Higher Education and the Anthropocene -

Towards an ecological approach to higher education policy in New Zealand

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Abstract

In this thesis I present an ecological direction for higher education policy in Aotearoa/New Zealand. This position is developed through an ecological approach to policy, which includes a postfoundational take on ecological theory, especially the work of Gregory Bateson and Felix Guattari. This ecological approach to higher education policy is in contrast to the neoliberal and technicist policy thinking which has informed New Zealand's *Tertiary Education Strategy* (Ministry of Education, 2014c). As a contrast, the ecological approach in this thesis draws strength from ecological economics, environmental politics, critical policy analysis, ecological theory and philosophical pragmatism. The methodological core of this approach is described as Critical Eco Pragmatism (CEP). Following a discussion of ecological theory and an exploration of the Global Ecological Crisis (GEC) as an interconnected problem of natural, political, social, psychological, pedagogical and epistemological dimensions, I develop a theoretical framework for being ecological in higher education. This framework draws on a critique of Ron Barnett's work on the ecological university (Barnett, 2010, 2018) and introduces the notion of 'Anthropocene Intelligence'. Anthropocene Intelligence provides a way to pragmatically bring together a range of theoretical ideas about education – especially those ideas that have a claim on improving our psychological, social and natural ecologies. This includes educational discourses that have not always had a high level of interaction, such as environmental and sustainability education (ESE), indigenous education, eco-pedagogy, engaged scholarship, ecological humanities, human development education, and education for wellbeing (including the healthy university). The potential of an ecological approach is also considered in relation to the many practical possibilities that currently exist in higher education policy and practice both internationally and in New Zealand. Together with the theoretical approach taken in this thesis, these practical possibilities inform the alternative, ecological direction this thesis develops for higher education policy in New Zealand. Included in this ecological direction is the aspiration for New Zealand to develop as an 'ecological democracy' (Dryzek, 2013).

Acknowledgements

We humans are social beings. We come into the world as the result of others'
actions. We survive here in dependence on others. Whether we like it or not,
there is hardly a moment of our lives when we do not benefit from others'
activities. For this reason it is hardly surprising that most of our happiness arises
in the context of our relationships with others.
– Tenzin Gyatso, 14th Dalai Lama

The idea of interconnection sits at the centre of this thesis. In contemplating the natural and social interconnection which makes up my existence, it is a humble process to thank some of those whose energies, ideas and support have been part of this thesis. In a very direct sense I would like to thank my supervisors, Professor Michael A. Peters and Associate Professor E. Jayne White. Their experience in this business has kept me focused on what matters. And even though I have been based several hundred kilometres from where they are, they have always sent timely feedback, advice and encouragement. They have been the best supervisors I could have hoped for.

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Abbreviations used in this thesis

Education is well-known for its use of acronyms. In drawing on the worlds of education and education policy this thesis is no exception. In general, the approach taken in this text is to use the full term at the beginning of each chapter (where it features) and the acronym throughout the rest of the chapter.

CEP	Critical Eco-Pragmatism
DESD	Decade of Education for Sustainable Development
EE	Environmental Education
EfS	Education for Sustainability
ESD	Education for Sustainable Development
ESE	Environmental and Sustainability Education
GAP	Global Action Plan
GEC	Global Ecological Crisis
GFC	Global Financial Crisis
GHG(s)	Green House Gas (emissions)
IMF	International Monetary Fund
IRP	International Resource Panel (of the UNEP)
ITPs	Institutes of Technology and Polytechnics
MDGs	Millennium Development Goals
NGO	Non-Government Organisation
NSCs	National Science Challenges
OECD	Organisation for Economic Co-operation and Development
RNZ	Radio New Zealand
SDGs	Sustainable Development Goals
SDSN	Sustainable Development Solutions Network
SE	Sustainability Education
SRC	Stockholm Resilience Centre
TEI	Tertiary Education Institute
TEO	Tertiary Education Organisation
TES	Tertiary Education Strategy (of New Zealand)
WWII	World War II
UN	United Nations
UNEP	United Nations Environment Programme

Higher education - a note on language

There are several different terms used in this study to refer to higher education systems and providers. In general the term 'higher education' is preferred over 'tertiary education', albeit that in different jurisdictions these terms can have slightly different meanings. In New Zealand, higher education refers more to the work of public providers, such as universities, wānanga and Institutes of Technology and Polytechnics (ITPs) whereas tertiary education refers to the total public and private provision of post-secondary education and training (The Productivity Commission, 2017).

In this thesis the focus for analysis is towards universities and ITPs (higher education). This usage is consistent with that typically used in literature addressing higher education and sustainability (see for example Tilbury, 2011). Similarly, this thesis typically uses the term 'Higher Education Institute' (HEI) rather than 'Tertiary Education Institute' (TEI). A little confusingly, in the New Zealand policy context, a TEI is a publicly owned body such as a university or ITP. A TEO, in contrast, is *any* organisation delivering or assessing post-secondary education. As a result, while this thesis generally uses the construction 'HEI' a switch is made however from HEI to TEI in Chapter 9.

Chapter 1: Higher Education and the Anthropocene

In July 2014 Jason Box, a professor in glaciology at the Geological Survey of Denmark and Greenland, tweeted about the newly found bubbles of methane rising in the Arctic (Merchant, 2014).

> If even a small fraction of Arctic sea floor carbon is released to the atmosphere, we're f'd.

As can usually be found in social media, this announcement was greeted with a variety of cynical, confused and laconic responses. An especially memorable tweet came from the handle @kanekos69, a person evidently living in one of Europe's struggling economies:

> I'm Greek, I'm already fucked.

Countless other news stories can be found on the internet about just how 'f'd' we are on planet Earth – socially, politically, economically and environmentally. Conversely there are also stories of humanity taking positive action – from record levels of investment made in renewable energy to the signing of the Paris climate agreement (Pearce, 2016, 2017). Hope does not come easy however in a context where there are daily reports of record weather events, record levels of inequality and record numbers of refugees trying to find their way into Europe. It can be a struggle to be optimistic too when, despite the compelling scientific evidence, there are public figures who pollute the political ecology by stating that climate change is a hoax, a wholly natural event or nothing more than a minor challenge. Such views could perhaps be written off as those of fringe lunatics, except for the fact that they have been tweeted by such figures as the President of the United States – Donald J. Trump (Mellino, 2015).

This thesis is concerned with how political ecologies interconnect with various social, pedagogical and natural ecologies. Leaving aside any judgements of hope for a moment, the election of Trump, along with other 'post-truth' political moments like Brexit and the rise of Vladimir Putin, indicate a global political environment that is in something of a flux at present. In some ways the

increasingly polarised political climate points to a possible fascist turn in global politics (Finchelstein, 2018). Certainly there is deep dissatisfaction with the way the status quo has been operating, and as climate denial meets climate action and pussy-grabbing meets #metoo, there is reason to think that the planet might be on the brink of some quite different approaches to policy – either from a more conservative (populist) perspective or perhaps something more progressive. This thesis takes its place on the latter side of this discussion and seeks to contribute to a democratic and deliberative approach to policy. In its own small way such an approach points to potentially unnoticed shifts already occurring deep within the policy mainstream. For example in 2016, the International Monetary Fund (IMF) published the report - *Neoliberalism: Oversold?* (Ostry, Loungani, & Furceri, 2016). This report questions some of the basic assumptions of the neoclassical thinking at the core of the unsustainable status quo in global policy approaches. Indeed given the IMF's role in heralding neoliberal policies since the times of Reagan and Thatcher, then IMF's equivocation is a small sign that alternative 'big picture' policy thinking could just possibly emerge.

Ecological policy analysis and an ecological approach to higher education - thesis questions and the central thesis argument

In a world experiencing so many dynamic and interconnected crises, this thesis argues that democracies such as New Zealand need to develop an alternative, 'ecological' approach to policy. The immediate focus for this discussion is how New Zealand's higher education policy could be transformed by ecological thinking. An ecological approach is in contrast to New Zealand's current approach to higher education policy, as exemplified in the *Tertiary Education Strategy (2014-2019)* (Ministry of Education, 2014c), with its focus on a narrow set of economic priorities. Instead, the ecological approach developed in this thesis draws from a philosophical or epistemological approach to 'ecology'. This approach emphasises interconnection, responsibility, limits and system thinking. It draws strength from a range of fields, including ecological economics, environmental politics, critical policy analysis, ecological theory and philosophical pragmatism. These ideas culminate in the view that an ecological approach to higher education needs to be part of a broader push for what John Dryzek has called an ecological democracy (Dryzek, 2013).

In an important sense then, there are two major rationales in this thesis – one based on New Zealand's approach to higher education policy and the other connected to the methodology of ecological policy analysis. Hence, while the original thesis ***questions*** were based very much on developing an alternative, ecological approach to higher education, the ***answers*** to these questions point to the potential of an ecological approach to policy that can inform much more than education policy. In this regard this thesis can also be thought of as a way of testing and exploring '***ecological policy analysis***' through the development of an ecological approach to higher education policy in New Zealand.

The methodological and policy arguments of this study are woven in and around the thesis questions. These questions are:

1. What is the Global Ecological Crisis (GEC) and to what extent is the GEC an educational crisis?
2. What does it mean to be 'ecological' in higher education?
3. What could an ecological approach to higher education policy in New Zealand look like?

The first of these questions requires an investigation into the broad context of higher education policy, including how the GEC can be understood in relation to education policy. Significantly, in attempting to understand the GEC, and develop an ecological approach to policy and higher education, it is necessary to explore what is meant by the term 'ecological'.

Traditionally, the idea of being 'ecological' has been associated with 'nature' or at least with being 'nature friendly'. As can be seen in everyday examples, from soap powder to solar panels, there are varieties of 'eco this' and 'eco that' which are designed to ameliorate humanity's impact on the planet and help us take some form of (consumerist) step towards planetary sustainability. At a deeper level, there are approaches to 'the ecological' which extend from this nature-loving standpoint to encourage systems thinking and ideas about interconnectedness. This thesis has set out more along this latter direction. The 'ecological' is subsequently seen as a more metaphorical way to understand the complexity and interconnectedness of the world. Ultimately this approach is less concerned with 'nature' as a separate context for humanity's impact, and more focused on the interconnections between different eco-systems – psychological, social, political and biological. From another perspective, this thesis theorises how human subjectivity, society and the biosphere are a series of interconnected systems which construct (or destroy) one another.

There are some important ontological positions taken by this thesis in seeing the world as a series of interconnected systems. The interconnected 'ontology' underpinning this thesis can be broadly aligned to an emerging focus on the 'actual' existence of the world, or what can be described as a realist ontology

(Archer, 1998) or the 'ontological turn' in social theory (Dall'Alba & Barnacle, 2007; Payne, 2016). While this thesis has not explored in depth its positions within these critical discussions, (and there is much that should be said about ontology following on from this thesis), arguments about interconnection and complexity – along with the realisation that humanity's activities can have unexpected impact on the 'real' world – help to justify why education needs to consider its sense of place and responsibility. 'Education' it is maintained in this thesis – as it is practiced in formal settings – should proceed on the basis that it actually happens on an interconnected and finite planet. Education indeed should recognise an ontology of place and being (Penetito, 2009; Wattchow & Brown, 2011), and from this position – responsibility (Barnett, 2018).

In making this connection to ontology and ecology, it should also be pointed out that as this thesis unfolds, I have subsumed questions of ontology, and the importance of education occurring 'in the world', within a broader than normal approach to 'epistemology'. Typically epistemology is concerned with rationalistic ideas about how knowledge is developed – how we, as humans, might build a theory of knowledge or justify how we might 'know' anything (Harries-Jones, 1995). The approach I have taken to epistemology in this thesis goes beyond the somewhat Cartesian assumptions that epistemology is a conscious act occurring in thought alone. It instead draws on the approach taken by Gregory Bateson's, whereby epistemology is seen as a recursive concept, one that reflects what is consciously and unconsciously included in the lived assumptions made by a 'system' (Bateson, 1972). An epistemology, from this perspective, always has ontological dimensions as the interconnected thoughts and actions (not all of them deliberate) reflect how humans can (habitually) make what Bateson calls 'epistemological errors' and fail to connect how the impacts of, for example, a growing economy, can lead to planetary scale degradation.

The use of a Batesonian epistemological approach to the ecological is reinforced in this thesis with a postfoundational philosophical framework. Such an approach

avoids essential truth claims about 'ecology' (or anything else) – yet draws on a socially constructed and pragmatist understanding of knowledge (B.G. Norton, 2005). Postfoundationalism can be summarised as a way of developing knowledge that is well theorised, conditional, provisional and subject to the scrutiny of the broader deliberative and scientific community. These ideas are explored in depth in the philosophical and methodological discussions in this thesis. In an overarching sense, postfoundationalism in ecological theory includes the idea that 'humanity' is not separate from nature at all – but deeply and politically enmeshed. In some ways this point seems obvious. Yet when the idea of what counts as ecological is unpacked through the work of such thinkers as Gregory Bateson, Felix Guattari, Lorraine Code, Rosi Braidotti, Timothy Morton and Fritjof Capra - then it is apparent that so much of what passes for thought in the Western tradition has occurred without this ecological consideration.

Ii is in this sense that the ecological approach to policy at the centre of this thesis is an attempt to develop a critical reset for policy on a 'finite planet'. Following on from a postfoundational understanding of ecological theory, this reset begins with an analysis of the GEC. Typically, the 'ecological' crisis might be seen in terms of the damage done to so many of the Earth's (natural) eco-systems. While there is a good deal of empirical evidence outlining this damage, a narrow focus on this damage misses both the interconnection between the planet's natural settings and the extent to which the global ecological crisis has psychological, social, pedagogical and political dimensions. In epistemological terms, the GEC can instead be understood as a crisis in the way humans think (and act, both consciously and unconsciously), as well as a crisis in the social and political contexts in which humanity constructs its 'thinking'. The policy implications of this view include the need to improve the quality of the planet's psychological, social and political environments as well as its natural environments. In brief, suitable policy responses to the GEC need to have a deep understanding of how 'culture' is at the centre of what is occurring in the biosphere.

Something of this type of thinking can be seen in the flurry of diverse academic activity now surrounding the 'Anthropocene'. In strict, scientific terms the Anthropocene is the name proposed for a new epoch in the Earth's geological timeline. For the scientists proposing the new epoch, 'The Anthropocene' marks a new stage in planetary history when the impacts of humanity are the defining feature of the Earth's stratigraphy. Plastic, mass extinction, ocean acidification and changes in the planet's levels of carbon dioxide can now be seen as a distinct layer in Earth's geology (Steffen, Broadgate, Deutsch, Gaffney, & Ludwig, 2015; Steffen, Grinevald, Crutzen, & McNeill, 2011; Zalasiewicz, Williams, Steffen, & Crutzen, 2010). For philosophers, educators and social scientists, the idea of the Anthropocene has ethical and intellectual implications linked to a world in which humanity can no longer ignore its natural contexts and/or assume that 'culture' can exist independent of our interconnection with the biosphere (Hamilton, Gemenne, & Bonneuil, 2015; Malone, Truong, & Gray, 2017).

The interconnected nature of the GEC and the Anthropocene also helps explain how policy is at the heart of what is happening to the planet's social and natural systems. One of the ways in which this can be understood is in the economic assumptions underpinning human social and political activity (including higher education policy). In answering the thesis question – what is the GEC? – I argue that mainstream economic thinking is an unhealthy component of humanity's psychological, social and political ecologies because it typically assumes that the consequences of economic growth can easily be decoupled from their impacts on the biosphere. From a slightly different perspective, mainstream economics has prioritised single, discrete variables, such as economic growth, without reference to the wider systems in which this growth occurs. While this sort of approach 'works' up to a point – the realisation that Earth is undergoing human-induced climate change – and a sixth great planetary mass extinction – is also evidence that this assumption should no longer be relied upon, at least not without the addition of other forms of thought.

The failure of mainstream economics informs this study's commitment to an ecological approach to economics and the development of an ecological approach to policy, including higher education policy. Ecological economics can be understood as a branch of heterodox economic thinking, one in which biophysical limits are more clearly built into the need to develop radical economic alternatives to the status quo (Spash, 2012, 2013). While there are deeper and shallower forms, it is the deeper forms of ecological economics which provide the preferred policy partner for the thinking in this thesis. Ecological economics is an interdisciplinary field where policy alternatives can be explored. Besides the emphasis on 'alternatives to growth', ecological economics brings with it a focus on how issues such as inequality, environmental justice and food sovereignty can be addressed within a sustainable economy as well as how, 'multi-dimensional forms of wellbeing', can be evaluated and considered as a central policy focus (Costanza et al., 2017; Higgs, 2014; T. Jackson, 2016).

In addition to its links to ecological economics, the ecological approach to policy in this thesis is linked to the tradition of critical policy analysis. Critical policy analysis is a field of analysis that has emerged from a diverse set of theoretical orientations which nevertheless all share an interest in analysing the ideological components of policy (Prunty, 1985; Rein, 1983; S. Taylor, 1997). Critical policy perspectives can be seen in contrast to the technicist policy thinking that dominates mainstream public policy thinking. Technicist policy analysis is characterised by assumptions that there is an easy separation between 'facts' and 'values' and that policy problems are amenable to rationalistic, scientific and (ostensibly) non-political forms of thinking (Codd, 1988). Technicist policy analysis does not challenge the instrumental assumptions provided by the mainstream's neoclassical economic foundation and its theoretical connections to such fields as human capital theory (Fitzsimons, 1997).

As part of its critical orientation, and the development of an eco-critical approach to policy, this thesis also draws from a range of other fields with links to ecological thinking. This includes ecological citizenship (Dobson, 2012) and

ecological democracy (Dryzek, 2013; M. A. Peters, 2017a). Indeed the notion of ecological democracy takes on a central role in this thesis as the development of both ecological policy and ecological education forms are seen as interlinked to the possibilities for ecological democracy.

Following on from the exploration of such concepts, the idea of ecological education is developed in this thesis with reference, at least initially, to the work of Ron Barnett and the emerging discourse surrounding the Ecological University (Barnett, 2018). In the original development of this thesis, Barnett's ideas about the Ecological University first led my thinking down a Guattarian path. The approach I take in this thesis can be seen as an attempt to add to the existing thought that exists about ecological education, including going beyond the traditional 'green' approaches developed over time. Hence while environmental and sustainability education (ESE) is included in a thesis framework for ecological education, I argue that a wide range of other educational thinking should also be included under the banner of 'ecological'. Indeed ecological education should reflect the ***content, thinking and engagement*** that extends from a postfoundational approach to ecological thought. Subsequently educational initiatives that could contribute to the health of our learning ecologies, knowledge ecologies and/or the planet's diverse psychological, social, political or natural ecologies, need to be considered as potential aspects of an ecological educational approach. Significantly, the focus on educational content, thinking and engagement means that an ecological approach to education is not limited to being a niche within education, but the basis for an overall approach to education policy and practice.

This approach to ecological education underpins how many different theoretical and practical possibilities could inform an ecological approach to higher education policy in New Zealand. In broad terms, this alternative direction reflects how educational policy could be developed with more emphasis on planetary limits, indigenous forms of knowledge (including the possibility for a 'healthy' partnership within the Treaty of Waitangi), diverse forms of human and

non-human wellbeing, systems thinking, interconnection, and the need to develop New Zealand as an ecological democracy. As a practical example of such thinking, New Zealand's higher education system could be governed by a broad policy approach which aims to achieve *all* of the United Nation's Sustainable Development Goals (SDGs) (and not just those that suit a particular government's policy focus). An ecological higher education system would also see students, staff and tertiary education institutions (TEIs) each develop 'Anthropocene Intelligence'. From such a basis New Zealand could aspire to lead the world in 'ecological' (or Anthropocene) education. Drawing on the sorts of ecological thinking identified in this thesis, New Zealand could even be in a position to lead the world in developing deeply ecological policy responses across a range of economic, social, pedagogical and natural ecologies.

The chapters of this thesis

This section explores how each of the following chapters contributes to the twin ambitions of this thesis to develop an ecological methodology for policy as well as an ecological framework for higher education in New Zealand. It provides details about each chapter and explains how the chapters work together to build the thesis argument. At the end of this section an outline is provided about the key recommendations made by this thesis for an alternative, ecological direction for higher education in New Zealand.

Integrated into this discussion of the thesis chapters are specific points about the limitations of these chapters. In introducing the chapters of this thesis it is important to recognise early on the strengths and weaknesses of this thesis and how this impacts on the overall objectives of this thesis and its specific chapters. At this early stage in the thesis, it is important to acknowledge the very broad scope of this thesis. The breadth of this thesis extends to many different literatures and conceptual frameworks on the way to making some suggestions about a new direction for New Zealand's higher education policy. In a sense, this thesis 'assembles' (perhaps too) many diverse forms of knowledge to address a 'policy' problem and provide a scholarly version of what is typically attempted in

a more technicist fashion in government policy agencies in neoliberalised democracies such as New Zealand.

While the breadth and ambition of this thesis provides a creative, critical, philosophical and ecological take on policy making – it necessarily has to sacrifice depth in many areas. This point is surrendered across the thesis by noting that there are many directions and ideas that cannot be fully and critically examined. The point is also made that this thesis represents the beginning of a survey from which additional critical scholarship could add considerable value (and no doubt contradict in specific cases). While an especially critical reader may see the final recommendations of this thesis as too speculative or unjustified, the point worth repeating is that this thesis nevertheless still represents an alternative approach for how (ecologically-minded) scholars may tackle the sorts of complex, integrated policy questions that are too often left to government policy shops (especially in New Zealand), and variously funded think tanks.

Being ecologically minded is very much the focus of the following chapter in this thesis. This chapter is intended to provide an introduction to the complexity of ecological thinking and explores a variety of philosophical and scientific ideas about the 'ecological'. This chapter presents five main groups or discourses of ecological thought – the romantic, scientific, radical-modernist, non-western/indigenous, and postfoundational. These groups are not discrete entities but overlapping (entangled) constructions of what it means to be ecological. While there are no doubt many ways in which ecological thought might be categorised, the five groups used in this thesis have been chosen for the way they reflect a broad evolution in epistemologies. Emerging from the more magical tendencies of the Romantic tradition, I then discuss how scientific approaches to the ecological can't quite contain the political interconnections of ecological thinking. Radical-modernist ecological thinking exemplified by the likes of Murray Bookchin and Arne Naess shows both the inevitable political quality to ecological thought, but also the limits of single frameworks for developing an ecological epistemology. Indigenous and non/Western ecological thought is

referenced to (briefly) point out that there is much that can be learnt outside of Western traditions. As this chapter winds through these different views it eventually points to the need for a critical and postfoundational approach to ecological theory. This approach does not exclude the wisdom of other approaches to the ecological, but instead draws on an interconnected epistemology to understand how psychological, social, political and natural systems construct one another. This approach to ecological theory, draws especially on the work of Gregory Bateson and Felix Guattari. For example, Bateson's ecology of mind (Bateson, 1972) and Guattari's triplex of ecologies (Guattari, 2000) to provide a philosophical and theoretical basis for policy and educational thinking that does not depict either 'humanity' *or* 'nature' as the central unit of survival, but rather sees a necessary interconnection between the psyche, society and the environment. This approach to the ecological is not limited to particular (fixed) views about 'nature' or even inflexible ideas about education, society and the economy. Postfoundational ecological thinking is flexible and can draw on scientific discourses about the ecological – such as the application of systems thinking or the collection of ideas that exists about biophysical limits, while also eschewing the idea that these are the only possible ideas for what is 'ecological'.

The critical postfoundational approach to ecological theory that is developed in Chapter 2 is carried over into a Chapter 3's discussion of the thesis methodology. At the core of this chapter is the development of what is described as Critical Eco-Pragmatism (CEP). CEP is a theoretical basis for ecological policy analysis. This chapter begins by providing an overview of CEP and explaining its potential in relation to ecological democracy and ecological economics. In line with the views expressed by John Dryzek (Dryzek, 2013), the key feature of an ecological democracy is its ability to 'learn'. This ability is based on its deliberative qualities, including the possibility of excluding from the deliberation the contributions made from 'post-truth' positions. In line with the postfoundational approach taken in this thesis, 'learning' here is analogous to an integrated, pragmatic inquiry developed on the basis of an ecological understanding (or ontology). As

Dryzek suggests, an ecological democracy provides a structure to facilitate collective learning around the ideas of sustainable development, ecological modernisation, green radicalism and democratic pragmatism (Dryzek, 2013). Ecological democracy subsequently aims to bring together diverse points of view in a way that could allow for more deeply sustainable policy solutions.

At a methodological level, CEP is connected to the need for policy alternatives in an ecological democracy. It is at this point that the policy alternatives implied by ecological economics becomes important. In contrast to mainstream approaches to economics, ecological economics takes seriously the unsustainable scale of the global economic footprint. Moreover, in line with the comments above about the breadth of this thesis, this chapter is unable to deliver a full critical evaluation of how ecological economics might be critically incorporated into the methodology of this thesis. Instead, following this introduction, the remainder of this chapter provides a rapid overview of the theoretical elements of CEP - critical policy analysis, ecological theory and philosophical pragmatism. The theoretical trajectory of this discussion is subsequently used in Chapter 4 to help analyse the interconnected nature of the GEC. Chapter 4 directly addresses the first research question and unpacks the GEC as a crisis across the planet's multiple interconnected ecologies – psychological, social, political and natural. The biospherical dimensions to the GEC are linked to the transgressing of planetary boundaries (Steffen, Richardson, et al., 2015), and the role played by the assumption (or addiction) that humanity can continue to grow its economies (and hope for the best). This chapter is an obvious place to concede the complexity and size of the GEC – especially in relation to what is possible to discuss in a single thesis chapter. That said, this thesis does still introduce the idea that the GEC is a crisis linked to humanity's 'success' as a species, or at least its success in developing large scale social and economic structures. In Bateson's terms, consumer capitalism 'works' ... up to a certain point (Bateson, 1972, p.487). As is discussed in this chapter, humanity has already gone well beyond this point.

Similarly, one of the key points made in this chapter is that the GEC is a crisis in the way humans think (and act). The issue of human 'thinking' (both consciously and unconsciously) is highly relevant to the arguments made in Chapter 5. Chapter 5 continues the discussion of the GEC in Chapter 4, but this time focuses on the second research question – the issue of whether the GEC is an educational crisis? The short answer to this question is that it is only partially an educational crisis. This answer is justified in light of the overall judgement that the GEC is not the result of a single variable, but instead has to be seen in relation to multiple dimensions or ecologies. Education though must be seen as an important aspect of the GEC, as well as a way to address the epistemological errors underpinning humanity's economic and political ecologies. This point helps build the overall case that education should not be seen as a separate policy issue but needs to be understood within the overall relationship humanity should have with its local and planetary interconnections.

In exploring how humanity's epistemological errors reflected in education, Chapter 5 explores some aspects of the history of Environmental and Sustainability Education (ESE). This chapter suffers from the shortage of critical historical work in relation to environmental and sustainability education but nevertheless makes the argument that the history of ESE can be seen as a way of responding to the unsustainable trajectory of global society - albeit that ESE has not been able to reorient mainstream education towards a healthy approach. In a broad sense this chapter points to the ongoing theoretical challenges that dogged ESE and limited its ability to reorient mainstream educational practice.

Chapter 5 provides an introduction to a deeper discussion about ecological education which follows in Chapter 6. Chapter 6 places the aspiration for all higher education to be oriented by an ecological approach. In particular, this chapter explores the idea of an ecological approach to education, in terms of the work of Ron Barnett and also in relation to the growing or emerging discourse surrounding 'the ecological university' (Barnett, 2010, 2013, 2018). Chapter 6 directly addresses the second research question – the nature of ecological

education. It builds on the earlier arguments about 'being ecological' and extends what ecological education means through a critique of the ecological university. Barnett's ecological university is a newly emerging, philosophical approach to ecological education – one, that is not connected to the history of ESE, but more aligned to the history of educational discussions that include such names as Newman, Humboldt and Readings. For Barnett, the ecological university supersedes the current (neoliberal) emphasis on the entrepreneurial university, and has a deeper sense of responsibility and engagement towards the university's multiple ecologies. Drawing on a Guattarian framework, Barnett suggests that the ecological university "is none other than the fullest expression of the idea of the university" (Barnett, 2010, p. 151).

Chapter 6 not only critiques Barnett's work but also surveys the emerging discourse surrounding his concept of the ecological university. In general, most of those who cite Barnett's work are not especially critical of this work, and are indeed more likely to use his point of view to reinforce their own arguments against the increasing neoliberalisation of higher education. Where deeper criticisms of the ecological university have emerged, they draw on pragmatic and posthumanist ideas, similar to those underpinning this thesis. In a minor way these criticisms reinforce the critique of Barnett's work presented in Chapter 6, which focuses on the under-theorised approach he has taken to 'things' ecological, the lack of any real emphasis he places on human subjectivity, the limited outline he provides for an ecological curriculum, and the limited political scope of his work.

In Chapter 7, the critique of Barnett's work joins up with the postfoundational ecological ideas presented earlier in the thesis. The focus for this chapter is the construction of a broad theoretical framework for an ecological approach to higher education. This chapter directly answers the question about what it means to be 'ecological' in higher education, albeit that the philosophical framework presented in this chapter is but the start of what might be identified as a fully 'ecological' approach to education practice. There are many significant

aspects to this framework, including how neoliberal and liberal approaches to education are considered as competing philosophical approaches within education. This framework also explains how an 'ecological' approach to education needs to draw on far more forms than those traditionally championed within ESE, including such fields as engaged scholarship (Watson, Hollister, Stroud, & Babcock, 2011), ecopedagogy (Fassbinder, Nocella, & Kahn, 2012; Kahn, 2010) and ecological humanities (Farrelly, 2010).

Central to Chapter 7's framework is the concept of 'Anthropocene Intelligence'. Anthropocene Intelligence is a concept that has been developed as part of this study. Its development has been used to explore what a set of contestable eco-theoretical principles might look for higher education. It has a broad range of possible applications (which go well beyond what is possible to discuss in this thesis), including as a basis for evaluating the extent to which graduates have the knowledge or wisdom required for this new geological age. While the notion of Anthropocene Intelligence can also be linked to approaches such as ecological and sustainability literacies (see for example, Orr, 1992 or Stibbe & Villiers-Stuart, 2009) its real worth comes from its ability to place ecological thinking at the centre of higher education. Beyond the niche role ESE has typically defaulted to within mainstream education, Anthropocene Intelligence brings together ecological theory, the idea of the ecological university and critical approaches to ESE (and other educational forms). Anthropocene Intelligence represents the basis for a new approach to mainstream education 'in' and 'for' the Anthropocene (Lloro-Bidart, 2015).

Chapter 8 somewhat reinforces the theoretical discussion developed in the earlier chapters to explore how existing policy examples might add to what is possible in ecological education. This chapter discusses the context of global policy making before examining some existing global policies and practices. These policies and practices provide a way of understanding what practical examples can inform an ecological approach to New Zealand's higher education context. Given the dominance of 'sustainability' education globally, this chapter

devotes some of its discussion to the newly developed Sustainable Development Goals (SDGs) and initiatives that have been developed in relation to the Decade of Education for Sustainable Development (DESD). It also explores examples of educational practice connected to engaged scholarship.

Chapter 9 examines the policy and practice context of higher education in New Zealand. This chapter points to the mixture of domestic possibilities that exist in support of a more ecological approach to higher education policy in New Zealand. Significantly, the New Zealand policy context has recently shifted with the election of a Labour-led coalition government in September 2017. The strong emphasis on environmental sustainability advocated for by this government represents a considerable change from the preceding nine years when New Zealand's political ecology was dominated by National-led governments. The governments led by John Key and Bill English oversaw a 'growing economy' along with unprecedented levels of environmental damage, homelessness and child poverty. High levels of success and failure in the language used to describe the GEC earlier in this thesis.

Despite the recent change of government in New Zealand, Chapter 9 makes clear that much of New Zealand's higher education policy and practice context nevertheless operates in a strongly neoliberal or 'entrepreneurial' manner (Barnett, 2010). That said, this chapter also identifies that there are also some policy and practice features that could still support an ecological direction for higher education in New Zealand. Specific policy initiatives included in this discussion are the New Zealand's Living Standards Framework and the possibilities that could be developed from via the United Nations Sustainable Development Goals (SDGs). At the level of educational practice, a limited survey of tertiary educational practices in this chapter shows that there are pockets of ecological expertise already within the system. There is less evidence that universities and polytechnics are prepared to become 'ecological' providers, in a deep sense, although some of the recent practices from Victoria University and

Otago Polytechnic, for example, show that questions of sustainability and engaged scholarship are being taken seriously by some higher education leaders.

Chapter 10 is the culmination of the thesis and presents the alternative direction for higher education policy in New Zealand. This chapter is also an opportunity to reflect on what has been learnt in this study, including what has been learnt about the application of an ecological approach to policy. In terms of the specific policy possibilities for higher education in New Zealand, this chapter points to how the current system could be broadly reconfigured. It presents a series of policy suggestions that attempt to move the current policy settings towards a far more ecological approach. Overall, what is intended in these policy recommendations can be compared to a government 'green paper', in that these proposals present what could be – in New Zealand's higher education policy. As was discussed at the beginning of this section, there is much more depth and discussion needed across the broad scope of this thesis to provide something approaching an authoritative set of possibilities for the ecological in New Zealand's higher education policy. That said, the major recommendations in this chapter are that New Zealand develops:

- A genuine commitment to ecological democracy, one which is oriented towards a strong version of sustainability, including an economy (society) that operates within biospherical limits;
- A commitment to leading the world in realising the UN's Sustainable Development Goals (SDGs) as a medium-term focus towards becoming an ecological democracy;
- An aspiration to develop the education system (including higher education) to be a world-leader in ecological education;
- A transformed set of priorities for the *Tertiary Education Strategy (TES)* so that there is much less emphasis on instrumental economic goals and more emphasis on education for: collective wellbeing; global and community interconnection and engagement; being 'future-ready'; realising the principles of the Treaty of Waitangi; and becoming an inclusive higher education system;

- A review of all current tertiary education policies, including governance and international education to ensure that they are consistent with the development of New Zealand's tertiary education system as a world-leader in ecological education;

- A national research strategy which supports New Zealand's transition to becoming an ecological democracy and also aims to develop a thriving research community in New Zealand. A significant focus of this strategy includes how research is undertaken in tertiary education, including by way of the National Science Challenges (NSCs);

- An independent (government funded) professional development service which would support tertiary education institutes to develop Anthropocene Intelligence as part of their teaching programmes; and

- An independent system of monitoring, evaluation and reporting about how well tertiary education institutes are realising the aspiration of New Zealand to become world leaders in ecological education.

Towards ecological policy in an ecological democracy - some reflections on the thesis journey

Following the presentation of the above recommendations, the thesis concludes with a final reflection on the issue of ecological policy analysis. This section in Chapter 10 is a reminder that there are different ways of approaching policy. Beyond post-truth and the politics of unsustainability, beyond technicist thinking, neoliberalism and the welfare state, is a set of ecological possibilities for policy - such as that attempted in this thesis. From this perspective, this thesis has drawn on a more interconnected epistemology than is typically used in policy thinking. While this thesis is just one small example of what might be undertaken in the name of ecological policy analysis and multidimensional forms of 'health', there are many more ways in which ecological policy thinking itself might be carried out. Ecological policy analysis is not limited to education either, and the potential exists for ecological policy extends across economic policy, social policy and policies that support social and natural wellbeing.

While this final reflection – at the end of the thesis – seems fitting for the learning journey this thesis has taken, there are other reflections that can be made too – reflections linked more closely to the experience of the author as part of the scholarly process. As I write this now, at what is the very end of the thesis project, and reflect on what has been produced, I am daunted at how little one thesis can achieve, while also marvelling at how much work one thesis actually involves. When this thesis was first explored, I was concerned with the possibilities for higher education to respond to issues of 'sustainability'. As the theoretical difficulties facing sustainability emerged in my thinking, and the work of Ron Barnett led me to explore what the potential of 'the ecological' could mean – the thesis started on its path to becoming the (overly) ambitious project filling my days from November 2014 to October 2018. The thesis subsequently took on some deeper questions about the approaches that were really needed to develop 'better' policy for a finite planet, while also refusing to let go of its initial desire to flesh out something of how higher education might itself change.

The emerging ambition of this thesis in the early stages helps explain something of the breadth of this thesis and its occasional 'stretching' of ideas at the expense of more in-depth analysis. Using such a 'galloping breadth' approach is not an easy way to write a thesis and it is important to acknowledge how reliant such work is on the scholarship of others. Engaging with high quality scholarship, drawn from either a broad or more specific focus, has been a rewarding pleasure as well as a lesson for me (and others hopefully) on how such work can be drawn together to inform and construct alternative ideas about how education, or indeed any other area of public policy. We are, it is important to remember, always dependent on communities. In this regard, and for what it is also worth to those contemplating a similar journey, I do offer a couple of personal observations. The first of these is especially addressed to those interested in attempting 'broad' policy theses, perhaps similar to this doctoral project. As valuable as such projects might be, I have also found potential that there is a constant insecurity attached to making 'broadly argued' points, especially when compared to how one may feel specialising in more discrete knowledge

problems. I would also point out, for those contemplating work on education and the fate of the planet, that they might face pressures above and beyond those typically imposed by thesis writing. From my perspective, I have found something highly confronting about the ongoing analysis of human 'unsustainability', to use Blühdorn's term. In the context of glancing up from my study and imagining how real change might arrive, I've found myself regularly feeling pessimistic about humanity's habitually expanding planetary footprint and the forces that seem so resistant to positive change. It can get you down, and in making this point, I suspect it will take me just a little time to regain all of that happy optimism which I had at the beginning of this project in November 2014.

Of course, as is also pointed out in the final chapters of this thesis – things can change – and this should be a source of optimism to me and all others. When I left New Zealand's public service late in 2014, and began working on this thesis, John Key's 'fifth' National Government was only part way through a policy programme that might be deemed anything other than ecological. A catalogue of serious policy concerns surrounded the work of this government – ranging from issues of water quality, housing affordability, child poverty, obesity and mental health failures. While this was a government that prided itself on New Zealand's moderately high levels of economic growth, it has also overseen a time of considerable damage to New Zealand's social and natural ecologies. Indeed, in between watching this government in action, and my many anxious and pessimistic imaginings about the future, I did feel at times that this thesis was an act of real rebellion (or in some darker times, something of a lonely 'cry' in the wilderness).

However, as I write this now, at the beginning of 2019, my own dented optimism is offered hope by a new government which wants to lead the world in climate change policy (J. Shaw, 2018) and develop the planet's first wellbeing budget (G. Robertson, 2018). As I return to New Zealand's public service now, time will tell if such moves towards wellbeing and public policy lead to the sorts of transformations that might be required for 'healthy' living, ecological democracy

and anything like 'actual' sustainability. And regardless of whether my same earlier levels of optimism return, there is something to hold onto in realising that change is still possible and the ethical thing to do is to support that change. This is not a blind endorsement of any positive sounding politics of course, but a question of examining how change can build momentum and realising that above and beyond any individual efforts, communities and nations can still achieve amazing things.

Chapter 2: Towards a critical-postfoundational understanding of the ecological

> *Let us agree from the outset that ecology is no magic term that unlocks the secret of our abuse of nature.*
>
> - Murray Bookchin Social Ecology versus Deep Ecology, 1987

In this chapter the concept of 'the ecological' is explored. The point of this exploration is to understand the different meanings of ecological and to explain how ecological is used in this thesis. In turn, the approach developed to the ecological in this chapter is used to help understand the context of higher education (the Global Ecological Crisis or GEC) and the possibilities for an ecological approach to higher education policy. In general, this thesis uses 'ecological' in a way that goes well beyond traditional and 'nature-based' definitions. Instead it posits an epistemological, interconnected and postfoundational approach, one that sees the world in terms of interconnected ecological systems.

In developing such an approach this chapter considers the often vague notion of 'the' ecological world view. While such a view is often assumed to be just one, holistic paradigm (often dressed up in scientific language), the notion of 'an' ecological world view can, at least in some cases, be a mish-mash of green theorising. In unpacking how such a 'mish-mash' can operate, the diversity of eco-theory discourse is explored below. Five strands of ecological thought are discussed: the Romantic – the Scientific – the Radical Modernist – the non-Western/Indigenous – and the Postfoundational. Each of these strands has particular strengths and weaknesses, although this chapter concludes that a critical postfoundational approach, which draws on aspects of these other perspectives, offers the most theoretically coherent and useful approach to the ecological. This approach draws on the work of many theorists, but the work of Gregory Bateson and Felix Guattari forms the basis of what is meant by ecological in this thesis.

'An' emerging ecological world-view

In many of the different discourses surrounding the Global Ecological Crisis (GEC), there is an assumption about the meaning of 'ecological'. Typically the word 'ecological' refers to issues of the 'environment', biosphere, or more generally 'nature'. Such comments can be seen in the following examples observed in the New Zealand policy context:

> *Strong sustainability means the preservation of the integrity of all ecological systems in the biosphere* (Sustainable Aotearoa New Zealand, 2009, p. 1).

And:

> *Maintaining the ecological sustainability of key parts of our environment will be critical to the sustainable development of New Zealand as a whole.* (New Zealand Office of the Parliamentary Commissioner for the Environment, 2002) p. 119

In addition to this 'literal-environmental' use of the word ecological, there is another approach which enlarges the notion of the ecological from a literal interest in 'nature', to a wider interest in relationships and interconnections. Such an approach is typically seen in scientifically-minded literature, for example in the work of Fritjof Capra and Edward Goldsmith (see the sub-section below). It has also been captured in the educational and psychological literatures via ideas such as Ecological Systems Theory (Bronfenbrenner, 1979, 2005) and the New Ecological Paradigm (Dunlap, Van Liere, Mertig, & Jones, 2000; Lundmark et al., 2007). Stephen Sterling has, for example, been a powerful advocate for an 'ecological-systems' approach and his work has energised sustainability education by providing 'an' ecological educational framework in response to what he has called a mechanistic worldview (P. Jones, Selby, & Sterling, 2010; Sterling, 2001, 2003, 2010).

Sterling's approach reflects some of the potential for theoretical challenges in articulating a more complex, ecological worldview. In Sterling's case, this tension is most obvious when he actively contrasts the idea of an ecological worldview with a mechanistic worldview. For example, Sterling characterises the move from

mechanistic to ecological as a "shift of emphasis away from relationships based on separation, control and manipulation towards those based on participation, empowerment and self-organization" (Sterling, 2001, p. 49). However, in the summarising of the ecological worldview *versus* the mechanistic worldview, the process can oversimplify these two into simple oppositions. As is set out in the book *Sustainable Education* (2001) Sterling opposes the mechanistic paradigm with 'the' emerging ecological paradigm:

Figure 1: Stephen Sterling's 'Core Values' of an ecological paradigm for education

Level 1: Educational Paradigm - Core Values	
Mechanistic	**Ecological**
Preparation for economic life	Participation in all dimensions of the sustainability transition – social, economic, environmental
Selection or exclusion	Inclusion and valuing of all people
Formal education	Learning throughout life
Knowing as instrumental value	Being/becoming (intrinsic/instrumental values)
Competition	Cooperation, collaboration
Specialisation	Integrative understanding
Socialisation, integrating to fit	Autonomy-in-relation
Developing institutional profiles	Developing a learning community
Effective learning	Transformative learning
Standardisation	Diversity with coherence
Accountability	Responsibility
Faith in 'the system'	Faith in people
Modernity	Ecological sustainability

(Sourced from Sterling, 2001, p. 58)

Although this description clearly differentiates between 'an' ecological and 'a' mechanistic approach to the world, as Sterling himself is probably aware, such a dichotomous presentation undermines his earlier point about the need to shift in emphasis *away* from 'separation, control and manipulation' *and towards* participation, empowerment and self-organization. Hence, although Sterling

didn't perhaps intend to create a dichotomy, this is nevertheless a plausible interpretation of the above table. Such dichotomies can be overly simplistic, as the following questions imply: Is faith in 'the system' somehow wrong? Can effective learning be transformative too? Part of the reason for this difficulty is that it is not clear what the relationship should be between the mechanistic and ecological paradigms, beyond that of opposites at least. In many senses Sterling's work seems to want to replace the mechanistic metaphor, which he says is "increasingly becoming untenable" (2001, p. 49), but this also leaves hanging the extent to which an ecological and mechanistic metaphor could work together.

Similarly, it is also not clear how aspects within the emergent ecological paradigm relate to one another. For example, Sterling outlines how the following components can be taken as evidence for a new ecological approach to thinking (and education):

> Evidence of this emergent ecological paradigm can be seen in aspects of ecological thinking; in particular, ecophilosophy and deep ecology, social ecology, ecofeminism, transpersonal and eco-pyschology, creation spirituality, and holistic science, as well as more practical expressions in areas such as ecological economics, sustainable agriculture, holistic health and ecological design and architecture. (Sterling, 2001, p. 50)

Sterling does not specify how these different approaches to 'the ecological' should be resolved. The use of the term 'emerging' arguably however provides some guidance here. What Sterling may be suggesting is that exponents of social ecology, with its materialist and anarchic underpinnings, and followers of creation spirituality, with what may be described as an allegiance to the mysticism of Thomas Aquinas (and others), can satisfactorily exist under an umbrella known as an emerging ecological paradigm. Perhaps the paradigm can be considered to be 'emerging' because such diverse philosophical approaches seen have yet to be resolved into a final ecological understanding? More likely is that these theoretical tensions in the 'ecological' world-view need to be more carefully considered in order to deeply understand what is meant by 'ecological'.

Approaches to the ecological

One way to reconcile the range of understandings of the 'ecological' is through an approach which groups and analyses the various views of the ecological in terms of their different thematic ideas, origins, patterns or structures. On this basis then, there are five epistemological or discursive categories of the ecological: Romantic, Scientific, Radical/Modernist, the non-Western/Indigenous and Postfoundational. Each of these broad types is discussed below. This discussion is followed by an argument explaining how a critical approach to postfoundational ecological thought is the most useful and rigorous philosophical framework for this thesis.

Romantic and Mystical approach to the ecological

In philosophical terms, Romanticism is an approach to knowledge that stands in opposition to Rationalist and Empiricist approaches that emerged as part of The Enlightenment in the 18th and 19th centuries. The origins of Romanticism have been linked to the philosophy of, for example, Jean-Jacques Rousseau, and the writing of literary figures such as William Wordsworth and Samuel Taylor Coleridge (Lane, 2014; Rigby, 2014). Key philosophical concerns for Romanticism include the relationship between 'people' and 'nature' as well as the extent to which enlightenment forms of technology and reason should be able to dominate society via such processes as the industrial revolution.

The Romantic tradition is the origin for some important aspects of 'ecological' thinking. For example, from Rousseau comes the idea that civilisation has had a corrupting influence on 'human nature', preventing it from truly being free and fulfilling its potential. Romanticism's tendencies towards holism, interconnectedness and artistic subjectivity (as opposed to 'scientific' objectivity) also signal the beginning of a critique that questions Cartesian forms of dualism and those forms of analytical thinking which reduce the understanding of complex entities down to their disconnected and lifeless components (reductionism). From Romanticism comes an emphasis on intuition, imagination and creativity as a reaction to the scientific and rationalist features emerging during The Enlightenment. Importantly, the Romantic tradition places great

emphasis on human abilities to love nature and, under the right circumstances, become liberated through the exploration of 'deeper' forms of emotion and thought (Bate, 2013; Oerlemans, 2004).

While this scant summary of Romanticism does little to emphasise the complexity of this movement, nor the great worth of its philosophy, literature and art (Hammond, 2004), it does at least introduce the idea that some forms of ecological thinking are propelled by greater and lesser forms of Romanticism. Indeed, while many contemporary (radical) approaches to ecology have arguably built upon Romanticism's questioning of dualist, mechanistic, empiricist and rationalist thought, there are also strands of ecological thinking which display less critical versions of Romanticism. In this respect there are elements of contemporary ecological thought that not only question scientific rationalisation, but are avidly anti-reductionist, anti-mechanistic, anti-technology and highly content to ground their epistemology in, for example, a highly questionable eco-spirituality and, in some cases, the promise of either an eco-utopia, or, failing that, an apocalyptic climax to industrial civilisation (Dean, 2001; Dryzek, 2013; Hay, 2002).

Sterling's dichotomous table (above), squaring off 'the' mechanistic worldview and 'the' ecological worldview, can be interpreted as an uncritical Romantic approach to ecological thought. While Sterling himself implies a more critical and overlapping transition away from mechanistic thought and towards an ecological worldview, the dualisms in this table suggest a 'good' v. 'bad' view of the world. This is also seen, for instance, in aspects of Edward Goldsmith's famous work *The Way – An Ecological World-view* (Goldsmith, 1992) with its polemical view on the fundamental failures in mainstream approaches to science and technology. For example, with reference to the lack of mainstream science's lack of acceptance of James Lovelock's Gaia hypothesis (Lovelock, 2000), Goldsmith makes the following point:

> Reductionist science clearly cannot help us understand the problems caused by
> the disintegration of a larger system, such as an ecosystem or Gaia herself,

whose principle feature it continues to deny and whose very existence, except in a metaphorical sense it continues to question. (p. 20)

An uncritical Romanticism is also evident in those Westerners seeking an 'ecological' foundation in the Earth mother, and the need to free ourselves from our shallow consumerist nightmare by undertaking a full spiritual 'awakening'. Such views can be inferred, for example, from the course statements on offer at the 'ecologically' focussed Schumacher College. From a 2017 web page providing an overview of the short courses at Schumacher comes the following:

> Drawing on spiritual traditions and indigenous wisdom from around the world and contemporary understanding of the nature of mind and consciousness, this exciting programme of short courses and events brings people together to explore the interface between our inner landscape and the outer world. (Schumacher College, 2017)

The statement above also shows how some Romantic tendencies in ecological thought can become mystical in their intensity. This is not to suggest however that there is no place for considerations of spirituality in relation to human relations to the planet. The point that the ecological crisis is linked to some form of spiritual malaise is compelling, especially in relation to a critique of the materialism and consumerism of Western society. The question is however one of degree, or at least criticality. What categorises such discourse as Romantic/Mystical is the extent to which it becomes 'a' fundamental solution. As Dryzek suggests, even if social attitudes changed dramatically, would humanity also be able to change its unsustainable economic, social and political structures? (Dryzek, 2013). At an epistemological level, how does such Romantic and Mystical discourse resolve its relationship with modernity? What is the place of reductionism and technological change if humanity decided to reject these ideas in favour of 'harmonious ways of living'?

Scientific approaches to ecological thought

To some extent most (Western) forms of ecological thinking have a basis in science. This link is most obvious in relation to the science of ecology and its

interesting history, including the ongoing tension that has existed between reductionist and holistic approaches to ecology (Worster, 1994, 2013). Without resorting to a full history of the science of ecology, or exploring in detail the range of scientific approaches which employ ecological and/or systems forms of thinking, this section broadly profiles how scientific approaches have manifested in ecological thinking. This profiling is summarised in terms of three themes: system thought, biophysical limits and interconnectedness. While these three themes show something of the potential of scientific approaches to the ecological, the point is also made that each of these 'scientific' approaches also cross over into questions that have epistemological and political dimensions. Hence the point is made that 'scientific' approaches to the ecological – at least in a traditional (positivistic) or objective sense – are insufficient to fully explain the ecological. Instead, it is argued, scientific approaches to the ecological require a critical grounding in the philosophical issues in which they are connected or 'entangled' to use a pragmatist term (Putnam & Sen, 2004).

Systems thinking

One of the most well-known and influential forms of ecological-systems thought applied in education is the socio-ecological systems theory of Urie Bronfenbrenner (Bronfenbrenner, 1979). Bronfenbrenner's Ecological Systems Theory can be seen as part of the wider interdisciplinary field of Human Ecology (Lawrence, 2003). It is a way of understanding human behaviour with reference to the layers of biological and social systems that surround each of us. In terms of the epistemological perspective of this thesis, Bronfenbrenner's Ecological Systems Theory provides a way of understanding various layers or interaction surrounding a person's psychology or development.

In addition to Bronfenbrenner's Ecological Systems there are many other ecological-systems approaches in scientific thought. For example, Capra and Luis' book *A System's View of Life* discusses the scientific complexity and interconnectedness of many different biological, social and physical systems (Capra & Luisi, 2014). In this book, their scientific *and* philosophical approach to

systems thinking begins with an analysis of how science has evolved from the dualistic universe of Descartes, through the mechanistic physics of Newton and then on into an increasing awareness of interactivity and systems thinking. While the majority of the book is dedicated to biological concepts, including the self-organising principles of autopoiesis, there are also sections dedicated to complexity theory, mechanistic social thought, cybernetics, post-Newtonian physics, epigenetics, consciousness and the interconnectedness of the planet's economic, social and environmental problems. These emerging fields show something of the increasing role played by a systems or ecological approach to science itself.

The philosophical issues raised by the work of Capra and Luis point to the epistemological issues that necessarily underpin the different scientific approaches to 'ecological' systems thinking (see also Meadows & Wright, 2008). Another way these ideas can be examined is via Donald Worster's fascinating history of the science of ecology (Worster, 1994). Beginning with the intellectual contributions of 'pre-ecology', Worster describes the beginning of a split in ecological thinking dating back to the 18th century with, on one hand, the 'Arcadian' eco-gardening of Gilbert White, and on the other, the 'imperial' and controlling view of Carolus Linnaeus and others. While White's Arcadian view was linked to a humble village pastoralism, and a relatively peaceful co-existence with nature, the imperial view became linked to reason, hard-work and the domination of 'man' against nature. At the risk of seeing these two positions as polar opposites, Worster is at pains to note the complexity of the dialectic that exists between the Arcadian and imperial approaches as he charts the ongoing tension these basic positions established, first through the "Romantic Ecology" of Henry David Thoreau followed by the "Dismal Science" of Darwinian evolution and then, subsequently, via the early American ecologists and onwards towards modern ecology.

One of the sections where this ongoing tension is best described by Worster is in Chapter 15: Declarations of Interdependence. This chapter begins with the work

of Alfred North Whitehead and his 1925 observation that the sovereignty of reductionism was coming to an end and would be replaced by "the realisation of events disposed in an interlocked community" (p. 317). According to Worster, Whitehead was prefacing an age of 'organicism' where the inter-relatedness of different species within a system would revive a more 'vitalist' view of the world. Whitehead's philosophical concern with reductionism extended to the moral domain because, the mechanical view of the world brought with it the idea that people, bodies and minds are "independent individual substances, each existing in its own right apart from any necessary reference to each other" (p.318). Worster correctly labels this feature of reductionism as an ontological version of individualism, one which has gone on to inform the moral assumptions of England and America, and, as has been pointed out by many other writers, part of the often unidentified ethics of neoclassical economics (Sen, 2017).

Worster's history of ecological ideas ends in the 1990s with the development of chaos and complexity theories. For him the argument about systems versus reductionist accounts has changed over time, but has not necessarily been resolved. Indeed he provides evidence that the field of ecology has valued both holistic ideas such as 'ecosystems' yet also become more reductionist in how it approached biological relationships. The conclusion to Worster's work implies that *systems thinking and reductionist* approaches are both part of a relationship that needs to be considered differently in different situations. Systems considerations are developed from various forms of measurement across linear and non-linear variables, even if it can be extremely difficult to adequately synthesise this information. That is, of course, the trouble with complex eco-systems – they're complex. Epistemologically, it is impossible to always know what is going on and at some level, some form of reductionism provides 'an' insight into the system dynamic. Effective systems thinking then requires more than a reductionist approach, but is not necessarily above using such thought in building a more complex, 'ecological' view of the world.

The complexity (and importance) of systems thinking comes through a range of other 'scientific' approaches. For example, the work of Aldo Leopold, whose insight from the *Sand County Almanac*, introduces the striking notion of thinking "like a mountain" (Leopold, 1970). Leopold coined the phrase as part of a piece of writing about wolves and deforestation. Leopold observed that his own earlier ideas about culling wolves had been a linear (reductionist) form of thinking (ideas he shared with a great many other men in the American backcountry). Leopold identified some unanticipated 'ecological' consequences of a linear chain of thought which assumed that fewer wolves meant more deer. As Leopold discovered, fewer wolves actually meant fewer deer too. Leopold's own words are worthy reading on this, including the links he makes to linear forms of agricultural thinking:

> I have watched the face of many a newly wolfless mountain, and seen the south-facing slopes wrinkle with a maze of new deer trails. I have seen every edible bush and seedling browsed, first to anaemic desuetude, and then to death. I have seen every edible tree defoliated to the height of a saddlehorn. Such a mountain looks as if someone had given God a new pruning shears, and forbidden Him all other exercise. In the end the starved bones of the hoped-for deer herd, dead of its own too-much, bleach with the bones of the dead sage, or molder under the high-lined junipers.
>
> I now suspect that just as a deer herd lives in mortal fear of its wolves, so does a mountain live in mortal fear of its deer. And perhaps with better cause, for while a buck pulled down by wolves can be replaced in two or three years, a range pulled down by too many deer may fail of replacement in as many decades. So also with cows. The cowman who cleans his range of wolves does not realize that he is taking over the wolf's job of trimming the herd to fit the range. He has not learned to think like a mountain. Hence we have dustbowls, and rivers washing the future into the sea.

Leopold's 'mountain' thinking is a reminder about relying exclusively on linear or reductionistic forms of thought. Thinking like a 'mountain' resonates in the work of other writers too who show the complexity of 'scientific' approaches to

ecological thought. The work of Rachel Carson for example, is a reminder that systems thinking can be the difference between 'carrying on as normal' and averting disaster. Carson's ground-breaking book *Silent Spring* (Carson, 1963) documented the effects of pesticide use across a range of US social-environment contexts. This included the build up of toxins, the death of bird species and the development of pesticide resistance in insect populations. Carson also identified the specific tactics used by chemical companies to promote the safety of such compounds as DDT (Dichloro-diphenyl-trichloroethane) in addition to the uncritical lack of responsiveness from public officials. While Carson did not advocate a pesticide-free approach to agriculture and insect control she was one of the first to strongly advocate for an ecological-systems understanding of how pesticides relate to their context of use, and how linear assumptions about killing insects, may have unexpected outcomes in their inter-action with different eco-systems (Code, 2006).

Biophysical Limits

There is a clutch of interesting scientific, epistemological and political issues surrounding the question of biophysical limits. While the contemporary discussion of 'planetary boundaries' avoids some of these challenges, the history of 'scientific' (or science-based) discourse on limits has been highly polarised. The debate surrounding planetary limits has included apocalyptic forms of pessimism as well as optimistic beliefs in the potential of technology (Boulanger, 2012). In such a context finding a critical form of science regarding limits has been challenging.

The contemporary scientific approach to biophysical limits is often linked to the 'planetary boundaries' work carried out by the Stockholm Resilience Centre (SRC) (Steffen et al., 2011; Steffen, Richardson, et al., 2015), and the efforts of the Inter-governmental Panel on Climate Change (IPCC) (Pachauri & Meyer, 2014; Pidcock, 2014). The work of the SRC and IPCC represent highly rigorous scientific collaborations and strenuous efforts to manage the inevitable political entanglements that come from discussing global disasters. The work of the SRC

has involved gathering data about the various biospherical systems on the planet, including the extent to which human impact has transcended what has been 'scientifically' judged to be a 'safe' level. While the work of the SRC has not been couched in apocalyptic language, the politics of their findings reveal how the issue of limits brings ecological thought into the political realm. Similarly, the IPCC reports, with their very careful framing of scientific judgements in terms of their evidence base and likelihood, show that however hard science might try to 'keep to the facts' there are always lived political interconnections (Latour, 2015).

The central figure in the history of scientific discourse about limits is the economist Thomas Robert Malthus (1766-1834). While economists such as Adam Smith, John Stuart-Mill and John Maynard-Keynes have openly pondered the possibilities of a society based on a 'steady-state' – that is an economy where the focus shifts to quality of life issues rather than wealth (and growth) per se (H. E. Daly, 2005; H. E. Daly & Farley, 2004) – questions about limits have often been reduced to uncritical vilifications of Malthus and his pessimistic views about population. Malthus wrote in the late 18th century and early 19th centuries, and his work, such as *An Essay on the Principle of Population* (Malthus, 1888), focused on the problems of food supply and human population pressures. Malthus observed that increases in the food supply were associated with an increase in the overall population. He reasoned that gains in wellbeing could only be sustained for a short time and that eventually there would be a crisis in the food supply leading to the starvation of human populations.

Malthus' work has been widely criticised for its inability to foresee changes in human fertility rates and future technological innovations, especially in agricultural science (Hansen & Prescott, 2002; Mebratu, 1998). His work has also provided a platform for politico-scientific work which has questioned whether technology and innovation will continue to keep the world fed despite ongoing population growth. In the mid 20th century, neo-Malthusian scientific thinking has been linked to the post-WWII environmentalism of writers such as William

Vogt and Fairfield Osborn (T. Robertson, 2012). William Vogt's *The Road to Survival*, (Vogt, 1948) for example, sold millions of copies and introduced ideas about population and food production that were later famously picked up by the biological scientists including Paul and Anne Ehrlich, Garret Hardin (Hardin, 1968) and Barry Commoner (Commoner, 1971).

Paul and Anne Ehrlich's *Population Bomb* (1968) became a very important text at this time, and like Malthus earlier, this work was later criticised for its 'catastrophising' of future scenarios and an inability to foresee the 'bounty' that was to be provided by technology. Critics of the Ehrlichs' work typically note the importance of Norman Baulaug's Green Revolution as an example of how technology can prevent any of the apocalyptical outcomes forecast in *The Population Bomb* (Sabin, 2013; Tierney, 1990). Similarly, some critics cite the debate that occurred between Paul Ehrlich and the American Business Professor Julian Simon, which culminated in a 10 year wager over the price of copper, chromium, nickel, tin, and tungsten (Lam, 2011). According to the logic of *The Population Bomb* the price of these commodities should have risen, whereas according to Simon's economic expectations, no such rise would occur. Simon won the bet, which was held over the ten year period between September 1980 and September 1990. While this is often taken to be a definitive refutation of the thesis in *The Population Bomb*, other commentators have noted that changes in the commodities chosen, or the time-frame would have seen the luck favour Ehrlich's position (Kiel, Matheson, & Golembiewski, 2010). A deeper analysis suggests that neither approaches had the sophistication needed to fully understand issues of scarcity and limits or, more accurately, the fickleness of (socially constructed) commodity markets.

This is not to say that there hasn't been some traction in the discussion of limits over time. In addition to the more Malthusian perspective of *The Population Bomb*, The Club of Rome also drew attention to the question of limits through their 1972 landmark report *The Limits to Growth* (Meadows, Meadows, Randers, & Behrens III, 1972). This report received considerable attention at the time, and

had a considerable influence on political discourse (Bardi, 2011; Macekura, 2015; Meadows & Meadows, 2007). *The Limits to Growth* report was based on a complex computer simulation of a range of variables based around issues of "planet-population increase, agricultural production, non-renewable resource depletion, industrial output, and pollution generation" (back-cover). Based on the team's analysis the report made the following conclusions:

1. If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity.

2. It is possible to alter these growth trends and to establish a condition of ecological and economic stability that is sustainable far into the future. The state of global equilibrium could be designed so that the basic material needs of each person on earth are satisfied and each person has an equal opportunity to realize his individual human potential.

3. If the world's people decide to strive for this second outcome rather than the first, the sooner they begin working to attain it, the greater will be their chances of success.

While not as dramatically pessimistic as *The Population Bomb*, the work of The Club of Rome has also been read within a similar polarised debate. Broadly speaking, on one side was a view that sought to acknowledge and respond (in various ways) to the issues of limits, and on the other side was what can be described as a 'business as usual' approach,[1] which has been far less inclined to shift away from a model of endless economic growth and the continued expansion of an industrial civilisation (Bardi, 2011; Nørgaard, Ragnarsdóttir, & Peet, 2010). Thomas Robertson, in his book *The Malthusian moment: global population growth and the birth of American environmentalism*

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[1] 'Business as usual' is the phrase used by the IPCC to describe a carbon emissions strategy that involves very few changes in the global policy context (Pachauri & Meyer, 2014).

(T. Robertson, 2012), has identified that a key moment in the history of *The Limits to Growth* report surrounded the 1980 presidential election in the United States. This contest saw Ronald Reagan defeat Jimmy Carter in a landslide victory. This was a difficult time for the American economy (as it was for many economies in the West) as it experienced high levels of unemployment, high levels of inflation and a stagnating growth rate. These economic challenges, alongside Jimmy Carter's broad acceptance of the 'limits' discourse, were seen as an opportunity for the Republican Party and Ronald Reagan. On a platform of neoliberal economics, reinforced with pro-American rhetoric and techno-optimistic and pro-growth expectations, Reagan was able to put aside questions of environmental limits. In a sense, Reagan's borrowing from the neoliberal policy toolbox of the Mont Pelerin society was a way of signalling the political distance between himself and Carter - while also characterising Carter in terms of a far less politically palatable form of Malthusianism (D. Harvey, 2005; Mirowski, 2009; Stedman Jones, 2012).

To some extent a mature political debate in the West about environmental limits and economic growth has not materialised since Reagan's election. In contemporary times it is typical for policy discussions to assume that there are no limits and that economic growth will just ***have*** to continue. This point can be seen emphasised through the mainstream discourses of sustainable development and 'green growth' (Boulanger, 2012). This is despite the fact that many of the systematic patterns forecast by *The Limits to Growth* report have been upheld. Most famously perhaps, Matthew Simmons, who was the president of the world's largest investment company specialising in energy in 2000, read the Club of Rome's report and found, much to his surprise, that the pejorative dismissal of this work by the many of his colleagues was unfounded. Instead Simmons found that *The Limits to Growth* report held a 'broadly correct view of world development' (Nørgaard et al., 2010; Simmons, 2000). Similarly other reconsiderations of the work of the 1972 report have tended to confirm much of the original analysis (Bardi, 2011; Randers, 2012; Turner, 2008, 2014). For example in Turner's work, trends in population, industrialisation, food, non-

renewable resources and pollution line up with the 'standard run' scenario of *The Limits to Growth* team, a result that leads to a form of crisis and collapse in the second half of the 21st century. Writing in *The Guardian* in 2014, Turner and his colleague Cathy Alexander ameliorated the apocalyptical potential of this message by suggesting that although 'collapse' was possible, it was not a predestined fact:

> Our research does not indicate that collapse of the world economy, environment and population is a certainty. Nor do we claim the future will unfold exactly as the MIT researchers predicted back in 1972. Wars could break out; so could genuine global environmental leadership. Either could dramatically affect the trajectory.
>
> But our findings should sound an alarm bell. It seems unlikely that the quest for ever-increasing growth can continue unchecked to 2100 without causing serious negative effects – and those effects might come sooner than we think. (Turner & Alexander, 2014)

The more measured, or critical, approach to 'limits' suggested by Turner and Alexander points to a way to approach questions of planetary boundaries or limits. This is not so much a 'scientific' or 'political' approach, but one which shows the importance of critically integrating this thinking into a reasoned position.

Interconnectedness and entanglements

In the previous two sub-sections, the issues of systems and limits also draw attention to questions of interconnection. The above examples show how political, natural and scientific 'ecologies' are inevitably entangled. These examples also show how competing forms of rationality, or at least competing epistemologies, for example 'growth' or 'limits', can be more or less accepted by electorates and decision-makers. While a full discussion of interconnection and entanglements will not be added to the above examples, it is useful to point to the work of Barry Commoner as a specific case of how science based ecological thought can embrace the overlapping of social, political and natural ecologies.

Barry Commoner's contribution to matters of interconnection and ecological thought is most succinctly linked to his four laws of ecology (Commoner, 1971). Commoner's laws are underpinned by interconnection and reflect a necessary relationship between 'humans' and everything else:

1. Everything is connected to everything else,

2. Everything must go somewhere,

3. Nature knows best, and

4. Nothing comes from nothing.

From Commoner's work it is possible to see how the traditional Western liberal assumption of nature as a 'taken for granted' background (for individual development) should be questioned. A full account of what Commoner means by this can be found in his publications, especially his most famous book *The Closing Circle* (Commoner, 1971). One of the ways in which Commoner's views have collided with philosophical and political thinking came from his doubting of the population thesis presented by the Ehrlich's. Instead of population issues, Commoner placed much more emphasis on how capitalist modes of production impact the biosphere (Butler, 2012; Foster, 2012). In this regard, Commoner is one of the first major writers to link the idea that the economy is not independent of the biosphere and should always be considered in terms of the wider planetary system in which it resides. Through the work of Herman Daly especially, this idea has come to be a fundamental tenet of ecological economics (P. G. Brown & Timmerman, 2015; H. E. Daly & Farley, 2004; T. Jackson, 2011, 2016) and stands in (remarkable) contrast to the algebraic logic of neoclassical economics which typically assumes that natural capital can easily be 'substituted' for other forms of capital. In less technical terms, that 'technology', 'labour' and 'innovation' can always find ways to improve economic growth, without reference to the amount of 'planet' available (H. E. Daly, 2005; Munda, 1997).

While the details of the 'substitution' debate between ecological economics and neoclassical economics is beyond the scope of this chapter, Commoner's work on

interconnection reinforces the point that scientifically-minded ecological thinking is typically entangled in the domain of socially constructed values. Indeed as the political ecology of Commoner shows, 'scientific' statements about ecological matters are always types of value statements too. Somewhat importantly, this also means that 'science' on its own is not enough of a basis to develop ecological thought and that there are dimensions of philosophical and political thinking (at least) that also need to be considered. Something of this political dimension of ecological thought is surveyed in the following section.

Radical/modernist approaches to the ecological

While the previous scientific approaches to the ecological were developed in response to scientific theorising, which then became entangled in a political context, the following set of radical/modernist approaches to the ecological have been explicitly developed as (somewhat totalising) political and philosophical positions. There are three main approaches to the ecological described here as radical/modernist: social ecology, deep ecology and some forms of early eco-feminism. While each of these approaches has made a considerable contribution to ecological thinking, I argue in this section that there are some epistemological problems linked to their strongly held political set of assumptions. Specifically, while the ideological bases of these positions provides a powerful way of thinking about ecology and humanity, the somewhat inflexible 'truths' (or grand narratives) underpinning their ideas limits their usefulness as a basis for critical policy thinking.

Social ecology

Social ecology is a political-ecological philosophy whose best known exponent has been the eco-anarchistic and libertarian socialist Murray Bookchin. Although social ecology was at its peak in the 1970s and 1980s, there continues to be a range of social ecologists working in various academic departments in the English speaking world (D. Wright, Camden-Pratt, & Hill, 2011). Central to social ecology is the idea that environmental problems have their basis in the hierarchy of human against human (Best, 1998; Bookchin, 1996; Light, 1998; White, 2008). During the 1960s and 1970s this was a marked improvement from more 'liberal'

forms of environmentalism, which tended to be related to single-issues and not focused on the social structures that led to environmental concerns. Rather, social ecologists, such as Bookchin, argue that it is the capitalist structuring of society that results in a class-ridden system that is profit-driven and ultimately exploitative of people and the planet. Bookchin emphasised that if humanity wanted to solve environmental problems then it needs to move away from capitalism and develop more authentic and communitarian ways of living.

Bookchin's use of a dialectical-materialist approach to history has informed his stinging rebuke of romantic and mystical tendencies in some forms of environmentalism. Bookchin's hostile engagements with Deep Ecology during the 1980s and 1990s, for example, reveal a curmudgeonly tendency that has possibly limited the appeal of social ecology (D. Alexander, 1998; Messersmith-Glavin, 2010; White, 2008). Overall, the worth of Bookchin's views reside in how he connects together economic, social, political and natural contexts and, on the other hand, also avoids those eco-centric approaches (such as Deep Ecology) which minimise humanity to be 'just another species' (Best, 1998).

Although social ecology represents a step forward in ecological thought during the 20th century, there are some important limitations that undermine it as a basis for policy thinking. These weaknesses are linked to the Marxist roots of Bookchin's work. For Bookchin history is evolving from less hierarchical 'organic societies' through a capitalist hierarchy and then onto a non-hierarchical (utopian) set of quasi-independent villages. Such a prescriptive analysis reflects a Marxist meta-narrative and is too rigid to offer a range of possible solutions to the GEC (or educational policy in response to the GEC). Similarly Bookchin's argument that environmental problems are social problems, while incisive to a degree, lacks the flexibility that comes from a more balanced analysis that includes the contribution made from technological, political, biological and even spiritual interpretations of the ecological. As John Clark has noted, a rigid form of Bookchin's social ecology is decidedly 'undialectical' when it comes to the contributions that could be made from a Deep Ecology perspective, or those

citing overpopulation as an environmental issue, or those (liberals) simply wanting to improve the ecology at a single place at a single time (as cited in Best, 1998). Extending this analysis out, there is a nagging question about the extent to which Bookchin's dismissal of 'green' capitalism, or capitalism more generally, offers enough of an opportunity for the 'state' and 'capitalism' to find some (pragmatic) mid-point between society's current trajectory and Bookchin's politically problematic eco-communitarianism (Luke, 1987).

Deep ecology

Deep ecology has energised many forms of environmental activism since its beginnings in the early 1970s. The Norwegian Arne Naess is credited with developing the term 'Deep Ecology' in 1972. The words 'Deep Ecology' were used to distinguish between the so-called 'shallow' environmentalism aimed at protecting nature (for ongoing human utility) and 'deeper' approaches that valued nature for its intrinsic worth (Næss, Drengson, & Devall, 2008; Næss, Rothenberg, & Naess, 1989). In April 1984, during a camping trip in Death Valley, Arne Naess and George Sessions developed an eight-point platform that sets out the essential features of Deep Ecology (Naess, 1986):

1. The well-being and flourishing of human and nonhuman life on Earth have value in themselves (synonyms: inherent worth, intrinsic value, inherent value). These values are independent of the usefulness of the nonhuman world for human purposes.
2. Richness and diversity of life forms contribute to the realization of these values and are also values in themselves.
3. Humans have no right to reduce this richness and diversity except to satisfy vital needs.
4. Present human interference with the nonhuman world is excessive, and the situation is rapidly worsening.
5. The flourishing of human life and cultures is compatible with a substantial decrease of the human population. The flourishing of nonhuman life requires such a decrease.
6. Policies must therefore be changed. The changes in policies affect basic economic, technological, and ideological structures. The resulting state of affairs will be deeply different from the present.

7. The ideological change is mainly that of appreciating life quality (dwelling in situations of inherent worth) rather than adhering to an increasingly higher standard of living. There will be a profound awareness of the difference between big and great.

8. Those who subscribe to the foregoing points have an obligation directly or indirectly to participate in the attempt to implement the necessary changes.

While it is not possible to provide a full commentary on the eight core principles of Deep Ecology, some important points to highlight include the focus on collective wellbeing as well as the emphasis placed on non-monetized forms of value. There is a rather bland sounding point above about a "substantial decrease of the human population", which has actually been a significant point of contention in the past, especially between social ecologists and deep ecologists. Social ecologists have accused deep ecologists of being indifferent to human suffering (and death) (Bookchin, 1987; Messersmith-Glavin, 2010). More positively, the emphasis placed in these principles on the 'quality of life' issues somewhat anticipates the way this idea has started to occupy the minds of mainstream economists (Dalziel & Saunders, 2014; OECD, 2014a). Overall there is also a clear signal here that ideological change, personal change and policy change are needed to achieve "the well-being and flourishing of human and nonhuman life on Earth".

Despite the surface appeal of Deep Ecology, there are some structural weaknesses that undermine it as 'an' ecological worldview and as a basis for ecological policy thinking. Such weaknesses can be seen in the criticisms that have been raised about Deep Ecology by ecofeminism and social ecology. Ecofeminist critiques have concentrated on the masculinist and 'gender-neutral' analyses of Deep Ecology – especially its inability to see that its own critique of anthropocentricism should include a strong analysis of androcentrism and the way male approaches to knowledge, relationships and power have subjugated both nature and gender (Chakraborty, 2015; Fox, 1989).

Social ecology's critique centres on Deep Ecology's lack of understanding of social power structures, hierarchies and sources of domination. This point of view has been most forcefully presented by Murray Bookchin, often in polemical terms. Putting aside Murray Bookchin's near hysteria regarding Deep Ecology, his arguments about Deep Ecology's structure and content nevertheless highlight some important issues (Bookchin, 1987, 1988; Messersmith-Glavin, 2010). For example, Bookchin has argued that Deep Ecology exhibits 'ecoauthoritarian' tendencies, in that it privileges the valuing of nature above the structural or social issues underpinning environmental concerns. Bookchin's argument here is set within the wider criticism of Deep Ecology's opposition to anthropocentricism and an endorsement of biocentric egalitarianism. From a Deep Ecology perspective biocentricism or ecocentrism is seen as a solution to the assumption that the planet is valuable in exclusively human terms (B. Taylor & Zimmerman, 2005). However, as Bookchin's arguments point out, it is unclear to what extent any view of nature by humans can be considered "biocentrically". As has been argued in other contexts, a biocentric worldview presupposes that humans can understand a reality beyond themselves, a difficult philosophical proposition considering the seemingly inescapable prospect of always being human (W. Grey, 1993; Van Wyck, 1997).

While there is not space here for a detailed analysis of Deep Ecology's philosophical framework, the reservations raised by Bookchin and others provide a glimpse into the limitations of Deep Ecology. That said, Deep Ecology does provide a somewhat useful 'generalised' alternative to mainstream worldviews (or unconscious assumptions), especially those which draw on more traditional ideas about human domination over nature. This can be seen, for example, in the way Deep Ecology has informed many environmental activists and their efforts to develop a broader set of ideas about the relationship between 'humans' and 'nature'. From a slightly different point of view, Deep Ecology's ecocentric approach has also helped introduce a 'decentred' view of humanity (perhaps as something of a fore-runner to posthumanism). Hence, while Deep Ecology may not be successful in asserting a fully functional ecocentric view, it has widened

the discussion and continues to broaden the possibilities for education and policy to include at least some moral consideration for animals and at least some recognition that nature may have an intrinsic value. This point is especially relevant as economists move towards trying to place a monetary value on such concepts as 'eco-system' services (Kopnina & Cherniak, 2015; Kronlid & Öhman, 2013).

Ecofeminism

Ecofeminism is a diverse field incorporating a considerable range of thinkers who have made significant contributions to ecological thought. The origins of ecofeminism have been linked to the social activism of the 1970s and an increasing willingness to build a connection between the feminism of the time with the environmental movement. Some early forms of ecofeminism carried with them an attachment to the idea of the 'feminine principle' as a way of responding to the masculine forms of rationality and environmental injustice. Central to the idea of the feminine principle was a belief in the inherently positive potential of feminine ways of operating in the world. Women were said to be better able to understand and respond to issues of environmental protection because they were more 'naturally' qualified to nurture and support the planet. Evidence for this qualification has been linked to female capacity for child-birth, breast-feeding and menstruation. Not surprisingly, this view came to be doubted, not least of all by those who disputed the 'essentialising' of women 'in' nature and the way such ideas built on those traditional views of women as somewhat mysterious beings who were less rational than men (Phillips & Rumens, 2015).

A more sophisticated tradition of ecofeminist thought can be traced beyond the debates about the feminine principle (Buckingham, 2015; Chakraborty, 2015; Moore, 2015). This tradition assembles itself around the social construction of gender relations and a poststructuralist epistemology. Instead of women being characterised as the bearers of ecological virtue, many contemporary ecofeminist concerns have moved more towards the social and economic

structures that simultaneously damage the environment and limit the potential of women, including the traditionally masculine rationality underpinning these structures (Plumwood, 2002, 2007). Included in this development is an awareness that ecofeminism should uphold a diversity of critical voices. From this perspective the work of Vandana Shiva has helped elevate the voice of non-Western (and non-academic) women as part of ecofeminism (Shiva, 2016).

From this perspective, ecofeminists have been at the forefront of 'gendering' the debates about ecological knowledge, rationality and the environmental crisis. For example, while neoclassical economics is underpinned by universalistic assumptions concerning the 'Rational Economic Man', writers such as Val Plumwood have been able to show just how 'socially constructed' such a view is (Plumwood, 2002, 2007). Not only is neoclassical economics universally 'normal' or 'natural', but it is actually underpinned by dominant male values. As Plumwood and others have noted, in recognising this aspect, the way out of the ecological crisis is to develop forms of reason that go beyond those manufactured in neoclassical economics and are instead built upon understanding that planet Earth is a finite resource. While at this point the temptation is to outline a range of ecofeminist positions that broadly align with a poststructural position, the work of ecofeminists such as Val Plumwood, Lorraine Code and Rosi Braidoitti sits more clearly within the postfoundational approach discussed later in this chapter.

Non-Western and Indigenous approaches to the ecological

There is an enormous range of Non-Western and Indigenous knowledge that can contribute to ecological thought. As has been briefly introduced already, there has been an overarching tendency in Western philosophy to focus more on rationality and individual thought at the expense of insight into the multiple contexts in which humanity operates. In broad terms, this tends to be less of a concern in Non-Western and Indigenous traditions where being 'in the world' lends itself to interconnected forms of wisdom and a deeper emphasis on interconnected forms of diverse and situated human/non-human wellbeing (Bowers, 2004; Mika, 2015, 2017).

In a New Zealand context, Māori ecological thought has shown how it can make important contributions to policy and practice. For example, there have been compelling efforts to build Māori knowledge into the management of natural eco-systems (Harmsworth & Awatere, 2013). In education and health, Mason Durie's concept of Te Whare Tapa Wha provides a framework for wellbeing (hauora) is made up of dimensions that go beyond the mental and the physical. Through the use of a marae (meeting house) metaphor, the dimensions of family, spiritual, mental and physical health in Te Whare Tapa Wha are seen as inseparable (interconnected). Moreover, the use of the marae metaphor underlines connections to place, whakapapa (genealogy) and whenua (land) as important aspects of both culture and health (Durie, 1998, 2011). The influence of Te Whare Tapa Wha can be seen in the *New Zealand Curriculum* (Ministry of Education, 2007a), especially in the Health Curriculum and in richer approaches to wellbeing in a school context (Education Review Office, 2013). The thinking behind Te Whare Tapa Wha has also influenced ongoing work such as the Meihana model of mental health (Pitama et al., 2007).

There is no doubt that there is a great deal to be done to further Māori thinking in New Zealand policy contexts. This is not just because New Zealand's Indigenous population have markedly lower levels of educational success and overall levels of wellbeing compared to the rest of New Zealand's population. Despite the breadth of thinking demonstrated by examples such as Te Whare Tapa Wha and the Meihana model, it is also clear that Pākehā policy makers and practitioners can still default to their own (narrow) philosophical systems when they try to discuss subjects such as wellbeing. This can be seen, for example in the work of the Education Review Office when, despite referencing Te Whare Tapa Wha in their own indicators, their evaluation of wellbeing in schools put very little effort into understand the deeper curricula and pastoral possibilities for wellbeing in the curriculum and instead focused on the impacts of assessment on student 'mental health' (Education Review Office, 2015).

The failure of Pākehā policy makers is a reminder of how complex Māori knowledge forms can be (at least for non-Māori). With this in mind, and with due deference to my Māori colleagues who have raised concerns about Pākehā use of Indigenous thought (Heaton, 2011; Mika & Stewart, 2017), I have not attempted in this study to 'borrow' from such thinking. While this might seem, from one perspective, as some form of critical 'shirking', it is an approach that avoids doing harm to concepts that simply don't belong to me. It is also important to point out that the postfoundational approach to the ecological is fit for the purposes of completing this study. That said, this does not mean that Māori forms of ecological thought should be excluded from improving New Zealand's tertiary education policy. In line with the possibilities that are available from a partnership or dialogue with Indigenous thought, the model of Anthropocene Intelligence developed in Chapter 7 includes a principle on the importance of traditional, Non-Western and Indigenous forms of knowledge. This principle is included because of what such thinking can add to humanity's understanding of how to live well on a finite planet (Bowers, 2006b, 2009, 2010, 2011, 2012).

This inclusion of this principle also means that ongoing work is needed, in a New Zealand context, to discuss how higher education 'can realise Māori potential' (on a finite planet). This possibility is also supported through the links made to the Treaty of Waitangi in the final recommendations of this thesis, and the need to include the full realisation of the Treaty principles as part of how higher education can help develop New Zealand's social ecology. Having Pākehā and/or the Crown enter into dialogue with Māori it is argued, offers far more for the policy context than what this study could reveal about Māori ecological thinking on its own.

Finally, it is also important to note that, beyond an immediate New Zealand context, there is a range of Non-Western and Indigenous thought which can inform ecological thinking. While the range of possibilities on offer from the many 'first nations' people of the world help show the scale of such thinking, it is

also important to point out that Eastern intellectual traditions have their own contributions to make. For example, some of the recent scholarship attempting to bring together Eastern and Western philosophies shows that there is an incredibly productive set of conceptual possibilities in developing philosophical dialogue about how, for example, Buddhist and Confucian thought can contribute to policy and practice, including education policy and practice (Peters & Hung, 2008; B. Taylor & Zimmerman, 2005; Wang, 2014a, 2014b). Moreover, as many ecological economics scholars already know, there is a well-developed set of ideas about Buddhist economics (Schumacher, 2011). There are ideas about how the Buddhist concept of the 'middle way' can be used to theorise a more enlightened and democratic approach to government (Adorjan & Kelly, 2008; Bandarage, 2013).

Postfoundationalist approaches to the ecological

The diversity and range of ecological positions seen across the romantic, scientific, radical/modernist, and Non-Western/Indigenous thought continues in the many different postfoundational ways of approaching the 'ecological'. Before these different positions are explored, it is necessary to explain what is meant here by postfoundational. There are many 'posts' in academic writing, most latterly joined by the political exegesis occurring about 'post-truth politics'. It is also the case that there is arguably nothing so badly misunderstood as the philosophical details underpinning postmodernism and poststructuralism (Yilmaz, 2010). As a way of side-stepping much of this imbroglio, the term postfoundational is used here to help develop a particular meaning of things 'post', which works for this thesis.

A useful understanding of the postfoundational has been provided by Bryan Norton. Within the appendices of his 600 page tome *Sustainability – A Philosophy for Adaptive Ecosystem Management*, is a discussion that links postfoundationalism to the history of Western philosophy, especially that related to the search for 'truth' through developing a foundation for our knowledge claims (B. G. Norton, 2005). Beginning with Descartes, Norton describes the early philosophical efforts to create a foundation for knowledge which included a

central position for God. Moving on from these early times, Norton discusses this history with reference to more recent forms of scepticism, linguistic philosophy, positivism and mathematics. He suggests that the road taken by the 20th century philosophers in these fields (including Carnap, Wittgenstein and Russell) can either be seen as something of a failure (if the goal was to ground knowledge or 'truth' in a solid epistemological foundation) or, more optimistically, as a vindication of the earlier work of philosophical pragmatists, especially Charles Sanders Peirce.

In characterising the search *for truth* or certainty in the history of Western philosophy, Norton makes the following observation about its 'foundational' nature:

> Foundationalism…is the view that in any adequate belief system there is some set of sentences that (1) can themselves be shown to be indubitable and (2) can serve, through the operations of deductive logic, as indubitable building blocks capable of supporting beliefs about the world. (p. 558)

Versions of foundational discourses abound. Most forms of religious discourse are foundational. Most (if not all) forms of evangelical Christianity, for example, especially those that see the Bible as literally 'The Word of God' (and not something socially constructed) are extreme versions of a foundational discourse. Similarly scientism, which elevates the objectivity, empiricism or versions of the scientific method as the only 'real' way to understand the world makes a foundationalist error because of its exclusion of other 'narratives' (Lyotard, 1984), or forms of knowing. This is especially relevant in developing a more integrated, diverse, ethical and contextualised approach to any (scientific) situation (Latour, 2004).

Following on, postfoundationalism can be said to operate as something of a release valve for those arguments between rationalists wanting to ground knowledge in deductive truths about 'reality' and empiricists who claim that reality can be depicted on the basis of sensory data. Postfoundational

approaches to pragmatism ask a different question, one based on how humanity deliberates as a community. Norton, for example, has set his version of pragmatism within an argument depicting Aldo Leopold as a pragmatist (in the tradition of Peirce) and seeks to use a philosophical approach to build linguistic communities about the extent to which its "practices and institutions are environmentally appropriate and 'adaptive'" (p. 525). The linking of postfoundationalism with pragmatism clarifies the (misguided) accusation of relativism often directed at 'postmodern' and 'poststructural' philosophical positions. The point of postfoundationalism is not just that there are no automatic or a priori places to ground 'truth', but that our positions, such as our understanding of 'ecological', requires an argument that is open to the scrutiny and repudiation of the wider scientific and/or critical community. In this sense, much of the ideological content of social ecology, Deep Ecology or essentialising ecofeminism is too rigid to admit deeper scrutiny. Similarly, some 'scientific' positions on the ecological can be challenged as 'objective' forms of truth – especially when they lack insight into how their positions are entangled with contestable (value-laden) philosophical and political assumptions.

Postfoundational approaches to the ecological tend then towards flexible (but not necessarily contradictory) analyses. The ecological is not just a single, narrowly defined scientific foundation, but a contestable, diverse and reasoned framework for approaching integrated natural and social settings. Lorraine Code's ecological naturalism demonstrates such a view (Code, 2006). Drawing on a feminist epistemological approach, which itself draws strength from a critique of Quinean naturalism as well as a deep questioning of the Anglo-American (analytic) philosophical tradition to which she broadly aligns, Code shows how the 'ecological' is an epistemological project, rather than a project about 'nature'. As such, for Code, the ecological represents a Copernican-style revolution in our understanding of knowledge, place and politics. Ecological thinking offers a way of both 'naturalizing and socializing' epistemology, one that builds a framework for knowledge that acknowledges the importance of the diversity of (detailed) knowledge 'down on the ground' (Code, 2008). Code's

approach eschews the spectator view of knowledge (which originated with the idea of the God's-eye view of the world) in order to underline that there is no 'transcendent' place to learn about 'reality'. Ecological thinking looks to understand something of the complexity of a situation, not from a universal point of view, but from what Code describes as a contemporary form of Aristotelian phronesis. In this sense, ecological thinking is interconnected with both a detailed understanding as well as a sense of responsibility for our mutual cohabitation on the planet.

> Ecological thinking is not simply thinking about ecology or about the environment: it generates revisioned modes of engagement with knowledge, subjectivity, politics, ethics, science, citizenship, and agency, which pervade and reconfigure theory and practice alike. First and foremost a thoughtful practice, thinking ecologically carries with it a large measure of responsibility... [As to] how it could translate into wider issues of citizenship and politics,... the answer, at once simple and profound, is that ecological thinking is about imagining, crafting, articulating, endeavoring to enact principles of ideal cohabitation. (Code, 2008, p.189)

For Code, this epistemological understanding of ecology demands some careful forms of 'thoughtful practice'. As a result, ecological thinking doesn't just lead to 'community' as an idealised way of knowing, (given that communities can potentially operate just as oppressively as any autocrat) but a nuanced interactivity which is a conditional and deliberative process. Such a process responds to how issues of power, gender, race, subjectivity and knowledge have prescribed traditional epistemological practices and, in so doing, privileged particular groups (typically those who were already in positions of privilege, including those subjects who are human, male, white and Western).

Significantly Code does not hold an oppositional approach to traditional or mainstream Anglo-American approaches to epistemology. As she points out so well in the passage below, the ecological is not a switch from 'mastery' (mechanistic) *to* ecological, but something all together more self-consciously interconnected (see also Plumwood, 2007).

In ecological thinking, knowers are repositioned as self-consciously part of nature, while anthropocentric projects of mastery are superseded by projects displacing Enlightenment "man" from the centre of the universe and developing radical critiques of the single-minded mastery claimed for "human reason". Ecological thinking works against the imaginary of God-given human dominion over all the earth and, more precisely, of dominion arrogated to certain chosen members of the human race, not just over the earth, but over human Others as well. Yet its purpose is not to substitute pure, disinterested contemplation for mastery. It aims to reenlist the successes of empirical science together with other forms of knowledge, reflexively and critically, in projects committed to understanding the implications and effects of such ways of knowing and acting, regardless of the short-term costs to "efficiency," ...

It is important to emphasise that the socially constructed approach presented here by Code is not 'anti-scientific'. It does aim however, to ensure that scientific ideas have a well-developed philosophical or epistemological support structure. This is a key aspect of an ecological epistemology and a point that connects Code's work to other postfoundational approaches.

In addition to the epistemological work of thinkers such as Code, there are a range of writers exploring how similar epistemological approaches to ecological theory are challenging traditional conceptions of knowledge. Some of these writers can be broadly grouped under the idea of 'new ecological theory' such as seen in the recent books by edited by Hamilton, Gemenne and Bonneuil (Hamilton et al., 2015) and that by Erich Hörl and James Burton (Hörl & Burton, 2017). One of the most fashionable approaches to the ecological under this umbrella include those linked to new materialism (Connolly, 2013; Van der Tuin & Dolphijn, 2012). In broad terms new materialism is an 'emerging' discourse which offers both exciting prospects for ongoing theoretical discussion and potentially complex academic dead-ends. Those conceptual approaches that are broadly included as new materialist include posthumanism, vital materialism, object-oriented ontology and speculative realism (Coole, 2010). There are also

versions of eco-criticism that can be included here too, for example the work of Timothy Morton (Morton, 2010, 2013).

Because of the emerging nature of new materialism, it can be difficult to use the 'tenets' of this work as a framework for building an adequately theorised approach to 'the ecological' – at least one that can develop ecological policy conversations with those outside of the academy. There are also some important questions that can be asked about the ontological assumptions of those aspects of new materialist theorising that seek to not only decentre human subjectivity, but actively create a subjectivity of 'things', and a sense of agency from what has typically been considered inanimate (Hill, 2015; Rekret, 2016).

What is possible however, is to see how these ideas of the ecological can contribute, test, develop, enhance and modify specific possibilities for the ecological in specific situations. For example, in Morton's *The Ecological Thought*, (Morton, 2010) it is not so much the 'down on the ground' epistemological possibilities offered by Code that Morton emphasises, but the vast and interconnected nature of thinking that the ecological perspective offers the world (Morton, 2013). For Morton, the interconnected nature of 'the ecological thought' means that beyond the literal or scientific meaning of 'ecology', there are artistic, spiritual and democratic dimensions of 'our environment':

> Ecology shows us that all beings are connected. The ecological thought is the thinking of interconnectedness. The ecological thought is a thought about ecology, but it's also a thinking that is ecological. Thinking the ecological thought is part of an ecological project. The ecological thought doesn't just occur "in the mind." It's a practice and a process of becoming fully aware of how human beings are connected with other beings – animal, vegetable and mineral. Ultimately, this includes thinking about democracy. (p. 7)

And from page 4:

> Ecological thinking might be quite different from our assumptions about it. It isn't just to do with the sciences of ecology. Ecological thinking is to do with art, philosophy, literature, music, and culture. Ecological thinking has as much to do

with the humanities wing of modern universities as with the sciences, and it also

has to do with factories, transportation, architecture, and economics. Ecology

includes all the ways we live together. (p. 4)

While there is not space to fully tease out the possibilities and limitations of

Morton's work, it is possible to see that his ideas express a similar wide-ranging

epistemological view to Code's – that is to say, an interest in the ecological as a

metaphor or structure for knowledge itself – and not simply a bifurcated

extension of things 'natural'. Similarly, the writing of Braidotti does much to

clarify the diversity and worth of posthumanism in relation to ecological thinking.

In her book *The Posthuman* (Braidotti, 2013) Braidotti describes three main

approaches to posthumanism. The first of these is linked to a re-emergent liberal

trend which she connects to the work of such writers as Martha Nussbaum (J. M.

Alexander, 2008; Nussbaum, 2006). Braidotti points out that in the face of a

decentred humanist subjectivity linked to the 30 year tradition of

postmodernism/poststructuralism (see also M. A. Peters & Tesar, 2016),

Nussbaum has attempted to reconstitute a liberal, individualistic and

universalising humanistic ethics through her work. While Braidotti supports

Nussbaum's attempt to find a role for a renewed subjectivity in the face of global

market and neoliberal imperatives, she ultimately sees Nussbaum's lauding of

humanist liberalism as an insufficient basis for generating deeper solutions to

issues of global importance (Braidotti, 2013, p. 38-39). Issues of subjectivity are

discussed again later in relation to the work of Ron Barnett and the ecological

university (Chapter 6).

The second strand of posthumanism discussed by Braidotti is that concerning

technology and its interconnection with humanity. In some ways this diverse

area gives posthumanism some of its academic sexiness via issues of the cyborg

(Haraway, 1991) and humanity's interconnected relationship with technology,

via robotic implants, virtual inter-activity and genomic tampering. Questions

emerge from such arrangements (assemblages), about what it means to be

human and the ethics of living in a world where, for example, robots are able to

undertake so many traditional forms of labour done by people. That said, while there is an ecological dimension to the interconnection between the (post)human and technology, Braidotti locates her own tradition of posthumanism in what she calls 'critical posthumanism'.

Critical posthumanism is consistent with the postfoundational understanding of the ecological presented in this thesis. Building off the anti-humanist roots of poststructuralism, critical posthumanism problematises the traditions of thought and action linked to masculine, scientific and colonising tendencies. A key aspect of posthumanism is its attempt to focus on the social and ecological systems in which humanity is found – rather than humanity itself. In such a view of the world humanity is said to be 'decentred'. From such a position questions arise about the inter-relationship between people and their surrounding matrix – not so much as opposites (as in 'culture' and 'nature') but as mutually constituting. As was set out in Code's work, Braidotti sees that through the interconnection of the posthuman and the environment there is an implicit 'ethical bond' (2013, p.39), one that occurs in the context of a rejection of liberal and unified ideas about the 'self' and the search for an ecological subjectivity:

> This view rejects individualism, but also asserts an equally strong distance from relativism or nihilistic defeatism. It promotes an ethical bond of an altogether different sort from the self-interests of an individual subject, as defined along the canonical lines of classical Humanism. A posthuman ethics for a non-unitary subject proposes an enlarged sense of inter-connection between self and others, including the non-human or 'earth' others, by removing the obstacle of self-centred individualism.

Despite the broad agreement between the approach taken in this thesis and the posthumanism of Braidotti, the relationship posthumanism has to this thesis is one of partnership (and resonance) rather than committed adherence. In line with the earlier comments made about the practical limits of new materialism more generally, the methodological decision has been made to use posthumanism as a potential resource, rather than the basis for analysis. In this sense posthumanism, and to a lesser extent new materialism, are seen as a way

of understanding and creatively testing ideas about the ecological. The central resources however for developing a critical postfoundational ecological perspective are derived from an analysis of the work of Gregory Bateson and Felix Guattari and it is their work that is discussed in the following section.

A critical-postfoundational approach to the ecological

In this section a critical and postfoundational approach to the ecological is discussed via the work of Gregory Bateson and Felix Guattari. While in some ways the work of Bateson is an example of 'scientific' approaches to the ecological that have a strong philosophical dimension (Harries-Jones, 1995), the combination of Bateson and Guattari is very much tied together through the pragmatist, postfoundational and epistemological approach of this thesis. Together, the usefulness of an approach to the ecological which draws on the work of Bateson and Guattari (as well as others) has the potential to provide a deeper insight into the epistemological and political dimensions of ecological theory.

Gregory Bateson is well known as an anthropologist, cyberneticist and social and biological theorist. His work can be understood in terms of his recursive epistemological approach (Bowers, 2010, 2011; Harries-Jones, 1995, 2016) and what he has described as an 'ecology of mind' (Bateson, 1972). Felix Guattari is known for his work with Gilles Deleuze via such texts as *The Thousand Plateaus*: *Capitalism and Schizophrenia* (Deleuze, 2004) and *What is Philosophy?* (Deleuze, 1994). Guattari's sole efforts have typically received less attention than his collaborations with Deleuze, with Guattari often seen as the junior figure in these collaborations. Both his junior status and the relative lack of attention paid to Guattari's sole-authored work may be linked to the fact that he was younger than Deleuze, and worked as a psychotherapist, while Deleuze was the working philosopher (Heroux, 2008; R. Shaw, 2015). Guattari's ecological theorising is predominantly carried by his short book *The Three Ecologies* (Guattari, 2000), which was published in French in 1989 and translated into English by Ian Pindar and Paul Sutton in 2000. It is also possible to find ecological thinking in Guattari's

well-presented essay Remaking Social Practices (Guattari & Genosko, 1996) and the more turgid book *Chaosmosis* (Guattari, 1995).

Guattari's work appears to owe a debt to Bateson as he begins *The Three Ecologies* with a quote from Bateson's essay, Pathologies of Epistemology (Bateson, 1972):

> There is an ecology of bad ideas, just as there is an ecology of weeds.

Bateson's overall point in Pathologies of Epistemology concerns the repetition of epistemological error. The paragraph that this sentence is taken from is worth quoting at length, not just because it provides an insightful introduction to Guattari's concerns, but because it shows the interests both writers share about the interconnection between human thinking and the state of the planet:

> Let us now consider what happens when you make the epistemological error of choosing the wrong unit: you end up with the species versus the other species around it or versus the environment in which it operates. Man against nature. You end up, in fact, with Kaneohe Bay polluted, Lake Erie a slimy green mess, and "Let's build bigger atom bombs to kill off the next-door neighbors." There is an ecology of bad ideas, just as there is an ecology of weeds, and it is characteristic of the system that basic error propagates itself. It branches out like a rooted parasite through the tissues of life, and everything gets into a rather peculiar mess. When you narrow down your epistemology and act on the premise "What interests me is me, or my organization, or my species," you chop off consideration of other loops of the loop structure. You decide that you want to get rid of the by-products of human life and that Lake Erie will be a good place to put them. You forget that the eco-mental system called Lake Erie is part of your wider eco-mental system - and that if Lake Erie is driven insane, its insanity is incorporated in the larger system of your thought and experience. (p. 491-492)

Bateson's focus here is on the (culturally mitigated) recursive system of reinforcing errors that can occur across intellectual, cultural and natural systems (Harries-Jones, 1995). From another perspective, the way humans think, (most

notably when we think in error) works in cognitive circles that can avoid an understanding of other information systems (such as Lake Erie). For Bateson, the inability of humans to reflect on the wider biological information systems, for example, in dealing with the industrial pollution created alongside the Great Lakes of America, eventually leads to monstrous results. As Bateson points out, such thinking 'works', at least at the beginning:

> In the case of such epistemological propositions, error is not easily detected and is not very quickly punished. ... The erroneous premises, in fact, *work*.

> On the other hand, the premises only work up to a certain limit, and, at some stage or under certain circumstances, if you are carrying serious epistemological errors, you will find that they do not work anymore. At this point you will discover to your horror that it is exceedingly difficult to get rid of that error. (p. 487)

By the end of this essay Bateson extends this point out to the habitual epistemological errors implicated in the damage to the planet's many ecosystems:

> I believe that the massive aggregation of threats to man and his ecological systems arises out of errors in our habit of thought at deep and partly unconscious levels. (p. 495)

It is at this point that Guattari's *The Three Ecologies* can best be understood. The 'three different ecologies' which Guattari is referring to are our mental ecologies (psyche), our social ecologies and the natural ecologies. Guattari is specifically interested in how our 'mental ecologies' can be made healthy as part of the overall social and natural ecologies of the planet. He sees these interconnected 'registers' as a way of developing an improved society. This view of an improved

society is not a utopian vision from Guattari, but what he calls an ecosophical perspective or ecosophy:[2]

> ...only an ethico-political articulation – which I call ecosophy – between the three ecological registers (the environment, social relations and human subjectivity) would be likely to clarify [the ecological dangers that confront us]. (Guattari, as cited in Peters, 2013)

Guattari clarifies the nature of this interconnection in the essay 'Remaking Social Practices'. This essay underlines the complexity of the interconnection between all three ecologies and emphasises the need to develop new forms of thinking (transversally) within a social and political environment less concerned about reducing all social and natural activity to its influence on profit. There is a difficult circular (recursive) aspect to this interconnection, one which reveals that our thoughts and our contexts are tied together:

> Without modifications to the social and material environment, there can be no change in mentalities. Here, we are in the presence of a circle that leads me to postulate the necessity of founding an "ecosophy" that would link environmental ecology to social ecology and to mental ecology. (Guattari & Genosko, 1996, p. 264)

As was also seen in the work of Code, Braidotti and Morton, Guattari's postfoundational approach to the ecological is much more than an interest in 'the natural'. Indeed Guattari actively avoids the depiction of ecology in solely natural terms in order to avoid being caught in dualist trap that between (an idealised) view of nature from an essentialised view of culture:

> The traditional dualist oppositions that have guided social thought and geopolitical cartographies are over. (Guattari, 2000, p. 32)

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[2] Not to be confused with the 'ecosophy' of Arne Naess and Deep Ecology. These concepts seem to have been developed independently and at similar times (Tinnell, 2012).

Instead Guattari points us towards approaches that can improve the health of
the planet's interconnected systems. While he is highly critical of what he calls
'Integrated World Capitalism', as well as the relatively unresponsive approach
taken by mass media, Guattari is not looking for a universalised, moralistic
revolution, but a transformation that is both radical, diverse (dissensual), and
focused on forms of value that support a diversity of healthy human
relationships across the planet. As Erik Heroux explains:

> A diseased psyche destroys its own environment and thus itself, but a healthy
> psyche cultivates and renews its own environment, obtaining as gifts the further
> productivity of the natural world. Societies of open cooperation multiply the
> benefits for individuals in tertiary effects beyond calculation. Guattari's
> ecosophy argues for a theory and praxis that cultivates both mutual
> interdependence and heterogeneous creativity at each level simultaneously:
> "Individuals must become both more united and increasingly different. The
> same is true for the resingularization of schools, town councils, urban planning,
> etc." (Heroux, 2009, p. 14)

Similarly, the idea of 'healthy living' is referred to in *Chaosmosis*:

> Our survival on this planet is not only threatened by environmental damage but
> by a degeneration in the fabric of social solidarity and in the modes of psychical
> life, which must literally be reinvented. The refoundation of politics will have to
> pass through the aesthetic and analytical dimensions implied in the three
> ecologies—the environment, the socius and the psyche. We cannot conceive of
> solutions to the poisoning of the atmosphere and to global warming due to the
> greenhouse effect, or to the problem of population control, without a mutation
> of mentality, without promoting a new art of living in society. (Guattari as cited
> in Heroux, 2009, p.8)

Despite the deep criticisms of Integrated World Capitalism, for Guattari, 'the new
art of living' still takes place within a broadly capitalistic and democratic (and
pragmatic) framework. Indeed, as is captured by Gary Genosko, Guattari is

resigned to capitalism in some form, if only because of the lack of suitable polar alternative (Guattari & Genosko, 1996).[3] As a result, beyond the universal moralising Guattari ascribes to such ideologies as Marxism, his 'dissensual metamodelisation', is a concept that calls for a focus on pragmatic ways of thought – what Guattari calls a "pragmatic cathexis" (Guattari, 2000, p. 60). Guattari is in search of new forms of relations that transcend the current system's single-minded focus on improving profit and subject to the over-simplistic reflection of a corporate media. His solution is not concerned *either* with changing structures *or* changing consciousness, but with changing the *overall interconnection* between subjectivity, society and the natural environment. This is what makes Guattari's notion of the ecological both integrated, powerful and open to a range of possibilities. For Guattari, a plural 'ecosophic' democracy, is not limited by techno-scientific discourse, but open to other forms of (creative) thought on the way to a complex, nuanced, ethic-aesthetic – a democracy where "emphasis must be placed, above all, on the reconstruction of a collective dialogue capable of producing innovative practices" (Guattari & Genosko, 1996, p. 264).

From this perspective Guattari can be read as a radical pragmatist in search of a (postfoundational) approach to planetary wellbeing. The pragmatic framework here provides scope for considering both the nature of the interconnection described by Bateson and Guattari, as well as the insights provided by ecological thinking from other traditions (i.e. non-Western, indigenous, radical/modernist and so on). Hence instead of mashing different ecological perspectives together, a pragmatic framework is directed towards healthy and interconnected planetary ecologies. Key questions for civilisation then could be: how can humanity support

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[3] For example in an interview with Nicholas Zurbrugg 'Postmodernism and Ethical Abdication' Guattari states that "nothing really offers a new polarity in opposition to the dominant forms of capitalism." He goes on to state that this fact means that the intellectual needs to be "self-assertive, to be individual, to be brave, and to continue to work resisting the fascination of academia, of the media, and other such institutions." (Guattari & Genosko, 1996, p. 116-117).

and improve the health of the (interconnected) three ecologies? How could humanity measure and evaluate the health of these diverse ecologies? These questions carry over into how education can support a society oriented by such goals.

Questions of how this Guattarian approach can translate into education policy are developed later in the thesis, from Chapter 6 onwards. In the next chapter, the methodological approach of this thesis is discussed. This chapter draws on the ecological discussion so far to explore the Critical-Eco Pragmatist approach used to develop an ecological approach to policy analysis and higher education policy in New Zealand. Following on, Chapters 4 and 5, present an interconnected, Guattarian and pragmatic approach to understanding the Global Ecological Crisis. It is this understanding that helps identify why an ecological approach to policy is required at this point in the planet's history – including an ecological approach to higher education policy.

Australian Greens MP Jeremy Buckingham by the burning Condamine River in Queensland, Australia. The burning has likely been caused by fracking in the area, as sourced from *The Ecologist* 22 April 2016.

Chapter 3: Critical Eco-Pragmatism as policy methodology

Only a crisis - actual or perceived - produces real change. When that crisis occurs, the actions that are taken depend on the ideas that are lying around. That, I believe, is our basic function: to develop alternatives to existing policies, to keep them alive and available until the politically impossible becomes the politically inevitable.

— Milton Friedman (1982, as cited in Dietz & O'Neill, 2013, p. 111)

This chapter presents the methodological approach taken in this thesis. This approach has been given a name – Critical Eco-Pragmatism (CEP). CEP provides a theoretical basis for answering the questions posed by this thesis and, at a broader level, is a platform for an ecological approach to policy. This chapter is divided into three sections. The first provides an overview of CEP. It discusses CEP's approach to the thesis questions and then explains how CEP can also be seen not just as a methodology for this thesis, but the basis of an ecological approach to policy making. The second section focuses on the theoretical components of CEP. It outlines the four interconnected dimensions of CEP – creativity, critical theory, ecological theory and pragmatism. A brief final section explores the methods used within the CEP approach of this thesis.

Critical Eco-Pragmatism (CEP) - an ecological approach to policy

An overview of CEP- from being ecological to ecological policy

In the introduction to this thesis, the point was made that an alternative ecological approach to policy was to be used to answer the thesis questions and develop an ecological approach to higher education policy in New Zealand. Linked to this point was the idea that the thesis questions are also energising an ecological approach to policy that could possibly be applied more broadly in support of what John Dryzek has called an ecological democracy (Dryzek, 2013).

The previous chapter explored what is meant by the term 'ecological'. The postfoundational approach argued for in Chapter 2 reveals the deep nature of the thesis questions and the need to recognise how they go far beyond 'nature', and damage to the biosphere, and tackle issues of how different psychological, social and natural systems are interconnected – bound together as integral aspects of the planet's health:

1. What is the Global Ecological Crisis (GEC) and to what extent is the GEC an educational crisis?
2. What does it mean to be 'ecological' in higher education?
3. What could an ecological approach to higher education policy in New Zealand look like?

Following on from the discussion of the ecological in the previous chapter, the idea of an 'ecological crisis' (question 1) is the focus of the following chapter (Chapter 4). Similarly, an ecological approach to education goes beyond a focus on 'environmental education' and establishes an approach that has new forms of thinking, engagement and content based on an ecological epistemology (Chapters 5, 6 and 7). Before these discussions take place however, this chapter sets out the methodological approach taken to translating ecological thinking into policy possibilities – for both higher education policy in New Zealand and policy more generally.

This section therefore provides an overview to the methodological approach in this thesis - Critical-Eco Pragmatism (CEP). In a broad sense, CEP is a way of using the insights of ecological theory as a basis for (improved) policy alternatives. It does this by drawing on postfoundational ecological theory to understand how issues such as interconnection, wellbeing and system thinking can provide policy options to improve the health of the planet's interconnected social and natural systems. Significantly, CEP solutions about 'what could work', draw inspiration from the key policy fields of ecological economics and ecological democracy (this is discussed in more detail in the following two sub-sections).

It is important to point out that CEP is radical in its intent to develop an alternative approach to policy. This radical quality is linked to CEP's postfoundational ecological basis and the desire to develop potentially workable policy solutions for a planet where human lifestyles have already significantly overstepped many planetary boundaries (see following chapter). It's 'pragmatism' therefore is about what works for the planet – not what might work for the immediate political context. This means that CEP has a deeper, more philosophical basis than some other forms of eco-pragmatism. As Ruth Irwin has noted, there are some eco-pragmatist positions which have shallower philosophical roots and, in a somewhat political move, are focussed on negotiating with unsustainable mainstream approaches to economics and policy (Irwin, 2007). Similarly, and in the context of environmental politics in the United States, James Galperin has suggested that the willingness of environmentally-minded professionals to 'build relationships' with the political centre results in a kind of 'desperate environmentalism', which doesn't challenge the deep causes of the ecological crisis and risks those most responsible for this damage being able to argue solely from their vision of the world (Galperin, 2015).

In contrast, CEP is an attempt to build alternatives that challenge the ongoing 'politics of unsustainability' (Blühdorn & Welsh, 2007). While not discounting that these more politically pragmatic approaches work can be of some value, CEP is not focused on incremental shifts solely within the current 'Overton window'[4] of political discourse. Instead, CEP is concerned with articulating how policy 'could be' developed with respect to the biophysical limits of the planet and the drive to improve the health of our interconnected social, intellectual and natural

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[4] The Overton window is named after Joseph P. Overton and is a term developed within American politics to describe what might be spoken about in the political climate. Based in Public Choice Theory, it has been a way for lobbyists to reflect on how constrained political decision making can be regardless of how persuasive an argument. In this regard the Overton window represents what is considered to be the politically feasible limits of discourse, after which policy options are considered 'too radical' to even speak about. For more information see (Russell, 2006).

ecologies. In this particular aspiration then, CEP shares an ironic similarity with the traditions of neoliberalism as a policy project – at least in terms of its eschewing of shallow pragmatic compromise. As the quote above from Milton Friedman suggests, there is potentially real political mileage to be made in developing an alternative policy position which, while initially politically 'impossible', may eventually become politically inevitable - that is to say, when the complex nature of the GEC is understood by political decision-makers and accepted by enough members of society. CEP then, is an approach to policy that explores what 'could be' in an ecological democracy.

CEP and Ecological Democracy

The connection CEP makes to community, interconnection and policy alternatives means that it should also be understood in terms of contemporary approaches to ecological democracy. The concept of ecological democracy however, needs some explanation. Different writers have different interpretations of what is meant by ecological democracy and these writers do not always reference and connect to how others are using the term (M. A. Peters, 2017a). Faber and McCarthy for instance (Faber & McCarthy, 2003) assert that the ecological democracy includes a commitment to the following principles:

(1) **grass-roots democracy and inclusiveness** – the vigorous participation of people from all walks of life in the decision-making processes of capital, the state and social institutions that regulate their lives, as well as civic organizations and social movements which represent their interests;

(2) **social and economic justice** – meeting all basic human needs and ensuring fundamental human rights for all members of society; and

(3) **sustainability and environmental protection** – ensuring that the integrity of nature is preserved for both present and future generations. (p. 57)

Another example, 'Radical Ecological Democracy', has gathered its energy from the writing of Ashish Kothari and the work of the Kalpavriksh Environmental Action Group in India. The focus for this work has been on a positive developmental framework beyond mainstream economic models and the potential for human equity and ecological sustainability. The specific principles of

Radical Ecological Democracy (RED) include: Ecological integrity and limits, Equity and justice, Right to meaningful participation, Rights of nature and Interconnectedness (Radical Ecological Democracy, 2017).

It is not possible in this thesis to rationalise the different versions and approaches to what counts as ecological democracy. Similarly, there has also been no attempt to specify a green theory of the state based on the diverse strands of green political theory that exist (Barry, 2012, 2014; Dobson, 2007). What is attempted however is a broad, but critical, analysis of ecological democracy, exploring the key aspects or assumptions that reinforce the CEP methodology of this thesis and its basis for an ecological approach to policy. In this regard, John Dryzek's approach to ecological democracy has been identified as an approach that can inform an eco-critical approach to policy and potentially overcome the issues identified by Blühdorn via the politics of unsustainability (above).

A key feature of Dryzek's approach to ecological democracy is his deliberative approach to eco-political discourses. These discourses include democratic pragmatism, ecological modernisation and sustainable development (Dryzek, 2013). While Dryzek outlines the specifics of these discourses in his book *The Politics of the Earth* (2013), the key point bringing these aspects together is their potential to promote ***learning***. According to Dryzek, these discourses make possible a society that is actually sustainable – that is to say, one that is able to find flexible (pragmatic) solutions that work for people and planet. Underpinning this learning is the radical green political discourse of limits and the recognition that whatever else governments have to achieve, ongoing forms of human flourishing (learning and development) have to occur within what is biophysically possible (Dryzek, 2002, 2013).

The concept of learning - or as it translates into the world of politics – deliberation, is closely linked to the philosophical pragmatism of this thesis.

Questions of deliberation emphasise that decision-making should be as free as possible from the influence of vested interests. As Dryzek notes (2012, p. 235):

> Discursive designs involve collective decision making through authentic democratic discussion open to all interests, under which political power, money and strategizing do not determine outcomes.

From this basis Dryzek makes clear the potential for such a framework to integrate very different perspectives in a process of mutual problem-solving. Using the work of Andrew Dobson, Dryzek suggests that deliberative systems can be "particularly good" (p. 236) at utilising the feedback from socio-ecological systems (see also, Dobson 2010, 2014). Other laudable features include the ability of deliberation to bring forward the wider interests of the community and the potential for it to be used to help generate novel solutions to the problems involving diverse cohorts in complex contexts (Dryzek, 2013).

Hence, Dryzek's framework for ecological democracy is flexible enough to incorporate aspects of other useful green political thinking such as green republicanism (Barry, 2008), ecological citizenship (Cao, 2015; Dobson, 2012) and environmental justice (Faber & McCarthy, 2003; Plumwood, 2002). These forms of green political thinking have slightly different theoretical frameworks, the first focusing on the broader legislative and constitutional arena, whereas ecological citizenship has been more focused on the actions of individuals (in communities), while environmental justice has been focused more on addressing structural inequalities in the economy and distribution of environmental 'bads'.

How these different aspects might be specifically integrated into a more detailed vision of ecological democracy is beyond what is possible in this thesis. What does demand some clarification however is how Dryzek's model of deliberative ecological democracy can deal with the inability of pluralistic (liberal)

democracies to build a policy platform beyond the current politics of unsustainability (Blühdorn, 2011, 2013).[5] Dryzek's approach to deliberation is more nuanced than earlier approaches based on a Habermasian communicative ideal and collective forms of consensus (Elstub, Ercan, & Mendonça, 2016). Drawing on a discursive approach, Dryzek puts forward the idea that different forms of discourse may be excluded from deliberation on the basis of socially constructed criteria. He also explains how deliberative forums can be developed which both reduce the influence of power and also find ways to establish forms of meta-consensus despite any irreconcilable differences over the core values of deliberative groups (Dryzek, 2011, 2013). Dryzek also makes the point that deliberation can exclude those discourses which lack a sound evidence base such climate denial and highly techno-optimistic forms of economic rationalism (Prometheans).

Despite these mechanisms of deliberation and exclusion (some of which are democratically elaborate), the point is made that politics is always mediated by forms of power and, to a lesser extent, difference, and there are always questions about the extent to which the deliberative mechanisms championed by Dryzek can be employed in some contexts (such as the United States). In an era of post-truth politics, and at a time when moneyed interests seem to have an increasingly significant role to play in the way policy is developed in the Western world (Gilens & Page, 2014), questions remain about how democratic deliberation can even become established. Dryzek has his own answers to these questions. While Dryzek's detailed justifications are a step too far for the scope of this thesis, his complex deliberative democratic forms stand in for the importance of democratic structures more generally, not simply in terms of participative democracy or majority rule mechanisms, but those various features of democratic systems that actively include, listen, deliberate and seek to resolve issues related to power, privilege and inequality.

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[5] The politics of unsustainability is discussed as a feature of the GEC in the following chapter.

Following on from this point, the work of other writers helps to clarify the issues of 'power' confronting 'ecological democracy' and what can be done to improve the quality of humanity's political ecologies. For example, Val Plumwood has convincingly argued from an environmental justice perspective, the development of 'a strong voice from below' requires not just active forms of communication, but also structures that support both participation and redistributive equality (Plumwood, 2002, p. 90-92). Similarly, Chantal Mouffe's approach to 'agonistic democracy' provides a way of seeing how a broad understanding of ecological democracy can confront the issue of power (Mouffe, 1999). For Mouffe, the rational ideal of deliberative politics denies the extent to which politics is always 'political', and structured by both hegemony and passions. In this sense Mouffe downplays the potential for rational decision making, and emphasises the temporary, contested and subjective features of democracy:

> It is for that reason that the ideal of a pluralist democracy cannot be to reach a rational consensus in the public sphere. Such a consensus cannot exist. We have to accept that every consensus exists as a temporary result of a provisional hegemony, as a stabilization of power, and that it always entails some form of exclusion. The idea that power could be dissolved through a rational debate and that legitimacy could be based on pure rationality are illusions, which can endanger democratic institutions (Mouffe, 2000, p.17).

Mouffe's suggestion is that humanity should accept the divisiveness of politics. For Mouffe, politics is frequently going to be beyond rational solutions. At best, Mouffe suggests, that politics moves from the 'antagonistic' engagement of enemies to agonistic dialogue with adversaries. Dissent remains 'alive' from this perspective with politics reflecting a (wildly) plural context, one not subject to the rationalistic harmonising Mouffe attributes to deliberative approaches.

> By warning us again of the illusion that a fully achieved democracy could ever be instantiated, [agonistic democracy] forces us to keep the democratic contestation alive. To make room for dissent and to foster the institutions in which it can be manifested is vital for a pluralist democracy and one should abandon the very idea that there could ever be a time in which it would cease to

be necessary because the society is now "well ordered". An "agonistic" approach acknowledges the real nature of its frontiers and the forms of exclusion that they entail, instead of trying to disguise them under the veil of rationality or morality. (Mouffe, 2000a, p.17)

Returning to the methodological approach taken in this thesis, and regardless of how much Dryzek and other deliberative democrats dispute Mouffe's argument (Dryzek, 2005, 2012; Kadlec & Friedman, 2007; Rummens, 2009), Mouffe's point about the potentially irreconcilable nature of the political context nevertheless provides a reminder that different forms of power can limit the extent to which deliberation can occur. Hence, while deliberation underpins the potential of an ecological democracy, there is always a question about the extent to which the political ecology will allow such deliberation to occur. Questions also arise about what ecological policy creativity is possible while humans wait for the health of the policy ecology to improve. Somewhere between deliberation and irreconcilable political differences, CEP points to the need for the development of policy solutions that do not necessarily end ideological animosity, but could instead be used to develop a more healthy set of social, educational and natural ecologies. In essence, CEP sits within this zone between deliberation and irreconcilable differences. While Dryzek's arguments about deliberation provide some hope that ecological and democratic politics is possible, it is also accepted that politics exists within an irrational and antagonistic reality.

Policy alternatives in an ecological democracy

The connection to policy alternatives in CEP is underpinned by a drive to use alternative forms of economic thought to help structure policy. In the first instance this drive comes from the critique of so-called technicist policy approaches. Under a technicist approach to policy, neoclassical economics, with its Taylorist links to such forms as managerialism and human capital theory, has helped to provide a set of (hidden) ideological assumptions or values for policy-making (Olssen, Codd, & O'Neill, 2004; S. Taylor, 1997). (This point is also reinforced through the links CEP has to Critical Policy Analysis, as discussed later in the chapter). The CEP approach taken in this thesis doesn't ignore the

importance of economics as an element of policy thought, but it does turn towards such examples as ecological economics as an alternative to the mainstream and a basis for developing policy alternatives.

The origins of ecological economics come from the work of Nicholas Georgescu-Roegen in the 1970s (Georgescu-Roegen, 1993). It was Georgescu-Roegen's concept of entropy that was developed by his student Herman Daly into an approach which emphasised the need to respect planetary limits, especially those related to resource use and waste disposal. Daly, who at one time worked as a World Bank economist, critiqued the assumption of endless expansion underpinning traditional economics and has been at the forefront of efforts to develop a technical infrastructure for an alternative, ecologically-sound economics (H. E. Daly, 2005; H. E. Daly & Farley, 2004).

Since Daly's work, there has been a growing diversity of approaches developed under the umbrella of ecological economics. There are, for example, deeper and shallower versions of ecological economics with different perspectives along this continuum more or less reliant on neoclassical ideas about the potential of the free-market to deliver an ecologically sound approach to policy (Spash, 2012, 2013). The CEP approach taken in this thesis aligns with those deeper ecological economics perspectives, which more rigorously problematise key tenets of conventional economics (Dietz & O'Neill, 2013; Higgs, 2014; T. Jackson, 2009). Clive Spash has described such perspectives as 'social ecological economics' and aligns this approach with heterodox approaches within the field of economics (Spash, 2013). Heterodox in this context refers to those diverse inter-disciplinary critiques of economics which point to the need for a radical overhaul of the way such a central organising policy discipline is currently undertaken. In contrast to the methodological formalism of neoclassical mathematics (with its simplistic assumptions about people and the world), social ecological economics leans on a plural set of theoretical possibilities and opens socio-ecological discussion to a range of theoretical and practical ideas. As Spash has noted (2013, p. 358):

Pluralism within the economic element is given structure through links across heterodox economic schools including the: critical institutional, evolutionary, feminist, neo-Marxist, psychological, Post-Keynesian, critical realist and social. The ideological drive is to address issues of ethics, injustice and social inequity inherent in current environmental problems with a recognised need for fundamental changes in the structure of economic systems and human behaviour, not merely problem solving. A key to that end is seen as changing the ideas and conduct of economics itself.

Other ecological economists that fit under this deeper or socio-ecological label including such writers as Peter Victor, Tim Jackson, Peter Timmerman, Peter Brown and Joan Martinez Alier (P. G. Brown & Timmerman, 2015; T. Jackson, 2009; Kallis, Kerschner, & Martinez-Alier, 2012; Victor, 2008). These thinkers have explored the ways in which humanity's addiction to economic growth and increasing resource use can be transformed into healthy economic approaches – that is to say, economies that do not tilt towards social, financial or environmental collapse. While there is not space to explore the technical details of ecological economics, it is important to note that there is a form of economics that goes beyond a fixation on GDP (Gross Domestic Product) and offers a potentially rich account of progress on a finite planet.

It is easy to see how the key ideas of ecological economics could influence an ecological approach to policy. There are also many approaches which can be thought of as 'working colleagues' with ecological economics, approaches which seek to systematise the way nation states (and collections of nation states) might seek to orient their economy and society. The notion of 'anticipatory governance' is one such approach, focused as it is on a reasoned, creative and long-term approach to governing during a time of uncertainty (Boston, 2016, 2017a, 2017b). There are many different aspects of anticipatory governance worth considering, but one of the key ways in which anticipatory governance reflects its ecological credentials is through its embrace of complexity and interconnectedness. As Jonathan Boston states:

> [Anticipatory governance] recognises the importance of resilience and the interconnected nature of its various dimensions (i.e. economic, social, infrastructural, institutional, environmental and cultural)" (Boston, 2016, p.12).

Boston goes on to say:
> It commends good evidence, critical evaluation and continuous improvement. It celebrates creativity, curiosity, innovation and imaginative reflection. It endorses a holistic approach to assessing performance: it focuses not only on fiscal deficits, but also on social, ecological and democratic deficits.

Another dimension of Boston's approach to anticipatory governance is the importance placed on ecological sensibility. This includes the need to develop a broad range of indicators to understand and respond to the risks facing a country like New Zealand; the importance of more heterodox economic positions, such as behavioural economics; and a focus on mechanisms that can move policy decisions away from short-term decision making in favour of a longer-term, multi-dimensional interest in building resilience to natural, social and economic shocks. In discussing the New Zealand context for example, Boston highlights the following 'wicked' problems as the sorts of issues that could be dealt with more effectively via an anticipatory governance approach: the obesity pandemic, microbial resistance, climate change and the loss of fresh-water (Boston, 2016, 2017a, 2017b; V. A. Brown, Harris, & Russell, 2010).

Another approach to policy, which is more ecologically oriented, is Kate Raworth's work on 'doughnut' economics (Raworth, 2016, 2017). As an alternative approach to policy, doughnut economics builds on the concept of planetary boundaries (Steffen, Richardson, et al., 2015) to develop an integrated socio-ecological policy approach linking both the need for human activity to occur within a recognised scientific ceiling, while also responding to a diverse range of social priorities. Doughnut economics draws on ecological economics' critique of economic growth in combination with a focus on the possibilities for human wellbeing (on a finite planet). Raworth talks about this process as a type of policy "sweet spot" where the Earth's resources are used to address human

rights, but not in such a way that it destroys the planetary life-support systems
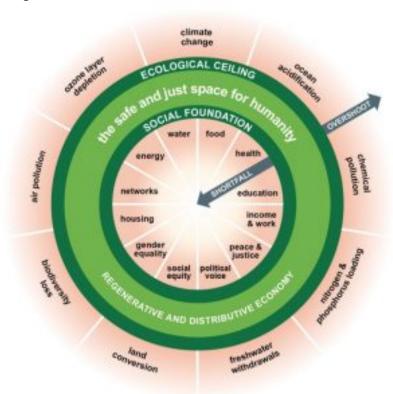(Raworth, 2016).

Figure 2: Doughnut economics

Source: https://www.kateraworth.com/doughnut/

As was suggested in relation to anticipatory governance, something of the
potential for an ecological policy analysis can be seen in the outline of doughnut
economics (below). From a 'doughnut' perspective, relevant educational
questions can be asked about the role of education in the GEC, and what sorts of
knowledge, competencies, skills and understanding are needed humanity stay
within the planetary "sweet spot"?

The four dimensions of CEP

While the previous section provided an overview of how CEP operates as a basis
for ecological policy alternatives, this section sets out the four key theoretical
dimensions of CEP. Building on the discussion of ecological theory in the previous
chapter, the specific focus in this section is on how the remaining aspects of CEP

– creativity, critical policy approaches and pragmatism interconnect with ecological theory and inform the methodological approach of CEP.

Creativity as a critical and transdisciplinary approach to policy

There are three explicit aspects to the CEP approach taken in this thesis – the critical, the ecological and the pragmatic. A central aspect of CEP that is not captured within its title-description is its inherently creative dimension. 'Creativity' is a term that can be broadly (mis)interpreted, given its links to artistic, psychological and cultural meanings (Banaji, Burn, & Buckingham, 2006), and ongoing changes in digital technologies and the emerging possibilities unfolding for labour and education in a 'knowledge' society (Peters, 2014; Peters & Besley, 2013). In the context of such a diverse range of possibilities, creativity is linked here to the critical possibilities for policy emanating from the critique of current policy thinking and the integration of a range of interdisciplinary knowledge forms.

The approach taken to higher education policy in this thesis then, stands in contrast to the approach taken by much of the educational research currently carried out in New Zealand. In general, a glance through New Zealand's doctoral educational theses will show a high number of useful but nevertheless reductionistic analyses of specific aspects of policy and practice.[6] While some theses include a critique of neoliberal educational ideas, this critique is not typically extended to imagine what alternative policy paradigms might be developed. In this sense, while these theses have offered specific forms of value, they can also be seen as part of a 'generation' of critique about the nature and scope of neoliberal reforms, even while neoliberal approaches continue to dominate policy formation (Olssen & Peters, 2005; Roberts, 2007; Shore, 2010).

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[6] This point is based on a brief survey of NZCER's educational theses database (when it was operational) and more recently via the nzresearch.org.nz website.

At one level this is not surprising given that neoliberalism is one of the most critiqued (and resilient) philosophical approaches in the Western world (D. Harvey, 2005, 2014; Schmidt & Thatcher, 2014; Stedman Jones, 2012). In New Zealand, as in other similar countries, the critique, eschewing or downright disavowal of neoliberalism has not yet resulted in a significant change in the globalised approach to policy, including higher education policy (Giroux, 2014). This point is especially noticeable when the international academic arguments against neoliberalism in policy have arguably been 'won', yet neoliberalism's 'zombified' form still dominates economic, social and educational thinking (Quiggin, 2012; Smyth, 2017; Walker, Moore, & Whelan, 2013). Indeed, while neoliberalism has withstood the Global Financial Crisis, with its ironically Keynesian-style government bail outs, it is the optimistic assumption of CEP that policy research which aims to actively create alternatives provides a worthwhile vehicle for academic labour – not just for education policy, but potentially for all government policy.

By necessity, the creative approach of CEP requires some degree of trans and/or interdisciplinary labour to help flesh out policy alternatives. The idea of transdisciplinarity has its own literature and methodological subtleties, and can be thought of in weak and strong forms (Max-Neef, 2005). The tendency here is towards what Max-Neef describes as a strong form of transdisciplinarity - one in which a more integrated, holistic or systemic understanding is attempted through the integration of various forms of knowledge. Such a perspective is reinforced through the ecological perspective set out in Chapter 2. The transdisciplinary approach of this thesis revolves around the need to analyse and synthesise a range of diverse literatures. The wide range of literatures in this project includes those connected to environmental politics, climate change, planetary boundaries, global footprint analysis, ecological economics, ecological theory, ecological and sustainability education, wellbeing, critical policy analysis, higher education policy and philosophical pragmatism. The creative aspect of this process involves developing a critical policy position from an integration of these ideas.

In this sense, the integration of these diverse forms also represents an attempt to solve a complex policy problem – in the case of this thesis, how higher education policy in New Zealand could be developed in the Anthropocene. Not only does the CEP approach of this thesis demand that these literatures are understood, there is also an expectation that the knowledge from these different perspectives can be used in a way that offers an original contribution for New Zealand higher education policy. Such an approach has to be both critical and creative if it is to go well beyond the sorts of neoliberalised approach to education policy seen, for example in New Zealand's current *Tertiary Education Strategy* (Ministry of Education, 2014c).

CEP as critical educational policy analysis

The methodology of this thesis is closely aligned with the field of critical educational policy studies (Mansfield, Diem, Lee, Welton, & Young, 2014; Prunty, 1985; S. Taylor, 1997; Young & Diem, 2016). Despite the focus on educational policy, the points raised in this critical tradition can be applied more broadly to a critical policy methodology because of the interest in ***power and ideology*** that has been developed in this writing. In essence, critical educational policy writing has attempted to understand the nature of the policy context in order to provide insight about educational policy. In this thesis the drive to understand the possibilities for an alternative approach to policy – CEP – have also been developed, and it is this methodology that is applied to higher education policy in New Zealand.

Critical policy analysis in education draws on a range of theories and approaches, although it has as its core the idea that education policy is the result of a fundamentally political set of processes. A critical policy perspective seeks to go beyond the idea that policy is the product of a 'scientific' rational or technical process (Codd, 1988; Fischer, Miller, & Sidney, 2007; Olssen et al., 2004; Prunty, 1985; Rein, 1983; Simons, Olssen, & Peters, 2009; S. Taylor, 1997; Young & Diem, 2016). The origins of critical policy analysis can be linked to the Frankfurt school and 'critical theory' as developed by Max Horkheimer, Theodor Adorno, Herbert

Marcuse and, more recently, Jurgen Habermas. Based on the understanding of ideology developed within critical theory, critical educational policy analysis emerged during the 1980s in response to a growing awareness of the political nature of education. In the academic context of this time, the development of the 'new sociology of education' equipped a growing number of academics with a critical awareness of how traditional approaches to education, including liberal theoretical approaches, typically reinforced societal inequalities and tended to have limited success in developing an egalitarian and democratic society (Rata, 2014).

Critical policy studies in education have also drawn from the knowledge/power analyses of Foucault and, in the process, have developed a discursive approach to policy (Ball, 1993; Codd, 1988). From a discursive perspective, some forms of critical policy analysis in education emphasise the idea of policy as a 'text' which is constructed from a range of different ideological perspectives. Such a view of policy helps to see that policy meaning is always the product of a contested series of political contexts. A feature of such a critical approach means that policy is never seen as having a fixed or transcendent meaning. It can, for example, be contested and variously interested at different levels of development and implementation.

In the last decade or so, critical policy perspectives in education have struggled to make much impact on policy imaginations – especially in New Zealand. In part this is because of the extent to which economic rationales for education have come to dominate policy thinking and the continuing disinterest from policy makers in the critical arguments made by social scientists (Simons et al., 2009). In the New Zealand context, critical policy work appears to have relatively little impact on the construction of government. Critical academics have also become less visible in universities too, as there has been far less emphasis on critical sociological, historical and philosophical thinking and far more focus on teacher education and 'leadership' training (Codd, 2005; O'Neill, 2012; O'Neill, 2013).

Despite the diminishing emphasis on critical educational approaches in New Zealand universities, critical policy approaches are employed in a range of global educational and social contexts. One of the ways in which critical educational policy analysis has been applied has been to question the assumptions underpinning 'evidence-based' educational policy. From a critical policy perspective evidence-based policy can often be read as an attempt to remove the political dimensions from the educational policy development process, while at the same time leaving a critically untested and default set of assumptions in place (Biesta, 2010; Head, 2013; Lingard, 2013; Nutley, 2013; Rein, 1983). For example, in discussing Australian policy approaches to Aboriginal and Torres Strait Islanders, Maddison has pointed out that the use of evidence has historically been shaped by particular mainstream values or attitudes towards the indigenous population and justified on the basis that this was 'for their own good' (Maddison, 2012). Importantly, Maddison's work is a reminder about the extent to which 'Eurocentric' universalising can become the default approach in evidence-based policy, and that there is no such thing as 'value-free' evidence. This latter point echoes years of argument from critical policy about the discursive nature of policy and the extent to which it reflects certain forms of power and authority (Ball, 1993, 2015; Codd, 1988; Olssen, Codd, & O'Neill, 2004; Prunty, 1985).

Furthermore, and in addition to the powerful critiques provided by critical approaches to policy, there have been very few attempts to use a critical perspective to develop 'critical alternatives' to the status quo (Mansfield et al., 2014; Young & Diem, 2016). Similarly, there has not been a strong emphasis in the critical educational policy literature on the role of education in developing an ecologically just relationship between people, education and the planet. In part this has been because of the particular traditions of critical educational scholarship, which, either from a critical theory perspective or poststructural perspective, belong to a Western philosophical tradition which defaults to an anthropocentric and bifurcated view of 'culture' and 'nature'. With this point in mind, the postfoundational ecological approach of this thesis can be seen as a

way of 'ecologising' critical educational scholarship and positioning it within the idea that the earth is both finite and part of the interconnected contextual whole that always needs consideration. This discussion is continued in the sub-section below.

The ecological and pragmatic dimensions of CEP

In the previous chapter, I argued that the work of Bateson and Guattari provides a useful way of interpreting our interconnected social, psychological, political and natural ecologies. Bateson's concept of 'epistemological error' was included in this discussion as a way of explaining how environmental problems can be developed through the extension of poor thinking. This idea is discussed in the following chapter where the GEC is analysed in terms of the 'success' **and** 'failure' of modern economies. Drawing on Bateson's ideas about epistemological error, Chapter 2 also introduced Guattari's triplex of mental, social and natural ecologies. This concept was used to emphasise that humanity has to change both the way it thinks and also the environments in which this thinking occurs. Our thoughts in other words are linked to our contexts, just as our contexts are linked to our thoughts. This 'recursive' epistemological feature of 'the ecological' means that the GEC should be understood in terms of multiple, interconnecting dimensions.

This brief section looks at how the ecological and the pragmatic are tied together in the CEP methodology of this thesis. While Chapter 2 has already provided much of the justification for the ecological approach taken in this thesis, there has been less explicitly stated about the contribution of pragmatism to CEP. These two – the ecological and the pragmatic – are discussed together here because of how much they have in common. These commonalities are linked to their epistemologies, especially through the postfoundational approach already outlined. In the sub-section below this point is discussed with reference to John Dewey's 'naturalistic transactionalism' and Charles Peirce's community of inquiry. In the second sub-section, the methodological potential of pragmatism is discussed in terms of its basis for public policy research, including the ability of

public policy approaches to 'learn' (a point that in turn reinforces Dryzek's discussion of ecological democracy discussed above).

Overlapping epistemologies

The postfoundational approach to 'the ecological' developed in this thesis understands the world (ontology) as dynamic and interconnected series of systems. This view of the world is similar to that developed in philosophical pragmatism, which argues that across the complexity of experience it is not possible for observers to perceive 'all' that is occurring. Something of the epistemological overlap between the ecological and the pragmatic can be traced to the non-dualist approach of the early pragmatists, especially in relation to the construction of 'culture' and 'nature'. In John Dewey's work, especially his later work, this has been described as a type of 'naturalistic transactionalism', which positions people as active agents within their learning (experiential) contexts. This is in stark contrast to a Cartesian spectator approach to knowledge which positions people as observers rather than as active participants (Boyles, 2012; T. Colwell, 1985; T. B. Colwell, 1971). From a Deweyan perspective, knowledge is developed when people interact with their contexts (including natural contexts). There is no bifurcated separation between people and their environments in such an approach, but one of exchange or interconnection.

In explaining John Dewey's 'pragmatist ecology', Neil Browne has made the point that the integrated epistemology of Dewey underpins an approach to both aesthetics and science (Browne, 2007). Browne explains that for pragmatists such as Dewey, the world is not structured into discrete or abstract silos of morality, ethics, politics and nature – but interconnected through webs of experience. Such an understanding is the basis for the 'natural' interconnection that occurs between 'facts' and 'values', a theme that was also explored in Chapter 2 (Putnam & Sen, 2004; Putnam & Walsh, 2012). From a pragmatic point of view, science is therefore much more than a Cartesian quest for certainty, and is instead understood as a contingent, situated, creative, ethical and aesthetic response to the world. As Browne notes:

> It is necessary to remark here that when Dewey speaks of science, he means
> science as a method—as the interaction of creative intelligence with the
> physical world in order to better know that world—not the facts and findings of
> science. (Browne, 2007, p. 6)

This idea of the creative inquiry is not limited to an individualised experience, but is more properly understood as being part of a collective, democratic endeavour. This point is underlined in the work of Charles Peirce and his concept of the 'community of inquiry' (Pardales & Girod, 2006). From a Peircian perspective, the fallible, active, 'messy' and contingent features of a pragmatist approach to knowledge necessarily emphasise that 'reality' must be understood as the product of collective intelligence. From a Peircian perspective, 'understanding' is developed in connection to others and is dependent on the quality of the knowledge community's deliberation.

The concept of reality needs to be briefly unpacked here. For Peirce the concept of inquiry could lead to more and more informed understandings of the world. In this sense, Peirce could be considered as a type of pragmatist-realist. This is not to suggest that all pragmatists have taken such an approach, and indeed, it is more useful to point out that pragmatists tend to be found across the realist-idealist spectrum (B. G. Norton, 2005; Pardales & Girod, 2006). Without running down that philosophical rabbit hole, the relevant epistemological point here is that through pragmatism, humans are able to correspond about reality, and even improve the usefulness (or accuracy) of our statements about the world. As this last sentence implies, epistemologically, pragmatists emphasise the role of *social construction* in building an understanding of the world, albeit that some pragmatists assume that deliberation always results in a more accurate picture of 'reality', whereas others, such as Richard Rorty (in an extreme case), assume that it is not possible to understand reality and what we are doing when we learn is changing one set of ideas for another (See B.G. Norton, 2005, Appendix 1, for a full discussion of these subtleties).

The methodological point for this thesis is that there is an actual reality – but one can only be known through experience. This is another way of saying knowledge is always socially constructed. To a non-philosopher this may sound rather strange. In fact, this approach to reality is fundamental in charting a course through two poles – at one extreme a Cartesian attempt to avoid doubt by 'grounding' our direct experience of reality in a foundation and, at the other extreme, postmodern or poststructural points of view which have argued that there is no reality outside of that which is socially constructed. Bryan Norton dryly explains this point with reference to Peirce's pragmatic approach to language and the importance of language and 'community':

> Peirce's triangular relationship is the key to avoiding both relativism and rank social constructionism; it is also the key to the pragmatist view that language functions as a tool that can, with care, be sharpened and made more functional. What animates the irreducibly triangular relation is that language is used to communicate and pursue goals in the real world. What unifies this triangular relationship—what binds it irreducibly—is the act of communication in service of a shared social goal. Although our belief structures are, on this view, socially constructed, the constructions themselves are not the property of one individual or any limited segment of the community; they are constructs out of the experience of communities of truth-loving inquirers. Language, as it functions in the service of communication within real communities, is constrained by the common experiences of the other members. Experiences in these communicative situations, though individual in origin, become shared building blocks of experience as they are rendered in language. One cannot separate the linguistic component from the experiential component of a sentence; nor can one purge values out of individual experience or the expression of it. These two philosophical realities doom the correspondence theory of truth and the representational approach to epistemological justification. Good riddance. (B.G. Norton, 2005 p. 448-449)

As is implied by Norton's discussion, a pragmatist view of language emphasises the importance of community and democracy. With reference to the importance of an interconnected notion of facts and values, and of science and morality, the development of a democratic culture is the outcome of a scientific culture in

search of an improved understanding of the world. As Michael Pardales and Mark Girod (2006, p. 302) have noted:

> For Peirce, it is necessary for us to subject our thinking to standards that lie outside of our own interests, concerns, and reflections. In this way, thinking must continually be subject to a community whose standards allow us to correct and revise our ideas in the course of living our lives.
>
> From this position, we get a feel for the importance of community to Peirce's view of inquiry. The community of inquirers, accepting of the method of scientific investigation, serves as the arbiter of standards and the justification for the production of reliable knowledge.

It is (a healthy) democracy then that holds the basis for a well-developed community of inquiry. A healthy democracy is one in which the pragmatic inquiry of facts and values can be interrogated by those with respect for, what can be described as, the rules of evidence. From the perspective of this thesis, a way of thinking about community is found in the notion of a healthy political ecology. Subsequently, a healthy political ecology joins up with other arguments made in this thesis, notably in relation to the concept of ecological democracy. In Dryzek's deliberative approach to ecological democracy, he suggests that the discourses of democratic pragmatism, ecological modernisation, sustainable development and ecological limits offer the most potential for 'learning' (Dryzek, 2013). Drawing on both an ecological and (postfoundational) pragmatic argument, Dryzek's point also means that policy forms should have some degree of flexibility and evaluative system to ensure that they actually do contribute to improvements in our interconnected ecologies.

Pragmatism and public policy

John Dryzek's application of pragmatism is not the only example of where pragmatism has been used to justify a useful approach to policy. In recent years the field of public administration has seen a considerable amount of debate, especially in the North American context, about the potential of philosophical pragmatism to contribute to government action. The focus for this discussion has

included the possibilities for using the inquiry-based features of pragmatism as part of a practical and reasoned move away from the focus on 'efficiency' provided by neoclassical economics, new public management and logical positivism (Evans, 2010; Shields, Whetsell, & Hanks, 2015). A central concern raised about 'efficiency' is that it lacks an (open) understanding of the interrelationship between facts and values and too often results in a technocratic application of government ideology. It can also lead to a focus on specialisation and the willingness of decision makers to split apart complex problems (such as climate change) and provide piecemeal solutions that fail to get to grips with the deeper causes of such problems. While much of this recent debate has a North American focus, it is highly relevant to New Zealand where a similar economic ideology and approach to Public Management has been used as a basis for public policy (B. Ryan, 2007).

In support of philosophical pragmatism as an alternative approach to public policy, David Brendel has articulated the principles of public policy pragmatism in terms of the following four Ps: practical, pluralistic, participatory and provisional (Brendel, 2006). On the basis of such a division, Patricia Shields and others have mounted the case that the use of pragmatic inquiry approaches in public administration is a way to overcome such (ecological) difficulties as the inevitable complexity and incompleteness of information in public policy, the need to bridge the artificial fact-value divide, the need for processes that include a diverse range of perspectives while also avoiding foundational forms of truth (Evans, 2010; Shields, 2003, 2005, 2008; Shields et al., 2015).

While Shields and other public administration pragmatists do not reference Guattari, their work is compatible with the CEP approach taken in this thesis and shows the worth of utilising philosophical pragmatism in policy. In particular, a pragmatic approach to policy is inherently interested in developing deeply considered alternatives, rather than incremental shifts in an ill-considered status quo. In this sense 'ideology' (of either an ecological or neoliberal persuasion) is not accepted as a finished basis for action. Instead, it is argued that policy

developments should be seen as the result of a process which is both participatory and organised in terms of normative and scientific integrity.

In response to the fact-value dichotomy of technocratic approaches to policy (rather than pragmatism per se), Frank Fischer has made a similar point about the importance of critical approaches to policy which draw on both scientific expertise and democratic processes (Fischer, 2011). Fischer's approach underlines the importance of a critical pragmatic epistemology by arguing that while scientific information is valuable in helping to establish technical information, this information does not substantively help resolve political differences or arbitrate between different sets of values. In line with the points raised by other critical policy theorists (and Chantal Mouffe as discussed above), Fischer points out that what is needed is a (pragmatic) understanding of how facts and values are interconnected, beyond the positivist separation of, technocratic and 'evidence-based' policy. Such an approach would involve a more nuanced realisation that policy decision-making occurs within the realm of values, and decisions are made by way of established power structures (see also Rein, 1983). Extrapolating from Fischer's point brings us back to the need for communities of inquiry that can mediate such structures and provide the best possible support for democratic decision-making.

The methods used in this thesis

There are a range of methods employed in this thesis, from the surveying of a wide range of literatures, through to the summarising of policy contexts and, in the later stages of this thesis, the construction of an alternative direction for higher education policy in New Zealand. In slightly more detail, Chapters 2 through 7 are where most of the theoretical work is undertaken, and where the most effort has gone into surveying the relevant literature. The word survey is used here rather than 'review' because the sheer scale of the diverse literatures drawn on for this type of thesis has meant that it has not been possible to carry out a systematic reading of all that is written across all of those scholarly areas relevant to this study.

In Chapters 8 and 9, the discussion of the Global and New Zealand contexts for higher education policy moves the thesis methods away from the analysis and use of specific philosophical and critical literatures and draws much more on the techniques of environmental scanning and evaluation. In Chapter 8 key aspects of the international context considered include the higher education policies of a range of OECD countries and the global efforts to develop sustainability and sustainability education. The focus for much of this work came from the writings provided as part of the Decade of Education for Sustainable Development (DESD) but other fields, not always linked to sustainability are also briefly discussed, including some of the work done in engaged scholarship and the emerging educational discussions surrounding education and wellbeing. Obviously the scale of the global policy and practice possibilities for education that could inform an ecological policy approach in New Zealand extend well beyond what is possible in one thesis chapter. Subsequently, much more work could be carried out in this area in the future.

Chapter 9 explores the policy and practice context for higher education in New Zealand. This chapter includes an assessment of the current higher education strategy as well as an analysis of the wider policy context in which higher education policy takes place. Included in this discussion is an analysis of what could be possible following the 2017 election of a Labour Coalition government, which appears considerably greener than the previous coalition governments led by the National party. At this early stage in the election cycle the key point made here is that there is both a great deal to be done to break free of New Zealand's habitual unsustainability, albeit that there are also some existing policy structures which could promote a more ecological policy direction in the future.

Chapter 9's discussion of higher education practice in New Zealand is based on an evaluation of documentary evidence, along with any existing research, linked to the performance of New Zealand's TEIs. On-line documentation was used to inform a judgement about the extent to which New Zealand's public higher

education providers are developing an ecological approach through their curriculum, research and operations. A basic matrix was used to group each of New Zealand's six universities; the six largest Polytechnics/Technical Institutes and largest Wānanga (see Appendix A). Due to space limitations however, a full presentation of this evaluative data was not possible. Moreover, given the limitations of the documentary evidence drawn upon for this 'evaluative survey', and the need in this chapter to only identify that there is an existing platform for the development of Anthropocene education forms, then only a selection of this information was used.

The final chapter of this thesis draws together the policy possibilities for an ecological approach to higher education in New Zealand and also provides a conclusion to this study. Methodologically speaking, this discussion represents a synthesis of the earlier points made. The 'method' used here is essentially one of critical imagination and the result of a creative response to the theoretical and practical possibilities for ecological education. Significantly, while this framework is developed as a tool to improve higher education provision in New Zealand, it is not meant as an isolated, individual initiative. The conclusion of this thesis also links the idea of an ecological approach to higher education to the broader ambition of developing New Zealand as an ecological democracy. It emphasises the point that there more that can be done to develop an ecological approach to policy analysis.

Chapter 4: The Global Ecological Crisis (GEC)

The ecological crisis is so obvious that it becomes easy – for some strangely or frighteningly easy – to join the dots and see that everything is interconnected.
– Timothy Morton (2010).

What we're now starting to understand is that everything is actually connected - our social systems, our political systems, our economic systems, our cultural systems. And all of those things are overlapping and are all embedded in one environment. What we're now beginning to understand...is the extent to which so many of our systems are coupled. In a way this has got worse with globalisation. Now we have this phenomenon where a failure in one system can very quickly transmit shocks into another system.
– Dr Nafeez Mosaddeq Ahmed (2017).

This chapter answers the thesis question – what is the Global Ecological Crisis? It uses the ecological understanding developed in Chapters 2 and 3 to explore how the Global Ecological Crisis (GEC) is an integrated set of systems which includes some catastrophic 'epistemological errors' (Bateson, 1972). As a result, the 'ecological' analysis of the GEC in this chapter does much more than provide a gloomy catalogue of the crises occurring in our natural, social and psychological ecologies. While recognising the stressed condition of the planet, the GEC is analysed as an **interconnected** set of crises with natural, physical, social, economic, political, educational and importantly, **epistemological** dimensions. From an epistemological perspective, it is not so much the detail of what is occurring in these systems that is the focus for discussion, but the idea that these systems do interconnect and that the GEC can be best understood in terms of these interconnections. From such an analysis it is possible to see why an ecological approach to higher education is needed along with an ecological approach to economics and democracy itself. Chapter 5 specifically addresses the educational links to the GEC while this chapter, chapter 4, concentrates on understanding the GEC and why an ecological approach to policy is required.

There are three main sections to this chapter. The first examines the planetary overshoot occurring as a result of humanity's social and economic success. This section connects issues such as climate change, planetary boundaries, inequality, depression and obesity to the 'success' of humanity. It also explores the need for new ways of thinking that can understand the interconnections between different systems. This section concludes with a brief analysis of recent events in Syria to provide an insight into the worth of an ecological analysis of context. The second section discusses the epistemological dimensions of the GEC in relation to economic growth and the debate surrounding the decoupling of humanity's 'success' from its environmental impact. The focus for this discussion is the easy 'belief' (epistemological error) that humanity can continue to expand its economy, yet also reduce the damage it does to the biosphere. In the third section of this chapter, the issue of decoupling is carried over to our political ecologies. In particular, this section looks at the 'politics of unsustainability' (Blühdorn, 2007, 2011, 2016) including the recent rise in 'post-truth' politics. A key focus for this section is examining the failure in our political systems. This analysis provides the necessary link to the wider thesis argument that an ecological approach to policy requires a shift towards ecological democracy.

I have some great, great, very successful golf courses. I've received so many environmental awards for the way I've done, you know. I've done a tremendous amount of work where I've received tremendous numbers. Sometimes I'll say I'm actually an environmentalist – Donald Trump (Hamblin, 2016).

Human 'success' on an interconnected planet

From a human perspective there is considerable evidence that life is getting better for many of us. Evidence from a range of sources, including the United Nations *Millennium Development Report* (2015), suggests that there are undoubtedly long-term, trending improvements across a range of health and welfare indicators, including the overall wealth of our economies, our life-expectancies, literacy rates, the rights of women and a global reduction in the amount of child-labour (OECD, 2014a; Roser & Ortiz-Ospina, 2017; United Nations, 2015).

As welcome as these improvements are, these statistics are not the final world on the state of the planet this far into the 21st century. Complicating the analysis of 'progress' that some libertarian commentators (Norberg, 2016; Ridley, 2010) have easily attached to such figures, are the recent shifts in the biosphere linked to, for example, climate change and the growing human impact on the planet. On questions of climate, the consensus of the Intergovernmental Panel on Climate Change (IPCC) points to an increasingly warmer and inhospitable world linked to human pollution. In their 2014 Summary Report for Policy Makers, the IPCC Working Group found that:

> Without additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread and irreversible impacts globally (high confidence). In most scenarios without additional mitigation efforts (those with 2100 atmospheric concentrations >1000 ppm CO_2-eq), warming is **more likely than not to exceed 4°C above pre-industrial levels by 2100**. The risks associated with temperatures at or above 4°C include substantial species extinction, global and regional food insecurity, consequential constraints on common human activities and limited potential for adaptation in some cases (high confidence). (p. 17-18).

The negative IPCC forecast for the second half of the 21st century (and beyond) is consistent with other analyses. Jorgen Randers, who was part of the original 1972 *Limits to Growth* team, has identified that by 2052 the planet will have

gained more than 2 degrees centigrade of warming (Randers, 2012). While his book – *2052: A Global Forecast for the Next Forty Years* – is focused on modelling up to the year 2052, Randers suggests (with reference to the considerable uncertainties) that the amount of Green House Gas (GHG) that is forecast to be in the atmosphere by 2052 will continue to warm the planet after this time and result in either a world of "managed decline" or "uncontrolled collapse" (Randers, 2012, p. 313). Either one of these models implies a world with a lower human population and/or a transformed set of social and economic systems.

Similarly, the Stockholm Resilience Centre (SRC) has collated scientific data across a range of identified planetary boundaries (not just climate change) and identified that biospherical changes are driving the planet to an uncertain future (Steffen et al., 2011; Steffen, Richardson, et al., 2015; Zalasiewicz et al., 2010). In the diagram below, this 'planetary boundary' data has been organised into a single diagram showing specifically where (enormous amounts of) scientific data is pointing to planetary stress and 'overshoot'. Perhaps surprisingly, climate change is an area where the level of overshoot is yet to become dangerous or uncertain. Other areas however, including the amount of phosphorus and nitrogen pollution (mainly via agricultural production and fertiliser use) and the level of biodiversity loss, have been judged by scientists to be 'unsafe'. For some areas of the planetary system, including the pollution variables labelled as 'Novel entities' (the emissions of toxic and long-lived substances such as synthetic organic pollutants, heavy metal compounds and radioactive materials) and 'Atmospheric loading' (dusts, smoke and haze) it has not, as yet, been possible to identify a safe limit (Steffen et al., 2015).

The analysis behind planetary boundaries helps to make the point that the Earth is a complex system, and that changes across different planetary aspects can have an unpredictable influence on other aspects of the biosphere. For example, ocean acidification (as a result of increased atmospheric CO2) results in a less healthy ocean, which leads to other problems for humans and non-humans, including the collapse of food sources for all species. Similarly, additional

nitrogen loading can lead to eutrophication of waterways and coastal environments, and in some cases contributing to what have been called 'oceanic dead zones' (Chislock, Doster, Zitomer, & Wilson, 2013; Wallace, Baumann, Grear, Aller, & Gobler, 2014).
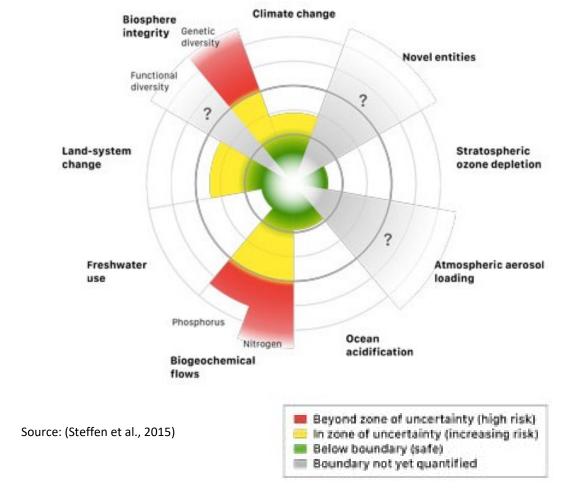
Figure 3: Stockholm Resilience Centre Planetary Boundaries

Source: (Steffen et al., 2015)

Aside from the well documented changes in the biosphere, other complications of humanity's 'success' includes the increasing inequality of our economies, with far greater levels of financial reward being distributed to the top of the economic ladder than is provided for those of us closer to the bottom. Inequality brings with it a collection of problems for all the members of a society (both rich and poor). These problems include reduced life expectancy, low educational qualifications, high crime rates, high proportions of teenage pregnancies, and high incidences of mental health problems (Wilkinson & Pickett, 2009). The OECD

have identified that high levels of inequality are bad for economic outcomes (OECD, 2015). With the top 1 percent of the wealthy gathering up most of the proceeds of economic growth in the last 30 to 40 years, especially in countries with strongly neoliberalised economies such as the United States, United Kingdom and New Zealand (Dietz & O'Neill, 2013; Rashbrooke, 2013), much of the 'success' humans have achieved economically, has also led to costly social issues.

Other complex issues which can be connected to the 'success' of our human economies are the increasing rates of depression and obesity in the Western world. Depression and obesity have been linked to social settings that are stressed, sedentary and surrounded by calorie-rich foods (de Graaf, Wann, & Naylor, 2014; Egger, Swinburn, & Amirul Islam, 2012; Hidaka, 2012; OECD, 2014b; Siervo et al., 2014; Swinburn et al., 2011; Van Deurzen, Van Ingen, & Van Oorschot, 2015; Volland, 2012). Similarly, new economic developments linked to globalisation have also led to a loss of blue-collar jobs in developed countries, a rise in unemployment (at least compared to the 1950s) and increasing economic insecurity. As if to emphasise the potential of technology, recent developments in robotics and information technology, including such possibilities as driver-less cars and electronic 'counsellors', suggest that many professional 'white-collar' jobs may be at risk as technology continues to 'improve our lives'.

This discussion could continue, and the point here is not to either simplistically laud or demonise such aspects as technology - or to fully document where humanity is succeeding and failing - but to emphasise that the GEC is linked to **both** our success and failure across the aforementioned psychological, social and natural dimensions. In a somewhat oxymoronic way, the point can be made that humans are both better off **and** facing an increasingly uncertain future in facing up to the GEC. From such a perspective, a deeper understanding of the GEC also helps to identify which indicators can provide sustainable measures of actual progress (beyond the traditionally isolated economic and social variables such as GDP and unemployment rates). When a deeper analysis is carried out, especially

from a systems perspective, then the achievements humanity make as a species will not "chop off" (Bateson, 1972, p. 492) concepts that economists frequently describe as externalities (Dietz & O'Neill, 2013). Drawing on more concrete examples, the point made here is that humanity should move towards those forms of analysis that do not so easily separate such issues as economic growth, inequality, housing, human health and environmental damage. This is an aspect of an ecological approach to policy analysis and indeed, this approach is used later in the thesis when I argue that the United Nations' Sustainable Development Goals (SDGs) could operate as an important step forward in New Zealand developing as an ecological democracy (Chapter 10).

Case study: An ecological analysis of the recent events in Syria

One way of understanding how an ecological approach can inform policy thinking can be found in relation to recent events in Syria. While much of the media coverage of 'the Syrian crisis' in recent years has focused on the horrific civilian casualties of the Syrian civil war, including the suspected use of chemical weapons by the Russian-backed regime of Bashar al-Assad, writers such as Nafeez Ahmed have examined the connections that exist between changes in the Syrian economy and society and the wider biophysical changes happening in this part of the world (Ahmed, 2016). In his book *Failing States, Collapsing Systems: BioPhysical Triggers of Political Violence*, Ahmed's analysis brings together a range of factors to help explain Syria's decline. In particular, Ahmed links the decline of oil production in Syria (oil production peaked in 1996) to the subsequent decline in revenue for the country, as well as a series of economic, climatic and societal changes, all of which were interconnected pre-cursors to the Arab Spring and the subsequent brutalisation of those in rebel held areas. The web of events discussed by Ahmed has been neatly summarised by Alice Friedemann on the progressive 'energy skeptic' website (Friedemann, 2017):

> In 1996... the main source of Syrian revenue came from their production of 610,000 barrels [of oil] per day (bpd). By 2010 oil production had declined by half. Falling revenues caused Syria to seek help from the IMF by 2001, and the onerous market reform policies required resulted in higher unemployment and

poverty, especially in rural Sunni regions, while at the same time enriching and corrupting ruling minority Alawite private and military elites.

In 2008 the government had to triple oil prices resulting in higher food prices. In 2010 food prices rose even more due to the global price of wheat doubling in 2010-2011. On top of that, the 2007-2010 drought was the worst on record, causing widespread crop failures. This forced mass migrations of farming families to cities (Agrimoney 2012; Kelley et al. 2015). The drought wouldn't have been so bad if half the water hadn't been wasted and overused previously from 2002 to 2008 (Worth 2010). All of these violence-creating events were worsened by one of the highest birth rates on earth, 2.4%. Most of the additional 80,000 people added in 2011 were born in the hardest-hit drought areas (Sands 2011).

As Ahmed explains, the burgeoning population of Syria in 2010 – an additional 13.6 million people compared to 1968 – meant that Syria could no longer feed itself. In 'successfully' gathering oil revenues from the 1960s to the 1990s, Syria laid the foundation for a later population explosion. Add to this the fact that the additional wealth generated at this time was captured by elites. Climate change is also an important aspect of Syria's case too. Specifically, while climate change itself has not been the major factor in the horrors of Syria, there is more than an ironic link between Syria's previously increasing oil revenues and the effect a changed climate has had on its ability to grow food. While a Malthusian analysis is too simple for what is going on in Syria (just as a linear analysis simply blaming 'climate change' is also inadequate) an ecological analysis, such as the one provided by Ahmed, demonstrates that population increases, poverty, inequality and poor governance can combine (and interconnect) for appalling outcomes.

Extending out the summary, it is also possible to see how an epistemology based on oil (and despotism) has 'worked' for Syria for many years, but its epistemological error is certainly apparent when the oil supply has dwindled, a record drought developed, the population has boomed, and the regime has sought to continue its approach through tyranny. In some senses Syria might not

just be written off as a poorly governed state, but as one of the first (of many) nations to succumb to integrated issues of their own success and failure in a climate changed world. Other, 'more advanced' nations are likely to struggle once climate change combines with other political and demographic issues. Here then, it is important to remember that the millions of refugees created by the events in Syria (not to mention the role played by the different terrorist groups) have already had an impact on the political contexts of developed countries, especially in Europe and the United States. In this sense, Syria's 'problems' are not limited to its borders, but flow over to all those nations impacted by their refugees.

Economic growth, biophysical limits and decoupling

While the discussion above provides a frame for discussing the broad interconnections between human success and failure in the GEC, this section examines humanity's addiction to economic growth. After briefly recapping both the 'successes' of economic growth, and the interconnections between our economy and the environment, the focus for this discussion is the contemporary quest for new ways to grow the economy while, at the same time, decoupling our expanding wealth from its impacts on the environment. While on the surface the issue of 'decoupling' may seem like a rather abstract, technical issue, far removed from higher education policy, the issue of how humanity might continue to be 'successful' without being an environmental 'failure' goes to the core of the GEC and the need for an ecological approach to all policy. Indeed, if humanity is able to continue to grow the economy, while also reducing its environmental footprint, then it has gone a long way towards a more sustainable society. However, if the issue of decoupling is more complex than many conventional economic points of view optimistically suggest, then there are many serious economic, democratic and pedagogical implications. In short, the issues surrounding decoupling suggest that humanity needs to find revolutionary ways to flourish with fewer resources. At the same time questions also arise about how the current levels of wealth could be redistributed to those with very little. The evidence so far suggests that the sort of ecological epistemology

needed to fully respond to these questions goes well beyond what is typically expected in the sustainability discourse.

Conventional (neoclassical) wisdom has it that economic growth is the basis for a healthy economy and a thriving society (T. Jackson, 2011; C. Jones & Vollrath, 2013). Without hesitation it is possible to agree that economic growth has been instrumental in raising the standard of living for high numbers of people across the planet. At the very least, the level of global economic growth since the industrial revolution, and especially since the end of World War II, has led to an unprecedented increase in per capita wealth for people living in the 'developed' world (C. Jones, 2016; C. Jones & Vollrath, 2013). As the economist Charles Jones has noted, with reference to the US economy:

> For nearly 150 years, GDP per person in the US economy has grown at a remarkably steady average rate of around 2% per year. Starting at around $3,000 in 1870, per capita GDP rose to more than $50,000 by 2014, a nearly 17-fold increase. (Jones, 2016, p. 5)

From an economic and lifestyle perspective, this increasing wealth has provided amazing levels of consumer choice, including new forms of electronic technology and developments in housing and transport, and, at least in theory, access to the considerable science of health care (perhaps not so much for US citizens). These developments have also meant increasing production and consumption. While it might be tempting to see this evolving consumption as a natural or inevitable side-effect of our development, evidence from the 1950s onwards suggests that our consumerist lifestyles have been formed as part of a deliberate strategy of governments and corporations. As has been argued in various contexts (Dietz & O'Neill, 2013), the origin of this conscious planning has been apocryphally revealed in the 1955 paper of Victor Lebow (Lebow, 1955):

> Our enormously productive economy demands that we make consumption our way of life, that we convert the buying and use of goods into rituals, that we seek our spiritual satisfactions, our ego satisfactions, in consumption. The measure of social status, of social acceptance, of prestige, is now to be found in our consumptive patterns. The very meaning and significance of our lives today

expressed in consumptive terms. The greater the pressures upon the individual
to conform to safe and accepted social standards, the more does he tend to
express his aspirations and his individuality in terms of what he wears, drives,
eats, his home, his car, his pattern of food serving, his hobbies.

Although Lebow's words may have been read by only a few at the time, the
consumerist strategy he discusses nevertheless unfolded in the West after World
War II - an event which has been described as 'the great acceleration' (Steffen,
Broadgate, et al., 2015). As can be seen in the graph on the following page, the
post WWII period marks a time when humans considerably increased their use of
resources. Or, as a joint report by the United Nations Development Programme
(UNDP) and the United Nations Research Institute for Social Development
(UNRISD) has noted, between 1950 and 2010 global population went up three-
fold and global resource use (biomass, fossil fuels, ores, minerals and water)
increased sevenfold (United Nations Development Programme & United Nations
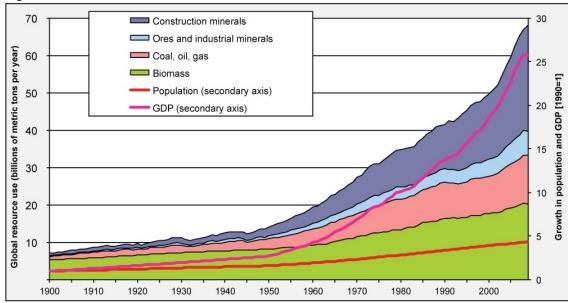Research Institute for Social Development, 2017).

Figure 4: Global resource use 20th and 21st centuries

Source: (Haberl, 2012)

The environmental impact of this resource use has already been outlined via the
summaries provided by the IPCC and SRC (previous section). The subsequent

'overshoot' of planetary boundaries represent what happens when the human claim on the environment extends beyond what can scientifically be established as a 'safe' level (Steffen, Richardson, et al., 2015; Zalasiewicz et al., 2010). Significantly, humans are continuing to ***increase their demand*** on the biosphere – rather than level off their demand for resources (United Nations Environment Programme, 2011; von Weizsäcker et al., 2014). In addition to the sort of resource diagram included above, another way such information can be presented is through a 'footprint analysis'. There are multiple forms of footprint analysis, including carbon footprints, but perhaps one of the most reliable sources of footprint analysis is linked to the Global Footprint Network, which has been based on the work of Wackernagel and Rees (Wackernagel & Rees, 1996). In summary, the idea of a global footprint is based on set of calculations establishing how much 'planet' (annually), measured in global hectares (gha), is used in the productive and consumptive acts of humanity (making stuff and throwing stuff away). Currently approximately 1.6 'Earths' are annually consumed per annum. The degree to which the global footprint exceeds the number 1 is accounted for as an overshoot. In practical terms this means that the amount of planetary resilience is being chewed through as the natural resources and waste sinks of the planet are declining at a faster rate than they are being replenished. While such a process can 'work' in the short-term, eventually such a strategy will lead to a significant failure.

A key question arising from the global footprint analysis is potential of technology to reduce global resource use. Technology, after all, has been responsible for a host of increased efficiencies – from the adaptation of early steam engines through to the production of energy efficient light bulbs. As can be inferred from the diagram above, the level of technological innovation occurring in the economy (efficiency gains) is less than the overall increasing demand for actual resources. In the language of economists, the growth of the economy has, at least to date, not managed to 'decouple' itself from increasing resource use.
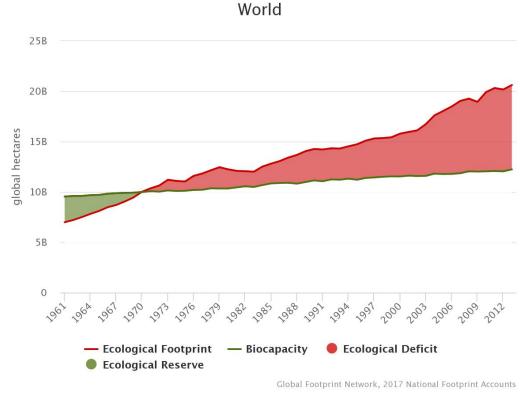
Figure 5: Global footprint analysis

World

Source: Global Footprint Network - http://data.footprintnetwork.org/#/

It is important to point out that there are different types of decoupling. This discussion is important because in arguing for the development of an ecological approach to policy analysis, the issue of decoupling is fundamental to deciding if the current economic policy framework will continue to dominate (neoclassical economics with unlimited economic growth and trickle-down solutions to inequality) or whether an alternative framework can be developed – based on planetary limits and an ecological epistemology (and economics) (Spash, 2012, 2013). Understanding the different possible approaches to decoupling also provides an insight into whether decoupling is common, straight forward and increasingly occurring or something more complex and demanding of new forms of thinking. The most commonly used approach to decoupling is 'relative decoupling' (also known as weak decoupling). Relative decoupling is equivalent to improving the overall efficiency of an operation. This is quite a common occurrence, and is most symbolically evident in the improvement in engine efficiency (say for cars), or the development of LED lighting (as opposed to

incandescent forms). Relative decoupling provides scope for optimism that technological improvements can be beneficial to the planet. That said, relative decoupling, often fails to bring about total decreases in the amount of energy put into a system as aggregate demand continues to increase, despite the efficiency gains. This phenomenon is known as the Jevons paradox (or effect), after Stanley Jevons whose improvements in the efficiency of the steam engine led, not to a decrease in the amount of coal demanded, but to a quantum increase in the amount of coal used in the 19th century. The Jevons paradox helps explain why the amounts of energy and natural resource used by the global economy has continued to (increasingly) rise despite the ongoing improvements in efficiency (T. Jackson, 2016; Polimeni, 2012; Victor, 2008; von Weizsäcker et al., 2014).

Conversely, absolute decoupling however refers to an overall reduction in the **_total amount of resource_** used relative to an increase in prosperity (Dietz & O'Neill, 2013; Fedrigo-Fazio et al., 2016; T. Jackson, 2009). Some commentators extend the idea of absolute decoupling to three different types. The first of these refers to a lower total amount of resource used (compared to increases in production). The second involves a decrease in the environmental impact of production and consumption (of a good or service) - a calculation which tends to consider not just the actual amount of natural resource used but the overall costs to the environment from its extraction and use (United Nations Environment Programme, 2011). Finally, 'absolute decoupling within limits', reflects, not just the potential to grow the economy while reducing natural resource input, but doing this in a way that makes natural resource use sustainable in the long term. Isolated examples of absolute decoupling within environmental limits are rare and, at the global level, highly unlikely based on present trajectories and scenarios (Fedrigo-Fazio et al., 2016; Ward et al., 2016).

Putting aside the evidence regarding the *increasing* rate at which the world is using resources, a key reason why economic growth is not accompanied by any form of absolute decoupling is the burgeoning global middle class, especially in

India and China. Newly wealthy consumers in these nations have an understandable appetite for the sorts of consumer products and high (animal) protein diets that are taken for granted by those in the Global North. As GDP increases in developing countries, and more people are lifted from poverty in Asia, Latin-America and Africa, the world can expect that more forms of mining, processing, industrial production and pollution will need to take place to meet increasing consumer demand. While those in developed countries seem reluctant to change their consumption patterns, the growing middle class from the developing world seem set to add to a footprint that is already over the identified carrying capacity of the biosphere.

That said, while there is a growing awareness of the need to 'be sustainable', the governmental and business thinking and action towards some state of absolute decoupling is nascent at best and arguably misguided. In 2011, the International Resource Panel (IRC) of the United Nations Environment Programme (UNEP), published its first report on the politics and reality of decoupling (United Nations Environment Programme, 2011). As Robert Fletcher has noted, the contradictory nature of this report can be linked to its neoliberal and fantastical ideas about the potential of decoupling even in the face of its own lack of evidence about the extent to which decoupling is actually occurring (Fletcher, 2016; Schandl et al., 2016). For example, the report suggests that decoupling is a project that is only just beginning:

> The conceptual framework for decoupling and understanding of the instrumentalities for achieving it are still in an infant stage (United Nations Environment Programme, 2011, p.ix).

And:

> Absolute reductions in resource use are rare ... they can occur only when the growth rate of resource productivity exceeds the growth rate of the economy (United Nations Environment Programme, 2011, p. 5).

For Fletcher, the essence of the IRC's fantastical approach to decoupling comes in the form of faith, or at least an a priori (deontological) assumption that

decoupling just has to occur. Fletcher attaches this faith to the work of Jeffrey Sachs as the UN's chief economic advisor on the Sustainable Development Goals (SDGs). In particular Fletcher points to the following statement from Sachs:

> There are many pessimists regarding decoupling who feel that the only way to limit resource use is to limit overall economic growth. We disagree. Decoupling has not yet been tried as a serious global strategy…

In 2014 the IRC published a second report – *Decoupling 2 – Technologies, Opportunities and Policy Options* (von Weizsäcker et al., 2014), which optimistically continues to champion the possibilities for decoupling despite also acknowledging the overwhelming challenge it poses, and the relatively few pockets where anything like absolute decoupling is actually occurring. The tension is best seen in the 44-page summary report via the Foreword by the UNEP Director, Achim Steiner, where he readily acknowledges that the world's use of resources is increasing, and looks like as if it will continue to increase.

> The IRP's new *Decoupling 2* report demonstrates that the worldwide use of natural resources has accelerated, causing severe environmental damage and depletion of natural resources.
>
> …
>
> This explosion in demand is set to accelerate as population growth and the increase in incomes continue to rise. More than 3 billion people are expected to enjoy "middle class" income levels in the next twenty years, compared to 1.8 billion today.

The *Decoupling 2* report places its particular faith in 'policy proposals' that have been linked to decoupling initiatives around the world. These proposals are essentially an increase in the taxes governments place on natural resources to increase their costs in a way that allows increases in efficiency to have an impact on the amount of resource actually used. The summary report acknowledges the "modest" forms of absolute decoupling that have occurred to date, including (bizarrely) some significant productivity increases in a Sri Lankan desiccated coconut company, the Swedish Government's attempts at energy efficiency, and the use of drip irrigation in India, Israel, Jordan, Spain and the USA. Despite the

modesty of these examples, even the IRC's optimism does not assume that it might be used as a single strategy.

> Although this report uses technological potential as the entry point into a transition to resource productivity, policies are also needed that encourage changes in consumption patterns – and support the community to consider arranging their daily habits, their homes and their nutrition so as to consume fewer resources while achieving improvements in quality of life. (p. 31)

The idea that the world's middle classes need to change their 'consumption patterns' suggests that some form of radical change is necessary even if an optimistic approach is taken to the possibilities for decoupling. For example, even if the current fanciful reports of decoupling (or decarbonisation) are accepted – including the global uptake of solar energy (Handrich, Kemfert, Mattes, Pavel, & Traber, 2015; International Energy Agency, 2016; Obama, 2017) – then such events are not enough (on their own) to reverse the current overshoots and the increasing demand for resources.[7] Hence we are forced to admit that in addition to increases in technological efficiency, many other social, psychological and political strategies are needed. This epistemological challenge is central to understanding the GEC, and ultimately central to the complex changes confronting education in the wider policy context of the Anthropocene.

The GEC, the politics of unsustainability and post-truth

In the previous section, the GEC was analysed as a complex and interconnected phenomenon. There were several dimensions to this analysis. From an environmental perspective attention was drawn to the 'natural' dimensions of the GEC, including how the expanding footprint of humanity is implicated in exceeding a set of scientifically defined planetary boundaries. Interconnected with this damage was the thinking and action underpinning the ongoing (but

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[7] There is considerable evidence that after a flattening out of global carbon emissions from 2014 to 2016, 2017 is on track to show a significant increase in carbon emissions based primarily on increases in China (Hausfather, 2017; R. B. Jackson et al., 2017).

misguided) drive for endless economic growth. The point was made that there are epistemological errors connected to the faith that humanity (just has to) decouple our increasing use of resources from its impact on the planet. There are also considerable epistemological challenges connected to the realisation that, on a per capita basis, humanity has to actually reduce its claims on the biosphere.

In this section, the GEC is analysed in terms of its political dimensions, specifically in terms of two important aspects – the politics of unsustainability and 'post-truth' politics. These two elements compliment the earlier points because they reflect how the epistemological dimensions of the GEC are played out in humanity's political ecologies. Through the politics of unsustainability Ingolfur Blühdorn provides an analysis which explains how humanity's unsustainability is maintained in a political context of 'sustainable development'. Blühdorn's work points to the key challenges faced by any policy forms that seek to move from the status quo. In the discussion of 'post-truth' politics, the point is made that there are powerful, irrational and deceptive elements in the political ecology that further complicate what is required of policy innovations in the Anthropocene. In brief terms, the rise and rise of post-truth politics points to a kind of epistemological insanity in the political ecology, one that demands new forms of policy thinking that go well beyond the current efforts at sustainability.

The politics of unsustainability

There are many paradoxes and complexities in the field of environmental politics (Z. A. Smith, 2017). Liberal democracies, it seems, consistently fail to develop policies that lead to strong forms of sustainability (Dobson, 2007; Sustainable Aotearoa New Zealand, 2009). One way to approach the complicated and paradoxical nature of environmental politics is via Ingolfur Blühdorn's theorising of the 'politics of unsustainability' (Blühdorn, 2007, 2011, 2013, 2016; Blühdorn & Welsh, 2007). Blühdorn's argues that environmental policy exists within a field of 'simulated politics', that is, as a form of acting or pretending – of going through the political motions – while the biosphere declines. Central to this concept is the idea that although society has gained a greater understanding of

environmental issues, there also exists a set of impulses which justify and continue the lifestyles, consumption and economy that are degrading the planet.

> The main argument to be elaborated is that despite their vociferous critique of *merely symbolic politics* and their declaratory resolve to take effective action, late-modern societies have neither the will nor the ability to get *serious*. Their *performance of seriousness*, however, is an effective response to certain challenges which are particular to the late-modern condition, and the discourses of symbolic politics are an important part of that performance. They are an integral part of the *politics of simulation* by means of which late-modern society manages to sustain – at least for the time being – what is known to be unsustainable. (Blühdorn, 2007, p. 253)

Blühdorn presents this idea in his analysis of the 'ecological paradox' and post-ecologist politics. Post-ecologist politics is part of an argument that the earlier and more radical (subjective) approaches to ecopolitics have become exhausted and, in more recent times, been replaced with less anxious and more economically grounded ideas. Similarly, arguments which attempt to develop a more objective (scientific) approach to sustainability also founder in the current political climate. From the earlier, subjectivist tradition, Blühdorn points to the work of Barry Commoner, the German Green Party and Jonathan Porritt as theorists who had substantial criticisms of industrial society and the capitalist mode of production, especially and its connections to both environmental degradation and social alienation (Blühdorn, 2013, 2016). Blühdorn argues that instead of concerns with capitalism, the growing economy and the overshooting of environmental limits, 'post-ecologist' politics has been forced into a debate framed by neoliberal interpretations of *ecological modernisation* and *sustainable development* (Blühdorn, 2013; Dryzek, 2013). Underpinning this debate is a fundamental and 'non-negotiable' acceptance for economic growth and a techno-scientific faith that new technology will be able to transform the negative environmental consequences of human society. For example:

> This paradox is a phenomenon specific to advanced consumer democracies where scientific research has accumulated unprecedented knowledge about environmental change and where several decades of environmental

campaigning have established an unprecedented societal awareness of the multiple sustainability crises, but where the value- and culture-shift outlined above effectively blocks the political will and ability to initiate commensurate change. (Blühdorn, 2013, p. 20)

Blühdorn uses the term 'normalisation' to describe one of the features of this paradox. There is a normalisation of the nature and scale of the damage to the biosphere as well as a normalisation of not doing enough to address this damage. One of the factors Blühdorn identifies as contributing to this normalisation process is the relationship that exists between ecological ideas and the processes of democracy, especially liberal democracy. Blühdorn is critical of the relationship between ecologist politics and both traditional liberal and neoliberal assumptions about freedom. Blühdorn emphasises that while liberal approaches to democracy assume that ***all norms*** are 'negotiable', an ecological perspective wants that negotiation to include some intrinsic valuing of nature and an approach to wellbeing that is consistent with a finite planet. Reinforcing the ecologist's point is that the points at which biophysical systems eventually collapse are themselves not negotiable (Plumwood, 2002; Steffen, Richardson, et al., 2015).

The questioning of democracy and liberalism as pathways to social and/or ecological transformation is the basis for several different and ongoing scholarly debates (Dobson, 2007; Sagoff, 1986; Žižek, 2015). In the context of these debates, Blühdorn does not have an easy solution to the circular political activity he describes as the ecological paradox. Instead he suggests that transcending the politics of unsustainability is something that researchers and the policy community "will find extremely difficult to address" (Blühdorn, 2013, p. 32). Nevertheless, the area for scrutiny suggested by his work is the role played by personal subjectivity as well as the restructuring of science and values in modern politics. In particular, Blühdorn notes that post-ecologist politics reflects a social-psychological emphasis on (neoliberal) individualism, typically through elevating rational individualism and consumer sovereignty as central forms of identity

generation. As a result, the typical (liberal) critique of Western consumerism itself has become trapped within the technical assumptions that 'living green' is ultimately a personal choice and not a matter of the economic and social structures which are actually in need of renewal.

> So, in the wake of the post-ecologist turn, eco-political approaches which are based on the (reinterpreted) norm of the autonomous subject as their ultimate point of reference invariably lose their transformative capacity. They can no longer generate, legitimate, and implement criteria for remolding the established order of unsustainability. Quite the contrary, prevalent norms of subjectivity, identity, and self-realization demand that the established order of unsustainability and the logic that supports it are sustained. (Blühdorn, 2016, p. 267)

The key implication of Blühdorn's point is that individual subjectivity (or at least transcending this idea) is a key area for scrutiny and change if something like new forms of lifestyle and education are to be developed. Indeed an implied way out of Blühdorn's ecological paradox is to develop forms of thinking (and subjectivity) that go beyond liberal individualism and reflect the importance of healthy social, political, natural and mental ecologies. Such a pathway out is not simple however. While the "categorical imperatives" (Blühdorn, 2013, p.23) of earlier 'subjectivist' and radical modernist approaches to ecology, are themselves 'trumped' by the neoliberalisation of sustainable development and ecological modernisation, a more scientific, or 'objectivist' approach is bound by its 'evidence-based' and unquestioned assumptions regarding economic growth and individual subjectivity.

In relation to the 'evidence-based' nature of objectivist approaches, Blühdorn has argued that sustainable development has been too connected to scientific knowledge, technological efficiency and managerialism, and less focussed on making changes to our values (Blühdorn, 2016). This point has been raised by many other commentators and goes to the heart of the connections that exist between neoliberalism and sustainable development (Blewitt, 2015; Kumi, Arhin, & Yeboah, 2014). The concept of being 'too connected' here is specifically aimed

at the extent to which issues of values and subjective (or political) decision-making have been masked by attempts to make efficient choices within a rational green model of sustainable development:

> Yet, in their endeavour to measure, map, quantify, and innovate, sustainability research and technology developers tended to neglect that the accumulation of scientific knowledge and technological know-how, however detailed and sophisticated, can never be a substitute for normative judgement. ... Science can gather empirical data, measure and explain processes of environmental change, and try to calculate how particular patterns of human behaviour and societal development may impact on natural ecosystems or the global climate. But the empirical data it delivers to, as such, never qualify as problems and nor do they necessitate or by themselves trigger any form of social action – unless they are put into relation to, and are perceived to conflict with, established social values, expectations, and aspirations. (Blühdorn, 2016, p. 263)

Based on Blühdorn's analysis, an important feature of the GEC is how values are both hidden and vital in contemporary approaches to sustainable development. "Breaking out of technocratic thinking" is therefore an integral way forward for Blühdorn (Blühdorn, 2016, p. 272). Blühdorn's point here links to the argument of this thesis that policy requires a critical approach to ***both empirical data and the values*** surrounding policy in the Anthropocene (Rein, 1983).

Post-truth politics and the political ecology

Blühdorn's notion of the ecological paradox, along with the analysis provided in the 'politics of unsustainability', reflects the habitual epistemological errors surrounding economic decoupling. Humanity, it seems, is habitually caught by its epistemological errors. In the approach taken by this thesis the assumption is that developing new ideas, including new forms of policy, requires more than pointing out these errors, but also actively constructing policy alternatives from which to develop new contexts and new forms of thinking. Furthermore the above discussion also reflects the need for a methodological approach which goes beyond the subjectivist-objectivist divide between 'science' or 'values' and develops a policy position which is rigorous on both fronts. This point reflects the importance of taking a critical approach to policy as is favoured in this thesis.

Moreover, reinforcing the need for new ideas, which are ecologically informed and rigorous in terms of 'science' and 'values', is the development of post-truth politics. Post truth politics has been most closely identified with the 'ravings' (tweets) of such figures as the US President Donald Trump, and in particular his ability to tell outrageous lies to the apparent benefit of his campaign and presidency (Freedland, 2016; Manhire, 2017; Peacock, 2016). The concept of post-truth politics provides an additional dimension to an understanding of the GEC as a crisis within humanity's political ecologies. Indeed, post-truth politics is a signal that deliberative democratic processes, and the development of ecological policy alternatives, are not just a matter of 'discussing' or 'dialoguing' with those in power (especially those who are so unbalanced), but recognising that new forms of thinking are needed from which to help reform the political ecology itself.

Post-truth politics has become the focus for both increased media attention and academic discussion since the 2016 Brexit campaign and election of Donald Trump as the US president (M. A. Peters, 2017b; Stratford, 2017). In broad terms post-truth politics is a disregard for factual content and a correspondingly disproportionate emphasis on individualistic 'feelings', prejudices and opinion. An important aspect of post-truth politics is that politicians are not just 'getting away with ignoring facts' but are typically being rewarded for their brazen dishonesty, either through being elected or gaining some form of popular appeal. Post-truth politics is usually (but not exclusively) linked politicians who are more authoritarian, right-wing and/or populist in their presentation and, following on from this, post-truth politics often shows contempt for environmental issues, especially climate change. Many 'post-truth' politicians evince various forms of prejudice or outright denial of climate science in the face of the overwhelming evidence as well as the consensus of the world's scientific community. The most famous example of this is Donald Trump's claim that global warming is a hoax developed by the Chinese to undermine US manufacturing (Freedland, 2016). Outside of Britain and the US, there are many politicians whose words and

actions have been described as 'post-truth'. This includes, for example, politicians from Russia, Turkey, North Korea, India and China. In Australia during 2014, Tony Abbot's repeal of carbon pricing was described by the Melbourne Age as the 'nadir' of post-truth politics. Similarly New Zealand's Prime Minister of the time, John Key said in 2015 that experts were like lawyers and that it was always possible to find one to say what you wanted (Peacock, 2016).

The academic analysis of post-truth politics has only just begun. There appear to be ongoing questions to investigate about whether 'post-truth' politicians actually tell more lies than politicians from previous times. There are also academic investigations required regarding the origins of post-truth politics, including why it is that post-truth tactics appear to be rewarding those who tell outrageous lies (M. A. Peters, 2017b; Stratford, 2017). While these analyses will emerge over time, it is nevertheless still possible to make some important points about the nature and origins of post-truth politics, points which can inform the policy approach of this thesis. At one level it is important to note the relationship between post-truth politics and (the ecology of) social media. The ubiquity and speed of social media, especially the rate at which false information is able to be spread across the planet, is seen as an important aspect of the post-truth system. Evidence from the US, for example, has shown that those voters who supported Donald Trump were far more likely to believe in 'fake news' stories and share these over sites such as Facebook, than were the more liberal citizens who voted for Hilary Clinton (Allcott & Gentzkow, 2017). It also seems to be the case that many of those who voted for Donald Trump were actually voting against the status quo. While Hilary Clinton was seen as being a continuation of (the same neoliberal) policies of previous political insiders, candidates such as Bernie Sanders and Donald Trump were seen as going against the traditional approaches of their respective Democratic and Republican parties. While Sanders never got the nomination for the Democratic party, Trump's popularity, especially among working class white voters helped propel him into the presidency (West, 2016).

Much more analysis is required about how those who voted Trump understood the status quo. Detouring for a moment into the history of US politics, more can be learnt about the origins of post-truth's success as a tool against the status quo by recognising the extent to which moneyed interests dominate political decision-making in the US. Martin Gilens and Benjamin Page from Princeton University have, for example, examined the extent to which the American political system reflects the interests of such constituencies as average voters, grass-roots democratic groups or the more financially endowed elite (Gilens & Page, 2014). In examining 1779 variables for a range of policy of variables Gilens and Page found that "economic elites and organized groups representing business interests have substantial independent impacts on U.S. government policy, while average citizens and mass-based interest groups have little or no independent influence" (Gilens & Page, 2014, p. 564). They conclude that the US political system delivers outcomes for the rich and powerful much more than it works as a representative democracy. Hence, as part of the post-truth context, it is possible to return to questions about what might make up a healthy political ecology in the United States (and other places). In the context of this thesis, questions about the need for a healthy political ecology underline the importance of ecological democracy as a basis for developing ecological policy alternatives.

Based on some of the underlying features of post-truth politics – there is a need for a more ecologically informed approach to democracy. The influence of moneyed interests are no surprise to many voters the US, as well as those in other Western democracies, who have seen neoliberal and corporate-friendly economic and social policies dominate government decision making. Certainly the evidence suggests that there has been a drop off in the number of voters turning out to elections in Western countries, especially among younger 'neoliberal natives' who don't see the relevance of voting, and who do not see that politicians will respond in ways that reflect their concerns – including their wider concerns about people and the planet (Steiner, 2010; Zelenko, 2011).

Beyond post-truth deliberations

The discussion of post-truth politics will continue. What this brief analysis shows is that some parts of the political ecology are highly irrational and this has a negative impact on social and natural ecologies. On top of the politics of unsustainability, post-truth politics underlines the need for new forms of policy thinking beyond what is currently available. As is argued in this thesis, these new forms of policy thinking need to not only take account of the irrational potential of the policy context, but also find ways to actively improve the health of democracies. In essence this means that among the attempts to improve the quality of the planet's democracies is the need to have well developed policy alternatives. It is from this basis that chapters 6 through 10 work towards developing an ecological approach to higher education. Before that discussion however, the following chapter answers the thesis question about the extent to which the GEC is an educational crisis.

Florida's tyre reef – a 35-acre epistemological error. In the 1970s between at least 700,000 tyres were dumped off the coast of Fort Lauderdale in an effort to bridge two pieces of existing coral. Unfortunately the tyres came free of their metal linkages and have moved across the sea floor damaging the existing healthy sea floor. A multi-million dollar decades long clean up is currently underway (G. Allen, 2007; Fleshler, 2016).

Chapter 5: The GEC, epistemology and Education

> *All education is environmental education. By what is included or excluded we teach students that they are part of or apart from the natural world. To teach economics, for example, without reference to the laws of thermodynamics or those of ecology is to teach a fundamentally important ecological lesson: that physics and ecology have nothing to do with the economy. That just happens to be dead wrong. The same is true throughout the curriculum.*
> — David Orr (Orr, 1994, p. 12)

This chapter explores the history of Environmental and Sustainability Education (ESE). One of the purposes of this exploration is to help answer the thesis question: to what extent is the GEC an educational crisis? Drawing on the arguments presented in the previous chapter, the short answer is that the GEC is much more than an educational crisis. Following on from the previous chapter, the GEC is much more than an educational crisis because the GEC is a crisis of our intellectual, social, political and natural ecologies – a crisis dominated by our epistemological errors connected to humanity's unsustainable planetary footprint. This idea is logically followed by two important points – the first being that education policy and practice (in the West especially) has been complicit in developing humanity's epistemological errors. Hence ***the GEC is <u>in part</u> an educational crisis***. The second (interconnected) point is that the connections between education and the GEC are somewhat self-evident given that there have been various efforts to help address the poor relationship between people and planet, most notably through Environmental and Sustainability Education (ESE).

It is this second point that focused on in this chapter. In particular, a series of points are made here about how ESE has sought to address unsustainable habits in humanity's approach to the planet. This has not been a straight forward process however, and this chapter unpacks the history of ESE with reference to some 'classic' educational challenges as identified by Johan Öhman. Öhman's challenges relate to questions about the purpose of 'education', including its

moral responsibilities, and how education might be 'for' anything (even 'nature') when it also has a responsibility to operate as a critical and democratic project (Öhman, 2016). In the context of such questions, I argue that ESE has historically wavered between two broad and overlapping approaches. On the one hand ESE is seen as a way of teaching people about 'nature' or 'sustainability' in order that they will make changes to the way they behave. In this approach, there has been a drive to find a niche for ESE and to modify the status quo from this niche. On the other hand is a strand of thought in which ESE has sought to more fundamentally address mainstream education itself and develop a core interest in ecological understanding.

Following the historical discussion of the ESE, this chapter argues that the theoretical challenges faced by ESE are tied to need for all of education to develop postfoundational approach to the ecological. In particular, and drawing on the work of David Orr, Stephen Sterling, Richard Kahn, Chet Bowers and Andrew Stables, I argue that the theoretical weaknesses of ESE can be addressed through a postfoundational ecological approach to education. Stables' work in particular points to the need for a postfoundational approach to deal with the theoretical 'paradoxes' imposed by the explicitly ethical dimensions of an ecological approach to education. This argument is a fitting introduction for Chapters 6 and 7, where this thesis critiques the more theoretically rich concept of the ecological university and develops its own ecological framework for higher education. This framework in turn, is the basis for an alternative higher education policy approach for New Zealand.

Classic tensions in Environmental Education

In 2016 Johan Öhman introduced a special issue in the journal *Environmental Education Research* (EER) by stating that there are 'new' ethical challenges within environmental and sustainability education linked sustainability politics, global citizenship, neoliberalism, poverty and climate change (Öhman, 2016). In this short article Öhman identified the need for a more interconnected approach to such issues, one in which features "new approaches to understanding [the]

interconnections and interdependence between and among social and ecological systems in current and future generations, and how education can and should contribute to the inclusion of these interrelated issues across the curriculum" (p. 766).

In the context of a more interconnected approach, Öhman argues that these 'new' ethical challenges should be understood in terms of some "classic dilemmas...that have bothered/puzzled educational and philosophical scholars for centuries" (p. 766). Within this overarching time frame, Öhman argues that there are ongoing epistemological tensions that affect **both** mainstream education and Environmental Education (EE). The challenges concern: (1) how we can ground our values for education; (2) what should be the legitimate moral object of focus for education; and finally, (3) what might be done in respect of the so-called democratic paradox of education. The first of these dilemmas is a restatement of the foundationalist concern regarding humanity's inability to ground ethical knowledge in any objective, universal position. It is instead acknowledged that humans are reliant on the social construction of what is ethical (B.G. Norton, 2005). Given the scientific and realist heritage of EE, the idea of 'social construction' has troubled many environmental educators, leading them to fear that such a view might lead them on a pathway towards relativism (at worst) or, more critically, questions about how such social construction could occur (Stables, 2001).

The second of Öhman's dilemmas is a reframing of the (dualistic) question about whether 'people' or 'nature' should be at the centre of any ethical decision-making. Öhman locates traditional educational thinking within an anthropocentric focus, going back to Kant and a humanist tradition which focused on people as the sole source of rationality and moral authority (see also Peters, 2015a). After briefly exploring the well-trodden arguments about either anthropocentric or ecocentric approaches to 'nature', Öhman tends towards the idea that some form of weakly anthropocentric view is possible given that "all human worldviews are in some sense anthropocentric" (p. 767). He is not

definitive however, and finishes with a question about how democracy might yet involve unheard voices (human and non-human animals) in classroom conversations (p. 767).

The final challenge identified by Öhman is what he calls the democratic paradox of education. In this section Öhman draws on the work of Chantal Mouffe (Mouffe, 2000) to question how education can foster "autonomous free subjects" (p. 768) while also delivering on specific cultural goals or values for education. Öhman translates this into an EE dilemma by highlighting the debate that has occurred about the normative content of education *for* the environment and Education *for* Sustainability. The question of universal values is again referred to by Öhman, as he implicitly questions how a normative structure for EE might be justified in the face of any number of competing moral positions for education.

An additional classic tension that could be added to Öhman's analysis concerns the relationship between ESE and mainstream education. As will be discussed in more detail below, the history of ESE has held two overlapping positions about how it might 'fix' mainstream education. On the one hand EE has sought to develop an alternative framework for all of education, a framework which corrects the epistemological errors that have eroded the quality of the planet's natural settings. Alternatively, EE has also been content to find a niche within mainstream education in the hope that its contribution might still lead to some sort of transformation. What links this concern to Öhman's dilemmas is that EE's challenges, in locating itself ethically (or democratically), and its inability to orient itself in relation to mainstream education, are both a result of theoretical failings in EE, and more broadly ESE. It is these theoretical failings that are the focus for the conclusion of this chapter which identifies the need for a postfoundational approach to all education.

The origins of Environmental Education

The dilemmas identified by Öhman can be used to help understand the origins and development of EE. The examination of a few historical examples shows how Öhman's concerns are entangled in ethical questions about what should be the 'right' focus for environmentalism itself – in particular, whether to value nature primarily for its intrinsic worth, or more exclusively in terms of its utility for humanity. In the earlier stages of EE's development, the enthusiasm of environmentalism in the 1960s meant that EE was swayed, at least to some extent, by a 'subjective' focus on the intrinsic value of nature. This approach helped propel some challenging ideas and a tendency from some environmentalists to seek a fundamental change to human activity on the planet.

Before exploring this 'subjectivism', it is useful to begin this discussion with the famous late 19th century debate between John Muir and Gifford Pinchot. This historical dispute demonstrates two differing views (or epistemologies) about how mainstream culture should value nature (Karr, 1992; Meyer, 1997; M. B. Smith, 1998). In brief terms, Muir's side of the debate was focused on how humans should recognise nature's intrinsic worth, while Pinchot championed the idea that nature should be seen in terms of its utility for people. Pinchot's view can be seen as an early example of a strongly anthropocentric thinking, whereas Muir was more inclined towards a more ecocentric valuing of nature. In terms of challenges identified by Öhman, the Muir-Pinchot debate is analogous to questions about the legitimate moral focus for EE – which might dualistically be constructed as placing either 'people' or 'nature' at the centre of one's analysis.

Moving from the late 19th century to post WWII America, the Aldo Leopold's *Sand County Almanac* shows a move towards systems thinking, and a more pragmatic valuing of both man and nature. As was discussed in Chapter 2, Leopold's work offers a necessary correction to mainstream and/or linear thinking about agriculture, forest systems and the role played by wolves. In this sense Leopold challenged the existing epistemologies of nature and introduced the need for some sort of ecological approach to human-nature systems through

his pithy phrase 'think like a mountain' (Leopold, 1970). Leopold's position is a step up from the 'either/or' features of Pinchot and Muir and more inclined to a pragmatic focus on systems (B. G. Norton, 2013). This point notwithstanding, environmentalism in the 1960s grew very concerned with what 'man' was doing to nature, especially with the publication of such texts as Rachel Carson's *Silent Spring* (Carson, 1963) and Steward Udall's *The Quiet Crisis* (Udall, 1963). Arguably such books even swayed public concerns for conservation towards the intrinsic value of nature and away from the more utilitarian importance of an Earth-friendly culture where humans can benefit from natural exploitation (Carter and Simmons, 2010).

However these two overlapping positions might have manifest – either 'man' and/or 'nature' first, there was certainly a new emphasis placed on the environment at this time as seen in the raft of new environmental legislation. In the United States, under Richard Nixon especially, the US government passed a series of reforms as part of a growing public concern about the environment, this included: The Wilderness Act of 1964, the Species Conservation Act of 1966 and the Wild and Scenic River Act (1968). The 1960s also saw the first uses of the term 'Environmental Education' as well as the publication of the first journal in the field. In April 1970, the first ever Earth Day proceeded (Carter & Simmons, 2010). In October 1970, Richard Nixon's presidency also oversaw the passing of the Environmental Education Act.[8] Interestingly, while these reforms did not articulate whether nature should be valued for intrinsic or utilitarian reasons, Nixon's efforts in developing EE show that there was existing political rhetoric about the need for a fundamental shift in mainstream culture. In a speech to Congress at the time, Richard Nixon spoke about the need for transformation –

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[8] The provisions of this legislation included the establishing of an Office of Environmental Education and funding for EE programmes in primary and secondary schooling. As Carter and Simmons note the Act's shortcomings include its limited funding and 5 year life span (Carter & Simmons, 2010, p. 7).

"at every point in the education process" - and attached this new drive for knowledge about nature to the idea of environmental literacy:

> It is also vital that our entire society develop a new understanding and a new awareness of man's relation to his environment—what might be called "environmental literacy." This will require the development and teaching of environmental concepts at every point in the education process. (Nixon, 1970, p. vii, as cited in Carter & Simmons, 2010, p. 7)

Similar legislative changes were happening around the world during this time, and internationally there was a growing awareness of the need for more scientific understanding of environmental issues as well as a stronger advocacy for looking after 'the environment' (Gough, 2014). In line with what was occurring in the United States, global emphasis on environmentalism and EE showed frustration with mainstream thinking and a radical intent for change. For example the 1972 United Nations Conference on the Human Environment, held in Stockholm, developed 26 ambitious principles for environmentalism, including the need for 'environmental education' (United Nations Conference on the Human Environment, 1972). After the Stockholm conference, the United Nations Environment Programme (UNEP) was established, which in turn led to the development of the UNESCO-UNEP International Environmental Education Programme (IEEP), directed by Bill Stapp. The IEEP was central to the Belgrade International Workshop in 1975 and the development of the Belgrade Charter (Gough, 2014; Hungerford, 2010; Marcinkowski, 2010; Potter, 2010). The emphasis on transforming, rather than modifying, mainstream culture was also reflected in the Club of Rome's report *Limits to Growth* (Meadows et al., 1972), as well as other such texts as Paul Ehrlich's *The Population Bomb* (Ehrlich, 1971) and Barry Commoner's *The closing circle: confronting the environmental crisis* (Commoner, 1971). From such a perspective, EE in the 1970s was arguably more radical than later incarnations (Kopnina & Meijers, 2014) as this quote from *The Belgrade Charter* suggests:

> Environmental education is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivations, commitments,

and skills to work individually and collectively toward solutions of current

problems and the prevention of new ones.

(UNESCO-UNEP 1976, p. 2, as cited in Carter & Simmons, 2010, p. 8)

Following the Belgrade Charter, the Tbilisi conference of 1977 helped establish a foundation for EE, one which has been championed through ongoing conferences of the World Environmental Education Congress (WEEC), including Moscow, 1987, Thessaloniki, 1997, and Ahmedabad, 2007 (Reid, 2009; T. Wright, 2002). The Tbilisi Declaration remains central to this work, and continues to be a focus for EE. The key goals from this declaration placed the idea of wider changes in human thinking and behaviour as a cornerstone of EE (Gough, 2014):

The goals of environmental education are:

1. to foster clear awareness of, and concern about, economic, social, political, and ecological interdependence in urban and rural areas;

2. to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment;

3. to create new patterns of behavior of individuals, groups, and society as a whole towards the environment. (UNESCO & UNEP, 1977)

The extent to which EE would maintain a focus on changing the mainstream culture however is questionable. As is followed up in the next section, the subjective, values-driven approach to both environmentalism and EE waned in the 1980s as the wider political context changed and questions also arose about the extent to which EE was contravening liberal democratic expectations for education to foster critical thinkers.

Questioning the advocacy of EE and the beginnings of SE

At about the same time as the 1977 Tbilisi Declaration was laying a foundation for EE, the perceived advocacy role of EE was being questioned by writers who suggested that there needed to be fewer 'environmentalists' and more 'educators'. As Harold Hungerford has identified (Hungerford, 2010), John Hug's influential paper "Two Hats" (Hug, 1977) represents the first of many voices

suggesting that 'education' (and/or environmental education) demanded less of an advocacy position and more emphasis on the development of conditions for critical thinking. Hungerford suggests that, given Hug's position, much of the subsequent debate about the role of EE might have subsided if environmental educators had just accepted Hug's position, moved away from advocacy and adopted a 'value-fair' approach (the next best thing to being value-free) (Hungerford, 2010).

As Hungerford laments, Hug's ostensibly reasonable position was not universally adopted and the debate about advocacy in EE continued through the 1980s and 1990s. In the early 1980s the context for this debate changed with the election of Margaret Thatcher and Ronald Reagan. These two leaders brought with them a neoliberal social and political order which included a global emphasis on individualism, economic growth, smaller government and unfettered business activity (D. Harvey, 2005; Stedman Jones, 2012). In the US, Ronald Reagan's presidency also meant the rolling back of Nixon's (and Carter's) environmental measures. With these political changes came less optimism that EE could change the mainstream and instead, EE developed more of a focus on operating as an alternative, 'green' educational option (Carter & Simmons, 2010).

In the context of increasing global efforts aimed at 'conservation' issues (rather than more political challenges regarding limits), including the 1980 *World Conservation Strategy* (Gough, 2014), EE was not in a strong position when, in 1987, Education for Sustainable Development (ESD) arrived via the publication of *Our Common Future* (*The Brundtland Report*) (World Commission on Environment and Development, 1987). This report provided the well-known default definition of sustainability[9] and launched sustainability education efforts across the planet. However in a neoliberal political context, which had made

[9] Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs

economic growth a non-negotiable, the theoretical challenges in EE arguably worsened in SE, as the poorly theorised foundations of sustainability education struggled to balance the need for significant cultural change with political 'realities' (Marcinkowski, 2010).

There are some important points that should be raised about the relationship between EE and SE at this time. Although the 1980s saw EE lose some of its earlier 'edge', sustainability education looked to expand the educational conversation by consciously going beyond EE's focus on nature through seeking to integrate issues of social, economic and environmental sustainability (Marcinkowski, 2010). That said, while sustainability education developed a more wide-ranging scope compared to EE, it also brought with it a lack of any theoretical structures to manage neoliberal expectations around 'development'. In other words, SE had a broader scope, but also a less critical eye for issues of limits and growth. In this sense sustainability and sustainability education has an inherently oxymoronic, contradictory, pluralistic and under-theorised quality which has continued to be questioned by many commentators (Baughan, 2015; Blewitt, 2013; Kopnina, 2014b; W. Scott, 2015; Stables, 2001). In terms of Öhman's dilemmas, sustainability education attempted to ground its values in a (superficially) objective focus on human survival and take as the legitimate moral focus individual humans and the development of an economy that could continue to grow. Significantly this represented less of a fundamental challenge to the status quo and more like an attempt to modify education by adding on a sustainability focus.

Ecological literacy versus liberal environmentalism

Despite the overall waning of EE in the 1980s, there still remained some efforts to fundamentally orient education to environmental concerns. In particular, the renewed focus on ecological literacy at the end of the 1980s can be seen as a response to the Brundtland report (1987), and a way of reemphasising the radical origins of EE. At the centre of this push-back was the work of David Orr who argued that ecological literacy was a basis for changing mainstream

education. David Orr's work notwithstanding, there still remained questions about the advocacy role played by EE, especially from those working from a liberal philosophical tradition.

Before exploring these concerns it is useful to identify that the terms 'environmental' and/or 'ecological' literacy date back to 1968 and Charles Roth's question: *How shall we know the environmentally literate citizen?* (McBride, Brewer, Berkowitz, & Borrie, 2013; Roth, 1968). Roth's usage may have inspired Nixon to use the term too (as discussed above). In these earlier contexts, environmental literacy reflected both the humanistic and scientific turn towards nature and conservation during the 1960s, as well as the emerging critical (and more political) ideas about the economy and limits that also emerged at this time. In line with the neoliberalism of the 1980s, as well as the land-mark educational publication of *A Nation at Risk* (Gardner, Larsen, Baker, Campbell, & Crosby, 1983), a less radical and more scientific approach to environmental literacy also emerged, especially in the United States. In this instance the idea of environmental knowledge also linked up with national concerns about the low levels of scientific knowledge of the American student population (McBride et al., 2013).

By the end of the 1980s, and in the context of waning support for a radical approach to EE, a more critical future for environmental literacy emerged with the publication of David Orr's work on environmental and/or ecological literacy (Orr, 1989, 1992). By this stage a variety of cognitive, attitudinal, values-based, affective and knowledge-based factors were being contested about the nature of environmental literacy (McBride et al., 2013). With Orr's work though, there is a return to earlier EE concerns and a strong statement about the role of environmental education to take on the fundamental challenge of mainstream culture including the emerging sustainability paradigm. The six key platforms for Orr's approach were:

1. the idea that all education is environmental education;

2. that more is needed to understand the complex problems facing the human-planet interaction than is possible within a single departmental or discipline basis;

3. that education occurs in a place and should resemble the elements of 'good conversation' (sharing, dialogue, deliberation, partnership (with nature);

4. that the educational process is as important as its content (hence EE needed to change the way they lived ala John Dewey, Paulo Freire and Alfred North Whitehead)

5. that experience in the natural world is both essential and part of good thinking;

6. that practical and relevant knowledge towards developing a sustainable society will enhance each learner's competence with natural systems (Orr, 1992, p. 90-92).

As a result of such principles, Orr's approach to ecological literacy highlighted the epistemological challenges facing Western forms of education. Ecological literacy was very much seen as the basis for reorienting or transforming Western forms of education (Orr, 1994). As part of his work Orr championed the idea that education that did not develop active forms of ecological behaviour and instead made people into better planetary vandals:

> The conventional wisdom holds that all education is good, and the more of it one has, the better. The essays in Part One challenge this view from an ecological perspective. The truth is that without significant precautions, education can equip people merely to be more effective vandals of the earth. If one listens carefully, it may even be possible to hear the Creation groan every year in late May when another batch of smart, degree-holding, but ecologically illiterate, Homo sapiens who are eager to succeed are launched into the biosphere. (Orr, 1994, p. 5)

Orr's point about education and vandalism, has been repeatedly cited by those in and around ESE. Orr's work has also continued to inform critical work on ecological literacy (Capra & Luisi, 2014; Cutter-Mackenzie & Smith, 2003; McBride et al., 2013; M. K. Stone & Barlow, 2005). That said, it was in the 1990s, when David Orr's critique of mainstream education was at something of a peak (Kopnina & Meijers, 2014), that the issue of whether education should be 'for'

anything re-emerged (Ferreira, 2009). In 1997, for example, the Independent Commission on Environmental Education argued that EE was "needlessly controversial" (as cited in Marcinkowski, 2010, p.36) and lacked a deeper understanding of economics and science. This report also undermined the approach taken by some environmental educators by claiming that EE was unprofessionally delivered by ill-prepared providers more intent on advocacy than deeper forms of understanding (Marcinkowski, 2010).

A symbolically important debate from this time took place involving Bob Jickling and Helen Spork on one side, and John Fien on the other. For their part Jickling and Spork represented a liberal position on environmental education, a viewpoint which questioned the more socially critical perspective defended by Fien. As Jo-Anne Ferreira has traced, Jickling and Spork's position first appeared at an AERA conference in 1996 (Ferreira, 2009). They claimed that EE had too great a direct moral component, and sought to impose a particular ethical view as part of its pedagogy (Jickling & Spork, 1998). In essence Jickling and Spork were reflecting Öhman's questions about both the social construction of values and the need for 'democracy' in education. Specifically Jickling and Spork were focused on why EE was typically so didactic when 'education' should be an inherently 'critical' process where learners can come to their own conclusions:

> The crux of the problem is, however, structural. When we talk about 'education for the environment' we imply that education must strive to be 'for' something external to education itself. Unfortunately, there is an oxymoronic quality embedded in this construction. If we want students to examine ideologies, criticize conventional wisdom and participate in cultural criticism and reconstruction, then we must accept that they may well reject the externally imposed aim that has been pre-selected for them. If we are serious about education, we should, in the first place, put aside *our* most promising visions for the future. Moreover, if we really want to open students' minds to alternative worldviews, it makes little sense to steer them, however gently, towards a particular vision. The prepositional use of 'for' ultimately leads, therefore, to either a literal or programmatic interpretation which is, in our view, deterministic. (Jickling and Spork, 1998, p. 323–4, emphasis in original)

John Fien responded to this argument by pointing out that Jickling and Spork lacked a certain reflexivity in relation to their own position (Fien, 2000). Fien was especially critical about the extent to which Jickling and Spork did not appreciate the ideological assumptions underpinning their own position. These assumptions concerned the liberal nature of education they endorsed, or at least unconsciously assumed, including their concerns with individualism, rationalism and a supposed 'value-free' pedagogy. These arguments have also been explored by Dirk Postma's who cites Jickling and Spork's work (1998) as an example of how liberalism operates (inadequately) as a framework for EE. For the record, Postma's criticism of Jickling and Spork reflects a wider critique concerning the limitations of liberalism in relation to environmentalism and environmental policy (Dobson, 2007; Sagoff, 1986). Postma's specific criticisms concern the idea that liberalism also reflects a market rationalism which is prefaced on a model of disinterested social actors tolerating one another and pursuing their own versions of the good life. Postma draws on Hannah Arendt to show that, in contrast with liberal individualism, humanity is part of a web of an interconnected and therefore interdependent series of relationships. In the terms set out by Öhman at the beginning of this section, Postma is challenging the idea of the liberal assumption that it is the individual (human) who should be the central unit of analysis and, via Arendt, suggests that it is humanity's interconnections that are a more legitimate moral focus for education.

Beyond liberal approaches to Sustainability Education

Fast forward a few years and Postma's analysis of liberal approaches in EE connects with the points raised about Education for Sustainability by such writers as John Blewitt and Helen Kopnina. Blewitt for example has argued that many of the underpinning (liberal) assumptions of SE has meant that "institutionalized EfS [has] continued to demonstrate a weakness that [comes] with decades of accommodation, compromise and collusion"(Blewitt, 2013). Blewitt goes on to point out that in a higher education context, a "paradigm shift towards a sustainable education … is today further away than ever" (Blewitt, 2013, p.61). In

using the term 'sustainability education' here, Blewitt is referencing the need for a deeper approach to sustainability, one that is not so much an add-on to education, or a vehicle for campus greening (Leal Filho, Shiel, do Paço, & Brandli, 2015), but an attempt to fundamentally reorient the higher education curriculum.

Similarly, Helen Kopnina has identified an ongoing, uncritical and neoliberalised 'pluralism' affecting ESD (Kopnina, 2014a, 2015; Kopnina & Cherniak, 2016). Drawing on the work of Postma and explicitly citing the ongoing fear of 'advocacy' in EE/ESD, Kopnina has argued that the tendency towards 'pluralism' within EE and SE is linked to neoliberal and anthropocentric assumptions. In order to develop a more critical and meaningful approach to ESE, Kopnina calls for a more radical pedagogy which critically addresses neoliberal economic approaches and moves away from a status quo of market solutions, economic decoupling, consumerism and anthropocentrism (Kopnina, 2014a, 2015; Kopnina & Cherniak, 2016).

Many other critical SE educators share the concerns of Postma, Blewitt and Kopnina (Corcoran, Weakland, & Wals, 2017; Huckle & Wals, 2015; Leal Filho, 2015; Malone et al., 2017; Wals, 2014). Stephen Sterling's work can be included here because of its explicit attempt to develop an 'ecological' framework for education beyond SE. Sterling's work can be seen as a continuation of David Orr's earlier work through the idea that all education is sustainability education.[10] For example in examining the aims of Sterling's 2001 publication *Sustainable Education – Re-visioning learning and change*, there is a (renewed) focus on transforming the mainstream and developing new thinking in education and society. In line with Öhman's dilemmas, Sterling is attempting to make the moral object of education "the whole person, communities, and the

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[10] David Orr wrote the foreword to Sterling's 2001 publication Sustainable Education Re-visioning Learning and Change (Sterling, 2001).

environment" (Sterling, 2001, p. 10). On page 15 of this briefing moreover, the specific transformational intent of Sterling can be seen:

> The term 'sustainable education' implies whole paradigm change, one which asserts both humanistic and ecological values. By contrast, any 'education for something', however worthy, such as for 'the environment' or 'citizenship' tends to become both accommodated and marginalized by the mainstream. So while 'education for sustainable development' has in recent years won a small niche, the overall educational paradigm otherwise remains unchanged. Within this paradigm, most mainstream education sustains unsustainability – through uncritically reproducing norms, by fragmenting understanding, by sieving winners and losers, be recognizing only a narrow part of the spectrum of human ability, by an inability to explore alternatives, by rewarding dependency and conformity, and by servicing the consumerist machine. In response, we need to reclaim an authentic education which recognizes the best of past thinking and practice, but also to re-vision education and learning to assure the future.

Sterling's attempt to cleave away from EE and ES, was by his own admission somewhat thwarted by a tendency in the mainstream to bundle together 'sustainability education', 'education for sustainability' and 'ESD' (Sterling, 2008). Nevertheless, Sterling's approach very much continues the challenge first posed by some aspects of EE to alter the way the mainstream thinks (the epistemology of mainstream education in the face of the GEC). From the perspective of ESE's 'classic' dilemmas, Sterling's position is far more about altering mainstream thinking than improving humanity's understanding of 'nature'. The breadth of Sterling's vision for 'education' has helped underpin an ongoing drive to argue for sustainability in higher education (P. Jones et al., 2010) and the 'sustainable university' (Sterling, Maxey, & Luna, 2013). Such work has informed the development of 'sustainability literacies', thereby extending David Orr's earlier conceptualisation of environmental literacy (Stibbe & Villiers-Stuart, 2009). Similarly, as has been critiqued in Chapter 2, Sterling's attempt to develop a broad-ranging ecological perspective is suggestive of a new educational paradigm based on an 'emerging' ecological consciousness underpinned by such diverse possibilities as eco-psychology, deep ecology, ecofeminism and holistic

health and systems thinking (Sterling, 2001, p. 50) (a view already critiqued in Chapter 2). It is the possibility for an ecological paradigm that is discussed in the next section of this chapter.

Towards an ecological epistemology for education

Sterling's efforts to build an ecological paradigm for education (rather than develop environmental education) demonstrate that there are still questions about whether EE represents a fundamental shift for education or an optional addition to the status quo. Despite Sterling's use of Bateson, and his overall theoretical sophistication, there are some concerns with Sterling's theoretical approach to 'the ecological', which can themselves be described as epistemological concerns – or at least theoretical concerns with how he might justify what counts as 'ecological' (as discussed in Chapter 2). That said, Sterling's instinct for transforming the mainstream and developing some form of ecological epistemology shows a potential way out from Öhman's dilemmas and towards a more developed theoretical position for 'education' (and not just EE). In broad terms, the sort of ecological theorising talked about by Sterling connects education to the wider need for ecological thought and a focus on 'people within ecological systems' as opposed to people or nature as the central point of analysis. As was also discussed in Chapter 2, and in line with Öhman's question about values, it is not quite clear, from Sterling's work, how his ecological perspective can justify its normative position – especially in terms of the variety of 'eco' perspectives he claims represent an ecological world-view.

That said, the search for an ecological epistemology for education – beyond liberal approaches to ESE – needs to include some other important critical positions. Overall, and within the broad possibilities of writers in and around ESE, many other writers reflect a deep concern that beyond EE, education itself is the product of bad thinking and needs to be reconfigured. The work of Richard Kahn, for example, shares with Sterling a similar critique of EE and SE and a theoretical thirst for a different epistemology for education. In Kahn's book *Ecopedagogy, ecoliteracy and the planetary crisis* (Kahn, 2010) Kahn describes how EE and ESD

have failed to engage a deeper structural analysis of the ecological crisis and not succeeded in developing the sort of meaningful change needed for today's stressed planet.

> It is clear, then, that despite the effects and growth of environmental education over the last few decades, it is a field that is ripe for a radical reconstruction of its literacy agenda. Again, while something like environmental education (conceived broadly) should be commended for the role it has played in helping to articulate many of the dangers and pitfalls that modern life now affords, it is also clear that it has thus far inadequately surmised the larger structural challenges now at hand and has thus tended to intervene in a manner far too facile to demand or necessitate a rupture of the status quo (Kahn, 2010, p. 11).

For Kahn the response to the failures of EE and ESD is the 'ecologising' of critical pedagogy. Drawing on the work of Paulo Freire (in particular his later work) and Herbert Marcuse's *One Dimensional Man* (Marcuse, 1968) Kahn develops what is very much a utopian approach to 'education' (not just environmental education). Kahn's work needs to be acknowledged for the powerful contribution it makes to an updated eco-conscious approach to critical pedagogy. For example, in collaboration with a range of writers Kahn, Samuel Fassbinder and Anthony Nocella have edited a compelling book on how ecopedagogy can inform the liberal arts curriculum on the way to developing a deeper form of ecoliteracy (Fassbinder et al., 2012; Kahn, 2010).

While there is not space here to discuss ecopedagogy in depth, it is worth noting that, it reflects a somewhat inflexible, radical essentialism that was earlier connected to Murray Bookchin and other 'radical-modernist' ecological theorists. We can see for example such essentialism in the way Kahn introduces the final chapter of *Ecopedagogy, ecoliteracy and the planetary crisis* and particularly how his reliance on a class analysis risks making his work rigid and somewhat ideological:

> Indeed, as this chapter will argue, the ruling class today promotes a ubiquitous sociocultural attitude that can best be described as the capitalist system's

extinction of life generally in the form of a growing global ecological catastrophe (Kahn, 2010, p. 125).

Chet Bowers reflects a similar radical intent to Kahn, although Bowers has been famously critical of Freire's work (Bowers, 2005, 2008). While Bowers has also been critical of environmental education (Bowers, 2001), his main focus has been the way mainstream education has made theoretical errors based on (unconscious) philosophical assumptions handed down in language (Bowers, 2010). Bowers' work has been influential in the thinking undertaken in this thesis given the way he draws on the work of Gregory Bateson (and to a lesser extent Garret Hardin) to launch his critique of the epistemological flaws in Western educational practices. Through Bateson, Bowers has questioned the (liberal) idea of the individual as an autonomous moral agent (Bowers, 2012). He has also sought to develop an approach to ecological intelligence more in line with Bateson's ecology of mind and an evolutionary view that emphasises the 'organism plus environment' (Bowers, 2010, 2011). For Bowers this has meant an emphasis on how non-Western indigenous cultures have developed cultures of (distributed) ecological intelligence that operate with reference to the surrounding 'commons' (Bowers, 2004). Moreover, as with the other attempts to 'ecologise' the curriculum discussed in this section, Bowers' Batesonian focus on 'organism plus environment' represents a more sophisticated moral focus for education than was suggested by Öhman's parameters of 'humanity' or 'nature' (or at least nature's intrinsic value or its utility for humanity).

Bowers' use of Bateson is linked to the idea of a cultural recursive (Bowers, 2010; Harries-Jones, 1995). While in some instances Bowers' work can be considered polemical, and may (cruelly) be judged as patchy in this regard (McLaren, 2007), it should be remembered that Bowers has written for many different audiences and his work for academic publications shows considerable depth. Keeping this in mind, a more balanced judgement about Bowers' work comes from Andrew Stables, who has linked the linguistic nature of Bowers' work to what Stables himself describes as a postfoundational approach (Stables, 2001). Stables' use of

the term postfoundational here reflects the idea that there are "plural valid responses to environmental issues" (p. 249) which are more philosophically considered than the more traditionally scientific approaches taken by EE. More importantly, and in keeping with the discussion above, Stables finds that the EE project is "shot through with paradox" (p. 1) and needs a far deeper understanding of its own history, especially its philosophical assumptions in the hope that it can gain a firmer theoretical footing. According to Stables, and in line with the argument made in this thesis, this process isn't just about changing EE, but concerned with changing the epistemological structures of mainstream education itself:

> The search becomes less for an holistic approach to EE and more for the best way to develop, and thus modify, the disciplines in a period of ecological crisis (Stables, 2001, p. 253).

Stables doesn't develop his own postfoundational ecological position, but the points he raises offer a way out of the challenges raised by Öhman and the unsatisfactory relationship between ESE and mainstream education. From Stables' point of view, the development of a postfoundationalist position offers a theoretical framework that is both pluralistic and focused on "a better, cleaner, healthier, or at least, not worse, biospherical environment" (Stables, 2001, p. 251). From such a perspective comes the realisation that education doesn't occur in an abstract domain of individual development – but an actual planet that needs citizens who can develop more healthy planetary ecologies.

Here then, Stables sees a broad scope for a postfoundational approach to education. Drawing on the necessary interconnection implied by an epistemology based on 'organism plus environment' Stables points to the importance of "functional, cultural, and critical environmental literacies" (p. 252). Stables work seems well aligned to Guattarian triplex of ecologies drawn upon in this thesis. More specifically, in understanding the world as a set of 'socio-ecological' (or just ecological) systems, then there are a variety of

knowledges, skills and attitudes needed by a community to develop multi-dimensional health on a finite planet.

In conclusion

The development of such an approach to education, specifically higher education, is the focus for the remaining chapters of this thesis. Leaping off from the postfoundational position that ends this chapter is the following chapter's critique of the emerging discourse surrounding the ecological university. Somewhat conversely, the ecological university is a theoretical concept that could benefit from a tighter practical connection to the work undertaken with ESE and other educational fields potentially contributing to multi-dimensional forms of planetary health. Such connections are made in Chapters 8 and 9 and finally, in Chapter 10, the development of an ecological approach to higher education is carried into an ecological direction for higher education policy in New Zealand.

A somewhat disoriented koala following the logging of its home in New South Wales, Australia. Despite the hyper-extended global footprint of humanity, developed countries still find ways to destroy forest remnants (Huffington Post, 2017)

Chapter 6: The Idea of the Ecological University

> *The ecological university would be a university embarked on a process of its own becoming, guided by the ideas of sustainability and wellbeing. The concept of sustainability is here oriented towards the sustainability of the university's multiple ecologies – personal, institutional, cultural, global, physical and social. ...However, the ecological university would not be content in rooting its self-understanding in the concept of sustainability, for it would want especially to embrace the concept of wellbeing.*
>
> — Ron Barnett *Imagining the University* (p. 113, 2013).

This chapter explores the idea of the ecological university. Specifically it critiques Ron Barnett's ideas about the ecological university and surveys the emerging discourse around this topic. From Barnett's perspective, the ecological university draws on an epistemological approach to 'ecologies', one that is beyond a simple, dualist focus on 'nature' and is "none other than the fullest expression of the idea of the university" (Barnett, 2010, p. 151). Barnett's ideas have attracted some discussion in the educational literature, although much of this material is broadly supportive of Barnett's approach and does not critically engage with his thinking. Despite the merit of Barnett's ideas, the argument made here is that there are important questions that can be asked about his approach including his theorising of the ecological, the epistemological dimensions of his ecological university and the politics of the ecological university.

In providing a critique of the ecological university, this chapter takes another step towards developing an ecological approach to higher education policy. This chapter adds to the points raised in the previous chapters, including the theorising carried out about the 'ecological', the description of the GEC, and the historical discussion of ESE undertaken in Chapter 5. Together with the critique developed in this chapter, the following chapter, Chapter 7, presents a framework for the ecological in higher education. Significantly, this approach draws on the postfoundational ecological methodology developed in this thesis

to show how the range of thinking that exists about the ecological in higher education can be critically considered as the basis for higher education policy.

The emerging discourse of the ecological university

This section summarises the emerging discourse of the 'ecological university'. At the centre of this discussion is the work of Ron Barnett, who first presented the concept of an ecological university (Barnett, 2010, 2011). Ron Barnett's approach to the ecological university has been primarily developed via a trilogy of books: *Being a University* (2010), *Imagining the University* (2013) and *Understanding the University* (Barnett, 2016). The last book in this trilogy is less focused on the ecological university and is more of methodological justification for Barnett's use of Critical Realism in thinking about the possibilities of the university. At the beginning of 2018, Barnett published a fourth book – *The Ecological University – a feasible utopia* - which has more exclusively focused on the ecological university and expanded on the points made in his earlier works (Barnett, 2018).

Barnett's approach to the 'idea' of an ecological university can be described as philosophical. In *Being a University* (2010) he traces the philosophical evolution of the university, locating its origins in the metaphysical university – a university linked to the relationships between people ('man') God, and the universe. Following on from the metaphysical university, Barnett provides an outline of the 'research university', which he links to the values underpinning the Enlightenment thought of von Humboldt and Newman. Barnett emphasises that the latest incarnations of the university –the entrepreneurial university and the bureaucratic university – are not the final forms and humanity has the ability to imagine and foster other ways of being. At the end of *Being a University* (2010) Barnett philosophically evaluates a series of approaches to higher education, which he describes as feasible utopias. There are four that he examines in detail: the liquid university, the therapeutic university, the authentic university and the ecological university. While Barnett finds much to favour in each of these forms it is his version of the ecological university which he judges to be "the fullest expression of the idea of the university" (p. 151).

The key features of Barnett's ecological university centre on its ecosophical nature. Drawing on the triplex of ecologies presented by Felix Guattari (Guattari, 2000), Barnett sees the ecological university as being engaged **in the world**. For Barnett the 'ecological' is a metaphorical idea, one that underlines the importance of 'multiple ecologies' and is not bound by a particular naturalised conception of ecology as 'nature':

> It might be tempting to think that the ecological university will be concerned about its impact on the environment. So it may; but this way of putting things is doubly problematic. First, 'the environment' is too often – especially in the context of the ecological domain – understood as referring to the natural environment when, as implied, it can and should have a much wider ambit, embracing the personal, social, cultural, institutional and technological environments and knowledge of those environments; in short, the world in its fullest senses (Barnett, 2010, p. 143).

There are seven ecosystems that Barnett says are of interest to the ecological university. These are Knowledge, Social institutions (including the political sphere), the Physical environment, Economy, Culture, Learning and Human subjectivity. For Barnett, it is our entanglement with these relationships which is the basis for the university's *responsibility* to the world. The university is not separate from these dimensions, but already interconnected and, as Barnett argues, ethically responsible within "pools of autonomy" (Barnett, 2010, p. 132) to "serve the world" (Barnett, 2013, p. 137). In *The Ecological University* (2018) Barnett extends these ideas to a set of ethical principles and maxims "that hold across all seven of its ecosystems" (p. 78), these are:

1. Active concern, (for the whole Earth)
2. Exploration
3. Wellbeing, (the maxim of which is to continually increase wellbeing in the world)
4. Epistemological openness
5. Engagement
6. Imagination

7. Fearlessness

Later in *The Ecological University* (2018), when discussing the type of curriculum implied by such a framework, Barnett argues for 'ecological reason' to be part of the higher education curriculum. Barnett is light on specifics and refers to the ecological curriculum as a "complex assemblage" (p. 113) linked to the use of ecological reason across the seven eco-systems of the university. In a nod towards the early work of this author, Barnett concludes that students at the ecological university need to develop a type of 'ecological intelligence' (Stratford, 2015) as part of their concern for the world. He signals that this concern goes beyond an interest in natural environments and extends to matters of social justice, freedom and democracy.

Barnett does not provide a finished or substantive set of possibilities for the ecological curriculum. It is however useful to draw attention to the way sustainability and wellbeing are discussed by Barnett in relation to the ecological university. While he does not declare any particular definition of sustainability or wellbeing, Barnett's approach can be seen as consistent with a more holistic understanding of health, or, from a slightly different perspective – eudaimonic flourishing (Deci & Ryan, 2008). The Aristotelian link to eudaimonia is not one explicitly made by Barnett, but some form of eclectic, ethical and contestable form of health, flourishing or wellbeing is more than implied:

> The ecological university has an interest not merely in sustainability, but in wellbeing. Whereas sustainability looks to maintain a given state of equilibrium, wellbeing looks to a continuous flourishing of the many ecologies that intersect with it. Certainly, what is to count as flourishing is itself open to debate but the ecological university understands too that it itself constitutes a space in which debate as to what it is to flourish should be conducted (Barnett, 2013, p. 137).

The above phrase 'merely in sustainability' reflects a systemic bias or weakness in Barnett's work. In general, Barnett treats the issue of sustainability as an inherently weak term, lacking in philosophical pedigree. This is most clearly

stated in his most recent book, where he devotes a chapter to being 'beyond sustainability' (Barnett, 2018). At the beginning of this chapter (p. 42) he states:

> A favoured concept within much ecologically oriented thought is that of sustainability but, for our purposes here, it must be put to one side. The ecological university is not concerned with sustaining life or systems or institutions or persons or technologies or cultures or learning or knowledge or even the natural environment, but is rather concerned with advancing or strengthening or positively developing life in all of its forms. The ecological university is not even concerned with change, but is concerned to play its part in change so as to bring about ever-enhanced wellbeing in the world. It is far more than 'the sustainable university' (Sterling, Maxey and Luna, 2013).

Although Barnett references the work of Sterling, Maxey and Luna (2013), he does not integrate his ideas about the ecological university with the diverse writing about Sustainability Education (SE) or indeed Environmental Education (EE). In this sense he misses out on work that deals with the sorts of classic tensions discussed in Chapter 5 and that which discusses the pedagogical possibilities for ecological education. Instead, and with reference to the United Nations Sustainable Development Goals (SDGs), Barnett explains that sustainability "has been stretched to include efforts and encouragements to improve world systems of various kinds, both natural and human. The term 'sustainability', therefore, is now being asked to do [too] much work" (Barnett, 2018, p. 43).

The detour around the ESE literature means that Barnett has more room to focus on the philosophical justifications for the ecological university. This creates difficulties for Barnett as he also leans away from the perceived pessimism he sees in the work of more postmodern forms of scholarship about the university, in particular the work of Bill Readings (1996), and more towards an optimistic and realist approach. In *Understanding the University* (2015b) this comes awry somewhat as he is forced to adopt a modernistic, 'universalistic' or 'foundationalist' approach, which is simultaneously dialectical and subject to (socially constructed) hierarchies of knowledge:

> This inquiry therefore is foundational in any attempt to realise the potential of
> the university. (Barnett, 2015b, p. 3)

Near the end of *Understanding the University* the confusion becomes more open
hostility where Barnett states:

> But this stretching of and by universals goes further, and in two ways. First,
> despite the warnings and the attacks by the relativists, postmodernists and
> constructivists, the cluster of reason remains lurking within the university.
> Hardly voiced these days, yet the cluster of universals of truth and truthfulness,
> knowledge, reason, critical dialogue and disinterested inquiry is understood still
> to be a constitutive feature of the university. Of course, again, there is conflict
> here as to just what allegiance to any such universal idea might contain. But the
> universals of reason are surely still present, as part of the background
> conceptual furniture of the university. It lies dormant, and springs into life when
> it is under threat. (p. 153)

There is not space here to address Barnett's somewhat British anxiety over
postmodernists and relativism. However, questions connected to Barnett's
theoretical approach are addressed in the following section of this chapter.
Instead, what is useful to discuss at this point is the range of perspectives
developed in relation to Barnett's ecological university. From the beginning of
this discussion it should be pointed out that of the many hundreds of writers
citing Barnett's work, the overwhelming majority have essentially endorsed
Barnett's approach. This can be observed in how most writers have drawn upon
the ecological university to argue for their own concerns, rather than to contest
the nature of the ecological university. There are, for example, many scholars
who have drawn on Barnett's work to reinforce their concerns about the
neoliberalisation of higher education (Hadley, 2014; Hambleton, 2014; Katz,
2015; Probert, 2016; Rinne, Jauhiainen, & Kankaanpää, 2014; Sutherland-Smith,
2013; Tribe, 2014). Similarly, there is another group of writers who have seen
Barnett's approach to the ecological university as part of a move towards global
citizenship in education and/or engaged scholarship and have therefore been
less interested in a close examination of the ecological university and more

interested in linking Barnett to their cause (Caruana, 2012; Maringe & Foskett, 2012; Wall & Perrin, 2015).

Other texts have used Barnett's work to question the bureaucratic or managerial nature of higher education (Bengtsen & Nørgård, 2014; Brady & Bates, 2016; Guzmán-Valenzuela & Barnett, 2013; Kimber & Ehrich, 2015; Watermeyer, 2014). Norman Jackson has written an interesting text based on Barnett's discussion of learning ecologies (N. Jackson, 2012). In lesser doses, there are also writers who have cited Barnett in support of their arguments about the digitisation of university education (Selwyn, 2014), or the importance of transdisciplinary learning (Aaen & Nørgård, 2016) and even the concept of 'slow innovation' (Swirski & Simpson, 2012). A group of Danish university students cite the work of Barnett as part of their insistence that there needs to be a move away from neoliberal universities and towards what they call a 'different' university (Risager & Thorup, 2016).

The ecological university is not yet a concept that has been addressed by those interested in the possibilities for wellbeing in or through higher education, although there are those who nevertheless draw attention given to this concept in Barnett's work (Sutherland-Smith, 2013). There have been a few papers that have connected the wellbeing-related concept of *bildung* to the ecological university, at least as part of a passing reference rather than a thorough investigation (Bengtsen, 2014; Porto & Byram, 2015; Rinne et al., 2014). Education for sustainability has also yet to develop strong connections with Barnett's theorising, although there are a few texts attempting something of a cross-over between Barnett's philosophical theorising and the overtly practical approach often seen in EfS. Examples of such work include Bronwyn Wood et al's recent work on sustainability champions (Wood, Cornforth, Beals, Taylor, & Tallon, 2016) and Patrick Baughan's paper which briefly links the ecological university to the much needed theorisation that is required for sustainability in education (Baughan, 2015).

There has been also been some interest in Barnett's work by writers drawing on posthumanism and/or object oriented ontology. Reem Al-Mahmood uses a vibrant matter approach (J. Bennett, 2009), along with aspects such as Actor-Network theory (Latour, 2005), to argue for the radical possibilities of the ecological university, at least in relation to e-learning (Al-Mahmood, 2013). Carol Taylor briefly critiques the ecological university as an anthropocentric project, but nevertheless suggests it offers a basis for an ethical, posthumanist approach to *bildung* (C. Taylor, 2017). Drawing on the work of writers such as Rosi Braidotti (Braidotti, 2013) and Karen Barad (Barad, 2007) Taylor's approach sees *bildung* as less of an individualised event and more as "a process of ecologies and relationships" (p. 420). Within Taylor's approach, *bildung* retains its traditional and holistic notions of development and citizenship, albeit she also argues against a liberal (Newmanesque) focus on individuals in favour of a much greater emphasis on interconnections and relationships.

David Rousell (2016) provides a slightly more detailed discussion of the ecological university, though Rousell is not focussed on critically extending the idea of the ecological university, but instead drawing on posthumanist thinking about social science and the Anthropocene to suggest that the ecological university offers a useful approach to education (or specifically learning spaces) at this time in the planet's history. Rousell sees the ecological university as an approach which extends our thinking, along with notions of the creative university (Peters & Besley, 2013) and a posthumanist multiversity (Rousell, 2016). Quoting from Guattari's *The Three Ecologies*, the endpoint of Rousell's discussion is that a posthuman curriculum "would be... orientated towards the realism of ecological catastrophe, and the "risk that there will be no more human history unless humanity undertakes a radical reconsideration of itself" (p. 150).

There has also been some critical discussion linked to Barnett's use of feasible utopias (Hughes, 2014; Lazaroiu, 2013). Given the approach taken in this thesis, Graham Badley's paper on the feasible utopia of the pragmatic university offers the most interesting example of this work (Badley, 2016). Badley doesn't

question the idea of the ecological university, but suggests that, as far as feasible utopias go, the pragmatic university is "a suitable candidate for inclusion in Ron Barnett's list of 'imaginings'" (Badley, 2016, p. 640). After taking Barnett to task for his historical dismissal of pragmatism, Badley argues that a pragmatic university easily fulfils four of the five major criteria Barnett has used to assess the potential of the ecological university. Badley points out the pragmatic university has 'range', through its theoretical connections to the work of Dewey, Peirce, F.C.S. Schiller, Quine, Davdison and, most especially, Richard Rorty. The pragmatic university also has 'depth' in that its socially constructed view of reality encourages a critical connection between different university departments. It is also 'emergent' through an ability to reflect, inquire and grow. It is also 'ethical', not so much in terms of Barnett's ethics linked to sustainability, deep ecology and wellbeing, but rather through the development of inclusive moral communities.

> Such an achievement would be the outcome of processes of communicative reason, of conversational persuasion, rather than force. This would be a matter of coming to accept an offer of communal agreement rather than being threatened into compliance by some dominant and powerful individual or group. Such unforced agreement between individual and groups, based on discussing what to do, is itself a form of community-building (Badley, 2016, p.635).

The one significant question mark over the pragmatic university discussed by Badley is its potential in relation to the managerial and utilitarian forces dominant in higher education. In the face of such "pernicious" forces, Badley suggests that it seems highly unlikely that a university culture could develop beyond performativity and market logic. Badley nevertheless sees some hope for the pragmatic university, albeit in highly anthropocentric terms, and he challenges Barnett to see how the pragmatic university, like the ecological university, can promote education as a "cultural, educational, political and social asset" (p.636).

Critiquing the ecological university

While there is much that might be learnt in the various responses to Barnett's approach to the ecological university, most of those citing his work do not fundamentally challenge or progress this concept. In this section however, a critique of Barnett's approach is undertaken. The point of this critique is to identify key areas for development in Barnett's articulation of the ecological university and to use these points to develop new thinking about how an ecological approach to higher education can be developed.

There are three broad aspects of Barnett's approach to the ecological university discussed in this section. These aspects are his view of the ecological, the epistemology of the ecological university, (including Barnett's approach to subjectivity) and his limited connection to the politics of education. In part at least, the critique of these aspects is informed by the discussion of ecological theory that has already occurred in this thesis. These points are also used in the following chapter, Chapter 7, where some of the key issues identified in Barnett's work have informed the development of a model for the ecological in higher education.

Barnett's approach to the ecological

Barnett's work has provided an important starting point for the research in this doctorate. In this sense, it is no surprise that this thesis has continued, in some ways at least, to draw from the work of Felix Guattari, especially Guattari's 'ecosophical perspective' and the triplex of ecologies (psyche, social and natural) (Guattari, 2000). This does not mean that that Barnett's approach to the ecological is beyond critique (or possible improvement). As was discussed above, Barnett sees the 'ecological' as a metaphorical idea, one that underlines the importance of 'multiple ecologies' and is not bound by a particular 'naturalised' conception, that is a ecology as 'nature'. From such a position, Barnett views the university, as an ecosophical institution is justified in relation to its existing interconnections to the world. The interconnected multiple ecologies of the university include learning ecologies, knowledge ecologies, economic ecologies as well as the many natural ecologies of the world. It is humanity's entanglement

with these relationships which is the basis for the university's *responsibility* to the world (not in what Barnett might see as a 'thin' Derridean sense) but in a more active (Heideggerean) sense of care for the world (Barnett, 2010, p. 141-142). Drawing on ideas of engagement, sustainability and wellbeing Barnett argues that the ecological university is "adding the world's resources" (Barnett, 2010, p. 143) and operates as a university for the 'whole Earth' (Barnett, 2018, p. 170).

The 'responsibility' of the ecological university does not quite make the leap to a postfoundational form of ecological thinking and in some ways Barnett has a tendency to be both flexible and foundational. In his earlier work especially, Barnett entertains the points of view of those writers with more postmodern or poststructural views of the university, such as that described by Jacques Derrida (Derrida, 2004), and by Bill Readings' (Readings, 1996), only to be occasionally caught between the moralising possibilities of wellbeing and the (postfoundational) possibilities of a Guattarian ecosophical perspective. Barnett appreciates something of this tension when he discusses the ecological university as both open and ethical, and also independent and virtuous (Barnett, 2010, p. 70):

> A wide array of virtues has been proposed and each one has its own worth; its own virtue, indeed. But they pose difficulties. Once begun, it is not clear why there should be an end to the listing of virtues. In turn, it is clear neither that any virtue will attract a consensus nor as to its status as a uniquely defining characteristic of universities. Faced with the difficulties of saying anything substantive as to what it is to be a university, modern philosophers have resorted on the other hand to an alternative gambit, falling back on a meta-strategy, on high-blown depictions of the communicative processes of 'the university'. In general, these processes should be such as to make possible rational discourse, systematic rational reflection, argumentative conflict, conversation and dissensus. The difficulty here is that these depictions exhibit a programmatic and imaginative thinness. They offer little help as to how to go on being and becoming a university, especially given the interconnections of the university with the world. Is there an intermediate way through here (one

hesitates to say 'a third way') that will avoid the dual difficulties of adding to a
question-begging list of dispositions and virtues, on the one hand, and, on the
other, of offering a stratospheric depiction of the university's conversational
processes that do little to help in the development of a programme of action?

In this paragraph Barnett almost caught in the gap (or dialectic) between
modernist and postmodernist thinking. In the later texts, *Understanding the
University* (2016) and *The Ecological University* (2018), he seems even more
modernist in his arguments by asserting the need for foundations and universals
(albeit alongside epistemological openness and flexibility). To some extent
Barnett's approach to the ecological reflects both modernist virtues and
'conversational' relativism, and at this point it is worth recalling that Critical
Realism, the theoretical base for Barnett's work, has historically attempted to
develop an ontological way out of this dilemma (via ontological realism) (Archer,
1998; Bhaskar, 1978). Barnett though doesn't resolve this issue in a conclusive
philosophical manner and, while he can accept that universities are contexts for
dissensus, he has little sympathy for ideas about the university which resemble
those 'thin' discursive concepts he equates with the idea of the university as a
"debating society" (Barnett, 2010, p. 69). Instead Barnett draws on concepts
such as 'autonomy' and 'responsibility' to suggest that the idea of the university
has a squid-like (or in Deleuzean terms rhizome-like) form, one that is capable of
supporting multiple forms of flourishing.

Significantly, the philosophical terrain that Barnett is working in here is
addressed in this thesis by a postfoundational-pragmatic approach to ecological
theory. From such a perspective, the development of 'multiple forms of
flourishing' is not relativistic or universal, but the product of (contestable)
scientific, political and educational deliberation. Ultimately such debates find
local, temporary and contestable resolutions in the ways in which the health of
our different ecologies can be improved. From this perspective, the dialectical
third-way approach attempted by Barnett can ironically be used in support of a

pragmatic approach to realism. This is ironic given Barnett's traditional eschewing of pragmatism (Badley, 2016).

Moreover, while Barnett's dialectical approach can potentially be redirected towards pragmatism (possibly to his horror), the lack of a more explicit postfoundational link to ecological theory (or at least his tendency to talk about universals) is again problematic when he draws on 'deep ecology' to help reinforce his arguments about the ecological university.[11] Barnett comes to Deep Ecology through the writings of Nicholas Unwin (2007) and Sandra Moog (Moog, 2009), and without reference to a wider study of Deep Ecology writing. In some ways the argument made by Barnett does not need to have a detailed account of Deep Ecology thought, and this may, at least in part, explain why his writing in this area is tentative. Barnett's tentativeness may also be a reaction to the foundational modernism of the Deep Ecology project. Barnett does not anchor his idea of the ecological to Deep Ecology but rather talks about the importance of being "sensitive to the idea of 'deep ecology'" (Barnett, 2013 p. 137) and of the university being "deeply ecological" (Barnett, 2018, p. 176) in relation to the seven discrete ecosystems of knowledge. His position is not so much framed by the radical intent of Deep Ecology but rather by its broad potential to problematise such tendencies as anthropocentricism. In light of such a relationship with Deep Ecology, Barnett's view of the ecological is not too different from Sterling's approach as discussed in Chapter 2, in that Barnett is drawing Deep Ecology's critique of the 'unecological', while not necessarily accepting its full eco-centric programme (including bioequality). Like Sterling too, and without a clear link back to postfoundationalism and pragmatism, it is not immediately clear what framework will be used by 'the university' to establish the sensible limits of one's 'sensitivity' to Deep Ecology. Similarly, it is also not

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[11] I use lower case letters for deep ecology here, reflecting Barnett's own usage. As is observed in Chapter 2, the style in this thesis involves the capitalisation of 'Deep Ecology' to reflect its status as a distinct philosophical approach.

clear what sort of sensitivity should be employed in relation to those forms of ecological thought that Barnett does not mention, including social ecology and ecofeminism. As will be discussed in Chapter 7, this has been an explicit consideration in the approach taken in this thesis.

Epistemology, subjectivity and the curriculum of the ecological university

This section traces a series of points linked to Barnett's approach to knowledge, subjectivity and the curriculum of the ecological university. Indeed, while Barnett has a well developed set of ideas about knowledge in the ecological university, this does not extent to an ecological awareness of subjectivity and this may be the reason why Barnett's approach to the ecological curriculum is limited in places, or at least, at the early stages of what is possible under an ecological epistemology.

Certainly Barnett has a strong awareness of epistemological issues, through, for example, his referencing to the interconnected notions of knowledge ecologies, learning ecologies and the need for epistemological openness. Such references suggest that different forms of knowledge can exist in various complex entanglements that are both unpredictable and yet productive. In more detail, the epistemological nature of Barnett is evident in *Being a University* (2010) when he draws on the work of Nicholas Maxwell to make a compelling case for universities to aspire to develop integrated forms of wisdom and not just isolated bodies of 'knowledge'. By way of a recap, Maxwell's 'four elementary rules of reason', require universities to:

1. Articulate and seek to improve the specification of the basic problem(s) to be solved.
2. Propose and critically assess alternative possible solutions.
3. When necessary, break up the basic problem to be solved into a number of specialized problems.
4. Inter-connect attempts to solve the basic problem and specialized problems, so that basic problem-solving may guide, and be guided by, specialized problem solving. (See also (Maxwell, 2006, 2007, 2012)

In some ways Maxwell's rules can be read as a heuristic for avoiding Gregory Bateson's 'epistemological error'(Bateson, 1972), or at least the development of some sort of 'system wisdom', in that these rules attempt to ground specific forms of knowledge within a recursive aimed at solving the big or 'wicked' problems of the world. Barnett makes no reference to Bateson though, and instead focuses on Maxwell's observation that, while academia has been highly engaged in the third feature of these rules of reason, there has been an insufficient focus on the other three aspects, including the bringing together of various pieces of knowledge to resolve face complex larger issues. These observations align very well with the points raised in Chapter 2 about reductionism and ecological thought and the idea that ecological thinking does not exclude the need for reductionism. The point being that reductionistic thought is at its best when it is also accompanied by healthy reflections on the relevant wider system (or systems).

While Barnett, via Maxwell, reflects an epistemological wisdom reminiscent of Bateson, he arguably misses out on an opportunity to explore more of Bateson's ideas, including how Bateson's thought operates as a source for Guattari's thinking (see also Shaw, 2015). This has important implications for the issue of human subjectivity. For example, in between Bateson's 'ecology of mind' and Guattari's triplex of ecologies there is an ecological insight into how the failure of our subjectivity (psyche) is an integrated ***product and cause*** of the GEC (Bowers, 2010; Stratford, 2015). This can be seen for instance if humanity's 'closed loop' thinking linked to economic growth and high-speed consumerism, which is both the basis of our 'success' as a species (at least in the West) and the basis of our confrontation with the planet's biophysical limits. Unfortunately Barnett has very little direct comment to make about subjectivity, including Guattari's approach to subjectivity (the word 'subjectivity' is only used once in *Being a University*) and, perhaps as a result, very little to say directly about the failures of our thinking and its relationship to the surrounding social and natural environments. In *The Ecological University* (2018) Barnett has a short sub-section devoted to

subjectivity (p. 60-61), but this does not substantively engage with questions of social construction, agency or traditional liberal assumptions about individualism. Guattari's 'interconnected' point about subjectivity and the environment is worth recalling here as both an example of what Barnett is missing and as a potential purpose (or organising dilemma) for the ecological university:

> Without a change in mentalities, without entry into a post-media era, there can be no enduring hold over the environment. Yet, without modifications to the social and material environment, there can be no change in mentalities. Here, we are in the presence of a circle that leads me to postulate the necessity of founding an "ecosophy" that would link environmental ecology to social ecology and mental ecology. (Guattari & Genosko, 1996, p. 264).

Barnett frequently uses the word 'interconnected' and this word applies here too, but in the sense above it is more useful to see Guattari's comment above as a recursive informational structure (Bowers, 2011; Harries-Jones, 1995). It is not just an interconnected relationship but a co-dependent one too. This is the sort of relationship that challenges traditional, liberal notions of the subject, and has a range of implications for how humans can be understood as producers and products of their various environments. On the basis of this point, Barnett's work would benefit from a deeper understanding of the 'philosophy of the subject' (Peters & Tesar, 2016), including how the established poststructural critique of an isolated, atomistic, liberal subject poses a real question mark over liberal ideas about the university (a point also made by Bill Readings) as well as liberal notions of environmentalism (Postma, 2002) or democracy (Dobson, 2007). Given this point, an interesting question for Barnett and his approach to the ecological university is: how can such an institution make a worthwhile 'impact' when so many psychological, democratic, social and natural ecologies are reinforcing each other to create so much material success in some ways and catastrophic failure in others? From a slightly different perspective comes the question: how does the ecological university contribute to an ecological subjectivity?

Such questions are justified in response to the underwhelming curriculum and pedagogical possibilities Barnett sketches for the ecological university. Despite Barnett's adoption of Maxwell's epistemological point about knowledge and wisdom, he does not seem to appreciate the radical potential of the ecological project, or how much the curriculum and research might transform based on Batesonian and Guattarian notions of ecological thought and subjectivity. For example, in *Being a University* Barnett presents a list of possibilities for the ecological university that he has some trouble disentangling (or appropriately entangling) from such (liberal) concepts as the service university or the civic university. At best he suggests that there is a global dimension to the ecological university that is beyond that offered by either the service university or the civic university (Barnett, 2010, p. 149). The subsequent list of curriculum possibilities however can be read like a summary of the minor innovations already present in 'engaged' approaches to higher education:[12]

- developing and vigorously pursuing a strategy of civic and community engagement;
- putting academic work on-line;
- holding public lectures – and putting podcasts on-line;
- working with local/regional authorities and community and third sector groups in addressing social issues;
- working with groups/communities in the developing world (projects here could include cultural projects as well technological and social projects);
- offering pro bono advice;
- producing materials for public consumption (a university in Colombia produces mini-booklets containing accessible work by its scholars for public consumption at minimal prices);
- research that tackles issues of concern and that might help to alleviate suffering or deprivation (locally and globally);

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[12] The references and notes Barnett provides with this list has been omitted.

- academics becoming public intellectuals, imaginatively utilising media so as to communicate to publics and so to enhance the public sphere;

- putting each class of students in touch with another class in another country and so develop a trans-national and trans-cultural learning space and so helping the formation of students as 'global citizens';

- offering to accredit the socially-oriented activities of students off-campus (where, for example, an individual student works in a care home or joins the St John's Ambulance Service);

- promoting inter-connectedness across disciplines and forging public-oriented programmes of activity (the UK's University of Durham is doing just this, in its Institute of Advanced Study, with a university-wide project led by two senior professors 'to communicate authoritative work on a spectrum of significant matters of being and knowing in a lively, open and accessible manner';

- universities coming together across the world to promote this kind of ecological thinking – of which the Talloires movement is the most prominent;

- universities being funded in part from the public purse in regard to the extent to which such a mission of concern towards the wider world is evident in their life and activities.

These are not the sorts of activities that will change humanity's recursively linked psychological and social ecologies. While they are likely to be a start in such a process, they do not, in many cases, appear to carry the necessary pedagogical weight needed for such an aspiration. Moreover, given the subdued way this list is presented, it is possible that many higher education leaders might suggest that their organisations are already doing many of these things (albeit shallowly and/or only in some places). From their perspective then, the ecological university could be described as more 'extant' than utopian (feasible or otherwise).

In *The Ecological University* (2018), Barnett has continued his broad approach to the ecological curriculum, and despite the fact that he has more scope to discuss a range of pedagogical possibilities, he remains more philosophical than specific

(or radical) in his discussion. For example in Chapter 8 – Sightings of an ecological curriculum – he discusses the ecological curriculum as a "complex assemblage", (p. 114) which should encourage a creative, nomadic and free traverse across different ecosystems. Barnett's language reflects a metaphorical and, at times, romantic approach to an ecological curriculum. For example, after discussing the ecological curriculum as one that reflects "ecological reason" (p. 114) the chapter is at its most specific when Barnett states that:

> The ecological curriculum entices the student into venturing across the ecosphere of the university. (p. 114)

He then provides the following examples:

> The chemistry student might be encouraged to explore – with some study in the field – the place of the chemical industry and its effects on the total human and natural environment (cf. Gomes Zuin and Lopes de Almeida Pacca, 2012). The geology student might be required to engage with peoples in a traditional culture in settings for field trips. The philosophy student might be led to consider the place of philosophy in the evolution of society and its ideological tendencies, and critically to examine the character of reason in the contemporary world. The student in nursing studies or medicine could be invited to reflect upon and give a systematic account of his/her felt experiences of clinical exposure to hospital settings. (p. 114)

An interdisciplinary approach is pointed to as well, when Barnett suggests that "[e]ach ecological venture can characteristically be a voyage across two or more ecosystems. The geology student on a field trip in a distant land is at once venturing across multiple ecosystems of knowledge..." (p. 114). From this point on however, a more metaphorical account of the ecological curriculum is employed by Barnett. There is more than a resonance of middle class Anglo-Saxon liberalism in Barnett's language when he says:

> This curriculum opens, too, spaces for the student's own responses. It affords the student an arena to discover and to develop her own voice, with all the vulnerability thereto (Batchelor, 2006). And just as there may be two sopranos (as in Delibes' 'Flower Duet' in Lakmé) or two tenors (as in Bizet's The Pearl

Fishers duet) on the opera stage, still they both hold their own lines and project their distinctive voices developed over the course of time. (p. 115)

In the conclusion of this chapter Barnett returns to the issue of openness and the interconnection that exists between the learner and the multiple eco-systems of the university. Barnett still seems hesitant to go too far beyond philosophical metaphors when he discusses the role the ecological curriculum in building student concern for the whole world – not just the natural world, but the many different ecologies and "life in all of its manifestations" (p. 124).

Moving on from Barnett's philosophical approach, and the idea of ecology as 'engagement', is the potential to develop the ecological curriculum in terms of its content (for example 'climate-change' education as the focus of research or teaching), or the ecological as a new form of thinking, for example using the insights from system theory to reinforce existing concepts as diverse as ecopedagogy (Fassbinder et al., 2012; Kahn, 2010), ecological humanities (Farrelly, 2010; Tinnell, 2012), ecological literacy or intelligence (Bowers, 2006b, 2011; McBride et al., 2013; Orr, 1989, 1992; Sebastian & Ajith, 2013), systems science (Capra & Luisi, 2014) or even integrative medicine (Stineman & Streim, 2010). As is discussed in the following chapter, developing such possibilities has the potential to inform an ecological approach to higher education, including what is described in this thesis as 'Anthropocene Intelligence'.

The ecological university as a political project

Barnett's tendency towards a philosophical (as opposed to a more pedagogical) approach to the ecological university and its curriculum has another, perhaps unintended consequence. In privileging a particular philosophical literature, Barnett also limits his engagement with the eco-political possibilities that could arise from ESE and other forms of education aiming to improve the wellbeing of the university's 7 eco-systems. Barnett doesn't expressly preclude others from taking this course however, but the point remains that such an approach leaves Barnett's work with an abstract quality, one in which the deeply political nature of education becomes assumed, and subsequently less of a focus. This can be

seen, for example, in his use of concepts such as the 'metaphysical university', the 'research university' and the 'entrepreneurial university'. In discussing these 'forms' of the university, Barnett emphasises their potential as creative possibilities, more than their existence being the result of political world-views. Similarly, Barnett's use of 'feasible utopias' - namely the 'liquid university', the 'therapeutic university', the 'authentic university' and the 'ecological university' – focus the reader's intention on the many ways there are to think about university, more than they unpack the ideology of these forms in a highly neoliberalised global context (Barnett, 2010, 2011).

Barnett's approach does have some advantages. Specifically, the use of feasible utopias, and ideas such as the research university and entrepreneurial university, provide a basis for the stimulating critical and imaginative responses to the status quo sought after by Barnett. In this sense Barnett's approach achieves what it sets out to do – provide a welcome addition to the 'impoverished' thinking that currently exists about the university – especially the idea that the 'entrepreneurial' university is not the final evolutionary stage for higher education. Barnett's approach recognises that there are 'choices' (potential or agency) in imagining different possibilities for the university (Barnett, 2013).

What Barnett's approach does not do so well, especially in his earlier texts, is provide a sense in which the aims and purposes of education are immensely political and contested. In this regard it is not clear how Barnett's ecological university might realise its feasibility in relation to such hegemonic forms as the neoliberal university and the liberal university (a point implied by Badley above). In this sense, there is no plan or framework from Barnett about how the ecological university might develop in relation to the existing liberal and neoliberal concerns for higher education – for example, the development of knowledge and cultural reproduction (within a liberal framework) and the development of vocations or 'employability' (within a neoliberal framework).

While he doesn't address these relationships, in *The Ecological University* (2018) Barnett does develop a more political dimension to his work, most notably through chapters, on the ecological curriculum, ecological inquiry and ecological professionalism. These chapters are still quite philosophical in their tone albeit that Barnett is starting to unpack the ecological university by exploring how it might negotiate itself in relation to its 7 eco-systems. In the 'Coda' section at the end of this book, Barnett also makes a more explicit political point as he looks towards the 'politics of potential' via the ideas of Guattari as presented in *Lines of Flight* (2015). Barnett identifies through Guattari the possibility for some form of political or revolutionary action which 'could just' mobilise the potential of the idea (of the ecological university):

> It is surely evident that the future of the university is at once a political and a global matter. The issue is the extent to which and the ways in which universities, collectively across the world, can go on forging themselves as a unified entity, expressive of the kinds of values and orientation embodied in the ecological university. Even if they are persuaded by the idea as an idea, many will be pessimistic about the political possibilities (and there is much to be pessimistic about). But, as Guattari remarked, '[o]ne can never say about a particular situation of oppression that it offers no possibility for struggle' (p. 104). And, as observed, universities possess considerable powers that are not being fully realized, powers that extend across the seven ecosystems in sight here.

In line with the assumed autonomy of universities around the world, Barnett's 'politics of potential' is focused on what is occurring both within these institutions and also how they can collaborate towards change. The possibility of change being supported by the policies of governments is not part of this discussion however, which leaves plenty of room for the arguments made in this thesis about the development of an ecological direction for higher education policy. It is also worth pointing out at this point that the Guattarian politics of potential here discussed by Barnett, is broadly consistent with the CEP approach taken in this thesis. After all, the development of ecological policy thinking is very

much an act of scholarship in the face of an uncertain (neoliberalised) policy context.

Conclusion: Towards Anthropocene Intelligence in higher education

As discussed above, one of the omissions in Barnett's work to date is the relationship between the ecological university and competing forms of the university (such as the neoliberal university). In addition to how the ecological university relates to such archetypal heavy weights as the neoliberal university, the next steps for the ecological university could also include how it is to engage with the 'sustainable university' (Sterling et al., 2013), the 'healthy university' (Dooris, Wills, & Newton, 2014; Newton, Dooris, & Wills, 2016), engaged scholarship (Shultz, 2013; Watson et al., 2011) or education for human development (J. M. Alexander, 2008; Boni & Gasper, 2012; Boni & Walker, 2013).

Unlike the relationships the ecological university might take up with neoliberal and liberal approaches to education, which involve contesting, or at least translating some of the traditional aims and ends of education, the relationships the ecological university has with ideas such as the 'sustainable university' can be characterised as a slightly different form of politics, with the potential for a more productive set of possibilities. These possibilities are included in the following Chapter, which presents a model for the ecological in higher education, including a focus on how 'Anthropocene Intelligence' can be an important aspect of higher education.

Chapter 7: Anthropocene Intelligence and being ecological in higher education

We abuse land because we see it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.

— Aldo Leopold (January 11, 1887 – April 21, 1948)

This chapter presents a framework for being ecological in higher education. This framework builds on the earlier discussions about ecological theory, the nature of the GEC and the emerging discourse on the ecological university. In line with these connections, the framework developed in this chapter draws on postfoundational ideas about the ecological to explain how a series of relationships can provide a theoretical basis for higher education in the Anthropocene. In terms of the overall argument developed in this thesis, this chapter provides a theoretical framework for answering the question – what does it mean to be 'ecological' in higher education?

This chapter is divided into five sections. These sections refer to four specific layers of the ecological framework presented in this chapter. The first section provides an overview of this framework. It concentrates on the key ideas, including the focus on learning and democracy needed for an ecological approach to higher education within an ecological democracy. The second section briefly recalls the postfoundational ecological theory which underpins this thesis and the framework presented in this chapter. The third section discusses the major contextual factors to be considered in an ecological approach to higher education – notably, the aspiration to develop ecological democracy and the entangled success and failure of the GEC. The fourth section introduces the concept of 'Anthropocene Intelligence'. This concept is central to the theorising of an ecological approach to higher education and this section reflects this importance by discussing the principles of Anthropocene intelligence as well as how Anthropocene Intelligence helps position the ecological university

in relation to the neoliberal university and the liberal university. The fifth (and last) section explores how the content, thinking and engagement of an ecological approach to higher education can operate. This discussion provides a broad steer on the possibilities for an ecological curriculum for higher education and uses the idea of the healthy university as an example of how the productive relationships that can inform the content, thinking and engagement of an ecological approach to higher education.

Overview: a model for the ecological in higher education

The diagram over the page presents a model for thinking about the ecological in higher education. It models how postfoundational ecological theory can be translated into an educational approach in support of our various interconnected ecologies. It demonstrates the relationship between different philosophical and theoretical layers of an ecological approach to higher education. Starting from the top of the model it reflects how postfoundational ecological theory can be developed in relation to the GEC, ecological democracy and existing approaches to higher education – especially the neoliberal university and the liberal university. Near the bottom of the model a series of relationships are identified as a potential source of productive learning for an ecological approach to higher education.

In keeping with the pragmatic approach of this thesis, the layers in this framework should be seen as a series of flexible, resonating and/or dialectical relationships. In this sense, these relationships reflect Guattari's interest in dissensus and the range of plural possibilities that emerges from a postfoundational focus on improving the health of our interconnected psychological, social and natural eco-systems. The 'working out' of such dissensus emerges from a postfoundational emphasis on deliberation and a Peircian-style community of inquiry. While it is beyond the scope of this thesis to detail how such a community might operate, this process is analogous to the deliberation sought after in John Dryzek's deliberative approach to ecological democracy, as presented in Chapter 3. The methodological assumption therefore

underpinning the relationship layers in the model below is that how they are negotiated is the product of a democratic pedagogical community.

Figure 6: Being ecological in higher education

Being ecological in higher education

Layer 1:
Philosophical relationships

Postfoundational Ecological Theory

The idea of the ecological university
- Healthy interconnected ecologies

Ecological Democracy

The GEC/The Anthropocene

Layer 2:
Contextual relationships

Anthropocene Intelligence

The neoliberal university

The liberal university

Layer 3:
Positional relationships

Learning ecologies

Ecological Humanities

Content Thinking Engagement

The service university

Human Development

The healthy university

Engaged Scholarship

Layer 4:
Productive relationships

The sustainable university

As with the exclusionary intent of the ecological democracy model put forward by Dryzek, the eco-democratic structures in the above framework do not uncritically accept all points of view. Based on a critical approach to empirical and values domains (Rein, 1983), there are expected to be some points of view that are not included in the learning framework for the ecological in higher education. From an ecological perspective, it seems unlikely that one could successfully contest contributions to climate change (at least not without actual evidence). While not all points of view will be as clearly ideological and as 'fact-free' as climate change denial, the point is made that an intelligent, scientific and critical community can be the aspiration within an ecological approach to higher education. Such a community does not have to find consensus, but that aspiration is implicit in how 'wisdom' can be developed ecologically speaking (Barnett & Maxwell, 2007; Maxwell, 2006, 2007, 2012). Indeed, in keeping with the point made in this thesis methodology about policy alternatives, there are many ways in which dissensus can be seen as part of a healthy education (learning) context and a basis for a healthy ecology of ideas within the Anthropocene.

Within such a dialectical model it is important to recognise the contestable and critical nature of the different layers within this model of the ecological in higher education. In the sections below the important structural features of each 'relationship layer' is discussed. There are two central ideas helping to drive this model. The first is 'the idea of the ecological university', which, in the logic of this thesis, is an approach focused on how higher education can help improve the health of our interconnected intellectual (pedagogical), social and natural ecologies. The second is that of 'Anthropocene Intelligence'. Anthropocene Intelligence is described here as a 'structural core' of the above framework.

Layer 1: The philosophical relationships in an ecological approach to higher education

Read from top to bottom the framework– *Being Ecological in Higher Education* - begins with the oval 'postfoundational ecological theory'. The content of this

oval reflects the discussion in Chapter 2 and the potential of ecological thought linked to the work of Guattari and Bateson. By way of a reminder, the work of Bateson and Guattari has been favoured in this thesis because of the way the eco-theoretical approach of these writers can provide a flexible basis for considering ways to improve the health of our interconnected psychological, social and natural ecologies. While both theorists help develop an interconnected ecological epistemology, the work of Bateson helps explain the epistemological errors built into humanity's (mainstream economic) relationship with the planet. Guattari's contribution informs the development of dissensual and interconnected pathways towards new forms of health.

As was also argued in Chapter 2, a postfoundational framework allows scope to utilise different forms of ecological thought in building interconnected forms of health, while also being sceptical of approaches that posit universal principles for what counts as ecological. From such a position, various eco-philosophical approaches, theories and evidence can be critically considered. For example, the insights from posthumanism can inform the possibilities for ecological thinking. Critical forms of posthumanism have considerable theoretical merit in relation to how humans must now move past a focus on themselves as special species, and towards the idea that they are situated beings living in social and natural ecologies (Braidotti, 2013). Similarly, there are also some scientific, modernist and radical ecological discourses that have value, albeit not as universal approaches to the ecological. While the contribution made by specific ecological theories is not listed in this model, the use of the black two-directional arrows emerging left and right of the oval are a reminder of the various forms of ecological thought contesting the ecological.

Layer 2: the context of the ecological university

Following on from the role played by postfoundational ecological theory, the following layer of the ecological educational model is that of the context for higher education. Two important contextual factors are emphasised in this layer: first: the idea that there is a GEC, with its interconnected dimensions of 'success'

and 'failure'; and secondly, the aspiration to live well on the planet via the concept of 'ecological democracy'.

Figure 7: Postfoundational Ecological Theory 2 – Contextual relationships

Placing the 'the idea of the ecological university' as part of a context that includes ecological democracy, the GEC and the Anthropocene reflects the interconnection between higher education and the fate of the planet. By extension it also shows the obligation of higher education to contribute to the health of the planet's various ecologies. Drawing on Barnett's ideas that the 'ecological university' has a necessary relationship of 'responsibility' and 'care' to its various settings (Barnett, 2010, 2018), the argument made in this model is that higher education is obliged to improve the 'health' of our interconnected ecologies. Significantly, this also means that an ecological approach to higher education is not just a 'product' of an ecological democracy, it also has a role in fostering such a political context.

Layer 3: Anthropocene Intelligence as a basis for an ecological approach to higher education

This section discusses the importance of Anthropocene Intelligence. This discussion is divided into two main sections. The first of these sections

introduces Anthropocene Intelligence. It explores the contestable nature of Anthropocene Intelligence then breaks into a series of sub-sections discussing the twelve draft principles that have been developed for this thesis. These twelve principles of Anthropocene Intelligence provide a skeleton of ecological thought within an ecological approach to higher education.

The second section provides some important context for Anthropocene Intelligence. Focusing on the aims and ends of higher education, I argue that Anthropocene Intelligence, or more broadly the ecological approach to higher education developed in this chapter, is an alternative to the existing liberal and neoliberal claims on the purposes of education. This point follows on from the argument that an ecological approach to higher education is not a niche within existing political settlements, but an alternative way of orienting all education.

The core principles of Anthropocene Intelligence

The table below presents a draft set of principles for Anthropocene Intelligence. These principles have been derived as part of this research and are based on the work of many of the theorists discussed so far. There is not space to fully explore each of these principles and their collection in this table is essentially derived from the work of the theorists discussed in this thesis so far. That said, the ideas represented in the principles below come from a range of ecological, philosophical and educational literatures. Their collection in this section of the thesis has been prepared to help form a basis for considering the basis on which to develop an alternative direction for higher education policy in New Zealand.

Figure 8: Twelve draft core principles of Anthropocene Intelligence

Twelve draft core principles of Anthropocene Intelligence

1. The realisation that **there is a Global Ecological Crisis (GEC)** and that human are unsustainably changing the planet (the planet has now entered the Anthropocene) (Steffen, Richardson, et al., 2015).

2. Understanding that the GEC is both a change in our environment and a product of our conscious and unconscious thinking, including the **deep cultural assumptions (recursives)** that shape our actions (Bateson, 1972;

Bowers, 2010; Guattari, 2000; Harries-Jones, 1995).

3. There are **multiple interconnected ecologies** – across our intellectual, social and natural domains (Bateson, 1972; Guattari, 2000).

4. **Values and facts are typically entangled** across our multiple ecologies, making the idea of 'value-free' or objective science problematic (Putnam & Sen, 2004; Putnam & Walsh, 2012).

5. Ecological thought demands a deep awareness of the ways in which **systems operate and interconnect**, meaning that some systems behave in unexpected, non-linear and complex ways (Capra & Luisi, 2014; Code, 2006; Meadows & Wright, 2008).

6. There are **biophysical limits** to the planet that are being 'overshot' and need to be respected (Steffen, Richardson, et al., 2015).

7. The need to be **sceptical of one-dimensional solutions** to the GEC such as the application of technology (Prometheans). While technological improvements are welcomed, they should not in themselves be seen as the basis for a new epistemology. A key source of our scepticism about technology operating as a primary solution for the GEC is the extent to which humanity continues to increase its use resources and fail to decouple this use from its impact on natural systems (Chapter 3).

8. It is important to value those traditional, Non-Western and/or Indigenous forms of knowledge (**cultural commons**) because of their potential to teach us how to live well on a finite planet (Bowers, 2006b, 2009, 2010, 2011, 2012).

9. There is a necessary ethic of situated **care, compassion, responsibility and obligation** towards the planet's interconnected ecologies (Guattari, 2000; Barnett 2011, 2018).

10. The central value in the Anthropocene is the development of our interconnected and collective **health and wellbeing** (Guattari, 2000; Barnett 2011, 2018).

11. Improvements in our interconnected health and wellbeing may require **imaginative leaps away from the status quo** – a healthy intellectual ecology requires diverse and critical approaches to business as usual (Guattari, 2000; Barnett 2011, 2018).

12. It is possible to improve the quality of our deliberation and find reasoned improvements to local and global issues within the overarching framework of an **ecological democracy** (Dryzek, 2013; B. G. Norton, 2005).

The principles are in no particular order and there is no hierarchy of importance to be assumed. These principles are intended to be used together, not as separate, behavioural criteria. These interconnections are somewhat captured in the following paragraphs exploring the above principles.

Principles 1 and 6: The GEC and biophysical limits

A suitable starting point for an analysis of Anthropocene Intelligence is the recognition that the GEC is 'real'. While this apparent 'realist turn' could be subject to an elongated ontological discussion (Jenkins, 2010), the simple point being made here is that regardless of 'how' humanity constructs its knowledge of the GEC or the Anthropocene, there are various changes occurring across our diverse planetary systems that imply the need for a changed set of relations between people and planet (including humanity's political and social environments). As indicated above, this point is underlined by the idea of biophysical 'limits' (principle 6), most notably in relation to the fact that humanity has significantly 'overshot' on some important planetary limits and is at risk of doing so on many more (Steffen, Richardson, et al., 2015). With a realisation that the GEC (or the Anthropocene) 'exists', earlier assumptions about education, society and development can also be called into doubt, and indeed questions arise about modernity itself (Hamilton et al., 2015). This has clear pedagogical implications linked to critical questions about what sort of 'future' is sought by our society and the assumptions that are made across all forms of knowledge. For every area of higher education the possibility of an uncertain future, or a future requiring changed relations between people and the planet, raises the question about how any particular teaching or research activity relates to this uncertainty. From a slightly different perspective, higher education in the Anthropocene has to now answer a question of whether it will respond to the GEC by either ignoring it, making a token effort or actively engaging through an ecological pedagogy?

Principle 2: The GEC is a cultural crisis

The second core principle of Anthropocene Intelligence links to the idea that the GEC is (at least in part) the product of deep, cultural recursives (including

humanity's epistemological errors). The implication of this principle is that humanity not only has to change its own thinking (and action), but also change the conditions for its deep cultural assumptions. For example, beyond a liberal model of subjectivity and agency comes the understanding that the GEC requires new a cultural reflexivity across multiple, interconnected dimensions of how we live and act and think. The educational implications of this point go to how educational environments can be developed in higher education. For example, the realisation that humanity's social contexts unconsciously construct our unsustainability suggests that need to understand how 'root metaphors' and deep cultural assumptions are embedded in language and, for example, in the use and development of technology (Bowers, 1993, 2001). Similarly, education needs to go beyond simplistic, liberal forms of subjectivity and agency and see human systems as deeply and culturally overlapped and embedded within social and natural systems. Such a change in world-view represents a considerable challenge to the dominant neoliberal and liberal humanist assumptions that underpin the intellectual ecologies of education and society (Bowers, 2012; Peters & Tesar, 2016).

Principles 3, 4 and 5 – relationships, interconnections and systems

Beyond the philosophy of the liberal subject, principle 3 underlines the nature of humanity's interconnection with various systems. Much of this ground has been well traversed in this thesis. Similarly the entangled nature of facts and values (principle 4), as well as the importance of system thinking (principle 5), has been emphasised within the description of pragmatic and ecological thought in Chapters 2 and 3. In pedagogical terms, this point has implications about the ongoing forms of positivistic thinking that still exist in many approaches to higher education, including the artificial divides put in place around 'theory' and 'practice', and the unwillingness to acknowledge the subjective or theoretical elements of 'science'. As Bruno Latour has noted, there is no philosophical error connected to 'scientists' acknowledging that there is a political dimension to their work verifying and exploring the nature of climate change. In the face of a political climate-denial process, realising that there are 'subjective' and political

implications embedded in the work of climate scientists should be part of a debate where a critical approach to the values and evidence around climate change is subject to critical scrutiny (Latour, 2015). From another perspective, this principle is also an acknowledgement that constructs such as 'post-normal' science have a pedagogical role to play in helping students and researchers understand something of the complexity of politico-scientific issues (Funtowicz & Ravetz, 2003; Ravetz, 2006; Turnpenny, Jones, & Lorenzoni, 2011).

Principle 7: Scepticism of one-dimensional solutions

Principle 7 of emphasises scepticism towards one-dimensional solutions. In some ways this principle might be read as a criticism of reductionist forms of thought – or at least reductionist forms of thought without reference to other forms of system understanding reflection. However, as was discussed in Chapter 2, especially in relation to work of Lorraine Code, the relationship between reductionist thought and ecological-systems thinking needs to be more seen as a critical partnership than competing epistemological positions (Code, 2006, 2008, 2012). What matters is not whether or not one takes a 'reductionist' approach to knowledge, but how this information is critically brought together. In this regard it is useful to link one dimensional thought to those reductionist approaches which refuse to acknowledge the existence of wider system variables and the fallibility of a single point of view. A crude example of one dimensional thinking is that associated with extreme forms of ecological modernisation - those which assume that technological progress (and the market) can easily solve humanity's environmental overshoot (Dryzek, 2013).

Principle 8: Non-Western and Indigenous knowledge

Chet Bowers' arguments surrounding the cultural commons (principle 8) reflects the value of his contribution to issues of education, ecology and collective wisdom (Bowers, 2004, 2006a). While Bowers' contributions have not been fully discussed in this thesis, his views on 'cultural commons' reflect the importance of those forms of knowledge that go beyond Western forms of science. As was briefly canvassed in Chapter 2, in a New Zealand context this can be linked, for example, to models of hauora and kaitiakitanga developed within Māori

epistemological frameworks. While these ideas need to be considered within a critical (rather than romanticised) approach, it is clear that the integrated understanding of wellbeing (hauora) and stewardship (kaitiakitanga) can provide wise ways of 'being' for the partners of the Treaty in Aotearoa/New Zealand. For example, in the Te Whare Tapa Wha model of wellbeing developed by Mason Durie, Māori and Pākehā can understand how their wellbeing goes beyond simple hedonic models and relies on their interconnections with body, family and environment (Durie, 1998; Rochford, 2004).

Principles 9 and 10 – wellbeing and responsibility

Principles 9 and 10 of Anthropocene Intelligence specifically address how enlightened views of wellbeing should become a central concern for higher education. Principle 9 specifically links to Barnett's points about the ecological university and the situated ethics that comes with realising that there is always a 'place' in which education takes place. With the realisation that there are (real) places and ecologies - and that education is not simply the abstract development of knowledge or employment skills - humanity is drawn to questions about whether or not it should give regard to these places. While not seeking to presuppose a transcendental set of ethics here, the contestable notion is that humanity is obligated towards some form of responsibility, compassion and care for the planet. By extrapolation, education has to be mindful of some form of 'place-responsiveness' (Wattchow & Brown, 2011). By a similar extension, education takes place within an ethic of care for multiple and interconnected forms of wellbeing connected to places, people and other species.

This broad understanding of wellbeing should also be connected to the long and complex origins of what counts as 'flourishing'. For example, there is an emerging literature on wellbeing (in the West), which despite its recent appearances via positive psychology and eudaimonic happiness, dates back to Greek philosophy (Deci & Ryan, 2008; Wolbert, de Ruyter, & Schinkel, 2015). It's rediscovery in more recent times by educationalists, economists and policy-makers (Au & Karacaoglu, 2015; Dalziel & Saunders, 2014; Forgeard,

Jayawickreme, Kern, & Seligman, 2011; Gibbons, Stratford, & White, 2017; K. Scott, 2012; Stratford, 2016b), suggests that there are many contestable pedagogical implications for locating education policy around specific wellbeing goals. Exactly how a more interconnected or integrated approach to wellbeing might be developed is not presented here, but what is evident is that, even in broad terms, such an approach to goes beyond those reductionist forms of thought seeking to measure wellbeing as a disembodied form of 'mental wellbeing' (Michalos, 2017; Ryff, 2014).

Principles 11 and 12: Imagination and Ecological Democracy

Principles 11 and 12 of Anthropocene Intelligence underline the importance of going beyond the current political forms. Principle 11 is a reminder that imaginative leaps from the status quo (especially those based on a critical consideration of values and evidence) are an important part of a healthy democratic ecology. Similarly, diverse points of view and dissensus are necessary parts to any good knowledge ecology. Significantly, this is not the same of course as allowing moneyed interests free access to whatever post-truth propaganda serves their interests, but is a reminder that new forms of knowledge are possible when reasoned arguments and conceptual development is supported to develop.

This point is in turn linked to principle 12 and the idea that there are ways to improve the quality of deliberation. This point is derived from the ideas about knowledge and community to be found in the writings of Peirce and other pragmatists discussed earlier in the thesis, along with the point that ecological democracy itself requires a deliberative framework to ensure that democratic systems have a positive approach to vested interests, power and anti-scientific (post-truth) rhetoric (Dryzek, 2013).

Anthropocene Intelligence and the aims and ends of higher education

This section focuses on what is described as the positional relationships of an ecological approach to higher education. It explores how the idea of

Anthropocene Intelligence provides an alternative basis for the aims and ends of education. This alternative basis is one that resonates with (or against) the overarching political forms that currently dominate higher education thinking – the idea of the liberal university and the neoliberal university. In this sense, this section is an extension of the earlier arguments (Chapter 5) about the potential for higher education to be organised by an ecological epistemology, rather than include environmental or sustainability education (ESE) as a niche within an unhealthy mainstream.

Central to this discussion is the need for the aims and ends typically connected to liberal and neoliberal educational forms to be renegotiated and updated in light of what can be learned from Anthropocene Intelligence. Specifically on the basis of an ecological approach to subjectivity, knowledge and 'place', traditional liberal ideas about teaching and learning, as well as more recent neoliberal emphases on employability and human capital, should no longer be held as 'the' overarching rationales for higher education systems. While there is not space in this section to tease out all of the ways in which an ecological approach can operate as an alternative way to approach the aims and ends in higher education, this section focuses on the ideas of 'academic freedom', as well as the place of 'knowledge' and 'employability' as three examples of how traditional liberal and/or neoliberal thinking can be improved upon by Anthropocene Intelligence and an ecological approach to higher education.

Academic freedom is often characterised as a central value of liberal education. Within a liberal paradigm academic freedom is seen as basis from which academics can explore unpopular or controversial areas of knowledge and potentially also contribute to public debates as a 'critic and conscience' of society (Malcolm & Tarling, 2007). From an ecological perspective, the valuable heritage of these ideas is not to be cast aside, but a critical 'positioning' is desired which moves beyond traditional liberal epistemologies. In particular, the idea of academic freedom, within what might be broadly described as a 'knowledge for knowledge' liberal sake framework, can be questioned in terms of how it

addresses higher education's obligation to the multiple ecologies of the university. Moreover, from an ecological perspective the point is made that academic freedom does not occur in a moral (or physical) vacuum and that there is no 'value-free' zone where the pursuit of individual academic liberty doesn't interconnect with historical, cultural, social and political issues. In particular the idea of 'academic freedom' has to be understood alongside the range of obligations facing staff and students in an ecological approach to higher education.

Subsequently, it is can be asked how academic freedom might operate within an ecological epistemology? From this perspective, the idea that academic freedom needs a liberal foundation can be questioned. Instead, academic freedom needs to **resonate with** the idea of Anthropocene Intelligence, including the responsibilities it has to improve our various ecologies. In many cases academic freedom makes some contribution to these ecologies, but this is not always the case (especially within an otherwise neoliberal university context). This can be seen in New Zealand where, despite the fact that the idea of 'critic and conscience' is enshrined in educational legislation, the extent to which academics have been able to help improve the health of its diverse eco-systems has been questioned. For example, Todd Bridgman has asked: where were the publically engaged economists of New Zealand universities in the face of the Global Financial Crisis (GFC)? (Bridgman, 2007, 2010). The implication from Bridgman's work is that, despite the liberal intent of the 'critic and conscience' dimension there are many aspects of the university environment working against the involvement of academics in the community. Subsequently, while the idea of 'critic and conscience' has been in place, the reality has been that there are social and institutional reasons which currently limit such activity – including the effects of a neoliberalised research environment which favours the publication of work to academic audiences over public engagement. When seen in its current context, academic freedom is more of an 'option' to draw attention to an issue, rather than a deeper moral obligation to the planet.

Is this sense, the idea of 'critic and conscience' is just too weak a concept for the Anthropocene. Considering the emphasis put on our responsibilities as academics in light of the GEC, a fitting question to be asked in establishing an ecological approach to higher education is the extent to which academics not only have the option to act as 'critic and conscience', but a more situated, interconnected obligation to critically engage. As Bridgman has also noted, the critical engagement of academics is not simply to provide universalising forms of science (and then walk away), but to work within the values/evidence entanglement of the complex issues our society currently faces (Bridgman, 2007).

The resonance academic freedom can make with the principles of Anthropocene Intelligence carries over the questions about 'knowledge'. Under traditional liberal approaches, knowledge is typically seen as a good unto itself – 'knowledge for knowledge sake' goes the pithy philosophical summary (Malcolm & Tarling, 2007; J. H. Newman, 1992). While there is not space to fully explore the liberal approach to knowledge, and in this sense I have to secure this thesis to earlier points raised in relation to the limitations of liberal views of subjectivity and the inherently anthropocentric and humanistic bias in liberal thought (Peters, 2015a; Peters & Tesar, 2016), it is worth pointing out that there is a persuasive liberal case that there is some form of collective (human) 'good' connected to such an approach to knowledge (Collini, 2012). Certainly, the liberal emphasis on the need for diverse forms of knowledge, which is often translated into an argument for the humanities and the arts, is to be preferred to a performative interest in knowledge developed within a neoliberal framework, which reduces all learning to questions of labour market efficiency (hardly a close proxy for diverse forms of planetary wellbeing).

Leaving neoliberal approaches to knowledge aside, from an ecological perspective comes the idea that there are valuable 'knowledge ecologies' and 'learning ecologies' (N. Jackson, 2012). The diverse value of these pedagogical ecologies rests with the idea that they improve society's understanding, for

example, of the past (history), literature, philosophy, fine arts and religions. In such a case then, there is some agreement with those liberal sentiments that argue that the knowledge functions of the university cannot always translate into immediate forms of utility – either for the biosphere or the economy (Collini, 2012). That said, from an ecological perspective, liberal values around knowledge are being updated in terms of the question about what sort of knowledge ecologies are needed in the Anthropocene? Focusing just on issues of arts education a supplementary question could be: does human knowledge in the Anthropocene need to have more or less reverence for humanities and the arts? While there is not space here to go into detail here, the point being made here is that an ecological approach to knowledge and higher education does not make totalising calls on what sort of ideas and imagination is needed to make a healthy democracy in the Anthropocene. That said, and in keeping with the deep questioning that can be carried out about the latent humanism of the arts (Braidotti, 2013; Wolfe, 2010) there is considerable potential to build creative Anthropocene societies on the basis of a diverse and healthy creative culture – one that goes beyond traditional liberal or market rationales. A brief discussion of how the thinking, content and engagement of the humanities and arts can resonate with Anthropocene Intelligence is included in the following section with reference to the ecological humanities (Farrelly, 2010) and eco-criticism (Carducci, 2009; Morton, 2010).

Following on from questions of academic freedom and liberal (and neoliberal) approaches to knowledge, there are also important possibilities to be realised in understanding how an ecological approach to higher education can update the traditional neoliberal fixation on employability. Employability is a central organising principle for neoliberal approaches to higher education and the issue here is not on how an ecological approach to higher education can replicate this primary focus. Instead, the issue is more like an explanation of how employability can be considered within an ecological approach to higher education. Conceivably, higher education will still need to address vocational development in the Anthropocene – our planet will, I suspect, still need lawyers

and plumbers in the Anthropocene (at least in the medium term).[13] Moreover, students attending an 'ecological' university would not expect all vocational concerns to be left aside in the development of Anthropocene Intelligence. However, in lining up employability with an ecological approach to higher education it is important to understand how employability operates within an overall aspiration to develop a society with Anthropocene Intelligence. The implication is that there are forms 'Anthropocene Intelligence' – at the level of the individual student – that need to be developed whether a student is learning to become a plumber, lawyer or art historian. While there is no prescriptive 'amount' of Anthropocene Intelligence each student may develop, and it is for example, at best unclear, to what extent a plumber, for example, might need an in-depth knowledge of the fact-value dichotomy, the broader point is that the principles of Anthropocene Intelligence above can still inform the development of the plumber (or any other vocation) for life in the Anthropocene. With due deference to my own knowledge of plumbing, exactly how Anthropocene Intelligence could inform the pedagogy of plumbing, is beyond the scope of this chapter. What is argued here however is the need for an aspiration to develop the Anthropocene curriculum that improves the capability of all graduates to suitably apply a relevant understanding of interconnection, limits and their responsibilities as citizens in an ecological democracy.

Towards the ecological curriculum - productive relationships in an ecological approach to higher education

This section explores the final layer of the model for being ecological in higher education. As is implied in the framework diagram there are a range of possible productive relationships for how Anthropocene Intelligence can both inform, and

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[13] This mild jest hides an important assumption in this thesis, namely that the philosophical justifications for the ecological university can be carried over to questions of 'higher education'. While higher education is not the same as university education, for the purposes of policy development, the differences between a university, a wānanga and a polytechnic are not seen as significant. While they have different approaches or focuses on research, they all develop skills, knowledge and vocations in the Anthropocene.

learn from, the many educational approaches with the potential to directly improve the health of the universities interconnected ecologies. There is no obvious limit on what these possibilities could entail, because this is the level at which the idea of the ecological university comes into contact with the many and varied possibilities for research, teaching, learning and operations. To borrow a line from Barnett's, this is the layer in which the ecological in higher education reaches its "fullest expression" (Barnett, 2010, p.151). That said, while Barnett has been criticised in this thesis for providing curricula possibilities that seem more in line with the 'service university', the first sub-section below expands such curriculum ideas by exploring how Anthropocene Intelligence can influence the *content, thinking and engagement* of the curriculum in an ecological approach to higher education. At its deepest level, Anthropocene Intelligence provides a (contestable) pragmatic basis for understanding the possibilities for ecological thought to shape the 'root metaphors' (Bowers, 2012) of higher education, which in turn influences the assumptions, focus and interconnections made across research and teaching in higher education. The second sub-section explores how the productive relationships of this layer can operate by drawing on the example of the healthy universities initiative based in the United Kingdom (Newton et al., 2016).

The content, thinking and engagement of the ecological curriculum

The emphasis placed on 'content, thinking and engagement' in model below restates the idea that an ecological approach to higher education needs to go beyond one-dimensional forms of curriculum 'greening' (Blewitt, 2013). At a deeper level, an ecological change to the 'content, thinking and engagement' of higher education is an epistemological shift linked to the points raised in the draft principles for Anthropocene Intelligence, and the overarching need for higher education (in the Anthropocene) to support the health of the planet's interconnected ecologies. Based on what has been learnt from the above framework, there is a need to learn more about what sort of content – curricula and research – can best support a healthy planet. There are also issues about how the thinking and assumptions around higher education can be challenged – especially as liberal and neoliberal aims and ends for education are updated by

Anthropocene Intelligence. And finally, there are questions about how these changes engage with the various ecologies of the university to go beyond knowledge production, to include knowledge development, sharing and exchange linked to context and improvements in multi-dimensional wellbeing.

Figure 9: Being ecological in higher education

Being ecological in higher education

Layer 1:
Philosophical relationships

Postfoundational
Ecological Theory

The idea of the
ecological university
- Healthy interconnected
ecologies

Ecological
Democracy

The GEC/The
Anthropocene

Layer 2:
Contextual relationships

Anthropocene
Intelligence

The neoliberal
university

The liberal
university

Layer 3:
Positional relationships

Content
Thinking
Engagement

Learning
ecologies

Ecological
Humanities

The service
university

Human
Development

The healthy
university

Engaged
Scholarship

Layer 4:
Productive relationships

The sustainable
university

Content

The content level of an ecological curriculum is perhaps the easiest dimension to analyse. As an entry point, the content of an education or research programme links to those forms of 'content' or 'knowledge' that are required to understand issues related to specific and interconnected systems of wellbeing. In line with traditional 'green' forms of education, there is a wealth of ways in which environmental and sustainability dimensions in every curriculum area (or indeed across university operations) can be developed. While the well-trodden links to sustainability education and the curriculum areas of science, business, design, technology and environmental studies are well documented in the sustainability literature (see for example (Barlett & Chase, 2013; Blewitt & Cullingford, 2004; Johnston, 2012; P. Jones et al., 2010)) it is also important to point out that there are 'content' possibilities that go beyond the traditional 'sustainability science' focuses. For example, as some writers point out, there are ways in which one can learn 'about' environmental and sustainability concerns through the humanities and the arts (Carducci, 2009; Fassbinder et al., 2012; LeMenager & Foote, 2012; Morton, 2010).

Thinking

Anthropocene Intelligence promises more than environmental content and learning about sustainability. The development of an ecological epistemology means that there is a competing, alternative framework for how education can approach the world. Anthropocene Intelligence's articulation of limits, interconnections, systems, entanglements and wellbeing asks that new considerations and assumptions are brought to education. One of the most obvious ways in which Anthropocene Intelligence offers new thought is to the way economics is taught.

Currently there are several world-wide movements seeking to change the neoliberal orthodoxy surrounding the teaching of economics. This includes such organisations as the Post-Crash Economics Society, Goldsmiths Political Economy Research Centre and the Post-Autistic Economics Movement. These

organisations draw on a variety of heterodox economic thinking, including the contributions from ecological economics, biophysical economics, feminist economics, economic history, behavioural economics and even the emerging critique of zombie economics (Dietz & O'Neill, 2013; Green, 2012; McNeill, 2014; Quiggin, 2012). A typical point raised by the many different critiques is that mainstream economics is too abstracted and not related to living social and natural systems – it lacks a sense of place, in other words. These critiques often extend to the lack of diversity in how theory is taught by many university economics departments and the dominance of mathematical logic and techniques linked the mainstream/neoclassical economics focus on quantitative modelling.

From an ecological perspective, there is, at least, a basis which goes beyond the liberal academic freedom of each university's economics department, to ask critical questions about how neoclassical thinking aligns with the principles of Anthropocene Intelligence. In a community of learners approach, there is scope to build off the critiques of the Post-Crash Economics Society to ask how ongoing neoclassical teaching and research meets a university's responsibilities to create economics students who can actually think and develop an economics that works well on a finite planet. As can be implied by the ongoing existence of organisations such as the Post-Crash Economics Society, the critical questioning of economics teaching does not mean that there will be a consensus anytime soon. This point also underlines why the CEP methodology focuses on the development of alternative models and not just democratic consensus. An aspiring ecological university would not be content with the best recycling programme on the planet, if its economics department made calculations substituting 'natural capital' for 'labour' and paid little attention to developing graduates who could use economics to think deeply about the planet's limits and interconnections (among other ideas)(Stratford, 2016a, 2016c). It would want its economics graduates to have Anthropocene Intelligence.

As is implied in the above discussion, the potential of ecological thinking has significant implications across the diverse research and teaching possibilities in higher education. Drawing on the work of Bateson, there are already many interesting ecological approaches to the humanities (or eco-humanities) in use around the world – some of which draw on indigenous knowledge forms (Farrelly, 2010; Hutchings, 2014; Plumwood, 2002; Rose & Robin, 2004). Extending from the concept of ecological humanities, there are also forms of eco-criticism for example, which bring the insights from critical ecological thought to the understanding and production of literary texts. Timothy Morton's work has been strongly connected to the idea of eco-criticism (as discussed in Chapter 2) but others include Ursula Heise, Lawrence Buell, Kate Soper and Cary Wolfe (Hiltner, 2015).

The possibilities for developing the thinking and content of teaching and research at the university extend well beyond ecological humanities and eco-criticism too. Among the other ways in which critical ecological thought could be developed in the higher education curricula include the offerings of systems science (Capra & Luisi, 2014), eco-philosophy, critical animal studies, climate change education, eco-psychology and, returning to issues of ecological economics, approaches such as Buen Vivir in development studies (Caria & Dominguez, 2016; Gudynas, 2011; Kothari, Demaria, & Acosta, 2014; Vanhulst & Beling, 2014). And while this list of eco-thinking possibilities sounds suspiciously like Sterling's 'ecological world-view' as discussed in Chapter 2, it is important to recall that unlike Sterling, the eco-pragmatic approach taken in this thesis does not universally accept all 'eco' education as equally worthwhile but subject to critical scrutiny on the basis on aspects such as Anthropocene Intelligence and a critically consideration of what productive approaches are likely to add to the planet's collective wellbeing.

Engagement
Additionally, beyond a curriculum challenged by an ecological epistemology, there are also questions asked about the way teaching and research engages

with the various ecologies of the university. In this regard, knowledge and learning is not just ecologically transformed in its assumptions but also in its applications – the way it interconnects with the world. While Barnett's 'service university' type examples discussed earlier reflect a bias to specific public forms of connection there are other, theoretical positions which go beyond one-off forms and help theorise the nature of staff and student interconnections with the world.

The theoretical examples that could productively inform an ecological curriculum include such concepts as ecological citizenship (Cao, 2015; Dash, 2014; Dobson, 2012); local and global citizenship (Caruana, 2012; Sant, Davies, Pashby, & Shultz, 2018) and ecopedagogy (Fassbinder et al., 2012; Kahn, 2010). Each of these fields is, in some way, linked to the idea of 'engaged scholarship' or the active civic university (Shultz, 2013; Watson et al., 2011). Ecological citizenship, like local and global citizenship, represents a challenge to move beyond traditional liberal models of passive citizenship, with an emphasis on a clear boundary between private and public modes of existence, so that individuals can take a more collective sense of responsibility for the planet. Similarly ecopedagogy is an extension of critical pedagogical notions of teaching and learning which seeks to explore how the problem-solving intent developed by writers such as Paulo Freire can be applied in the context of global and local eco-justice issues. While the ecopedagogy of Richard Kahn was briefly discussed at the end of Chapter 5, there is limited scope in this thesis to expand on how it can develop a productive place within an ecological approach to higher education. In brief terms then, one of the key issues that would need to be addressed in the relationship between ecopedagogy and Anthropocene Intelligence is the extent to which the radical/modernist roots of ecopedagogy might be updated by the postfoundationalist epistemology of the framework presented in this thesis.

Healthy universities as a potential productive relationship

The above section explored how various theoretical approaches can inform an ecological approach to higher education, specifically in relation to its content, thinking and engagement. Implicit in this process is a series of productive

relationships oriented by a postfoundational critical consideration of how such relationships could develop deep forms of teaching and research in higher education. This sub-section looks briefly at one possible productive relationship to understand a little more about how existing theoretical positions could improve the quality research and teaching in an ecological approach to higher education. The example focused on is the idea of the Healthy University.

The approach of the healthy universities movement can be described as 'salutogenic' (Becker, Glascoff, & Felts, 2010) and is based around a health promotion approach that has been widely applied in schools, but far less incorporated into higher education (Dooris et al., 2014; Newton et al., 2016). Such an approach can be considered ecological in the way in attempts to link broad notions of health to the overall structure, content and culture of a university. As a result of this approach to health and health promotion, the logic of the healthy university also returns to issues of sustainability, a point well made by the Okanagan charter:

> Health Promoting Universities and Colleges transform the health and
> sustainability of our current and future societies, strengthen communities and
> contribute to the wellbeing of people, places and the planet…They infuse health
> into everyday operations, business practices and academic mandates. By doing
> so, they enhance the success of our institutions; create campus cultures of
> compassion, wellbeing, equity and social justice; improve the health of the
> people who live, learn, work, play and love on our campuses; and strengthen
> the ecological, social and economic sustainability of our communities and wider
> society. (Okanagan Charter, 2015)

The implied reach of the healthy university movement has a special resonance with the comments made by Barnett about the limitless possibilities of wellbeing (especially in relation to the comparatively limited scope of sustainability). The holistic reach of the healthy university also suggests an evolution from the 'nature' versus 'culture' dichotomy underpinning aspects of environmental and sustainability education (ESE). In some ways the aspiration portrayed in the comment above shows the deeper forms of reflection that are possible with a

central organising metaphor of health. This can also be seen in key concepts: 'health, wellbeing and sustainability' as well as the types of questions it asks about how well universities support the multi-dimensional flourishing of staff and students.

With these aspirations in mind, there is scope for the idea of the healthy university to complement or work within an ecological approach to higher education. That said, it is also clear that at this stage of its theoretical development and practical realisation, the healthy university model is yet to develop deeper curriculum possibilities (Dooris & Doherty, 2010). In part it seems that there are undeveloped theoretical dimensions to the healthy university (Dooris et al., 2014) an issue which can be improved with reference to the ecological framework on offer in this thesis. Much more work would need to be undertaken to explore the extent to which such a productive relationship would be worthwhile, but what is clear is that the focus on interconnected forms of health and wellbeing (and sustainability) provide a basis for developing the practice for an ecological approach to higher education and a potentially updated focus for including health as the basis for education.

Conclusion: Ongoing productive relationships in an ecological approach to higher education

While the Healthy University discourse offers one way to contribute to higher education's content, thinking and engagement, there are many other theoretical and practical possibilities for developing an ecological approach to higher education. In the following chapter this thesis takes a less theoretical turn and draws on the practical examples from sustainability education and engaged scholarship. This discussion also provides an insight into the global policy and practice possibilities that can be developed within an alternative direction for higher education policy in New Zealand, and in this sense builds an evidence base for how New Zealand's higher education system could be developed on ecological terms.

Chapter 8 – The Global policy and practice context for ecological education

I said "Describe the global position, Bruce"
He said "Fred, it's a mess".
— John Clarke (29 July, 1948 - April 9, 2017), aka Fred Dagg from the song 'We don't know how lucky we are'

This chapter explores the global context for the ecological in higher education policy and practice. This discussion provides an overview of what is occurring in higher education across the planet and also points to how existing policies and practices can be contested, developed and enhanced with an ecological perspective. The central argument in this chapter is that despite the neoliberal and managerial hegemony surrounding global higher education policy and practice, there are a range of existing, practical structures and approaches which could inform the development of an ecological approach to higher education policy in New Zealand. With one eye on the possibilities for higher education within an ecological democracy, this chapter therefore looks at some significant, existing global initiatives and demonstrates that much can be learnt from these practices when they are seen through an eco-critical perspective.

This chapter is not able to provide an exhaustive survey of all that might be learnt from global policies and practices. Instead, it points out some key 'bones' within the global context and makes a start on what might be learnt from higher education policy and practice across the planet. This chapter begins with an analysis of how the global context for higher education policy and practice is dominated by neoliberal and managerial structures. The point is made that this neoliberal approach to higher education policy is part of a global neoliberal economic order, which, nevertheless, can also be contested. The possibility for contesting this order is discussed in the second section of this chapter, which explores how the United Nations' Sustainable Development Goals (SDGs) could, when considered from an ecological policy analysis perspective, provide a basis

for policy that supports ecological democracy (Dryzek, 2013). This discussion sets up the main focus of this chapter, which is on how the examples of sustainability and engaged scholarship have been manifest in education policies and practices around the globe. It is important to note that sustainability and engaged scholarship are just two of many potential areas which could have been chosen to illuminate what might be learnt from the global higher education context. Again, word limits are against a more detailed discussion, but these two areas nevertheless provide considerable insight into what might be learnt using an eco-critical approach. The specific contexts examined in terms of sustainability and/or engaged scholarship include national policy positions within the Decade of Education for Sustainable Development (DESD); international declarations for sustainability and engaged scholarship; a range of ranking, assessment and award systems; and, finally networks of professional development and support.

From neoliberal hegemony to ecological possibilities

In previous chapters the point has been made that the GEC is linked to humanity's epistemological errors. Underpinning this unsustainability has been a neoliberal policy orthodoxy that has been widely discussed in critical policy discussions (Bang, 2011; D. Harvey, 2005; Stedman Jones, 2012). The neoliberal economic policy orthodoxy also underpins a range of market and managerial structures in higher education policy. These structures are linked to the emphasis placed on a global higher education market and the potential of higher education to create, international earnings (through international students, for example), as well as 'human resources' for the global labour market (Giroux, 2014; Olssen & Peters, 2005; Roberts, 2007).

The neoliberalisation of higher education can be compared to Ron Barnett's arguments surrounding the entrepreneurial university – a university for 'itself' and focused on how it might secure its economic success in 'the world' (Barnett, 2010, 2018). From a more explicitly political point of view, there is a vast array of literature pointing to the way in which universities are now sites of 'academic capitalism' involving the economics of course design, the commercialisation of

knowledge, the ongoing expansion of student debt (Jessop, 2017; Peters, Paraskeva, & Besley, 2015). Henry Giroux (Giroux, 2013), for example leaves no room for doubt about what he sees as the effects of the neoliberalisation of higher education:

> The effects of the assault are not hard to discern. Universities are being defunded; tuition fees are skyrocketing; faculty salaries are shrinking as workloads are increasing; and part-time instructors are being used as a subaltern class of migrant laborers. In addition, class sizes are ballooning; the curriculum is being instrumentalized and stripped of liberal values; research is largely valued for its ability to produce profits; administrative staff is depleted; governance has been handed over to paragons of corporate culture; and valuable services are being curtailed.

The neoliberalisation of higher education has a global presence because of the ways in which universities and governments around the world have been drawn into a process of tighter managerial controls around academic labour, increasing efforts to attract international students, competition for research funding and higher and higher rankings in spurious methods of international comparison (Olssen, 2016; Shore, 2010; Shore & Wright, 2015; Walker et al., 2013).

The Taylorist tendencies of the global higher education market aside, there are nevertheless moments within higher education that are not wholly structured by the logic of global capital. At the level of the individual university, department or scholar for example, there are many examples of the neoliberal hegemony being contested or subverted (Klocker & Drozdzewski, 2012; Lorenz, 2012; Preston & Aslett, 2014). Favourite HEIs in this category include Schumacher College's eco-aspirations, Arizona State University's sustainability focus or Aalborg's problem-based methodology. The issue though is not just identifying these alternatives within an unsustainable mainstream, but identifying how the mainstream itself might be further contested. What ecological possibilities can be developed, for example, in the New Zealand policy context? Before this question can be answered however, it is important to identify how the global neoliberal order itself might be contested. In the following section, one particular example of how

an ecological approach to policy might be furthered is developed in relation to
the United Nations Sustainable Development Goals (SDGs).

Figure 10: The Sustainable Development Goals

Transforming our world: the 2030 Agenda for Sustainable Development

At the beginning of this thesis, the point was made that the global policy context
was potentially in flux. This point was made in relation to the election of Donald
Trump and the idea that the global hegemony of neoliberal capitalism might at
some point soon be overturned, either by the darker forces associated with
authoritarian populism or, more optimistically, by something more deliberative
and ecologically sound. And while this section is not going to provide an
overarching analysis of the global political situation in a time of 'Trump', it is
going to examine the SDGs as both a function of the issues surrounding the
global political context and also as an avenue for more progressive change when
they are approached from an ecological perspective. This approach is a high level

metaphor for how the policy context could move towards greater levels of ecological democracy.

The Sustainable Development Goals (SDGs) are a set of 17 major outcomes that over 150 countries have signed up to through the United Nations. The SDGs are an evolution from the 2000-2015 Millennium Development Goals (MDGs), which were eight broad-based goals targeted at global issues affecting predominantly developing countries. The MDGs achieved some degree of success, especially in relation to poverty reduction, hunger and the education of girls (United Nations, 2015). Compared to the MDGs, the SDGs have a broader range and are focussed on developed and developing countries. Within the 17 specific goals are 169 targets, ranging across social, economic and environmental domains. The goals are typically represented as per the diagram above and include concerns as diverse as poverty, wellbeing, education, inequality, environmental protections and economic growth.

The wide-ranging scope of the SDGs is intended to provide an overarching view of how 'sustainability' could look on the planet. Unlike the MDGs, which targeted particular indicators, the wide-ranging objectives and targets of the SDGs can be seen as a way of setting sustainability objectives for all countries across a key set of planetary indicators. The many objectives are intended to operate like a 'network' with all signing countries expected to develop policy approaches which operate wisely across social, economic and environmental policy (Le Blanc, 2015). Ideally, the range of targets in the SDGs is designed to avoid the privileging of economic 'success' over issues of environmental or social justice. In theory, the SDGs also provide some protection against the 'cherry-picking' of particular sustainability indicators without reference to the actual sustainability of the total system.

Although the goals are not legally binding they do hold considerable weight as a global development tool. Experience in international diplomacy has shown that while binding agreements have traditionally been the gold-standard in

governance arrangements, the failure of the Kyoto protocol to mobilise significant change (despite its legally binding nature), and the success of the non-binding target-setting of the Paris Climate agreement, have moved international sustainability diplomacy away from 'top down' binding agreements and towards more of a focus on monitoring, evaluation, reporting and good practice (Macey, 2017; J. D. Sachs, 2012).

In order to understand the potential of the SDGs, it is useful to briefly reflect their history, especially in relation to the wider context of Global Environmental Governance (GEG). Fundamentally, GEG has seen environmental issues receive less status when compared to global economic and security matters. Economic governance, for example, is subject to powerful governance structures linked to the World Trade Organisation (WTO) and the World Bank. Security issues receive the highest governance status of all through the UN Security Council. There is no WTO for the environment or UN Environmental Council, and instead issues of global environmental importance are subject to an array of over 1500 multi-layered international, transnational agreements (many voluntary and informal) covering a range of specific environmental issues centred by such stand out initiatives as the UN Framework Convention on Climate Change (Pattberg & Widerberg, 2015) and the recent Paris Climate Agreement (Chan, Brandi, & Bauer, 2016; Dryzek, 2016; Macey, 2017).

The reason for the relatively low status of global environmental goverance can be understood in relation to the history of global sustainable development policy (Macekura, 2015). Understanding this history also provides insight into the sustainability discourse in education, including why it is that some writers have suggested that mainstream ideas about sustainability lack the theoretical credibility to become a basis for educational practice in the Anthropocene (Blewitt, 2013; Corcoran et al., 2017; Wals & Blewitt, 2010). Stephen J. Macekura's book *Of Limits and Growth*, charts the role of Non-Government Organisations (NGOs) in developing the sustainability discourse during the 20th century and argues that while 'sustainability' has allowed NGOs to successfully

integrate environmental concerns into discussions about international aid to the developing world, it also meant that they lost the ability to question the role played by economic growth in the degradation of the planet (Macekura, 2015). Macekura's point of view helps explain Blühdorn's politics of unsustainability (Blühdorn, 2007, 2011, 2013, 2015, 2016) in that, despite the increasing visibility of environmental problems within the sustainability discourse, this has not been enough to either adjust the economic policies growing humanity's footprint, or reduce the ongoing damage to the biosphere:

> The sustainability discourse took hold because it allowed leaders to acknowledge general environmental imperatives while also sanctioning aspirations for continued economic development. By the 1980s the phrase had acquired multiple definitions, and many national policy makers used it to suggest the compatibility of environmental protection with a growth oriented market economy. Infused with this optimistic meaning that elided calls for greater resource transfers from the wealthy countries to the Global South – which many NGO officials believed was a necessary component for realizing sustainable development plans – the sustainability discourse did little to persuade leaders in powerful countries to alter the balance of power in international politics. (Macekura, 2015, p. 9)

Macekura's history is concentrated on the role played by NGOs because, post WWII, it had been their input that started asking questions about the role of post-decolonisation development, especially in Africa. Perhaps ironically the initial NGO environmentalism came from wealthy westerners concerned with the loss of the mega-fauna the made up their big game hunting trips 'to the continent'. Subsequent evolutions of environmental thinking saw such ideas as the Club of Rome's (Meadows et al., 1972) interest in 'limits' lose ground to questions about the rights of poor countries to 'develop' their natural resources. In the course of this debate, and as the Western world leaned towards neoliberal economic policies during the late 1970s, issues about how the wealth of rich countries might be 'redistributed' were set aside on the way to developing the particular economic growth dynamic that has dominated mainstream

approaches to sustainability since the Brundtland report in 1987 (World Commission on Environment and Development, 1987).

In line with Macekura's analysis, it is possible to see how the current SDGs contain both admirable environmental goals and somewhat contradictory economic aspirations. For example, economic growth is unproblematically included as a target within goal 8, albeit alongside the previously discussed ambition to decouple this growth from 'environmental degradation':

> Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries
>
> ~
>
> Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead[14]

From a slightly different perspective, the SDGs arguably lack a critical perspective on the possibilities of planetary limits and economic redistribution alongside any (meagre) decoupling efforts. Similarly, although there are aspirations towards responsible production and consumption in the SDGs (Goal 12), there is no clear commitment to either move away from a neoliberalised framework for SDG policy (Kopnina, 2016; Kumi et al., 2014) or develop some form of 'strong sustainability' (Sustainable Aotearoa New Zealand, 2009) or indeed, some form of alternative development approach based on alternative models of 'post-development' such as Buen Vivir, degrowth or Ecological Swaraj (Kothari et al., 2014). In other words, the SDGs are their own radical project because they rely

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[14] As sourced from http://www.globalgoals.org/global-goals/good-jobs-and-economic/. There are a total of 12 targets within Goal 8, which has as its overall aim: "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all".

so heavily on the same economic growth logic that has underpinned so much of the recent environmental damage to the planet.

In the face of such contradictions the question remains about their potential to help shape an ecological dimension to nations around the world. Based on the initial evidence collected, there has been a relatively weak international response so far, especially from developed countries. Key areas where OECD countries, for example are not doing well (at this early stage) OECD countries include goals on inequality, sustainable consumption, climate change and ecosystems (International Institute for Environment and Development, 2017; United Nations, 2017). For some developed countries there is also a lack of urgency in developing policy solutions (and monitoring programmes) in support of the goals. The government in the United Kingdom for example, has been criticised by its own select committee – the International Development Committee (IDC) because of its lack of implementation of the a policy agenda to achieve the SDGs (Stuart, 2016). A similar lack of commitment has been seen in the New Zealand policy response (as discussed in the following chapter).

That said, it is nevertheless possible to learn something from those countries near the top of list in terms of achieving the SDGs. For example, early evidence collected by Jeffery Sachs and the collaborative team from Bertelsmann Stiftung and the Sustainable Development Solutions Network (SDSN) has helped identify, not just which countries are doing 'well' in terms of the SDGs, but what sort of policies have helped this success (A. Norton, 2016; J. Sachs, Schmidt-Traub, Kroll, Durand-Delacre, & Teksoz, 2017). Using Sweden as a case, which by no means has achieved 'sustainability' in terms of the measures used by Sachs and his team, attention should be drawn to the way in which Sweden has, for example: made sustainability a central policy platform since the 1990s; included a range of community and business groups into sustainability policy decision-making; reduced its greenhouse gases by 25 percent since 1990; become the most generous provider of overseas development aid by GDP in the world; and

developed an extensive plan to monitor and report on its own progress in terms of the SDGs (Halonen et al., 2017; Sweden Government Report, 2017).

Figure 11: Global ranking of nations by 'achieved' scores across the SDGs

Rank	Country	Score
1	Sweden	85.6
2	Denmark	84.2
3	Finland	84
4	Norway	83.9
5	Czech Republic	81.9
6	Germany	81.7
7	Austria	81.4
8	Switzerland	81.2
9	Slovenia	80.5
10	France	80.3

Source: http://sdgindex.org/assets/files/2017/2017-SDG-Index-and-Dashboards-Report--full.pdf

Where Sweden (and indeed other countries too) might go next to improve on its sustainability ranking, returns this thesis to questions of ecological democracy and the development of an ecological approach to policy thinking. As is suggested by the example of Sweden, much can be achieved by governments focused on developing some form of mainstream sustainable development. However, as John Dryzek notes, the extent to which Nordic countries might progress their approach could be determined by how well ecological radical elements are able to challenge the lack of a 'limits' discourse in policy making and open up 'sustainability' policy to the insights provided by those alternative forms of policy less enamoured with economic growth and more focused on wellbeing on a finite planet (Dryzek, 2013). As is subsequently explored in the following chapter, what is required by a country like New Zealand is not just the emulation of Sweden, but a more eco-critical response to the SDGs themselves, one which sets the achievement of the SDGs as a central, public and deliberative

focus for policy making, including higher education policy. From this perspective it is possible to see how the SDGs can provoke deep questions about the health of each nation's approach across the range of goals and indicators.

The global context of higher education policy and practice

While the SDGs provide some potential for global governance, albeit that they are themselves subject to a neoliberalised global policy context (and history), there are some analogous global policy 'potentials' for global policy related specifically to higher education. As with the discussion above, the approach in this section is not to attempt to provide an overview of the many global and national policy objects that construct the context of higher education policy and practice, but instead to point to some emerging potentials that exist despite the default, hegemonic tendency towards a neoliberalised (and managerial) global education context. The contexts discussed in this chapter are linked to the considerable number of projects carried out in the name of sustainability education – for example, as part of the Decade of Education for Sustainable Development. Attention has also been paid to initiatives that have been undertaken in the name of engaged scholarship. The specific contexts discussed in this section include policy initiatives linked to: international declarations; ranking, assessment and award systems; and networks and professional development. In line with the arguments made about the SDGs, an ecological perspective can help identify how such initiatives could support an ecological policy approach. It is this potential for learning that is used by this thesis to inform Chapter 10's policy alternatives for higher education in New Zealand.

The UN DESD and national policy positions emphasising sustainability in higher education

Despite the reservations that should be held in relation to the sustainability discourse (including sustainability in education) there is still much that can be learnt about how projects such as the DESD have been developed across the planet. In the following sub-sections there are several examples linked to the work of the DESD, including the policy positions taken by the United States and Germany and the work carried out by the Sustainability and Policy Network

(SEPN) in Canada and the Australian Research Institute for Environment and Sustainability (ARIES). Before exploring these examples however, it is useful to draw attention to the national policy approaches of France and Ireland as current leaders in sustainable higher education policy approaches.

Overall, the efforts of both France and Ireland demonstrate that there are no intrinsic policy barriers in developing a 'greener' approach to higher education. In France for example, a national strategy for sustainable development provides a context for each French government sector to set out how it will respond to a sustainability imperative (Chiodo et al., 2013). One of the initiatives taken by France's Ministry of Higher Education has been to develop a virtual university (https://www.uved.fr/) dedicated to promoting "free access to knowledge, education and the dissemination of knowledge and training resources to various actors in the field of environment and sustainable development" (Higher Education and Research for Sustainable Development, 2018)

Similarly, Ireland has a specific strategy to address sustainability across its education system. This strategy is very much located within the wider discourse of sustainable development although it has great aspirations for what it might achieve (Department of Education and Skills, 2014):

> The National Strategy on Education for Sustainable Development aims to ensure that education contributes to sustainable development by equipping learners with the relevant knowledge (the 'what'), the key dispositions and skills (the 'how') and the values (the 'why') that will motivate and empower them throughout their lives to become informed active citizens who take action for a more sustainable future. (p. 3)

Key principles for this strategy include engaging all areas of the education system; as well as providing a focus on interdisciplinarity, social justice and equity, active models of democratic citizenship, and community change processes towards sustainable development (p. 4). In higher education specifically, this strategy has sought to embed the development of 'green skills' across its vocational sector and as well as funding the development of

undergraduate and post-graduate courses linked to sustainable development and, somewhat ambitiously, also 'explore' the "potential for introducing [the] principles of sustainable development into existing disciplines" (p. 22). This last suggestion comes about in response to the strategy identifying that the traditional departmental structure of universities can limit the extent to which sustainable development can become a deeper component of teaching and research (p. 21-22). At the time of writing Ireland's strategy for sustainable development was about to undertake the first review of its progress to date (Department of Education and Skills, 2014).

International Declarations

Outside of national policy positions on higher education, there are a large number of International Declarations operating in the field of higher education. Included in the range of international declarations to be found are those which focus on regional agreements (for example Bologna, and the first African higher education summit); the importance of democracy (Strasbourg); and education for the 21st century (UNESCO, 1998). Sustainability has been an especially popular focus for international declarations with over major 30 international treaties specifically addressing the issue of sustainability in higher education. Approximately half of these agreements have been made by the university sector, while the other half have been led by intergovernmental bodies, most notably UNESCO (Grindsted, 2011). A sample of the most important of these agreements is set out in the table below.

Figure 12: Some international declarations on sustainability in higher education

Year	Declaration	Partners	Scope	Keywords
1990	Talloires Declaration	University Leaders for a Sustainable Future (ULSF)	Global	First declaration specifically targeted to the higher education sector.
1991	Halifax Declaration	Consortium of Canadian Institutions, International Association of Universities (IAU), United Nations University (UNU)	Global	The ethical and moral obligation of universities in addressing sustainability was recognised.
1993	Kyoto Declaration	International Association of Universities (IAU)	Global	Closely tied to Agenda 21 and the United Nations

Year				
				Commission on Environment and Development (UNCED) Conference in Rio de Janeiro 1992. It called for specific sustainability plans.
1993	Swansea Declaration	Association of Australian Government Universities	Global	The declaration stressed the commitments outlined in previous documents (incl Talloires, Halifax)
1993	COPERNICUS University Charter for Sustainable Development	Association of European Universities (Copernicus Alliance)	Regional (Europe)	It called for a paradigm shift in European universities.
2001	Lüneburg Declaration	Global Higher Education for Sustainability Partnership (GHESP)	Global	In preparation for the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg.
2002	Ubuntu Declaration	UNU, UNESCO, IAU, Third World Academy of Science, African Academy of Sciences and the Science Council of Asia, COPERNICUS Campus, GHESP, ULSF	Global	Called for the development of a global learning environment for learning for sustainability. It suggested the creation of networks and Regional Centres of Expertise (RCEs).
2005	Graz Declaration on Committing Universities to Sustainable Development	COPERNICUS CAMPUS, Karl-Franzens University Graz, Technical University Graz, Oikos International, UNESCO	Global	Stressed the key opportunities, which the Bologna Process creates for embedding sustainability across higher education.
2008	G8 University Summit Sapporo Sustainability Declaration	G8 University Network	Global	The aim was to develop common recognition of the need for global sustainability, to discuss responsibility of universities and provide messages to G8 leaders and societies.
2009	Promotion of Sustainability in Postgraduate Education and Research Network (ProSPER.Net) Charter	UNU-IAS	Asia/ Pacific	An alliance of several leading higher education institutions in Asia and the Pacific Region that committed to working together to integrate Sustainable development into postgraduate courses and curricula.
2012	Rio+20 Higher Education Sustainability Initiative	UNESCO, UNEP, PRIME, UNU, Academic Impact	Global	Declaration supported in the lead-up to Rio+20.

2012	The People's Treaty on Sustainability for Higher Education	COPERNICUS Alliance and 35 HE agencies, associations and organisations	Global	Treaty developed to influence international negotiations. It is a formal voluntary commitment of Rio+20.
2014	Nagoya Declaration on Higher Education for Sustainable Development	UNU, United Nations Environment Programme, UNESCO, the IAU and the Japanese Ministry of Education	Global	Emphasises the role of the GAP programme following the DESD and calls on world leaders to work together to develop ESD

Source: Adapted from (Lozano et al., 2015; Tilbury, 2013)

In addition to these declarations, there are many other environmental and/or sustainability agreements and statements which have been focused on 'education', rather than specifically targeted at higher education. These include commitments which pre-date the Brundtland ESD discourse, including the Stockholm declaration (1972), the Belgrade Charter and the Tbilisi Declaration (1977). Each of these agreements was influenced by early Environmental Education imperatives, including the policy ideals connected with the Club of Rome (Meadows et al., 1972), and in this sense might be considered more aspirational than contemporary and mainstream approaches to ESD (Kopnina, 2014b). At the time of writing, the most recent educational agreement is that made at Aichi-Nagoya, at the World Conference on Sustainable Development in 2014. This agreement followed the (higher education focused) Nagoya agreement, which was presented at the UN-led meeting just before the 2014 World Conference. The Nagoya declaration linked higher education to the Global Action Plan and the ongoing international collaboration following the DESD.

A wide body of critical scholarship has developed in relation to such declarations. In the higher education context, much of this scholarship analyses how these agreements have failed to penetrate the practices of universities or shifted higher education policy and practice from its essentially neoliberal foundation (A. Ryan, Tilbury, Blaze Corcoran, Abe, & Nomura, 2010; Sylvestre, McNeil, & Wright, 2013; Tilbury, 2011; Wals & Blewitt, 2010; T. Wright, 2004). The core of this debate has been outlined in the critiques of sustainability already provided in this thesis. For example, Wals & Blewitt (2010), as well as Sylvestre et al (2013),

describe how higher education providers have repeatedly failed to acknowledge their role in developing the current GEC through the reproduction of what might be described as 'epistemological errors' in their graduates. Echoing David Orr's point about education and the creation of planetary vandlals (Orr, 1994), Sylvestre et al explain:

> Equally ubiquitous and directly related is the omission of any mention of culpability on the part of universities for how knowledge generated within their walls has contributed to the current socio-ecological crisis. All declarations readily construct the university as the solver of societies —problems, and to an extent, it can be and is, but discussing the obverse of this issue without admitting its reverse, we argue, displays a lack of reflexivity on the part of the declarations, which may imply a lack of self-reflection on the part of universities (Sylvestre et al, 2013, p.1362).

Such critical analysis underlines the need to go beyond mainstream approaches to sustainability and towards more considered ecological approaches. The sort of 'ecological' thinking advocated by this thesis is one starting point for such a process. However, even without reference to ecological theory, there is evidence that these declarations have still had a positive impact on the wider policy context, even if they do not tend to lead the transformation of higher education provision. Thomas Grindsted has identified this impact in terms of three outcomes (Grindsted, 2011). Putting aside Grindsted's own reservations about sustainability declarations, he has outlined how they have helped to create an 'emerging consensus' for "the university's role and function in relation to sustainable development" (2011, p.30). He has also identified how they have influenced the development of national legislation about sustainability in higher education; and finally, he has explained how they have influenced universities to compete with one another to develop sustainable campuses.

In relation to the emerging consensus developing about the role of higher education in relation to sustainability, Grindsted points to the range of international declarations, including the different international contexts in which they have been signed, and the over 1400 HEIs that have signed these

declarations. Reinforcing Grindsted's point is the research which also explores how these declarations can be seen as evidence of the importance of the sustainability in higher education discourse, despite the difficulties that have been observed in implementing many of these aspirations (Lozano et al., 2015; Tilbury, 2011, 2013; T. Wright, 2004).

In terms of the influence of sustainability declarations have had on national policy, Grindsted points to examples from the UK, Germany and the US. The evidence Grindsted provides is somewhat tentative, but it does nevertheless point to there being some influence between international declarations and incremental shifts in national policy positions (at least those outside New Zealand). His evidence in the German case is the most compelling, specifically in relation to how sustainability in higher education has became part of the German constitution both in relation to the Graz declaration and in terms of its influence on European higher education policy via the Bologna process. And although the development of a constitutional requirement for sustainability in higher education is, of itself, a significant impact, such a gain needs to be seen in the context of the structure of German higher education policy context. While constitutional change is a significant outcome, the German federalist structure also means that responsibility for policy is devolved to individual states, which has made difficult for sustainability to make widespread systemic gains in practice (Chiodo et al., 2013; Wals & Blewitt, 2010).

An analogous situation has occurred in the US too, where, despite the changes in policy that may have been influenced by sustainability declarations, the final result does not register as an overall system transformation (J. Newman, 2011). The US example shows how sustainability can change the discourse surrounding policy, but still fail to change the actual policy implemented (there are, after all, more forces at work than 'sustainability' in American politics). Here, Grinsted specifically identifies that after a series of aspirational higher education sustainability declarations (and lobbying) linked to such agencies as The National Science Foundation (NSF), the National Science Board (NSB) and the Association

of American Universities (AAU), the federal government introduced and passed the Higher Education Sustainability Act (HESA). HESA represented a potentially powerful piece of legislation that promised to bring "together higher education faculty and staff, federal staff, and leaders from both the private and public sectors to collaborate on sustainability projects and share best practices between campuses" (J. Newman, 2011, p. 211). HESA also promised funding for programmes that assisted with sustainability operations, research and curricula, including the development of 'sustainability literacy' for higher education students. In its intended form, HESA was a sustainability model that could well have influenced higher education policy in far less progressive countries such as New Zealand. Sadly for HESA (and the planet), it was never fully implemented despite being signed into law by George W. Bush (C. Allen, 2010; Elder, 2008). Elements of HESA were incorporated into other legislation and almost all of the intended funding was never released when congress became dominated by members of the Republican Party (James L. Elder, personal communication, 20 September, 2016).

Grindsted's third point – about the role declarations play in universities competing over their green campuses, is taken up in the following sub-section of this chapter (Ranking and Assessment systems). Before beginning that discussion it is useful to apply Grinsted's arguments to the area of socially engaged scholarship. While there is not space here to conduct a detailed policy history of engaged scholarship (Cox, 2012; Grau, Hall, & Tandon, 2017; Watson et al., 2011) it is worthwhile briefly exploring how, for example, the 2005 'Talloires Declaration On the Civic Roles and Social Responsibilities of Higher Education' has had an impact on university policy and practice.

The 2005 'Talloires Declaration On the Civic Roles and Social Responsibilities of Higher Education' has aspired to energise the emerging policy discourse of socially-engaged higher education. In this context, socially engaged learning includes such aspects as service learning, civics education, action research, community research and policy analysis (as scholarship) (Cox, 2012). In 2005, 29

HEIs from 23 countries signed up to the Talloires Declaration, and as at the time of writing there were 367 HEI signatories from 77 countries. Tufts has also registered an extensive number of 'partner' organisations connected to this declaration, each with their own discursive presence emphasising and supporting various forms of engaged scholarship policy and practice. The global organisations include the Association of Commonwealth Universities, The Global Alliance on Community-Engaged Research (GACER) and the Global University Network for Innovation (GUNi). Among the regional and national partners to the 2005 declaration is the USA-based 'Campus Compact', which claims to: "advance the public purposes of over 1,000 colleges and universities by deepening their ability to improve community life and to educate students for civic and social responsibility" (Campus Compact, 2017). Closer to home, the Australian (and New Zealand) organisation 'Engagement Australia', which includes among its members 70 percent of Australian universities (along with the one New Zealand university – the University of Canterbury) has a dedicated website providing models of practice, professional development resources and published research (Engagement Australia, 2017).

It is very difficult to judge the impact of the 2005 Talloires Declaration, including the difference made by the socially engaged scholars – especially given the managerial defining that occurs about what counts as 'engagement' (Shultz, 2013). That said, as Grinsted found with sustainability, there is nevertheless evidence of an 'emerging (and contested) discourse' surrounding 'engagement'. As will be followed up in the following sub-sections, in the face of neoliberal policy and practice contexts, such processes nevertheless still provide a way to discuss best-practice approaches. If nothing else, this sets a framework for what is already possible in higher education.

University rankings, assessments and awards

Global ranking systems for universities have proliferated during the 21st century. Many of these ranking systems typically are marketed in a way which implies that they provide robust information that not only accurately identifies the world's leading universities, but is highly useful to policy-makers, university

leaders and those purchasing higher education services – students. However, it would be more accurate to analyse global university ranking systems such as the Shanghai Academic Ranking of World Universities (ARWU), the *Times Higher Education* World University Rankings and the QS (Quacquarelli Symonds) World University Rankings as signposts of the neoliberal and managerial tendencies of a global education market.

The initial point should be made about such tools in that the accuracy, worth and overall quality of these ranking systems is subject to critical scepticism. Part of this doubt is linked to the methodologies used by these ranking systems, and the extent to which they focus on easily measureable data on the one hand (such as research citations), along with more subjective 'reputational' accounts. From this perspective these ranking systems are far from the scientific adjudicators of quality their coverage in the media suggests (or the emphasis put on them by the marketing departments of universities across the planet). Methodological issues aside, such ranking systems nevertheless do seem to have an impact on student decision-making, the donation of money to universities (endowments), business partnerships and university strategies. While in some ways such ranking systems have encouraged more transparency and a public openness in universities, in other ways they have encouraged managerial systems and approaches which have, to say the least, dubious relevance to either educational value and/or the public good (L. Harvey, 2008; Hazelkorn, 2015; Marginson, 2011; Thakur, 2007).

Despite these concerns, global ranking systems are now an entrenched part of higher education. Moreover, in addition to the efforts to contest the methodologies of these systems, there are also efforts to more critically use such tools (Burrows, 2012; Sadlak, 2010). One small way in which this occurs is in the development of alternative tools for recognising the performance of universities. With a kind of 'if you can't beat them join them' energy, there are a range of ranking, assessment and award schemes in areas such as sustainability engaged scholarship that reflect a kind of 'green' or ecological logic that goes beyond that typically found in systems purporting to rank 'the world's best universities'.

While a degree of critical reservation can be held about such alternative tools, as was found with national policy statements and international declarations, they are a still a potential source of learning for how a country such as New Zealand can develop a more ecological approach to higher education policy. Examples of such tools include the Princeton Review and its examination of 'green' colleges (predominantly USA and Canada); the University of Indonesia's GreenMetric system (Global rankings) and, in an even broader sense, the People and Planet Green League table based in the UK. Despite the reservations that should be made about such tools, each is also able to identify useful higher education practices which could be the basis for (hopefully deeper) policy alternatives.

Sustainability assessment tools

A deeper ecological approach to sustainability assessment could potentially be applied to those tools designed to give universities a sustainability 'rating'. Again, a critical approach is needed to the methodological approach of such tools in that they tend to favour measurable (and comparable) forms of data, primarily in relation to their operations and to a lesser extent, easy to measure educational features (for example dollars spent on ESD research). Examples of such assessment tools include the Campus Sustainability Assessment Framework (CSAF), the Global Reporting Initiative (GRI), ISO140001 environmental management system standard, the Graphical Assessment of Sustainability in Universities (GASU) and the STARS system (Sustainability, Tracking, Assessment and Rating System) from the Association for the Advancement of Sustainability in Higher Education (AASHE). In some cases the information collected in these assessment systems is made publically available (not all HEIs release this information). An example of how this information is presented can be found, for example, on the AASHE website, where the overall sustainability rating for registered HEIs can be accessed, along with their campus sustainability reports. At the time of writing, only two of the 838 registered campuses of the STARS system had achieved a 'platinum status' (AASHE, 2017).

Universities at the top of such rating systems provide a point of comparison for higher education provision in New Zealand – even if policy makers should be wary of the limitations of these tools too. For example, the methodology used in these sustainability ranking tools shows how the "campus greening" agenda of education for sustainability in higher education has been supported by the highly measured (and compartmentalised) attempt to pin down features that could be easily compared across HEIs. This can also be seen in the somewhat more enlightened People and Planet university league, which stretches the sustainability message in attempt to provide an independent account of how well UK universities have performed based on their "environmental and ethical performance" (People and Planet's university league, 2018). Despite their student and activist links, the People and Planet league still waters down any deep focus on pedagogical matters across 12 other sustainability variables (see table below).

Figure 13: The 13 Variables in the 2017 People and Planet Green league table

Sustainability Variable	Weighting
1. Environmental Sustainability; Policy and Strategy 2017	4%
2. Human Resources for Sustainability 2017	8%
3. Environmental Auditing & Management Systems 2017	10%
4. Ethical Investment 2017	7%
5. Carbon Management 2017	7%
6. Workers Rights 2017	5%
7. Sustainable Food	4.5%
8. Staff and Student Engagement 2017	5%
9. Education for Sustainable Development	10%
10. Energy Sources	8%
11. Waste and Recycling	8%

12. Carbon Reduction	15%
13. Water Reduction	8%

Source: https://peopleandplanet.org/university-league-2017-methodology

Noticeably, there is no separate category for 'research' in the People and Planet criteria - this is subsumed within the 'education for sustainable development' section. Significantly, if sustainability was deeply concerned with the core function of universities then how it might be manifest in research would need to be uppermost in how sustainability rankings were actually developed (something that could be 'learned' by New Zealand policy makers).

In addition, a closer look at the variables considered as part of the 'Education for Sustainable Development' shows that the information collected about education (including research) is of limited depth, especially in relation to any eco-critical questions that could be asked about how many students actually graduate a campus with anything like 'Anthropocene Intelligence'. Such issues are not addressed however, and instead the People and Planet's education variable is scored in terms of the following 4 'process' variables (People and Planet university league, 2018):

1. Commitment and governance for education for sustainable development. (20%)
2. Implementing and tracking progress in education for sustainable development (50%)
   - The university has developed or uses a framework or strategy for ESD
   - The university has a mechanism for reviewing and reporting on progress of the integration of Education for Sustainable Development into the curriculum with names person(s) responsible for progress.
3. Supporting academic staff
   - The university makes available support AND training to help all academic staff integrate Education for Sustainable Development into the curriculum) (10%)
4. Education for sustainable development actions

- Coursework linked to sustainability projects within the university/estates department
- The university supports and highlights School, Faculty or Research team projects for Sustainable Development

Greater detail on how these variables are assessed is available on the People and Planet website (People and Planet's university league, 2018). Without going into detail about the essentially input-driven nature of these indicators, what needs to be emphasised is the extent to which such educational variables are, at best, a minimum standard for sustainability in higher education. These variables also represent what can most easily be measured and it is an easy mistake to develop policy on the basis of these easy measurements and without recourse to any complex system issues. In this sense there it is important to understand that such assessment systems also require other forms of evaluation, research and monitoring to provide in-depth information about the quality of teaching or research (D. Jones, 2012).

Sustainability and engagement awards in higher education

A similar mix of critical scepticism and potential for policy learning can be found in the range of sustainability awards on offer in global higher education practice. While it is positive to see the achievements made by staff and students at some HEIs, in reality, many of these awards are greater or lesser versions of campus greening and do not amount to anything like a curricula or research transformation of the mainstream. In some cases, for example, sustainability awards reflect greater and lesser versions of corporate green-washing (Buchanan & Evans, 2012). For example, The 'Green Gown' awards are one of the most famous HEI sustainability awards. The Green Gowns is an international sustainability awards initiative with a variety of international regions having their own ceremonies. A glance at the recent Australasian Green Gown awards shows that alongside some worthwhile activities there is more than a hint of green wash (Australasian Campuses Towards Sustainability, 2016). As can be seen in the 2016 awards, the type of sustainability practices receiving an award reflected the 'measureable', technocratic categories used in the sustainability assessment

and ranking systems. In the order of how they are presented in the 'glossy' online corporate finals brochure, the Australasian Green Gowns were awarded for: Built Environment; Carbon Reduction; Community Engagement; Continuous Improvement; Facilities/services; Learning, Teaching and Skills; Student Engagement; and Leadership (Green Gown Awards, 2016). In the short 'blurb' that accompanies each category the top 3 education nominees were focussed on specific strands of 'sustainability' education (and not connected to the learning of mainstream students). Again, there was no explicit focus on research. That said, there were nevertheless some opportunities for learning from these winners. Special mention from the 2016 Green Gown winners could, for example, be given 'Carbon Reduction Winner' – Charles Sturt University – as Australia's first 'carbon neutral' university and to The University of Tasmania's 'Teaching and Learning and Skills' award for its work on the Sustainability Integration Program for Students (SIPS). While it may be instructive (though not transformative) to learn how Charles Sturt University developed its systems and processes to become carbon neutral it may also be worth learning more about how the University of Tasmania have developed authentic teaching and learning projects based on improving campus sustainability.

Away from sustainability, there are also a few global ranking, assessment and award schemes for community engagement that also offer possibilities for learning. As was seen with sustainability however, some of this learning is not especially deep. The QS ranking system, for example has a category for 'social responsibility', albeit that the 'rigour' of this category is a long way from what is meant by Anthropocene Intelligence in this thesis given that it is based on each university's community investment profile, their donations to charity, the ratio of students employed in their region as well as the overall campus environmental impact (including if the university has a recycling programme) (QS Rankings, 2018). Similarly, there are various smaller scale ranking systems for community engagement in the US operated by the Carnegie Foundation and 'Best Value' schools.

There are a few university awards for engaged scholarship including the Talloires Network's MacJannet prize for "exceptional student community engagement initiatives" (The Talloires Network, 2017) and Engagement Australia's, Sir David Watson Award' for "the combined efforts of community and university partners towards making a difference in the lives of people in their shared community" (University of Brighton, 2017). Small-scale though such initiatives might be in relation to the more global rankings of higher education 'performance', they nevertheless do show the extent to which issues of sustainability and engagement are an emerging aspect of the global higher education context.

Global higher education networks

There are a range of national and international higher education networks supporting varieties of research, innovative teaching practice and the professional development of staff. There are far more of these networks than can be discussed here, but, like international declarations, their missions and values typically aspire towards improving the quality of some aspect of higher education practice in relation to such areas as sustainability and engaged scholarship. Those networks discussed here are The Talloires Network, along with the nationally oriented professional development initiatives such as SEPN in Canada and ARIES in Australia. The structure and content of these networks provides a basis for thinking about what sort of support can benefit HEIs in New Zealand and could be provided as part of a government policy direction.

Many of the existing international networks are linked to International Declarations (such as HESI and Copernicus networks), or are the result of HEIs in a particular country or international region coming together to address a common concern, for example the Healthy Universities Network based in the United Kingdom (as discussed in the previous chapter). As was introduced in the declarations section above, one of the most prominent international networks is that of The Talloires Network. The network's overarching goal (mission and values) revolves around developing a global network of civic universities and engaged scholarship (Cox, 2012). The Talloires Network supports research activities for community development, conferences, civic engagement research

and education, student volunteer programmes, international prizes and a wide range of publications. It has partner organisations across the planet as it attempts to fulfil its mission. Its funding comes from private foundations rather than any specific government policy initiatives (Hollister et al., 2012). In addition to the MacJannet prize discussed earlier in the chapter, particular highlights of The Talloires Network include its work in supporting university engagement in Africa where grants have been provided to support health graduates establish medical centres in Cameroon and in South Africa where the University of Pretoria's faculty of Engineering, Built Environment and Information Technology have partnered with community organisations to develop a community engagement course as a core part of their undergraduate programme (The Talloires Network, 2015). One New Zealand university is a Talloires Network signatory, Victoria University Wellington.

The Talloires Network represents a sizeable global network of educational practice, especially when it is seen alongside its partner organisations such as The Global Alliance on Community-Engaged Research (GACER), the Global University Network for Innovation (GUNi) and the University Social Responsibility Network (USR). Together such organisations show the extent to which higher education institutions are collaborating to develop meaningful research and teaching activities at a global level. Its existence alongside organisations such as Engagement Australia reveal an international move towards the sort of engaged research activity discussed by Barnett and affirmed by this thesis. Such activities also suggest that there is a role for government to support such activities and to potentially provide funding which could be linked to any national policy focus that supported engaged scholarship.

In addition to the large, trans-national networks such as Talloires, there are smaller networks that have developed from national initiatives in engaged scholarship and sustainability. Two examples of these include the Sustainability and Education Policy Network (SEPN) based out of Canada and the Australian Research Institute for Environment and Sustainability (ARIES). SEPN is closely

linked to the sustainability discourse and has a range of research operations covering areas of documentary analysis, educational surveys and strategies to mobilise knowledge about sustainability education across policy and practice settings. Significantly, SEPN receives the majority of its funding (C$2million) from the Federal government in Canada via the Social Sciences and Humanities Research Council (SSHRC). It describes itself as "the world's first large-scale, national-level research collaboration by collecting and analyzing comparable data across Canada's formal education system" (SEPN, 2017). Particular highlights of its work include seeking a greater strategic focus on sustainability in Canada's higher education system and developing an approach to policy that includes building relationships with policy makers and drawing on monitoring and evaluation evidence to "inform the development of effective policy and practice" (Chopin, Thompson, & McKenzie, 2017). SEPN has also developed a global interconnection with sustainability researchers through a nascent SEPN+ initiative which seeks to build connections to share and develop its knowledge with sustainability researchers in such countries as Australia, Sweden and New Zealand.

In Australia, the ARIES network began life in 2003 with federal government funding, but has, since 2009, operated as a not-for-profit consultancy business focused on sustainability in education, community, government and business sectors. It is based at Macquarie University in Sydney. In education its work has contributed to a wide range of professional development, research and organisational change tools. Recent educational initiatives included a project to showcase Aboriginal stories online, which was funded by the Australian Government's Indigenous Heritage Program, and a teaching module that was developed on energy efficiency and renewable energy funded by the Australian Government Department of Education, Employment and Workplace Relations (ARIES, 2018).

Concluding statement

The work of SEPN and ARIES shows how the state can potentially support improved Anthropocene Intelligence in education. One of the complicating policy factors across higher education is the role of 'autonomy' in higher education, and questions that arise around what possible role the state might take in developing policy in a way that respects this autonomy. Without wishing to go too far down this rabbit hole, the above examples show that there is already a great deal of higher education energy devoted to activity that has the potential to support Anthropocene Intelligence in students and the wider society. Moreover, as the examples from this chapter suggest, nation states do not need to 'direct' or 'instruct' or legislate for 'sustainability' or Anthropocene Intelligence – they can instead just fund, support and, in effect, catalyse existing thinking and activity. In the chapter following, the New Zealand higher education context is discussed, and while New Zealand 'lags' behind other nations in terms of the greenness of its policy and practice contexts, there is still some interesting and innovative efforts, especially within HEIs themselves. The findings from both of these 'educational practice' chapters, together with the more philosophical points raised in the earlier chapters, inform the work done in the final chapter of this thesis in presenting an alternative direction suggested for higher education policy in New Zealand.

Chapter 9: New Zealand's higher education context

"We are 100 percent pure."

– New Zealand's Prime Minister John Key in an interview with the BBC programme *Hardtalk* in 2011[15]

This chapter explores the New Zealand higher education context. This discussion provides an important step in the development of an ecological direction for higher education policy in New Zealand. It begins by identifying how the policy and practice dimensions of New Zealand's higher education context are primarily oriented by economic considerations – far more than they informed by concerns with anything like multi-dimensional forms of sustainability, wellbeing or engagement. That said, it is also evident that despite the economic emphasis in the higher education policy and practice contexts, there are still minority elements in the higher education context that provide a basis for an improved (more Anthropocene-friendly) approach to higher education. These elements are reflected in both the broader policy context for higher education and in some of the specific practices of New Zealand's Tertiary Education Institutes (TEIs). Hence, while this chapter raises some critical concerns about the extent to which New Zealand's higher education context reflects an enduring neoliberal focus – and the politics of unsustainability – it also identifies that there are nevertheless aspects that can inform and support the sorts of policy directions set out in the final chapter of this thesis.

This chapter is divided into three sections. The first of these sections explores the New Zealand political context, including the 2017 election of the Labour coalition government and the legacy left by the previous National Governments of John Key and Bill English. While it is difficult to provide anything like a full critical

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[15] A portion of this video interview was embedded in an online article on the Radio New Zealand (RNZ) website (Peacock, 2016)

history of these events, the policy approach taken by New Zealand from 2008 to 2017 has been highly focussed on developing a 'growing economy'. This economic growth was gained at a cost in terms of environmental quality, housing affordability and increased inequality. There is also evidence that the quality of New Zealand's political ecology has declined in these years too, and, together with the approach taken to the country's social and environmental challenges, it is argued that the political context has actively avoided, minimised and distorted 'inconvenient' (Gore, 2006) data in a way that that is broadly consistent with 'post-truth' politics and the politics of unsustainability (Chapter 3). Despite this legacy, there are also aspects of the New Zealand policy context that could support a more ecological approach to policy. These aspects are enhanced by the 'post-neoliberal' promises made by the Labour-led coalition government of Jacinda Ardern.

In the second section of this chapter, New Zealand's higher education policy context is analysed. Following a brief history of New Zealand's tertiary education policies, the focus for this discussion is New Zealand's 2014-2019 *Tertiary Education Strategy* (TES). This version of the strategy was developed by the previous National government and very much reflects the economic focus of this government. While this primarily economic approach is highly questionable, it is also apparent that there are some elements of the higher education policy context that could potentially support a more (ecologically) intelligent approach to higher education in the Anthropocene. The example critically considered in this section is the National Science Challenges (Ministry of Business Innovation and Employment, 2016) and their scope to bring together a range of academic researchers, community and business partners to deliberate on what can be done to develop more healthy environments.

The third section of this chapter surveys the provision of higher education in New Zealand. This section is based on a close inspection of documentary evidence from all of New Zealand's universities, wānanga and its largest eight polytechnics/technical institutes. The central argument in this section is that

while most of the major tertiary providers in New Zealand have done little more than 'campus greening' (and occasional bouts of green-washing), there are nevertheless many pockets of good practice across the system. As a result, it is possible to see how a deeper set of principles for structuring higher education could be feasible, despite the otherwise strongly neoliberal nature of policy and practice.

Prime Minister Jacinda Ardern. Pregnant, unmarried and on maternity leave during 2018 − a sign that some things can change.

The New Zealand political context

This section explores three interconnected aspects of the New Zealand policy context. It begins by examining the election of the Labour coalition government in November 2017. This discussion provides a basis for understanding how New Zealand could develop a more ecological approach to policy, including higher education policy, even though its policy context is still dominated by neoclassical economic thinking. The mixture of possibility and neoclassical hegemony is located in and around the election of the Labour coalition and the broad point that while there is scope to be optimistic about the possibilities for an ecological approach to policy, it is by no means assured that New Zealand is in the process of transitioning to any sort of ecological democracy, at least in the short term. As

with any political context, there are many factors at play. In support of an ecological shift is the aspiring political rhetoric of the Labour coalition leaders, including a clear ambition to move away from some of the ecologically hazardous approaches of the previous National governments. This rhetoric is backed up with some ambitious policies too, including a focus on putting wellbeing at the centre of policy thinking (G. Robertson, 2018; Waters, 2018). Alternatively, the aspirations of the Labour coalition might also be understood as another version of the 'politics of unsustainability' (Blühdorn, 2007, 2011, 2013, 2015, 2016; Blühdorn & Welsh, 2007) as the expressions of outrage about issues such as climate change are managed in a potentially tricky political coalition by a Labour leader (Jacinda Ardern) who once worked as a staffer in the office of Tony Blair. In the second aspect of this section, the possibilities for 'actual' change are further questioned in the face of the range of policies left behind by the previous National government and the extent to which New Zealand has habituated itself to damaging its environment, high levels of child poverty, unaffordable houses and increasing inequality. That said, swinging back in support of an ecological change in policy, the third aspect of this section explores how the previous National governments also left behind some potentially useful features in the policy context which could be drawn upon to develop improved national wellbeing.

New Zealand's 2017 election

New Zealand's 2017 election was perhaps the most tumultuous since 1984. In a context that saw many changes in party leadership, the 2017 election eventually resulted in a shift away from the incumbent National-led government, and towards a Labour coalition led by Jacinda Ardern. The installation of the Labour coalition occurred on the back of a significant number of special votes and despite the fact that the National party was by far the largest single party in the parliament. National however, were not able to develop a majority coalition and instead, the Labour party, in coalition with New Zealand First (and backed with a confidence and supply agreement from the Green party) secured a majority in parliament. The development of the coalition was made all the more dramatic as it followed three and a half weeks of coalition agreements in which time Winston

Peters, the leader of the New Zealand First party, had the option of going with either of the main parties as a coalition partner.

Peters announced his coalition partner on a live TV speech. One of the more compelling aspects of Peters' speech, who has traditionally trodden a conservative and populist political path, was the open questioning he expressed about capitalism:

> Far too many New Zealanders have come to view today's capitalism, not as their friend, but as their foe.
>
> And they are not all wrong.
>
> That is why we believe that capitalism must regain its responsible - its human – face. (W. Peters, 2017)

The overt questioning of capitalism is not something New Zealand politicians have tended to do in recent times (even those of a green shade). Winston Peters' words were also reinforced by his judgement, based on the analysis of some commentators (Amaro, 2017; Buttonwood, 2017), that there is a "looming" economic slowdown. That aside, this speech has taken place in a context where Peters has previously expressed concerns about neoliberalism (M. Daly, 2017), concerns also voiced by past and present politicians, including Jim Bolger and the new Labour leader Jacinda Ardern (Bolger, 2017; Cooke, 2017). The extent to which Peters' and other politicians have a critical understanding of neoliberalism is far from clear. Nevertheless, in addition to the rhetoric of concern about neoliberalism, there are also many statements from the coalition leaders about the need for new policies in response to climate change and the high priority the new government puts on issues of child poverty and mental health. These sentiments can be seen in excerpts from Jacinda Ardern's campaign launch speech:

> And for me it's simple: I want to build a country where every child grows up free from poverty, and is filled with hope and opportunity.
>
> We will take climate change seriously because my Government will be driven by principle, not expediency. And opportunity, not fear.

... This is my generation's nuclear free moment, and I am determined that we will tackle it head on.

New Zealand's youth suicide rate is the highest in the OECD. While there is a lot of talk about targets, I know I will never ever be satisfied so long as there is even one life lost.

It is time we focused on love and hope rather than grief and loss. And we need to start with young people. (Ardern, 2017)

The extent to which Labour might realise these aspirations is yet to be seen. At the time of writing the coalition government has made some early policy decisions that appear positive, including some attempts at alleviating child poverty and a review of mental health services. Conversely, the new government has also signed an updated version of the Trans-Pacific Partnership Agreement, which also seems to continue some highly questionable global neoliberal economic governance processes (Kelsey, 2018a, 2018b). The signing of such an agreement should also be seen in the context of Labour's tradition while in government, going back to 1984, of broadly supporting a neoliberal approach to policy. In this sense it is not clear that this coalition government will reach any sort of escape velocity when it comes to the politics of unsustainability. They may rail against neoliberalism, and its associated impacts on social and natural ecosystems, but, in the face of global and economic pressures, they also risk leaving many of its structures in place. Compounding this point is the fact that many of Labour's senior MPs, have served their time as neoliberal policy makers. Moreover, as a potentially telling example of this heritage, the Labour's party leader, Jacinda Ardern, worked as a staffer in the 'third-way' Cabinet Office of Tony Blair. Time will therefore tell whether the Labour coalition are able to deliver on their progressive rhetoric, or whether their governance is in fact another version of Blühdorn's politics of unsustainability (Blühdorn, 2007, 2011, 2016). Should Labour's coalition fail to substantively deliver, then this would appear to be an especially cruel version of such politics, surrounded as it has been with promises to turn away from neoliberalism as a policy platform.

The policy context inherited from National 2009-2017

An additional factor against the Labour coalition adopting a deeper approach to sustainability and wellbeing is the policy base they have inherited from National. This policy context is concerning for two important reasons. The first is that there is considerable policy work to be done to develop an approach that is consistent with the rhetoric of the Labour coalition, and second of all, the political ecology left behind by National's approach to policy ironically means that it is possible to see how the Labour coalition's ambitions for change might be undermined by 'post-truth' political tactics.

In terms of the policy context left behind by the previous National governments, and in line with the points raised in Chapter 3 of this thesis, about the role of 'success' in the GEC, it needs to be emphasised that National's policies have overseen a growing New Zealand economy – even as this growth has been the basis of some damaging social and environmental failures. Some of this tension can be seen in June 2017 report of the Economic and Development Review Committee (EDRC) of the OECD. This group reported that New Zealand's economic model was doing well in many respects, with an enviable growth forecast of 3% over the next two years and a relatively low level of unemployment. Despite this, and the concerns the EDRC raised about New Zealand's low productivity, this report raised concerns about house prices, pollution due to primary production, the lack of effective climate change policies and the ongoing loss of biodiversity (OECD, 2017a).

Leaving aside questions about any (more subtle) epistemological errors that can be linked to the 'green growth' agenda of this report (Costanza et al., 2017; Lorek & Spangenberg, 2014), it is the realisation that New Zealand's economic model is significantly impacting upon the quality of the natural environment that is significant here. If it is not too patronising a point, even a traditionally 'mainstream' organisation like the OECD realises that New Zealand's policy approach is not 'sustainable'. This point was further emphasised by another OECD report, this time from the OECD environment group, headed by ex-

National party Minister Simon Upton (OECD, 2017b). This report declared that, despite leading "the international research effort to reduce greenhouse gas (GHG) emissions and water pollution from agriculture...New Zealand's growth model...has started to show its environmental limits with increased GHG emissions, freshwater contamination and threats to biodiversity" (OECD, 2017b, p. 3).

Other reports have linked New Zealand's approach to economic policy with associated impacts on inequality (Oxfam NZ, 2017; Rashbrooke, 2013), child wellbeing (UNICEF, 2017) and housing affordability (Callahan, 2017; Harris, 2016; Stuff.co.nz, 2017). One of the most telling examples of National's legacy can be seen in how the previous National-led government approached the United Nations Sustainable Development Goals (SDGs). Almost bizarrely the National government implied that the SDGs were already being achieved by New Zealand, and indicated that their main focus was in helping other (lesser developed) nations achieve the goals. One of the few places where the SDGs have had a policy presence under National was on the website of the Ministry of Foreign Affairs and Trade (MFAT) (Ministry of Foreign Affairs and Trade, 2017). Here the SDGs were characterised by National as a foreign development issue. Where New Zealand's own response to the SDGs is surfaced, the National government emphasised only those goals which aligned with their existing economic epistemology and said nothing about those SDGs which point to New Zealand requiring an alternative approach to economic and social policy. For example, in a 2016 speech on the SDGs (and the signing of the Paris Agreement) the Minister for Climate Change Issues, Paula Bennett stated:

> There is a lot of alignment between the objectives contained in the SDGs and what the New Zealand Government is already working to achieve. Growing the economy, improving living standards, health, and education, creating jobs, increasing the supply of affordable housing, encouraging women in leadership, keeping our communities safe, and protecting our environment: these are some of the issues that are of greatest importance to New Zealanders, and where the New Zealand Government is focussing our hard work (P. Bennett, 2016).

Nothing in the National government's policy statements indicates that there was to be any action to be taken on goals such as poverty reduction, affordable and clean energy, decoupling economic growth from environmental degradation or developing responsible consumption and production. In this sense, part of the legacy being left to Labour here is a laggard's approach to sustainable development. Such a backward response points to the need for the Labour Coalition to carry out a considerable amount of policy work to address this gap in policy action by New Zealand.

In addition to this issue however, the blatant mistruths captured in Paula Bennett's statements about the SDGs link to real concerns that New Zealand has a serious democratic deficit linked to post-truth politics (Palmer, 2017). At one level, this concern makes it likely that National might be rewarded (or at least not punished by the electorate) for saying whatever it likes about the effects of Labour's policies. By way of a summary, National's heritage with post-truth politics can be traced to examples such as that seen in 2011, when the National Prime Minister of the time, John Key, asserted to the BBC that New Zealand was "100% pure". This point made despite the overwhelming evidence of experts such as freshwater ecologist Mike Joy (Stewart, 2012). Other post-truth moments include the assertion from National ministers that there was no 'housing crisis' (RNZ, 2016). No larger post-truth signifier might be observed than the repeated lie told by the National party during the 2017 election campaign that there was an $11.7 billion 'hole' in the Labour party's election budget. Incredibly, this fiction was maintained throughout the campaign despite the fact it was widely ridiculed by a wide range of economists and supported by no one outside of the National party. However, in keeping with the 'success' of post-truth politics elsewhere, the negative message about Labour's economic management held enough 'truthiness' to help National win more seats than any other party in the 2017-2020 parliament (Manhire, 2017).

The lies told by National during the 2017 election campaign speak to the power of post-truth politics to benefit conservative politicians, as evidently gullible

conservative voters succumb to whatever floats across their Facebook feeds. Other aspects of New Zealand's 'democratic deficit' are linked to the politicisation of the public service, as identified by Sir Geoffrey Palmer (Palmer, 2014) and a lack in the overall transparency of government processes as discussed by commentators such as Max Rashbrooke (Rashbrooke, 2017) and Bryce Edwards (Edwards, 2014). There are also concerns that New Zealand's ongoing bouts of 'dirty politics' will contribute to the long term trends, which have seen a drop off in the number of younger voters, and declining voter turnout (Hager, 2014). Hence, if Labour and the Greens especially, are to achieve anything like their political aspirations, they will have to find a way to overcome a polluted political ecology.

A basis for alternative policy thinking

Despite the challenges posed by post-truth politics and New Zealand's democratic deficit, there is also some scope for policy optimism, even considering National's policy legacy. Keeping with the issue of the SDGs for example, it is clear that the Green party are keen to use their time in government to monitor New Zealand's progress across the UN's targets. The confidence and supply agreement between the Greens and Labour is predicated on a transformational approach to the SDGs (from the Greens at least). Included on page 4 the agreement between Labour and the Greens is the goal to develop a "comprehensive set of environmental, social and economic sustainability indicators"(New Zealand Labour Party & Green Party of Aotearoa New Zealand, 2018). In support of this goal, one of the portfolios taken by the Green co-Leader James Shaw is that of Statistics.

The choice of the statistics portfolio is an important one in light of the world-wide emphasis placed on monitoring and evaluating world-wide progress on the SDGs (Maurice, 2016). For example, the annual United Nations' backed *SDG Index and Dashboards Reports* show that New Zealand has several 'red lights' across the 17 goals (Sustainable Development Solutions Network (SDSN) & Bertelsmann Stiftung, 2017). These red lights were for 'zero hunger', 'climate action', 'life below water' and 'life on land'. There were also several other goals

where New Zealand was rated as orange or yellow, and just five goals where the country's performance was rated green (satisfactory). In the light of such evidence, along with whatever else is collected by the Ministry of Statistics, one of the key battlegrounds over whether New Zealand can move towards less 'unsustainability' will be whether the coalition can develop enough political will to realise significant improvements in these areas (if it can continue to get elected).

In support of potential improvements under the Labour coalition are some pre-existing elements within the public service. These are elements which were developed under National, but in no way achieved their potential as an ecological policy tool. One example is the New Zealand Treasury's Living Standards Framework (LSF) (Au & Karacaoglu, 2015; Karacaoglu, 2015), which offers a potentially powerful way to organise policy advice for the government beyond a one dimensional focus on economic growth. Under National, the LSF's reliance though on neoclassical assumptions (Stratford, 2016b) and its failure to be utilised in any substantial way by the government however (Boston, 2016), have made it little more than another example of the weak lip-service to sustainability typical of Blühdorn's politics of unsustainability. Conversely, there is some hope that the LSF may achieve something of its potential under Labour given the finance's Minister's claim that he is going to produce New Zealand's first 'wellbeing' budget (Stock, 2018; Waters, 2018).

A similar story of potential can be seen in New Zealand's Environmental Reporting Act 2015, and the associated a series of reports that have been produced on the quality of New Zealand's natural environment. While under National these have been criticised by the a variety of environmental expects, including the (independent) Parliamentary Commissioner for the Environment (New Zealand Office of the Parliamentary Commissioner for the Environment, 2016), the potential of such reporting remains. In this sense, despite some poor practices previously in environmental reporting, there is still an opportunity for the Coalition government to use these reports to add, for example, to New

Zealand's analysis of progress (or otherwise) in relation to the SDGs. In the broader scheme of possibilities, the potential that exists to leverage better policy off such existing tools also offers some high level optimism that better policy possibilities could also be developed for higher education. This policy area is discussed in the following section.

Higher education policy in New Zealand

Following on from the discussion of the broader policy context of New Zealand, the argument running through this section is that the immediate context for higher education policy – especially the history of the Tertiary Education Strategies (since 2002) – has been dominated by economic concerns. In addition, under the current Labour-led coalition government, this focus on economic imperatives seems unlikely to substantially change. This doesn't of course mean that all is lost, but only that there are relatively few current higher education policy initiatives on which to develop the ecological policy alternatives of this thesis. From another perspective New Zealand comes from a long way back, and the policy initiatives suggested by this thesis represent a radical departure from the unsustainable traditions of higher education policy in this country.

This section begins with a brief history of higher education policy since the education reforms of 1989. This discussion reflects how economic concerns have dominated higher education policy and also explores how any (minor) sustainability concerns have actually diminished over time. Following this, there is a discussion of the current tertiary education strategy (2014-2019), with its strong focus on economic priorities. This is followed by a discussion of what could become of the next tertiary education strategy – due for release in 2019 under the Labour coalition government. While the Labour party has had little to say about how higher education policy links to any specific ecological concerns, there is some evidence that the next tertiary education strategy will be slightly less driven by economic concerns. In this regard this discussion points to a 'third-way' mix of welfare state-liberalism and economic rationalism in the current coalition government's approach to education. Significantly, this approach does

not imply a strong focus on ecological concerns, although it does reflect a light-green interest in sustainability. A better basis for ecological policy thinking is identified in this section's final discussion, which focuses on existing policies on research, such as the National Science Challenges, the Performance-Based Research Fund and the Marsden Fund, all of which have the potential to inform the decision-making of an ecological democracy.

A brief recent history of tertiary education policy reforms

The recent history of tertiary education in New Zealand (since 1989) has revolved around strengthening the links between education and the economy. This has manifest in a variety of ways, including a shift away from the idea of education as a public good, and a move towards the idea of education as a private good – one in which its benefits tend to be more captured by individual 'consumers' rather than society as a whole (Grace, 1994). Similarly, there has been more emphasis on tertiary education providers working to support economic imperatives and/or operating as teaching and research 'enterprises', in both the domestic and international market (Fitzsimons, 1997; Olssen et al., 2004; Olssen & Peters, 2005; Roberts, 1999, 2007, 2009; Sutherland, 2018). Perhaps ironically, the increasing use of 'market' rationales for education has also been associated with a stronger set of policies to control the activity of higher education institutes, including the development of government strategies for tertiary education (Ministry of Education, 2007b, 2010).

In the early 2000s Helen Clark's Labour-led government identified certain 'inefficiencies' in using a market approach to higher education. In particular it recognised that there 'market-failures' in having many different tertiary providers offer the same sorts of courses. There were also concerns that tertiary education providers were enrolling high numbers of students in courses that were of low quality and/or weakly aligned with any 'labour market' demands. As a result, the Labour-led government ensured that, within the overall market approach taken to higher education, there were government structures in place to develop a central, strategic direction for higher education in New Zealand (Crawford, 2016).

This finding influenced the establishment of the Tertiary Education Advisory Commission (TEAC) in 2000/2001.[16] From TEAC came the first tertiary education strategy (2002) and a framework which linked central funding decisions to the priorities the government expected to see delivered from the higher education sector, notably through the Statements of Tertiary Education Priorities (STEPS). It was at this time that the Performance-Based Research Fund (PBRF) was also established (Roberts, 2007). By 2008, the STEPS process was overtaken by "institutional investment plans, negotiated between providers and the TEC, that set out performance targets and that became the basis of funding allocations" (Crawford, 2016, p. 4). This is the funding architecture that is currently used with the priorities of the *TES* forming the basis for these funding agreements.

In 2008, when the Labour party lost the election to John Key's National-led coalition, the priorities of the *TES* (2007-2012), (Ministry of Education, 2007b), were focused on the following (economic) priorities:

- increasing educational success for young New Zealanders – more achieving qualifications at level four and above by age 25
- increasing literacy and numeracy levels for the workforce
- increasing the achievement of advanced trade, technical and professional qualifications to meet regional and industry needs
- improving research connections and linkages to create economic opportunities (Ministry of Education, 2007, p. 29).

As Peter Mellalieu has identified, among the economic focus of these priorities, was a series of statements suggesting that 'sustainability' was at least part of the general focus of this strategy (Mellalieu, 2011). That said, as Mellalieu also notes, there was nothing in the overall funding structures of this strategy that linked sustainability to the funding the government provided to higher education

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[16] Which later became the Tertiary Education Commission (TEC)

institutions. Hence, while the strategy itself mentioned the importance of 'sustainability', this was not backed up by explicit government structures or financing (Mellalieu, 2011). From his perspective at the Unitec campus, Mellalieu claims that this lack of structure undermined campus efforts to develop meaningful change towards sustainability education.

Interestingly Mellalieu also criticises the Parliamentary Commissioner for the Environment for what he sees as a weak response the *TES* at the time. Following on from the critical 2004 *See Change* report on Education for Sustainability across New Zealand's education system, (New Zealand Office of the Parliamentary Commissioner for the Environment, 2004), Mellalieu suggested that a 2007 evaluation/update from the PCE (New Zealand Office of the Parliamentary Commissioner for the Environment, 2007) had claimed that the lack of a focus on sustainability in New Zealand's higher education system in 2004 was a defect that had "been remedied" (Mellalieu, 2011, p. 13). This is somewhat unfair given that the words of the 2007 PCE report stated:

> While environment-specific courses are available, with some offering good opportunities for skills and knowledge in sustainability, learning about sustainability is not a core (or even a fringe) component in most mainstream courses (New Zealand Office of the Parliamentary Commissioner for the Environment, 2007, p. 20).

And on page 22:

> Although the tertiary sector is expected to contribute to environmental outcomes, knowledge and learning for sustainability is absent from the list of priority outcomes for tertiary education. The priorities focus on economic growth.

Other indicators reflect the lack of any real sustainability focus in New Zealand's approach to education policy at this time (Bolstad, Joyce, & Hipkins, 2015). For example, Chapman, Flaws and Le Heron found that the Ministry of Education did not significantly engage with the Decade of Education for Sustainable Development (DESD) (Chapman, Flaws, & Le Heron, 2006). Not long after this,

the newly elected National government also withdrew funding for the enviro-schools initiative (they also effectively dismantled Labours emission trading scheme at this time too). In higher education policy, National strengthened the economic focus in the *TES* of 2010-2015, in part linking this emphasis to the need for 'action' in the face of the Global Financial Crisis (GFC) (Mellalieu, 2011). The new priorities for the 2010-2015 strategy were:

- increasing the number of young people moving successfully from school into tertiary education
- increasing the number of young people (aged under 25) achieving qualifications at level four and above, particularly degrees
- increasing the number of Māori students enjoying success at higher levels
- increasing the number of Pasifika students achieving at higher levels
- improving literacy, language and numeracy skills outcomes from levels one to three study
- strengthening research outcomes
- improving educational and financial performance of providers

Noticeably, there was very little mention of 'sustainability' at all in the 2010-2015 *TES* (Ministry of Education, 2010) – although there is a mention of 'environmental and social challenges'. The closest this document gets to 'sustainability' is on page 5, albeit that the use of the word 'sustainable' is part of a justification for higher education's connection to economic growth:

> The Government has identified six main structural policy drivers that will improve our economic performance and support more sustainable growth in future.

The Tertiary Education Strategy (2014-2019)

The National party continued to lead governments in New Zealand following wins in the 2011 and 2014 elections. A new *TES* was developed in 2014 and essentially the same priorities were carried over from the 2010-2015 strategy. These were:

> Priority 1 - Delivering skills for industry
>
> Priority 2 - Getting at-risk young people into a career
>
> Priority 3 - Boosting achievement of Māori and Pasifika

Priority 4 - Improving adult literacy and numeracy

Priority 5 - Strengthening research-based institutions

Priority 6 - Growing international linkages (Ministry of Education, 2014).

Significantly, just as the earlier *TES* documents had brief references to sustainability and/or environmental challenges, the 2014-2019 *TES* has a brief focus on 'environmental' outcomes, albeit that there were still no funding mechanisms put in place to explicitly support the achievement of these outcomes. This lack of a focus on sustainability was also noted during the public consultation (Ministry of Education, 2014a). For example, the University of Auckland submitted that:

> The TES needs to demonstrate a broader understanding of the role of tertiary education...We are concerned that the narrow focus on economic outcomes risks the important social, cultural and environmental outcomes provided by the sector… The TES 2014-2019 needs to provide for investment in the range of contributions that the tertiary education sector makes to improving social, cultural and environmental outcomes for New Zealand communities…(Ministry of Education, 2014a, p. 12).

There are many other submissions about the *TES* at this time that commented on the lack of support for the role of universities as the 'critic and conscience' of society, although, overall, the analysis of the feedback suggested that the overwhelming number of groups responding to the *TES* were said to be "in general... relatively positive..." about the "direction and focus areas for the *TES*, and the priorities" (Ministry of Education, 2014a, p. 4). While this can be disputed, the overall thrust of the *TES* not only survived the consultation process, relatively intact, but the overall policy context for higher education under the National party continued its focus on economic priorities.

As an example, the economic rationale for education has arguably been maintained by such processes as the work of the Productivity Commission's review of tertiary education and the National government's *Leadership Statement for International Education* (Ministry of Education, 2011, 2014b). The

400-page 2017 report by the Productivity Commission looked at new models for tertiary education in light of "emerging trends in technology and the internationalisation of education, and changes in the structure of the population, and the skills needed in the economy and society" (The Productivity Commission, 2017). While this report contained several interesting suggestions, its overall focus was on developing a more flexible market for tertiary education in New Zealand. Amongst its recommendations was the re-instatement of interest on student loans and the development of a quasi-voucher system for young people to use in the tertiary education system (Barr, 2017; Tertiary Education Union, 2017).

Similarly, the 2017 *Leadership Statement for International Education* reflects an overwhelming interest from the government in using tertiary education as a way of generating overseas income. Indeed in this document there is no background reference to anything like citizenship or environmental outcomes in the face of what is clearly an economic policy approach to tertiary education. The tone for such a policy is set in the introduction provided on the Ministry of Education's website for the *Leadership Statement*:

> Doubling the economic value of international education to New Zealand is at the heart of the Government's new strategy for the sector. The Government has prepared the first version of a Leadership Statement for International Education, which sets bold aspirations for the growth that we want to achieve over the next 15 years and beyond (Ministry of Education, 2017).

The strong economic rationales underpinning the *TES* were reinforced by some significant governance changes made by the National government to ITPs (in 2010) as well as universities and wānanga (in 2014). These changes replaced the representative structure of the governing councils of ITPs, wānanga and universities with what was, in more ways than one, a corporate model. As part of this process the government reduced the overall size of each council, while also increasing the number of government appointees. For ITPs, the council size shifted to eight members with four being appointed by the Minister for Tertiary

Education (including the Chair and deputy Chair) (Tertiary Education Commission, 2011). For universities and wānanga the council size shifted to between eight and twelve members with three or four being appointed by the Minister (Ministry of Education, 2015). As a result of these changes, the make-up of the governing councils of TEIs in New Zealand adopted a more explicitly managerial or 'busnocratic' (Peters & Marshall, 1996) look, with many of the Ministerial appointments having a background in business, accounting and finance (and no doubt sympathetic to using higher education primarily for economic concerns). Understandably, the explicit attempt here by the government to undermine the traditionally democratic nature of higher education governance, especially in universities, was widely condemned by academics in New Zealand (Education Review, 2014; Greatbanks & O'Kane, 2014; Universities NZ – Te Pōkai Tara, 2014).

The Tertiary Education Strategy after 2019

At the time of writing it is not especially clear how the newly elected Labour coalition government will respond to the tertiary education strategy, including how they will update the current *TES* after 2019. What is evident is that the Labour government have prioritised the affordability of higher education during their election campaign and they have also begun a sizeable policy review process across the education system. Neither of these processes suggests that there will be a strong ecological focus for higher education in New Zealand, although there is likely to be a return to some liberal-progressive educational thinking on top of the current neoliberalisation.

In relation to affordability, the Labour-led coalition has, in 2018, implemented their election promise to make tertiary education free to those beginning their tertiary education journey (Ministry of Education, 2018b). This policy change was accompanied by some other changes to student allowances that were signalled in the 2017 election campaign. None of the tertiary education policies suggested by the Labour party during the 2017 election referred to the need to alter the previous government's approach via the *TES* (New Zealand Labour Party, 2017). As a signal of an ominous return to its liberal-progressive roots however, the web

page hosting the Labour party's tertiary education policies for the 2017 election was headlined by a mis-quoting of that famous statement on education from previous Labour Prime Minister Peter Fraser:

> "Labour's objective is that every person, whatever their academic ability, whether they be rich or poor, whether they live in town or country, has a right, as a citizen, to a free education of the kind for which they are best fitted." – Peter Fraser, Labour's First Minister of Education.[17]

This centre-piece of liberal-progressive education history underpins the educational epistemology of the Labour party in 2018. Given the return of this statement from the policy archives however, a suitable set of questions are begged about the extent to which the Labour party understands the history of this 'idea' in New Zealand education, including the ongoing myths surrounding the liberal ideology of this statement and the reasons why it failed as an overarching policy in the past (Beeby, 1992; Olssen & Morris Matthews, 1997). Still less might be expected of the Labour party in regards to the liberal subject of this statement (Peters & Tesar, 2016) and the limited set of assumptions underpinning humanity and the environment that can be connected to this liberal and Western way of looking at the world (Bowers, 2012).

Underlining this point is the progressive-liberal discourse to be found in the Labour party's approach to education policy. From a cabinet paper developed for the Minister of Education (Ministry of Education, 2018a), which included an announced a review of Tomorrow's Schools and the National Certificate in Educational Achievement (NCEA) assessment system, can be found overarching objectives linked to learner-'centredness', barrier-free access, quality teaching,

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[17] Note, that the speech marks are left in here to show that the Labour party intended this re-writing of history to appear like an actual quote. Fraser's original (liberal-progressive) utterance captured the casual sexism of the time: "The Government's objective, broadly expressed, is that every person, whatever his level of academic ability, whether he is rich or poor, whether he live in town or country, has a right, as a citizen, to a free education of the kind for which he is best fitted and to the fullest extent of his powers" (Alcorn, 1999).

quality inclusive public education and 21st century learning. Without wishing to pull all of the liberal-progressive bones from this policy statement, it is worth quoting the emphasis placed in the section on 'barrier-free' access to the following statement: "Barrier-free access is not just about breaking down barriers, but also about actively giving all learners the same opportunities regardless of their socio-economic background" (Hipkins, 2018, p. 7). As might be expected, there is little in this document about the nature of the social and economic structures which are the basis for educational inequalities, and nothing which links education to issues of the economy and the destruction of the biosphere. From this perspective too, there appears to be little room for exploring how an updated tertiary education strategy can go beyond a mix of Peter Fraser's 1939 statement for education or the predominantly neoliberal economic structures of New Zealand's economy and approach to policy. From such an angle, the approach taken by the Labour-led coalition appears to be a nostalgic version of 'third-way' politics.

The National Science Challenges

The National Science Challenges (NSCs) were developed in 2013 under John Key's National-led government. These challenges have been retained by the Labour-led coalition in 2018. The NSCs are series of 11 overarching categories for research in New Zealand. They are not solely designed as a tertiary education funding model but exist as a way for university researchers to collaborate with a range of other public and private providers to achieve goals of significance to New Zealand. The Challenges themselves were identified in a collaborative process involving a range of expert and broader public representatives. A board appointed by the Minister of Science and Innovation decides which applications receive funding. After Cabinet sign off in April, 2013 $326.4 million was allocated the NSCs over 10 years, although the government has reported that it expects that nearly $1.6 billion will form part of the overall research funding sourced from new funding, contestable government contracts, CRI funding, and the Health Research Council (Ministry of Business Innovation and Employment, 2016).

From one perspective these challenges represent a way for the government to influence (or guide) the medium term research context (for universities and other research centres). The NSCs also reflect something of Maxwell (and Barnett's) interest in solving large-scale problems, or, from a slightly different perspective, a way of bringing together various forms of scientific knowledge to deal with issues of the utmost importance to the development of New Zealand (Chapter 6). The 11 categories came from the following list of proposed by the 'Peak' panel of science experts. This group suggested the following 12 challenges form the basis of the NSCs:

Challenge 1 Ageing Well: Harnessing science to sustain health and wellbeing into the later years of life, so that older people can continue to contribute to New Zealand

Challenge 2 A Better Start: Research to improve the potential of young New Zealanders (up to 25 years) to have a healthy and successful life

Challenge 3 Healthier Lives: Research to reduce the burden of major New Zealand health problems

Challenge 4 High-Value Nutrition: Research to develop high-value foods with validated health benefits

Challenge 5 New Zealand's Biological Heritage: Research to protect and manage our biodiversity

Challenge 6 Towards More Sustainable Primary Production: Research to enhance primary productivity to meet future demands while protecting water quality and recognising environmental constraints

Challenge 7 Enhanced Biosecurity: Research to enhance our resilience to potential harm caused by the invasion of organisms that affect the health of animals and plants

Challenge 8 Life in a Changing Ocean (later renamed Sustainable Seas): Research to understand, exploit and sustain our marine richness

Challenge 9 The Deep South: Research to understand the role of the Antarctic and Southern Ocean in determining our future environment

Challenge 10 Science for Technological Innovation: Research to enhance the capacity of New Zealand to use physical and engineering sciences for economic growth

Challenge 11 Building Better Homes, Towns, and Cities: Research to develop affordable and better housing and urban environments

Challenge 12 Nature's Challenges: Research to enhance our resilience to physical challenges that nature throws at us

Two of these suggested challenges (5 & 7) were merged in the final proposal to Cabinet because of their similarity, and one, Challenge 11, was delayed to consider its relationship to other research on building and construction taking place in New Zealand. In addition, the newly elected Labour coalition has said that it intends to add to this list by creating a challenge connected to New Zealand's transition to a low carbon economy (New Zealand Labour Party, 2018).

Despite the way the Science Challenges lean towards the sort of epistemological 'wisdom' discussed by Maxwell and Barnett in Chapter 5, there are some questions that can be raised about the extent to which these Challenges represent something approaching the 'ecological' policy approach presented in this thesis. Before these questions are raised, the point is made that the Challenges themselves are in their early stages (when one considers their overall time-span) and in that sense the questions that are raised here cannot be equated with a deep critique of how they are progressing. Moreover, a wider critique of the NSCs also needs to take place in the context of broader analysis of science funding, a task which well beyond the scope of this thesis.[18]

These points aside, there are some significant concerns from scientists about the NSCs. These concerns have related to the lack of transparency scientists have found with the NSC processes and the extent to which the oversight or management of the challenges has been captured by a small number of senior

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[18] There have been some critiques carried out as part of the public consultation on the National Statement of Science Investment. A draft statement was produced in 2014, and following a public consultation process the *National Process of Science Investment 2015-2025* (Ministry of Business Innovation and Employment, 2015) was produced. Of the many public submissions was an extensive submission provided by the Royal Society (Royal Society of New Zealand, 2014).

scientists (The New Zealand Association of Scientists, 2014). Other concerns, which are more related across the science funding landscape and research in Universities, include the lack of post-doctoral/early career funding for researchers and the lack of funding for 'curiosity-driven' or 'investigator-led' science (Royal Society of New Zealand, 2014). The NSC's themselves are described as 'mission-led' because of the central focus on an 'issue' and a series of problems to be solved. The point made about the need for curiosity-driven research is that New Zealand's relatively low rate of investment in such research undermines a science culture and limits the opportunities to develop much of the serendipitous work which has frequently led to unexpected benefits in the past (Royal Society of New Zealand, 2014, p. 3-5).

These questions about the NSCs can also be directed at the overall 'research ecology' surrounding higher education in New Zealand. As is followed up in the next chapter, a government committed to developing New Zealand as an ecological democracy should be interested in the quality of such a knowledge ecology. Currently in New Zealand, the expressed concerns about the NSCs also need to be considered in relation to the overall support for tertiary research and researchers in New Zealand as well as the existing funding streams such as the Performance-Based Research Fund (PBRF), the Marsden Fund, funding from the places such as the Health Research Council and the monies allocated to initiatives such as the Centres of Research Excellence (CoREs).

In terms of the ambitions of the NSCs, time will tell if the NSC's are able to make a worthwhile impact in terms of their specific issues. Certainly the context surrounding the Challenges, along with the narrow focus of some the Challenges, suggests that they may fail to support meaningful (sustainable) change. For example, the sustainable seas challenge seems like an excellent work stream for an ecological democracy:

> The Sustainable Seas National Science Challenge work is focused on enhancing
> the utilisation of New Zealand marine resources within environmental and
> biological constraints. To achieve this, the Challenge will involve leading experts,

including Māori, in researching ecosystem-based management. This will enable researchers to provide decision-makers with up-to-date information about marine ecosystems alongside information about cultural, economic, social and environmental values. The aim is that the New Zealand marine environment is understood, cared for, and used wisely for the benefit of all, now and in the future(Sustainable seas, 2016).

There is an informative and persuasive video on the Sustainable seas website setting out the holistic approach to be taken by the team and emphasising the importance of people 'working together' to get the best results. Putting aside what critical questions can be raised about the anthropocentric term 'eco-system' management, the context for this Challenge includes some very deep concerns about how sustainable New Zealand fishing really is (Ministry for the Environment & Statistics New Zealand, 2016; OECD, 2017b; WWF-New Zealand, 2016), and how well this fishery is being monitored (Migone, 2016; Morrah, 2016; University of Auckland, 2017a). An important question for this particular Challenge then concerns how such an ostensibly good initiative can make an impact when the overarching political and economic momentum is against it? More optimistically, a question that can be asked in terms of the approach taken in this thesis is: how can the NSCs (and other forms of research funding) be developed to ensure the best possible support for an ecological democracy?

Higher education practice in New Zealand

In this section, the nature of the higher education practice is discussed, first with reference to the small literature base focused on sustainability in higher education and secondly, with reference to an evaluative survey of the strategies, plans and initiatives of a sample of higher education providers. The key point that emerges from this information is that although New Zealand's public tertiary education providers operate within a neoliberal, market-oriented frame, and do not have a strong track record in relation to such matters as sustainability and the 'greening' of the curriculum, they do however demonstrate, in pockets, a range of interesting and innovative practices. While more research could be undertaken to determine the quality and depth of these practices, the point is

made that these pockets of ecological practice demonstrate that there exists some basis for developing higher education beyond conventional sustainability education, including perhaps greater levels of Anthropocene Intelligence.

Research evidence about higher education practice in New Zealand

Tertiary education in New Zealand does not have a strong record when it comes to matters 'ecological'. Something of this historic weakness can be seen in a small number of reports and academic papers which have specifically examined issues of sustainability. For example, the work of Chapman, Flaws and Le Heron provides a critical introduction to these issues (Chapman et al., 2006). They identify the lack of a strong history of either EE or ESD in New Zealand education, along with a relatively weak policy framework for both sustainable development and sustainability education. In surveying a series of sustainability academics across New Zealand universities, about the UNDESD, Chapman et al found: "almost zero recognition or commitment to any aspect of the UNDESD agenda" (Chapman et al, 2006, p. 289).

In addition to the weak history of EE and ESD in New Zealand, Chapman et al also identify the neoliberal tradition of economic, social and education policy as a key reason for the lack of involvement by tertiary providers (and schools) in the UNDESD. The lack of a strong EE/ESD presence in New Zealand's tertiary education system has been reinforced by several other reports. As has already been briefly introduced, the Parliamentary Commissioner for the Environment produced two reports relevant to issues of sustainability and higher education in New Zealand (New Zealand Office of the Parliamentary Commissioner for the Environment, 2004, 2007). A key finding from these reports is summed up with the comment: "While environment-specific courses are available, with some offering good opportunities for skills and knowledge in sustainability, learning about sustainability is not a core (or even a fringe) component in most mainstream courses" (2007, p. 20)

Other reports confirm this view. For example, Pamela Williams' doctoral thesis finds that New Zealand universities lag behind international contexts (Williams,

2008). This view was shared by Stone and Baldoni (L. J. Stone & Baldoni, 2006). In 2010 the Regeneration Network's short evaluation of sustainability in higher education found that New Zealand lacked the same level of engagement with sustainability education as could, for example, be found in Australia (Packard, 2010). This report identified some interesting examples of good practice too, including the overall approach taken to sustainability at Otago Polytechnic, and the University of Auckland's signing on to the *Universitas 21* declaration with its commitment to:

a) Research towards sustainable futures

b) Education for sustainability

c) Universities as living laboratories for sustainability

d) Enhancing citizenship and engagement

e) Building capacity through cross network collaboration and action

Felicity Topp's Master's thesis also identifies the good work done at Otago Polytechnic (see also Mann, 2011, for a frank assessment of the work done at Otago Polytechnic). Topp's work contrasts the deeper attempt to develop 'sustainable practitioners' across the Polytechnic campus with the more piecemeal approach taken at the University of Otago (Topp, 2014). Even more recently, the work of Wood et al, focusing on the work of sustainability 'champions' in higher education in New Zealand (Wood et al., 2016) underlined the extent to which the curricula of higher education providers lacks any momentum in terms of developing an embedded and 'across the curriculum' ('third-wave') approach to sustainability (Wals & Blewitt, 2010). Drawing from some of the earlier studies cited above, Wood et al suggest that EfS "remains persistently more likely to be represented within a small range of historically environmentally-focused disciplines and single-disciplinary programmes. This tendency presents a challenge to many who have highlighted the necessarily interdisciplinary nature of EfS" (p. 5).

Surveying tertiary education in New Zealand

The findings of the above research papers are consistent what has been found in an evaluative survey carried out for this thesis. This approach examined (on-line)

documentary evidence from each of New Zealand's eight universities, its three wānanga and its eight largest ITPs. The information evaluated included strategic plans, investment plans, journal articles, sustainability plans, graduate profiles and curriculum reporting/planning. No private training providers or smaller ITPs were included, not just because of the overall difficulties this would have posed in terms of the size of the sample, but because the documentary information that could be gathered from such providers was limited.[19] While 'sustainability' information was the easiest form of information to gather (or identify as absent) an attempt was also made to see how issues of engaged scholarship and wellbeing, influenced teaching, research and outreach activities. For the record, very few examples of wellbeing education were found in line with the understanding of this field taken in this thesis. Where wellbeing was discussed it was via the mental and emotional wellbeing of staff and students.

In the original scoping and planning of this research, the discussion of the findings from this 'desktop' survey was originally to form a larger part of the thesis. It was decided however, on the basis of space available, and the priority given to other elements of this study, that the findings did not warrant a full chapter.[20] In part this was because of the relatively low emphasis placed on sustainability and ecological thought as an over-arching curriculum and research priority in New Zealand's TEIs. There also seemed little point in documenting an absence. A detailed discussion was also undermined by the fact that it can be difficult to compare the effectiveness of each TEI's overall approach with so little data on available on its pedagogical impact, especially in relation to how many staff and students might (or might not) be improving their Anthropocene Intelligence as a product of research and teaching. From a slightly different

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[19] It was also found that some of the ITPs and wānanga did not include online a full range of strategic documentation. More research is therefore needed to develop a full picture of how such TEIs have addressed sustainability.

[20] A basic evaluative approach was used to group New Zealand's TEIs. This structure is provided as an appendix to this study.

perspective, it is also difficult to evaluate the worth of any 'green' initiatives in New Zealand's provision of higher education because of the obvious and less obvious forms of green-washing surrounding public statements on these efforts. That said, there is a need for more research and evaluation in this area, especially work that includes interview data, student achievement data, more detailed self-review and on-site observations.

Despite the documentary approach taken here however, it has been possible is to identify some overall patterns in the way higher education provision in New Zealand is oriented in relation to the possible development of Anthropocene Intelligence. The major collection of this data happened during the second half of 2016, although it is also evident, on returning to the websites of these TEIs in 2017 and 2018, that some have continued to develop aspects of their operations. For example Massey University and the University of Otago have each released a new sustainability plan (Massey University, 2018) and Victoria University Wellington have signed a commitment linking education and the SDGs (Victoria University Wellington, 2017c).

One aspect that is unlikely to have shifted from 2016 is the overall neoliberal nature of higher education practice in New Zealand. This point reflects the sentiments of Chapman et al (2006), although it should also be emphasised that such an approach to higher education is very much embedded, not just in any institutional mindsets of university leaders, but in the actual policies and structures in which New Zealand's TEIs operate. Evidence of the neoliberal mindset of higher education practice can be seen, for example, in the countless references *within the system* regarding the role higher education plays in delivering 'economic growth':

> National and international evidence suggests that investing in universities is a positive way to grow an economy. (Universities NZ – Te Pōkai Tara, 2017)

> If we want our economy to prosper, we need to create and sell new products and processes. These arise from research, and the bulk of a society's research is

conducted in universities or by people who graduated from universities.
(McCutcheon, 2014)

As well as aligning tertiary education outputs with economic growth, successive
governments want the sector to be more 'business-like'. (S. Grey & Scott, 2012)

Despite the overarching neoliberal culture within and surrounding TEIs, there
was a range of interesting initiatives which, at least in terms of their potential,
showed an aspiration to develop a more ecologically responsible approach to
education. As has already been introduced, the work of Otago Polytechnic is the
standout TEI in terms of sustainability in New Zealand. On the basis of its current
reporting, website, research data (Topp, 2014) as well as the publications of one
of its sustainability leaders, (Mann, 2011) it is clear that this TEI has done much
to develop a sustainability approach across its curriculum (and not just in terms
of campus greening). It has done this through promulgating the idea of the
'sustainable practitioner' across its different departments, although this has not
always gone smoothly as the frank account of Samuel Mann points out:

Like a commitment to developing Total Quality Management, EfS is an ongoing
project. It is therefore important not to forget that Otago Polytechnic is on a
journey, and is not making the claim that all is perfect, or that it is a sustainable
organisation (Mann, 2011, p. 21).

Such a point of view is supported by the long-term goals presented in the 2016
Annual plan of Otago Polytechnic (Otago Polytechnic, 2016), which suggests that
sustainability is not yet developed across all of its courses. For example, as an
aspiration for Otago Polytechnic's future includes the sentence: "Embed
sustainable practice into all of our programmes so all graduates can become
sustainable practitioners" (p. 45). Despite the fact that it still has work to do,
what has been developed at Otago Polytechnic provides a benchmark for other
TEIs. According to Felicity Topp, Otago Polytechnic's success is linked to such
factors as: leadership, staff commitment and participation, communication,
organisational culture and organisational context. On this basis, Topp found that
Otago Polytechnic's approach to sustainability was much stronger than its

University counterpart in Dunedin (which also formed part of her study). While Otago Polytechnic had a systemic, well-led, inclusive and widely shared approach to developing sustainability, the University of Otago did not:

> At the University of Otago, sustainability was perceived to have low priority within institution, and to be treated as a competing agenda rather than an institutional value. The lack of policy and formalised structures for taking vision through to action in the transition to sustainability was a significant source of frustration for study participants. It also contributed to low expectations both for finding opportunities to contribute within professional roles, and for institutional capacity building and progress. (Topp, 2014, p. 121)

Topp's analysis draws on data from 2011. More recently, while there have been a few developments at the University of Otago in terms of sustainability, it is also clear that sustainability has not developed to the point where it represents anything like the 'third-wave' approach discussed by Wood et al (2016). Overall, sustainability, as seen through the university's website, has very much a campus greening element to it, and nothing like a curriculum-wide approach:

> University staff working in the field of sustainability in operations management think of sustainability as being defined by a broad set of ideas, such as minimising the production of waste, using renewable energy, maximising opportunities to recycle, reducing our impacts on ecological systems and contributing to the wellbeing of people and communities at a local, national and international level. (University of Otago, 2017a)

From the 'teaching and research' tab, within the University's sustainability website, is the underwhelming confirmation that sustainability is predominantly the concern of some specific subject areas:

> A committee of academic staff has been formed to discuss the further advancement of sustainability as an essential part of all teaching and learning, and one of the outcomes of the committee has been compiling a list of all current papers and courses that involve sustainability related issues.(University of Otago, 2017b)

Certainly some of the places where sustainability education occurs at the University of Otago are significant, including the Otago Energy Research Centre, the New Zealand Centre for Sustainable Cities and the Oceans and Climate Change Research Centre. However, as an organisation that could potentially develop the sort of epistemological shift underpinning the Anthropocene Intelligence argued for in this thesis, then such an approach seems highly limited. Sustainability, in other words, remains something of a fringe option and not a basis for curriculum reorientation.

The approach taken to sustainability at the University of Otago reflects that of other TEI's in New Zealand. There are certainly some standout pockets of academic work linked to sustainability and engagement, but little of depth in terms of how TEI's have developed their overall curricula in terms of such aspects as sustainability, engagement and wellbeing. At an overall level, those organisations that reflected a moderate to good focus on sustainability, engagement and wellbeing included the Ara Institute of Canterbury, Massey University, Victoria University Wellington and Lincoln University. The Ara Institute's *Sustainability Charter* sets out to make sustainability a more central aspect of their teaching and learning (Ara Institute of Canterbury, 2016b). Such an orientation is evident in their well-regarded courses on sustainability and the outdoors, and permaculture, and is also discussed as part of their investment plan for 2017-2019 (Ara Institute of Canterbury, 2017). Such an emphasis is not however part of their brief strategic plan. Evidence from their 2016 annual report (Ara Institute of Canterbury, 2016a) suggests that the presence of sustainability in their courses is not yet embedded, measured or evaluated.

Victoria University (VUW) has some notable corporate sustainability achievements as part of what it describes as a 'Global-Civic' approach to higher education (Victoria University Wellington, 2017b). According to VUW, Global-Civic universities are those in which:

- the virtuous cycle connecting great universities with healthy communities is actively fostered in a sustainable and intergenerational manner

- community engagement is a core function alongside teaching and research and is seen in both a local and global context

- the university's international agenda is one of partnership—linking the local to the global and the global to the local—and the provision of knowledge to enhance global governance and the global commons

- public good values dominate over market values

- securing the intellectual potential put at risk through experience of disadvantage is a collective priority

- research quality and research impact are co-priorities and intellectual property processes foster innovation and partnership

- ranking with the world's best universities is the shared expectation.

In addition to the previously mentioned commitment to the SDGs, Victoria University is also a member of the Talloires Network. It appointed an assistant vice-chancellor (Sustainability) in 2016, and won a Green Gown award from ACTS (Australian Campuses Towards Sustainability) for carbon reduction in 2015. Victoria's strategic plan has a central commitment to civic engagement and sustainability and commitments to these ideas are at least acknowledged in a range of teaching, learning and operational initiatives. For example, its curriculum and research profile includes some high profile work on climate change, much of which has also involved a high level of engagement with government policy and several efforts to deliver free public lectures also. Similarly the Institute for Governance and Policy Studies has shown high levels of engagement with government policy through departmental and public research presentations on such issues as Anticipatory Governance, Open Government, Deliberative Democracy and Climate Change policy.

Victoria has also developed an interesting engaged scholarship approach through is 'Victoria Plus' programme. This programme, which is the foundation of its connection to the Talloires Network, provides a strategic approach to a range of 'extra-curricular' skills and activities that are broadly consistent with the aspirations of approaches such as 'ecological citizenship' (Dobson, 2010, 2012). Students participate in a range of personal and professional development

activities and are also expected to contribute to community social and environmental projects. The achievements of students are recorded as part of their academic transcripts, either at the level of a certificate, or an 'award'. At the time of writing the Victoria University website claimed that over 500 students were part of the programme.

The Victoria Plus programme is complemented by an academic programme that includes a Bachelor of Arts (BA) Internship opportunity for students (with at least a B+ average) who can receive an academic grade for a "work-based project while on a voluntary placement in a public sector agency, private sector establishment, or non-governmental organisation" (Victoria University Wellington, 2017a). The extent to which the Victoria Plus programme, the BA Internship opportunity and the overall VUW curriculum actually develop forms of 'Anthropocene Intelligence' in its students is difficult to establish at a distance. It is however possible to see competing versions of the curriculum across Victoria University's corporate profile, including weak and strong versions of sustainability alongside the 'Global-Civic' push of its leadership. The extent to which these aspirations actually manifest in a majority of students seems questionable given the relatively conventional structure of, for example, the courses in the business school or education faculty. Education at Victoria, as is found now at most other New Zealand Universities, has very little connection to issues of EE and EfS for example (see also Williams, 2008). As a possibility for further research and evaluation then, a key question for Victoria is the extent to which its global-civic mission is content to draw upon conventional (liberal) approaches to sustainability and engagement compared to the development of alternative and critical epistemological models such as those linked to postfoundational ecological thought as presented by this thesis?

That said, it should also be acknowledged that Victoria, along with Otago Polytechnic, are ahead the other TEIs in New Zealand when it comes to issues of sustainability, engagement and wellbeing. One of the few TEIs which compares is Lincoln University, which has developed its mission as a land-based university

around three significant goals: 'Feed the world', 'Protect the future' and 'Live well' (Lincoln University, 2018). Again it is not easy from a distance to explore in any detail the extent to which Lincoln is achieving these goals, especially in terms of student outcomes. Lincoln has in recent times also had some difficulties in managing its finances, which is arguably a distraction in fulfilling its mission. Moreover, while there is much in its research profile that suggests that it *is* developing some compelling and ecologically enlightened approaches to important issues, there are also aspects of its research which reflect an unsustainable status quo (Lincoln University, 2015/16). For example, Lincoln research investigating what can be learnt by the New Zealand dairy industry in relation to the recently developed 'mega-farms' of the United States (with over 25,000 cows) found, that more intensive farming in New Zealand could be good for profits, especially in relation to the increased protein demand from China and India:

> The modelling results showed that changing dietary patterns in India and China could lead to higher producer returns from meat and dairy commodities in New Zealand, with only moderate increases in GHG emissions (p. 30)

The remainder of New Zealand's TEIs tend very much towards a more 'campus greening' approach to sustainability, which includes courses that have a 'sustainability component' along with somewhat traditional pedagogical approaches to issues such as engagement and wellbeing. Such organisational approaches can also be accompanied by pockets of teaching and/or research that is of international quality, albeit that such work is more the product of individual and small group passions, rather than deeper organisational structures. This was found especially with the remaining universities, where an otherwise routine approach to sustainability was accompanied by occasional examples high quality scholarship.

For example, New Zealand's largest and highest ranking university, the University of Auckland, has taken an approach that very much reflects a liberal and neoliberal approach to education - with far fewer characteristics consistent with

an ecological university (Barnett, 2011). As can be seen in a variety of sources, including the extensive public campaign aimed at having the University of Auckland to divest from fossil fuels, the University of Auckland's management place far more emphasis on the development of revenue (in the first instance) than they do on developing meaningful organisational approaches to sustainability, citizenship or education in the Anthropocene (see for example, (McCutcheon, 2014; NZ Herald, 2014; University of Auckland, 2013, 2016).

In such a context there are a few aspects to the University of Auckland's performance that are worth noting. For example, despite the organisational limitations placed on sustainability, there is evidence of some energy for this issue via the small sustainability office (attached to the property services division) and the 'sustainability news' website of the University (which includes news about 'sustainability week') (University of Auckland, 2018). Pedagogically, and despite a somewhat weak graduate profile (Academic Quality Agencies for New Zealand Universities, 2014), the University of Auckland also has a wide set of general education courses at the undergraduate level. Students who complete an undergraduate degree at Auckland are expected to take two general education courses, which include a range of courses spanning history, dance, conservation, earth science, languages, computing and so on. While a few of these courses have a strong sustainability element, overall, perhaps more importantly, such courses also represent a small first step in developing the sort of inter-disciplinary competence in students that has been advocated in sustainability education. The extent to which these courses actually develop anything like Anthropocene Intelligence in students is questionable based on the variety of courses students may take and the extent to which these courses could positively disrupt the unsustainable assumptions underpinning their main subject choices.

Other features of note at the University of Auckland include its signing of an international declaration (Universitas 21) as well as being an "institutional member of the UN Sustainable Development Solutions Network (SDSN)"

(University of Auckland, 2017b). More importantly perhaps, the University of Auckland is home to a range of highly able academics, working across many different departments who, despite their organisation's questionable commitment to a more ecological approach to education, have nevertheless worked towards such an approach in their own research and teaching. Without going into detail, just a few of these academics includes Jane Kelsey, Niki Harre, Barry Coates, James Russell and Glenn Simmons. As with other universities in New Zealand, the University of Auckland demonstrated relatively limited focus in the education departments on issues of sustainability, environmental education and education for the Anthropocene.

At the level of polytechnics and technical institutes, New Zealand's remaining ITPs share, with most of its universities, a tendency towards a 'campus greening'. Unlike the universities, New Zealand's ITPs lack the high level pockets of research that can contribute to new societal approaches in the Anthropocene. No doubt in line with the 'technology' focus of many of the remaining ITPs, it is clear that shallow forms of ecological modernisation structures organisational and curricula thinking. For example, Unitec's 'One planet' strategy introduces itself in terms of transforming teaching and learning before quickly articulating 10 campus greening goals (Unitec, 2018). Even more extremely, the Manukau Institute of Technology makes no attempt at even green-washing its audience and focuses purely on what it can add to the economy (Manukau Institute of Technology, 2018). As its strategy states:

Our Purpose

Our purpose is to get people into great jobs.

Our Vision

To be widely recognised as the leading Institute of Technology in New Zealand.

Our Mission

Our mission is to deliver vocationally focused tertiary education, research and technology transfer that ensures Auckland's economy, graduates, employers and communities have the capability and skills to achieve their potential. We

recognise that we have a special obligation to serve the people, communities
and employers of Counties Manukau and that achieving significantly improved
tertiary education outcomes in this subregion is critical to both our mission and
to the future economic and social prosperity of the nation.

Among the typically shallow responses though, one quote that does stand out
across the ITPs belongs to the grand sounding facility at Wintec – the Advanced
Sustainability Research Facility. This department specialises in a range of
technical developments. Its main initiative is the 'Eco-village' on the Wintec
Rotokauri Campus, which is described on Wintec's website as "five houses which
are occupied by students and where dedicated technology evaluation can be
done in a domestic setting" (Wintec, 2018). While in some ways this initiative is
modest by domestic and international standards, the extent to which this
approach reflects an ITP tendency towards (weak) ecological modernisation is
significant:

> The Advanced Sustainability Research Facility focuses on research in the
> domestic and small business sustainability space. The aim is to improve
> sustainability practices for end-users on a national scale, without the need for
> consumers to make major changes in their lifestyle choices.

From one perspective it can be argued that a view of sustainability that endorses
the uncritical view that sustainability **does not** involve "major changes" to our
lifestyle risks doing more harm than good. At a very significant level, the point
made here is that such a view of sustainability trivialises the GEC, reducing it to a
technical problem without an epistemological dimension, and without reference
to the extent to which the global footprint of humanity already far exceeds
biophysical limits. From another perspective, this nadir of sustainability thinking
also represents how much there is to achieve in New Zealand tertiary education.

Towards a new approach to higher education policy

The change of government for New Zealand at the end of 2017 represents an
interesting change in rhetoric around sustainability and wellbeing in public
policy. It remains to be seen how such an approach actually develops given New

Zealand's current policy context. In higher education especially, while there is some obvious aspiration for a change in the mission and approach to higher education, the overall context has only pockets of activity reflecting the sort of Anthropocene Intelligence described in this thesis. This is underlined in relation to New Zealand's higher education policy framework, where the current *TES*, and the intended policy focus of the Labour coalition government, suggests that there will be few substantive changes from the current neoliberal aims and purposes. Indeed the lack of thought in relation to higher education does not bode well for the Labour-led coalition supporting deeper forms of thinking and action about sustainability, wellbeing and limits. As some form of contrast perhaps, the following chapter sets out some possible steps towards a more ecological approach for higher education policy in New Zealand.

Chapter 10: New approaches to policy are possible

*You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolet*e – Buckminster Fuller

This thesis began as an attempt to develop an ecological direction for higher education policy in New Zealand. In trying to think differently about higher education policy, this thesis has also been an exploration of ecological policy analysis. The focus on higher education has become a type of case study, a way of testing whether or not an ecological approach to policy can offer a healthy alternative to the politics of unsustainability. At the end of this thesis, an important question left to ask is whether this thesis has succeeded in furthering the case for an ecological approach to policy? Or, from a slightly different perspective, it can be asked if the ecological approach to policy used in this thesis, provides a useful response to the Anthropocene?

In drawing this thesis to a conclusion, the judgement made here is essentially positive – another approach to policy is possible. This chapter argues this point by synthesising how an ecological approach to policy has been carried out in this thesis – through the first nine chapters – and then by concluding this policy process by identifying a new, ecological direction for higher education policy in New Zealand. This ecological direction for higher education policy in New Zealand features some significant recommendations for how higher education could operate in an Anthropocene Aotearoa. This includes how New Zealand could aspire to be world leaders in ecological education and how the priorities for New Zealand's Tertiary Education Strategy could be transformed.

Interconnected with these recommendations for higher education policy is the aspiration that New Zealand should develop as an ecological democracy. It is this recommendation that brings together the reasons for developing an ecological approach to higher education in the first place. Fittingly, this recommendation underlines the possibility that ecological policy analysis can be applied, not just

to other areas of education policy, but more broadly to fundamental economic and social policy concerns. An important implication of this point is that despite being a thesis aimed at reconsidering the higher education policy of a small OECD country – this thesis also operates, in its own way, as an argument that there is real potential for ecological policy thinking to be applied more broadly. Potentially ecological policy thinking could become a more common aspect of scholarship as well as a more common tool helping to take the planet beyond the current status quo.

Synthesising the case so far

How then has this thesis operated as a piece of ecological policy thinking? As an important step in this synthesis it is worth remembering that this thesis began with three questions:

1. What is the Global Ecological Crisis (GEC) and to what extent is the GEC an educational crisis?

2. What does it mean to be 'ecological' in higher education?

3. What could an ecological approach to higher education policy in New Zealand look like?

The answers to these questions reflect what has been learnt in this thesis as well as how this particular example of ecological policy thinking has been undertaken. The first thesis question involves the GEC, but before analysing the GEC, Chapter 2 of this thesis provided a key philosophical contribution to what it means to take an ecological approach. This chapter argued that there are a range of views about what counts as ecological but pointed to the need for a postfoundational approach to ecological theory. In particular the work of Gregory Bateson and Felix Guattari was identified as a way of understanding the epistemological dimensions of ecological thought. Through a critical approach to Bateson and Guattari, this thesis has been able to justify an ecological epistemology and challenge established liberal and neoliberal ideas about economics, subjectivity and the nature of the GEC.

On the basis of the ecological theorising developed in Chapter 2, Chapter 3 provided some important links to the need for a critical approach to policy. This chapter explored the role of pragmatism in the methodological approach taken in this thesis and also helped name this approach as Critical Eco-Pragmatism (CEP). While there were many theoretical links made in this chapter, the key connections were those made between ecological theory and the potential of critical policy analysis processes to suitably respond to the entangled values and evidence of policy problems. It is from such a basis that an ecological approach to policy could draw from critical ideas about ecological democracy (Dryzek, 2013; Faber & McCarthy, 2003) and ecological economics (Spash, 2013).

Subsequently, it was the critical ecological perspective developed in this thesis that was used to analyse the GEC and establish the connections between human 'success' and the transcending of planetary boundaries (Steffen, Richardson, et al., 2015). From a CEP perspective, the GEC is an interconnected crisis linked to the social, psychological, political and natural dimensions of life on Earth. Hence, the GEC can be understood as a policy problem linked to humanity's epistemological errors – including those related to economic growth – as well as the challenges offered up by the politics of unsustainability and post-truth.

The interconnected nature of the GEC underlines the need for alternative policy approaches. Making an ironic link to how neoliberalism itself became hegemonic, it has been argued throughout this thesis that an approach to policy informed by a postfoundational approach to ecological theory is much more than an act of political pragmatism. Ecological policy alternatives are about imagining what policy ideas are able contribute to planetary wellbeing. This is an approach that demands high levels of rigour about the ***entangled values and evidence*** of policy making (Rein, 1983). It is such an approach which was able to analyse the GEC as only partly an educational crisis (in Chapter 5) and then also seek out what an alternative, ecological approach to education might actually look like. By the end of Chapter 5 the argument made was that although a few critical elements of Environmental and Sustainability Education (ESE) have sought to develop a

postfoundational approach that re-orients all of education, ESE itself lacks a philosophically rigorous tradition to deliver such an approach.

In this regard, Chapter 6's critique of the ecological university, and the development of an ecological framework for higher education in Chapter 7, demonstrated how the ecological theory approach in this thesis can fulfil the philosophical rigour expected in an ecological approach to policy analysis. Among the ideas developed in this section of the thesis is the importance of Anthropocene Intelligence and the possibility that an ecological approach to higher education can develop a healthier orientation for higher education than traditional liberal and/or neoliberal assumptions.

Chapters 8 and 9 of this thesis explored a few of the contemporary global and domestic policy and practice approaches used within higher education. While in many ways these chapters offered only a glimpse of what is already occurring in higher education policy and practice, the evidence discussed in these chapters provided a basis for understanding how any ecological policy recommendations can be linked to existing practices. In the broadest sense, the example of the United Nations' Sustainable Development Goals (SDGs) showed how aspects of the current policy context can be contested using an ecological approach to policy and reinterpreted in terms of the aspiration to develop an ecological democracy. In particular, when policy thinking is directed into how a nation (or a planet) is to achieve all of the SDGs – and not just those goals that reflect some of the neoliberal heritage of the SDGs, or policy-makers' views about which specific goals they think are relevant – then there is an urgent policy need to understand how issues of decoupling, or sustainable consumption and production, might be achieved in anywhere near the levels required to avoid a catastrophic Anthropocene. Subsequently, the key conclusion made here is that for the planet to actually achieve the SDGs, countries including New Zealand will require a deep understanding of how humanity's psychological, social, political and natural systems are tied together – they will need, in other words, some form of ecological approach to policy.

An ecological direction for higher education in New Zealand

With this reflection made about how an ecological perspective might influence a deep and ecological policy approach to the SDGs, it is time to use the knowledge developed in this thesis to identify how an ecological approach to higher education in New Zealand can be translated into a new policy direction. Before this direction is articulated, it is important to recall what was said at the beginning of the thesis in relation to these ideas being the start of a conversation about what could be an ecological approach to higher education. There is, after all, no essential limit to the philosophical speculations and empirical evidence that might be gathered in a policy development process. It would then be an act of extreme hubris to think that one thesis is the end of the discussion. Nevertheless a point of view has been developed and justified, and in that sense the following ideas represent a type of 'green paper' of what an ecological approach to higher education can look like in New Zealand. Following on, the policy possibilities recommended in this section are that New Zealand develops:

- A genuine commitment to ecological democracy, one which is oriented towards a strong version of sustainability, including an economy (society) that operates within biospherical limits;

- A commitment to leading the world in realising the UN's Sustainable Development Goals (SDGs) as a medium-term focus towards becoming an ecological democracy;

- An aspiration to develop the education system (including higher education) to be a world-leader in ecological education;

- A transformed set of priorities for the *Tertiary Education Strategy (TES)* so that there is much less emphasis on instrumental economic goals and more emphasis on education for: collective wellbeing; global and community interconnection and engagement; being 'future-ready'; realising the principles of the Treaty of Waitangi; and becoming an inclusive higher education system;

- A review of all current tertiary education policies, including governance and international education to ensure that they are consistent with the

development of New Zealand's tertiary education system as a world-leader in ecological education;

- A national research strategy which supports New Zealand's transition to becoming an ecological democracy and also aims to develop a thriving research community in New Zealand. A significant focus of this strategy includes how research is undertaken in tertiary education, including by way of the National Science Challenges (NSCs);

- An independent (government funded) professional development service which would support tertiary education institutes to develop Anthropocene Intelligence as part of their teaching programmes; and

- An independent system of monitoring, evaluation and reporting about how well tertiary education institutes are realising the aspiration of New Zealand to become world leaders in ecological education.

Each of these possibilities is discussed below. These ideas form the basis of how New Zealand could develop an ecological approach to higher education (thesis question 3). Before these ideas are discussed in more detail, it is important to reiterate that these possibilities have not been 'costed' or considered in relation to the total policy and legislative context of higher education in New Zealand. These suggestions are not then, a total redesign of New Zealand's higher education policy architecture. They are instead a new direction for higher education in New Zealand – one which draws on aspects of the existing framework. A great deal more work would be needed to implement these ideas and develop them into actual, meaningful change. This is especially true of the aspiration to develop New Zealand as an ecological democracy, where the potential for change extends well beyond what might be discussed in a single thesis.

New Zealand as an ecological democracy

John Dryzek discusses an ecological democracy as a structure that is capable of learning (Dryzek, 2013). In particular he has argued that ecological democracy could learn from those political forms linked to ecological modernisation, sustainable development, pragmatism and a radically-inspired understanding of

limits. Given the interconnected nature of the GEC, the development of New Zealand as an ecological democracy is seen as a cornerstone within the ambition to develop an ecological approach to higher education. There seems little point, after all, in developing what could be described as the greenest education system in the world, if other policy areas reflect deep forms of unsustainability.

The aspiration for New Zealand to flourish as an ecological democracy includes the importance of building a healthy and deliberative democratic culture, one in which alternative points of view are given more consideration than they are currently, and where moneyed interests are given less. Significantly, this democratic culture-shift requires an understanding of the values needed for life in the Anthropocene, but should also integrate high quality research and evaluation. Experts then, are not just people who can be found to agree with your point of view (thank you ex-Prime Minister Key), but can contribute to deliberative and scientific cultures. In this regard ecological democracy represents a willingness to adopt policy approaches that are more like adaptive management (B. G. Norton, 2005) than the current politics of unsustainability and post-truth backed up with technocratic policy analysis.

Within such an approach to ecological democracy, there are some important features that can be identified about the policy development process. This includes the need for longer-term planning, in line with the sorts of anticipatory governance approaches suggested by Jonathan Boston (Boston, 2016). It also includes a 'gathering up' of those approaches to policy and deliberation that can mitigate those forms of power that are less interested in deliberation and more interested in domination. This goes to the heart of the discussion between deliberative democrats (Dryzek, 2005, 2012; Elstub et al., 2016), agonistic democracy (Mouffe, 1999) and those more pragmatic forms looking to improve the ways political decisions are made, including such figures as Kate Raworth (Raworth, 2016) and Andrew Dobson (Dobson, 2014). Within this approach New Zealand could aspire to be world-leading in terms of global and environmental citizenship. Such a position would, in New Zealand's case, set a direction away

from what has been New Zealand's woeful environmental record, especially under the previous National government.

Better aspirations and longer term policy thinking also needs to have high quality and independent sources of data. Currently in New Zealand the quality of data 'allowed' to be released by government departments is considerably politicised (Palmer, 2014; Rashbrooke, 2017). In an age of post-truth politics there is much to commend in the idea that New Zealand needs to have an independent climate commission along the lines suggested by Generation Zero through their proposed Zero Carbon Act. The fact that New Zealand's Green party has also identified this as a key policy area in the 2017 coalition agreement with Labour provides some scope that the quality of information in New Zealand's political ecology will improve. This aspect is discussed further below.

New Zealand and the United Nations Sustainable Development Goals

In the context of the ecological approach taken in this thesis, the idea of an independent commission should not just be linked to climate change. As an ecological democracy New Zealand should expect to lead the world in responding to the UN's SDGs. As has been argued earlier in this thesis, there is much to commend the UN's goals, should issues like decoupling and sustainable production and consumption be taken seriously. Seriously in this case includes the possibility of taking an ecological approach to the goals, one that does not cherry pick the goals or prioritise economic growth. In a New Zealand context, our poor environmental record would provide scope for developing far more integrated solutions to improving our performance across the goals – rather than the unsustainable (neoclassical) tradition of growing the economy and putting in place a few (unsustainable) environmental reforms. A more ecological aspiration for the goals could therefore benefit from having a suitably resourced independent commission whose role it was to critically consider New Zealand's performance across the SDGs. Such a commission could potentially also provide policy alternatives that would help the country achieve these goals.

This does need not be a single agency and there is scope to consider how any independent government body works with public sources of information and scrutiny. Universities are an obvious source of policy nous in such a context, and any policies looking at the quality of evidence surrounding New Zealand's progress on the SDGs could benefit from the involvement of committed scholarship in this area – both in terms of monitoring and evaluation, but also in terms of alternative policy possibilities too. In ecological terms, the aspiration for an ecological democracy should be to develop an ecology of knowledge that supports learning and the sort of development that arises from New Zealand progressing across the full range of the SDGs (not just what suits at the time).

New Zealand as world leaders in Anthropocene education

As the evidence surrounding New Zealand's engagement in the Decade for Education for Sustainable Development (DESD) shows (Chapman et al., 2006), New Zealand starts from a long way back when it comes to issues of environmental and sustainability education (see also Bolstad et al., 2015). While at one level this absence suggests a lack of any community momentum around anything like 'green' education (in the broadest sense) this can also be interpreted as a positive in any future leap to 'Anthropocene' education. The basis for this optimism comes from the possibility that rather than ESE advocates, the drive to develop Anthropocene education could be led by, for example, by a coalition of indigenous scholars, educational philosophers and social theorists. These thinkers, after all, have had the clearest theoretical concerns about the way New Zealand's liberal and neoliberal excesses in the past have impacted upon educational delivery (Mika, 2015; Peters, 2015a, 2015b). Interestingly, while this thesis has been aimed at higher education, there is some potentially intriguing work that could be carried out to identify how ecological thinking could help address issues that, as this thesis is being written, are being reviewed by the current Labour-led coalition (Ministry of Education, 2018a). There are potentially some very productive possibilities to be developed in using ecological thought to help imagine alternatives to Tomorrow's Schools, or in developing an alternative to the New Zealand's National Certificate of Educational Achievement (NCEA). It is such areas of educational thought that will

also have to be addressed if New Zealand is to develop an education system that is actually world leading in terms of the ecological vision developed in this thesis. Furthermore, alongside any government's aspiration to develop New Zealand's education system as world-leading in a deep, ecological sense, will have to be measures of progress that go beyond NCEA pass rates (or National Standards results) – as was undertaken by the previous National government. Presumably, indicators of educational system health and student flourishing will require a more nuanced form of analysis and a more diverse set of indicators than is currently in use.

The development of a richer set of indicators, and a more critical approach to analysis, would be supported by a critical shift towards Anthropocenic pedagogy. Here then, and as part of any aspiration to lead on Anthropocene education, New Zealand could benchmark its education policies against nations such as Sweden and Ireland. Learning from the world's best offers much more scope than continuing a narrow economic focus for education. A particular way such an approach could be supported is by encouraging education providers (from early childhood through to tertiary) to learn from the best in the world too. Potentially this could mean that the government could help establish research funding/units in universities that are committed to developing particular aspects of Anthropocene education (see also below).

A transformed Tertiary Education Strategy

The aspiration to lead the world in Anthropocene education requires changes to the priorities within higher education. In New Zealand's current tertiary education policy architecture this indicates changes are needed to the priorities of the *Tertiary Education Strategy (TES)*. As was discussed in the previous chapter, the current priorities in the *TES* are guided by a narrow economic agenda. While New Zealand continues to have an economy in the Anthropocene, the ecological thought in this thesis implies that a broader set of priorities need to be developed. While there is not enough space in this thesis to weigh up all the possible alternative priorities that could be developed, some important candidates can be identified based on the discussion to date. These priorities

relate to issues such as collective wellbeing, global and community interconnection, being 'future ready', realising the principles of the Treaty of Waitangi and developing an increasingly inclusive higher education system.

Such priorities will be more difficult to measure, monitor and/or evaluate than, for example, the number of adults who can read, or the overall level of achievement by Māori and Pacific students, however they do address more fundamental issues in terms of New Zealand's interconnected ecologies. Hence instead of a narrow focus on discrete skills like literacy, an updated *TES* could consider how well TEIs are developing partnerships with the Māori communities and helping Māori students develop their potential (as is implied by the principles of the Treaty of Waitangi). Similarly, the idea of an inclusive higher education system speaks to how well higher education is promoting the success of students from a variety of backgrounds, including those with disabilities, ethnic minorities or from working class communities. Such a priority speaks to the overall health of New Zealand's social ecologies.

Admittedly, the idea of a higher education system being 'future ready' echoes the sort of discourses borrowed from political spin. The intent with such a suggestion however, is to connect the mission of higher education to the long-term possibilities for the nation and planet. More often than not the idea of 'future' learning, such as '21st century learning' is captured by techno-optimistic accounts of what is possible in a curriculum fixated on information technology (Bowers, 2014; Cuban & Jandrić, 2015). This is not so much the intent here, where issues of sustainability, automation, collective wellbeing and/or low-carbon forms of flourishing need to be integrated into teaching and learning.

Review of New Zealand's tertiary education policies and legislation

In addition to the changes to the priorities of the *Tertiary Education Strategy*, there are a range of other tertiary education policies and legislative structures that need to be reviewed in light of New Zealand aspiring to be world leaders in education for the Anthropocene. In light of the discussion in the previous chapter, specific policies that could be part of such a review process include the

recent changes made to University Governance; the international education strategy of New Zealand; the Performance-based Research Fund (PBRF); and Centres of Research Excellence.

A review of research issues is discussed in the sub-section following, but the question of university governance is an important avenue to review given its role in structuring the strategies of individual TEIs. As discussed in the previous chapter, the 'busnocratic' (Peters & Marshall, 1996) changes made to the governance of TEIs has significantly increased the proportion of government appointed board members and essentially created a more narrow, economic focus for higher education in New Zealand. Potentially there is much that can be done to rebuild a more democratic aspect to these boards and also support Boards to achieve a broader range of outcomes (especially in line with a change to the tertiary education priorities).

Legislative changes could also be used to support the updating of the tertiary education priorities. In line with those countries that have developed educational strategies around sustainable development, there are potential changes that could be made to New Zealand's Education Act that include a focus on ecological democracy (or something equivalent) alongside an updated aspiration for higher education to go beyond being the 'critic and conscience' of society. Such an aspiration would reflect higher education's role in supporting the development of an ecological democracy.

New Zealand's international education strategy, which currently has an exclusively economic approach, should also reflect any wider aspirations for national and planetary health developed through the *TES* and any legislative changes. Somewhat ironically perhaps, the aspiration to develop New Zealand as a world leader in Anthropocene education opens up economic possibilities. Such possibilities need to be researched however, and developed in a way that is consistent with the responsibilities that go along with education in the Anthropocene.

A national research strategy

As was discussed in the previous chapter, New Zealand has a range of research opportunities linked to such avenues as the PBRF, National Science Challenges, Centres of Research Excellence (CoREs) and the Marsden fund. While there is much to like about these different funds, there remain questions about the extent to which these funds support the development of New Zealand as an ecological democracy. Included in these concerns are questions about the support of early career researchers. While this thesis has not been able to examine all the different forms of funding available for research, nor fully investigate the claims made about the limited opportunities for early career researchers (that will happen soon after this doctorate is completed), the tentative suggestion is that if New Zealand is to adopt a focus on ecological democracy, including a focus on achieving the SDGs, then there does need to be a proportionate research strategy to support this aspiration. Included in such a strategy should be an awareness of how well 'research ecologies' are themselves developing in New Zealand. For example, to what extent are there research funding forms available to researchers in early, mid and later career stages? How does a research strategy align with the principles of the Treaty of Waitangi? Are there forms of research funding available across different knowledge ecologies? And are there suitable avenues for new forms of interdisciplinary research?

A professional development service for higher education

In line with the ARIES initiative in Australia (Chapter 8), New Zealand tertiary education policy could establish a professional development (and/or organisational development) service which supports TEIs to develop curricula that aims to improve the Anthropocene Intelligence of its staff and students. There are many ways in which such a service could operate, it could for example, become a Centre of Research Excellence (CoRE), accommodated within an existing TEI.

Such a service could be substantially funded by the government as well as generating a portion of its own funding, as ARIES does now (exclusively so, given that government funding has ceased). In this case then, there is an

entrepreneurial potential for the state to support a feature of New Zealand's higher education context that could also generate its own funding through an organisational change and education focus. Currently the University of Otago's 'Centre for Sustainable Cities' (http://sustainablecities.org.nz/) provides an example of how a similar concept has operated for urban development (albeit that the Centre is not itself a CoRE, but an initiative developed by the University of Otago).

An independent monitoring and evaluation service for tertiary education

While the idea of an independent commission for New Zealand's performance with the SDGs was mentioned above, there is good reason to favour some form of independent monitoring and evaluation of how well TEIs are developing within a government aspiration for New Zealand to be world leaders in Anthropocene Education. Potentially, such monitoring and evaluation would go beyond the existing work of the New Zealand Qualifications Authority and the Academic Quality Agency. It could potentially, have a governance structure that included membership from the TEIs, and the state, as well as members of any independent commission created to monitor and evaluate New Zealand's performance on the SDGs.

A key challenge for any such service would be ensuring that it developed the best possible indicators for Anthropocene education. As was observed in the previous chapter there is a tendency for ranking and award systems to be dominated by poor measures and subsequent bouts of green-washing that do little to generate critical pedagogical change. Developing more sophisticated evaluation techniques – in line with those needed to understand New Zealand's progress on the SDGs – will be an important part of any such service. One of the ways in which this service could improve the quality of New Zealand's tertiary education (with respect to the development of Anthropocene Intelligence) is by reporting on models of exemplary practice and identifying the deeper issues limiting ecological forms of teaching and research.

Final word - Ecological policy analysis for ecological democracy

> "These people are cowards. They're not going to walk into a school if 20% of the teachers have guns -- it may be 10% or may be 40%. And what I'd recommend doing is the people that do carry, we give them a bonus. We give them a little bit of a bonus," Trump said. "They'll frankly feel more comfortable having the gun anyway. But you give them a little bit of a bonus."
>
> – 'Trump proposes bonuses for teachers who get gun training' CNN Article 22 February, 2018 (Liptak & Gray, 2018)

The comment from Donald Trump above was made in response to the mass shooting at Florida's Marjory Stoneman Douglas high school in February 2018. For those readers with a passing knowledge of the evidence surrounding gun violence in the United States, the idea of arming teachers to prevent mass-shootings in schools is just plain stupid. From a slightly more scientific perspective, the point can be made that there is (unsurprisingly) little evidence that such a strategy would be effective in reducing the total number of deaths in such an event[21] - although there is considerable evidence that America's gun laws are (increasingly) tragic. These facts aside, the above policy 'moment' from President Trump, is a reminder of what can happen to a policy ecology when money, power and poor thinking take root. Beyond the politics of unsustainability and post-truth, there are, it seems, no lower limits to how unhealthy policy making can be.

This thesis does not have a solution to America's political ecology. It does however provide a small case study of how higher education policy could be improved in Anthropocene New Zealand. That said, it has also drawn on, and

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[21] The FBI published a study of 'Active shooters' in 2014, which found that individual mass shooting suspects tended to end without the intervention of police or civilians. Of the 160 incidents investigated by the FBI, 21 were stopped by citizens, workers or off-duty police officers, 6 of whom were armed. https://www.fbi.gov/file-repository/active-shooter-study-2000-2013-1.pdf

developed, an approach to ecological policy analysis which has implications for how governments around the world may develop policy in a variety of domains. The key implication is that there are potentially other forms of educational, economic and social policy could be developed using an approach based on ecological policy thinking. Rather than just any sort of 'ecological' approach, the philosophical, theoretical and empirical work undertaken in this thesis suggests that there are some important aspects that support ecological policy thinking, including:

- The need for an ecological (and deliberative) approach to democracy, one which includes a focus on limits
- A focus on developing policy alternatives to improve the options available to policy makers (rather than what is politically feasible at the time)
- The application of postfoundational ecological thought - including a theorising about the interconnections between psychological, social, political and natural ecologies
- Links to critical policy thinking (critical policy analysis) and critical forms of ecological economics (and other forms of heterodox economic thinking)
- An emphasis on a wide-ranging series of indicators to help understand and respond to the health of our multiple interconnected ecologies

Each of these aspects has been discussed in different ways across the thesis. The potential these different aspects have to create new policy thinking, including new forms of scholarship, is exciting. Looking out over the policy horizons, there are other ecological policy and research possibilities that could be developed in relation to trade policy, poverty reduction, community development, energy policy, housing, employment or health care. Ecological approaches in these fields could offer transformative policy options – not just in comparison to Donald Trump, but to neoliberalised policy thinking the world over.

In the face of such grand possibilities, it is worth taking a moment to bat off any accusations of utopian excess creeping into this final section of the thesis. In this point I refer back to the introduction of this thesis and the idea that the global policy context is in a state of flux at present – a state which might involve a much more ugly future or much more liberating policy alternatives. In New Zealand, the current Labour-led coalition can be seen as a move away from the 'ugly' and towards something ostensibly more progressive. Echoes of possibility can be found in other jurisdictions too. Just this week (at the time of writing), likely US presidential candidate Elizabeth Warren introduced the Accountable Capitalism Act to congress in an attempt to find legislative solutions to how corporations have been able to make profits without reference to workers, communities and the environment (Durkin, 2018). In a global political context that has so openly questioned capitalism, there is scope to see how radical ecological policy possibilities could soon be much more than academic and/or utopian exercises and regularly find their way into legislation in the near future.

As has been noted through this thesis too, the aspiration to develop policy thinking without reference to its current potential as a political 'win' has been at the core of how neoliberalism went from an isolated and erudite policy shop to a hegemonic approach to policy. Indeed neoliberalism found its way through to the mainstream on the basis of a crisis (an economic crisis) and, in relation to the analysis carried out in this thesis, there is every reason to believe that the GEC is far more of a crisis than stagflation was in the 1970s (D. Harvey, 2005; Stedman Jones, 2012).

The final example of why the possibilities for ecological policy are not wholly utopian, return us to questions of politics after Trump. Regardless of how any criminal investigations might undermine this presidency, there are democratic possibilities that can still champion better possibilities for the future. This is not to say that democracy will always win against moneyed interests – certainly the evidence has been against this in recent decades in American politics (Gilens & Page, 2014) – but as has been proven in relation to the events surrounding

following the gun violence at Marjory Stoneman Douglas high school, it is still possible to find popular, ethical and democratic ways of protesting – of thinking differently. There are, it seems, many young people concerned about the future – who need to have policy alternatives they can develop and fight for. Ultimately this is how this thesis could go into the world – in support of those battling for a more just, democratic and sustainable planet. If gun laws in America could change – anything is possible.

Time to go tramping – Kea, helping itself to my friend's chocolate, Nelson Lakes 1 January, 2014

References

Aaen, J. H., & Nørgård, R. T. (2016). Participatory academic communities: a transdisciplinary perspective on participation in education beyond the institution. *Conjunctions. Transdisciplinary journal of cultural participation, 2*(2), 67-98.

AASHE. (2017). STARS Participants & Reports.   Retrieved from https://stars.aashe.org/institutions/participants-and-reports/?sort=rating

Academic Quality Agencies for New Zealand Universities. (2014). *University of Auckland Academic Audit Report Cycle 5*. Retrieved from http://www.aqa.ac.nz/aucklandcycle5

Adorjan, M. C., & Kelly, B. W. (2008). Pragmatism and 'Engaged' Buddhism: Working Toward Peace and a Philosophy of Action. *Human Architecture, 6*(3), 37-49.

Ahmed, N. M. (2016). *Failing states, collapsing systems: Biophysical triggers of political violence*. Syracuse, NY: Springer.

Al-Mahmood, R. (2013). *Re-imagining the university: Vibrant matters and radical research paradigms for the 21st century.* Paper presented at the ASCILITE-Australian Society for Computers in Learning in Tertiary Education Annual Conference.

Alcorn, N. (1999). *To the fullest extent of his powers: CE Beeby's life in education*. Wellington, NZ: Victoria University Press.

Alexander, D. (1998). On Murray Bookchin's philosophy of social ecology. *Capitalism Nature Socialism, 9*(1), 125-130. doi:10.1080/10455759809358785

Alexander, J. M. (2008). *Capabilities and social justice: The political philosophy of Amartya Sen and Martha Nussbaum*. Portland, OR: Ashgate Publishing, Ltd.

Allcott, H., & Gentzkow, M. (2017). *Social media and fake news in the 2016 election*. Retrieved from http://www.nber.org/papers/w23089

Allen, C. (2010). Sustainability - splurging with your tax dollars. Retrieved from http://www.mindingthecampus.org/2010/12/within_days_of_the_gop/

Allen, G. (2007). Fallout from Bad '70s Idea: Auto Tires in Ocean Reef. *National Public Radio (US)*. Retrieved from https://www.npr.org/templates/story/story.php?storyId=11462066

Amaro, S. (2017, 10 April, 2017). There's more than 60% chance of a global recession within the next 18 months, economist says. *CNBC*. Retrieved from https://www.cnbc.com/2017/04/10/theres-more-than-60-chance-of-a-global-recession-within-the-next-18-months-economist-says.html

Ara Institute of Canterbury. (2016a). *Annual Report 2016*. Retrieved from Christchurch, NZ: http://www.ara.ac.nz/__data/assets/pdf_file/0005/407669/03810-Annual-Report-2016-LR.pdf#

Ara Institute of Canterbury. (2016b). *Sustainability Charter*. Retrieved from Christchurch, NZ: http://www.ara.ac.nz/__data/assets/pdf_file/0006/332385/03507-Sustainability-Charter-2016.pdf#

Ara Institute of Canterbury. (2017). *Investment Plan 2017-2019*. Retrieved from Christchurch, NZ: http://www.ara.ac.nz/__data/assets/pdf_file/0011/399935/Investment-Plan-Ara-Institute-of-Canterbury-2017-2019_.pdf#

Archer, M. (1998). *Critical realism essential readings*. London, UK; New York, NY: Routledge.

Ardern, J. (2017). Jacinda's speech to Campaign Launch.   Retrieved from http://www.labour.org.nz/jacindas_speech_to_campaign_launch

ARIES. (2018). Selected ARIES Projects. Retrieved from
        http://aries.mq.edu.au/projects/index.php#edu

Au, J., & Karacaoglu, G. (2015). Using the living standards framework: Update and policy
        examples. *New Zealand Sociology, 30*(3), 27-40.

Australasian Campuses Towards Sustainability. (2016). 2016 Awards. Retrieved from
        http://www.acts.asn.au/initiatives/ggaa/2016ggaa/

Badley, G. (2016). The pragmatic university: a feasible utopia? *Studies in Higher
        Education*, 631-641. doi:10.1080/03075079.2014.942269

Ball, S. J. (1993). What Is Policy? Texts, trajectories and toolboxes. *Discourse, 13*(2), 10-
        17. doi:10.1080/0159630930130203

Banaji, S., Burn, A., & Buckingham, D. (2006). *The rhetorics of creativity: A review of the
        literature*. England: Arts Council England.

Bandarage, A. (2013). *Sustainability and well-being: the middle path to environment,
        society and the economy*. New York Palgrave Macmillan.

Bang, H. P. (2011). The politics of threats: late-modern politics in the shadow of
        neoliberalism. *Critical Policy Studies, 5*(4), 434.
        doi:10.1080/19460171.2011.628065

Barad, K. M. (2007). *Meeting the universe halfway: quantum physics and the
        entanglement of matter and meaning*. Durham, NC: Duke University Press.

Bardi, U. (2011). *The limits to growth revisited*. New York, NY: Springer.

Barlett, P. F., & Chase, G. W. (2013). *Sustainability in higher education: stories and
        strategies for transformation*. Cambridge, MA: The MIT Press.

Barnett, R. (2010). *Being a university*. New York, NY; London, UK: Routledge.

Barnett, R. (2011). The coming of the ecological university. *Oxford Review of Education,
        37*(4), 439-455. doi:10.1080/03054985.2011.595550

Barnett, R. (2013). *Imagining the university*. New York, NY: Routledge.

Barnett, R. (2016). *Understanding the University: institution, idea, possibilities*. London,
        England; New York, NY: Routledge.

Barnett, R. (2018). *The Ecological University: A Feasible Utopia* (1st ed. ed.). Milton Park,
        Abingdon, Oxon, UK: Taylor and Francis.

Barnett, R., & Maxwell, N. (2007). EDITORIAL: Wisdom in the university. *London Review
        of Education, 5*(2), 95-96. doi:10.1080/14748460701440335

Barr, G. (2017). Giselle Byrnes: Productivity Commission's tertiary education report
        warrants a closer look. Retrieved from http://www.nzherald.co.nz/hawkes-bay-
        today/opinion/news/article.cfm?c_id=1503459&objectid=11822690

Barry, J. (2008). Towards a green republicanism: constitutionalism, political economy,
        and the green state. *The Good Society, 17*(2), 3-11.

Barry, J. (2012). *The politics of actually existing unsustainability: Human flourishing in a
        climate-changed, carbon constrained world*. Oxford, UK: Oxford University Press.

Barry, J. (2014). Green political theory *Political Ideologies: An Introduction* (4th edition
        ed.). London, UK: Routledge.

Bate, J. (2013). *Romantic Ecology: Wordsworth and the Environmental Tradition*.
        Cambridge, UK: Routledge.

Bateson, G. (1972). *Steps to an ecology of mind: Collected essays in anthropology,
        psychiatry, evolution, and epistemology*. San Francisco, CA: Chandler Pub. Co.

Baughan, P. (2015). Sustainability policy and sustainability in higher education curricula:
        the educational developer perspective. *International Journal for Academic
        Development*, 1-13. doi:10.1080/1360144X.2015.1070351

Becker, C. M., Glascoff, M. A., & Felts, W. M. (2010). Salutogenesis 30 Years Later:
        Where do we go from here? *Global Journal of Health Education and Promotion,
        13*(1), 25-32.

Beeby, C. E. (1992). *The biography of an idea: Beeby on education*. Wellington, NZ: New Zealand Council for Educational Research.

Bengtsen, S. S. (2014). Into the heart of things: Defrosting educational theory. In P. Gibbs (Ed.), *Thinking about higher education* (pp. 175-191): Springer International Publishing.

Bengtsen, S. S., & Nørgård, R. T. (2014). *Becoming jelly: A call for gelatinous pedagogy within higher education.* Paper presented at the Proceedings of the 9th International Conference on Networked Learning.

Bennett, J. (2009). *Vibrant matter: A political ecology of things*. Durham, NC: Duke University Press.

Bennett, P. (2016). Statement on Achieving Sustainable Development Goals - Speech delivered by Hon Paula Bennett Minister for Climate Change Issues, 22 April 2016 [Press release]. Retrieved from https://www.mfat.govt.nz/en/media-and-resources/ministry-statements-and-speeches/statement-on-achieving-sustainable-development-goals/

Best, S. (1998). Murray Bookchin's theory of social ecology. *Organization & Environment, 11*(3), 334-353. doi:10.1177/0921810698113004

Bhaskar, R. (1978). *A realist theory of science*. Atlantic Highlands, N.J; Hassocks, Sussex: Harvester Press.

Biesta, G. J. J. (2010). Why 'what works' still won't work: From evidence-based education to value-based education. *Studies in Philosophy and Education, 29*(5), 491-503. doi:10.1007/s11217-010-9191-x

Blewitt, J. (2013). EfS: contesting the market model of higher education. In S. Sterling, L. Maxey, & H. Luna (Eds.), *The sustainable university* (pp. 51-70). Abingdon: Routledge.

Blewitt, J. (2015). *Understanding sustainable development* (Second ed.). Oxfordshire, UK;: Routledge.

Blewitt, J., & Cullingford, C. (2004). *The sustainability curriculum: the challenge for higher education*. Sterling, VA; London: Earthscan Publications.

Blühdorn, I. (2007). Sustaining the unsustainable: Symbolic politics and the politics of simulation. *Environmental Politics, 16*(2), 251-275. doi:10.1080/09644010701211759

Blühdorn, I. (2011). The Politics of Unsustainability: COP15, Post-Ecologism, and the Ecological Paradox. *Organization & Environment, 24*(1), 34-53. doi:10.1177/1086026611402008

Blühdorn, I. (2013). The governance of unsustainability: Ecology and democracy after the post-democratic turn. *Environmental Politics, 22*(1), 16-36. doi:10.1080/09644016.2013.755005

Blühdorn, I. (2015). A much needed renewal of environmentalism? In C. Hamilton, C. Bonneuil, & F. Gemenne (Eds.), *The Anthropocene and the Global Environmental Crisis: Rethinking Modernity in a New Epoch* (pp. 156-167). London, UK: Routledge.

Blühdorn, I. (2016). Sustainability—Post-sustainability—Unsustainability. In T. Gabrielson, C. A. Hall, J. M. Meyer, & D. Schlosberg (Eds.), *The Oxford Handbook of Environmental Political Theory* (pp. 259-273). Oxford, U.K.: Oxford University Press.

Blühdorn, I., & Welsh, I. (2007). Eco-politics beyond the paradigm of sustainability: A conceptual framework and research agenda. *Environmental Politics, 16*(2), 185-205. doi:10.1080/09644010701211650

Bolger, J. (2017, 21 April, 2017) *The Negotiator - Jim Bolger: Prime Minister 1990-97/Interviewer: G. Espiner*. The 9th Floor, RNZ.

Bolstad, R., Joyce, C., & Hipkins, R. (2015). *Environmental education in New Zealand schools*. Retrieved from Wellington, NZ: http://www.nzcer.org.nz/research/publications/environmental-education-new-zealand-schools

Boni, A., & Gasper, D. (2012). Rethinking the quality of universities: how can human development thinking contribute? *Journal of Human Development and Capabilities, 13*(3), 451-470.

Boni, A., & Walker, M. (2013). *Human development and capabilities: re-imagining the university of the twenty-first century*. New York, NY: Routledge.

Bookchin, M. (1987). Social ecology versus deep ecology: A challenge for the ecology movement. *Green Perspectives: Newsletter of the Green Program Project, 1987*, 4-5.

Bookchin, M. (1988). Social ecology versus deep ecology. *Socialist Review, 18*(3), 9-29.

Bookchin, M. (1996). *The philosophy of social ecology: essays on dialectical naturalism*. New York; Montréal: Black Rose Books.

Boston, J. (2016). Anticipatory governance: How well is New Zealand safeguarding the future. *Policy Quarterly, 12*(3), 11-24. doi:10.4225/50/57F57A6123B0C

Boston, J. (2017a). *Governing for the future : designing democratic institutions for a better tomorrow*. Bingley, U.K. : Emerald.

Boston, J. (2017b). *Safeguarding the future: governing in an uncertain world*. Wellington, NZ: Bridget Williams Books Limited.

Boulanger, P. (2012). Old Cleavages, New Green Debates. *Green European Journal, 3*, 7-15.

Bowers, C. (1993). *Education, cultural myths, and the ecological crisis: Toward deep changes*. Eugene, OR: Suny Press.

Bowers, C. (2001). How Language Limits Our Understanding of Environmental Education. *Environmental Education Research, 7*(2), 141-151. doi:10.1080/13504620120043144

Bowers, C. (2004). Revitalizing the commons or an individualized approach to planetary citizenship: The choice before us. *Educational Studies, 36*(1).

Bowers, C. (2005). *Rethinking Freire globalization and the environmental crisis*. Mahwah, N.J.: Lawrence Erlbaum.

Bowers, C. (2006a). *Transforming environmental education: Making the cultural and environmental commons the focus of educational reform*. Eugene, OR: Eco-Justice Press.

Bowers, C. (2006b). University curriculum reforms that revitalize the commons. *Curriculum and Teaching Dialogue, 8*(1/2), 99.

Bowers, C. (2008). Why a critical pedagogy of place is an oxymoron. *Environmental Education Research, 14*(3), 325-335.

Bowers, C. (2009). The Misuse of Academic Freedom in an Era of Global Warming. *Tikkun Magazine, 24,* 29.

Bowers, C. (2010). The insights of Gregory Bateson on the connections between language and the ecological crisis. *Language and Ecology, 3*(2), 1-27.

Bowers, C. (2011). *Perspectives on the Ideas of Gregory Bateson, Ecological Intelligence, and Educational Reforms*. Eugene, OR: Eco-Justice Press.

Bowers, C. (2012). Questioning the idea of the individual as an autonomous moral agent. *Journal of Moral Education, 41*(3), 301-310. doi:10.1080/03057240.2012.691626

Bowers, C. (2014). *The false promises of the digital revolution: how computers transform education, work, and international development in ways that are ecologically unsustainable*. New York, NY: Peter Lang.

Boyles, D. (2012). Dewey, ecology, and education: historical and contemporary debates over Dewey's naturalism and (transactional) realism. *Educational Theory, 62*(2), 143-161.

Brady, N., & Bates, A. (2016). The standards paradox: How quality assurance regimes can subvert teaching and learning in higher education. *European Educational Research Journal, 15*(2), 155-174.

Braidotti, R. (2013). *The posthuman*. Cambridge, UK: Polity Press.

Brendel, D. H. (2006). *Healing psychiatry: bridging the science/humanism divide*. Cambridge, MA: MIT Press.

Bridgman, T. (2007). Assassins in academia? New Zealand academics as critic and conscience of society. *New Zealand Sociology, 22*(1), 126-144.

Bridgman, T. (2010). Empty talk? University voices on the global financial crisis. *Policy Quarterly, 6*(4).

Bronfenbrenner, U. (1979). *The ecology of human development: experiments by nature and design*. Cambridge, MA: Harvard University Press.

Bronfenbrenner, U. (2005). Ecological systems theory (1992). In U. Bronfenbrenner (Ed.), *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, CA: Sage Publications Ltd.

Brown, P. G., & Timmerman, P. (Eds.). (2015). *Ecological economics for the anthropocene: an emerging paradigm*. New York, NY: Columbia University Press.

Brown, V. A., Harris, J. A., & Russell, J. Y. (2010). *Tackling wicked problems through the transdisciplinary imagination*. New York, NY: Earthscan.

Browne, N. W. (2007). *The world in which we occur John Dewey, pragmatist ecology, and American ecological writing in the twentieth century / Neil W. Browne*. Tuscaloosa, AL: University of Alabama Press.

Buchanan, T., & Evans, T. (2012). Not so fast: A dose of reality about sustainability. In J. Martin & J. E. Samels (Eds.), *The sustainable university: green goals and new challenges for higher education leaders*. Baltimore, MD: John Hopkins University Press.

Buckingham, S. (2015). Ecofeminism *International Encyclopedia of the Social & Behavioral Sciences (Second Edition)* (pp. 845-850). Oxford, UK: Elsevier.

Burrows, R. (2012). Living with the h-index? Metric assemblages in the contemporary academy. *The sociological review, 60*(2), 355-372.

Butler, S. (2012, 4 October). Barry Commoner: scientist, activist, radical ecologist. *Green left weekly*. Retrieved from https://www.greenleft.org.au/content/barry-commoner-scientist-activist-radical-ecologist

Buttonwood. (2017, 8 September). Will credit cause a slowdown? *The Economist*. Retrieved from https://www.economist.com/blogs/buttonwood/2017/09/global-economy-0

Callahan, C. (2017, 10 March). New Zealand housing most unaffordable in the world - The Economist. *Newshub*. Retrieved from http://www.newshub.co.nz/home/money/2017/03/new-zealand-housing-most-unaffordable-in-the-world-the-economist.html

Campus Compact. (2017). Home page. Retrieved from https://compact.org/

Cao, B. (2015). *Environment and citizenship*. Abingdon, Oxon, UK; New York, NY: Routledge.

Capra, F., & Luisi, P. L. (2014). *The systems view of life: a unifying vision*. Cambridge, UK: Cambridge University Press.

Carducci, V. (2009). Ecocriticism, Ecomimesis, and the Romantic Roots of Modern Ethical Consumption. *Literature Compass, 6*(3), 632-646. doi:10.1111/j.1741-4113.2009.00638.x

Caria, S., & Dominguez, R. (2016). Ecuadors Buen vivir: A New Ideology for Development. *Latin American Perspectives, 43*(1), 18-33. doi:10.1177/0094582X15611126

Carson, R. (1963). *Silent spring*. London, UK: Hamish Hamilton.

Carter, R. L., & Simmons, B. (2010). The history and philosophy of environmental education. In B. Alec, K. Beth Shiner, & W. Starlin (Eds.), *The inclusion of environmental education in science teacher education* (pp. 3-16). Dordrecht: Springer.

Caruana, V. (2012). Global citizenship for all: Putting the'higher'back into UK higher education? In N. Foskett (Ed.), *Globalization and Internationalization in Higher Education: Theoretical, Strategic and Management Perspectives* (pp. 51-64). London and New York: Continuum.

Chakraborty, R. (2015). The Deep Ecology/Ecofeminism Debate: an Enquiry into Environmental Ethics. *Journal of Indian Council of Philosophical Research, 32*(1), 123-133.

Chan, S., Brandi, C., & Bauer, S. (2016). Aligning Transnational Climate Action with International Climate Governance: The Road from Paris. *Review of European, Comparative & International Environmental Law, 25*(2), 238-247. doi:10.1111/reel.12168

Chapman, D., Flaws, M., & Le Heron, R. (2006). A due diligence report on New Zealand's educational contribution to the UN decade of Education for Sustainable Development. *Journal of Geography in Higher Education, 30*(2), 281-292.

Chiodo, E., Aguado, P., Attard, E., Bugeja Douglas, A., Valente, F., Yancheva, C., . . . Lemiere, J.-P. (2013). *Sustainable development in higher education in Europe. Good practices compendium* (E. Chiodo Ed.). Msida: University of Malta.

Chislock, M. F., Doster, E., Zitomer, R. A., & Wilson, A. (2013). Eutrophication: causes, consequences, and controls in aquatic ecosystems. *Nature Education Knowledge, 4*(4), 10.

Chopin, N. S., Thompson, C., & McKenzie, M. (2017). *SEPN Impact report*. Retrieved from Saskatoon, Canada: https://sepn.ca/resources/impact-report/

Codd, J. A. (1988). The construction and deconstruction of educational policy documents. *Journal of Education Policy, 3*(3), 235-247. doi:10.1080/0268093880030303

Codd, J. A. (2005). Teachers as 'managed professionals' in the global education industry: the New Zealand experience. *Educational Review, 57*(2), 193-206. doi:10.1080/0013191042000308369

Code, L. (2006). *Ecological thinking: The politics of epistemic location*. Oxford, UK: Oxford University Press.

Code, L. (2008). Thinking about Ecological Thinking. *Hypatia, 23*(1), 187-203.

Code, L. (2012). Ecological responsibilities: which trees? Where? Why? *Journal of Human Rights and the Environment, 3*, 84-99. doi:10.4337/jhre.2012.02.05

Collini, S. (2012). *What are universities for?* London, UK: Penguin.

Colwell, T. (1985). The ecological perspective in John Dewey's philosophy of education. *Educational Theory, 35*(3), 255-266.

Colwell, T. B. (1971). The Ecological Basis of Human Community. *Educational Theory, 21*(4), 418-433.

Commoner, B. (1971). *The closing circle: confronting the environmental crisis*. London, UK: Cape.

Connolly, W. E. (2013). The 'new materialism'and the fragility of things. *Millennium, 41*(3), 399-412.

Cooke, H. (2017, 12 September). Jacinda Ardern says neoliberalism has failed. *stuff.co.nz*. Retrieved from

https://www.stuff.co.nz/national/politics/96739673/jacinda-ardern-says-neoliberalism-has-failed

Coole, D. (2010). *New Materialisms Ontology, Agency, and Politics*. Durham, NC: Duke University Press.

Corcoran, P. B., Weakland, J. P., & Wals, A. E. J. (2017). *Envisioning futures for environmental and sustainability education*. Wageningen, The Netherlands: Wageningen Academic Publishers.

Costanza, R., Alperovitz, G., Daly, H., Farley, J., Franco, C., Jackson, T., . . . Victor, P. (2017). *Building a sustainable and desirable economy-in-society-in-nature*. Cham: Springer.

Cox, D. (2012). *History of the scholarship of engagement movement*. East Lansing, MI: Michigan State University Press.

Crawford, R. (2016). *History of tertiary education reforms in New Zealand*. Retrieved from Wellington, NZ: https://www.productivity.govt.nz/working-paper/history-of-tertiary-education-reforms-in-new-zealand

Cuban, L., & Jandrić, P. (2015). The dubious promise of educational technologies: Historical patterns and future challenges. *E-Learning and Digital Media, 12*(3-4), 425-439.

Cutter-Mackenzie, A., & Smith, R. (2003). Ecological literacy: the 'missing paradigm'in environmental education (part one). *Environmental Education Research, 9*(4), 497-524.

Dall'Alba, G., & Barnacle, R. (2007). An ontological turn for higher education. *Studies in Higher Education, 32*(6), 679-691. doi:10.1080/03075070701685130

Daly, H. E. (2005). Economics in a full world. *Scientific american, 293*(3), 100-107.

Daly, H. E., & Farley, J. C. (2004). *Ecological economics: principles and applications*. Washington DC: Island Press.

Daly, M. (2017, 20 October). Winston Peters wants 'today's capitalism' to regain its 'human face. *Stuff*. Retrieved from https://www.stuff.co.nz/national/politics/98084598/winston-peters-wants-todays-capitalism-to-regain-its-human-face

Dalziel, P., & Saunders, C. (2014). *Wellbeing economics: future directions for New Zealand*. Wellington, NZ: Bridget Williams Books Limited.

Dash, A. (2014). The moral basis of sustainable society: the Gandhian concept of ecological citizenship. *International Review of Sociology, 24*(1), 27-37.

de Graaf, J., Wann, D., & Naylor, T. H. (2014). *Affluenza: How overconsumption is killing us—and how to fight back*. Oakland, CA: Berrett-Koehler Publishers.

Dean, H. (2001). Green citizenship. *Social policy & administration, 35*(5), 490-505.

Deci, E. L., & Ryan, R. M. (2008). Hedonia, eudaimonia, and well-being: an introduction. *Journal of Happiness Studies, 9*(1), 1-11. doi:10.1007/s10902-006-9018-1

Deleuze, G. (1994). *What is philosophy?* New York, NY: Columbia University Press.

Deleuze, G. (2004). *A thousand plateaus : capitalism and schizophrenia*. London, UK: Continuum.

Department of Education and Skills. (2014). *Education for Sustainability - The national strategy on education for sustainable development in Ireland, 2014-2020*. Retrieved from Ireland: https://www.education.ie/en/Schools-Colleges/Information/Education-for-Sustainable-Development/

Derrida, J. (2004). *Eyes of the university: Right to philosophy 2* (Vol. 2). Palo Alto, CA: Stanford University Press.

Dietz, R., & O'Neill, D. W. (2013). *Enough is enough: building a sustainable economy in a world of finite resources*. Abingdon, Oxon, UK: Routledge.

Dobson, A. (2007). *Green political thought* (4th ed.). London, UK: Routledge.

Dobson, A. (2010). *Environmental citizenship and pro-environmental behaviour*. Retrieved from London, UK: www.sd-research.org.uk

Dobson, A. (2012). Ecological Citizenship Revisited. In P. Dauvergne (Ed.), *Handbook of global environmental politics* Cheltenham, UK: Edward Elgar.

Dobson, A. (2014). *Listening for democracy: recognition, representation, reconciliation* (Vol. Firstition.). Oxford, UK; New York, NY: Oxford University Press.

Dooris, M., & Doherty, S. (2010). Healthy Universities: current activity and future directions-findings and reflections from a national-level qualitative research study. *Global health promotion, 17*(3), 06-16.

Dooris, M., Wills, J., & Newton, J. (2014). Theorizing healthy settings: a critical discussion with reference to Healthy Universities. *Scandinavian Journal of Social Medicine, 42*(15_suppl), 7-16. doi:10.1177/1403494814544495

Dryzek, J. S. (2002). *Deliberative democracy and beyond: liberals, critics, contestations*. Oxford, UK: Oxford University Press.

Dryzek, J. S. (2005). Deliberative democracy in divided societies: Alternatives to agonism and analgesia. *Political Theory, 33*(2), 218-242.

Dryzek, J. S. (2012). *Foundations and frontiers of deliberative governance.* Oxford, UK: Oxford University Press.

Dryzek, J. S. (2013). *The politics of the earth: environmental discourses*. Oxford, UK: Oxford University Press.

Dryzek, J. S. (2016). Global Environmental Governance *The Oxford Handbook of Environmental Political Theory*. Oxford, UK: Oxford University Press.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale. *Journal of Social Issues, 56*(3), 425. doi:10.1111/0022-4537.00176

Durie, M. (1998). *Whaiora: Maori health development* (2nd ed.. ed.). Auckland, N.Z.: Oxford University Press.

Durie, M. (2011). Indigenizing mental health services: New Zealand experience. *Transcultural Psychiatry, 48*(1-2), 24-36. doi:10.1177/1363461510383182

Durkin, E. (2018, 15 August). Elizabeth Warren unveils bold new plan to reshape American capitalism. *The Guardian*. Retrieved from https://www.theguardian.com/us-news/2018/aug/15/elizabeth-warren-accountable-capitalism-act-richest-companies

Education Review. (2014, June 2014). Improving governance or government power grab? *Education Review*. Retrieved from http://www.educationreview.co.nz/magazine/june-2014/improving-governance-or-government-power-grab/

Education Review Office. (2013). *Wellbeing for Success - Draft Evaluation Indicators for Student Wellbeing*. Wellington, NZ: Education Review Office.

Education Review Office. (2015). *Wellbeing for Young People's Success at Secondary School*. Wellington, NZ: Education Review Office.

Edwards, B. (2014, 27 November). Bryce Edwards: The democratic deficit of Dirty Politics. *Herald*. Retrieved from http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11365448

Egger, G., Swinburn, B., & Amirul Islam, F. M. (2012). Economic growth and obesity: An interesting relationship with world-wide implications. *Economics and Human Biology, 10*(2), 147-153. doi:10.1016/j.ehb.2012.01.002

Ehrlich, P. R. (1971). *The population bomb*. London, UK: Pan Books.

Elder, L. J. (2008). Bush Signs New Law to Fund the Sustainability Movement in Higher Education. Retrieved from http://fundee.typepad.com/fundee/2008/08/congress-votes.html

Elstub, S., Ercan, S., & Mendonça, R. F. (2016). Editorial introduction: The fourth generation of deliberative democracy. *Critical Policy Studies, 10*(2), 139-151. doi:10.1080/19460171.2016.1175956

Engagement Australia. (2017). About us. Retrieved from http://www.engagementaustralia.org.au/about.html

Evans, K. G. (2010). Into the Woods: A Cautionary Tale for Governance. *Administration & Society, 42*(7), 859-883. doi:10.1177/0095399710386433

Faber, D., & McCarthy, D. (2003). Neo-liberalism, globalization and the struggle for ecological democracy: linking sustainability and environmental justice. In J. Agyeman, R. D. Bullard, & B. Evans (Eds.), *Just sustainabilities: Development in an unequal world* (pp. 38-63). London, UK: Earthscan.

Farrelly, T. A. (2010). *Imagining 'environment' in sustainable development*. Retrieved from Palmerston North, NZ: http://hdl.handle.net/10179/1473

Fassbinder, S. D., Nocella, A. J., & Kahn, R. (2012). *Greening the academy: ecopedagogy through the liberal arts* (Vol. 1). Rotterdam, The Netherlands: Sense Publishers.

Fedrigo-Fazio, D., Schweitzer, J.-P., ten Brink, P., Mazza, L., Ratliff, A., & Watkins, E. (2016). Evidence of Absolute Decoupling from Real World Policy Mixes in Europe. *Sustainability, 8*(6), 517. doi:10.3390/su8060517

Ferreira, J. A. (2009). Unsettling orthodoxies: education for the environment/for sustainability. *Environmental Education Research, 15*(5), 607-620. doi:10.1080/13504620903326097

Fien, J. (2000). 'Education for the Environment: A critique' - an analysis. *Environmental Education Research, 6*(2), 179-192. doi:doi.org/10.1080/713664671

Finchelstein, F. (2018, 17 January). President Trump isn't crazy. But he is dangerous. *Washington Post*. Retrieved from https://www.washingtonpost.com/news/made-by-history/wp/2018/01/17/president-trump-isnt-crazy-but-he-is-dangerous/?utm_term=.e59879e119f5

Fischer, F. (2011). The 'policy turn' in the Third Wave: return to the fact-value dichotomy? *Critical Policy Studies, 5*(3), 311. doi:10.1080/19460171.2011.606304

Fischer, F., Miller, G., & Sidney, M. S. (2007). *Handbook of public policy analysis: theory, politics, and methods* (Vol. 125). Boca Raton, FL: CRC/Taylor & Francis.

Fitzsimons, P. (1997). Human capital theory and participation in tertiary education in New Zealand. In M. Olssen & K. Morris Matthews (Eds.), *Education policy in New Zealand: The 1990s and beyond* (pp. 107-129). Palmerston North, NZ: Dunmore.

Fleshler, D. (2016, 4 July). Push is on to remove thousands of tires from ocean floor in Fort Lauderdale. *Sun Sentinel*. Retrieved from http://www.sun-sentinel.com/local/broward/fl-ocean-tire-removal-20160630-story.html#

Fletcher, R. (2016). Decoupling: A Dangerous Fantasy. Retrieved from https://entitleblog.org/2016/05/10/decoupling-a-dangerous-fantasy/

Forgeard, M., Jayawickreme, E., Kern, M. L., & Seligman, M. (2011). Doing the Right Thing: Measuring Well-Being for Public Policy. *International Journal of Wellbeing, 1*(1). doi:10.5502/ijw.v1i1.15

Foster, J. B. (2012). The four laws of ecology and the four anti-ecological laws of capitalism. Retrieved from http://climateandcapitalism.com/2012/04/02/four-laws/

Fox, W. (1989). The deep ecology-ecofeminism debate and its parallels. *Environmental Ethics, 11*(1), 5-25.

Freedland, J. (2016, 13 May). Post-truth politicians such as Donald Trump and Boris Johnson are no joke, Opinion. *The Guardian*. Retrieved from

https://www.theguardian.com/commentisfree/2016/may/13/boris-johnson-donald-trump-post-truth-politician

Friedemann, A. (2017). Book review of Failing states, collapsing systems biophysical triggers of political violence by Nafeez Ahmed.   Retrieved from http://energyskeptic.com/2017/book-review-of-failing-states-collapsing-systems-biophysical-triggers-of-political-violence-by-nafeez-ahmed/

Funtowicz, S., & Ravetz, J. (2003). Post-normal science. In International Society for Ecological Economics (Ed.), *Encyclopedia of Ecological Economics* Online.

Galperin, J. (2015, 29 October). 'Desperate environmentalism' won't save the environment, Op-Ed. *Los Angeles Times*. Retrieved from http://www.latimes.com/opinion/op-ed/la-oe-galperin-environmental-desperation-20151029-story.html

Gardner, D. P., Larsen, Y. W., Baker, W., Campbell, A., & Crosby, E. A. (1983). *A nation at risk: The imperative for educational reform*. Washington D.C.: United States Department of Education.

Georgescu-Roegen, N. (1993). The entropy law and the economic problem. In H. E. Daly & K. N. Townsend (Eds.), *Valuing the Earth: Economics, ecology, ethics* (pp. 75-88). Cambridge, MA: MIT Press.

Gibbons, A., Stratford, R., & White, E. J. (2017). A 'Good Life'for Infants in Early Childhood Education and Care? The Place of Well-Being in ECEC Curriculum, Pedagogy and Policy *Under-three Year Olds in Policy and Practice* (pp. 41-55). Singapore: Springer.

Gilens, M., & Page, B. I. (2014). Testing theories of American politics: Elites, interest groups, and average citizens. *Perspectives on politics, 12*(03), 564-581. doi:10.1017/S1537592714001595

Giroux, H. A. (2013). Beyond Dystopian Education in a Neoliberal Society. *Fast Capitalism, 1*(10).

Giroux, H. A. (2014). *Neoliberalism's War on Higher Education*. New York, NY: Haymarket Books.

Goldsmith, E. (1992). *The way: an ecological worldview*. London, UK: Rider.

Gore, A. (2006). *An inconvenient truth: The planetary emergency of global warming and what we can do about it*. Emmaus, PA: Rodale Press.

Gough, A. (2014). A long, winding (and rocky) road to environmental education for sustainability in 2006. *Australian Journal of Environmental Education, 30*(1), 96-101. doi:10.1017/aee.2014.30

Grace, G. (1994). Education is a public good: on the need to resist the domination of economic science. *Education and the market place, 125*, 125-136.

Grau, F. X., Hall, B., & Tandon, R. (2017). *Higher education in the world 6. Towards a socially responsible university: Balancing the global with the local*. Girona: Global University Network for Innovation.

Greatbanks, R., & O'Kane, C. (2014). New Zealand university governance; show us the problem [Press release]. Retrieved from http://www.otago.ac.nz/otagobulletin/news/otago072091.html

Green Gown Awards. (2016). 2016 Winners.   Retrieved from http://www.greengownawards.org/2016-winners

Green, T. L. (2012). Introductory economics courses and the university's commitments to sustainability. *Erasmus Journal for Philosophy and Economics, 5*(2), 157. doi:10.23941/ejpe.v5i2.116

Grey, S., & Scott, J. (2012). *When the government steers the market: implications for the New Zealand's tertiary education system*. Retrieved from Wellington, NZ: http://teu.ac.nz/wp-content/uploads/2012/03/When-the-government-steers-the-market-NTEU-Paper.pdf

Grey, W. (1993). Anthropocentrism and deep ecology. *Australasian Journal of Philosophy, 71*(4), 463-475.

Grindsted, T. S. (2011). Sustainable universities – from declarations on sustainability in higher education to national law. *Environmental Economics, 2*(2).

Guattari, F. (1995). *Chaosmosis: an ethico-aesthetic paradigm*. Bloomington, IN: Indiana University Press.

Guattari, F. (2000). *The Three Ecologies*. London; New Brunswick, N.J: Athlone Press.

Guattari, F., & Genosko, G. (1996). *The Guattari Reader*. Cambridge, MA, Oxford, UK: Blackwell Publishers.

Gudynas, E. (2011). Buen Vivir: Today's tomorrow. *Development, 54*(S4), 441-447. doi:10.1057/dev.2011.86

Guzmán-Valenzuela, C., & Barnett, R. (2013). Marketing time: Evolving timescapes in academia. *Studies in Higher Education, 38*(8), 1120-1134. doi:10.1080/03075079.2013.833032

Haberl, H. (2012). Addicted to resources.   Retrieved from http://www.igbp.net/news/features/features/addictedtoresources.5.705e0806 13685f74edb800059.html

Hadley, G. (2014). *English for academic purposes in neoliberal universities: a critical grounded theory* (Vol. 22). Cham: Springer.

Hager, N. (2014). *Dirty politics: How attack politics is poisoning New Zealand's political environment*. Nelson, NZ: Craig Potton Publishing.

Halonen, M., Persson, Å., Sepponen, S., Siebert, C. K., Bröckl, M., Vaahtera, A., . . . Isokangas, A. (2017). *Sustainable Development Action–the Nordic Way: Implementation of the Global 2030 Agenda for Sustainable Development in Nordic Cooperation*. Denmark: Nordic Council of Ministers.

Hambleton, R. (2014). *Leading the inclusive city: Place-based innovation for a bounded planet*. Bristol, UK: Policy Press.

Hamblin, A. (2016, 23 November). Climate change: Here's exactly what Donald Trump told The New York Times. *San Diego Tribune*. Retrieved from http://www.sandiegouniontribune.com/opinion/the-conversation/sd-exactly-what-donald-trump-said-on-climate-change-20161123-htmlstory.html#

Hamilton, C., Gemenne, F., & Bonneuil, C. (2015). *The Anthropocene and the global environmental crisis: rethinking modernity in a new epoch*. New York, NY: Routledge.

Hammond, K. (2004). Monsters of modernity: Frankenstein and modern environmentalism. *cultural geographies, 11*(2), 181-198. doi:10.1191/14744744004eu301oa

Handrich, L., Kemfert, C., Mattes, A., Pavel, F., & Traber, T. (2015). *Turning point: Decoupling greenhouse gas emissions from economic growth*. Retrieved from Berlin: https://www.boell.de/en/2015/09/22/turning-point-decoupling-greenhouse-gas-emissions-economic-growth

Hansen, G. D., & Prescott, E. C. (2002). Malthus to solow. *The American Economic Review, 92*(4), 1205-1217.

Haraway, D. J. (1991). A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century *Simians, Cyborgs and Women: The Reinvention of Nature*. New York: Routledge.

Hardin, G. (1968). The tragedy of the commons. *Science, 162*(3859), 1243-1248.

Harmsworth, G. R., & Awatere, S. (2013). Indigenous Māori knowledge and perspectives of ecosystems. In J. R. Dymond (Ed.), *Ecosystem services in New Zealand*. Lincoln, NZ: Manaaki Whenua Press.

Harries-Jones, P. (1995). *A recursive vision: Ecological understanding and Gregory Bateson*. Toronto, Canada: University of Toronto Press.

Harries-Jones, P. (2016). *Upside-down gods: Gregory Bateson's world of difference*. New York, NY: Fordham University Press.

Harris, C. (2016, 1 September). NZ tops IMF's housing unaffordability list. Retrieved from http://www.stuff.co.nz/business/money/83750475/nz-tops-imfs-housing-unaffordability-list

Harvey, D. (2005). *A brief history of neoliberalism*. New York, NY; Oxford, UK: Oxford University Press.

Harvey, D. (2014). *Seventeen contradictions and the end of capitalism*. New York, NY; Oxford, UK: Oxford University Press.

Harvey, L. (2008). Rankings of Higher Education Institutions: A Critical Review. *Quality in Higher Education, 14*(3), 187-207. doi:10.1080/13538320802507711

Hausfather, Z. (2017). Analysis: Global CO2 emissions set to rise 2% in 2017 after three-year 'plateau'. *CarbonBrief*. Retrieved from https://www.carbonbrief.org/analysis-global-co2-emissions-set-to-rise-2-percent-in-2017-following-three-year-plateau

Hay, P. R. (2002). *Main currents in western environmental thought*. Bloomington IN: Indiana University Press.

Hazelkorn, E. (2015). *Rankings and the reshaping of higher education: The battle for world-class excellence*. Cham: Springer.

Head, B. W. (2013). Evidence-Based Policymaking - Speaking Truth to Power?: Evidence-Based Policymaking. *Australian Journal of Public Administration, 72*(4), 397-403. doi:10.1111/1467-8500.12037

Heaton, S. (2011). The co-opting of 'hauora' into curricula. *Curriculum Matters, 7*, 99-117.

Heroux, E. (2008). Guattari's Triplex Discourses of Ecology. In B. Herzogenrath (Ed.), *An [Un]Likely Alliance: Thinking Environment[s] with Deleuze/Guattari* (pp. 176-190). Newcastle, UK: Cambridge Scholars Publishing.

Hidaka, B. H. (2012). Depression as a disease of modernity: explanations for increasing prevalence. *Journal of affective disorders, 140*(3), 205-214. doi:10.1016/j.jad.2011.12.036

Higgs, K. (2014). *Collision course: endless growth on a finite planet*. Cambridge, MA; London, UK: The MIT Press.

Higher Education and Research for Sustainable Development. (2018). Virtual University of Environment and Sustainable Development. Retrieved from http://www.iau-hesd.net/en/universities/2445-virtual-university-environment-and-sustainable-development.html

Hill, C. (2015). Žižek's critique of New Materialism: can we theorise natural subjectivity? Retrieved from https://thisisnotasociology.blog/2015/03/12/zizeks-critique-of-new-materialism-can-we-theorise-natural-subjectivity/

Hiltner, K. (2015). *Ecocriticism: The essential reader*. London, UK: Routledge.

Hollister, R. M., Pollock, J. P., Gearan, M., Stroud, S., Reid, J., & Babcock, E. (2012). The Talloires Network: A global coalition of engaged universities. *Journal of Higher Education Outreach and Engagement, 16*(4), 81-102.

Hörl, E., & Burton, J. E. (2017). *General Ecology: The New Ecological Paradigm*. London, UK: Bloomsbury Publishing.

Huckle, J., & Wals, A. E. J. (2015). The UN Decade of Education for Sustainable Development: business as usual in the end. *Environmental Education Research, 21*(3), 491-505. doi:10.1080/13504622.2015.1011084

Huffington Post. (2017, 6 December). Koala Photo Shows Forest Destroyed By Loggers, Animal's Heartbreak After Losing Home. Retrieved from https://www.huffingtonpost.com/2013/04/30/koala-photo-loggers-australia_n_3179029.html

Hug, J. (1977). Two Hats. In J. Aldrich, A. Blackburn, & A. George (Eds.), *The report of the North American Regional Seminar on Environmental Education for the Red World*. Columbus, OH: The Ohio State University Press.

Hughes, G. (2014). *Ipsative Assessment*. London, UK: Palgrave Macmillan.

Hungerford, H. (2010). Environmental Education (EE) for the 21st Century: Where Have We Been? Where Are We Now? Where Are We Headed? *The Journal of Environmental Education, 41*(1), 1-6. doi:10.1080/00958960903206773

Hutchings, R. (2014). Understanding of and Vision for the Environmental Humanities. *Environmental Humanities, 4*(1), 213-220. doi:10.1215/22011919-3615007

International Energy Agency. (2016). Decoupling of global emissions and economic growth confirmed.   Retrieved from https://www.iea.org/newsroom/news/2016/march/decoupling-of-global-emissions-and-economic-growth-confirmed.html

International Institute for Environment and Development. (2017). Evaluation: a missed opportunity in the SDGs' first set of Voluntary National Reviews. *Briefing*. Retrieved from http://pubs.iied.org/pdfs/17423IIED.pdf

Irwin, R. (2007). The neoliberal state, Environmental Pragmatism, and its discontents. *Environmental Politics, 16*(4), 643-658. doi:10.1080/09644010701419154

Jackson, N. (2012). *Exploring Learning Ecologies*. Online: Lulu.com.

Jackson, R. B., Quéré, C. L., Andrew, R. M., Canadell, J. G., Peters, G. P., Roy, J., & Wu, L. (2017). Warning signs for stabilizing global CO2 emissions. *Environmental Research Letters, 12*(11), 110202.

Jackson, T. (2009). *Prosperity without growth: economics for a finite planet*. London, UK: Earthscan.

Jackson, T. (2011). *Prosperity without growth : economics for a finite planet*. Sterling, VA: Earthscan.

Jackson, T. (2016). *Prosperity Without Growth: Foundations for the Economy of Tomorrow* (Second Edition ed.). London, UK: Taylor & Francis.

Jenkins, C. S. (2010). What Is Ontological Realism? *Philosophy Compass, 5*(10), 880-890. doi:10.1111/j.1747-9991.2010.00332.x

Jessop, B. (2017). Varieties of academic capitalism and entrepreneurial universities. *Higher Education, 73*(6), 853-870. doi:10.1007/s10734-017-0120-6

Jickling, B., & Spork, H. (1998). Education for the environment: A critique. *Environmental Education Research, 4*(3), 309-327. doi:10.1080/1350462980040306

Johnston, L. F. (2012). *Higher education for sustainability: cases, challenges, and opportunities from across the curriculum*. New York, NY: Routledge.

Jones, C. (2016). The facts of economic growth. In J. B. U. Taylor, Harald (Ed.), *Handbook of Macroeconomics* (Vol. 2, pp. 3-69). Amsterdam: Elsevier.

Jones, C., & Vollrath, D. (2013). *Introduction to Economic Growth* (3rd ed.). New York, NY: W. W. Norton & Company.

Jones, D. (2012). Looking through the "greenwashing glass cage"; of the green league table towards the sustainability challenge for UK universities. *Journal of Organizational Change Management, 25*(4), 630-647. doi:10.1108/09534811211239263

Jones, P., Selby, D., & Sterling, S. (2010). *Sustainability education: perspectives and practice across higher education*. Washington, DC; London, UK: Earthscan.

Kadlec, A., & Friedman, W. (2007). Deliberative democracy and the problem of power. *Journal of Public Deliberation, 3*(1).

Kahn, R. (2010). *Critical pedagogy, ecoliteracy, & planetary crisis: The ecopedagogy movement*. New York. NY: Peter Lang.

Kallis, G., Kerschner, C., & Martinez-Alier, J. (2012). The economics of degrowth. *Ecological Economics, 84*, 172-180. doi:10.1016/j.ecolecon.2012.08.017

Karacaoglu, G. (2015). *The New Zealand Treasury's Living Standards Framework - Exploring a Stylised Model*. Wellington, N.Z. Retrieved from https://treasury.govt.nz/publications/wp/new-zealand-treasurys-living-standards-framework-exploring-stylised-model-wp-15-12-html.

Karr, J. R. (1992). Ecological integrity: protecting earth's life support systems. In R. Costanza & B. G. Norton (Eds.), *Ecosystem health: new goals for environmental management.* (pp. 223-238). Washington, DC: Island Press.

Katz, L. (2015). Against the corrosive language of Corpspeak in the contemporary university. *Higher Education Research & Development, 34*(3), 554-567. doi:10.1080/07294360.2014.973377

Kelsey, J. (2018a, 7 February). Jane Kelsey: Excess of spin on revised TPP cause for concern. *The Herald*. Retrieved from http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11989194

Kelsey, J. (2018b). Why we must rally to stop this new TPPA Frankenstein. Retrieved from https://thedailyblog.co.nz/2018/02/12/why-we-must-rally-to-stop-this-new-tppa-frankenstein/

Kiel, K., Matheson, V., & Golembiewski, K. (2010). Luck or skill? An examination of the Ehrlich–Simon bet. *Ecological Economics, 69*(7), 1365-1367. doi:10.1016/j.ecolecon.2010.03.007

Kimber, M., & Ehrich, L. C. (2015). Are Australia's universities in deficit? A tale of generic managers, audit culture and casualisation. *Journal of Higher Education Policy and Management, 37*(1), 83-97. doi:10.1080/1360080X.2014.991535

Klocker, N., & Drozdzewski, D. (2012). Survival and subversion in the neoliberal university. Retrieved from https://ro.uow.edu.au/smhpapers/1184/

Kopnina, H. (2014a). Neoliberalism, pluralism, environment and education for sustainability. *Horizons of Holistic Education, 1*(2), 93-113.

Kopnina, H. (2014b). Revisiting Education for Sustainable Development (ESD): Examining Anthropocentric Bias Through the Transition of Environmental Education to ESD. *Sustainable Development, 22*(2), 73-83. doi:10.1002/sd.529

Kopnina, H. (2015). Neoliberalism, pluralism and environmental education: The call for radical re-orientation. *Environmental Development, 15*, 120-130. doi:10.1016/j.envdev.2015.03.005

Kopnina, H. (2016). The victims of unsustainability: a challenge to sustainable development goals. *International Journal of Sustainable Development & World Ecology, 23*(2), 113-121. doi:10.1080/13504509.2015.1111269

Kopnina, H., & Cherniak, B. (2015). Cultivating a Value for Non-Human Interests through the Convergence of Animal Welfare, Animal Rights, and Deep Ecology in Environmental Education. *Education Sciences, 5*(4), 363-379. doi:10.3390/educsci5040363

Kopnina, H., & Cherniak, B. (2016). Neoliberalism and justice in education for sustainable development: a call for inclusive pluralism. *Environmental Education Research*, 1-15. doi:10.1080/13504622.2016.1149550

Kopnina, H., & Meijers, F. (2014). Education for sustainable development (ESD) Exploring theoretical and practical challenges. *International Journal of Sustainability in Higher Education, 15*(2), 188-207. doi:10.1108/IJSHE-07-2012-0059

Kothari, A., Demaria, F., & Acosta, A. (2014). Buen Vivir, Degrowth and Ecological Swaraj: alternatives to sustainable development and the green economy. *Development, 57*(3-4), 362-375. doi:10.1057/dev.20

Kronlid, D. O., & Öhman, J. (2013). An environmental ethical conceptual framework for research on sustainability and environmental education. *Environmental Education Research, 19*(1), 21-44. doi:10.1080/13504622.2012.687043

Kumi, E., Arhin, A. A., & Yeboah, T. (2014). Can post-2015 sustainable development goals survive neoliberalism? A critical examination of the sustainable development–neoliberalism nexus in developing countries. *Environment, Development and Sustainability, 16*(3), 539-554. doi:10.1007/s10668-013-9492-7

Lam, D. (2011). How the World Survived the Population Bomb: Lessons From 50 Years of Extraordinary Demographic History. *Demography, 48*(4), 1231-1262. doi:10.1007/s13524-011-0070-z

Lane, J. H. (2014). Jean-Jacques Rousseau: The Disentangling of Green Paradoxes. In J. H. Lane & P. F. Cannav (Eds.), *Engaging Nature: Environmentalism and the Political Theory Canon* (pp. 133-152). Cambridge, MA: MIT Press.

Latour, B. (2004). *Politics of nature: how to bring the sciences into democracy*. Cambridge, MA: Harvard University Press.

Latour, B. (2005). *Reassembling the social: an introduction to actor-network-theory*. Oxford, UK: Oxford University Press.

Latour, B. (2015). Telling friends from foes in the time of the Anthropocene. In C. Hamilton, C. Bonneuil, & F. Gemenne (Eds.), *The Anthropocene and the Global Environmental Crisis: Rethinking Modernity in a new epoch.* (pp. 145-155). New York, NY: Routledge.

Lawrence, R. J. (2003). Human ecology and its applications. *Landscape and Urban Planning, 65*(1), 31-40. doi:10.1016/S0169-2046(02)00235-9

Lazaroiu, G. (2013). Barnett on new forms of the university. *Analysis and Metaphysics, 12*, 172.

Le Blanc, D. (2015). Towards integration at last? The sustainable development goals as a network of targets. *Sustainable Development, 23*(3), 176-187. doi:10.1002/sd.1582

Leal Filho, W. (2015). "Sustainability 2.0" a new age of sustainable development in higher education. *International Journal of Sustainability in Higher Education, 16*(1). doi:10.1108/IJSHE-10-2014-0149

Leal Filho, W., Shiel, C., do Paço, A., & Brandli, L. (2015). Putting sustainable development in practice: Campus greening as a tool for institutional sustainability efforts. In J. P. Davim (Ed.), *Sustainability in Higher Education* (pp. 1-19). New York, NY: Chandos Publishing.

Lebow, V. (1955). Price competition in 1955. *Journal of retailing, 31*(1), 5-10.

LeMenager, S., & Foote, S. (2012). The Sustainable Humanities. *PMLA, 127*(3), 572-578. doi:10.1632/pmla.2012.127.3.572

Leopold, A. (1970). *A Sand County Almanac*. New York, NY: Ballantine.

Light, A. (Ed.) (1998). *Social ecology after Bookchin*. New York, NY: Guilford Press.

Lincoln University. (2015/16). *Transform - A profile of Lincoln University's research*. Retrieved from https://www.lincolnagritech.co.nz/news/lincoln-universitys-transform-magazine/

Lincoln University. (2018). Mission.   Retrieved from http://www.lincoln.ac.nz/About-Lincoln/Why-Lincoln/Our-Mission/

Lingard, B. (2013). The impact of research on education policy in an era of evidence-based policy. *Critical Studies in Education, 54*(2), 113-131. doi:10.1080/17508487.2013.781515

Liptak, K., & Gray, N. (2018). Trump proposes bonuses for teachers who get gun training. *CNN*. Retrieved from https://edition.cnn.com/2018/02/22/politics/donald-trump-gun-reforms-school-shooting/index.html

Lloro-Bidart, T. (2015). A Political Ecology of Education in/for the Anthropocene. *Environment and Society, 6*(1), 128-148. doi:10.3167/ares.2015.060108

Lorek, S., & Spangenberg, J. H. (2014). Sustainable consumption within a sustainable economy–beyond green growth and green economies. *Journal of Cleaner Production, 63*, 33-44. doi:10.1016/j.jclepro.2013.08.045

Lorenz, C. (2012). If you're so smart, why are you under surveillance? Universities, neoliberalism, and new public management. *Critical inquiry, 38*(3), 599-629.

Lovelock, J. E. (2000). *Gaia: A new look at life on Earth*. Oxford, UK: Oxford University Press.

Lozano, R., Ceulemans, K., Alonso-Almeida, M., Huisingh, D., Lozano, F. J., Waas, T., . . . Hugé, J. (2015). A review of commitment and implementation of sustainable development in higher education: results from a worldwide survey. *Journal of Cleaner Production, 108*, 1-18. doi:10.1016/j.jclepro.2014.09.048

Luke, T. W. (1987). Social ecology as critical political economy. *The Social Science Journal, 24*(3), 303-315. doi:10.1016/0362-3319(87)90078-4

Lundmark, C., Luleå University of, T., Social, S., Department of Business Administration, T., Social, S., & Political, S. (2007). The new ecological paradigm revisited: anchoring the NEP scale in environmental ethics. *Environmental Education Research, 13*(3), 329-347. doi:10.1080/13504620701430448

Lyotard, J. F. o. (1984). *The postmodern condition: a report on knowledge*. Minneapolis, MN: University of Minnesota Press.

Macekura, S. (2015). *Of Limits and Growth*. Cambridge, UK: Cambridge University Press.

Macey, A. (2017). The atmosphere the Paris Agreement and global governance. *Policy Quarterly, 13*(1), 26-31.

Malcolm, W., & Tarling, N. (2007). *Crisis of identity? The mission and management of universities in New Zealand*. Wellington, NZ: Dunmore Publishing Ltd.

Malone, K., Truong, S., & Gray, T. (2017). *Reimagining sustainability in precarious times*. Cham: Springer.

Malthus, T. R. (1888). *An essay on the principle of population: or, A view of its past and present effects on human happiness*. London, UK: Reeves & Turner.

Manhire, T. (2017, 23 September). Ardern's New Zealand election bid punctured by post-truth politics. *The Guardian*. Retrieved from https://www.theguardian.com/commentisfree/2017/sep/23/arderns-new-zealand-election-bid-punctured-by-post-truth-politics

Mann, S. (2011). *The green graduate: educating every student as a sustainable practitioner*. Wellington, NZ: NZCER Press.

Mansfield, K. C., Diem, S., Lee, P.-L., Welton, A. D., & Young, M. D. (2014). The intellectual landscape of critical policy analysis. *International Journal of Qualitative Studies in Education, 27*(9), 1068-1090. doi:10.1080/09518398.2014.916007

Manukau Institute of Technology. (2018). Plans and strategies. Retrieved from https://www.manukau.ac.nz/about/about-the-institute/plans-and-strategies

Marcinkowski, T. J. (2010). Contemporary Challenges and Opportunities in Environmental Education: Where Are We Headed and What Deserves Our Attention? *The Journal of Environmental Education, 41*(1), 34-54. doi:10.1080/00958960903210015

Marcuse, H. (1968). *One-dimensional man: the ideology of advanced industrial society*. London, UK: Sphere Books.

Marginson, S. (2011). Higher education and public good. *Higher Education Quarterly, 65*(4), 411-433. doi:10.1111/j.1468-2273.2011.00496.x

Maringe, F., & Foskett, N. (2012). *Globalization and internationalization in higher education: Theoretical, strategic and management perspectives*. London, UK: A&C Black.

Massey University. (2018). Developing an Environmental Sustainability Strategic Plan. Retrieved from http://www.massey.ac.nz/massey/initiatives/sustainability/strategy/strategy_home.cfm

Maurice, J. (2016). Measuring progress towards the SDGs - a new vital science. *The Lancet, 388*(10053), 1455-1458. doi:10.1016/S0140-6736(16)31791-3

Max-Neef, M. A. (2005). Foundations of transdisciplinarity. *Ecological Economics, 53*(1), 5-16. doi:10.1016/j.ecolecon.2005.01.014

Maxwell, N. (2006). Knowledge to Wisdom: We Need a Revolution. *Philosophia, 34*(3), 377-378. doi:10.1007/s11406-006-9037-5

Maxwell, N. (2007). From knowledge to wisdom: the need for an academic revolution. *London Review of Education, 5*(2), 97-115. doi:10.1080/14748460701440350

Maxwell, N. (2012). Arguing for Wisdom in the University: An Intellectual Autobiography. *Philosophia, 40*(4), 663-704.

McBride, B. B., Brewer, C. A., Berkowitz, A. R., & Borrie, W. T. (2013). Environmental literacy, ecological literacy, ecoliteracy: What do we mean and how did we get here? *Ecosphere, 4*(5), 1-20. doi:10.1890/ES13-00075.1

McCutcheon, S. (2014, 31 October). Stuart McCutcheon: Higher education must come at a price. *NZ Herald*. Retrieved from http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11350829

McLaren, P. (2007). Conservation, Class Struggle, or Both: A Response to C.A. Bowers. *Capitalism Nature Socialism, 18*(1), 99-108. doi:10.1080/10455750601164667

McNeill, J., Williams, Jeremy & Coleman, Michael. (2014). *What are we teaching and why it matters: A survey of the Australian and New Zealand university macroeconomics curriculum in a post-GFC, ecologically stressed world*. Paper presented at the Opportunities for the Critical Decade: Enhancing well-being within Planetary Boundaries. Presented at the Australia New Zealand Society for Ecological Economics 2013 Conference, The University of Canberra and Australia New Zealand Society for Ecological Economics, Canberra, Australia.

Meadows, D. H., & Meadows, D. (2007). The history and conclusions of The Limits to Growth. *System Dynamics Review, 23*(2-3), 191-197. doi:10.1002/sdr.371

Meadows, D. H., Meadows, D., Randers, J., & Behrens III, W. W. (1972). *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. New Yory, NY: Universe.

Meadows, D. H., & Wright, D. (2008). *Thinking in systems: A primer*. White River Junction, VT: Chelsea Green Publishing.

Mebratu, D. (1998). Sustainability and sustainable development: historical and conceptual review. *Environmental impact assessment review, 18*(6), 493-520. doi:10.1016/S0195-9255(98)00019-5

Mellalieu, P. J. (2011). *The Rise and Fall of Education for Sustainability in New Zealand's Tertiary Education Strategies: An Orchestrated Conspiracy of Ignorance?* Retrieved from https://www.academia.edu/1465827/The_Rise_and_Fall_of_Education_for_Sustainability_in_New_Zealands_Tertiary_Education_Strategies_An_Orchestrated_Conspiracy_of_Ignorance_Extended_version_

Mellino, C. (2015). 6 of Donald Trump's Most Outrageous Tweets on Climate Change. Retrieved from http://www.ecowatch.com/6-of-donald-trumps-most-outrageous-tweets-on-climate-change-1882108349.html

Merchant, B. (2014). If We Release a Small Fraction of Arctic Carbon, 'We're Fucked': Climatologist. *Motherboard.* Retrieved from http://motherboard.vice.com/read/if-we-release-a-small-fraction-of-arctic-carbon-were-fucked-climatologist

Messersmith-Glavin, P. (2010). Between Social Ecology and Deep Ecology: Gary Snyder's Ecological Philosophy. *Perspectives.* Retrieved from https://theanarchistlibrary.org/library/paul-messersmith-glavin-between-social-ecology-and-deep-ecology-gary-snyder-s-ecological-philos/bbselect?selected=pre-post

Meyer, J. M. (1997). Gifford Pinchot, John Muir, and the boundaries of politics in American thought. *Polity, 30*(2), 267-284. doi:10.2307/3235219

Michalos, A. C. (2017). Education, happiness and wellbeing. *Social Indicators Research, 87*(3), 277-299.

Migone, P. (2016, 19 May). MPI's own officials think fish dumping high. *RNZ.* Retrieved from http://www.radionz.co.nz/news/national/304235/mpi%27s-own-officials-think-fish-dumping-is-high

Mika, C. T. H. (2015). Counter-Colonial and Philosophical Claims: An indigenous observation of Western philosophy. *Educational Philosophy and Theory, 47*(11), 1136-1142. doi:10.1080/00131857.2014.991498

Mika, C. T. H. (2017). *Indigenous education and the metaphysics of presence : a worlded philosophy.* London, UK; New York, NY: Routledge.

Mika, C. T. H., & Stewart, G. M. (2017). Lost in translation: western representations of Māori knowledge. *Open Review of Educational Research, 4*(1), 134-146. doi:DOI:10.1080/23265507.2017.1364143

Ministry for the Environment, & Statistics New Zealand. (2016). *Our marine environment 2016*. Retrieved from Wellington, NZ: http://www.mfe.govt.nz/sites/default/files/media/Environmental%20reporting/our-marine-environment.pdf

Ministry of Business Innovation and Employment. (2015). *National Process of Science Investment 2015-2025*. Retrieved from Wellington, NZ: http://www.mbie.govt.nz/info-services/science-innovation/pdf-library/NSSI%20Final%20Document%202015.pdf

Ministry of Business Innovation and Employment. (2016). National Science Challenges. Retrieved from http://www.mbie.govt.nz/info-services/science-innovation/national-science-challenges

Ministry of Education. (2007a). *The New Zealand Curriculum*. Wellington, NZ: Ministry of Education Retrieved from http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum.

Ministry of Education. (2007b). *Tertiary Education Strategy 2007-2012*. Wellington NZ: Ministry of Education Retrieved from https://www.educationcounts.govt.nz/publications/series/tes.

Ministry of Education. (2010). *Tertiary Education Strategy 2010-2015*. Wellington N.Z. Retrieved from https://www.educationcounts.govt.nz/publications/series/tes.

Ministry of Education. (2011). *Leadership statement for international education*. Wellington, NZ: New Zealand Government.

Ministry of Education. (2014a). *Draft Tertiary Education Strategy 2014-19 - Summary of Submissions* Wellington, NZ: Ministry of Education.

Ministry of Education. (2014b). *Leadership statement for international education - progress update*. Wellington, NZ: New Zealand Government.

Ministry of Education. (2014c). *Tertiary Education Strategy 2014-2019*. Wellington, N.Z. Retrieved from https://www.education.govt.nz/further-education/policies-and-strategies/tertiary-education-strategy/.

Ministry of Education. (2015). Reforms of university and wānanga governance: review documents. Retrieved from https://education.govt.nz/ministry-of-education/consultations-and-reviews/recent-consultations-and-reviews/review-

of-university-and-wananga-governance/reforms-of-university-and-wananga-governance-to-proceed/

Ministry of Education. (2017). *Leadership Statement for International Education*. Wellington, NZ: Ministry of Education.

Ministry of Education. (2018a). Cabinet Paper - Education Portfolio Work Programme: Purpose, Objectives and Overview.   Retrieved from http://www.education.govt.nz/assets/Documents/Ministry/Information-releases/R-Education-Portfolio-Work-Programme-Purpose-Objectives-and-Overview.pdf

Ministry of Education. (2018b). Details of fees free tertiary education and training for 2018 announced.   Retrieved from https://www.education.govt.nz/news/details-of-fees-free-tertiary-education-and-training-for-2018-announced/

Ministry of Foreign Affairs and Trade. (2017). Sustainable Development Goals. Retrieved from https://www.mfat.govt.nz/en/peace-rights-and-security/work-with-the-un-and-other-partners/new-zealand-and-the-sustainable-development-goals-sdgs/

Mirowski, P. (2009). *The road from Mont Pèlerin the making of the neoliberal thought collective*. Cambridge, MA: Harvard University Press.

Moog, S. (2009). Ecological Politics for the Twenty-First Century: Where Does 'Nature' Fit In? In S. Moog & R. Stones (Eds.), *Nature, Social Relations and Human Needs: Essays in honour of Ted Benton*. Basingstoke, UK: Palgrave Macmillan.

Moore, N. (2015). *The changing nature of eco/feminism: telling stories from Clayoquot sound*. Vancouver, BC: UBC Press.

Morrah, M. (2016, 3 April). Fishing industry in ethical dilemma. *Newshub*. Retrieved from http://www.newshub.co.nz/home/new-zealand/2017/04/fishing-industry-in-ethical-dilemma.html

Morton, T. (2010). *The ecological thought*. Cambridge, MA: Harvard University Press.

Morton, T. (2013). *Hyperobjects: Philosophy and Ecology after the End of the World*. Minneapolis, MN: University of Minnesota Press.

Mouffe, C. (1999). Deliberative democracy or agonistic pluralism. *Social Research, 66*(3), 745-758.

Mouffe, C. (2000). *The democratic paradox*. New York, NY: Verso.

Munda, G. (1997). Environmental economics, ecological economics, and the concept of sustainable development. *Environmental Values, 6*(2), 213-233.

Naess, A. (1986). The deep ecological movement: Some philosophical aspects. *Philosophical inquiry, 8*(1/2), 10-31. doi:10.5840/philinquiry198681/22

Næss, A., Drengson, A. R., & Devall, B. (2008). *Ecology of wisdom: writings by Arne Naess*. Berkeley, CA: Counterpoint.

Næss, A., Rothenberg, D., & Naess, A. (1989). *Ecology, community, and lifestyle: outline of an ecosophy*. Cambridge, UK: Cambridge University Press.

New Zealand Labour Party. (2017). Making tertiary education and training affordable for all.   Retrieved from https://www.labour.org.nz/tertiaryeducation

New Zealand Labour Party. (2018). Real Action on Climate Change.   Retrieved from https://www.labour.org.nz/climatechange

New Zealand Labour Party, & Green Party of Aotearoa New Zealand. (2018). *Confidence and supply Agreement*. Retrieved from https://www.greens.org.nz/sites/default/files/NZLP%20%26%20GP%20C%26S%20Agreement%20FINAL.PDF.

New Zealand Office of the Parliamentary Commissioner for the Environment. (2002). *Creating our future: Sustainable development for New Zealand*. Retrieved from

Wellington, NZ: http://www.pce.parliament.nz/publications/archive/1997-2006/creating-our-future-sustainable-development-for-new-zealand

New Zealand Office of the Parliamentary Commissioner for the Environment. (2004). *See change: learning and education for sustainability* (1877274127; 9781877274121). Retrieved from Wellington, NZ: https://www.pce.parliament.nz/publications/archive/1997-2006/see-change-learning-and-education-for-sustainability

New Zealand Office of the Parliamentary Commissioner for the Environment. (2007). *Outcome evaluation - See Change - Learning and education for sustainability*. Retrieved from Wellington, NZ: http://www.pce.parliament.nz/media/pdfs/See_change_evaluation.pdf

New Zealand Office of the Parliamentary Commissioner for the Environment. (2016). *The state of New Zealand's environment: commentary by the Parliamentary Commissioner for the Environment on Environment Aotearoa 2015*. Retrieved from Wellington, NZ: https://www.pce.parliament.nz/publications/the-state-of-new-zealands-environment-commentary-by-the-parliamentary-commissioner-for-the-environment-on-environment-aotearoa-2015

Newman, J. (2011). *Green Education An A-to-Z Guide*. Thousand Oaks, CA: SAGE Publications.

Newman, J. H. (1992). *The idea of a university*. Notre Dame, IN: University of Notre Dame Pess.

Newton, J., Dooris, M., & Wills, J. (2016). Healthy universities: an example of a whole-system health-promoting setting. *Global health promotion, 23*(1_suppl), 57-65. doi:10.1177/1757975915601037.

Norberg, J. (2016). *Progress: Ten Reasons to Look Forward to the Future*. London, UK: Oneworld Publications.

Nørgaard, J., Ragnarsdóttir, K. V., & Peet, J. (2010). The history of the limits to growth. *Solutions journal, 1*(2), 59-63.

Norton, A. (2016, 21 July). Will the UK be left behind on sustainable development? *The Guardian*. Retrieved from https://www.theguardian.com/global-development/2016/jul/21/sustainable-development-goals-will-uk-be-left-behind-andrew-norton

Norton, B. G. (2005). *Sustainability: a philosophy of adaptive ecosystem management*. Chicago, IL: University of Chicago Press.

Norton, B. G. (2013). Leopold, Hadley, and Darwin: Darwinian Epistemology, Truth, and Right. *Contemporary Pragmatism, 10*(1), 1-28.

Nussbaum, M. (2006). Education and Democratic Citizenship: Capabilities and Quality Education. *Journal of Human Development, 7*(3), 385-395. doi:10.1080/14649880600815974

Nutley, S. (2013). Reflections on the mobilisation of education research. In B. Levin, J. Qi, H. Edelstein, & J. Sohn (Eds.), *The impact of research in education: An international perspective* (pp. 243-262). Chicago, IL: University of Chicago Press.

NZ Herald. (2014, 28 October). Fossil fuel divestment not 'big issue' for NZ universities. *NZ Herald*. Retrieved from http://www.nzherald.co.nz/element-magazine/news/article.cfm?c_id=1503340&objectid=11349408

O'Neill, J. (2012). Rationality and Rationalisation in Teacher Education Policy Discourse in New Zealand. *Educational Research, 54*(2), 225-237. doi:10.1080/00131881.2012.680046

O'Neill, J. (2013). Is initial teacher education a profession? *Waikato Journal of Education, 18*(1). doi:10.15663/wje.v18i1.134

Obama, B. (2017). The irreversible momentum of clean energy. *Science, 355*(6321), 126-129. doi:10.1126/science.aam6284

OECD. (2014a). *How's Life? 2013: Measuring Well-being,* . Retrieved from Paris, France: http://www.oecd.org/statistics/how-s-life-23089679.htm

OECD. (2014b). *Obesity Update*. Retrieved from Paris, France: http://www.oecd.org/health/obesity-update.htm

OECD. (2015). *In It Together: Why Less Inequality Benefits All*. Retrieved from Paris, France: http://dx.doi.org/10.1787/9789264235120-en

OECD. (2017a). *Economic Survey of New Zealand 2017*. Retrieved from Paris, France: http://www.oecd.org/newzealand/economic-survey-new-zealand.htm

OECD. (2017b). *OECD Environmental Performance Reviews: New Zealand 2017*. Paris, France: OECD Publishing.

Oerlemans, O. (2004). *Romanticism and the Materiality of Nature*. Toronto, Canada: University of Toronto Press.

Öhman, J. (2016). New ethical challenges within environmental and sustainability education. *Environmental Education Research, 22*(6), 765-770. doi:10.1080/13504622.2016.1165800

Okanagan Charter. (2015). *An international charter for health promoting universities and colleges.* Paper presented at the 2015 International Conference on Health Promoting Universities and Colleges.

Olssen, M. (2016). Neoliberal competition in higher education today: research, accountability and impact. *British Journal of Sociology of Education, 37*(1), 129-148. doi:10.1080/01425692.2015.1100530

Olssen, M., Codd, J. A., & O'Neill, A.-M. (2004). *Education policy: Globalization, citizenship and democracy*. London, UK: SAGE Publications.

Olssen, M., & Morris Matthews, K. (1997). *Education policy in New Zealand: the 1990s and beyond*. Palmerston North, N.Z: Dunmore.

Olssen, M., & Peters, M. A. (2005). Neoliberalism, higher education and the knowledge economy: from the free market to knowledge capitalism. *Journal of Education Policy, 20*(3), 313-345. doi:10.1080/02680930500108718

Orr, D. W. (1989). Ecological Literacy. *Conservation Biology, 3*(4), 334-335. doi:10.1111/j.1523-1739.1989.tb00238.x

Orr, D. W. (1992). *Ecological literacy: education and the transition to a postmodern world*. Albany, NY: State University of New York Press.

Orr, D. W. (1994). *Earth in mind: on education, environment, and the human prospect*. Washington, DC: Island Press.

Ostry, J. D., Loungani, P., & Furceri, D. (2016). Neoliberalism: Oversold. *IMF Finance & Development, 53*(2), 38-41.

Otago Polytechnic. (2016). *Annual Plan*. Retrieved from https://www.op.ac.nz/assets/marketing/2017/PDF/J02811-Otago-Polytechnic-Annual-Report-2016-FA2-WEB.pdf

Oxfam NZ. (2017). NZ's two richest men own more wealth than poorest 30% [Press release]. Retrieved from https://www.oxfam.org.nz/news/nz-s-two-richest-men-own-more-wealth-poorest-30

Pachauri, R. K., & Meyer, L. A. (2014). *IPCC Fifth Assessment Synthesis Report-Climate Change 2014 Synthesis Report*. Geneva, Switzerland: IPCC.

Packard, A. (2010). *Sustainability in the New Zealand Tertiary Sector: A Short Report*. Wellington (N.Z.) ReGeneration Network.

Palmer, G. (2014, 25 February). Why New Zealand's public service needs fixing. *Dominion Post,* p. A9.

Palmer, G. (2017, 10 July). Democracy is in decline, so what can we do? *Newsroom*. Retrieved from https://www.newsroom.co.nz/2017/07/09/37784/democracy-is-in-decline-so-what-can-we-do#

Pardales, M. J., & Girod, M. (2006). Community of Inquiry: Its Past and Present Future. *Educational Philosophy and Theory, 38*(3), 299-309. doi:10.1111/j.1469-5812.2006.00196.x

Pattberg, P., & Widerberg, O. (2015). Theorising Global Environmental Governance: Key Findings and Future Questions. *Millennium - Journal of International Studies, 43*(2), 684-705. doi:10.1177/0305829814561773

Payne, P. G. (2016). What next? Post-critical materialisms in environmental education AU *The Journal of Environmental Education, 47*(2), 169-178. doi:10.1080/00958964.2015.1127201

Peacock, C. (2016, 10 July). Is a 'post-truth' era upon us? *RNZ*. Retrieved from http://www.radionz.co.nz/national/programmes/mediawatch/audio/201807260/is-a-'post-truth'-era-upon-us

Pearce, F. (2016, 14 April). Can We Reduce CO2 Emissions And Grow the Global Economy? *Yale Environment 306*. Retrieved from http://e360.yale.edu/features/can_we_reduce_co2_emissions_and_grow_global_economy

Pearce, F. (2017, 8 June). With the U.S. Out of Paris, What Is the Future for Global Climate Fight? *Yale Environment 360*. Retrieved from http://e360.yale.edu/features/with-the-u-s-out-of-paris-what-is-the-future-for-global-climate-fight

Penetito, W. (2009). Place-based education: Catering for curriculum, culture and community. *New Zealand Annual Review of Education, 18*(2008), 5-29.

People and Planet's university league. (2018). How sustainable is your university? . Retrieved from https://peopleandplanet.org/university-league

People and Planet university league. (2018). Education for sustainable development. Retrieved from https://peopleandplanet.org/university-league-2016/methodology/9-education-sustainable

Peters, M. A. (2014). Competing Conceptions of the Creative University. *Educational Philosophy and Theory, 46*(7), 713-717. doi:10.1080/00131857.2013.785074

Peters, M. A. (2015a). The Humanist Bias in Western Philosophy and Education. *Educational Philosophy and Theory, 47*(11), 1128-1135. doi:10.1080/00131857.2014.991497

Peters, M. A. (2015b). Why is My Curriculum White? *Educational Philosophy and Theory, 47*(7), 641-646. doi:10.1080/00131857.2015.1037227

Peters, M. A. (2017a). Education for ecological democracy. *Educational Philosophy and Theory, 49*(10), 941-945. doi:10.1080/00131857.2017.1339408

Peters, M. A. (2017b). Education in a post-truth world. *Educational Philosophy and Theory, 49*(6), 563-566. doi:10.1080/00131857.2016.1264114

Peters, M. A., & Besley, T. (Eds.). (2013). *The creative university*. Rotterdam, ND: SensePublishers.

Peters, M. A., & Hung, R. (2008). Solar Ethics: A New Paradigm for Environmental Ethics? *Environmental Education: Identity, Politics, Citizenship.* (pp. 13-24). The Netherlands: Sense Publishers.

Peters, M. A., & Marshall, J. (1996). The politics of curriculum: Busnocratic rationality and enterprise culture. *Delta, 48*(1), 33-46.

Peters, M. A., Paraskeva, J., & Besley, T. (2015). *The global financial crisis and educational restructuring*. New York, NY: Peter Lang.

Peters, M. A., & Tesar, M. (2016). *Beyond the philosophy of the subject: an educational philosophy and theory post-structuralist reader*. New York, NY; London, UK: Routledge.

Peters, W. (2017). Post-Election Announcement Speech [Press release]. Retrieved from http://www.nzfirst.org.nz/post_election_announcement_speech

Phillips, M., & Rumens, N. (2015). *Contemporary perspectives on ecofeminism*. New York, NY: Routledge.

Pidcock, R. (2014). Briefing: What's new and interesting in the IPCC synthesis report. Retrieved from http://www.carbonbrief.org/briefing-whats-new-and-interesting-in-the-ipcc-synthesis-report

Pitama, S., Robertson, P., Cram, F., Gillies, M., Huria, T., & Dallas-Katoa, W. (2007). Meihana model: A clinical assessment framework. *New Zealand Journal of Psychology, 36*(3), 118.

Plumwood, V. (2002). *Environmental Culture: The Ecological Crisis of Reason*. London, UK: Taylor & Francis.

Plumwood, V. (2007). Ecopolitical debate and the politics of Nature. http://videolectures.net/dpu06_plumwood_edpn/.

Polimeni, J. M. (2012). *The Jevons paradox and the myth of resource efficiency improvements*. London, UK: Earthscan.

Porto, M., & Byram, M. (2015). A curriculum for action in the community and intercultural citizenship in higher education. *Language, Culture and Curriculum, 28*(3), 226-242. doi:10.1080/07908318.2015.1087555

Postma, D. W. (2002). Taking the future seriously. On the inadequacies of the framework of liberalism for environmental education. *Journal of Philosophy of Education, 36*(1), 41-56. doi:10.1111/1467-9752.00258

Potter, G. (2010). Environmental Education for the 21st Century: Where Do We Go Now? *The Journal of Environmental Education, 41*(1), 22-33. doi:10.1080/00958960903209975

Preston, S., & Aslett, J. (2014). Resisting neoliberalism from within the academy: Subversion through an activist pedagogy. *Social work education, 33*(4), 502-518.

Probert, B. (2016). The era of universal participation in higher education: Australian policy problems in relation to cost, equity and quality. *Occasional paper for Higher Education Research and Development Society of Australasia (HERDSA). Retrieved November, 8*, 2016.

Prunty, J. J. (1985). Signposts for a critical educational policy analysis. *Australian Journal of Education, 29*(2), 133-140. doi:10.1177/000494418502900205

Putnam, H., & Sen, A. K. (2004). *The collapse of the fact/value dichotomy and other essays* (Vol. 1st Harvard University Press pbk.). Cambridge, MA: Harvard University Press.

Putnam, H., & Walsh, V. (2012). *The end of value-free economics*. New York, NY: Routledge.

QS Rankings. (2018). Rating Universities on Social Responsibility: QS Stars. Retrieved from https://www.topuniversities.com/qs-stars/qs-stars/rating-universities-engagement-qs-stars

Quiggin, J. (2012). *Zombie economics: how dead ideas still walk among us*. Princeton, NJ: Princeton University Press.

Radical Ecological Democracy. (2017). Radical Ecological Democracy - Searching for alternatives to unsustainable and inequitable model of 'development'. Retrieved from http://www.radicalecologicaldemocracy.org/

Randers, J. (2012). *2052: a global forecast for the next forty years*. White River Junction, VT: Chelsea Green Publishers.

Rashbrooke, M. (2013). *Inequality: a New Zealand crisis*. Wellington, NZ Bridget Williams Books.

Rashbrooke, M. (2017). *Bridges both ways*. Retrieved from Wellington: http://igps.victoria.ac.nz/publications/files/56bff49c7f9.pdf

Rata, E. (2014). The three stages of critical policy methodology: an example from curriculum analysis. *Policy Futures in Education, 12*(3), 347-358. doi:10.2304/pfie.2014.12.3.347

Ravetz, J. R. (2006). Post-normal science and the complexity of transitions towards sustainability. *Ecological complexity, 3*(4), 275-284. doi:10.1016/j.ecocom.2007.02.001

Raworth, K. (2016). Exploring the doughnut.   Retrieved from http://www.kateraworth.com/doughnut/

Raworth, K. (2017). *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. White River Junction, VT: Chelsea Green Publishing.

Readings, B. (1996). *The university in ruins*. Cambridge, MA: Harvard University Press.

Reid, A. (2009). Environmental education research: will the ends outstrip the means? *Environmental Education Research, 15*(2), 129-153. doi:10.1080/13504620902871705

Rein, M. (1983). Value-critical policy analysis. In C. D. & J. B. (Eds.), *Ethics, the social sciences, and policy analysis* (pp. 83-111). Boston, MA: Springer.

Rekret, P. (2016). A critique of new materialism: ethics and ontology. *Subjectivity, 9*(3), 225-245. doi:10.1057/s41286-016-0001-y

Ridley, M. (2010). *The rational optimist: how prosperity evolves*. London, UK: Fourth Estate.

Rigby, K. (2014). Romanticism and Ecocriticism. In G. Garrard (Ed.), *The Oxford Handbook of Ecocriticism* (pp. 60-79). Oxford, UK: Oxford UP.

Rinne, R., Jauhiainen, A., & Kankaanpää, J. (2014). Surviving in the ruins of the university?- Lost autonomy and collapsed dreams in the Finnish transition of university policies. *Nordic Studies in Education, 34*(03), 213-232.

Risager, B. S., & Thorup, M. (2016). Protesting the neoliberal university: The Danish student movement 'A Different University.'. *Interface: A Journal for and about Social Movements, 8*(1), 7-33.

RNZ. (2016). No housing crisis in NZ - Paula Bennett. *RNZ News*. Retrieved from http://www.radionz.co.nz/news/national/304378/no-housing-crisis-in-nz-paula-bennett

Roberts, P. (1999). The future of the university: Reflections from New Zealand. *International Review of Education, 45*(1), 65-86. doi:10.1023/A:1003525921200

Roberts, P. (2007). Neoliberalism, Performativity and Research. *International Review of Education, 53*(4), 349-365.

Roberts, P. (2009). A new patriotism? Neoliberalism, citizenship and tertiary education in New Zealand. *Educational Philosophy and Theory, 41*(4), 410-423. doi:10.1111/j.1469-5812.2008.00437.x

Robertson, G. (2018). A wellbeing approach to assessing the Government's balance sheet [Press release]. Retrieved from https://www.beehive.govt.nz/release/wellbeing-approach-assessing-government%E2%80%99s-balance-sheet

Robertson, T. (2012). *The Malthusian moment: global population growth and the birth of American environmentalism*. New Brunswick, NJ: Rutgers University Press.

Rochford, T. (2004). Whare Tapa Wha: A Māori model of a unified theory of health. *Journal of Primary Prevention, 25*(1), 41-57. doi:10.1023/B:JOPP.0000039938.39574.9e

Rose, D. B., & Robin, L. (2004). The ecological humanities in action: An invitation. *Australian Humanities Review, 31*(2).

Roser, M., & Ortiz-Ospina, E. (2017). Global Extreme Poverty.   Retrieved from https://ourworldindata.org/extreme-poverty/

Roth, C. (1968). On the Road to Conservation. *Massachusetts Audubon*, 38-41.

Rousell, D. (2016). Dwelling in the Anthropocene: Reimagining University Learning Environments in Response to Social and Ecological Change. *Australian Journal of Environmental Education, 32*(2), 137-153. doi:10.1017/aee.2015.50

Royal Society of New Zealand. (2014). *Comments on the Draft National Statement of Science Investment 2014-2024*. Retrieved from Wellington, NZ: https://royalsociety.org.nz/assets/documents/RSNZ-Comments-on-Draft-NSSI.pdf

Rummens, S. (2009). Democracy as a Non-Hegemonic Struggle? Disambiguating Chantal Mouffe's Agonistic Model of Politics. *Constellations, 16*(3), 377-391. doi:10.1111/j.1467-8675.2009.00548.x

Russell, N. J. (2006). An Introduction to the Overton window of political possibilities. Retrieved from https://www.mackinac.org/7504

Ryan, A., Tilbury, D., Blaze Corcoran, P., Abe, O., & Nomura, K. (2010). Sustainability in higher education in the Asia-Pacific: developments, challenges, and prospects. *International Journal of Sustainability in Higher Education, 11*(2), 106-119. doi:10.1108/14676371011031838

Ryan, B. (2007). *Elephant in the room: The embeddedness of positivism in public sector practice.* Paper presented at the QualIT 2007 – Qualitative Research: From the Margins to the Mainstream, Wellington, NZ.

Ryff, C. D. (2014). Psychological well-being revisited: Advances in the science and practice of eudaimonia. *Psychotherapy and psychosomatics, 83*(1), 10-28. doi:10.1159/000353263

Sabin, P. (2013). *The bet: Paul Ehrlich, Julian Simon, and our gamble over Earth's future*. New Haven, CT: Yale University Press.

Sachs, J., Schmidt-Traub, G., Kroll, C., Durand-Delacre, D., & Teksoz, K. (2017). SDG Index and Dashboards Report 2017. *Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN): New York, NY, USA*.

Sachs, J. D. (2012). From millennium development goals to sustainable development goals. *The Lancet, 379*(9832), 2206-2211. doi:10.1016/S0140-6736(12)60685-0

Sadlak, J. (2010). *Ranking in higher education: Its place and impact*. Retrieved from http://www.educationarena.com/pdf/sample/sample-essay-sadlak.pdf

Sagoff, M. (1986). Can environmentalists be liberals? Jurisprudential foundations of environmentalism. *Environmental Law, 16*(4), 775-796.

Sant, E., Davies, I., Pashby, K., & Shultz, L. (2018). *Global Citizenship Education: A Critical Introduction to Key Concepts and Debates*. London, UK: Bloomsbury Publishing.

Schandl, H., Hatfield-Dodds, S., Wiedmann, T., Geschke, A., Cai, Y., West, J., . . . Owen, A. (2016). Decoupling global environmental pressure and economic growth: Scenarios for energy use, materials use and carbon emissions. *Journal of Cleaner Production, 132*, 45-56. doi:10.1016/j.jclepro.2015.06.100

Schmidt, V. A., & Thatcher, M. (2014). Why are neoliberal ideas so resilient in Europe's political economy? *Critical Policy Studies, 8*(3), 340-347.

Schumacher College. (2017). The Elmhirst Programme. Retrieved from https://www.schumachercollege.org.uk/elmhirst

Schumacher, E. F. (2011). *Small is beautiful: A study of economics as if people mattered*. London, England: Random House.

Scott, K. (2012). *Measuring wellbeing: towards sustainability?* : Routledge.

Scott, W. (2015). Education for Sustainable Development (ESD): A Critical Review of Concept, Potential and Risk. In R. Jucker & R. Marthar (Eds.), *Schooling for Sustainable Development in Europe* (pp. 47-70). Cham, Switzerland: Springer.

Sebastian, K. S. A., & Ajith, K. K. (2013). Social Mobilization for Ecological Literacy. *Rajagiri Journal of Social Development, 5*(2), 177.

Selwyn, N. (2014). *Digital technology and the contemporary university: Degrees of digitization*. London, UK: Routledge.

Sen, A. (2017). *Collective Choice and Social Welfare: Expanded Edition*. London, UK: Penguin.

SEPN. (2017). About SEPN.   Retrieved from http://sepn.ca/the-project/

Shaw, J. (2018, 6 February). James Shaw: We can lead world dealing with climate change. *NZ Herald*. Retrieved from https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11988529

Shaw, R. (2015). Bringing Deleuze and Guattari down to Earth through Gregory Bateson: Plateaus, Rhizomes and Ecosophical Subjectivity. *Theory, Culture & Society, 32*(7-8), 151-171. doi:10.1177/0263276414524451

Shields, P. M. (2003). The Community of Inquiry: Classical Pragmatism and Public Administration. *Administration & Society, 35*(5), 510-538. doi:10.1177/0095399703256160

Shields, P. M. (2005). Classical Pragmatism: Roots and Promise for a PA Feminist Theory. *Administrative Theory & Praxis, 27*(2), 370-376.

Shields, P. M. (2008). Rediscovering the taproot: Is classical pragmatism the route to renew public administration? *Public Administration Review, 68*(2), 205-221. doi:10.1111/j.1540-6210.2007.00856.x

Shields, P. M., Whetsell, T. A., & Hanks, E. K. (2015). Pragmatism and Public Administration: Looking back, Looking forward. In N. Rumens & M. Kelemen (Eds.), *American pragmatism and organization: issues and controversies* (pp. 115-129). Farnham, UK: Gower.

Shiva, V. (2016). *Earth democracy: Justice, sustainability and peace*. London, UK: Zed Books Ltd.

Shore, C. (2010). The Reform of New Zealand's University System:" After Neoliberalism". *The International Journal of Higher Education in the Social Sciences, 3*(1), 1-31.

Shore, C., & Wright, S. (2015). Governing by numbers: audit culture, rankings and the new world order. *Social Anthropology, 23*(1), 22-28. doi:doi:10.1111/1469-8676.12098

Shultz, L. (2013). Engaged scholarship in a time of the corporatization of the university and distrust of the public sphere. In S. L. & K. T. (Eds.), *Engaged scholarship* (pp. 43-53). Rotterdam, ND: Sense Publishers.

Siervo, M., Montagnese, C., Mathers, J. C., Soroka, K. R., Stephan, B. C. M., & Wells, J. C. K. (2014). Sugar consumption and global prevalence of obesity and hypertension: an ecological analysis. *Public health nutrition, 17*(3), 587-596. doi:10.1017/S1368980013000141

Simmons, M. R. (2000). Revisiting The Limits to Growth: could the Club of Rome have been correct, after all? *An energy white paper.* Retrieved from https://www.resilience.org/stories/2000-09-29/revisiting-limits-growth-could-club-rome-have-been-correct-after-all-part-one/

Simons, M., Olssen, M., & Peters, M. A. (2009). *Re-reading education policies: a handbook studying the policy agenda of the 21st century*. Rotterdam, ND: Sense Publishers.

Smith, M. B. (1998). The value of a tree: public debates of John Muir and Gifford Pinchot. *The Historian, 60*(4), 757-778.

Smith, Z. A. (2017). *The environmental policy paradox*. New York, NY: Routledge.

Smyth, J. (2017). *The toxic university: Zombie leadership, academic rock stars and neoliberal ideology*. London, UK: Palgrave McMillan.

Spash, C. L. (2012). New foundations for ecological economics. *Ecological Economics, 77*, 36-47. doi:10.1016/j.ecolecon.2012.02.004

Spash, C. L. (2013). The shallow or the deep ecological economics movement? *Ecological Economics, 93*, 351-362. doi:10.1016/j.ecolecon.2013.05.016

Stables, A. (2001). Who Drew the Sky? Conflicting assumptions in environmental education. *Educational Philosophy and Theory, 33*(2), 245-256. doi:10.1111/j.1469-5812.2001.tb00266.x

Stedman Jones, D. (2012). *Masters of the Universe: Hayek, Friedman, and the Birth of Neoliberal Politics*. Princeton, NJ: Princeton University Press.

Steffen, W., Broadgate, W., Deutsch, L., Gaffney, O., & Ludwig, C. (2015). The trajectory of the Anthropocene: the great acceleration. *The Anthropocene Review, 2*(1), 81-98. doi:10.1177/2053019614564785

Steffen, W., Grinevald, J., Crutzen, P., & McNeill, J. (2011). The Anthropocene: conceptual and historical perspectives. *Philosophical Transactions, 369*(1938), 842-867. doi:10.1098/rsta.2010.0327

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., . . . Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science, 347*(6223).

Steiner, N. D. (2010). Economic globalization and voter turnout in established democracies. *Electoral Studies, 29*(3), 444-459. doi:10.1016/j.electstud.2010.04.007

Sterling, S. (2001). *Sustainable Education: Re-Visioning Learning and Change. Schumacher Briefings*. Cambridge, UK: Green Books.

Sterling, S. (2003). *Whole systems thinking as a basis for paradigm change in education: Explorations in the context of sustainability.* University of Bath, Bath, UK.

Sterling, S. (2008). Sustainable education-towards a deep learning response to unsustainability. *Policy & Practice - A Development Education Review, Spring*(6), 63-68.

Sterling, S. (2010). Learning for resilience, or the resilient learner? Towards a necessary reconciliation in a paradigm of sustainable education. *Environmental Education Research, 16*(5-6), 511-528. doi:10.1080/13504622.2010.505427

Sterling, S., Maxey, L., & Luna, H. (2013). *The sustainable university: progress and prospects*. London, UK: Routledge.

Stewart, M. (2012, 1 December). 100% Pure Fantasy? Living up to our brand.

Stibbe, A., & Villiers-Stuart, P. (2009). *The handbook of sustainability literacy: Skills for a changing world*. Cambridge, UK: Green Books.

Stineman, M. G., & Streim, J. E. (2010). The biopsycho-ecological paradigm: a foundational theory for medicine. *PM&R, 2*(11), 1035-1045. doi:10.1016/j.pmrj.2010.06.013

Stock, R. (2018, 28 January). Treasury adopts 'wellbeing' focus, but insists it's not going fuzzy. *Stuff.co.nz*. Retrieved from https://www.stuff.co.nz/business/money/100642800/treasury-adopts-wellbeing-focus-but-insists-its-not-going-fuzzy

Stone, L. J., & Baldoni, M.-J. (2006). *Progress and pitfalls in the provision of tertiary education for sustainable development in New Zealand.* Wellington, NZ: Parliamentary Commissioner for the Environment.

Stone, M. K., & Barlow, Z. (2005). *Ecological literacy: educating our children for a sustainable world*. San Francisco, CA: Sierra Club Books.

Stratford, R. (2015). *What is the ecological university and why is it a significant challenge for higher education policy and practice?* Paper presented at the PESA - Philosophy of Education Society of Australasia, ANCU, Melbourne. https://www.academia.edu/19661131/What_is_the_ecological_university_and_why_is_it_a_significant_challenge_for_higher_education_policy_and_practice

Stratford, R. (2016a). *Beyond economic growth and rational, liberal humanism – the posthuman and ecological education in the Anthropocene*. Paper presented at the Aims and Ends in Education, University of Canterbury, Christchurch.

Stratford, R. (2016b). *New Zealand's Living Standards Framework at a time of unsustainability*. Paper presented at the The Treasury, Wellington, N.Z.

Stratford, R. (2016c). *Towards a postfoundational ecological approach in higher education*. Paper presented at the SEPN, Saskatchewan, Canada.

Stratford, R. (2017). Post-truth, political ecology and education. *Educational Philosophy and Theory, 49*(6), 586-587. doi:10.1080/00131857.2017.1288810

Stuart, E. (2016). Britain's progress on the SDGs is 'insufficient'. Retrieved from https://www.odi.org/comment/10407-britain-s-progress-sdgs-insufficient

Stuff.co.nz. (2017, 20 July). Report shows housing affordability dropping throughout NZ. *Stuff.co.nz*. Retrieved from https://www.stuff.co.nz/business/94924525/report-shows-housing-affordability-dropping-throughout-nz

Sustainable Aotearoa New Zealand. (2009). *Strong sustainability for New Zealand: Principles and scenarios*. Wellington, NZ: Nakedize.

Sustainable Development Solutions Network (SDSN), & Bertelsmann Stiftung. (2017). SDG Index and Dashboards. Retrieved from http://sdgindex.org/

Sustainable seas. (2016). Sustainable Seas - Ko ngā moana whakauka. Retrieved from http://www.mbie.govt.nz/info-services/science-innovation/national-science-challenges/sustainable-seas

Sutherland-Smith, W. (2013). Competition or collaboration: Policies and practices in international higher education. *The Australian Educational Researcher, 40*(3), 391-401. doi:10.1007/s13384-013-0115-y

Sutherland, K. A. (2018). The Changing Academic Profession in New Zealand Universities *Early Career Academics in New Zealand: Challenges and Prospects in Comparative Perspective* (pp. 21-35). Cham, Switzerland: Springer.

Sweden Government Report. (2017). *Sweden and the 2030 Agenda — Report to the UN High Level Political Forum 2017 on Sustainable Development*. Retrieved from https://sustainabledevelopment.un.org/hlpf#vnrs

Swinburn, B. A., Sacks, G., Hall, K. D., McPherson, K., Finegood, D. T., Moodie, M. L., & Gortmaker, S. L. (2011). The global obesity pandemic: shaped by global drivers and local environments. *The Lancet, 378*(9793), 804. doi:10.1016/S0140-6736(11)60813-1.

Swirski, T., & Simpson, M. D. (2012). Re-imagining work-integrated learning through slow innovation in higher education. *Asia-Pacific Journal of Cooperative Education, 13*(4), 239-253.

Sylvestre, P., McNeil, R., & Wright, T. (2013). From talloires to turin: A critical discourse analysis of declarations for sustainability in higher education. *Sustainability, 5*(4), 1356-1371. doi:10.3390/su5041356

Taylor, B., & Zimmerman, M. (2005). Deep Ecology. In B. Taylor (Ed.), *Encyclopedia of Religion and Nature* (pp. 456-460). London, UK: Continuum International.

Taylor, C. (2017). Is a posthumanist Bildung possible? Reclaiming the promise of Bildung for contemporary higher education. *The International Journal of Higher Education Research, 74*(3), 419-435. doi:10.1007/s10734-016-9994-y

Taylor, S. (1997). Critical policy analysis: Exploring contexts, texts and consequences. *Discourse: Studies in the cultural politics of education, 18*(1), 23-35. doi:10.1080/0159630970180102

Tertiary Education Commission. (2011). *Review of Governance Change - Evaluation of the implementation and short-term outcomes of the change*. Retrieved from Wellington, NZ:

https://www.iod.org.nz/Portals/0/Governance%20resources/2011-Review-of-Governance-Change-Evaluation.pdf

Tertiary Education Union. (2017). Good effort, but Productivity Commission misses the mark. Retrieved from http://teu.ac.nz/2017/05/productivity-comm-misses-mark/

Thakur, M. (2007). The impact of ranking systems on higher education and its stakeholders. *Journal of Institutional Research, 13*(1), 83-96.

The New Zealand Association of Scientists. (2014). National Science Challenges under fire [Press release]. Retrieved from http://scientists.org.nz/files/posts/admin/PressReleaseNSC-Survey.pdf

The Productivity Commission. (2017). Tertiary education. Retrieved from https://www.productivity.govt.nz/category/tags/http%3A/wi-dev2.co.nz/taxonomy/term/13

The Talloires Network. (2015). University Education for Transformative Leadership in Africa. Retrieved from https://talloiresnetwork.tufts.edu/blog/news/2015/11/25/africa-faculty-support-grants/

The Talloires Network. (2017). The MacJannet Prize. Retrieved from https://talloiresnetwork.tufts.edu/about-the-macjannet-prize/

Tierney, J. (1990). Betting the planet. *New York Times,* pp. 52-82. Retrieved from https://www.nytimes.com/1990/12/02/magazine/betting-on-the-planet.html

Tilbury, D. (2011). Higher Education for Sustainability: A Global Overview of Commitment and Progress. In GUNI (Ed.), *Higher Education in the World 4. Higher Education's Commitment to Sustainability: from Understanding to Action.* (pp. 18-28). Barcelona, Spain: Palgrave McMillan.

Tilbury, D. (2013). Another world is desirable: A global rebooting of higher education for sustainable development. In S. Sterling, L. Maxey, & H. Luna (Eds.), *The sustainable university: Progress and prospects* (pp. 71-85). London, UK: Routledge.

Tinnell, J. C. (2012). Transversalising the Ecological Turn: Four Components of Félix Guattari's Ecosophical Perspective. *Deleuze Studies, 6*(3), 357-388.

Topp, F. C. (2014). *From Vision to Action: Transitions to Sustainability in Otago's Tertiary Education Institutions: a Thesis Submitted in Partial Fulfilment for the Degree of Master of Arts at the University of Otago, Dunedin, New Zealand.* University of Otago.

Tribe, J. (2014). A philosophic practice? In D. Dredge, D. Airey, & M. J. Gross (Eds.), *The Routledge handbook of tourism and hospitality education* (pp. 17). London, UK: Routledge.

Turner, G. (2008). A comparison of The Limits to Growth with 30 years of reality. *Global Environmental Change, 18*(3), 397-411. doi:10.1016/j.gloenvcha.2008.05.001

Turner, G. (2014). Is global collapse imminent? An updated comparison of the Limits to Growth with historical data. *MSSI Research paper, 4*, 21.

Turner, G., & Alexander, C. (2014, 2 September). Limits to Growth was right. New research shows we're nearing collapse. *The Guardian*. Retrieved from https://www.theguardian.com/commentisfree/2014/sep/02/limits-to-growth-was-right-new-research-shows-were-nearing-collapse

Turnpenny, J., Jones, M., & Lorenzoni, I. (2011). Where now for post-normal science?: A critical review of its development, definitions, and uses. *Science, Technology, & Human Values, 36*(3), 287-306. doi:10.1177/0162243910385789

Udall, S. L. (1963). *The Quiet Crisis*. New York, NY: Holt, Rinehart and Winston.

UNESCO, & UNEP. (1977). *The Tbilisi Declaration.* Paper presented at the Intergovernmental Conference on Environmental Education.

UNICEF. (2017). *Building the Future: Children and the Sustainable Development Goals in Rich Countries*. Retrieved from

Unitec. (2018). One Planet Living: Our Commitment. Retrieved from https://www.unitec.ac.nz/about-us/one-planet-living-our-commitment

United Nations. (2015). *The Millennium Development Goals Report 2015 - the United Nations*. Retrieved from New York, NY: https://www.un.org/development/desa/publications/mdg-report-2015.html

United Nations. (2017). Global Action Programme on Education for Sustainable Development. Retrieved from http://en.unesco.org/gap

United Nations Conference on the Human Environment. (1972). *Declaration of the United Nations Conference on the Human Environment*. Retrieved from Stockholm: http://www.un-documents.net/unchedec.htm

United Nations Development Programme, & United Nations Research Institute for Social Development. (2017). *Global trends: Challenges and opportunities in the implementation of the Sustainable Development Goals*. Retrieved from New York, NY: http://www.undp.org/content/undp/en/home/librarypage/sustainable-development-goals/global-trends--challenges-and-opportunities-in-the-implementatio.html

United Nations Environment Programme. (2011). *Decoupling: natural resource use and environmental impacts from economic growth*. Retrieved from http://hdl.handle.net/20.500.11822/9816

Universities NZ – Te Pōkai Tara. (2014). Governance changes will undermine role of universities [Press release]. Retrieved from http://www.universitiesnz.ac.nz/latest-news-and-publications/governance-changes-will-undermine-role-universities

Universities NZ – Te Pōkai Tara. (2017). Growing New Zealand's Economy. Retrieved from http://www.universitiesnz.ac.nz/sector-research/growing-new-zealand-economy

University of Auckland. (2013). *University of Auckland strategic plan 2013-2020*. Retrieved from https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/sustainability-and-environment/our-commitements-to-sustainability.html

University of Auckland. (2016). *Annual Report*. Retrieved from Auckland, NZ: https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/official-publications/annual-report.html

University of Auckland. (2017a). Failed fisheries management system costing NZ economy and environment, experts say [Press release]. Retrieved from https://www.auckland.ac.nz/en/about/news-events-and-notices/news/news-2017/06/failed-fisheries-management-system-costing-nz-economy-and-environment-experts-say.html

University of Auckland. (2017b). University embracing UN Goals [Press release]. Retrieved from https://www.auckland.ac.nz/en/about/the-university/how-university-works/sustainability-and-environment/se-whats-new_1/se-whats-new-2017/university-embracing-un-goals.html

University of Auckland. (2018). Sustainability and environment. Retrieved from https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/sustainability-and-environment.html

University of Brighton. (2017). Sir David Watson Award: winner announced. Retrieved from https://www.brighton.ac.uk/about-us/news-and-events/news/2017/10-26-sir-david-watson-award-winner-announced.aspx

University of Otago. (2017a). Sustainability Policies and Principles.   Retrieved from https://www.otago.ac.nz/sustainability/policies/

University of Otago. (2017b). Teaching and Research.   Retrieved from https://www.otago.ac.nz/sustainability/teaching/

Van der Tuin, I., & Dolphijn, R. (2012). *New materialism: Interviews & cartographies*: Open Humanities Press.

Van Deurzen, I., Van Ingen, E., & Van Oorschot, W. J. (2015). Income inequality and depression: the role of social comparisons and coping resources. *European Sociological Review, 31*(4), 477-489. doi:10.1093/esr/jcv007

Van Wyck, P. C. (1997). *Primitives in the Wilderness: Deep ecology and the missing human subject*. Albany, NY: SUNY Press.

Vanhulst, J., & Beling, A. E. (2014). Buen vivir: Emergent discourse within or beyond sustainable development? *Ecological Economics, 101*, 54-63. doi:10.1016/j.ecolecon.2014.02.017

Victor, P. A. (2008). *Managing without growth: slower by design, not disaster*. Cheltenham, UK: Edward Elgar Publishing.

Victoria University Wellington. (2017a). BA Internship.   Retrieved from https://www.victoria.ac.nz/courses/fhss/302/2018/offering?crn=26062

Victoria University Wellington. (2017b). A global-civic university.   Retrieved from https://www.victoria.ac.nz/about/global-civic-university

Victoria University Wellington. (2017c). Victoria leads in commitment to Sustainable Development Goals [Press release]. Retrieved from https://www.victoria.ac.nz/news/2017/06/victoria-leads-in-commitment-to-sustainable-development-goals

Vogt, W. (1948). *Road to Survival*. New York, NY: Slodne Associates.

Volland, B. (2012). *The effects of income inequality on BMI and obesity: Evidence from the BRFSS*. Retrieved from Marburg, Germany: https://ideas.repec.org/p/esi/evopap/2012-10.html

von Weizsäcker, E. U., de Larderel, J. A., Hargroves, K., Hudson, C., Smith, M. H., Rodrigues, M. A. E., . . . Swilling, M. (2014). *Decoupling 2: technologies, opportunities and policy options*. New York, NY: United Nations Environment Programme.

Walker, R., Moore, C., & Whelan, A. (2013). *Zombies in the Academy: Living Death in Higher Education*. Bristol, UK: Intellect.

Wall, T., & Perrin, D. (2015). *Slavoj Žižek: A Žižekian Gaze at Education*. Cham, Switzerland: Springer.

Wallace, R. B., Baumann, H., Grear, J. S., Aller, R. C., & Gobler, C. J. (2014). Coastal ocean acidification: The other eutrophication problem. *Estuarine, Coastal and Shelf Science, 148*, 1-13. doi:10.1016/j.ecss.2014.05.027

Wals, A. E. J. (2014). Sustainability in higher education in the context of the UN DESD: a review of learning and institutionalization processes. *Journal of Cleaner Production, 62*, 8-15. doi:10.1016/j.jclepro.2013.06.007

Wals, A. E. J., & Blewitt, J. (2010). Third wave sustainability in higher education: Some (inter) national trends and developments. In P. Jones, D. Selby, & S. Sterling (Eds.), *Sustainability education: perspectives and practice across higher education.* (pp. 55-74). London, UK: Earthscan.

Wang, C.-L. (2014a). Curricula without Boundaries: Developing an Ecological Connection for Higher Education Curricula. *Educational Philosophy and Theory, 46*(13), 1402-1411. doi:10.1080/00131857.2014.964162

Wang, C.-L. (2014b). *Towards self-realisation: The exploration of the ecological self for education*. Paper presented at the 2014 Philosophy of Education Society of Australiasia Conference, Hamilton N.Z. .

Ward, J. D., Sutton, P. C., Werner, A. D., Costanza, R., Mohr, S. H., & Simmons, C. T. (2016). Is Decoupling GDP Growth from Environmental Impact Possible? *PLoS One, 11*(10), e0164733. doi:10.1371/journal.pone.0164733

Watermeyer, R. (2014). Issues in the articulation of 'impact': the responses of UK academics to 'impact'as a new measure of research assessment. *Studies in Higher Education, 39*(2), 359-377. doi:10.1080/03075079.2012.709490

Waters, L. (2018, 1 February). NZ Government to lead world in measuring success with wellbeing measures. *Stuff.co.nz*. Retrieved from https://www.stuff.co.nz/national/politics/101066981/nz-government-to-lead-world-in-measuring-success-with-wellbeing-measures

Watson, D., Hollister, R., Stroud, S. E., & Babcock, E. (2011). *The engaged university: International perspectives on civic engagement*. London, UK: Routledge.

Wattchow, B., & Brown, M. (2011). *A pedagogy of place: outdoor education for a changing world*. Clayton, Vic: Monash University Publishing.

West, C. (2016, 17 November). Goodbye, American neoliberalism. A new era is here. *The Guardian*. Retrieved from https://www.theguardian.com/commentisfree/2016/nov/17/american-neoliberalism-cornel-west-2016-election

White, D. F. (2008). *Bookchin a critical appraisal*. London, UK: Pluto Press.

Wilkinson, R. G., & Pickett, K. (2009). *The spirit level: Why more equal societies almost always do better*. London, UK: Allen Lane.

Williams, P. M. (2008). *University leadership for sustainability : an active dendritic framework for enabling connection and collaboration.* (PhD : Doctor of Philosophy in Environment Studies), Victoria University of Wellington, Wellington (N.Z.). Retrieved from http://hdl.handle.net.ezproxy.waikato.ac.nz/10063/625

Wintec. (2018). Research Facilities - Advanced Sustainability Research Facility. Retrieved from https://www.wintec.ac.nz/study-at-wintec/faculty/centre-for-transdisciplinary-research-innovation/research-facilities

Wolbert, L. S., de Ruyter, D. J., & Schinkel, A. (2015). Formal Criteria for the Concept of Human Flourishing: The First Step in Defending Flourishing as an Ideal Aim of Education. *Ethics and Education, 10*(1), 118-129. doi:10.1080/17449642.2014.998032

Wolfe, C. (2010). *What is posthumanism?* Minneapolis, MN: University of Minnesota Press.

Wood, B. E., Cornforth, S., Beals, F., Taylor, M., & Tallon, R. (2016). Sustainability champions? Academic identities and sustainability curricula in higher education. *International Journal of Sustainability in Higher Education, 17*(3), 342-360. doi:10.1108/IJSHE-12-2014-0171

World Commission on Environment and Development. (1987). *Our common future*. Oxford, UK: Oxford University Press.

Worster, D. (1994). *Nature's economy: a history of ecological ideas*. Cambridge, UK: Cambridge University Press.

Worster, D. (2013). *Shrinking the Earth, The rise and decline of American abundance*. New York, NY: New York University Press.

Wright, D., Camden-Pratt, C. E., & Hill, S. B. (2011). *Social Ecology: Applying Ecological Understandings to Our Lives and Our Planet*. Stroud, UK: Hawthorn.

Wright, T. (2002). Definitions and frameworks for environmental sustainability in higher education. *International Journal of Sustainability in Higher Education, 3*(3), 203-220. doi:10.1108/14676370210434679

Wright, T. (2004). The evolution of sustainability declarations in higher education. In P. B. Corcoran & A. E. J. Wals (Eds.), *Higher education and the challenge of sustainability* (pp. 7-19). Cham, Switzerland: Springer.

WWF-New Zealand. (2016). New Report Gives Stark Warning on State of NZ's Oceans [Press release]. Retrieved from http://www.wwf.org.nz/media_centre/?uNewsID=14361

Yilmaz, K. (2010). Postmodernism and its Challenge to the Discipline of History: Implications for History Education. *Educational Philosophy and Theory, 42*(7), 779-795. doi:10.1111/j.1469-5812.2009.00525.x

Young, M. D., & Diem, S. (2016). *Critical Approaches to Education Policy Analysis: Moving Beyond Tradition*. Cham, Switzerland: Springer.

Zalasiewicz, J., Williams, M., Steffen, W., & Crutzen, P. (2010). The new world of the Anthropocene. *Environmental science & technology, 44*(7), 2228. doi:10.1021/es903118j

Zelenko, M. (2011, 29 August). Democracy in decline. *World Policy Journal*. Retrieved from https://worldpolicy.org/2011/08/29/democracy-in-decline/

Žižek, S. (2015). A Permanent Economic Emergency In M. A. Peters, J. M. Paraskeva, & T. Besley (Eds.), *The Global Financial Crisis and Educational Restructuring*. New York, NY: Peter Lang.

Appendix A: Evaluative matrix for the provision of higher education

This document sets out the approach used in this thesis to evaluate the ecological orientation of some of New Zealand's tertiary education providers. This approach is designed to establish the extent to which these providers take an ecological approach in their overall mission, strategy and performance. It is more focused on evidence that these organisations have processes, structures and values consistent with ecological forms of education. It does not set out to gather explicit forms of outcome information, such as the number of students acquiring sustainability competencies and so on. Moreover this evaluation/survey draws on documentary evidence, rather than detailed monitoring and evaluation data and on-site visits.

This evaluation/survey **_does not_** set out to establish the extent to which each area of an organisation's operations, teaching and research might contribute to the production of planetary sustainability, wellbeing, engagement or ecological intelligence. It is also not designed to capture all of the excellent ecological work that might be carried out by staff and students in each department. It is however designed to use documentary evidence that could provide an indicative finding about the degree to which each organisation might be said to have an 'ecological' education approach.

The ideas underpinning the notion of 'ecological', 'sustainability', 'wellbeing' and 'engagement' are discussed in the main body of the thesis, but in general they are used here as inter-changeable indicators of diverse forms of ecological education.

Five 'quality' areas or categories have been used to group tertiary organisations. A set of criteria or judgement statements has been prepared to help group tertiary education providers and to help develop an overview of the missions and approach of these tertiary organisations (see table below).

The organisations included in this overview evaluation were:

- All 8 universities
- All 3 Wānanga
- Eight largest ITPs by EFTS – Unitec, MIT, ARA Canterbury, Open Polytechnic, WINTEC, EIT, SIT, Otago Polytechnic

The evidence being used to make judgements about these organisations include:

- Organisational Charters
- Annual Reports/Strategic plans

- Press releases/Media coverage
- Sustainability, wellbeing and/or engagement plans, articles, books and reports, public audit information
- Organisational partnerships
- Sustainability assessments/rankings
- Highlights among operations, research and teaching
- Graduate profiles

Overall rating	Judgement statement
Five	This organisation **is an ecological tertiary provider** across its mission, planning, operations, research and teaching. Students graduate with high levels of sustainability practice and/or ecological literacy/intelligence or equivalent and are ready to operate as ecological citizens. The organisation is focused on developing forms of ecological intelligence via such approaches as sustainability, diverse forms of wellbeing, and/or engaged or active learning. There are a considerable range of research and teaching projects that contribute in a range of ways to increasing natural or social ecologies. These projects reflect high levels of ecological intelligence and develop ecological intelligence in its participants (students, staff and stakeholders). Deep ecological forms of understanding are shown by high numbers of staff and students about a diverse range of ecological practices.
Four	This organisation is **strongly focussed** on sustainability, wellbeing, ecological awareness, ecoliteracy, engagement or equivalent. This seen in its plan and is evident in its operations, curriculum, research and planning. There is some evidence that most students have some aspects of ecological intelligence which has been gained through their connection to the provider. Diverse forms of wellbeing, sustainability or engagement might also be a primary focus for the organisation, its operations, research and teaching and learning. There are quite a few aspects of the provider's operations, research, curriculum and planning that reflect varieties of weak or limited forms of sustainability/ecological intelligence. These might be an ongoing development focus so that they match the headline practices that make this such a green organisation.
Three	The organisation has **a moderate focus** on sustainability, wellbeing, ecological awareness, ecoliteracy, engagement or equivalent. This

	seen in its plan and is evident in its operations, curriculum, research and planning. There are some very strong practices in some parts of the organisation, but it is not clear that most students would graduate with anything like ecological intelligence/sustainability literary/ecological literacy.
Two	The organisation has **a minor focus** on sustainability, wellbeing, ecological awareness, ecoliteracy, engagement or equivalent. This seen in its plan and is evident in its operations, curriculum, research and planning. This may be an organisation with some sustainability highlights, especially in its operations, but has not made significant progress in developing a curriculum that develops the ecological credentials of its students. There may also be some research projects that show real ecological promise, but these are the minority and must be considered against the majority of projects which lack any focus on environmental sustainability and might be described as entrepreneurial and/or belonging to views of the world linked to endless economic growth and/or individualism and liberal humanism without an ecological conscience. This is essentially traditional tertiary education.
One	The organisation has a **limited or poor focus** on sustainability, wellbeing, ecological awareness, ecoliteracy, engagement or equivalent. This seen in its plan and is evident in its operations, curriculum, research and planning. It may have some aspects that have a sustainability element, such as aspects of operations such as waste management and energy conservation but these are arguably little more than green washing.