Flood Resilient Aotearoa New Zealand:

Flood risk management and land use planning

POLICY BRIEF NO.2

Embracing uncertainty: Informing decisions on flood risk and land use planning in a changing climate

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KEY MESSAGE

To increase resilience, decision-makers must embrace uncertainty by shifting from static planning to adaptive strategies that incorporate multiple future scenarios, support consistent national policy, and ensure equitable access to and understanding of evolving flood risk information.

PROBLEM STATEMENT

Climate change is driving more frequent and severe floods in Aotearoa New Zealand, yet current land use planning and flood risk management approaches are often outdated and inflexible. A fragmented governance system results in inconsistent flood risk assessments and policies across regions. Limited communication of uncertainty and a lack of national direction hinder communities' ability to prepare for future risks. Over-reliance on single-probability forecasts and static flood maps risks maladaptation and increased vulnerability.

KEY FINDINGS

- Static, hazard-based planning approaches do not reflect the dynamic and uncertain nature of flooding in a changing climate.
- Uncertainty in future flood risk, particularly due to climate change, is difficult for many local authorities to model and plan for consistently.
- Governance of flood risk is fragmented, with regional variations in assessment methods, policy language, and climate integration leading to inconsistency.
- Flood risk information is often not communicated clearly to the public, limiting understanding and informed decision-making.
- There is strong support for national guidance to improve consistency, enable adaptive methods, and promote collaboration across scales.

Image by Hanna, C. 2021

Policy Recommendations

1. Develop and implement **National Direction** for natural hazards and climate change planning (see Policy Brief 1). This should also include:
    a. A framework for clearly communicating uncertainty in flood modelling and data collection & analysis.
    b. Inclusion of flood hazard maps in statutory plans.
    c. Requirements to assess and regulate residual risks from potential flood defence failures.
    d. Directions to incorporate expected land use changes/intensification in flood modelling based on the permitted baseline or strategic spatial planning projections.
2. Provide guidance and support to local governments to acquire more rigorous and consistent **residual flood risk information**, and to actively engage with the public for better residual flood risk awareness and outreach.
3. Encourage the use of **adaptive planning** approaches to support dynamic spatial and temporal allocation of interventions and regulatory controls to manage flood risk.
4. Develop **national guidance** on providing clear, accessible **communication** of flood risk to a diverse audience.
5. Provide **support and resources to local authorities** to improve technical skills in flood modeling, planning, and climate integration.

KEY RESEARCH OUTPUTS

Afsari Bajestani, S., Serrao-Neumann, S., Hanna, C., & Fu, X. (2024). Dealing with uncertainty in flood risk management and land use planning decisions: Insights from Aotearoa New Zealand. *Climate Risk Management*, *46*, 100666. https://doi.org/10.1016/j.crm.2024.100666

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