Chronological Modelling of Village Sites across the Torres Strait

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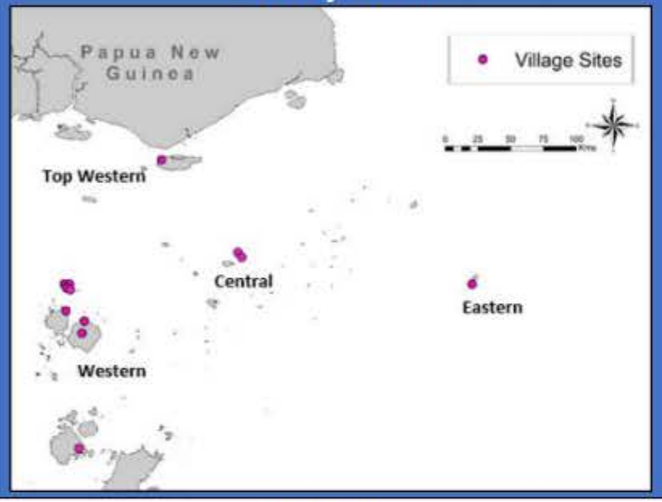
Chronological modelling of village sites across the Torres Strait utilises legacy archaeological data and new ^{14}C dates to investigate temporal events associated with major settlement expansion over the last two millennia. This research is the first attempt to chronologically model all archaeologically dated Torres Strait village sites and aims to further understand the impact that the timing of village site development had on cultural transformation and ongoing ritual development throughout the Torres Strait. By employing rigorous quality assurance techniques and utilising isotopic, archaeological/ethnographical and chronometric information we aim to constrain the timing of these events.

Study Area



Method

(1) Using the stable carbon isotope ($\delta^{13}C$) values from bivalves from archaeological sites we assess the reliability of the sample for quantifying the variability of the marine reservoir effect (MRE) across the Torres Strait. *MRE is the offset of carbon between the atmosphere and ocean, this is expressed as a ΔR value.

(2) Variability of the marine reservoir effect across Torres Strait is calculated using site location and the $\delta^{13}C$ value to determine variation across the island groupings.

(3) Building reliable chronological models of Village sites. Results from island groups are modelled using Bayesian methodologies to determine the start and end dates for site occupation across the Torres Strait.

Results

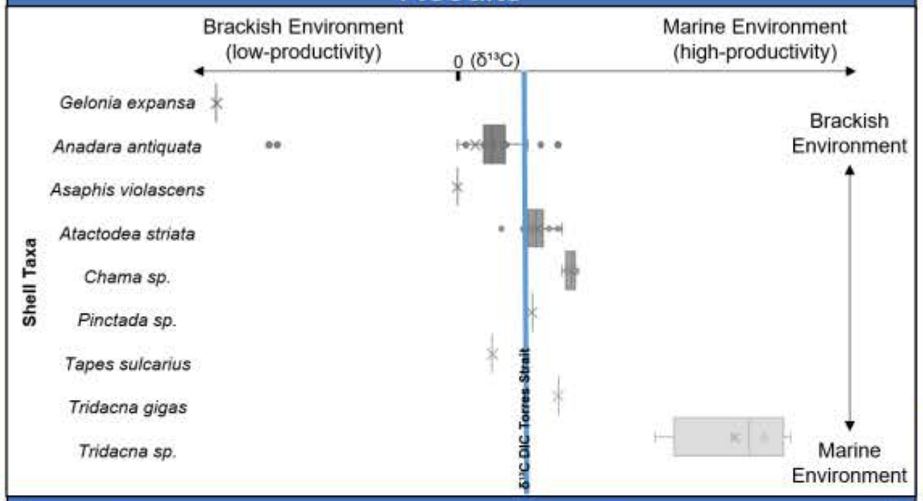


Fig 1. $\delta^{13}C$ values of bivalve species within the ^{14}C Torres Strait database. Modelled $\delta^{13}C$ DIC (dissolved inorganic carbon) value for Torres Strait indicated by orange bar (Tagliabue and Bopp 2008). *Gelonia expansa* and *Tridacna sp.* have $\delta^{13}C$ values which significantly depart from the modelled averaged value.

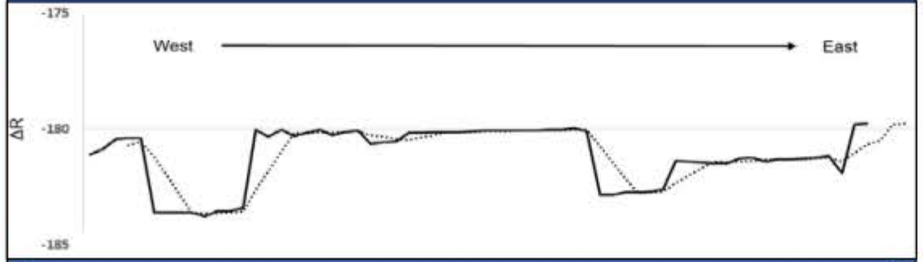


Fig 2. Change in ΔR values moving from West to East using new MARINE20 corrections. Trendline based on a 4-point moving average.

Preliminary Modelling Results: MARINE20 and IntCal20

Village site age boundaries across the Torres Strait

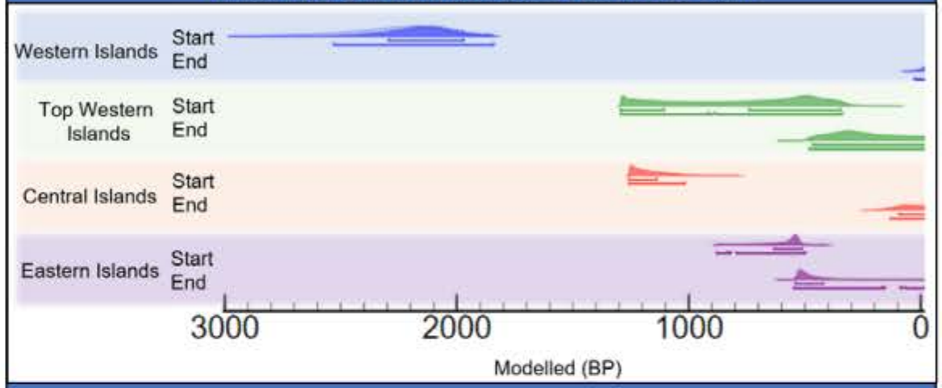
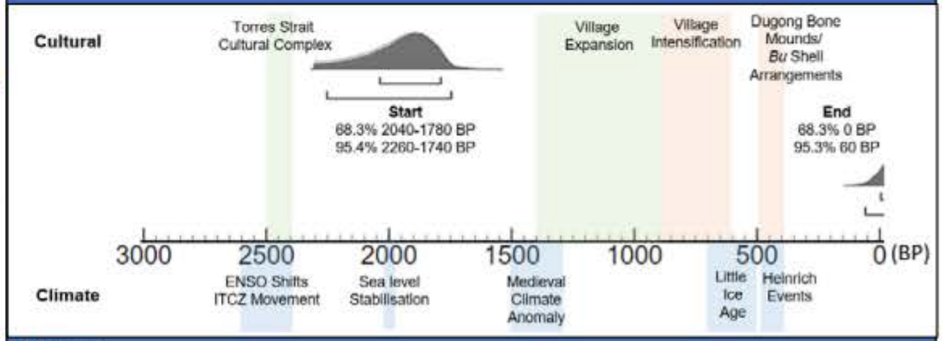


Fig 3. (Above) The start and end ages of all island groups are modelled to give a final start and end ages of village sites across the Torres Strait.
Fig 4. (Below) Timeline includes important climate and cultural events for the Torres strait during the last 2500 years BP. * ENSO = El Niño-Southern Oscillation shifts, ITCZ = Inter Tropical Convergence Zone



References:
Barham, A.J. 2000 Late Holocene maritime societies in the Torres Strait islands, northern Australia- cultural arrival or cultural emergency? *Modern Quaternary Research in SE Asia* 16:223-314. David, B., McNiven, I.J. 2004 Western Torres Strait Cultural History Project: Research Design and Initial Results. *Memoirs of The Queensland Museum Cultural Heritage series* 3(1):199-208. David, B., Mura Badulgal 2006 What Happened in Torres Strait 400 Years Ago? Ritual Transformations in an Island Seascape. *The Journal of Island and Coastal Archaeology* 1(2):123-143. McNiven, I.J., Feldman, R. 2003 Ritually Orchestrated Seascapes: Hunting Magic and Dugong Bone Mounds in Torres Strait, NE Australia. *Cambridge Archaeological Journal* 13(2):169-94.Tagliabue, A., Bopp, L. 2008 Towards understanding global variability in ocean carbon-13. *Global Biochemical Cycles* 22:1-13. Ulm et al. In Prep