

# Archaeology in Coastal Environments

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# Types of sites

- ▶ Pā on headlands use the coast as a defence
- ▶ Occupation sites – kainga, storage pits
- ▶ Stone and resource procurement sites
- ▶ European historic sites – wharves, mills, customs houses, etc.
- ▶ Dune middens are one of the most common sites type in Aotearoa





# The dune environment

- ▶ Dune formation dependant on winds and waves
- ▶ Wave energy, tides, sand quantity and type, sea floor and land topography
- ▶ Not usually stable – may recede or prograde
- ▶ Dune swales sheltered, close to resources
- ▶ Attractive living space



# Coastal middens

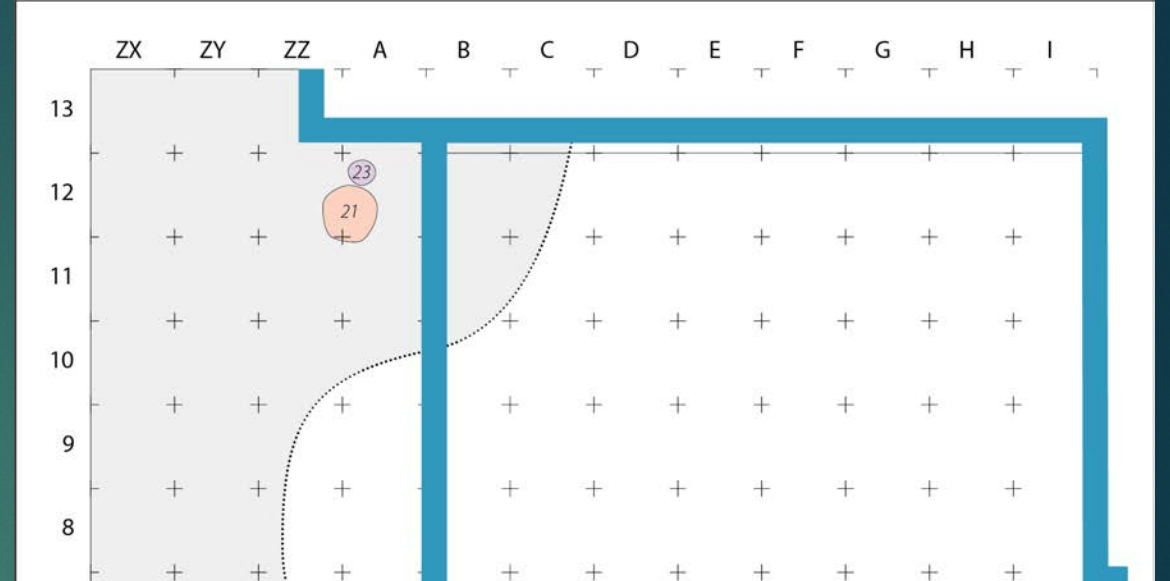
- ▶ Middens deposited in swales in lee of foredune
- ▶ Protected by moving sand
- ▶ Dunes may blow out
- ▶ Midden can cap dunes
- ▶ Or deflate with the dune
- ▶ Exposed in eroding dune face





# Long Bay

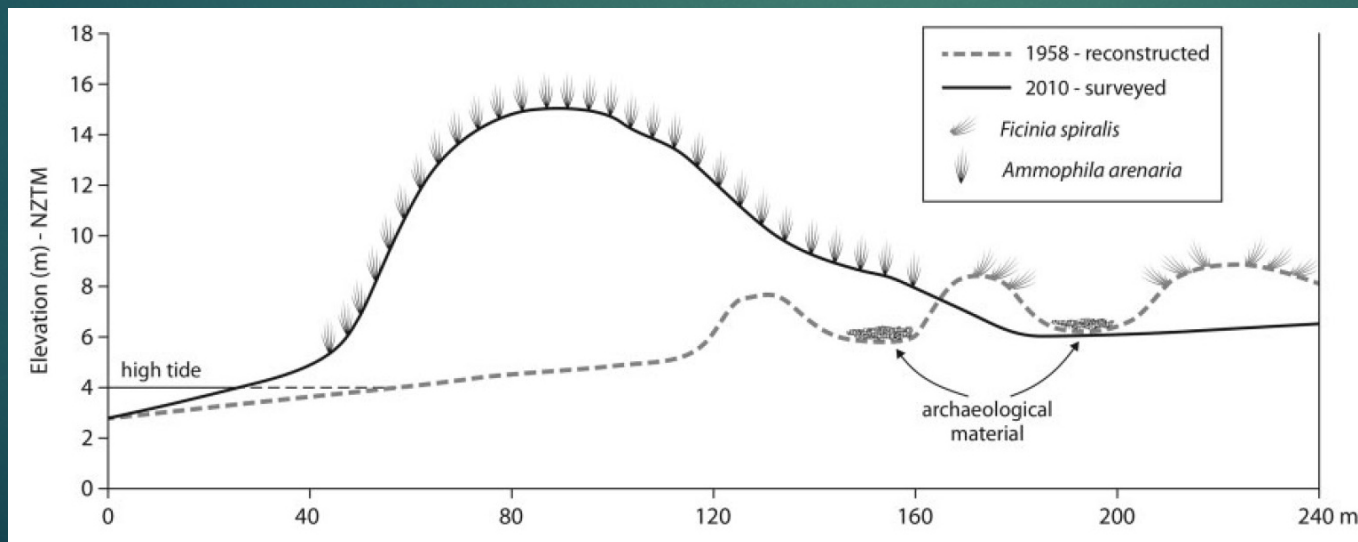
- ▶ Middens in low foredune (low energy coast)
- ▶ 6 occupation Phases
- ▶ 23 burials
- ▶ Middens include firescoops and postholes
- ▶ Shell, fish, bird (incl. moa) and mammal bone
- ▶ Mid to late 15th century AD
- ▶ Human occupation destabilises dune
- ▶ Middens deposited, but may blow out
- ▶ After site abandonment, dune stabilises
- ▶ Midden protected beneath sand cover
- ▶ Cycle repeats





# Dune vegetation

- ▶ Pīngao (*Ficinia spiralis*), kowhangatara (*Spinifex sericeus*)
- ▶ Marram (*Ammophila arenaria*)
- ▶ Revegetation stabilises dunes at a lower level
- ▶ But may expose previously buried middens
- ▶ New stable dune not same as pre-European dune





# Climate change

- ▶ Increased extreme weather events
- ▶ Storms and storm surge
- ▶ Flooding
- ▶ Sea level rise



NZ Auckland - Rising Sea Level  
- 80m sea level rise as a result of glacial and polar ice melt

Drawn by Jonathan Musther - 2015  
Credit to Land Information New Zealand for NZ Digital Elevation Model, Topo250 maps and Topo50 map data.



# ~~Opportunities~~ Responses

- ▶ Monitoring of dune changes and effects on sites
- ▶ Protection strategies
- ▶ Site excavation – rescue by record