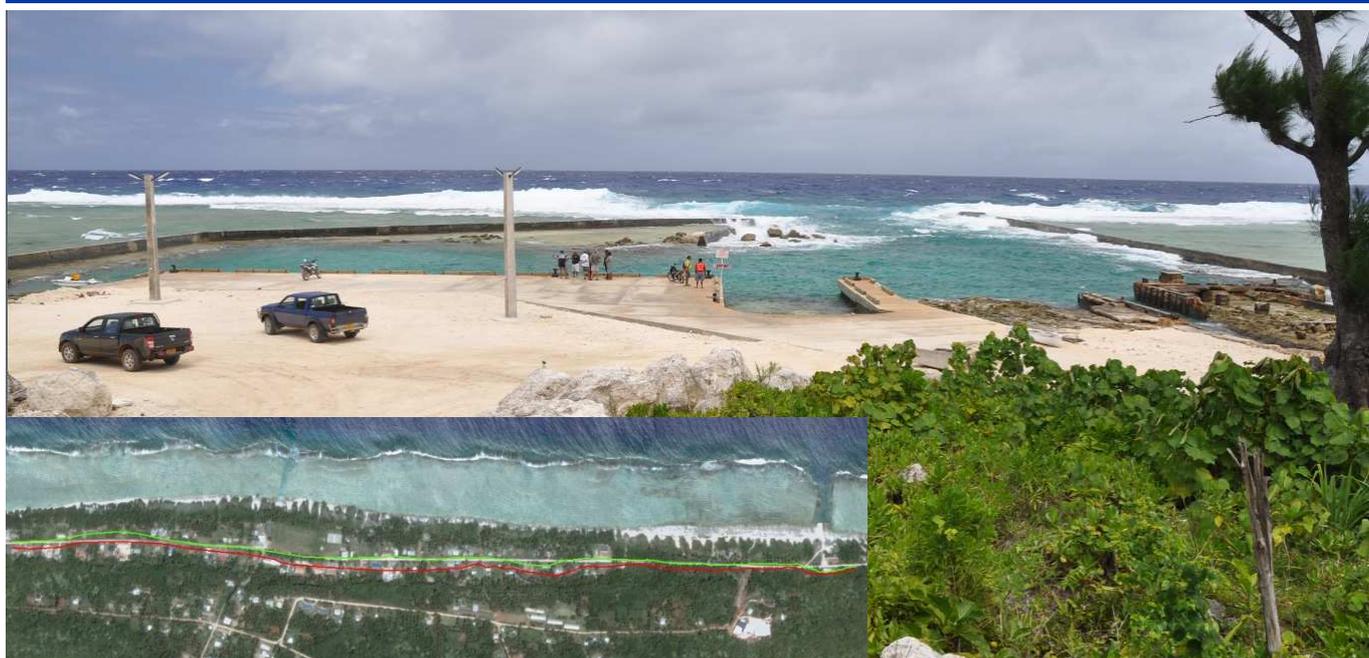


Geospatial framework for climate change adaptation in the coastal zone of Mangaia, Cook Islands



Client: Secretariat of the Pacific Environment Programme (SPREP) & Cook Islands Ministry of Infrastructure and Planning

Location: Cook Islands

Duration: 2011 – 2012

Services: Cyclone wave & storm surge modelling, Coastal extreme analysis, infrastructure design conditions, climate change and sea-level rise assessment,, training and capacity development

Property and infrastructure located in the coastal margins of the Cook Islands are extremely vulnerable to the effects of coastal hazards and the exacerbation of these hazards by climate change and sea-level rise. However, little specific work has been carried out to quantify the changes on hazard occurrence and magnitude and associated risk at island or community levels that may result due to different future climate change scenarios, and incorporate risk-based information to underpin and “climate-proof” infrastructure and community decision-making and planning.

The project is part of the Pacific Adaptation to Climate Change (PACC) project involving 13 Pacific Island countries including the Cook Islands. The Cook Island component is being implemented by the Ministry of Infrastructure and Planning (MOIP).

NIWA, in collaboration with the Secretariat of the Pacific Community, provided the technical support to the project and were responsible for:

- Derivation of extreme cyclone, swell and storm tide probabilistic information as input in to coastal infrastructure design.

- Assessment of climate change impacts on cyclone-related extreme wave and water level probabilistic information.
- Development of a risk-based tool (coastal calculator) to enable coastal-related probabilistic information and the effects of climate change to be easily incorporated in to coastal infrastructure design by Cook Island Ministry of Infrastructure and Planning engineers.
- Training in the use of the tool and risk-based information for Cook Island engineers
- Development of cyclone wave run-up zones and effects of climate change on these inundation zones, and with the community of Oneroa village, identification of community assets at risk and development of risk-reduction and adaptation options for the village.

The Coastal Calculator has subsequently been used by the engineers in MOIP to provide design conditions for a range of other harbour and coastal engineering projects within the Cook Islands.