

# The Cook Islands planning to get more cyclone savvy



Photo: Cook Islands News

Coastal infrastructure in Rarotonga, such as the iconic bar Trader Jacks, is at the frontline of storm surge and destructive waves during cyclones.

AUSTRALIAN GOVERNMENT-FUNDED research is helping the Cook Islands understand how to adapt its infrastructure and plan for more intense cyclones and extreme weather.

During the last 15 years, the Cook Islands has experienced more intense storms where flooding and wave surge have severely damaged coastal infrastructure.

Most notable was an unprecedented five cyclones within as many weeks in February and March 2005. Three of the five reached Category Five status (wind speeds in excess of 200 km/h) and caused NZ\$20 million damage across the nation's southern group of islands.

Matt Blacka, a coastal engineer for the Water Research Laboratory in Sydney, is leading research in the Cook Islands to calculate the impact that more extreme storm events will have on the capital town of Avarua.

He says that implementing large-scale protection measures has challenges.

'Practical strategies, such as understanding the hazards and improving the planning and design of future development, accommodate the risks from extreme events', he says.

'Our research work will provide hazard mapping for most of the north coast of Avarua, identifying areas of [vulnerable] land.'

## Measuring the risk to infrastructure

Avarua lies on the north coast of the main island of Rarotonga and is the centre for tourism, government and trade.

Over 110 000 tourists pass through its international airport each year and



Photo: Econnect Communication

## Managing risk

Matt Blacka, coastal engineer for the Water Research Laboratory, says the new flood hazard maps will allow government agencies to better manage the associated risks of major cyclones.



Photo: Econnect Communication

## Reviewing building codes

Timoti Tangirua, urban and rural planner for the Ministry of Infrastructure and Planning, says that the new maps will help with reviewing building codes.



Photo: Water Research Laboratory, UNSW

## Creating hazard maps

Matt Blacka surveys the depth of the water in the reef lagoon surrounding Rarotonga's capital Avarua. During cyclones, water in the lagoon can rise by three metres.

about 90 per cent of international and domestic sea trade passes through its harbour Avatiu.

Both ports are essential international lifelines for the remote country, and both are vulnerable to severe damage from extreme weather events.

‘What we have found is that a lot of important infrastructure along the coast, like the airport, is vulnerable to storm surge and wave impact during one-in-50-year cyclone events’, says Mr Blacka.

Mr Blacka’s research looked specifically at the impacts that changes in sea level and wave behaviour have during cyclones.

‘The project has allowed us to model the bathymetry [depth] of the lagoon and topography of the land in much more detail than what it has been in the past’, says Mr Blacka.

‘We are also looking at the outcomes of extreme weather events that have affected the area and what might happen during even larger weather events.’



Photo: Cook Islands Ports Authority

Rarotonga’s international airport and harbour, in the capital of Avarua, are exposed to coastal damage from major cyclonic events.

## New insight into lay of the land

Rimmel Poila, senior environment officer for the National Environment Services, says the hazard maps will be ‘hugely beneficial’ for carrying out environmental impact assessments for Avarua.

‘We are strongly campaigning that people do not backfill the wetlands area behind Avarua airport and the town because it is prone to flooding’, says Rimmel Poila.

‘The maps will provide us with a tool to show the public how vulnerable those areas are to flooding, so they can see for themselves.’

The inundation maps also impressed Timoti Tangiruaine, an urban and rural planner for the Ministry for Infrastructure and Planning.

Mr Tangiruaine says: ‘The maps prove what we have been saying for a long time: that the drainage in these low-lying areas needs to be managed better so that floodwater isn’t trapped for weeks after the event.’

‘What we have learnt from the climate project is that there are other ways we can deal with these problems, and that having scientific data is actually critical.’



Photo: Econnect Communication

## Avoiding problems

Rimmel Poila, from the National Environment Service, says the new data and flood-inundation map provides evidence that wetland areas should not be backfilled for development as they are prone to flooding from storm surge.

## More information

The Australian Government funded research into climate change and institutional adaptation in the Cook Islands as part of Australia’s **Pacific Adaptation Strategy Assistance Program (PASAP)**.

For further information on the Cook Islands institutional strengthening or other PASAP projects, go to [www.tiny.cc/t5axxw](http://www.tiny.cc/t5axxw) or contact [InternationalAdaptation@climatechange.gov.au](mailto:InternationalAdaptation@climatechange.gov.au)



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