



Analysis from the
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PDC's mission is to provide applied information research and analysis support for the development of effective policies, programs, and products for the disaster management and humanitarian assistance communities of the Asia Pacific region and beyond.

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OBSERVATION:

Niue comprises the world's smallest island nation, and the recent devastation caused by Tropical Cyclone Heta is an ominous symbol for the Pacific Islands--such destructive events can make islands uninhabitable, and even entire nation-states can be lost. The cyclone event has impacted Niue's population, economy and possibly its future as a sovereign state.

Clean-up costs are estimated at around NZ\$36 - \$44 million (U.S. \$24 - 30 million), more than five times Niue's annual budget and three times its Gross Domestic Product. The effects of Heta will be felt on Niue's economic sectors for years to come. The very future of Niue itself is now in question as it faces the tremendous costs of reconstruction. At the same time, a refugee outflux from Niue is bringing the island nation dangerously close to the threshold of viable statehood.

Over the next year, Pacific Island nations need to understand and learn from the long-term implications of Heta's impact on Niue. This should lead to a set of risk reduction strategies designed to secure a sustainable future for island nations.

DISCUSSION:

After causing widespread damage on Samoa, American Samoa, the Cook Islands, and Tonga, the first storm of 2004, Tropical Cyclone Heta (07P), slammed into the South Pacific island of Niue on Monday, January 5th. Winds speeds of 190 miles per hour and storm surges that swept up 100-foot cliffs caused major damage to the world's smallest island nation. Heta achieved the highest storm severity ranking possible, a "super typhoon" status the equivalent of a category five hurricane in the Atlantic.



Destruction in Niue in the aftermath of Cyclone Heta.. (Source: South Pacific Applied Geosciences Commission (SOPAC).)

Event History and Impact

Tropical Cyclone Heta was a powerful and destructive storm that caused extensive damage as it churned through the South Pacific on January 5th and 6th. Heta's eye passed just to the west of Niue as it traveled south,

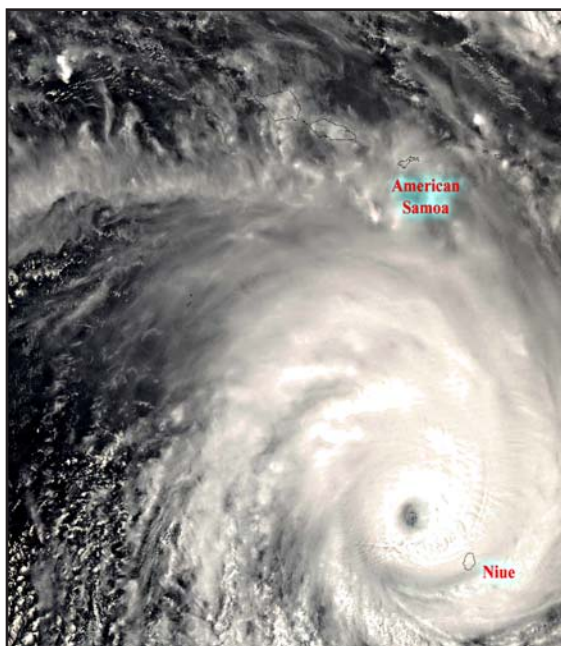


Figure 1. Image of Tropical Cyclone Heta on January 5th as it approaches Niue. (Source: NASA GSFC-MODIS Land Rapid Response Team.)



Figure 2. Winds from Heta wracked Niue with wind speeds in excess of 190 miles per hour. (Source: SOPAC.)

The devastation that occurred on Niue was caused not only by Heta's powerful winds, but also by storm surge

exposing the island to the most intense part of the storm--towards the western side of the eye (Figure 1). The devastation that occurred on Niue was caused not only by Heta's powerful winds, but also by the high waves that accompanied Heta's storm surge. Hardest hit was Niue's western coast, especially the capital, Alofi, which sustained significant devastation to both residential and commercial sectors. One person was killed, and several were injured. Most notably, Heta internally displaced 200 residents -- nearly 10% of Niue's resident population.

While tropical cyclones in this region of the South Pacific are not uncommon, a storm of Heta's magnitude is rare. Many small island communities are conscious of the dangers posed by a tropical cyclone's strong winds, but are unaware of the dangers of the storm surge and associated flooding. Heta's high winds (Figure 2) and storm surge both contributed to the devastation in Niue's capital, Alofi. The cyclone passed very close to the west of Niue during a time of

high tide and close to a full moon (spring tide)--all factors that helped contribute to the substantial storm surge. The surge was also enhanced because the incoming waves were parallel to the shore, and immediately offshore lies a submerged flat terrace, 15-meters deep and 50-meters wide, which acted as a "ramp" as the seawater washed ashore.

Alofi, with some 500 residents, was worst hit by the storm. Half of the commercial buildings were destroyed, and most of the main infrastructure, government buildings, businesses, and public records have been damaged or completely decimated. The island's only hospital and service station have been destroyed completely, and a five-story fuel depot was moved off of its foundation. Public utilities including power, water, roads, and communications all suffered damage. One hundred homes in Alofi and other villages have been completely or partially destroyed.

Nearing the Threshold of Sovereignty

In the aftermath of Heta, a significant out-migration of Niue's total population of 2,145 is threatening its existence as a sovereign state. Niue has been a self-governing country with a free association with New Zealand since 1974, and the United Nations would fail to recognize Niue



Figure 3. Total damages from Heta are estimated between U.S. \$24 to 30 million, a total more than five times Niue's annual budget. (Source: SOPAC.)

independent state if its population drops below 1,500. A likely resettlement location for Niueans is New Zealand, where they hold citizenship rights. New Zealand is already home to some 20,000 Niueans, a diaspora over ten times the size of Niue's population. Niue's Premier, Young Vivian, has quickly dismissed talk of his country relinquishing sovereignty and returning to New Zealand rule. But if the population drops below its current level, it will be difficult for the island to be a self-sustaining, viable state and retain independence.

Economic Impacts on Future Sustainability

Even houses inland some 300 feet that were thought to be safe, were damaged by storm surge. Clean-up efforts have revealed another problem, as many destroyed houses and buildings had asbestos roofing that poses a serious health risk. Clean-up efforts were delayed until proper safety equipment arrived and local crews were trained on how to remove asbestos. Clean up costs are estimated at around NZ\$36 - \$44 million (U.S. \$24 - 30 million), more than five times its annual budget, and three times its GDP.

Only a handful of storms have passed by Niue in the past 20 years, the last destructive one being Cyclone Ofa in February 1990. Ofa passed within 50 miles of Niue with hurricane force winds up to 105 miles per hour. There were no deaths or serious injuries to the island's then 4,000 residents,

as an

but there was serious damage to Lord Livermore Hospital, the Niue Hotel, public and government buildings, as well as widespread damage to trees and crops. After Ofa, most damaged buildings and houses were rebuilt on the same spots including the hospital, which was destroyed again by Heta.

Coupled with the sovereignty issue, the economic impacts of Heta may pose a threat to the very future of Niue itself. New Zealand Foreign Affairs Minister Phil Goff stated that Niue's best hope to remain a sustainable community was through the tourism industry, the island's only industry of any size. However, Heta will have a major effect on all tourism activities since the Niue Hotel, one of only two resorts on the island, was completely destroyed along with the island's lush, green scenic beauty. The cyclone's timing is unfortunate given that tourism had increased by 44% in the last quarter of 2003. In addition, prospects for further business activity are very slim. Annual exports amount to less than NZ \$240,000, and Niue's few exported cash crops including taro, vanilla and limes were all destroyed. Non-exported crops such as bananas, grapefruit, and papaw were also decimated. Reefs along the western side of the island have been severely damaged and will take years to recover--significantly impacting the fishing and tourism industries.

ADDITIONAL SOURCES

News and Photographs of Heta's Destruction in Niue via BBC ([http:// news.bbc.co.uk](http://news.bbc.co.uk)):

"Cyclone Slams into Pacific Island. In Pictures: Niue Cyclone Aftermath." BBC News. January 8, 2004.

Speculation on Niue's Future via the New Zealand Herald (<http://www.nzherald.co.nz>):

Gregory, Angela. "Niue's Survival the Cheaper Option." The New Zealand Herald. December 1, 2004.

Gregory, Angela and Philip English. "New Zealand Keen for Tiny Island to Survive." The New Zealand Herald. December 1, 2004.

"Viable Future for Niue Looks Bleak." The New Zealand Herald. December 1, 2004.

Niue: Geographic Background

Niue consists of a single island of 162 square miles, the largest raised coral atoll in the world. It is situated in the South Pacific Ocean (latitude 169°55'W, longitude 19°02'S), approximately 300 miles southwest of Tonga, and 410 miles south of Samoa (Figure 4).

The current population on the island is approximately 2,100. Over 20,000 Niueans reside overseas, mostly in New Zealand. Niue has been a self-governing state since 1974 in its free association with New Zealand which manages its foreign affairs.

Niue is primarily an agriculturally-based economy, providing people with their main means of support, and more recently, some exports. Ninety percent of the population is employed as subsistence farmers. Fishing, particularly for tuna or billfish, and collection of marine invertebrates are also important as providers of food. In recent years there has been an increased effort to develop a tourism industry, largely based on the natural attractions of the island and surrounding seas.

Niue has a tropical climate with a wet season from December to March and a dry season from April to November. Southeast trade winds blow during the dry season. The island receives approximately 80 inches of rain, fairly well distributed throughout the year and experiences the effects of a cyclone on average once every four years.

During a cyclone, Niue typically experiences damage from the wind and from storm surge, but not usually from flooding. Other natural hazards that pose a high risk to Niue include: agricultural and communicable diseases, drought, and earthquakes.



Figure 4. Map of Niue showing the capital Alofi, and coastal villages, where over three fourths of the population resides. (Source: Lonely Planet.)