GEOMORPHIC SENSITIVITY OF ISLANDS IN THE PACIFIC REGION TO CLIMATE CHANGE

SHEET 3 OF 3

SCALE 1:10 000 000

0 250 500 750 1000 Kilometres

WORLD MERCATOR PROJECTION
WGS84

GEOMORPHIC SENSITIVITY OF ISLANDS IN THE PACIFIC REGION TO CLIMATE CHANGE

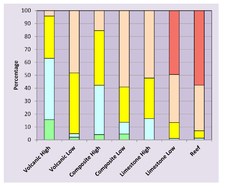
Climate and ocean processes in the Pacific were combined in a single ranking of potential sensitivity of the coast to a change in mean sea level. This 'process sensitivity' was then combined with the 'indicative susceptibility' to provide a final ranking for the overall sensitivity of landforms to changes in climate and ocean conditions. This is referred to as geomorphic sensitivity.

The three climate and ocean processes selected were (i) a composite water-level range (tide and ENSO) (Figure 1), (ii) average annual significant wave height (Figure 2), and (iii) tropical cyclone frequency (Figure 3). They were selected to indicate the vertical range of water level and wave activity, together with the influence of tropical cyclones on coastal dynamics. Each parameter was separated into five categories to ensure sufficient spatial variation for development into the final process rank and process sensitivity. The three parameters were then combined to yield a single value for ranking. This is referred to as 'process ranking' of potential sensitivity of the coast to a change in mean sea level across the region. The measure focuses on future sensitivity to changes in mean sea level, with less emphasis on present levels of risk.

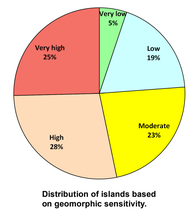
The Process Ranking and Indicative Susceptibility were then combined to give a final geomorphic sensitivity rank. For each of the islands in the database, the Process Ranking value that was the closest to that island in terms of Euclidean distance was selected and attributed as a process sensitivity. For many of the smaller islands, the island polygon sat within the larger Process Ranking pixel so that pixel was extracted. For the larger islands, where there are gaps in the Process Ranking, the value of the closest cell was selected as the process sensitivity.

Geomorphic Sensitivity

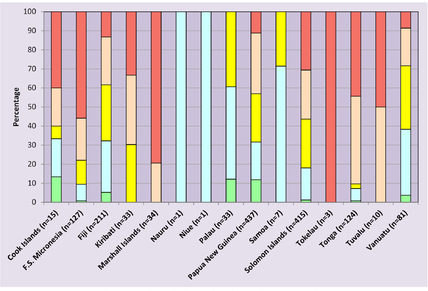
VERY LOW · LOW · MODERATE · HIGH · VERY HIGH



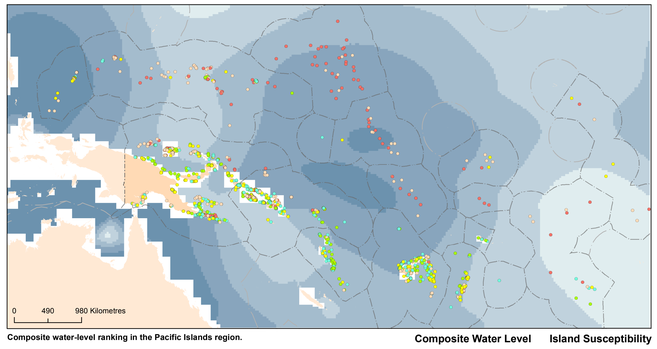
Geomorphic Sensitivity - Distribution by island type.



Distribution of islands based on geomorphic sensitivity.



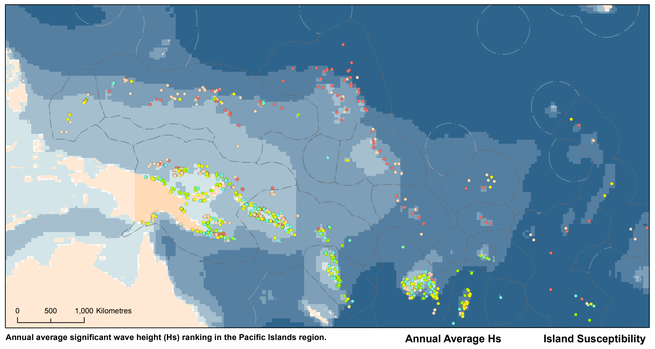
Geomorphic Sensitivity - Distribution patterns by country.



Composite water-level ranking in the Pacific Islands region.

Composite Water Level
- <1.0
- 1.0 - <1.5
- 1.5 - <1.75
- 1.75 - <2.0
- >=2.0

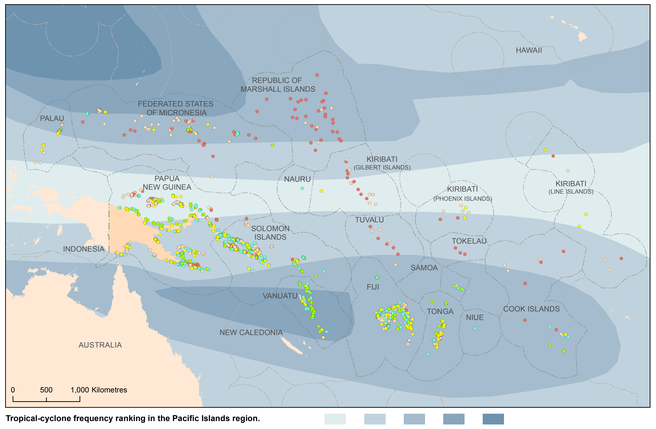
Island Susceptibility
- Very low
- Low
- Moderate
- High
- Very High



Annual average significant wave height (Hs) ranking in the Pacific Islands region.

Annual Average Hs
- <1.0
- 1.0 - <1.5
- 1.5 - <1.75
- 1.75 - <2.0
- >=2.0

Island Susceptibility
- Very low
- Low
- Moderate
- High
- Very High



Tropical-cyclone frequency ranking in the Pacific Islands region.

Very low · Low · Moderate · High · Very high

BIBLIOGRAPHIC REFERENCE:
Nunn, P., Kumar, L., Eliot, I. McLean, R. (2014). Regional Coastal Susceptibility Framework for the Pacific Islands. Report prepared for the Government of Australia, Department of Environment, 77 p. [38 figures, 35 tables].

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Background bathymetry image is derived from a grid by W.H.F. Smith and D.T. Sandwell, Global Seafloor Topography from Satellite Altimetry and Ship Depth Soundings, Science v.277, pp. 1956–1962, 26 September 1997.

Exclusive economic zone dataset is derived from Exclusive Economic Zones of the World - version 8. VLIZ (2014). Maritime Boundaries Geodatabase, version 8. Available online at http://www.marineregions.org/. Consulted on 2014-04-10.

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