TROPICAL CYCLONE RISK ASSESSMENT IN THE PACIFIC REGION

Innovative Tools for Adaptations and Mitigations

Craig Arthur, Martine Woolf, Ioana Dima, Peter Dailey, Melicie Desflots

The Tropical Cyclone Risk Assessment in the Pacific Region aims to improve understanding of the risks posed by severe TC winds and other hazards to key assets and infrastructure in the Pacific region under current and future climate scenarios. The project covers 15 countries across the Pacific (Cook Islands, Fiji, Kiribati, Federated States of Micronesia, the Republic of the Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor Leste, Tonga, Tuvalu and Vanuatu), and examines the impacts of severe winds, flooding and storm surge on buildings, infrastructure and cash crops. This risk information will allow Partner Country governments to better integrate climate risk considerations into infrastructure development and ex-ante disaster planning.

One of the primary goals of the Australian Government's International Climate Change Adaptation Initiative is to support Partner Countries in the Pacific assess their vulnerability to climate change and develop evidence-based adaptation strategies. Supported under the Pacific-Australia Climate Change Science and Adaptation Planning (PACCSAP) Program with co-financing from the Global Fund for Disaster Risk Reduction, this project will directly assist with this goal through delivering information and methods for evaluating vulnerability and risks from tropical cyclones.

A collaboration between the Australian Government Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE), Geoscience Australia (GA) and AIR Worldwide, the project draws together complementary skills to deliver an integrated and consistent risk assessment of likely damages from future tropical cyclones in the Pacific region. GA utilised outputs from the science component of PACCSAP to identify changes in key parameters describing TC activity in the Pacific under future climate scenarios. The process identified relative changes in annual frequency, genesis location, location of peak intensity and changes in the distribution of intensity, which are delivered as change factor tables or 'peril matrices' to AIR. AIR has developed a catastrophe model and stochastic catalog for the South Pacific region, which represents 10,000 years of TC activity. Using a targeted sampling methodology, and in line with the factors included in the peril matrices, AIR sampled from their baseline catalog to develop climate-conditioned catalogs. These climate-conditioned catalogs are then run through AIR's South Pacific catastrophe model to arrive at national and regional loss estimates for given climate scenarios and return periods.

By comparing loss estimates based on the baseline catalog and the future climate-conditioned catalogs, it is possible to quantify the projected changes in losses due to changes in TC activity associated with climate change. The information developed in this project is valuable for prioritising adaptation options around issues such as land-use zoning, building codes, crop choice and urban infrastructure planning. The information generated is also valuable for quantifying – in dollar terms – the risks of climate change and provides an evidence base for national policy makers to prioritise ex-ante disaster risk reduction measures.

The presentation will outline a brief summary of the project, including methods used in the analysis, and present outcomes of the risk assessment for current and future climate

scenarios. This work will be discussed in more detail at the PACCSAP side event during the Road Map meeting on 11th July 2013.

Name: Shin Furuno, International Adaptation Strategies Team, Ph: +685 66315
Organization: Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE)
Postal Address: DIICCSRTE, GPO BOX 854, Canberra, ACT 2601
Email: shin.furuno@climatechange.gov.au