

EGU24-13976, updated on 19 May 2024

<https://doi.org/10.5194/egusphere-egu24-13976>

EGU General Assembly 2024

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



Quantifying future risk of South Pacific Hospitals from climate change

Michelle McCrystall¹, Chris Horvat², Liz McLeod³, Madelyn Stewart⁴, Lydia Stone⁵, Subhashni Taylor⁶, Callum Forbes⁷, Eileen Natuzzi⁸, and Berlin Kafoa⁹

¹University of Auckland, New Zealand (michelle.mccrystall@auckland.ac.nz)

²Department of Earth, Environment and Planetary Sciences, Brown University, Providence, USA

³Royal Australasian College of Surgeons, Melbourne, Australia

⁴Yale University, Connecticut, USA

⁵Harvey Mudd College, California, USA

⁶College of Arts, Society and Education, James Cook University, Cairns, Australia

⁷Harvard University, Cambridge, USA

⁸Georgetown University, Washington D.C., USA

⁹The Pacific Community, Nouméa, New Caledonia

Health facilities in Pacific Island Countries are under threat due to ongoing climate change, namely from extreme weather events such as tropical cyclones. However, obtaining accurate projections of risks are inhibited due to the size and complex geometries of these islands which are not accurately or sometimes even entirely represented in the current resolution of global climate models. Using higher resolution models and the Synthetic Tropical cyclOne geneRation Model (STORM) to generate 10,000 synthetic tropical cyclones, this study takes a greater in-depth analysis of extreme weather events and tropical cyclones at hospitals in Fiji, Vanuatu, Solomon Islands and Tonga.

Preliminary results show an approximately 150% increase in the frequency of extreme cyclones of category 4 or 5 at hospitals across the Pacific, with Vanuatu and Tonga projected to experience a 200% increase in extreme storms. Projected increases in extreme rainfall days (number of days where rainfall exceeds 95th percentile) ranges between 14-161% and extreme heat days are expected to increase between 43-303 days per year by the end of the century. Mitigating against the impacts of climate change on medical care in these islands is hugely important, and so future aims of this work are to use statistical downscaling and AI-driven model acceleration, as part of our project EMPIRIC² (EMulation of Pacific Island Risk to Infrastructure from Climate), to provide robust, time-variant facility risks statistics directly to policymakers who are working to improve health infrastructure resilience across the South Pacific.