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Exploration of a Time-dependent Forecast for Tsunami in New Zealand

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New Zealand's (NZ) entire coastline is at risk of tsunami from local, regional, and distant sources. With more than 75% of New Zealanders living or working within 10 km of the coast, the tsunami risk is significant.

The Rapid Characterization of Earthquakes and Tsunamis (RCET) research programme is being undertaken to better understand, mitigate and respond to tsunami events in NZ. Within this project, my PhD focuses on improving the communication of tsunami threats to local stakeholders and the emergency response sector by creating a new concept: a time-dependent forecast for tsunami.

I have been using the software ComMIT (a tsunami model developed by the NOAA Center for Tsunami Research) to create a catalogue of synthetic tsunamis focusing on the cities of Tauranga and Whangarei, situated on the northeast coast of the North Island. These two cities have been selected due to their exposure to tsunamis: flat topography, densely populated, infrastructure-rich harbour, exposed coastline, proximity to the Kermadec-Tonga trench.

Using Python, I have generated a diverse assembly of forecasts where the tsunami waves amplitude measured on the coastline are linked to threat levels, resulting in the creation of the final product: a time-dependent forecast. I have also been engaging with stakeholders and various end user communities with the aim of adapting these models to their needs. We anticipate that this new tool will help them to respond to these threats more efficiently.