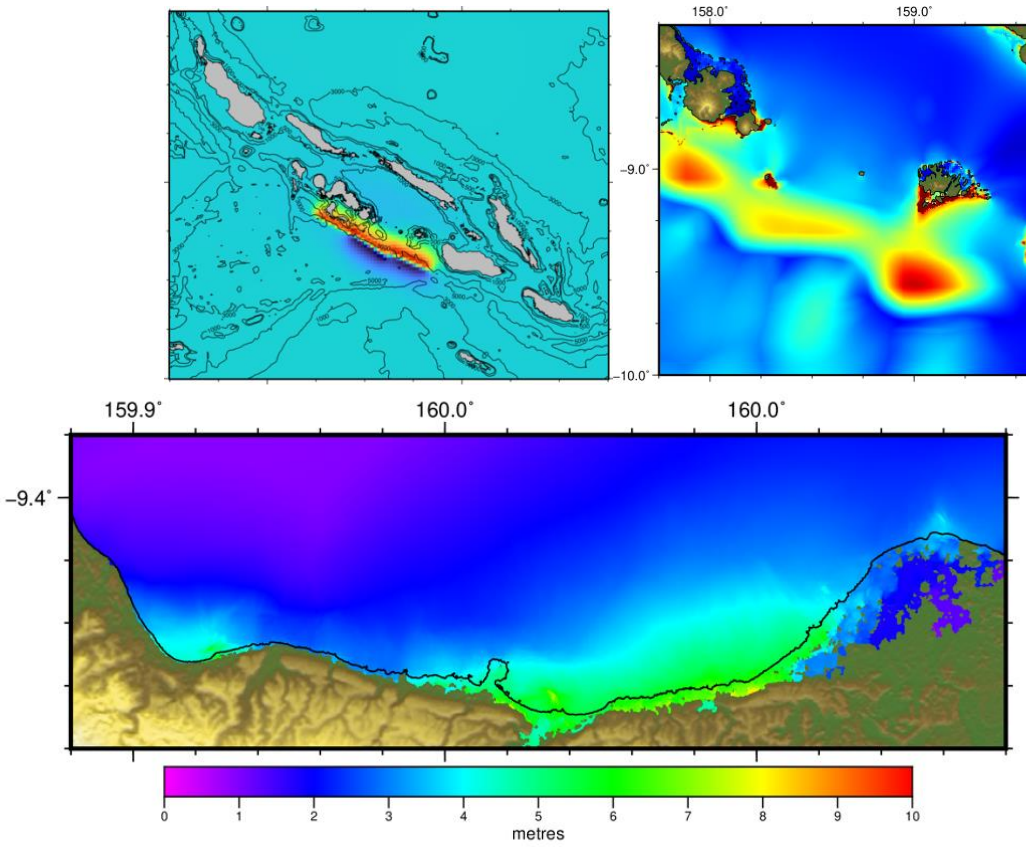
DETAILED MODELLING OF TSUNAMI INUNDATION AT HONIARA AND GIZO

SOLOMON ISLANDS



(top row): Initial surface deformation (L) and maximum computed tsunami amplitude (R) for a hypothetical M9 event. (bottom) Maximum computed tsunami amplitudes and inundation extents in Honiara.

PROJECT INFORMATION:

Location: Honiara and Gizo, Solomon Islands

Client: Government of Solomon Islands, NOAA

Project Date: 2025

SCOPE OF WORK:

- Preparation of detailed bathymetry and topography
- Characterisation of tsunami sources for a 2500-year RI event.
- Detailed hydrodynamic modelling
- Report preparation and delivery
- Presentation to clients

PROJECT DESCRIPTION:

The UNESCO/IOC Tsunami Ready Recognition Programme (TRRP) is an international community-based recognition programme aimed at building tsunami resilient communities. As part of a TRRP project, ORCAS Consulting was contracted by NOAA's International Tsunami Information Center (ITIC) to prepare detailed inundation maps for communities in and around Honiara and Gizo. Using the ComMIT tsunami modelling software, we simulated several historical and hypothetical tsunami events covering both regional and far field sources. Comparison of measured tide gauge data to model output suggested that our model accurately represented tsunami dynamics offshore of Honiara.

For the inundation assessment we considered six scenarios for Honiara, with earthquake magnitudes ranging tom 8.2 to 8.8, and seven scenarios for Gizo, with earthquake magnitudes ranging tom 8.2 to 8.9. The sources included both outer rise normal faulting, subduction thrust faulting and a hybrid scenario with both mechanisms present. Maximum modelled tsunami heights in Honiara ranged from ~2 m to ~8.0 m for the Mw 8.2 and 8.8 scenarios respectively. The intermediate M 8.4 scenarios produced maximum tsunami amplitudes of 5.4 m and 6.2 m for a subduction thrust type event and an outer rise event respectively. Maximum modelled tsunami heights were considerably higher in Gizo and ranged from ~12 m to ~30.0 m for the Mw 8.2 and 8.9 scenarios respectively. Again, it is noted however that the 'maximum' tsunami amplitude reported is not ubiquitous for each scenario and that tsunami heights vary across the modelled region and are somewhat smaller along the less exposed shorelines.