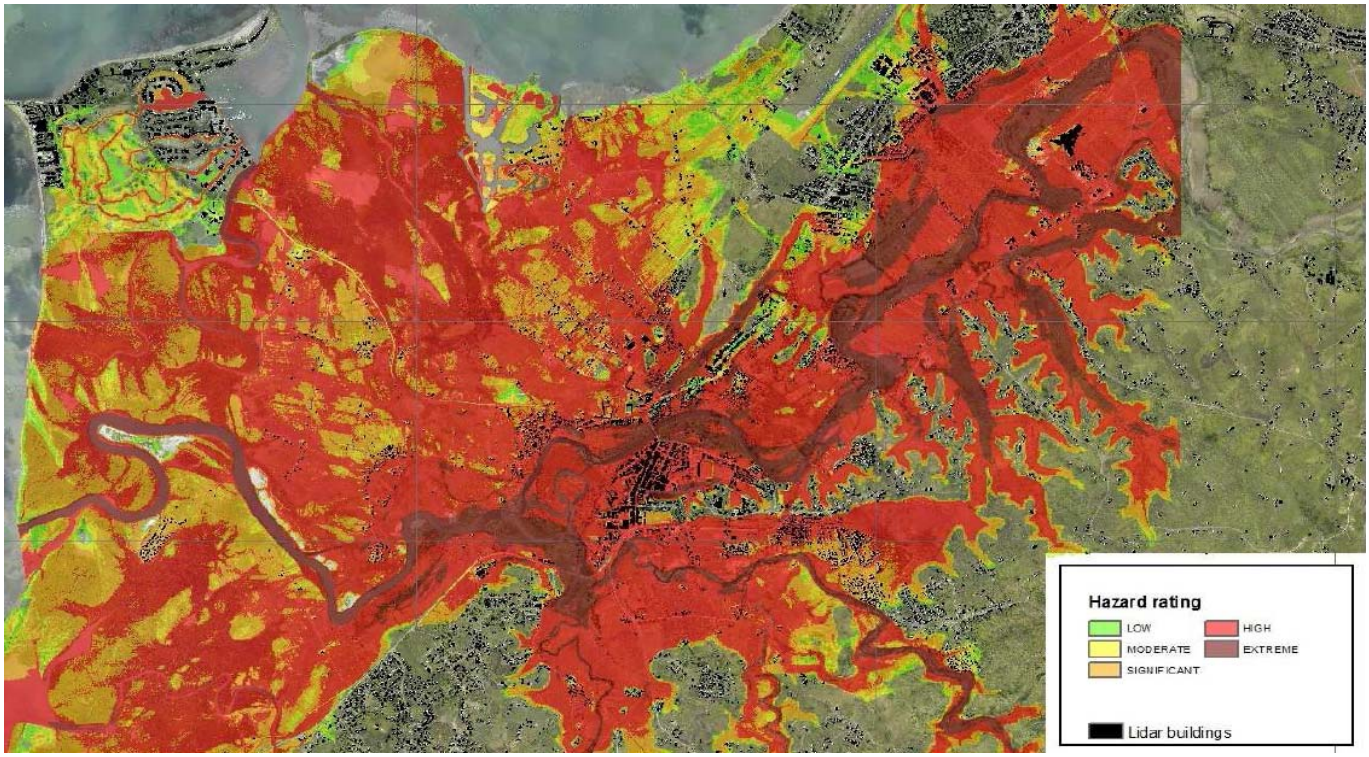
Nadi River Flood Risk Assessment

PROJECT



Client:	Secretariat of the Pacific Community / World Bank
Location:	Nadi, Fiji
Duration:	2013 - 2014
Services:	Hydrological analysis, LiDAR based topographic mapping, roughness mapping, historic flood mapping, hydrodynamic modelling, option assessment, risk analysis using Riskscape

In January 2009 areas of Fiji were inundated by devastating floods which claimed over 11 lives, left 12,000 people temporarily homeless and caused FJ$113 m of damage. Worst hit was the Nadi area with total damage estimated at FJ$81.2 m. On 30 March 2012 torrential rain caused flooding that affected more than 150,000 people with 4 deaths. Again Nadi was severely impacted with the continued development of land within the Nadi River floodplain likely to result in more flood disasters in future.

NIWA was contracted to carry out the Nadi River Flood Risk Project by the Applied Geoscience & Technology Division (SOPAC) of the Secretariat of the Pacific Community (SPC), funded by the World Bank. The project used topographic data derived from high resolution LiDAR, hydraulic inundation and risk models to produce 100-year return period (one per cent annual exceedance probability) flood inundation maps and calculate economic damages and human losses for the Nadi peri-urban floodplain area.

Results were produced for the following situations:

- The present day conditions.
- Future conditions with a flood diversion channel in place.
- Impact of the new Airport-Denerau link road.

In the 1 in 100 year flood inundation scenario for the present day scenarios, more than 52 per cent of buildings in Nadi are exposed and damaged by flood inundation.

Total direct and indirect financial building loss estimates are similar for the present day 1 in 100 year flood inundation and similar scenario with the Airport-Denerau link road in place at FJ$794 m and FJ$796 m respectively. These loss estimates reduce by 31 per cent to FJ$551 m when the 1 in 100 year flood model incorporates the proposed flood diversion scheme.

For such an event, half of Nadi's population could experience displacement from their homes. The proposed flood diversion scheme may not considerably reduce the total number of people displaced but would reduce the length of displacement time for many affected buildings