Sea Level Rise Map Differences

GWRC - WCC

Data accuracy

Data used in this sea-level rise model (SLR) map is based on primary data sources and methodology similar to the NIWA/PCE project of 2015. It was based on a laser-airborne (LIDAR) elevation survey from 2013. An earlier independent SLR map of Wellington City was created by Tonkin & Taylor for WCC in 2012, based on a 2009 LIDAR survey.

Issues

We are aware of some differences in SLR inundation areas shown by these 2 map sources, particularly in flat areas of Wellington CBD near tall buildings. In extreme cases, vertical differences can be up to 50cm. In contrast, areas of open ground show near-identical values.

Cause of differences

The major cause of differences between the 2 datasets is the more detailed manual extraction of the bare earth surface in the WCC dataset for Wellington CBD. The effect of many tall sided buildings introduces more uncertainty into the LIDAR datasets. The WCC dataset is more likely to be accurate in these areas.

Other causes of variation include:

- Estimates used for tidal offsets to mean sea level and mean high water springs level in Wellington Harbour vary by minor amounts;
- Survey control of vertical accuracy of ground levels has improved over time, especially with the adoption of the new national vertical datum (NZVD2016). This applies especially in Wellington south of the Mt Victoria tunnel;
- Tectonic effects, including slow-slip between seismic events, are causing the land mass of the Wellington area to vary in elevation, independent of ocean sea level changes. Overall, the region is generally subsiding punctuated by the crustal response from significant earthquakes.
- Both SLR maps were derived from elevation models created using older LIDAR survey equipment. Recent advances in LIDAR and GPS-based survey equipment would provide improved results.

What are we doing about this?
As new LIDAR survey data becomes available, it will be integrated into our SLR modelling products. As new SLR model products are developed across NZ, national standards will emerge and be adopted. These standards will recognise differences between national-scale exposure mapping (national to regional screening of risk exposure e.g. NIWA/PCE study) to detailed local-scale mapping to inform land-use planning.

A case may be made for recapture of LiDAR data to provide improved data accuracy, rather than continuing to use data based upon a 1953 vertical datum.

No-one knows the rate at which sea level will rise in future. Thus these maps are only indicative of relative vulnerability to inundation. In all cases of property transactions in vulnerable areas, seek the advice of a professional surveyor.

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