Toitū Te Whenua
Land Information
New Zealand

Joining Land and Sea (JLAS)

We're investigating requirements for a transformation tool that would enable merging adjacent height and depth datasets in terms of a common reference frame.

Current Situation

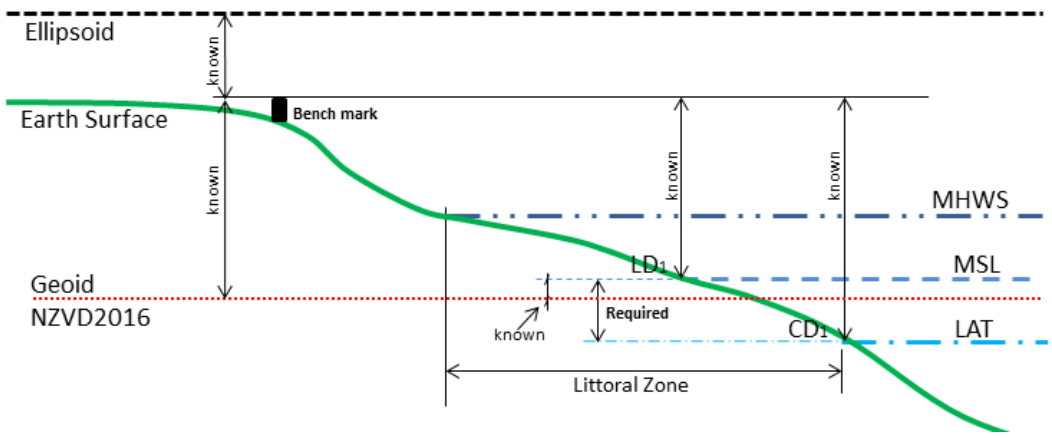
Height and depth datasets in New Zealand are currently captured to a range of reference surfaces or datums. Terrestrial height datums are based on Mean Sea Level (MSL) at discrete locations and epochs around the country (eg. Moturiki Vertical Datum 1953). Cadastral and maritime boundaries are defined in terms of tidal levels (eg. Mean High Water Springs (MHWS) and chart datums are based on Lowest Astronomic Tide (LAT)).

Hydrographic and land surveyors are increasingly using the ellipsoid for vertical positioning. The nation-wide NZVD2016 (ie. the geoid) allows height transformations between the ellipsoid and the historical MSL-based vertical datums, but the relationships between the height and depth datums are not readily available nor completely rectified across the country.

Defining the relationship between datums will support the growing number of applications that require seamless datasets.

What is needed?

Seamless dataset require transformation models between reference surfaces. Many of New Zealand's current datums are related to tidal data, ie. MSL, LAT, MHWS. At some sites, the determination of MSL is based on older tidal records and so we will need updated data to take into account sea level changes over time. Improvements to national tidal models may also be required to ensure the information is accurate enough for reference transformations. The relationship between reference surfaces is described in the diagram below.



What are the benefits?

The ability to create seamless vertical datasets across sea and land will mean:

- Improved sea level rise and flood modelling for stronger resilience to natural events
- Improved tsunami modelling
- Improved ability to determine coastal boundaries
- More effective coastal zone management
- Greater efficiencies in integrating bathymetric datasets
- Greater efficiencies in collecting and processing survey data

How will we do this?

Our key activities for the investigation include:

1) Assessing the quality and quantity of current tidal and geodetic data
2) Seeking out other sources of data – satellite altimetry, hydrodynamic model, etc.
3) Reviewing literature and international solutions
4) Consulting New Zealand stakeholders