

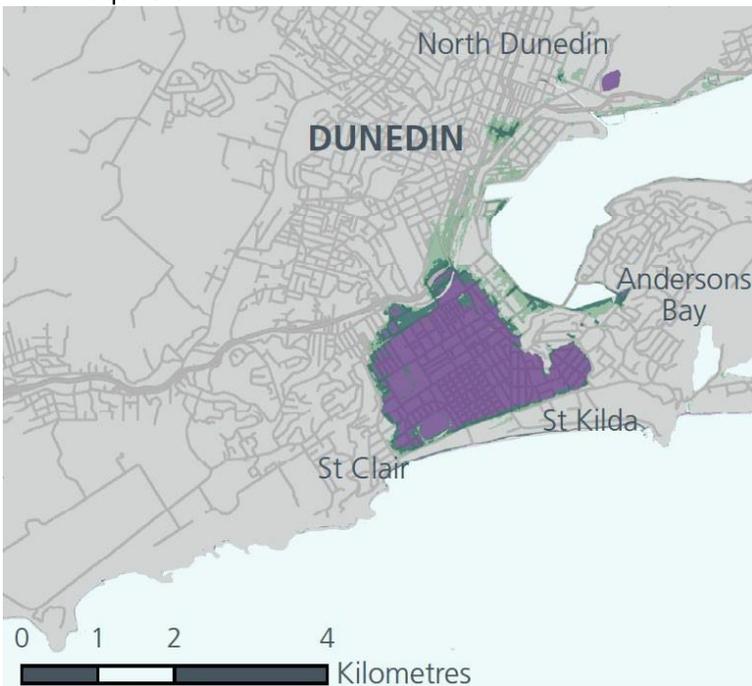
Adapting to Sea Level Rise

Positioning and Measurement Stream

The Impacts of Climate Change on our Coast¹

Like most countries, we live and work by the sea. We need to adapt to sea level rise since coastal areas include much of our urban development and infrastructure. Possible impacts of climate change on coastal areas include:

- vulnerability to coastal erosion and floodinundation;
- increased frequency, duration and extent of coastal flooding;
- overtopping of coastal structures by waves or high tides more often;
- severe storms increase in intensity and surge levels rise, and;
- saltwater may enter underground freshwater aquifers.



Low-lying coastal land in Dunedin¹

¹ MFE. (2017). Adapting to Sea-Level Rise. Ministry for the Environment. Retrieved 30/3/2020 www.mfe.govt.nz/climate-change/what-government-doing/adapting-climate-change/adapting-sea-level-rise

² Nguyen et al. (2019). Risk to Residential Property Values from Climate Change-Related Flooding Hazards: A Mixed Methods Approach. Retrieved 30/3/2020. [dx.doi.org/10.2139/ssrn.3489445](https://doi.org/10.2139/ssrn.3489445)

³ LINZ (2018) New Zealand Vertical datum 2016 (NZVD2016). Retrieved 30/3/2020. www.linz.govt.nz/data/geodetic-system/datums-projections-and-heights/vertical-datums/new-zealand-vertical-datum-2016-nzvd2016

South Dunedin Case Study²

South Dunedin is particularly vulnerable to the impacts of SLR and climate change. It has a coastline that bounds the Otago Harbour and Pacific Ocean. It is low lying, has high ground water and a dense population. In June 2015, the combined impact of a record rain event (greater than 140 mm) and a king tide resulted in significant flooding. It is estimated that this “one in 100-year” event resulted in 2400 property claims and cost insurers NZ\$28.2. Studies have also shown that properties subject to flooding sell at a discounted rate and there is a similar discount for SLR related impacts.

With global warming, South Dunedin is expected to suffer from extreme flooding events caused by high tides and storm surges that will increase in frequency and duration. Extreme climatic events, such as the prolonged rainfall in June 2015, will occur at a more frequent level that will lead to coastal flooding and inundation of low-lying land.

New Zealand Vertical Datum 2016³

Central and local government need to plan and prepare for these impacts. To do this, it is imperative that everybody is working with reliable data that is consistent and in terms of the same vertical datum i.e. NZVD2016. Height information becomes critical when dealing with sea level.

Future planning depends upon integrating disparate regional, national and global datasets including topographic, bathymetric, GIS, LiDAR and remote sensing. Decision makers require accurate and reliable information to make informed decisions concerning planning, building consents, urban development and infrastructure e.g. roading, storm and foul sewer pipes. This enables authorities to make plans for future retreat, adaption and/or engineering solutions.

Having a standardised height system is critical to making the correct decisions.

Want to know more?

Contact the Survey and Spatial New Zealand Positioning and Measurement Stream:

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