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NZVD2016 – Hawkes Bay
Setting the scene - mapping NZ 2025

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Group Manager Positioning and Resilience

NZVD2016 Seminar, Hawkes Bay, 2-2 October 2018.

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OUR VISION	The power of 'where' drives NZ's success
OUR OUTCOME	Geographic and property information are both used effectively to address key challenges for NZ: resilience and climate change, water, urban areas
CRITICAL FEW PROGRAMMES	Mapping NZ 2025 Improving Resilience to Natural Events Improving Property Information
OUR PURPOSE	We drive the delivery of accessible, useable geographic and property information to provoke better decisions and inspire innovation

the power of where drives NZ's success

Some predictions for our land and sea domain

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By 2068, NZ's population will be 7.5 million	Within the next 30 years, Auckland's population will grow by 1 million	Half of the infrastructure required by 2050 has not been built yet
In the next 10 years, the Government will invest $50 billion in infrastructure	By 2050, sea levels will rise by 30cm, impacting our coastal communities	Within 50 years, climate change will significantly increase droughts in some areas, flooding within others
By 2030 NZ will need to significantly reduce carbon emissions to meet international obligations	In the next 25 years, dairy cows numbers will double increasing stress on the environment	Since 1990, fertilizer use has increased by 600% increasing nitrogen runoff into waterways
90% of NZ wetlands have been drained by farming, continuing to put stress on our environment	While the continental shelf is 21 times larger than NZ's land area, it's poorly mapped, resulting in unrealised opportunities	By 2050 NZ aims to make the nation predator free

Mapping NZ 2025 - will help us answer some of these and other questions

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Where to plant 1M ha of trees that can improve our carbon emissions?

Where are waterways affected by intense agriculture?

Where to build 500k buildings needed in Auckland?

Where to minimise the impacts of flooding?

Where to invest $50B in infrastructure over the next 3 decades?

Where is the greatest potential for productivity gains in Māori land?

Where is productive land most at risk from climate change and how do we mitigate that?

Where are pests impacting our native vegetation?

Mapping NZ 2025

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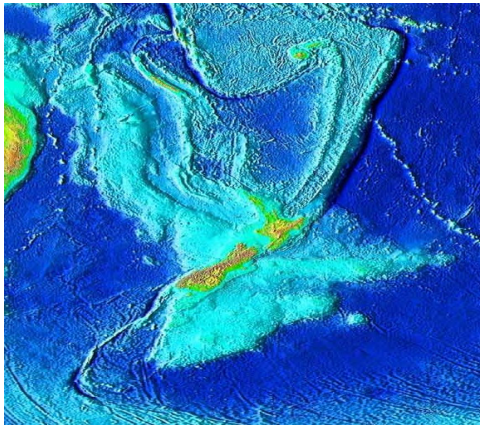
Mapping NZ 2025 is a 10-year programme of leadership and coordination by LINZ.

It aims to ensure seamless, integrated mapping and provision of national datasets that help answer the most critical 'Where' questions.



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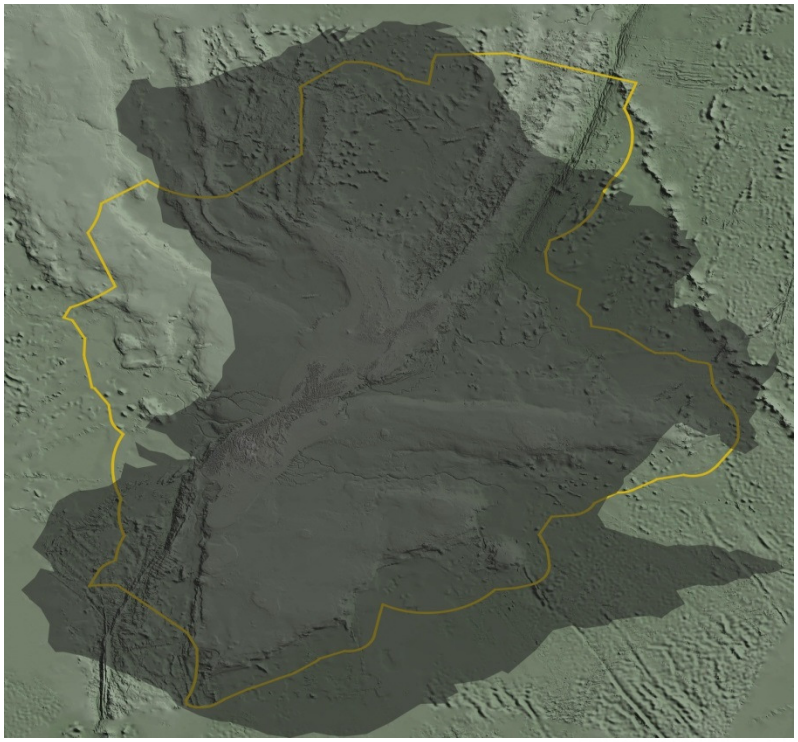
A land and marine domain similar to the size of Australia.



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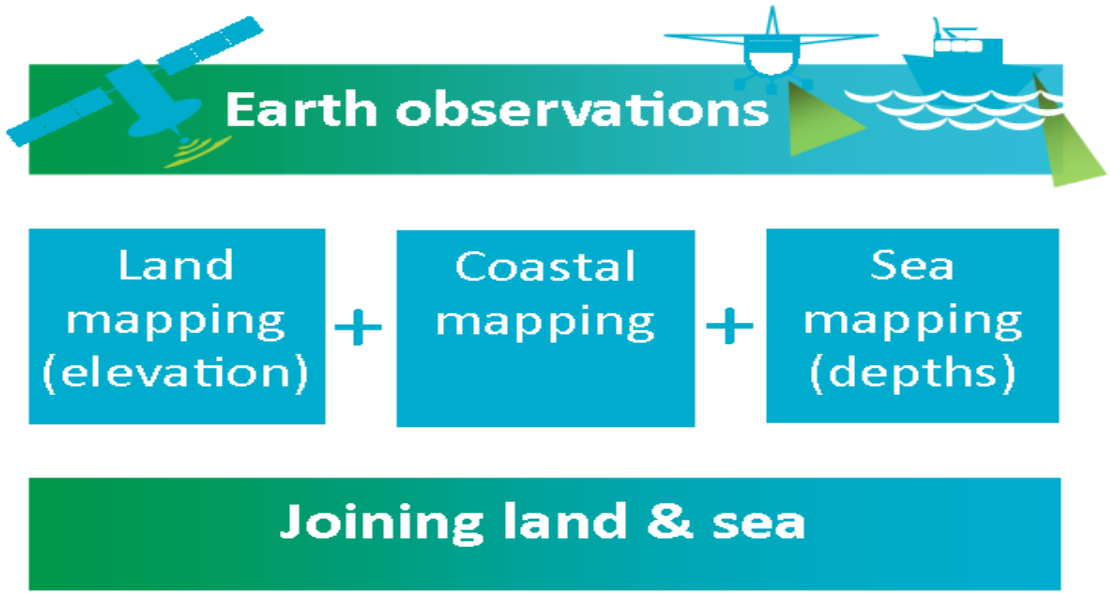

Vision:

Seamless mapping across land & sea

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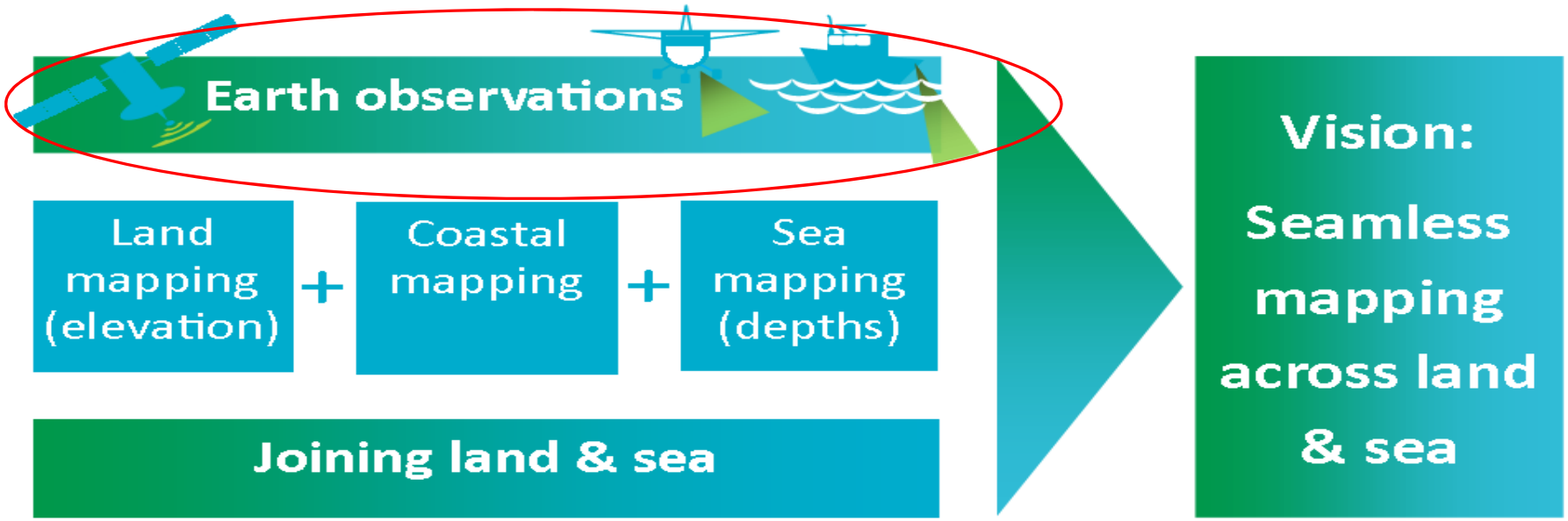

What are we doing?

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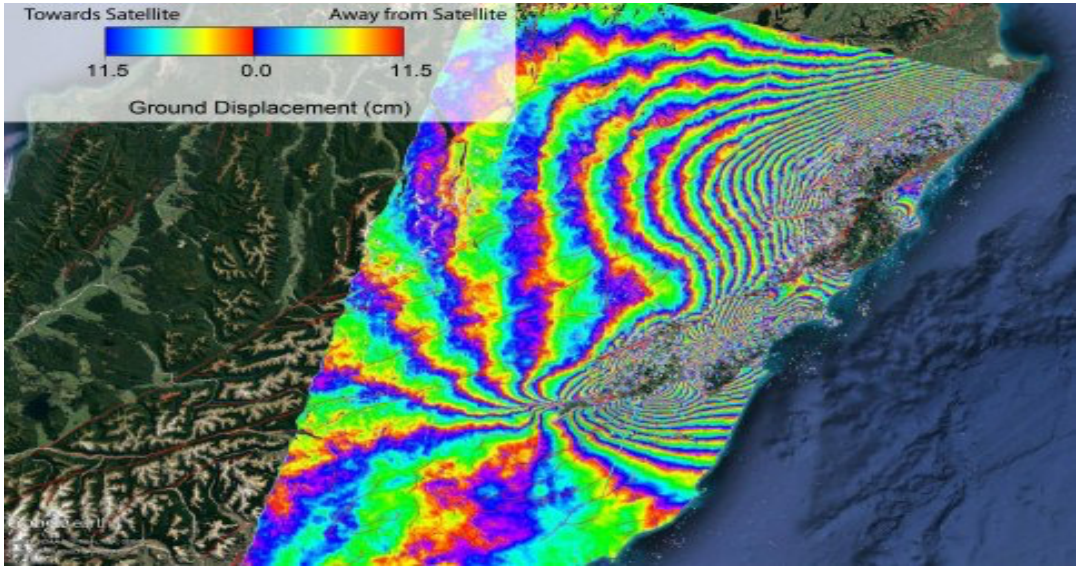
- INSAR
- Sentinel mosaic



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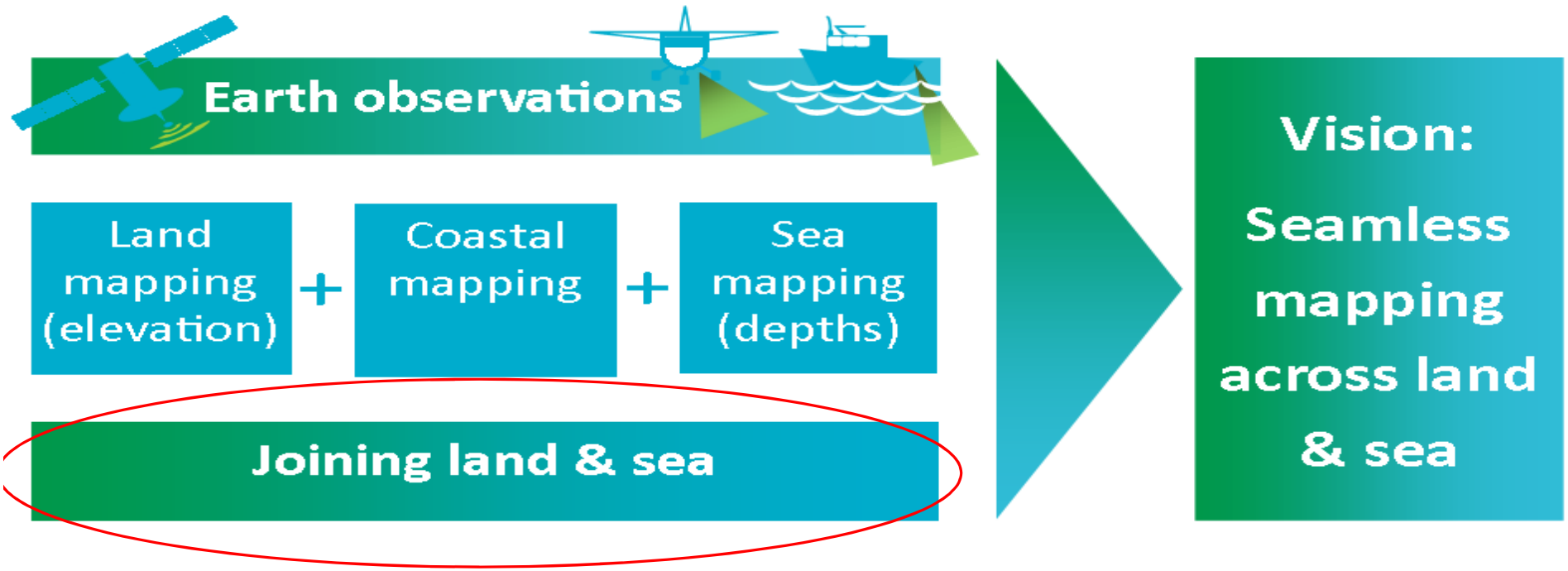
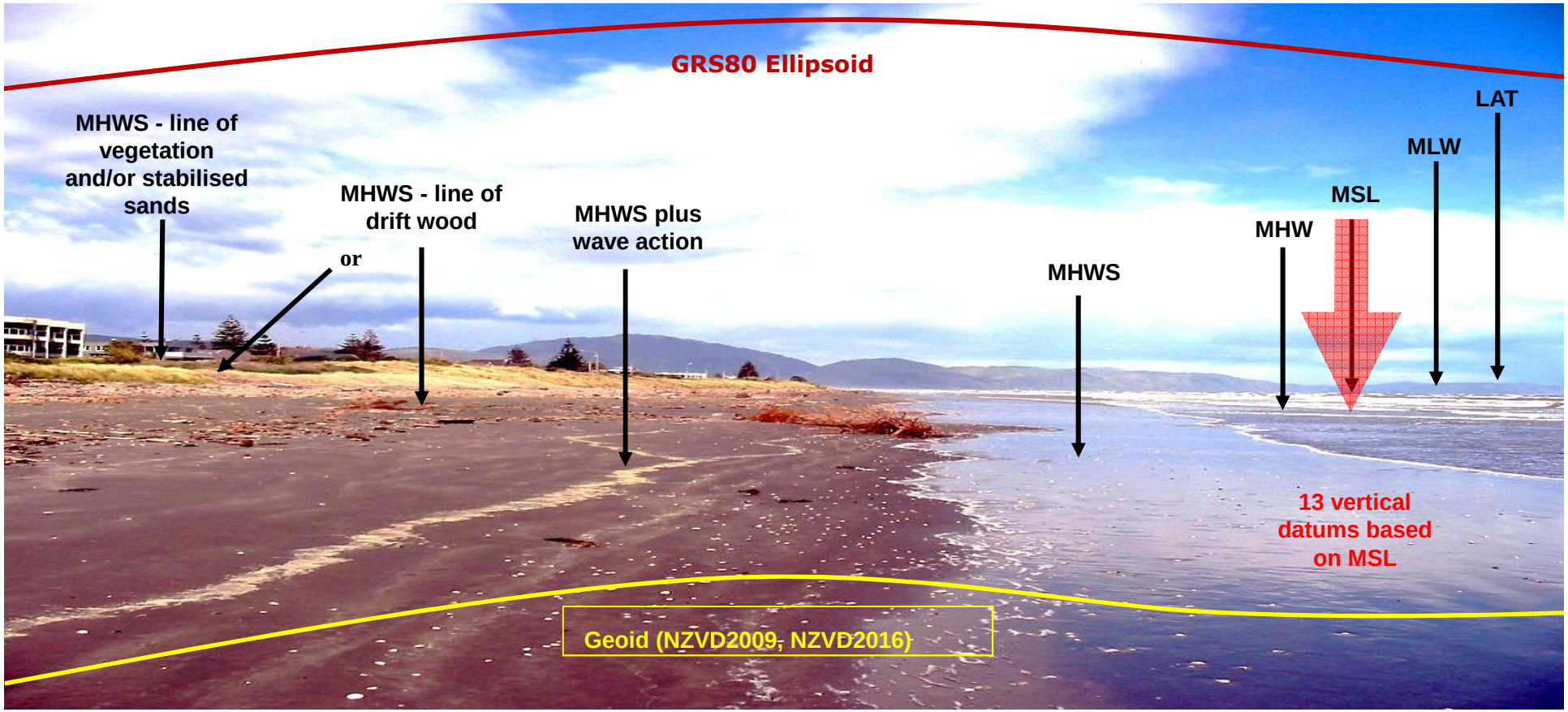


- **Working with NIWA to enable linking boundaries in the littoral zone and seamless data:**
  - tool for transforming data between datums
  - improved NZ tidal model



Joining Land and Sea datasets

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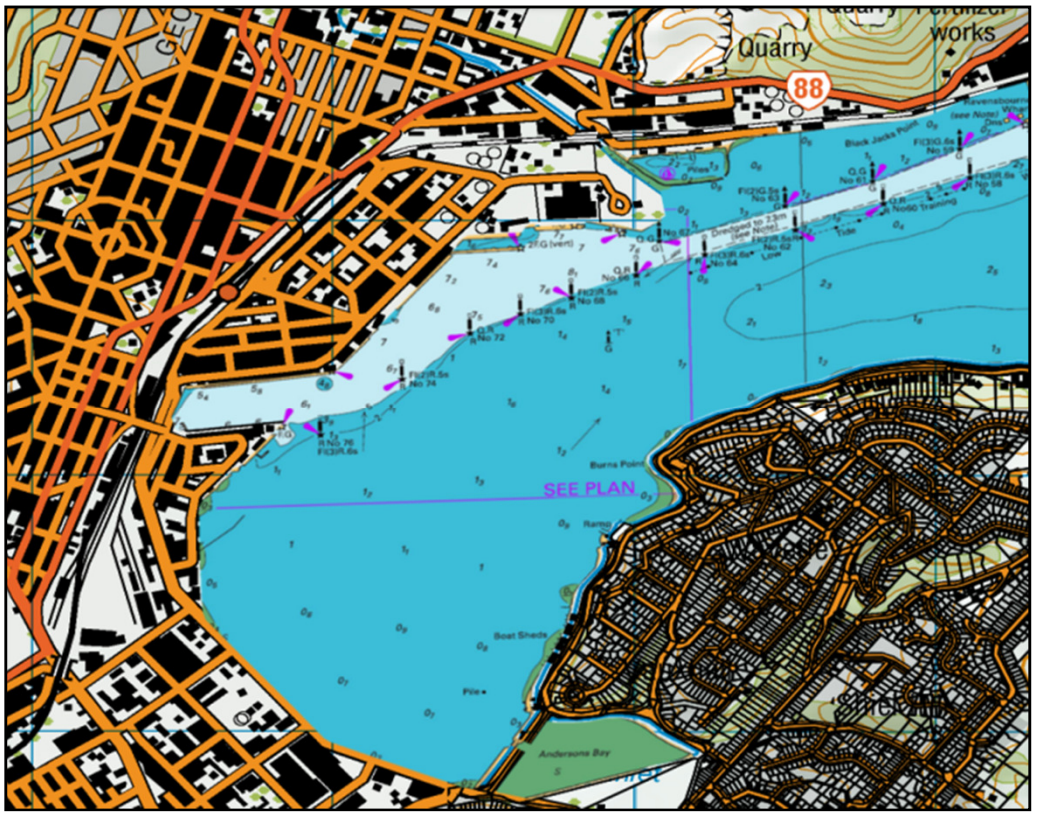
Datasets usually defined in terms of different vertical datums and reference surfaces:

- **Topography – MSL**
- **Hydro – LAT/CD**
- **Cadastral – MHWS**
- **Geodesy – MSL & ellipsoid**

The challenge is to combine different datasets



Joining Land and Sea (JLAS)

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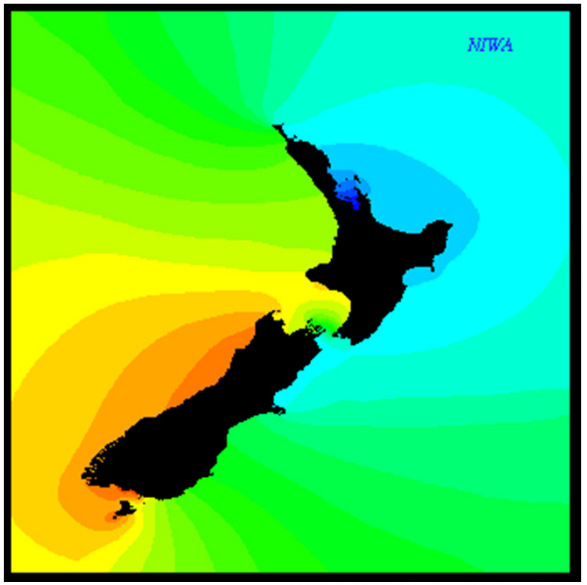
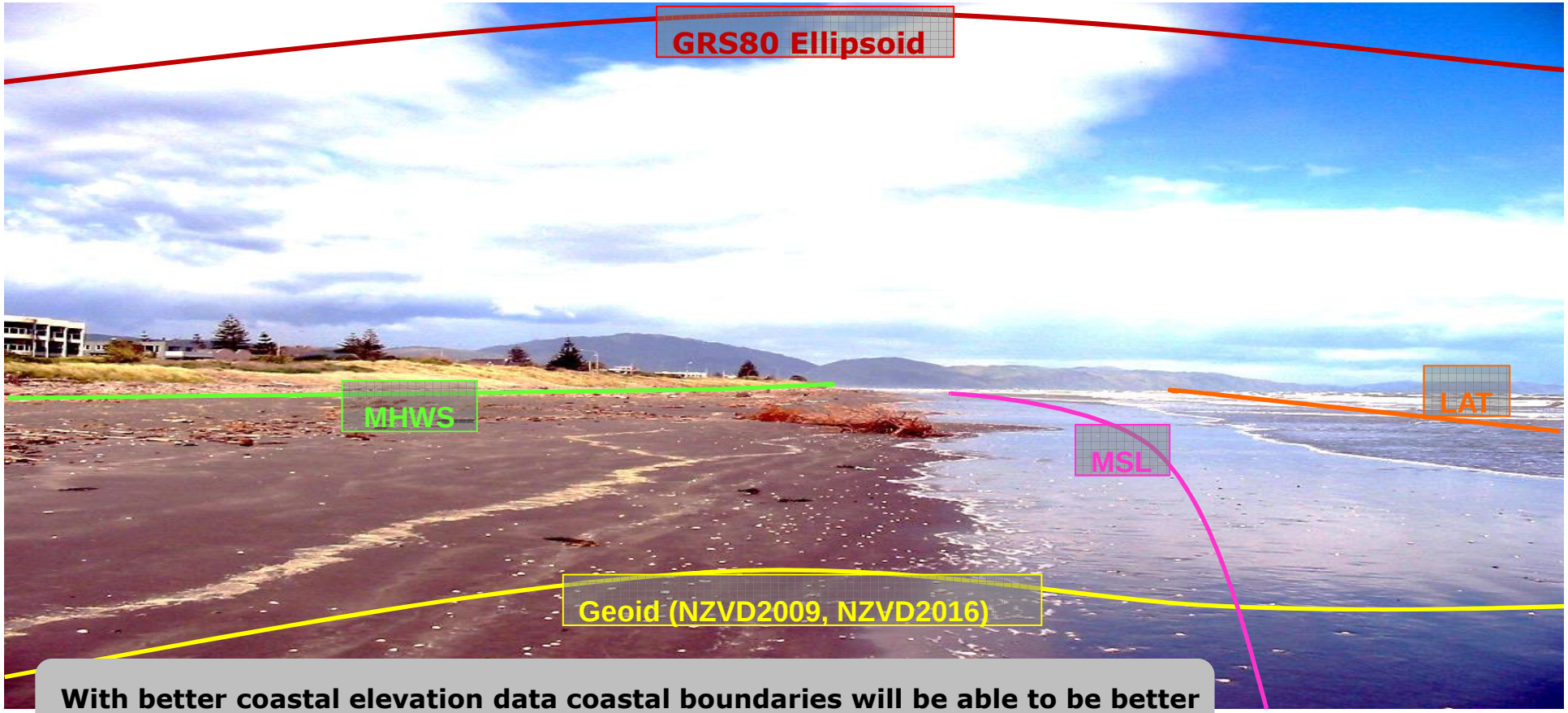
Aim: To provide the transformations between physical and geometric vertical datums to enable datasets to be collected in terms of a consistent vertical datum across the land and sea and to compute sea level boundaries and heights away from tide gauges.

1. **Consulting with peers – NIWA, GNS, industry** ✓
2. **Reviewing international solutions** ✓
3. **Assessing our current tidal and geodetic data**
4. **Implementing a solution for NZ**



The Result



With better coastal elevation data coastal boundaries will be able to be better mapped and monitored and heights in terms of these boundaries determined

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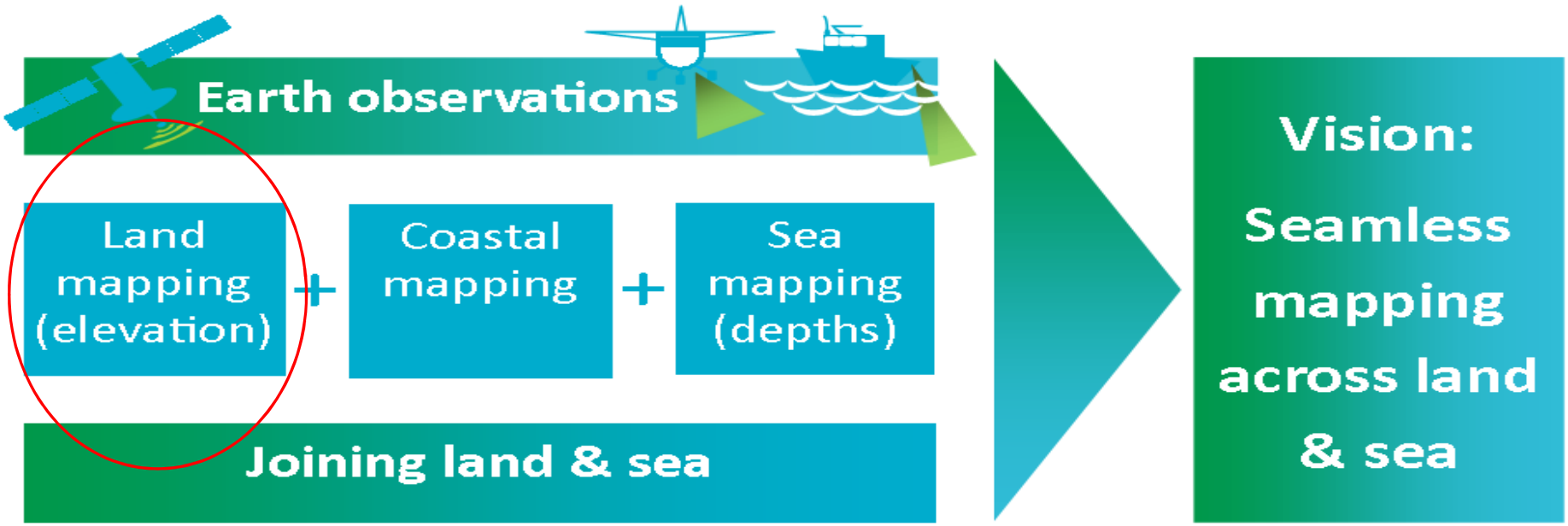

Learning from the past to inform the future

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Regional Aerial Imagery

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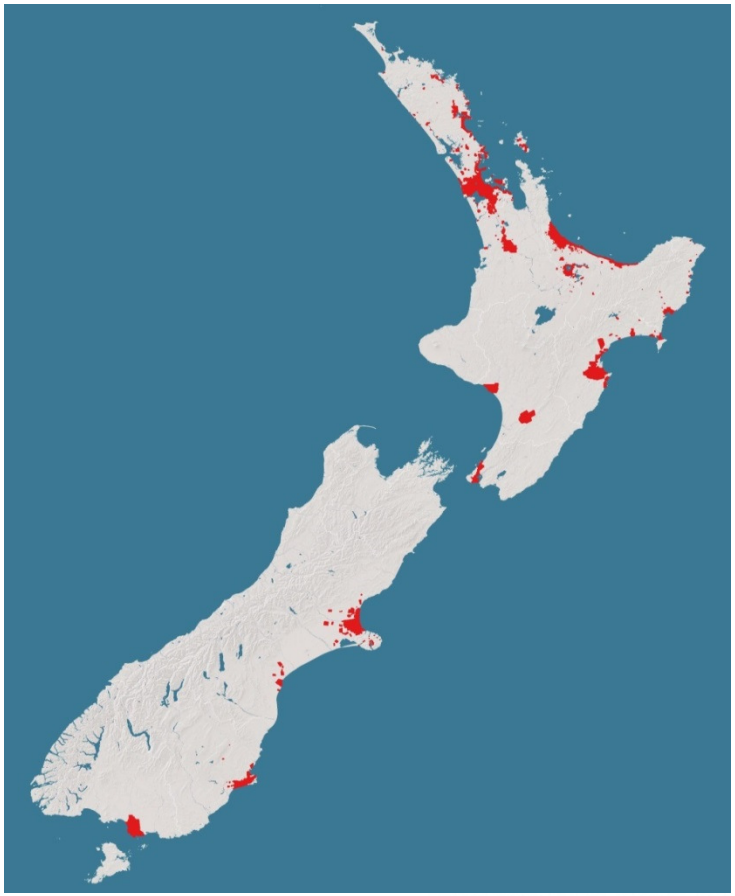
- Work in regional consortiums
  - regional councils
  - territorial authorities
- Central government
  - MPI
  - DOC
  - LINZ
- Creative Commons License
- Resolution ~ 30 – 40 cm
- Accuracy ~1m accuracy
- Available on the LINZ Data Service.

Urban Aerial Imagery

- Territorial authorities
- Central government
  - MPI
  - DOC
  - LINZ
- Creative Commons License
- Resolution ~ 10 cm
- Accuracy ~ 30 cm accuracy
- Available on the LINZ Data Service.



LiDAR Coverage

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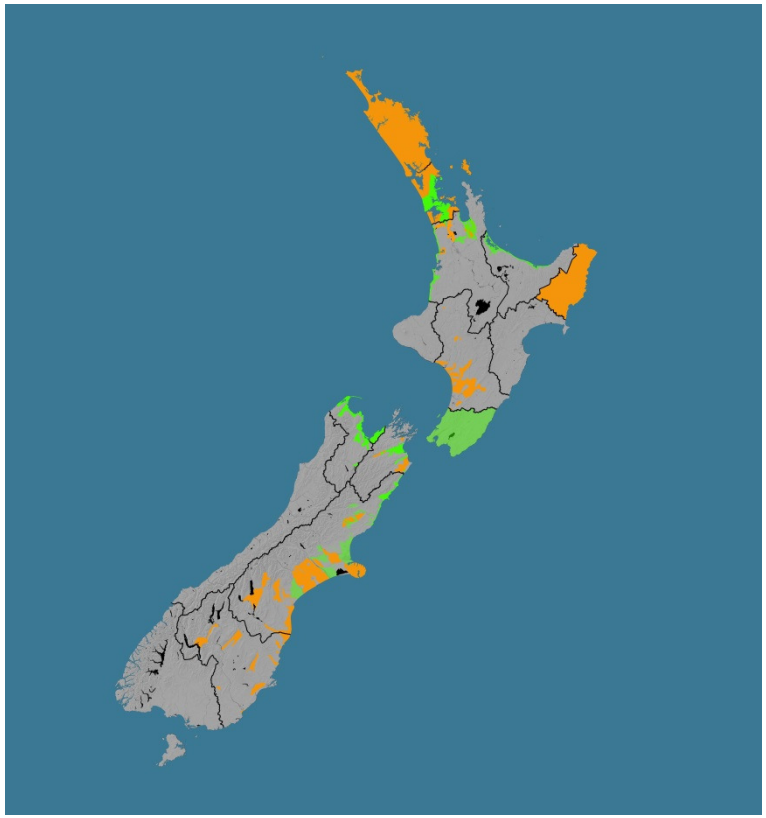
LDS now - 18,000 km^2

In progress - 33,000 km^2



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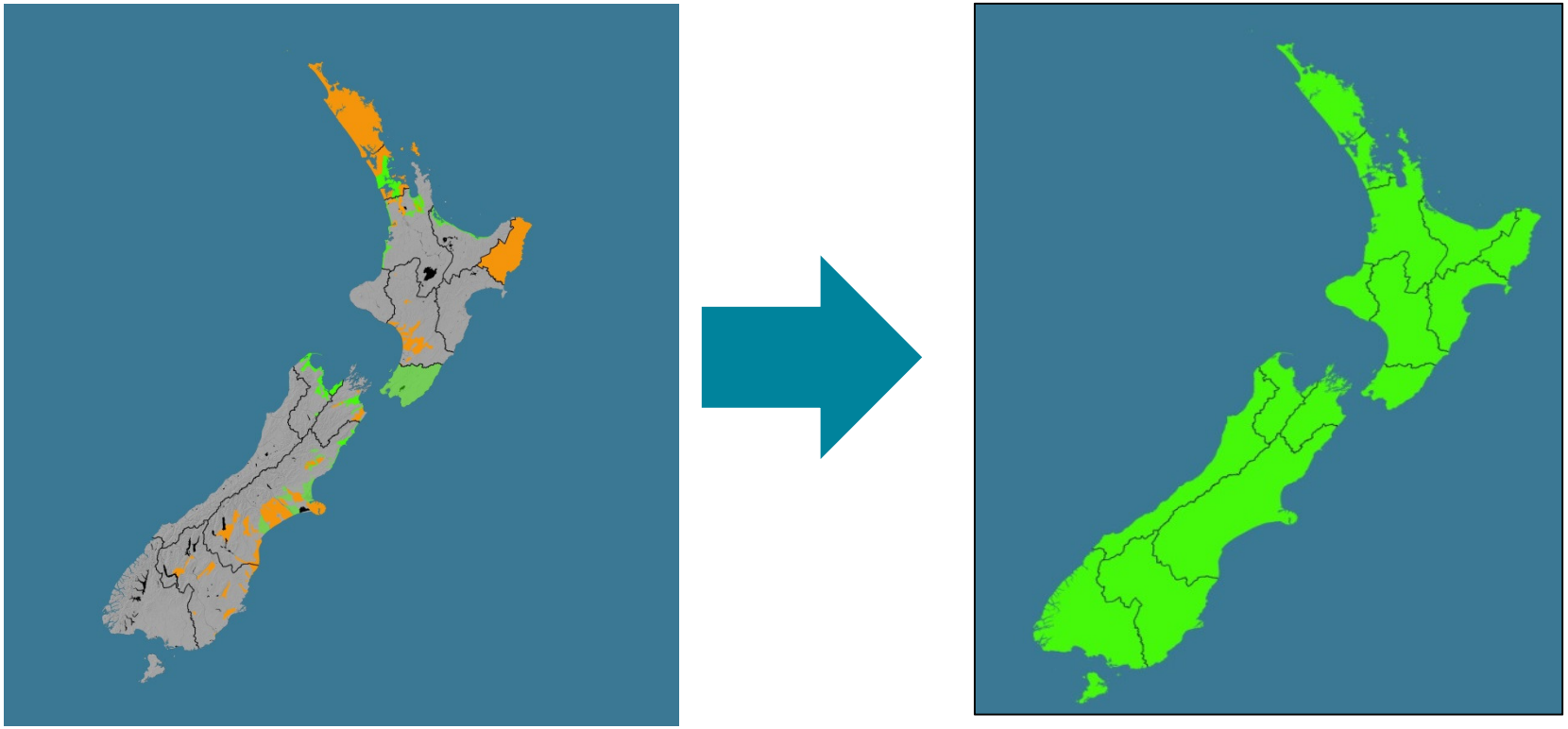
Build the national DEM New Zealand needs



Sumner flood risk example

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National DEM – 10m accuracy

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LiDAR provides sub-m accuracy

Wellington region-wide LiDAR

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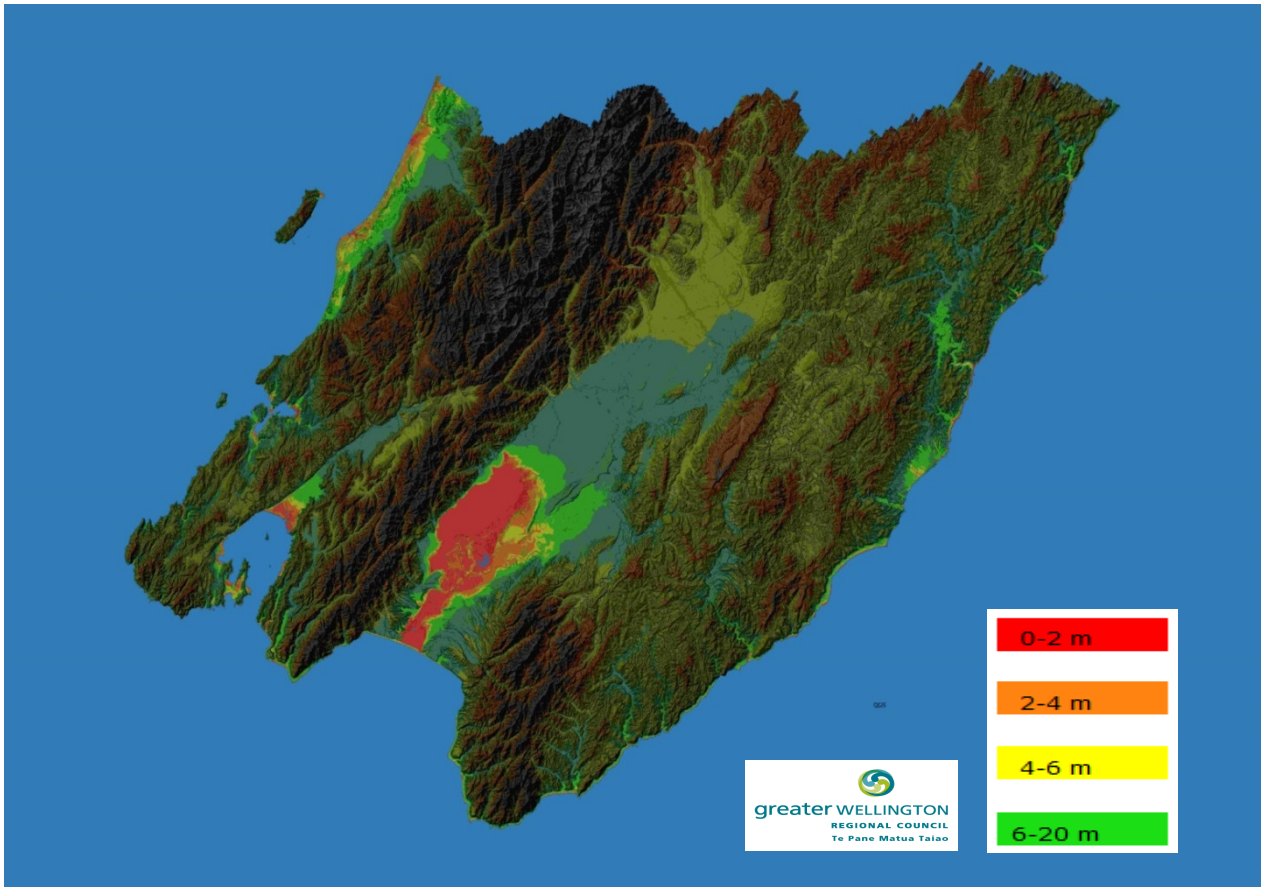

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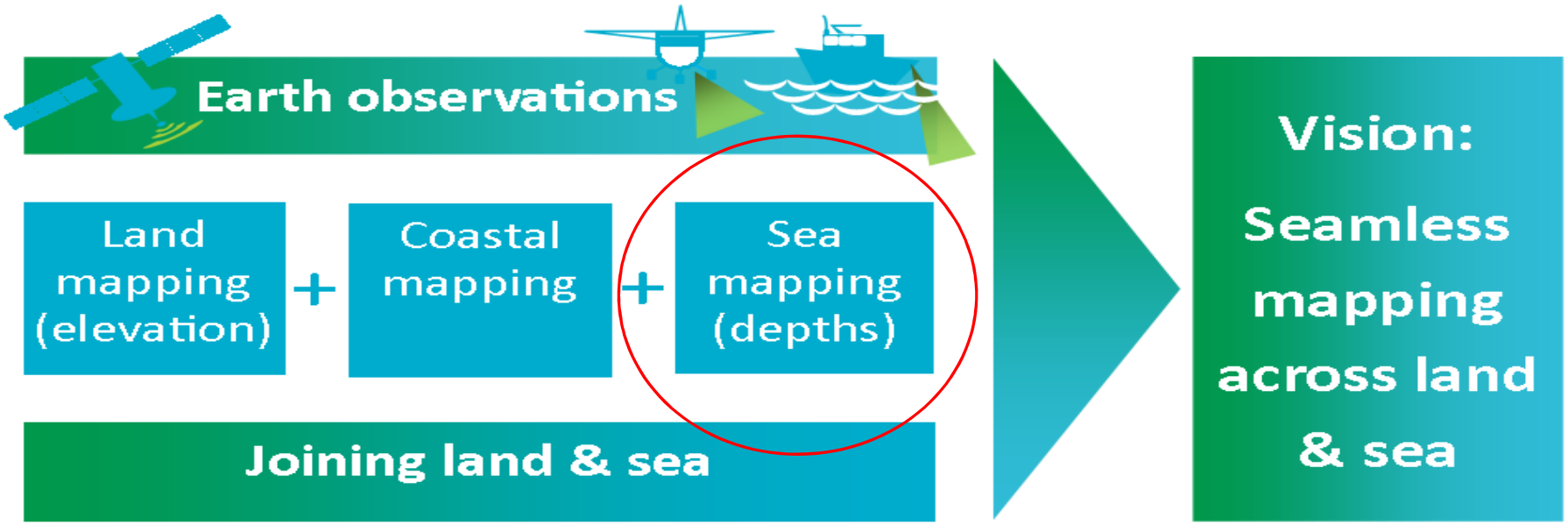

Improving national bathymetry

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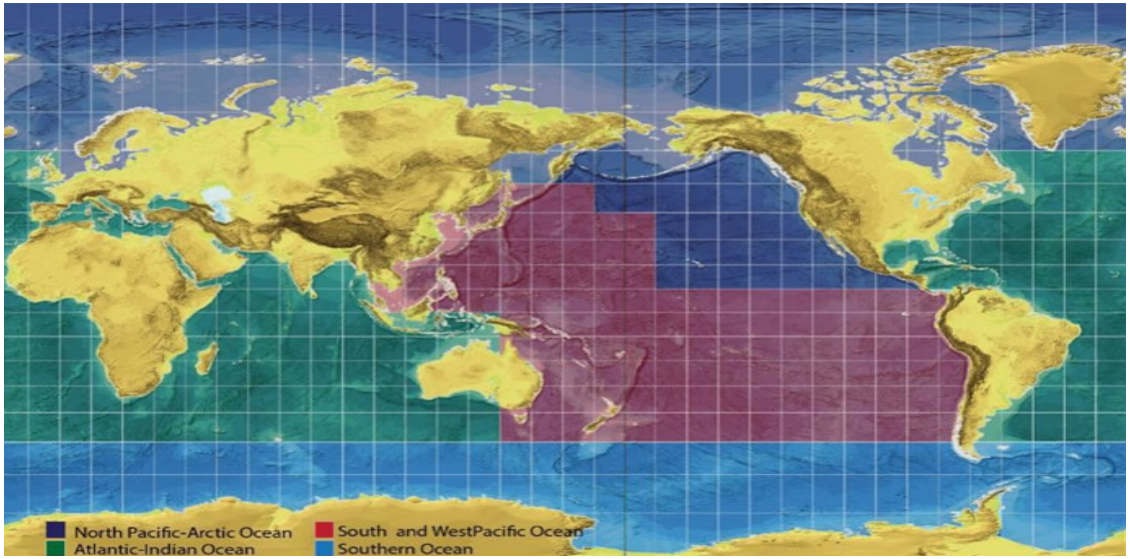
- Operating survey programme and partnerships
- Joint agency work on international initiatives (Seabed 2030)
- Gathering bathymetric data from research vessels
- Focus on near shore mapping.



Bathometry

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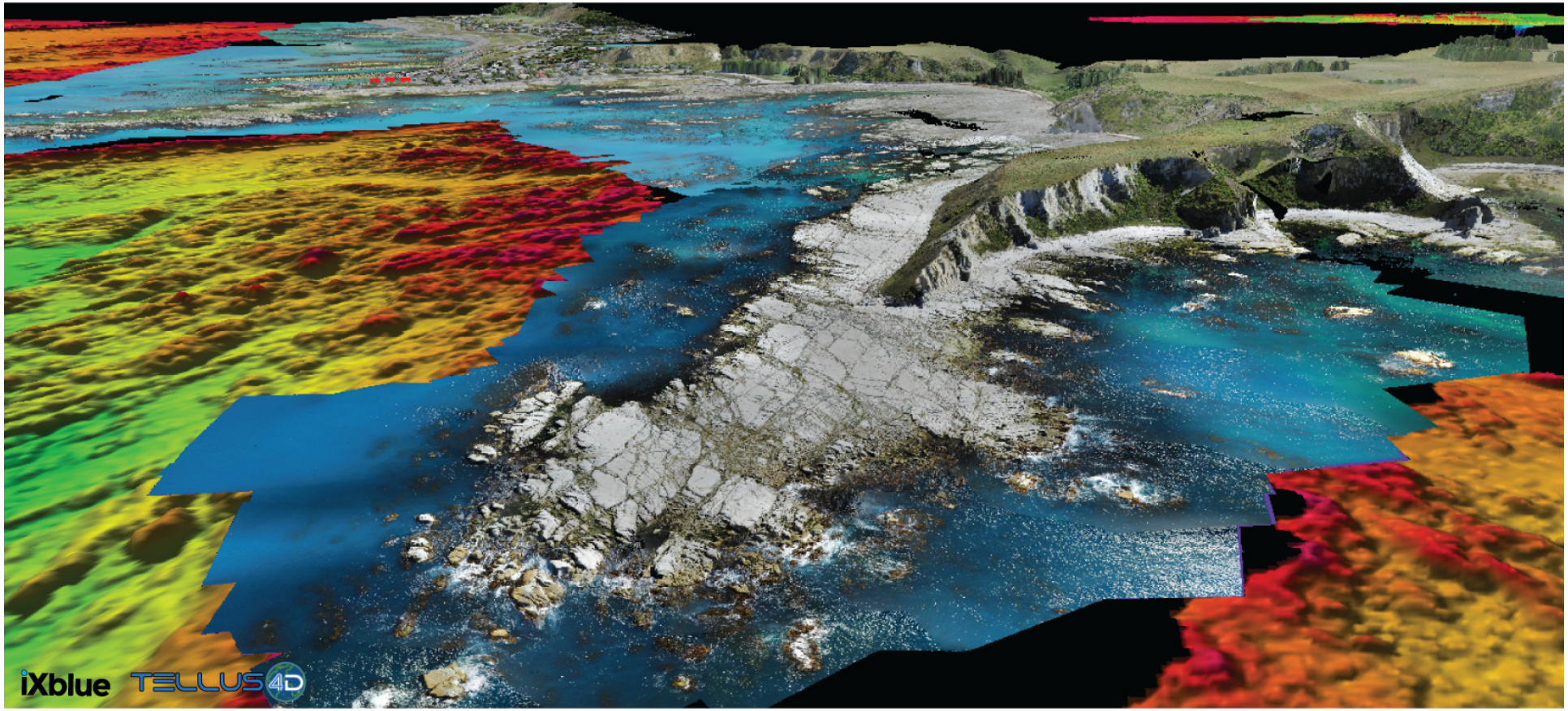
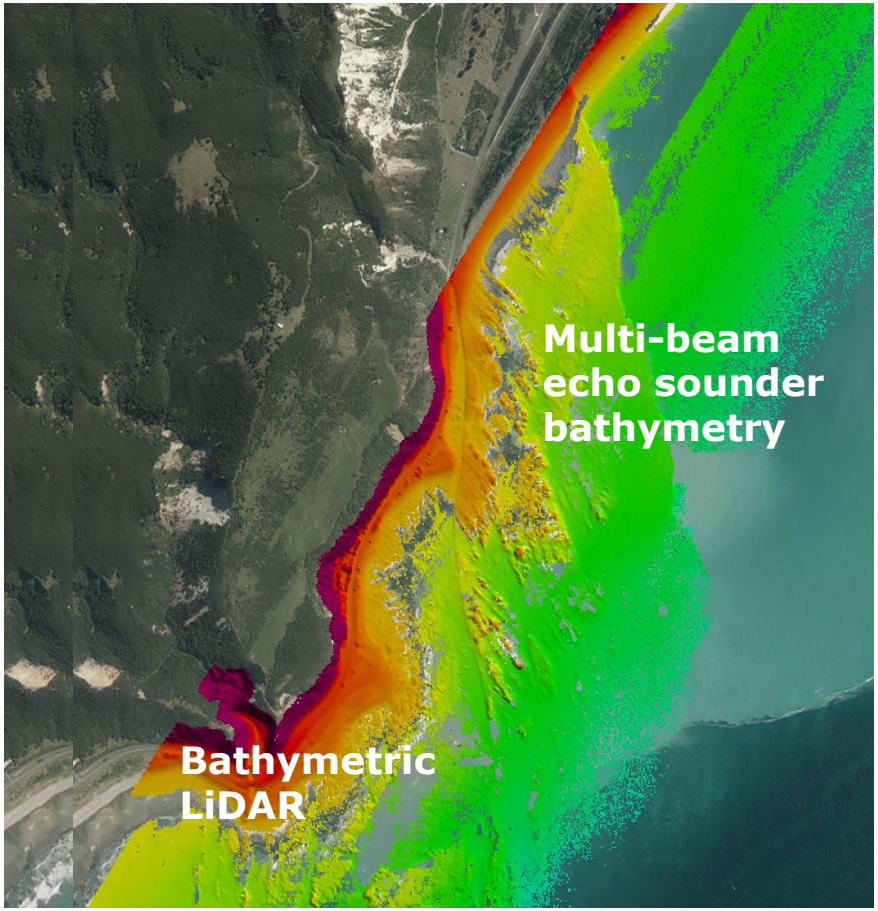


Filling in the missing piece



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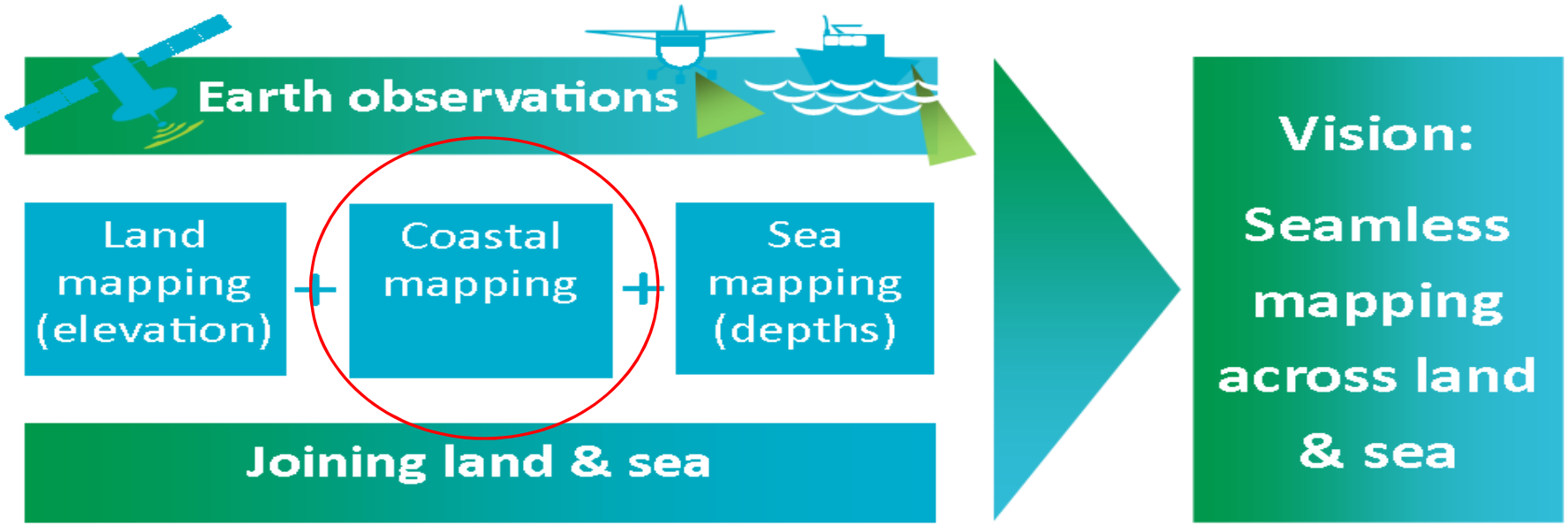

Mapping the coastal zone

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Bathymetry adds further context

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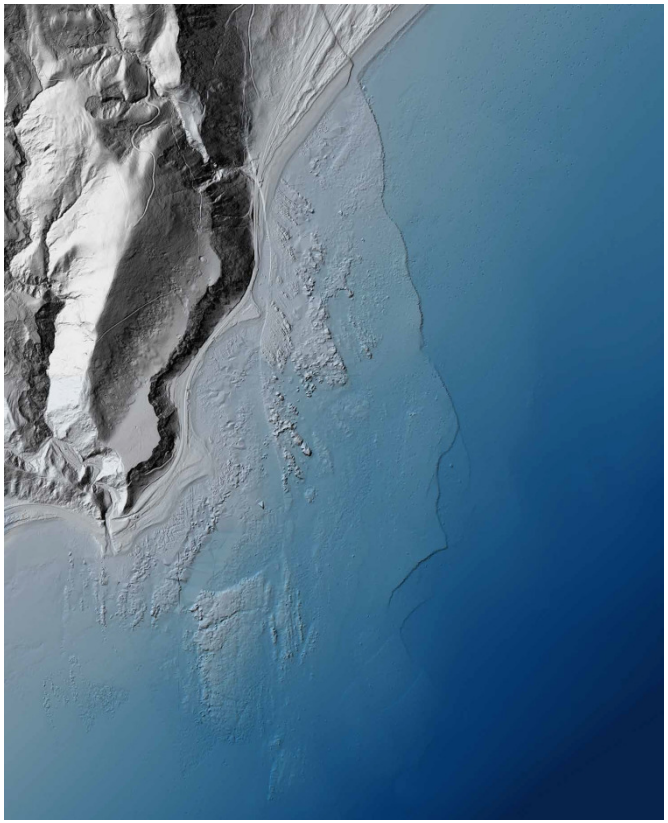

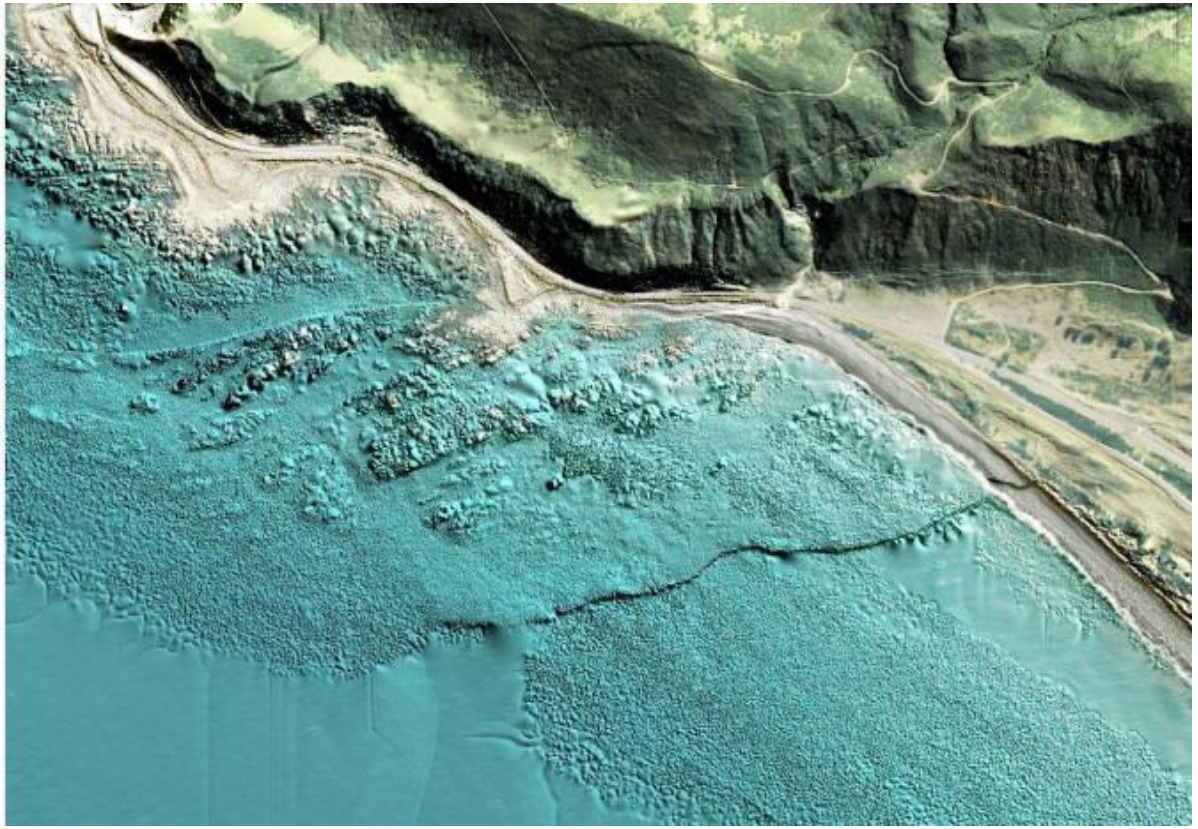

Coastal mapping benefits and applications

- Improved modelling
  - Sea level rise
  - Flooding
  - Tsunami
- Integrated ocean and coastal mapping
  - Shoreline studies
  - Hydrographic surveying
  - Integrating bathymetric datasets
- Collecting and Processing survey data
- Surveying on the ellipsoid.

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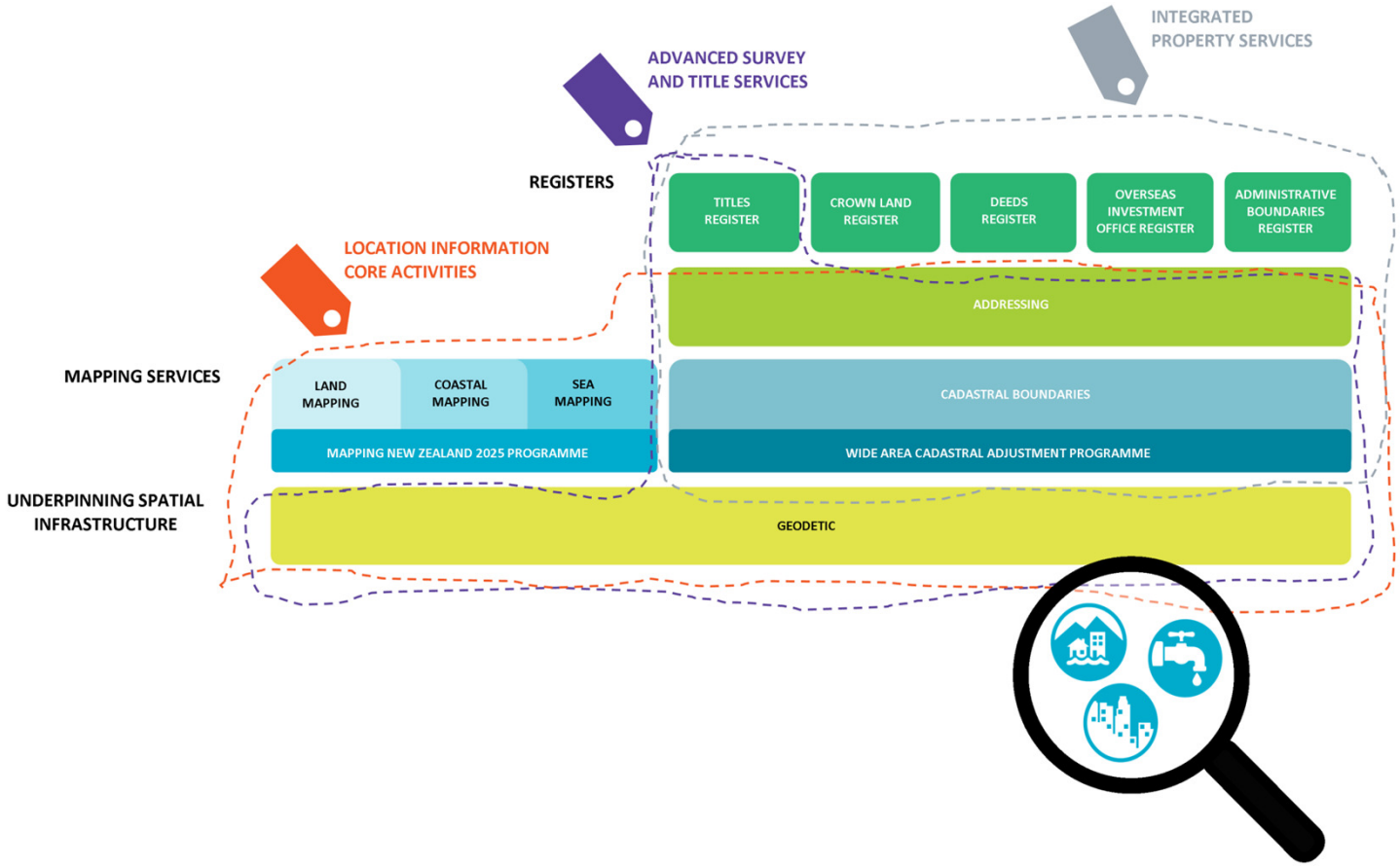
Questions

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