Toitū Te Whenua
Land Information
New Zealand

Integrating and reusing marine spatial data

to support a sustainable blue economy in New Zealand

Rachel Gabara
New Zealand Hydrographic Authority

October 2021

Marine Management in New Zealand

Castlepoint by Donan Nellas

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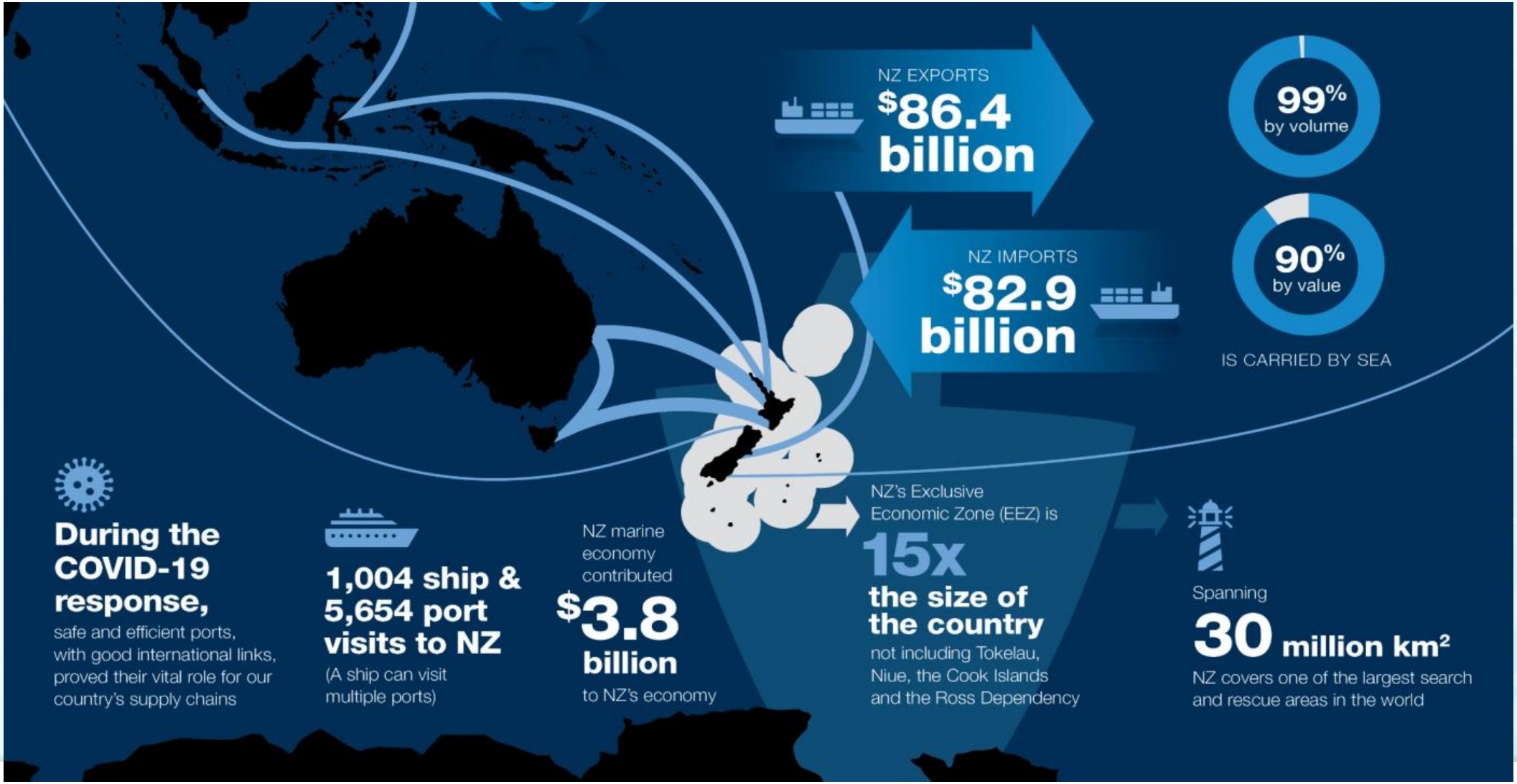
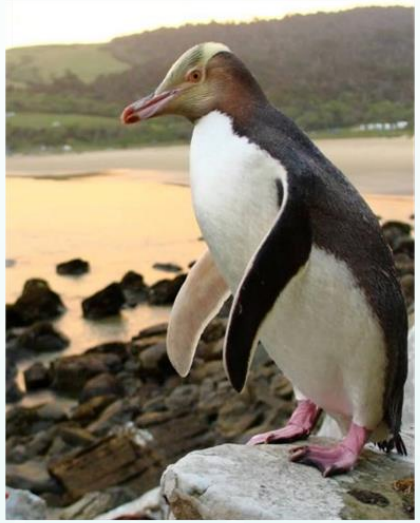
Te Kāwanatanga o Aotearoa
New Zealand Government

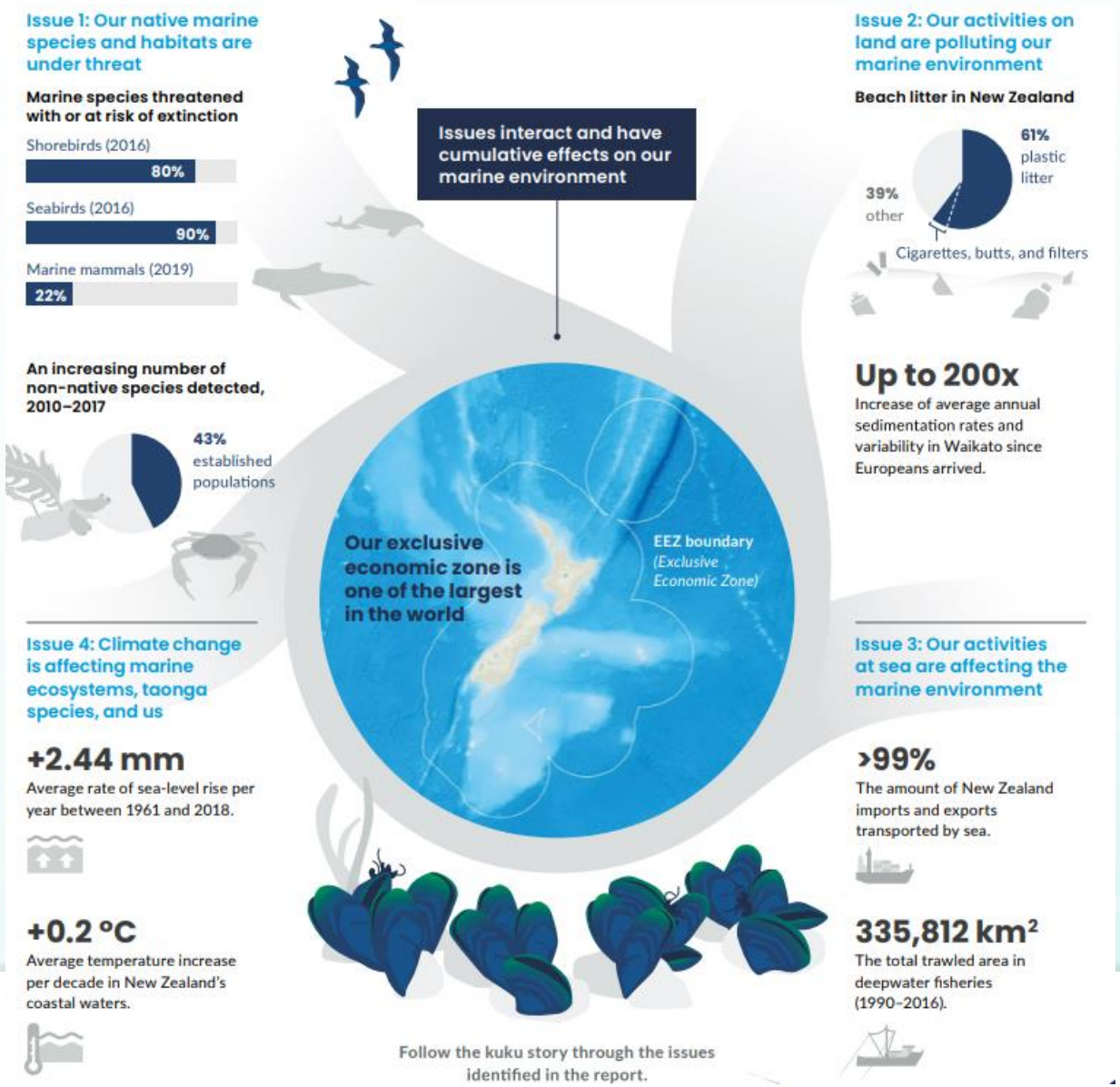
NZ Marine Economy



Rich in biodiversity



Risk and threats



NZ Ocean management system

Fisheries / Aquaculture

Fisheries Act 1996

Treaty of Waitangi (Fisheries Claims) Settlement Act 1992

Māori Commercial Aquaculture Claims Settlement Act 2004

Māori Fisheries Act 2004

Fisheries (Quota Operations Validation) Act 1997

Biosecurity & Climate Change

Biosecurity Act 1993

Climate Change Response Act 2002

Minerals & Mining

Crown Minerals Act 1991

Continental Shelf Act 1964

Conservation

Conservation Act 1987

Marine Reserves Act 1971

Wildlife Act 1953

Marine Mammals Protection Act 1978

Hauraki Gulf Marine Park Act 2000

Fiordland (Te Moana o Atawhenua) Marine Management Act 2005

Sugar Loaf Islands Marine Protected Area Act 1991

Kaikōura (Te Tai o Marokura) Marine Management Act 2014

Resource Management

Resource Management Act 1991

Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

Shipping

Maritime Transport Act 1994

Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

Other

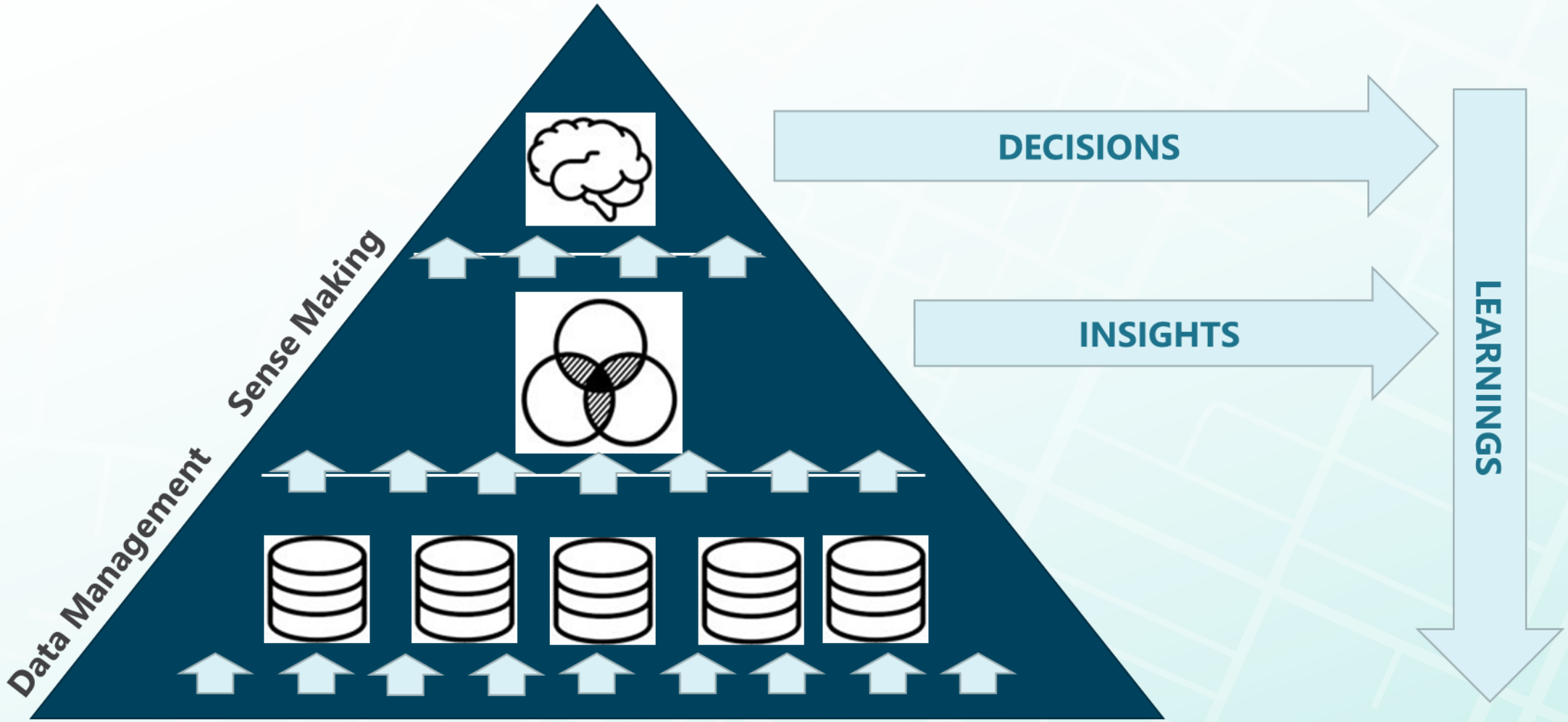
Heritage New Zealand Pouhere Taonga Act 2014

Marine and Coastal Area (Takutai Moana) Act 2011

Submarine Cables and Pipelines Protection Act 1996

Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

Integrated decision making



Marine Geospatial Information

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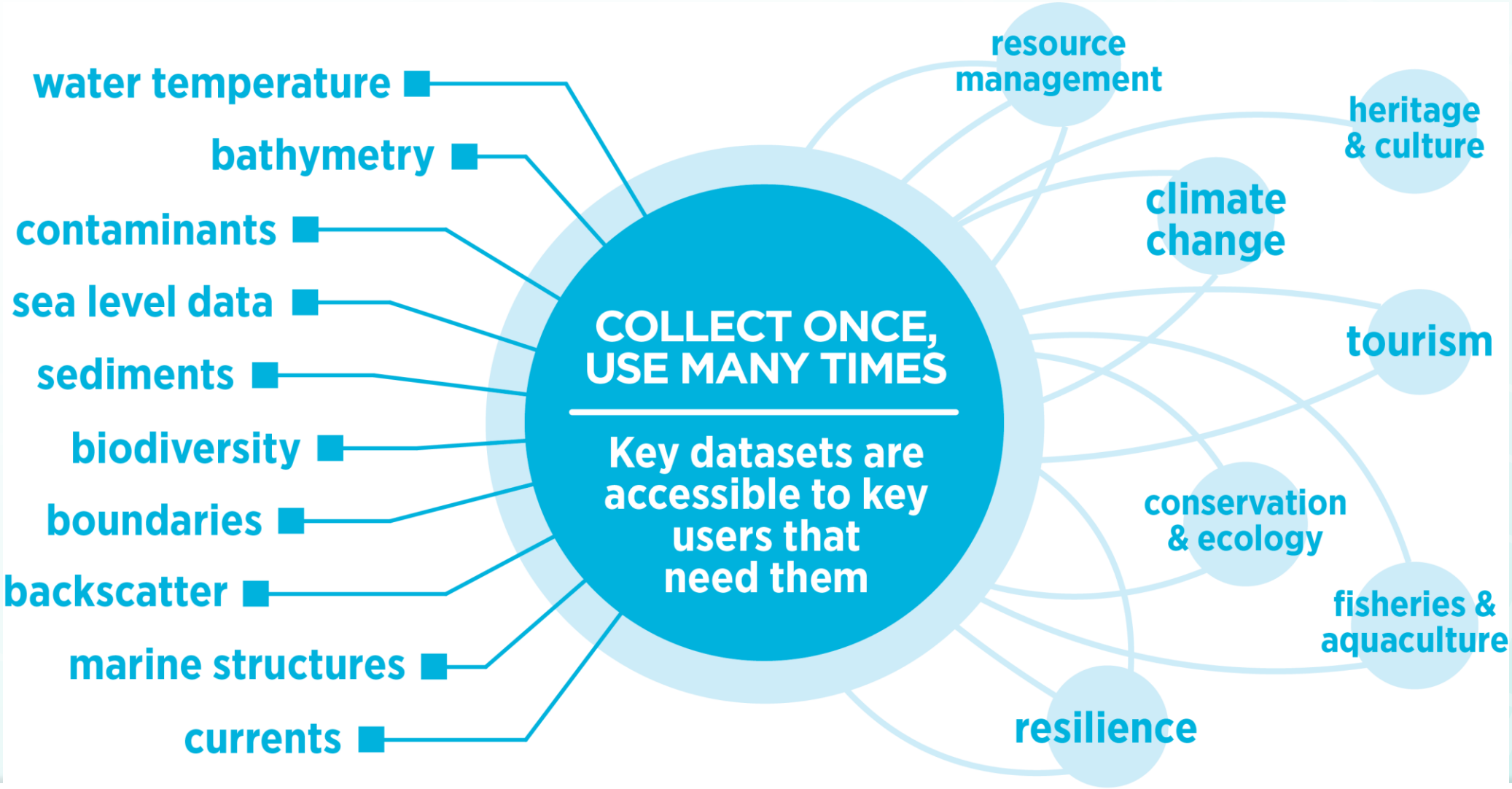
Collect once, use many times



NZ MGI Working Group

Governance / Steering Group

Toitū Te Whenua Land Information New Zealand

Ministry for Primary Industries Manatū Ahu Matua

Ministry for the Environment Manatū Mō Te Taiao

Ministry of Business, Innovation & Employment Hikina Whakatutuki

Department of Conservation Te Papa Atawhai

New Zealand Defence Force Te Ope Kātua O Aotearoa

Te Ohu Kaimoana

NIWA Taihoro Nukurangi

GNS Science Te Pū Ao

Wider Membership

Stats NZ Tatauranga Aotearoa

Northland Regional Council Te Kaunihera ā rohe o Te Taitokerau

eCoast

iXblue

Te Ātiawa o te Waka-a-Māui

Ministry of Transport Te Manatū Waka

Nō te rere moana Aotearoa Maritime New Zealand

Marlborough District Council

DML Discovery Marine Ltd

sustainable coastlines

TERRA MOANA

Victoria University Wellington Te Whare Wānanga o te Ūpoko o te Ika a Māui

The University of Auckland New Zealand

Te Arawhiti The Office for Māori Crown Relations

IIC Technologies

Moana Project

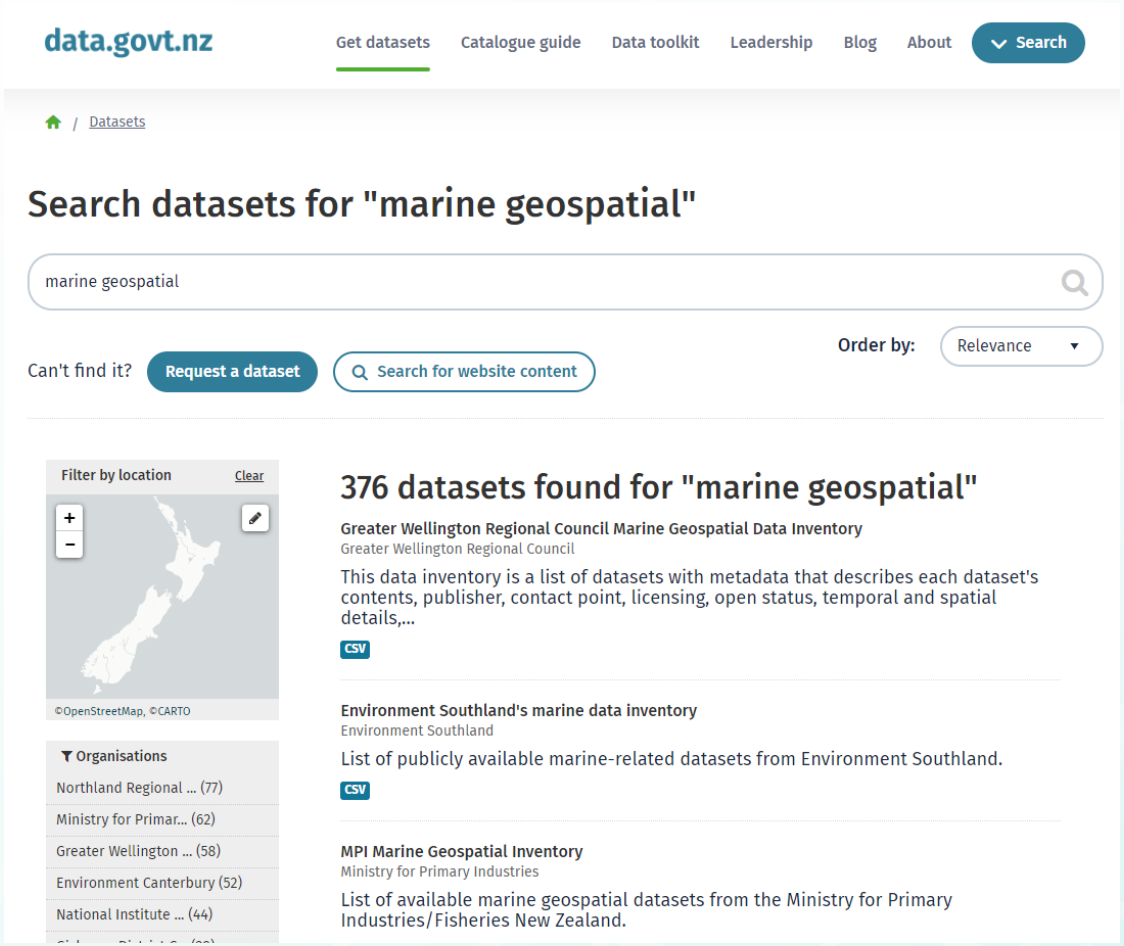
CAWTHRON The power of science®

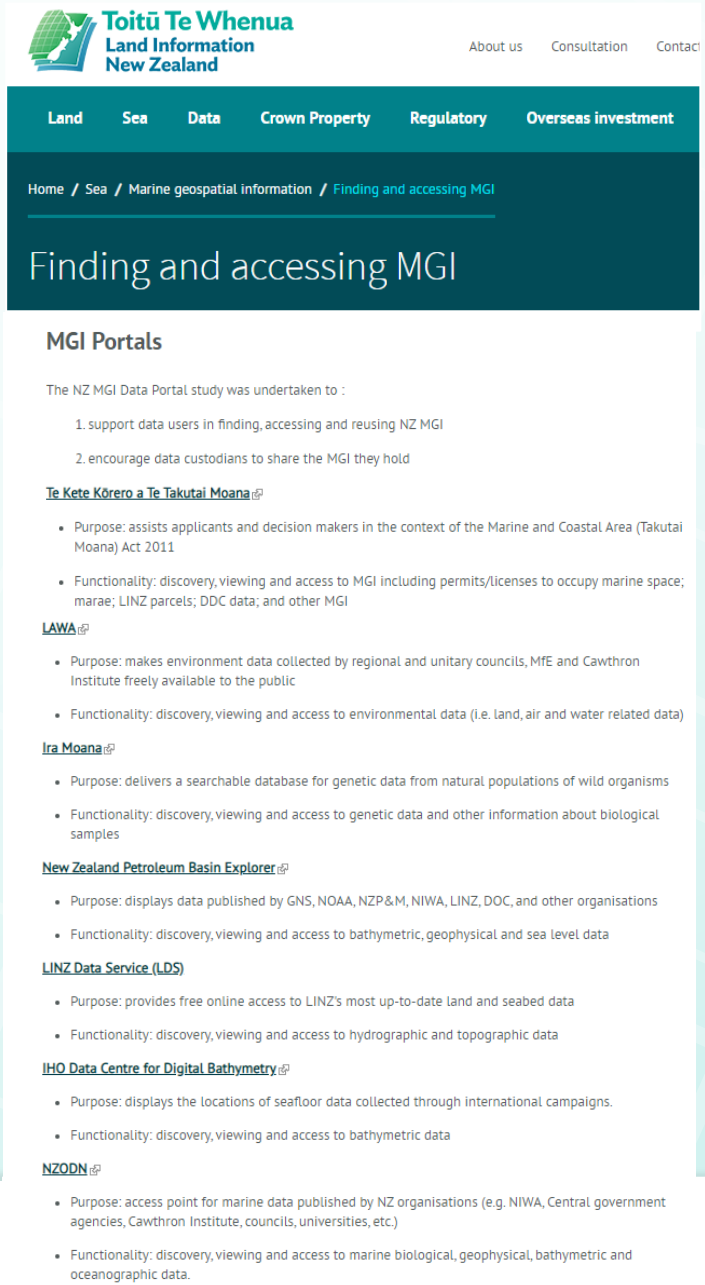
University of Otago Te Whare Wānanga o Otāgo New Zealand

AUS SEABED

The University of Waikato Te Whare Wānanga o Waikato

Findable and Accessible





Interoperable and Reusable

NZ MGI Working Group

NZ Marine Geospatial Information Metadata Guidance

The metadata guideline provides recommendations on the content, structure and formats of metadata describing marine geospatial datasets in New Zealand to ensure consistency in how marine geospatial data is described, managed, published and therefore to facilitate its discovery.

Structure, field names and contents

The following table describes the field name and field content conventions a data provider shall use when creating, managing and providing metadata for a dataset.

- For simplicity, a 'flat' structure is followed (as opposed to a hierarchical approach). This allows implementation as a simple tabular format.
- Some of the fields only require 'Text' entry and it is left to the data provider to determine the most useful content according to the guidelines in column 'Description / Guidelines for field contents'. No field size limit is prescribed.
- For some of the fields, content best practices are recommended. Using these content best practices will enable easy discovery / enterprise search across published data sources. Guidance for common formats (e.g. use of ISO8601 datetime string for Temporal Coverage) is provided in a separate table below.
- This guideline specifies minimum mandatory fields, and as a best practice a data provider shall aim to provide as many metadata fields as possible and useful (to comprehensively describe the dataset). A data provider can add more data fields for this purpose, and, preferably these additional fields shall be based on existing standards, such as Ecological Markup Language (EML), Dublin Core, ISO19115 or other relevant published standards.

Relationship to relevant standards

This guideline / best practice shall be consistent with existing metadata standards, and a range of relevant (international) standards that are already heavily used are referred to here, and equivalent fields / structures for these standards are listed.

- Ecological Markup Language (EML), as used in GBIF / OBIS for describing ecological datasets https://eml.ecoinformatics.org
- ISO19115-3 International Standard provided through the International Standards Organisation (ISO) for 'Geographic information — Metadata' https://www.iso.org/standard/32579.html
- The Dublin Core™ Metadata Element Set is a vocabulary of fifteen properties for use in resource description maintained by the Dublin Core™ Metadata Initiative (DCMI) https://www.dublincore.org/

Use of vocabularies

Use of vocabularies is important to enable consistent search and discovery across published data sources. However, mandated vocabularies limit flexibility in describing specifics / details

Marine Geospatial Information Themes

Categorising marine geospatial information in a consistent way has many benefits, including:

- supporting better data management practices,
- facilitating discovery, access, publication and reuse of information, internally and externally,
- improving data interoperability.

The categories recommended in this document aim of provide consistency in the NZ context and support the development of a NZ National MGI Inventory. The categories draw on input from international initiatives (i.e. IHO MSDI WG, AusSeabed, Australian Ocean Data Network) and the NZ MGI community through the NZMGI Working Group.

Please note: keywords/tags are not intended to be exhaustive nor exclusive to the themes and data types, these are examples.

Administrative areas and boundaries

for data related to marine management and human usage

Data types	Examples of keywords / tags
Maritime jurisdictions	contiguous zone, exclusive economic zone, EEZ, continental shelf, high sea; maritime governance; jurisdictional boundaries; territorial sea
Marine conservation areas	protected areas; habitat classification; Marine Protected Areas[1]; marine mammal sanctuaries; reserves; marine conservation; restored areas; conservancy; marine parks; benthic protection areas
Regulatory use restrictions	military areas; defence operations; energy exploration areas; permit boundaries; harbour limits; dredged areas; activity management areas; monitoring areas
Fishing/aquaculture areas	marine farms; fishery zones; fisheries; aquaculture; seaweed harvesting; fish farm; quota management areas; trawl footprint
Mining extraction/exploration areas	boulder exploration; drilling areas; exploration zones; extraction areas

[1] as defined in the MPA Policy and Implementation Plan 2005 https://www.doc.govt.nz/globalassets/documents/conservation/marine-and-coastal/marine-protected-areas/mpa-policy-and-implementation-plan.pdf

MGI case study library

See how MGI can be used to inform important decision-making and support our communities.

- Case study 1 – Habitat mapping Queen Charlotte Sound / Tōtaranui and Tory Channel / Kura Te Au 2018 (PDF 8MB)
- Case study 2 – Impact of earthquake on marine ecosystems – Kaikoura 2016 (PDF 7MB)

Last Updated: 5 August 2021

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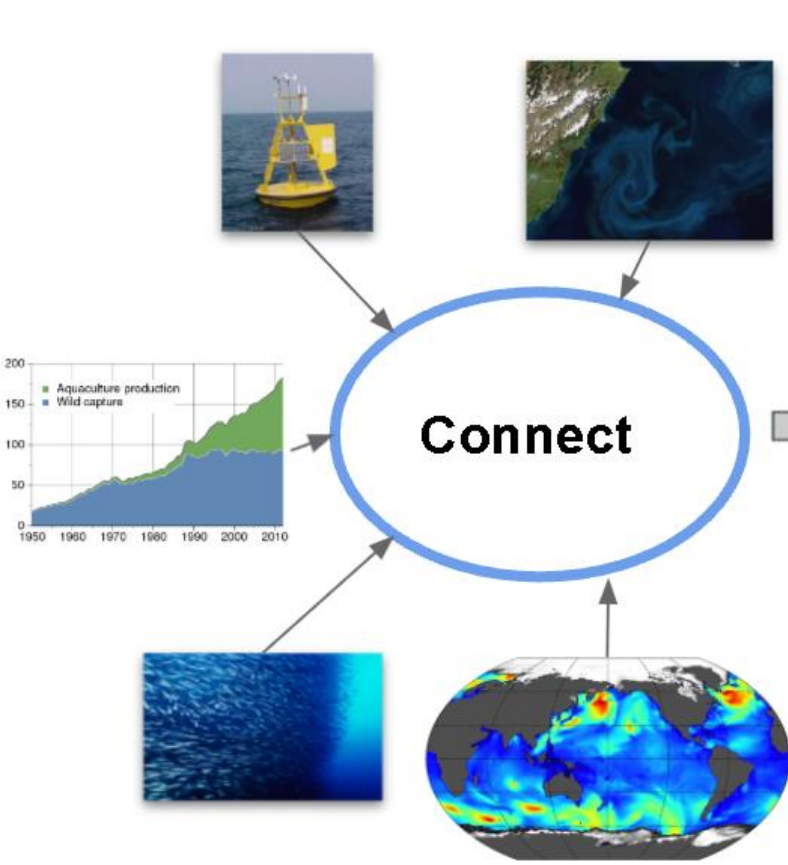
https://www.linz.govt.nz/sea/marine-geospatial-information

Communication and Collaboration

Enable informed & connected decisions



Connect

Explore

Model

Decide

Joining Land and Sea (JLAS)

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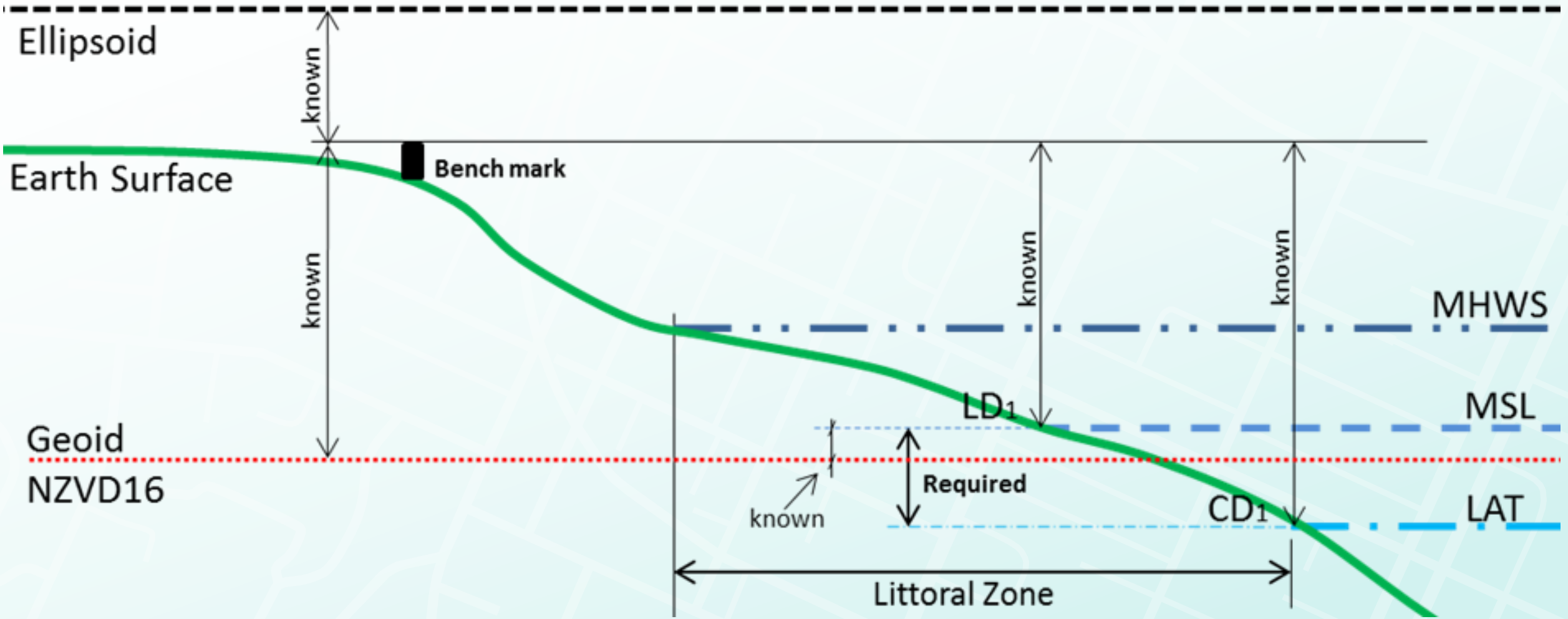
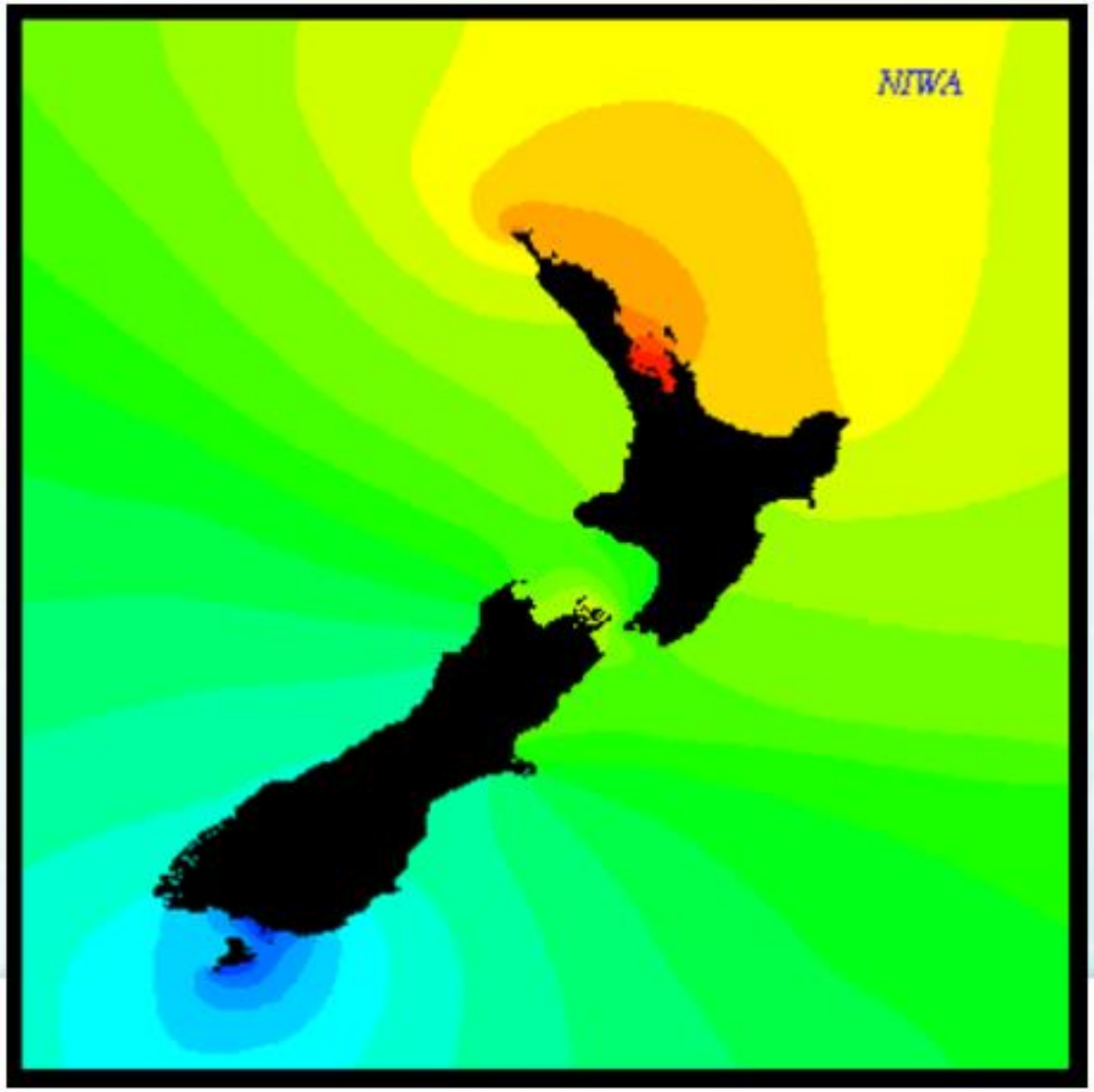
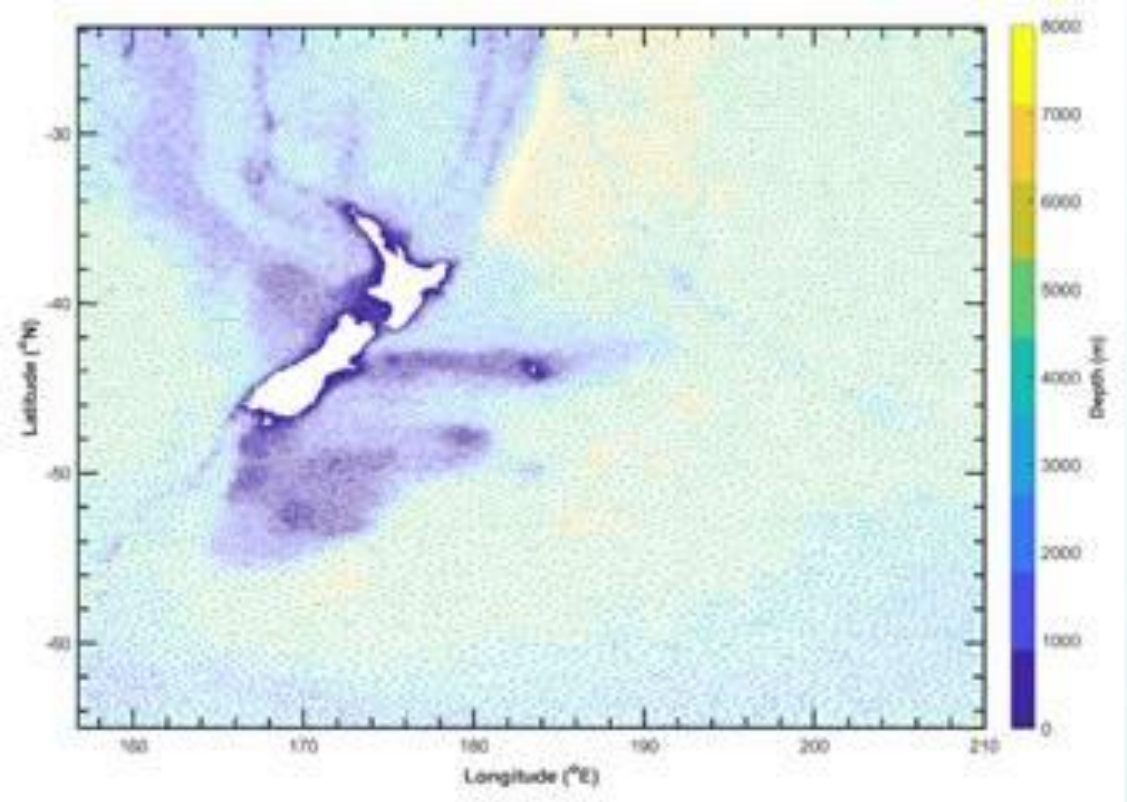
Method


Ellipsoid
known
Earth Surface
Bench mark
known
known
known
MHWS
LD1
MSL
Geoid
NZVD16
known
Required
CD1
LAT
Littoral Zone

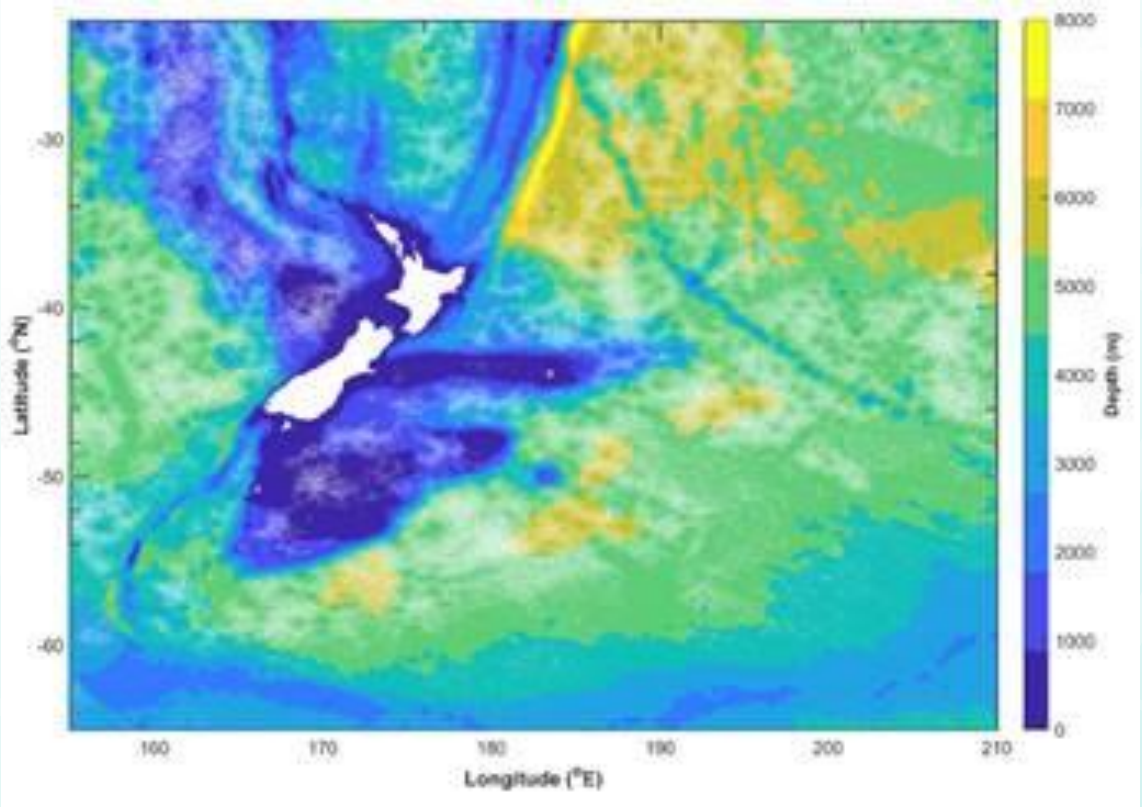
Tidal Model



Improved Tidal Model



2000 – 32,000 nodes

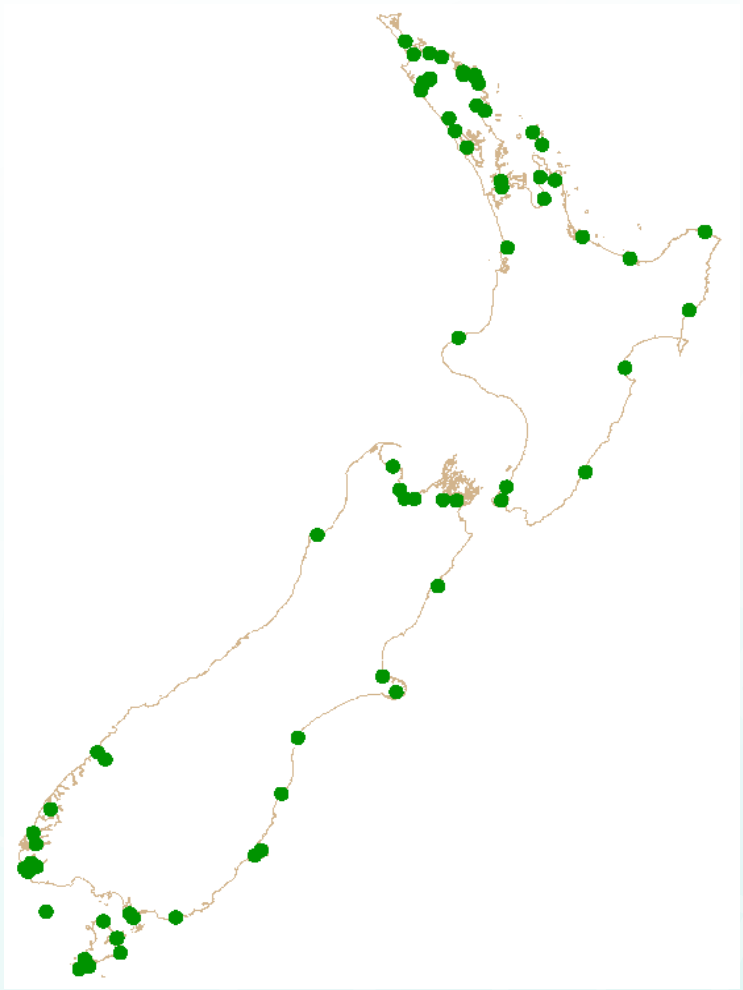


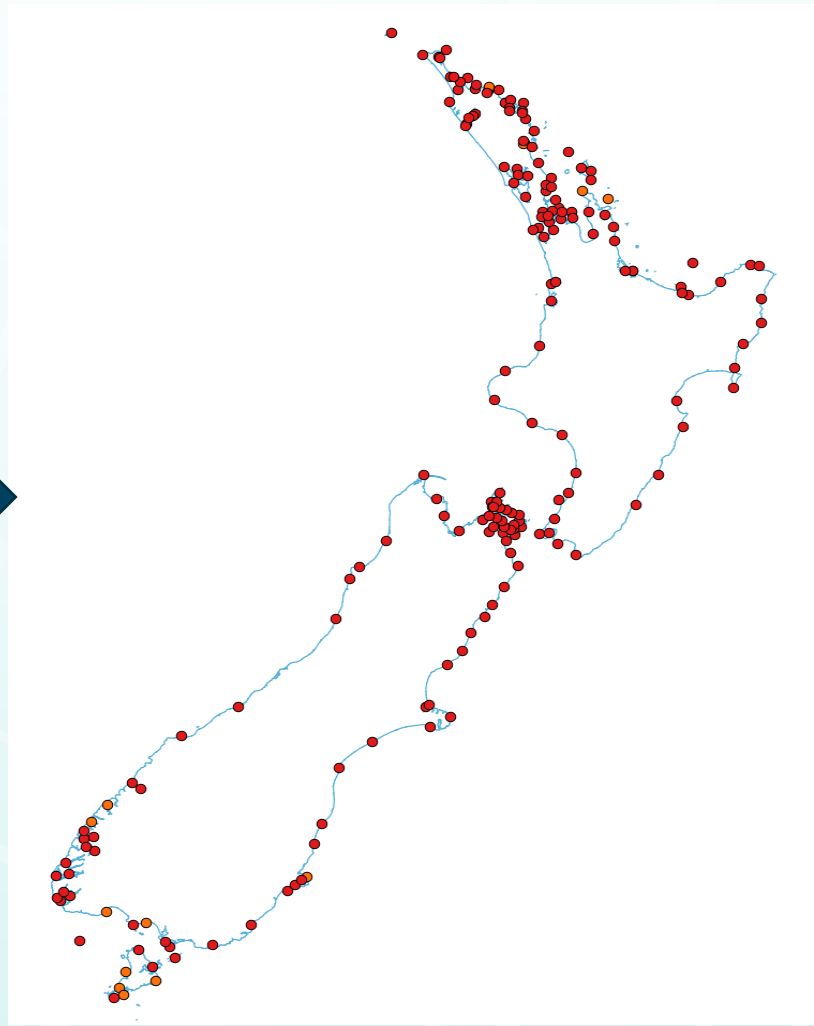
2021 – 3,500,000 nodes

Gridded Tidal Surfaces

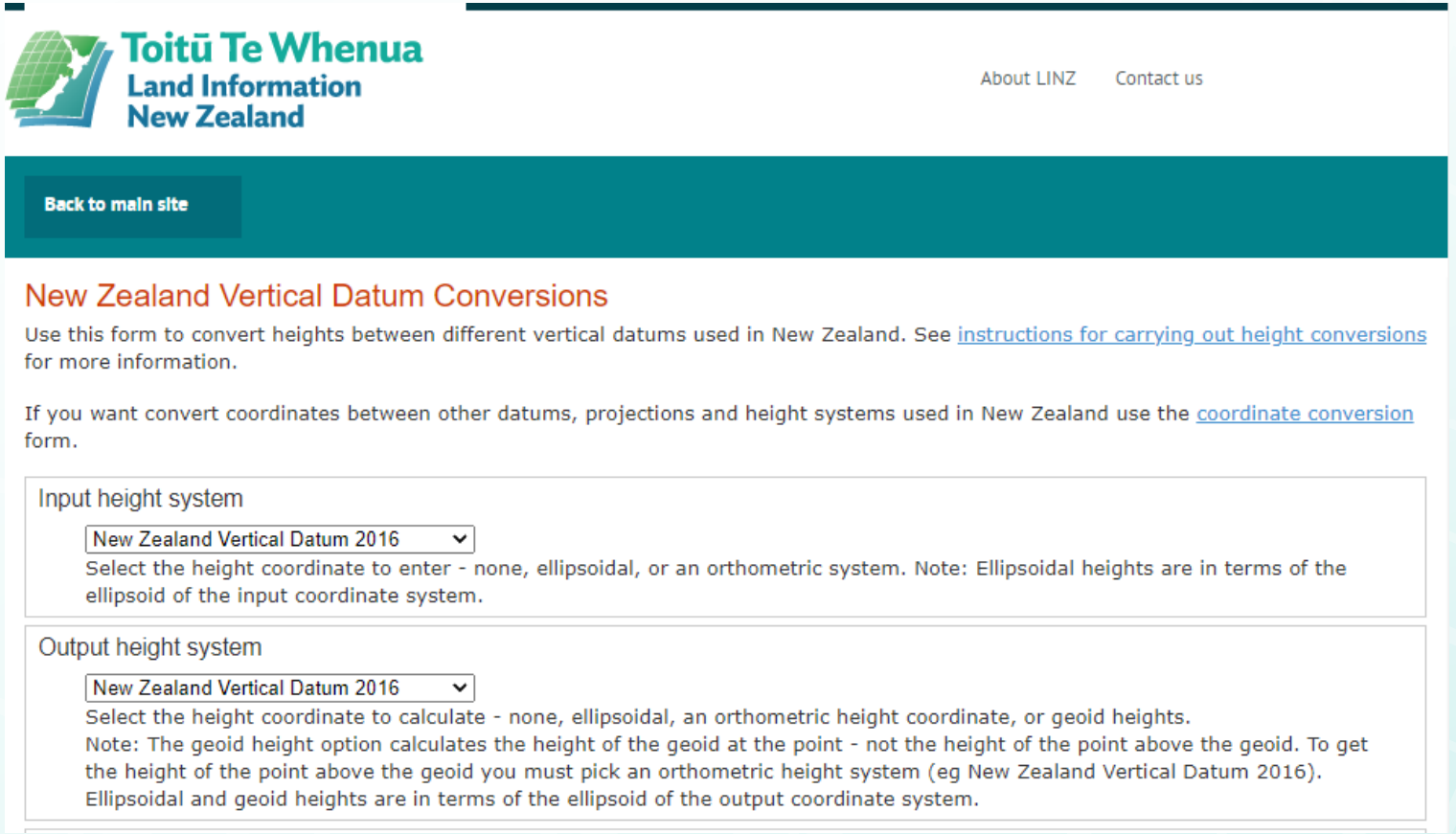
HAT: Highest Astronomical Tide	**LAT**: Lowest Astronomical Tide
MHWS-10: Upper 10 percentile of all high waters	**MLWS-10**: Lower 10 percentile of all low waters
MHWS: Mean High Water Springs	**MLWS**: Mean Low Water Springs
MHW: Mean High Water	**MLW**: Mean Low Water
MHWN: Mean High Water Neaps	**MLWN**: Mean Low Water Neaps
MSL: Mean Sea Level	

Coastal Link Sites





Algorithm development



Thank you!

rgabara@linz.govt.nz