



Te Mana Raraunga Raumati Virtual Wānanga

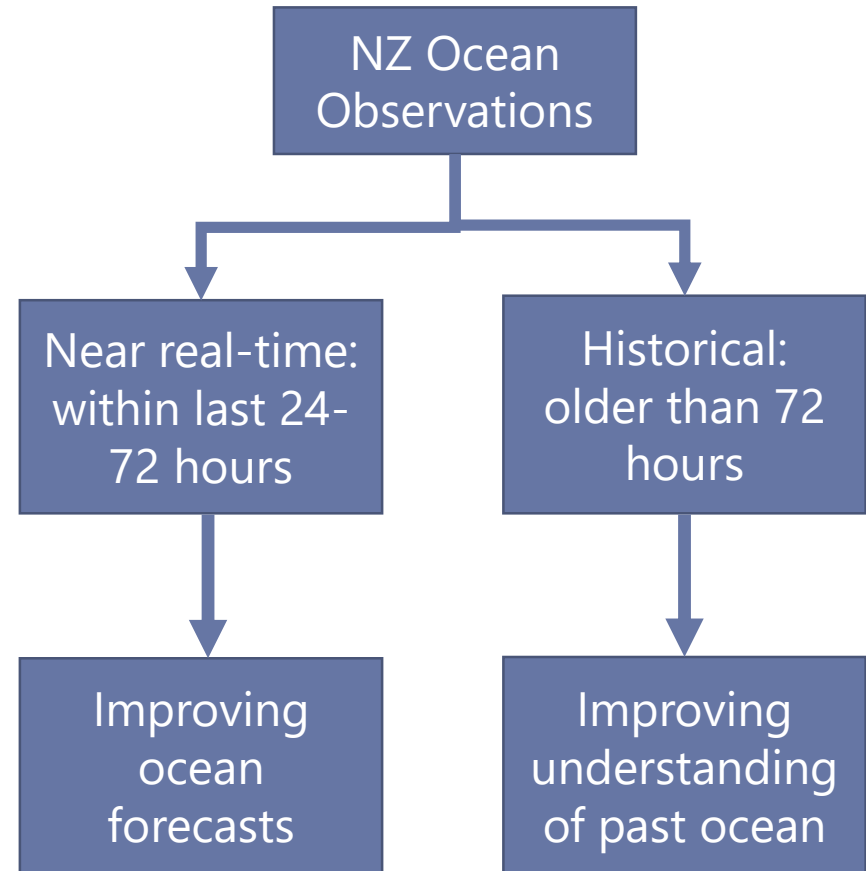
Date: 22 February 2022

Presenter: Julie Jakoboski

Organisation: MetOcean Solutions (Meteorological Service of New Zealand)

Introduction: what physical ocean observations are available around New Zealand?

- Ocean temperature, salinity, current velocity, sea level
- Some are public, others are not -> OIA
- Global, national, regional, local organisations hold ocean observations around New Zealand
- There is currently no central database for New Zealand ocean observations!



Types of measurements that are available

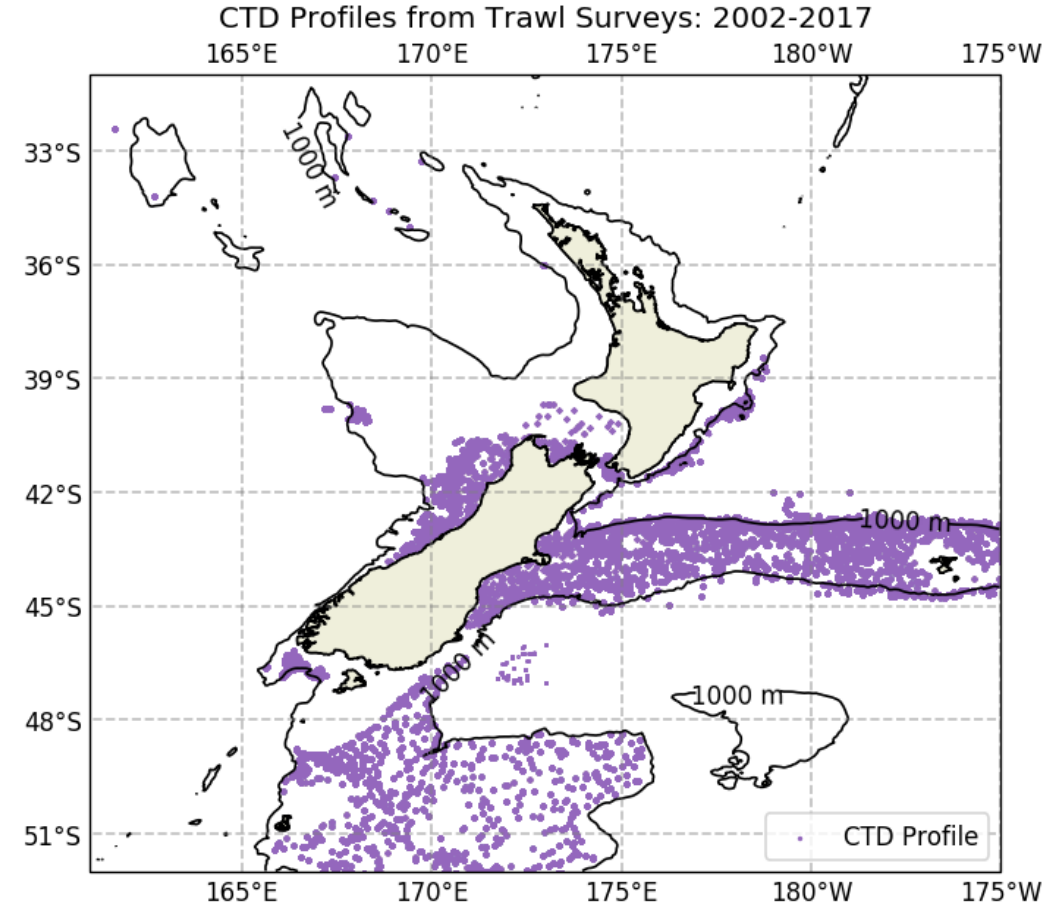
- Historical datasets: CTD/XBT observations, gliders, moorings, ships of opportunity, long-term temperature records
- Near real-time global programs: Argo, drifters
- Near real-time local scale: tide gauges, wave buoys
- Pressure sensor, current velocity sensors



Image: UCSD Libraries



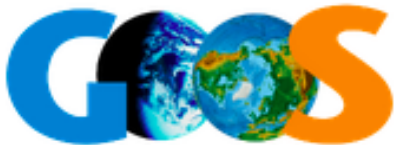
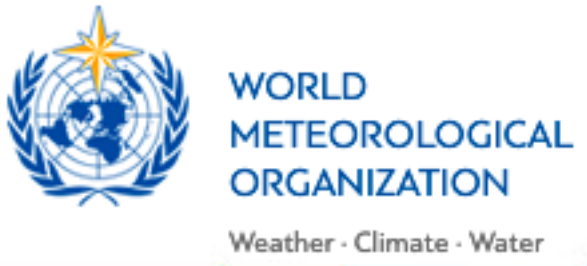
Image: NIWA



*CTD data were obtained by the National Institute of Water and Atmospheric Research (NIWA), funded by the New Zealand Ministry of Primary Industries, provided by the NZODN, and accessed on 2 February 2020.

Who holds physical ocean observations around New Zealand?

Global



National



Regional

11 regional councils
11 city councils
50 district councils
6 unitary councils

Universities
Industry councils
Ports
Private companies
Surf Lifesaving NZ
Coast Guard NZ

And many more



Examples of Historical Datasets

In-hand data for use by the Moana Project in the New Zealand region:

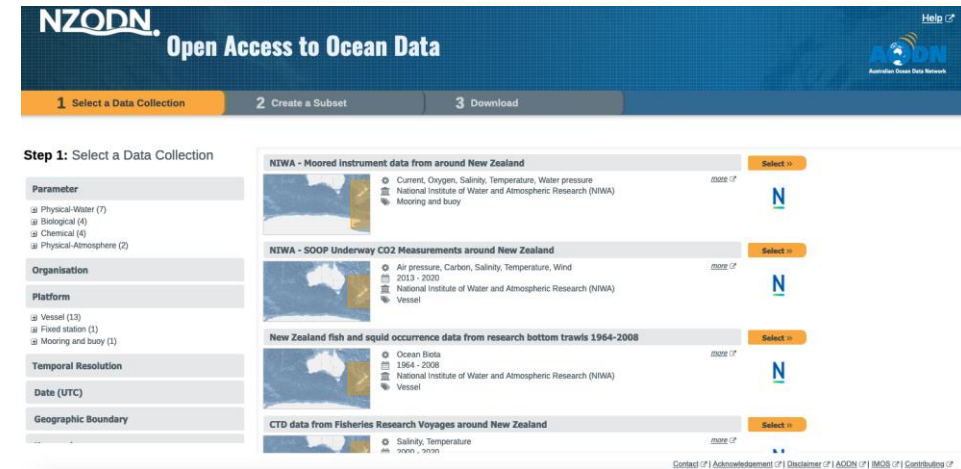
- NIWA CTD data from the NZODN
- Complete Ministry of Primary Industries CTD dataset
- Pāua diver turtle logger data (Pāua Industry Council): millions of coastal observations
- DTA temperature data: successfully quality controlled by MetOcean with report back to DTA
- Cawthron-held observations, including regional council data: access to buoy data, temperature probes
- University of Otago, Portobello Marine Lab observations
- Whakatōhea / Bay of Plenty obs (some open access online)
- University of Washington ADCP measurements
- Port Lyttleton and additional NIWA data
- Council Data Received: Auckland, Bay of Plenty, Marlborough, Wellington, Canterbury
- Council Data in Progress: Northland, Waikato, Hawke's Bay, Otago, Southland
- Internally-held MetOcean data
- Many more on the way!

Multiple datasets provided to the New Zealand Ocean Data Network

Accessible to the Moana Project via the internal observations database

Historical Data Archive: the NZODN (www.nzodn.nz)

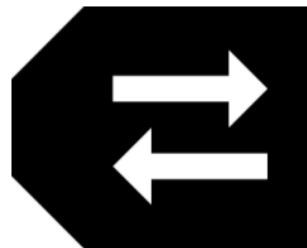
- New Zealand Ocean Data Network (in conjunction with NIWA, LINZ, and IMOS Australia)
- Hardware and software of the NZODN managed by NIWA
- Collaboration with LINZ to develop a nationwide marine data catalog and to help LINZ understand the resources needed for other organizations to take a similar approach
- Current capability includes cataloging historical data only, with the potential to add near real-time data



Number of available datasets is growing!

Data Sharing Principles

- FAIR (Wilkinson, M. D. et al., 2016)
- CARE Research Data Alliance International Indigenous Data Sovereignty Interest Group. (September 2019). “CARE Principles for Indigenous Data Governance.” The Global Indigenous Data Alliance. GIDA-global.org
- Traditional knowledge labels (Maui Hudson and <https://localcontexts.org/tk-labels/>)
- CF-Compliant netCDF or files in other formats (<http://cfconventions.org/>)
- Wherever possible, open access to benefit the broader New Zealand community



TK Attribution
(TK A)



TK Outreach
(TK O)



TK Open to
Commercialization
(TK OC)



TK Non-Commercial
(TK NC)

How can we incorporate Traditional Knowledge Labels in Aotearoa and beyond?

- Metadata: can be added both to the data files and to the NZODN/AODN
- What kinds of labels are appropriate for physical ocean observations?
- Public versus non-public data: what other factors should be considered?
- What about on a global scale?

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Maintenance and update frequency

Descriptive keywords

Descriptive keywords

Descriptive keywords

URL

URL

URL

mcp:licenseName

Attribution Constraints

Attribution Constraints

Use limitation

monthly: data is updated each month

Oceans | Salinity/density | Conductivity, Oceans | Ocean Temperature | Water Temperature, Oceans | Salinity/density | Salinity, Oceans | Ocean Circulation | Ocean Currents, Oceans | Ocean Chemistry | Oxygen (theme).

Buoys | Moored Buoys, .

Global / Oceans | Southern Ocean, Global / Oceans | Pacific Ocean, Regional Seas | Tasman Sea, Countries | New Zealand (place).

<https://creativecommons.org/>

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<https://i.creativecommons.org/l/by/4.0/88x31.png>

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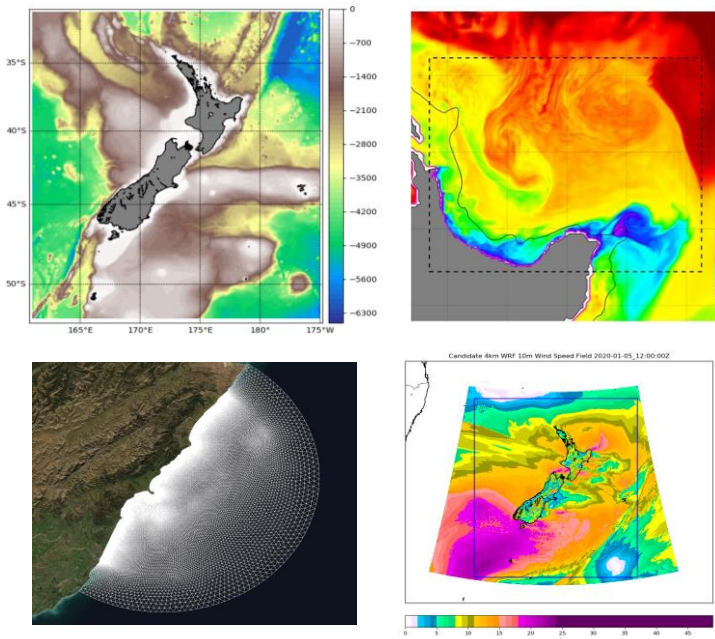
The citation in a list of references is: "NIWA [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access]."

Any users of this dataset are required to clearly acknowledge the source of the material in the format: "Data was provided by the National Institute of Water and Atmospheric Research, and accessed via the Australian Ocean Data Network (AODN) portal." If relevant, also credit other organisations involved in collection of this particular datastream (as listed in 'credit' in the metadata record).

Data, products and services from NIWA are provided "as is" without any warranty as to fitness for a particular purpose.

Moana Project Hindcast/Forecast Products

Models



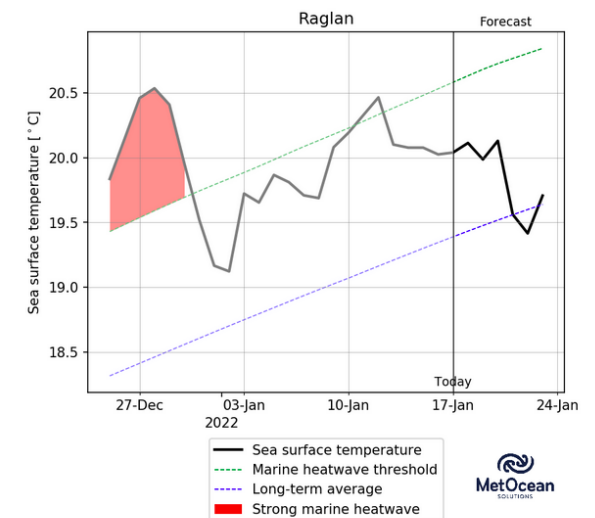
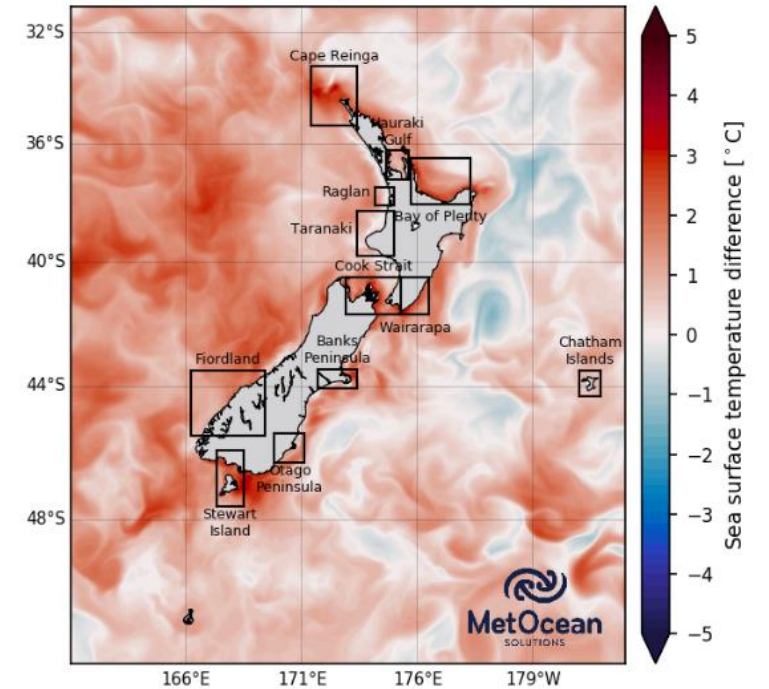
Datasets

NeSI (NZ)
THREDDS
MetOcean View
Swellmap

Tools

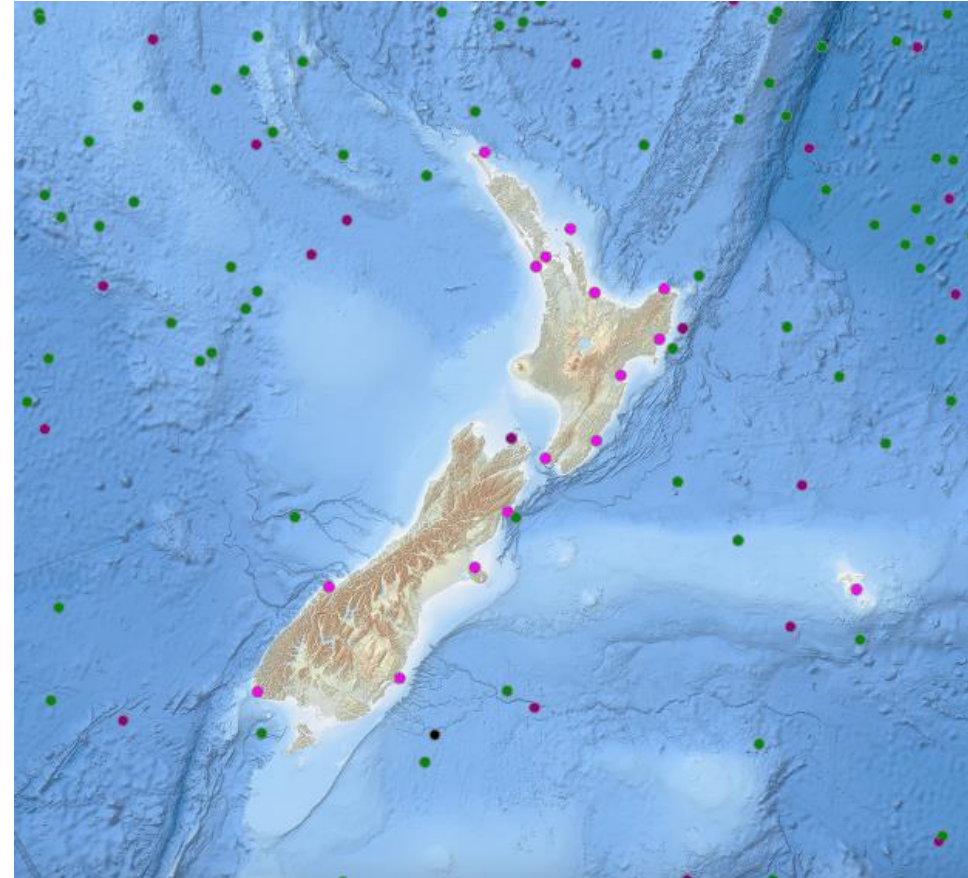
Plastic Tracker
MetOcean Track
Marine Heatwave forecast

Difference between forecast and average long-term sea surface temperatures
2022-Jan-19



Incorporating Māori interests into ocean observing programme design

- Ocean observing systems often motivated by academic research questions, industry, safety
- How can we effectively partner with Māori groups to maximize benefit to Māori?
- How can future programmes reflect values associated with Indigenous Data Sovereignty?
- How are observations made available?
- Example: are there pressing questions we should be trying to answer? Or that ocean observing systems could help answer?



Nationwide Impacts and Benefits

- Benefits Aotearoa-wide
- Sharing data publicly when possible
- Making sure ocean observations are accessible
- Traditional knowledge labels to encourage appropriate use of observations
- Designing future systems in partnership with the stewards of the Aotearoa's oceans





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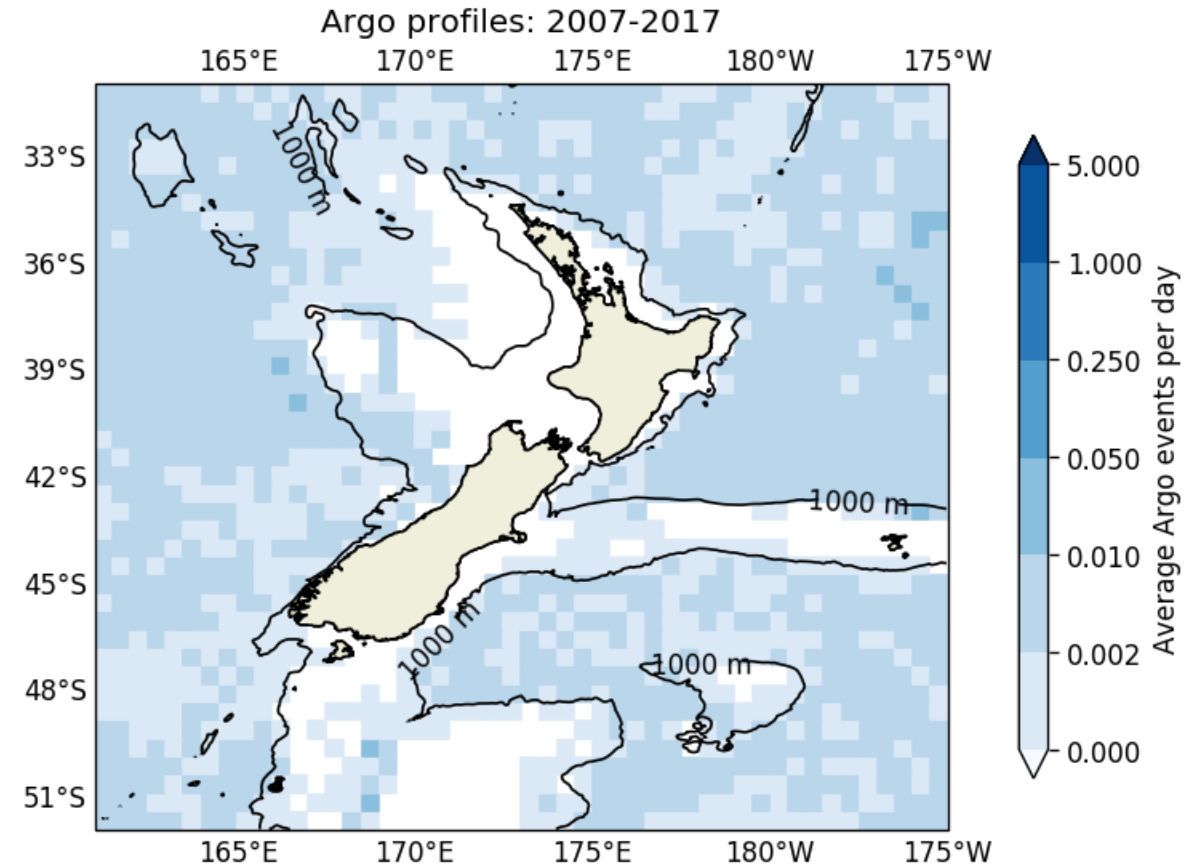


Thank you



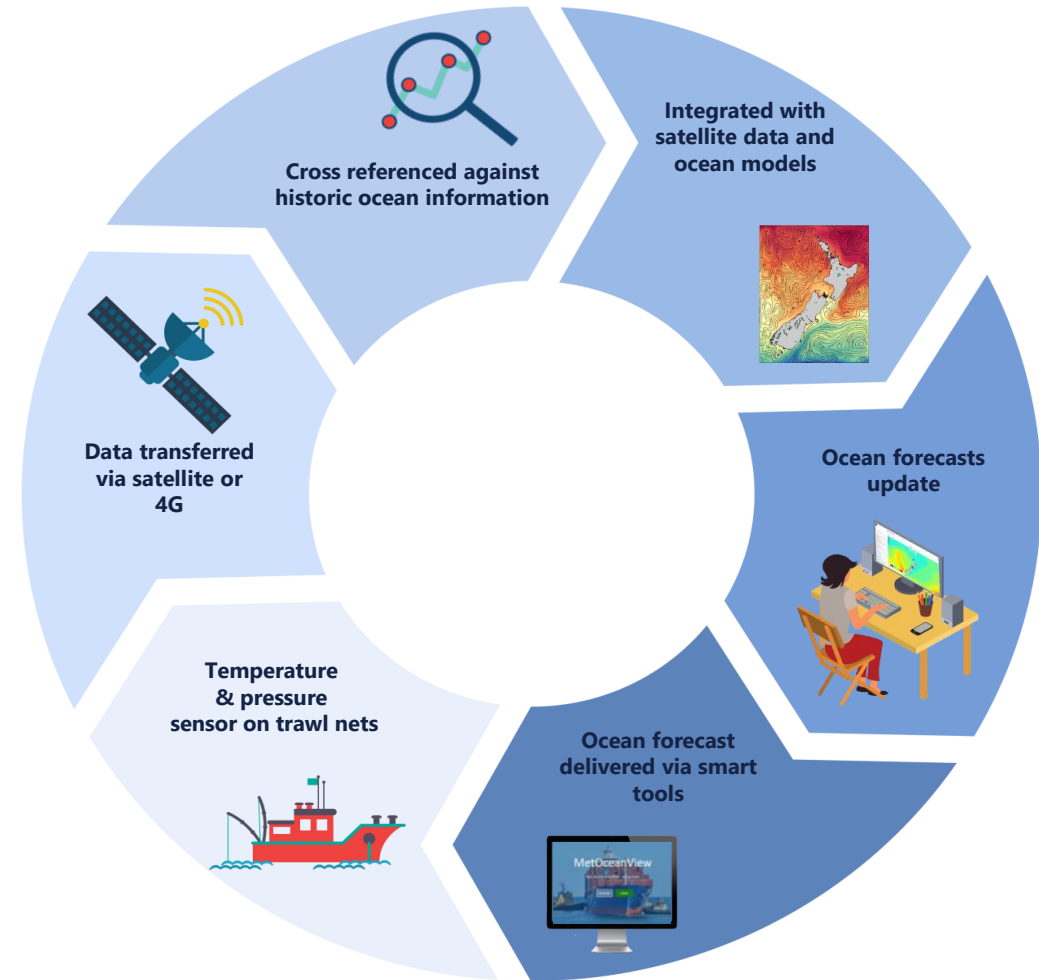
Moana Project and Te Tiro Moana

- Identifying where ocean observations already exist and obtaining access to build a 25+ year “hindcast” -> publicly available
- Encouraging the NZODN
- Working with LINZ to identify portals – together with their catalog effort: <https://www.linz.govt.nz/data/linz-data/hydrographic-data>
- Filling in gaps where data are missing with new observations



Mangōpare Temperature and Depth Sensor

- Developed by technology partner Zebra-Tech lead by John Radford
- “Mangōpare” named by Danny Paruru (Whakatōhea iwi)
- Installed on 40+ vessels so far via partnership with Deepwater Group, Fisheries Inshore NZ, NZ Rock Lobster, Seafood NZ Magazine (all 3 biggest NZ fishing companies + others, Independent fishers)
- International collaboration: Berring Data Collective, sensor trials abroad



ZEBRA-TECH LTD



deepwater group

FISHERIES
INSHORE NEW ZEALAND



Seafood
New Zealand



MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

