



New Zealand MetService Ocean forecasting activities

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Ocean Science Team

Carine Costa, Mireya Montaña, Phellipe Couto, Gael Arnaud

Moana Project Team

Joao de Souza, Julie Jakoboski





The Moana Project

Changing the way we see our seas



Five teams

Whai Hua – Benefits & Impacts

He Hono Moana –
Kaimoana connectivity

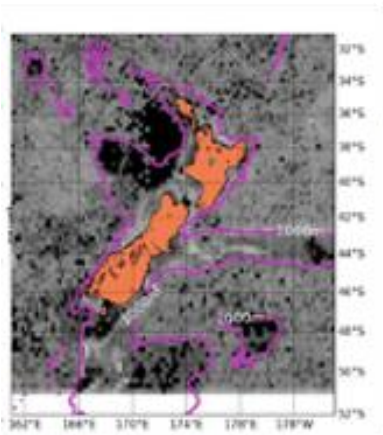
Ngā Ripo o Te Moana -
Modelling

He Papa Moana – Cross-
cultural ocean knowledge
exchange

Te Tiro Moana - Data

Te Tiro Moana - Data

Applying the 'internet of things' concept to achieve smart and sustained nation-wide ocean observing capability; liberating/discovering existing physical ocean observations.



Historical Observations

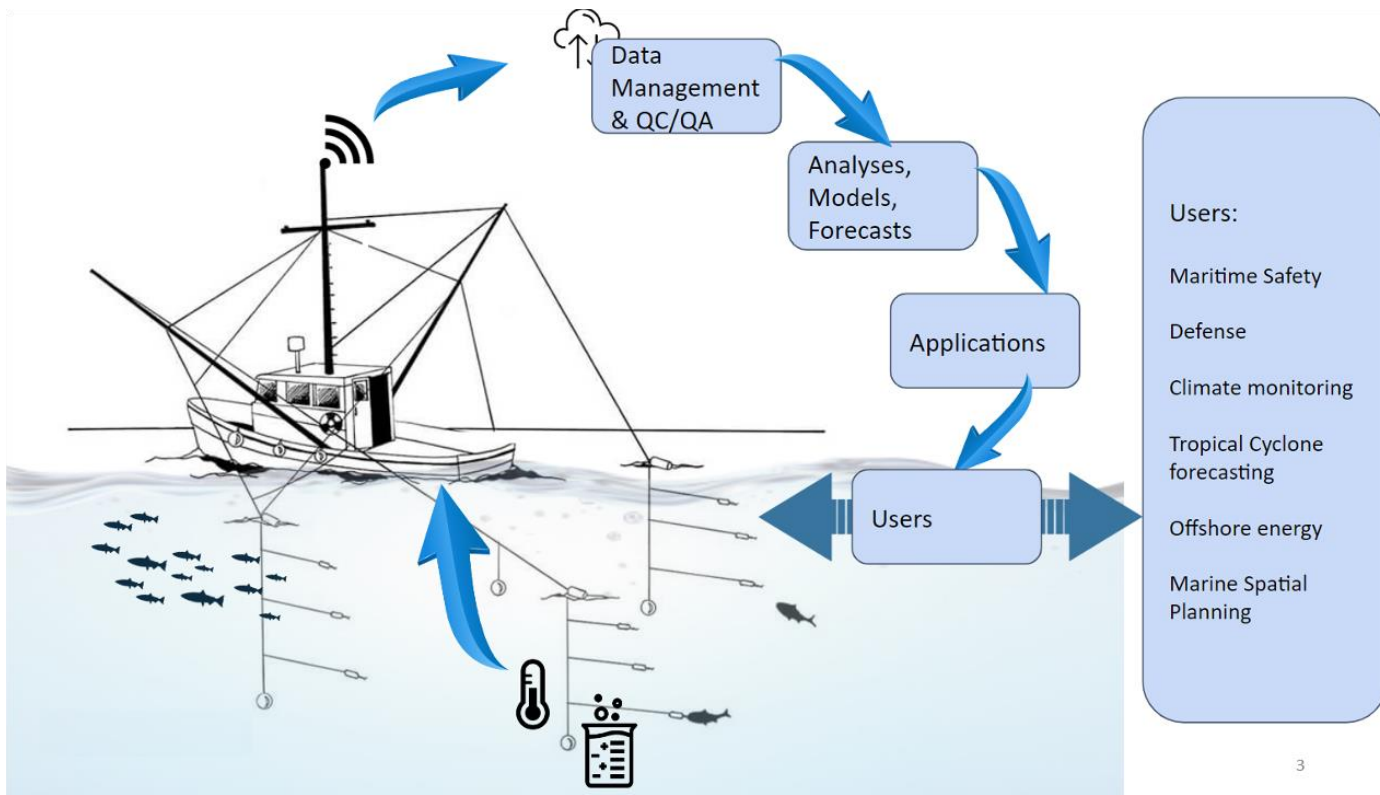
- Finding, quality-controlling, and making existing measurements of New Zealand's oceans available

Near Real-Time Observations

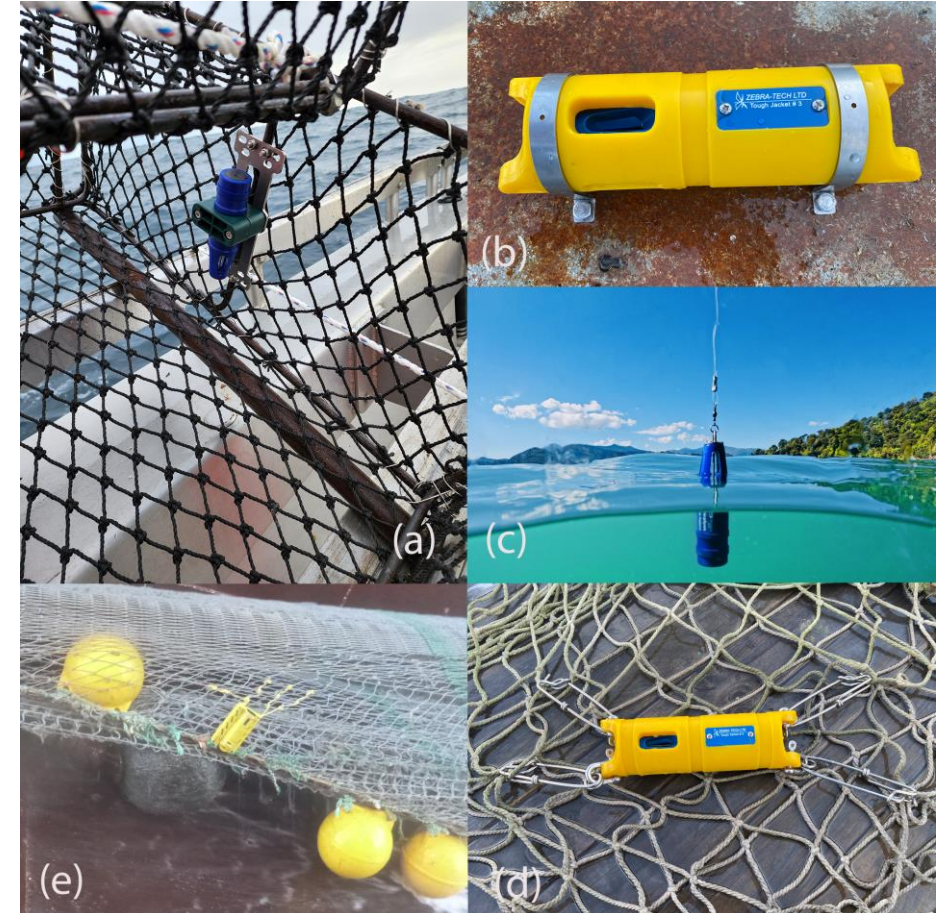
- Mangōpare sensor programme
- Accessing existing data feeds



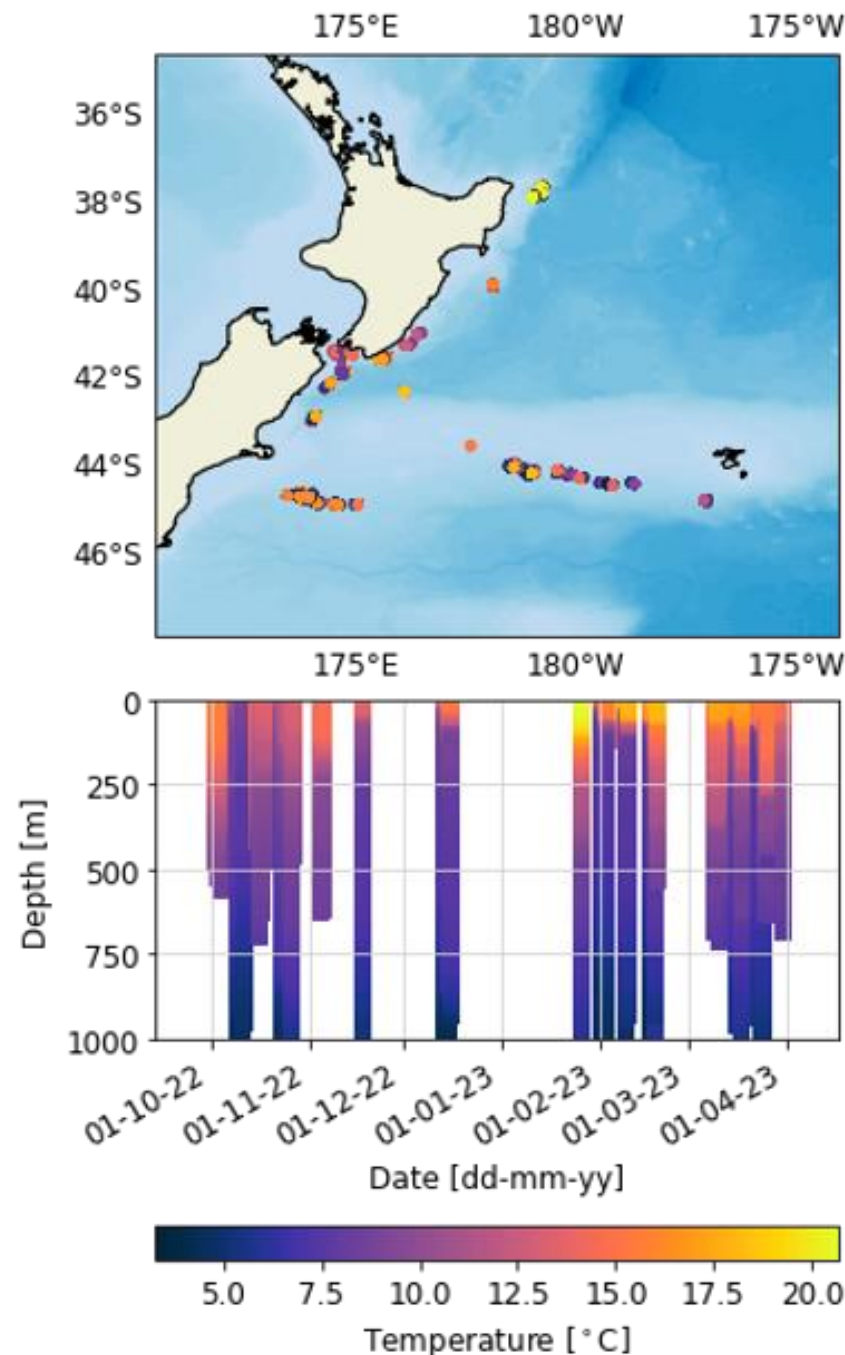
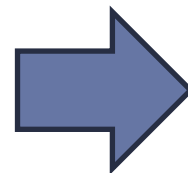
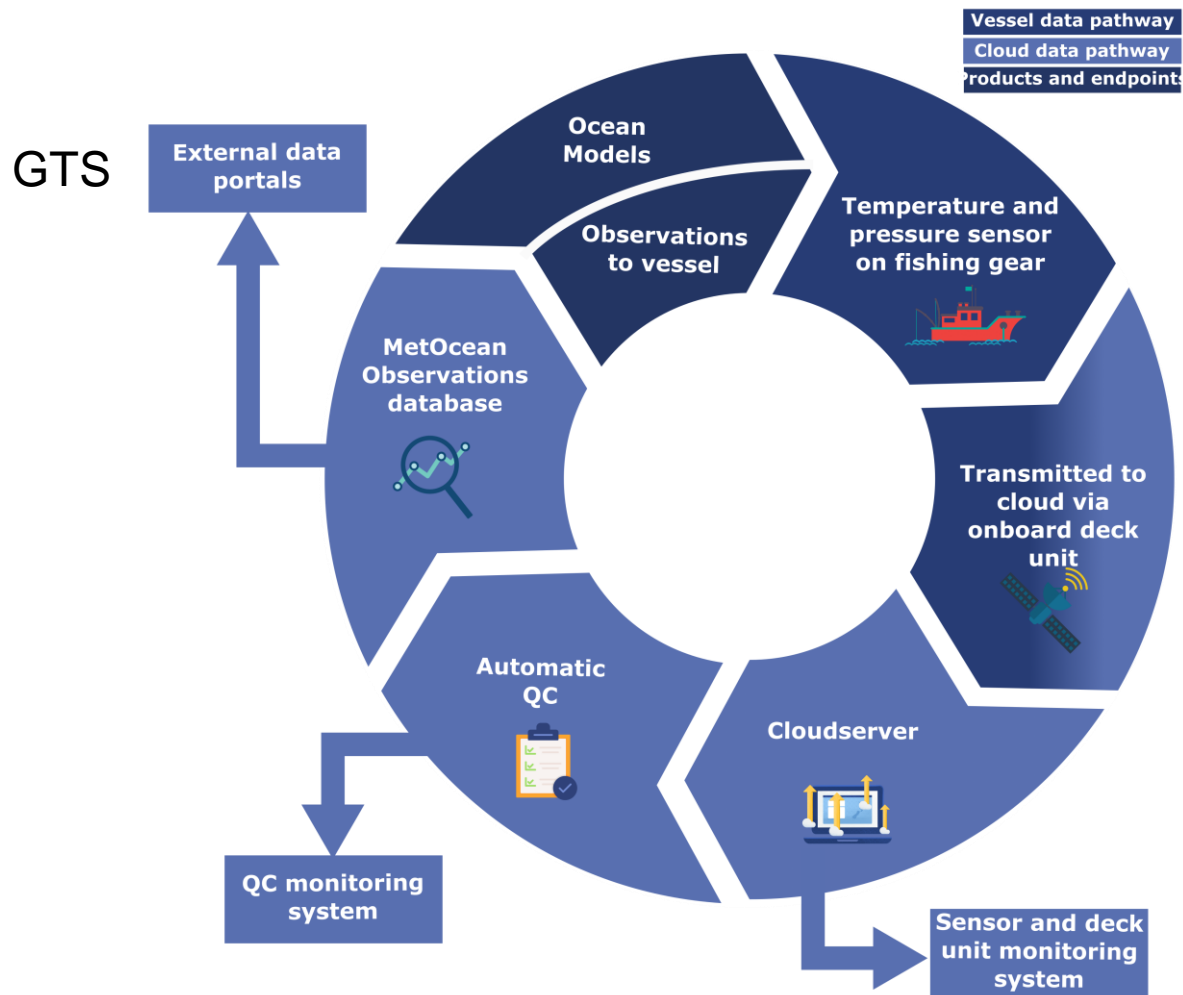
Ocean Observations New Zealand-wide



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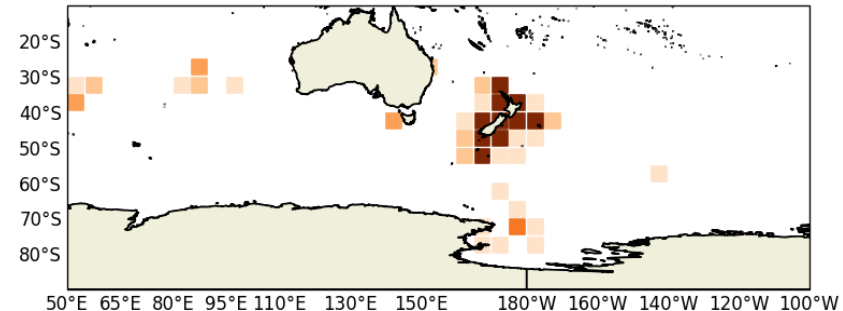


Ocean Observations New Zealand-wide

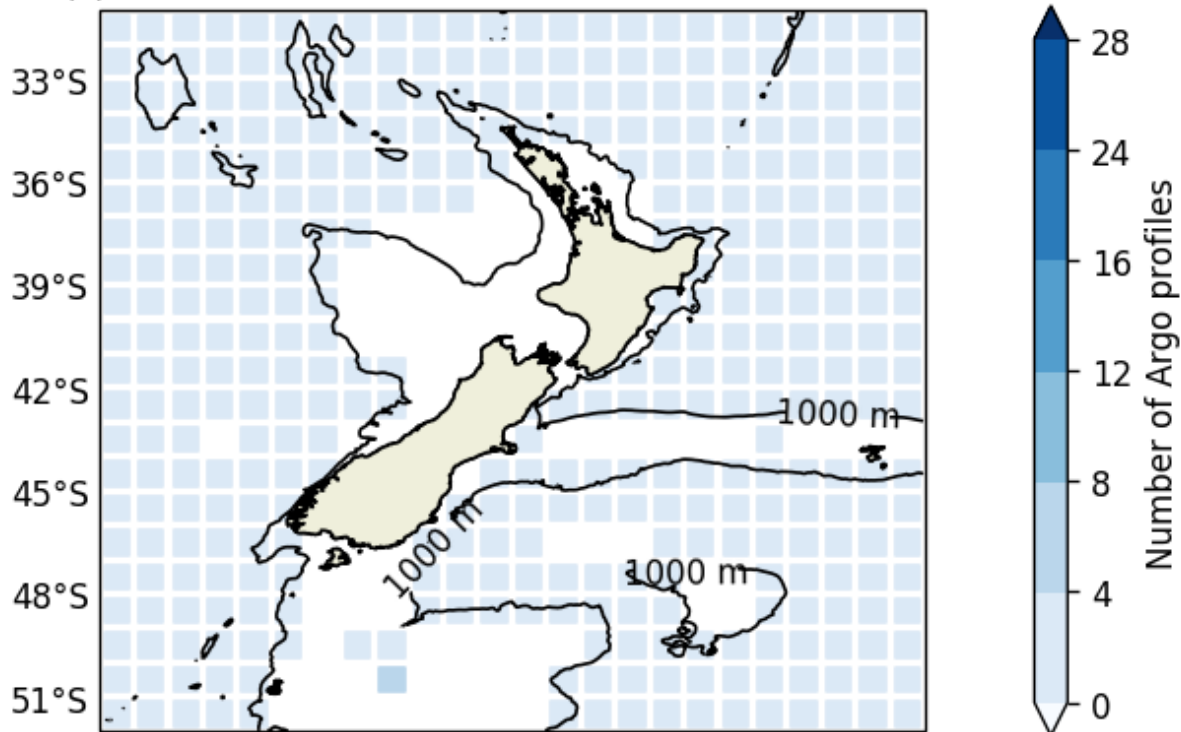


Ocean Observations New Zealand-wide

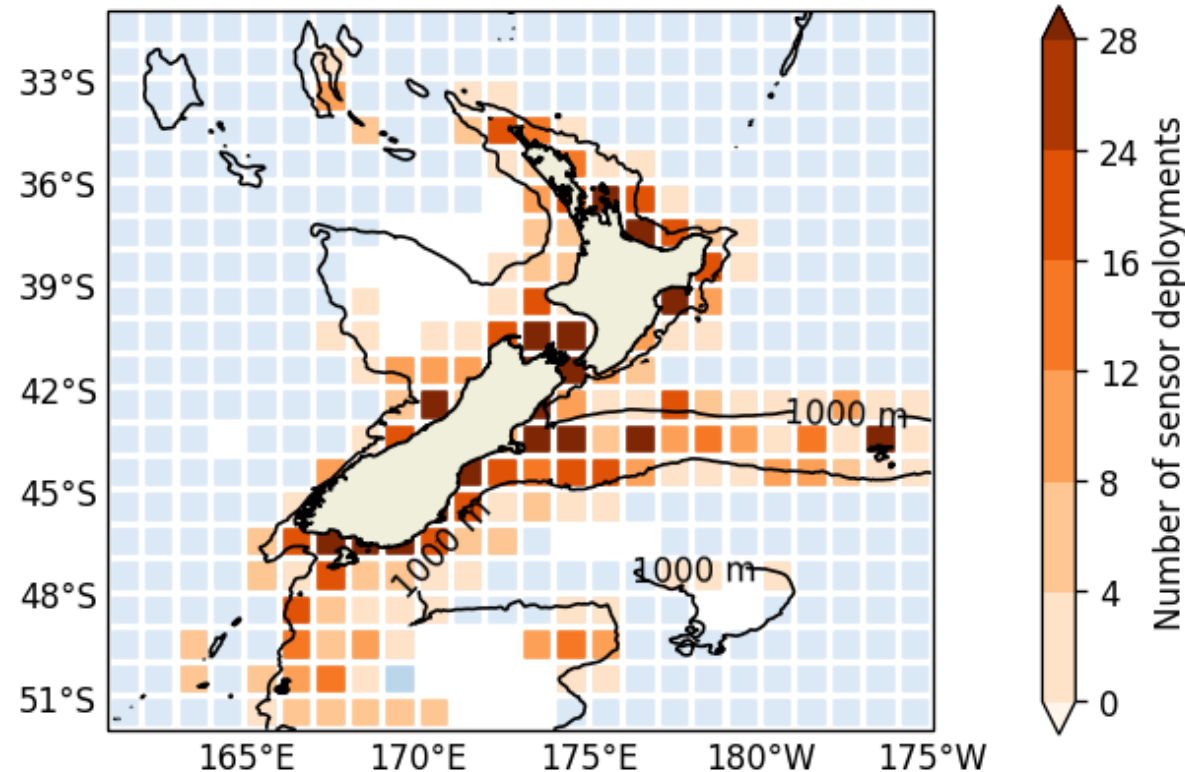
Average Mangōpare Deployments: 2020-06-16 through 2023-03-30
50°E 65°E 80°E 95°E 110°E 125°E 145°E 180°W 160°W 140°W 120°W 100°W



(a) 165°E 170°E 175°E 180°W 175°W

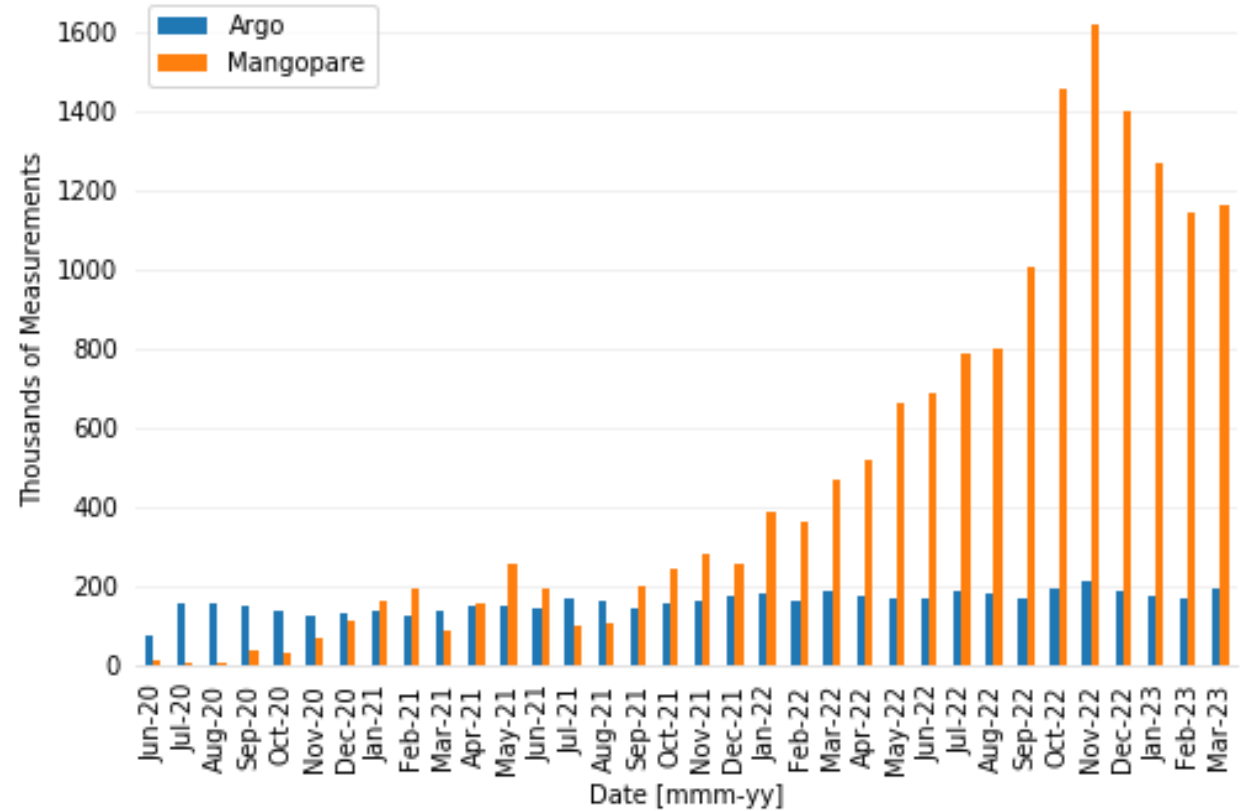
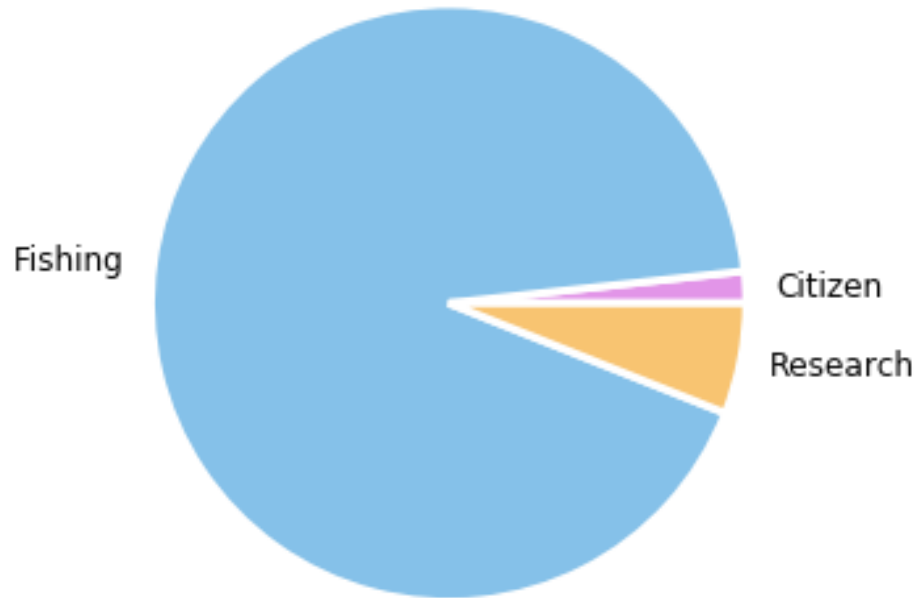


(b)

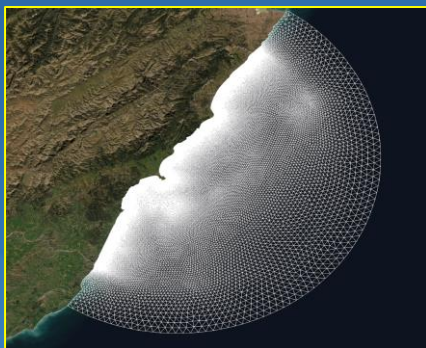
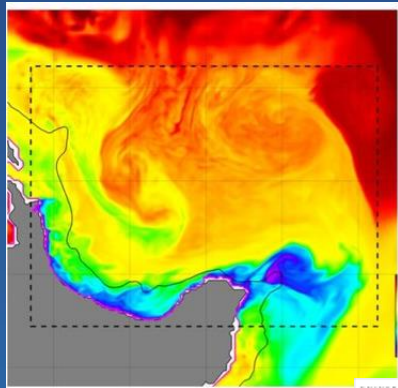
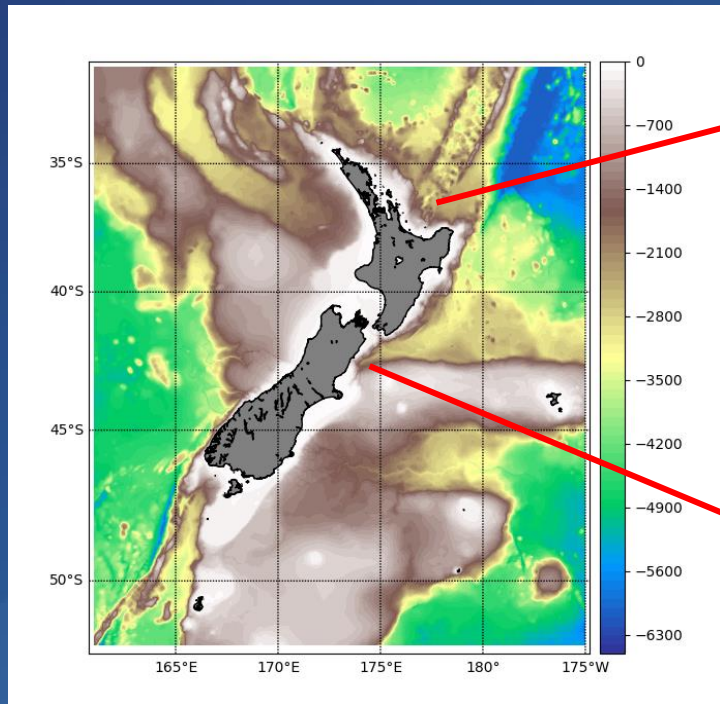


Ocean Observations New Zealand-wide

Number of Participating Vessels by Vessel Type



NUMERICAL MODELS



DERIVED PRODUCTS

Ocean particle trajectory tracking tool:

- Plastics
- Larvae
- Bio-invasive
- Oil spill
- Search & Rescue
- Contaminants

7-day forecast & analysis

Marine 28-year historical data

Marine heatwave hindcast & forecast

Hydrodynamic models:

- NZ EEZ
- Bay of Plenty

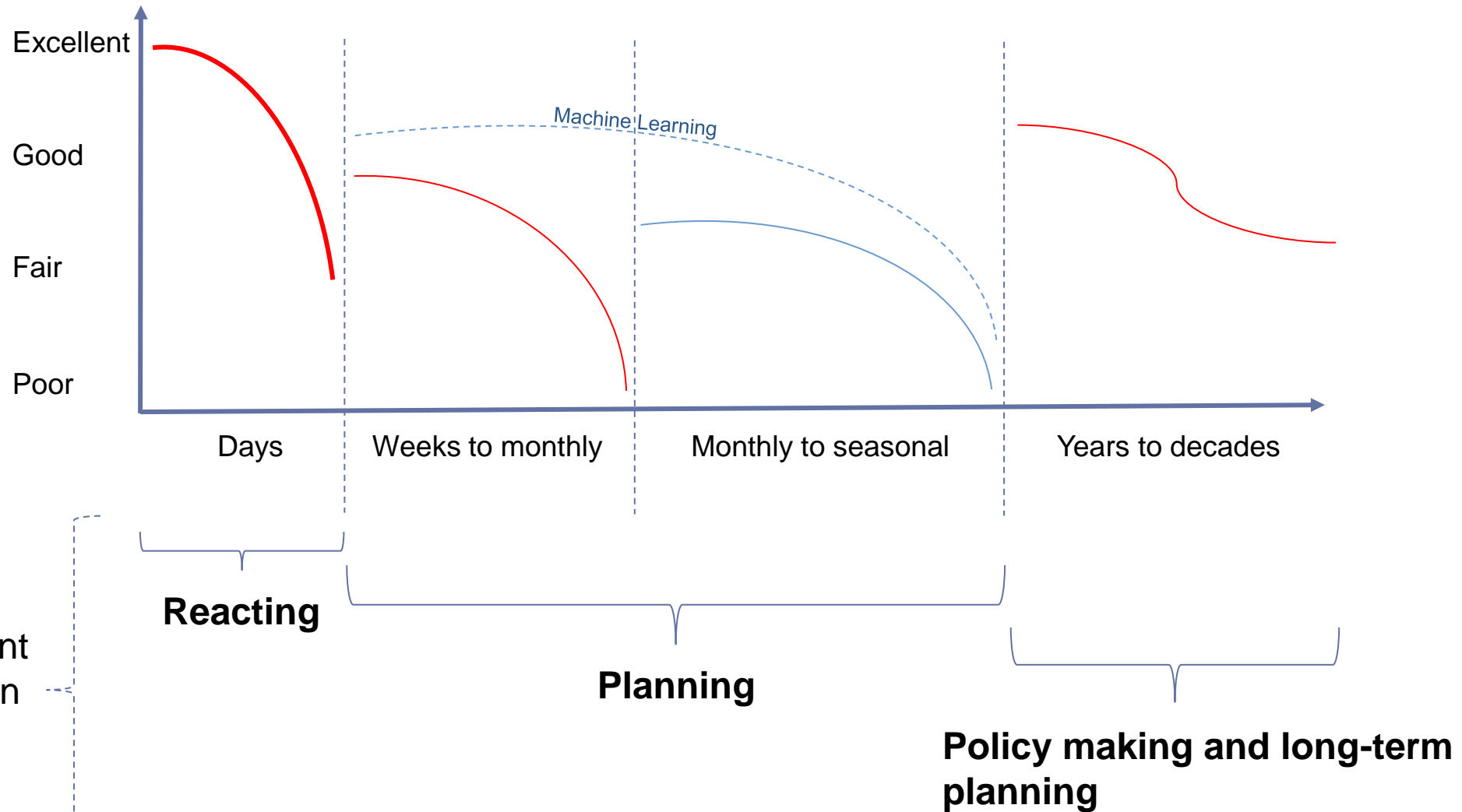
Temperature profile data from thousands of fishing trips available to the fishers who collect them

NZ ocean observation data liberated, quality checked and stored in open-access catalogue (NZ-ODN)

"28+" years Hindcast + Reanalysis + Forecast

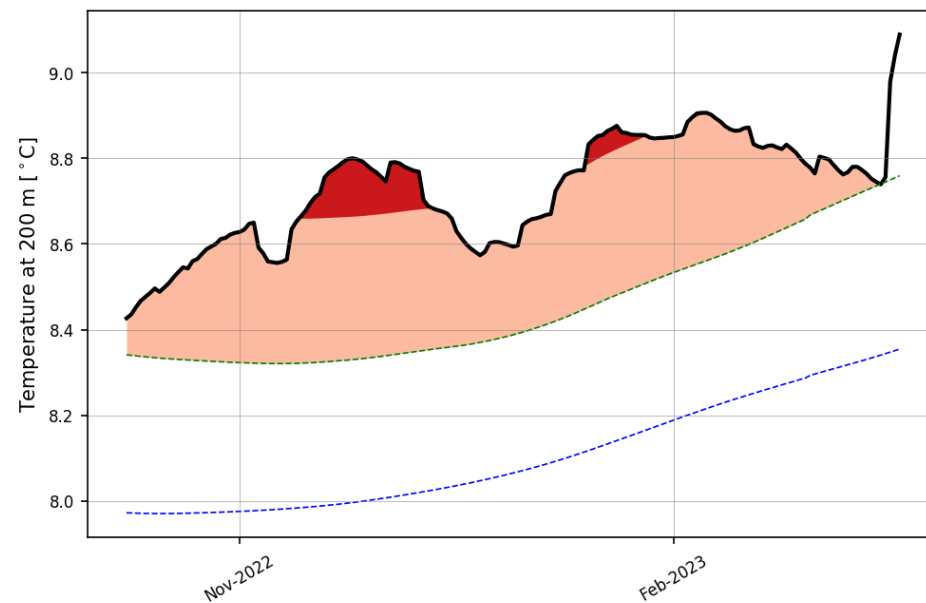
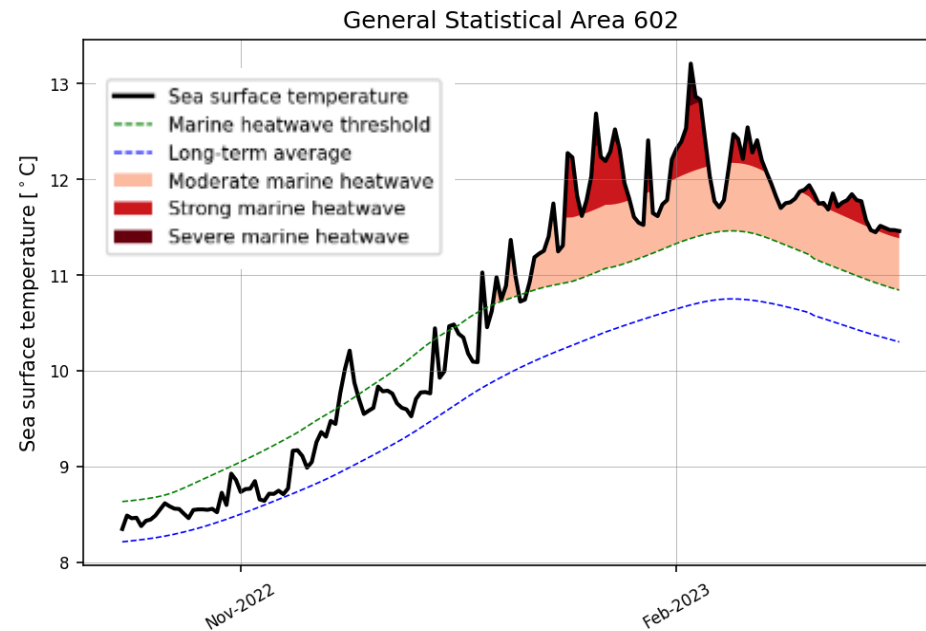
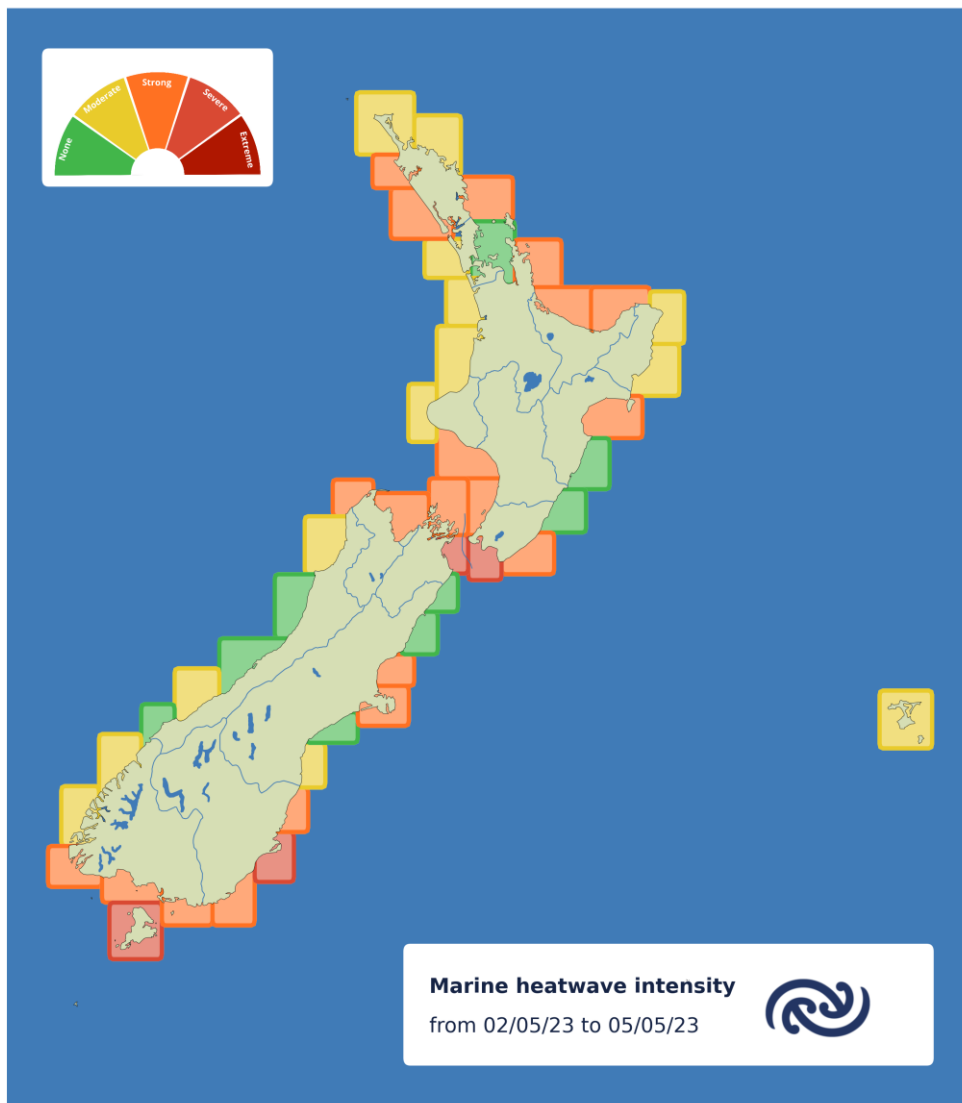
4DVar Data Assimilation

Ocean forecast time-scales



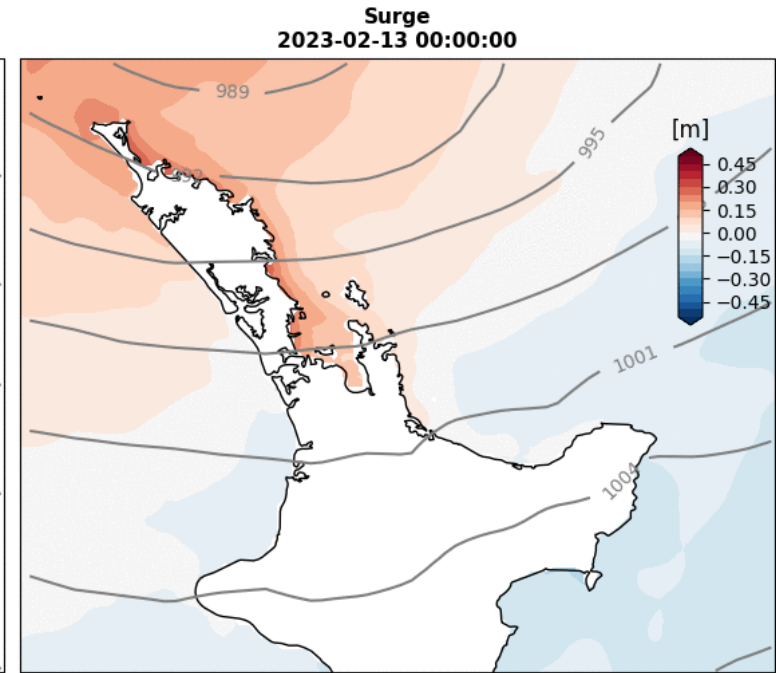
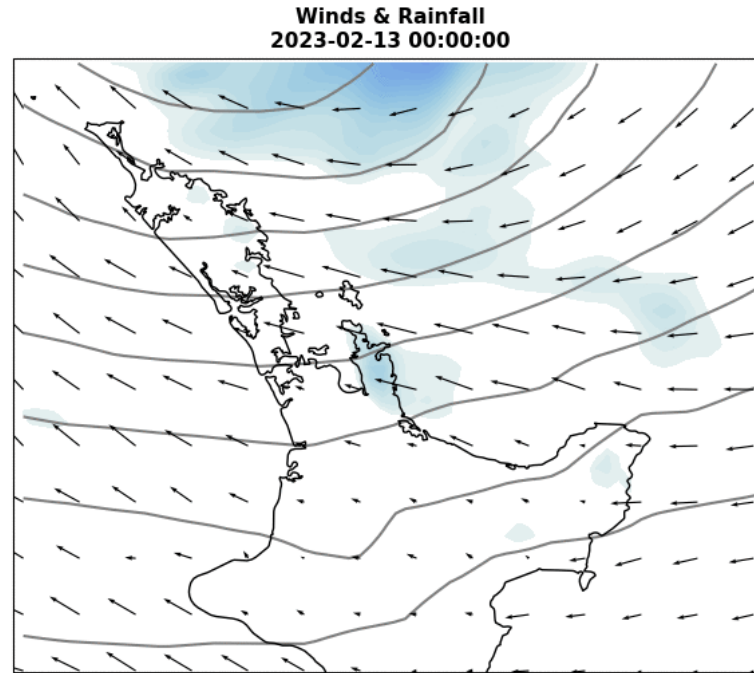
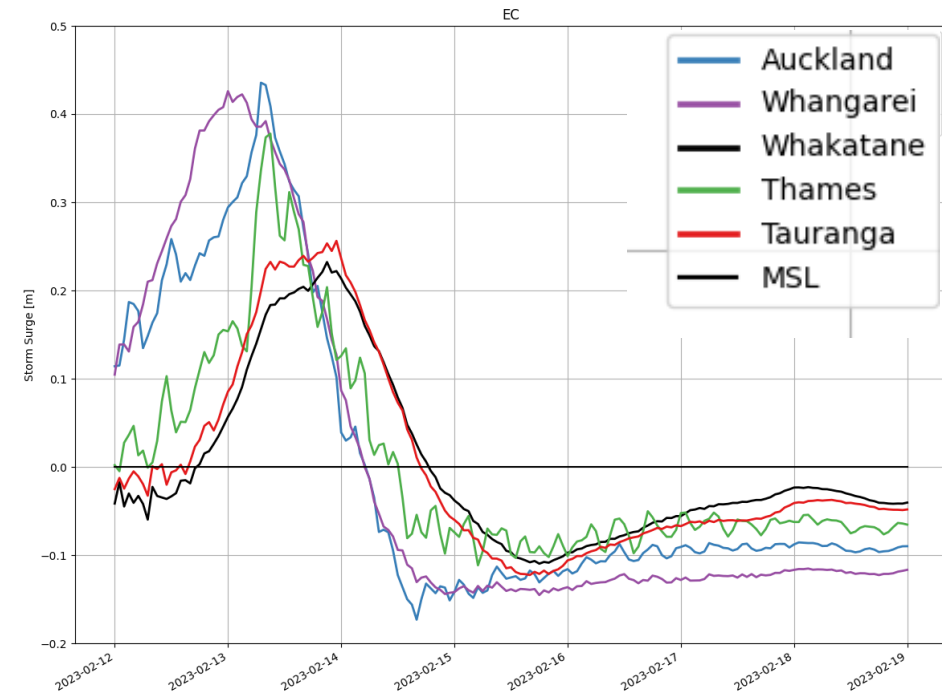
Management and decision making

Reacting: marine heatwave "forecast"



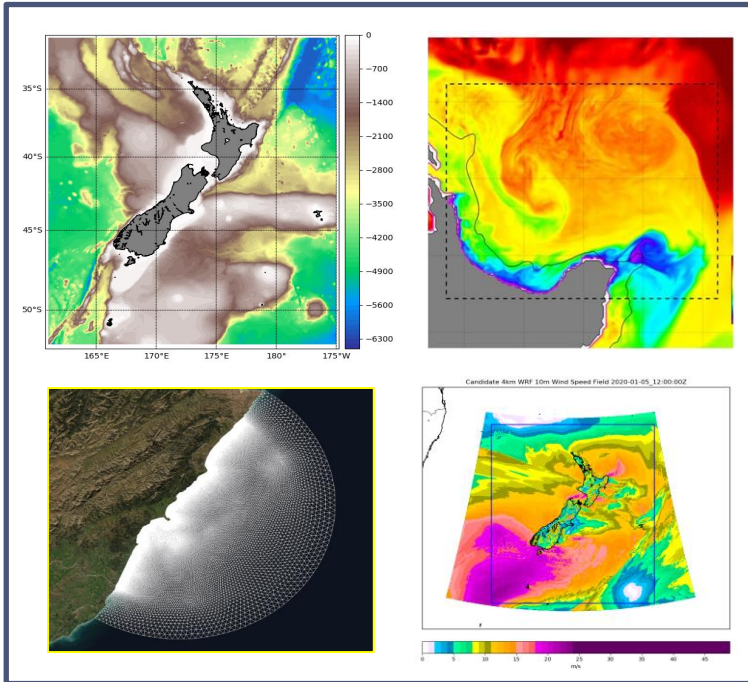
Reacting: Coastal storm surge - TC Gabrielle

EC-based



How can I access/use the Moana Project results?

Models



Datasets

- THREDDS (Hindcast)
- swellmap.co.nz (Forecast)

Tools

- MetOcean Track
- Marine Heatwaves forecast

+Open source code, publications, etc...



Thank you 