CLIVAR-GOOS Workshop:
From global to coastal

Collaborative Ocean Observation with Fisheries

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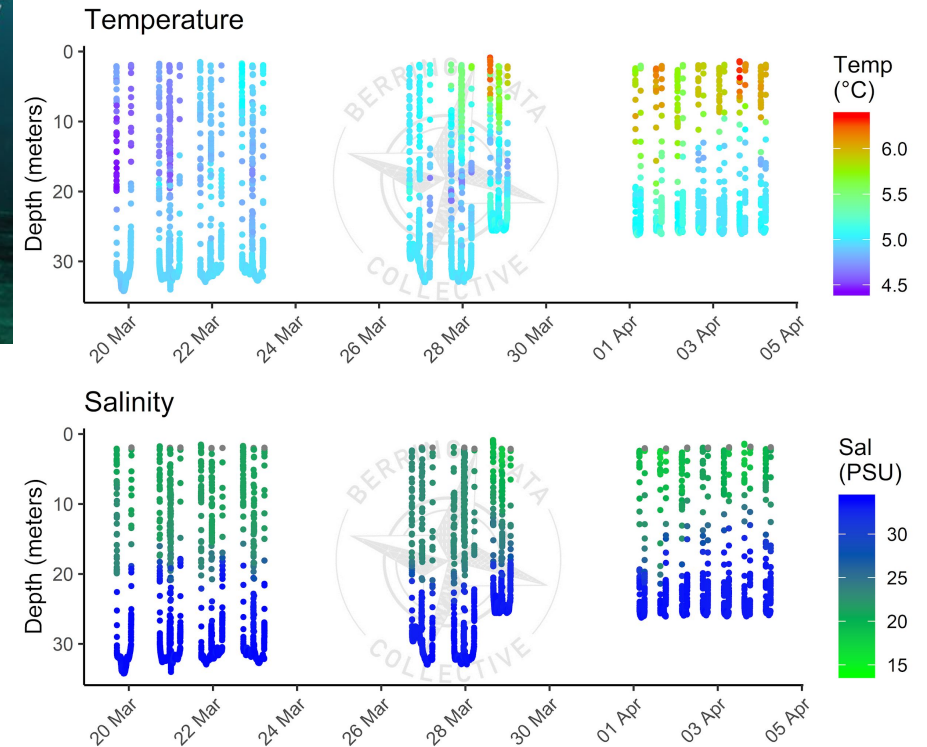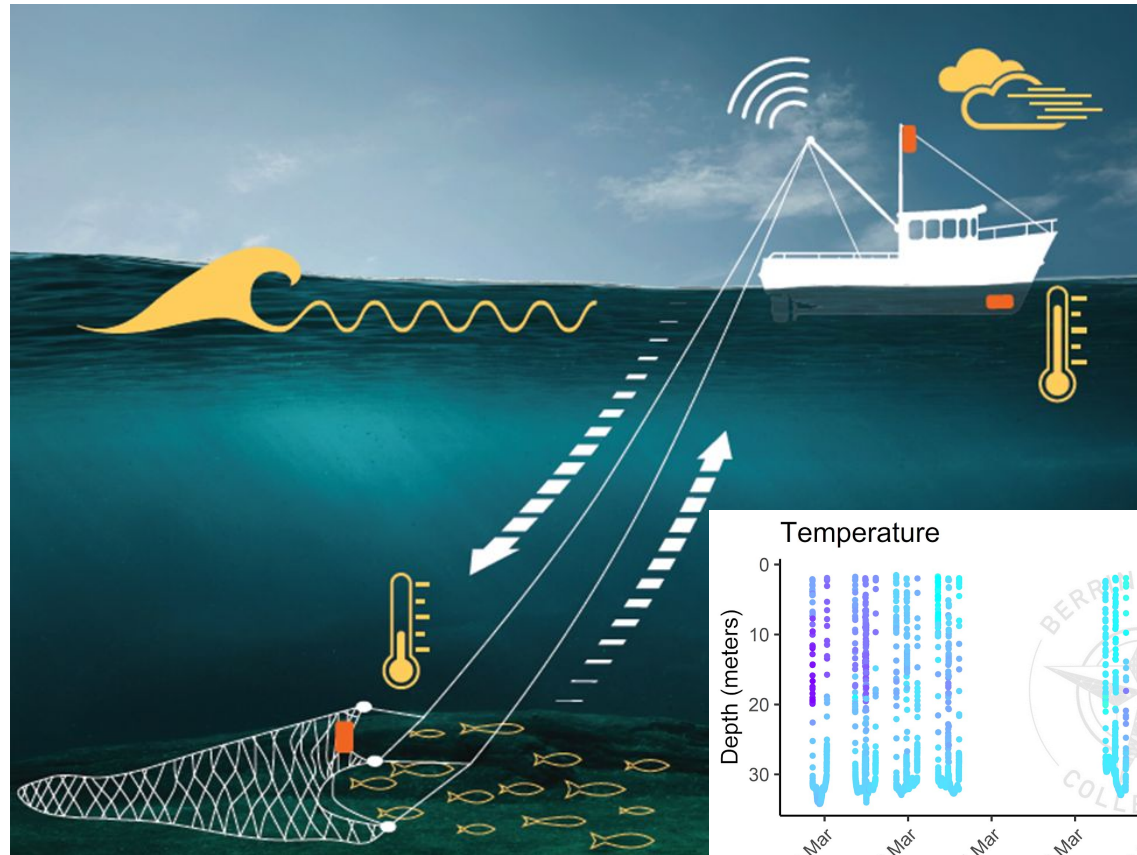Naoki (Nick) Hirose, Ph.D.
Hirose[at]riam.kyushu-u.ac.jp

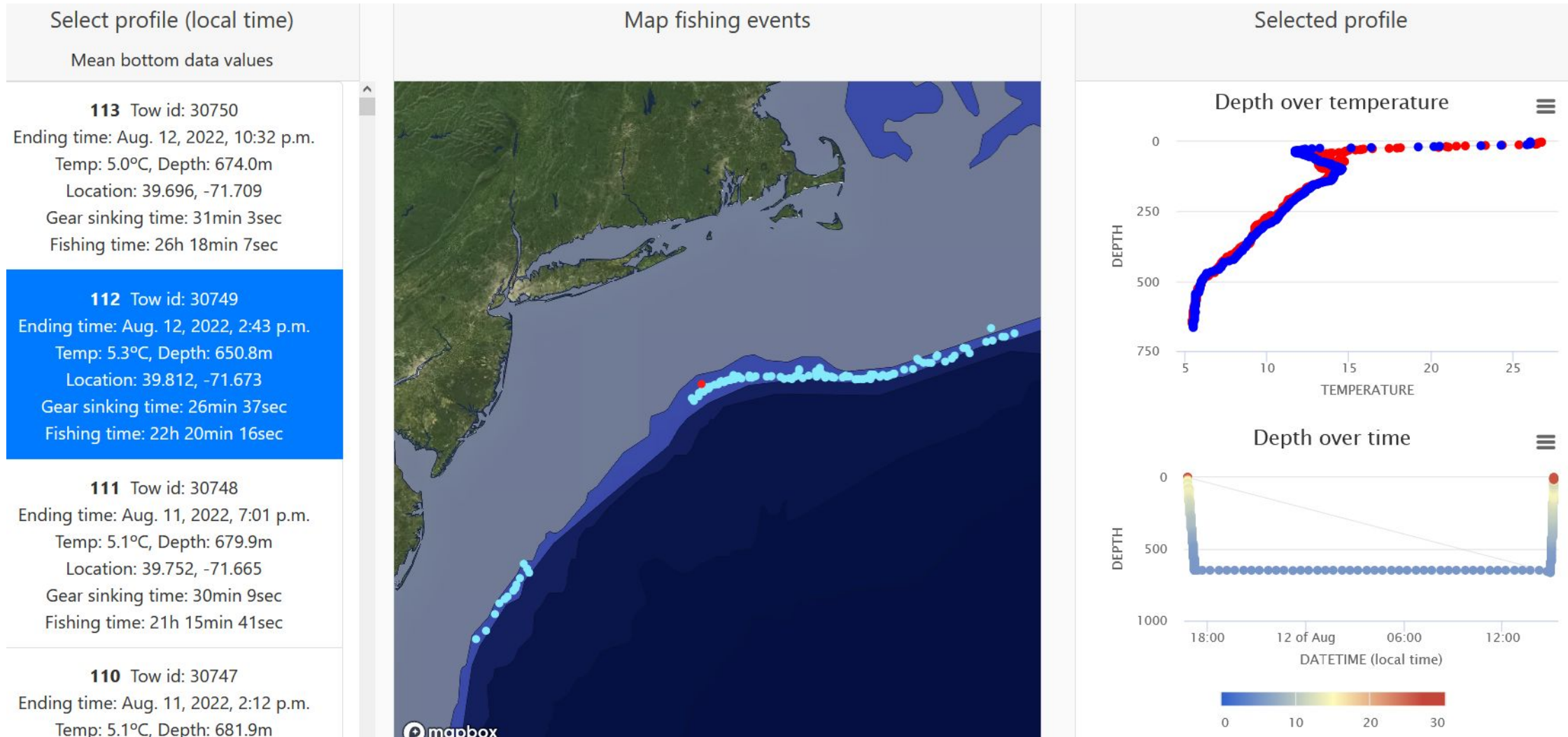Cooper Van Vranken
cooper[at]oceandata.net

Fishing for Data

Fishing gears provide a ride down and back up during normal fishing operations. IoT sensors measure water column profiles.

As the net surfaces, data is transmitted in real time to our database and then onto data users.

Subsurface is the unique data collection capability of F/Vs when compared to other vessels of opportunity; however, there are opportunities for co-located EOVs.
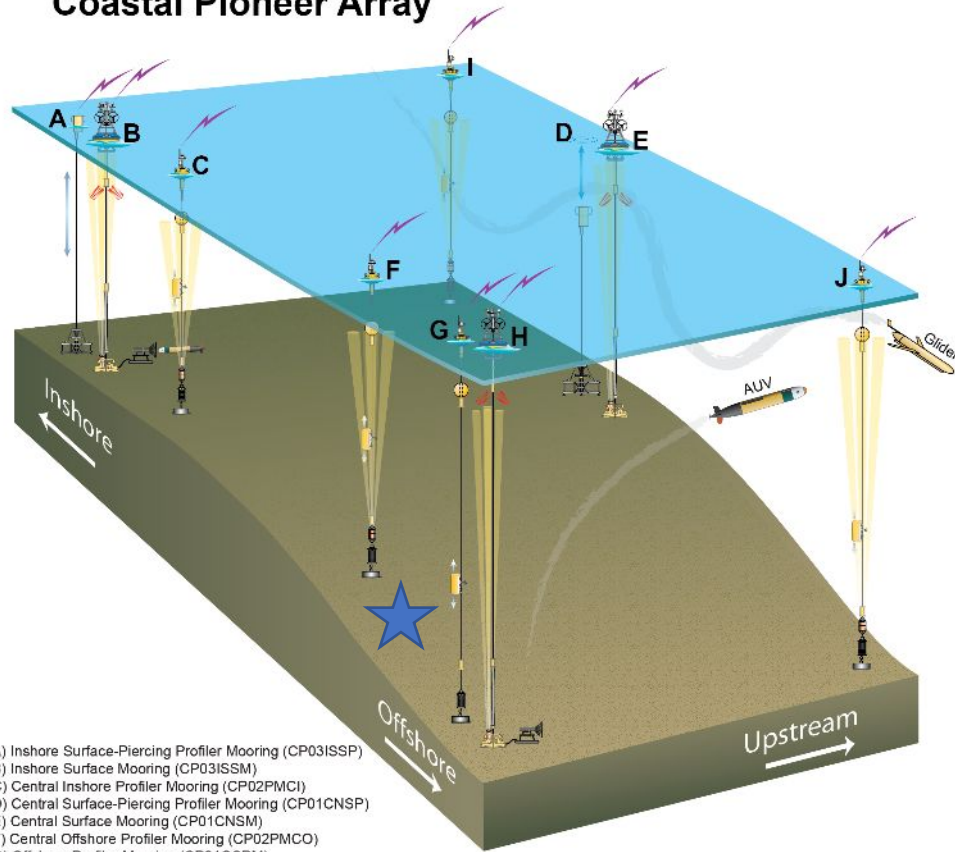
Resulting data

This material is based upon work supported by the U.S. Office of Naval Research under Contract No. N00014-22-P-2003.

OOI Pioneer Array Comparison


Tow ID: 28140 -- 6km seperation

Coastal Pioneer Array

(A) Inshore Surface-Piercing Profiler Mooring (CP03ISSP)
(B) Inshore Surface Mooring (CP03ISSM)
(C) Central Inshore Profiler Mooring (CP02PMCI)
(D) Central Surface-Piercing Profiler Mooring (CP01CNSP)
(E) Central Surface Mooring (CP01CNSM)
(F) Central Offshore Profiler Mooring (CP02PMCO)
(G) Offshore Profiler Mooring (CP04OSPM)
(H) Offshore Surface Mooring (CP04OSSM)
(I) Upstream Inshore Profiler Mooring (CP02PMUI)
(J) Upstream Offshore Profiler Mooring (CP02PMUO)
Mobile - AUV (CP02MOAS-AV)
Mobile - Coastal Glider (CP02MOAS-GL)

OOI offshore mooring wire profiler
Moana sensor in Crab Trap
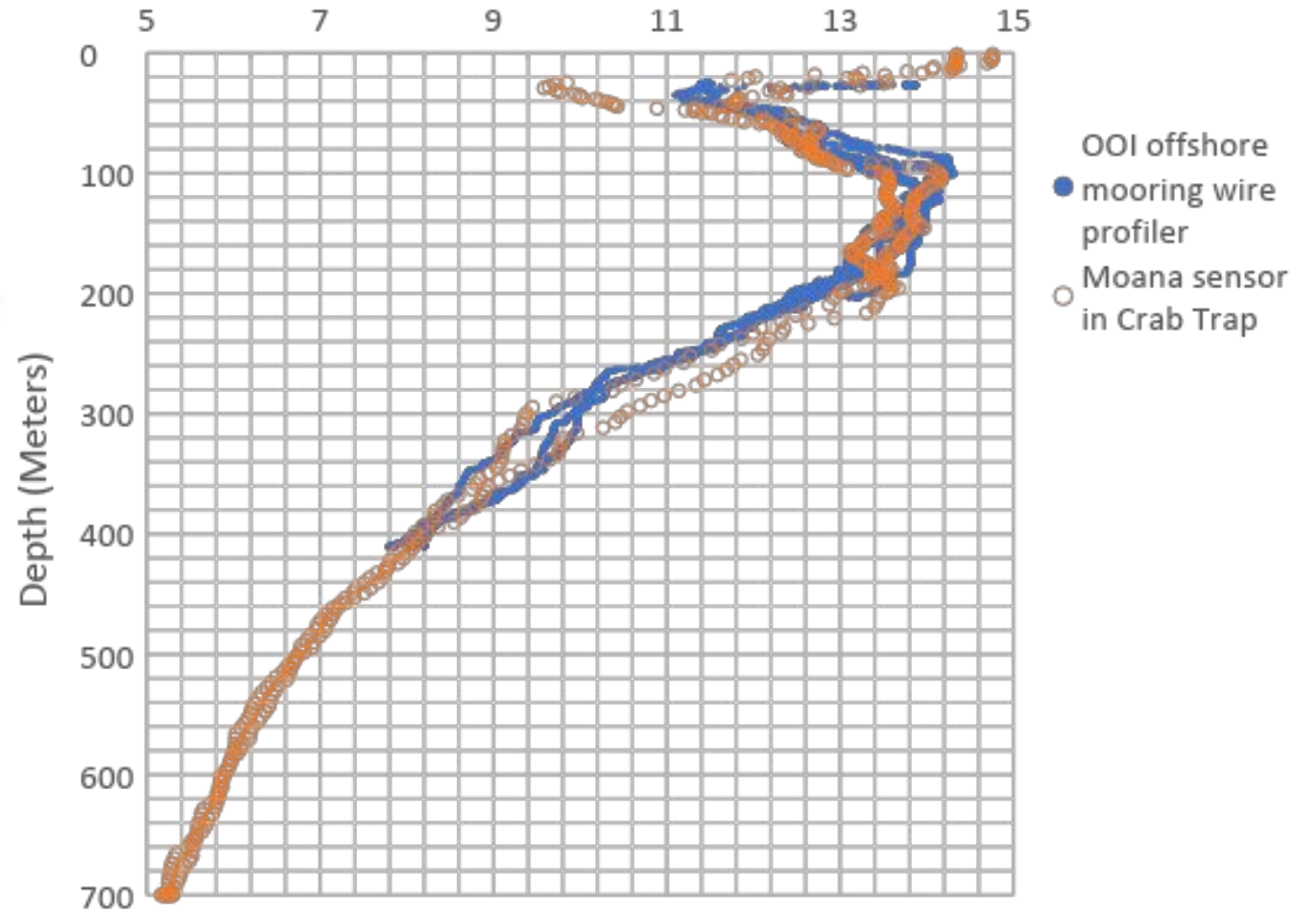
FV Observation Network at scale: the Moana project
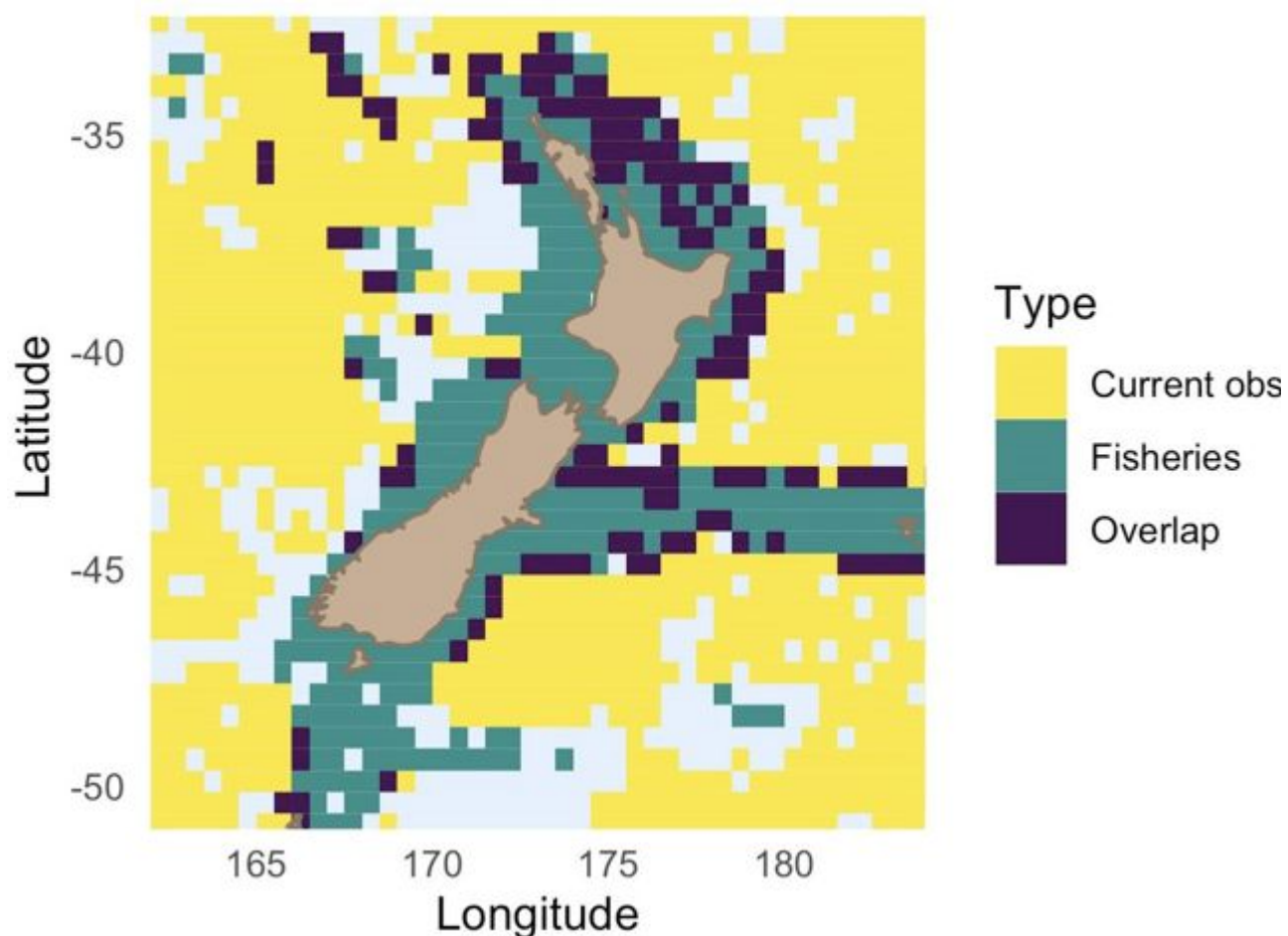
- Fishing activity lines up precisely with coastal data gaps

- Relative data gaps created by the success of Argo

- Pattern repeated around the world

Van Vranken, C. H., Vastenhoud, B. M. J., Manning, J. P., Plet-Hansen, K. S., Jakoboski, J., Gorringe, P., & Martinelli, M. (2020). Fishing gear as a data collection platform: Opportunities to fill spatial and temporal gaps in operational sub-surface observation networks. Frontiers in Marine Science, 7, 864.

FV Observation Network at scale: the Moana project

Average Mangōpare Deployments: 2020-06-16 through 2022-06-25
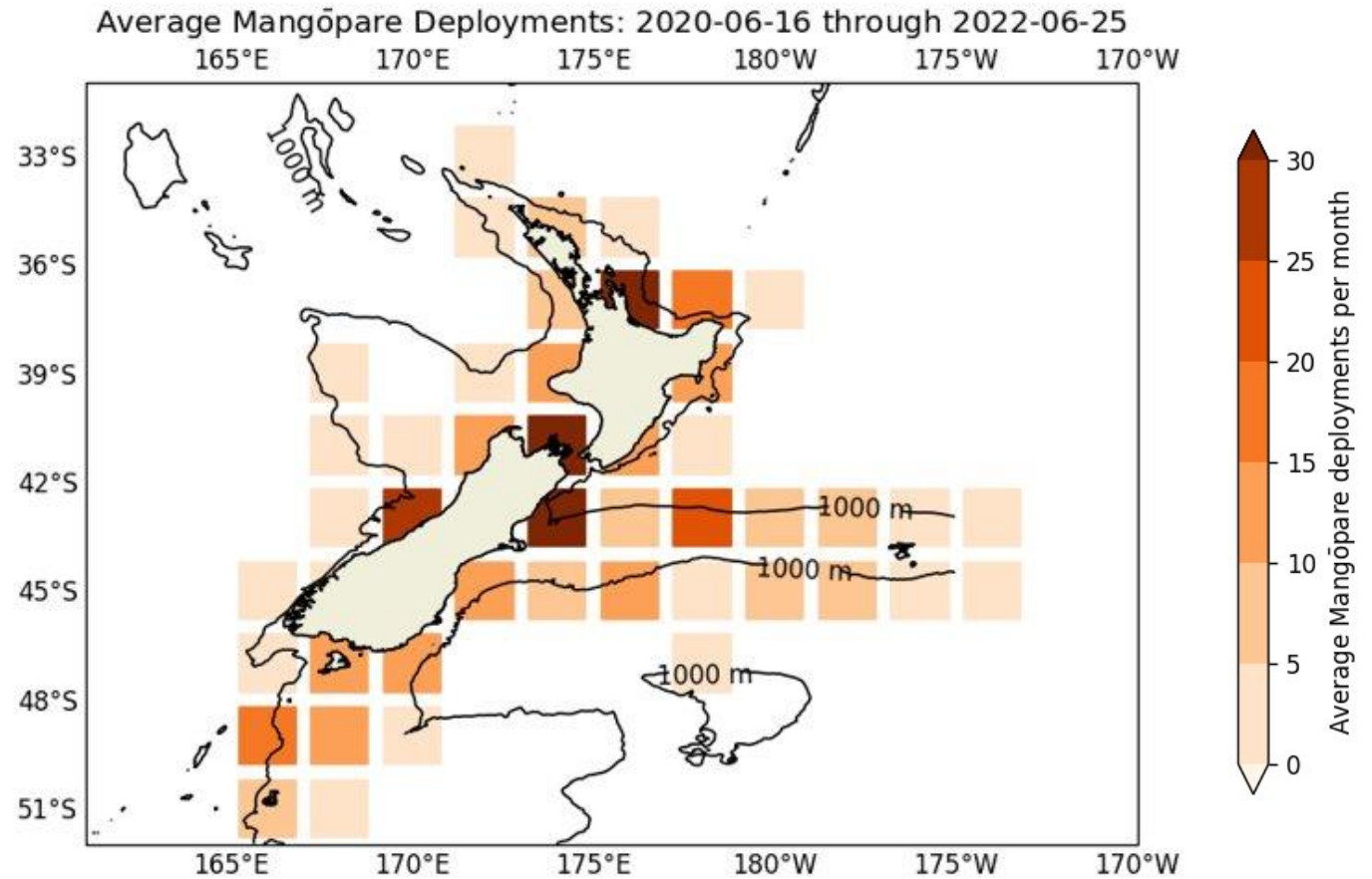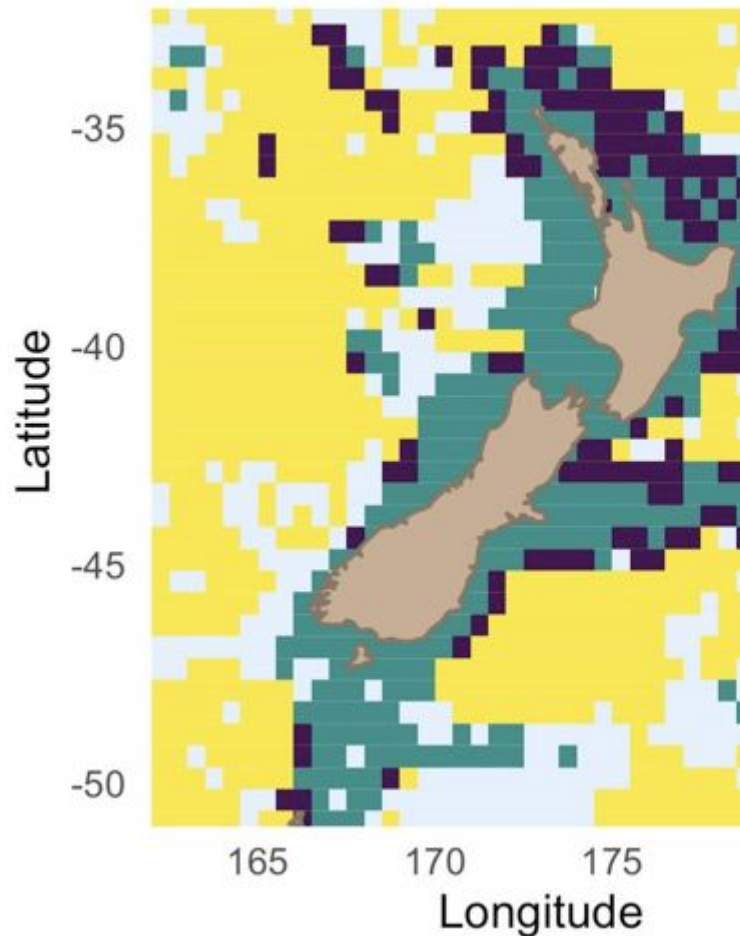
Data coverage outfitting ~150 out of 900 FVs in New Zealand
(Moana project target is 300 deployments by end of 2022)

FV Observation Network at scale: the Moana project
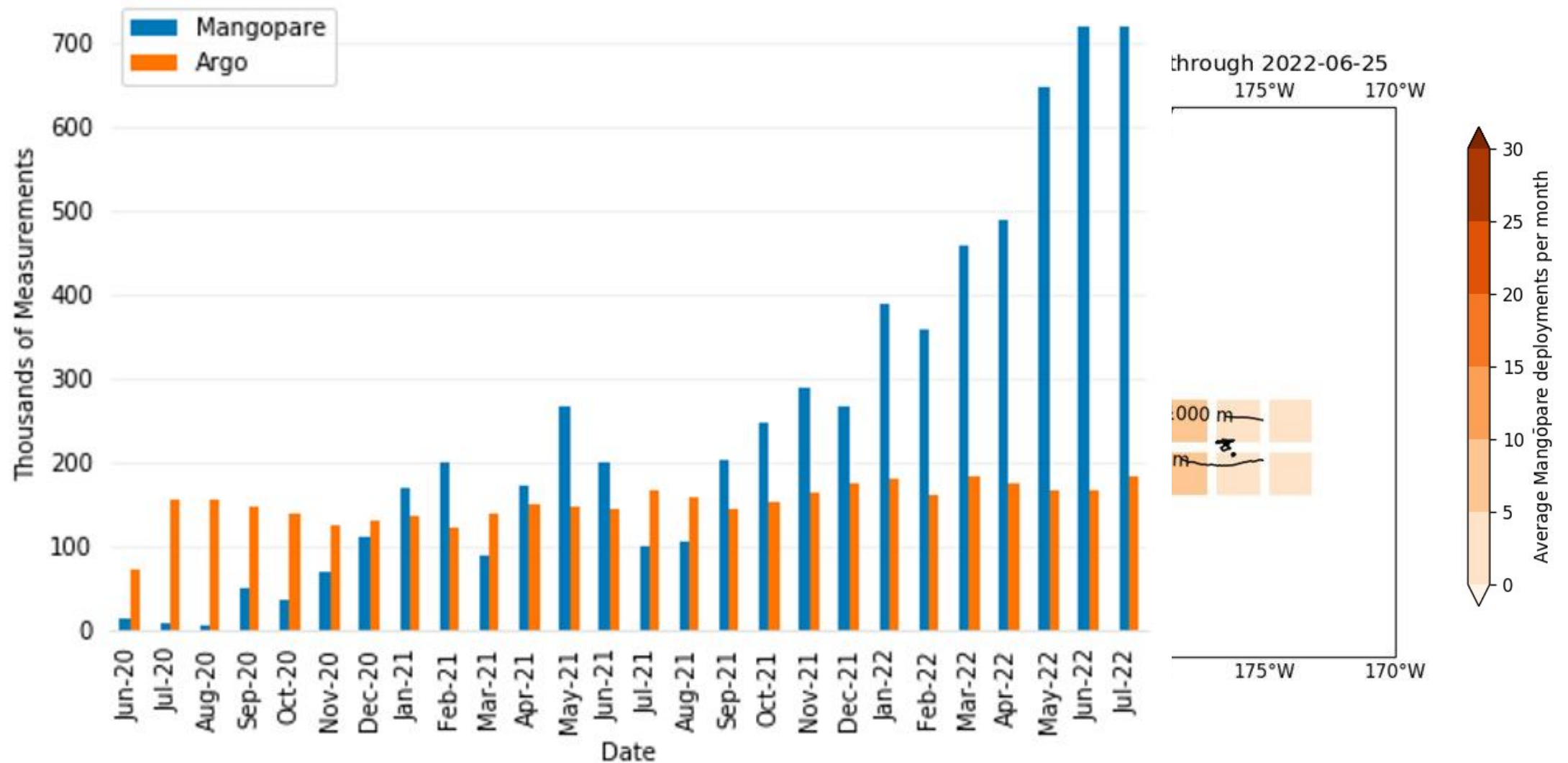
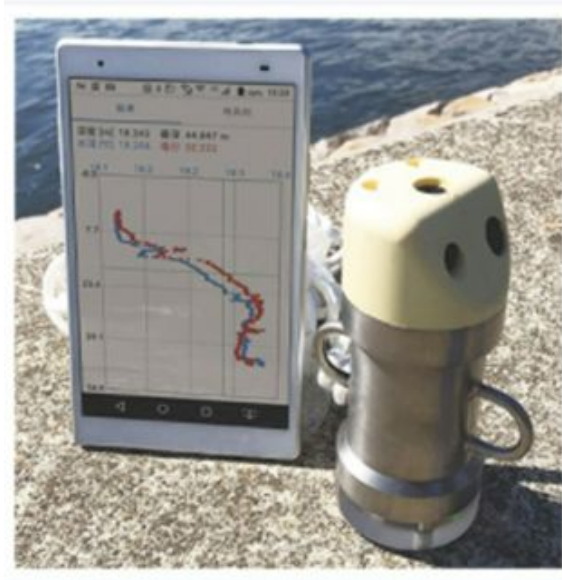Argo and FV monthly contributions to modelling framework
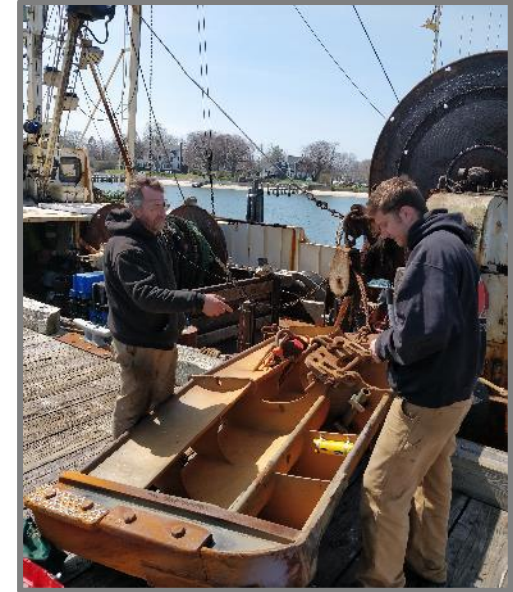
Diversity of Sensors and Vessels

Salmon Trolling, SE Alaska
Zebra-Tech Moana
TD with protective housing

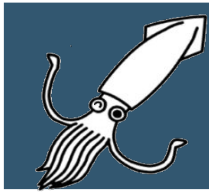
Inuit longline fishing
NKE (CTD & TD)
NW Greenland

RIAM, Kyushu
University
JFE Electronics CTD

ZT Moana TD install
on a trawler,
Long Island, NY

There are millions of fishing vessels at sea every day. We can instrument vessels ranging from subsistence fishers to factory trawlers.

Many larger vessels already have high quality sensors that produce valuable data. (Equivalent to SST and surface-met instrumentation that feeds into GTS via SOOP/VOS program from cargo ships)
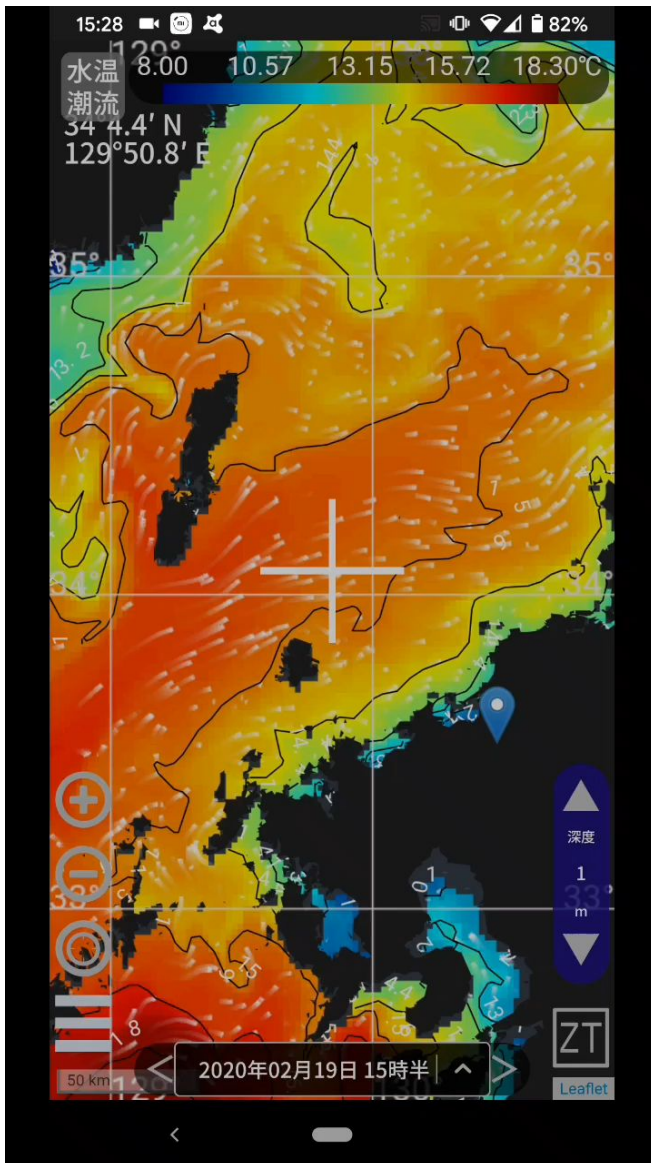
"Through the CTD castings, I found the range of bottom temperature for good catches."

"Prediction of high-frequency changes of ocean current is quite accurate on this app. I can choose the moderate condition for the best behavior of my fishing gear."

*"Visualization of ocean environment helps to teach fishing conditions for beginners."*

"I do not have to look around the fishing grounds anymore and thus 15% cut of fuel oils. It makes me so relaxed that I can take a nap on site."

Android

App

FAIR data flow:

Balancing the needs of both science and industry. Translating the diversity of fishing activities into standardized and interoperable data streams
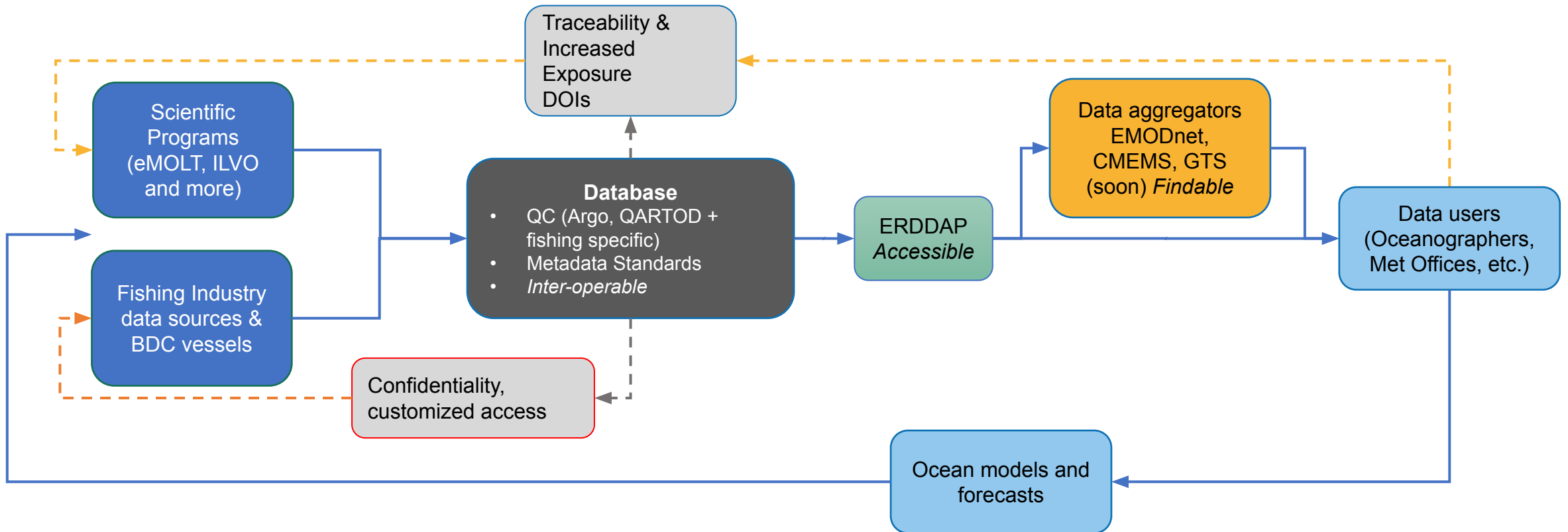
Moving Forwards

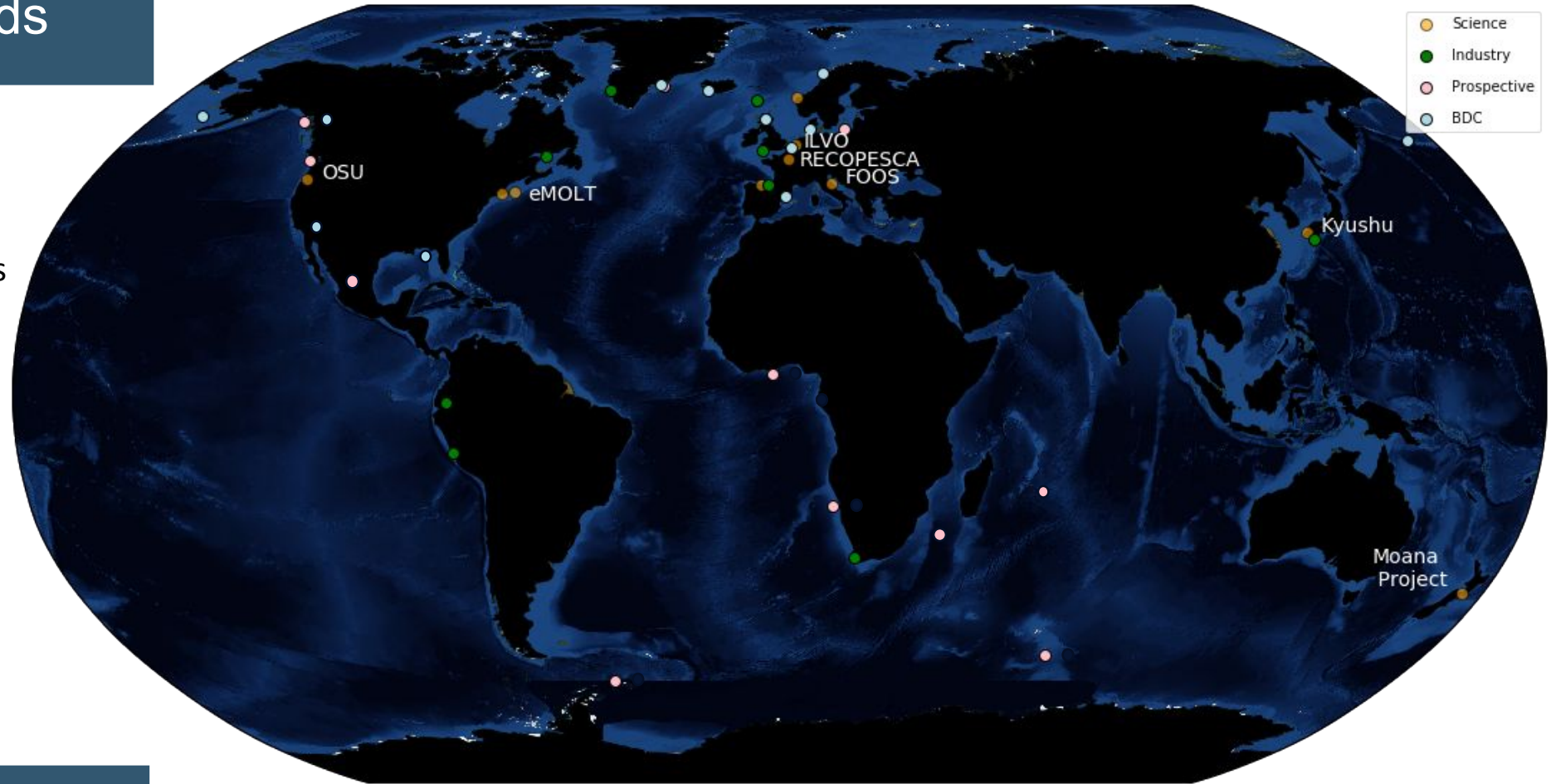Expanding the emerging global community

Increasing to more EOVs & ECVs

Series of workshops as part of next EMODnet Phase

Steering Committee

UN Decade Project

GOOS network

Partners & Support

Thank you!

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