

CLIVAR-GOOS Workshop:
From global to coastal

Collaborative Ocean Observation with Fisheries



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Cooper Van Vranken

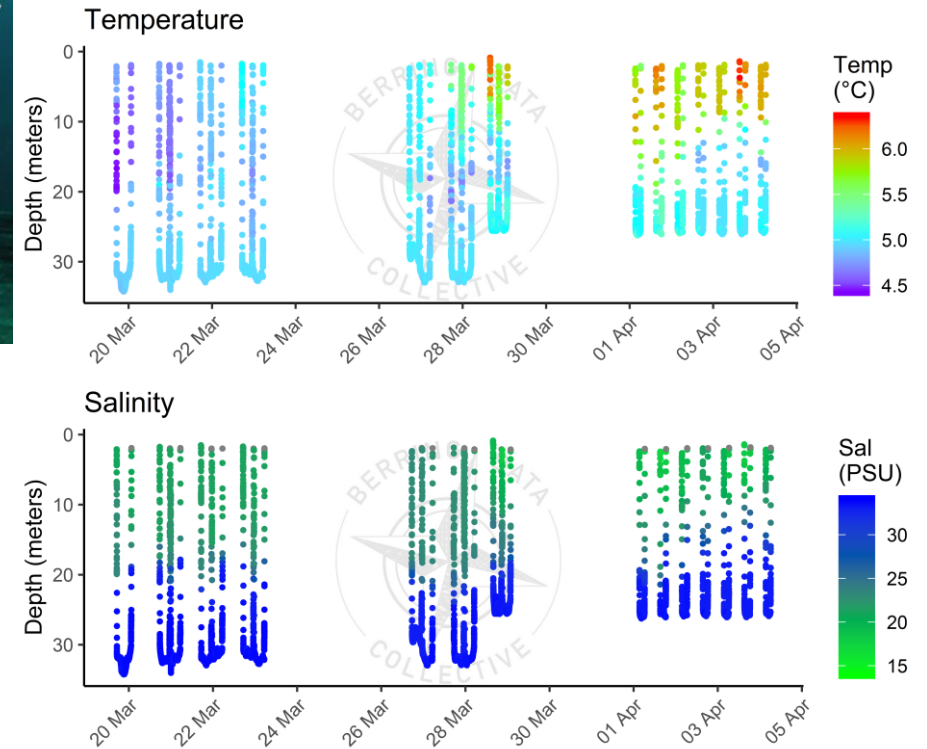
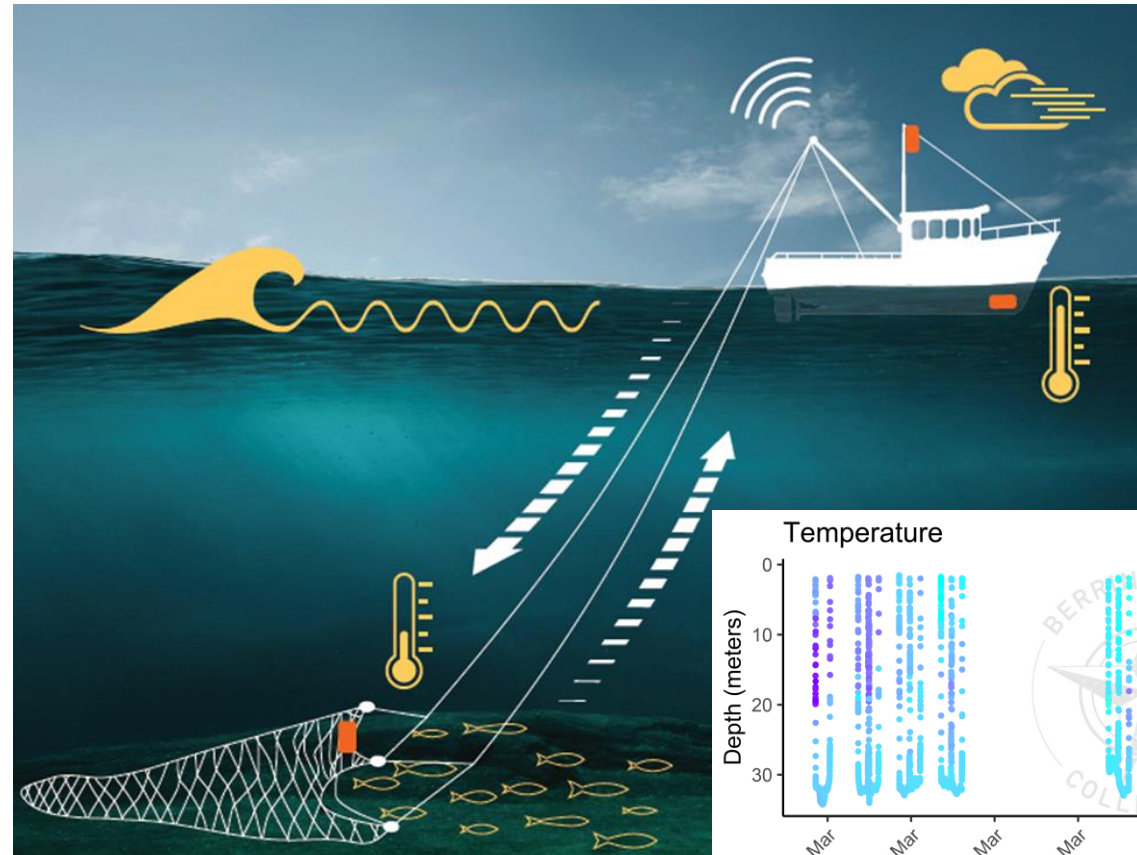
cooper[at]oceandata.net

Fishing for Data

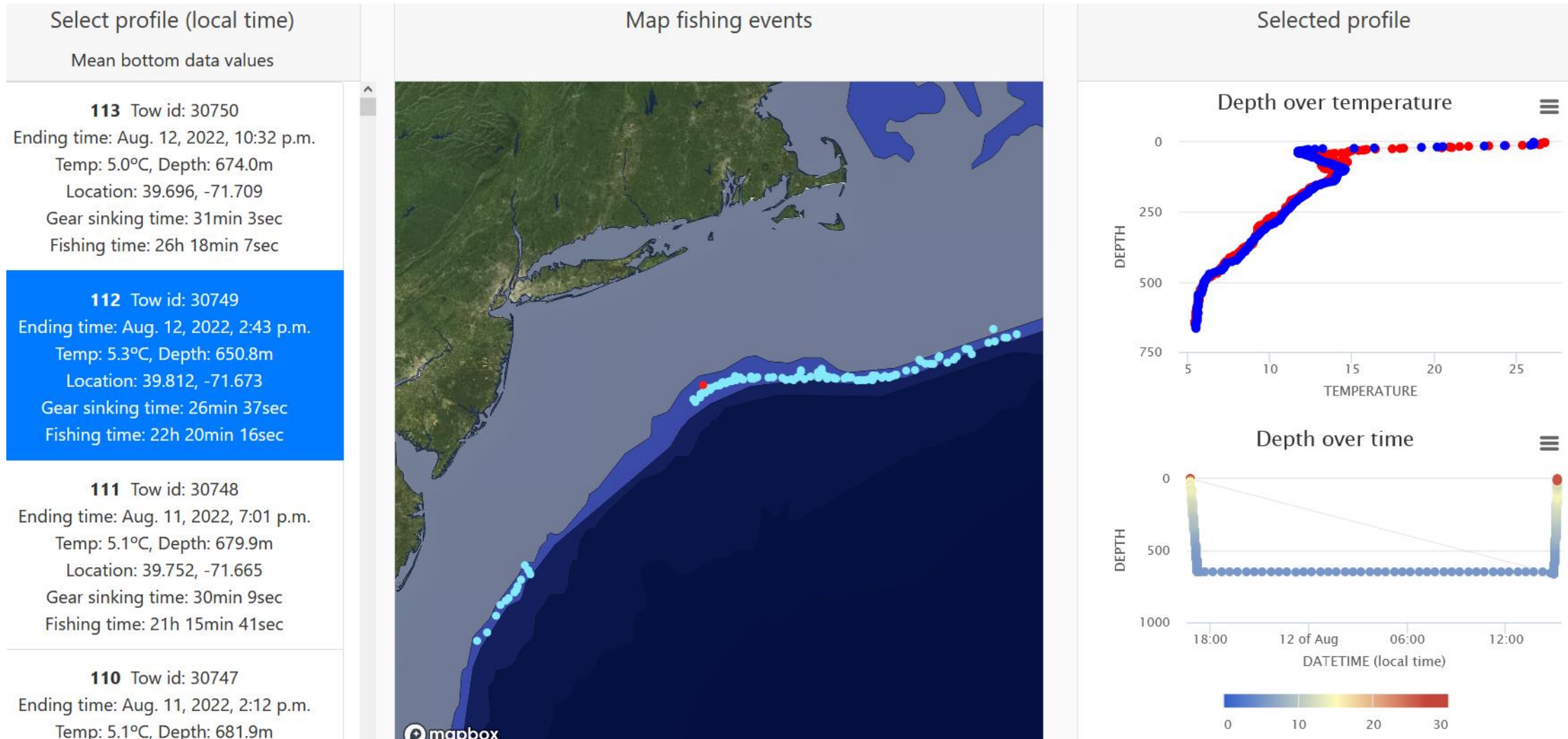
Fishing gears provide a ride down and back up during normal fishing operations. IoT sensors measure water column profiles.

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.



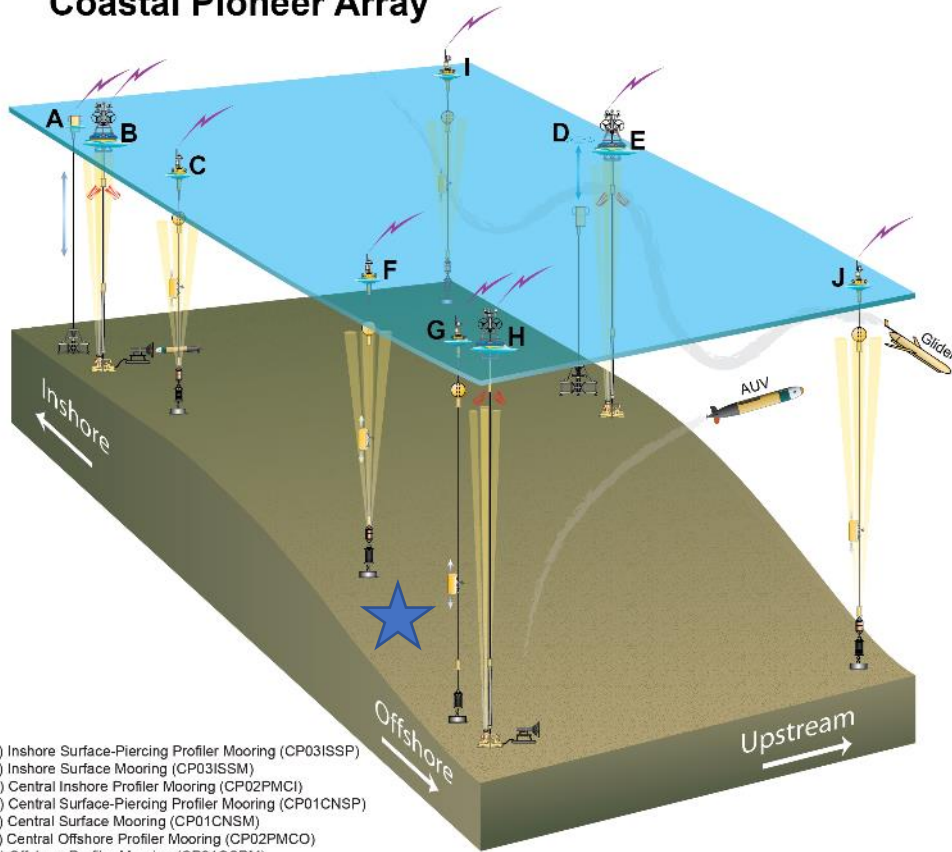
Resulting data



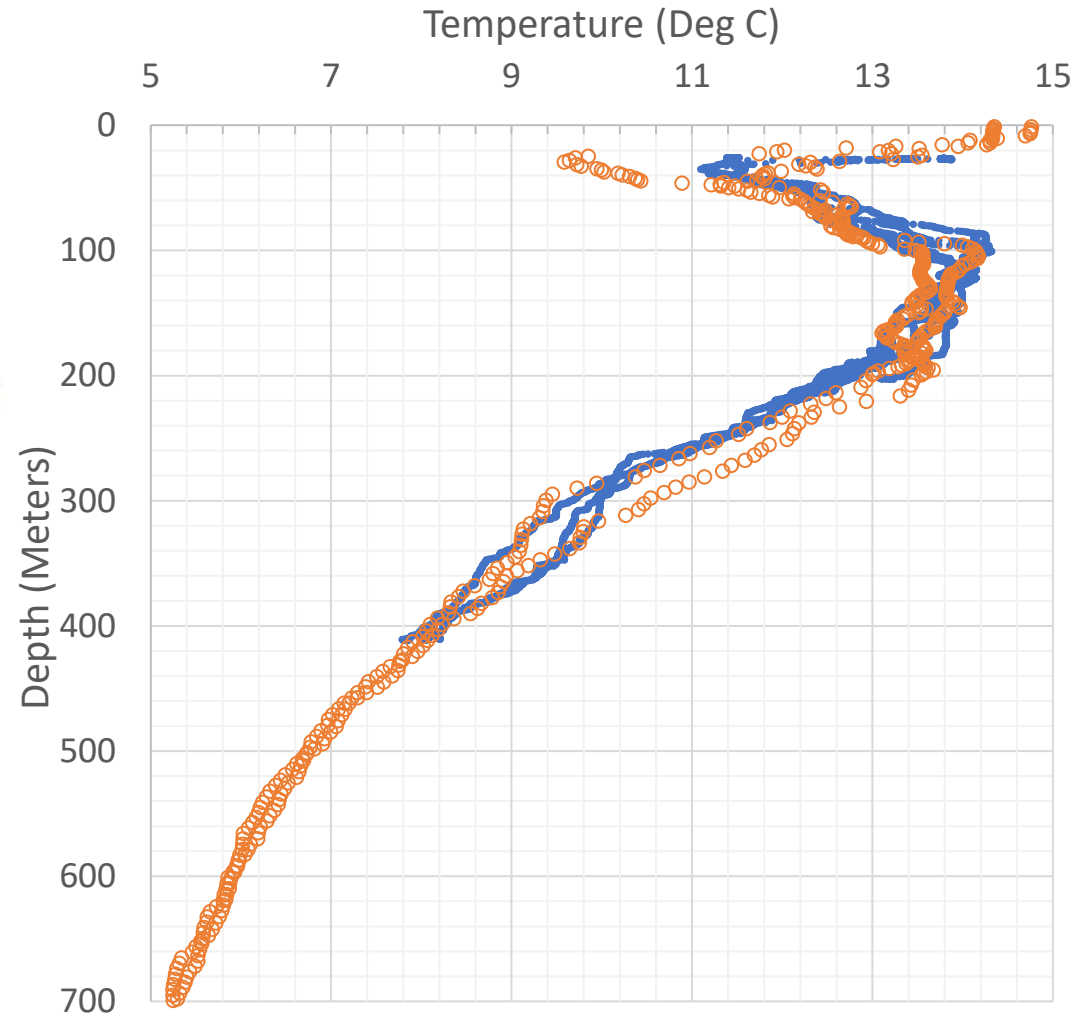
OOI Pioneer Array Comparison

Tow ID: 28140 -- 6km separation

Coastal Pioneer Array

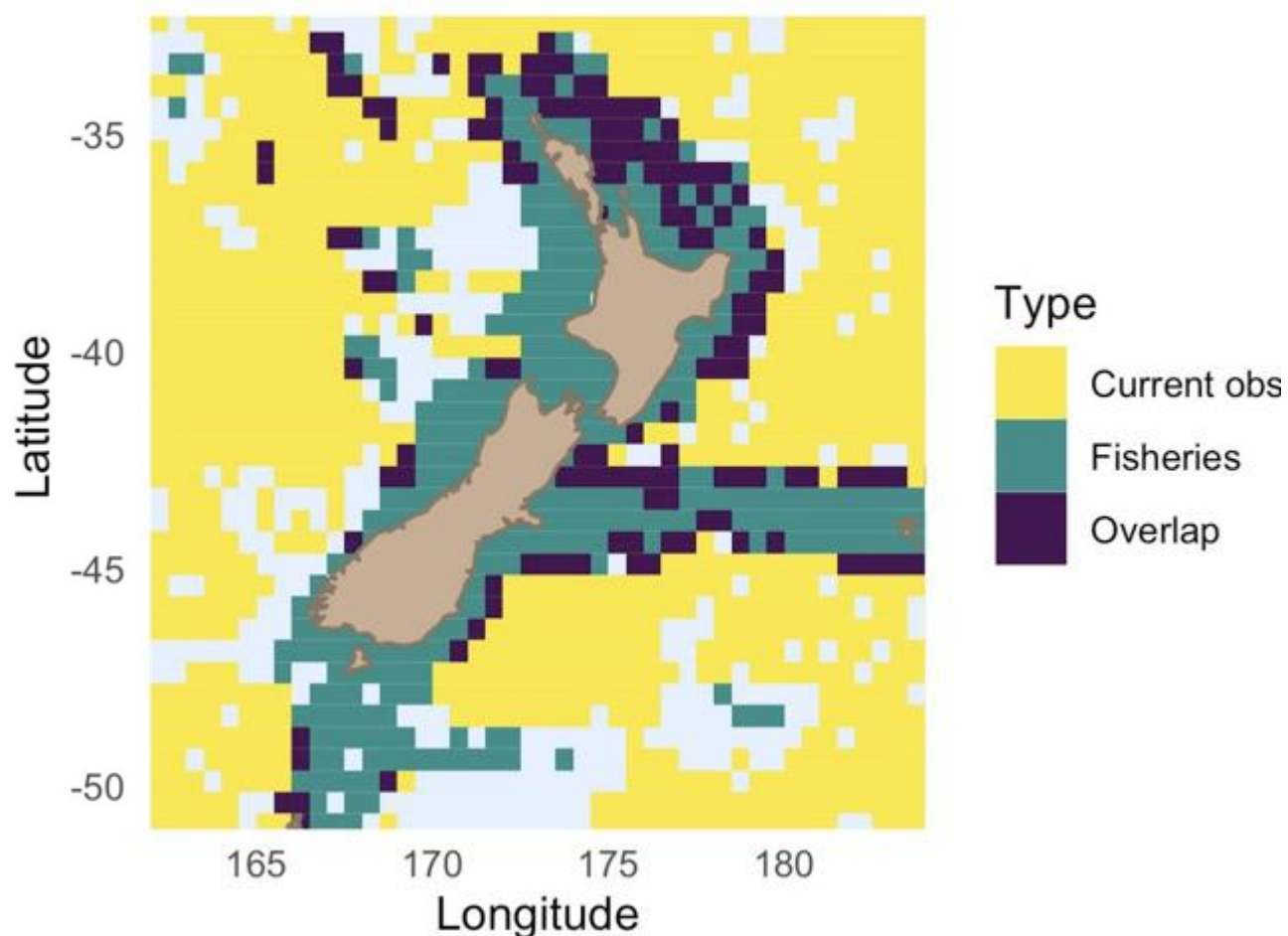


- (A) Inshore Surface-Piercing Profiler Mooring (CP03ISSP)
- (B) Inshore Surface Mooring (CP03ISSM)
- (C) Central Inshore Profiler Mooring (CP02PMCI)
- (D) Central Surface-Piercing Profiler Mooring (CP01CNPS)
- (E) Central Surface Mooring (CP01CNMS)
- (F) Central Offshore Profiler Mooring (CP02PMCO)
- (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

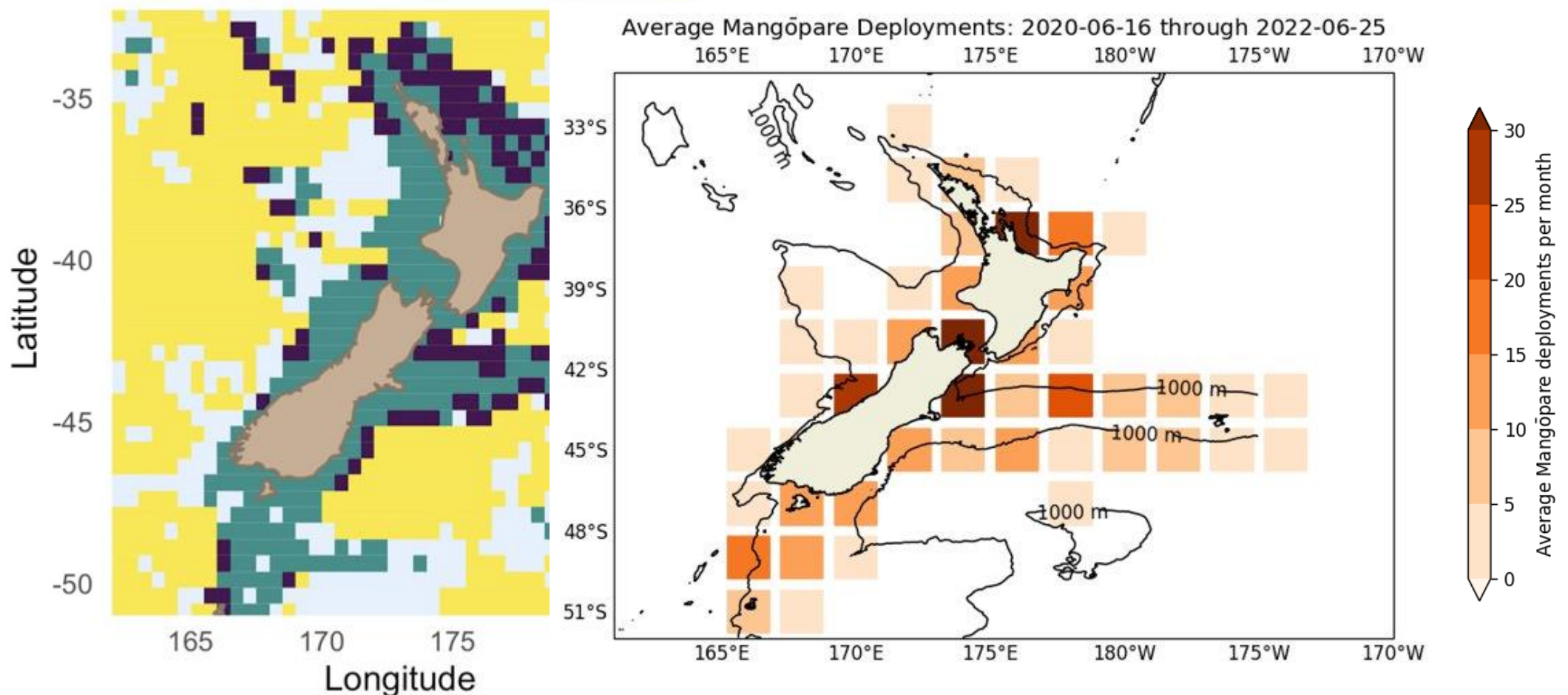
FV Observation Network at scale: the Moana project



- Fishing activity lines up precisely with coastal data gaps
- Relative data gaps created by the success of Argo
- Pattern repeated around the world

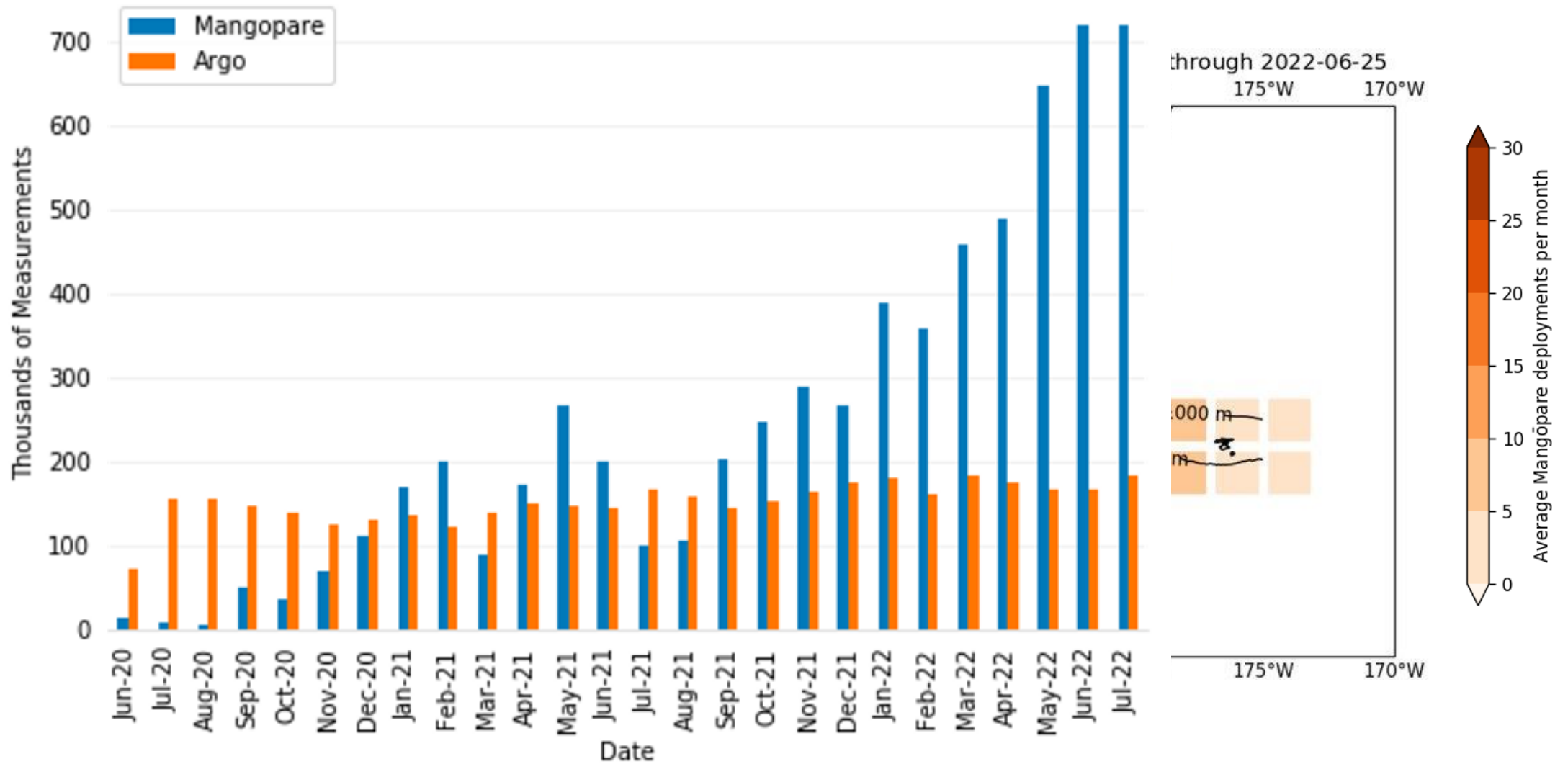
Van Vranken, C. H., Vastenhou, B. M. J., Manning, J. P., Plet-Hansen, K. S., Jakoboski, J., Goringe, P., & Martinelli, M. (2020). Fishing gear as a data collection platform: Opportunities to fill spatial and temporal gaps in operational sub-surface observation networks. *Frontiers in Marine Science*,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

FV Observation Network at scale: the Moana project



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

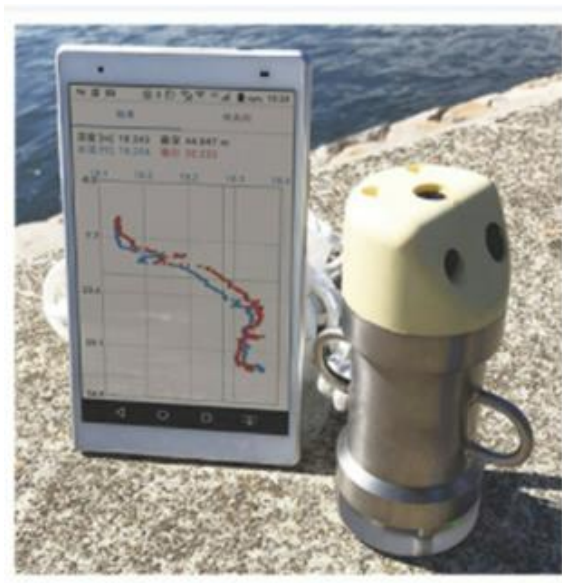
Diversity of Sensors and Vessels



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



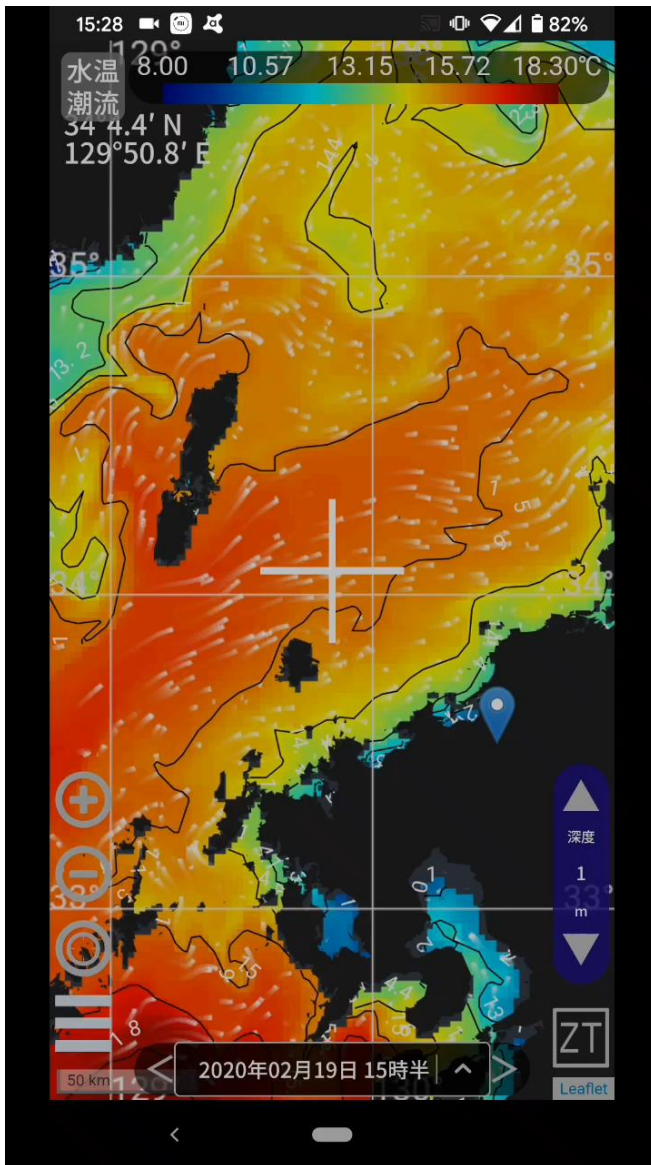
ZT Moana TD install
on a trawler,
Long Island, NY

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)



Comments from Kyushu Fishers



“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.”

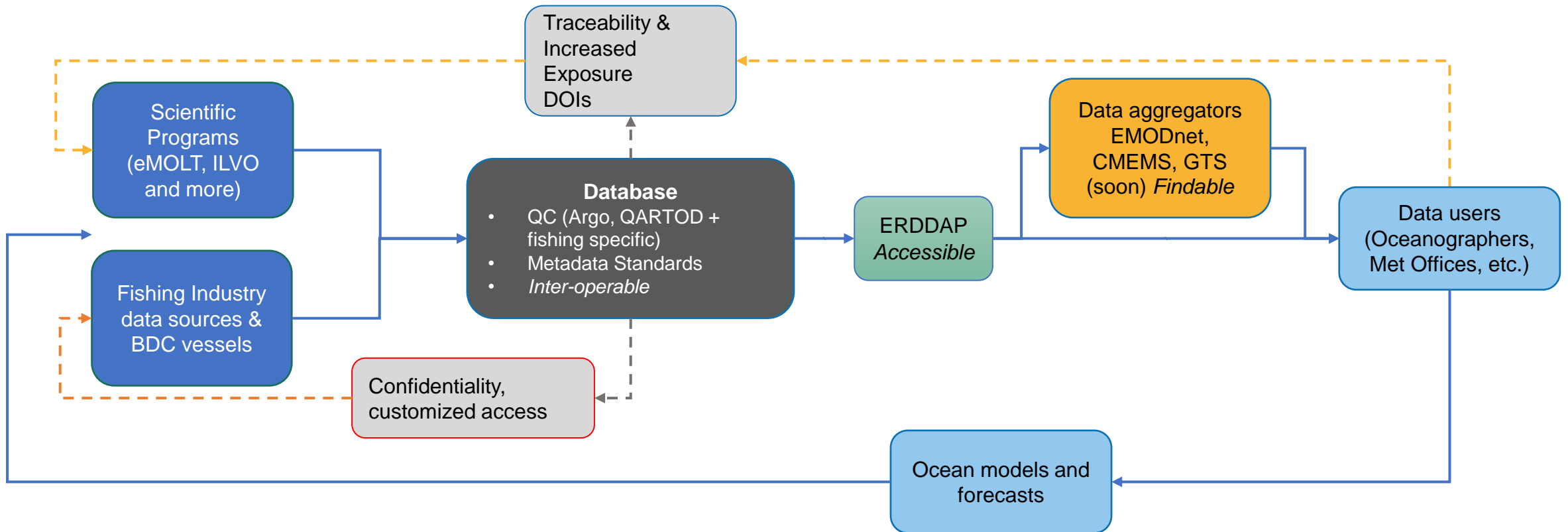
“I do not have to look around the fishing grounds anymore and thus 15% cut of fuel oils. It makes me so relaxed that I can take a nap on site.”

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

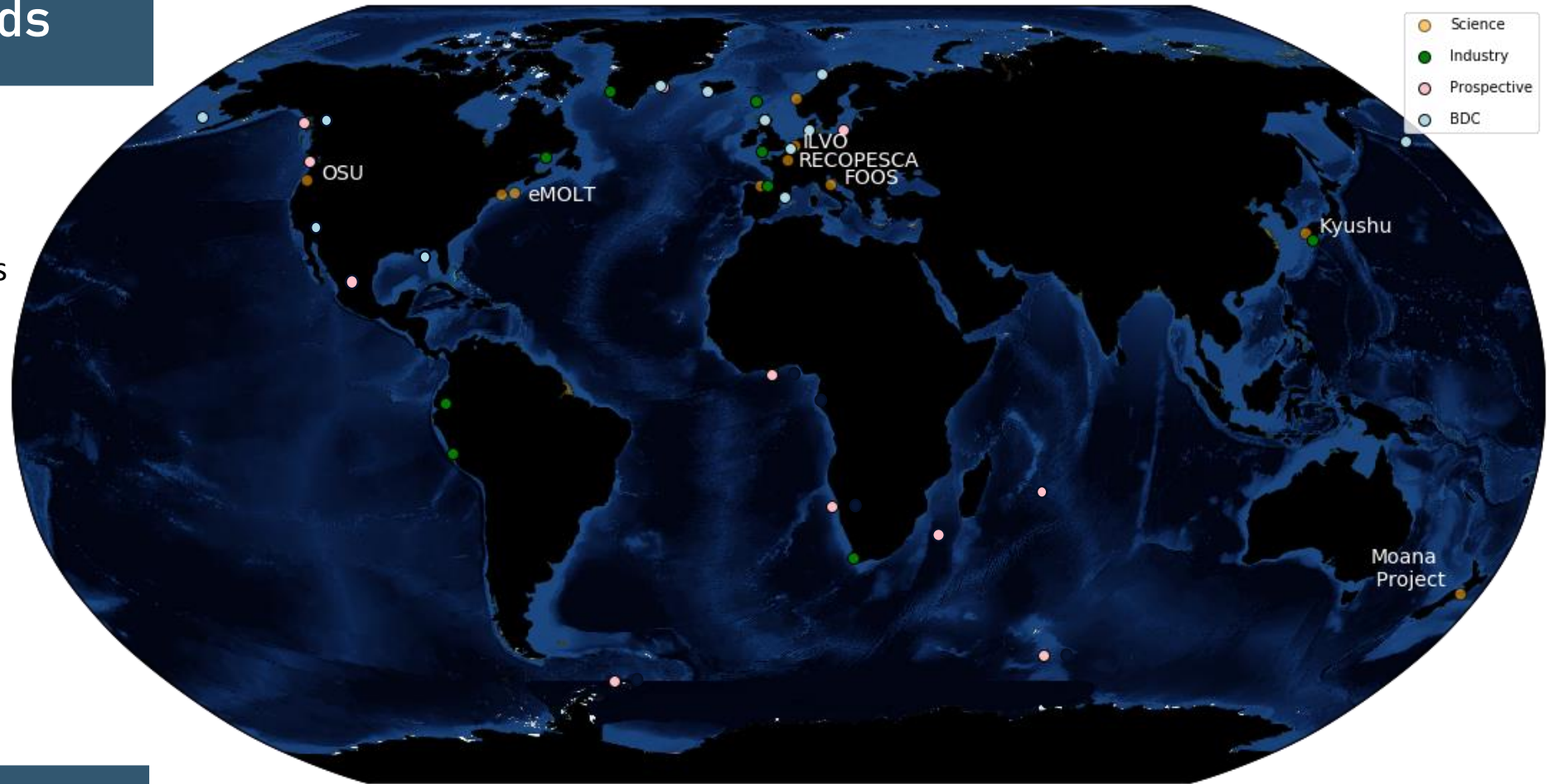
Increasing to more EOVs & ECVs

Series of workshops as part of next EMODnet Phase

Steering Committee

UN Decade Project

GOOS network



Partners & Support



Thank you!



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