

GOOS Network OCG-15 Report

The Fishing Vessel Ocean Observing Network (FVON)

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1. Highlight the key network successes

For FVON being here at OCG considered for becoming an emerging network is likely our greatest success to date! So, thank you for having us, and we are thrilled to be here.

FVON was also recently endorsed by the Decade as a project under the GOOS CoastPredict Program, which we are confident will be a fantastic framework to advance our network maturity and proliferation around the world.

The most exciting regional development is that the Fish-SOOP Australian program is now supported by IMOS to be expanded into a nation-wide observing network.

While the models using FVON data are at this point fairly limited, there is a recent OSSE paper from the NZ Moana Project showing quite exciting results. We are just now starting to get some of our data flowing onto the GTS, so hopefully this will accelerate modeling usage. There are also several good examples of direct data use to increase climate resilience of fisheries.

2. How has the network advanced across the OCG Network Attribute areas¹

Global in Scale: at least a pilot scale network exists on every continent, ranging from equatorial to polar. Particularly exciting traction in the Global South, and the CoastPredict Global Coastal Experiment presents a great vehicle for rolling out new networks.

Observes one or more EOVs or ECVs: For the most part FVON is focused on temperature profiling, as subsurface profiling is the unique data collection capability of fishing vessels, and due to the rough conditions of fishing necessitating rugged dependable instruments. That being said, particularly the FOOS (Italy) program is working with a variety of EOVs, and several programs are putting surface weather stations on vessels (ECVs).

Observations are Sustained: Observations are not sustained. However, by being so cost-efficient, it is our goal to be an enabler of making wide-spread

¹ <https://oceanexpert.org/downloadFile/45372>

observations sustainable. Furthermore, due to the collaborative nature of this approach, we have some tools available to us for non-traditional funding: stemming from making data collection a win-win for fishing industry stakeholders.

Community of Practice: We are FVON, but we do not have a formal legal structure or governing process. Significant work to be done.

Maintain network mission and targets: We are boldly claiming the network mission to become the coastal/shelf complement to Argo. Given the existing distribution of fishing activities, this by default helps to focus to our mission and targets.

Delivers data that free, open, and accessible in a timely manner: That is a requirement for data being “FVON official.” However, there is still plenty of FV data which is not publicly available which could/should be.

Ensures metadata quality and delivery: Yes, we are registering metadata with OceanOps. Many of our networks are not yet though, so substantial work to bring everyone up to speed.

Develops and follows Standards and Best Practices: There are some published best practice documents; however, these need to be updated and expanded to be inclusive of the global diversity of fishing vessels, which will be a continual job. We are striving to meet standards in order to make FVON data more usable for applications such as fisheries science. However, we are still working to standardize across even the founding networks.

Undertakes capacity development and technology transfer: This approach is fundamentally inclusive as it is built on collaboration. And by costing at least an order of magnitude less than other profiling technologies, our hope is that this can make ocean observing accessible in many regions where it previously has not been. Plans to work both internally and with CoastPredict to create a cookbook of modular components to roll out new FVON obs networks lead by local stakeholders.

Environmental Stewardship Awareness: While fishing undoubtedly has a substantial environmental and ecosystem impacts, by going along for the ride with activities that are already occurring mean that the impacts of FVON data collection are essentially zero. Furthermore, these data will be a key enabler of enabling more dynamic and ecosystem based fisheries management strategies, which are key for increasing the economic and ecological sustainability of fisheries, particularly in a climate change context.

3. Future Plans² and Opportunities - at network and/or cross-network OCG level

One of our first tasks is to do instrument intercomparisons and assessment experiments, which would include experiments on different fishing gears in conditions from polar to equatorial. Building off of this intercomparison, we aim to publish open standards, targets, and market projections in order to encourage innovation from instrument providers, and give them economies of scale in order to drive costs down.

We are still working to standardize automated QC and data management across our founding networks. For the most part, there is no delayed mode.

Early discussions with Argo and Glider groups around a serving a profile data product combining all of our profiling networks.

We are keen to collaborate with and support relevant GOOS exemplar programs, e.g. Tropical Cyclone and Boundary Currents.

4. Challenges and Concerns - at network and/or cross-network OCG level

The coordination of FVON has zero funding thus far, so we have good plans, but challenging to implement.

The Moana project, which is the first national scale network, is in grave danger of having budget completely dry up. This would be a tragedy, and they only need less than \$1MM. Does anyone have ideas on people worth asking or avenues to try?

5. Asks from OCG (Exec, networks, OceanOPS, and/or GOOS), perhaps related to the responses to parts 3 and 4 and how OCG can support your network

As this is our first OCG meeting, we are primarily here to listen and learn from the more mature networks and about the OCG process.

We are feeling quite positive about recent GOOS directions looking to confront accessibility of ocean obs in developing nations, filling the coastal gap, and other directions as outlined in challenge 7 white paper for UN Decade.

FVON wants the broader oceanographic community to know that fishing vessels can be among the tools available for ocean observing. Simply being a part of GOOS is a huge step in the right direction but would be great to discuss further steps. Have there been thoughts about a GOOS ocean observation network design tool, guide, or framework? This could be interesting, particularly for coastal nations that previously have not been engaged in ocean obs.

² Future plans on implementation, instrumentation, data management, test, new sensors, plan for new EOVS/ECV observations, capacity development, etc.

Lower priority: could discuss green branding opportunity for fishing fleets, which they have been bringing up. Word Ocean Council has expressed interest in partnering on this initiative.

6. Recent publications, articles, etc. (if you want to share)

OSSE: Kerry, K., Roughan, M., De Souza, J. (2024). Assessing the impact of subsurface temperature observations from fishing vessels on temperature and heat content estimates in shelf seas: A New Zealand case study using Observing System Simulation Experiments. *Frontiers in Marine Science*, 11, 10.3389/fmars.2024.1358193

Community FVON paper: Van Vranken, C. H., Jakoboski, J., Carroll J. W., Cusack, C., Gorringer, P., Hirose, N., Manning, J. P., Martinelli, M., Penna, P., Pickering, M., Santos, A. M., Roughan, M., De Souza, J., & Moustahfid, H. (2023). Towards a global Fishing Vessel Ocean Observing Network (FVON): State of the art and future directions. *Frontiers in Marine Science*, 10, <https://doi.org/10.3389/fmars.2023.1176814>

Penna, P., Domenichetti, F., Belardinelli, A., and Martinelli, M. Dataset of depth and temperature profiles obtained from 2012 to 2020 using commercial fishing vessels of the AdriFOOS fleet in the Adriatic Sea, *Earth Syst. Sci. Data*, 15, 3513–3527, 2023. <https://doi.org/10.5194/essd-15-3513-2023>

Martinelli M., Penna P., Guicciardi S., Duchene J., Haavisto N., Marty S., King A., Van Bavel B., Ødegaard Ø., Ntoumas M., Campanelli A., David A., Domenichetti F., Le Gall C., Lescroart E., Malardé D., Moro F., Kielosto S., Seppälä J., Sparnocchia S., Zacchetti L. D5.6 Validation and integration report on ships of opportunity, WP5 “Integration” H2020 NAUTILOS project “New Approach to Underwater Technologies for Innovative, Low-cost Ocean observation”, 03/11/2023. <https://doi.org/10.5281/zenodo.10665503>

Short YouTube video about Ghana pilot: <https://www.youtube.com/watch?v=3FoQkyIW5DM>