



Supporting the
All-Atlantic Ocean Research
and Innovation Alliance



Hackathon Report

Small-Scale Fisheries
June 2026



Funded by
the European Union

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Context and Problem Statement

Problem Statement

How can we help fishers, aquaculture operators, and managers convert diverse ocean and climate data into clear choices about fishing gear, fishing seasons, fishing areas and Aquaculture siting? Our challenge was to develop a low-cost prototype decision support tool (DST) that will support data driven, climate aware and biodiversity positive decision making across the Atlantic basin.

Context

Small scale fisheries (SSF) provide at least 40% of global fisheries catches, and 1 in 12 people globally depend at least partly on small scale fishing (Basurto, Gutierrez, Franz et al. 2025). Small scale fisheries are an important source of both food security and employment across the Atlantic basin. In the EU alone, small scale fishing vessels make up 80% of the fleet, accounting for 40% of employment in the sector (Blomeyer; Sanz, 2017). Decisions faced by small-scale fishers include those related to risk mitigation and safety (weather, vessel traffic, sea conditions), economic efficiency (fuel consumption, focusing fishing effort for maximum catchability), compliance and sustainability (International and national regulations, gear type selection, local ecological factors).

Currently, the data needed to drive these decisions is spread across a wide range of sources, including lengthy legislative documents, complex academic publications, and ever-changing real-time data for meteorological, oceanographic and marine traffic information. Although a wealth of data useful for decision making exists, issues with accessibility often result in it being underutilised. It takes significant time to comprehensively review such a range of data sources, and it is not always viable or cost effective to small scale fishers.

There exists a gap for an 'all in one' solution for small scale fishers. A mobile application combining safety information, weather data, legal requirements, and catchability would be invaluable to those working in the small scale fisheries sector. Ease of use in the field, accessibility, and a personalised experience showing only the information relevant to the users' specific requirements would drive better decision making and improve efficiency in small scale fisheries.

The solution proposed below aims to remove uncertainty from the daily decisions made in the field by small-scale fishers such as when and where to fish, gear selection, compliance with regulations, and maximising yield and profitability while ensuring sustainability.

Added Value of the Solution

The proposed solution is a mobile-based decision support platform for small-scale fisheries that integrates environmental, regulatory, spatial, and fisheries data into a real-time predictive tool that supports safer, more efficient, and sustainable daily harvest decisions.

The app adds value by transforming fragmented environmental, regulatory and fisheries data into a single decision-making support tool for small-scale fisheries. Through predictive analysis, spatial mapping, and real-time information sharing, the platform supports informed decision making for fishers while also generating benefits for fisheries management, research, and coastal communities.

Value to Fishers and Local Communities:

- Collates a broad range of data into a simple, user-friendly format
- Reduces uncertainty in daily fishing decisions
- Improves catch efficiency and reduces fuel costs through predictive fishing-zone recommendations
- Enhances safety at sea through live environmental alerts and peer-peer communication
- Supports compliance with fisheries regulation by integrating licensing, gear restrictions, and marine protected area information into the app
- Minimises manual reporting burden through simplified data entry
- Provides offline functionality and satellite connectivity for use in remote environments
- Creates incentive for participation through verified profiles, access to data and community knowledge
- Provides localised community control over data and information sharing (data governance) through tiered access and user controlled data sharing
- Encourages trust and collaboration between fishers, governments, researchers, and local communities
- Strengthens peer-to-peer communication and shared environmental awareness

Value to Fisheries Management and Research:

- Improves stock monitoring and long-term fisheries trend data collection
- Enables more accurate spatial understanding of fishing efforts, bycatch hotspots and environmental pressure
- Encourages standardised data collection in real time
- Provides datasets that could support fisheries research, climate studies, and evidence-based policy development

Innovation and Scalability:

- The app offers a scalable and adaptable solution suitable for different fisheries, regions, and governance systems
- Integrates predicted AI and machine learning capabilities that improves over time and user feedback

- Uses a co-development approach with end users to ensure trust, usability, and long-term adoption.

Overall the tool adds value by improving decision making capabilities, safety, sustainability, operational efficiency and community trust whilst supporting the long-term resilience and livelihoods of local fishing communities.

Prototype

Over 24 hours, a prototype of this app was developed during the All-Atlantic Ocean Research Alliance event titled “Intergenerational Hackathon 2026” in Bahia, Salvador. HOOC is an app that hosts data on bycatch hotspots, vessel traffic, oceanographic data, ghost gear locations, regulations such as location of Marine Protected Areas and borders, bathymetry data and more that will be implemented by the app developers from reputable sources. Fishers using the app can include more data from their own trips such as local weather data, real-time bycatch data, changes to bathymetry, data on currents and more to ensure there is ground truthing to the data on the app. The app will use AI based on existing models, such as MarineGuardian, to convert the data into a predictive model which will feed the red, yellow and green traffic light widget on the app. Using a map in the app, users can explore potential fishing areas and be presented with an associated colour indicating the likelihood of a safe and successful fishing trip. A red area tells fishers that a certain area is not ideal to fish in, a yellow area describes an area as available to proceed with caution while any area showing green indicates a safe area with high likelihood of a successful catch.

Following a presentation at the MarineGuardian meeting in Bilbao (Spain) and at the BioProtect meeting in Azores (Portugal), we are keen to incorporate feedback into further developing a working prototype. Specifically, we are interested in defining the predictive powers of the tool before developing it into an app. For this, however, we will need to collect some on-the-ground information (see Limitations below).

Limitations

There are currently some limitations in the following areas:

Development:

Currently, the lack of input from potential end-users (fishers) is the main limitation to the project. Specifically, we will require guidance on which sources fishers currently use for information gathering (e.g. weather, sea conditions, fish abundance). Furthermore, we require a clear breakdown of how this information is used to inform their decisions (i.e. how they weigh the pros and cons of embarking on a fishing trip, and how this information is fed into the decision of where to fish).

App function:

App functionality may be limited by the availability of reliable network and/or wireless internet connection. As the app is projected to incorporate large and complex datasets, a reliable connection may be needed, yet may be absent in certain geographical or rural areas. We need more information on functionality of offline versions to accommodate this, while respecting the data needs.

App implementation:

Extrapolating from functional limitations, we project that data coverage may differ across areas. This may affect the accuracy of the app in both data-deficient areas and fisheries. In addition, we anticipate discussions regarding data sovereignty, access and confidentiality. There are examples of apps (e.g. OutdoorActive, GoogleMaps, SIKU, Strava) that allow users to download maps and associated metadata, while in areas of available data connection which can be used when the users travel to areas without data connectivity. However, users can only upload new data once back in areas of data connectivity.

As we work through the PESTEL framework (Political, Economic, Social, Technological, Environmental, and Legal factors), we hope to build trust and a collaborative workflow with end-users. Some solutions we have already considered are:

- Test first, then scale up
- Building trust through a co-development pathway
- Test on SSFs with a verified profile and adequate data availability
- Explore local data storage options for offline functionality
- Data accuracy:
 - Track data accuracy over time based on cross-referencing local authorities and/or remote monitoring systems
 - Boats sign up for verified profile
 - Time data collection and recording to shorten gap of time and ensure data is not 'forgotten' this would affect accuracy score
 - Include photos in posts would elevate accuracy score
 - Feedback loops - users can report issues with the app
- Confidentiality:
 - Tier system of data sharing: users decide who gets access to what data
 - Incentives to share data: subsidies for groups that allow commercial or government use of data.

Scale-Up

The first testing stage of the app will be conducted in Bahia, Brazil. The coastal community there hosts several small-scale fisheries, which also will allow exploration of transferability among gears and target species. Additionally, the concept of the app was

conceived in Bahia and part of the group members developing this project are based in Bahia. Once we complete proof of concept regionally, we can share the success to funders, investors, governments and other users to support the growth of the app across Brazil and internationally.

Other uses of the app could be for academics to use the data to publish research related to small-scale fishery development and climate change indicators. The government could use the data output of the app to inform policy related to fishing regulations, location of future Marine Protected Areas, climate change policies and more. Investors could use the data from this app to learn more about specific areas before they decide to invest in local fisheries.

Promotion

As all fisheries, communities and socio-economic situations are different, we cannot viably upscale without situation-specific community input. The app developers must commit to consulting with on-the-ground users regarding needs and applicability at all steps of the upscaling process. As the model includes the use of AI learning processes, the platform will remain flexible enough to incorporate these changes. It will be key to heavily promote the use of this app to local fishers. Building working relationships and trust is foundational for uptake of the app in communities. During the development stages, the trial period and after the launch, local fishers will be consulted at every step. When people are included throughout every step of development, they are more likely to use the app and provide meaningful input. In the future, it is ideal to offer users the option to download the app on multiple platforms via their respective app stores.

Funding

The app co-creators are from countries all over the world adjacent to the Atlantic Ocean. Therefore there is an opportunity to apply for funding in several countries. Possibilities for funding include Governmental funding regionally or nationally as well as funding from the high-level administration of AAORIA or partners. Another opportunity to explore is to pitch the solution to philanthropic organizations and fishing associations in the industry. In the development process of the app, consultation with local users will be required to discuss consent about offering data to academia, industry or government in order to sustain funding of the app.

References

(Basurto, X., Gutierrez, N.L., Franz, N. *et al.* Illuminating the multidimensional contributions of small-scale fisheries. *Nature* **637**, 875–884 (2025). <https://doi.org/10.1038/s41586-024-08448-z>)

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