

# Knowledge Transfer Platform FindFISH – Numerical Forecasting System for Fisheries for the Marine Environment of the Gulf of Gdańsk

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www.findfish.pl

## Introduction

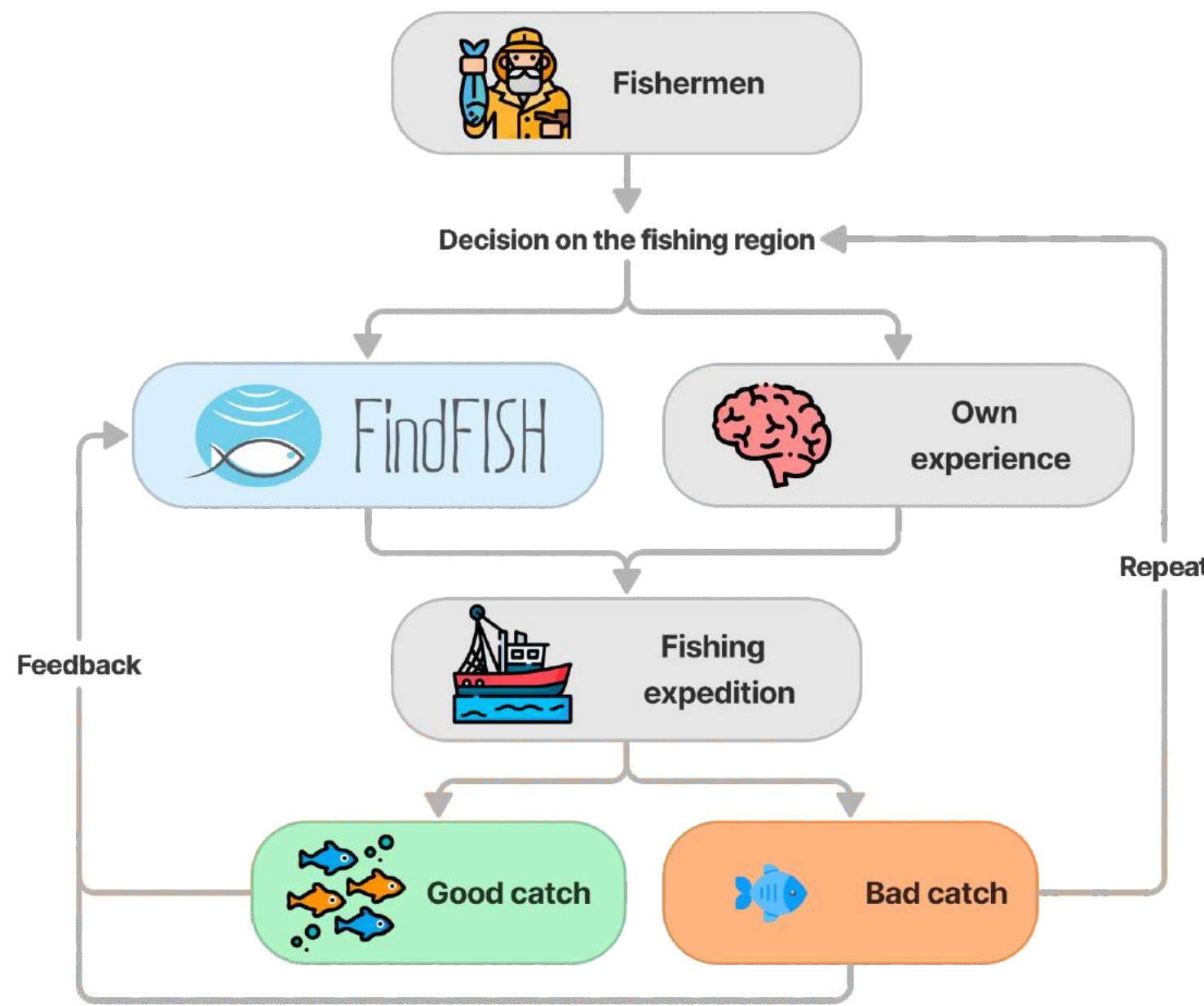


Fig.1. Simplified scheme of the FindFISH platform.

The FindFISH Knowledge Transfer Platform aims to tackle the primary challenge facing the fisheries sector: the declining profitability of fishing operations. This challenge is accompanied by several concerns, including rising operational costs for fishermen, the need for longer and more distant fishing trips to find fish, catching low quantities or low-quality fish, engaging in activities that barely break even due to increasing costs, complying with fishing quotas, and dealing with associated difficulties.

Currently, the Polish fishing industry is searching for effective strategies in response to these challenges. Increased awareness of the nutritional benefits of fish among the Polish population has led to a rise in fish consumption (European Commission, 2009). While new technologies help meet this growing demand, they also add pressure on fishing resources. As a result, many fish stocks are being overexploited, posing a threat to the marine ecosystem of which fish are a crucial part (Fousiya et al., 2023; Kemp et al., 2023; Laghari et al., 2022).

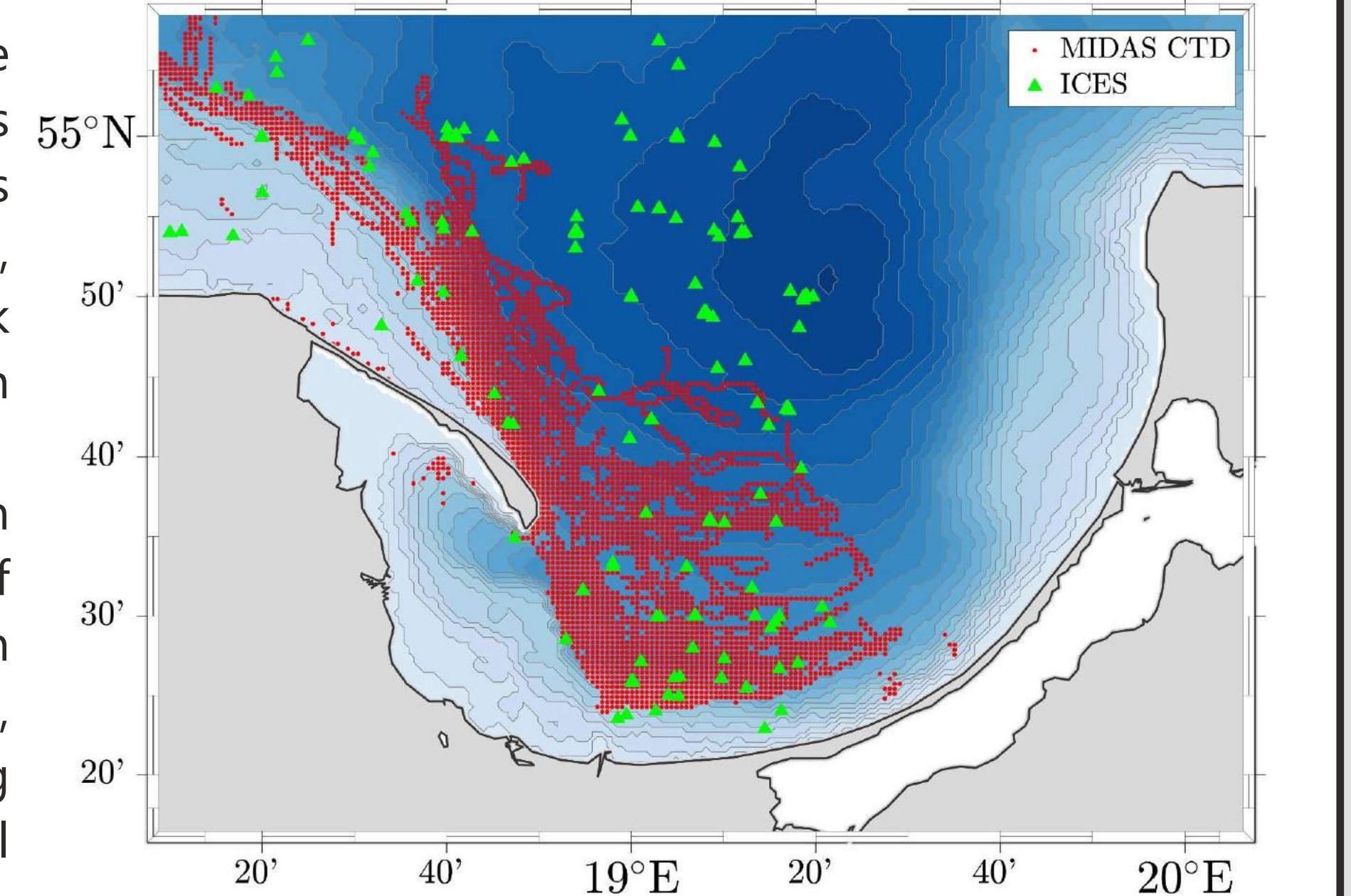


Fig.2. Map of the fishing expeditions and ICES monitoring.

## Materials & Methods

The work within the FindFISH project was divided into five main stages and implemented in three blocks: environmental research, numerical work, and IT tasks (Dzierzbicka-Głowacka et al., 2018). In the first stage, an assessment of the Gulf of Gdańsk's environmental condition was conducted, focusing on chemical and ecological aspects, particularly the ichthyofauna, utilizing existing and newly acquired data (Kuczyński et al., 2023; Zaborska et al., 2023, 2019). The second stage involved fishing expeditions where physicochemical measurements were taken, including water temperature, salinity, and dissolved oxygen levels, to determine habitat preferences of selected fish species and validate the EcoFish model (Krzemień and Wittbrodt, 2023). Analysis of the data from these expeditions allowed for identifying habitat preferences for commercially harvested fish species in the Gulf of Gdańsk (Pieckiel et al., 2023). The third stage was the development of the EcoFish model, comprising hydrodynamic, biochemical, and Fish Module components, enabling the monitoring and prediction of changes in the marine environment (Janecki et al., 2023c, 2023b; Janecki and Dzierzbicka-Głowacka, 2023; Nowicki et al., 2023b, 2023a). The Fish Module, employing fuzzy logic, was created to interpret environmental parameters and determine optimal conditions for fish habitat (Janecki and Dzierzbicka-Głowacka, 2023). Additionally, the FindFISH Platform was designed to visualize measurement data, forecasts, and environmental conditions for fish habitat in real-time (Biernaczyk et al., 2023).

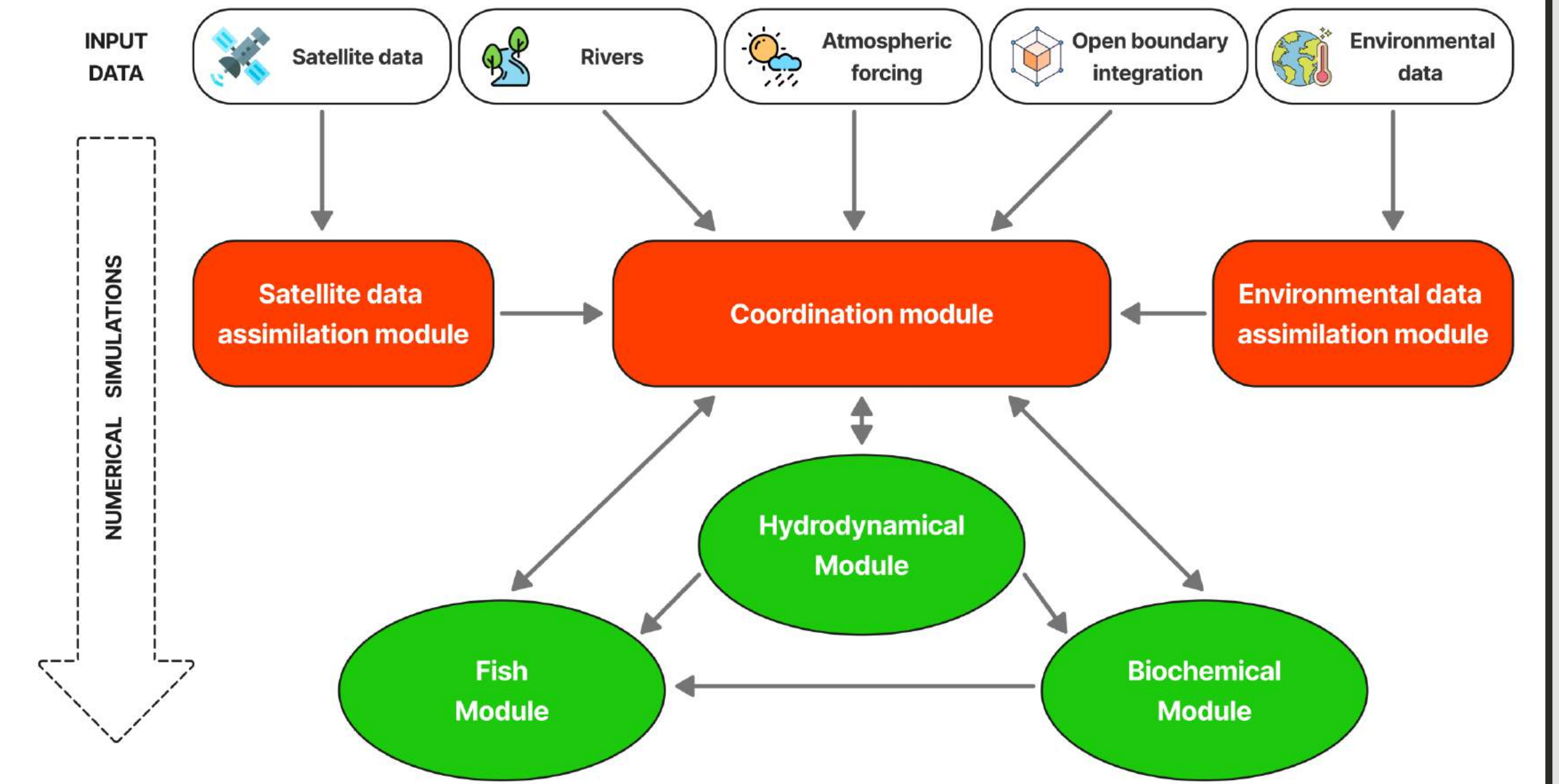
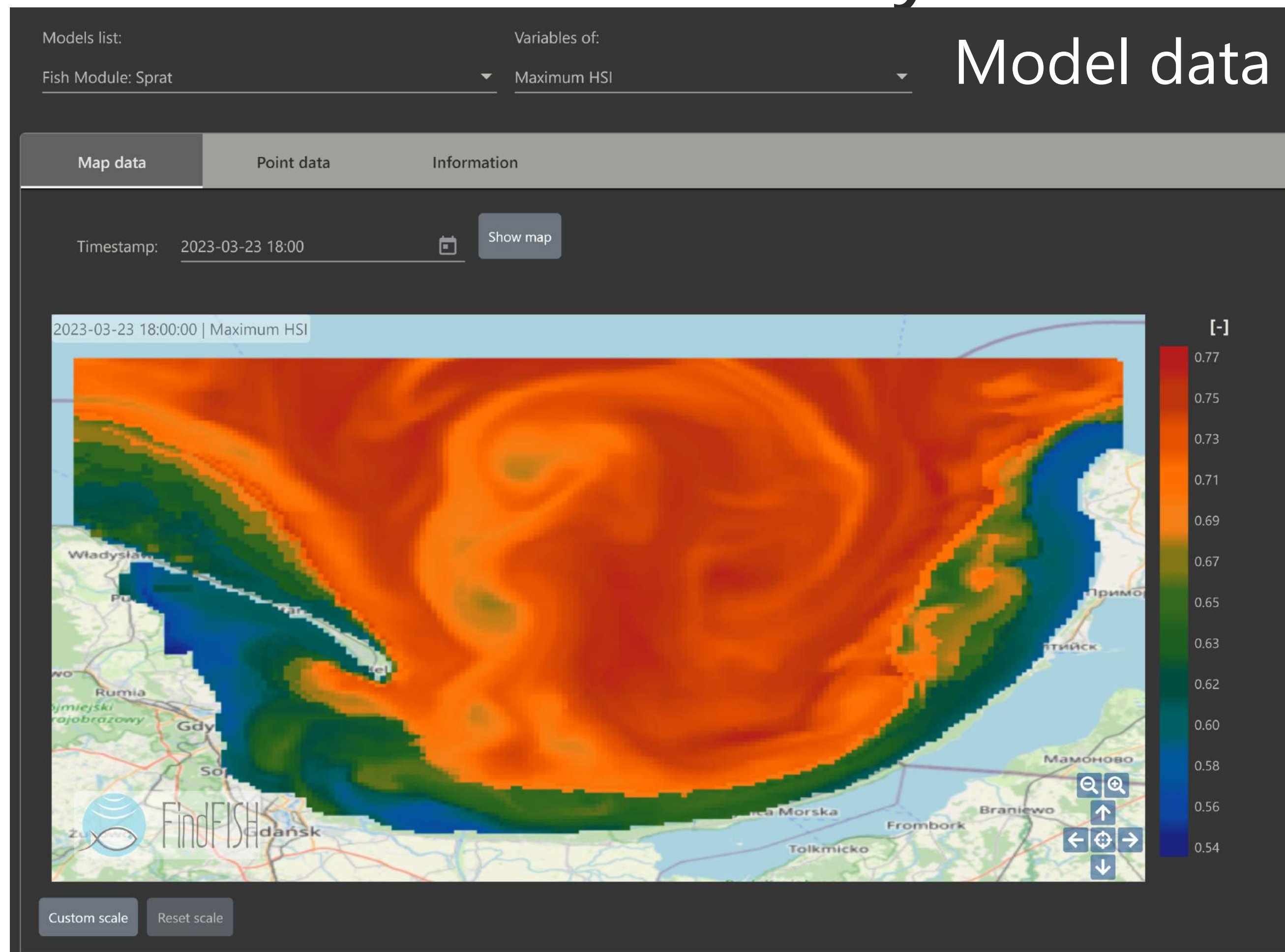


Fig.3. Structural scheme of the FindFISH numerical model.

## Results & Summary



The FindFISH Platform represents a significant leap forward in fishing technology, presenting a comprehensive solution that integrates historical data, environmental observations, and user feedback to optimize fishing operations. This platform holds the potential for substantial economic and ecological advantages:

- **Fuel Savings and Operational Cost Reductions:** Drawing from operational data, the FindFISH Platform has the capacity to curtail overall operational expenses by 5-15%. This reduction is realized through the implementation of more efficient fishing routes and strategies, leading to significant fuel savings, particularly for vessels engaged in extended voyages.
- **Time Efficiency and Enhanced Fish Quality:** The platform stands to decrease trawling time by approximately 25%, facilitated by precise location predictions that enhance fishing efficiency. This translates to a roughly 20% reduction in the time from catch to port, consequently improving the freshness and quality of the catch.
- **Environmental Benefits:** The FindFISH service contributes to mitigating the environmental impact of fishing activities. Reduced trawling time translates to diminished disturbance to marine ecosystems and a decrease in bycatch.
- **Profitability and Compliance:** By facilitating targeted fishing, the platform ensures adherence to fishing quotas while enhancing the profitability of catches, as fishermen can concentrate on commercially valuable species.

These projections are derived from the experiences and input of fishermen who have utilized the platform, coupled with an analysis of diverse factors influencing the costs of fishing operations. The precise impact of the FindFISH Platform on cost reductions will become more apparent in the coming years, as a growing number of fishermen embrace the system and provide feedback on its efficacy.

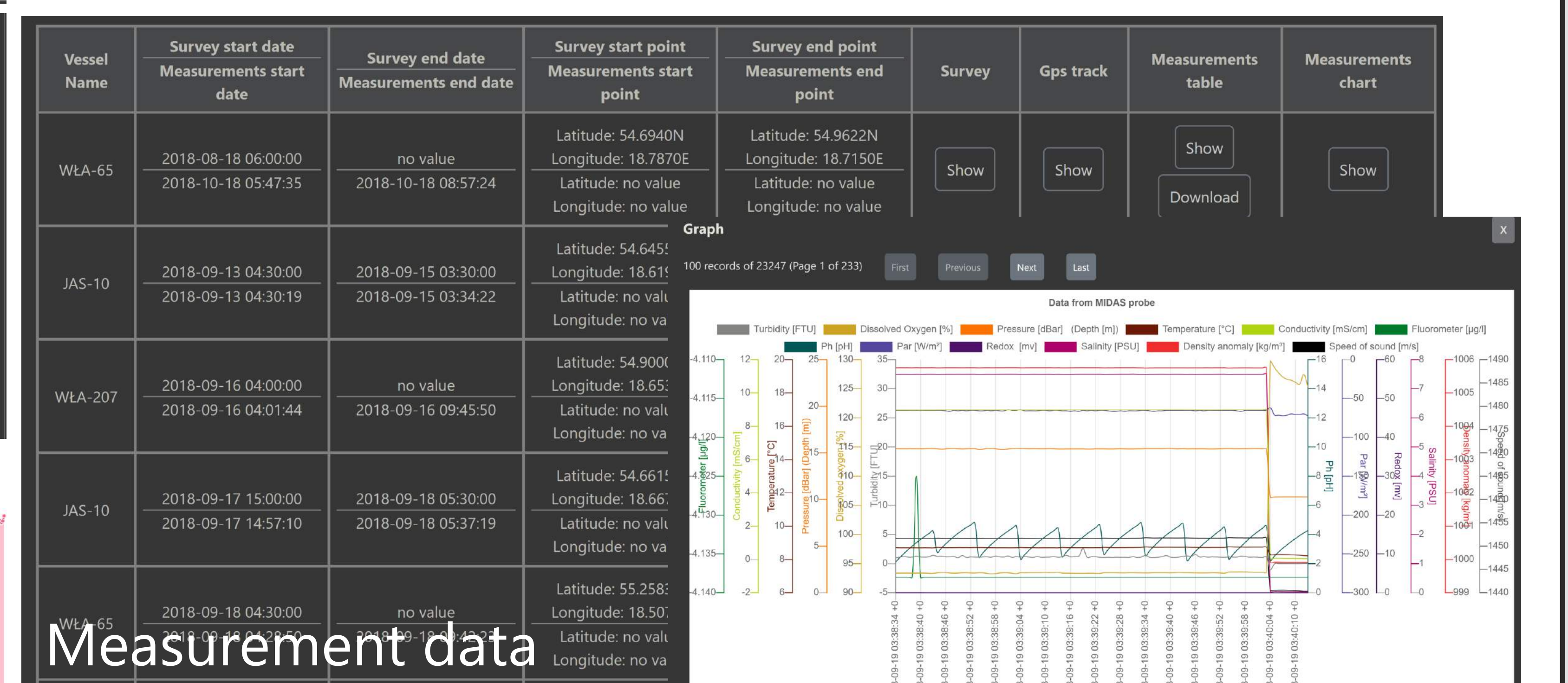
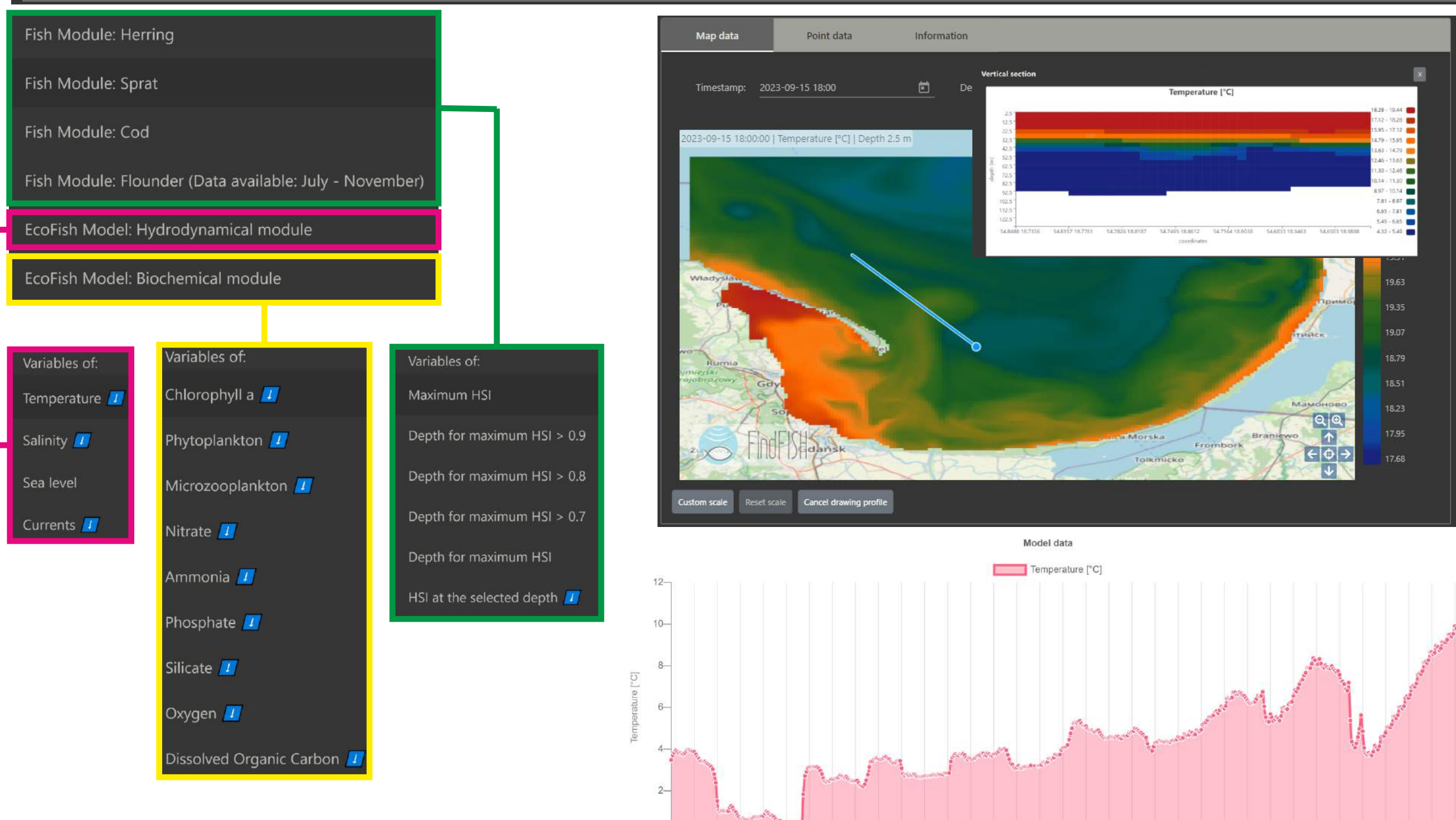


Fig. 4. Operational forecasting system FindFISH supporting fishermen in their daily tasks.

Project co-financed by the European Regional Development Fund (ERDF) under the ROPPV for 2014-2020

