



NATIONAL
MARINE
FISHERIES
RESEARCH
INSTITUTE

OFFER
of the National Marine Fisheries
Research Institute

Gdynia, June 2025

Offer of the National Marine Fisheries Research Institute (NMFRI).

1. General information about the Institute

The National Marine Fisheries Research Institute (NMFRI), located in Gdynia, is a leading scientific and research unit in Poland, specializing in interdisciplinary research of the marine environment, fisheries, aquaculture, aquatic food technology. The Institute has been operating continuously for more than 100 years, supporting the development of the fisheries sector, the protection of marine resources and the innovation of the food industry. It employs 233 people, including 31 researchers.

The institute meets international quality and safety standards (ISO 9001:2015 and ISO 45001:2018).

2. Historical outline and international position

NMFRI has been involved in shaping maritime policy in Poland and the European Union for decades and has contributed to the implementation of the Common Fisheries Policy. It is an active member of international organizations related to marine protection and fisheries, including ICES, EFARO and the Helsinki Commission (HELCOM) working groups, as well as food processing - WEFTA. It has ongoing cooperation with research units from the EU countries, as well as the USA (NOAA - cooperation since 1974). NMFRI employees are also members of the STECF fisheries scientific committees of the European Commission.

3. Scientific achievements and potential

The institute employs qualified scientific and research staff, both experienced experts and young scientists. In 2024, NMFRI staff published 43 scientific articles, including in renowned international journals, and presented research results at 39 scientific and sector-specific conferences. The institute provides ongoing support to the administration responsible for managing the fisheries sector, by providing advice on living resource management and economic efficiency of the sectors.

NMFRI specializes in scientific and service units (plankton sorting and determination), a marine education center operating at the NMFRI Aquarium, and state-of-the-art research infrastructure. Scientific units are supported by an administration responsible for handling research projects and services provided by the Institute.

The Institute has a modern research infrastructure, including:

- Experimental and breeding center in Gdynia (<https://pike.mir.gdynia.pl>), equipped with fish culture systems and aquaria for invertebrate experiments;
- Field Research Station in Świnoujście, enabling to conduct a wide range of oceanographic and fishing research in the waters of the Pomeranian Bay, the Szczecin Lagoon and adjacent waters, including the shallows of the coastal zone of the Oder estuary;
- Laboratory for spectroscopic analysis in the near and mid-infrared (NIR/MIR);
- Automated epifluorescence microscope with artificial intelligence-based image analysis software for quantitative and qualitative analysis of bacterioplankton and pico- and nano-phytoplankton;
- Flow cytometer with five lasers and autosampler for quantitative analysis of bacterio- and picophytoplankton;
- Oxford Nanopore's MinION sequencer;
- ARIS (Adaptive Resolution Imaging Sonar) multibeam sonar for non-invasive imaging of fish behavior in situ;
- State-of-the-art laboratories offering a wide range of chemical and biological analyses, including phyto-, zoo- and ichthyoplankton, and marine zoobenthos;
- Rt PCR Analyzer;
- HPLC and GC chromatographs;
- The scientific research vessel Baltica, enabling research work in the Baltic Sea, and smaller vessels for research in shallow transitional and coastal waters.

4. Scope of services and research activities

(a) Research and consulting

- Monitoring and assessment of the status of the biological resources of the Baltic Sea, statistical analysis of biological and economic data, and the creation and development of databases and analytical and visualization tools dedicated to the management of living marine resources;
- Studies of diet composition and age of fish;
- Trend studies of early life stages of fish as indicators of spawning grounds and reproductive efficiency of selected fish species;
- Experimental studies of early developmental stages of fish in small experimental RAS systems;
- Application of microstructural analysis of otoliths of larvae and fry in the study of the ecology of early life stages of fish;
- Experimental studies on the effects of environmental and anthropogenic factors on invertebrates and fish (behavioral, biochemical and physiological parameters);
- Study of trophic relationships using trophic markers (fatty acids, amino acid isotopes);
- Toxicological and environmental studies for ecological risk assessment;
- Testing for the presence of undesirable substances in the environment;

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- Research on the development of environmental assessment methodologies in accordance with the Water Framework Directive and the Marine Framework Strategy Directive;
- Studies of ecotones associated with the Baltic coastal zone by direct and telemetric methods;
- Zoobenthos research in the open Baltic Sea and in the coastal zone;
- Physical and chemical studies correlated with the situation of the biotic component of the Baltic and coastal zone ecosystems;
- Exploring the potential of using infrared spectroscopy techniques for multifaceted biological, chemical and environmental research;
- Developmental research in the technology of processing fish raw materials into food, feed and technical products;
- Shelf-life studies of fish products involving a variety of tests to assess product quality, functionality and safety;
- Research and development (R&D) in the mechanization of unit operations and processing systems in the fish industry;
- Fleet capacity modeling and resource availability forecasting; scenarios for sector development and restructuring;
- Economic consulting for the fisheries sector (including cost analysis, compensation, fleet efficiency);
- Research, analysis and public consultation on processes in the fisheries and aquaculture industry. Conducting focus groups, field surveys and interviews with stakeholders;
- Economic consulting for the fisheries sector (including cost analysis, compensation, fleet efficiency). Valuations and methodologies for national entities for marine fisheries and aquaculture programs. Financial analysis of the fisheries sector;
- Public awareness research in the blue economy sector.

(b) Services and knowledge commercialization

- Marine spatial planning in terms of impacts on fisheries;
- Genotyping of microsatellite markers (msDNA) of fish to determine individual and population genetic variation and identify population structure in the species' area of distribution;
- Species identification of fish and food fish products (fresh, frozen, smoked, dried products) based on identification of COI gene fragment and cytochrome b;
- Determining the age of fish - we have decades of experience in determining the age of fish. We have determined the age of fish under multi-year contracts for scientific institutions in the UK and the Falkland Islands government;
- Determining the diet composition of fish - we have many years of experience in analyzing the food composition of predatory fish, not only from the Baltic Sea, but also from the North Sea.
- We also offer consultation on determining taxonomic groups that may be problematic to identify during fish diet analysis. Our extensive experience is confirmed by our long-standing cooperation with the Swedish University of Agricultural Sciences;
- Environmental surveys using drones, satellite imagery and other digital tools;
- NMFRI carries out numerous commercial projects related to the environmental impact assessment of investments planned in the marine environment. Our role is both to carry out environmental inventories of areas where investments are planned, and to prepare inputs to the Environmental Impact Assessment based on them. Experience includes comprehensive studies performed for such investments as the construction of ports, offshore pipelines, wind farms or energy infrastructure (such as the planned nuclear power plant in Pomerania). The institute provides full technical support in planning, execution of field studies, laboratory analyses and reporting in accordance with legal and environmental requirements (e.g., in the context of Natura 2000, MSFD, WFD);
- Microbiological testing based on molecular methods (amplicon sequencing, qPCR) for rapid identification and monitoring of environmental hazards caused by bacterial pathogens and/or toxic algal blooms;
- NMFRI conducts work in modeling the functioning of marine ecosystems, including analysis of the flow of matter and energy in trophic networks and assessment of the impact of anthropogenic pressures on the structure and functioning of ecosystems. Ecosystem models support the sustainable management of the marine environment and allow the assessment of scenarios for the development of economic activities in the context of the protection of biological resources and ecosystem services;
- Determination, sorting and analysis of plankton - including taxonomic identification and phytoplankton imaging;
- Quantitative and qualitative analyses of bacterio- and picoplankton, including selected pathogens and toxic species
- Studies of quality, chemical composition of fish and fish products, as well as expert opinions, technological opinions, courses and industry training;
- Opinion on Polish market names of fish, invertebrates and algae;
- Providing opinions on legislation in the fish sector. Proposals for solutions of traceability systems for fish industry players.

(c) Research specialized directions

- Use of fish industry by-products to produce food, feed and pharmaceutical components;
- Application of numerical and machine learning methods for otolith-based fish age determination and stock modeling;
- Validating methods for determining the age of fish and providing training in hard structure analysis;
- Assessing the impact of stressors on marine organisms;
- Analysis and monitoring of microplastics in water, sediment, and marine organisms;
- Monitoring of pollutants that are indicators for assessing the state of the marine environment in accordance with the Water Framework Directive and the Marine Strategy Directive;
- Species identification of fish and fish products using genetic techniques (COI, msDNA) and, MIR/NIR spectroscopy;
- Qualitative and quantitative analysis (including monitoring) of bacterial communities and phytoplankton;
- Reproduction of fish and rearing of their early life stages under farming conditions (including for stocking purposes).

5. Examples of ongoing projects and achievements

- **The Multiannual Fisheries Data Collection Program (DCF – data collection framework)** implemented since 2005 and financed with EU funds - is a key tool for fisheries management policy in Poland. NMFRI is responsible for the comprehensive collection, analysis and sharing of data on fishing resources and fleet activities.
- **International recognition for innovative technological solutions** - the Institute has won, among others, the Grand Prix Mercurius Gedanensis (POLFISH), the IPITEx 2024 silver medal (Thailand), the IWIS 2024 gold medal, and an award from the Minister of Agriculture for the development of innovative packaging methods for fish products;
- special awards for fish processing equipment and modern packaging technologies developed jointly with industry.
- **Implementation of FT-IR spectroscopy methods and the concept of "green chemistry"** - implementation of infrared spectroscopy (MIR/NIR) methods for rapid and non-invasive testing of raw material quality and species identification of aquatic organisms.
- **Novel applications of digital and AI methods** - work on applying image recognition and machine learning methods to automatically analyze otoliths to determine the age of fish and create models to help plan sustainable resource exploitation.
- **Participation in national and international projects** funded by numerous sources, such as European Union funds (e.g. FER, Horizon, Interreg), funds from the Ministry of Agriculture and Rural Development, NSC, NCRD; e.g. Horizon Europe - REFEST - *Retrofitting of fishing fleets with low payback time and easy to deploy solutions for footprint and GHG emissions reduction* - research and assessment of the impact of small-scale fisheries' electric vessel drives, IMPRESS - *Innovative approaches for marine and freshwater based ingredients to*

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develop sustainable foods and value chains - research on management of low-trophic organism species;

- **Strong and systematic international cooperation** - NMFRI actively participates in the work:
 - **ICES** - International Council for the Exploration of the Sea (scientists from the Institute head the expert groups),
 - **EFARO** - a European network of fishing institutes (the Institute's Director serves as President of this organization),
 - **HELCOM** - Helsinki Commission for the Protection of the Baltic Sea (participation in environmental assessment groups),
 - **NOAA (USA)** - conducting joint research on fisheries ecology and environmental monitoring,
 - **WEFTA WG** - improving research methodologies and collaborating in aquatic organism research
 - **PKN - KT 37** Technical Committee for Fish and Fish Products - creation and opinion of standards in the field of fishery and aquaculture products.
 - **European Commission** - carrying out the service of EC inquiries for scientific advice in the field of marine policy and aquaculture in international consortia,
 - Institutes and universities in Europe and around the world,
- **Recognized scientific achievements** - numerous publications on the 2024 ministerial list, presentations at prestigious international conferences, awards for young scientists and research teams.

6. Opportunities for developing cooperation

The institute is open to cooperation with:

- Research units and universities;
- Fishing and processing industries;
- Public administration;
- International partners.

We offer a flexible approach to R&D projects, the possibility of joint implementation of grants, and full substantive and analytical support.

7 Contact

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