

## Offer for cooperation



### Instytut Morski w Gdańsku Maritime Institute in Gdańsk

#### Research topics

The Institute offers consultations and services in the field of:

- Operational oceanography,
- Shaping and conservation of the nature,
- Marine ecology,
- Integrated management of the coastal areas and maritime spatial planning,
- Maritime hydrotechnics,
- Monitoring and threats prevention of the Southern Baltic,
- Physical and chemical studies of the biotic and abiotic elements of marine environment,
- Water economy and maritime engineering,
- Modernization and management of sea ports
- Establishing databases and monitoring of continuous phenomena,
- Transport economy, maritime law and economics,
- New technologies and electronic economy.

#### Profile of the Institution:

##### Short description of the Institute including areas of research

Our mission is to take care and preserve the values of the sea and sustainable development of the maritime economy. Maritime Institute in Gdańsk is a research and development unit supervised by Ministry of Infrastructure and Development. For over sixty years the Institute has been closely associated with maritime economy. The Institute conducts research work, scientific and implementation projects, studies and assessments.

We are interested in the implementation of international projects in the following research areas:

#### I. Department of Operational Oceanography

1. Assessment of the potential of energy resources of the open sea areas and the coastal zone with particular regard to:
  - wind energy
  - wave power
  - tidal energyfor
  - spatial planning at sea
  - identify investment conditions and possible directions of development of renewable energy

The proposed research will be based on recent and archival – multiannual observation and measurement data collected from the coastal zone and the open sea waters and the results of analysis of numerical predictions of several mesoscale atmospheric models covering the area of the Baltic Sea and the Baltic Sea hydrodynamic models with high resolution for the period min. 10 years. The final result of the research should identify the most promising areas of the sea under the terms of the possibility of obtaining energy from unconventional sources and to assess the most effective sources and methods of obtaining it.

**II. Department Aquatic of Ecology**

**III. Department of Environment Protection**

- protection of marine resources and the search for new solutions for safe use
- using macrophyto- and zoobenthos as an alternative substrate for use in cosmetic, food or fuel industry
- developing a good solutions to minimize the risk of contamination and reduce negative effects of oil spills
- continuation of work on legislative changes regarding the use of stabilization technology in Poland
- keeping the monitoring of the dumping sites of dredged material
- wide cooperation with other institutions and knowledge transfer

In addition

- Sustainable aquaculture – algae and mussels for fish feed
- Baltic Blue Growth –Initiation of large-scale, business-based feed-mussel farming to
- harvest nutrients from the Baltic Sea.
- Turning waste into a resource.
- Cultivation of macroalgae for a biobased Baltic Sea Region
- Collection of wild aquatic biomass for a cleaner Baltic Sea

**IV. Numerical Modelling Laboratory**

**V. Laboratory of Spatial Policy**

**VI. Department of Economics and Law**

**VII. Department of Maritime Electronics**

**VIII. Department of Maritime Hydrotechnics**

**Department of Operational Oceanography**

Department of Operational Oceanography consists of five laboratories: Multipurpose Oceanographic Research Laboratory r/v IMOR, Geophysics Survey Laboratory and The Oceanographic Data Analysis Laboratory, and this clearly describes the scope of activities of the Department. The Department operates vessels: r/v Imor and hydrographic boats Imoros 1, Imoros 2 and Imoros 3 and PUCK.

Latest projects:

**4POWER** - stimulates knowledge exchange between leading regions (Rostock, Dundee, Emden), less advanced regions (Groningen, Rimini) and regions which are still in the stage of

orientation (Azores, Malta, Corfu, Latvia) to create a common understanding on current and future regional challenges in OSW development. The partners jointly work on two themes: (1) creating an efficient regional policy framework and (2) promoting a favourable business and innovation climate aimed at implementation. The project's findings will be offered to the Committee of the Regions.

<http://www.4-power.eu/>

**BalticBottomBase** - the aim of the project is to create a information database about the environment of the southern Baltic, on the basis of measurements and tests collected, stored and processed by many years of operation of the Maritime Institute in Gdansk.

<http://www.balticbottombase.eu>

**BRISK** - aim of the project Sub-regional risk of spill of oil and hazardous substances in the Baltic Sea (BRISK) is to increase the preparedness of all Baltic Sea countries to respond to major spills of oil and hazardous substances from shipping.

<http://www.brisk.helcom.fi/>

**MyOcean** (2009-2012), **MyOcean2** (2012-2014) and **MyOcean follow-on** (October 2014-March 2015) projects, respectively funded by the EU's Seventh Framework Programme for Research ( FP7 2007-2013) and HORIZON 2020 (EU Research and Innovation programme 2014-2020) have been designed to prepare and to lead the demonstration phases of the future Copernicus Marine Environment Monitoring Service. MyOcean services have been designed to respond to issues emerging in the environmental, business and scientific sectors. Using information from both satellite and in situ observations, MyOcean provides state-of-the-art analyses and forecasts daily, which offer an unprecedented capability to observe, understand and anticipate marine environment events.

<http://www.myocean.eu/>

**SPICOSA** (6FP) project, aimed to create a self-evolving, operational research approach framework for the assessment of policy options for the sustainable management of coastal zone systems. SPICOSA contributed to the understanding of social interactions within coastal zone systems and how these impact the environment and future policies. It supported the implementation of existing EU Directives and ICZM good practices.

<http://www.spicosa.eu/>

**EfficienSea**- the project aims to improve the environmental state of the Baltic Sea with particular emphasis on environmental protection and safety. The project covers issues related to ensuring efficient and secure, and thus, sustainable transport in the Baltic Sea (including education, planning, electronic navigation sea, risk analysis and vulnerability assessment, dynamic management of the crisis).

<http://www.ufficiensea.org/>

### **Department Aquatic of Ecology**

Department carries out a wide range of ecological and pollution-impact studies on marine, port and inland waters; elaborates threat assessments of the marine biocenoses regarding introduction of non-indigenous organisms; natural valuation of the marine areas.

Latest projects:

**Marine Protection Area N2000 Plans**

## **Department of Environment Protection**

Department of Environment Protection since 1972 r. Physical and chemical research on underground water and ground water pollutants, sewage, marine water, bottom sediments, soils, industrial waste and ground pollutants. DEP performs also:

- ecological reports
- environmental impact assessments (EIA),
- surface and underground waters monitoring
- expertise of industrial waste
- expertise of bottom sediments
- management of contaminated sediments (e.g. dredged material)

expert's statements of environmental impact of the troublesome objects (industrial factories, dumping sites, wind farms, pipelines)

Latest projects:

**ECODUMP** - The project plans, as a course of action, to establish proper management of existing dumping sites, to develop new ecosystem based principles for location of the new sites, to test the developed methodology in the pilot area of the Sventoji port in Lithuania and to make recommendation to HELCOM on how to locate, monitor and manage the new dumping sites.

Outputs of the project:

- Sonar maps of existing dumping sites in SE Baltic including the information on the types of sediments, their amount and characteristics.
- Monitoring and control programme for the existing dumping sites.
- Principles of new dumping sites location using MSP procedure and ecosystem based approach.
- Guideline for the location of new dumping sites using ecosystem based principles.
- EIA study for pilot dumping site near Sventoji
- Cross-border network of experts for offshore dumping sites management and control.

<http://www.corpi.ku.lt/ecodump/>

**SMOCS** – in the Baltic Sea Region project SMOCS the problem of sustainable management of contaminated sediments is addressed. The aim of the project was to provide support for dredging actions all around the Baltic Sea. The objective were reached through the development of guidelines for management of contaminated sediments, including sustainability assessment practices and decision support regarding the handling alternatives as well as treatment technologies.

Outputs of the project:

1. Guideline comprising knowledge and practice regarding the handling alternatives for dredged sediments. It cover disposal at sea and on land including beneficial use of dredged material.
2. Tool-box of how to manage dredged sediments. It include tools for the assessment of sustainability and a decision support tool to be used in different planning and application processes.
3. Support on feasible treatment options. Methods for capping and for beneficial

use of stabilized contaminated sediments.

4. A durable network was created for management of the dredged sediments. It include: stakeholders such as maritime organisations, contractors, consultants, R&D performers and authorities on national and trans-national level.

<http://smocs.eu/>

### **Numerical Modelling Laboratory**

The scope of activities of the Laboratory deals with modelling of marine environmental conditions changed by men made structures like harbours, breakwaters, shore protection structures or human activities like dredging works, disposal works or cable/pipeline trenching. In latest works, Laboratory: estimated sediment transport in bed load and suspension modes; carried out calculations to define design conditions (wind, waves, currents) for different locations, to define interaction structure-water-bottom (forces, scour, scour protection etc.).

Latest projects:

**AQUILO** – The project which tends to create a knowledge base helpful for the investors to choose the best type of support structure for offshore wind farm specific location in Polish maritime areas. Research concentrates not only on the definition of environmental conditions at a given location but also on criteria of methods for the selection of the support structures due to impact of waves and currents.

**VISTULA** – The primary aim of the project is to perform a quantitative estimation of sediment transport at the Vistula River mouth estuary using hydroacoustic measurements and numerical models of hydrodynamic and sedimentation processes, in consideration of the effect of their interactions.

**ECODUMP** – The project is accomplished in cooperation with Department of Environment Protection where the task of Laboratory is to build the model of spill spreading during disposal operations and partly to develop ecosystem based principles for new disposal sites.

### **Laboratory of Spatial Policy**

Latest projects:

**SUBMARINER** - The Baltic Sea Region (BSR) faces enormous challenges including growing transport, new installations, fishery declines, severe marine pollution, excessive nutrient input, and the effects of climate change. Within the project the **SUBMARINER Compendium** has been designed to provide, for the first time, a comprehensive picture of the contribution the Baltic Sea Region can make to European wide initiatives on Blue Growth and a sustainable bioeconomy.

Based on the findings of the Compendium, the **SUBMARINER Roadmap** promotes new initiatives in the field of sustainable and innovative uses of Baltic marine resources..

The **SUBMARINER Network** is a unique platform that brings actors from the whole Baltic Sea Region together to actively promote innovative and sustainable uses of marine resources. It operates across the whole knowledge triangle integrating perspectives from local to international scale, different science disciplines as well as policy and economic stakeholders. It is a hub for projects, initiatives and activities at all levels – from

transnational and cross-border regional development, innovation and research projects to local and business level. The network is registered as a not-for-profit European Economic Interest Grouping (EEIG) and is managed by a professional secretariat.

#### Topics

- Combinations with Offshore Wind Parks
- Macroalgae Harvesting and Cultivation
- Mussel Cultivation
- Reed Harvesting
- Large-Scale Microalgae Cultivation
- Blue Biotechnology
- Wave Energy
- Sustainable Fish Aquaculture

<http://www.submariner-network.eu/>

**BaltSeaPlan** - the project aims to create the basis for developing, introducing and implementing maritime spatial planning throughout the Baltic Sea in a coherent manner.

<http://www.baltseaplan.eu/>

**PartiSEApate** - Maritime Spatial Planning (MSP) is the main tool for coordinating spatial use of the sea, balancing the interests of competing sectors so the marine space and resources are used efficiently and sustainably. MSP requires land-sea integration, transnational consultation, an ecosystem based approach and stakeholder participation. However, little practical experience and few examples are available, so the Baltic Sea Region bodies responsible for MSP joined forces through PartiSEApate to develop a pan-Baltic approach to topics whose spatial dimension transcends national borders

<http://www.partiseapate.eu/>

**ARCH** – project develops participative methodologies in collaboration with the involved managers, policy makers and stakeholders to manage the multiple problems affecting lagoons in Europe. This will generate realistic solutions and provide roadmaps for their implementation at the lagoon scale.

<http://www.arch-fp7.eu/>

#### **Department of Economics and Law**

Department of Economics and Law carries out a wide range of studies on functioning and sustainable development of maritime economy, land-sea transport logistics, market conditions and prognoses of the maritime economy development, studies on economic effectiveness in transport.

**BATCo** - Baltic-Adriatic Transport Cooperation - The Baltic-Adriatic Axis stands for the intermodal railway axis which connects the Baltic and the Adriatic sea basins and their relevant ports (Trieste, Venice, Ravenna, Koper, Gdansk, Gdynia), with primary hinterland cities (Vienna, Graz, Klagenfurt, Villach, Udine) in between Poland and Italy. The Baltic-Adriatic Axis is a backbone of the Central European transport network. In order to support the further development of the Baltic-Adriatic Axis, a selection of institutions along this intermodal corridor have come together in a dedicated support project the BATCo.

<http://www.baltic-adriatic.eu/>

**TransBaltic** - The overall objective of TransBaltic is to provide regional level incentives for the creation of a comprehensive multimodal transport system in the BSR. This is to be achieved by means of joint transport development measures and jointly implemented business concepts.

<http://www.transbaltic.eu/>

**VILA** - The common benefits of the Vistula Lagoon potential development - will allow to prepare uniform assessment of the socio – economic and environmental conditions of all area and will contribute to develop the joint strategy of the Vistula Lagoon development. This strategy will be able to be implemented in whole region, both by polish and russian authorities ensuring its development and increasing its role.

<http://vilaproject.eu/>

**Department of Maritime Electronics**

Department of Maritime Electronics carries out research on maritime electronics, implementation of modern radio-communication and radio-navigation systems, particularly GMDSS, automatic identification system (AIS), human protection against electromagnetic radiation.

**Department of Maritime Hydrotechnics**

Department of Maritime Hydrotechnics deals with problems of shore and environment protection and restoration mechanisms of shore and environment degradation, elaborates technical, organizational and biotechnical renovation measures.

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