

MARINE SCENE

Professor Janusz Pempkowiak, director of the Institute of Oceanology at the Polish Academy of Sciences, on using research to improve the sustainable use of marine resources

The Institute of Oceanology at the Polish Academy of Sciences (IO PAN) was founded in 1983 as the successor to the Marine Station of the Academy, which had been in existence in the city of Sopot since 1953.

The institute's mission is to conduct research to increase our knowledge of the processes and phenomena taking place in the marine environment. The results of our work are used to support the sustainable use of marine resources and the conservation of the marine environment.

For the last 30 years IO PAN has been consistently expanding its expertise in interdisciplinary studies of the Baltic Sea and other European shelf seas, with a special focus on the Arctic waters. The institute is known as one of the leading centres investigating Baltic water circulation, biogeochemistry, ecosystem biodiversity and health, marine bio-optics and remote sensing. Rapid growth of the institute has occurred in the last decade, mainly as a result of increased international collaboration and new opportunities that emerged with the Polish EU-access.

IO PAN's research activities are in line with the following strategic directions:

- The role of the oceans in climate change and its effects on European seas;
- The natural and anthropogenic variability of the Baltic Sea environment;



- Contemporary changes in the coastal ecosystems of shelf seas;
- The genetic and physiological mechanisms involved in marine organism functioning and the principles of marine biotechnology.

Of the 184 research staff at the institute (as of June 2012), 13 are full professors, 18 are associate professors and 44 have PhD degrees. The institute participates in the educational process by running postgraduate courses as well as contributing to the dissemination of knowledge to the society at large. IO PAN is authorised to confer PhD and habilitation degrees in Earth sciences. It offers a PhD study course designed to educate highly qualified young scientists in the field of oceanology. The four-year course provides experimental and theoretical training in all the fields of marine sciences:

- Marine chemistry and biochemistry;
- Physical oceanography;
- Marine ecology;
- Marine physics;
- Genetics and marine biotechnology;
- Marine pollution.

The institute is the owner of the research vessel s/y Oceania, built in 1985 and fully renovated in 2010. The Oceania can accommodate 14 professional and 14 scientific crew members. The vessel has an unlimited sailing range and is usually at sea for about 250 days each year.

The English-language, peer-reviewed quarterly journal, *Oceanologia* has been published by IO PAN since 1971. It is a leading Polish publication in the field of basic marine research, open to contributions from all over the world and with a worldwide distribution. Since 1990, the institute has also been publishing one or two issues per year of 'dissertation and monographs' in Polish or English.

IO PAN also manages a large oceanographic database which includes marine ecology parameters, the Atlas of the Arctic, and extensive numerical modelling and physical oceanographic data gathered by the institute over many years in the course of scientific expeditions and research programmes.

Partnerships

In recent years, there has been a dynamic growth in IO PAN's involvement in partnerships, networks and consortia aiming to



address important questions regarding the study, exploration and exploitation of the marine environment. These include:

PolMar – Consortium of Polish Marine Research Institutes

This consortium, consisting of IO PAN, the Sea Fisheries Institute (Gdynia), the Institute of Meteorology and Water Management, the State Institute of Geology and the Maritime Institute (Gdańsk), was established in order to consolidate and reinforce the members' scientific, research, organisational and financial potential to carry out large-scale scientific projects. Raised standards and strategic synergies are envisaged in relation to the members' statutory tasks such as marine research, exploration and exploitation of the sea's resources, the conservation and sustainable development of the marine environment and popularisation of knowledge about the sea – with particular focus on the Baltic Sea.

MORCEKO – Marine Eco-Energy and Eco-System Centre

This consortium's main objective is to develop new technologies enabling renewable energy resources available in the Baltic Sea and on the Polish coast to be utilised. The centre comprises the Institute of Fluid Flow Machinery (PAN), the Gdańsk University of Technology, the Maritime Institute (Gdańsk), the Gdańsk Ship Design and Research Centre and the Pomeranian Special Economic Zone plc.

GEOPLANET – Centre of Earth and Planet Studies

Established in 2009 this scientific consortium was formed by several institutes of the Polish Academy of Sciences responsible for oceanology, geophysics, geology and space studies. With its scientific and infrastructural potential, joint databases and research groups, this consolidation will create a strong player on both domestic and international scientific markets.

International co-operation:

Besides carrying out national research projects and statutory activities financed by the Polish Ministry of Science and Higher Education, IO PAN is a beneficiary of numerous projects

co-financed by the structural funds of the European Union. IO PAN is also actively involved (as partner and lead partner) in various international scientific co-operation efforts, such as the FP6 and FP7 programmes, BONUS Plus, Poland-Norway grants, Poland-USA co-operation and the COST Programme. Examples of current projects are:

CHEMSEA – Chemical Munitions Search and Assessment

This large-scale Baltic Sea Region Programme project was initiated by IO PAN in 2008 as a flagship initiative of the EU Baltic Sea Strategy. Its goal is to assess and mitigate the risks associated with underwater activities in regions where chemical weapons from WWII were disposed. Running to 2014, the project will identify and map nearly all areas of the Baltic's seabed contaminated with chemical weapons. Moreover, CHEMSEA will produce safety instructions for the handling and disposal of contaminated objects and sediments. Under the leadership of IO PAN, CHEMSEA brings together leading research institutes and maritime administrations from Poland, Sweden, Finland, Germany and Lithuania. www.chemsea.eu

SatBałtyk – Satellite Monitoring of the Baltic Sea Environment

This research project co-financed by the Polish structural funds (Innovative Economy Programme) aims to prepare and set in motion the technical infrastructure and practical operational procedures for the efficient routine monitoring of the state of the Baltic environment. This project has twice been awarded the 'Quality of the Year' title by the donor programme. Running until 2014, the programme already enables real-time maps of the Baltic Sea state, using 16 differential parameters.

www.iopan.gda.pl/projects/SatBałtyk/

ZSPDO – An Integrated System of Oceanographic Data Processing

IO PAN is co-ordinator of the Polish structural funds (Innovative Economy Programme) project aiming to establish the IT infrastructure for scientific data. Advanced applications and tele-information services are being developed for the scientific community in order to digitalise and store their resources. In co-operation with the Polish Ministry of Transport, Building and Shipping and several sea-oriented institutions, this project has the potential of turning into a National Oceanographic Database.

<http://www.iopan.gda.pl/projects/ZSPDO/>



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