United Nations

Intergovernmental

Ocean observations

Polish perspective

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The Operational Oceanography of IOC (for group II)

Varna, March 19th-22nd, 2012

Historical background of national ocean observation

- First oceanographic survey conducted by Polish researcher: expedition of Belgica 1897-1899 (H. Arctowski and A.B. Dobrowolski)
- Foundation of Polish Meteorological Institute: 1921
- First Fishery Marine Laboratory founded at Hel Peninsula by K. Demel: 1921
- New headquarter of Sea Fisheries Institute raised in Gdynia: 1939
- Constitution of the Technical Maritime Institute in Gdańsk: 1950
- Marine Station of the Polish Academy of Sciences (part of the Geophysics Department of PAS) founded in Sopot: 1953



Historical background of national ocean observation

- Institute of Hydroengineering, Polish Academy of Sciences (IBW PAN): 1953
- Maritime Institute in Gdańsk: 1954
- Polish Arctic Research Station in Hornsund: 1957
- Coastal Research Station of IBW PAN: 1960
- Faculty of Biology, Geography and Oceanography of the Univeristy of Gdańsk: 1970
- Institute of Geophysics, Polish Academy of Sciences (IGF PAN): 1971
- Polish Antarctic Research Station “Arctowski” : 1977
- Institute of Oceanology, Polish Academy of Sciences (IO PAN): 1983

former Marine Station PAS from 50’s



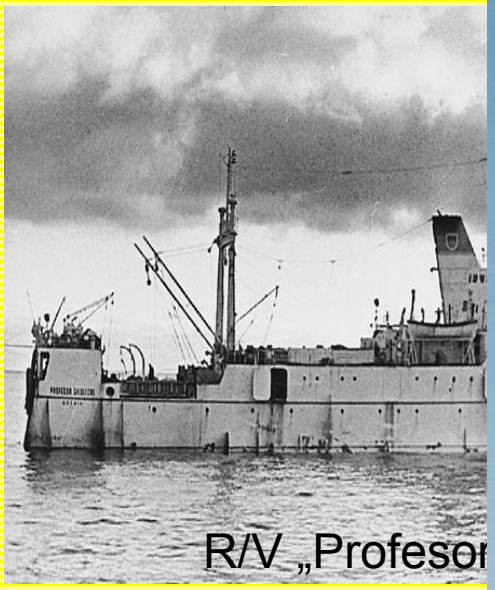
Coastal measurements

Coastal Research Station at Lubiatowo

http://mlb.ibwpan.gda.pl/index.php/en/camera/

Coastal experiment in Камчия, Bulgaria 1977

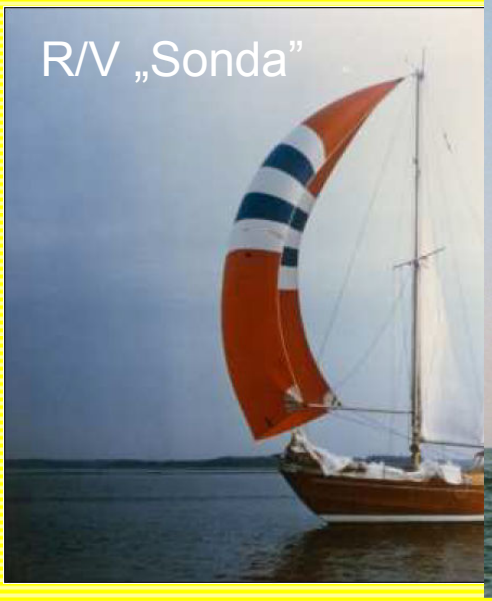
Polish research vessels fleet - history



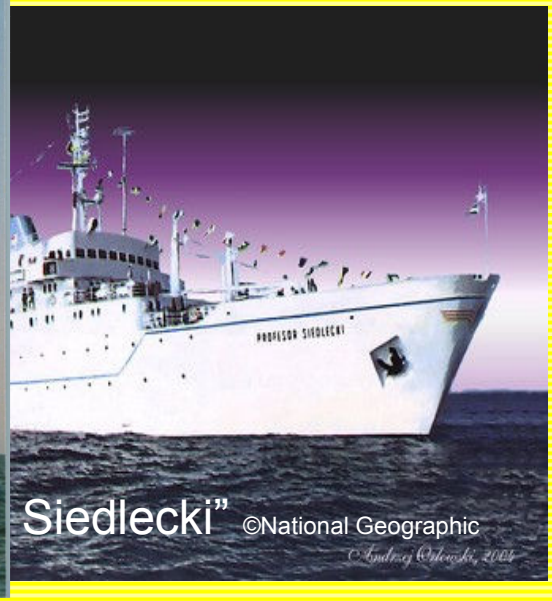
R/V „Profesor

R/V „Oceania”

O” ©National Geographic



R/V „Sonda”



Siedlecki” ©National Geographic

Polish research vessels fleet – present time


M/S „Horyzont II”


K/H „Oceanograf II”


R/V „Baltica”


R/V „Imor”


R/V „Oceania”

Foto:Jerzy Dąbrowski

Organizations involved in oceanography in Poland

- Akademia Morska w Gdyni
- Akademia Morska w Szczecinie
- Akademia Marynarki Wojennej
- Akademia Pomorska w Słupsku
- Biuro Hydrograficzne Marynarki Wojennej
- Centrum Badań Kosmicznych PAN w Warszawie
- Instytut Budownictwa Wodnego PAN w Gdańsku
- Instytut Geofizyki PAN w Warszawie
- Instytut Meteorologii i Gospodarki Wodnej
- Instytut Morski w Gdańsku
- Instytut Oceanologii PAN w Sopocie
- Morski Instytut Rybacki w Gdyni
- Państwowy Instytut Geologiczny
- Uniwersytet Gdański
- Uniwersytet Szczeciński
- Uniwersytet Śląski
- Uniwersytet Warszawski

International cooperation

- Baltic Operational Oceanographic System
- EuroGOOS
- GMES
- EMODNET
- HELCOM
- Baltic Sea Action Plan
- BONUS+

National Policy and Regulations

Communications from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: "A European Strategy for Marine and Maritime Research. A coherent European Research Area framework in support of a sustainable use of oceans and seas" COM(2008) 534, "Marine knowledge 2020 marine data and observation for smart and sustainable growth" COM(2010) 461, and "An Integrated Maritime Policy for the European Union" COM(2007) 575

According to this Policy organizations are enforced to supervise and conduct monitoring of the sea area, develop airborne systems of the monitoring of se area, to participate in satellite monitoring program CleanSeaNet, deploy recommendations of National Program of the Monitoring of Marine Environment in the field of water quality assessment of shallow water, shelf and deep sea areas, to integrate national infrastructure of the monitoring systems with systems in use at European level

Polish Baltic Monitoring Programme

Conducted by Generalny Inspektorat Ochrony Środowiska (GIOŚ)

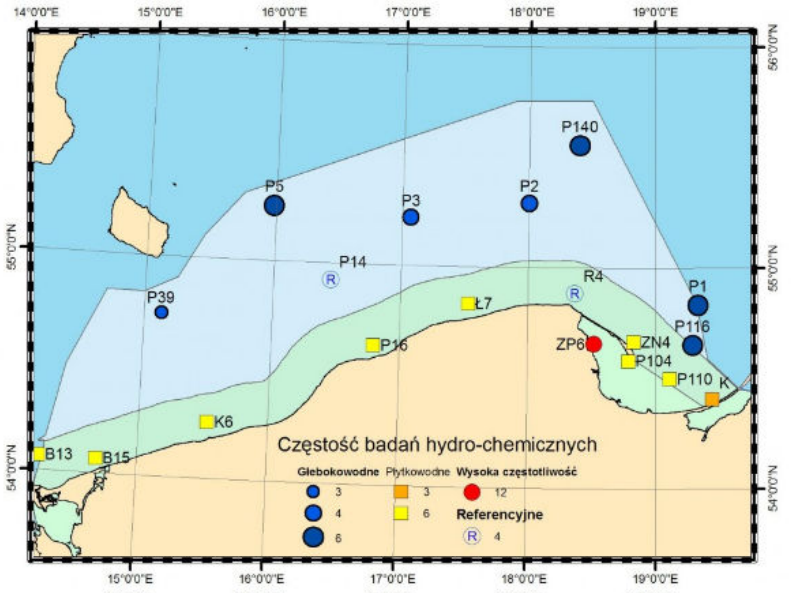
Chief Inspectorate of Environmental Protection

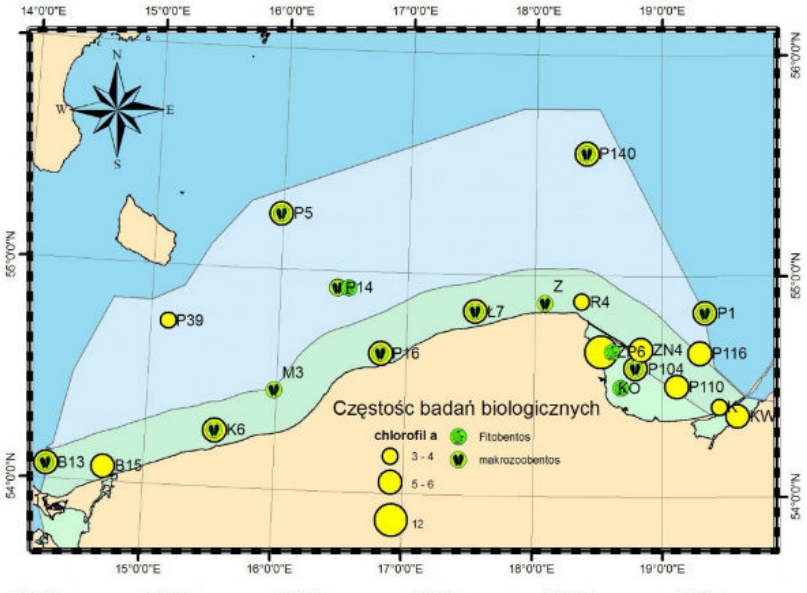
Legal basis:

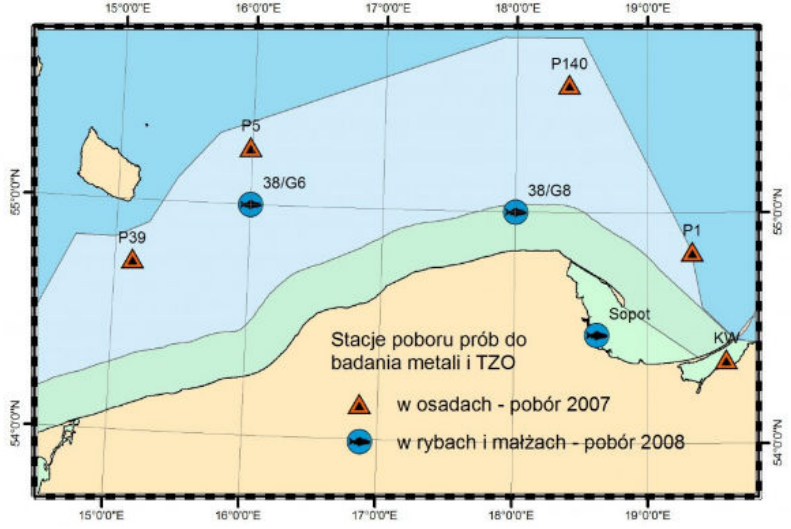
Law act of Polish Parliament: **Ustawa z 20 lipca 1991 roku o Inspekcji Ochrony Środowiska (Dz. U. z 2007 r. Nr 44, poz. 287 z późn. zm.)**

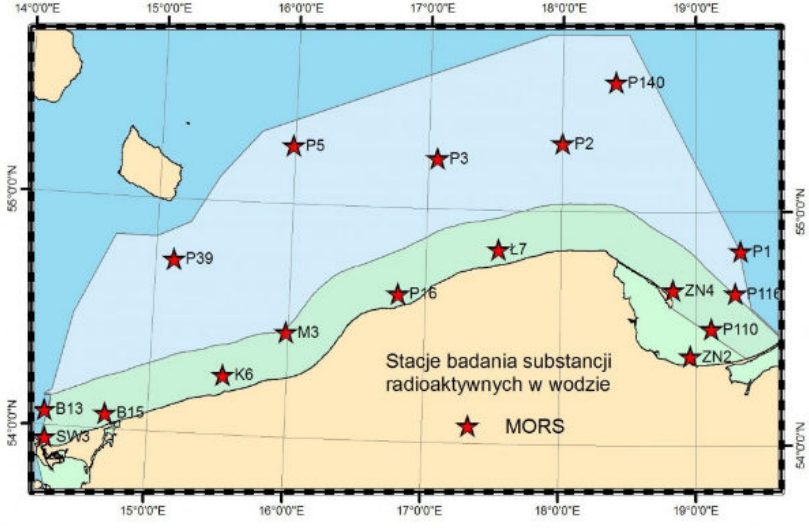
The Polish Baltic monitoring programme covers with regular control (6 times a year) the state of the marine environment in the Polish zone of the southern Baltic at stations located in the deep-sea zone – in the area of the Gdańsk Deep (station P1=BMP L1), the Bornholm Deep (station P5=BMPK2), at the south-eastern slope of the Gotland Deep (station P140=BMP K1) and at stations located in the coastal zone

Polish Baltic Monitoring Programme







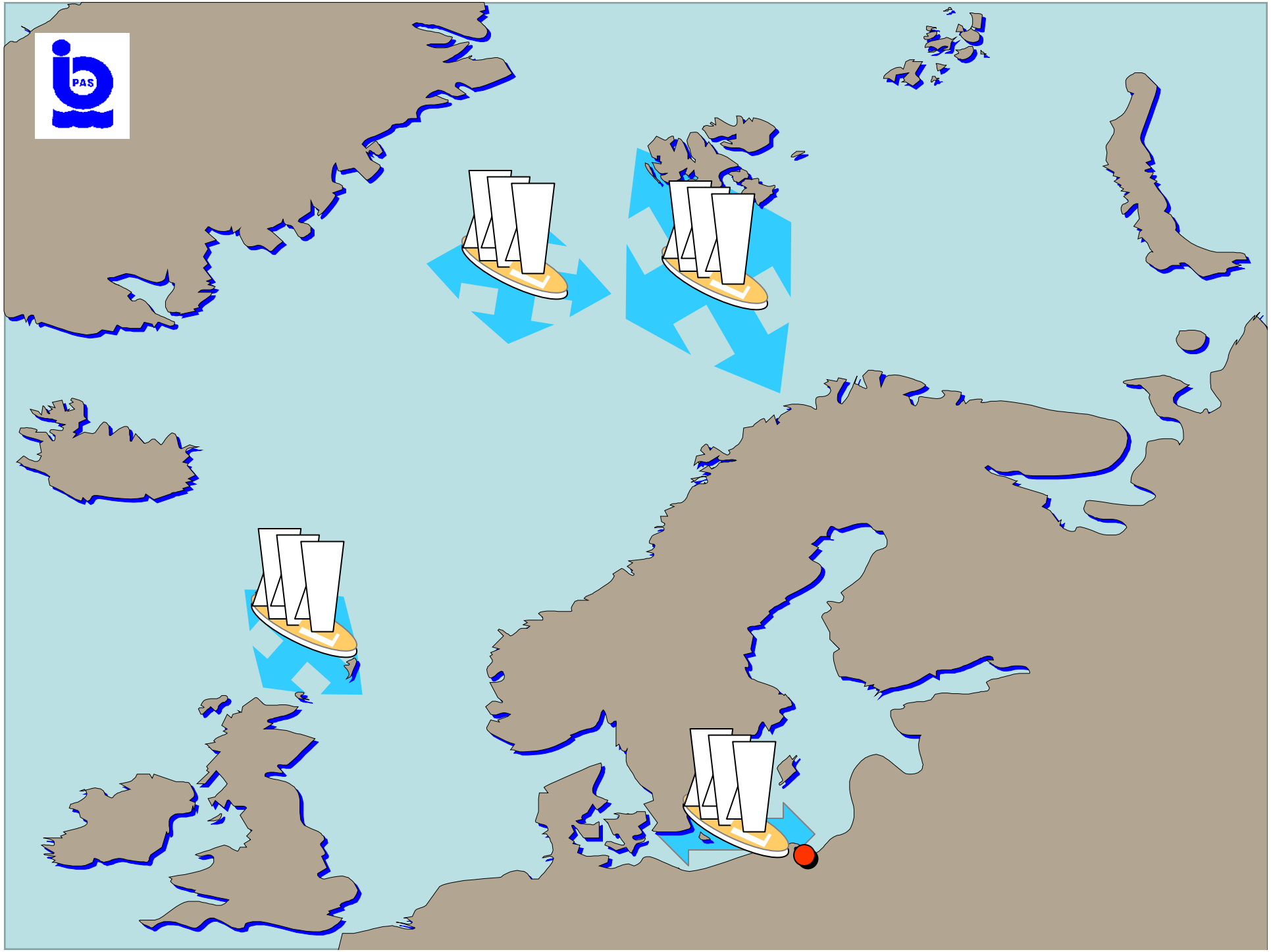


Observations conducted in Poland

- ADCP, AWAC measurements for models validation: NW from Kołobrzeg – in total 353 days of records – currents in water column, sea level changes, water temperature near bottom
- Continuous motinoring and research cruises of RV OCEANIA
- Regular marine monitoring of the Polish EEZ in frame of the Polish Monitoring Programme,
- Regular ADCP and CTD measurements carried out during monitoring cruises of r/v “Baltica”,
- Meteorological observations and measurements carried out during monitoring cruises, sent to the Marine Weather Forecast Office of IMGW in Gdynia,
- Daily Ferry-Box measurements on a Stena Baltica between Gdynia (Poland) and Karlskrona (Sweden),
- Automated sea level measurements at selected stations along Polish coast as well as at the oil rig of Petrobaltic.
- Meteorological and hydrological measurements at coastal stations,
- Sea service

Modelling activity in Poland

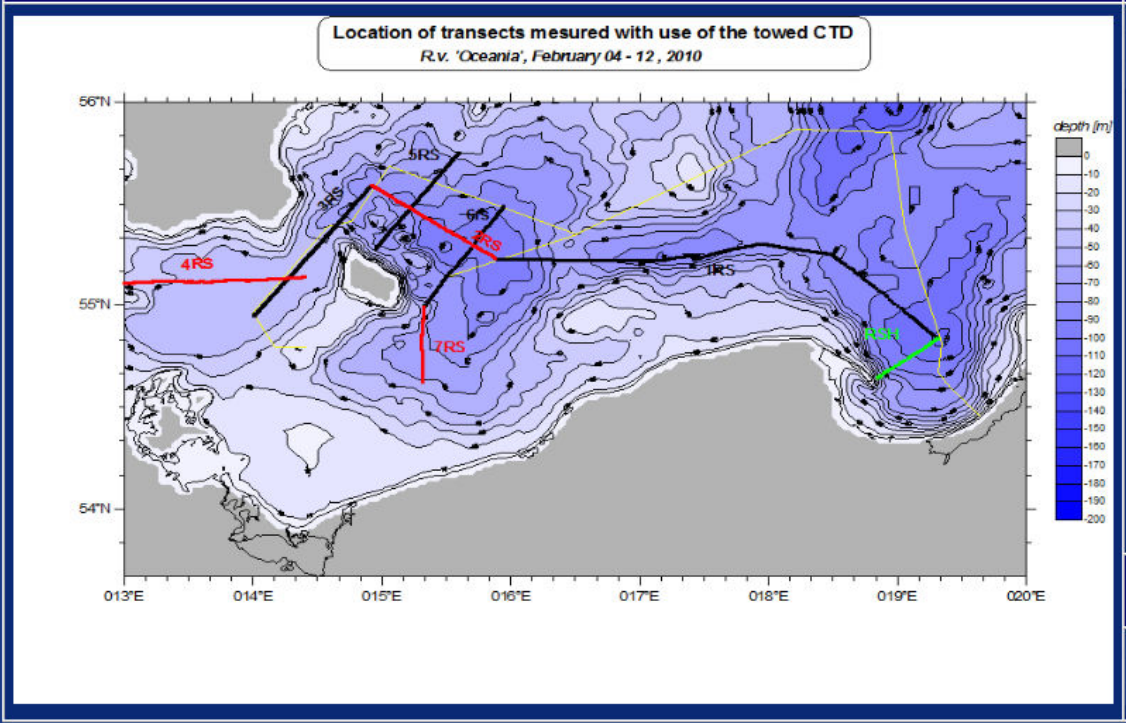
- adaptation of CESM (Community Earth System Model - NCAR/UCAR (National Center for Atmospheric Research/University Corporation for Atmospheric Research)) – ice, ocean and ecosystem model for the Baltic Sea with 9km resolution (2km planned in SATBALTYK project.
- implementation of high resolution HIROMB model for Polish EEZ
- Internet presentation of the HIROMB model forecast for the Polish EEZ,
- Implementation of the hydrodynamic model with ecological module (MIKE 3D) for the Gulf of Gdańsk and Puck Bay (result of the PL0103 project co-financed from Norway Grants funds),
- Implementation of the hydrodynamic model (MIKE 3D) for the Vistula Lagoon (result of the PL0223 project co-financed from Norway Grants funds) in co-operation with AB IO RAS,
- Implementation of the ecological module of MIKE 3 for the Vistula Lagoon (result of the PL0223 project co-financed
- A one-dimensional Coupled Ecosystem Model (1D-CEM) an open model which enables the study of: (1) annual, seasonal, monthly and daily variability of marine plankton in the southern Baltic Sea, (2) the impact of various climatic conditions over several years, and (3) the influence of different hydrophysical and biological processes on the vertical distributions of characteristics as a function of time.



Monitoring cruises of R/V Oceania

Bałtyckie profile CTD

Lokalizacja profili, zmierzonych holowaną sondą CTD



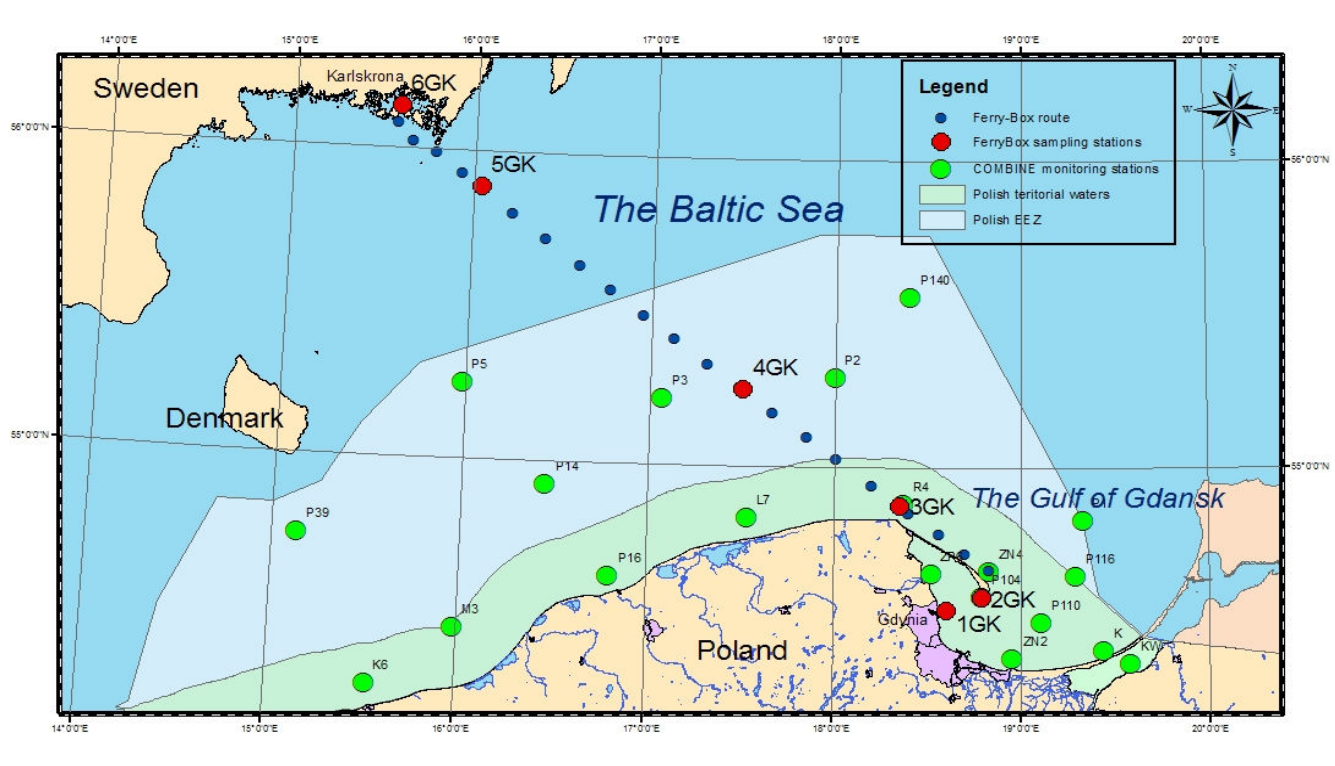
Wybierz profil

- RSH
- 1RS
- 2RS

Informacje dodatkowe

- Rejsy
- Kontakt

Ferrybox operating Gdynia-Karlskrona line



A Ferrybox system was developed and deployed for operational surveillance and control of episodic events in the Baltic Sea. The main element of this module was an autonomous “Ferry Box” system, installed on a commercial passenger ferry commuting daily between Gdynia (Poland) and Karlskrona (Sweden) and covering the distance of ca. 315 km in the middle of the Baltic Proper. The system initially operated (2006-2008) onboard m/f “Stena Nordica” and was transferred to m/f “Stena Baltica” in early 2009

Ferrybox operating Gdynia-Karlskrona line

In situ information was combined with multi-sensory satellite imagery to determine the extent of algal blooms, follow their evolution and the evolution of rapid environmental events, like hydrological fronts. BlueBox module on a ferry operating between Gdynia and Karlskrona, measured on-line temperature, salinity, oxygen and chlorophyll-a fluorescence. Additionally, discrete water samples were collected at pre-selected locations and subjected to laboratory phytoplankton community analyses, determination of algae hepato- and neurotoxins and toxicity tests on *Artemia franciscana*.

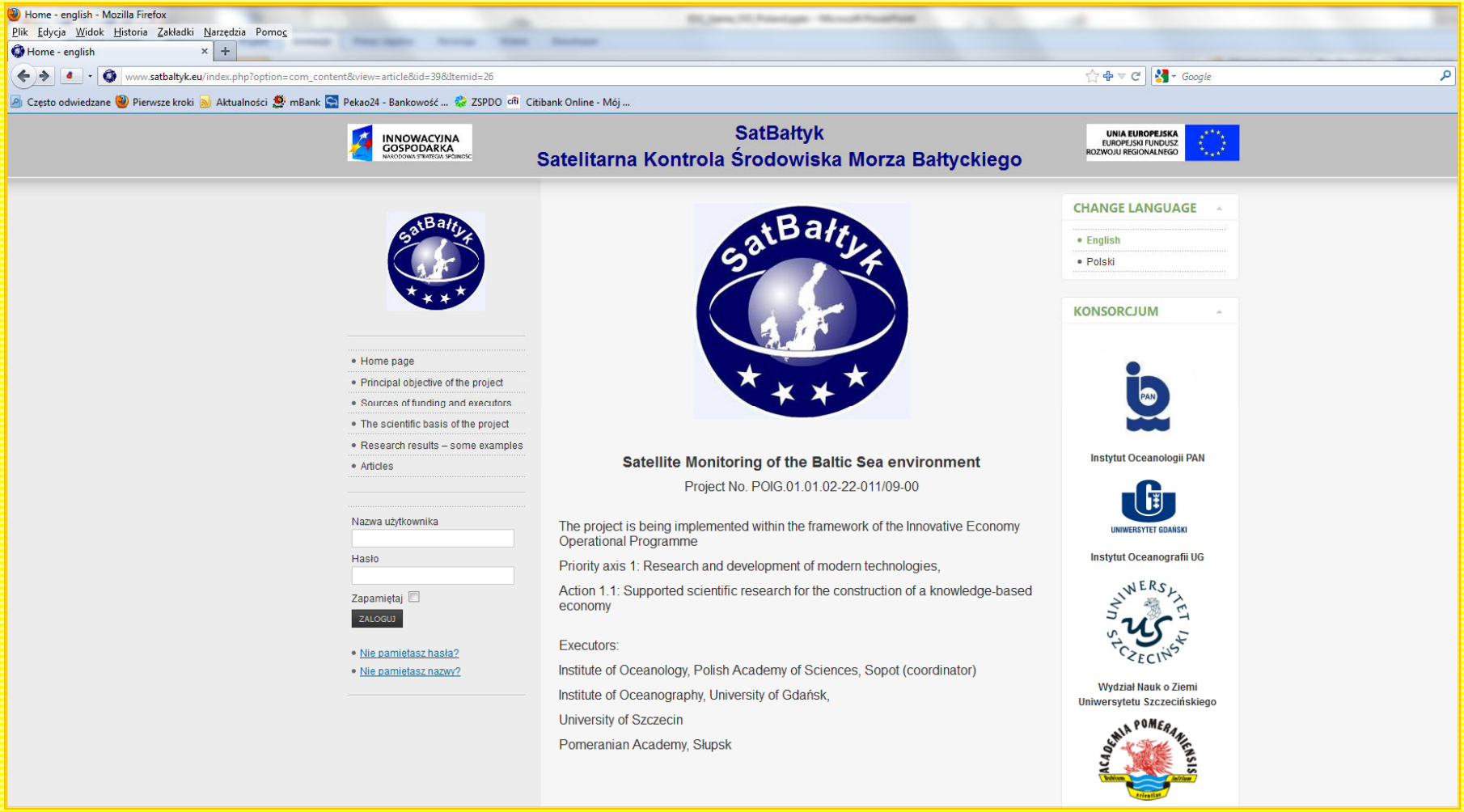
The satellite module was included in the project to give spatial extension to the Ferry Box measurements. This module comprises of the retrieval of data relating to chlorophyll-a and surface seawater temperature (SST) from satellite images. Additionally, *in situ* Ferry Box data was used for the calibration and validation of satellite data provided by NASA (AVHRR and MODIS sensors). For calibration and validation of the remote sensing algorithm performance and interpretation of the satellite data products, the series of cruises on r/v “Oceania” were organized, corresponding with the Ferry Box measurements and a satellite passage

SatBałtyk – Satellite Monitoring of the Baltic Sea Environment

The main aim of the SatBałtyk project is to prepare and set in motion the technical infrastructure and practical operational procedures for the efficient, routine monitoring of the states of the Baltic environment, that is, the production of maps of the sea's structural and functional characteristics, including the inflow of energy (PAR1 , UV2) and its characteristics, temperature distributions, the dynamic state of the sea surface, the concentrations of chlorophyll and other phytoplankton pigments, blooms of toxic algae, the occurrence of upwelling events, the appearance of slicks of oil and other pollutants, and the characteristics of the primary production of organic matter.

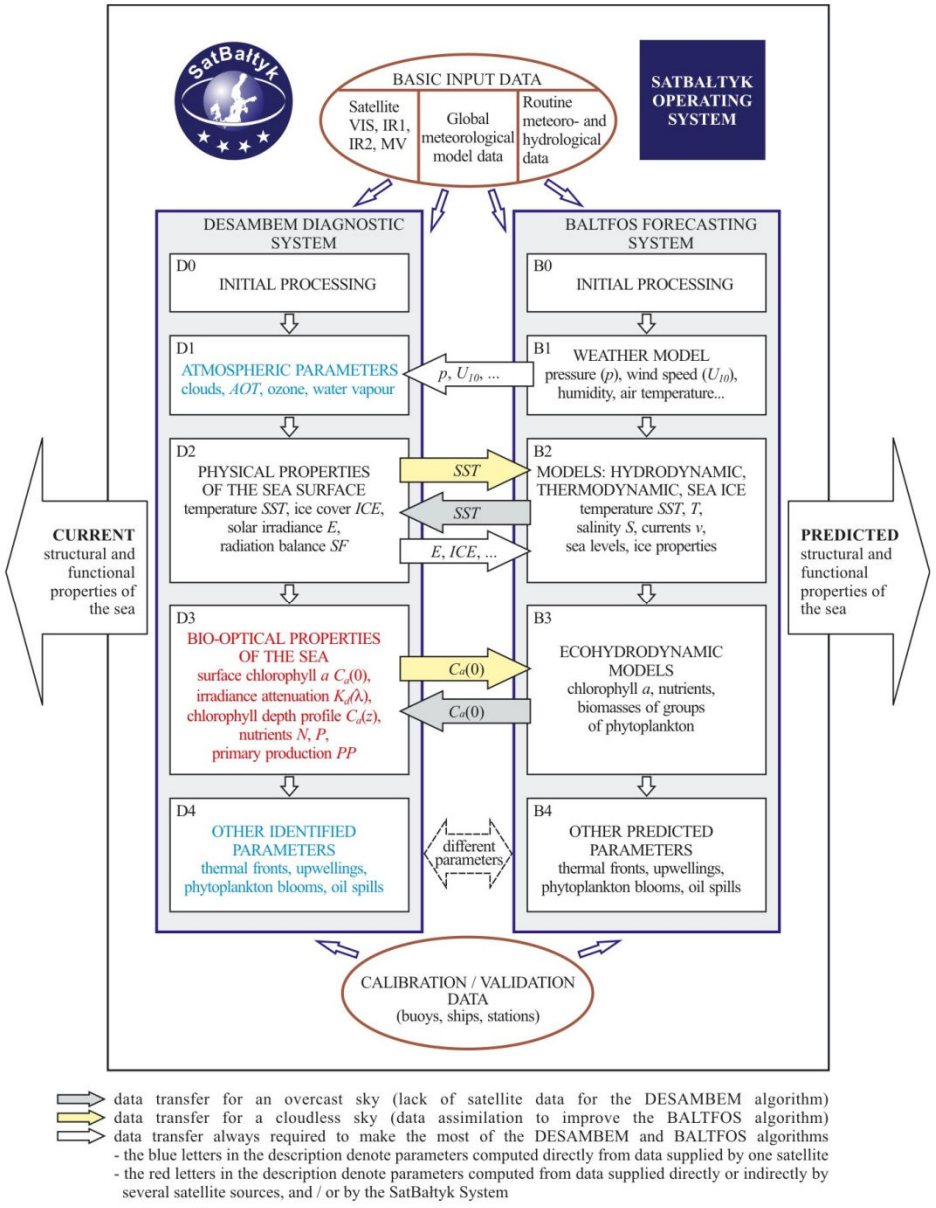
The project's ultimate objective is to run an operational system for the rapid and effective determination of all the above-named characteristics of the Baltic in the form of maps of their distributions in the Baltic Sea region

SatBałtyk – Satellite Monitoring of the Baltic Sea Environment

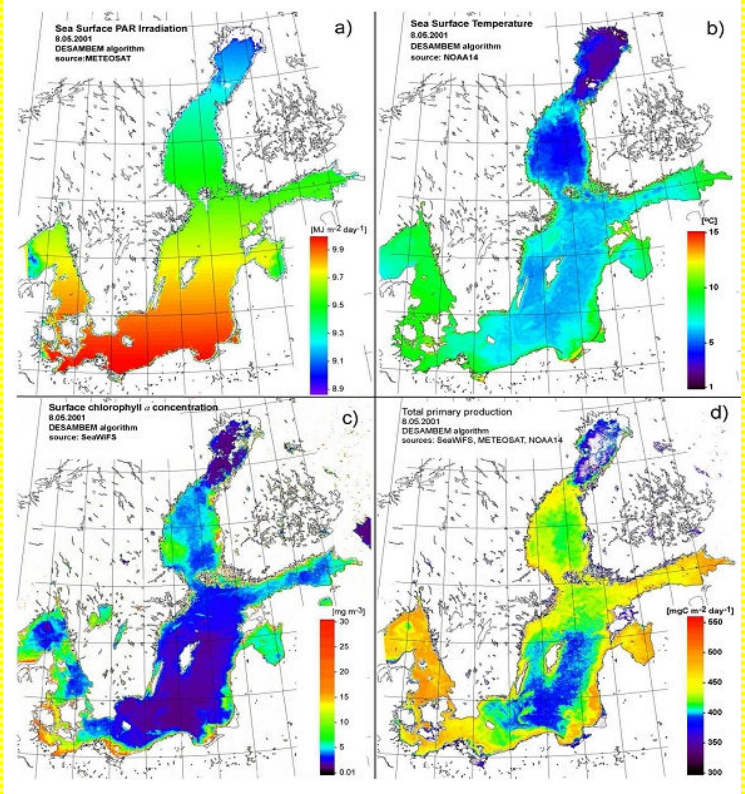


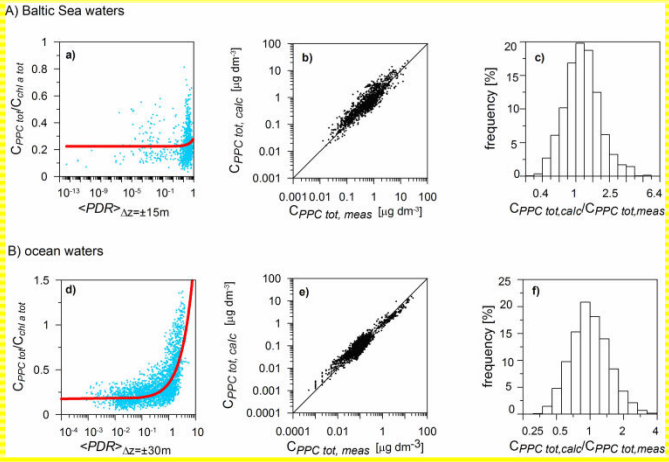
http://www.satbaltyk.eu

SatBałtyk – Satellite Monitoring of the Baltic Sea Environment



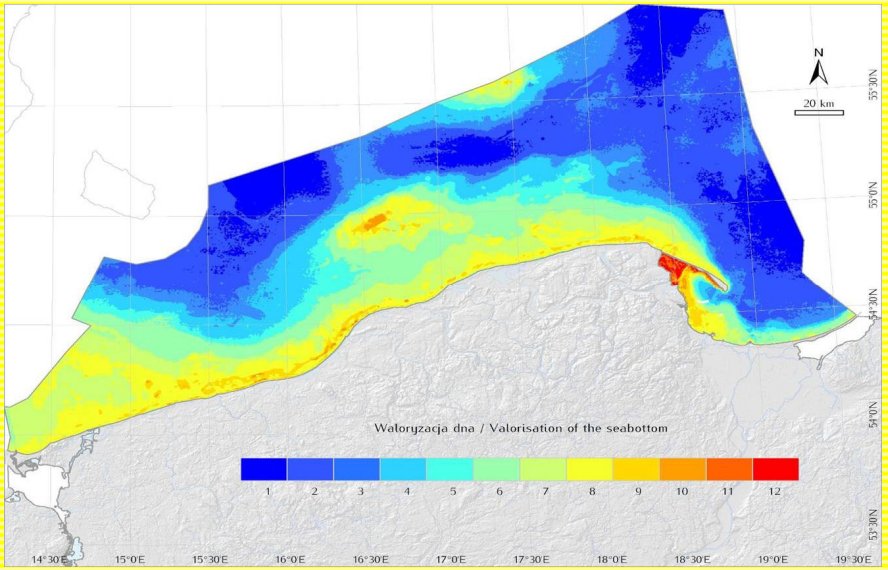
data transfer for an overcast sky (lack of satellite data for the DESAMBEM algorithm)
data transfer for a cloudless sky (data assimilation to improve the BALTFOS algorithm)
data transfer always required to make the most of the DESAMBEM and BALTFOS algorithms
- the blue letters in the description denote parameters computed directly from data supplied by one satellite
- the red letters in the description denote parameters computed from data supplied directly or indirectly by several satellite sources, and / or by the SatBałtyk System



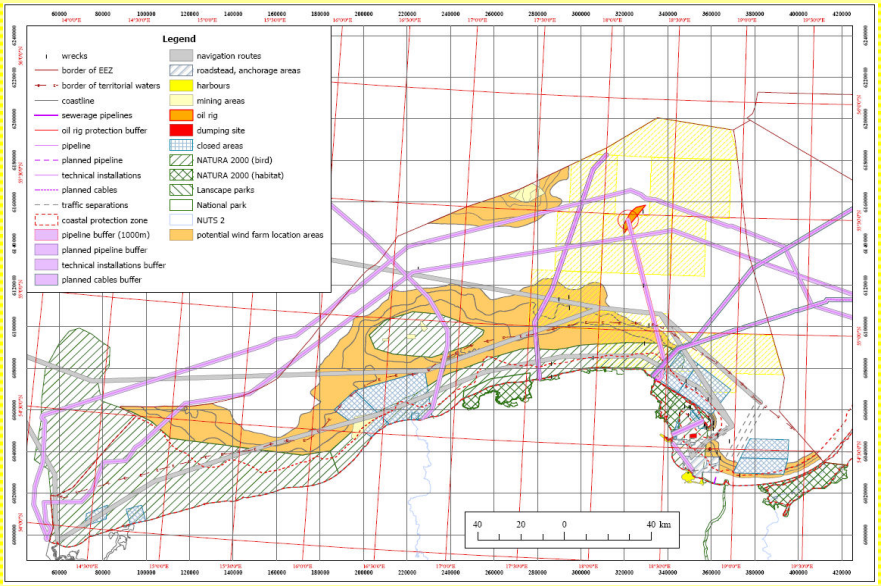


Operational Oceanography Users

- marine research institutes and coastal, environment and marine management organizations
- industrial R&D organizations active in shelf, coastal land and river estuaries areas involved in exploitation of marine environment
- national and international scientific institutions
- administration and authorities at local, regional and national level



Valorization of the seabottom, Węsławski et al., 2009

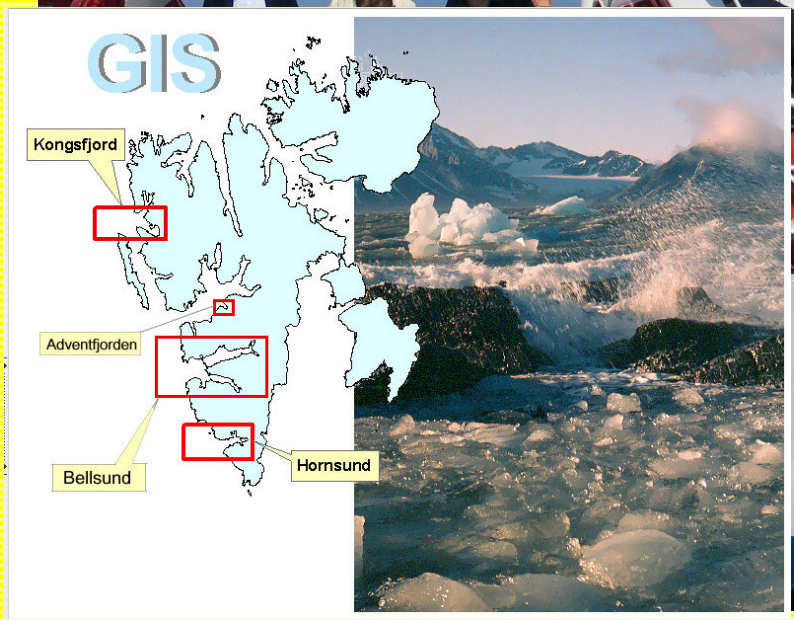


Main sea uses of the Polish sea areas, Maritime Institute in Gdańsk, 2009

Citizens awareness of operational oceanography

Communication channels

- web site
- visiting excursions onboard the vessels
- direct contact to schools and institutions
- press release and newspapers



Conclusions

•In response to obligation of deployment “Polish Maritime Policy” Polish government has call into existence Interdepartmental Commission for Maritme Policy Development Affairs. This commission works on development of Maritime Policy according to recommendations elaborated in 2009.

•Integration of Polish Research Institutions is ongoing process. Institutions willing to foster data exchange and communication and share effort of monitoring activities.

Thank you!