

SatBałtyk - the sense of the Baltic environment

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Design of the SatBałtyk System

The current state of knowledge enables supporting decisions undertaken by authorities governing activities in sea and coastal areas by generally accessible, cross-border complex information on state of the marine environment.

Up to date and detailed information, essential for assessing the current state of the environment, constituting the foundation for such decisions, will be highly reliable if:

- satellite data are used for the day-to-day monitoring of large sea areas;
- environmental information is updated and expanded by use of ecohydrodynamic models;
- the information from both sources is supported by in situ measurements from continuous monitoring systems (buoys, shore stations, drones) and research vessels.

Easy accessible and cost effective system operationally exploiting different sources of data and information on the Baltic Sea as well as expert knowledge was developed and launched in 2015 by SatBałtyk Scientific Consortium in frame of European Funds (Innovative Economy Programme). Variety of services provided by organisations contributing to project (ie the Institute of Oceanology PAN in Sopot – the project coordinator, the University of Gdańsk, the Pomeranian Academy in Słupsk and the University of Szczecin) are integrated on the unified platform and streamlined to the endusers.

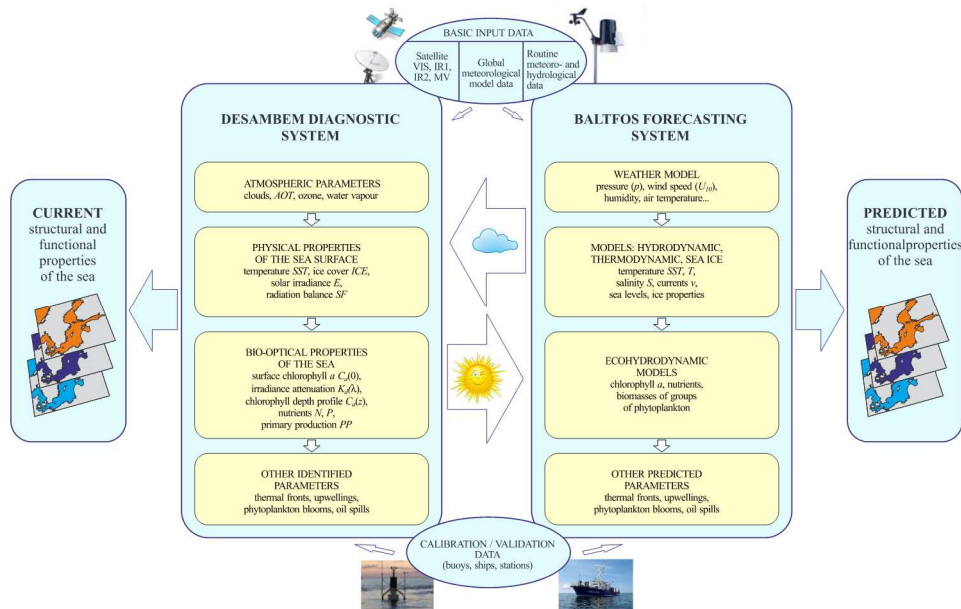


Figure 1: Deployment diagram of the SatBałtyk system

To meet a present-day requirements for the continuous monitoring of the marine environment in SatBałtyk System two independent but cooperating subsystems were used: the diagnostic ones named the DESAMBEM, consists of several bio-optical algorithms, and the prognostic ones referred to as BALTFOS. The environmental parameters determined with the aid of these two systems complement one another: BALTFOS assimilates empirical data obtained from satellite information using the DESAMBEM algorithms, while at the same time filling in gaps in the DESAMBEM data when the satellite retrieval could not be made because the relevant areas were covered by clouds.

SatBaltyk Product Portal

Up to one hundred parameters currently available in the system have been divided into eight groups: 1. Atmosphere, meteorology, 2. Hydrology, 3. Ocean optics, 4. Radiation budget, 5. Sea water components, 6. Phytoplankton, photosynthesis, 7. Coastal zone, 8. Hazards. The values and maps of spatial distributions of these parameters are available in near real time to users on the website <http://satbaltyk.iopan.gda.pl/> (Fig. 2).

Among the other functionalities the system diagnoses and monitors various kinds of risk occurring in the Baltic Sea region. By supplying information on the regions where dangerous changes to the environment have been diagnosed, it will improve the capability of institutions to take decisions for preventing environmental disasters, mitigating their effects should they occur, tracking the changes and forecasting their possible development.

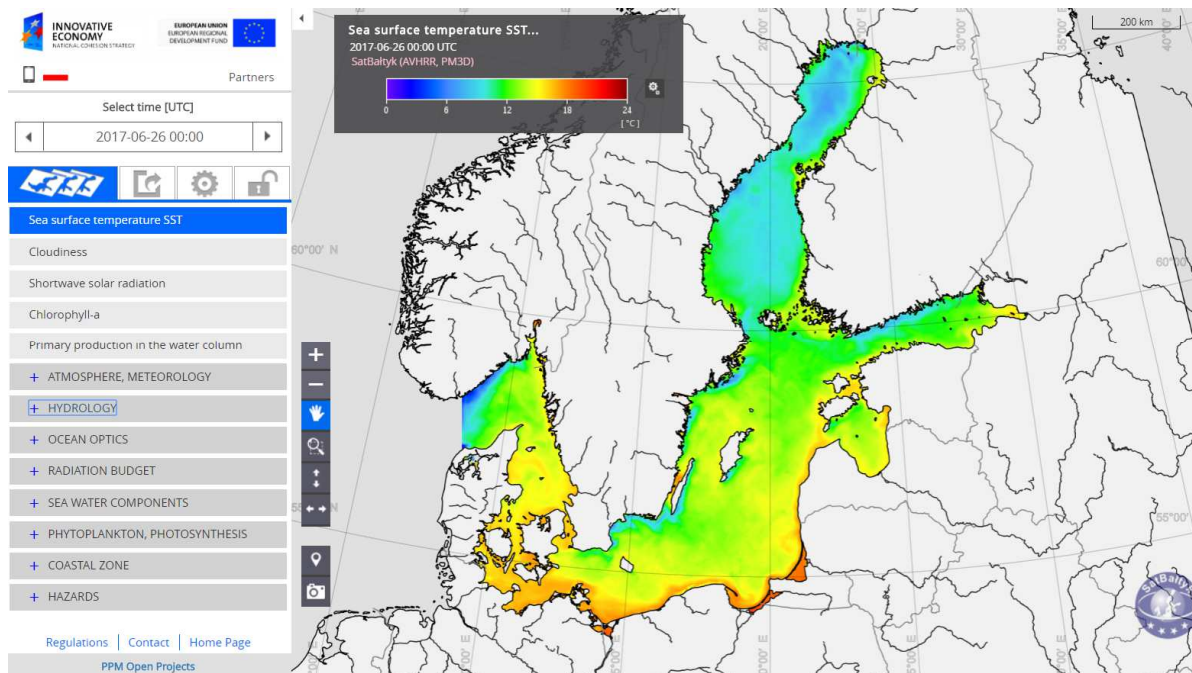


Figure 2: SatBaltyk Product Portal

Significant feature of System SatBaltyk is facilitation of close cooperation between the project's designers and end users, focusing on identification of the individual needs of various groups of customers, tailor-made information can be provided to particular services, as support for their actions to protect the environment, improve security, manage maritime resources and plan military or rescue operations at sea and in the coastal zone.

Awareness of new data sources, access to them and efficiency of data exchange between institutions in the Consortium are to be increased. Reporting on the state of implementation of obligations arising out of legally binding regulations is to be supported by relevant governmental institutions. The system will become a significant link in the exchange of data and information among organisations and international observation systems of the Earth (Copernicus, GEO/GEOSS), the ocean (GOOS, EuroGOOS) and the Baltic Sea (BOOS). An independent data source, it may be of assistance in the arbitration of disputes relating to the influence on the Baltic Sea environment of users at different levels (individual/regional/national). The system's data resources, embracing long-term observations, can be used for developing adaptive strategies to climate change.