NEW LEVEL OF BALTIC SEA MONITORING USING SENTINEL-3 DATA

Maritime Spectator is a web-based application simplifying process of gathering satellite data and helping understand sea surface behaviour.

The challenge

Monitoring Baltic Sea levels is a very important task which ensures safe shipping and investments in coastal regions, environment protection and foremost safety for urban areas vulnerable to rapid changes in this large water body. Unfortunately, constant measurement at such a large scale is a costly and dangerous process. Very often, this makes it impossible, as even with sufficient funds this type of monitoring is difficult to carry out due to continuously varying conditions of the sea's surface. Therefore, a more technologically advanced solution was needed which could tackle this problem at much lower operational cost and without the need to directly involve humans.

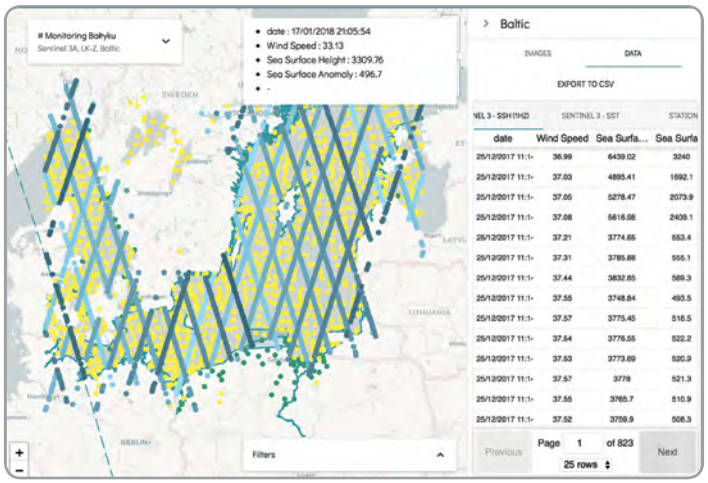
The space based solution

Maritime Spectator is a web-based software solution developed for the Maritime Institute in Gdansk. It is fuelled on a daily basis by a stream of data continuously delivered by Sentinel-3. Maritime monitoring received a big boost in terms of technological capabilities thanks to the Copernicus Programme. The first two satellites allowed improvements of applications such as vessel tracking and sea pollution detection. But the biggest help came after the successful launch of the Sentinel-3 satellite which takes maritime monitoring to another level. Sentinel-3 on its own allows monitoring sea temperature, surface height, wind speed, ice thickness and more. Maritime Spectator visualises data on the map and enables easy processing and tracking of new measurements, giving specialists access to new information just hours after the satellite passes over Baltic. This enables the analysis of the state of the sea surface, with unprecedented temporal and spatial resolution which physically would not be possible without Sentinel 3 being in orbit.

Benefits to Citizens

Maritime Spectator enables coastal authorities and institutions such as the Maritime Institute to increase the frequency of measurement and its coverage to complement their earth-based data. Thanks to Sentinel-3 data they are able to produce better and more complete products for their clients and for citizens. Better awareness of a number of parameters of the large water body opens up new possibilities for their domain. In many cases this directly translates into ensuring the safety and wellbeing of citizens spending their time at the coast in the Baltic region.

Furthermore, through much better understanding of sea surface behaviour it provides the opportunity to optimise solutions for the shipping industry, improving the safety of vessels and transport management. Thanks to frequent data updates Maritime Spectator can fuel early warning systems for areas endangered by rising sea levels, potentially saving lives and allowing for a much more effective response in critical situations.



Full coverage of Baltic Sea with Sentinel-3 satellite. Sea level and temperature measurements in Maritime Spectator.
Credit: Contains modified Copernicus Sentinel data [2018]

Thematic Area: CLIMATE, WATER AND ENERGY

Region of Application: POMERANIAN VOIVODESHIP

Sentinel mission used: S3

Copernicus Service used: –

Usage Maturity Level: 3

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In the future, it will be also able to share information directly with the citizens, who will always have a possibility to monitor situations for themselves in chosen areas of interest. The solutions provides completely new opportunities for understanding this large water body whose behaviour strongly affects the economy of coastal regions. Thus, its better understanding will directly convert to citizens wellbeing.

Outlook to the future

The very existence of Maritime Spectator and its increasing capabilities are directly related to what programmes, such as Copernicus, can deliver and how the European Space Sector will vevolve over the coming years. That is why it is so crucial for citizens, industry and administration to fully support the development of space technologies for us all to benefit from.

"Possibility to retrieve and use satellite data is an invaluable addition to our analysis which allows to expand and improve its temporal and spatial extent."

Maciej Kałas, PhD,
Maritime Institute in Gdańsk

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ABOUT COPERNICUS4REGIONS

This Copernicus User Story is extracted from the publication "**The Ever Growing use of Copernicus across Europe's Regions: a selection of 99 user stories by local and regional authorities**", 2018, Edited by NEREUS, the European Space Agency and the European Commission.
The model cases focus on local and regional authorities who successfully applied Copernicus data in 8 major public policy domains.
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