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Raising data treasures with ODIN 2 by easily surfing through over 60 years of Baltic Sea monitoring

This year, the first international agreement on joint monitoring of the Baltic Sea marine environment turns 50: As early as 1969, the riparian states for the first time carried out measurements along a coordinated station network as part of a so-called “Baltic Year”. The Warnemünde oceanographers have been involved ever since and are making a significant contribution to this valuable long-term data set. Their more than 70 million data, some of them even dating back to 1951, are now freely accessible and can be visualised user-friendly with the ODIN 2 research tool developed by the Leibniz Institute for Baltic Sea Research Warnemünde (IOW): <https://odin2.io-warnemuende.de>.

Just like 50 years ago, the IOW will again go on five monitoring cruises this year, collecting data at stations that were already defined as reference points for the entire Baltic Sea research community five decades ago. This is quite a long time span – and yet it can still be topped: In 1950, the GDR's Hydrographical Service was founded as the first oceanographic institution in Warnemünde. Soon after its opening, the regular monitoring cruises began. The first took place from December 27, 1951, to January 6, 1952.

What was measured at the time and how the data changed in the course of more than 60 years can still be researched in the IOW database today – for example, sudden salinity changes in the depths when, after a long period of stagnation, a strong saltwater inflow from the North Sea finally replaced the deep water of the Baltic Sea, or creeping changes in the times when oxygen was gradually depleted. Meanwhile, the data volume has grown to over 70 million entries. Over 900 research cruises and other measuring campaigns have been documented. Routine recordings include the physical parameters temperature, salinity, oxygen and data on marine currents as well as various chemical parameters on the nutrient situation and pollutant load of the Baltic Sea. The measuring programme also includes surveys on zooplankton and phytoplankton. This vast data set is of particular interest for the modellers among the Baltic Sea researchers, as such long-time observations not only provide an ideal basis for tracking down long-term trends, but also for extrapolating future scenarios to a wide variety of questions.

Since last year, this data treasure has been freely accessible and is equipped with a user-friendly research tool: ODIN 2 provides Internet-based access and additionally offers the automatic visualization of long-term data series for regularly measured parameters. While external users without registration only have access to selected data sets (time series and depth profiles from the monitoring program), almost the entire contents of the IOW database is available with registration. The comfortable search is possible either in German or in English with any current web browser and can be customized for specific projects, stations, parameters, time periods, depths and/or areas.

ODIN 2 offers the possibility to choose between different output formats for the results and is also able to provide a permanent link for each individual search. “This

makes the data citable, because even after they have been included into comparative publications, it is still possible to trace where they originally came from,” emphasizes Susanne Feistel, who is responsible for data curation at the IOW. “We have attached particular importance to an intuitive user interface. But we are also satisfied with the performance: For ‘normal’ searches, the system only takes seconds, rarely more than a minute,” adds Steffen Bock, the developer of ODIN 2.

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