ODIN2 - User-friendly, web-based access to more than 70 million oceanographic readings

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The Oceanographic Database of IOW (IOWDB) had originally been designed for particular internal requirements of the Leibniz Institute for Baltic Sea Research (IOW). IOWDB has always been aimed at the management of historical and recent oceanographic measurements. Most recently, the research tool ODIN2 was published to provide those research data to the public in a user-friendly way.

Figure 1: QR code for https://odin2.io-warnemuende.de

The data stock possessed by IOW was declared as highly valuable by independent commissions. Research cruises have been conducted since 1949, and their data systematically collected. The post-processing and analysis of the resulting observational data was carried out by varying methods and with changing quality. A substantial fraction of legacy data was successively transferred to modern storage media, their quality was controlled and, if possible and necessary, improved by detailed individual scientific inspection.

The content of our database includes oceanographic readings and metadata (mainly Baltic Sea) from 1877 to 2018 obtained during 932 research campaigns of the IOW (the former Institut für Meereskunde, IfM) and cooperating institutions. As of April 2018, the IOWDB contains more than 70 million measured samples representing georeferenced point data from the water column, primarily from CTD profiles, hydrochemical and biological sampling, current-meter time series, trace metal sampling and long-term monitoring. Phyto- and zooplankton data are available for 1988 to 2017.

To access this data treasure the IOW released ODIN2 for the public (https://odin2.io-warnemuende.de). It is a web-based search application to access all of the data stored in the IOWDB. Instantly accessible are, for example, either ship tracks or station lists for each campaign as well as on-the-fly depth profiles of each CTD cast taken (Fig. 2). For the long-term monitoring stations in the Baltic Sea, ODIN2 offers automatic visualisation of up to 50-year time series for regularly sampled parameters at standard depths (Fig. 3).

To explore the research data in IOWDB, ODIN2's individual search engine is the most powerful and fastest tool. It offers complex search and filter options for geographic areas, time spans, seasons, depth range, parameters, cruises or standard positions. After executing a search, the results are integrated in user-friendly digital export formats such as plain text, xls or netCDF.

ODIN2, and along with it IOW's long-term monitoring data, have been made publicly available worldwide since April, 2018. For convenience, ODIN2 offers the creation of a URL as a permanent link to repeat or share any previously defined search.

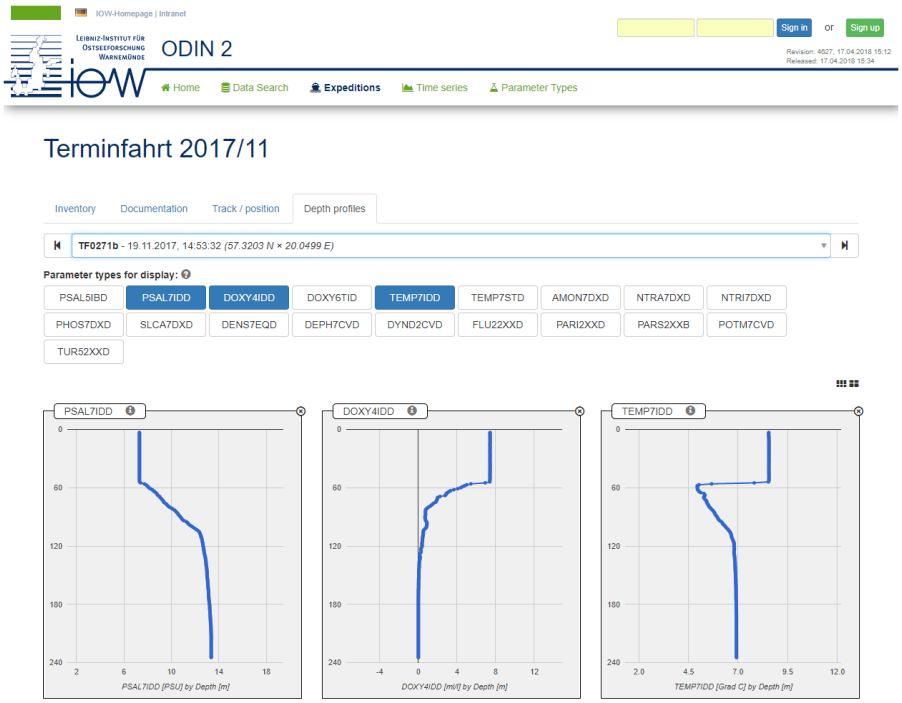

Figure 2: Depth profiles available in ODIN2: A single CTD cast at the Gotland Deep in the Baltic Sea, taken November 19, 2017, from surface (top) to 240 m depth (bottom). Profiles from left to right: practical salinity ranging between 7 and 14 PSU, dissolved oxygen concentration (8 to 0 ml/l) and temperature (8 to 4 °C). The stratification of the Baltic Sea is instantly visible.

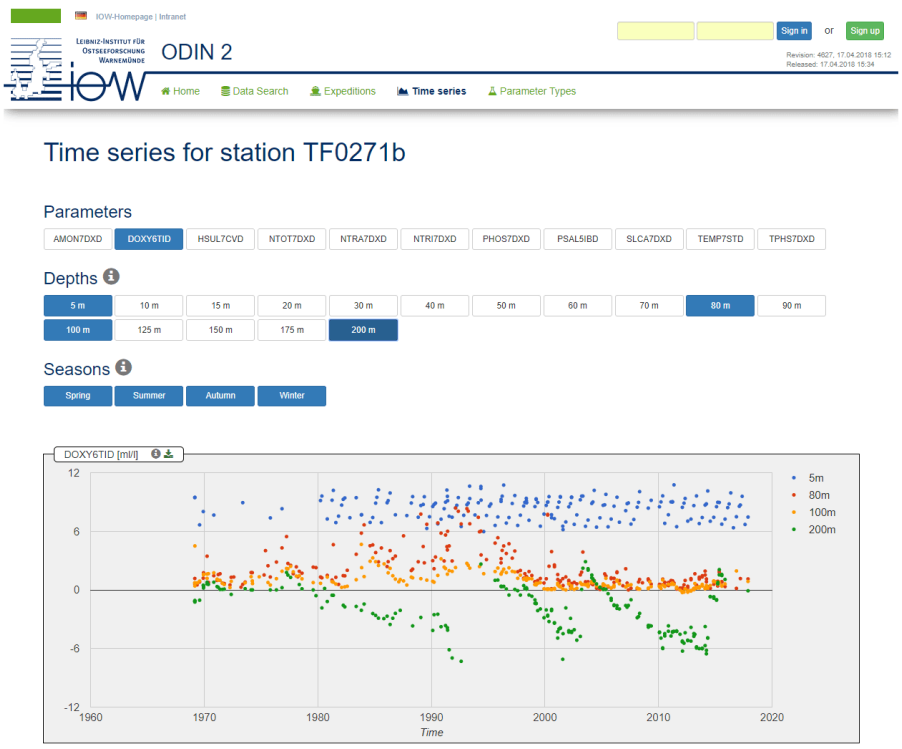

Figure 3: Visualisation of long-term measurements of dissolved oxygen and hydrogen sulphide at the Gotland Deep in the central Baltic Sea. The time series starts in 1969 and continues to 2017. Displayed are data from the surface (5 m, blue dots), from the halocline depth (80 m, red dots; 100 m, yellow dots) and from the near-bottom depth (200 m, green dots). Clearly discernible are the Major Baltic Inflow events in 1993, 2003 and 2014.