



## **ProWaS – Climate Projection service for Waterways and Navigation in Germany (Pilot study)**

Enno Nilson (1), Birte-Marie Ehlers (2), Janna Abalichin (2), Ahmad Bilal (1), Jennifer Brauch (3), Manuel Dröse (3), Dörte Eichler (5), Helmut Fischer (1), Frank Janssen (2), Gerrit-Mathis Keller (3), Matthias Rothe (1), Hauke Stachel (4), Michael Schröder (4), Christoph Stegert (3), Trang van Pham (3), Andreas Walter (3), and Norbert Winkel (4)

(1) BfG - Bundesanstalt für Gewässerkunde, Federal Institute of Hydrology, Koblenz, Germany (posteingang@bafg.de), (2) BSH - Bundesamt für Seeschifffahrt und Hydrographie, Federal Maritime and Hydrographic Agency, Hamburg, Germany (posteingang@bsh.de), (3) DWD - Deutscher Wetterdienst, German Weather Service (info@dwd.de), (5) WSV - Wasserstraßen und Schifffahrtsverwaltung, Federal Waterways and Shipping Administration, (4) BAW - Bundesanstalt für Wasserbau, Federal Waterways Engineering and Research Institute, Hamburg/Karlsruhe, Germany (info@baw.de)

If the conditions in federal waterways change in future, waterway transport must be able to adapt in a timely manner. In mid-2017, the German Ministry of Transport and Digital Infrastructure (BMVI) and its upper authorities launched the service "ProWaS". The service is designed to assess the long-term effects of climate change on inland and coastal waters. ProWaS currently comprises the Rivers Rhine and Elbe and the German Bight. Fundamental information on the navigability and water quality will be provided based upon the findings of the latest IPCC Assessment Report.

ProWaS aims to regularly provide projections for the effects of climate change on waterways, navigation, and further sectors that are vulnerable to hydrometeorological, hydrological, and oceanographic change. The project is coordinated by the BfG (Bundesanstalt für Gewässerkunde, German Federal Institute of Hydrology), working closely with its partners DWD (Deutscher Wetterdienst, German Weather Service), BSH (Bundesamt für Seeschifffahrt und Hydrographie, Federal Maritime and Hydrographic Agency) and BAW (Bundesanstalt für Wasserbau, Federal Waterways Engineering and Research Institute). The German Federal Waterways and Shipping Administration (WSV) is a key user of the products and is therefore continuously involved in the implementation and maintenance of ProWaS.

The partner institutions offer services in the areas of meteorology, climatology, oceanography, hydrology, hydro- and morphodynamics, water quality, hydraulic engineering economic efficiency of inland navigation, and data storage and supply. On the one hand, the projection service provides structured and documented data series for scientific users who want to carry out further model simulations and evaluations. On the other hand, aggregated data and consultancy is provided for management purposes and strategical planning. Advice is available e.g. on the specific impacts of climate change on the transport sector, for example, with the help of low flow and cost indicators, but also on the statistical robustness of the projections.

ProWaS uses earlier work and experience from research programmes (e.g. KLIWAS). The project is the logical next step forward to integrate climate knowledge into planning and decision-making processes in Germany, including the Federal Waterways and Shipping Administration (WSV), the transport sector, and beyond. The developed data cover a decadal time scale and are important contributions to the "German Adaptation Strategy to Climate Change" (Deutsche Anpassungsstrategie an den Klimawandel D.A.S.).

The contribution highlights the organisational and technical framework of ProWaS as well as exemplary data and information products.