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Hypeweb – open scientific data for practical applications and decision support

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Access to transparent and quality assured Open data is not only a constraint for scientists, but also for practical applications of new scientific knowledge. In this presentation we will demonstrate a web-based water service (http://hypeweb.smhi.se/), which bridges the gap between science and practice, and between scientific disciplines. We will also showcase a number of practical applications of real-world use cases on how new scientific data have been useful in decision-making.

The water service HYPEWEB is using results from the Hydrological Predictions for the Environment (HYPE) model, which is applied for 130 000 catchments covering the world landmass and also for specific regions with higher resolution. The service is designed based on experience from numerous user interactions over the years from developing different web-based tools in various R&D projects. The current users are either so called knowledge purveyors (working with e.g. flood risk or climate change adaptation on behalf of authorities) or related research institutes (e.g. oceanographic or marine centers) or commercial companies (e.g. hydropower industry). The users can download open data manually, subscribe to automatic data deliveries or purchase customized data.

The hydrological catchment model HYPE simulates water flow and substances on their way from precipitation through soil, river and lakes to the river outlet (Lindström et al., 2010). The catchment is divided into subbasins, which in turn are divided into classes (calculation units) depending on land use, soil type and elevation. In the large-scale modelling the numerical code calculates water volume and fluxes encompassing many river basins, cross regional and international boundaries, and a number of different geophysical and climatic zones (e.g. Andersson et al., 2017; Donnelly et al., 2016; Pechlivanidis and Arheimer, 2015). Thus, each geographical domain includes numerous coupled catchments and has a relatively high spatial resolution, although most basins are ungauged. The temporal resolution in the calculations is normally daily.
From the web interface the users can explore maps & graphs of historical simulations, forecasts (1-10 days and monthly/seasonal), and projections of climate change impacts. The user can also check various criteria of model performance wherever gauges are available and get access to guidance in how to understand and use the data from exploring various info sheets, tutorials and showcases.

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