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The End-to-end Demonstrator for improved decision making in the water sector in Europe (EDgE)

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High-resolution simulations of water resources from hydrological models are vital to supporting important climate services. Apart from a high level of detail, both spatially and temporally, it is important to provide simulations that consistently cover a range of timescales, from historical reanalysis to seasonal forecast and future projections. In the new EDgE project commissioned by the ECMWF (C3S) we try to fulfill these requirements.

EDgE is a proof-of-concept project which combines climate data and state-of-the-art hydrological modelling to demonstrate a water-oriented information system implemented through a web application. EDgE is working with key European stakeholders representative of private and public sectors to jointly develop and tailor approaches and techniques. With these tools, stakeholders are assisted in using improved climate information in decision-making, and supported in the development of climate change adaptation and mitigation policies. Here, we present the first results of the EDgE modelling chain, which is divided into three main processes: 1) pre-processing and downscaling; 2) hydrological modelling; 3) post-processing.

Consistent downscaling and bias corrections for historical simulations, seasonal forecasts and climate projections ensure that the results across scales are robust. The daily temporal resolution and 5km spatial resolution ensure locally relevant simulations. With the use of four hydrological models (PCR-GLOBWB, VIC, mHM, Noah-MP), uncertainty between models is properly addressed, while consistency is guaranteed by using identical input data for static land surface parameterizations. The forecast results are communicated to stakeholders via Sectoral Climate Impact Indicators (SCIIs) that have been created in collaboration with the end-user community of the EDgE project.
The final product of this project is composed of 15 years of seasonal forecast and 10 climate change projections, all combined with four hydrological models. These unique high-resolution climate information simulations in the EDgE project provide an unprecedented information system for decision-making over Europe.