

## Abstract

The increasing frequency of hydro-climatic extreme events poses serious risks to the quality and quantity of drinking water stored in the surface water supplies upon which the majority of Europeans depend. Extreme precipitation can add large inputs of nutrients and dissolved organic carbon (DOC) to a water supply, the effect of which depends on the load, the processing of materials and the time of transport to the location of water withdrawal. On the other hand, droughts and extreme lack of precipitation can both reduce water availability, and also water quality. In this case, the biogeochemical processes regulating materials already in a reservoir play a prominent role, as do the processes that regulate internal mixing and thermal structure. The final impact of extreme events on the water quality are regulated by the complex combined effects of watershed hydrology, reservoir hydrodynamics and biogeochemistry.

The goal of this project is to develop a freely available open source 3D reservoir modelling system that can simulate the longitudinal and lateral transport of nutrients and DOC that enter reservoirs and which can promote algal blooms and impact water quality.

Model simulations will increase knowledge of the complex regulation of the extreme events on drinking water quality, and how this may change in a future climate. Workshops with the stakeholders from 3 major water supplies in 3 different countries from 3 different climate zones that serve millions of consumers, will provide stakeholders with the knowledge and tools to better manage the impacts of hydro-climatic extreme events, both in terms of long-term planning and short-term event mitigation.

The project consortium includes European groups that have been involved in the forefront of lake and reservoir model development during the last 3-4 decades and have expertise in modelling complex hydrodynamics, algal blooms and DOC concentration and transport. The consortium also has extensive experience working with and within drinking water utilities.



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### ► Project partners

- BOLDING & BRUGGEMAN APS - DENMARK
- CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS - FRANCE (SELF-FUNDED)
- HELMHOLTZ-ZENTRUM FUR UMWELTFORSCHUNG GMBH - UFZ - GERMANY
- ISRAEL OCEANOGRAPHIC AND LIMNOLOGICAL RESEARCH LIMITED - ISRAEL

### ► Funding organisations

FORMAS (SWEDEN) / IFD (DENMARK) / BMBF (GERMANY) / MOE (ISRAEL)

### ► Duration

3 years

### ► Contact

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Climatology and climate change,  
 Water management,  
 Water-climate interactions,  
 Numerical analysis, simulation, optimisation, modelling tools

## KEYWORDS