

## **PROGNOS**

### **PREDICTING IN-LAKE RESPONSES TO CHANGE USING NEAR REAL TIME MODELS**

Lakes and reservoirs represent important resources that are critical for ensuring European water security. Many are under continuous pressure from urbanization and agricultural intensification, and from changes in climate, including increases in the occurrence of extreme events. These pressures can reduce water quality through, for example, the occurrence of nuisance algal blooms or higher levels of dissolved organic carbon (DOC), and therefore increase the costs for water treatment. Increasingly, automated high frequency (HF) water quality monitoring systems are being adopted for lake and reservoir management across Europe. Generally, these HF data are still used only to inform on the present lake state, and their full potential to guide water quality management is not realized. We propose to develop an integrated approach that couples HF data to dynamic models to forecast short-term changes in lake state, and thus inform management decisions to safeguard the ecosystem services that lakes provide. The project consortium includes expertise from European sites that have been involved in the forefront of HF monitoring systems since the late 1990s, a state-of-the-art mesocosm system which can test scenarios for adaptive management, expertise in modelling algal blooms and DOC levels, and expertise in assessing societal benefits from changes in water management.

This project will promote innovative solutions for water-related challenges across Europe. It will develop, demonstrate and disseminate forecast based adaptive management solutions for two specific water quality threats: nuisance algal blooms and the production disinfection by-products from DOC. The technology demonstrated here has the potential to transform water management and foster the growth of European companies that specialize in adaptive water management and water quality forecasting systems.