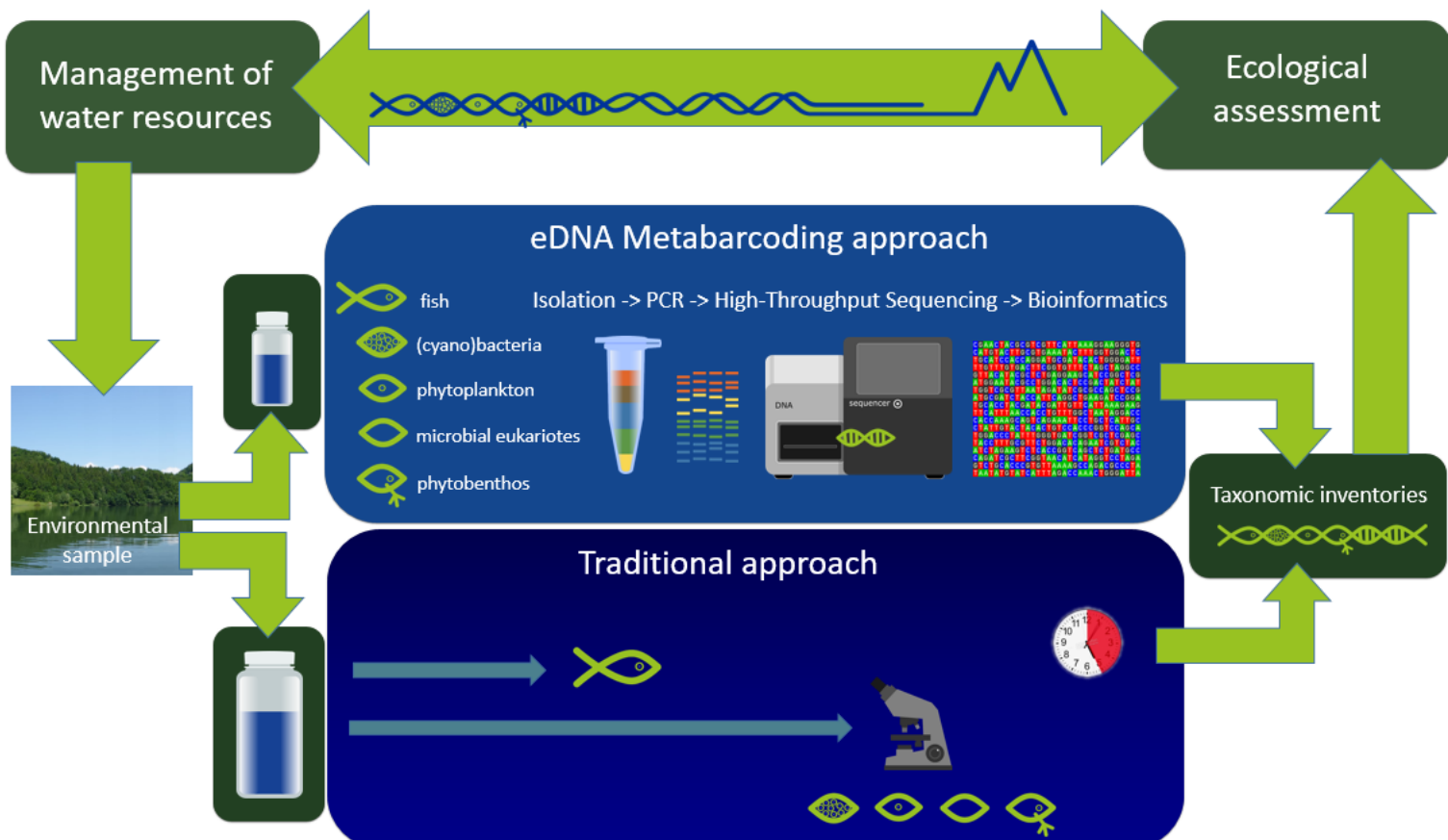




## Innovative Ecological Assessment and Water Management Strategy for the Protection of Ecosystem Services in Alpine Lakes and Rivers

With the adoption of new methodologies and approaches, the project [Eco-AlpsWater](#) sets very ambitious objectives, anticipating the route in the development of the new generation water monitoring systems in Europe. Ecosystem services provided by lakes and rivers are facing serious threats under the pressure of anthropogenic impacts, climate change, loss of biodiversity and invasion of exotic species. The evaluation of these changes is still evaluated by traditional criteria, which include expensive and time-consuming approaches (for example based exclusively on the classical identification of aquatic species with microscopy techniques). The main objective of Eco-AlpsWater is to integrate the traditional monitoring approaches used in the Alpine region and at the European level ([Water Framework Directive 2000/60 EC](#) and, in Switzerland, the Water Protection Ordinance-WPO) with advanced and innovative approaches, providing solid and qualified knowledge to further support water resources management plans. The new approach will use Next Generation Sequencing (NGS) technologies to analyze environmental DNA (eDNA) extracted from water samples collected in lakes and rivers. These new techniques, based on the amplification and analysis of millions of DNA sequences and on the use of smart technologies (automation in data processing and storage and information retrieval), allow a rapid and low cost identification of aquatic organisms, from bacteria to fish.



Together with the implementation of new monitoring techniques in European regions, the new technologies will provide the census of lake and river biodiversity in the Alpine region at an unprecedented level, based on the analysis of hundreds of samples collected in over 30 bodies of water. The data will in particular identify the areas most at risk due to the presence of toxic cyanobacteria, pathogenic bacteria, and invasive or potentially invasive organisms.

### Project structure:

**WP1: Innovative monitoring approaches** - Develop and test metabarcoding protocols

**WP2: Harmonization of approaches for water quality assessment** - Identify gaps in the present monitoring approaches

**WP3: Local pilot implementation** - Implement novel metabarcoding techniques in water bodies

**WP4: Next generation biomonitoring and Policy** - Improve management of water resources and ecosystem services using the new, innovative approaches

### Project outputs:

Metabarcoding Innovative methods

Policy on data storage and handling

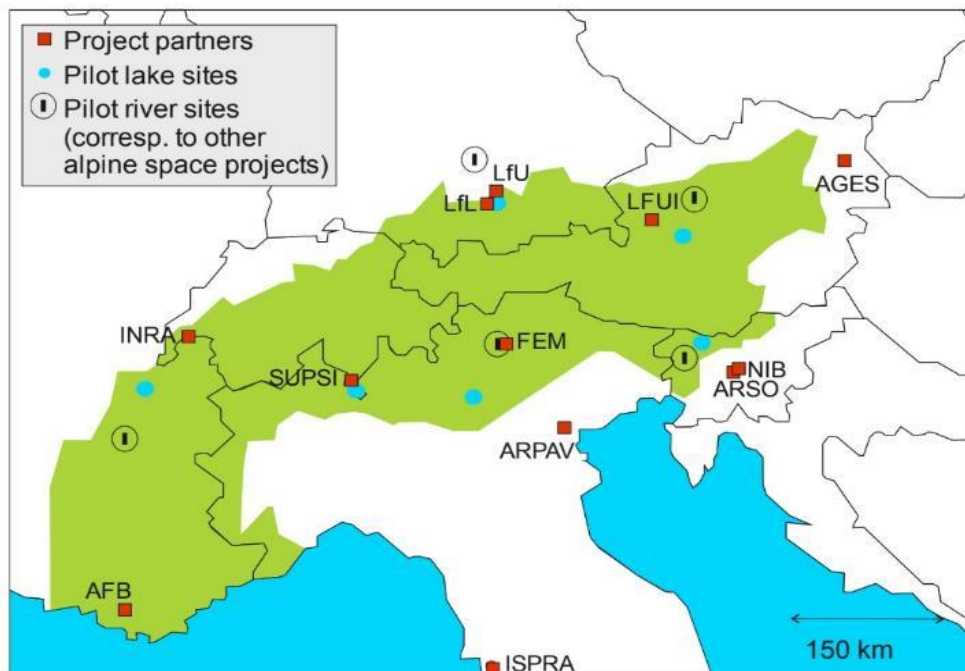
Harmonization of EU-WFD and CH-WPO approaches

Implementation of traditional & NGS monitoring

Improved transnational cooperation structures

Strategic elements and policy recommendation

### Partners and pilot sites



Lakes: Starnberg, Hallstadt, Bled, Garda, Lugano, Bourget

Rivers: Wertach, Steyr, Soca, Adige, Drac/Drome

### **Lead partner**

LP 1) [FEM](#), Fondazione Edmund Mach, (IT)

### **Project partners**

PP 2) [LFUJ](#), Leopold Franzens University, Innsbruck (AT)

PP 3) [ARPAV](#), Regional Agency for Environmental Protection and Prevention of Veneto (IT)

PP 4) [NIB](#), National Institute of Biology (SI)

PP 5) [ARSO](#), Slovenian Environment Agency (SI)

PP 6) [INRA](#), National Institute for Agricultural Research (FR)

PP 7) [LfL](#), Bavarian State Research Center for Agriculture, (DE)

PP 8) [AGES](#), Austrian Agency for Health and Food Safety (AT)

PP 9) [ISPRA](#), Italian National Institute for Environmental Protection and Research (IT)

PP 10) [LfU](#), Bavarian Environmental Agency (DE)

PP 11) [AFB](#), The French Agency for Biodiversity (FR)

PP 12) [SUPSI](#), University of Applied Sciences and Arts (CH)

### **Austrian observers**

Observer 1) [Federal Agency for Water Management, Institute for Freshwater Ecology, Fisheries Biology and Lake Research](#), Hubert Gassner

Observer 2) [ARGE Limnology](#), Christian Moritz

Observer 3) [Regional Government of Carinthia, Department & Environment, Water and Nature Protection](#), Helmut Serro

Observer 4) [Austrian Fisheries Organisation](#), Manuel Hinterhofer

Observer 5) [World Wide Fund for Nature \(WWF\) Austria](#), Elisabeth Sötz

Observer 6) [University of Natural Resources and Life Sciences Vienna, Institute of Hydrobiology and Aquatic Ecosystem Management](#), Thomas Hein