

## ***ExtremAqua...***

is a long term research program of the WasserCluster Lunz. ***ExtremAqua*** is established as a research site and acts as a main component of the LTSER (long term socio-ecological research) 'Platform Eisenwurzen' which is the flagship of Austrian long-term ecological research (LTER).

### Focus

The main issue of ***ExtremAqua*** is the investigation of climatic changes and weather-induced inputs on aquatic ecosystems and their constituent organisms.

### Motivation

Possible shifts in aquatic ecosystems may significantly affect human welfare. There will probably be relevant alterations according to water supply and water quality, the functioning of water dominated ecosystems and its impacts on the production of food and human health in general. Therefore it is essential to obtain additional knowledge about to the impacts of possible shifts in climate on aquatic ecosystems and its consequences. This enables us to give prospects and to provide relevant information for political actors, governmental and non-governmental planning institutions.

### **Aim and Content**

Superior aim of ExtremAqua is to provide continuous data sets with high temporal and spatial resolution and the frame for fundamental research questions. Both components are necessary to understand shifts and possible human induced fluctuations in aquatic and terrestrial ecosystems and their interactions. Effecting very different parts of human life, water quantity, water quality and possible changes in the hydrological cycle are one main topic which will doubtlessly affect diverse parts of future private and public life. Therefore, ***ExtremAqua*** provides basic research and its use for scientific sound advice for governments as well as agencies regarding sustainable supply and distribution of water, prevention/risk assessment of catastrophic events caused by extreme weather events such as floods, storms, or droughts.

### **Spatial extent**

The LTER study site of ExtremAqua is the upper catchment area of the Ois (Ybbs) river in Lower Austria. It contains the headwaters of the Ois, down to Göstling, and also includes the three lakes of Lunz (i.e., Lunzer Ober-, Mitter-, und Untersee).

Within the WasserCluster Lunz, ***ExtremAqua*** acts as the link between the three research groups.

### Research questions of ***ExtremAqua***

- 1.) Pulsing in catchment areas: High-resolution spatial modelling of nutrient loads from soils and fluvial systems. Possible inputs of extreme climatic incidences on the balance of transport and transformation.
- 2.) CO<sub>2</sub> and CH<sub>4</sub> fluxes from fluvial networks: Modelling of carbon fluxes through river networks.
- 3.) Microbial biofilms and hydrodynamic replacement as main contributors within the nutrient turnover in fluvial ecosystems

- 4.) Biochemical quality of aquatic organisms: The importance of terrestrial, bacterial and algal organic matter for life strategies of aquatic organisms at various trophic levels.
- 5.) Bioavailability and transfer of contaminants: Effects of rapid changes of weather events on transfer dynamics of contaminants.
- 6.) Lipids as essential nutrients in animals' and humans' nutrition: The impacts of extreme weather events on lipids and fatty acids profiles in aquatic ecosystems.
- 7.) Reaction of aquatic primary producers on extreme hydrological events in riverine landscapes: impact on nutrient uptake and primary production.
- 8.) Buffering capacity of riparian areas and other retention zones along the aquatic/ terrestrial interface and their relevance in the case of extreme flood events for nutrient turnover (especially nitrogen) in riverine landscapes.

Link: LTSER Platform Eisenwurzen

[http://www.umweltbundesamt.at/en/umweltschutz/oekosystem/lter\\_allgemein/mfrp\\_eisenwurzen/](http://www.umweltbundesamt.at/en/umweltschutz/oekosystem/lter_allgemein/mfrp_eisenwurzen/)

Contact

Elisabeth Werschonig