# Catchment and Eco-hydrology

In order to make accurate predictions of future changes in water quality and quantity in Europe and elsewhere, it is necessary to have a better understanding of the influence of different physiographic factors (topography, land use, soil types, geology, etc.) on catchment response behaviour and hydrological processes (water sources, flowpaths and transit times).

## Our research challenges

We work to develop new understanding of runoff generation processes, as well as the fate and transport of pollutants in river basins. A special focus is placed on how river basins store and release water and contaminants at different time and space scales. We support the development of models that can reduce uncertainty in projections of river basin response to changing climate and land use.
To this end, we actively contribute to the development, testing and validation of innovative environmental sensors and analytical equipment, operating at unprecedented spatial and temporal scales. These new datasets enable us to substantially improve our understanding of the collection, storage, mixing and release of water and related pollutants, and consequently, the performance of flood forecasting models. We also explore new tracing techniques based on biological tracers such as terrestrial diatoms for tracing hydrological connectivity and catchment functions of water mixing, storage and release.

## Our equipment

Our world-class experimental research site in hydrological sciences is installed in the Alzette river basin and allows us to collaborate with scientists from all over the world on cutting-edge research questions. Through its nested set-up, covering a wide spatial scale (0.45 to 1,100 km2), and a large variety of geologies and land use types, the Alzette river basin is a unique research site for generating groundbreaking insights into dominating controls on the multiple and highly variable processes that characterise the rainfall-runoff transformation.

### Contact

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