

Hydroecology



Hydroecology at Birmingham has a long history and is an internationally recognized group shaping current research avenues and driving the future direction of the discipline, particularly with respect to climate change.

Hydroecological research focuses on the bi-directional nature of hydrological-ecological process interactions at a range of spatial and temporal scales. These processes regulate the vulnerability of regionally and globally important ecosystem services to disturbance. With a strong focus on the biodiversity of freshwater and terrestrial habitats, feedbacks between physical and biological environments and the vulnerability of critical global carbon stores, hydroecological research at Birmingham provides a global centre of excellence that is influencing both national and international policies by combining innovative field and laboratory based experiments with the development and testing of theoretical, statistical and mathematical models.

Examples of our research



Fragility of stream ecosystem functioning in response to drought: an experimental test

Flow manipulations in stream mesocosms are revealing how the future intensification of drought will reshape freshwater ecosystems.



Ecohydrological implications of hotspots in biogeochemical turnover in hyporheic and riparian zones

Applying novel sensor network technology with reactive “smart tracers” to investigate the efficiency of interconnected nutrient cycling in reactive “hot-spots”.



Hydroecological response of Arctic river systems to climate change



Assessing climatic change and impacts on the quantity and quality of water



Geophysical investigation of peatland ecohydrological function

Application of electrical imaging and ground penetrating radar to monitor past peatland development and to characterise current carbon dynamics.



Hydroecological functioning of peatland environments and their response to wildfire

Quantifying the vulnerability of boreal peatlands to a changing wildfire regime.



Projects

- [INTERFACES - Ecohydrological interfaces as critical hotspots for transformations of ecosystem exchange fluxes \(/generic/interfaces/index.aspx\)](/generic/interfaces/index.aspx)
- [DRI-STREAM: Drought impacts on stream ecosystem structure and functioning \(/research/activity/water/projects/dristream/index.aspx\)](/research/activity/water/projects/dristream/index.aspx)

Collaborative links

The group has close internal links with the Health and Atmosphere research cluster and with other members of the Water Sciences cluster, together with other Schools and Departments within the University of Birmingham, including Biosciences and Civil Engineering.

Strong external links have been established with other universities across the UK and research organizations (e.g. Center for Ecology and Hydrology; The Environment Agency; Freshwater Biological Association and Severn and Trent Water). Current research also includes a number of international collaborators in for example, Alaska, Berne, ETH-Zurich, Geneva, McMaster, Florida Atlantic, Alberta, Oregon State, Oslo and Vienna.

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