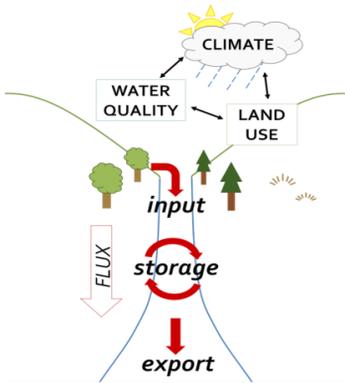


I developed a strong interest in the effects of global change on aquatic ecosystems during my Biology degree at Cardiff University. In my final year I investigated how episodic acidification affects leaf breakdown in streams, the findings of which were later published in [Freshwater Biology](#).

After graduating in 2011, I spent a year working as a research assistant within the Catchment Research Group at Cardiff University, investigating organic matter dynamics in upland streams within the long-established [Llyn Brianne Stream Observatory](#). During that year, the birth of DURESS led me to organising field surveys of invertebrates and fish in different types of streams all across the Welsh uplands.



Major energy pathways through streams and imposing environmental factors

Later in 2012, I began my PhD project as part of DURESS, working with Dr Isabelle Durance, Prof Steve Ormerod and Dr Ian Vaughan, investigating energy flows through stream ecosystems (see figure, left).

Headwater streams are fuelled by large amounts of organic matter entering from their surrounding catchments. This material is then processed and provides an important supply of energy to larger rivers downstream.

My research focuses on understanding how land use, climate and water quality interactions could affect the dynamics of these resources and their ecological effects in upland streams.

So far in DURESS, we have carried out a large-scale manipulation experiment simulating a land-use change to deciduous woodland (pictured, right). This tests the effects of land-use change on the regulation of decomposition, an important ecosystem service.

By monitoring the export of organic matter from these streams, my aim is to shed light on the processing and downstream transport of this material, and the role that biodiversity plays in these important stream functions.



Large amounts of leaf material were added to mimic a land-use change to deciduous woodland



Sampling for organic matter and invertebrates in the stream benthos

Other work involves using quantitative sampling methods (pictured, left) to look at how the storage and transport of energy resources in different streams varies from year-to-year, and what effect this might have on invertebrate consumers.

Future work will involve looking at resource dynamics during storm events, as well as using existing data from the Llyn Brianne Stream Observatory to look at the long-term effects of land-use and climate change on invertebrate production.