

Industrial fellowship: Engineering river freedom for resilience

This year, Dr Richard Williams from the University of Glasgow is undertaking an [industrial fellowship](#) with cbec eco-engineering. Funded by the Royal Academy of Engineering, the fellowship enables the [University of Glasgow](#) and [cbec eco-engineering](#) to undertake a collaborative research project, titled “Engineering river freedom for resilience”.



[Richard Williams](#) is a lecturer in the School of Geographical and Earth Sciences, University of Glasgow. His research interests lie in the fields of geomatics, fluvial geomorphology, remote sensing, flood risk management, and numerical modelling. Specifically, he is interested in the dynamism of river systems at the reach spatial scale and event-to-decadal timescale. His research focuses upon enhancing and applying novel geomatics and remote sensing methods to gain insight into river morphodynamics. Such data also provide innovative parameterisations for hydro- and morpho-dynamic numerical models, and spatially-temporally explicit metrics for model assessment. His research supports fundamental insights into the controls on river planform and provides evidence for scientifically informed management of flood conveyance, and in-stream and riparian habitat.

Richard has an undergraduate degree in Geography, from the University of Cambridge, and a masters degree, in Science of the Environment, from Lancaster University. Richard moved to Aberystwyth University in 2009 to work as a Research Assistant on the NERC funded ReesScan Project. At this time he also commenced his doctoral work on modelling braided river morphodynamics. Richard was appointed to a lectureship at Aberystwyth University in 2013. He moved to a lectureship at the University of Glasgow in 2015. Richard’s email is richard.williams@glasgow.ac.uk

Collaborative research during Richard’s industrial fellowship aims to assess the morphological sensitivity of recently completed river restoration schemes. The specific objectives are: (1) to assess rates of morphological adjustment following river restoration implementation using a variety of survey methods including unmanned aerial vehicles (UAVs); (2) to evaluate scheme resilience based upon restoration approach, river energy and scheme maturity; (3) to produce evidence to shape future river restoration efforts. The project will examine a set of cbec’s restoration sites that are distributed across Northern England and Scotland, where topographic or aerial survey data exist to quantify pre-flood morphology. The sample of sites represents a diverse range of restoration approach, river environments and scheme maturity. They include restoration schemes on Wooler Water (Northumberland), Eddleston Water (Tweeddale), River Findhorn (Moray), Allt Lorgy (Highland), East Tullos Burn (Aberdeenshire), College Burn (Northumberland), and Mains of Dyce (Aberdeenshire).

Research to date has included surveys of the Allt Lorgy and Wooler Water realignment schemes, and a site visit to Eddleston Water. Richard has also been involved in the survey of the River Findhorn and subsequent analysis to derive a morphological change sediment budget for the surveyed reaches.

