

Historical and contemporary catchment-scale dynamics and geomorphological influence of large woody debris

Background:

Although traditionally viewed as causes of increased flood risk due to their influence on channel capacity and flood conveyance, large woody debris (LWD) are increasingly being used in river restoration schemes in order to improve habitat diversity and as an alternative to channelisation for flood mitigation. However, our knowledge of LWD dynamics in natural streams is relatively limited, especially over short (annual-decadal) timescales. Recent studies have shown that, even in relatively small rivers, LWD can be transported large distances (> 1 km) in short periods (Dixon and Sear 2014). In addition, there is also a lack of information regarding the longer term (>10¹ a) dynamics of riparian vegetation on Welsh rivers, despite its likely impact on channel planform and rates of bank erosion and channel planform change.

This project would aim to:

- 1) Quantify historical changes in riparian tree cover on 40 Welsh river systems by comparing vertical aerial photography from 1944, 1992 and 2006.
- 2) Identify sources, pathways and dynamics of LWD in three river systems in west Wales (the Afon Leri, Afon Ystwyth and Afon Dyfi) using dGPS tracing of LWD in the river channel and on floodplains.
- 3) Investigate the role of geomorphology in controlling and reflecting historical and contemporary LWD dynamics.

Dixon, S. J., & Sear, D. A. (2014). The influence of geomorphology on large wood dynamics in a low gradient headwater stream. *Water Resources Research*.

Personal specification:

Essential:

An undergraduate degree (II:i or higher) in any Physical Geography or Earth Science related subject. Experience in using GIS and remote sensing software packages and evidence of having studied fluvial geomorphology.

Desirable:

A Masters degree awarded at the Merit level or higher in any Physical Geography, Earth Science or Computer Science-related subject.

Further information:

For further information specific to the project, please contact Hywel Griffiths (hmg@aber.ac.uk)

For application forms and procedures, please go to the Department's Postgraduate Student webpage and the University's Postgraduate Student webpage.

Your application form needs to be accompanied by two references (although these can be sent separately following the form if time is tight) and a research proposal, typically ~ 1500 words outlining your project.