

Institution: Loughborough University

Unit of Assessment: C17 Geography, Environmental Studies and Archaeology

a. Context

The Geography Unit at Loughborough University (LU) has engaged with a range of non-academic user groups, beneficiaries and audiences. The reach of our impact includes: (i) Supra-National Government (European Commission); (ii) UK Central Government (Departments for International Development, Business Innovation and Skills (BIS), Food and Rural Affairs (DEFRA), Energy and Climate Change (DECC), the Cabinet Office and the Home Office); (iii) UK local government (e.g. Brighton and Hove Council); (iv) Regulators (e.g. Environment Agency (EA), Natural England (NE)); (v) International Donors (e.g. European Bank for Reconstruction and Development (EBRD), World Bank); (vi) Non-Governmental Organisations (e.g. World Wildlife Fund); (vii) Private sector (e.g. EDF, MasterCard, Wessex Water); and (viii) Professional bodies (e.g. Royal Town Planning Institute). The significance of our work is evident in three types of impact. First, our research impacts on the environment (e.g. underpinning the development of new tools, protocols and planning guidelines for water resource management in the public (EA, EU) and private (utility) sectors (Wilby, Wood)). Second, it reshapes practitioner activities and professional services (e.g. developing software for practitioner use in climate change (Wilby, Dawson) and river management (Graham, Rice) contexts. Third, our scholarship informs public policy (e.g. UK state policy on Housing in Multiple Occupation (Smith)).

Research activities underpinning these impacts originated within the Unit's *Centre for Hydrological and Ecosystem Science (CHES)* in Physical Geography and within the areas of *Children Youth and Families (CYF)* and *Migration Identity and the State (MIS)* in Human Geography.

b. Approach to impact

Unit research culture and support for impact: The Unit's approach to impact is inclusive. We believe that all research matters, and that all staff should seek to ensure their work has an appropriate impact. Continuing professional development (CPD), organised by the Associate Dean for Enterprise (ADE-Smith), has provided an opportunity for all staff to engage with this changing aspect of the research landscape. The incorporation of impact into Personal Research Planning has further developed a research culture in which impact is seen as an integral, and valued, part of an academic workload. To enable staff to develop the impact of their research the Unit has provided a variety of support mechanisms, including: (i) Allocation of recurrent funds to pump-prime impact activities; (ii) Working practices that allow staff to take on enterprising scholarship alongside normal contractual duties; (iii) Networking opportunities created by bringing in non-academic guest speakers and potential partners to activities within the Unit; (iv) Web presence to showcase our expertise to non-academic audiences; (v) Mentoring and advice by Assistant Deans for Research and Enterprise for all staff (ADR-Wilby); (vi) Impact advice through mentoring/probationary arrangements for new staff; and (vii) Laboratories and technical support which sustain excellent research and which are made available for research with stakeholders.

Institutional support for impact: The Unit takes advantage of LU institutional structures that enable and encourage a culture of 'research that matters'. First, we utilise the services of the Research Office and Loughborough University Enterprise Limited (LUEL), both of which manage contracts, intellectual property issues, and liability insurance for work funded by stakeholders (including BIS, DEFRA, DECC, EA, EBRD, Brighton and Hove Council, and Anglian Water). Second, bespoke resources are available to stimulate impact activities via the "Higher Education Innovation Fund" (HEIF). This has supported initiatives within the Unit such as a climate scenarios primer for the Tunisian Meteorological Service (Wilby), software development to improve usability of the Digital Gravelometer (Graham), and a 'bridging the gap' forum for government housing officials in London (Smith). Third, the Unit was awarded a one-year LU Enterprise Fellowship involving secondment to DECC and the Energy Generation and Supply Knowledge Transfer Network which enhanced the relationship between the Low Carbon Energy Development Network and UK SMEs active in energy technology markets across the Global South. Finally, public visibility

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of our research is raised by the LU open access Institutional Repository (www.dspace.lboro.ac.uk).

Developing relationships with research users: The Unit engaged with stakeholder groups at the global, national, and local scales. Relationships were developed by: (i) Winning competitive bids for consultancy (e.g. Wilby and Acclimatise for EBRD work in Tajikistan); (ii) Direct approaches to stakeholders in researchers' area of interest (e.g. Holloway & Pimlott-Wilson's work co-producing best-practice guides for community engagement with local authority outreach workers); (iii) Approaches by stakeholders to acknowledged experts in the field (e.g. Wilby's review of the UK Climate Change Risk Assessment for the Adaptation Sub-Committee); (iv) Introductions via other stakeholders (e.g. Rice, NE). (vi) Movement of staff between industry and the Unit (e.g. Hillier, Zurich Insurance); and (vii) Joint supervision of postgraduate research (e.g. an EPSRC-funded studentship between Anglian Water Services and the Unit).

Co-producing knowledge: Relationships with users develop in depth and intensity over time. In some instances, stakeholders are initially seeking expert advice to inform policy and practice. In 2009, Smith provided evidence to the Minister for Communities and Local Government during revisions of the Use Classes Order planning legislation. Such relationships rarely remain unidirectional, as we engage with users in the co-production of knowledge and its deployment. The EA, for example, approached Wood for help in the devising of the Proportion of Sediment Sensitive Invertebrates (PSI) metric; they then developed the tool on the basis of expert advice; a tool which he then helped test and refine using independent data prior to its deployment. Indeed, as links with stakeholders are developed their insights, data and practical expertise feed back into our research. Rice has used his expertise in gravel-bed rivers to provide technical assistance to NE enabling them to audit sediment sources, pathways and mitigation strategies. This work, and subsequent interactions with the EA, laid the foundations for the Loughborough University Temperature Network, and will play an important role in CHES research beyond REF2014.

c. Strategy and plans

1. Strategy: Our strategic aim is to use our research to promote social justice and environmental sustainability through engagement with academics, policy makers and other stakeholders. The Unit has facilitated impact by setting clear goals and formulating plans that will realise these in practice. Our goals are first, to develop further a *research culture* which moves beyond dualist understandings of 'pure' and 'applied' approaches to knowledge, ensuring that our RCUK research has greater impact, and our impactful enterprising scholarship is nurtured and valued. Second, to provide a *research environment* where impact is supported, both through infrastructural mechanisms within the Unit, and by drawing on funding, expert advice and services provided within LU. Third to design *research that matters* and co-produce knowledge, by taking advantage of planned and serendipitous opportunities to develop meaningful relationships with private, public and third sector organisations that play key roles in managing social and environmental futures.

2. Plans: This agenda has already been driven forward through the mechanisms and relationships identified in section B. To ensure our current and future research has impact going forward to 2020 and beyond, we will:

(i) Enhance Continuing Professional Development provision about impact: (a) Further integrate impact into our research culture by holding annual 'i-days' involving industry speakers and showcasing best practice; (b) Convene quarterly impact seminars within the Unit to share best practice; (c) Formally incorporate the documenting of impact development into arrangements for the mentoring of new staff, the probationary arrangements of early career staff, and promotions; (d) Continue to utilise ADR/E mentoring for impact.

(ii) Refine Unit workload model to reflect time spent upon impact: Impact has been incorporated into personal research planning for all staff, and new weightings in the Unit's workload model will be applied from 2014-5, ensuring dedicated staff time for impact as we move forward.

(iii) Utilise Unit resources to support impact: (a) Maximise use of research capacity by using laboratory facilities and technical support both for academic research and enterprising scholarship, ensuring that research needs and industry standards are met in facility redevelopment; (b) Provide recurrent monies, and run competitive bids for seed-corn funding, to support impact; (c) Direct Research Committee to evaluate impact performance by research theme and address barriers to

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progress; (d) HOD, and LU Senior Management, to monitor individual impact activities.

(iv) Capitalise on institutional support for impact: (a) Utilise LU funding for impact to maximise the reach of impact (e.g. Enterprise Project Group (EPG) grants for knowledge transfer); (b) Continue to employ the services of Research Office and LUEL, thereby freeing staff to focus on the co-production of knowledge with non-academic partners; (c) Share data sets through the LU Research Data Management Initiative; (d) Exploit LU Enterprise Office (EO) expertise in developing and realising Impact Plans.

(v) Maintain and forge links with public, private and third sector organisations: (a) We will build on the links already developed with stakeholders at the global, local and national level; (b) We will extend the reach of our impact by establishing new links through the seven-fold strategy outlined in section B; (c) We will also make greater use of specialists employed to help us establish links that will develop the significance of future impact. For example, we currently have a 6-month placement funded by the EU, and two 1-month placements funded by European Institute of Innovation and Technology, in the EO to facilitate collaboration with industry on developing solutions to waste problems, and with the private sector on advancing innovation in low carbon technologies; (d) In addition, we will utilise EO's University Partner Database, and opportunities created by Loughborough University in London, to extend our collaborations.

(vi) Consolidate and extend the range of our impact: (a) We plan to consolidate our impact in water, climate, sediment, and housing (see case studies); (b) We have attracted, and will continue to seek, funding which will extend the significance and reach of our research: e.g. arctic futures (Anderson, NERC, community groups in Alaska and Russia); children's and young people's geographies (e.g. S. Mills, Institute of Historical Research, public exhibitions); environmental sustainability and energy policy (Brown, Harrison, EPSRC, African and Asian NGOs); migration and the state (e.g. Antonsich, EU Marie Curie, Italian Ministry of Education).

d. Relationship to case studies

The Unit has created an environment that nurtures underpinning research and its impact. Below we identify 4 key ways in which support for impact has shaped the case studies. For brevity, we focus on one issue per study, but note that multiple forms of support cross-cut our impact portfolio.

Scientific advisory services for climate adaptation and development planning. This case study demonstrates the importance of institutional support mechanisms. The research underpinning this case study originated from Wilby's work at LU in 1993, but since 2008 the reach and significance of this impact has been significantly strengthened by the deployment of institutional support for impact. For example, LUEL has facilitated Wilby's engagement with EDF by negotiating/managing contracts, giving legal advice, and brokering indemnity insurance.

Transferring knowledge of fluvial geomorphology to river sediment management. This case study illustrates how synergies between RCUK research, and the development of impact through enterprise activities, depend upon the Unit's provision of state-of-the-art laboratories and field instruments. Together with technical staff resources, these facilities meet the needs of both 'blue skies' research and the development of its impact through collaboration with user groups.

Regulating the effects of Housing in Multiple Occupation (HMO) and student populations. This case study highlights the strategic benefits of providing seed-corn funding to develop impact from underpinning research. Smith was able to bid for resources that allowed him to undertake a national-level survey of planning officers, travel to meet with users, and run training workshops for stakeholders, activities which underpinned his contribution to national and local housing policy.

Transposition of European policy into practice: Conservation and management of riverine ecosystems. This case study matured the Unit's approach to time allocation for impact activities. To date, the Unit has allowed members of staff to develop impact during normal working hours, but this was in addition to other research, teaching and administrative commitments. The new workload model places greater value on the work of colleagues such as Wood through the weighting of impact. This will further incentivise all staff to ensure that the social and/or environmental benefits of their research are fully realised.