Institution: Plymouth University

Unit of Assessment: C17 (Geography, Environmental Studies and Archaeology)

a. Context

The Centre for Research in Environment and Society (CeRES) is the basis for our submission to UoA 17. Through the Centre we have established an integrated and dynamic group of staff with a strong emphasis on policy-based research and interdisciplinary thinking. The range of our non-academic beneficiaries and partners is diverse, reflecting the wide spectrum of research undertaken. They range from UK Government (e.g. Foreign and Commonwealth Office), national media (e.g. TV for Electoral studies), regional and local bodies (e.g. National Parks), business enterprises (e.g. KTP with Milk Link UK), to overseas and international organisations (e.g. IAEA/UN-FAO). Among our over-arching research themes with important non-academic audiences and end-users are:

1. Reconciling personal mobility and social/environmental sustainability, for example, via access to local public transport provision (e.g. the Devon and Cornwall Rail Partnership);
2. Poverty alleviation, improved quality of life and geographical (in-)equality of opportunity, whether in southern Africa, European cities, or UK regional transformation;
3. Climate change and its consequences for international, national and local policy and practice, in terms of societal change (e.g. energy transitions), cultural value (e.g. wild spaces) and for environmental systems (e.g. coastal zone management);
4. Land-use management for habitat conservation, maintenance of ecosystem services, and sustainable rural economies, in settings ranging from SE Asian rainforest, to Bangladesh rice cultures, Mediterranean hill-slopes, Californian creeks and Exmoor peatlands;
5. Democratic participation and good governance, both overseas (e.g. Philippines government bureaucracy) and in the UK (e.g. equitable national electoral geography).

CeRES has historically had strong regional collaborative research links along with memoranda of agreement with the Environment Agency, Natural England, DEFRA, businesses and NGOs. This is evidenced by numerous partnership research projects which are providing clear benefits for grassroots organisations (e.g. Dartmoor-based Moor Trees charity) and regional businesses.

b. Approach to impact

Given the diversity of research within CeRES, we do not adopt a single model for engagement with key users to develop impact. One favoured model is to develop external (i.e. non-academic) relationships through co-evolutionary partnerships, such as the Devon and Cornwall Rail Partnership. The D&CRP is an example of 'action research' that has put into practice our studies of local-scale mobilities and spatial access. It has won numerous national awards, and its director, *Richard Burningham* (a University employee) was awarded the MBE for his contributions to rail travel in the Southwest in the 2010 New Year Honours list.

In reality, processes of engagement with key external users may be opportunistic and wider benefits of academic research can be unexpected. Whether planned or serendipitous, we have established a culture of enterprise so that staff can maximise opportunities as they arise and a series of steps for their support (see c below). These are given practical form via the University's 'Enterprise Solutions' unit and the Institute for Sustainability Solutions Research (ISSR). In some cases, opportunities are small-scale; such as via annual V-C's Community Research awards which provide seed-corn financial support for research requested by local bodies; e.g. award to ***Blake*** working with the Plymouth Groundwork Trust to investigate pollution sources in urban streams. Other opportunities are larger and multi-disciplinary, and serve wider strategic priorities. The £34m Wave Hub off the Cornish coast, for example, is central to the UK's Government initiative for finding non-carbon based means of energy generation. Working with other partners and additional EU funding, CeRES staff (***Bailey, Rodwell***) have provided policy-makers with key results regarding its socio-economic and environmental impacts, for example on coastal communities, as well as high-quality academic publication outputs. This initiative has been possible as a result of University-wide coordination and support via the Plymouth Marine Institute and business-led external engagement with the former South West Regional Development Agency (SWRDA).

Collaboration with SWRDA and its successor bodies (notably local enterprise partnerships) illustrates another route we have employed in order to develop research partnerships with external users, namely through co-funded PhD research studentships. Under the Great Western Research (GWR) scheme, we successfully bid for 4 co-funded PhD studentships, with 50% funding from SWRDA and 50% obtained by CeRES staff from non-university partners, such as Dartmoor National Park. All research students completed in good time and gained work-based experience. The awards to CeRES were highlighted in the GWR final report as exemplars of good practice in terms of meeting both academic excellence and the wider needs of regional stakeholders; e.g. in drafting Local Authority transport plans.

Our research has enhanced evidence-based decision-making by the provision of expert advice by CeRES staff to public bodies, businesses and NGOs. For instance, ***Shaw*** provided advice to the House of Commons' Transport Committee's inquiries into the major road network (2009), and into taxes/charges on road users (2008). In recognition of his expertise in transport policy, he also serves as a member of the First Great Western Advisory Board. As other examples, ***Bailey*** was an invited participant at a 10 Downing Street roundtable seminar in 2009 on 'Industrial activism, market regulation and low carbon transitions', ***Gaskarth*** has been an advisor to the FCO, while ***Holden*** drafted one of the official background papers for a key OECD policy forum on Aid for Trade. CeRES staff are also actively engaged in public dissemination of knowledge. This ranges from media appearances, such as ***Rallings'*** and ***Thrasher's*** contracts with TV, radio and the press analysing UK electoral scenarios, through to joint academic-industry seminars run by our Centre for Sustainable Transport. CeRES staff are encouraged to think carefully about how stakeholders can be directly involved in the research process, and how their research can be successfully communicated to stakeholders and target audiences. For example, two interactive workshops on the streamlining of consenting processes for marine renewable energy projects were attended by >80 stakeholders including local representatives, the European Commission and regulatory bodies. University support proved crucial to the success of this process by help in liaising and information exchange.

c. Strategy and plans

Building on the University's Strategy 2020, our goals for supporting impact are to

- Embed an enterprising approach throughout our research
- Develop a partnership approach with individuals and organisations to spark creativity
- Create conditions that support knowledge exchange with businesses and other organisations, including the commercialisation of research outcomes for public good
- Enhance public engagement in, and understanding of, research and innovation through a range of channels and media
- Use our expertise in sustainability research to contribute to defining the problems and creating solutions for pressing environmental, economic and social challenges;
- Engage with national and local government, professional and statutory bodies, business groups, and key opinion-formers to inform and influence policy developments.

Reflecting the diversity of opportunistic approaches (outlined above), within CeRES we have distilled the following strategic steps for supporting impact:

- **Promotion of enterprise directly:** this is achieved by staff-led research that focuses on outcomes with practical applications for specific stakeholder groups and wider society. Examples include research interfacing closely with business (e.g. KTP with Milk Link UK; ITSO smart ticketing Case Study) and the involvement of stakeholders in research projects through day workshops and conferences.
- **Development and application of new approaches for improving the wider understanding of research outcomes:** impact is explicitly integrated in the CeRES strategy through (1) dissemination to the user community of new approaches for understanding the linkages between environmental change and community resilience (e.g. Totnes as a transition town, the subject of ESRC-funded PhD research by *Rob Hopkins*, one of the founders and co-leaders of the Transition movement, supervised by ***Wilson*** and ***Bailey***); (2) publication of regular reports and improved public understanding; e.g. of impacts of renewable energy projects (***Bailey, Rodwell***); (3) maintaining and enhancing our strategy for PhD studentships co-funded with external

partners; e.g. European Social Fund on coastal fisheries' management by better understanding the resilience and vulnerability of Cornish fishing communities.

- **Investigation of current research challenges using a combination of field and laboratory based techniques:** consultancy activities are integrated in our strategy, in particular with regard to the Consolidated Radio-Isotope Facility (CoRIF) laboratory, an ISO 9001:2008 accredited, state-of-the art facility that provides a range of contract analytical services in sediment geochronology, soil erosion and sediment budget studies, radioactively contaminated land and tracer studies. A recent example is provided by ***Blake's*** work on the transfer of fallout radiocaesium in catchments impacted by the Fukushima nuclear accident in Japan. In similar vein, we are currently investing in laboratory facilities to permit optical (luminescence) dating, which will be offered to external users as well as in-house research, and costed appropriately (***Telfer***). Field techniques have similarly wide applications in applied research/consultancy, e.g. in river channel design for restoration and industrial usage of floodplains, and developing tools (e.g. MiMAS) for assessing the impact of river engineering on the good ecological quality of rivers (***Gilvear, Downs***) for Scottish Coal, DEFRA, RSPB, etc.
- **Collaboration with key stakeholders to ensure that research outcomes benefit wider society:** e.g. land owners, local and regional decision-makers, in order to ensure dissemination of research results to relevant authorities. An example is provided by the new Plymouth-led EU-funded VALMER project, which is evaluating how improved ecosystem service valuation can support effective marine spatial planning and management (***Glegg*** and colleagues).

Targets that have been set in the business plans of externally-funded contracts (e.g. consultancy) are subject to regular reporting and monitoring, both financially and in terms of deliverables, via each project's advisory panel. All such projects have to be fully costed (c.f. FEC), with a financial fire-wall separating them from other budgets. Monitoring of progress includes ethical and equality dimensions, staff development, assessment of health and safety, and sharing of best practice.

d. Relationship to case studies

UoA 17 is submitting the following four case studies that represent examples at different stages of the pathway to impact:

1. **British Local Elections Database (*Rallings, Thrasher*):** this relates to key research theme 5 (see a above), namely democratic participation and good governance;
2. **ITSO smart ticketing throughout South West England (*Shaw*,** *Seedhouse*)**:** this research involves the delivery of a more sustainable and socially-equitable transport policy by the application of SmartCard technology. It illustrates key research theme 1, viz. personal mobility and sustainability;
3. **Wildfire threat to water resources: informing catchment management policy and practice (*Blake*):** this illustrates key research themes 3 and 4, viz. climate change and land-use management, in Australia and the UK, to create a sustainable solution for a pressing environmental challenge;
4. **Sea-level rise and critical transport infrastructure (***Gehrels,* ***Shaw*****):** this research has shown the threat of future sea-level rise to existing transport infrastructure (especially rail network); it relates to key research theme 3 (climate change);

These case studies exemplify aspects of the research approaches adopted, especially the close engagement with specific stakeholder groups, including practitioners and businesses, and a focus on research goals that aim at aiding and influencing societal processes or responses. CS1 highlights our role in providing expert advice which enhances public understanding and engages with national and local government in regard to policies affecting the UK political arena. CS2 has led to the creation a region-wide not-for-profit company with practical benefits for businesses and wider society. CS3 involved the development of co-evolutionary partnerships with water catchment policy-makers and managers. CS4 has provided crucial information to local, regional and national stakeholders and decision-makers in regard to possible future scenarios and hence for future transport infrastructure investment. Our case studies are based on long-standing good practice, and in turn they have informed the development of CeRES' research philosophy. Our approach has thus been characterised by emergent and mutually reinforcing processes that are adapted to the need to establish strong impact case studies as befits the circumstances.