Institution: University of the West of England

Unit of Assessment: 17 Geography, Environmental Studies and Archaeology

a. Context: Research in this Unit reflects University strategy to pursue 'excellent research that has a positive impact on economy and society'. The Unit comprises three research areas (*Air Quality and Carbon Management*; *Water and Society*; and *Society, Culture and Community*) that aim to optimise research relevance to policy-makers and practitioners by cultivating strong and enduring relationships with key partners locally, nationally and internationally. These partners, and wider beneficiaries, include government organisations (e.g. Defra, DECC, DfT, DG Environment), non-government organisations (e.g. Environmental Protection UK, Consumer Council for Water), local authorities (e.g. Bristol, South Gloucestershire, GLA), businesses (both SMEs and larger companies such as Bristol Water Plc), professional bodies/learned societies (e.g. RGS-IBG, CIWEM, Institution of Environmental Sciences (IES)) and third sector organisations (charities, e.g. Oxfam, the Pew Foundation, Tourism Concern; local community groups such as arts and river campaigning groups; and the general public, e.g. Lower Severn and Bristol flood risk groups). Our research has had wide-reaching benefits for those involved in the planning, management and utilisation of a diversity of natural, semi-natural and cultural environments. Through our partnerships, we have impacted upon advancement of user knowledge (e.g. improved identification of flood patterns; more nuanced understandings of relations between individual and aggregate water demand patterns; clearer understanding regarding ownership of public fishing rights) and development of user skills, capacity and capability (e.g. 'Water and Planning' educational events; national conferences on marine planning). We have consequently influenced:

Quality of life in the UK and targeted nations (Bulgaria, Indonesia, Nigeria, South Africa, Uganda) by developing capacity for effective environmental decision making (e.g. preparing the emission inventory for the Niger Delta and the National Framework for Air Quality in South Africa; informing the sustainable management of UK water resources) and by making key contributions to socio-environmental justice (e.g. working with UK communities and charities to increase flood risk preparedness; improving water services in poor communities in Uganda; raising awareness of inequitable water distribution in the Balinese tourism industry).

Economic development in the UK and internationally (e.g. integrating lay and expert knowledge to increase resilience around water security/flood risk; developing tools to enhance effectiveness of Local Air Quality Management processes; advising on the role of charity retailing in economic regeneration; setting a sustainable urban development agenda in Durban, South Africa).

Environmental conservation by co-developing stakeholder-based models for environmental and social benefit (e.g. Arran Seabed Trust, the first community-led marine protected area in the UK; the Chagos Marine Reserve, the largest marine reserve in the world; the Bristol Avon Rivers Trust, a catchment-based community organisation, and the Bristol Local Engagement Forum, through which consumers influence business planning by their water provider).

b. Approach to impact: Our emphasis is on knowledge co-production with a diverse range of partners, and establishing clear links between conceptual/methodological research innovation and advances in policy and practice. Specifically (and citing selected examples), we do the following:

1. Work in partnership with users - Working closely with UWE's Research, Business & Innovation (RBI) unit, we collaborate with non-academic partners throughout our projects e.g. in ESRC-funded KE partnership with the Environment Agency (EA) (*McEwen*) to maximise impacts of the ESRC Flood Memory project, trialling digital stories around preparedness within different flood risk settings. We undertake consultancy to translate our research into practice e.g. *Staddon* enlisted by Bristol Water to scrutinise 'Consumer Willingness to Pay' - part of business planning processes mandated by government. We support business development through connecting knowledge and industry need e.g. £2m ERDF and DCLG-funded Environmental Technologies iNet (innovation network) (*Longhurst, Hayes*). Through this network we assist businesses connected with environmental goods and services in SW England to innovate products and services, improve competitiveness and develop new routes to market (knowledge exchange, through a UWE-led network of 1300+ SMEs and 'business assists', helping to support the creation of over 100 new jobs and sales growth in excess of £2.5m, building upon protected IP and over 60 new products).

2. Lead and participate in networks and encourage secondments with user organisations - We are proactive in bringing together academics and non-academics to innovate and inform practice, playing leading roles in numerous inter-professional networks, bringing researchers and practitioners into shared real and virtual spaces. Examples include the AHRC Living Flood

Histories network (*McEwen*), River Science Network (*Parker*), HEIF-funded Water and Tourism Network (*Cole*) and the Lloyd's Register Foundation International Water Security Network (*Staddon*). We support secondments and encourage hybrid roles as academic-practitioners – e.g. ESRC/DECC funded 12-month policy placement fellowship in DECC (*Chatterton*) leading to DECC undertaking broader engagement with the social science research community and being more open to sociological approaches in understanding and influencing consumption behaviour.

3. Act as expert commentators - Staff have influenced policy and practice through expert input to panels, commissions and inquiries with the following examples. *Staddon* provided expert oral and written testimony to the Government's Cave and Walker Reviews related to competition, metering and pricing in water services; his commentary has contributed to changes to OFWAT policy around surface water drainage (the so-called 'rain tax'). *Appleby* made a cited and endorsed response to a House of Commons Treasury Committee investigating management of the Crown Estate; his work was used in the High Court in an important judicial review regarding ownership of the UK's fishing rights via the case of 'United Kingdom Association of Fish Producer Organisations v Secretary of State for the Environment Food and Rural Affairs'. *Everard* advised Defra on embedding an Ecosystem Approach, including significant input into 'The Natural Choice' (June 2011 Natural Environment White Paper) and served as a team member developing the Defra Payments for Ecosystem Services (PES) Action Plan (2013). *Longhurst*, *Chatterton* and *Hayes* have offered advice and guidance on reviewing and assessing air quality, including contributions to ministerial responses, MPs' questions and senior civil servants' enquiries and the preparation of Technical (TG09) and Policy Guidance (PG09). *Staddon*, *Longhurst* and *Bailey* provided expert input into Bristol's successful bid for 'European Green Capital 2015' designation.

4. Use research findings as tools for practitioners and directly inform community projects - We have co-developed outputs with clients and users and turned findings from fundamental research into usable formats with the following examples. Working with NGOs and community organisations, *Staddon* (with McLaughlin) has developed a handbook for Water User Committees (WUCs) in Uganda in an effort to help rehabilitate community water supplies. The document, translated into local dialects, has been distributed to over 200 WUCs and is already being used by them to challenge illegal enclosure of communal water resources. *Parker* developed ST:REAM, a model of river catchment sediment dynamics that is being applied by the Scottish Environment Protection Agency to inform its sediment management and flood risk responsibilities. In collaboration with the IES, Bristol City Council and others, *Bailey* is using the award winning Future Bristol web environment, derived from *Longhurst*'s EPSRC award, to engage community and other partners in the visioning of a low carbon 2050 Bristol. This work was a key component of the public engagement campaign of Bristol's winning bid for European Green Capital. *Maddrell* worked with the Praying the Keeills pilgrimage group on the Isle of Man to improve promotional strategies to widen participation (especially for young and working age people).

5. Develop innovative strategies for co-production of knowledge - We consciously broker relationships with key gatekeepers to organisations and constituencies. This includes development of the Stakeholder Competency Group model (*McEwen*) which achieves mutual capacity building between researchers and stakeholders throughout research projects. We are innovating co-generated water narratives with Bristol communities, increasing local awareness of positives/negatives of 'living with water' in an environmental change context (*McEwen*). *Appleby* has forged a partnership with Port of Bristol, Regen SW and RSPB examining power production from the Severn in the Sustainable Severn Initiative. *Appleby* is a founder member of the Blue Marine Foundation, sitting on its management committee - to date, £11m has been raised to protect marine areas, including establishment of the world's largest marine reserve. *Chatterton* has developed relationships with the International Energy Agency, the London Sustainability Exchange, Brook Lyndhurst, and the Smart Meter Central Delivery Body, jointly examining and informing energy behaviours.

6. Supply research-based courses and training with (inter)national reach - We have sustained our contribution to Continuing Professional Development, e.g. our EA/Defra sponsored CIWEM/ICE accredited FdSc/BSc (Hons) River & Coastal Engineering programme, which is explicitly tailored to industry needs. We have developed a Flood Risk Management Teaching and Learning Network to render our research findings accessible (*Quinn*, *Staddon*). We provide air quality and carbon management training and practitioner development accredited by the Institution of Air Quality Management and IES (*Bailey*, *Chatterton*, *Hayes* and *Longhurst*).

c. Strategy and plans: The goal of maximising impact across the research portfolio aligns with 'UWE Bristol Strategy 2020', and the Faculty of Environment and Technology 'Research Strategy Implementation 2013-2020', which codify the University priority of 'research with impact'. The Unit's overall objective is to ensure that impact is an integral element of all research planning, practice and dissemination, independent of funding source. This will be achieved by targeting external and internal investment toward user-centred collaborative research, and through strategic resource allocation planning, directed staff development and HR policy, and strong research leadership and management. Key elements of the impact strategy are:

Strengthening/extending strategic alliances with external organisations to develop effective and innovative models of knowledge co-production and routes to impact. Specifically, we will pursue impactful research on: flooding and community resilience; water consumption behaviours and urban water security; innovative ways to address challenges around air quality management and low carbon futures; embedding an Ecosystem Approach into a range of societal activities; and improving understanding of socio-spatial inequalities to secure socio-environmental justice.

Sharing experience and best practice of impact pathway activity. Within and beyond the Unit, we will support staff development and subsequent forward planning by staff and teams regarding impact engagement before (proposal stage), during and beyond each of our research projects. Staff contributions to pursuing impact will be monitored explicitly through the annual Performance Development Review. Externally, we will continue to engage in best practice fora and to support secondments and visiting positions.

Bidding into external funding schemes that have explicit requirements to deliver high impact. We will partner with UWE's Science Communication Unit in developing our proposals, drawing upon its internationally recognised competencies in advancing the 'science of communicating science' to ensure we embed creative and effective approaches to connecting with the users relevant to our research (e.g. developing game-based social engagement tools for water conservation; new social media such as Second Life in local flood risk management).

Seeking strategic external funding to promote interactions between our research and industry. Following the success of the Environmental iNet (now extended), research groups will seek additional funding to continue activities aimed at business support and collaboration.

Maximising use of University support to ensure our research has the widest possible reach. This will include co-working with RBI to source new collaborative partners and co-working with the Marketing and Communications Press Office to showcase research to target audiences.

d. Relationship to case studies:

Case study 1: Reducing overfishing and supporting marine communities demonstrates our pivotal involvement in safeguarding a billion pound public asset and creating the world's largest marine reserve. The work was initiated through innovative action research with the Community of Arran Seabed Trust (COAST). This led to participation with a network of coastal representatives, including visiting academic appointments. Our unique interdisciplinary expertise enabled professional commentary on key issues, which directly assisted the COAST project and led to systemic changes in practice benefiting many communities. We undertook joint research with NGOs and adopted innovative practice such as peer review of potential court papers. Such applied research has directly supported our professional training in this area, through our MSc in Environmental Consultancy and via numerous short courses in marine management.

Case study 2: Improving the Management of Air Quality demonstrates the benefits of a sustained relationship over the impact period between AQMRC, central government (Defra and Devolved Administrations) and local authorities. AQMRC research directly contributed to the UK government strategy, policy guidance and technical guidance for air quality management. AQMRC research informed and directed the practice of *c.* 400 UK local governments with the implementation of the statutory air quality management process. Through partnership working with local government, AQMRC research tools and techniques directly contributed to the identification, or provided scientific confirmation, of the requirement to declare an Air Quality Management Area due to exceedence of an Air Quality Objective in some 200 local authorities. The research led to the invitation to work in partnership with South African research institutes to develop the National Framework for Air Quality Management in the Republic of South Africa (RSA). This framework provides the national, provincial and local context for air quality management in RSA. The partnership has led to co-production of air quality management approaches which have, in turn, fed back into on-going AQMRC air quality management work in the UK and the EU.