Institution: University of York

Unit of Assessment: 7, Earth Systems and Environmental Science

a. Context

The Mission of the Unit is to understand the fundamental processes that underpin key environmental issues through rigorous, interdisciplinary, cutting-edge research that drives policy towards a sustainable and equitable world. To achieve this, the Unit applies a range of mechanisms to ensure that its research has impact. The effectiveness of these mechanisms is reflected in the fact that Thomson Reuters recently ranked the University of York as ***second in the UK and in the World top 20 (17th) in terms of impact*** in the environmental sciences area. The Stockholm Environment Institute (which has a centre at York) is ranked as one of the ***Top 6 Environmental Think Tanks in the world***. The Unit performs research, the results of which are used by and/or benefit a range of stakeholders, including: ***policy makers*** (e.g. Defra, UNEP, UNECE); ***environmental regulators*** (e.g. the Environment Agency, Natural England); ***industry*** (agrichemical manufacturers, human and veterinary medicine producers, the home-use product sector); ***NGOs and charities*** (e.g. WWF, Conservation International, RSPB); ***water utilities*** (Yorkshire Water) and the ***general public***. During the REF period, our impact has occurred in a range of areas, most notably: Improving procedures and processes for environmental risk assessment and management of chemicals; Informing the development of policy around environmental pollution; Improving public understanding of conservation issues; Designation of marine protected areas around the world; Promoting sustainable use and management of African biodiversity; Implementing the ecosystem approach into environmental policy.

b. Approach to impact

We employ two approaches to ensure our research has impact: 1) ensuring that our research is useful to end-users: and 2) effectively disseminating the results of our research.

Ensuring that research is useful to end-users

Advisory Board: At a high level, we are supported by an Advisory Board, comprising senior representatives from the research, regulatory and business sectors. The Board imparts intelligence on matters relevant to the work of the Unit, including business and community relationships and wider policy developments. The Board also shares good practice about the promotion of the Unit to key external audiences and aids in fostering strong links to the business and regulatory sectors

Actively identifying the priorities of policy makers and other end users: We have an on-going programme of research to better understand the needs of environmental policy makers and other end-users. Our academics have run key question exercises to identify the top questions around fisheries, global conservation and chemicals in the environment. These have been peer-reviewed and published in the international literature. Findings from these exercises have been used to steer our research. Through an internally-funded project, we have studied how previous environmental research has been translated into impact in order to identify good practice. Findings from these initiatives are disseminated to end users (e.g. our prioritisation work on conservation has been presented at a US Congress 'Breakfast-on-the-hill' briefing and our work on priorities around pharmaceuticals in the environment has been presented to regulators in Europe, USA, and Australasia and industry groups). The information has been used to inform our impact strategy.

Engagement of end-users in research projects: We place great emphasis on the inclusion of stakeholders and end-users from the very start in the planning, execution and dissemination of our research. For example, our recent £2.65m project on pollution monitoring in cities involves 16 end user partners from large businesses (IBM, Arup, PerkinElmer, Scottish Water and Siemens), SMEs (Ecologic, Gaist, Markes) environment agencies (e.g. Umweltbundesamt), local authorities (City of York Council, Seoul Metropolitan Government) and research institutes and networks (NPL, NORMAN, US Geological Survey). Similarly, the £14m BESS programme has a great number of stakeholders from across the public and private sectors actively engaged with the development and execution of the research. We work to secure **CASE and industry funded Studentships and Partnerships** meaning that many of our graduate students are working on 'real world' issues. We exploit knowledge exchange funding schemes (e.g. the KTP scheme and TSB funding) to further promote the dissemination of our results to the user community. For example, during the REF period we have received PhD funding to develop improved methods for environmental risk assessment of products (from Unilever, GlaxoSmithKline, Syngenta, Reckitt Benckiser) and for environmental monitoring (Yorkshire Water). A KTP project led to the successful development of the joint York/Flamingo Land Centre for Integration for Research, Conservation and Learning

(CIRCLE) which conducts ground-breaking research to conserve wildlife in Africa.
Involvement in National and International Committees: We encourage staff to engage with National or International Committees and we provide time to allow them to do this. This means we have an understanding of current policy issues. Members of the Unit have participated in committees covering topics such as the impacts of chemicals on the environment and human health (Advisory Committee on Pesticides, Veterinary Products Committee, Hazardous Substances Advisory Committee, UK Indoor Environment Group, European Food Safety Authority Groups on ecotoxicology and feed additives, European Medicines Agency Working Group on Fate of Veterinary Medicines, and a US EPA Science Advisory Panel), marine conservation (British Indian Ocean Territory Science Advisory Panel) and wildlife disease (Defra TB Expert Panel).
Exploitation of consultancy opportunities: We see consultancy as an important route for transferring knowledge to end users and provide staff with the time and resources necessary for them to engage effectively as consultants. Our staff have performed consultancy work during the REF period for either industry (European Crop Protection Agency, Huvepharma, Invesa, European Detergents Association), national or international government departments or agencies (Countryside Council for Wales, Natural England, European Parliament, Foreign and Commonwealth Office, German Federal Agency for Nature Conservation, WHO, OECD), and NGOs (Wildlife trusts, Royal Botanical Gardens Edinburgh). Our consultancy work has covered topics including: indoor air quality, emerging contaminants, climate change and health, climate change and biodiversity, provision of pollen data and the ecosystem approach; and has led to a number of reports on which international environmental policy has been based.

Dissemination of our research

Presentations aimed at industry: Staff are encouraged to present the results of their research at conferences and seminars aimed at industry and policy makers. Examples include presentations at Informa and Institut Fresenius conferences on the risks of chemicals to humans and the environment and invited presentations of our research to the industry and policy sector (e.g. invited presentations to Syngenta, Unilever, UK Water Industry Research, Health Canada, the US Food and Drug Administration, House of Lords, Natural England and Defra).
Participation in expert meetings run by policy makers: Members of the Department regularly participate in workshops run by policy makers. For example, European Environment Agency expert workshops on emerging environmental contaminants (Copenhagen, December 2011) and on risk management of pharmaceuticals (Newquay, December 2012).
Dissemination of our research through books, press releases, public lectures: We work with the University Press Office to publicise the results of our work. We have released numerous press releases on a diverse range of topics including marine protected areas, conservation research in Africa, pharmaceuticals in the environment, pollution monitoring and the links between ecosystem services and policy. We often communicate in other languages to increase the effectiveness of dissemination initiatives. As a result of this pro-active approach, our work has featured in the Guardian and on BBC 2, ITV, Channel 4 and the National Geographic Channel. We have delivered public lectures and staged a public exhibition on the state of our oceans. Two areas of our research were presented at the Royal Academy of Engineering Summer Soiree in 2013. Of particular note is the publication of '*Ocean of Life – How our seas are changing*' by Professor Callum Roberts, this popular science text received the Mountbatten Maritime Award for best literary contribution at the annual Maritime Media Awards ceremony. Roberts' earlier book '*The Unnatural History of the Sea* won the 2008 Rachel Carson Environment Book Award of the US Society of Environmental Journalists.

c. Strategy and plans

Our impact strategy to date has been to produce research which both informs and is informed by appropriate user groups and beneficiaries. We plan to continue these mutually beneficial relationships and use our experience from building and developing these relationships to shape our future strategy. We aspire to embed a culture of impact into the Unit in order to more effectively translate our research to end users, such as the policy and business sectors, in order to realise our mission of driving policy towards the development of an equitable and sustainable world. We will also introduce systems to monitor and measure our impact. In the next five years, our strategy will focus on the areas described below. To deliver this strategy, we will draw on the experiences, systems and networks of SEI, who have vast experience in translating research into policy, and will put in place mechanisms (including the recruitment of an administrator) to support our impact work.

The Departmental Research Committee will monitor the level of end user involvement in projects as well as the success of impact activities and will disseminate examples of good practice to members of the Unit (e.g. at staff away days).

Answering research questions that matter to the policy and business sectors: We will use a range of approaches, including increased engagement of staff in national and international activities, running prioritisation exercises (*e.g*. we are currently leading a 3-year worldwide initiative with the Society of Environmental Toxicology and Chemistry to identify key policy questions around environmental stressors) and staging industry and policy events and away days, to ensure we continue to understand the key environmental research questions that matter to the policy and business sectors. The conclusions will be used to inform the development of future proposals to research councils, governments and industry. These activities will increase the likelihood of participation of end-users in our research and ensure that our research has real influence on environmental policy around the world.

Increasing stakeholder engagement in our research: We will continue to foster new relationships across the policy and business sectors through greater interaction with York's Research and Innovation office, through focused activities (e.g. industry information days) supported by a new Research Administrator and through exploitation of partner/University funding opportunities such as the KTP scheme. We will encourage, where appropriate, staff to focus their research activities towards questions of interest to the business and policy sectors and introduce mechanisms (e.g. appointment of mentors with experience of interacting with stakeholders) to support staff to engage partners from different sectors in research projects. By continuing to increase stakeholder engagement in our research, we will enhance the likelihood that our research results will be used by end users.

Ensuring that the results of our work reach decision makers in a clear format: We employ a range of approaches to disseminate our work effectively and have strategies in place to increase this further. We will broaden the engagement of our staff in national and international expert committees responsible for advising governments and international agencies on environmental issues. We will put in place mechanisms to support staff to interact with industry and policy makers (e.g. by supporting attendance at industry events). Our new Research Administrator will have responsibility for more pro-actively disseminating the results of our work through press releases and via the Unit's website.

Promoting wider engagement in environmental issues: We will build on our current activities related to the engagement of the public in environmental issues (e.g. OPAL and CIRCLE) and seek to actively communicate the results of our research to the general public.

Demonstrating that our research has impact: We will monitor the impact of our research across the globe and maintain an evidence base demonstrating our impact. In doing this, we will draw upon SEI's experience in assessing impact and base our approach on SEI's Planning, Monitoring, Evaluation and Communication (PMEC) system, which is based on the theory-of-change approach of the International Development Research Centre's Outcome Mapping methodology. PMEC encourages staff to think beyond a project's outputs, and asks what change they want to contribute towards and which people and organisations could be influenced by the work. This helps project teams to focus on the foreseen outcomes and to be realistic about the influence they can have in the complex realm of sustainable development and environmental policy. By demonstrating real impact of our research, we will convincingly demonstrate to research funders, and to future research assessment exercises, the usefulness of our research, ensuring that York is recognised for research impact and is the partner of choice for companies and the policy sector.

d. Relationship to case studies

The effectiveness of our approach to impact is demonstrated by our three case studies. Our collaboration with Flamingo land, partly supported through a KTP programme, has led to the establishment of the highly successful CIRCLE initiative which has spawned a wide-range of practically-orientated research projects investigating biodiversity management, animal exhibit design, measuring the success of environmental education, and the role of zoos. This work is helping to improve biodiversity in Africa. Our two other case studies have seen York researchers working closely alongside the policy sector (e.g. UNECE, LRTAP, OSPAR) to translate our research into real world impact. As a result York's research has been instrumental in the designation of the world's first network of marine protected areas and the adoption of new risk assessment methodologies for ground level ozone.