

<p>Institution: University of Chester</p>
<p>Unit of Assessment: 17A Geography, Environmental Studies and Archaeology (Geography and Development Studies)</p>
<p>a. Overview</p> <p>UoA17 at the University of Chester brings together staff from Geography and Development Studies, Biological Sciences, Social Studies and Counselling and the Learning and Teaching Institute. They conduct environmental, pedagogic and social research, collaborate within research groups via project management, co-authorship of outputs and co-supervision of research students and meet regularly at centrally-funded cross-faculty seminars.</p>
<p>b. Research strategy</p> <p>The strategy outlined in our Geography submission to RAE2008 identified four aims:</p> <ol style="list-style-type: none"> b1. To expand our work on sustainable community-environment interactions b2. To take forward work on processes and hazards focussing on biological soil crusts, landslides and tsunami b3. To expand our pedagogic research on the (changing) role of fieldwork, use of new technologies in teaching and the role of women in the history of science b4. To develop research on gender and vulnerability issues in the developing world. <p>Staff appointments, success in research grant applications and the forging of stronger cross-departmental/faculty links supported by central university funding have enabled progress on each aim and led to the development of three clearly-defined research groups that bring together researchers from different departments. Our strategy going forward is to build on the secure base represented by these vibrant research groups, extending activity in each area with further staff appointments and enhanced collaboration across the University, and capitalising on our growing reputation in these fields in order to attract increased levels of external research income. Objectives and activities for the next five years are described below in the context of the main areas of research conducted by each of these groups.</p> <p>Environmental Research Group (Aims b1, b2)</p> <p>Our reputation for research on low carbon communities is founded on close collaboration with community groups and the public and private sectors and has been funded largely by central and local government agencies. Research on the award-winning low carbon community of Ashton Hayes facilitated a 20% reduction in domestic carbon footprints and led to national and international recognition of the village as a flagship sustainable community (Alexander 4). Building on this work and recent research conducted in collaboration with the New Economics Foundation (funded by the Department of Energy and Climate Change (DECC) LEAF-APP-01-439, 2012), we will examine the effectiveness of community initiatives and the social return on investment that they bring. A research assistant and/or PhD student will be appointed to take the work forward. Research conducted in collaboration with the power services industry, which has examined the feasibility of rural community microgrids based on renewable generation (Alexander 3), will be extended to include a proposed hydroelectric generation scheme on the River Dee and developed with a focus on the potential of novel funding sources to support community generation.</p> <p>Sustainable mobility research has focussed both on the development of cycling technology and the changing views of cycling within society (Cox 1 – 4). Cox is currently concentrating on technologies of sustainable-transport, in particular the growing role of e-mobility. Work is on-going in collaboration with civil society and industry bodies (ECF - European Cyclists' Federation and ETRA - European Twowheel Retailers' Association) to develop appropriate EU regulations and Cox is currently working on a EU Marie Curie Research Fellowship proposal at the invitation of TU Berlin Center for Transport and Society to join a new "ebike lab" for a two-year period. Future work will also include expanded engagement with colleagues as part of the Scientists for Cycling Network (in conjunction with the ECF), particularly in developing an initiative on cycling cultures with colleagues in Austria (TU Wien & Universität Innsbruck). Part of the focus of this work will be</p>

to increase understanding of light hybrid human-electric vehicles, looking especially at the linkages between infrastructures and users from a social construction of technology (SCOT) perspective.

Burek's work (**Burek 2, 3**) on geoconservation has moved from an early concentration on developing an internationally-accepted definition and public awareness-raising, to focus on influencing policy and legislation at all levels, especially within Wales and the other devolved countries. Future work will examine the effect of climate change on limestone pavement habitats, and the contribution of Regionally Important Geological/Geomorphological Sites (RIGS) groups to the development of environmental and conservation legislation by the devolved administrations. She collaborates with **Alexander** in the supervision of PhD theses; classification and management of limestone pavements (completed 2011) and soil conservation and sustainable development (on-going). Another on-going PhD project is examining the conservation of Ordovician and Silurian sites either side of the Hirnantian Glacial Mass extinction event in the mid Wales basin.

The appointment of **Lawrence** (from the University of the West Indies in Trinidad and Tobago) to a chair in Biological Sciences in 2012 provided further support for aim b1. **Lawrence** brings expertise in biological conservation with significant publications on wildlife ecology and ecophysiology, pollution and climate change impacts on ecophysiological processes, and also in conservation and sustainable use of marine resources, particularly in relation to the application of environmental economics (UN TEEB (The Economics of Ecosystems and Biodiversity) process) and Options Value as tools for conservation in a changing environment (**Lawrence 1 – 3**). **Lawrence** has recently gained support from the Government of Trinidad and Tobago to undertake a three-year TEEB assessment of the Caroni mangrove swamp in Trinidad. This multi-partner project includes the Universities of Chester and the West Indies, Government of Trinidad and Tobago and United Nations Environment Programme (UNEP), and funding is supporting three PhD students. **Lawrence** will also act as a consultant to a recently-funded Global Environment Facility (GEF) project to develop a mariculture system for sea cucumber in Marsa Alam, Egypt. With University support, these projects will enable us to increase staff numbers and build a dedicated unit working on biodiversity conservation and sustainable development. Work here will include the use of assessment tools such as TEEB to highlight the value of ecosystem services to governments and support the sustainable use of ecosystems and wildlife resources. For example, partnership with the Government of Trinidad and Tobago in the Caroni Mangrove Swamp TEEB study should ensure that results are incorporated into government policy. In addition, the recently-supported GEF project on sea cucumber mariculture in the Red Sea will highlight the immediate (food value) of these animals as well as their potential future options value as sources of bioactive compounds.

Aim b2 has progressed through funded projects in SE Spain examining the crucial role of biological soil crusts in the evolution of soil surfaces (**Alexander 1**), their potential as sensors of climate change and the effects of changing precipitation patterns on vegetation in the semi-arid Mediterranean (PREVEA, 2007-2010). A recent review of research in the Tabernas badlands conducted in collaboration with colleagues in Spain (Calvo-Cases *et al*, in press) has identified the need to exploit our learning from two decades of experimental and modelling work (eg **Alexander 2**) to reassess ideas concerning the long term evolution of badlands in Almería province. This will form the basis of future field-based research involving the appointment of at least one PhD student.

Miller, S has led our hazards research with the use of digital analysis to examine landslide susceptibility and impacts in the UK and Jamaica (**Miller, S 1, 4**) and the investigation of seismic hazard and risk evaluation, tsunami (**Miller, S 3**), and limestone subsidence in tropical coastal environments. This area of work will develop to focus on multiple hazards (earthquake, slope instability and tsunami) in high risk areas of Jamaica not only investigating the physical dimensions of the risks associated with natural hazards but also exploring factors contributing to varying levels of vulnerability to better inform hazard mitigation programmes on the island. **Miller** has also examined impacts on the travelling public of UK airspace closure due to volcanic eruption (April 2010) and its implications for future travel (**Miller, S 2**). Research into flooding and flood insurance in the UK, funded by the Department for Environment, Food and Rural Affairs (Defra) and undertaken in collaboration with the National Flood Forum (NFF), has explored the relationship between flood risk, property level protection and the challenge of accessing affordable insurance

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(Cobbing and **Miller**, 2012). A number of undergraduate students have worked as research assistants in this area in recent years and research into building a 'flood resilient society' will develop with future funding prioritised to support a dedicated postgraduate research assistant and/or PhD student.

Pedagogic Research Group (Aim b3)

France's research has investigated the student learning experience, particularly the use and application of e-learning technologies to enhance learning and teaching (**France 1 – 4**). His recently completed three-year NTF project on Enhancing Fieldwork Learning through the inclusion and evaluation of Web 2.0 technologies in fieldwork has resulted in numerous other journal articles and conference outputs at ISSOTL 2011, AAG 2012 & 2013, and HEA STEM 2012 & 2013. The recent appointment of **Litherland** has enabled us to extend this research with an additional focus on virtual fieldwork (**Litherland 1**). **Litherland** joined the University in July 2013 and has become integral to a research grant proposal (submitted to the HEA) to explore more flexible learning strategies with the implementation of Bring Your Own Device. Little research has been done on its impact on student learning or on how to manage the issues raised. Work will thus centre on exploring the learning experiences of students using their own devices in a range of learning spaces to support and enhance their own learning and also on the pedagogic challenges posed to students, departments and institutions.

Ribchester has worked with **France** in examining the use of podcasting as a mechanism for feedback to undergraduate students (**Ribchester 1**) and with others on education for sustainable development interventions in UK universities (**Ribchester 2**) and the role of pre-induction social networking in supporting the student transition to higher education (**Ribchester 3, 4**). **Healey's** appointment in 2009 broadened the scope of our pedagogic research to include ethics and teaching for social transformation within Geography curricula (**Healey 1, 2, 4**) while **Burek** has brought the further dimension of the role of women in the history of science (**Burek 1**).

Our research on the ethical development of undergraduate students and on how to support their ethical decision-making will continue, partly through the detailed interrogation of recently collected qualitative data with students and tutors. This work will develop a better understanding of how students respond to ethical problems alongside analysis of students' ethical development in relation to tutors' expectations. Dissemination of this research will inform wider debates about critical thinking skills in HE, the effectiveness of scenario-based learning and the preparedness of students for the contemporary workplace.

Social Research Group (Aim b4)

Our plans to develop a new strand of research activity on gender and vulnerability issues in the developing world led to the appointment of **Evans** and **Healey** in 2009, enabling us to expand development research into the area of displaced people and migrants. **Evans** has, with British Academy funding (SG-50255), conducted research on displacement and return in Senegal's southern borderlands in the context of the Casamance rebellion, West Africa's longest-running civil conflict. He has shed light on the complex articulations between insecurity, international reconstruction aid, local political dynamics and vulnerability amid communities seeking to rebuild their villages and livelihoods (**Evans 1 – 4**). A further dimension of vulnerability has been explored by **Besemer**, whose PhD thesis considered the impacts of trade liberalisation on farming livelihoods in Vietnam, while **Healey** has explored the experiences of asylum seekers and refugees once they arrive in the UK (**Healey 3**). **Miller, G** has recently begun research projects examining health, particularly of the elderly, and education in Ghana and Kenya, from which she has so far published one article.

This area of research will advance in line with increasingly important global agendas. **Evans'** research will examine how agro-ecological systems in southern Senegal adapt in the context of environmental and social change and rising world food prices. On-going research in Ghana by **Miller, G** will consider the challenges to health policy and practice posed by ageing populations in Africa. Developing on **Healey's** PhD, research will continue with refugees in host countries by exploring the factors that influence their integration and what this means to the individuals involved.

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A further developing area is work on urban regeneration that builds on the recently completed PhD and emerging publications of another recent appointment, McNally.

The drivers for our work in all areas are curiosity, a sense of obligation to conduct research into pressing social and environmental problems and a desire to identify and develop the most appropriate ways to enhance learning and teaching in the changing higher education landscape. Inevitably the opportunities that arise to acquire research funding also have some influence on the precise trajectory of work, particularly in areas of applied research. Targets for research income and publication outputs are set and monitored annually during individual staff Performance and Development Reviews conducted by Heads/Deputy Heads of Departments, in liaison with Departmental Research Coordinators. These are summarised below for the unit as a whole.

c. People, including:

i. Staffing strategy and staff development

The Unit and University's strong commitment to the development of all staff received external recognition by the recent receipt of the HR Excellence in Research Award, which demonstrates a commitment to implementation of the Concordat to Support the Career Development of Researchers. All new academic staff of the University are supported through an accredited programme leading to Fellowship of the Higher Education Academy. A particular feature of the Chester programme is that the compulsory core modules provide developmental support helping and encouraging newly appointed staff to understand the demands and opportunities of research supervision, and encouraging them to study a further optional module that develops skills in supervision to an even higher level. Participation in this programme by members of the Unit has led to the development of a number of our initiatives in pedagogic research. Research features strongly in the University's Annual Staff Conference, with sessions on opportunities to develop impact, sharing of good practice in grant applications and management, collaborative initiatives, and understanding good research governance.

The University of Chester supports activities promoting equality and diversity. There is a long-established annual University Diversity Festival and the Human Resources Department monitors equality issues regularly as part of the recruitment process for staff and funded research students. Probationary and induction programmes are interlinked and ensure that all new members of staff are introduced to a wide range of facilities and policies. These include access to colleagues from the Research and Knowledge Transfer Office (who provide assistance in applying for grants and setting up R&D contracts) and colleagues in the Graduate School (who provide advice on all research student procedures).

Recruitment policy within the departments constituting the Unit is to appoint academic staff with interests synergistic with those of our main research groups. Our policy of closer collaboration between staff in cognate disciplines also serves to sustain our strategy. The Unit has a healthy demographic profile with staff ranging in age from mid 20s to early 60s. New members of staff are allocated a mentor who guides them in their research. Professorial staff lead many major projects but each research group contains a mixed age range and senior staff hold regular meetings with more junior colleagues to discuss progress and ensure early experience is gained in proposal writing and project management. Eight members of staff have been appointed within the review period, from the Universities of Dundee, Lancaster, Leicester, Liverpool, Liverpool John Moores, Sheffield, Sheffield Hallam and the West Indies. Four are submitted to the REF, the remaining four being either research assistants or early stage researchers. One member of staff left during the period to take up an academic post at the University of Ulster and another moved to the University of the West Indies. Continuity was maintained as research areas were covered and extended by three of the new appointments. Succession planning has not been an issue to date but, as our age profile increases, it will become so during the next five years. We will maintain key research areas by the development of early career researchers and, where necessary, by making new appointments within the same area(s) of expertise, including two in Geography early in 2014.

Research staff are recruited to support senior academic staff and to fulfil specific roles related to

grant funding. RAE2008 QR funds were used initially to maintain a Postgraduate Research Assistant (PGRA) post to support the work of **Alexander**. Sufficient external funding was attracted during the first annual appointment to sustain the post and QR funds were diverted to create a second PGRA post to support colleagues more widely. **France's** award of both a personal chair and a National Teaching Fellowship during the review period facilitated his successful application for £200,000 NTF funding for a project on Personal Learning Environments that enabled the creation of another PGRA post and also served to raise the profile of our pedagogic research within the institution and beyond. **France** also received the Royal Geographical Society with The Institute of British Geographers' Taylor and Francis Award for Excellence in Teaching and Learning in Geography in Higher Education in 2013.

Our strategy seeks to ensure close collaboration between senior and junior staff, maintenance of key research areas and adequate staffing to ensure the timely completion of specific research projects. This has proved effective over the assessment period in enabling us to strengthen existing areas of research and to bring forward new areas. For example the appointment of Miles in September 2013 brings additional expertise in the application of GIS and remote sensing to coastal processes, enabling further development of our work on coastal hazards.

ii. Research students

The University of Chester meets the QAA Quality Code requirements for PGR students. Training and support is a shared responsibility between the Graduate School (provision of generic training and support) and the subject department (supervision and specialist training and support). PGR students are offered face-to-face training sessions by the Graduate School, supported by a Moodle site providing on-line access to training materials written by academic staff from across all subjects and faculties. Students experience both a central University induction and a local induction within the department, so that they have a full understanding of the regulations and services provided by central support departments as well as of the local support staff and facilities in the department where they are studying. All students undertake an early skills audit to help them to identify their training needs, and they are welcome to attend taught sessions from within the postgraduate curriculum, as well as seminars and training sessions specifically designed for PGR student needs. Students who will be involved in teaching and assessment are expected to undertake specific training to prepare them for this activity, and may, if they wish, undertake modules leading to eligibility for Associate Fellowship of the Higher Education Academy, which provides a good basis for future applications for academic posts.

Every student is supported by a team of at least two approved supervisors, one of whom is designated Director of Studies and who has supervised at least one student to successful completion of their award. Supervision meetings take place frequently, with at least one meeting per month being recorded with outcomes and targets. Following a probationary period of 6-9 months, student progress is reviewed formally. If the student's registration is confirmed at the probationary review, a termly meeting of the full supervisory team reviews progress with the student subsequently and an Annual Progress Review (chaired by an independent academic staff member) reviews progress against objectives and expectations on an annual basis before the Annual Progress Board meeting. Students must submit a report, give a seminar and attend an interview before their upgrade from MPhil to PhD can be confirmed. There is a similarly rigorous process to consider applications to transfer to 'writing up' status. Each Faculty has at least one Faculty PG tutor who is available to see PGR students by appointment and to resolve any issues or questions they may have. Faculty tutors represent their Faculty and its students at the regular Graduate School meetings and also represent the Graduate School as appropriate in their Faculty.

The University recognises the value of conference participation for all PGR students and has established a fund to provide a contribution to conference attendance. Each year applications are invited and all successful applicants are provided with financial support. Further support is available within departments. Each Faculty also organises an annual internal PGR conference, providing an opportunity for students to showcase their work and practise their presentation skills in preparation for attendance at conferences elsewhere.

d. Income, infrastructure and facilities

The majority of RAE2008 income has been distributed directly to submitted departments. This serves as 'base load' and has been used in the Unit to fund Postgraduate Research and Teaching assistant posts to support research-active staff. External funding has been received in recognition of the quality of funding bids, supported in turn by the underlying high quality and innovative nature of our work in these areas. The national and international recognition accorded to our work in community carbon reduction has attracted some £100,000 of competitive external income from UK and local government, industry and academic sources and has also led to commissioned work and invitations to bid for research funds. Similarly, the established nature of **France's** pedagogic work puts us in a strong position to obtain further funding in this area and to support funding bids made by other members of staff. Much of **Evans'** recent work has been supported by a British Academy Small Research Grant and also by funding received from legal work. His growing reputation in his field puts **Evans** in a good position to attract further funding. Recognition of **Lawrence's** work has also been instrumental in the attraction of significant research funding and invitations to contribute to major projects. These established researchers act as mentors to more junior colleagues, guiding and advising them with reference to funding bids.

A dedicated research office serves as a base for our research assistants and many of our research students and thus forms the nucleus of research activity. Each staff member in the Unit has a dedicated desktop PC providing access to research resources via the intranet and internet. PCs are replaced on a rolling three-year basis and all new academic and research staff members are provided with a new desktop PC on appointment. Additionally researchers in the Unit have access to a soils laboratory in the Geography and Development Studies department and to specialist laboratory facilities within Biological Sciences. A PC suite in our Geomatics laboratory provides GIS, image processing and statistical analysis software and these software packages are also available on networked PCs in a Map Room, which doubles as a space for specialised seminars and a bookable meeting room. A dedicated, new PGR facility – a large, card-accessed room with desktop PCs and lockers – has been established in an adjacent building, catering for on-going PGR growth across the institution.

The University Library subscribes to over 1,000 printed journals and more than 13,000 electronic journals which can be accessed online. It also maintains subscriptions to a number of databases and other research facilities (e.g. *Digimap*). The Library has approximately 260,000 printed volumes in its collections and books can be borrowed from any of the libraries at the University's different sites. The collections also include 15,000 e-books plus access to many other online materials. At the main campus library there is 24/7 access to computers, printing and quiet study space throughout the year and extended access to all collections across all sites is provided during term-time and at peak periods.

e. Collaboration or contribution to the discipline or research base

Much of the work conducted within the Unit is interdisciplinary in nature. Our submission comprises Geographers, Geologists, Biologists and Social Scientists working in three academic departments and in the Learning and Teaching Institute, and there are close links to colleagues in other HE institutions and research institutes in the UK and abroad and to those working in industry and the third and public sectors. Internally, colleagues work in teams, for example to manage research projects and supervise PhD students, and externally via planning and project steering groups. The Unit receives central support enabling groups of colleagues and collaborators to meet together at research seminars and conferences.

The Environment Research Group contains a cluster of staff working in the broad area of sustainability with networks that include collaborators in universities and research institutes in Spain, the West Indies, Belgium and Austria. Beyond academia our community carbon reduction work involves close collaboration with EA Technology Ltd on energy efficiency and renewable energy generation, and with ScottishPower Energy Networks on work examining the influence of renewable generation and energy saving initiatives on the functioning of low voltage feeders. Work

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with Ashton Hayes Parish Council and Blacon Community Trust (from whom the University has recently purchased a demonstration eco home) is focussed on consumer behaviour, energy saving/efficiency, the development of community-owned renewable generation assets and social return on investment.

Collaboration with colleagues in Spain (Universities of Valencia and Almería and the Geoecology team at the Estación Experimental de Zonas Aridas) has involved research into biological soil crusts leading to wider recognition of their importance to soil conservation in dryland areas, to publications and joint supervision of PhD theses, and to the attraction of research funding.

We have particularly close links to the University of the West Indies for both hazards and conservation research. Work on environmental economics and Options Value, particularly within the Caribbean, has included **Lawrence** being invited to lead sessions in a Reef Resilience Training Workshop in Tobago (2010), with the Government of Trinidad and Tobago, Institute of Marine Affairs. Work also led to the team (led by **Lawrence**) organising and running the First (2010) and Second (2012) National Biodiversity Symposia for the Government of Trinidad and Tobago, proceedings from the first symposium being published in 2011. It also led to **Lawrence's** team co-organising and hosting, with UNEP, the first Regional TEEB workshop for the Caribbean in 2011 and later in the same year, again with UNEP, the Group of Latin America and the Caribbean (GRULAC) meeting of Ozone Officers under the Montreal Protocol. Also in 2011 **Lawrence** was invited as a Caribbean Environmental Expert to present an overview and expert opinion at EUCARINET, an EU Research Funding Priorities meeting in the Dominican Republic.

Collaboration with colleagues at the Universities of Reading and Sheffield on pedagogic research has led to numerous publications and conference contributions and to the organisation of highly successful workshops attended by GEES discipline staff from many UK institutions. **France** also collaborates with colleagues in New Zealand and Singapore and is editor of the *Journal of Geography in Higher Education*, for which **Healey** is a member of the editorial board. He chairs the Higher Education Research Group of the RGS-IBG of which **Healey** is a committee member. In the Social Research Group, **Evans'** membership of the Council of the African Studies Association of the UK has been to represent the post-1992 universities and has helped secure funding for two research colloquia held at Chester.

All submitted colleagues act as referees for a number of academic journals and most serve as external examiners for PhD theses. **Alexander** has been a member of the Project Steering Group of the charity Carbon Leapfrog since its inception in 2010 and sits on the Sustainability Commission of Cheshire West and Chester Borough Council. He is a member of the Project Advisory Group for the EVALOC project at Oxford Brookes University and was a member of the Low Carbon Communities Challenge Working Group at the Department of Energy and Climate Change from 2010 to 2012.

References

Calvo-Cases, A., Harvey, A.M., Alexander, R.W., Cantón, Y., Lázaro, R., Solé-Benet, A and Puigdefábregas, J. Badlands in the Tabernas Basin, Betic Chain. In Gutierrez, F. and Gutierrez, M. (Eds) *Landscapes and Landforms of Spain*. Springer. In Press

Cobbing, P and Miller, S. *Property Level Protection and Insurance*. National Flood Forum report commissioned by Department for Environment, Food and Rural Affairs. 2012. 53pp.