Institution:	University of Northumbria at Newcastle
Unit of Assessment:	17 - Geography, Environmental Studies and Archaeology

a. Overview

The Department of Geography at Northumbria has grown more than six-fold in research activity, from the small core of three staff submitted across a number of interdisciplinary units of assessment in RAE 2008, to the 19 staff submitted to REF 2014. This reflects the quality of achievement of existing staff, focused appointments and investment in two research groups.

1. ***Cold and Palaeo Environments:*** Members of the group work in polar and high mountain environments addressing key problems in earth systems science. Since 2008 funding has been secured competitively from the European Union and the Natural Environment Research Council (NERC), through multiple grants and facilities awards. International collaboration has provided field support from the International Ocean Drilling Programme (IODP), US National Science Foundation (NSF), Environment Canada and Centro de Estudios Cientificos (CECs), Chile.
2. ***Communities and Resilience:*** Members of the group work in diverse topics from the localism of community engagement and social inclusion to the internationalism of world city economics and disaster risk reduction across Africa and Asia. Since 2008 funding has been secured competitively from the Economic and Social Research Council (ESRC), the Department for International Development (DFID) and the European Union.

b. Research strategy

In RAE 2008 three Geography staff were submitted by Northumbria as part of interdisciplinary submissions to UoA12, UoA40 and UoA62. Our overarching strategic aim for the period 2008-14 has been to take this core of research and grow both quality and volume. The aim was to create a coherent Geography research unit, based on our interdisciplinary and impact-focused past, but clearly centred on the geographical and societal challenges of the future. To do so we identified three strategic objectives: **1)** the need to raise further the aspirations and achievement of existing academic staff; **2)** the appointment of, and investment in, staff of high research calibre to broaden the ethos of academic enquiry and knowledge creation; **3)** the strengthening of themes to form the spine of our research endeavour. In response to these three strategic drivers we have: **1)** developed existing staff research through investment in sabbaticals, seed-funding for project work, PhD studentships, conference bursaries, personal promotion opportunities, capital equipment purchases and investment in laboratory facilities; **2)** appointed fourteen new staff through a combination of staff replacements and strategic development, and invested in these staff; and **3)** focused research investment on the two distinctive groups outlined below.

Cold and Palaeo Environments: this group was built around the NERC funded research into Antarctic subglacial lakes and ice sheet stability by **Woodward** whose work was recognised by the award of a Chair in 2012. He has been joined by: **Pearce**, appointed from the British Antarctic Survey (BAS) to a Chair in Environmental Microbiology in 2013; **Mann,** a hydrologist working on carbon release from permafrost into Russian river systems (appointed in 2013 as a University Anniversary Research Fellow from Woods Hole Oceanographic Centre, USA); **Salzmann** (promoted to Reader in 2011), who joined Northumbria in 2009 from BAS, bringing expertise in palaeo-biogeography, and who works closely with **Pound** (appointed from Leeds as a Research Fellow); **Ersek** (recently appointed from Oxford), who studies high-resolution records of climate change using speleothems; and **Brock** (appointed from Dundee to a Readership), a world leader in the modelling of debris-covered glaciers, who works closely with **Rutter** (appointed from Sheffield in 2009 while a NERC Fellow) and who models energy fluxes in Arctic snow-packs. The complementary work of **Dunning** (an early career researcher (ECR) in 2008) and **Lim** (appointed from Durham and promoted to Research Fellow) on rock avalanches and cliff processes is supported by the coastal work of **Hocking** (neé Watcham) (appointed from Durham in 2011), and **Wake** (appointed in 2013 from the University of Calgary, Canada, as a University Anniversary Research Fellow), who study and model causes of contemporary sea-level change. The group has made a concerted effort to: **1)** lead on the application of novel techniques to field data collection, including new borehole radar technologies, novel infrared camera techniques for snow pack investigations, the use of bespoke unmanned aerial vehicles (UAV) in new environments and the

development of new approaches for glacier mass balance monitoring and sea level change analysis; and **2)** work collaboratively and internationally to address significant problems in Earth Systems Science.

Communities and Resilience: this group was built around the ESRC and DFID-funded resilience research of **Collins** whose work was recognised by the award of a Chair in 2012 and **Askins** who works on emotions, multiculturalism and community cohesion. They have been joined by: **Taylor**, the world expert on world city networks (appointed from Loughborough to a Chair in Human Geography, 2010); **Alvanides,** who works on public health and environmental justice (appointed from Newcastle as a Reader, 2010); **Cassidy,** working on gendered mobility, informal economic practices and cross-border trade (appointed from Queen Mary University, 2013); **Clayton,** who works on urban inequality, everyday multiculturalism and socio-spatial identities (appointed in 2013); and **Fitzgerald,** who studies the rights and community integration of migrant workers. The Group has a participatory, evidence-based approach to fieldwork, research and scholarship, informing theoretical and policy debates on vulnerability, sustainability and resilience.

Strategic indicators of success: the trajectory of research development demonstrates a step change in activity. This is exemplified by the following.

1. The 19 staff submitted have published over 220 peer reviewed papers, 75 book chapters and nine books between them in the REF 2014 period. 22% of this output is submitted for assessment. In ***Cold and Palaeo Environments*** all 40 outputs are co-authored, with 192 international co-authors from institutions including the Alfred Wagner Institute (Germany), Byrd Polar Research Institute (USA), Geodetic Institute (Norway), Icelandic Meteorological Institute, National Centre for Atmospheric Research, Boulder (USA), Russian Academy of Sciences, US Geological Survey and over 150 universities, including Jiatong (China), King Saud (Saudi Arabia), Malaya (Malaysia), and Tokyo (Japan). In ***Communities and Resilience,*** nine of the 25 papers are single-authored, reflecting the sub-discipline. In the 16 co-authored papers there are 15 international co-authors from institutions including the Chinese Academy of Sciences and the Universities of Chittagong (Bangladesh), Monash (Australia) and Peshawar (Pakistan).
2. Income obtained competitively from external bodies to support research rose to £2.151 million in the REF cycle. Over half of the awards in the period involve international collaboration with colleagues from, for example, the Danish Meteorological Institute, the Swiss Federal Institute of Technology, the International Centre for Diarrhoeal Disease Research (ICDDR) Bangladesh, and the Universities of Calgary (Canada), Clarke, Irvine, Montana State, Santa Cruz (USA), Ghent (Belgium), Kyoto (Japan), Utrecht (Netherlands) and Wits (South Africa).
3. PGR student completions increased eight-fold from two in the RAE 2008 cycle to 16 between 2008 and 2013. More significantly we have grown our PhD student base and have 26 registered at REF census date. This will ensure that our annual number of completions at least doubles.

Initiatives of strategic importance to the Unit: A number of initiatives of strategic importance have strengthened our research environment and supported the delivery of impact: **1)** *Northumbrian Environmental Training and Research Centre* (NETREC): this established Centre supports cross-Faculty collaboration. The group has developed novel techniques for assessing the risks to human health associated with ingesting and inhaling toxic elements in urban areas. NETREC runs the Environment Agency's Air Quality in Major Incidents Project for the North of England. **2)** The *Disaster Development Network* (DDN) and **3)** the *Gender and Disaster Network* (GDN) are impact-focused and internationally collaborative. The staff in these areas focus on applied policy aspects of disaster prevention and relief, working with international bodies such as the United Nations and DFID to support disaster planning and risk reduction.

New and developing initiatives: Two developing initiatives of strategic importance to the unit are: **1)** *The Centre for Microbial Ecology (*CME*):* The recent appointment of **Pearce** strengthens a cluster of microbial ecologists and physical geographers exploring microbial assemblages in lakes sediments, permafrost, soils and hydrological systems, providing the basis for the development of this collaborative centre; **2)** *The Network for Economic Development Research* (NEDR) brings together cross-Faculty work from Architecture and the Built Environment, Geography, Northumbria University's Newcastle Business School and the Department of Social Sciences on global issues of economic development. Planned investment in laboratory facilities, postgraduate scholarships, seed-funding for research work and interaction with stakeholders will establish these initiatives.

Future research strategy 2014-2020: the trajectory of growth in staff submitted to REF 2014 sets our research agenda beyond this REF cycle, towards a sustainable and embedded research culture which creates and applies knowledge, contributing to international, national and regional research agendas. Our aim is to grow the number of Category A staff within our UoA from 19 to 30 FTE by 2020. This will be achieved through: **1)** strategically-targeted staff appointments using opportunities created by natural staff turnover (20% expected with the Geography Department) and staffing base growth to support increased postgraduate-taught provision and research and consultancy contracts (10% expected); **2)** investment in existing fields of strength (*Cold and Palaeo Environments* and *Communities and Resilience*) and in new and emerging areas; **3)** key strategic investment to develop research networks, particularly CME, DDN, NEDR and NETREC*;* **4)** continuing to develop our research by investing in staff sabbaticals, PhD studentships, laboratory equipment, and capital investment in the development of novel technologies; **5)** supporting academics to publish in high-quality international peer-reviewed publications and apply for collaborative grants. We will invest in proof of concept studies, support for staff to travel to conferences, open access publication routes, visits from world-renowned scholars and UK travel for networking purposes; **6)** enhancing research output through the continued development of our impact agenda.

Progress Assessment*:* we will assess performance against strategy by: **i)** developing our staffing appointments through clear succession planning (see policy below), the establishment of a '*Search Committee*' to identify quality applicants for senior appointments and a focus on developing areas of strength and strategic research networks; **ii)** developing *Personalised Research and Innovation Plans* (PRIP) recently introduced by the University as the driver and method for encouraging and monitoring aspiration. PRIPs are completed by all staff ahead of annual appraisals. Individuals will be supported through the PRIP process by senior research mentors. Appropriate targets will set the course of development towards 2018. Annual progress of the Unit against PRIP targets will be monitored by Faculty research management; and **iii)** increasing grant submission by 50% to 1.2 submissions per FTE academic per year while maintaining or improving the quality of applications and their success rate. Since 2008 bidding has quadrupled from 0.2 to 0.8 bids per FTE per year. This has been achieved through targeted outcomes from sabbaticals and the support of the Faculty Grant Committee, set up to support staff in identifying grant opportunities and to provide support from experienced grant winners in mentoring and developing ECRs. Future progress will be monitored by the Faculty Grant Committee.

c. People, including:

i. Staffing strategy and staff development

Our staffing strategy since 2008 has been to: **1)** actively support existing staff, developing their research through the professional development which underpins the quality of research activity; **2)** appoint excellent academics to new posts created from University strategic investment funds and to posts created through natural turnover and staff base growth; **3)** reinvigorate the research agenda by appointing junior research staff to three-year University Fellowships and Faculty Research Fellow positions; and 4) provide opportunities for personal promotion to reward and retain excellent staff.

The success of the staffing strategy is exemplified through: **1)** four staff (**Askins**, **Collins**, **Dunning** and **Woodward**) in post in 2008 have developed their research and are submitted to REF 2014. Of these staff, **Askins** and **Dunning** were appointed as ECRs during the RAE 2008 cycle; **2)** ten new staff have been appointed since RAE 2008. University strategic investment has allowed the appointment of four new senior staff: two Professors, **Taylor** in *Communities and Resilience* and **Pearce** in *Cold and Palaeo Environments*; and two Readers, **Alvanides** in *Communities and Resilience* and **Brock** in *Cold and Palaeo Environments*. In addition, six new academic staff, two in *Communities and Resilience* (**Cassidy** and **Clayton**) and four in *Cold and Palaeo Environments* (**Ersek**, **Hocking**, **Rutter** and **Salzmann**) have been appointed through natural turnover and staff-base growth. Five have accepted their first permanent academic post at Northumbria and three are ECR for REF2014; **3)** the development of the careers of five Independent Research Fellows. **Fitzgerald** has progressed from Independent Research Fellow to Senior Lecturer. **Mann** and **Wake** were appointed to highly-competitive University Anniversary Research Fellowships in 2013. We fully expect both to progress to lectureships in 2016. **Lim** and **Pound** have been promoted to

Faculty Independent Research Fellowships; **4)** three staff have been awarded personal promotions, **Collins** and **Woodward** (Chairs) and **Salzmann** (Reader).

Staff development: we have supported early career researchers by involving them in co-supervised PhDs with experienced academics. We provide field and laboratory equipment to support the research of newly-appointed staff, and to develop existing staff. Sabbatical leave is available through Faculty and University awards to enable all academic staff to have periods of intensified focus on research. Eleven sabbaticals have been awarded in the REF cycle, with a number of staff using this opportunity for international visits; for example, **Askins** visited the University of British Columbia and **Rutter** visited Environment Canada for extended study periods. Staff workloads are managed via the University Staff Development and Appraisal process so that a balance is maintained between research and teaching with no staff member allocated more than 40% of their time in student teaching. ECRs are given a significantly-reduced teaching load for their first year in post to enable them to establish their research. Northumbria University holds a Vitae HR Excellence in Research Award, acknowledging our alignment with the principles of the European Charter for Researchers. Our commitment to the Concordat is illustrated by the University Action Plan that supports staff training and development for researchers and academic staff, including various research-orientated courses.

Competitive Personal Fellowships: staff have been awarded a number of personal fellowships. **Rutter** won a prestigious NERC Fellowship and was subsequently appointed to a permanent lecturing post. **Ersek** won a Marie-Curie Postdoctoral Fellowship before being appointed to a permanent lecturing post and **Cassidy** held a Marie Curie Fieldwork Fellowship. **Mann** and **Wake** have won highly-competitive three-year University Anniversary Research Fellowships. **Wake** previously held a CIFAR Canadian Research Fellowship. **Collins** was awarded a one-year Senior Research Fellowship at Bielefeld University, Germany in 2011 and **Askins** was awarded a Visiting Fellowship to the University of British Columbia, Canada in 2012.

Visiting and Emeritus Professors: during the period 2008-2013 members of the UoA have collaborated, managed externally-funded research, and published with a number of internationally-renowned Visiting and Emeritus Professors. Appointments are three-year terms, awarded by a university committee following a formal application and awards process, that must evidence interaction with and benefit to the UoA and the awardee. Appointees visit the University annually to engage in research and teaching activities. In the Communities and Resilience Group appointees include: Prof David Alexander, Chief Scientific Advisor to the Global Risk Forum in Davos, Switzerland (when appointed, now at UCL); Prof Abbas Bhuiya, a Director of the International Centre for Diarrhoeal Disease Research, Bangladesh and Co-I on an ESRC research grant; Prof Sirajul Islam, an expert in micro-ecological risk reduction approaches in Bangladesh and Co-I on a DFID Research Grant; Prof Norio Okado, Kwansei Gakuin University, Japan and President of the Integrated Disaster Risk Management Society; Prof Phil O'Keefe, expert in poverty alleviation, sustainability and risk management and awarded the 7th James Blaut Award and memorial Lecture at the 2012 Association of American Geographers (AAG) Annual Meeting; and Prof Ben Wisner, an expert in natural hazards and disaster vulnerability. In the Cold and Palaeo Environments Group Prof Matti Seppala, formerly University of Helsinki, Finland is an expert in periglacial processes and cold environment geomorphology.

Future Staffing appointments, staff demographics and succession planning: during the period 2014-20 we will increase the number of Category A staff in our UoA from 19 to 30 FTE. This will be achieved through continued University strategic investment, and through existing staff further developing their research activity. Towards this ambition the University has, in principle, identified nine planned appointments: **i)** a Professor, an ECR and two University Research Fellows will support the work of the CME and NETREC; **ii)** two senior academics, two ECRs and a University Research Fellow will strengthen *Communities and Resilience* around economic and social geographies. Planned investment in the research careers of existing staff will allow promotion to Reader and Professor and the appointment of a University Research Fellow will assist the development of NEDR; **iii)** a senior academic to further strengthen *Cold and Palaeo Environments*. Priority investment will be used to support the promotion of existing staff to Reader, Enterprise Fellow and Professorial positions where endorsed through proper promotion processes, and to appoint the two Anniversary Research Fellows onto permanent contracts.

Research standards, integrity equality and diversity: the Unit is committed to providing an environment in which diversity is valued and encouraged, where there is equal access to opportunities and services and in which all prospective and existing staff and research students are treated fairly, with equity, dignity and mutual respect. This is reflected in several initiatives: e.g. research staff are included within the Equal Pay Audit and work-life balance opportunities are available and promoted. Members of the Unit, through appropriate Faculty and University Committees, place considerable emphasis on the need to maintain high standards in research governance and good practice, particularly with regard to ethics and health and safety.

ii. Research students

Investment in PGR students has substantially enriched the research environment: current registrations have grown to 26, and completions have multiplied eight-fold in the REF 2014 period compared to the 2008 RAE. In addition to fully-funded University PGR awards, studentships have been provided by **i)** NERC in recognition of staff grant success, **ii)** Knowledge Transfer Partnerships (KTP) awarded jointly with companies (e.g. North Tyneside Council), **iii)** a University-industry matched scheme (match-funding provided by Environment Canada, Dan Holdsworth Studios Ltd. and IES Ltd.) and **iv)** self-funding and overseas government sponsorship (e.g. the Association of Commonwealth Universities, River State University, Nigeria and Bangladesh Chamber of Commerce).

PGR projects are openly advertised and all applicants are required to complete an initial project proposal before confidential references are collected ahead of formal interview from two academic staff. Quality is high with the eight students awarded University scholarships since 2012 having either a First Class honours degree and/or a Masters degree at Merit or Distinction. Within three months of registration PGR students complete an initial project approval. Students have at least two Northumbria academic supervisors (including an experienced supervisor) and most have an additional external supervisor (from industry or academia), enhancing UK and international links. All supervisors complete Graduate School training on PGR regulations, supervision requirements and examination procedures. Students are formally assessed every 12 months to monitor progression, and must complete a Personal Development Portfolio. The examination includes an independent internal examiner, an external examiner and an independent Chair.

PGR students have individual desk space and a computer in a shared office for the duration of their studies. Laboratory-based students are supported by a dedicated laboratory infrastructure including specialist facilities which have been fully refurbished and equipped during this REF period (see below). The initial training needs analysis directs PGR students to attend undergraduate and postgraduate taught modules as necessary for their individual projects, and a number of students have attended the Royal Geographical Society and British Geomorphological Research Group annual Postgraduate Research Training Workshop. Students present their work at least three times during their study at internal research seminars. Graduate School and Departmental bursaries enable students to present work at national and often international conferences. Example prize/awards include best postgraduate poster at the 2013 British Organic Geochemistry Society Conference (Gilbert) and best poster at the University Research Conference 2013 (Ferdinand). The initial interview identifies equipment, laboratory needs and field trip resources required. Students have spent extensive periods of research in diverse field environments, including Alaska, Bangladesh, Canada, Congo Brazzaville, east Timor, Falkland Islands, Finland, Germany, Iceland, Mozambique, Nepal, New Zealand, Sudan and Zimbabwe. Students are expected to submit work to peer-reviewed publications prior to submitting their thesis, which has resulted in papers authored by research students being published in high-profile international journals such as the *Journal of Health and Place*, *Quaternary Science* and *Quaternary Science Reviews*.

d. Income, infrastructure and facilities

Competitively Awarded Income: research income for the REF period is £2.151 million, equating to £113,000 per submitted academic. Over 25% of this income has been earned from competitive applications to UK Research Councils and 32% from EU funding. Example grants include:

Cold and Palaeo Environments: researchers have been involved in collaborative grants totalling over **£20 million** in the period 2008-2013. Funding success is largely sourced from the Natural Environment Research Council (NERC): **Hocking** (née Watcham), 'Late Holocene

Palaeoseismicity in South-Central Chile', £72,000 (to Northumbria); **Pearce, '**Chemosynthetically-driven ecosystems south of the Polar Front: biogeography and ecology (ChEsSo)', £3.2 million; **Pearce,** 'Lake Ellsworth: a multidisciplinary investigation of life in extreme environments and ice sheet history', £6.6 million; **Pearce, '**Productivity and Biogeochemistry of terrestrial ice-bound ecosystems of the maritime Antarctic', £418,000 (£242,000 to Northumbria); **Rutter, '**Snow-Vegetation-Atmosphere Interactions over Heterogeneous Landscapes', £553,000 (£80,000 to Northumbria); **Salzmann,** 'Southern High Latitude Vegetation Response to Rapid Climate Change at the Cenozoic Greenhouse to Icehouse Transition', £91,000 (to Northumbria); **Salzmann,** 'Late Pliocene soils and lakes: A global data set for the analysis of geophysical feedbacks in a warmer world', £45,000 (to Northumbria); **Woodward, '**Geophysical exploration of a West Antarctic lake: Subglacial Lake Ellsworth', £534,000 (£79,000 to Northumbria); **Woodward,** 'Elevation change anomalies in West Antarctica: implications for the subglacial drainage of ice streams', £64,000 (to Northumbria); **Woodward** and **Dunning, '**A new approach to West Antarctic Ice Sheet evolution using blue-ice moraines on nunataks', £558,000 (£148,000 to Northumbria). Other collaborative funding has been won by: **Brock** from the EU, 'Assessing climate impacts on the quantity and quality of water', €6.5 million, Carnegie Trust and British Council; **Ersek** from the National Authority for Scientific Research, Romania 'Millennial-scale geochemical records of anthropogenic impact and natural climate change in the Romanian Carpathians', £247,000 and the Leverhulme Trust, 'Climatic environmental and tectonic influences on prehistoric human development in Iran', £176,000 (as named researcher); **Mann** from National Science Foundation, 'POLARIS Project', $1.1 million; **Pearce** from the EU, 'Martian analogues for space exploration', €2.5 million; and **Woodward** from The Leverhulme Trust, 'Artist in Residence Scheme', £15,000 (to Northumbria).

Communities and Resilience: researchers have been involved in collaborative grants totalling over **£9 million** in the period 2008-2013. Funding success in this group includes European funding streams, ESRC, DFID, agencies of the UN and NGOs. A flavour is provided below, with more detail on policy-related funding included in the Impact Strategy Statement: **Alvanides**, ESRC, 'School choice and progression amongst Johannesburg children', £56,000 (to Northumbria); **Askins,** ESRC, 'Engaging geography' Seminar series, £20,000 (to Northumbria); **Collins,** ESRC, **'**The Meaning of Health Security for Disaster Resilience in Bangladesh, £238,000 (to Northumbria); **Collins,** DFID, 'Zambezi Valley Advocacy Project', £460,000 (to Northumbria); **Collins**, ESRC, 'Disaster Education in UK' Seminar Series, £15,000 (to Northumbria); **Fitzgerald,** ESRC, 'Cross border trade union collaboration and Polish migrant workers in Britain', £79,000 (to Northumbria); **Fordham**, EU FP6, 'MICRODIS Integrated Health Social and Economic Impacts of Extreme Event', €5 million (€450,000 to Northumbria) (see Impact Statement); **Fordham**, EU FP7, emBRACE: 'Building Resilience Amongst Communities in Europe', €3.46 million (€484,000 to Northumbria) (see Impact Statement); **Taylor**, ESRC, 'Benchmarking the World City Network: City Connectivities on the Eve of the Current Financial Crisis', £74,000.

Infrastructure and facilities: to support our expanding research base all our laboratory facilities have been upgraded during the REF cycle with over £1 million of University Strategic Research Investment in space and capital equipment. The laboratory upgrades have created: new laboratory facilities for palaeo-environmental work, including core storage, HF fume cupboards and microscope rooms; newly-refurbished and equipped laboratories for environmental geochemistry including a fast High Performance Liquid Chromatography, Gas Chromatography and Liquid Chromatography Mass Spectrometer; and new space for a physical geography modelling table and field equipment storage. We share three entirely refurbished large multiuser laboratories (260 m^2 total) with colleagues in the Faculty of Health and Life Sciences. These provide facilities for geochemistry, biochemistry and microbiology. Microbiology is also supported by our newly-established OMICs technology platform in dedicated laboratories (total 55 m^2). This includes a high throughput DNA sequencing platform which allows genomic and other DNA sequencing analyses; a mass spectrometer for metabolic analyses; and facilities for proteomics. Within the Faculty we also have access to a Scanning Electron Microscope and a newly-developed geotechnical laboratory. Over £0.5 million has been invested from the University Research Development Fund (RDF) in field equipment including: Terrestrial Laser Scanner with ~2km range; sub-bottom profiler for lakes and offshore surveys; portable XRF system for environmental geochemistry; global positioning systems for precise point positioning across a range of applications; state-of-the-art unmanned aerial vehicles with high-resolution cameras for DEM generation and change detection;

novel bespoke borehole radar equipment; ground-penetrating radar; seismic equipment; meteorological equipment for glacier and snow pack monitoring, including distributed arrays of sensors and new eddy covariance equipment; and lake coring equipment to support palaeo-environmental work.

e. Collaboration and contribution to the discipline or research base

Large research consortia: researchers work in a number of international consortia, for example:

Subglacial Lake Ellsworth Consortium (SLE): **Pearce** and **Woodward** are part of the Consortium which aims to drill into a subglacial Antarctic lake. The consortium, funded by NERC for £6.6 million, is a partnership between the British Antarctic Survey, the National Oceanography Centre and the UK university sector. Over 30 scientists and engineers have been involved since 2004 including collaborators from Chile and the US (http://www.ellsworth.org.uk/)

Globalization and World Cities Research Network (GaWC): **Taylor** is the Founder and Director of GaWC, the leading academic think-tank on cities in globalization. The consortium comprises: 13 researchers from five countries including China, Germany, The Netherlands and the USA; 2,600 followers on Twitter; 280 scholars who have contributed to GaWC Research Bulletins or the website; and a network of research fellows. According to ClusterMaps the GaWC website annually attracts ~ 35,000 hits from over 150 countries (http://www.lboro.ac.uk/gawc/group.html).

Pliocene Model Intercomparison Project (PLIOMIP): **Salzmann** leads a scientific work package investigating the mid-Pliocene warm period. The consortium comprises more than 23 researchers from seven countries including China, France, Germany, Japan, Norway and the USA (http://geology.er.usgs.gov/eespteam/prism/prism_pliomip.html)

POLARIS Consortium: **Mann** is a grant-holder in the NSF POLARIS Project ($1.1 million) which aims to advance scientific understanding of the changing Arctic though international outreach collaboration among students, teachers, and scientists. Collaborators include the East Science Station, Cherskii, Russia as well as Western Washington University, St Olaf College, Clark University and Woods Hole Research Centre US (http://www.thepolarisproject.org/).

The broad and diverse contribution of the unit to the research base is best exemplified by the most significant esteem indicators for each staff member:

Alvanides: (Reader) **i)** member of the ESRC Peer Review College; **ii)** Associate Editor of *Journal of Transport and Health* (2013-2016)**; iii)** Chair of the Geographical Information Science (GISc) Research Group of the RGS-IBG (2011-2014)**; iv)** Research Visit Grant for Senior Academics by the German Academic Exchange Service (DAAD).

Askins: **i)** member of ESRC Peer Review College and ESRC rapporteur for completed research projects; **ii)** Chair, Participatory Geographies Research Group (PyGyRG) of the RGS-IBG, 2008-11; **iii)** principal co-ordinator for the ESRC Seminar series '*Engaging geography*', 2008-10; **iv)** Co-ordinated PyGyRG-sponsored sessions on participatory research and teaching at RGS-IBG annual conferences, 2009-2011; **v)** Visiting Fellow at University of British Columbia, 2012.

Brock: (Reader) **i)** Editorial Board of Environmental Research Letters (Institute of Physics); **ii)** Associate Researcher, Centro de Estudios Cientificos, Valdivia, Chile (since Jan 2013); **iii)** organiser of the Alpine Glaciology Meeting, Zurich, Switzerland (Feb 2012); **iv)** Co-Editor of two volumes of the *Annals of Glaciology*; **v)** session convener, EGU 2013.

Cassidy: (ECR) **i)** awarded Marie Curie Fieldwork grant, based at Babes-Bolyai University, Romania; **ii)** grant reviewer for Portuguese government-funded Foundation for Science and Technology (Fundacao para a Ciencia e a Tecnologia - FCT); **iii)** 2011 paper awarded '*Emerald Highly Commended award'* from the *Journal of Sociology and Social Policy*.

Clayton: **i)** consultant for European Commission MIREIA framework, measuring the impact of digital inclusion; **ii)** referee for IWT, the Belgian Government Innovation Stimulation Agency; **iii)** regular reviewer for *Environment and Planning A* and *Social and Cultural Geography*.

Collins: (Professor) **i)** member of ESRC Peer Review College; **ii)** executive board member for *Enhancing Learning and Research for Humanitarian Assistance* (ELRHA); **iii)** member of the UK Government Office for Science (GOS) Foresight Review of *Global Environmental Migration*; **iv)** Chair of the ESRC Seminar Series '*Disaster Education in the UK'* 2008-2011; **v)** editorial member of *Journal of Health, Population and Nutrition* and *Journal of Integrated Disaster Risk Management;* **vi)** organiser of the annual *Dealing with Disasters Conferences*, 2006-13.

Dunning: **i)** member of the NERC Knowledge Exchange committee for UAV research; **ii)** member of the RSPSoc Special Interest Group for UAV usage in geography; **iii)** 2010 paper awarded Quarterly *J. of Engineering Geology and Hydrogeology*, Geological Society of London Professor W Dearman Young Author of the Year Award; **iv)** invited collaborator on Polish National Science Centre Grant, 2011; **v)** Co-I on NERC urgency grants in Iceland and Cumbria.

Ersek: (ECR) **i)** awarded Marie Curie Postdoctoral Fellowship, 2009-2011; **ii)** co-ordinator Oxford Climate Research Network 2012-13; **iii)** Managing Editor for GeoResJ; **iv)** grant reviewer for Austrian Science Fund; **v)** session convenor EGU 2011; **vi)** Lead author of paper in *Nature Communications*.

Fitzgerald: **i)** Editor of *Capital and Class* (2009-present); **ii)** member of the UK Executive Board of the European Institute for Construction Labour Research (2009-present); **iii)** British Universities Industrial Relations Association Executive Member (2010 to 2013); **iv)** led UK expert team to investigate workers' rights in the subcontract chain for the European Commission (2011-2012).

Hocking (née Watcham): (ECR) **i)** organising committee for QRA Annual Discussion Meeting 2013, Newcastle; **ii)** reviewer of papers for the journals Quaternary Science Reviews, Geology; **iii)** reviewer of grant application to the Czech Science Foundation.

Lim: (ECR) **i)** research used in the current Shoreline Management Plan (http://www.northeastsmp2.org.uk/pdf/final_SMP2/pdz/pdz7.pdf); **ii)** Geographical Association (Tyne and Wear) Treasurer (2012-present); **iii)** Chartered Geographer with the RGS; **iv)** professional member of the IAG Rocky Coasts Working Group and the Laser Scanning and LiDAR Special Interest Group of the RSPSoc.

Mann: (ECR) **i)** awarded Co-PI status on United States National Science Foundation (NSF) Polaris II project; **ii)** invited talk at AGU Chapman Conference, Birmingham, 2008; **iii)** session convener at EGU 2012.

Pearce: (Professor) **i)** member of NERC and BBSRC peer review panels and ESF pool of experts; **ii)** member of *ISMEJ* Editorial board; **iii)** Visiting Professor, University of Malaysia; **iv)** Adjunct Professor, University Centre in Svalbard (UNIS), Norway; **v)** British Ecological Society meetings Committee; **vi)** elected member of the Council for the Society of General Microbiology.

Pound: (ECR) **i)** President's Award from the Geological Society of London (2013); **ii)** Assistant Editor of Palynology; **iii)** invited talk to Royal Meteorological Society National Meeting on Palaeoclimate (February 2013); **iv)** Co-author on paper in *Nature Climate Change*.

Rutter: **i)** awarded NERC Fellowship 2007-2010 **ii)** invited Postgraduate student mentor at Ludwig Maximilian University of Munich via the MICMoR program; **iii)** reviewer for NSF and NERC; **iv)** Session Chair at AGU 2010.

Salzmann: (Reader) **i)** contributing author to the 5th Assessment report of the IPCC 2013; **ii)** invited participant in the NERC-NCAS - Palaeoclimate Forum (2011)**; iii)** Referee for ERA-Net BiodivERsA, EU 7th framework programme (2008); **iv)** Guest Editor for Special Issue of *Palaeogeography, Palaeoclimatology, Palaeoecology***; v)** lead author on *Nature Climate Change* paper and co-author on articles in *Science* and *Nature Geoscience.*

Taylor: (Professor) **i)** member of the Scientific Panel of the International Geographical Union's proposal for UNESCO to designate 2016 as the International Year of Global Understanding; **ii)**member of Scientific Committee, Globus et Locus, Milan (2010-11); **iii)** advisor, Global Urban Competitive Project, Chinese Academy of Social Sciences (2009-14); **iv)** awarded 'Lifetime achievement award by Political Geography Speciality Group of the Association of American Geographers (2010); **v)** ranked fourth equal among Human Geographers for '*influentialness*' from 1958 to 2008 (calculated from citations) (*Journal of Economic Geography*, 2012).

Wake: (ECR) **i)** external reviewer for the Norwegian Mapping Authority's advisory report, '*Estimates of Future Sea-Level Change for Norway'*; **ii)** examiner for Doctoral Thesis, University of Calgary, Canada; **iii)** awarded Doctoral Fellowship from Canadian Institute for Advanced Research (CIFAR).

Woodward: (Professor) **i)** member of NERC Peer Review College (from 2005), now core panel member; **ii)** Scientific Editor for *Journal of Glaciology* (from 2010); **iii)** organiser of International Glaciological Society Conference on '*Glaciology in the International Polar Year'* at Northumbria (2009); **iv)** Associate Editor for special issue of *Journal of Environmental and Engineering Geophysics* (2007); **v)** invited talks at Presidents' Session of AGU 2009 and INQUA 2011.