

Institution: University of Sheffield

Unit of Assessment: 17B - Geography, Environmental Studies and Archaeology: Geography

a. Overview

Founded in 1908, the Department of Geography comprises an academic community of over 100 researchers, including academic staff, postdoctoral researchers (PDRs) and PhD students (PGRs), spread evenly across human and physical geography. Geography is in the Faculty of Social Sciences and has strong links with other Faculties and Centres. Research is overseen by a Director of Research who chairs a Research Committee comprising seven academic and support staff. Support for individual and collaborative work is provided through our research groups which currently focus on: **climate and cryosphere; ecosystem dynamics and bio-geochemistry; environmental reconstruction and monitoring; international development; social and cultural geography; social and spatial inequalities; and society and environment.** We aim to undertake innovative research that addresses environmental and social issues of global significance. Since 2008 there have been major investments in climate and cryosphere research and in international development; staff numbers have grown; expenditure on research infrastructure has risen; research funding remains very strong; and PhD completions are buoyant.

b. Research strategy

Our goal is to lead intellectual debate in Geography and nurture world-leading research across the social and environmental sciences. Our research strategy emphasises **creativity, curiosity and critical thinking**, supporting the intellectual ambition of academic colleagues at all career stages and addressing issues of global significance (including RCUK's 'grand challenges'). Our strategy acknowledges the growing importance of impact and knowledge exchange, an agenda which we have helped shape (through papers in *Antipode* and *Transactions*). We aim to provide the necessary infrastructure to support high quality research across all our research groups.

Our strategic aims, announced in RAE2008, were to further enhance our research prowess by promoting high quality publications; maintaining a strong link between research income and published outputs; encouraging younger colleagues to develop their careers; further developing our international profile; continuing to expand our graduate school; and increasing the importance of interdisciplinary research. **All of these aims have been achieved.** Specifically:

- We have continued to publish in the best journals across the environmental and social sciences (including six papers in *Nature*, *Nature Geosciences* and *Nature Climate Change*; twelve papers in the *IBG Transactions*; and five in the *AAG Annals*; eleven in *Environment and Planning A*; six in *Environment and Planning D*; seventeen in *Quaternary Science Reviews*; and six in *Earth and Planetary Science Letters*). Dubow won an Ashby prize for 'most innovative paper' in *Environment and Planning A* (2012) and M Jones was awarded a Routledge/RSA prize for sustained excellence in the advancement of regional studies (2013). We are also distinctive in our regular contributions to leading humanities journals (such as *Interventions*, *New Formations* and *New German Critique*). While emphasising the quality of research outputs, quantity is also impressive averaging 3.4 refereed papers/staff member/year.
- Early career researchers (ECRs) appointed during the last RAE cycle have established a strong international profile, while those appointed since 2008 are already demonstrating international potential, winning research grants and other awards (detailed under People).
- Our internationalisation strategy was pursued by hosting >30 academic visitors since 2008 including distinguished scholars from the US (Schatzki, Belasco), Australia (Simmonds), Canada (Oswin), Germany (Scheffran), Japan (Hanaoka, Nakaya) and New Zealand (Le Heron). We have also won Visiting Fellowships to develop collaborative research with Truninger (Lisbon) on food security and Jordana (Barcelona) on regulatory capitalism. Jones is a named collaborator on an Academy of Finland Centre of Excellence programme with Passi (Oulu) and also collaborates with Brenner (Harvard Graduate School). Other high-profile visitors have included Schlesinger (Desert Research Institute, Nevada), Stewart (Geosciences, Plymouth) and Kleman (Stockholm). A recent review of our international links confirmed that we have collaborated with colleagues in 77 different countries since 2008.
- The Department has taken a leading role in advancing the Faculty's internationalisation

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strategy including strengthening links with the National University of Singapore (via joint workshops and staff exchanges). Yeoh (Dean, NUS Faculty of Arts and Social Sciences) was our Hart Visitor in 2013, giving a public lecture and participating in a research workshop.

- The expansion of our graduate school was enabled by the award of an ESRC Doctoral Training Centre (with pathways in human geography and development), participation in two Marie Curie Training Networks and submission of a successful NERC Doctoral Training Partnership bid with colleagues in Liverpool, York and the Centre for Ecology and Hydrology.
- Staff participate in several interdisciplinary research centres with Grugel leading the Sheffield Institute for International Development and Bateman leading the Sheffield Centre for International Dryland Research.

Mechanisms for promoting research: During the current REF cycle we have reviewed existing support mechanisms, strengthening our research environment and enhancing our research culture, responding to a rapidly changing HE sector. The Department's Research Committee encourages strategic thinking and supports grant capture through seed-corn funding. Our research culture and environment have also been improved by:

- Reviewing our **research groups** to promote interdisciplinary and collaborative research. Rather than focussing on a small number of distinctive and mostly non-overlapping groups, we identified seven groupings, optimised to maximise scholarly exchange amongst staff. Our new groupings (see Overview) are a combination of previous ones that operated vigorously (e.g. Climate & Cryosphere) and new research directions (e.g. International Development). Growing interaction across human and physical geography resulted in the introduction of a Society & Environment grouping. Our groups aim to facilitate research interactions across all levels of staff (including PDRs and PGRs) and to instil and enhance a vibrant research culture that improves research discussions, published outputs and success in grant applications.
- Developing an **explicit strategy for staff appointments** involving a balance between growing successful research themes and starting up new ones (see Staffing Strategy below).
- Introducing a **research grant mentoring scheme**, using existing grant holders.
- Providing greater **administrative support** by appointing an experienced research manager.
- Making refinements to our internal **workload model** to help researchers meet their goals.
- Increasing internal funds to support **research workshops** and **travel for collaboration**.
- Maximising access to University research support and infrastructure through schemes such as the **Faculty and Vice-Chancellor Fellowships** (Hammett, Hodson, Jackson and Sole).

Research achievements and future objectives: Research achievements since 2008 include high-level recognition of many of our staff as international research leaders in their fields through fellowships and prestigious awards including **ERC Advanced Investigator Grants** (Jackson and Valentine); a NERC Fellowship and a Vice-Chancellor Fellowship (Livingstone); a Leverhulme Early Career Fellowship (Riding); Leverhulme Emeritus Fellowship (Parsons); Marie Curie Fellowship (Oldekop); and an ESRC Future Leaders award (Little). Five staff (plus one Emeritus Professor) have been elected to the Academy of Social Sciences (AcSS).

Consistent with our research strategy, we aim to conduct **research on major environmental and social issues** including the challenges of climate change, ice sheet responses and food security. Examples include the joint Sheffield (Bigg, Clark) and Bergen project on *Punctuated disintegration of the NW European Ice Sheet*, funded by NERC. Clark and Ng also won a two-year NERC grant, in collaboration with BAS and Oxford University, to investigate the formation of drumlins. As well as Ng's theoretical and modelling work on glacial processes, research also examines the Greenland Ice Sheet and its rapidly changing mass balance. Bigg's expertise on iceberg modelling led to two NERC-funded projects, one on the variability of Greenland melting and iceberg calving (with Hanna as co-I and collaborators from Engineering at Sheffield, Ocean and Earth Sciences at Southampton and INSTAR-Colorado), the other focusing on predicting the trajectory of the recently calved giant Pine Island iceberg (also with Southampton). Long-running work by Clark on the British and Irish Ice Sheet culminated in the award of a £3.75m NERC consortium grant (**BRITICE-CHRONO**, with Bigg and Bateman) involving 14 UK institutions and the University of Bergen, lasting well into 2017. Research on food security includes Jackson's Leverhulme-funded programme on **Changing Families, Changing Food** (£1.2m) and his ERC-funded work on consumer anxieties about food

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(with Watson, Meah and others). A distinctive feature of this research is its emphasis on theories of practice, as outlined in Watson's co-authored *The Dynamics of Social Practice* (2012) and developed empirically in work on sustainable transport, waste reduction and end-user energy demand (funded by EPSRC).

The significance of our commitment to **interdisciplinarity** is demonstrated by work on ecosystem dynamics and bio-geochemistry including Hodson's development of the concept of ice sheet bio-geochemistry during a Leverhulme Research Fellowship which led to a NERC-funded research collaboration with Bristol, providing the first models of ice sheet carbon cycling and showing how the known limits of photosynthesising organisms on Earth's surface need to be revised southwards to include the East Antarctic Ice Sheet. Other projects focussed on bio-geochemical processes in the polar regions and ecosystem dynamics in arid drylands, while Hodson's **Marie-Curie network (NSINK)** examined the causes and impacts of nitrogen enrichment in the European High Arctic. Novel interdisciplinary research is also being pursued through PhD studentships (including two ESRC-NERC awards and two White Rose interdisciplinary networks).

Our **future objectives** include the development of new initiatives on cross-cutting themes across the nexus of energy, environment and food security through further integration and collaboration across research groups. The climate and cryosphere group, for example, has a healthy overlap with other research groups particularly in ecosystems research (notably with Hodson and others), environmental reconstruction (including Bateman, Clark and Swift's Arctic work) and the cross-disciplinary society and environment group (especially Twyman). Other cross-cutting projects are examining human responses to global environmental change and climatic variability; land degradation and change; reconstructing past climates and environments from diverse data sources; environmental management and policy; health and well-being; biodiversity; and water resources. There are also strong synergies between the research interests of the international development, social and cultural geography, social inequalities and society and environment clusters, particularly around the study of post-colonialism, social justice, food security and sustainability. Other work in social and cultural geography includes Phillips' research on the UK anti-war movement (funded by ESRC) and memories of the 1981 riots (British Academy); Dubow's *Archive of Exile* project (AHRC) and new work on the mobility of Jewish European intellectuals; and Jazeel's AHRC-funded work on architectural modernism in Sri Lanka.

Our work on environmental monitoring involves the development of innovative methods and their application in **enhancing the impact of our research**. For example, McGonigle's AXA-funded research into techniques to monitor volcanoes led to a prestigious Rolex award for enterprise, with high-level media coverage including contributions to National Geographic and Discovery channel programmes. New work focuses on demonstrating the application of these techniques as well as first-principle understanding of volcanic processes. Parsons and Wainwright used NERC funding to examine the links between vegetation and runoff in US drylands, while their recently-completed NERC-funded work examined the links between runoff and erosion dynamics using novel erosion laboratory and advanced optical diagnostic techniques. The Department's long-standing dryland research has been advanced via an on-going NERC-funded study of dust source-area processes, while Bateman's research focuses on the reconstruction of coastal dunes systems in South Africa and high-profile work on mega-flood deposits in Arctic Canada.

The **policy-relevance and practical application** of our research is also demonstrated by the work of the social and spatial inequalities group. Founded by Dorling, the group's high-profile studies of inequality and injustice (funded by the British Academy, Joseph Rowntree and the Leverhulme Trust) led to a series of award-winning books and atlases including: *The Real World Atlas* (2008), *The Grim Reaper's Road Atlas* (2008), *Injustice* (2010), *Bankrupt Britain* (2011), *Visualisation of Social Spatial Structure* (2012), *The Population of the UK* (2012) and *Population 10 Billion* (2013). The group's current research on poverty and inequality in London is funded by the Trust for London (2013-14) while other work involves the microsimulation of health and well-being and innovative studies of single parents and employment. Pattie's research on electoral geography and political participation also has a strongly applied dimension, including his assessment of local contextual effects on voting choices, the impact of electoral campaigning, the effects of voters' relationships with other citizens, the inherent bias of different electoral systems, the effects of redrawing constituency boundaries and the consequences of political devolution. Policy-makers have also shown significant interest in Valentine's work on alcohol consumption (JRF), sexual

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minorities (Stonewall) and social identities (ESRC, with Sporton) and in Grugel's work on children's rights (UNRISD, UNICEF and the EU).

Our **strategy for the next five years** is to lead intellectual debates in Geography and related fields, driven by a mix of intellectual curiosity and a desire to address major social and environmental challenges. Staff are actively encouraged to take initiatives and to explore new ideas, with space provided for reflection and blue-skies thinking (such as the Arts-Science Encounters, one of which on critical approaches to Islam recently attracted >100 participants). In meeting major global challenges, we are well placed to respond to future research calls on climate change and global food security, particularly through Hanna's involvement with IPCC and Jackson's membership of ESRC's expert group on Energy, Environment and Food Security which is helping shape social science agendas in relation to these global challenges. Other **priority development areas** will build on our recent strategic investment in international development (detailed under Staffing Strategy). Existing funding provides us with a solid base for future work over the next five years including new research on ice sheet bio-geochemistry (funded by NERC in collaboration with BAS) that will examine ice-bound ecosystems in maritime Antarctic glaciers. The climate and cryosphere group will continue to exploit the BRITICE-CHRONO consortium's work on reconstructing the retreat phase of the last British and Irish Ice Sheet, using new knowledge to improve ice-sheet modelling for forecasting sea-level change. Building on recent polar (particularly Arctic) climate change work, the group will improve knowledge and understanding of current Arctic and Antarctic environmental change, with a particular focus on Greenland where Sole has recently won a three-year NERC grant to investigate controls on flow variability in tidewater glaciers. The environmental reconstruction and monitoring group will drive forward the development and integration of chronological methods, observation technologies and large-scale models to deliver new, collaborative research involving fundamental earth surface processes and environmental fluxes. Building on interdisciplinary collaborations across the University, colleagues in the society and environment cluster will undertake new work on food security, climate change and ecosystem services. Future work in social and cultural geography includes Valentine's new AHRC-funded work on intergenerational justice and Watson's EPSRC-funded study of photovoltaics (with colleagues in Architecture and Physics). Watson will conduct new work on energy demand reduction as part of a £5m EPSRC consortium grant (led by Lancaster). Riding (recently appointed to a three-year Leverhulme Early Career Fellowship) will complete new work on the regional geographies of Sarajevo (mentored by Dubow) and Oldekop, who joins us as a Marie Curie Fellow, will focus on food security and development in Latin America and Nepal. The International Development group will pursue innovative work on natural resource exploitation and climate change, linking political economy, livelihoods and sustainability. Building on our existing expertise on citizenship and democratisation, new work will examine the complexity and heterogeneity of civil society in the global South, natural resource politics, global social justice and the role of ICTs and social media in civic engagement practices. Following Jones' appointment, new work is also anticipated on political economy and regional governance.

c. People:**i. Staffing strategy and staff development**

Our research-led staffing strategy aims to appoint the best researchers from Geography and cognate areas with research interests and expertise that complement or enhance our existing strengths. Recent appointments have also drawn in talent from abroad and from beyond the discipline. The size of the Department gives us **strength in depth** in particular research areas (such as cold regions science, development geography and socio-spatial analysis), providing critical mass in attracting new recruits. The strategy to 'appoint the best' (judged in terms of track record and intellectual promise rather than replacing like with like) has been supplemented by a concerted attempt to build research capacity in particular areas such as in international development. New professorial appointments (including Jones and Wookey) provided the opportunity to grow new research areas while others (Grugel, Phillips, Valentine) have allowed us to build on existing strengths. **Two new senior posts** (in human and physical geography) and **two new lectureships** have recently been advertised. We also actively encourage the integration of academic staff, postdoctoral researchers (PDRs) and PhD students (PGRs); provide tailored support for early career researchers (ECRs); and value a strongly collaborative research culture.

The effectiveness of our policies is confirmed by the fact that our early-career staff appointed

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during the last RAE cycle have established a strong international research profile. In human geography this includes powerful new work on aesthetics and social theory (Dubow), postcolonial geographies (Jazeel) and practice theory (Watson) (see outputs in REF2). Other ECRs, appointed since 2008, are fast establishing such a reputation including Hammett (on citizenship), Nem Singh (on natural resource management) and Whitworth (on social policy). In physical geography, ECRs appointed during the last RAE cycle have rapidly gained international reputations for their work on the remote sensing of volcanic gases (McGonigle), glacier dynamics (Ng) and landscape evolution (Swift). Livingstone and Sole (appointed since 2008) are already demonstrating international calibre in palaeo- and contemporary glaciology (see REF2).

There has been major **strategic investment** in international development research since 2008 enabling the Department to address major global challenges in this important area. New appointments (Grugel, Hammett and Nem Singh) have strengthened the work of Twyman, Sporton and others. The University invested c.£800k to create the **Sheffield Institute for International Development** (SIID). Led by Grugel, SIID is the University's hub for research on international development and a centre for graduate training and post-doctoral research. New work focuses on citizenship and democracy, including Hammett's ESRC-funded research and his ERC-funded collaboration with Staeheli (Durham). Grugel received research funding from the EU (DG Justice and DAPHNE III) and from the ESRC for her work on democratisation and poverty-reduction, culminating in *The Politics of Poverty Reduction* (2012). Closely related work includes Twyman's research on natural resource management in southern Africa; Bigg and others' research on wildlife and protected areas in Mozambique and the reconstruction of past climate in Zimbabwe; and Nem Singh's work on copper mining in Chile. Twyman (as PI) and Grugel (as co-I) are leading two newly-funded ESRC seminar series.

The Department secured two early-career Fellowships (Hammett, Sole) and two senior Fellowships (Hodson, Jackson) in a recent Faculty-wide competition, supporting the development of two outstanding early-career researchers and providing dedicated research time for two professorial colleagues. Livingstone won a prestigious Vice-Chancellor Fellowship in a University-wide, openly advertised, competition and Little won a highly-competitive ESRC Future Research Leaders award (mentored by Jackson). Strategic investments have also been made in fixed-term teaching-only posts and in GTAs to support research-active staff.

Our appointment strategy is supported by a strong commitment to **career development, mentoring and succession planning**. Specific initiatives include recruiting and developing outstanding ECRs; an excellent record of internal promotions at all career levels including, since 2008, three promotions to Professor, two to Readerships and five to SL plus the professorial transfer of Grugel from Politics and Clark's recognition as Sorby Chair of Geosciences; dedicated support for ECRs and other new staff including a comprehensive programme of mentoring and staff review, with all probationary staff taking the University's Certificate in Learning and Teaching (including a module on PhD supervision); dual supervision of PGRs with new academics working alongside more experienced staff; reduced teaching and administrative loads for the first three years of appointment; developing post-doctoral opportunities as a transition between PhD research and permanent academic careers, with external support for postdoctoral staff awarded from NERC (including Rutter, now at Northumbria and Irvine-Flynn, now Bristol) and ESRC (Everts, now at Bonn and Adam-Bradford, now FAO).

The University is committed to applying the seven principles of the UK Concordat for the Career Development of Researchers and in 2012 won the **HR Excellence in Research** award from the European Commission. Besides a formal system of research mentoring for probationary staff and ECRs, senior staff provide informal mentorship within and beyond the Department, reading draft papers and grant applications. There is also a well-established programme of support for all academic staff including an annual staff appraisal scheme (SRDS) which assesses progress against previous plans, sets objectives and identifies priorities for future support. SRDS also identifies staff for performance-related **Exceptional Contribution Awards** which have been won by 16 staff in Geography since 2008. The effectiveness of these policies is confirmed by a recent (2012) survey which showed that staff in Geography had significantly higher levels of job satisfaction than Faculty or University averages. Opportunities for career development and improving skills were also rated well above average.

The departmental **workload model** ensures that research time is protected for staff at all career

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stages. A system of office hours and a nominated 'research day' help protect research time during teaching semesters. Staff are eligible for **study leave** (1:7 semesters). Applications must include clear research plans, with future entitlement subject to previous successful outcomes. 24 staff have taken one or more semester's study leave since 2008, timed to maximize its impact on individual career development and wider departmental goals. Grugel, Twyman and Watson attended the Sheffield Leaders' programme, Jackson taught on the Sheffield Crucible programme for new academic staff and Twyman won support from the Women Academic Returners scheme to focus on research following a career break.

The Department takes **equality and diversity** (E&D) issues seriously, with Valentine providing strategic direction at Faculty level. Approximately one-third of academic staff are women (including two Professors) and women are well represented in senior management roles including Faculty PVC (Valentine), Head of Department (Grugel) and Director of Research (Dubow). The Department's **demographic profile** is well-balanced in terms of age and more diverse than ever before in terms of staff from religious and ethnically diverse backgrounds. E&D policies are rigorously pursued in staff recruitment and selection, followed through consistently in induction, mentoring, appraisal and promotion, with particular attention to the development of **fixed- and part-time staff**. To maintain research standards, clear guidance is provided on research ethics and integrity. Staff in Geography contributed to shaping the University's policies on Good Research Practices and Integrity including the development of policies on the ethics of participatory research. These policies are now among the most comprehensive in the UK and are audited annually by the University's Research Ethics Committee.

ii. Research students

The Department supports PhD students throughout their research training, ensuring that they are well supervised, participate fully in one or more research groups, receive high-quality training (in both subject-specific and generic transferable skills) and that they are well networked nationally and internationally, preparing them for careers within or beyond academia. PhD students are fully integrated into the Department and are represented at Staff Meetings, participating in seminars, workshops, coffee club and other research meetings. They also present seminars as part of the upgrade (confirmation) process and in their final year, as well as at more specialised seminars and workshops. All PGRs take a compulsory research integrity module and enrol in the Doctoral Development Programme (detailed below). Many also attend Faculty-wide PGR Forums. PhD students have the opportunity to teach at undergraduate level (with appropriate training, monitoring and evaluation). Some also teach in other departments. PGRs are encouraged to present their work at major international conferences and to publish their work either independently or with their supervisors. Reflecting the success of this policy, our **PhD students have published >100 papers** in international journals since 2008.

The Department was part of a successful bid for an **ESRC Doctoral Training Centre** (the White Rose DTC, led by Sheffield, with Leeds and York) including pathways in human geography and international development. Since 2008, we have held 26 ESRC and 6 NERC studentships, plus four ESRC-CASE and two NERC-CASE awards and other awards from AHRC, EPSRC, Leverhulme, Marie Curie, ERC and industry. Our students have won ten competitive University awards and we have co-supervised 8 PGRs based in other departments. >50 PhDs have been awarded since 2008 and our four-year submission rate remains above 75%. The robust standards of PGR supervision were praised by the QAA institutional review (Dec 2012). PGRs are eligible for conference support from the departmental Learned Societies Fund as well as from their RTSG. Several have received ESRC funding for Overseas Institutional Visits (e.g. Hughes, Wollongong; Heeley, Concordia) or internships (e.g. Krzywoszyńska, Easton and Temple, all with the Scottish Government). Our PGRs have hosted high-profile glaciology and modeling workshops, attracting international speakers, including two major conferences for the UK Polar Network of Early Career Scientists. A group of PGRs won support from ESRC's Festival of Social Science in 2013 and another group managed the inaugural conference of the Sheffield Institute for International Development. Emeny served as Chair of the RGS-IBG **Postgraduate Forum** and several other PGRs have been committee members of RGS-IBG research groups.

Training and career development for PGRs is delivered via the **Doctoral Development Programme** which begins with an individually tailored Training Needs Analysis (reviewed annually) and includes advanced subject-specific training and personal transferable skills. Our flourishing

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portfolio of PGT provision contributes to skills training and career development (including field-based and placement opportunities). Some training opportunities are also delivered via the University's **Virtual Graduate School** including modules on overseas fieldwork, research with children, research supervision, employability, research integrity and research leadership.

The success of our PhD programme is demonstrated by the **career destinations** of our students who have gone on to lecturerships in 13 British and overseas universities and to research posts in 16 other national and international institutions. Career destinations beyond academia include the Environment Agency, Met Office, Pearson and NHS.

d. Income, infrastructure and facilities

The volume of our **research income** has increased by 37% since 2007, despite an increasingly tough funding environment, with >90% of income coming from RCUK and other competitive sources. We have been particularly successful in attracting European funding including two prestigious Advanced Investigator Grants from the European Research Council for Jackson's *Consumer culture in an 'age of anxiety'* (2009-12, €1.6m) and Valentine's *Living with Difference* projects (2010-14, €2.2m). Hodson was coordinator of a Marie Curie network on Arctic nitrogen deposition (2008-12, £770k). We have also won substantial funding from UK charities and research councils. Jackson led the Leverhulme Trust's interdisciplinary programme on families and food (2005-8, £1.2m); Gregson led ESRC's *Waste of the World* project (2006-11, £3m, with Jackson and Dubow as co-Is); and Clark is PI on NERC's major (5 year, £3.75m) multidisciplinary *BRITICE-CHRONO* consortium grant. NERC awards have been held by Bigg, Clark, Hodson, Livingstone, Ng, Parsons, Sole and Wainwright (all as PI); three NERC Facilities grants were won by Swift; Leverhulme Awards by Dorling, Hodson and Jackson; AHRC awards by Dubow, Jackson, Jazeel and Valentine; and ESRC awards by Hammett, Grugel, Phillips, Sporton, Twyman and Valentine. All of our research grants have led to high-quality international outputs.

Strategic and practical support for grant applications is provided centrally including direct assistance from the Faculty Research Strategy Manager and Faculty Income Capture Officer and other staff in Research and Innovation Services. A recent **review of departmental support staff** led to significant internal restructuring, including the creation of several new posts (a research manager, marketing officer and additional lab support). Our research groups also provide significant organisational, infrastructural and practical support, encouraging internal and external collaboration. Each group meets regularly for academic and social purposes, reading draft papers and research bids, holding seminars and workshops, reading groups and brain-storming events.

Geography is a major player in the Faculty and the University: Dubow and Phillips lead the University's programme of Arts-Science Encounters; Jackson provided research leadership as Faculty Director of Research; Jones is Director of the ESRC-funded White Rose DTC; Valentine is Faculty PVC for the Social Sciences; Watson is Faculty co-Director for Postgraduate Research; and Whitworth is Deputy Director of the Faculty's KE hub (the Research Exchange). The Department takes full advantage of Faculty facilities with three of our research groups based in ICoSS (the Interdisciplinary Centre of the Social Sciences), a £5.9m building providing state-of-the-art IT infrastructure, exhibition space and specialised support for social science research.

There has been major investment in the Department's **infrastructure and laboratory space** since 2008, consolidating provision in the Winter Street building. New office space has been created for Masters students, postdocs and academic visitors, together with a new café area and refurbishment of the Ron Johnston Research Room. The Department has opened a new field station in the Peak District which is fostering collaborative links with Animal and Plant Sciences and enabling meteorological research. Total investment in improving the Department's estate exceeds £1.5m since 2008 and is set to continue. Staff and students also have access to excellent library facilities, including the new STAR Plus search engine, specialist research libraries and a range of IT services provided by Corporate Information and Computing Services.

The Department has its own **Research Fund** to pump-prime new projects, together with an earmarked fund to enable conference participation for all staff and PGRs. Alumni have donated funds to support PhD studentships and the new field station, as well as financing the LR Moore and Hart visiting lecturerships. Four staff have won competitive awards from the **Faculty Research Enhancement Fund** to support the creation of international research networks, to write successful grant applications and/or to make presentations at major overseas conferences. Further targeted

research support from Faculty was won by Clark, J Jones and Watson.

e. Collaboration or contribution to the discipline or research base

Staff have made significant contributions to the discipline and to the wider research base. Hanna contributes to a wide range of international panels (including IPCC) and advises on government policy relating to Arctic climate change; Bateman and Wainwright hosted a UK Geoarchaeology meeting and edited a related special issue; Clark serves on the REF panel; Bateman hosted the UK luminescence dating conference and edited a special issue of *Boreas*. Jackson has served on the British Library's Research Board and on ESRC's Training and Skills Committee. He also chairs the Food Standards Agency's Social Science Research Committee. Dorling's contributions to geographical education and public policy led to him winning the RGS-IBG Back Award and the GA's Gold Prize. Parsons served on RGS Council and Bigg is on the Council of the Challenger Society for Marine Science.

As part of our **internationalization** strategy, the Department has hosted workshops on post-colonial sexualities (led by Phillips) and on decentring geographical knowledge (led by Jazeel) involving colleagues from the National University of Singapore. Staff have co-authored papers with collaborators in >30 different countries. Three staff won Research Mobility Awards from Santander and Jazeel was Visiting Research Fellow at NUS (with Faculty of Social Science funding) and in Pondicherry, India (funded by the British Academy). McGonigle holds Associate Scientist status at the Istituto Nazionale di Geofisica e Vulcanologia in Rome.

Interdisciplinary collaboration includes joint grants with colleagues in many other disciplines including Dubow with Education (AHRC-ESRC), Jackson with Information Science (AHRC, EPSRC), Clark with Mathematics (NERC), Bigg with Systems Engineers (NERC), Watson with Physics (EPSRC) and Phillips with Politics and Sociology (White Rose).

Staff also have strong research links with numerous commercial, government and third sector organizations including ESRC-CASE and AHRC Collaborative Awards with **industry and other end-users**. Recent examples include Bigg's development of a software package to identify icebergs from SAR satellite imagery (ITSARI) which is now being used to aid navigation and advise on marine ice hazards. The project involves research collaboration and a funded studentship with a Norwegian environmental company (KSat). The dissemination of our research has led to **creative partnerships with local and national museums** including Jackson's 'Food Glorious Food' exhibition at Weston Park Museum and the Museum of Childhood; Dubow's 'Archive of Exile' exhibition at Bank Street Arts; and Sporton and Valentine's 'Visualising Identities' exhibition at The Workstation. The Social and Spatial Inequalities group contributed to an exhibition at the British Library ('Census and Society') and to a touring exhibition ('Picturing the Social Order').

Staff have made significant contributions to the research community via membership of the **Peer Review Colleges** of AHRC (Dubow, Jackson, Phillips), ESRC (Hammett, Jackson) and NERC (Bateman, Bigg, Bryant, Clark, Hanna, McGonigle, Wookey), also serving on the Pool of Reviewers for the ERC and the ESF (Bigg, Jackson). Staff contribute to several White Rose **collaborative PhD training networks** and to Learned Societies through membership of executive committees and as journal editors. Since 2008, staff have served on the **editorial boards** for 26 international journals including prominent roles on the *Annals of Glaciology* (Clark); *Arctic, Antarctic and Alpine Research* (Wookey); *Environment and Planning A* (Dorling); *International Journal of Oceanography* (Bigg); *Geografiska Annaler A* (Swift); *Journal of Maps* (Clark); *Quaternary Newsletter* (Bateman); *Ocean Challenge* (Bigg); *Territory, Politics, Governance* (Jones); and *The Cryosphere* (Hanna). Staff regularly review papers for a wide range of international journals and have reviewed grant proposals for >30 different funding agencies.

Since 2008, staff have examined PhDs at 24 UK and 16 overseas universities. Several staff have contributed to ESRC's Festival of Social Science including Grugel, Jackson, Jones and Sporton who received funding for this purpose. Bigg, Dorling and Sole all participated in the University's Festival of the Mind events. Staff have also provided methodological training to PhD students and ECRs via NCRM courses on multi-level modelling, micro-simulation and small-area estimation.

Finally, staff have provided advice to a variety of UK **government departments** including DCLG, DCSF, DECC, DEFRA, HEFCE and ONS and to international bodies including the IPCC, UNICEF and WHO (see REF 3a for further details).