

<p><b>Institution: King's College London</b></p> <p><b>Unit of Assessment: 17, Geography</b></p> <p><b>a. Overview</b></p> <p>Geography at King's sits within the School of Social Science and Public Policy (SSPP). Since 2008, we have appointed 17 academic staff, with a strengthening of cultural, quantitative and historical specialisms, and strategic re-focusing in environment-climate-society interactions. We have grown research income by 68% and increased the RCUK proportion from 38% to 60%; developed one of the largest PGR and PGT communities in the world; had major infrastructural improvement with a new physical laboratory and upgraded computer-GIS lab; strengthened research monitoring, support and governance; and extended and deepened the range of partnerships, networks and leadership roles involving King's Geography academics. The Department is now positioned to produce research that shapes the core of Geography as a discipline, and which brings Geography into the heart of a 'transdisciplinary' culture to address the grand challenges of our time. Core to research strategy is the organisation of research (including enabling and monitoring) around four Research Groups (RGs) reflecting broad sub-disciplinary expertise:</p> <p><i>Cities</i>: social inequality, welfare and public policy; urban governance, livelihoods and health; regulation and design of (eco) cities; modelling urban flows and networks.</p> <p><i>Earth and Environmental Dynamics - EED</i>: Earth observation science; climate, land and environmental change; eco-hydrology and bio-geomorphology; natural hazards and environmental management.</p> <p><i>Environment, Politics and Development - EPD</i>: nature, knowledge and sustainability; development; political ecology; human security, global change and culture; water, geopolitics and international boundaries.</p> <p><i>Hazards and Risk - HRG</i> (including King's Centre for Risk Management (CRM)): natural and environmental health hazards; governance and social theory of risk; risk perception and communication; organizational risk management.</p> <p><b>b. Research Strategy</b></p> <p>The Department has, for more than a decade, represented an ideal of multi-disciplinary research, with staff from varied first degree backgrounds, and Research Groups with broad representation across major sub-fields of the discipline. Our research culture thus encourages a balance between personal scholarship and collaborative research, which enables both collective presence and individual leadership in Geography and its interdisciplinary family.</p> <p>Since RAE2008, research strategy has emphasised greater inter-disciplinary working: (i) as a response to external research calls and opportunities: (ii) to increase internal research capacity and output; and (iii) to address increasingly complex society-environment research questions. Moving through, and looking beyond the current REF period, our strategy is to strengthen this inter-disciplinarity further, working within and beyond the Department to address research questions of international significance, scale, uncertainty and complexity requiring 'transdisciplinary' perspectives, while at the same time, adding greater capacity in key sub-disciplinary fields (below and Section c). Accordingly, two principal strategic objectives may be identified: (1) <i>developing interdisciplinary working, to provide a forward vision and capacity for future transdisciplinary research</i>: recognising that research into the large questions of our time requires multiple scientific and user viewpoints to co-produce knowledge and build impact; (2) <i>identifying and shaping multiple human and physical geographies</i>, where inputs to, and outputs from, interdisciplinary and lone scholar research are aligned with the mainstream of Geography as a discipline.</p> <p><i>Research Goals and Achievements in Support of Overarching Objectives</i></p> <p>Research strategy has been guided by RAE2008 future priorities for the development of research quality, as follows:</p> <p>(1) <i>To support world-leading research quality through increasing the volume of Full Economic Cost and other research grants and the number of staff involved in attaining them</i>. Over the REF period, the number and value of grants, and proportion of income from UK Research Councils (RCUK) sources has increased substantially. Research income has grown and numbers of</p>
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research active staff at all levels has increased (Sections c and d).

(2) *To enhance capacity to develop novel thinking within and across the research groups, and in collaboration with researchers nationally and internationally.* King's scholars take leadership roles in shaping geographical discourse through internal and external networking. Internal to King's, research networks led from Geography include: King's Centre for Integrated Research on Risk and Resilience (CIRRR) (Pelling); King's CRM (Löfstedt); and the Environmental Science Knowledge Exchange (Wooster). Such networks are connected to a lively range of RG and PhD reading groups, workshops and seminar series (Section e). External collaborations include: organising major international conferences (e.g. Rothstein and Löfstedt, Society for Risk Analysis Europe Annual Conference, 2010; Malamud, European Geosciences Annual Conferences 2010 and 2011); funded workshops with international partners (e.g. Potts, African Urban Economies, Netherlands Government; Wooster, Quantitative Fire Description, European Science Foundation; Rothstein and Demeritt, Governance of Risk in Psychiatry in Europe, ESRC, ANR (France), DFG (Germany), NWO (Netherlands)); national contributions (e.g. Butler, Gentrification and Social Mixing, ESRC; Loftus, Gramscian Geographies, British Academy); and international MoUs with UNESCO-IHE for water research and education; and as the UK centre for the UN Global Compact Cities programme.

(3) *To improve opportunities for rising numbers of postgraduate research students (PGR) and post-doctoral researchers (PDRA) associated with Geography by offering enhanced training, mentoring, and professional development.* A successful ESRC Interdisciplinary Social Science Doctoral Training Centre (KISS-DTC) bid was led by Geography (Demeritt, ESRC, £5.2m). Training is provided across 15 interdisciplinary themes, with Political Ecology and Environmental Health led from Geography; and supported by 71 study areas in research philosophy, design and methodology. Geography contributes over 60 hours of teaching across these themes in addition to individual supervision and RG focused activities. Similarly, King's' contribution to the new London NERC Doctoral Training Partnership (DTP; 24 awards per annum in total) is also led by Geography (Wooster), as is the development theme of the new AHRC London Partnership and Block Grant (Potts). Departmentally, PGRs are also represented in the Departmental Research Committee (DRC) and can apply to the Department Research and Impact Fund (DRIF) for career development support (Section c).

Post-RAE2008, international partners and external reviewers identified additional aims:

- (4) Further support for research infrastructure, administration and management of research, to ensure the delivery of high quality outputs.
- (5) Extending the scope and impact of Geography research and build interdisciplinarity by further engaging with academics and policy makers, nationally and internationally (REF3a).

These two additional research goals have been addressed by:

- (i) Major and sustained investment through new staff that has deepened and extended the scale and scope of research and research leadership (Section c);
- (ii) Encouraging staff development, with, for example, four promotions to chair (Section c);
- (iii) Considerable upgrading of research infrastructure, investing well in excess of £1m, including the addition of a state-of-the-art physical laboratory and major upgrade to computing-GIS (Section d);
- (iv) Extending international research capacity including policy outreach benefits through College level support for conferences, exchanges, and formal collaborative research partnerships with international centres of research excellence (Section e);
- (v) Developing the cohort of PGR students (see below), with a near three-fold increase in RCUK studentships (13 at RAE; 30 in the REF period; NERC 9, ESRC, 21), including those from KISS-DTC; these will be augmented by the new London NERC DTP and AHRC London Partnership;
- (vi) Five new PGT degrees highlighting interdisciplinary science. PGT students feed into PhD programmes; they participate in reading groups, seminars and workshops; and publish outstanding thesis work in internal working paper series and peer-reviewed journals. As recorded by the ESRC Human Geography Benchmarking Exercise, King's has one of the two largest Geography PGT communities in the UK and one of the largest internationally, with annual numbers averaging c. 200;
- (vii) Key administrative appointments to support research activity; a re-organisation of research-management functions; revisioning of the former Environmental Monitoring and Modelling RG to

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EED; and instituting the HRG. Together, these support and clarify the internal research process, augment research capacity and promote problem-driven research.

*Research management for REF and post-REF research*

Progress on Departmental objectives and research goals has been reviewed in a rolling five-year planning cycle appraised annually through the Research Strategy Group (RSG) of SSPP. Departmental research governance was restructured in 2008-9, and revisited recently. The aims are: to balance long-term stability in research reputation and purpose with research experimentation; to generate renewal; to enhance staff development and research capacity; and to monitor research activity. In 2011, *shaping and delivery of research strategy* was strengthened by the creation of a Deputy Head of Department-Research (DH-R), while *research management and support* is now the responsibility of a Director of Research (DR), chairing the Department Research Committee (DRC), and reporting to the DH-R. The DRC administers internal funds and provides research coordination, discussion and reporting. All RGs have a Convenor to serve on this, together with other representatives from the academic staff and the PDRA community. RGs manage specific research themes and associated programmes of activity, learning and outreach, including key research partnerships and senior visiting appointments. RGs are central to cultivating a vibrant and supportive research culture underpinning international quality research. This extends to PGRs, who lead RG seminars and reading groups, which may also be inter-institutional, such as EPD's London Water Research Group, with over 100 members from 10 countries. The DH-R, DR, DRC and Convenors are supported by a dedicated Research Support Officer (RSO). In addition, *ad hoc* Working Groups and individual scholars populate specific projects of all kinds, and respond as opportunity arises.

SSPP and College monitor departmental activity by establishing expectations for research income. SSPP also encourages and provides support for networking and public engagement activities and provides professional ethics review, with pre- and post-grant support. Through DH-R representation, the Department works closely with the RSG which is a forum for discussion and networking. Connected to the RSG and complementing the role of the Department's RSO is the Arts and Sciences' Research Office, which supports Departmental research priorities by: identifying new research funding opportunities, including those with the private, public and third sectors (nationally and internationally); providing support for grant applications, budgeting and submission; and providing internal peer review of proposals and proposal mentoring. This is an especially valuable service for early career researchers, but is used frequently by all. Enhanced mentoring and peer review, managed via the DRC and implemented through RGs, has coincided with increased grant income and PhD studentships success. King's Policy Institute (KPI), also located in SSPP, is a key resource for major grant writing, college networking and accessing sponsorship beyond the College. In 2013, KPI provided £20k start up for the CIRRR as a College resource led from Geography, and £20K for the Cities initiative, 'New Limits to Growth'.

At Department level, research is supported through individual networking grants given to all academic staff (currently £750 per annum; increased from £500 in 2010). In addition, since 2011, competitive awards of up to £2,000 have been available from the DRIF. This has provided targeted support for research evolution and experimentation, with a competitive application process. DRIF has: enabled novel transdisciplinary work, e.g. on the biopolitics of pest control in urban places (EED, EPD and Cities); brought new methods to geographical questions, e.g. using new global positioning system technologies and modelling analysis to map international movements of electronic waste to improving understanding of global trade flows (EED and EPD); added value to existing grants, e.g. purchase of an unmanned aerial vehicle to support Wooster's (EED) NERC grants; and helped build new networks, e.g. funding a transboundary water and justice side event at World Water Week in Stockholm, 2013 (EPD). In 2012, the DRIF was increased from £6k to £8k to include a protected award for a PDRA to enhance career development. Ongoing evaluation of the effectiveness of the DRIF and individual networking grants on research and impact will be undertaken: DRIF will, in the interim, be increased by a further £4000 for impact-focused research (REF3a).

Interdisciplinarity is championed by all RGs, for example in EED through the integration of environmental modelling and management for wildfire events. Emerging transdisciplinary vision and capacity is evidenced by: the creative conversation between natural and social science with users

at the interface of HRG, EED and EPD (e.g. Demeritt (EPD) and Rothstein (HRG) on risk regulation in Europe (ESRC)); Demeritt and Malamud (EED) on probabilistic flood forecasting (NERC and ESRC); Pelling (EPD) two FP7 grants on cultures of natural hazard risk governance; and Malamud (EED) and Pelling (EPD) on disaster visualisation tools (ESA). Three new grants awarded from the Belmont Forum attest to international recognition of integrated social and natural science research at King's. Additionally, Hulme (with a Rachel Carson Writing Fellowship) and Berkhout (with a major FP7 grant) joined the Department in 2013, bringing track records for leadership to further strengthen this trajectory for research.

External collaboration is a hallmark of King's Geography success and will continue as we move to an increasingly transdisciplinary mode of research. Individual researchers are extensively networked with leading research centres in Geography and allied subjects globally, as evidenced through grant and publishing profiles. Support for collaboration comes from King's International Office which has generated joint PhD programmes with Hong Kong, Humboldt and NUS. The Department's international reputation attracts high-profile senior visiting scholars; in EPD for example over the REF-period, visitors have included James Scott, Michael Watts, Joan Martinez Alier and Richard Norgaard. Visiting scholars have influenced research planning and activity at RG level. In Cities, for example, visits by David Ley, Jamie Peck, Neil Smith and Patrick Le Galès, have all involved PhD training workshops; Le Galès has hosted Cities staff at Sciences Po (where Butler held the Vincent Wright Chair); Josef Konvitz (formerly OECD director) has convened the 'New Limits...' seminar as noted above. More emphasis on building strategic collaborations will be important for achieving the Department's two overarching research objectives beyond the current REF period, as evidenced in the recent MoUs with UNESCO-IHE and the UN Global Compact Cities Programme. Berkhout's Interim Directorship of Future Earth (2013-15) provides further opportunities for increased international research collaboration and impact.

Beyond REF2014, RCUK and EU will continue to be the mainstay of research funding, incorporating Knowledge Exchange awards (REF3a), such as Wooster's on remote sensing for the UK fire and rescue services. Success in non-traditional research support, including consultancy, also indicates the reputational strength projected by RGs and individuals. With judicious application, consultancy can extend value to research by piloting or further deploying research. An example is the organisational adaptive capacity indexing tool developed for London (Pelling; EU FP7 project, MOVE, 2010) which was subsequently developed with the Inter-American Development Bank in Guyana (2011) and the World Bank (2012). This fed back into academic research as a core element of a successful Belmont proposal. Helping researchers to prepare for and better target collaborative, international and impact-building research awards in these ways will become an increasingly important task for the DRC and RGs.

Institutional support for enhanced cross-RG working through Working Groups is in place and supported by the DRIF. Planned support aims to encourage bottom-up, organic collaboration where it already exists and to use Departmental resources to facilitate this in promising new fields, including promotion of College-wide initiatives. Existing extra-Departmental networks in King's include the King's Environmental Science Network initiated by Wooster. This promulgated links between the EED Earth observation and Biomedical Sciences working on urban air pollution, generated grants from EPSRC's 'Bridging the Gap' initiative with Department of Informatics, and led to inclusion of EED within an EPSRC bid co-ordinated by the Department of Physics. Extra-college networks are also extensive, and generate multiple significant opportunities. Examples include: Wooster's membership of the NERC National Centre for Earth Observation (Carbon Theme PI, £250k) and of the international teams prototyping the multi-million Euro *Copernicus* Atmospheric Monitoring Service (funding to KCL thus far, £700k); Pelling's and Malamud's research to enhance visualisation techniques for disaster risk for the European Space Agency (£250k), and a consortium for disaster resilience including Bristol, Durham and UCL; and work re-examining priorities for development geography, such as Herrick's research with Parnell (University of Cape Town) on alcohol control, poverty and development funded by ESRC-DFID (£218k) and the British Academy (£5k). Exploring how best to maintain the momentum built during the REF period in rebalancing internal incentives and supporting external efforts for collaboration is vital.

With respect to leadership in the wider academy and discipline (also Section e), support for monographs, key edited collections and strategic journal publications is, and will remain,

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significant. Editorships of synthetic series include Baas as volume editor for '*Modelling of Geomorphology*', *Treatise on Geomorphology* (Elsevier, 2013); Demeritt's co-edited *A Companion to Environmental Geography* (Wiley, 2009); Löfstedt's editorship of Earthscan's series on *Risk, Society and Policy*; and Schofield's 18-volume *Arabian Boundaries* (CUP). Some 10 monographs and six edited collections were published in the REF period. These include strategic publications in Geography series, such as Pelling's co-edited *Climate Change and the Crisis of Capitalism* (Routledge Series in Human Geography; 2011). Impact on the discipline is also indicated by the awarding of publication prizes, including Hulme's *Why We Disagree About Climate Change* (2009, CUP), joint Winner, Gerald L Young Human Ecology Book Award, 2010 and one of *The Economist's* four science and technology Books of the Year, 2009; and De Genova's *The Deportation Regime* (2010) Bronze Award, 2011, Association of Borderland Studies.

*Post-REF research priorities - Emerging thematic initiatives of strategic importance post-REF*

The following areas are being developed to maintain international leadership within and beyond the discipline, directed towards RCUK, and wider public policy and academy agendas. They further develop the multi- and inter-disciplinary ethos, research culture and trajectory of the Department to address questions of transdisciplinary significance and nature.

- (1) *Comparative urban research*. The Cities group is now positioned to address this emerging agenda. This can extend critiques of past and present urban inequality (Butler, De Genova, Green, Hamnett) and sustainability (Barbu, Caprotti, Pelling) from the global north to the south (Garmany, Potts) and, increasingly, to Asia. At the same time, it offers new insights into the importance of urban places in the production of space and performance of governance at all scales (Andersson, Barbu; Craggs). This includes endemic otherness associated with sexuality (Andersson) and migration (De Genova) and the quantitative analysis of new ('big') data held in large datasets derived from digitally-enabled communications and transportation networks (Reades) supported by agent-based modelling (Millington).
- (2) *Integrated geographies of water management and security*. Water is at the frontline of human security and wellbeing. Drawing across established EED expertise in aquatic ecology (Francis) and forest watershed management (Mulligan) with EPD strengths in water governance (Allan) and development (Mustafa), work on water management and security has undergone a step change in capacity. The priority is to engage fully across physical, development and critical geography and geopolitics with the addition of new expertise in hydrogeomorphology (Clifford), community (Clever) and international (Matthews, Mirumachi) water governance and the critical conceptualisation of water as an object of governance (Loftus).
- (3) *Hazard, risk and resilience*. Geography at King's is in a rare position of having world-leading expertise from hazard assessment to risk policy analysis. This brings together observing and explaining natural (Malamud, Wooster) and social/health (Herrick) hazards, including multi-hazard interactions; analysis of risk as a technology for communication (Demeritt) and wider public policy (Rothstein, Löfstedt, HRG) including critiques of resilience (Francis) and alternative framings of risk and development such as transformative adaptation (Pelling). King's CRM, and from 2013, King's CIRRR, both led from Geography, facilitate collaboration at School and College level.
- (4) *Global change, resources and knowledge*. Processes of urban change, water and food security, and risk and resilience across scales are all connected and require 'joined-up' research and policy. The intersection of Hulme (climate science and cultures of knowledge, EPD, supported by Adamson) and Berkhout (system innovation and climate-change governance, EPD) - both Nobel citation laureates for their work with the Intergovernmental Panel on Climate Change - with these themes as a catalyst for new analyses connecting natural and social science with environmental, economic and social policy and culture, to draw-out thresholds and tipping points, feedback pathways and governance challenges.

### c. People

#### *Staffing strategy and staff development*

Staffing strategy has been directed at anticipating and giving shape to the overarching objectives and emerging thematic initiatives outlined above, with a strengthening of cultural, historical, quantitative and urban specialisms, and strategic re-focusing in leadership in environment-climate-society interactions. Appointments are informed by the Athena SWAN Charter (recent Bronze Award). Appointment opportunities have arisen from retirement and career moves, and

also from College investment, fellowship awards, and senior visiting appointments. Four professorial (Berkhout, Cleaver, Clifford, Hulme), three senior lecturer/reader (Caprotti, De Genova, Loftus) and ten (early career researchers) lecturers (Adamson, Andersson, Barbu, Brooks, Craggs, Matthews, Millington, Mirumachi, Reades, Smith) have been appointed. In addition, four promotions to chair (Drake, Green, Malamud, Pelling) and five promotions to reader/senior lecturer (Baas, Francis, Herrick, Mustafa, Potts) have occurred. This has allowed successful rebalancing in the Department's career demographic. Earlier-career staff are spread across the RGs, and it is noteworthy that they are at the forefront of respective fields, as indicated by early award success: Andersson (large grant success in his PDRA role), Brooks (awarded a British Academy Early Career Fellowship), Loftus (RCUK academic fellowship), Millington (Leverhulme Early Career Fellowship), Mirumachi (British Academy small grant award holder), Reades (International Balzan Prize) and Craggs (Association of South East Asian Studies Fellowship). Only three of the 34.8 FTEs returned are fixed-term posts; Berkhout (0.2 returned) and Newson (0.6) are part-seconded from King's to ICSU/Future Earth and the University of London. Senior recruitment has brought new leadership as well as additional expertise, strengthening water and development (Cleaver in EPD); broadening perspectives from environmental monitoring towards modelling and dynamics (Clifford in EED), and refocusing former atmospheric-climate themes towards climate-society interactions and policy (Berkhout and Hulme; EPD and other RGs). Succession planning includes preparing in advance of retirement: in the Cities group, Caprotti (SL) and De Genova (Reader) anticipate two senior retirements, and with Craggs and Reades develop new, comparative, historical and quantitative urban dimensions. Support for career development is indicated by permanent positions from fellowships for Brooks, Loftus (direct to a senior lectureship), and Millington; Matthews, Mirumachi and Smith from King's PhDs, as well as Adamson and Barbu from PDRA positions elsewhere. Combined, this interplay of sustained research leadership with the vitality from new, including early career, appointments, exemplifies the research and staffing strategy for Geography at King's over the period.

Staffing policy, underpinned by a transparent workload model, ensures equity of teaching and administrative loadings, with a basic allocation of up to 40% of time for research. Peer mentoring supports all staff in their research alongside formal annual Development Review of research performance and forward development plans. The innovation of two Deputy Head positions (Research and Education) has also enhanced senior skill development and succession planning. Mentoring, review and leadership structures are mechanisms through which standards of research quality and integrity are maintained with support from the College: the Department also has three staff members on the College Research Ethics Panel. There is a one-year-in-seven sabbatical system, claimed through an application process prioritising large grant applications and publishing projects, and subject to post-sabbatical review. Early career researchers are additionally supported through the King's *Concordat to Support the Career Development of Researchers*. This is implemented in the Department through a reduced teaching and administrative load, mentoring, and bi-annual probation meetings and monitoring of performance. Support extends to early career fellowships, as seen in Millington's Leverhulme Fellowship on landscape modelling, which has extended a bridge between social and physical science modelling. Close working between staff at all career stages is strongly supported - for example, Mirumachi and Allan's collaboration in the London Water Group; and Wooster and Smith in wildfire detection - and early career, as well as newly-appointed staff, are provided with start-up funds for conference participation and networking.

#### *Research Students*

At RAE2008, the Department committed itself to increase PGR numbers, enhance the quality of their experiences, and ensure timely completion. Since RAE2008, the numbers of registered PGRs has generated one of the largest scholarly research communities for any Geography Department worldwide. The current cohort is 122, increased from 110 at RAE. In addition, the REF period saw 116 PhDs commence. To manage this large population and to assure quality, the PGR committee structure was revised in 2008, bringing the PhD tutor, admissions team and PhD committee into a postgraduate board of study. PGR management effectiveness is evidenced in high completion rates (86 awards, 76 within four years). Opportunities for the training of PGRs have been enhanced significantly since 2008, including the development of the KISS-DTC (2011-2016), enriching the College's outstanding environment for postgraduate study and professional development. KISS-

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DTC, connecting the social sciences with the humanities, health, natural and mathematical sciences, is key to the bottom-up promotion of Geography's emerging transdisciplinary research culture. Advanced methods training and summer school courses are run collaboratively with learned societies and other universities, including the College's international partners. In addition, PGRs have access to the Graduate School's 'Researcher Development Programme' providing professional development including gender and other equity, ethics and project-management skills.

All RGs sustain large and vibrant PGR and PDRA communities, and are committed to the inclusion and development of early career researchers. Intellectual development and induction into scholarly networks occurs through reading groups, seminar programmes and international exchange programmes. For example, Cities Group PGRs have participated in a German Research Council (DAAD) funded network between KCL and Humboldt University exploring issues of comparative urbanism; EPD PGRs helped organise a University of Bonn/United Nations University Summer School on Environmental Security (2009) and participated in an annual Africa research workshop for UK PhDs at Oxford; HRG PDRAAs have raised grants for, and organised, international risk conferences at KCL (2009) and Université Libre de Bruxelles (2010), resulting in a special issue of the *Journal of Risk Research*.

Success in developing the research and academic careers of both PGRs and RAs is indicated through the destinations of completed PhDs. First destination professional employment is dominated by core academic posts (researcher 37%, lecturer 28%), with applied careers well-represented through business and NGO sectors (22%) and government (13%). First academic destinations include many centres of excellence in UK Geography (e.g. Durham, LSE, UCL) and overseas (e.g. Maastricht, Santa Cruz). The outstanding research of the PGR body is signified also by publications in quality journals including *Transactions of the Institute of British Geographers* (Srinivasan) and the *International Journal of Urban and Regional Research* (Jackson).

**d. Income, infrastructure and facilities**

Between RAE and REF, Geography's total research income has grown from £4.2m to £7.0m, and the proportion by value of income from RCUK sources has increased from 38% to 60%. Major RCUK grants focus on core competencies and demonstrate the success of focussed research efforts in environment and policy (Mulligan £240k DFID-RCUK ESPA), cities (ESRC-DFID, Herrick, £217k), wildfires and remote sensing (Wooster £1.3m from six large NERC grants) and risk regulation (Rothstein and Demeritt, £1.1m, £386k to King's, ESRC-ORA).

Overarching objectives were supported by major investments in state-of-the-art research infrastructure, in particular the John B Thornes laboratory (JBT), a range of physical geography field instrumentation and a dedicated research quality GIS/computing lab seating 43. The JBT is part of a strategic investment from the College of approximately £1.2m. The laboratory is well equipped, has a permanent manager, and is used for spectroscopy, sediment analysis, and quantification of environmental pollutants in water/soil and light microscopy for ecological studies. This is a central resource for maintaining research leadership in Geography from the EED group. Instrumentation such as a laser particle sizer, graphite furnace AAS and ion chromatograph are used by researchers from across King's (e.g. Medicine). We have also installed a Linux research computing cluster as a departmental facility.

Observational equipment is installed at dedicated monitoring sites in the UK and overseas (enabling NERC research by Baas, Mulligan and Wooster). Other significant field equipment includes a field-portable FTIR spectrometer deployed for the measurement of greenhouse and other gases from biomass burning in the UK, Canada, Australia and South Africa with support from NERC (Wooster, Smith). In addition, a human geography 'laboratory' provides digital voice recorders, camcorders, video technologies, and a range of computer software packages to enable ease of analysis of data. Facilities are managed by full-time, professional services staff, comprising: a Research Computing Support Officer; Earth Surface Materials Technician; and, a Laboratory Manager and Field Instrument Technician, all of whom are PhD qualified.

**e. Collaboration or contribution to the discipline or research base**

Contribution to the discipline builds from the culture of collaboration, and the scope and engagement of research as outlined above. This helps to shape the discipline through publishing, conference activity and editorial work, and helps to project and articulate Geography's centrality in

responding to critical issues of the day, whether through government, RCUK and other advisory and leadership roles, or through research partnership with international centres of research excellence. Partnerships with international centres of excellence are numerous, including The British Antarctic Survey, the British Ecological Society and the Environment Agency, Royal Institute of British Architects, the Royal Geographical Society (RGS with IBG), Overseas Development Institute, and the International Institute for Environment and Development. Since January 2008, the Office of the Vice Principal for Arts and Sciences has provided financial support to forge links with a host of international universities and organisations, seen most clearly in the dedicated joint PGR initiatives noted above. These relationships complement those with major government offices, including the DCLG, Defra, DFID, DBIS, HM Treasury and Government, and agencies including EA, HSE, FSA, HPA and Met Office. Other examples reflect the international orientation of research and range from partners with detailed national interests in integrated research (e.g. the International Bureau of Social and Economic Research, Medellin, Colombia) and strategic, global (e.g. UN Global Compact Cities programme, Melbourne, Australia). Added value is reflected in associated publications and through a capacity to integrate research on connected issues. A particular case is the range of research undertaken at King's with a London focus. London offers King's Geography a global city with scope to contribute to international research with influence across the breadth of the discipline from gentrification and social inequality (Butler, Hamnett: ESRC), education (Butler and Hamnett: ESRC) and risk management (Pelling: FP7 MOVE) to the historical analysis of wealth and poverty (Green, ESRC) and urban sustainability. Contributions are increasingly multidisciplinary, e.g. Francis' work on the ecology of the Thames (Thames 21) and interdisciplinary, e.g. collaboration between urban climate specialists (Grimmond, now Reading) and Pelling (PI) on social resilience and on adaptation (FP7 and Belmont). Other pathways to, and indicators of, excellence in collaboration and contribution to the discipline are outlined below.

*Hosting workshops and large conference activity* influence mainstream Geography, position the Department and support staff development. Recent examples include ESRC workshops on 'Climate change and the crisis of capitalism' (Pelling) and 'gentrification and social mixing' (Butler), resulting in edited publications with Routledge (2011) and Policy Press (2012). In 2010, Rothstein and Löfstedt hosted the Society for Risk Analysis Europe Annual Conference with 300 delegates. Sessions and plenary addresses are now sponsored at annual conferences e.g. with the RGS-IBG (Loftus and Clifford plenaries at RGS in 2012); Association of American Geographers, and European Geophysical Union (Malamud was Conference Chair for three years). These are in addition to numerous presentations made at seminars across and beyond Geography Departments in the UK and overseas.

*Shaping networks* to scope future research priorities and influence wider disciplinary communities is also important. Examples include: DFID/RCUK Ecosystem Services and Poverty Alleviation networking grants awarded to Cleaver, Clifford and Mulligan; extending work on the application of open-path FTIR spectroscopy (Wooster, Smith), collaboration with the NERC Centre for Ecology and Hydrology and the British Antarctic Survey, NERC, British Antarctic Survey Antarctic Funding Initiative and the NERC Field Spectroscopy Facility); Mulligan's research on climate, hydrology, vegetation process and land-use interactions, (CGIAR Challenge Programme for Water and Food with partners from the International Centre for Tropical Agriculture, CONDESAN, UNAL, WWF, SEI); Baas' research on fundamental aspects of sand transport involving collaborations with eight institutions and funding from NERC); Drake's research on Saharan paleoclimate with seven universities from the UK and Libya with support from the Society for Libyan Studies, NERC and the oil industry; and Green's work (with Daunton (History, University of Cambridge) and Owens (Geography, QMUL)) on wealth and inheritance. National and interdisciplinary networks hosted at King's included Pelling's 'Megacities and the Coast' consortium that culminated in an International Human Dimensions Programme synthesis report (Earthscan, 2013). The impact of such activity can also be seen at the College level through cross-school engagement, e.g. the £4.5m KCL Patient Safety and Service Quality Centre, for which Rothstein was Co-I.

*Prestigious positions in international organisations* are held by many staff and provide evidence of international reputation and contribution, as well as informing research trajectories. Posts include: Butler, Vincent Wright Chair, Sciences Po (Paris), 2011; Cleaver, Visiting Professor University of Wageningen; Clifford, Distinguished Visiting Professor at University College Dublin; Löfstedt,

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Adjunct Professor at Carnegie Mellon University; Clifford, Academic Council Member, Indian Institute of Bio-Social Research and Development, Kolkata. These appointments are complemented by the awards received in recognition of high academic achievement and public service. REF3a notes awards for impact. For research and service, awards include: Butler and Hamnett (Academicians of the Academy of Social Sciences), Hamnett (Back Award, RGS, 2010), Malamud (EGU medal) and Wooster (Cuthbert Peek Award, RGS, 2011).

*Staff advisory roles* with public and private organisations, nationally and internationally, provide academic leadership, and facilitate communication for policy needs to feed into research (including impact, REF3a). Academic leadership roles include Newson's membership of the Council of the British Academy (2007-2010); Clifford (2011) President, British Science Association (Geography); Malamud (2007-11) President, Natural Hazards Division of the European Geosciences Union and (2010-11), Chair, Programme Committee of the European Geosciences Union; and Mulligan's ongoing membership of the RGS-IBG Council (Honorary Secretary for Expeditions and Fieldwork). Other roles include: Berkhout (2013) international advisory board for Lund University Centre for Sustainability Studies and a senior advisor to the World Social Science Report 2014 and International Social Science Council/UNESCO; Demeritt (2012-), UK Gov. Natural Hazard Partnership; Löfstedt (2011) Chair, UK Gov. Review of Health and Safety Regulation; Pelling (2012), Lead Expert Group for UK Government Foresight study, *Disaster Avoidance and Resilience* and memberships of international scientific steering committees for UN University Measuring Vulnerability Expert Group, the IGBP-IHDP core project Land-Ocean Interactions at the Coastal Zone (LOICZ) and the ICSU-IHDP core project Integrated Research on Disaster Risk (IRDR); and Wooster (2008-13), Department for Energy and Climate Change (A)ATSR Science Advisory Group.

*Journal editorships* (more than 40 over the REF period) are a strong vehicle for extending intellectual leadership to the discipline. These include Founding Editorships of *Wiley's Interdisciplinary Reviews Climate Change* (Hulme), *Journal of Risk Research* (Löfstedt) and *Geopolitics* (Schofield); Managing Editorship of *Global Environmental Change* (Hulme) and *Progress in Physical Geography* (Clifford). Editorial Board Memberships are numerous and include leading Geography titles: *Annals of the Association of American Geographers* (Pelling); *Global Environmental Change* (Pelling); *Geoforum* and *Cultural Geographies* (Demeritt); *Geomorphology* (Baas), and *Transactions of the Institute of British Geographers* (Hulme). There are also leading interdisciplinary, specialist and area-specific titles, such as *Current Opinion in Environmental Sustainability* (Berkhout); *Journal of Arid Environments* and *Origini* (Drake); *International Journal of Wildland Fire* (Wooster); *Catena* and *River Research and Applications* (Clifford); *Plant Ecology* (Millington); *Health, Risk and Society* (Rothstein); *Journal of Southern African Studies* and *Africa - Journal of the International Africa Institute* (Potts); *Journal of Arabian Studies* (Schofield) and the *London Journal* (Green).

*Engagement with RCUK, and cross-RC initiatives, including Belmont, is important for demonstrating leadership and influencing research strategy.* Examples include engagement with NERC through Chairing its Field Spectroscopy Facility Steering Committee and the NERC National Centre of Excellence for Earth Observation (Wooster); the Sandpit for the Virtual Observatory for Water (Clifford as Director); and panel memberships for the Changing Water Cycle Programme in both the UK and India (Clifford), and Living With Environmental Change (Berkhout). Other roles are: Knowledge Exchange Peer Review Committee (Demeritt, Wooster) and Committee for Fellowships for the Increasing Resilience to Natural Hazards Programme (Pelling), and the Peer Review College (Baas, Demeritt, Malamud, Wooster). Engagement with ESRC has included membership of the Research Evaluation Committee (Berkhout); Post-Doctoral Fellowship Assessor College (Demeritt); the Research Assessment Panel C (Demeritt); and Peer Review College (Pelling, Butler). Outside of the RCUK, Potts is a member of the African Studies Association UK Council advising on International Research Council activity and Clifford is a Belmont G8 panel member for freshwater security. Many staff also sit on international research council boards and awarding committees: prominent are the Netherlands, Norwegian, US NSF, Canadian and Australian research councils and the European Union, including the European Science Foundation.