

Institution: NEWCASTLE UNIVERSITY
Unit of Assessment: GEOGRAPHY
<p>1. Unit context and structure, research and impact strategy</p> <p>Overview: Since REF2014, Geography at Newcastle University (NU) has advanced as a world-leading centre of geographical research, impact, and capacity-building through: major investments in staff (additional 29FTE: 85% early-career, 50% female); increased female research leadership (7 women Professors cf. 4 REF2014); 36 promotions based on outstanding research profiles; extensive publication of high quality research (1054 total outputs); increased external grant income (£6.22M representing a 52% increase cf. REF2014); major success in Global Challenges Research Funding (GCRF) including establishment of the £17.5M UKRI GCRF <i>Living Deltas Hub</i>; widespread and varied research engagement and impact with diverse stakeholders; and £63M NU investment in our School research facilities, laboratories and building infrastructure.</p> <p>Geography at Newcastle celebrated its 90th anniversary in 2018, and is the largest Unit within the School of Geography, Politics and Sociology (GPS). GPS sits within the Faculty of Humanities and Social Sciences (HASS), the largest of NU's three faculties. Research in Geography is organised around four established clusters – <i>Physical Geography, Geographies of Social Change, Economic Geographies, and Power, Space and Politics</i> – plus the internationally-renowned Centre for Urban and Regional Development Studies (CURDS, 40th anniversary 2017). Since 2014, Geography has also received significant internal research investment (£4.03M) through NU interdisciplinary research initiatives, including: the <i>Spatial Analytics and Modelling (SAM) Lab</i> (£2M, NU Research Investment Fund); <i>NU Research Excellence Academy (REA, 5FTE PDRFs, 2 yrs., £530k)</i>; <i>NU Academic Track (NUAcT) Research Fellowship Scheme</i> (three 5-year tenure-track fellows, £500k each with PhD and training attached); and has co-led the establishment of four interdisciplinary <i>NU Centres of Research Excellence</i> (in Data, Energy, Cities, Climate & Environmental Resilience). Underpinning these achievements, NU Geography has prioritised a collegial, supportive, and inclusive research culture that celebrates colleagues' diverse skills, interests, funding strategies and impact practices.</p> <p>Research agenda: to advance world-leading geographical research and scholarship, through productive mutual engagement with diverse stakeholders, to create new knowledge that has societal benefits. This sits at the heart of the GPS School Research Strategy, and is closely aligned with NU's renewed Vision and Strategy (2019) 'to nurture excellent research that expands fundamental knowledge and addresses societal and global needs'.</p> <p>In REF2014 our research objectives were to: (1) advance original research that is conceptually fresh, empirically rigorous and world-leading; (2) advance research that has significant impact and reach; (3) increase external grant income; (4) extend our international collaborative networks; and (5) make strategic staff appointments, including ECRs, in priority research areas. Additional priorities in the School's successful Athena SWAN Bronze submission (2017), led by Geography, were to: (6) develop an inclusive research environment; and (7) enable all colleagues and students to realise their full research potential free from bias or discrimination. In fulfilment of these objectives, achievements include:</p> <ol style="list-style-type: none"> (1) Substantial increase in research capacity through 107% growth in Unit size (56.3FTE 41% female cf. 27.2FTE 40% female REF2014) consequent from our success in REF2014 as one of the strongest performing Units in UK Geography and NU. Strategic investment in 22 new open-ended posts (plus 7 replacement posts) has enabled a step-change in research capacity, and furthered our development of an ambitious, innovative, and sustainable research programme going into the next REF period and beyond. (2) Extensive publication of high quality research (673 papers in international journals, 35 monographs, 176 chapters in edited collections). Our submitted outputs portfolio (n=128)

evidences gender-inclusive research teams (65% female authored); and extensive research collaboration in the UK (53%), across disciplines (48% including: geology, engineering, oceanography, geochemistry, ecology, mathematics, computing, economics, anthropology, archaeology, management, planning, politics, international relations, education), and internationally (35%).

- (3) **Widespread engagement and impact** via existing and new research partnerships, evidenced through 5 Impact Case Studies and wider collaboration with over 270 stakeholders, spanning: international NGOs, national governments, charities, environmental groups, civic groups, industry, labour collectives, and not-for-profits.
- (4) **Success in Global Challenges Research Funding** through collaboration with overseas academics and non-HEIs, including establishment of a UKRI GCRF interdisciplinary research hub *Living Deltas* (£17.5M, PI Large, £2.1M to Newcastle; 1 of 12 Hubs, £200M UKRI investment), plus 5 other GCRF projects (40% female-led).
- (5) **Increased external research grant funding**: £6.22M income cf. £4.1M REF2014, across 144 total awards (by 84% of staff).
- (6) **Increased total research grant expenditure** from UKRI sources (£3.97M equivalent to 64% total spend cf. £2.4M 56% REF2014).
- (7) **Nurturing Early-Career Researchers** to enhance our long-term research vitality. Since 2014 we have appointed 23 new lecturers and 13 Postdoctoral Fellows (NuACT, REA, Leverhulme, ESRC; 38% female).
- (8) **Growth of the Graduate School** with 59 PGRs average registered per annum (cf. 49.6 REF2014) from diverse geographical and social backgrounds; a 40% increase in successful PhD completions (66 cf. 47 REF2014); and UKRI PhD funding through multiple DTPs (ESRC NINE, NERC IAPETUS 1&2, NERC One Planet).
- (9) **New research-intensive Masters MRes Environmental Geoscience** to recruit UG students across multiple disciplines into postgraduate research in physical geography (average 15 registered p.a. 2019-).
- (10) **Substantial infrastructure and resources investment** to enhance our research facilities, including £3M Drummond laboratories refurbishment, and new accommodation in the £60M Henry Daysh Building refurbishment, to provide state-of-the-art facilities to meet our growth and evolving research needs.

Research ecosystem: Geographical research at Newcastle is organised through **four research clusters**: *Physical Geography (PhG)*, *Geographies of Social Change (GoSC)*, *Economic Geographies (EG)*, *Power Space and Politics (PSP)*; and **one research centre**, the *Centre for Urban and Regional Development Studies (CURDS)* whose members sit primarily within the EG cluster. Each cluster is mixed gender and includes PGRs, PDRFs, staff and research technicians (PhG) at all career stages in broad communities of interest. The clusters provide intellectual stimulus and mutual support and have evolved since REF2014 with new staff and colleagues' research trajectories.

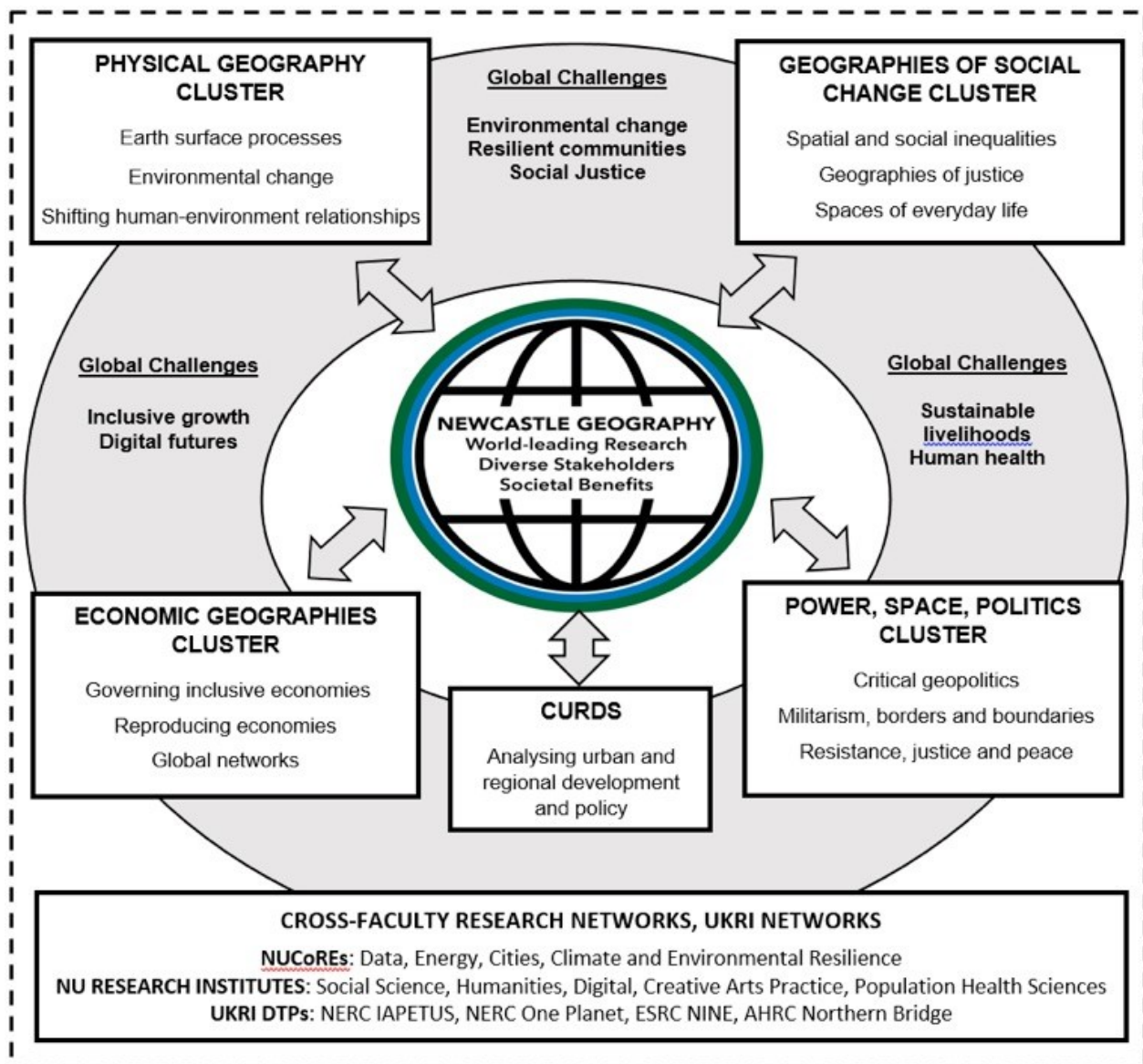
All staff belong to a cluster, many active across several, supported by our recruitment strategy to develop **cross-cluster global challenges themes**: *sustainable livelihoods, environmental change, resilient communities, human health, inclusive growth, social and economic justice and digital futures*. Advancing these themes, we have won multiple GCRF projects: *Living Deltas* Interdisciplinary Research Hub to safeguard deltas and build resilient communities (GCRF-UKRI £2.1M **Large**); tackling drug-resistant infections in food systems (GCRF-AHRC £40k **Hughes**); climate change and El Niño fishing and farming systems (GCRF-AHRC **Henderson** £39k); migrant mothers and maternal health care in refugee camps (GCRF-EPSC £16k **Bagelman, Pain**); rural community response to wildfire hazards (GCRF-AHRC £53k **Johnston**); monitoring hydro-geomorphological risk in Patagonia (GCRF-NERC £100k **Russell, Perks**); and social reproduction in conflict zones (BA International Challenges **Griffiths** £45k).

NU Geographers also contribute to and benefit from **cross-faculty research networks** that respond to multidimensional research problems, shifting funding structures, and diverse research beneficiary needs. These include NU's interdisciplinary *Research Institutes* (Population and

Health Sciences, Social Science, Humanities, Digital, Creative Arts Practice) and newly established *Centres of Research Excellence* (NUCoREs). Geographers provide research leadership in the: *Centre for Data* built on £100M of cross-faculty research income to transform methods for data-rich applications to smart cities, spatial analytics, and data visualisation; and *Centre for Energy* to catalyse new interdisciplinary thinking about energy systems across scales. Geographers also led the establishment of the *Centre for Research on Cities* (MacKinnon, Pike) and *Centre for Climate & Environmental Resilience* (Henderson).

This **research ecosystem** (Figure 1) provides colleagues with the intellectual and material resources to advance individual and collective research; address fundamental societal, economic, environmental and ecological challenges; and define geographical research priorities within the UK and internationally.

Figure 1: Research Ecosystem, Newcastle Geography



(1) **PHYSICAL GEOGRAPHY (PhG)**: is a world-leading group of scientists at the forefront of research on earth surface processes, environmental change, and shifting human-environment relationships. Work blends cutting-edge field and lab-based science, remote sensing and GIS, with expertise in mathematical and statistical modelling, to make fundamental advances in geomorphology, glaciology, environmental change and geohazards. Since REF2014 the group has expanded (from 9 to 15.3FTE, plus 4 technicians 3.5FTE), carrying out research in Antarctica,

Iceland, Patagonia, Peru, Turkey, USA, Tibet, Japan, Alaska, Greenland, Australia, China, and Europe. Staff also play leading roles in multiple international networks (DIMA, SCAR, MOXXII, IODP, ICDP). Work has advanced through 5 streams:

(a) **Water science:** has analysed catchment dynamics and impacts of intense rainfall-induced floods (NERC SINATRA consortium £1.2M **Russell, Large** 2013-19), advanced citizen science-led approaches to validate flood risk models (**Large**) and developed novel non-contact flow monitoring of peak floods using particle image velocity (PIV) (**Perks**). This PIV technology is now embedded in national environment agencies (NERC £1M **Russell, Large, Perks** 2016-19) and deployed in South America to reduce hydro-geomorphological risk (GCRF NERC £100k **Russell, Perks** 2017-19). The UKRI GCRF *Living Deltas* interdisciplinary research hub led by **Large** (Director) and **Henderson** (£17.5M, £2.1M to NU Geography, 2019-24) brings together a world-leading team to assess and communicate the status of ecosystem health and safeguard delta futures through more resilient communities and sustainable development across the Red River and Mekong (Vietnam), and Ganges-Brahmaputra-Meghna (Bangladesh, India). A crucial component of this work analyses the Mekong's sediment pathway dynamics and bank stability, essential for maintaining delta systems undermined by sand mining and shifting cyclone activity (NUAcT £490k **Hackney** 2020-25).

(b) **Past environments:** advances research on Holocene climate change, human-environment interactions and long-term climate evolution. A major focus has been the El Niño Southern Oscillation (ENSO), to develop and apply stable isotope proxies for rainfall to reconstruct ENSO-driven rainfall variability in NE Australia (**Henderson**), and fingerprinting the sedimentary signature of ENSO events in lake sediments in northern Peru (NERC £53k **Henderson, Ross** 2017-18). New work on Arctic Holocene climate shows that ice sheet retreat during the latter half of the Younger Dryas triggered warming over Baffin Bay (**Juggins**), and has been extended to understand Holocene environments in Siberia and the Russian Far East, a major data gap (NERC £77k; Foreign & Commonwealth Office £31k, **van Hardenbroek, Henderson** 2018-20). Work on human-environment interactions has exploited innovations in sedimentary DNA and biomarkers of humans (**Henderson, van Hardenbroek**), to analyse the impacts of human-made islands (cránnogs) on lakes (AHRC £182k **Henderson** 2015-18). Work has also documented human colonisation responses to environmental stresses in small island communities (AHRC £205k **Henderson, van Hardenbroek** 2018-21), and used faecal sterols and wax leaf isotopes in lake sediments to delineate a new, earlier date of colonisation for East Polynesia (**Henderson, Pearson**). Research on long-term climate change has helped establish the climate controls and context for human migration out of East Africa (NERC £67k, **Pearson** 2013-19) and reconstructed East Asian monsoon history, spanning the last 0.5m years based on cores collected on IODP Expedition 346 (**Henderson**).

(c) **Glaciology:** work advances international debates on ice sheet dynamics and valley glacier responses to climate change. Research has analysed modern ice sheet behaviour in East Greenland (**Carr, Ross**), implications of ice fracturing and iceberg generation from Greenland for Arctic oceanography (**Dunning**), and implemented portable ice radar to investigate ice sheet hydrology and response to climate change (Royal Society £15k **Ross** 2014-15). In Antarctica, work has identified extensive subglacial lakes and canyons, with crucial implications for ice sheet hydrology (**Ross**). Research also suggests that the West Antarctic ice sheet has been stable for the last 1.4 million years (**Dunning**), and has established the role of glacial erosion in mountain uplift in East Antarctica (**Ross**) and importance of sediment supply to erosion rates based on cosmogenic-nuclide chronometers (**Dunning**). Beyond the modern polar ice sheets, work on the British-Irish Ice Sheet (BIIS) collapse, as part of the BRITICECHRONO consortium, identified the initial trigger for ice sheet retreat as relative sea level rise over marine-anchored ice sheets (**Callard**).

(d) **Ecosystems:** work on global soil biodiversity connects below-ground biodiversity changes to above-ground ecosystem succession within and across biomes (**Cutler**) and has advanced a new taphomic model of vegetation response to tephra transformations following volcanic eruptions (Carnegie Trust £10k **Cutler**). Our Arctic research has demonstrated how climate change has driven rapid ecosystem responses in West Greenland (**Juggins**), how catchment vegetation mediates productivity in Arctic lakes (**van Hardenbroek**), and how penguin colonies on the Antarctica peninsula were decimated by volcanic eruptions over the last 7000 years (**Juggins**,

Pearson). Extending our development of ecological monitoring tools for water quality, new work has established diatom-based metrics for Water Framework Directive monitoring (**Juggins**) and strong seasonality in diatoms for improved monitoring (**Large**).

(e) Geomorphology and geohazards: advances global agendas on hillslope processes, landslides, earthquake risk and tectonic- and fluvial-induced landscape changes. Research has analysed the impacts of hillslope failure on road transport infrastructures and developed innovative solutions to forecast, detect, and warn about imminent landslides (NERC £46k; NERC £120k; Transport Research Laboratory £55k; Scottish Roads Research Board £85k, **Dunning** 2016-19). Vital work has also analysed destructive mudflow dynamics following volcanic eruptions in Chile (NERC £52k **Russell** 2015-16). Earthquake research has modelled co-seismic landslide intensities to provide ensemble scenario analysis of seismic risk in vulnerable countries (**Robinson**). Ongoing work examines landscape geomorphology as a result of fault activity (**Meriaux**) and river terrace formations linked to climate change, volcanism and neotectonics (**Maddy**).

Joint research with external organisations includes: the Wildfowl and Wetlands Trust, Ouseburn Catchment Partnership, Newcastle City Council, UK Met Office, British Antarctic Survey, British Geological Survey and the Cabinet Office's Natural Hazards Partnership. Innovative engagement activities have involved training sessions on flood risk management for chief scientists and engineers from the UK Environment Agency; training environmental scientists in Siberia and the Russian Far East; and large-scale earthquake simulations for governments, militaries, and humanitarian organisations to guide emergency response and reduce disaster risk. International stakeholders in the *Living Deltas Hub* include: the Vietnamese Center for Water Resources Conservation and Development, International Union for Conservation of Nature, and Wetlands International. **PhG's research agenda 2021-28** will explore: river delta sustainability, earthquake-generated landslide hazard and risk, glacial response to climate change, new methods for palaeoenvironmental reconstruction, and histories of methane production using lake sediments and novel isotope proxies.

(2) GEOGRAPHIES OF SOCIAL CHANGE (GoSC): *one of the largest and most dynamic groups of social geographers in the world, with strong interdisciplinary links within and beyond NU. This group is known for agenda-setting research on spatial and social inequalities, justice, and everyday life. Work examines disparities in wealth, health, violence, living conditions and life-chances; and analyses the many sites, scales and dimensions of disadvantage and discrimination that undermine the social and ethical fabric of human well-being.* This work spans global North and South; from the intimacy of the body to the global; and examines connectivities across these realms. Since REF2014, this group has expanded from 10 to 22FTE, and advanced research on:

(a) Race, ethnicity and migration: has developed novel theorisations of whiteness and anti-racism (**Bonnett, Nayak**); analysed the evolution of youth identities in relation to globalisation, diaspora and displacement (**Blazek, Finlay, Johnston**); and created new understanding of collective religious rituals for healing during post-traumatic adaptation amongst refugees (Leverhulme ECF £83k **Ghaffari** 2019-22). Vital EU-funded work on Islamophobia identifies everyday consequences of bigotry and prejudice connected to terrorist events and Brexit (£118k **Hopkins** 2016-18).

(b) Rethinking gender and sexualities: analyses place-based variations in representations and lived experiences of gender and sexuality, and how private relations are fundamental to the expression and enactment of social and political power in public sites. Work examines the relationship practices of young British Pakistanis (AHRC £42k **Hopkins, Pande** 2016-19), changing family lives in different urban welfare regimes (**Jarvis, Stenning**) and contested spaces of diversity (REA PDRF £106k **Mearns** 2017-19). Other work has analysed shifting masculinities (**Nayak, Hopkins, Richardson**), everyday sexism and intimate violence (**Pande, Pain, Nayak**) and the spatial-political implications of gender non-conformity (**Hopkins**).

(c) Spaces of youth and childhood: examines youth engagement with national identity and geopolitics in South America (**Benwell**) and Scotland (**Hopkins, Richardson**); education and aspirations among black and minority ethnic youth (**Hopkins, Nayak**); and youth experiences of belonging in post-industrial UK cities (REA PDRF £106k **Finlay** 2017-19). New research explores

playing out in neighbourhood streets (Leverhulme SRF £54k **Stenning** 2019-21), and children's agency (**Blazek**).

(d) Domestic-global spaces: unsettles scale as a hierarchical organising principle, and challenges assumptions about domestic spaces by examining: new forms of family, intimate relations and politics stretched across the globe (**Johnston**); birthing across borders in migrant refugee camps (GCRF £109k **Bagelman** 2020-21); family and community life in austerity (**Stenning, Ormerod**); displacement of low-income homes and households (**Pain, Ormerod**); and viable alternative modes of living, co-housing and community-building (**Jarvis**).

(e) Justice, wellbeing and community: explores recession and mental health in Scotland (ESRC £129k **Cunningham**); uneven geographies of healthcare and wellbeing (**Copeland, Jones, Johnston**); geographies of loneliness (**Stenning, Jarvis**); and social housing disposal as chronic urban trauma (**Pain**). Work has also explored possibilities for change through: intentional communities and degrowth initiatives (**Jarvis**); citizen participation and civil society organising (**Lin, Pugh, Jarvis**); environmental justice and green activism (**Powells, Jarvis**).

The group's commitment to creating knowledge that has material benefits to the wider community, voluntary sector and policy sphere is evidenced through **engagement and co-production** with diverse local and international organisations including: Tyne and Wear Citizens, Islamic Diversity Centre, Muslim Engagement and Development, Tyneside Women's Health, Northumberland Trans Equality Network, Canadian Filipino Association of Yukon, UNHRC, and Dadaab Refugee Training Centre Kenya. Since 2014 the cluster has also advanced influential participatory and arts-based methodologies: participatory action research (**Blazek, Johnston, Pain, Pugh**), participatory GIS (**Lin**), and community-based volunteering (**Jarvis**). **GoSC's research agenda 2021-28** advances this vital body of work, alongside new engagements with: urban masculinity in 'modern' India, geographies of youth work, geographical ethics, potential space and playing out in neighbourhoods and streets, and shifting care networks amongst refugees and asylum seekers during Covid-19 (ESRC £323k **Hopkins, Benwell** 2020-22).

(3) ECONOMIC GEOGRAPHIES (EG): Since REF2014, this has become *the UK's largest Economic Geography research cluster. Enlarged and diversified through 6 strategic appointments (to 17.5FTE) it encompasses the Centre for Urban and Regional Development Studies (CURDS). Research challenges economic and policy orthodoxies, and explores viable possibilities for progressive change amongst economically marginalised people and places.* Extending our long-standing engagement with local communities in the UK's NE region, new work has interrogated socioeconomic (dis)advantage and sustainability challenges across India, Kenya, Malawi, China, Singapore, Brazil and South Africa. Our interdisciplinary intellectual partnerships span development studies, political economy, evolutionary economics, spatial analytics, critical urban studies and planning. NU's distinctive brand of EG is advanced through 5 major work streams:

(a) Governing unequal economies: interrogates how institutions differently organise and regulate economies, and identifies governance possibilities for socially and spatially inclusive development. Work has advanced new conceptual understandings of economic evolution, institutional adaptation and path creation (**Dawley, MacKinnon, Pike**), decentralised governance and place-based industrial policies (European Commission £44k **Vallance, Kempton** 2016-18). This includes ESRC-funded work on city economic evolution and adaptive pathways (£27k **Pike** 2015-18), manufacturing renaissance in 'old' industrial regions (ESRC **Pike** £27k 2017-20; EPSRC £51k **Pike** 2015-17), and the future of declining cities in the UK (Joseph Rowntree £82k **Coombes** 2014-15; £50k **MacKinnon, Pike** 2016-17)). Our research has also re-imagined economies beyond 'capitalism-as-usual' through work on Chinese state governance (**Lim**) and ethical procurement in global commodity chains (ESRC £205k **Hughes** 2018-21).

(b) Geographies of money and finance: has interrogated the geographical evolution of financial systems, structures and institutions (**Coombes, Dawley, Pike, Pollard**) and uneven geographies of financial crisis and debt in the wake of austerity (**Coombes, Pollard**); and identified socially responsible possibilities for financial innovation (**Pollard, Coombes, Loomis**), including the role of faith-based charity in protecting vulnerable migrant communities (**Pollard, James**). It also includes high-profile work on financialisation of city statecraft and urban

infrastructure funding (EPSRC-ESRC **Pike** £250k) as part of the NU-led £3.5M *iBUILD Research Centre*.

(c) Precarious economic lives: advances new understanding of people's everyday lives in economically vulnerable communities, and strategies for coping. ESRC-funded work explores uneven geographies of the UK housing crisis (£81k **Ormerod** 2018-19) and collaborative housing for community resilience (£27k **Jarvis** 2014-16). Work in labour geographies demonstrates the employer benefits of family-friendly working (**James**), feminizes 'digital labour' in the gig economy (BA £104k **James** 2017-18), and explores youth (un)employment and labour market agency in the global South (REA PDRF £53k **Pettit** 2019-20; **James**).

(d) Sustaining economies: pioneering work on energy transitions has analysed: the management of affordable energy systems to tackle fuel poverty and promote energy justice (Affordable Warmth Solutions £240k **Powells** 2019-22; EPSRC £98k **Powells** 2016-21) as part of the £1.8M *Centre for Energy Systems Integration (CESI)*; and regional development through renewable energy transitions (Research Council of Norway £98k **Dawley, MacKinnon** 2016-20). ESRC-funded work has demonstrated new possibilities for sustainable consumption and agri-food ethics in the global South (£205k **Hughes** 2018-20), and for tackling the global health challenge of antimicrobial resistance in food supply chains (ESRC £105k **Hughes** 2017-19; AHRC/GCRF £187k **Hughes** 2019-21). Work also identifies innovations in sustainable urban transport in the global South (**Wood**).

(e) Analysing economies: combines established quantitative methods with cutting-edge spatial modelling applications and data visualization to analyse the role of individual, place-characteristics and demographic change in shaping unequal economic and wellbeing outcomes. This work is supported by the Alan Turing Institute on digitally-mediated spatial inequalities in smart cities (£268k **Franklin** 2018-21) and by the ONS on defining travel-to work areas for labour market analysis (£24k **Coombes** 2014-15). Ongoing research analyses geographical variations in people's life chances (**Coombes, Champion**) and the profound implications of depopulation across cities and regions in the USA (**Franklin**).

This distinctive work has been advanced through **diverse engagement with varied stakeholders** including: ILO, UN, UK Food Standards Agency, Citibank, Northern Gas Networks, Northern PowerGrid, Malawi Ministry of Health, Kenya Institute for Livestock Research, and UK Department of Business, Energy and Industrial Strategy. We also seek to advance local communities within our region, challenging characterisations of the NE as 'peripheral' and helping refine policy responses as part of the UK government's 'levelling up' agenda. **EG's research agenda 2021-28** examines: post-Brexit and lockdown economies, debt and indebtedness, financialising local statecraft, digital labour, entrepreneurial state housing, global food supply networks, hydrogen energy transitions, technologies for urban social justice, and new forms of inclusive development in 'left behind' places (ESRC £563k **MacKinnon, Pike, Franklin** 2020-23).

(4) POWER, SPACE, POLITICS (PSP): *is a world-class group of critical geopolitical and international development geographers whose influential research examines the spatially uneven expressions, operation, and outcomes of political power, politics and the political. Enlarged through multiple strategic appointments to 14FTE, this research agenda is multi-scalar and spans multiple sites of contemporary and historical political change including: the contemporary Middle East, post-Soviet Europe, Latin America, Antarctica, Falkland Islands, South Africa, and North Africa.* Extending this group's established work on geopolitical theory and practice, military geographies, and peace, new research since 2014 explores: conflict and displacement, military occupation, civil-military relationships, healthcare in war zones, and geographies of international law. Advancing interactional, ethnographic, participatory, and creative arts research methods this work spans four key streams:

(a) Borders, bordering and boundaries: examines the re-emergence of geographical boundaries that separate states, as sources of disagreement, instability and conflict, including critical analyses of: military occupation and the territorial politics of bordering (NUAcT £490k **Griffiths** 2019-24); how Israel's visa restrictions are reconfiguring social reproduction in Palestine (BA £45k **Griffiths** 2019-21); and geographies of war, conflict medicine and forced displacement in the Middle East (Independent Social Research Foundation Fellowship £50k **Jones** 2019-21).

Ongoing work explores nationalism and borders in modern Central Asia (**Megoran**) and shifting oceanic geographies, maritime borders and islands in the Anthropocene (**Pugh**).

(b) Militarism: NU is a leading centre for analysis of the effects of military activities on space, places, landscapes and people. Agenda-setting work on military geographies has analysed: involvement of military lawyers in planning and lethal and non-lethal US military operations in Iraq and Afghanistan (**Jones**) and geographical dynamics of university-military relations (**Williams**). ESRC-funded work has also analysed gendered military experience (£77k **Cree** 2018-19; £299k **Cree** 2020-22); and negotiation of military identities amongst reservist soldiers employed in civilian workplaces (£204k **Woodward, Jenkins** 2014-18).

(c) Critical geopolitics: analyses the interface between international and intimate violence (**Jones, Hopkins, Pain**); the making of geopolitical citizens (Leverhulme Early-Career Fellowship £37k **Benwell** 2014-16) and geopolitics of renewable energy (**Manzo**). New work analyses the everyday micro-politics of young refugees and asylum seekers in public spaces (HERA £223k **Hopkins, Benwell** 2019-21); and how former European states endure in the public consciousness (NUAcT £490k **Riding** 2019-24).

(d) Resistance, justice and peace: explores new geopolitical possibilities for resistance, conflict resolution, justice and peace, by analysing peacebuilding and political strategies of resistance (**Megoran**), and protest exercised by young people and survivors of violence (**Hopkins, Pain**).

This work has been developed through **diverse engagement with organisations** including: International Committee of the Red Cross, Médecines Sans Frontières, British Army, Royal Air Force, Ministry of Defence, English Heritage, OSCE, World Bank, DFID, FCO, European Centre for Minority Issues, and War Childhood Museum Sarajevo. **PSP's research agenda 2021-28** examines: low-wage cross-border labour in occupied Palestine, cross-border casualty evacuation and medical care systems in the Middle East, Anthropocene island relations, and shifting public understanding of UK nuclear deterrence and space monitoring facilities (AHRC £946k **Woodward, Jenkins** 2020-23).

Impact strategy: *NU Geography has a long-standing tradition of engaged research with benefits for the economy, society and environment, through innovative projects co-designed with and for beneficiary communities.* This is exemplified through our development of the 'Civic University' agenda (Goddard et al. 2016) to foster 'research with a purpose that benefits society' – and now includes 56 UK universities. Extending this ambition since REF2014 our impact activity has diversified through staff recruitment, and into wider areas of public and policy concern, many driven by Global Challenges. Our impact ambition is three-fold:

- (1) *Co-produce robust research findings that improve evidence-based decision-making, risk-management and resource allocation by research partner organisations.*
- (2) *Use original geographical research to improve the everyday lives of vulnerable people.*
- (3) *Develop better research through new methodological, participatory, and dissemination techniques that raise public understanding and inform the impact practices of other researchers.*

Within this framework our **5 Impact Case Studies** demonstrate research impact across all four research clusters and CURDS, with contributions spanning government, commercial, and voluntary sectors in the global North and South. These result from established work alongside more recent research, enabled by a varied range of funders, resources, and pathways (including: NERC, ESRC Knowledge Exchange, ESRC IAAs, NU Faculty Impact Fund, and NU 'Pitch-In' supported by Research England's Connecting Capability Fund). They also evidence impact activity across early-career, mid-career and senior staff. Beyond the ICSs, all Geography staff are supported to engage in this vital research activity. Our School *Impact Manifesto*:

(a) Responds to urgent societal and environmental challenges. The diversity of challenges reflects our Unit growth since REF2014, ranging from: supporting disadvantaged and vulnerable communities in austerity and COVID-19 lockdown, to improving access to affordable housing, to developing early warning systems to predict and mitigate natural hazards, to building justice in war

zones, to improving commercial state and third sector responses to health challenges, to advancing low carbon economies.

(b) **Engages with research beneficiaries in diverse places.** This includes groups locally in the UK NE (e.g. Jarvis's work with *Tyne and Wear Citizens* to implement living wages, reduce racial hate crime and improve mental health; Richardson's work with the *North East Young Dads and Lads Project* supporting vulnerable young men; and Nayak's work with the *Southwick Neighbourhood Youth Project* (Sunderland) to promote youth community inclusion through austerity). It also engages organisations overseas (e.g. Griffiths' work with *Jerusalem Legal Aid* with communities vulnerable to house demolitions; and Megoran's collaboration with *Saferworld* on conflict prevention working with policy makers in The Hague (OSCE High Commission on National Minorities), Bishkek (Kyrgyz Prime Minister's Office, KGB) and Washington DC (US State Department)).

(c) **Builds pathways to impact through innovative co-production methods,** also shaping research practice beyond NU (see section 4). Important examples include Pain's novel participatory research on chronic trauma, Pande's use of animation and film to narrate young British Pakistanis' relationships of love, and Perks' collaboration with the Environment Agency to train technicians in non-contact monitoring of river channel flows.

(d) **Moves beyond end-of-project dissemination-based approaches.** Engagement with research stakeholders is commonly *embedded across multiple stages of the research process* in a 'virtuous circle' of engagement from project proposal, pilot work, initial research design, to data collection, analysis and theory-building, write-up and communication. We work with decision-makers and grassroots members at multiple levels to understand how our research has generated impacts within beneficiary organisations, identify barriers to change, and co-design follow-on research proposals, through long-term commitment to user-led research.

(e) **Develops interdisciplinary forms of engagement and impact** with NU geographers also leading international teams of researchers and stakeholders to develop novel strategies for improvement and change. This approach is epitomised through the UKRI GCRF *Living Deltas Hub* which combines participatory capacity-building frameworks from multiple disciplinary perspectives to: support vulnerable groups; advance low cost, stakeholder-driven, data-collection systems; produce a Delta Health Index for improved environmental planning; and advance delta-level policy interventions to achieve sustainable coastal systems. Support structures for enabling our Unit impact strategy are described in Section 3.

NU Geography's research culture: is defined by collective values, codified through successive research away days. These give our work a distinctive identity and integrity, underpin our research strategy and ethics, steer our recruitment and resource allocation, and embed equality of research opportunity:

- (1) *We value diverse forms of research and are committed to creative work that is socially and politically engaged, theoretically and empirically rich, and ethically sound.*
- (2) *We value research that is interdisciplinary and located within and across geography.*
- (3) *We value research that is locally-embedded and that is global in scope and outlook.*
- (4) *We are committed to critical research that has a societal impact, is openly accessible to all, engages with diverse communities and audiences, and promotes socio-economic and environmental justice.*
- (5) *We value and nurture all talent so that we can all fulfil our productive potential, and all researchers (including UGs, PGRs, ECRs, technicians and academic staff) are integral members of our research environment.*
- (6) *We integrate our research into our cutting-edge teaching.*

Strategic objectives for research and impact 2021-28:

- (1) *Support all colleagues to advance original and ambitious research that is critical, conceptually innovative, empirically rigorous and yields societal and environmental benefit.*
- (2) *Develop high-profile research that connects human and physical geography and responds to global societal and environmental challenges.*

- (3) *Equip all colleagues with the skills and equality of opportunity to attract external research grant income.*
- (4) *Provide targeted support for PGRs, early- and mid-career staff to reinforce the long-term sustainability of our research.*
- (5) *Invest in and extend our research networks with collaborators and stakeholders in the UK and internationally.*
- (6) *Enhance Newcastle's position as a world-leading centre of excellence in geographical research, engagement and impact, and capacity-building.*

These strategic objectives are written into the School Research Strategy 2021-28. **Capacities in place to meet those goals include:** expanded bid collaborations between ECR colleagues and senior academics to foster 'research apprenticeship'; Unit-wide peer research mentoring; bid development workshops to develop flagship NU Geography projects, including those bridging physical and human geography; open access and research data management training; and targeted PhD-supervisor co-publishing, CV development, and job interview training to position our PGRs more effectively in a tight labour market (with NU Careers Service).

Our **strategy for developing new ICSs** rests on deepening recently-established impact work, further development of long-standing co-production partnerships, continued NU investment in high-risk/high-reward research ideas, and colleagues' commitment to developing imaginative solutions to societal and global needs. **UKRI project funding is already being used to develop major impact pathways** including: improving the lives of young refugees and asylum seekers (HERA Hopkins, Benwell); tackling drug-resistant infections in food systems (GCRF-AHRC Hughes); improving maternal health care in refugee camps (GCRF-EPSRC Bagelman, Pain); and building Palestinian youth agency in communities vulnerable to house demolitions (BA Griffiths). Sustainable impact activity is also strengthened through CURDS, founded on a commitment to policy engagement and research impact over the long-term.

2. People

Staffing strategy and staff development: *Since REF2014 NU Geography has embarked on an ambitious growth strategy through strategic investment in outstanding new staff across physical and human geography.* Combined with strong retention, this success has **more than doubled our Unit size** (56.3FTE cf. 27.2 REF2014), to add new capacity, continuity and 'homegrown' leadership across all 4 research clusters and CURDS. Geography has seen only 4 staff departures to other HEIs (Laurie, Vallance, Nakagawa, Yamazaki). **Replacement of former staff** plus succession planning for 4 retired staff means that our research programme has not been disrupted. Alongside **7 replacement posts, substantial NU investment in 22 new open-ended posts** (with 3 more to start Summer 2021), has enabled appointment of a mix of in-house, UK and international talent to broaden and enhance our research capacity.

Two new Chairs have been appointed, both women: **Pain** (2017 Durham) provides leadership in the *GoSC Cluster*; and **Franklin** (2018 Brown USA, funded through the NU Research Investment Fund) provides new leadership in *CURDS* and *NU Spatial Analytics and Modelling Lab*.

Another 27 open-ended appointments (one third women) have infused all 4 clusters and CURDS with best practice from other leading Geography departments in the UK and internationally:

- **PhG Cluster:** **Callard** (2019 Durham) ice sheets; **Carr** (2014 Aberystwyth) glaciology; **Cutler** (2017 Cambridge) ecosystem science, biogeography; **Dunning** (2015 Northumbria) hillslope processes, avalanches; **Perks** (2017 Durham) fluvial geomorphology; **Robinson** (2019 Durham) earthquakes, landslides; and **van Hardenbroek** (2017 Southampton) aquatic ecosystems.
- **GoSC Cluster:** **Blazek** (2017 Loughborough) childhood and migration; **Copeland** (2014 Durham) health inequalities; **Cunningham** (2019 Durham) urban inequalities; **Johnston** (2017

Edinburgh) transnational social reproduction; **Lawshaw** (2015 Durham) urban social geographies; **Richardson** (2014 Newcastle) gender and masculinities.

- **EG Cluster:** **James** (2016 QMUL) labour geography; **Loomis** (2020 Clark) feminist political economy; **Powells** (2014 Durham) energy and infrastructures; **Wood** (2016 Cardiff) transport, urbanisms. **CURDS:** **Lim** (2018 Nottingham) Chinese political economy; **Ormerod** (2020 Newcastle) urban economy.
- **PSP Cluster:** **Benwell** (2016 Newcastle) everyday geopolitics; **Bagelman** (2019 Exeter) migration, sanctuary, anticolonial justice; **Jones** (2017 UBC) war, conflict, displacement; **Pande** (2015 Durham) postcolonial feminism; **Pugh** (2014 Newcastle) island studies.
- Three NU Academic Track Fellows (3FTE, 2019-2024) have also been appointed, from a global field of 750 applicants: **Griffiths** (2019 Northumbria) critical geopolitics of development, **Riding** (2019 Tampere) cultural geographies of trauma and nostalgia, **Hackney** (2020 Hull) fluvial geomorphology and deltaic systems. Each fellowship transitions to an open-ended lectureship after 5 years, and accelerates research development through 100% dedicated research time, mentorship, an allocated PhD studentship, and £50k research budget. Geography secured the largest allocation of all NU Units (3 of 22 Fellows year 1), further evidencing our world-class research profile and ambition.

Collectively, these posts represent a **major investment in early-career staff**, to enable new research activity, increased interdisciplinary reach, and cluster succession into the next review period. They include targeted recruitment in EG in response to a UK trend of economic geographers moving into Business and Management Schools over successive RAE/REFs since 2000, against which NU's growing EG cluster is distinctive, leading and vital to the discipline internationally. **Additional investment in postdoctoral researchers** includes: 5 Newcastle Research Excellence Academy Postdoctoral Fellows (2 years, 4FTE) in: human geography (**Pani** (QMUL (1 year), **Pettit** (Oxford (1 year)), **Finlay** (Newcastle), **Mearns** (Newcastle)) and physical geography (**Brough** (Keele), **Bainbridge** (Northumbria)); 3 ESRC Postdoctoral Fellows (all women: **Ormerod**, **Cree** Durham; **Mason** Newcastle); 2 Leverhulme Early-Career Fellows (**Benwell** Keele, **Ghaffari** Newcastle); and one AHRC Senior Research Associate (**Jenkins**).

These appointments have enabled staff representation at all levels of experience, from early-career (45%), to mid-career (20%), to professor (35%, 16 Chairs in the UoA, 7 women). Promotions since 2014 (36, 80% female success rate) have rewarded exceptional research performance, impact and leadership, including: **Hughes, James, Jarvis, Juggins, Large**, and **Megoran** to Chairs; **Dawley, Dunning, Henderson, Pugh** and **Williams** to Readerships; **Benwell, Blazek, Carr, Johnston, Lawshaw, Lim, Lin, Pande, Powells** and **Ross** to SL; and **Pearson** to Principal Research Associate. Geographers are also leading the university research and engagement agenda: *University Dean of Social Justice* (**Hopkins**); *Associate Dean for Research and Innovation HASS* (**Kempton**); *Chair NU NERC Demand Management Panel* (**Large**); *Director ESRC NINE DTP* (**Marshall, Hopkins, Pain**); *NERC One Planet DTP management group* (**Large**); *Co-Director Centre for Researching Cities* (**MacKinnon**); *Co-Lead Centre for Climate & Environmental Resilience* (**Henderson**); *Spatial Analytics lead Centre for Data* (**Franklin**); and *NU Martin Luther King Peace Committee* (**Megoran** founder, co-lead).

Our School has **taken action to reduce the number of staff on fixed-term contracts** (21% REF2014 cf. 12% REF2021). Staff secondments to Faculty and University leadership roles, ICS development, PT working in support of family care, and completion of externally-funded research fellowships have been supported through fixed-term lectureships (8 since 2014). This has enabled 6 PhD students to secure their first academic post, mentored as below.

Supporting our researchers: *Newcastle geographers benefit from an established and comprehensive support network to develop their research practice. Particular effort is directed towards ECRs to develop independent research profiles:*

(1) **Research mentoring and planning:** is offered to all colleagues. Mentoring pairs are matched on research interest, mentor experience, and mentee needs, and mentors receive

workload allowance. Staff also undergo comprehensive research induction (Unit, School, Faculty), thereafter annual *Personal Research Planning* meetings and *Performance Development Review* with rotating senior leads. Staff review the past year, connect research to promotion plans, receive constructive feedback, and agree future objectives and support.

(2) **Full sabbatical scheme:** is open to all staff by annual application, and builds research capacity through opportunities for extended fieldwork, concentrated writing time, and funding bid development. Staff are entitled to fully-funded research leave (1 in 7 teaching semesters), conditional upon a clear research plan, teaching cover and end-of-leave report. Since REF2014, 41 staff have benefitted from 50 semesters of sabbatical leave. We provide year-long leave for staff following major management roles. **Research leave in NU Geography has been maintained in full through COVID-19.**

(3) **Sustainable administrative and teaching workloads:** are agreed between Head of Geography, School Manager and colleagues to support their research activity with realistic citizenship goals and a good work-life balance. Space for research and impact activity is provided through a transparent workload allocation model (WAM) that protects 40% of staff time for research, provides reduced and graduated teaching and administrative loads for ECRs in their first 2 years, and is emulated as best practice by other NU Units.

Postgraduate researchers: our graduate community continues to be a benchmark of the quality, vitality and sustainability of our research culture and practice. NU Geography has attracted high quality PhD students (average 59 students registered p.a., 42% women), of whom 85% have won competitive external studentships or prestigious NU scholarships. We have supervised 66 PhD students to completion (49.07FTE cf. 36.61FTE REF2014). And as our PGR numbers continue to grow, our cohort remains diverse in terms of gender, social background and geographical origin (from 26 countries). Colleagues have co-supervised 45 PGR students in 20 other Geography departments (UK and internationally), contributing to the global sustainability of our discipline. Evidencing our commitment to interdisciplinarity, we have also co-supervised 23 PGRs at NU outside Geography (Business, Civil Engineering, Fine Art, Heritage, Planning, Education, Maths, Computing).

PGR support and training: selection, induction, research skills development, and employability training are overseen by a Geography PGR Director (supported by 0.8FTE PGR Manager) and School Postgraduate Studies Committee. Newcastle's HASS Faculty's PGR researcher training and development programme is interdisciplinary, multicultural, and develops epistemological and methodological research skills for successful PhD completion. NU's code of practice requires joint PhD supervision and involves the majority of Geography staff in PGR research mentoring, pairing ECRs with experienced supervisors. Students complete an Annual Progress Review with 2 staff outside their supervisory team. All PGRs belong to one or more research clusters, and are encouraged to present in cluster reading groups, lunchtime seminars, workshops and writing groups. All PGRs benefit from desk space and computing facilities access in dedicated offices, and full access to School research facilities. Geography also offers PGRs paid RA work to develop their research skills further. PGRs are supported £1.8k p.a. (training, workshops and international conference attendance) to showcase their research and build international networks. Our excellence and leadership in PGR training is also evidenced through **membership of multiple UKRI Doctoral Training Partnerships:** ESRC 2011-, AHRC 2013-, NERC 2014-:

- **ESRC Northern Ireland and North East (NINE) DTP** (2014-2021, £14M). 16 training pathways are offered, with NU Geography successful through the *Children Youth and Families*, *Conflict Security and Justice*, and *Health Well-Being and Society* interdisciplinary pathways, and *Human Geography* pathway, securing 39 PhD studentships (and 3 PDRFs) in this review period. Since REF2014 the NINE DTP has been directed by NU Geographers Marshall (2014), Hopkins (2015-16), and Pain (2019-). Under Hopkins it achieved ESRC reaccreditation, expanded from 2 to 7 universities, and introduced new interdisciplinary pathways.
- **NERC IAPETUS DTP** (2014-2022, £5.3M) and **IAPETUS2 DTP** (2019-2024, £7.3M) train the next generation of environmental scientists through interdisciplinary clusters of internationally-recognised excellence: global environmental change; geodynamics and Earth resources; carbon and nutrient cycling; hazards, risks and resilience, and biodiversity and ecosystem

resources. NU Geography has secured 5 IAPETUS and 3 IAPETUS2 studentships in this period.

- **NERC One Planet DTP** (2019-2024, £5.5M) integrates natural and social sciences to establish transdisciplinary responses to global environmental challenges (climate change, earth system processes, Anthropocene and environmental informatics). Students follow a common 6-month training programme and then spend 6 months developing discipline-specific and interdisciplinary research skills. Training involves frequent interaction with international scientists and end-users around: rigorous design and conduct of experiments, socially responsible research, and effective communication. NU Geography has secured 3 One Planet studentships (est. 2019).
- NU Geography is also part of the **AHRC Northern Bridge DTP**, which offers up to 67 studentships annually. Geography has yet to recruit through this DTP and we will target this in the next review period by working with talented UG students in cultural geography. Additional mechanisms for PGR recruitment are the *MA in Human Geography* and *MA in Local and Regional Development (Research)* (both ESRC-recognised), *MA in Regional Development and Spatial Planning* and new *MRes Environmental Geoscience* - all offered on a FT/PT basis.

PGR research excellence: NU Geography continues to play a **vital role in sustaining our discipline**. Since REF2014, 9 PGR students have moved to university lectureships and 14 to postdoctoral research positions. Our PGRs have published their outstanding PhD research in major international journals (including TIBG, JEG, EPA, JQS, Jnl. Glaciology) and have won awards including: 3 UKRI-Mitacs global citizen research placements in Canadian universities; European Consortium for Ocean Research Drilling Outstanding Young Scientists Award 2016; *Urban Studies* best paper 2018; and scholarships to the 2016 and 2018 Summer Institutes in Economic Geography and 2018 Degrowth International Summer School. Building research impact, our PGRs have collaborated with public, private and charitable organisations across the region and beyond, including: ESRC CDAs with the UN, Investing in Children, Twin Trading, North East Refugee Service, Tech Nation, Newcastle City Council, Newcastle Gateshead Initiative, Yorkshire Trans Support Network; and NERC-CASE studentships with the Wildfowl and Wetlands Trust and AOC Archaeology. Post-graduation, 15 PGRs have moved to senior research, impact and policy roles nationally and internationally.

Equality, diversity and inclusion: *NU Geography has a long history of promoting equal opportunity, also evident through our research on gender politics, inclusive economies, work/life balance, racial equality, LGBTQ+ support and intersectionality.* Colleagues benefit from a welcoming and inclusive research environment, recognised through the School's 2019 Athena SWAN bronze award for promoting women in academia, led by Geography (Jarvis). Women comprise 41% of Geography's 56.3FTE (23 women, doubled from REF2014, stable at 41%). All our research clusters and CURDS are mixed gender, and our **female Professorial leadership is more than double the UK average for Geography**: 7 women hold Chairs (44% cf. UK 21%). Our returned outputs (128) include 52% female co-authored and 36% female-first authored outputs. Research funding success is also evenly distributed: 84% of staff have been awarded external income since 2014, with gender rates of application consistent with Unit gender composition, and female award success rates marginally higher. Our PGR cohort is 52% female, with **no gender inequality evident in PhD completion rates nor PGR attrition**. UG/PGT/PGR transitions also reveal very low female attrition. Continued inclusion of 4 emeritus colleagues furthers our EDI commitment across all career stages.

Underpinning this inclusive research environment, **EDI is promoted through multiple initiatives** at Unit, School, and Faculty level:

(1) **Inclusive hiring process:** all staff are invited to advertise posts widely and participate in pre-interview group discussions with short-listed candidates. Job descriptions and adverts are checked for subtle gender, racial, heteronormative codes that would undermine applicant diversity. EO policies are followed throughout, with gender-balanced selection and interview panels, and mandatory unconscious bias training for all panellists.

(2) **Flexible working:** Geography has a strong track record of support for staff switching to reduced hours (16 academic staff during this review period). Alongside parents and carers this includes colleagues taking phased retirement, and with other personal-life commitments. A positive 'demonstration effect' is evident, supported by fair adjustments in the Workload Allocation Model. Research meetings, training events, reading groups and seminars are majority scheduled within core hours (10am – 4pm) to accommodate caring.

(3) **Supporting parents through leave:** Geography encourages all staff to make full use of: maternity, paternity and parental leave (22% staff in this review period), full holiday entitlement, and NU Parents Network. Maternity leave is counted as part of semesters accumulated for research leave. The full annual entitlement of Independent Research Staff Allowance funds (Section 3) is made available for staff on maternity/adoption leave to ensure colleagues are equally treated and well supported on their return. Promotion applications can be made on maternity leave with guidance provided at the annual School Equality Day. Geography maintains a **100% maternity return rate**.

(4) **Making diverse role models visible:** through our external seminar series, with 45 women presenting across a programme of 103 seminars in Geography and CURDS since REF2014. GPS funding is also promoted for Visiting Researchers, to provide accessible role models (61 visitors hosted since REF2014). We have encouraged repeat short visits to facilitate visitors with caring responsibilities. Female representation on School Research Committee has increased since REF2014, with research leadership roles held by women in Geography including: *School Research Director, Geography PGR Director, Director of NINE DTP, Geography Research Impact Coordinator, and Associate Dean for Business and Innovation HASS Faculty*. Geography also leads through Jarvis as *School Director of EDI*.

(5) **Enhancing EDI through Estates Planning:** the £60M Henry Daysh Building refurbishment included equality analysis in its design to address longstanding accessibility issues, increase availability of inclusive toilets for transgender students and staff, and provide baby changing facilities and 'NU well-being rooms' for expressing milk and breastfeeding.

Advancing EDI 2014-28: Geography submitted 45 applications for promotion in this review period: 80% of women were successful, but only 22% of applicants were women. Over the next 7 years we will work with *NUWomen* and the *Women in Higher Education Network* and seek enlarged access to Aurora Programmes and coaching to develop female research leadership, increase female-led UKRI bids, and offer tailored mentoring for promotion, as our ECR female cohort moves through. We will continue to ensure that equal gender representation on research committees does not create an EDI-driven administrative overload for some colleagues. Beyond gender inclusion, we remain a predominantly white group of staff of UK origin (14% international, 8% BAME). We will work with the HASS Faculty Director of Equality, Diversity and Inclusion to widen our job search networks, target graduate schools with racially diverse PGR communities, and ensure candidates from the global South are properly resourced during recruitment. We will continue to work with NU, through School Executive Board (SEB), to reduce casualization, and monitor EDI in recruitment and promotion, outreach and engagement.

3. Income, infrastructure and facilities

Research income: *Since 2014, NU Geography has increased external grant income in support of intellectually-rigorous, world-leading research with positive academic, societal and environmental impact.* Total research income is **£6.22M (cf. £4.1M REF2014) across 144 awards** (40% include female investigators from NU Geography). UKRI spend represents £3.97M or 64% of total spend (cf. £2.42M 56% REF2014). We have also diversified our funding portfolio: alongside UKRI and EU monies, income spans **56 different funding providers** (UK and international). This also reflects our strategy for developing partnership models of research, including: Joseph Rowntree Foundation, VSO, TUC, HM Government Department for Innovation and Skills, UK Office for National Statistics, Environment Agency, National Trust, Historic Environment Scotland, British Antarctic Survey and The Royal Society. Evidencing strategic development of new staff, **UKRI grants led by ECRs** as PI include: Van Hardenbroek (NERC, £654k); Cree (ESRC New Investigator, £299k); and Bagelman (GCRF UKRI £150k).

Research infrastructure: NU Geography is supported at School level by a *full-time professional services research support team of 5FTE* (Research Manager, Research Officer, Pre-Award Officer, and 2 Post-Award Officers). CURDS also has a research centre manager (0.5FTE) and administrator (0.5FTE). This team disseminates diverse funding opportunities, develops costings and contracts, administers award spends and co-ordinates research-related events and visitors. School Research Committee (SRC) meets monthly to develop and implement the School's research strategy, distribute seed-funding, and support and monitor research activity. Geography has its own Research Directors for Human and Physical Geography who are members of SRC and work with the Head of Geography, Geography Impact Coordinator, Research Cluster leads and PGR Director to enable Geography research and impact and monitor progress on strategic research objectives, with oversight from the School Research Director.

Additional *Faculty research support structures* include a team of 10.3FTE (including Faculty Research Manager, 3 Impact Officers, 2 Business Development Managers in support of partnerships with non-HEIs, 2 Research Support Officers, Media Relations Officer). The Faculty Research and Innovation Committee (FRIC) and Faculty Impact Forum (FIF) monitor and promote research activity throughout the Faculty and report to the University Research and Innovation Committee (URIC). URIC develops cross-faculty research policy and strategy and is chaired by NU's PVC Research Strategy and Resources. The development of the GCRF UKRI *Living Deltas Hub* bid saw Geography catalyse enhanced NU grant finance support structures for international consortium bid development.

Support for project proposal development: is provided for all staff through one-on-one support, monthly drop-in sessions, 'best practice' workshops, bespoke training, peer review, and sharing successful bids. Expert pre-award input covers multiple bid elements: strategic alignment to funder priorities, case for support development, costings, staffing needs, data management, non-HEI collaboration, response to reviewers, mock interview training, project management and media engagement. Additional input is provided to physical geographers through the NERC Demand Management Panel. Early-career academics gain additional peer support from the NU Early-Career Network. Successful award holders undertake NU's PI Development Course.

Research support funds: enable staff to pump-prime their research activities at different stages. These include: (i) **School Research Fund** (£1k per project); (ii) **Faculty Research Fund**, supporting ECRs beginning new research projects (up to £4k); (iii) **Faculty Bid Preparation Fund** (£5k for bids up to £200k, £10k for bids over £200k); and (iv) **Open Access Publication Support Fund** (up to £5k). All staff receive an annual Independent Research Allowance (IRSA) of £2.3k p.a. (increased from £1.3k 2014) in support of research activity (pump-priming, fieldwork, conferences, research travel, accommodation, equipment), across *all academic and research staff regardless of contract or career stage*. In this review period, PIs and Cols have accrued 70% of their FEC Directly Allocated time to their personal Research Support Fund – alongside consulting fees - to enable strategic buyout from teaching to support research activities (additional to the 40% staff research time automatically allocated in the WAM, and maintained during COVID-19). Additional Geography research funds (£10k p.a.) support cluster initiatives.

Support for research engagement and impact is provided by the Geography Impact Coordinator (new role since 2014), Geography Research Director, School Research Director, HASS Impact Manager and ESRC IAA Officer. Since REF2014, research impact in Geography has been enabled through: (1) **Internal impact funding** comprising Faculty Impact Fund (FIF) (£76k total) and Geography Impact Fund (GIF) (£138k total) to reinforce ESRC IAA Awards (£134k total) and UKRI funded pathways to impact; (2) **Impact pathway development support** for colleagues at all career stages is part of internal peer review of all grant applications; (3) **Impact mentoring / apprenticeship for ECRs** as Cols on funded impact pathways guided by senior PIs; alongside new staff research induction, and PhD supervision and training; (4) **Sharing best practice** through Geography impact development workshops, including training in methods of co-production and engagement, impact seminars, and learning across human and physical

geography; and (5) **Protected staff time for research engagement activities** in the Geography Workload Allocation Model, with additional provision for staff leading ICSs.

Research Facilities: Since REF2014, Geography has benefitted from a £60M refurbishment of the Henry Daysh Building, to house *all* colleagues on one floor for the first time (phase 1 completed 2020, phase II 2021). This new accommodation brings facilities benefits in support of Geography's research ambition going into the next REF with: enhanced everyday learning interactions, physical integration of staff and PGR offices, new seminar rooms, high-end computing suite, and videoconferencing. In addition, NU provides high-quality IT and library resources: 3 year rolling computer upgrades; specialist software for advanced quantitative research and GIS (including field and remote sensing data processing, numerical modelling, visualisation); **online repository to facilitate immediate and total public access to staff outputs (OA green route) with additional HASS funding for gold access in pay-to-publish journals in physical geography**. Geography has also benefitted from a £2M investment from the NU Research Infrastructure Fund, to develop the transdisciplinary Spatial Analytics and Modelling Lab, including four new Chairs (one in CURDS) connecting computational, digital, engineering, physical and social sciences.

Supporting lab and field research in physical geography: Since 2014, research capacity in physical geography has been enhanced through *new world-class laboratory facilities* (Drummond labs, Houston lab, Sedimentology labs: combined £3M investment), supported by 3 technicians (2.5FTE), plus 1 technician (1FTE) on *Living Deltas*. Our laboratories offer outstanding facilities for analysis of sediment geochemistry, paleoecology, physical characteristics of sediments, cosmogenic isotope and organic geochemistry. Key equipment in the new labs includes: a Jena sediment carbon analyser, and GCMS gas chromatography mass spectrometer (chemical trace fossil analysis for climate change work). Additional *lab equipment* purchased since REF2014 (£640k investment) includes: new ball mill for faster sediment processing; a portable XRF for rapid analytical processing of metals in cores and other sediments; new freeze dryer that has doubled freeze drying capacity; and new mastersizer for more efficient analysis of sediment particle size. Additional strategic investment (£500k) in *state-of-the-art fieldwork equipment* includes: 4km terrestrial laser scanner, ground- and ice-penetrating radar, Leica dGPS, seismic reflection sub-sediment profiler, sidescan sonar for lakebed mapping, bespoke equipment for non-contaminated DNA analysis of cores, a UWITECH coring platform, dedicated departmental 4x4 vehicle for remote fieldwork, plus new *Living Deltas* equipment for field water quality analysis. This has been coupled with new investment in *sample refrigerated storage* (cores, sediments, water samples) tripling our capacity.

Research income plans 2021-28: we have already secured over £3.7M in UKRI monies for spend in the next review period, underpinning the viability of our future research plans. Research mentoring of our new ECR cohort combined with strategic use of NU bid development and pilot project funds will help these colleagues expand their research programmes and move to larger collaborative submissions and mid-career fellowships, to increase our per capita research income. A funding environment shifting towards interdisciplinary, challenge-led and internationalised research also puts NU Geography in a strong position to compete and succeed in the next review period.

4. Collaboration and contribution to the research base, economy and society

Since REF2014, NU Geography has built successful research partnerships with other academics; advanced the global research base in Geography; and engaged with non-HEIs to develop new research with positive economic, societal and environmental impacts for diverse stakeholders:

Disciplinary service and research leadership (UK and international): continuing our Unit's long-standing practice of leading international research agendas and contributing to the academy, staff hold key leadership roles in learned societies and professional associations. Staff and PGRs have **advanced the work of the RGS-IBG research groups** through *key developmental and*

advocacy roles: Economic Geography RG (Hughes Chair; James, Lim, Pettit); Geographies of Children, Youth and Families RG (Blazek, Benwell); Geographies of Justice RG (Hopkins Founder and Chair), Political Geography RG (Williams, Benwell, Mason); Participatory Geographies RG (Blazek); Developing Areas RG (Pande). Staff have also **advanced the work of AAG specialty groups** through leadership and advocacy roles: Population SG (Franklin President), Economic Geography SG (Lim), Digital Geographies SG (Lin), Urban Geography SG (Wood). Staff have also **advanced the work of international research organisations** providing *research leadership, advocacy, and capacity-building*: Western Regional Science Association (Franklin), Regional Studies Association (Dawley), International Glaciological Society (Carr), IGU Islands Commission (Pugh), International Society for Diatom Research (Juggins), International Society for River Science (Large) and International Paleolimnology Association (Henderson).

Newcastle Geographers have also played important roles in shaping research agendas by representing our discipline on **multiple major funding bodies**. Within UKRI, staff have served on key committees for NERC, ESRC, AHRC, EPSRC and NIHR. Human geographers have: chaired AHRC Grant Panel C; and served on ESRC DTC assessment panels, Wellcome Trust Scientific Advisory Group, ESRC strategic review of social science, AHRC Strategic Reviewers' Group and ESRC Strategic Advisory Network to *define research priorities for grant funding bodies*. Physical geographers have provided research leadership through NERC Panel A, NERC Isotope Geoscience Facilities Committee, and Geology and Environment Panel of the National Environmental Isotope Facility. Three-quarters of staff have engaged in grant peer review to *shape the allocation of the UKRI research budget* through ESRC, AHRC and NERC, with one third also completing peer review for international funders, including European Research Council, US National Science Foundation, and 15 national research councils overseas.

Our international research leadership also extends to **professional service roles** through: the European Research Executive Agency, Marie Curie, US National Science Foundation, NERC British Ocean Sediment Core Research Facility and Scientific Committee on Antarctic Research. Staff have also provided **reviews on senior academic promotions** in the UK and overseas throughout the review period.

Disciplinary leadership and service is evidenced through **editorship of international journals** including *Economic Geography* (Pollard), *Gender, Place and Culture* (Hopkins), *Progress in Human Geography* (Hughes), *Journal of War and Cultures Studies* (Woodward), *Children's Geographies* (Benwell), *Geographical Analysis* (Franklin), *Journal of Glaciology* (Carr), *Frontiers in Earth Sciences* (Carr). Staff have served on the editorial boards of 40 major journals in physical and human geography (plus 15 interdisciplinary journals); and editorial boards of high-profile international book series, including: *RGS-IBG*, *Gender Space and Society*, *RSA Policy Impact* and *Spaces of Peace, Security and Development Series*.

Research collaborations, networks and partnerships: are central to our strategy and the influence of our research. This is evidenced through our submitted outputs portfolio (n=128): 81% co-authored with UK collaborators; and 46% co-authored with international collaborators. Illustrative *international research partnerships in physical geography* include: the Russian Academy of Sciences Tomsk (Van Hardenbroek EU Horizon 2020) and University of Tokyo, University of Melbourne, Yunnan University, University of Kanazawa, and Chinese Academy of Science (Henderson NERC). *International research partnerships in human geography* include: Federal University Rio De Janeiro and Sun Yat-sen University China (Hughes ESRC); Tampere Finland and Hebrew University of Jerusalem (Griffiths BA); Kenyatta University, Kenya (Bagelman GCRF / Leverhulme); University of Malawi (Hughes AHRC); UBC Canada (Johnston ESRC, SSRC); and Gakushuin University and Sophia University Japan (Cunningham ESRC). The UKRI GCRF *Living Deltas Hub* exemplifies this commitment, through a global network of 55 Co-Is from 34 partner institutions (UK, Europe, US, South and SE Asia).

Closer to home, successful *collaborative research within NU Geography* is evidenced through 31 externally-funded projects (total £4.55M income) and co-authorship of 25% of returned outputs. *Interdisciplinary collaboration* at NU is also evident through leadership of NUCoREs (Data,

Energy, Cities, Climate & Environmental Resilience); and Spatial Analytics and Modelling Lab (see section 1). Our location in the School of Geography, Politics and Sociology further supports our interdisciplinary strategy.

Our commitment to research collaboration, networking and partnership is also evidenced through our contributions to **international conferences, workshops, symposia**: since REF2014 NU Geography staff have delivered over 620 research papers (including 85 invited keynotes), and organised over 120 conference sessions. Building on REF2014, we continue to host **international visiting academics** (61 total). These visitors act as conduits for collaboration and impact and have also supported career development, through sessions on journal paper submission for ECRs, research mentoring, and cross-departmental benchmarking. Returning the favour, NU Geography staff have held **visiting positions at 15 universities overseas**. Geography and CURDS run high-profile **external seminar programmes** (103 seminars since 2014) to foster cross-institutional dialogue, learning, and engagement. Colleagues have delivered 167 invited seminars in the UK and overseas. Extending our international role in disciplinary reproduction, **NU Geography will host the 2022 RGS-IBG Annual Conference** with significant NU investment, the largest conference that NU has ever hosted (1800 delegates).

Building research capacity through advancement of PGRs and ECRs: Collaborative PGR training is central to our research strategy and disciplinary role. In addition to our internal cohort, staff have co-supervised 23 students in other NU Units, and 45 PhD students registered at 20 other universities. This includes successive cohorts of PGRs through the ESRC NINE DTP and NERC IAPETUS(2) DTP, based on our long-established partnership with Durham University. Externally-funded projects have also enabled research apprenticeship of 31 ECR research assistants in NU Geography. The NU-led *Living Deltas Hub* alone employs over 40 postdoctoral researchers at 26 institutions worldwide.

Diverse engagement and co-production with non-HEIs and publics: NU Geography's longstanding reputation for engaged research and co-production is rooted in our collective commitment to applied work. Since 2014 colleagues have **engaged with over 270 non-HEI research users and beneficiary organisations** locally, nationally and internationally. NU Geography research has benefitted: *government agencies* through provision of robust evidence and scientific models for evidence-based policy making; *NGOs and charities* by enabling more effective decision-making and resource allocation; and *environmental groups, labour collectives, and development organisations* by improving knowledge and understanding amongst practitioners in response to human and environmental needs, and generating new capacities for improving the everyday lives of vulnerable people.

Extending across all staff, and beyond our submitted ICSs, this **breadth of research engagement** spans: pioneering work in CURDS to establish and deliver a civic role for UK universities within their respective cities to meet challenges of sustainability, health and cultural development (55 UK universities are now committed through the UK Civic University Commission); ESRC-funded research with the UN's Codex Alimentarius, UK Food Standards Agency and UK corporate retailers to develop strategies for tackling antimicrobial resistance in food systems; and community engagement through Tyne and Wear Citizens listening campaigns that led to NU becoming the first university in the North East to accredit as a Living Wage Employer. It also includes: EPSRC research on hydrogen as an affordable home energy source with energy providers (Northern Powergrid, Northern Gas Networks) and stakeholders (Affordable Warmth Solutions, National Energy Action); and NERC/WFP earthquake modelling and landslide simulation research to improve national earthquake contingency planning (UN Office for Coordination of Humanitarian Affairs) and to target key trail routes in Nepal for landslide mitigation to maintain critical access routes following earthquakes (World Food Programme). Pioneering work to deliver the UK's COP26 climate change adaptation strategic programme in South and SE Asia is being developed through UKRI GCRF *Living Deltas Hub* with the UK Foreign, Commonwealth and Development Office at Ambassadorial and High Commissioner level in Vietnam, Bangladesh and West Bengal, India. These **partnerships enrich our research environment** by providing diverse critical feedback, access to valuable datasets and hard-to-

reach participant groups, innovative co-production of engagement ethics and locally-appropriate codes of conduct, collaborative PhDs, and dissemination of research that matters.

Our research expertise has also been called on **extensively by UK Government** with colleagues providing expert guidance to: the Department of Business Innovation and Skills, Department for International Development, Treasury, Department for Education, Ministry of Defence, House of Commons Committees (Business Energy and Industrial Strategy, Communities and Local Government Committee), House of Lords Economic Affairs Committee, Welsh Government, Northern Ireland Executive, Scottish Parliament Local Government and Communities Committee, and UK All Party Parliamentary Group on the Polar Regions; alongside the UK National Audit Office, UK Office for National Statistics (2021 Census Advisory Group), UK National Infrastructure Commission, NHS, Environment Agency, and Forestry Commission. We also maintain strong and longstanding input into the European Commission and Organisation for Economic Cooperation and Development (e.g. EUROSTAT Labour Market Areas Taskforce).

We use a **range of media and venues to extend public understandings of our research and build diverse pathways to impact**, through targeted events and enduring relationships with local schools, employers, galleries, theatres, museums, cinemas and community enterprise. Innovative public engagement activities use **visual art**, including Nayak's research workshops with Barnardo's and local primary schools to produce and exhibit 150 artworks featured in the 'Boys To Men' 2018 exhibition (Great North Museum) in which children questioned assumptions about masculinity and gender stereotypes. We have also hosted two Leverhulme Artists in Residency (Woodward: Mulvihill 2014, Turner 2017) using **movement, dance and play** to explore connections between people and space with cleaning staff, local schools, and an elders dance group. Innovative engagement through **theatre and stage** includes Cree's use of participatory theatre to raise public understanding of gendered military experience; Johnston's documentary theatre play performing the ethics of outsourced dementia care; and Richardson's live theatre performances at Sage Gateshead through the *North East Dads and Lads Project* on male childcare. Our research has also been shared through **TV and film**, including BBC Scotland's documentary on domestic violence showcasing Pain's research on everyday terrorism with Scottish Women's Aid. Staff have featured prominently in *NU's Public Insights Lectures*, successive *ESRC Festivals of Social Science*, and continue to host the prestigious *Tyneside Geographical Lectures*. We are routinely approached to contribute to public debate through **commercial media**, further evidencing the quality, international profile and urgency of our research.

Research recognition and influence: *The research excellence of staff has achieved prestigious recognition in this review period, evidencing the reach and significance of our work and intellectual contribution to the research base:*

- **Learned Fellowships:** *Academy of Social Science* (Hopkins, Hughes, MacKinnon, Pollard, Pain, Pike), *Royal Society of Arts* (James), *Alan Turing Institute* (Franklin).
- **Research Fellowships:** BA Mid-Career (James 2017-18); Independent Social Research Foundation Early-Career (Jones 2019-20), Leverhulme (Stenning 2019-20); Leverhulme Early-Career (Ghaffari 2019-2022, Benwell 2013-16, Riding 2013-16).
- **Prizes and awards in physical geography:** President's Medal of the Royal Scottish Geographical Society (Ross 2014); Outstanding Service Award International Palaeolimnology Association (Juggins 2014); highest cited paper *Journal of Palaeolimnology* (Juggins 2015) and *Progress in Earth & Planetary Science* (Henderson 2020).
- **Prizes and awards in human geography include:** RSA Routledge Early-Career Researcher Award (Lim 2019); Boyce Award Distinguished Service to Regional Science (Franklin 2015); *Environment and Planning A* Ashby Prize Best Paper (Hughes 2016, James 2018); *Urban Studies* Best Article (Pain 2020); AAG Cultural Geography Best Paper (Loomis 2018); AAG Socialist and Critical Geography Solidarity Award (Hopkins 2018); *Local Economy* Best Paper (Champion 2014); Winner ITB Book Awards Germany 2016 (Bonnett); *Journal of Flood Risk Management* outstanding paper (Lin 2018).

NU Geography is proud of these multiple research, impact, engagement, and EDI achievements since REF2014, and our creation of a world-class research environment that enhances the abilities of all our researchers to fulfil their potential. Moving into the next REF period our ambition is to extend our position at the forefront of global research agendas in Geography, and to work closely with colleagues in the UK and internationally to train the next generation of Geography research leaders, as part of an inclusive global interdisciplinary research community.