Research Strategy – Department of Earth Sciences

Vision

Earth Sciences at Durham University is nationally and internationally successful (featuring in top-10 in several national league tables and in top-50 internationally), and looks forward to the future, where we continue to contribute to solving grand challenges for society and planet Earth.

Our research vision is:

> *"To deliver outstanding and impactful research that tackles the global Earth and environmental challenges of the 21st century".*

Earth and Environmental Scientists are critical to overcoming many of humanity's most pressing challenges: climate and environmental change, the search for and use of natural resources, net-zero energy solutions, the management and safe disposal of wastes, and the prediction and mitigation of natural hazards (volcanoes, earthquakes, landslides, etc). Durham Earth Sciences aspires to address these issues, using our strengths in environmental geoscience, geohazards and Earth-surface processes, geochemistry, geo-energy, geophysics, geodynamics, structural geology and volcanology.

Our structure and strategy are aligned with the University and Faculty strategies of Sustainability, Data, Health and Culture/Creativity/Heritage. We have a track record of transformative and impactful research, supported by worldclass facilities, on renewable energy, critical resource management, past/present climate and resilience, natural hazards and mitigation strategies, and numerical modelling of Earth and environmental systems. Consequently, we are uniquely placed as an academic department to make major contributions to all of these themes.

Strategic Research Themes and Priorities

Research themes and groups	**Outputs, impact and profile**

• Research has been organised into three themes for several years:
  ○ **Earth Surface Processes and Hazards;**
  ○ **Climate, Environment and Resources;**
  ○ **Physics and Chemistry of Earth and Planetary Processes**
• We have recently introduced four associated Impact Themes to support translation of our research into changes in practice:
  ○ **Towards Net Zero** (e.g. CCS, Geothermal)
  ○ **Sustainable Resource Management** (Water and Critical Metals)
  ○ **Environment and Climate Change** (Palaeoclimate, future climate and Modelling)
	• Our outputs were ranked 10th nationally in REF 2021 (rising from 18th in the REF 2014 ranking), with ~60% of submitted outputs at a 4* outstanding rating. We seek to maintain and improve this research excellence.
	• In response to a drop in 'Impact' from 10th to 35th place we have prioritised enhancing our impact, with the ambition of matching our national and international metrics for research quality and environment.
	• We aim to further raise our profile in research in climate science, data science and renewable energy, and pivote our research and teaching away from the hydrocarbon extraction industry and towards Environmental Geoscience and Climate Science. This matches

○ **Geohazards** (e.g. Volcanoes and Earthquakes) • We will continue to support our informal research groups, e.g. Volcanology, Structural geology, Geophysics, Geochemistry, Environmental that underpin each impact theme. Similar group(s) are encouraged to develop for the growing Environmental and Climate Science research expertise in the department.	the changing research funding landscape and end-user priorities.
Research grant income • We aim to increase our research income to at least £160k/FTE/yr, which is the Earth Science average within the top-3rd Russell Group Universities. Earth Sciences experienced a gradual decline in research grant applications, from ~£10-15M before the Covid pandemic to just over £5M during and immediately after. In 2024 this has recovered to £16M, with awards of £2.6M. This is a promising step towards achieving our income goal. • As a long-term trend, the research funding landscape has gradually, but considerably changed with significantly more opportunities in climate-, data- and renewable energy-related research, an increasingly competitive landscape for curiosity-driven research funding, and significant global reduction in fossil fuel-related research. • The research portfolio in the Department has changed accordingly, and an active decision was taken to appoint new academic hires in environmental geoscience, climate and data science. • This dynamic shift is still in progress and will inevitably feed forward into changing our future areas of research impact and interactions with external end-user communities. • A major goal is to leverage Departmental expertise to secure funding for research into critical resources. This is a national and global priority area for research that has the potential to underpin substantial and sustained research effort within the Department, leading to profound societal, environmental, and economic impact.	**Research environment and culture** • The Department aims to maintain or improve its high ranking (13th nationally in REF 2021) for environment. • All research-active staff in the Department are expected to develop high-quality research portfolios that are self-sustaining in terms of funding, are international, cross-disciplinary and where appropriate deliver impact at both national and global levels. This mandate is supported using the following strategies and resources: ○ Peer-review of draft research proposals both informally by academic staff in the Department and external colleagues, for example through the NERC Liaison Group. ○ An Impact Coordinator whose role is monitor and encourage the development of Impact Case studies that highlight how the Department's research is translated into UK and international policy and economic activity. ○ Research and Impact seed-corn schemes made available by the Department (through its Research Incentivisation Scheme), in addition to University and external resources. ○ We have developed a number of forums and processes in which we engage stakeholders to identify opportunities to translate research outcomes into changes in policy and practice. These include interaction with end user communities via the Durham Earth Sciences Advisory Board (DESAB) and partnerships with Department spin-out companies(e.g. Geospatial Research Ltd, Geoenergy Durham Ltd).

	○ Through a facilitated workshop at our 2024 Research Away Day we have developed a ten-point roadmap for enhancing the research culture and environment. Research Committee is overseeing delivery against identified milestones.

Aims and Indicators of Success

Aims	Strategy into action: critical initiatives	Success indicator
Research themes and groups Embed the four new research impact themes into Department research culture	1) The department has identified ~10 potential impact case studies for REF2028. We aim to develop around half them towards a full and strong case studies, ready for potential submission to REF2028. 2) Develop or maintain a number of initiatives (e.g. impact workshops, internal peer-review networks, 'buddy' systems) under the auspices of each impact theme to develop co-operation within the Department; the new themes need to grow and develop life. 3) Develop and/or consolidate research groups for aspects of Environmental Geoscience and Climate Science, to mimic the success of existing groups, e.g. Volcanology.	1) Top-10 ranking for impact in the next REF round. 2) Emergence of group-focussed impact case studies 3) Group activities, outputs, proposals and impact case studies developed by those new research groups.
Continue strategic hiring of new academic and technical staff	Focus recruitment in key areas for research and impact growth. Not coincidentally, these are the areas of expected strength in undergraduate and PGT demand. Increase in engagement with RIS activities, University funding routes and cross-department and cross-faculty initiatives.	Substantially increased income from successful grant applications and increased UG and PGT student numbers in those key areas.
Outputs, impact and profile Continue to deliver high-quality research output and to provide strong research environment in the department.	Continue focus on quality, not quantity of outputs; effective mentoring in department;	Maintain high REF ranking for outputs and environment

Broaden and strengthen impact of Department research	encourage fellowship applications; foster productive research environment in department through Increase collaboration **within** the Department through organisation of impact workshops, internal peer-review networks, 'buddy' systems.	Top-10 ranking for impact in the next REF round.
Research grant income We aim to increase our research income to at least £160k/FTE/yr, which is the Earth Science average within the top-3rd Russell Group Universities. We furthermore aim to reduce fragmentation of time. This is identified as a key drag on writing large research grant proposals. ADR process should be used by HoD to mentor and encourage staff.	Better support and planning for each academic staff member – help with workload, balance of activities. Balance workload effectively and encourage staff to think strategically about research funding bids. This will be facilitated by yearly meetings to discuss DPC 'Form B – Future Plans' template.	Every academic staff member to submit a large (>£500k) research funding proposal most years Improved grant success rates. Staff perception of workload balance improved.
Research environment and culture Improve quality (and perception) of research culture within the Department.	Research Committee to oversee delivery of ten-point roadmap for enhancing the research culture and environment. Revised 'Form B – Future Plans' template to encourage staff to think strategically about research.	Delivery of ten-point plan against measure of success. Improved perception of research culture among staff.