Durham University

Earth Sciences

Dr Jenny Jenkins and Dr Richard Brown
Admissions Directors

Schedule

- Presentation (~40 minutes)
  - What is Earth Science?
  - Our department and degrees
  - Careers for Earth Scientists
  - Student perspective – Isabel Cory
- Displays of course/module information & student work
- Stay and chat to us!

What is Earth Science?

What do you think?

US and Ukraine sign critical minerals deal after months of tense negotiations

By Victoria Butenko, Kit Maher, Ivana Kottasová, Daria Tarasova-Markina and Lauren Kent, CNN

5 minute read

Updated 8:02 AM EDT, Thu May 1, 2025

US Treasury Secretary Scott Bessent and Ukrainian Economy Minister Yulia Svyrydenko sign a deal that gives the United States preferential access to Ukraine's mineral resources. U.S. Department of the Treasury/ Reuters

Afghanistan

Kabul at risk of becoming first modern city to run out of water, report warns

NGO says Afghan capital's 7 million people face existential crisis that world

Climate and environment updates: Atmospheric CO2 hits highest level in human history

For the first time, carbon dioxide in the atmosphere crossed 430 ppm.

How penguin feces can help to mitigate climate change Penguins could be playing a crucial role in stabilizing the climate in Antarctic... Show more

By ABC Climate Unit

Last Updated: June 11, 2025, 3:28 PM BST

Nuclear power

Explainer

What's behind Keir Starmer's decision to back nuclear power?

Does the UK need nuclear to keep the lights on? What has big tech got to do with it? And do the costs stack up?

What is Earth Science?

Applied Science – answering questions about our planet

Maths, Physics, Chemistry, Geography, Biology, Statistics, Computing, Engineering

Geophysics, Geochemistry, Palaeontology, Environmental, Climatology, Geology

Major field of study and a major global employer

What do Earth scientists study?

The *Genesis, Form and Functioning* of the Planet

oceans, continents, plate tectonics, mountains, volcanoes, earthquakes, the deep earth, planet formation, evolution of life, minerals, rocks, fossils

***Our Relationship* with the Planet**

climate change, pollution, environmental management, hazard and risk management, sustainability, energy and resources

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Earth scientists protect humans from the planet…

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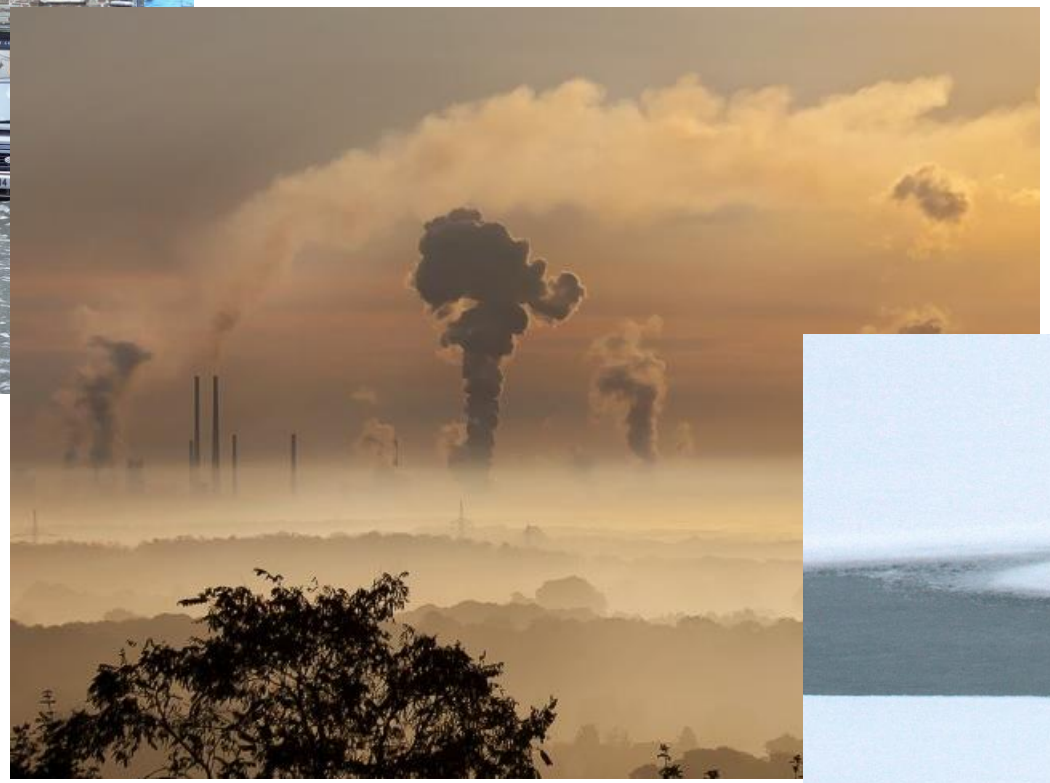
…and the planet from humans



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There has never been a **more important** time to study **Earth Sciences**

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How Do We Tackle These Important Questions?

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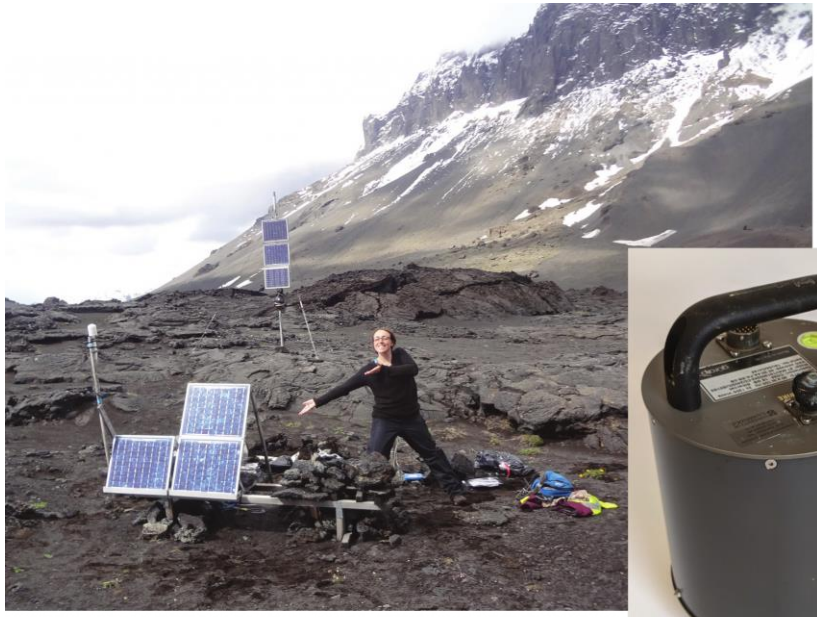
- **Fieldwork** – gathering real world data



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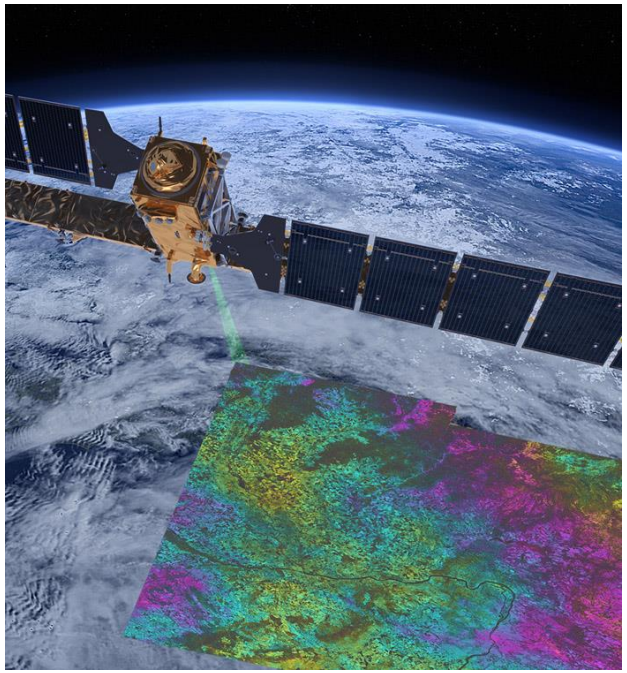
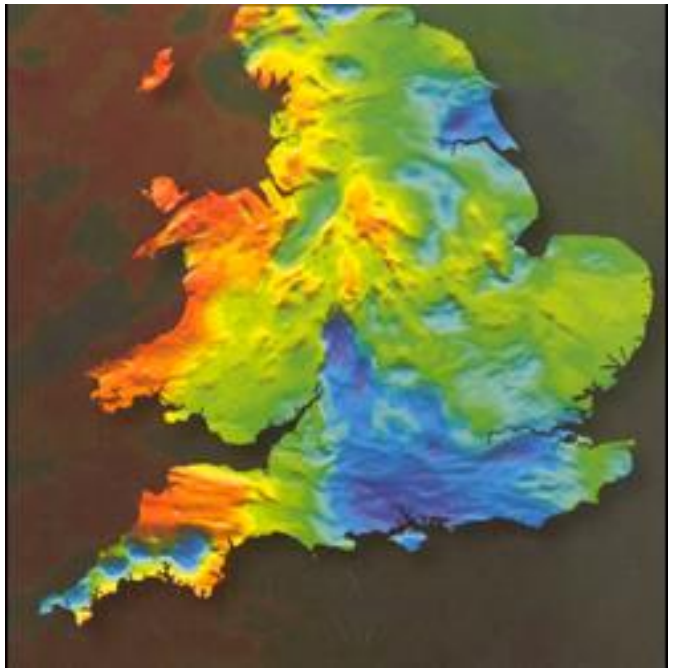
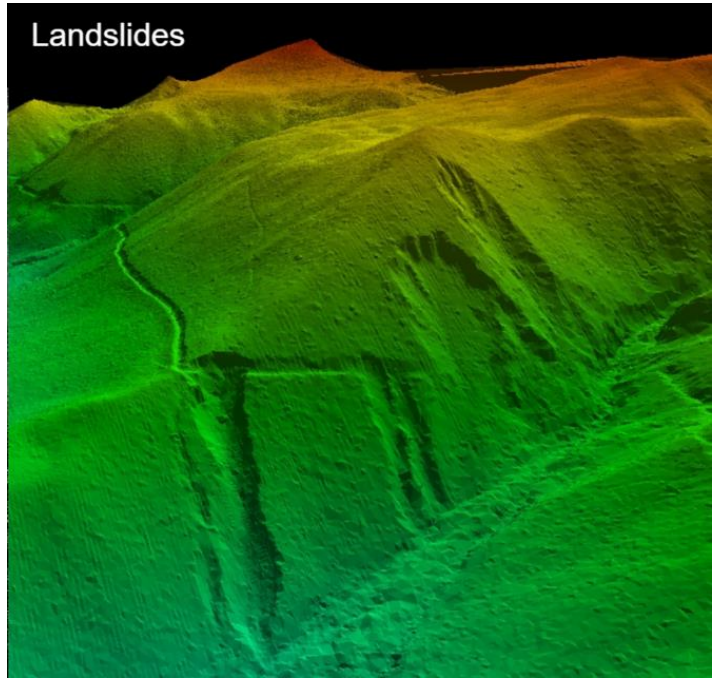
How Do We Tackle These Important Questions?

- **Fieldwork** – gathering real world data
- **Remotely sensed data** – satellite/seismic/drone







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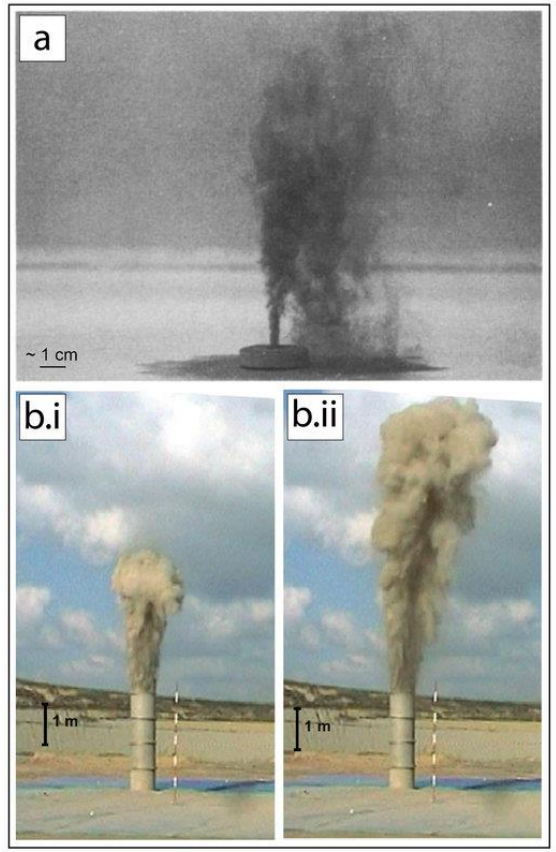

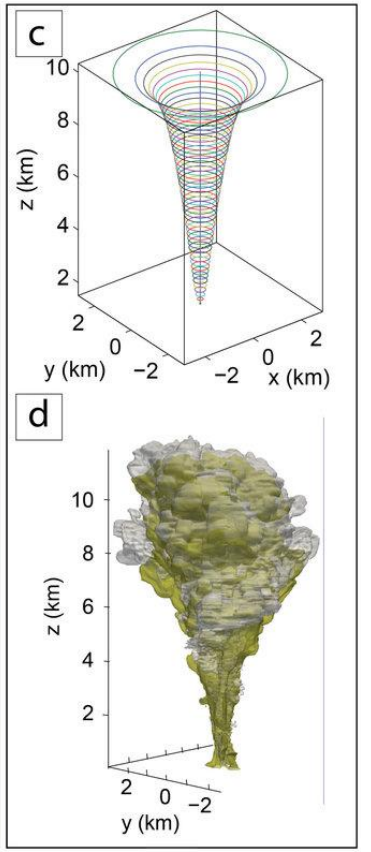

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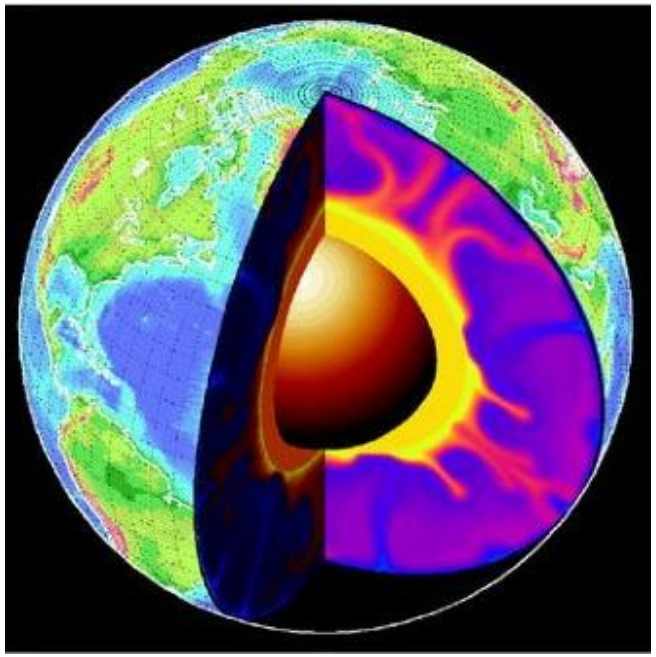
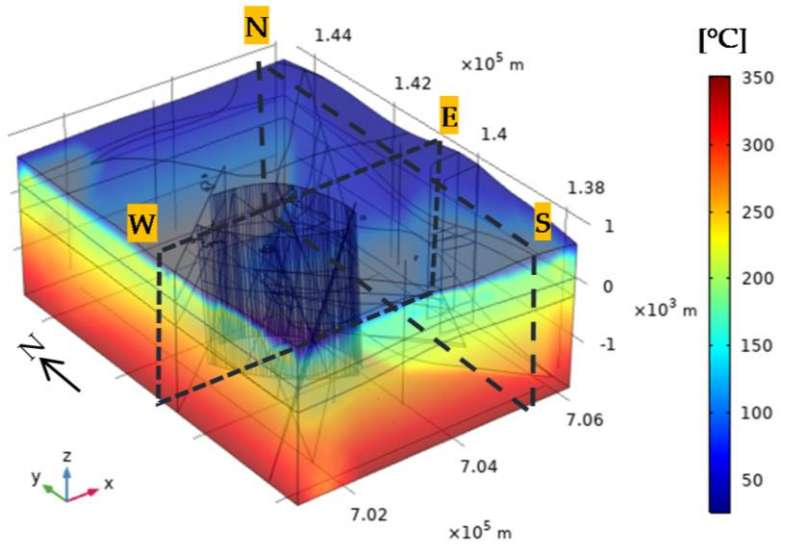
- **Computational** & **numerical modelling** – processes through time





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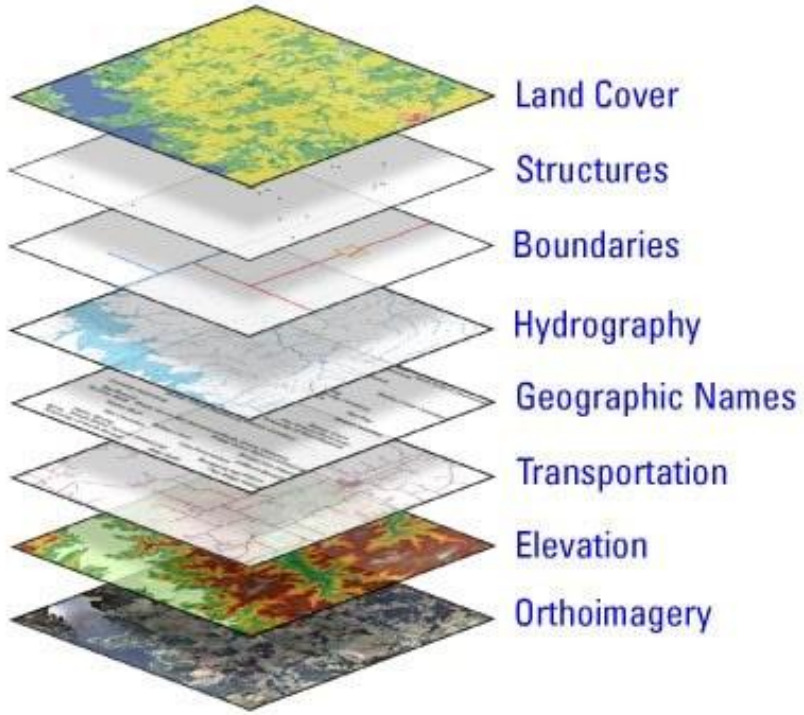

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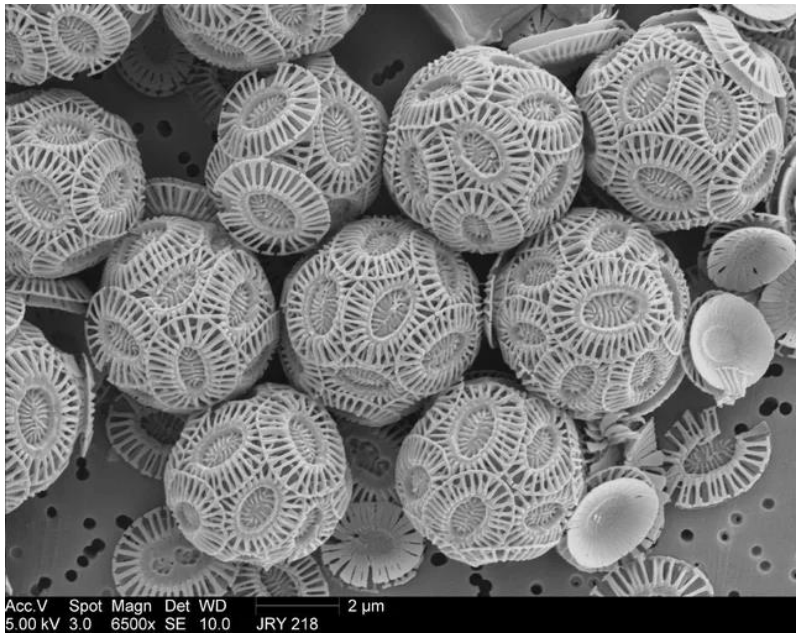
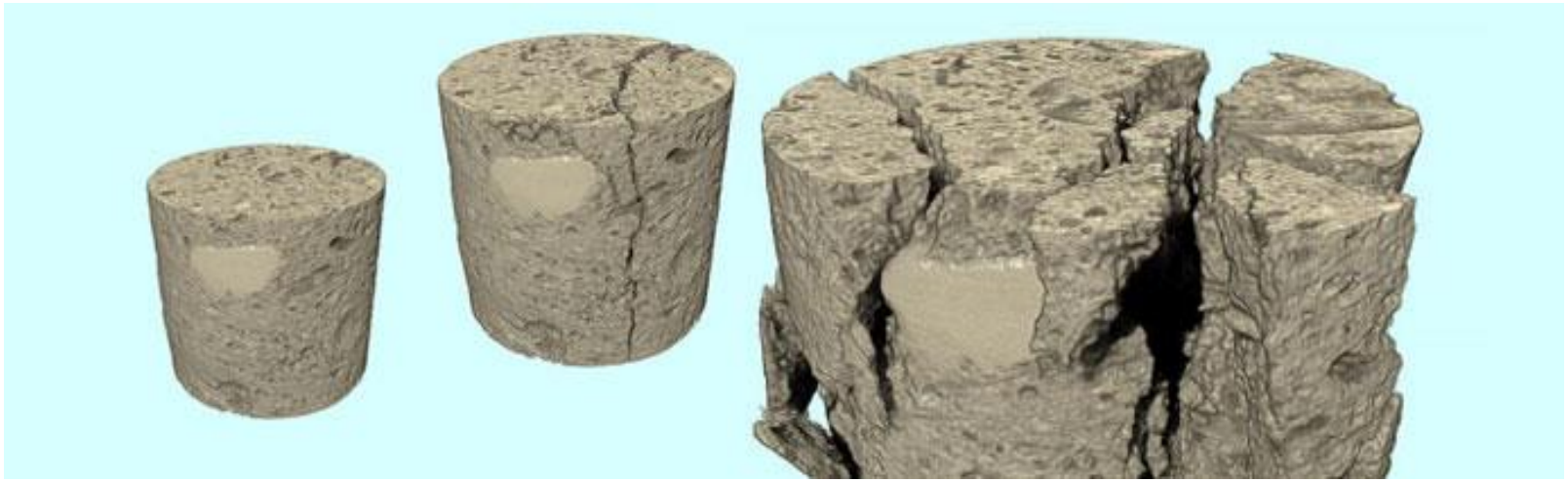
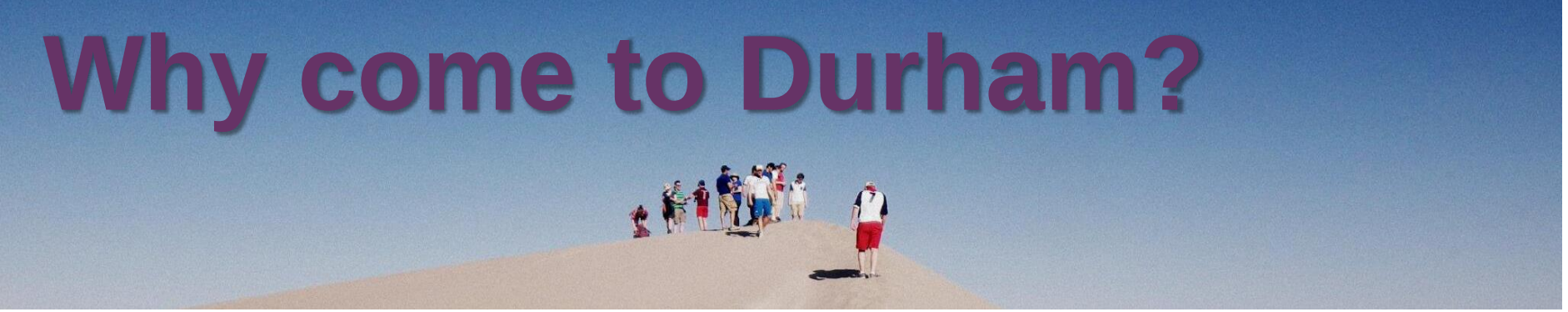
- **Artificial intelligence** & **machine learning** - analyse big data
- **Statistical analysis** - reveal patterns in geospatial data
- **X-ray tomography, scanning electron microscopy & synchrotron technology** - image at high resolution





Why come to Durham?



What's important to you when choosing where/what to study?

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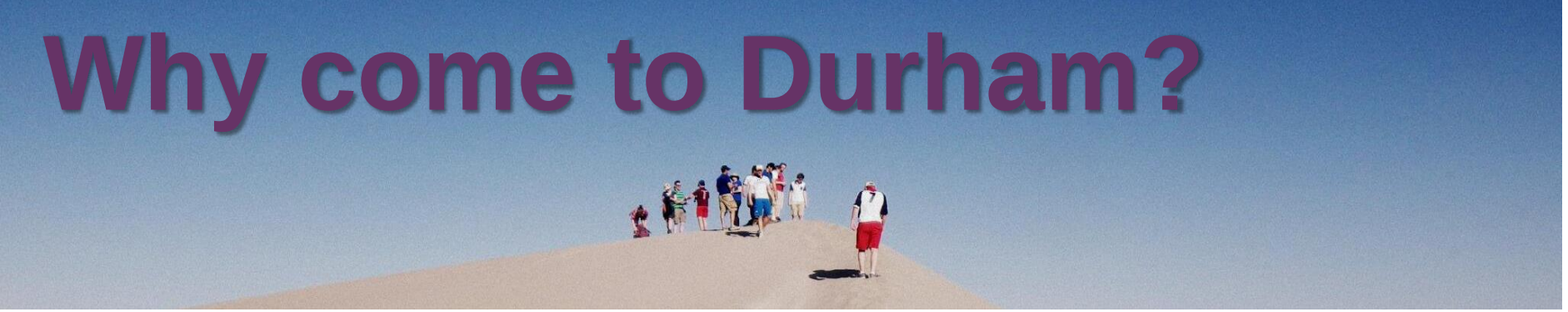
Why come to Durham?



QS WORLD UNIVERSITY RANKINGS 2024 GEOLOGY TOP 50

QS WORLD UNIVERSITY RANKINGS 2024 GEOPHYSICS TOP 50

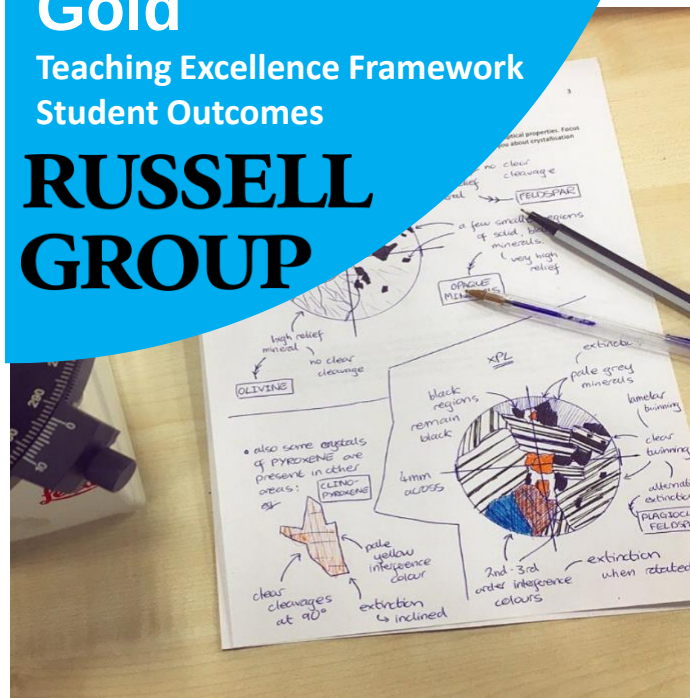
- Bespoke teaching and research facilities with state-of-the-art equipment

- Friendly Community composed of:
  - 33 academic staff;
  - 21 technical &support staff;
  - 12 research staff;
  - 250 undergraduate students across 4 years;
  - 70 PhD & MRes students;
  - Dedicated student support staff
  - ***Recently UK #1 for department support & administration (NSS)***

Janice Oakes – Teaching & Learning Manager

2023 Durham Uni Award for:
"Excellence in Student Academic Support"

7th
Complete University Guide 2024
7th
Guardian University Guide 2025
Gold
Teaching Excellence Framework
Student Outcomes
RUSSELL GROUP



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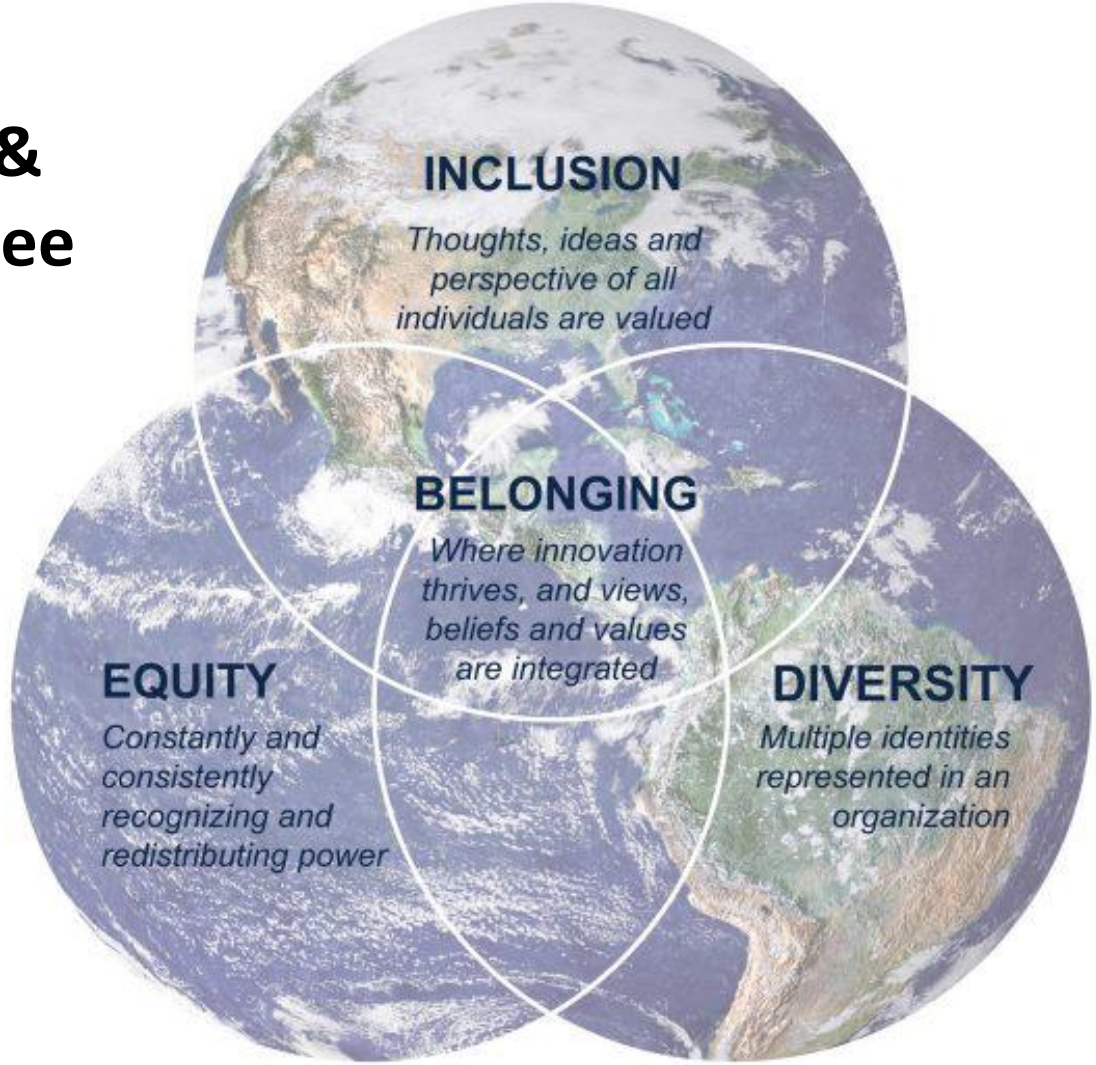
Athena SWAN Silver Award
GENDER CHARTER

Earth Sciences for Everyone

It's important to us that our department is a safe, welcoming and comfortable place to work or study, independent of race, gender, sexuality, age, nationality and background. We are continually trying to change and improve how our department runs.

Student participation is encouraged and welcomed!

Equality Diversity & Inclusivity Committee



Athena SWAN Silver Award

GENDER CHARTER

URGE
Unlearning Racism in Geoscience

First Generation Scholars

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Degree Courses – entry requirements

A minimum of **two science A-levels** from the list below:

Chemistry, Physics, Geology, Environmental Science, Mathematics, Further Mathematics, Geography, Economics, Computer Science, Engineering, Life and Health Sciences, Biology, Psychology,

(*only Geophysics requires A-level Maths or equivalent)

Course (80 students total)	Degree	Typical offer
Environmental Geoscience (F630)	BSc - 3 yrs	AAB
Geophysics (F665)	BSc - 3 yrs	AAB*
Geology (F600)	BSc - 3 yrs	AAB
Geoscience (F643)	BSc - 3 yrs	AAB
Climate Science (F645)	BSc - 3 yrs	AAB
Natural Sciences (CFG0)	BSc – 3 yrs	A*AA
Earth Sciences (F644)	MSci - 4 yrs	AAA

Environmental Geoscience (F630)

Interdisciplinary science addressing Environmental issues

- Combines geological understanding & specialist environmental modules.

  Hydrology and climate, Environmental geochemistry, Environmental management, Fieldwork (environmental), Sustainability

- Careers in:
  - Environmental management and remediation, environmental consultancy, mineral, water and energy sectors, geotechnical and geoengineering consultancies.

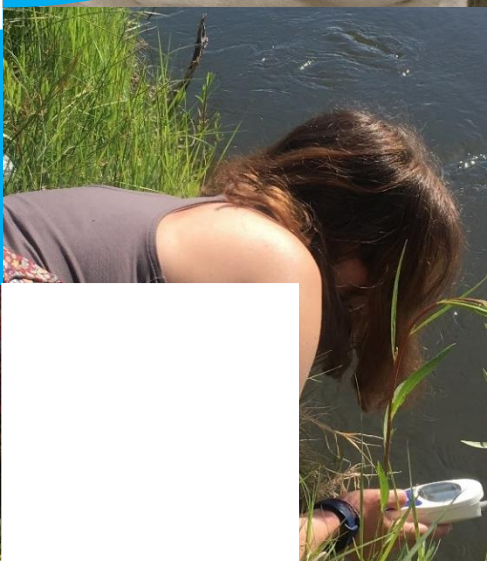
The Geological Society Accredited

Geophysics (F665)

Applied physics, maths and modelling to learn about our planet

- Combines geological/environmental understanding with geophysics modules
  - Mathematics for geoscientists, Geophysical methods, Geophysical data applications, Advanced geophysics, Geophysical hazards
- Careers in:
  - geotechnical consultancies, data science, hazard and risk management, environmental consultancies, engineering, mineral, water and energy sectors.

The Geological Society Accredited



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Geology (F600)

Broad Earth science topics and field work focus

The Geological Society Accredited

- Accredited - modules on all major topics in earth science & field experience each year.
  - climate and hydrology, volcanology, igneous petrology, natural resources, palaeontology, geophysical methods, Earth structure, structural geology and tectonics

3rd year - independent geological mapping project

- Careers in:
  geotechnical companies, environmental management, geological surveys, mineral, water and energy sectors.

Geoscience (F643)

Flexibility and breadth across Earth sciences

- Follow your interests
- Combine modules from any of our degree streams!
- Options to select 2 modules a year from any other departments
- Field work non-compulsory post 1st year

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Earth Sciences (MSci, F644)

Stay an extra year for more research experience

- After any 3 year BSc course take specialist modules in 4th year:
  Science Communication, Field Seminar (currently to California), Earth Sciences into Industry
- Focus on research, critical thinking, communication & teamwork.
- 50% - Independent research project: fieldwork, lab work, statistical analysis, numerical or computational modelling.

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www.nature.com/scientificreports

scientific reports

Check for updates

OPEN

Diffuse and concentrated nitrogen sewage pollution in island environments with differing treatment systems

F. C. Alldred[1✉], D. R. Gröcke[1✉], C. Y. Leung[1], L. P. Wright[1] & N. Banfield[2,3]

minerals

MDPI

Article

Chemical Force Microscopy Study on the Interactions of COOH Functional Groups with Kaolinite Surfaces: Implications for Enhanced Oil Recovery

Nipada Santha, Pablo Cubillas *, Adrian Saw, Harry Brooksbank and Hugh Christopher Greenwell

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

ELSEVIER

Ground air: A first approximation of the Earth's second largest reservoir of carbon dioxide gas

James U.L. Baldini *, Rachel A. Bertram, Harriet E. Ridley

Department of Earth Sciences, University of Durham, Durham DH1 3LE, UK

RESEARCH ARTICLE

VOLCANICA

Syn-eruptive agglutination of kimberlite volcanic ash

David Haddock[α], Shukrani Manya[β], Richard J. Brown*[α], Thomas J. Jones[γ], Fabian B. Wadsworth[α], Katherine J. Dobson[δ], Thomas M. Gernon[ε]

[α] Department of Earth Sciences, Durham University, Durham, DH1 3LE, UK.
[β] Department of Geology, University of Dar es Salaam, Dar es Salaam, Tanzania.
[γ] Department of Earth, Environmental and Planetary Sciences, Rice University, 6100 Main Street, Houston, TX 77005, USA.
[δ] Department of Civil and Environmental Engineering, University of Strathclyde, Glasgow, Scotland, G1 1XJ, UK.
[ε] School of Ocean and Earth Science, University of Southampton, SO14 3ZH, UK.

Study across difference science departments…

Climate Science (F645)

Multi-disciplinary focus on climate research

- Led by Earth Sciences choice of modules from:
  Earth Science, Geography and Archaeology.

  climate change, sustainability, environment and resources, reconstructing environmental change, carbon and biogeochemical cycles, oceans past &present, sea level change & coastal evolution, glaciers & glaciation, ice age environments, archaeology & climate

- Careers in:
  environmental management, sustainability, climate and environmental research

Natural Science (CFG0)

Choice, flexibility and depth

- Combine Earth science with multiple other subjects
- Popular combinations:
  Biology and: Anthropology, Geography, **Earth Sciences** or Psychology
  Earth Sciences and: Biology or Geography

Degree Logistics

Flexible modular system*
choose subjects to study each year (depending on degree)

Teaching builds year-on-year
Technical expertise
Ability to think and learn critically and independently.
Key transferable skills

Assessment
Coursework, practical work, tests, and exams, Field studies -individual work + teamwork.

Contact time

- >22–25 hours/week
- 3-hour teaching slots – mix lectures / practical work.
- May include residential and day fieldtrips.
- Research-led Education:
  Enquiry based learning led by world experts
- Academic advisor meetings each term
- Open door policy.

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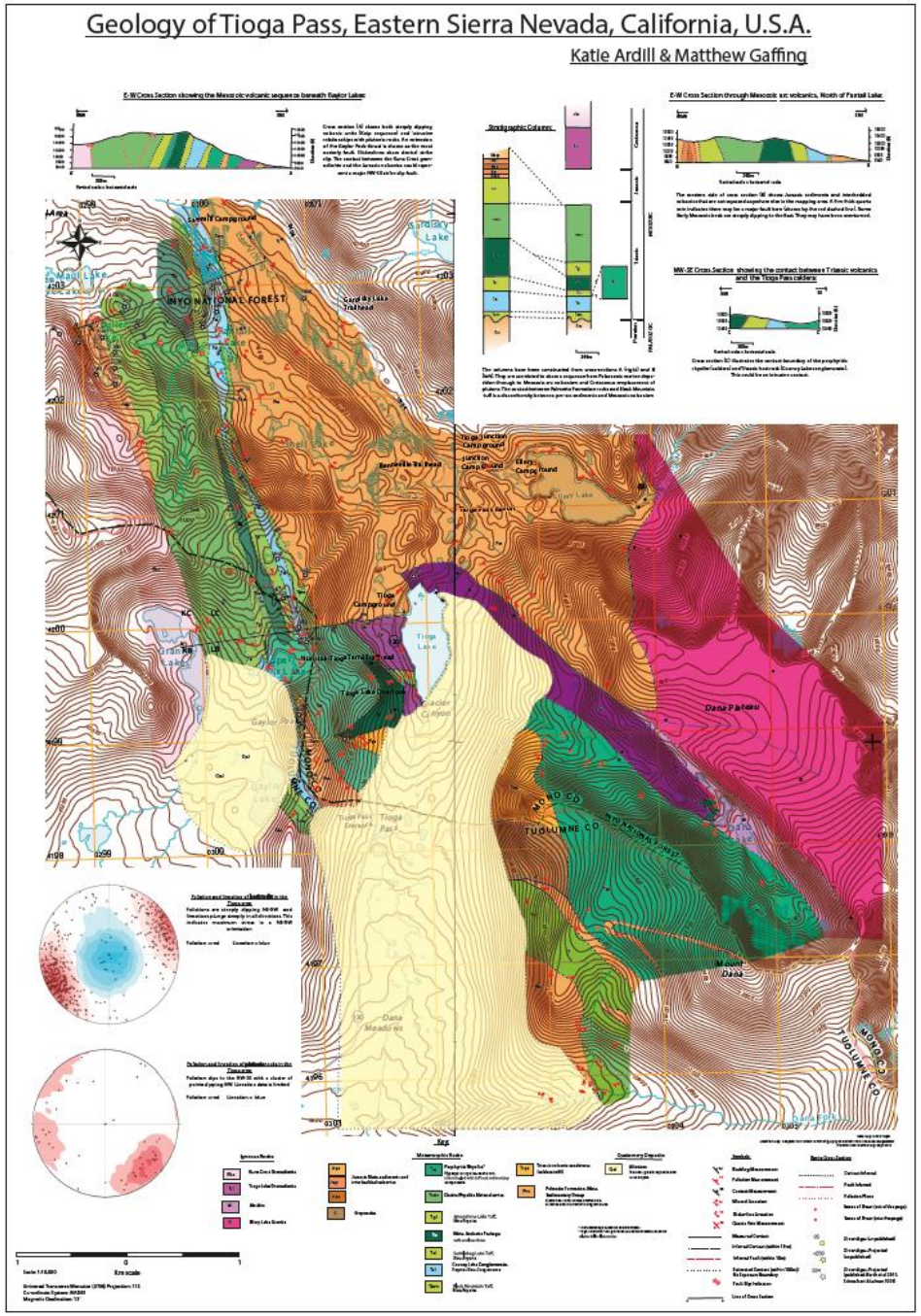
**Module content and availability is subject to change*

Dissertations

Conduct independent research guided by world leaders

- **Geology (F600)*** – Independent geological mapping
- Produce map & report on the geological history



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*Department subsidies: £650 geological mapping, £250 other field studies

Dissertations

Conduct independent research guided by world leaders

- **Other streams** –novel research under supervision of staff

Field studies* / lab work / coding, numerical analysis / computational analysis / data mining

  - *Seismic noise in the time of coronavirus: Seismic monitoring of human behaviour during the pandemic*
  - *Archaeology Geophysics – mapping the subsurface of Hylton Castle Sunderland*
  - *Interpretation and analysis of density data from snow avalanches*
  - *How does evapotranspiration affect the growth rates of cave calcites?*
  - *Developing methods for acid mine drainage remediation*

- Learn to work independently, to motivate yourself, to synthesize data and recognise patterns, think in 3D, and critically assess ideas and interpretations.
- Pinnacle of undergraduate study where you can showcase your growing skills and technical knowledge.
- Important for CV: demonstrates high-level report writing, independent thought, analysis skills, research skills, and high-level knowledge.

Contents lists available at ScienceDirect
Global and Planetary Change
journal homepage: www.elsevier.com/locate/gloplacha

Environmental controls on stable isotope ratios in New Zealand Podocarpaceae: Implications for palaeoclimate reconstruction

Marianne J. Brett [a,*], James U.L. Baldini [b], Darren R. Gröcke [b]
[a] Department of Earth Sciences, Royal Holloway, University of London, London TW20 0EX, UK
[b] Department of Earth Sciences, University of Durham, Durham DH1 3LE, UK

Clim. Past, 14, 969–990, 2018
https://doi.org/10.5194/cp-14-969-2018

Climate of the Past
Open Access
EGU

Evaluating the link between the sulfur-rich Laacher See volcanic eruption and the Younger Dryas climate anomaly

James U. L. Baldini, Richard J. Brown, and Natasha Mawdsley
Department of Earth Sciences, University of Durham, Durham, DH1 3LE, UK

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*Department subsidies: £650 geological mapping, £250 other field studies

Field studies

- Our degrees provide experience in both **direct** and **indirect** approaches to learning in the field.
- We'll provide practical support so you can enjoy the learning experience without stress. *What kit will you need? Where can you find it? Exactly what can you expect from Field studies?*
- We've also developed **virtual field trips** that immerse students in a field-learning experience for when access is not possible for whatever reason.
- We currently offer a mix of compulsory and optional fieldtrips depending on course and year.
- Compulsory fieldtrips free to students (excluding food and drink)
- Optional fieldtrips students contribute towards cost
- Fieldtrips currently a mix of UK and overseas locations (fieldtrip locations subject to change)
- Durham University

*fieldtrip locations depend on degree course and are subject to change.

The Clean Growth Strategy

Leading the way to a low carbon future

HM Government

A Green Future: Our 25 Year Plan to Improve the Environment

Earth Scientists: Key Players in a Sustainable No-Carbon Future

Environmental Geoscientists – sustainable use of resources; stewardship of the environment; water management.

Surveying Geophysicists – site exploration/monitoring of new wind, wave, and solar power plants

Engineering Geologists – construction of wind, wave, and solar power plants.

Exploration Geologists – rare earth elements in solar panels, technology, and batteries

Natural Hazard Mitigation and Defence – protect against climate change, volcanoes, flooding, earthquakes.

Teachers and Communicators – schools, universities, public, and governments.

Data Geoscientists – application of AI, machine learning, and big data to Earth Science problems.

Academic and Industrial Researchers – energy solutions; data from the geological past to inform the future.

Salary information for Earth scientists

https://www.geolsoc.org.uk/Geology-Career-Pathways/Careers/Salary-Information

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Admissions
What our selectors consider

- **Prior and predicted grades**
- Personal Statement
- Teachers/Academic Reference
- Contextual evidence of merit & potential
- Motivation for the degree programme
- Study & other skills

Find out more by attending 'Applying to Durham' session or visit the Admissions Desk.

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Earth Science Department

Student perspective

Isabel Cory

4th Year Earth Sciences (Geophysics)

2025

Why did I choose Durham?

- Durham being a prestigious Russel group member
- Collegiate system
- Welcoming staff and environment
- Work life balance – sports and societies

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Earth Science department – My experience

- **Welcoming environment**
  - Small cohort – everyone knows everyone
  - Open door policy

- **Prepares you for future life**
  - Wide variety of module choices and speciality path ways
  - Scientific writing workshops
  - CV workshops and career advice

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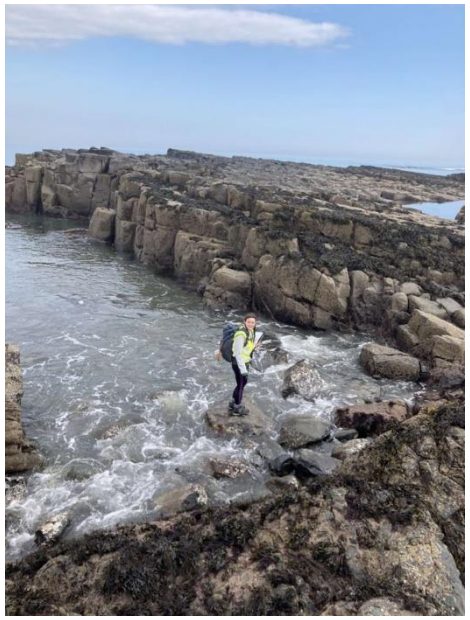
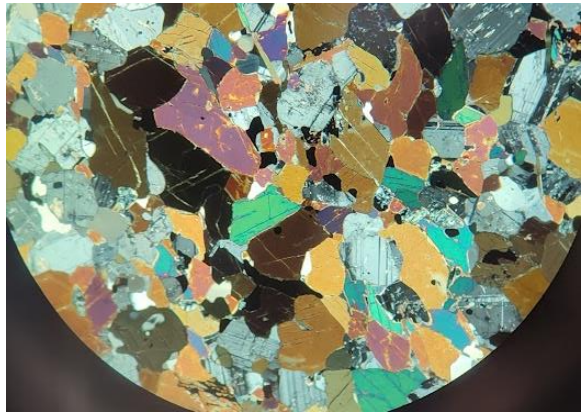
The course



- Flexible degree course
- Wide range of module choices
- Classroom style learning
- Lots of contact hours – lecture and practical style
- Fieldwork



Rock specimen under a microscope

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The future:

- Offshore Geotechnical Engineer
- Fugro – multinational company
- Travel the world
- Putting my 4 years at university to real use!

A degree in geosciences or earth sciences is incredibly versatile, making you employable across a wide range of jobs and industries!

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Earth Science Department

Thankyou

Why Choose Durham?

- We’re an inclusive, student-focused, research-intensive department in a top university and we care a lot about your education and professional development.

- We teach expansive, cutting edge, research-led courses.

- Our graduates are highly sought-after by a wide range of employers.

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QS WORLD UNIVERSITY RANKINGS 2024 GEOPHYSICS TOP 50

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RUSSELL GROUP

TEF Gold Student Outcomes

Stay & Chat or Contact us!

Jenny Jenkins
Admissions Tutor
jennifer.jenkins@durham.ac.uk

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For info on admissions logistics:
durham.ac.uk/study/ug

https://durham.ac.uk/departments/academic/earth-sciences/undergraduate-study/

durham.ac.uk/study/ask-us/

Rich Brown
Admissions Tutor
richard.brown3@durham.ac.uk

duruniearthsci **@DurUniEarthSci**