

Studying Earth Sciences at Durham University

Dr Jenny Jenkins and Dr Richard Brown
Admissions Tutors



@DurUniearthSci



duruniearthsci

Level 4 MSci Fieldtrip to California, 2018. Photo: Samuel Kirkman

Schedule

- Presentation (~40 minutes)
 - What is Earth Science?
 - Our department and degrees
 - Careers for Earth Scientists
 - Student perspective – Isabel Cory
- Tours of department (10-15 minutes)
- Displays of course and module information and student work
- Come and chat to us!

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

Earth scientists protect humans from the planet...



...and the planet from humans

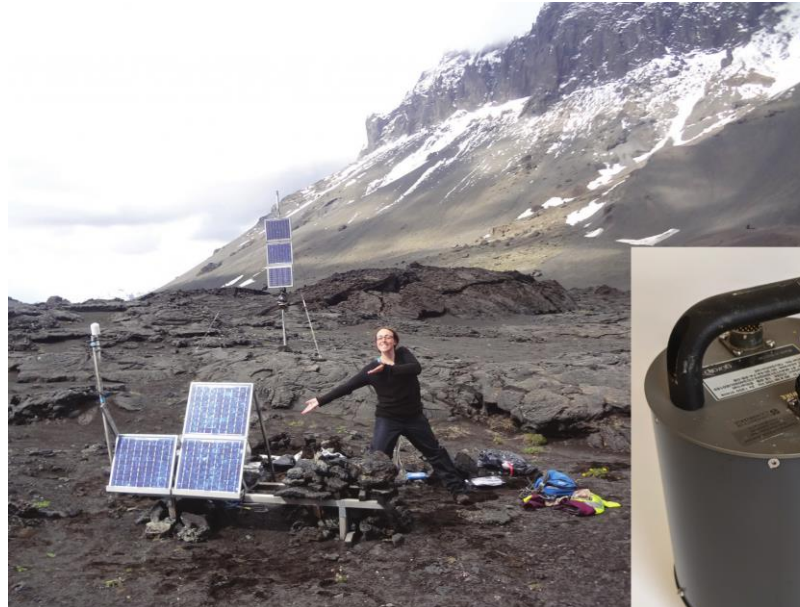


There has never been a **more important** time to study **Earth Sciences**



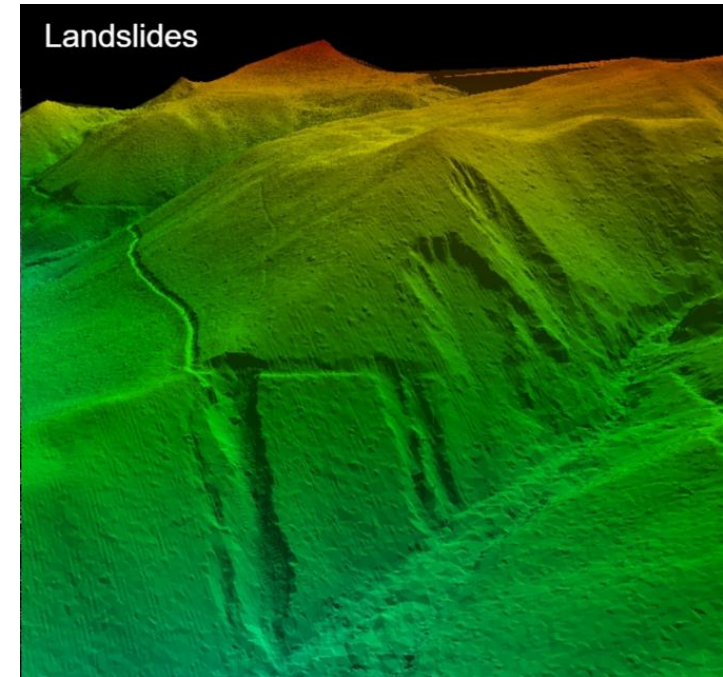
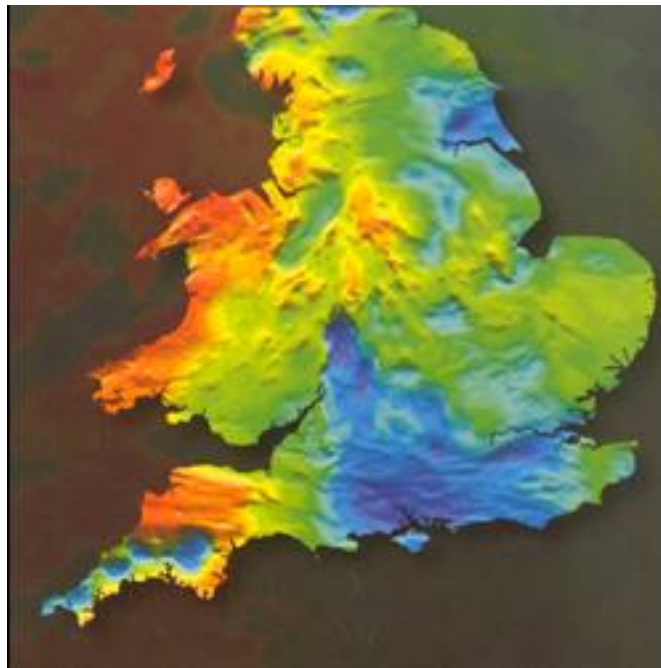
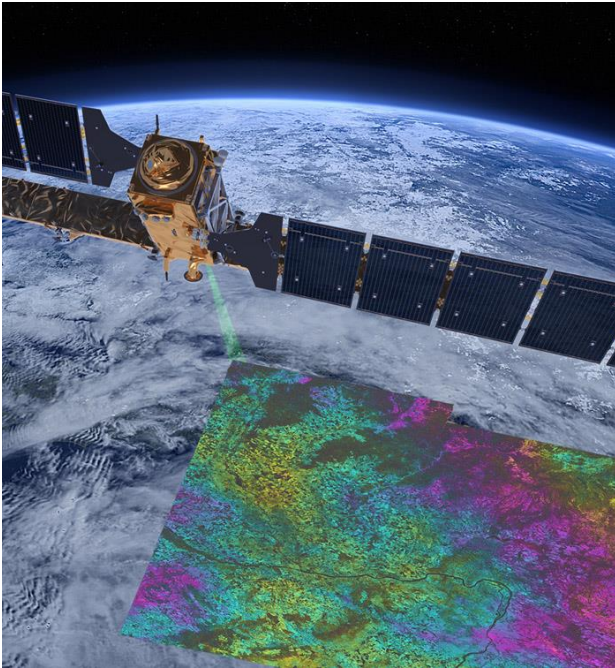
How Do We Tackle These Important Questions?

- **Fieldwork** – gathering real world data



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- **Remotely sensed data** – satellite/seismic/drone



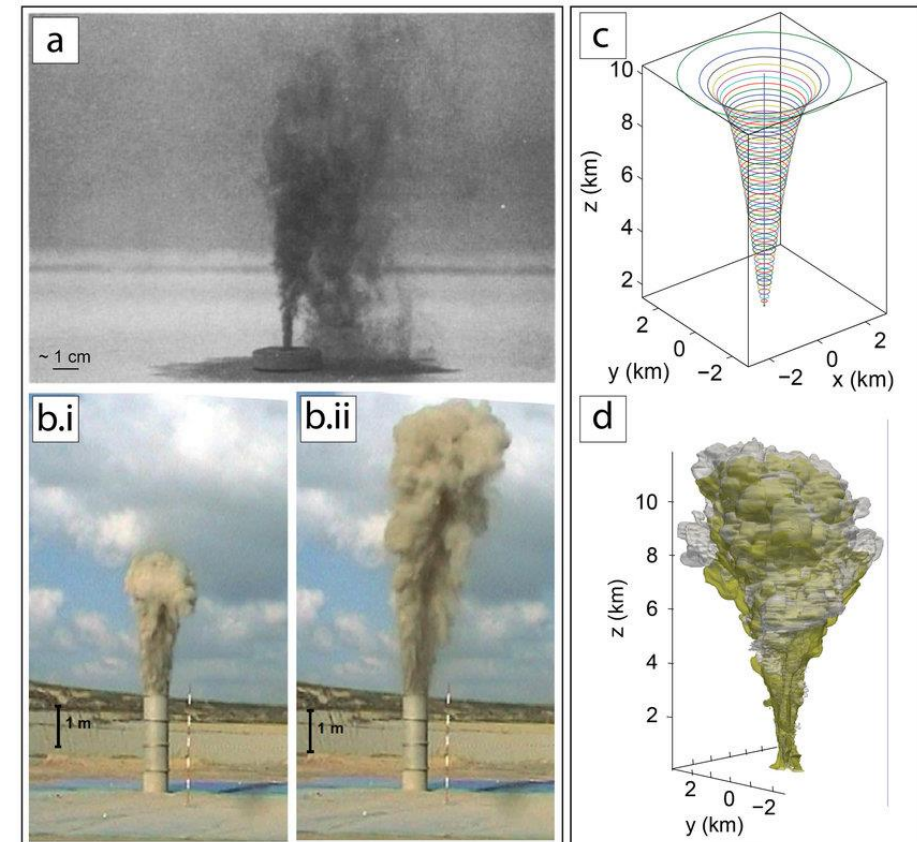
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- **Geochemical analysis** – rocks/isotopes/sediments/liquids/gases



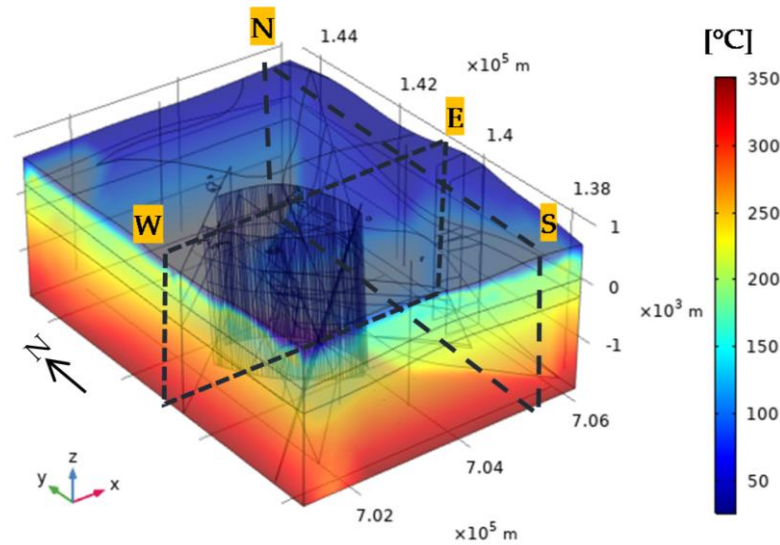
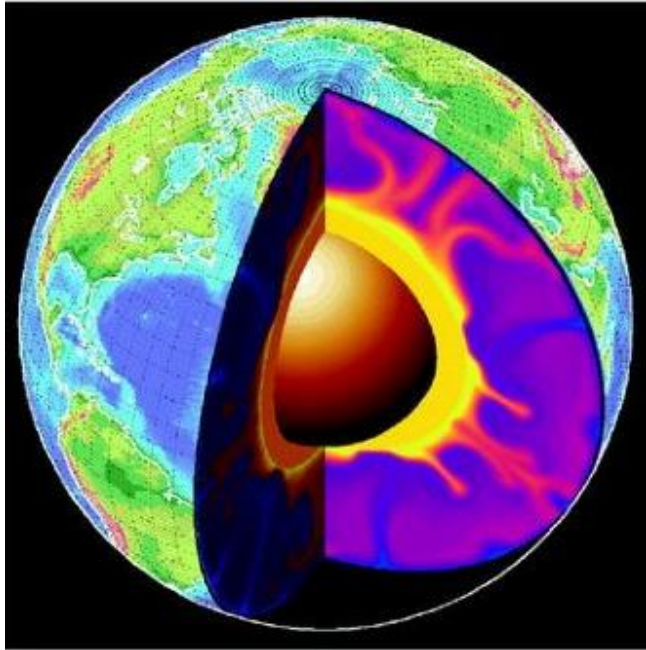
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- **Analogue experiments** - understand processes



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- **Analogue experiments** - understand processes
- **Computational & numerical modelling** – processes through time



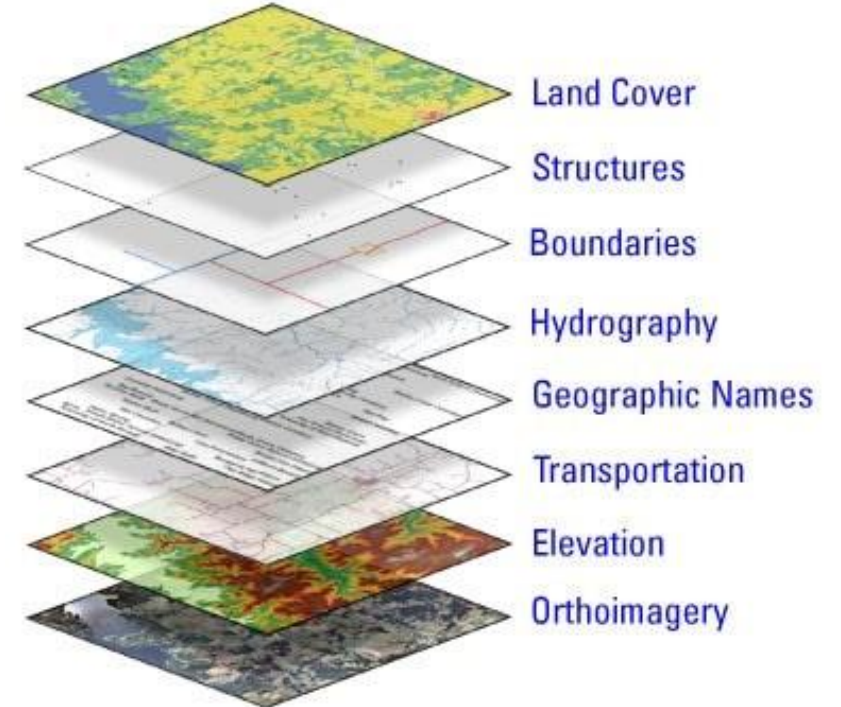
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- **Artificial intelligence & machine learning** - analyse big data



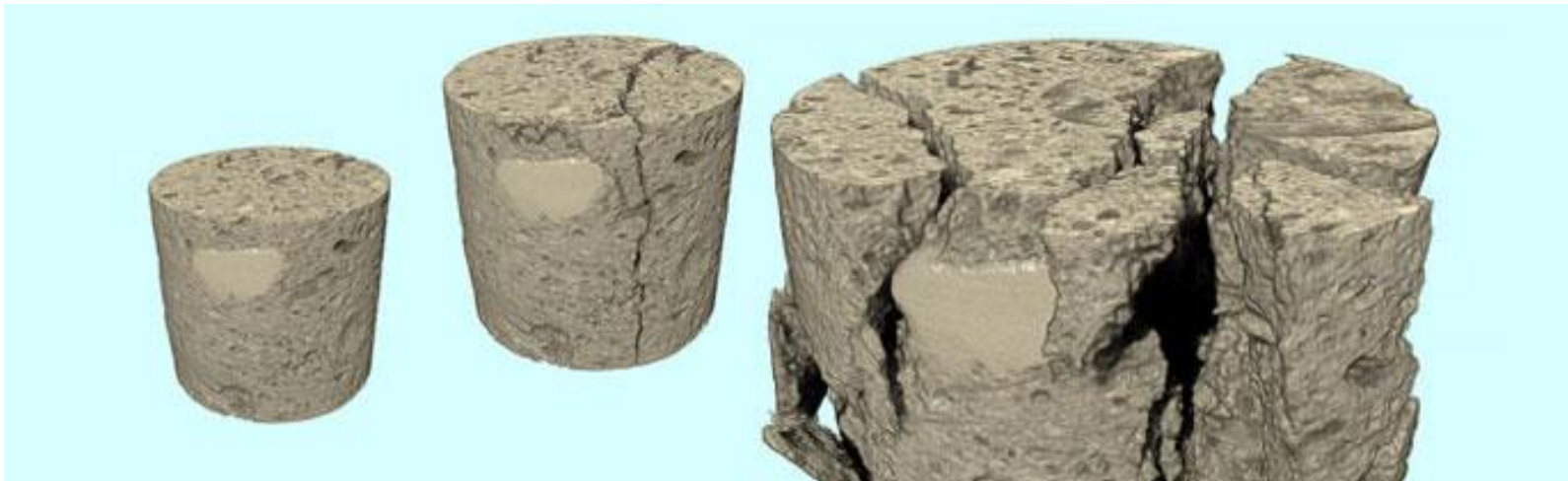
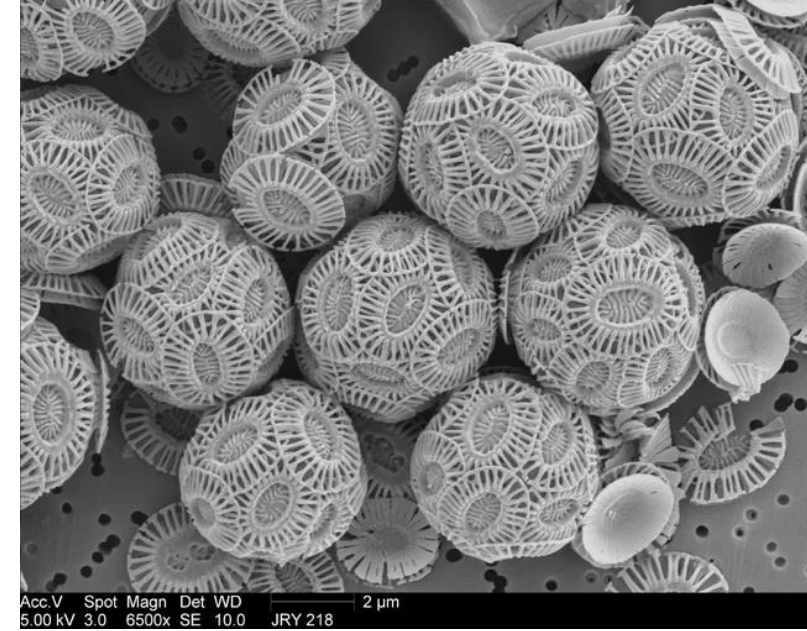
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- **Statistical analysis** - reveal patterns in geospatial data



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- **Analogue experiments** - understand processes
- **Computational & numerical modelling** – processes through time
- **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?



- Bespoke teaching and research facilities with state-of-the-art equipment
- Friendly Community composed of:
 - 34 academic staff;
 - 22 technical & support staff;
 - 20 research staff;
 - 260 undergraduate students across 4 years;
 - 70 PhD & MRes students;
 - Dedicated student support staff
 - **#1 in country for department support and administration (NSS)**

Janice Oakes – Teaching & Learning Manager

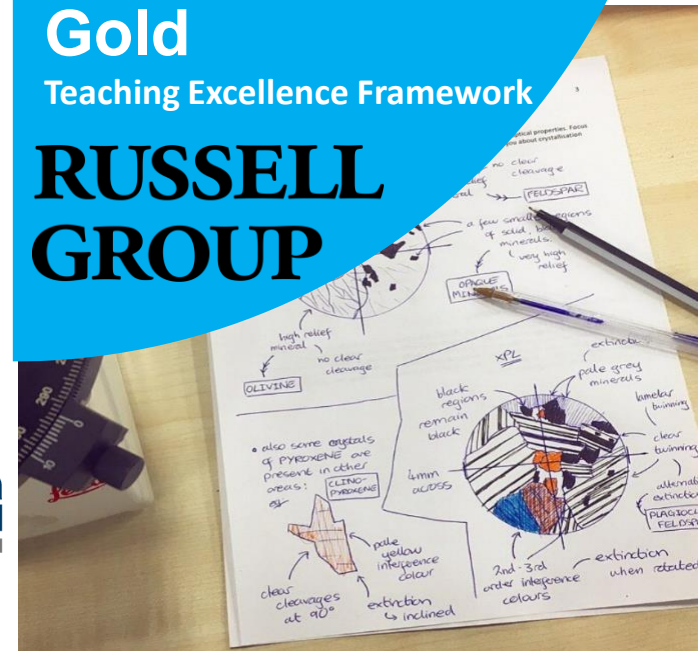


2023 Durham Uni Award for:
“Excellence in Student Academic Support”



6th
Complete University Guide 2022
4th
Guardian University Guide 2022
Gold
Teaching Excellence Framework

**RUSSELL
GROUP**

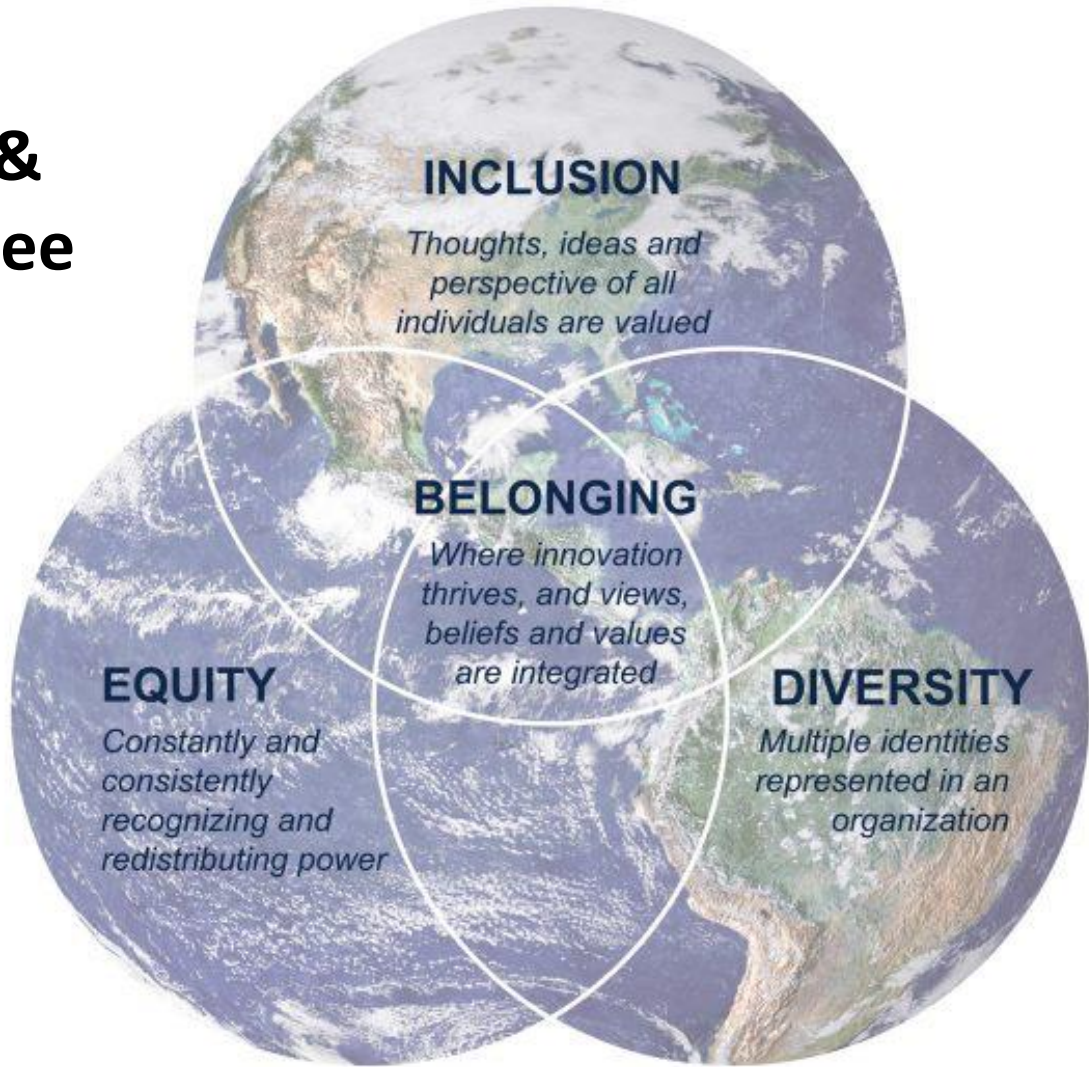


Earth Sciences for Everyone

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



First Generation Scholars



Degree Courses

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

*Chemistry, Physics, Geology, Environmental Science, Mathematics, Further Mathematics, Geography, Economics,
and Biology or Psychology (not both)*

(A-level Maths or equivalent required for Geophysics).

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

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.

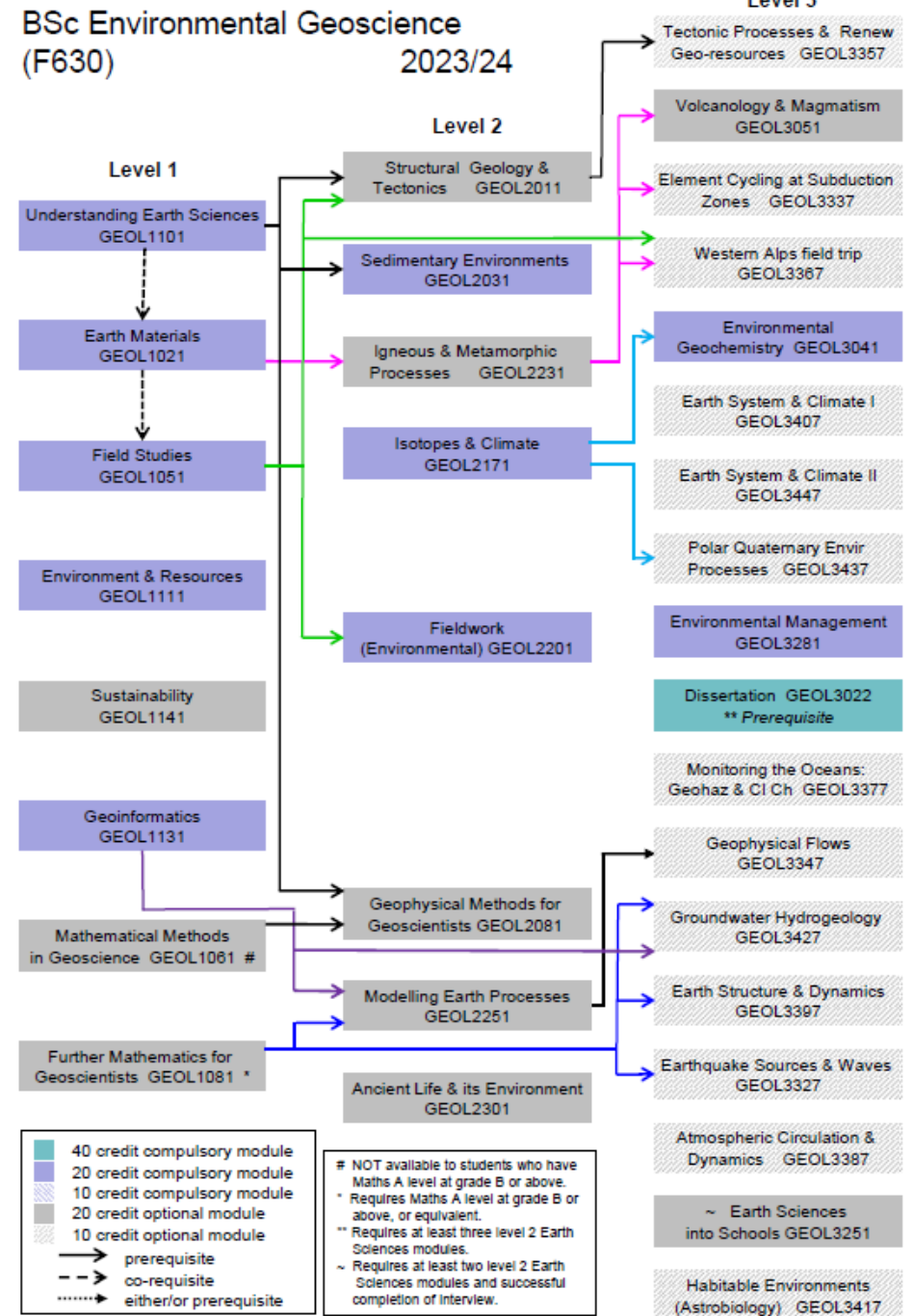
Contact time

- >22–25 hours/week
- Generally teaching in 3-hour slots - lectures and practical work.
- Residential fieldtrips.
- Six tutorials per year (1st and 2nd year).
- Academic advisor meetings 3 times per year.
- Dissertation supervised by member of staff in year 3/year 4.
- Open door policy.

Module Choice

- 6 per year
- Exam and/or coursework assessed
- Mix of compulsory /optional
- Cover the full breadth and depth of Earth science.
- Choice of optional modules increases year-on-year so you can follow and develop your interests

Module content and availability is subject to change



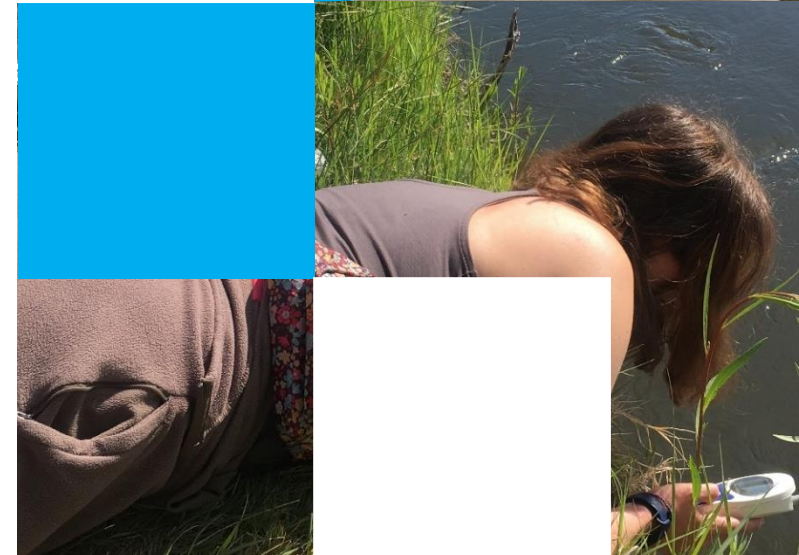
Environmental Geoscience (F630)

- Accredited course combines geological understanding with specialist environmental geoscience 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.



Geophysics (F665)

- Accredited course combines a comprehensive geological background with specialist geophysical knowledge:
 - 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 geology, mineral, water and energy sectors.



Climate Science (F645)

- Led by the Department of Earth Sciences and allows students to choose modules in Earth Science, Geography and Archaeology.
- Topics covered include:
 - introduction to climate change,
 - sustainability
 - environment and resources,
 - reconstructing environmental change,
 - carbon and biogeochemical cycles,
 - ancient life and its environments,
 - Oceans, sea level change and coastal evolution,
 - isotopes and climate,
 - archaeology and climate,
 - ice age environments.
- Careers in environmental management, sustainability, climate and environmental research.

Geology (F600) and Geoscience (F643)

- Study a range of modules covering all major topics in earth science:
 - climate and hydrology, volcanology, igneous petrology, natural resources, palaeontology, petroleum geoscience, earth structure, structural geology and tectonics
 - F643: increased module choice (non-accredited degree course)
- F600: Practical experience in the field each year.
- F643: Fieldwork after first year not compulsory.
- Careers in geotechnical companies, environmental management, geological surveys, mineral, water and energy sectors.
- F600 Geology is accredited by The Geological Society.



Earth Sciences (MSci, F644)

- Follow any 3 year BSc course then take specialist modules in 4th year.
 - Research Project (triple module), Science Communication, Field Seminar (currently to California), Earth Sciences into Industry
- Focuses on research, critical thinking, communication skills and teamwork.
- Independent research project involving fieldwork, lab work, statistical analysis, numerical or computational modelling.
- Students interested in post-graduate research or research-heavy industry jobs.

scientific reports



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

F. C. Allred¹, D. R. Gröcke¹, C. Y. Leung¹, L. P. Wright¹ & N. Banfield^{2,3}



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



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^a, Shukrani Many^b, Richard J. Brown^{*a}, 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.

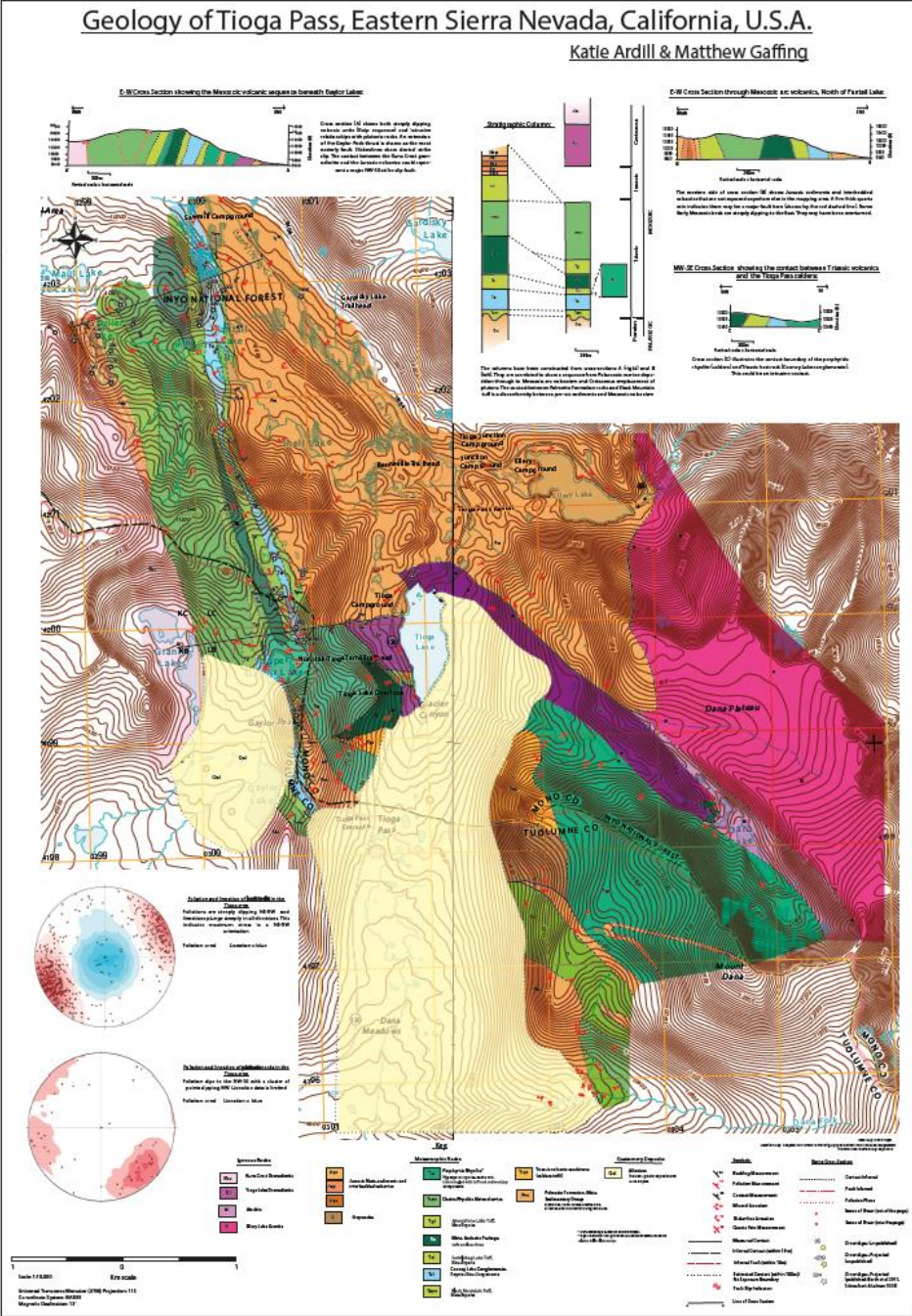
^γ Department of Earth, Environmental and Planetary Sciences, Rice University, 6100 Main Street, Houston, TX 77005, USA.

^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.

Dissertation

- **Geology (F600)*** – 6 weeks independent geological mapping (UK or abroad). Produce map & report on the geological history



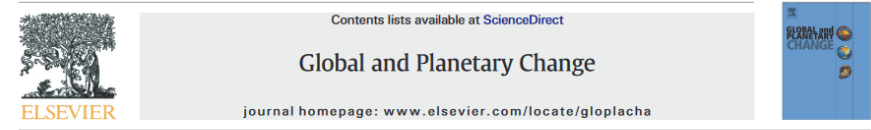
*Department subsidies: £650 geological mapping, £250 other field studies

Dissertation

- **Geology (F600)*** – 6 weeks independent geological mapping (UK or abroad).
Produced map & report on the geological history
- **Other streams** – novel research project under supervision of member 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*
 - *Seismic unrest around an active volcano*
 - *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.

Some published in academic journals!

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



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>
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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



Field studies

- Much of what we know about the Earth comes from **direct observation** during **Field studies**.
- We also gather data **indirectly** using **remote satellites and geophysical instruments** and use **mathematical, geochemical, statistical, physical or computational**, approaches to interrogate the Earth. We can help you learn these vital 21st century skills.
- Our degrees provide experience in both **direct** and **indirect** approaches. You have the **choice**. Field studies is integral to our **Geology** course, but on our **Geoscience** course, you don't have to do field studies beyond Year 1.
- Durham support: new to an outdoor work environment? We'll provide practical support and preparation before every trip 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.

You choose, **your** way. We're here to help.



Field studies



Field studies options on our degree courses*

Currently we take our students to:

- NE England day excursions (Year 1)
 - NW Scotland (Year 2)
- Cumbria (Year 2, Environmental)
- South Lake District (Year 2, Geophysics)
 - Spain (Year 2, Geology)
 - Tenerife (Year 3, optional)
 - Alps (Year 3, optional)
- California (Year 4, MSci, optional)

Students currently DO NOT PAY COSTS for compulsory fieldtrips

Small contributions for optional field work (~£150-200) - hardship bursaries are available

Field studies



No Fly – degree pathway (Geoscience)

For those who wish to minimise their carbon footprint



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 - Spain (Year 2, Geology)
 - Tenerife (Year 3, optional)
 - Alps (Year 3, optional)
- California (Year 4, MSci, optional)

Compulsory fieldtrips free to students (excluding food and drink)

Optional fieldtrips students pay 20 % full cost (~£150–200 for 2022-23)



Level 3 optional fieldtrip to Tenerife



It's not all hard work...



Geophysics students on Field studies



Environmental geoscience students



Geophysics students on Field studies



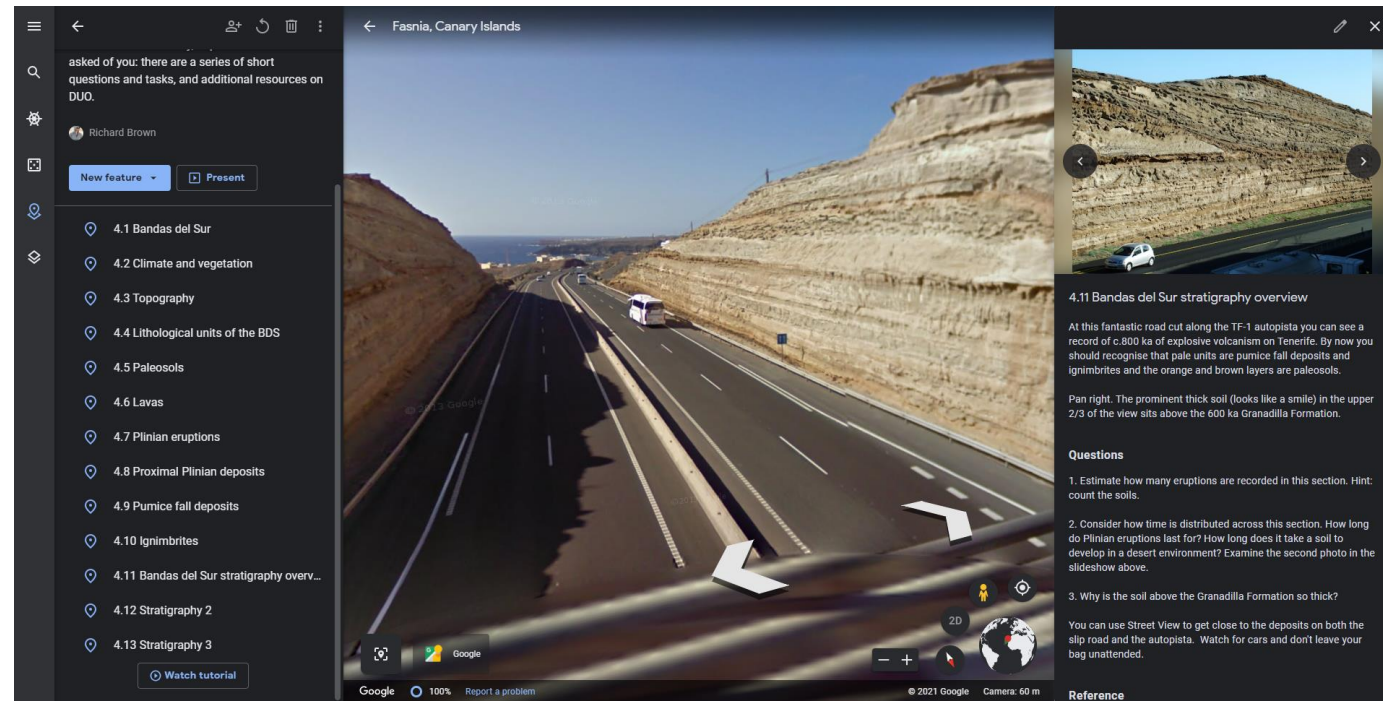
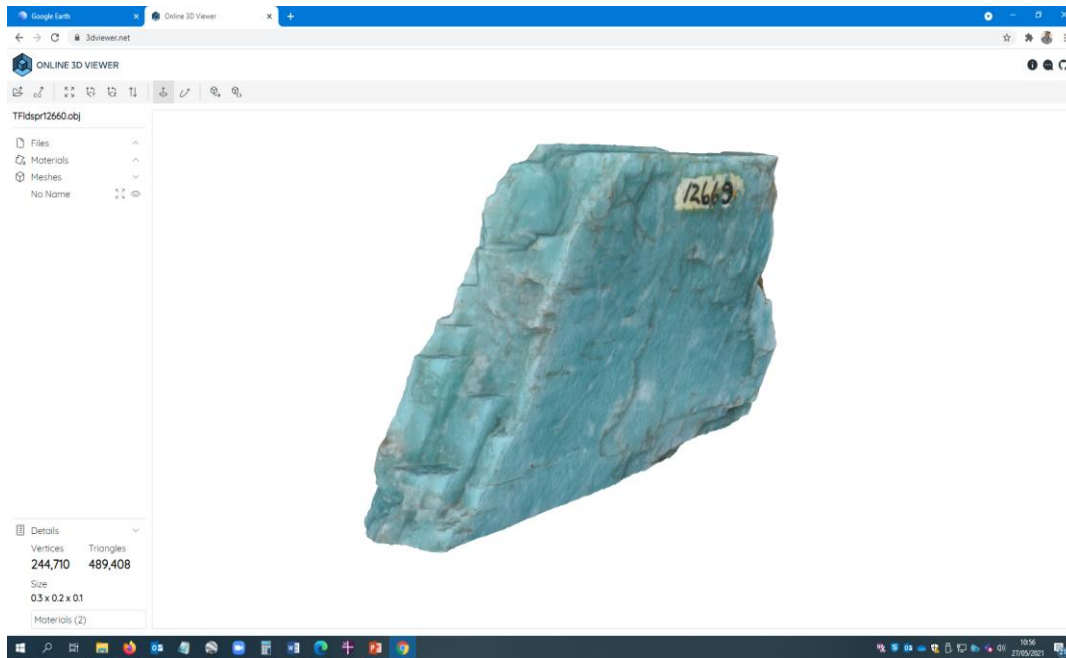
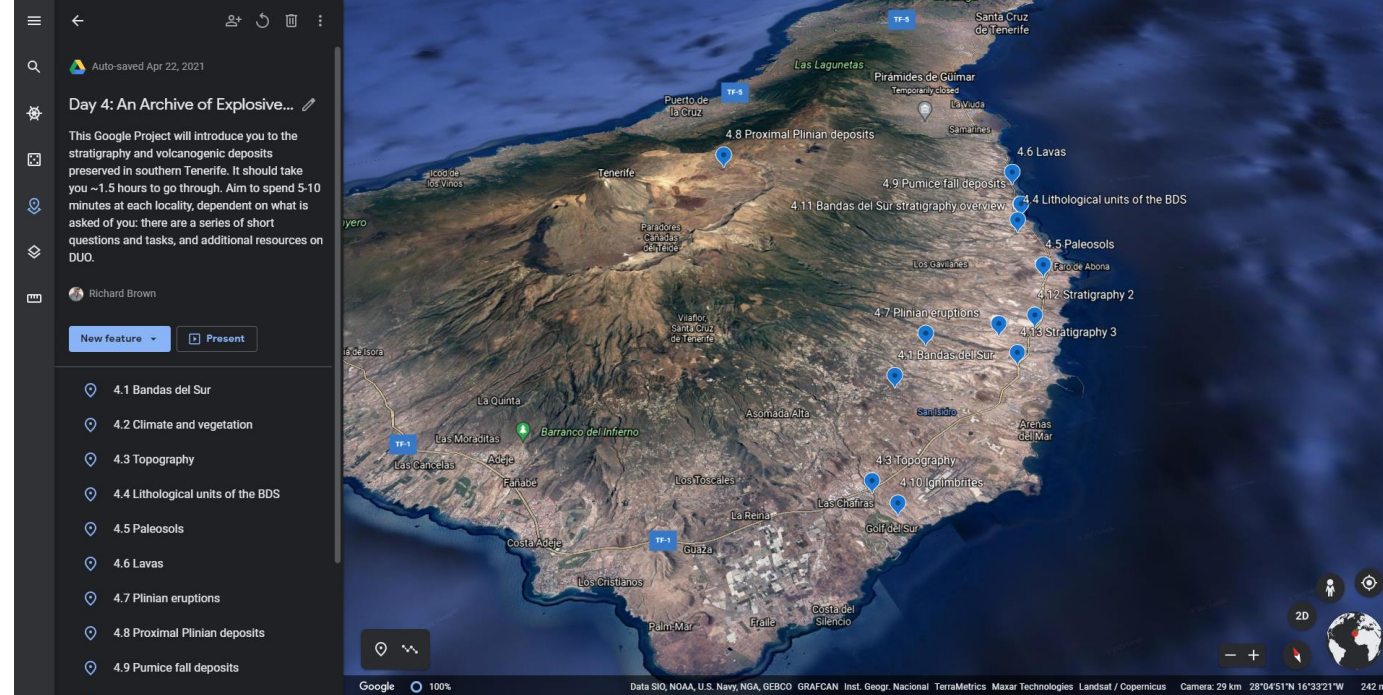
MSci optional fieldtrip to western USA

Virtual Field Trips

Virtual field trips allows students to immerse themselves in a virtual field learning environment.

They can also enhance a student's experience in the field and provide access to materials and experiences not achievable on foot.

See for yourself – [try this virtual fieldtrip on Tenerife](#) (works best in Google Chrome)



Research-led Education

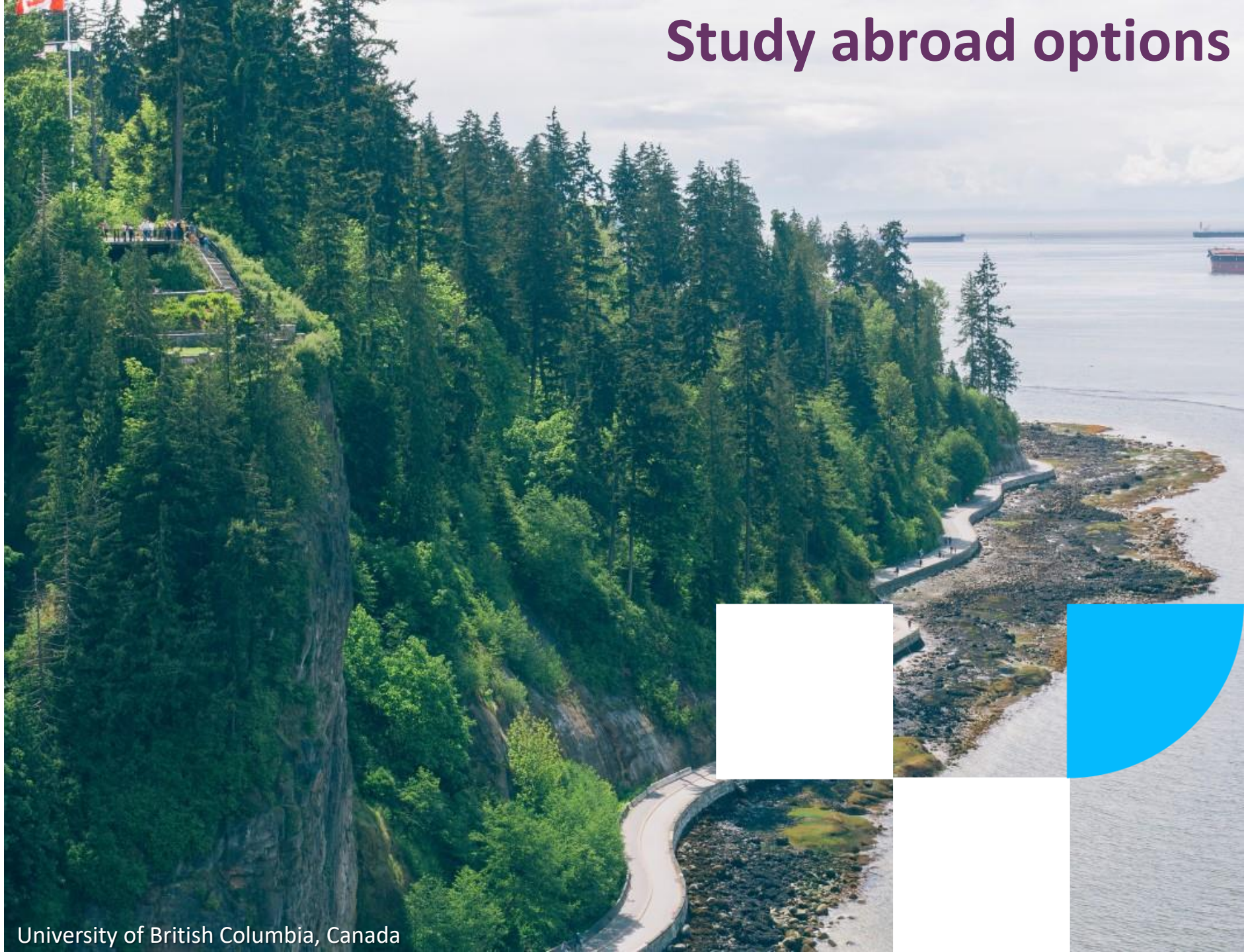
- Learn from world-leading researchers who are experts in their subject
- Cutting edge science integrated into degree course
- Inquiry-based learning rather than acquisition of content.
- Learn by doing – conduct your own research dissertation



Study abroad options

- Our degree programmes all offer a year abroad at one of our partner universities
 - *As a year out for our 3 year degrees*
 - *Included within our 4 year degrees*
- Current partner universities
 - *9 in Asia*
 - *3 in Australia/New Zealand*
 - *7 in Canada, 1 in USA*
 - *2 in South America*

durham.ac.uk/international/studyabroad/outbound





ARTHUR HOLMES GEOLOGICAL SOCIETY

THE SOCIETY FOR EARTH SCIENTISTS AT DURHAM UNIVERSITY



AHGS PRESENTS:

The Crystal Ball

10.02.2023

RADISSON BLU HOTEL

Socials, stash & seminars!



16 likes

arthurholmesgeologicalsociety Big thanks to those that made cakes for the AHGS Bake Off. We're... more

POLAR FIELDWORK EXPERIENCES

WITH

CAT HIRST HEDA AGIC & CATRIONA MENZIES

AHGS CAREERS

DURHAM UNIVERSITY

Employer: Shearwater

Virtual Employer Presentation

Tuesday 1st November
12.00 noon Zoom

Opportunities in STEM panel

Friday 4th November
13.00 Zoom

Athena SWAN Bronze Award EarthSciences

Graduate Careers in Earth Sciences





The Clean Growth Strategy

Leading the way to a low carbon future



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>

UK skills shortage in Earth scientists

[Immigration Rules - Immigration Rules Appendix Shortage Occupation List - Guidance - GOV.UK \(www.gov.uk\)](#)

Preparing you for a Profession

- Academic staff work closely with industry and can provide advice on careers in the Earth Sciences
- Durham Earth Sciences Advisory Board (DESAB): Professionals advise us on aligning our teaching with industry needs.
- Courses are designed to provide you with the skills needed to face 21st century challenges in science and industry.



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Year in Industry BSc

- available on any 3 year programme
- Student arranges placement with support from science faculty

Earth Sciences (MSci)

- module *Earth Science into Industry*
- teams of students work with industrial partners on a project that is important to them



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
CG93 Chemistry Building or visit the Admissions Desk in
the Teaching and Learning Centre/Business School



College Allocation and Preferences

- We no longer ask you to make a college preference on your UCAS Application Form. The only option listed at UCAS is 'Durham City'
- Your college is NOT linked to your degree subject
- Before we allocate your college, you will be invited to rank the colleges in the order of your preference
- You will be allocated your college in or around May

To find out more visit the Colleges Hub on the top floor of the Teaching and Learning Centre



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.
- Our experts teach expansive, cutting edge, research-led courses with high degrees of flexibility.
- We produce high-calibre graduates who are highly sought-after by a wide range of employers.



Contact us



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



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

durham.ac.uk/earth.sciences/ugadmissions

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



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