

Can Geology Save The World?



Prof. Christopher Jackson (he/him/his)

 @seis_matters

GEOSCIENCE for
the **FUTURE**

#BLACK 
in GEOSCIENCE

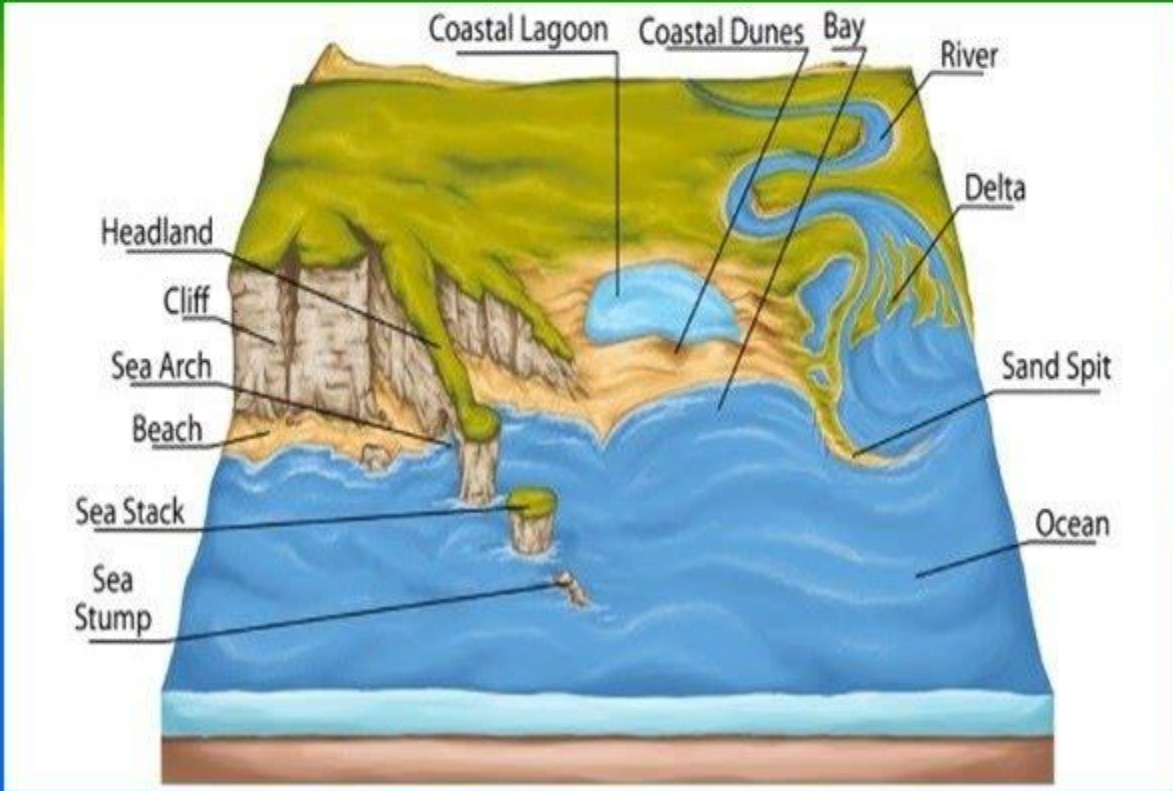


YES!

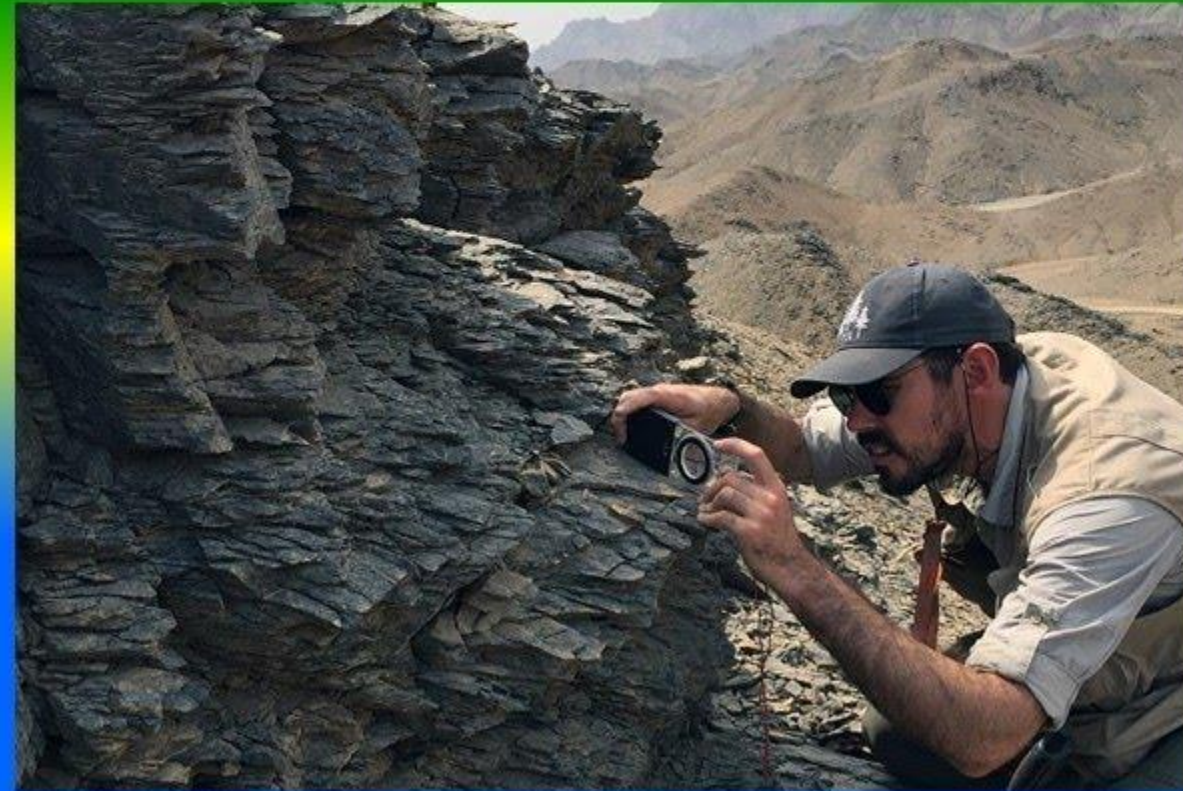


Difference Between

Geography



Geology

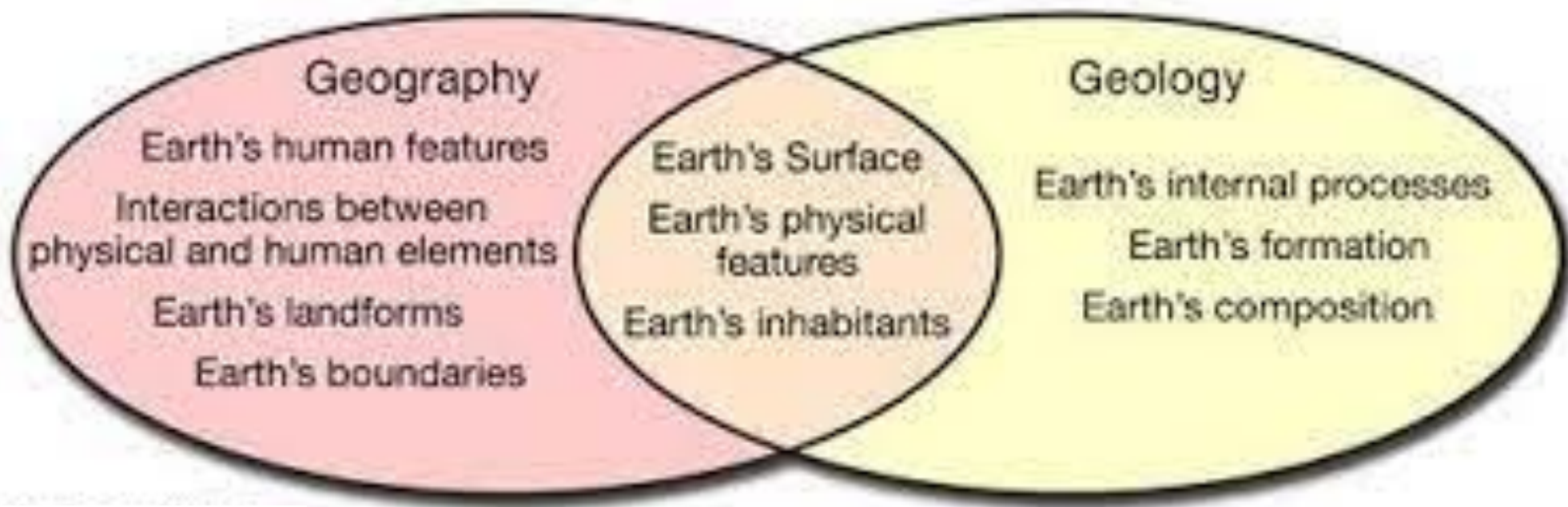




Geography

VS

Geology



“ GEOSCIENCE STUDENT NUMBERS ARE DWINDLING. THIS SPECIAL ISSUE ON GEOSCIENCE EDUCATION DELVES INTO THE POTENTIAL CAUSES, AS WELL AS INITIATIVES THAT AIM TO TACKLE THIS DEPRESSING TREND ”

FROM THE EDITOR'S DESK:

Halt the decline

Globally, geoscience departments are reporting that student enrolment in degree courses is declining. The reasons for this drop off are manifold and complex. In the UK, the dearth of exposure to geoscience, and particularly geology, during early education, the lack of focus on geology as a standalone subject, a shortage of trained teachers, and the erosion of the subject's status as a science all contribute to diminishing uptake (see page 16).

Perception is a major issue. Many people don't fully comprehend the essential role the geosciences must play in addressing the grand challenges and several geoscientific professions are not viewed as noble in the way they once were. The association of geoscience with the oil-and-gas and extractive industries has (not unfairly) led to the subject being labelled as 'dirty' (page 9), and few youngsters are interested in studying a subject that they perceive as having played a central role in damaging our planet. The problem is, geoscience also has a crucial part to play in fixing these issues and creating a pathway to sustainable development—we desperately need a new generation of skilled, passionate geoscientists to take up this mantle.

For example, the successful implementation of carbon capture and storage, the effective management of water resources, as well as the adequate supply of the raw materials needed to create renewable energy technologies, the infrastructure that underpins efficient, functional cities, and the fertiliser that nourishes crops to feed our exploding population, all rely on experts with an intricate understanding of the subsurface and Earth systems.

Fortunately, several initiatives are underway to boost teaching, challenge public perceptions and revamp geoscience-training courses. Organisations such as the Earth Science

Teachers' Association (page 16) and our own Society (page 8) are working with teachers in schools and universities to raise geology's profile. Post-graduate training courses are also evolving. On page 10, John Underhill discusses the Centre for Doctoral Training model—an exemplar of how a training course can successfully evolve from its oil-and-gas remit to address the challenges faced by society in the 21st Century.

This training evolution goes well beyond a simple rebrand. The next generation of geoscientists will need an expanded skill set that incorporates economics, social science and policy, and our training provisions must reflect this. Geoscientists will also need to work closely with experts from these sectors. The Researching Social Theories, Resources, and Environment International Summer School (page 24) was setup with precisely this aim—to facilitate connections between disparate disciplines and build a global community to tackle the issues of sustainable resource extraction.

It is heartening to learn that many in our community are working to halt the subject's decline. But, geology as a discipline remains at risk and we must each take every opportunity to engage the next generation. Complacency may contribute to the demise of our science.

In other news, change is coming. From mid-October, I will head off on maternity leave and Sarah Day will take over as *Geoscientist* Editor. Sarah will be familiar to many, having worked at the Society for 11 years as Earth Science Communicator and Head of Media Relations & Outreach. Sarah studied Natural Sciences, as well as the History & Philosophy of Science & Medicine at Durham University, before completing a Masters in Science Communication at Imperial College London. She is also an award-winning author, so I look forward to spending my sleep-deprived leave reading her beautifully crafted editorials.

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Editorial | [Published: 08 September 2021](#)

Geoscience on the chopping block

[Nature Reviews Earth & Environment](#) **2**, 587 (2021) | [Cite this article](#)

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[A Publisher Correction](#) to this article was published on 23 September 2021

[This article has been updated](#)

Earth sciences are fundamental to tackling climate change, natural hazards and the energy transition, yet universities worldwide are putting geoscience departments on the chopping block – right when they are needed most.

Royal Holloway mulls job cuts in less popular disciplines

By Fiona McIntyre

Share    



Laurentian University cuts 100 professors, dozens of programs

Sudbury, Ont., school to issue details of tentative agreements later this week as it moves through insolvency

CBC News - Posted: Apr 09, 2021 5:48 PM ET | Last Updated: April 12, 2021



Earth sciences erode at Macquarie U

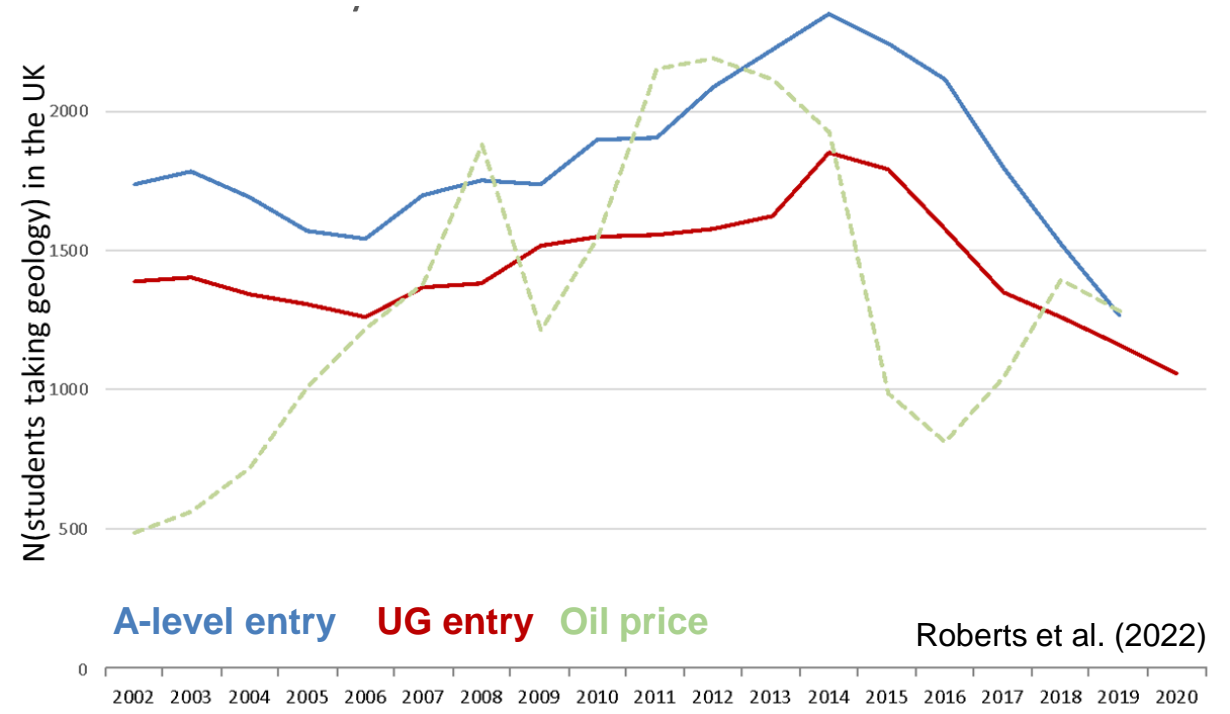
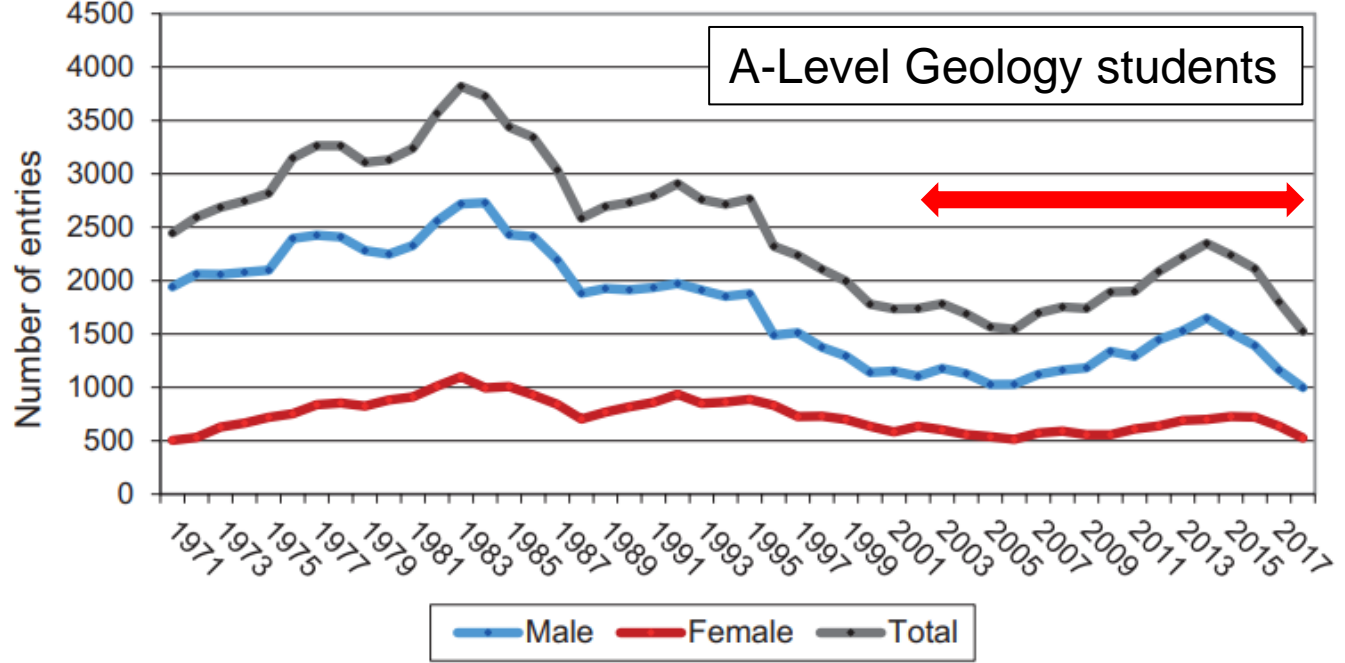
July 19, 2021

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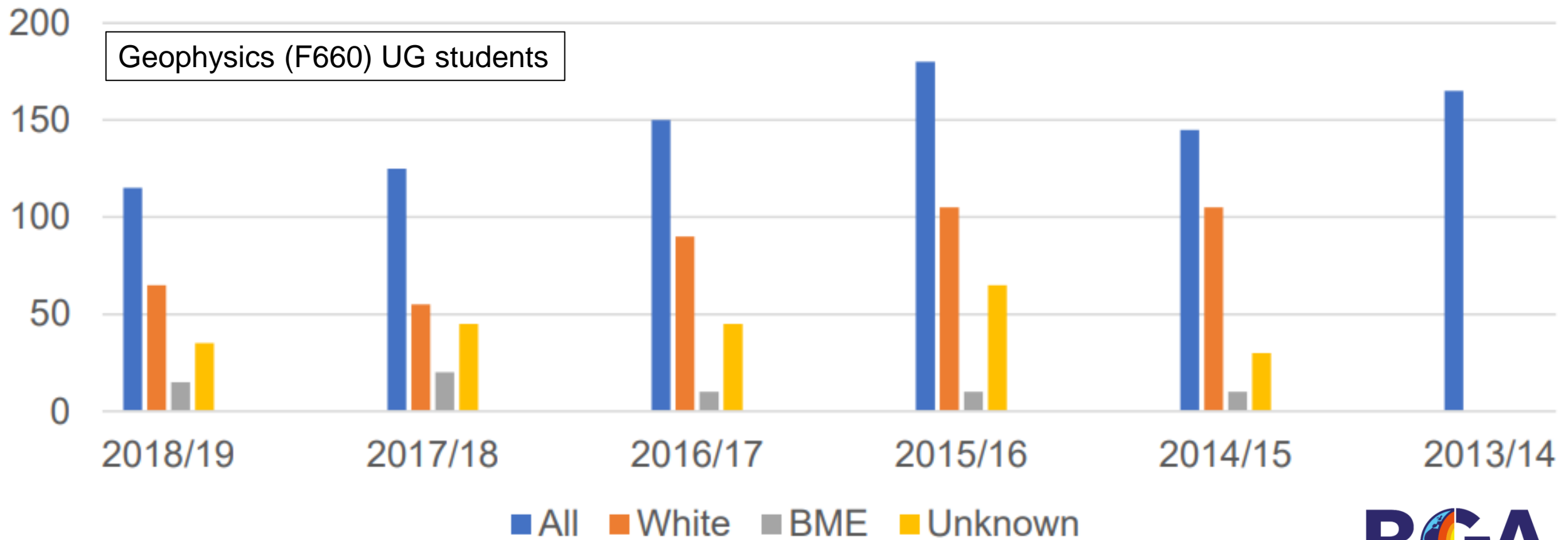
Applications close today for heads of the new schools of Life Science and Fundamental Science at Macquarie U – which marks the end of another job-shedding restructure

The schools were created by department mergers. Biological Sciences, Earth and Environmental Sciences and Molecular Sciences become Life Science. Maths and Stats, Physics and Astronomy are now in Fundamental Sciences.

In terms of the 15 FTE jobs gone there is bad news all over – but observers suggest it is another blow for earth and environmental sciences. Its disciplines took a hit in 2019, when earth and planetary sciences merged with environmental science, people left and there were cuts to what was taught. The research and teaching merits of this were debated back then but observers also suggested it was a way to reduce headcount after a science faculty early retirement scheme had not reached savings target (CMM July 9 2019).



Roberts et al. (2022)



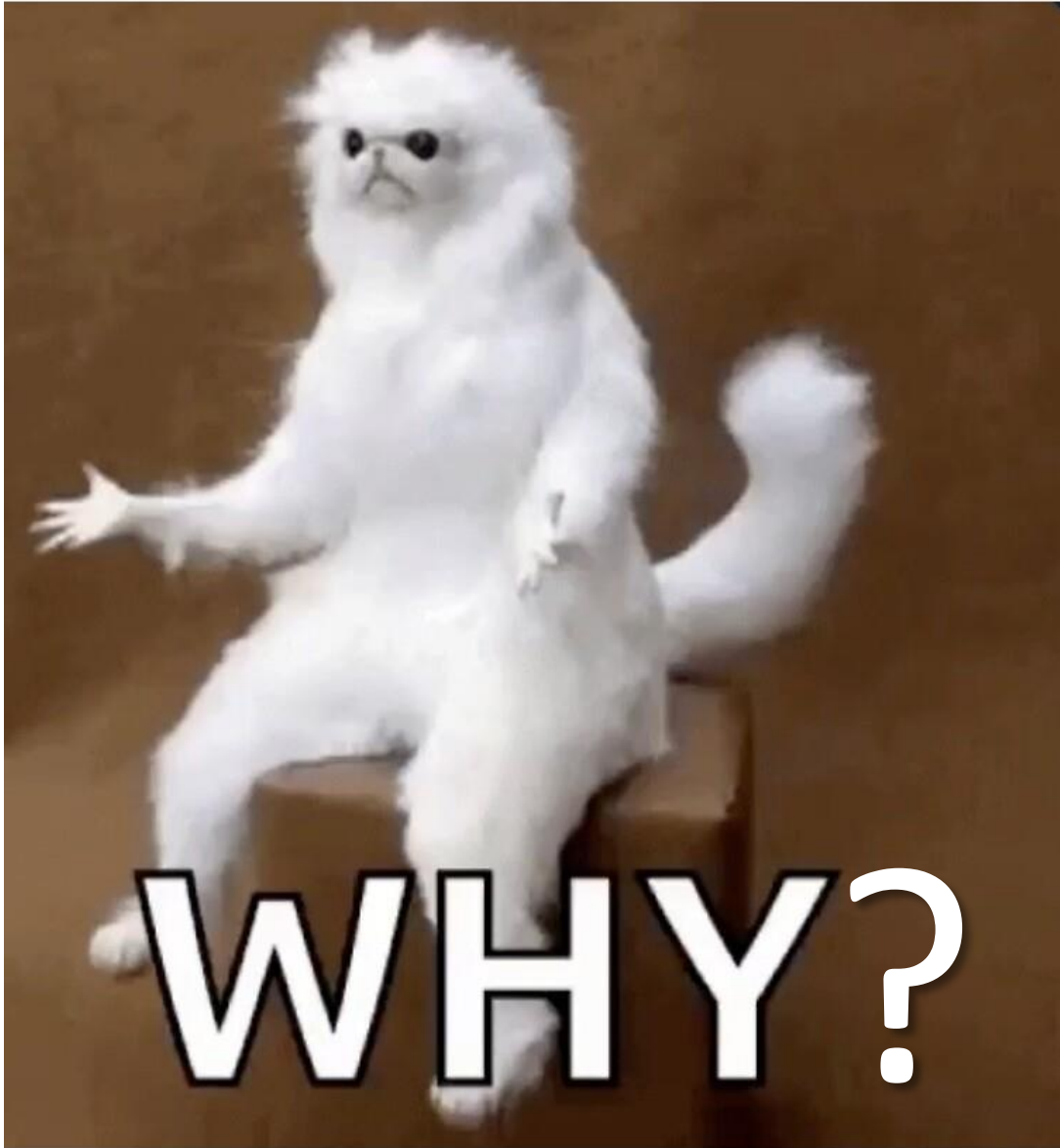
“Without action, the decline in skilled graduates will pose a serious and economically damaging skills shortage in the UK, particularly at a critical time of transition for many industries and businesses that rely on geological expertise...” (UGUK, 2020)



The Geological Society

-serving science, profession & society

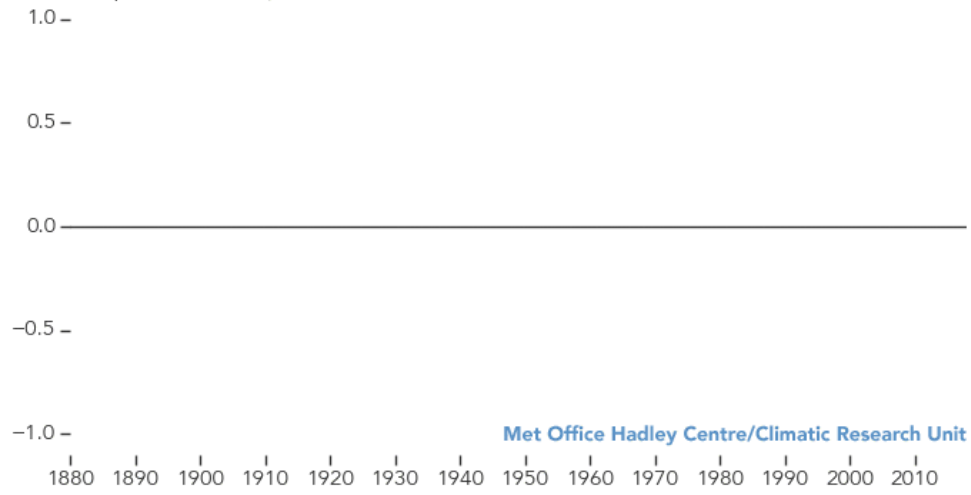


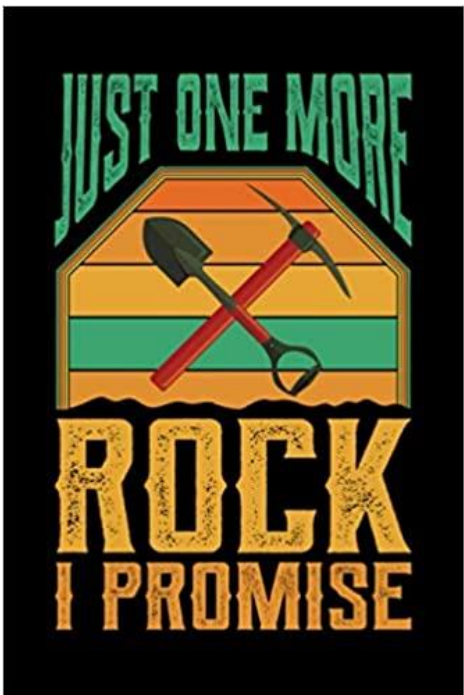
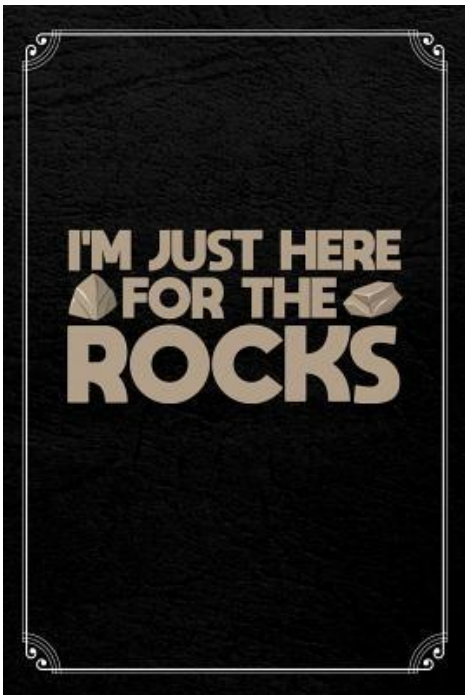




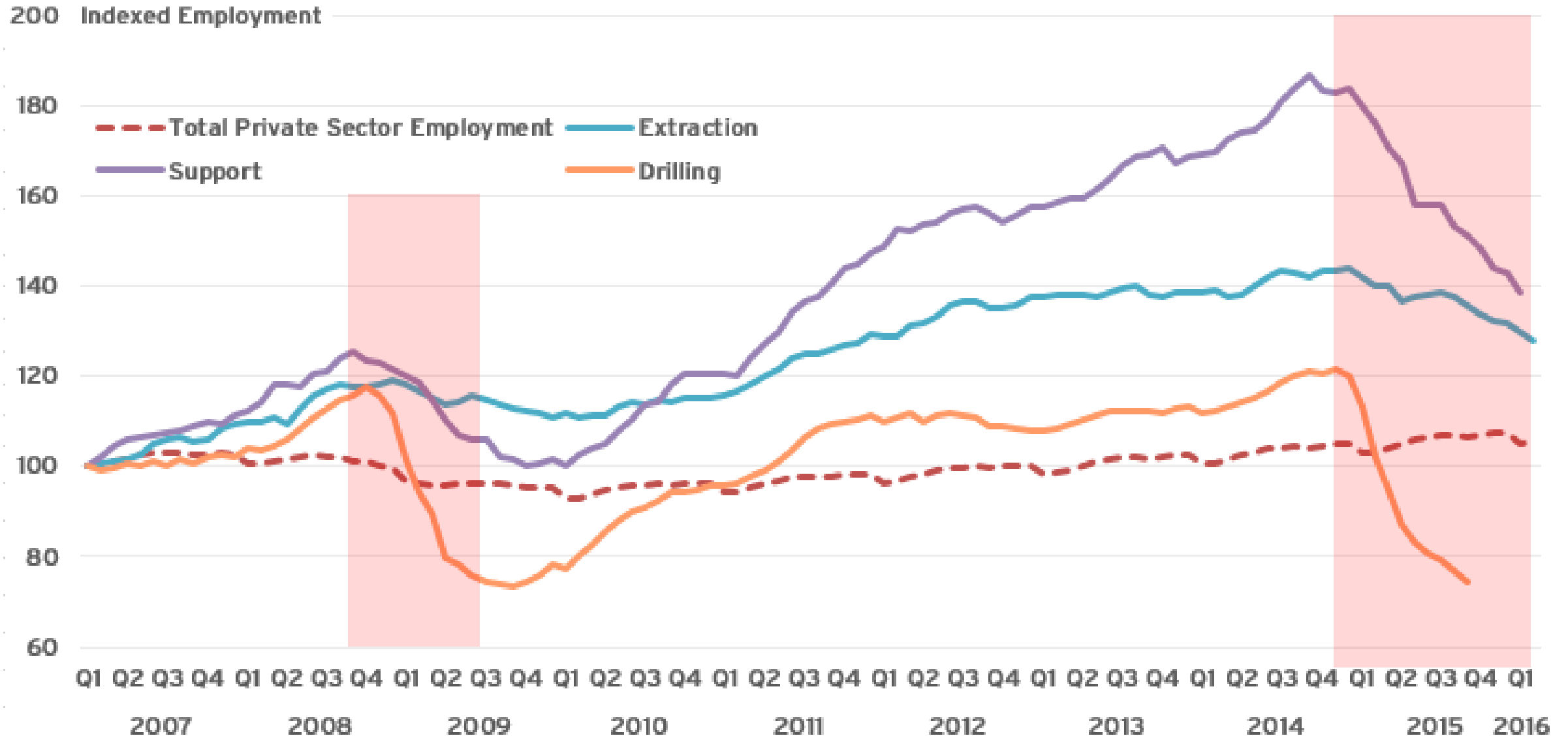
A World of Agreement: Temperatures are Rising

Global Temperature Anomaly (°C)





Employment in Oil and Gas Drilling and Support Services



SUSTAINABLE DEVELOPMENT GOALS



“...a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity...”

GEOSCIENCE FOR THE FUTURE

Geoscientists will be crucial in meeting society's future challenges, be that through the United Nations Sustainable Development Goals, the Paris Agreement to avoid dangerous climate change, or through other important policies to protect the environment and ensure the availability of vital resources for all.

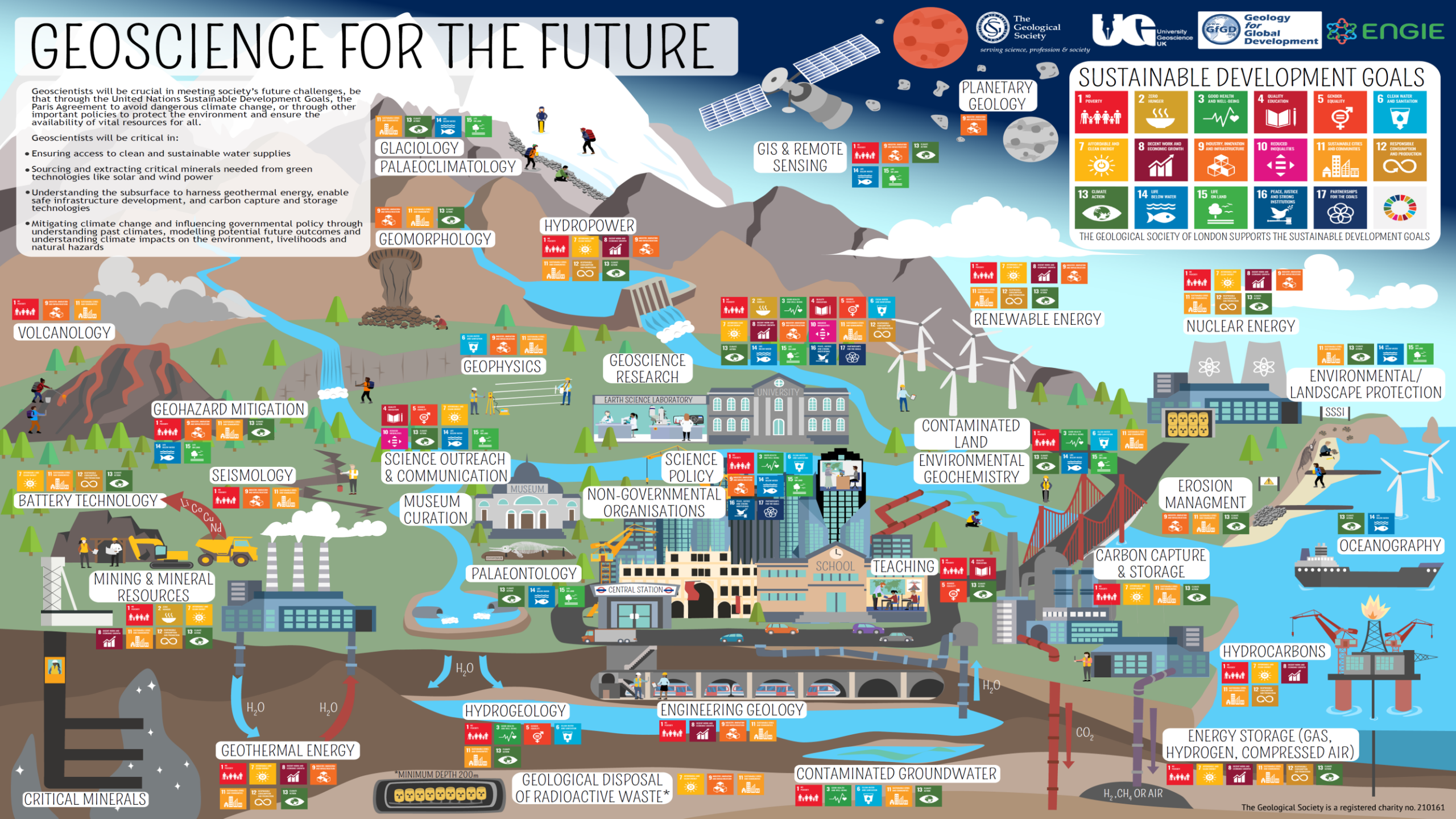
Geoscientists will be critical in:

- Ensuring access to clean and sustainable water supplies
- Sourcing and extracting critical minerals needed from green technologies like solar and wind power
- Understanding the subsurface to harness geothermal energy, enable safe infrastructure development, and carbon capture and storage technologies
- Mitigating climate change and influencing governmental policy through understanding past climates, modelling potential future outcomes and understanding climate impacts on the environment, livelihoods and natural hazards



SUSTAINABLE DEVELOPMENT GOALS

THE GEOLOGICAL SOCIETY OF LONDON SUPPORTS THE SUSTAINABLE DEVELOPMENT GOALS



GLACIOLOGY
PALAEOCLIMATOLOGY

GIS & REMOTE SENSING

PLANETARY GEOLOGY

GEOLOGY
GEOGRAPHY

HYDROPOWER

VOLCANOLOGY

RENEWABLE ENERGY

NUCLEAR ENERGY

GEOPHYSICS

GEOSCIENCE RESEARCH

ENVIRONMENTAL/
LANDSCAPE PROTECTION

GEOHAZARD MITIGATION

SCIENCE OUTREACH & COMMUNICATION

SCIENCE POLICY

CONTAMINATED LAND
ENVIRONMENTAL GEOCHEMISTRY

BATTERY TECHNOLOGY

MUSEUM CURATION

NON-GOVERNMENTAL ORGANISATIONS

EROSION MANAGEMENT

MINING & MINERAL RESOURCES

PALAEOONTOLOGY

TEACHING

CARBON CAPTURE & STORAGE

OCEANOGRAPHY

GEO THERMAL ENERGY

HYDROGEOLOGY

ENGINEERING GEOLOGY

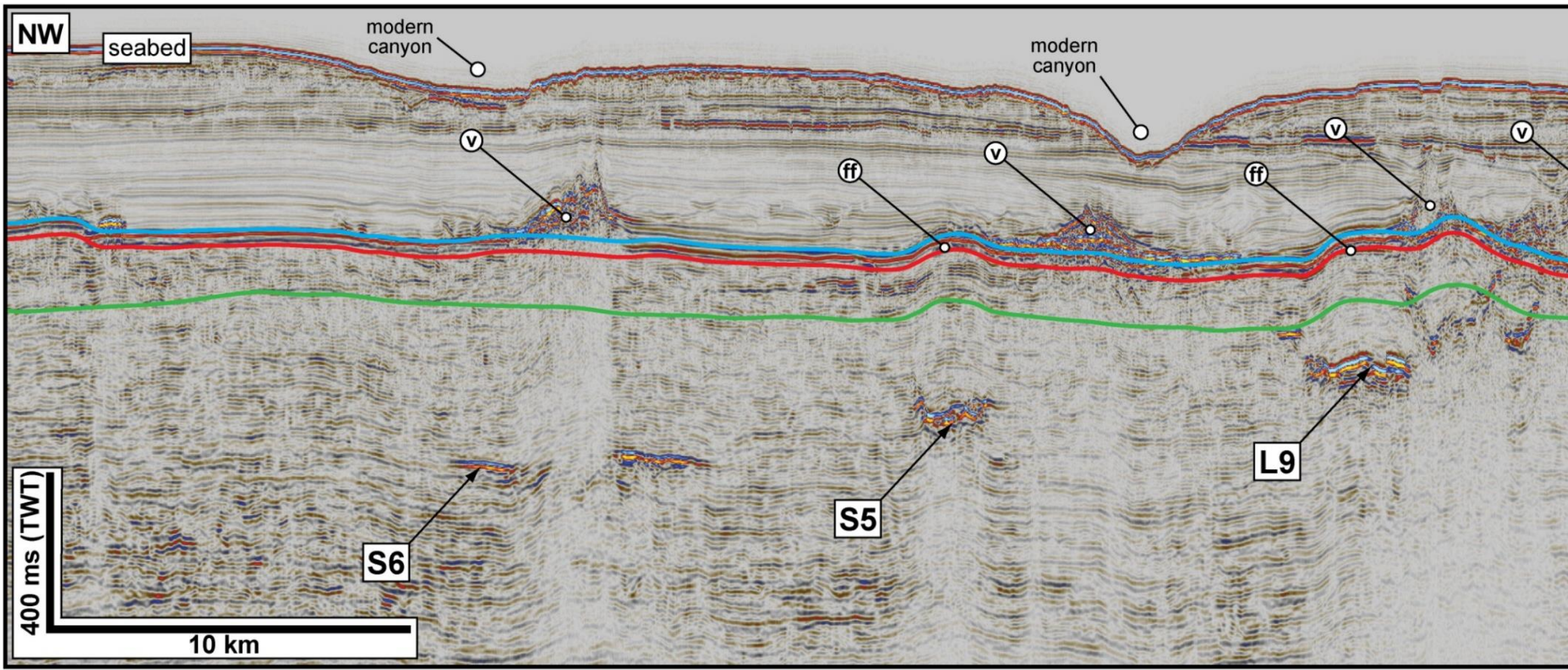
HYDROCARBONS

CRITICAL MINERALS

*MINIMUM DEPTH 200m
GEOLOGICAL DISPOSAL OF RADIOACTIVE WASTE*

CONTAMINATED GROUNDWATER

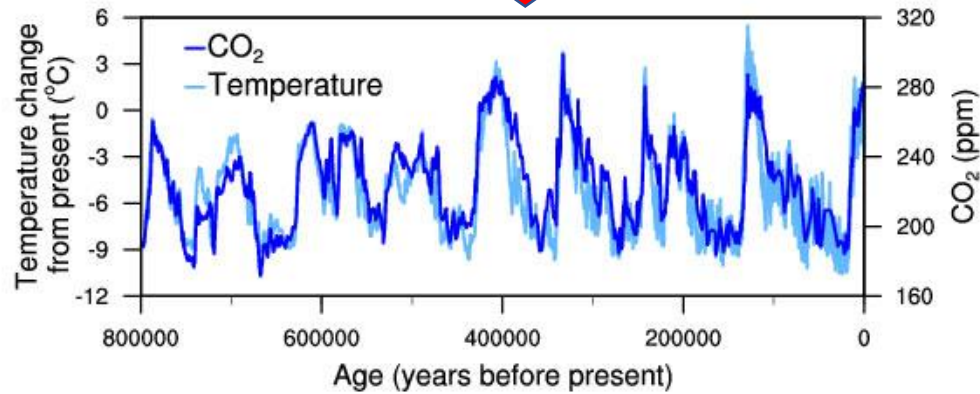
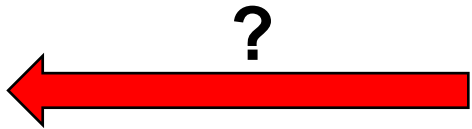
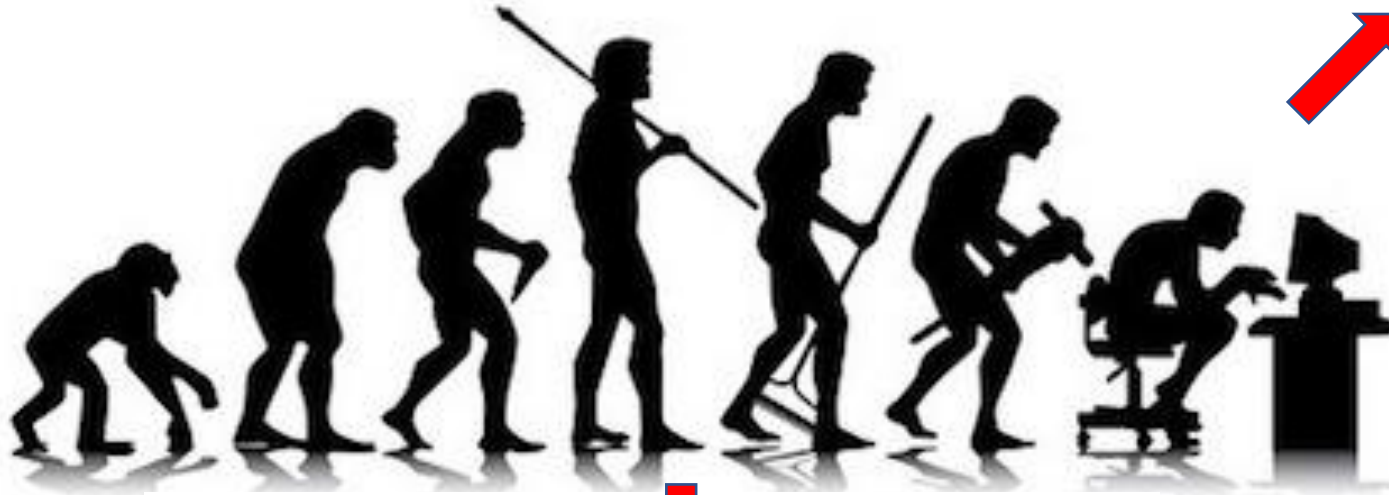
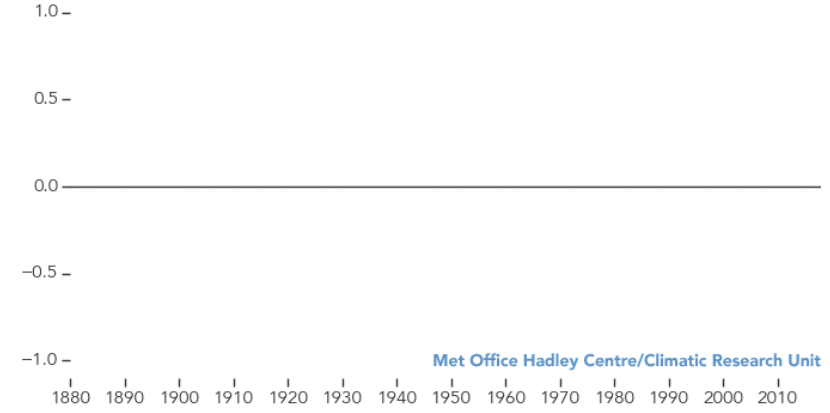
ENERGY STORAGE (GAS, HYDROGEN, COMPRESSED AIR)

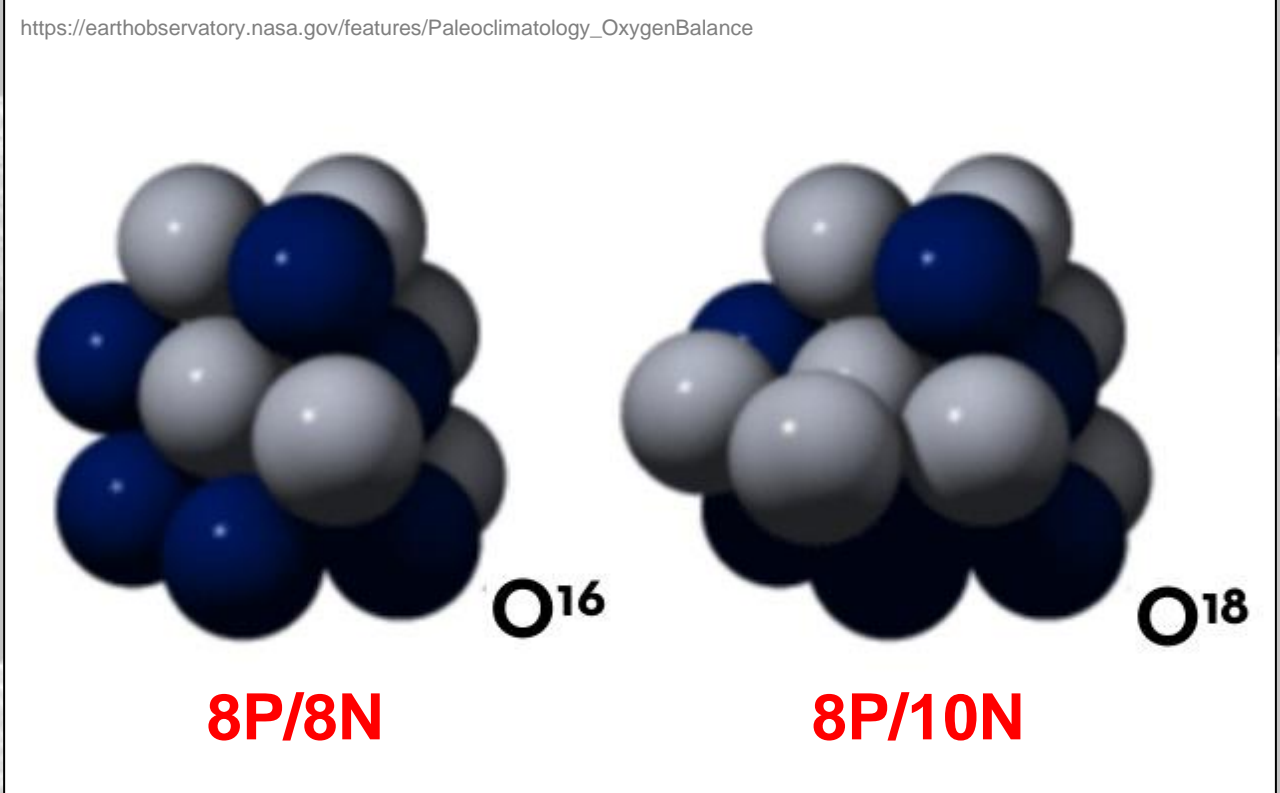




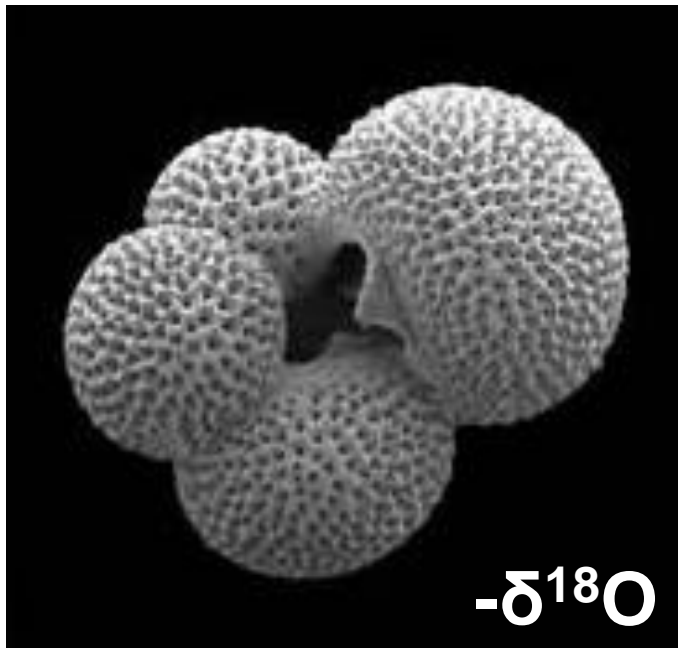
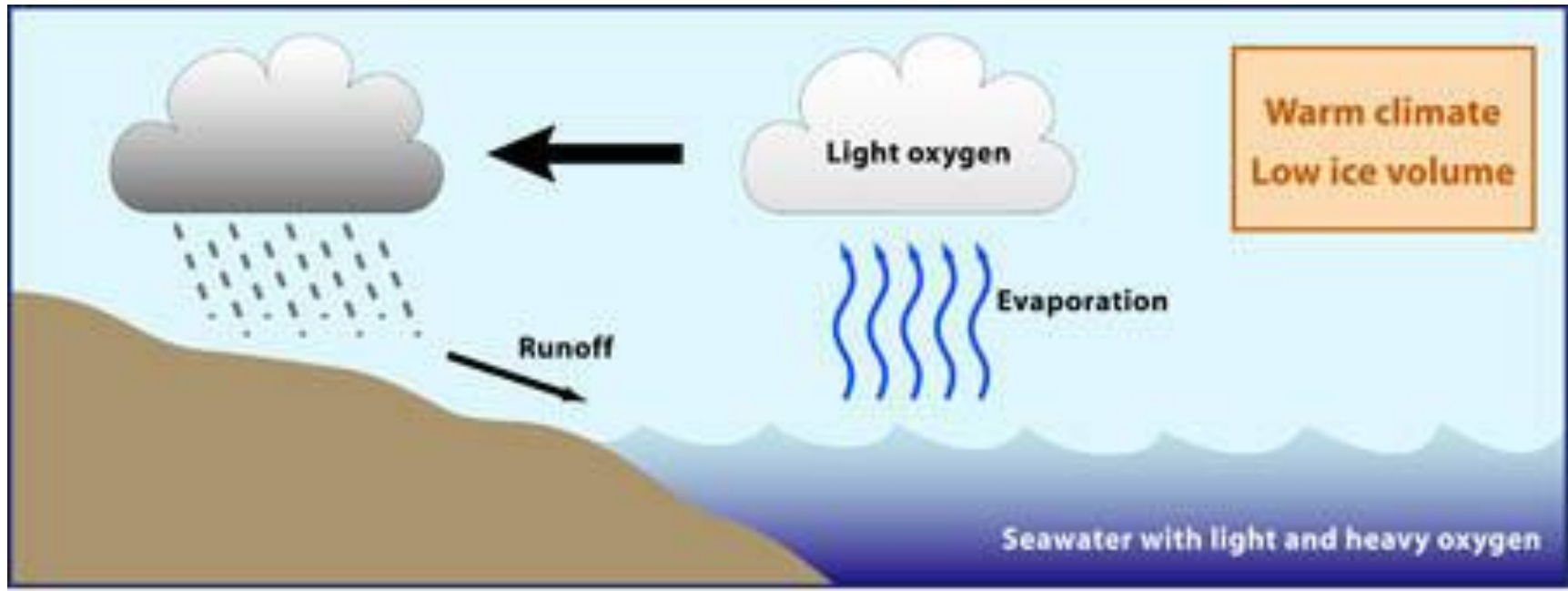
A World of Agreement: Temperatures are Rising

Global Temperature Anomaly (°C)

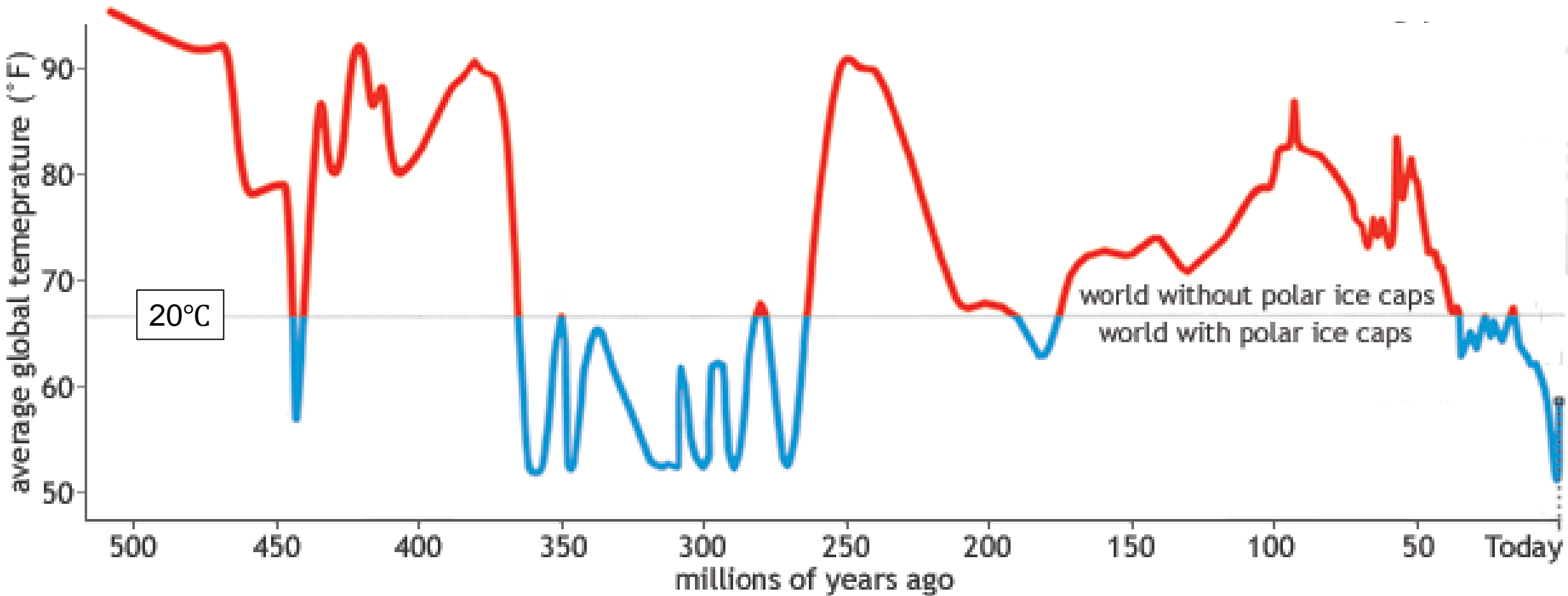




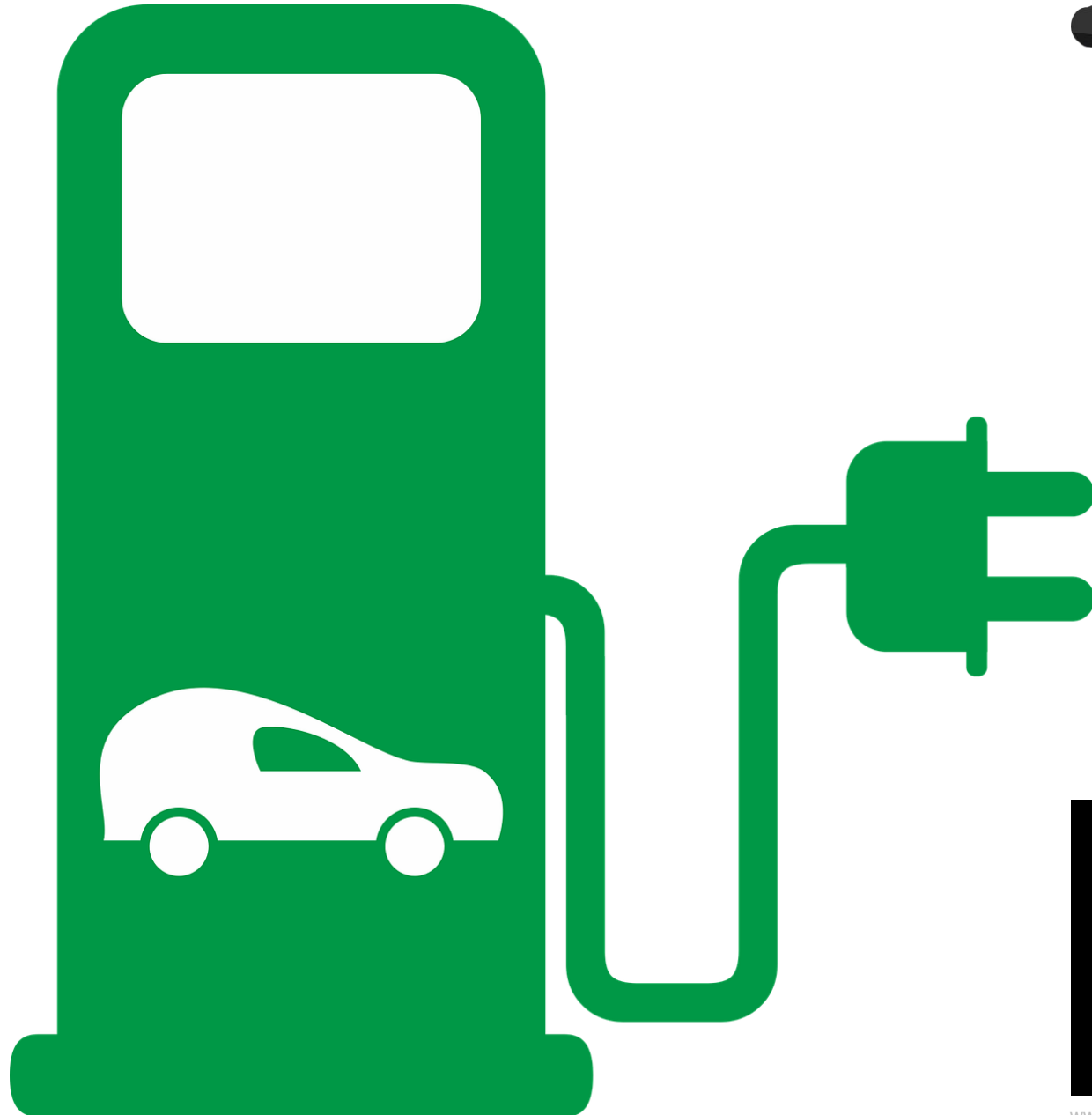
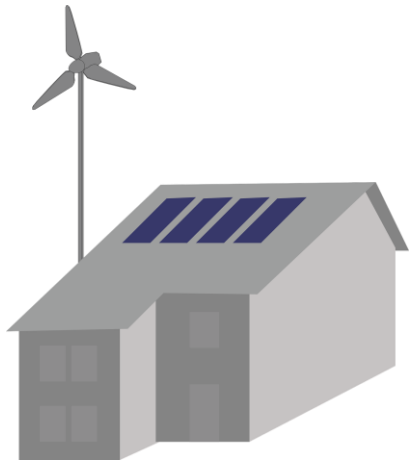
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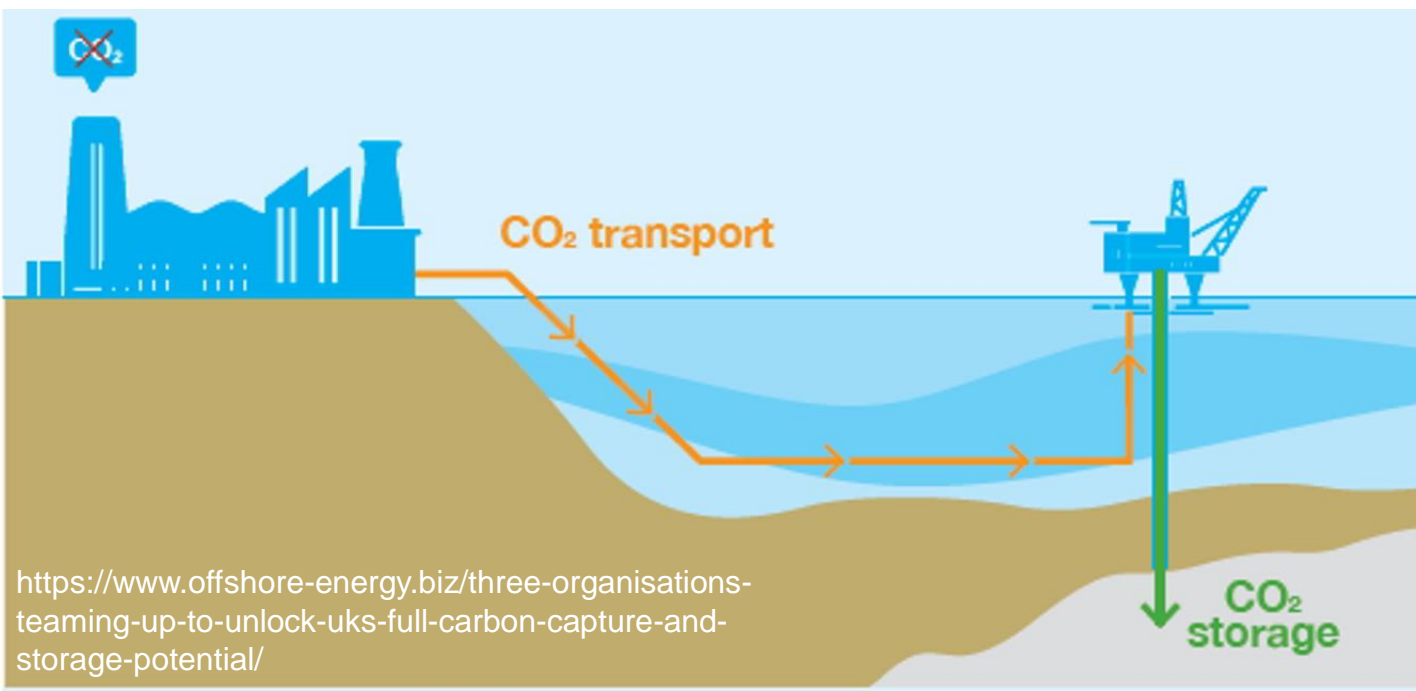
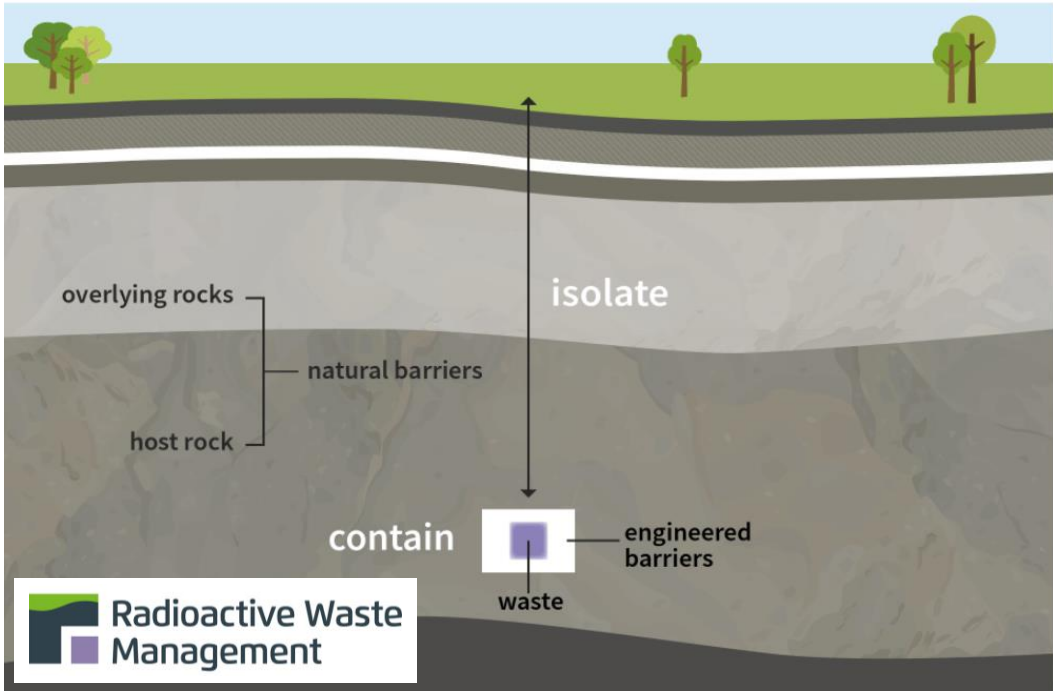
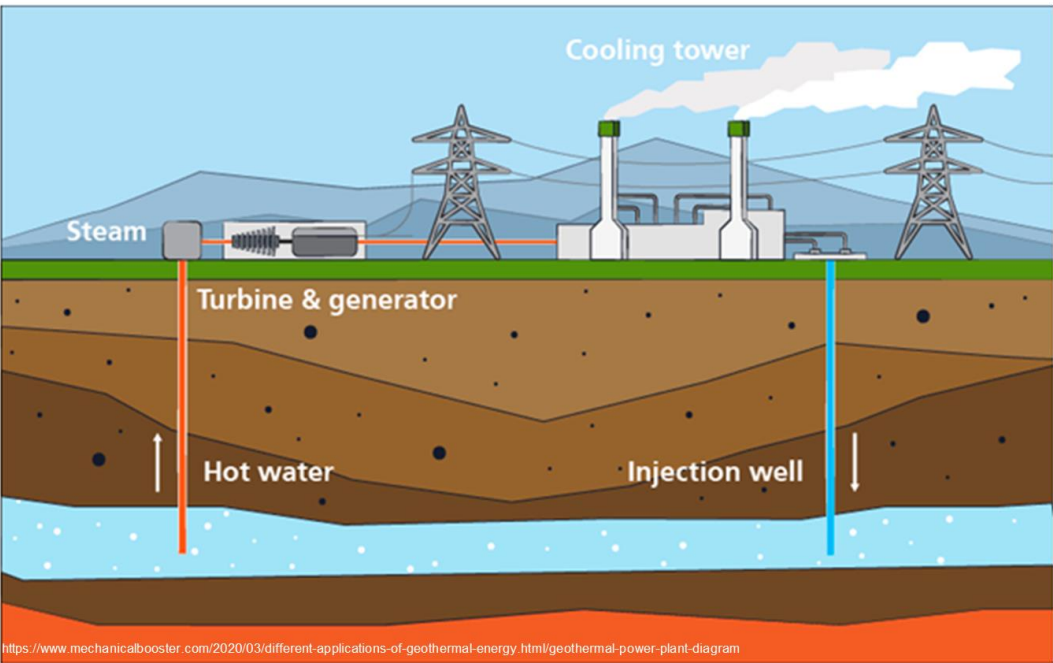


Estimated global temperature over the last 500 million years









Engineering Geologist



£21,000-£50,000++

Hydrogeologist



£17,000-£50,000+

£

Environmental Geologist



£16,000-£52,000+

Mining and Quarrying Geologist



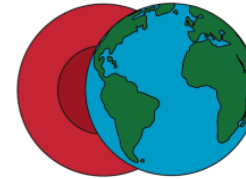
£20,000-£75,000+





Draft Strategic Aims for UK Geoscience Education 2020-2025

- S1. Create an effective forum for collaboration between the diverse range of geoscience bodies in the UK, facilitated by the Geological Society, to develop a unified voice for the geosciences and to promote a coherent narrative of geoscience as a STEM subject of vital importance to addressing societal challenges.
- S2. Engage with various government departments and agencies, to ensure that the importance of the geosciences to meeting net zero targets, addressing the UN SDGs and leading the UK through the energy transition and underpinning "clean and green growth" is recognised and to ensure geosciences are accurately reflected in research and industrial strategies.
- S3. Develop a unified voice and view of what geoscience encompasses, its place among the STEM subjects, and its importance to society that can be communicated through education and outreach programming.
- S4. Attract and support people from a diverse range of background, culture and gender to become geoscientists, creating a vibrant community fit for the grand challenges facing industry and academia in the UK.
- S5. Support teachers of STEM subjects, higher education advisors, career counsellors and parents in confidently teaching geoscience concepts and their relevance to society in a way that emphasizes geoscience careers as essential to providing solutions for grand challenges and for community development



Earth Science Teachers' Association

SUPPORTING EARTH SCIENCE TEACHING THROUGH GEOLOGY, GEOGRAPHY & THE SCIENCES



Geology
for
Global
Development

BLACK
GEOGRAPHERS

GEOSCIENCE for
the **FUTURE**

PRIDE IN ENERGY

GiG
GIRLS INTO GEOSCIENCE

W WOMEN
M IN MINING



**THE NEW NATURAL HISTORY
GCSE AND HOW WE'RE LEADING
THE WAY IN CLIMATE AND
SUSTAINABILITY EDUCATION
- YOUR QUESTIONS ANSWERED**



Department
for Education



Earth sciences face a crisis of sustainability

Why geology must abandon fossil fuels and embrace sustainability

Geologists have often served fossil fuel exploration – now is the time for them to focus on climate change and other sustainable development goals instead, says **Christopher Jackson**

EARTH | COMMENT 9 December 2020

By **Christopher Jackson**



Michelle D'urbano

To preserve its appeal, the subject needs to overcome its reputation as a mere feeder for the oil and gas industries, say four geologists

January 14, 2020

Fabian Wadsworth, Edward Llewellyn, Richard Brown Andrew Aplin

Twitter: [@FabianWadsworth](#)



GEOSCIENTIST

The magazine of the Geological Society of London

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FEATURES

Reimagining applied geoscience for the energy transition

Phil Ringrose offers some framing perspectives on what the energy transition may entail for practising geoscientists working in the Earth-resources industries

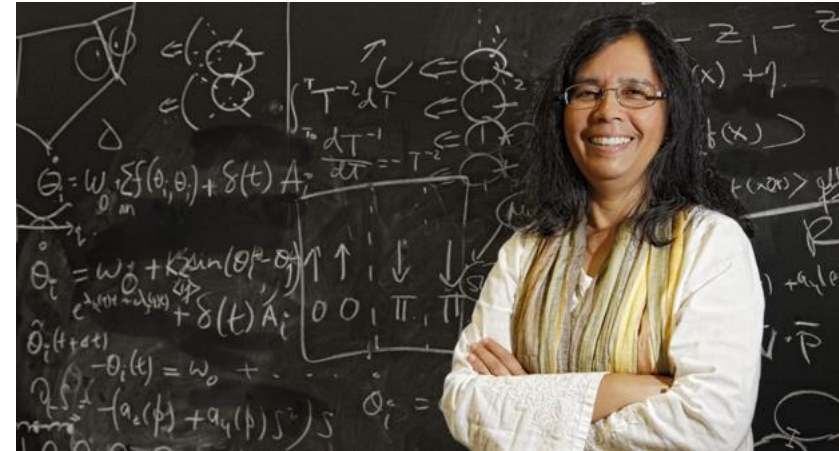
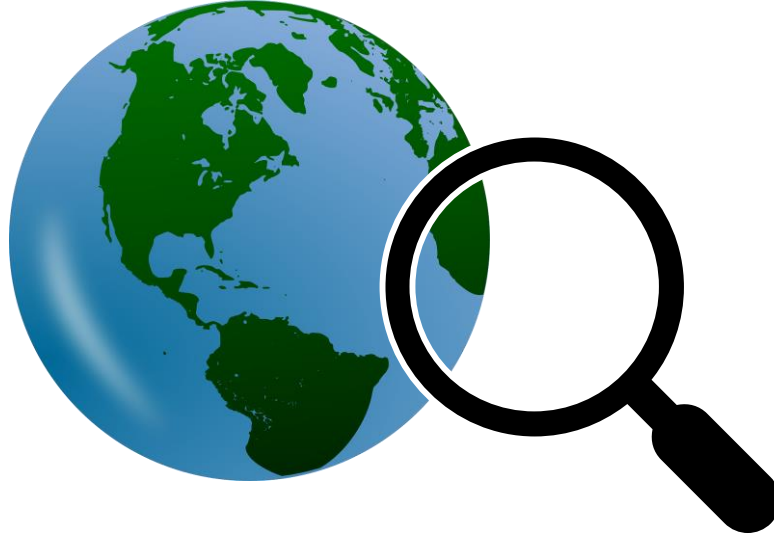


Words by Professor Philip Ringrose
1 September 2021



#SCICOMM

Who Are Earth Scientists?



WE NEED YOU!



Disability (visible and invisible) - 17% of UK-domiciled geology undergrads have a known disability (HESA, 2018)

Socio-economic circumstance, race, and ethnicity - “In a recent unpublished Geological Society survey of undergraduate students, 60% of respondents mentioned a lifelong interest in the natural environment.” Dowey et al. (2021)

Sexual and gender identity - “[people] need to be aware of...potential dangers to LGBTQ+ geoscientists at field sites.” Olcott & Downen (2020)

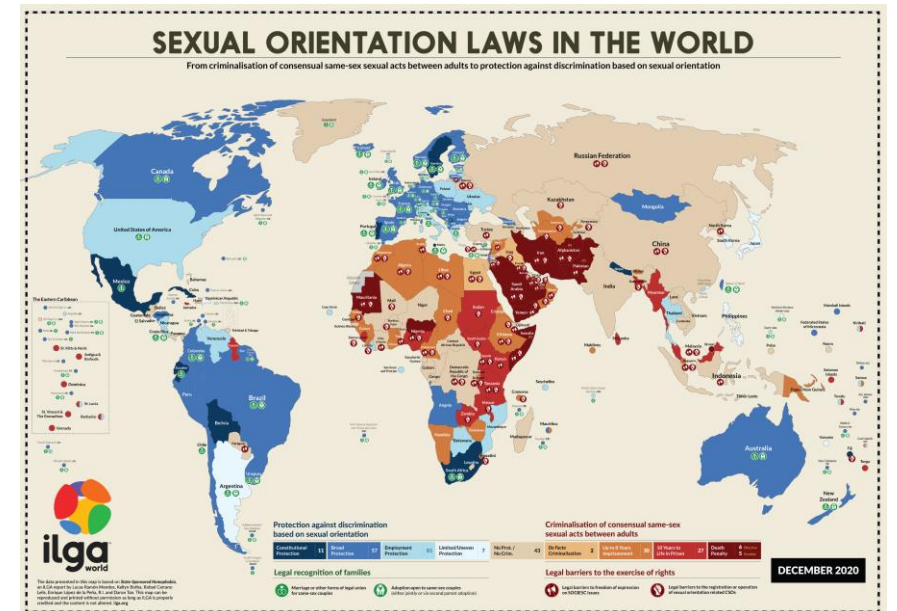
Frankie Butler



<https://twitter.com/frankiealoise/status/1402537930107899905?s=20>

Dr Anjana Khatwa

Black and brown faces in green spaces



<https://ilga.org/maps-sexual-orientation-laws>

Can Geology Save The World?





НАКЛЕЙКИ ОНЛАЙН

НАКЛЕЙКИ ОНЛАЙН

...but only
if we work
at it...

YES!