

MSc GeoEnergy

Dr. Stuart Gilfillan, Programme Director 12th November 2024





WE TACKLE PROBLEMS THAT ARE HAPPENING TODAY

About me

- Reader in Geochemistry
- Programme Director for MSc GeoEnergy
- Passionate about enabling the energy transition
- BSc University of Glasgow
- PhD University of Manchester
- Postdoc, NERC Fellowship, Chancellors Fellowship at University of Edinburgh













What do I do?



Old oil rigs could become CO2 storage sites

🕲 8 August 2019 | 📮 Comments







International Journal of Greenhouse Gas Control Volume 63, August 2017, Pages 215–225

Using noble gas fingerprints at the Kerr Farm to assess CO_2 leakage allegations linked to the Weyburn-Midale CO_2 monitoring and storage project

https://doi.org/10.1016/j.ijggc.2017.05.015

Get rights and content











~ 1°C of warming relative to 1850 - 1900



How close are we to 1.5°C?

2.00

Human-induced warming reached approximately 1°C above pre-industrial levels in 2017

Source: IPCC Special Report on Global Warming of 1.5°C

Current warming rate

EDINBURGH xtraordinary futures await



Extreme heat and wildfires

US wildfires: Firefighters battle raging blazes across western states amid heatwave

 WORLD
 ENVIRONMENT
 CALIFORNIA
 UNITED STATES
 Image: Monday 12 July 2021, 7:19pm



Climate > News

Wildfires spread across more than 1 million acres of US and Canada as California urged to cut energy for fifth time

The fires are fueled by the drought-dried brush and high temperatures

Graig Graziosi | 2 days ago | 1 comments









Heavy rainfall and flooding

Germany and Belgium floods: At least 44 dead and more than 70 missing after heavy rain

Houses have been washed away with many others in danger of collapsing, dozens of people are missing or stranded and 200,000 properties are without power after two days of heavy rain causes rivers to burst their banks across western Germany and neighbouring Belgium.

Edinburgh flooding: Half of July rain fell in one hour

🕓 5 July





() Thursday 15 July 2021 17:44, UK











Paris Agreement - 2015

Aim: Limit increase in global av. temperature to well below 2 °C above pre-industrial levels; and to limit the increase to 1.5 °C, to *substantially reduce the risks and effects of climate change*

 194 states & EU have signed. 178 states & the EU, *representing more than 87%* of global greenhouse gas emissions, have ratified or acceded







Net Zero

Our MSc enables you to pursue a geosciences career in the energy sector as it transitions from fossil fuels to enable a low carbon economy



How to keep global warming below 1.5 °C.



Data source: IPCC, Mercator Research Institute





Why study at The University of Edinburgh?

- Learn from internationally renowned researchers accelerating the transition to a low-carbon economy
- Benefit from the strength of our research groups and established networks with organisations leading the energy transition
- Gain real-world geological field skills through fully-funded field trips to the Scottish Highlands







Full-time programme structure

Find a full list of compulsory and optional courses on <u>Degree Programme Timetables</u>

- Students with a geoscience background
 - 6 compulsory courses, including Future GeoEnergy Resources
 - 1 or 2 option courses
 - 4 month Dissertation on a topic of your choice
- Students without a geoscience background
 - 7 compulsory courses, including Future GeoEnergy Resources
 - 1 or 2 option courses
 - 4 month Dissertation on a topic of your choice









Part-time structure

- A two-year part-time option is available.
- We recommend living within a commutable distance from Edinburgh in order to undertake part-time study.
- Students with a geoscience background
 - Year1
 - 4 compulsory courses
 - 1 or 2 option courses
 - Year 2
 - 2 compulsory courses
 - Dissertation

- Students without a geoscience background
 - Year 1
 - 5 compulsory courses
 - 1 or 2 option courses
 - Year 2
 - 2 compulsory courses
 - Dissertation





Assessment and teaching

- You will experience a range of teaching and assessment styles
- Courses are delivered through a mix of lectures, seminars, interactive practical sessions and laboratory work
- Each course/module is taught appropriately for the material









Field trips

- Cohort building day trips throughout Semester 1 & 2
- Week-long residential field excursion to the Scottish Highlands
 - provides a real-world synthesis of the separate strands of GeoEnergy:
 - Carbon capture and storage
 - Energy storage
 - Geothermal energy
 - Hydrogeology
 - Nuclear waste disposal in both hard and soft rocks
 - Subsurface reservoir quality
 - Unconventional and conventional hydrocarbon production









Dissertation topics

Previous topics that have been studied include:

- Assessing the capacity for hydrogen storage and renewable energy provision in the USA
- Assessing the potential for CO₂ storage in the East Irish Sea basin
- What offshore storage capacity for hydrogen is available to the UK in the Southern North Sea and can it be linked to an offshore renewable source?
- Are the current standard leakage mitigation and remediation approaches suitable for hydrogen leakage in the near surface?
- Modelling of microbial growth and corresponding permeability reduction in the subsurface





Career Opportunities

Equips you with the knowledge and skill required to use subsurface geological knowledge for future GeoEnergy applications

- Diverse range of career pathways in low-carbon technologies and disposal of energy-related wastes
- Pursue a career in many energy-related areas, including:
 - Energy companies
 - Energy sector consultancies
 - Civil engineering companies
 - Environmental regulators
 - Environmental consultants
 - Local or national government agencies
 - National research laboratories
 - Non-governmental organisations







Our Graduates

Successfully gained employment worldwide in the public and private sector in roles such as:

- Low carbon consultant
- Energy and Climate Change Consultant
- Research Analyst
- Energy Officer
- Applications Engineer
- Hydrographic Surveyor
- Hydrogeologist
- Flood Risk and Sustainable Water Management Engineer

Organisations our graduates have gained employment include:

- Element Energy
- The Environmental Protection Group Ltd
- Flexitricity
- Wood Mackenzie







Scholarships and funding

- Featured funding
 - <u>ScottishPower Master Scholarships</u>
 - <u>Chevening Scholarships</u>
- School of GeoSciences scholarships
 - <u>See potential funding for GeoSciences students</u>
- You are encouraged to research the range of potential scholarships and other funding outside the University for which you may be eligible.
 - Search for funding





Asking questions

When asking a question, select 'Chat', then type your question







Next steps...







Contact details for follow-up questions

- We apologise if we did not get through all of your questions in the time allotted for this session. If you have further questions that have not been answered, please email: <u>futurestudents@ed.ac.uk</u>
- Or if your query is specifically related to the MSc content please feel free to contact myself at: <u>stuart.gilfillan@ed.ac.uk</u>





Thank you – click 'Leave' when the session ends

Return to your 'e-ticket' to find and attend other sessions you've booked – by clicking on the button in the email we sent you...

Postgraduate Virtual Open Days 14 to 16 November 2023

It's Day One!

Hi {{contact.full_name.first_name|case.camel}},

It is Day One of our Postgraduate Virtual Open Days! We are looking forward to welcoming you during the day.

Joining the event

To access the event, use your 'ticket' link below. The sessions are listed in chronological order and the times shown are in Greenwich Mean Time (<u>GMT</u>). The link to join a session will appear 15 minutes before it starts.





- ...and visit the event homepage:
- <u>https://edin.ac/4gZuP3G</u>







Thank you

Dr. Stuart Gilfillan stuart.gilfillan@ed.ac.uk

