Geoscience on the chopping block

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.

Universities are ruthlessly cutting geoscience departments, funds and staff, bringing a terrible blow to Earth science research worldwide. In Australia, Macquarie University axed their entire Earth science department, while nearly every other university in the eastern states also slashed jobs and undergraduate courses. Laurentian University, Canada, similarly shuttered their School of Environment and discontinued undergraduate and postgraduate courses in environmental sciences, geography and ecology. The Department of Geology at the University of Vermont, USA, also fell onto the chopping block. Royal Holloway, University of London, has plans to reduce staffing in "less popular" Earth sciences, with similar losses anticipated in other UK institutes.

Universities attempt to justify these cuts as dwindling student numbers make courses less profitable. However, decreasing student numbers often follow drastic cuts in government funding in a vicious positive feedback. In Australia, a 29% reduction in 2020 funding for Earth science courses, equivalent to about AU$10,000 per student per year, necessitated decreases in course size, in turn, triggering further drops in enrolment and profit in 2021. Funding reductions also inevitably lead to lower-quality student experiences amidst lecturer, field-course and lab equipment constraints. Academics found themselves stranded, postgraduates were left without supervisors, and undergraduates faced transfers to other institutions.

Such short-sighted plans neglect to consider the need for qualified geoscientists to achieve the United Nations Sustainable Development Goals (SDGs). Scientists trained to manage water resources, monitor pollution, combat coastal erosion, discover technology metals, mitigate climate change, and much more, are critical. Culling Earth science talent pools, rather than increasing and nurturing them, is incredibly impetuous and will have long-term negative consequences — without geoscientists there will be no sustainable future.

There are many inaccurate perceptions that geology graduates' only career options are in the oil industry. Instead, many of the skills and techniques needed to source oil and gas are directly applicable to industries critical to climate change mitigation. As one example, carbon capture and storage can involve pumping CO_2 into spent oil wells in sedimentary basins. Over 2,500 large-scale carbon capture and storage facilities will need to be operational by 2040 to store approximately 190 $GtCO_2$ and contribute to the Paris Agreement — facilities that will need trained geoscientists.

Climate change will only be taken more seriously when a higher percentage of the population has a base understanding of the geosciences. Earth science education at all levels must be recognized as fundamental to tackling climate change on national and international levels. A short-term solution to prevent low student numbers on university geoscience courses would be to provide accessible and compulsory first-year Earth science modules to students from business, politics, law and other STEM subjects. These modules would be similar to the 'core curriculum' system in many US universities, designed to increase students' base knowledge.

Governments around the world must stop funding cuts and start engaging children in the topic at an early age. The interest is there, as demonstrated by pupils striking and fighting for climate action. They demand educational reforms to learn about the urgency, severity and scientific basis of the climate crisis, showing there is a desire to study Earth science en masse.

Yet, geology is often randomly spread across the other sciences or not taught at all. In some cases, geography is not even counted as a science subject. As such, geoscience has kept a low profile in the school curriculum, causing higher-education uptake to be low. Earth and environmental sciences must therefore be recognized as STEM subjects and form a compulsory part of school curriculums up to high school level. In doing so, a higher percentage of the population would have a more advanced understanding of the Earth system. More children would be inspired to take geoscience to higher-education levels, providing the skills necessary to implement the SDGs and continue the fight against climate change.

As the climate crisis rages on, human populations continue to grow and Earth's resources dwindle, it is imperative to have more geoscientists willing and able to mitigate, research and act. If institutions want to call themselves 'sustainable' or 'environmentally friendly', they need to prove this in more than words: they must increase their support to the geosciences and train the next generation.

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