ATSE ELEVATE SCHOLAR
Talia Hawkes

FIELD OF STUDY
Paleoceanography

ARTICLE WORD COUNT
652 words

KEYWORDS
Antarctica, soil analysis, sea levels
ATSE Elevate Scholarship

Digging deep in Antarctic mud

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A degree in paleoceanography can include a lot of looking at screens, graphs and spreadsheets. It can include long hours in the lab and a lot of reading.

For PhD student from the University of Tasmania Talia Hawkes, it has also included a once-in-a-lifetime trip to Antarctica.

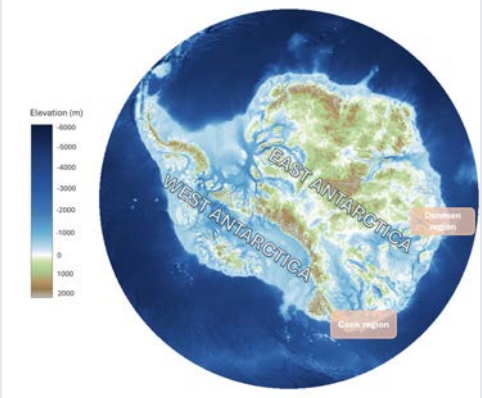
Spending two months on board the Australian research ship RV Investigator, Talia experienced first-hand the exhilarating aspects of scientific fieldwork and genuine cross-disciplinary collaboration. In February 2026, among a group of fantastic scientists and crew members, she saw icebergs, felt the spray of the Southern Ocean and lived through the long days and short nights of an Antarctic summer.

The trip formed a key part of her PhD studies, supported by the Elevate scholarship program from the Australian Academy of Technological Sciences and Engineering. While on board, she collected samples that she will spend the next 2.5 years analysing and understanding. Aiming to optimise analytical chemical methods for the analysis of seawater and rare mud samples from the ocean floor, Talia is building knowledge that will support the work and the findings of other ocean scientists in the future.

To do this, she helped collect long cylinders of mud from the bottom of the ocean, ranging in length from less than a metre to over 20 metres of silt and minerals deposited millimetre by millimetre over tens of thousands of years to form an untouched and invaluable record of the past. For within these mud cores are traces of the ocean as it once was. They tell us the story of past warming periods and ice ages, and the details of their ancient climates.

Understanding these ancient times helps us also understand the modern ocean and ice sheets. Talia does this through her sediment and seawater samples, and in particular, through the lead isotopes found within them. Lead in the sediments is a proxy for lead in the seawater. Lead in the water can tell us about glacial meltwater. And glacial meltwater tells us about the state of Antarctic rock and ice over the past millions of years.

How has Antarctica changed in the past? And what does that tell us about sea level rise in the future? With 58 metres of possible sea level rise currently trapped frozen in Antarctic ice, it's critical we understand the rates of melting at vulnerable glaciers around the continent. This, and much more, can be learnt from the analysis of ocean floor mud cores.



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But applying these methods of analysis to East Antarctic samples is relatively scientifically novel. For Talia, that's both exciting and nerve-wracking. What helps is peers, on board and on land, who help her feel supported, uplifted and empowered. Bringing her own passion to her studies, she is also guided by the cohort of young women all studying alongside her as recipients of the Elevate: Boosting diversity in STEM scholarship. Giving her the freedom to focus on her Antarctic mud, Elevate is also teaching her new skills through workshops that connect her to other young researchers and demystify the processes of scientific research and career building.

Talia knows how important it is for there to be opportunities for her kind of science to continue to be done. There's lots more to know about the impacts of climate change, and many people around the world collaborating to get us there. Whether they are on board Antarctica-bound ships tossing on southern swells or building on these methods in wet and muddy labs around the world, the global cooperative effort of Antarctic science is not lost on Talia.

Getting to hold - and behold - this ancient mud as a window into the distant past, her analysis is another step in a longstanding journey of ocean discovery. As the climate changes, understanding the state of the modern ocean is only becoming more important. To find those answers, the scientific community will need to keep diving deep into the ancient ocean.

Talia's research is supported by a grant of sea time on RV Investigator from the CSIRO Marine National Facility and by an Elevate: Boosting diversity in STEM postgraduate scholarship.

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