



PhD scholarship on nitrogen cycling and nitrous oxide emissions from mangroves, salt marshes and seagrasses

Anthropogenic disruption of the nitrogen cycle is the second most important global scale environmental issue. The coastal zone plays a disproportionately large role in the downstream removal of terrestrial nitrogen and the global emissions of N₂O (a potent greenhouse gas). The coastal zone is a mosaic of hydrologically connected open water and vegetated aquatic ecosystems, but little is known about how this complex landscape controls anammox-denitrification trade-offs that maximise nitrogen removal but minimise N₂O emissions under current and future climates. This Australian Research Council funded Linkage project brings together coastal nitrogen process and N₂O emission measurements, including surface water-groundwater interactions, and hydrodynamic-biogeochemical modelling to quantify and model nitrogen removal and N₂O emissions under current and future climates.

We are currently seeking a PhD student to focus on tidal and seasonal effects on nitrogen cycling and N₂O emissions in Australian tidal wetlands. This project will use a combination of different techniques such as stable isotopes, isotopomers, cavity ring down spectroscopy, process measurements and benthic and floating chambers. You will work as part of a multidisciplinary team of post-graduate, post-doctoral and senior biogeochemists, groundwater hydrologists and biogeochemical modellers across several institutions. We are also working with an industry partner who will be translating our research into nature based solutions to the management of coastal systems.

The candidates will be based in the Centre for Coastal Biogeochemistry (<https://twitter.com/biogeochemSCU>, <https://www.scu.edu.au/centre-for-coastal-biogeochemistry/>) at Southern Cross University (Australia). The Centre for Coastal Biogeochemistry has a world-class research group including a number of post-graduate, post-doctoral and senior researchers working in similar areas, providing an outstanding environment for intellectual stimulation and opportunities for exchange of ideas. Southern Cross University received the highest rank of 5.0 (well above world standard) in geochemistry in the most recent national research excellence assessment. The Centre's PhD and postdoc graduates have excellent employment outcomes including tenured academic positions in Australia, Europe, New Zealand and the US, as well as industry positions Australia, New Zealand and the US.

The Centre has world-class infrastructure including access to an extensive stable isotope facility with full technical support, a membrane inlet mass spectrometer (MIMS), well equipped inorganic and organic chemistry laboratories, and a range of field equipment including benthic chambers, data sondes, Picarro Cavity Ring-down Spectrometers, Los Gatos isotope N₂O analyser and a transportable Proton Transfer Reaction-Mass Spectrometer (PTR-MS) (see <http://scu.edu.au/coastal-biogeochemistry>).

Applicants must have an Honours or Master degree, undertaken in English, in a related field such as biogeochemistry, environmental chemistry, limnology, or closely related. The project will involve periods of intensive field measurements, laboratory work, and data processing. Experience with large data sets, stable isotopes and field work from 4WD and small boats will be viewed favourably.

Scholarships provide a tax-free annual stipend of \$28,597 for 3 years and 3 months, and tuition fees will be exempt for 4 years. Interested applicants should send a CV and short (< 1 page) statement highlighting their research background and interests, with respect to the criteria above, to Prof Bradley Eyre (bradley.eyre@scu.edu.au). Only short-listed applicants will be notified. Closing date for applications is January 30, 2022. The preferred starting date is June to August 2022, but is negotiable. Australia's borders are currently open to international students.

Southern Cross University is based in Lismore, northern NSW, Australia (near Byron Bay). The region is a great place to live with a perfect sub-tropical climate (not too hot, not too cold), some the best beaches and surfing in the world, plus great fishing, scuba diving and wilderness areas. The quality of life is high and the cost of living relatively low.