Oil spills and bioremediation in cold climates

PREREQUISITES
GEOS710 or GEOS920

SUPERVISORS / RESEARCH GROUP / PROJECT PARTNERS
Supervisor Simon.George@mq.edu.au
Co-Supervisor Dependent on project
Organic Geochemistry group; Australian Antarctic Division; UNSW Molecular Biology group; Southern Cross University.

RESEARCH PROJECT (Suitable for 2nd Year MRes or GEOS891)
Oil and fuel spills are surprisingly common in Antarctica and the Sub-Antarctic, in particular around human bases. Simon George has had a succession of projects funded by the Australian Antarctic Division to examine the degradation pattern and rate of loss of hydrocarbons when they are spilled. In one project we are working on a large set of soil samples from Macquarie Island, where diesel has been spilt near a tank farm. Research Assistant Sarah Houlahan has analysed some of these samples, and in collaboration with Grant Hose and students (Biological Sciences) and UNSW (Molecular Biology; Belinda Ferrari and students) we are now continuing geochemical work on mesocosms developed to track the degradation pattern of artificially-spiked soils on Macquarie Island, and relate changes to the ecotoxicity. In a second project (involving PhD student Kostas Kotzakoulakis) we are assessing the behaviour of fuel spills when they interact with Antarctic seawater, and the positive and negative impacts of dispersants. In this project we are collaborating with ecotoxicologists at Southern Cross University led by Peter Harrison.

There is an opportunity to join either of these teams and develop your skills in organic geochemical analyses as applied to environmental contamination and bioremediation. We have plenty of samples available to work on, pre-existing knowledge and critical mass in this area, and are able to design a Masters project to suit both your and our needs.

Figure: Potential sources of fuel spills in the Southern Ocean near Antarctica, and on Macquarie Island.