

What can peat tell us about the past and future climate of the Falkland Islands?

Dr Zoë Thomas, University of New South Wales

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We arrived in Stanley on February 29th 2020, totally unaware of the coronavirus-chaos that would soon hit the world in just a couple of weeks. Under a research project funded by the Australian Research Council, our goal was to collect peat sediments from across the islands to better understand the past climate and environmental history of the islands and the broader Southern Ocean region. This enables us to place current/future changes into a longer-term context. This field campaign was led by Dr Zoë Thomas, Prof. Chris Turney and Dr Haidee Cadd, all from the University of New South Wales, Australia, and working closely with Dr Steffi Carter from SAERI.

One of our specific goals is to look for indicators of changing westerly wind strength and location over time (nominally the last 15,000 years). To do this we will examine wind-blown material that gets trapped in the peat bogs as they form over thousands of years. Dust with a different chemical signature to the geology of the Falklands and tree pollen from Patagonian forests are two particular interests. In order to determine when changes in the westerly winds occurred, we will use radiometric dating to determine the age of the peat sediments. Using the new *Chronos* ¹⁴Carbon-cycling facility at the University of New South Wales, we will extract seeds and twigs from peat layers and measure the amount of radiocarbon decay to determine when those plants were last living!



Dr Zoe Thomas, Dr Haidee Cadd and Tony Heathman wrapping a peat core at Cape Carysfort.

On March 1st, the islands experienced a beautiful late summer day, with temperatures hitting 22°C in Port San Carlos. We took the opportunity to drive around the

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Scientists Dr Zoe Thomas, Dr Haidee Cadd and Prof. Turney with volunteer scientists Kapil Jiwa, Joanna Zanker, Susan Rutherford (Neil Golding).

East Island to get a feel for the landscape, and take in the beautiful scenery. Our relaxing start did not last for long and 3 weeks of intensive peat coring across islands ensued. We owe tremendous thanks to our SAERI collaborators, all the landowners who kindly gave us permission to take peat samples, and to our local drivers who expertly navigated the camp terrain. Kidney Island and Weddell Island were two highlights of our trip, due in part to the amazing volunteers that joined our sampling expeditions. The fast accumulating tussac peat on Kidney Island will be very interesting to compare to the slower accumulating peat that we found just below the summit of Mount Weddell.

The map below shows locations from which we collected peat samples. In some of these locations, peat cores were taken down to the bedrock (the maximum depth we recorded was 6 m in Cape Carysfort). To do this we used a 'Russian D-section corer', which enables us to collect a 1 m length half cylinder section of peat. In other locations just a small sample of peat from the beginning of growth was taken. We managed to visit far more sites than we dared hope,

somewhat due to the fantastic weather, landowner support, and enthusiasm of the volunteers that accompanied us.

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Map of all the locations we visited and took core or basal samples from.

The samples we collected are slowly making their way to Sydney on a ship and should be with us in a few months ready for analysis. We look forward to providing updates when our samples have arrived and we are allowed back in the lab post coronavirus-chaos. We left the Falklands in strange and sad circumstances, on the last flight out to Sydney via South America. Although the conclusion of our trip was an unexpected end, it did not dampen the amazing 3 weeks we had in the Falklands and all the wonderful people we met along the way. We will be thinking of our friends in the Falklands and hope everyone stays safe and well over the coming months.



Dr Zoe Thomas, Dr Haidee Cadd, Prof Turney, Robert Short and Jo Turner looking at a peat core from Penguin Valley, Weddell Island.