Katie Wilkinson Scholarship Report

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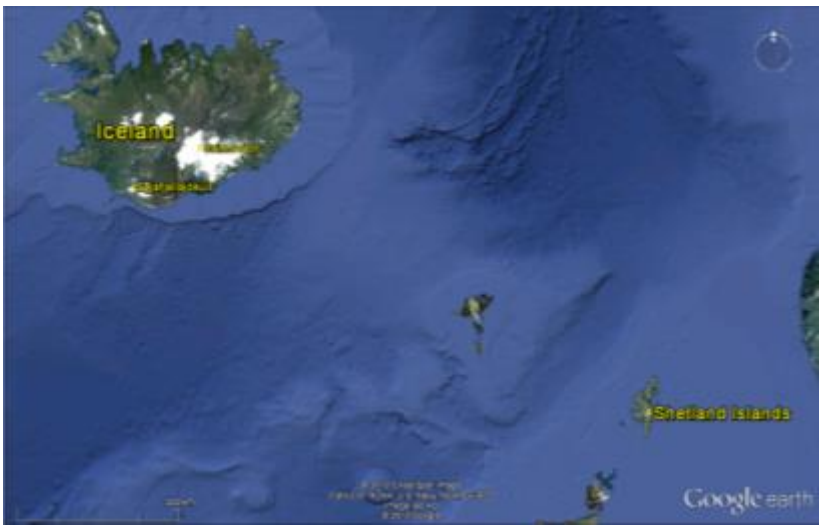
In the summer of 2012, with the help of the Katie Wilkinson Scholarship, I travelled to the Shetland Islands to investigate the deposition of tephra (tiny particles of volcanic ash) from the recent Icelandic eruptions of Eyjafjallajökull and Grímsvötn. The project investigated the depositional patterns of the volcanic ash in relation to topography and vegetation. These explosive eruptions produced particularly fine ash, which wreaked havoc in the European air space, grounded flights and disrupting the transport of thousands. The ash clouds were transported all over Northern Europe and I decided to see if I could find any of the tephra in the Shetlands, and see what its deposition could tell us about ash fall and these volcanic hazards.



Map of Iceland and the Shetland Islands, showing the location of Eyjafjallajökull and Grímsvötn (Google Earth).

Tephra can be used to stratigraphically date layers of peat and ice for archaeological or environmental purposes by matching them to specific eruptive events in a study called ‘tephrochronology’. In order to gain a better understanding of the ways in which these records are distributed and preserved, I took samples of peat from a transect lain across three hills in the midland Mainland Island: Moustoffe Hill, Weisdale Hill and South Midfield Hill. On each transect there were 4 sample points with 4 samples taken on each, to obtain samples with a variation of vegetation cover, slope and aspect.

(a) Map of sample sites

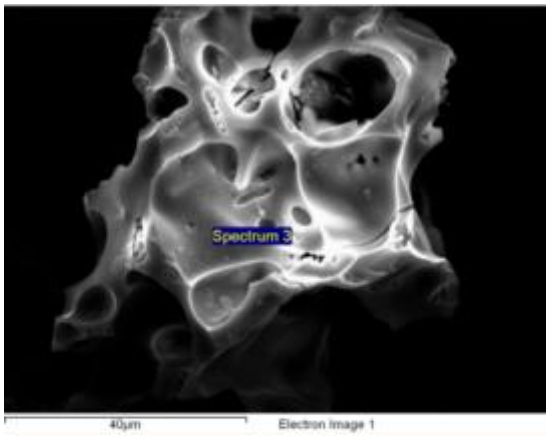
(b) Image showing topography (Google Earth)

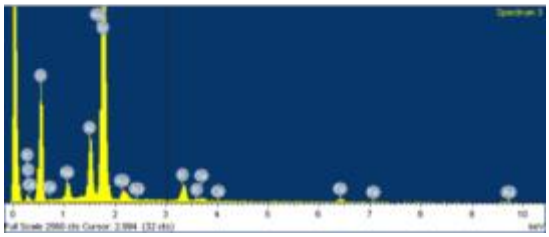
The peat collected was brought back to Norwich where it was cleaned using a tephra floating method, and the tephra was isolated. I then studied the samples under the petrological and scanning electron microscope, using the electron x-ray backscatter device to find out what elements and how much of each it was made of.

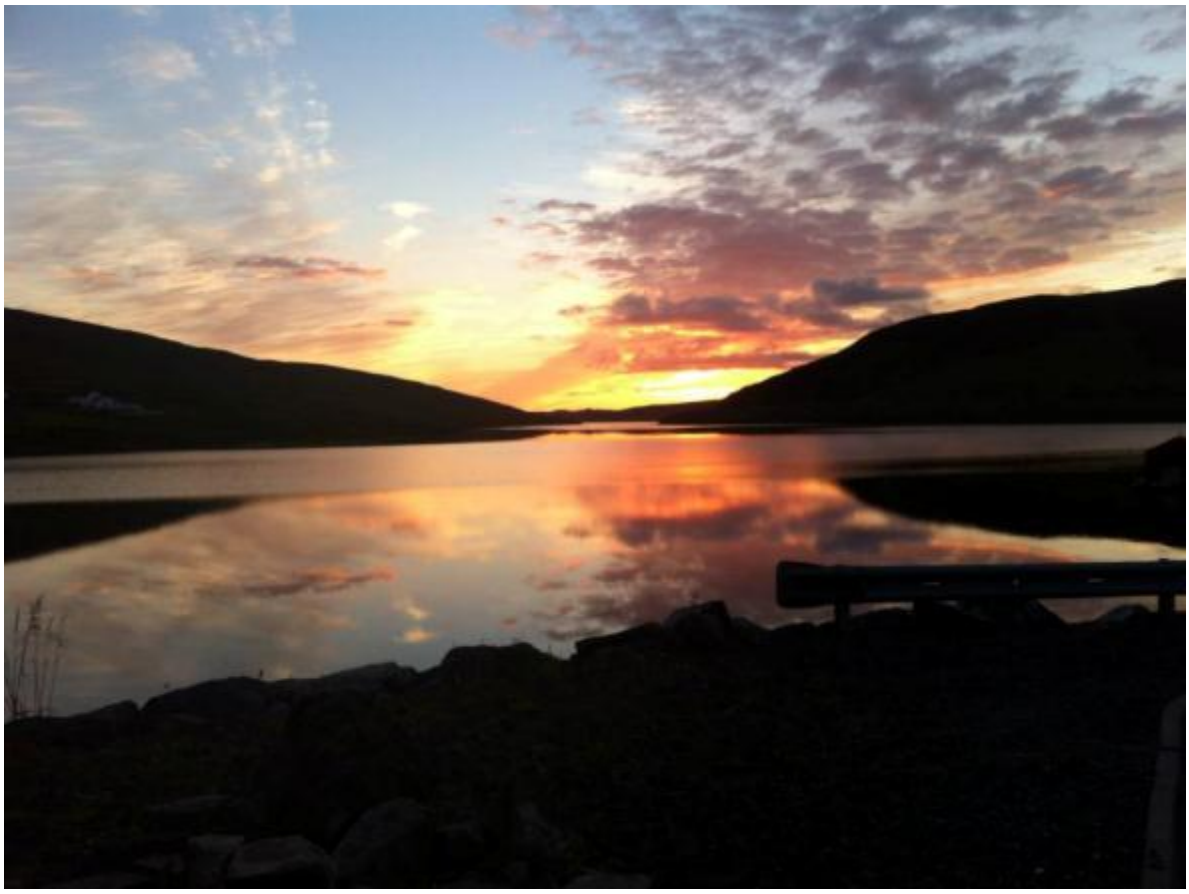
The tephra found was studied in its quantity, morphology, and elemental composition in order to determine its origin, either Eyjafjallajökull or Grímsvötn. Any other origin would have been interesting indeed.

I travelled by train and boat and bicycle with my field assistant Peter Fitt. Cycling in such a place as the Shetlands was not an easy task, especially with 40kg of luggage and equipment on our backs. Sometimes we managed to find help with transport from the incredibly friendly local people of the Shetlands. Walking up the hills and through the bogs under attack by the wildlife (midges and overly territorial skuas, or bonxies as they are know there) and the weather, which could hardly make up its mind as to what exactly it should be doing, was a fun and challenging experience, though Peter is now very wary of any Skua like bird.

The conclusion to the investigation was that tephra was found from Eyjafjallajökull, that the less vegetation there was, the more ash was found, and that the flatter the site, the more ash was found. One of the particles, along with its elemental spectrum is shown below:







A sunset in Voe, where we drank whisky and smoked a pipe, the perfect end to a hard day's fieldwork.

A marsh, one of the many obstacles, and sites of interest.

Peter taking notes on Moustoffe Hill, with an exposed section of peat.

Thank you to the Katie Wilkinson Scholarship for this opportunity to investigate a fascinating topic, in a beautiful and friendly place, and thank you to Katie for being an inspiration to do my best wherever I am.