

Postdoctoral & Early Career Researcher Exchange (PECRE) funding: Report of activities

Nature of funding: A 1 month visit to the Soil Science and Biogeochemistry Unit, Department of Geography, The University of Zurich

Report:

Funding was provided through SAGES to undertake a visit to the Soil Science and Biogeochemistry Unit, Department of Geography, The University of Zurich. This was in order to learn a new lab technique, the Benzene Polycarboxylic Acid (BPCA) approach to quantifying and characterising pyrogenic (fire-affected) carbon in the environment.



Figure 1

This department is one of the leading centres for soil science worldwide, and has particular expertise in the BPCA method, something that is rarely available in the UK, but is a powerful technique to analyse a presently neglected part of the global carbon cycle. The visit went extremely well, due in no small part to the willingness of the researchers in the department to support me in training and analysis, and the friendly, collaborative atmosphere. This trip was complementary to an earlier visit by a researcher from Zurich to work with me in the UK in the summer of 2016, so by making the trip I was able to cement collaborative relationships, and share expertise. This led to agreements to submit a large grant proposal to the Swiss National Science Foundation in October 2017.

I received training in all aspects of the BPCA method, from initial sample preparation to analysis. This involved extensive wet chemistry, such as column separation (Fig. 1), and sequential dilutions (Fig 2). BPCAs are released from solid samples by digestion under pressure in nitric acid, after which they can be purified and diluted for analysis by High Performance Liquid Chromatography. The lab work involved analysis of standards, followed by a suite of charcoal samples that I had brought to Zurich. These have already been extensively characterised, and it is hoped that by using the BPCA data, a paper can be prepared detailing the mechanisms of pyrogenic carbon alteration in the environment.



Figure 2



The funding provided by SAGES has enabled not only the expansion of expertise in Scotland for analysis of an important part of the terrestrial carbon cycle, but also the possibility of fruitful and high profile research in the future. I am very grateful for the opportunity to spend time in a European laboratory to gain new perspectives in my field of science.