Quan**T**i**L**e
Quantitative Teaching and Learning
in Geography

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Quantitative Methods: Student Work

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For my final year dissertation project I investigated the different types of fuel used in Iceland from the 18th to 20th century.

Aims:

- Construct a general model of fuel resource use from settlement (between c. AD871 and AD1000) to the present day.
- Develop a method for accurately quantifying microscopic fuel ash residues within a stratigraphic deposit using thin section micromorphology.
- Employ this method to investigate the fuel ash residues from an Icelandic farm settlement to understand the proportions of the fuel resources used through time.

Fieldwork

Fieldwork was carried out at Hofstaðir, a farm site located in north-eastern Iceland. The site was selected as it had previously been the subject of extensive archaeological investigations.

Soil samples were taken and back in the lab thin section slides of each sample were created for microscopic analysis.
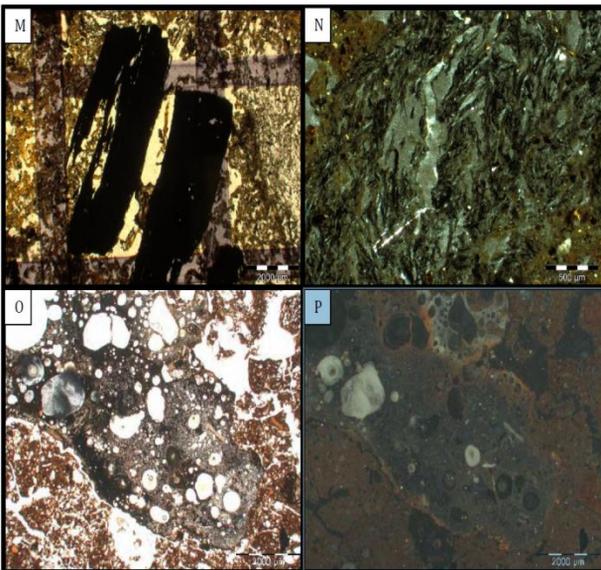
What did you find?

There is evidence for woodland resource management up until the 20th Century, which is much later than previously thought. However, the introduction of modern fuels such as coal and clinker appear to have had little impact on the fuel strategies employed at the site.

Fuel residues used for comparison: M) Wood (Charcoal) – PPL, N) Wood (Crystalline) – PPL, O) Clinker – PPL (McKenzie, 2006), P) Clinker – OIL (McKenzie, 2006).

How did you apply Quantitative Methods to your work?

I created thin section slides from the soil samples . The proportion of fuel residues on each slide was estimated and recorded using a feature abundance scale.

I then transferred these data to an Excel model developed specifically for this project. This allowed the fuel distribution data to be visualised and analysed on a per fuel basis or a total fuel mix basis for each slide. Each fuel type was recorded separately and the proportional contribution of that fuel type within each cell was entered into the model. The model then allowed for the data for each fuel type to be overlaid in order to view the total fuel mix for any given slide. Graphical summaries of the quantified data allowed data to be compared between slides while the raw data allowed statistical analysis of the fuel data to identify temporal patterns in fuel use.