**Jess McCoy**

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**Bio**

My adventure into palaeoecology began in 2016, when my main Ph.D. supervisor hosted my Nuffield Research Placement, after which I learned working in academia could satiate my hunger for writing and science. My work specialises in palaeoecology, specifically to the palaeoreconstruction of terrestrial environment in Western Europe. My research using palaeoproxies – primarily sporomorphs, diatoms and geochemistry – takes me back in time to the Oligocene-Miocene epochs! This study will develop our understanding of the equilibrium between global carbon dioxide concentrations and the corresponding environment in a warming world, helpful in developing present-day global climate models.

**Research questions**

The research for my Ph.D. focuses on climate-proxy interactions, Palaeogene-Neogene climate change and understanding the extent of different climate drivers**.**

* Refinement of biostratigraphy - Precision of proxy identification is always developing, suggesting our knowledge of corresponding sediment ages will also change, so we need to refine sediment age to a greater precision. This occurs at a national, UK-scale.
* Test the spatiotemporal precision of reconstruction techniques - Palaeoclimate reconstructions can be refined from using several techniques, including modelling with probability density functions (Gibson *et al*., In review).
* Understand the main climate drivers- The Neogene provides a great analogue for a uni-hemispherical glaciation, which is soon forecasted with present-day climate change, we can understand the climate-proxy equilibrium better (Steinthorsdottir *et al*., 2021). This helps us understand regional-scale climate change across Palaeogene-Neogene western Europe.

**Techniques**

Most of my methods utilise quantitative data, I model palaeoenvironments using Bayesian climate models and probability density functions using palaeoproxy results – models primarily use R and MATLAB. To retrieve proxies, I utilise new and reproducible laboratory-based methods, and use the created slides to observe changes in palaeoenvironments over millennial-year timescales. I present data using coding software and study the interactions between different proxies and contribute towards the UK’s record of palaeoproxy distributions, by dating sediment. I make inferences from the results of employed geochemical techniques.

**Supervisors**

* Matthew Pound, Department of Geography and Environmental Sciences, Northumbria University, UK
* Geoff Abbot, School of Natural and Environmental Sciences, Newcastle University, UK

**Collaborations**

* Martha Gibson, Northumbria University, UK
* Jen O’Keefe, Morehead State University, National Science Foundation (NSF) and Fungi in a warming world (FIAWW), USA
* Jim Riding, British Geological Survey, UK
* Stuart Campbell, Natural Resources Wales, UK
* Raymond Roberts, Natural Resources Wales, UK

**Peer-review publications**

Gibson, M.E., McCoy, J.L., O’Keefe, J.M.K, Nuñez-Otaño, N.B., Warny, S. and Pound, M.J. (In review) The development of UK Neogene Climate: a comparison of the co-existence approach, Bayesian and probability reconstruction techniques, *In review*.

Pound, M.J. and McCoy, J. (2021) Palaeoclimate reconstruction and age assessment of the Miocene flora from the Trwyn y Parc solution pipe complex of Anglesey, Wales, UK. *Palynology*: 1-21.

Pound, M., Dalgleish, A., McCoy, J. and Partington, J. (2018) Melissopalynology of honey from Ponteland, UK, shows the role of Brassica napus in supporting honey production in a suburban to rural setting. *Palynology*, **42**(3): 400-405.