ONE Planet
Doctoral Training Partnership

Natural Environment Research Council

ONE Planet Undergraduate Research Experience Placement (REP) Scheme

Placement title: Assessing changes in soil health across grasslands at different stages of restoration at Northumberland Wildlife Trust Nature Reserves.

One Planet Research Theme:
Climate & Climate Change ☐ | Earth System Processes ☐ |Anthropocene ☒ Environmental Informatics ☒

Supervisor: Elisa Lopez-Capel
School/Department: School of Natural and Env Sci (SNES)
University: Newcastle University

Placement Description:
Mineral extraction activities, including quarrying and mining, can have long-lasting impacts on ecosystems, reducing biodiversity and ecosystem services. With the United Nations declaring 2021-2030 to be the "Decade on Ecosystem Restoration", restoration ecology and the need to not only protect, but to restore, landscapes is gaining increasing prominence as a way to limit and reverse biodiversity losses from industrial activity. With appropriate management and restoration practices in place, post-industrial sites have the potential to support diverse ecosystems. This project seeks to assess biodiversity, through soil, vegetation and invertebrate assessment on grassland on two rewilded, post-industrial sites in Northumberland.
Fieldwork will take place at West Chevington and East Chevington nature reserves; two former open-cast mining sites near Druridge Bay, which are owned and managed by Northumberland Wildlife Trust. As one of the most ambitious lowland rewilding projects in the North of England, West Chevington consists of a mosaic of habitats, which the Wildlife Trust are restoring through different rewilding techniques. East Chevington, further along in the restoration process, lies closer to the coast and is one of the best birdwatching sites in the county. The successful REP student will have the opportunity to compare soil health and biodiversity across these sites, helping to inform the Wildlife's Trust's restoration practices.

Objectives:

1. To assess the impact of restoration stage on soil health at Northumberland Wildlife Trust Nature Reserves.
2. To assess the use of vegetation and invertebrate assessment as indicators of soil health on post-industrial sites.

Timescale:
1st-5th July: Desk and field work to collect soil and invertebrate samples and assess site vegetation. Vegetation (UKHab) and invertebrate pollinators (insect count) will be assessed on field work site visits.
8th-12th July: Preparation of soil samples and analysis (including organic matter, C and N elemental analysis, TOC/TIC, pH, EC, nutrient and metal extractions). Store invertebrate samples.
15th-19th July: Continue with soil sample extractions and analysis. Identify and analyse invertebrates.
22nd-26th July: Analysis and interpretation in relation to restoration stages and practices.
29th July – 2nd August: Finalisation of analysis (data interpretation, GIS visualisation and stats)
8th-12th August: Report write-up.

Itemised Budget for the Project:

- Travel to sites £200 (car hire for 5 field work days), and Field work materials £150 (pan traps, tubes, flags)
- Laboratory soil analysis £150. Training in soil, vegetation, invertebrate assessment and analysis (included)

Prerequisites:
Suitable for a student currently studying Biology or Environmental Science. Knowledge of soil science, invertebrate and vegetation assessment and general field skills is desirable. Lab skills, particularly for soil analysis, are advantageous.

For more information, please contact Elisa Lopez-Capel (elisa.lopez-capel@newcastle.ac.uk).

Newcastle University

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