ONE Planet
Doctoral Training Partnership

Natural Environment Research Council

# ONE Planet Undergraduate Research Experience Placement (REP) Scheme

**Placement title: What lies beneath: quantifying soil function in contrasting soils**

**Proposed placement length (max 8 weeks): 8 weeks**

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

**Supervisor: Dr Miranda Prendergast-Miller** (also with Dr Mark Goddard, Dr Katherine Baldock)
**School/Department: Geography and Environmental Science**
**University: Northumbria**

**Placement Description:**
Soils provide important ecosystem services that support human society, through provision of food and fibre, and clean air and water. However, we need to understand how different land management practices (e.g. artificial lawns; urban greenspace; plastic waste disintegration) affect soil quality in terms of its physical, chemical and biological properties. Measuring soil quality can help us determine the impact of above ground processes on the underlying soil and its biodiversity; identify which ecosystem services are being affected; and so devise effective mitigation strategies to overcome anthropogenic impacts.
This project will focus on quantifying the impact of land uses/anthropogenic activities on the soil microbial community, using a respiration technique. The student will gain hands-on experience of fieldwork in ecology and environmental science at existing project fieldsites around Newcastle and in performing lab analyses for a range of soil properties. The student will be working in the ecology group within the Geography and Environmental Science department.
The objectives are:

1. Conduct fieldwork to collect soil samples from a range of anthropogenic soils around Newcastle e.g. artificial lawns; urban greenspace; plastic decomposition study
2. Compare soil quality of the samples using soil physical, chemical and biological properties
3. Develop a protocol for using microbial respiration to measure soil function in contrasting soil types

**Timescale:** 8 weeks
Weeks 1 - 2: lab training in soil methods and pilot the respiration technique
Weeks 3 - 6: fieldwork and soil sampling at project sites. Over this time, samples will be analysed for soil properties and the respiration technique will be tested and the protocol developed.
Weeks 7 - 8: data collation, write-up report; finalise the respiration technique protocol
*The proposed timeframe is flexible and will be agreed with the student. The lead supervisor is not available 1-12 Aug 2022.*

**Itemised Budget for the Project:**
Travel and subsistence expenses during fieldwork in Newcastle (car mileage/public transport): £100
Lab consumables: soil analyses and consumables; soil elemental analyses; bulk density equipment (£400)

**Prerequisites:** An interest in ecology and/or environmental issues and experience of working in a lab environment (e.g. able to follow protocols; attention to detail; awareness of health and safety procedures). For more information, please contact Miranda Prendergast-Miller (miranda.prendergast-miller@northumbria.ac.uk).