

PROJECT TITLE: Microclimate monitoring for climate adaptation with the National Trust

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Project keywords: climate adaptation, microclimate, National Trust, weather observation, climate data analysis

Proposed start date: 3/6/24

Project description: In July 2023, a project was launched by the University of Bristol and National Trust to measure the weather at the National Trust's Mount Stewart gardens in Northern Ireland. Sensors were installed to measure temperature, humidity, rainfall and soil moisture with the aim of helping understand how the unique microclimate of Mount Stewart's gardens compare to the surrounding countryside and coastline as, ultimately, the gardens may have to move in future due to sea level rise. Following this successful pilot project, in Spring 2024 further sensors were obtained and have been installed by the National Trust at two further sites: Sheffield Park and Trelissick. The data from these sensors will also help inform the National Trust's climate adaptation strategy for each of these sites, where changing rainfall variability is a key concern.

This project will analyse the data from each of these sites and benchmark it against national and international datasets, including historic observations and reanalysis (HadUK-GRID and ERA5) and future climate model projections (UKCP18). The aim is to downscale longer-term past and future climate records for each site, thus providing precise and tailored insight into how local climate conditions at each of these sites is expected to change in the future.

The project will include visits to each of the National Trust sites so the researcher has an opportunity to experience the specific microclimate of each site and so that the results can be shared directly with the National Trust team at each site who are the local experts. This discussion with team members is vital to ensure the results are sense-checked and to get a better understanding of the decision-making process and climate adaptation options at each site. This project therefore offers an opportunity to work with primary data and develop new methods that are being applied on the ground for climate adaptation.

Candidate requirements: Candidate should have ability to do data analysis in either R, Matlab or Python, and ideally will have experience of using netCDF data. Candidate must be fit and able to travel within the UK.

Background reading: <https://environment.blogs.bristol.ac.uk/2023/10/02/the-microclimate-of-mount-stewart-northern-ireland-planning-and-planting-for-the-future/>

Approximate Work Schedule in weeks (desk based/lab/report writing)

- Week 1: (desk based) Kick off meeting, introduction to the data, data cleaning, travel logistics
- Week 2: (desk based) Meet National Trust partners (online), familiarise with data for downscaling
- Week 3: (desk based) Initial development of downscaling methods
- Week 4: (field/desk based) Field visit to Mount Stewart, development of downscaling methods
- Week 5: (desk based) Online meeting with National Trust, feedback on initial downscaling
- Week 6: (field/desk based) Field visit to Sheffield Park, review downscaling methods
- Week 7: (field/desk based) Field visit to Trelissick, review downscaling methods
- Week 8: (desk based) Writing of final report