UGRLS Research Project Proposal: The Leeds Forest Observatory

1. **Research Project Leader:** Prof Dominick Spracklen
2. **Scholarship Project Supervisor:** Dr Catherine Scott
3. **Working title of Scholarship Project:** Establishing the Leeds Forest Observatory
4. **Period of Scholarship Project Work (see note i):** July/Aug 2017/2018
5. **Summary of the research to which the Scholar will contribute:**

Urban green spaces such as domestic gardens, parks and woodlands provide many benefits to human urban populations, and a vital habitat for wildlife. Green spaces affect our health by improving air quality and limit the impact of heatwaves by reducing urban temperatures. The presence of green spaces can also enhance the health and wellbeing of people living and working in cities by improving physical fitness and reducing depression. In addition, urban vegetation stores carbon, helping to mitigate climate change, and reduces the likelihood of flooding by storing excess rain water.

The Leeds Forest Observatory (LFO) is a natural ecosystem field laboratory recently established by the Leeds Ecosystem Atmosphere and Forest (LEAF) centre at the University of Leeds, in collaboration with Leeds City Council and the United Bank of Carbon. Research at the LFO will allow us to explore the important role of urban forests in the provision of ecosystem services.

The LFO is a 1 hectare region of woodland in Middleton Park (South Leeds), home to the second largest remaining area of ancient woodland in West Yorkshire. Through long term monitoring of the site, we will enhance our understanding of the role of forests in mitigating climate change, improving air quality, reducing flood risk, enhancing human health and well-being, and maintaining biodiversity.

6. **Summary of the work to be undertaken by the Scholar:**

Undertaking an UGRL with us would give the student the opportunity to contribute to the establishment and the initial data collection at the Leeds Forest Observatory, the UK’s first outdoor laboratory in public woodland. The exact nature of the research conducted can be influenced by the interests of the student.

Areas for investigation could include, but are not limited to: air quality monitoring, tree measurement (height/width) for biomass estimates, species identification, biodiversity investigations, surveys of public attitudes and experiences using the park, and meteorological monitoring.

Following data collection, the student would have the opportunity to conduct exploratory environmental modelling which could include using the iTree software, which allows an economic valuation of the ecosystem services (carbon storage, air quality improvement and flood risk reduction) provided by urban trees.

7. **Detail of the work to be undertaken by the Scholar:**

The exact nature of the UGRL project conducted at the LFO can be influenced by the interests of the student. Areas for investigation could include, but are not limited to: air quality investigations, tree surveying (height/width/species) for biomass estimates, biodiversity investigations, surveys of public attitudes and experiences using the park, and meteorological monitoring.
The UGRL student would have the opportunity to:
- Review the existing literature on the impacts of green spaces in urban areas
- Collect field data at the Leeds Forest Observatory
- Perform analysis of this data to understand the role of woodlands in the wider urban environment
- Compare data collected at the LFO to other temperate woodlands
- Use the iTree software to generate an economic valuation for the part of the woodland under investigation
- Work with a diverse range of LEAF scientists from across several faculties at the University of Leeds
- Contribute to blogs on the LEAF website and content on social media (Twitter & Facebook)

An example project could involve using a portable air quality monitor to investigate how air quality varies in and around the park and surrounding urban areas. The UGRL student would then have the opportunity to present their findings to the local authorities and community groups responsible for maintaining Middleton Park.

8. Detail of the Leadership development to be undertaken as part of the project:

During the course of the project, the student will be involved in designing the plan of work for the two 6-week periods and will be required to plan their data collection and analysis, in collaboration with the supervisors. The student will be required to visit the LFO independently to collect data.

The student will have the opportunity to present their project findings to the Biosphere-Atmosphere Group, a research group in the School of Earth and Environment, and the cross-faculty Leeds Ecosystem Atmosphere and Forest (LEAF) research network.

The student will also have the opportunity to work alongside, and present their research to, staff at the United Bank of Carbon, a non-profit collaboration between businesses and environmental scientists who work to protect forests globally.

Additionally, the student will have the opportunity to contribute to the delivery of community events in Middleton Park in collaboration with an active local community group, the Friends of Middleton Park (FoMP).

9. Outputs expected of the Scholar including the final report:

The scholar will be expected to:
- attend a meeting with the project supervisors at the start, middle and end of each summer project period
- establish a method of measuring / collecting data related to at least one variable at the LFO, by the end of the first project period
- submit a report (of between 1000 and 2500 words) before the end of the first summer project period outlining the work that has been performed and the leadership skills that have been developed
- revisit the LFO during the second project period to explore changes to the variable being recorded
- submit a report (of between 1000 and 2500 words) before the end of the second summer project period covering the work performed and the leadership skills developed during the whole project
- write two blogs about the project for the LEAF website (one during each project period)

10. Details of supervision arrangements

The student would be supervised by Dr Catherine Scott and Prof Dominick Spracklen, with whom they will meet at the start, middle and end of each 6-week project period to review progress and agree action points. The scholar will also meet with Dr Scott on a weekly basis, or as required. The student will also be
working alongside staff at (and postgraduate students sponsored by) the United Bank of Carbon who will be available to offer guidance.

The student would join the Biosphere Atmosphere Group (BAG) and have the opportunity to attend presentations and group meetings to learn more about the research being conducted in the Institute for Climate and Atmospheric Science (ICAS). The student would also join the cross-faculty Leeds Ecosystem Atmosphere and Forest (LEAF) centre.