

SPITFIRE Doctoral Training Partnership (DTP)

Research Experience Placement Project 2019

Lead Supervisor:	Alan Radbourne
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University/Research Organisation:	Centre for Ecology & Hydrology, Bangor
Department:	Soils and Land Use
Project Title:	Developing Earth Observation Monitoring for Welsh Peatlands

Total Student Support Costs: £	Student based at CEH will undertake an 8 week placement, working 30 hours a week. The successful candidate may be required to complete further local paperwork and internal processes. The hourly rate paid, will be no less than the legal minimum wage.
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Proposed Start Date: 1 st July 2019	Proposed End Date: 23 rd August 2019
<i>Projects should run over the summer vacation and we recommend that projects will have terminated by 25 September 2019.</i>	

Brief Summary

This should include:

- *Project outline;*
- *Links to staff/School/Centre activity as appropriate;*
- *Supervisory arrangement;*
- *How space/equipment/supporting resource demands will be met;*
- *Elements of the project that will incorporate elements other than computer/modelling e.g. fieldwork and data collection;*
- *How the project will enhance the skills of the appointed student;*
- *Any intellectual property rights concerns that may arise from the work.*

The project collects ground data on peatland condition in north Wales, developing a satellite imagery based model of regional peatland condition. A student with expertise in Earth Observation techniques and spatial modelling will have the opportunity to extend their knowledge of environmental monitoring and field data collation through carrying out an in-depth field campaign of peatland condition assessment using recently developed standardised protocols. Full training in field data collection and protocols will be provided.

The project links closely with the Welsh Government funded Peatlands Sustainable Management Scheme (SMS), a 3-year project led by Snowdonia National Park in collaboration with CEH, Swansea University and Natural Resources Wales, giving the successful student experience of working within a wider team. Supervision will be by Dr Alan Radbourne, who is co-leading the CEH peatland monitoring work package for the Peatland SMS.

The student will be hosted at CEH in Bangor and will be allocated desk space and computing facilities, including access to high performance virtual machines for processing satellite data. CEH have a fleet of vehicles that can be used to access field sites.

Under the project agreement with Welsh Government any IP that arises from work carried by staff and students affiliated to CEH will be the joint property of CEH and Welsh Government. This does not preclude the student from using work they carry out in their own thesis, if desired, and field data collected will be used within the wider Peatlands SMS project, for which the student's inputs will be acknowledged.

Skills the student will acquire:

- Field identification of main peatland condition types.
- Carrying out fieldwork according to agreed protocols.
- Data collation of environmental data including thorough documentation and quality assurance
- Working within a project team of environmental scientists, conservation practitioners and policy makers.
- Satellite imagery classification and validation.
- Report writing.

Please give an indicative timescale for the student's work over the length of the project:

This should include:

- *The broad tasks the student will undertake;*
 - *An indicative timescale for these tasks.*
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There will be 3 main tasks during the placement.

Firstly, the collection of ground-based peatland condition data. The data will be collected according to protocols that have been developed by CEH for the Welsh Government funded Peatlands Sustainable Management Scheme.

Secondly, their task will be to develop training and validation datasets from the ground measurements for use in a supervised classification of open source Sentinel imagery to determine peatland condition across an area of north Wales, incorporating ancillary data such as ground aspect, elevation, slope and surface roughness.

The final task will be to carry out a supervised classification of peatland condition using GIS software and test the resulting classification against their validation data.

It is estimated task 1 will take the first four weeks, task 2 approximately one week and task 3 three weeks, with time for further assessment and report writing at the end.

Proposed procedure for appointing students, including selection criteria:

Please identify specific criteria that should be considered for the selection of placement students e.g. specific quantitative skills that may be required, subject knowledge etc. If a student has been pre-selected, or the research area has been led by the student, please provide the student's contact details, and a summary of their suitability for the SPITFIRE DTP REP programme.

- Experience of using GIS software, preferably ArcGIS or QGIS.

- Experience of working with satellite monitoring data, such as Sentinel 1 and 2
- Appreciation of Peatland habitats
- Interest in environmental sciences and monitoring
- Full UK Driving license (preferable)