

2014 YCCSA SUMMER SCHOLARSHIP PROJECT SUBMISSION

This form is for prospective project supervisors to submit their projects to be included in the YCCSA Summer Scholarships Programme for 2014.

It is the purpose of the Summer School that any projects submitted are interdisciplinary in nature.

Date	<i>05/01/2014</i>
Main Supervisor's Name	<i>Dr Andreas Heinemeyer (Senior Researcher at SEI-Y)</i>
Main Supervisor's Department	<i>Stockholm Environment Institute (part of Environment Department)</i>
Co-supervisors' name(s) and Departments	<i>Jon Pitchford (Biology Department and Department of Mathematics) Simon O'Keefe (YCCSA)</i>
Project Title	<i>Assessing the importance of realistic variability in Holocene climate on UK blanket bog peatland carbon stocks and past accumulation rates</i>
Project Description	<p><i>UK upland peatlands, specifically blanket bogs, contain vast amounts of carbon. These stocks built up over 10,000 years - since the last glaciation. Recent models show the importance of including a past climate in predicting this build-up of peat as changes in climate alter fresh vegetation C input and decomposition of old peat. However, so far recreated past Holocene climate is very smooth and does not reflect the natural variability and periodicities in current annual mean temperatures and total precipitation.</i></p> <p><i>This project will:</i></p> <ol style="list-style-type: none"> <i>1) recreate a UK Holocene climate for the uplands making full use of the latest available data from across the Northern Hemisphere</i> <i>2) describe the recent variability and patterns in recorded climate over the past 200 years from other UK sites and derive a (e.g. stochastic) model for this information</i> <i>3) back propagate this information to the Holocene upland climate reconstructions</i> <i>4) explore what the impact is of the inclusion and improved patterns on simulated carbon stocks and peat accumulation rates in the UK uplands</i> <p><i>The student will have full access to a published and well documented (and fairly simple) peat model (MILLENNIA; Heinemeyer et al., 2010). The model contains a user friendly GUI and is available in C++.</i></p>
Required skills	<i>The student should be able to read and write computer/model code (C++) and have a good understanding of applying statistics to large datasets in order to derive variability and information and apply this in a model context. Ideally, the student would be competent in R. The student will gain basic ecological understanding about carbon dynamics and modelling from an experienced ecologist and obtain project advice from two co-supervisors (mathematics and YCCSA).</i>
Project dates	<i>To create a cohort of students who can work and learn together, ideally all projects would run for 9 weeks, starting on Monday, 14 July 2014 and finishing on Friday, 12 September 2014. If you have any special requirements regarding the dates of your project, please indicate these here.</i>
Other information	<i>The student should not worry about anything – the project will be good fun and be of direct relevance to the supervisor and current research interests across the globe! As such we will aim to publish the project's findings based on the outcome.</i>

References	<p><i>Two open access journal publications are available for further reading:</i></p> <p><i>A. Heinemeyer, S. Croft, M.H. Garnett, M. Gloor, J. Holden, M.R. Lomas & P. Ineson (2010) The MILLENNIA peat cohort model, predicting past, present and future soil carbon budgets and fluxes under changing climates in peatlands. Climate Research (Special Issue: Climate Change and the British Uplands) 45: 207–226.</i></p> <p><i>J.M. Clark, M.F. Billett, M. Coyle, S. Croft, S. Daniels, C.D. Evans, M. Evans, C. Freeman, A.V. Gallego-Sala, A. Heinemeyer, J.I. House, D.T. Monteith, D. Nayak, H.G. Orr, I.C. Prentice, R. Rose, J. Rowson, J.U. Smith, P. Smith, Y.M. Tun, E. Vanguelova¹, F. Wetterhall¹ & F. Worrall (2010) Model inter-comparison between statistical and dynamic model 2 assessments of the long-term stability of GB blanket peat (1940-2099). Climate Research (Special Issue: Climate Change and the British Uplands) 45: 227–248.</i></p>
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When complete, please email the form to sarah.christmas@york.ac.uk