



2013 PhD studentships

Department of Environment, Earth and Ecosystems

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Tropical vegetation, environment and climate: The present is the key to the past

Guaranteed funding as part of larger NERC project

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- Investigate the dynamics of modern tropical forest and savannah ecosystems
- Training in micro fossil and organic geochemical analysis
- Develop a comprehensive understanding of modern pollen-vegetation relationships
- Field work in Ghana

Understanding how vegetation responded to past climate change requires the development of well constrained relationships between living floras, environment and climate. This project will help constrain the great uncertainty which exists as to how tropical ecosystems are represented in the fossil record by examining the relationship between modern vegetation and the pollen it produces. The project will analyse modern pollen rain using a combination of traditional microscopic analysis [1] and cutting edge geochemical techniques [2]. We anticipate that the findings will provide new insight into past vegetation and climatic change.

The main objectives of this project are to:

1. Establish the relationship between parent vegetation and modern pollen rain (morphologically and geochemically) in forest and savannah ecosystems in tropical West Africa.
2. Assess the variance in pollen rain within and between ecosystems over a three year monitoring period.
3. Develop a comprehensive understanding of the modern pollen-vegetation relationships which will facilitate a better understanding of the nearby Lake Bosumtwi fossil pollen record and hence regional past vegetation change.

Although this studentship project is entirely independent, the successful candidate will join the Natural Environment Research Council (NERC) funded “500,000 years of solar irradiance, climate and vegetation changes” project team, which comprises leading academics at five UK universities and partners within the Forestry Research Institute of Ghana. This project will examine modern pollen collected from a range of forest and savannah vegetation study plots between 2011 and 2014. The project will be hosted within the Palaeoenvironmental Change Research Group (<http://palaeolim.wordpress.com/palaeo/>) at The Open University, but will draw on expertise and facilities at partner organisations. The combination of traditional and geochemical pollen analytical techniques offers the potential for exciting new insights to be gained into tropical vegetation, environment and climate.

The Department of Environment, Earth and Ecosystems has a thriving postgraduate community and the postgraduate training programme provides a full range of courses covering: research techniques, scientific methods, information technology, communication and interpersonal skills, which are tailored to the needs of each student.

If you would like to apply or have any queries about this project please contact the first named supervisor either by email William.Gosling@open.ac.uk or by writing to the address above enclosing a brief letter of motivation, a full academic CV and the names and addresses of three academic referees.

CLOSING DATE: 25th April, interviews will be held at The Open University during May.

References: [1] Gosling, W.D., et al., Differentiation between Neotropical rainforest, dry forest, and savannah ecosystems by their modern pollen spectra and implications for the fossil pollen record. *Review of Palaeobotany and Palynology*, 2009. 153(1-2): p. 70-85. [2] Lomax, B.H., et al., Plant spore walls as a record of long-term changes in ultraviolet-B radiation. *Nature Geoscience*, 2008. 1(9): p. 592-596.