



Faculty of Environment
School of Earth and Environment
Institute for Climate and Atmospheric Science

Research Fellow

Job Summary

Research: Impacts of biomass burning aerosols on the dynamics of regional weather: South American Biomass Burning Analysis (SAMBBA)

Full-time, fixed term for 34 months

This SAMBBA post is focused on the impacts of biomass burning aerosols (BBA) on the dynamics of weather systems and the implications for weather forecasts, climate and climate projections. We seek a motivated researcher to understand and quantify the effects of BBA on regional weather in South America using a synthesis of simulations and new field observations. Deforestation and agricultural burning across South America (Fig. 1) emit large amounts of aerosol and trace gases to the atmosphere with impacts on weather, climate and air quality. The aim of the South American Biomass Burning Analysis (SAMBBA) consortium project is to understand the properties and impacts of this aerosol.

SAMBBA is a large consortium project funded by the UK Natural Environment Research Council (NERC) involving partners across the UK and in Brazil. The field campaign using the UK large BAe-146 research aircraft took place in September 2012, based out of Porto Velho in Brazil. The research flights have provided an unprecedented wealth of data on atmospheric thermodynamics, fire emissions, BBA radiative properties and BBA distributions in this region. You will work alongside another SAMBBA research fellow at Leeds, who is studying aerosol microphysics. Collaborating with others in the UK and Brazil, you will quantify how BBA affect regional weather. BBA interacts directly with radiation (direct effects) and *via* clouds (indirect effects). You will use models and observations to understand how these processes affect weather and how different treatments of these processes with different levels of complexity affect predictions on a range of space and time scales.

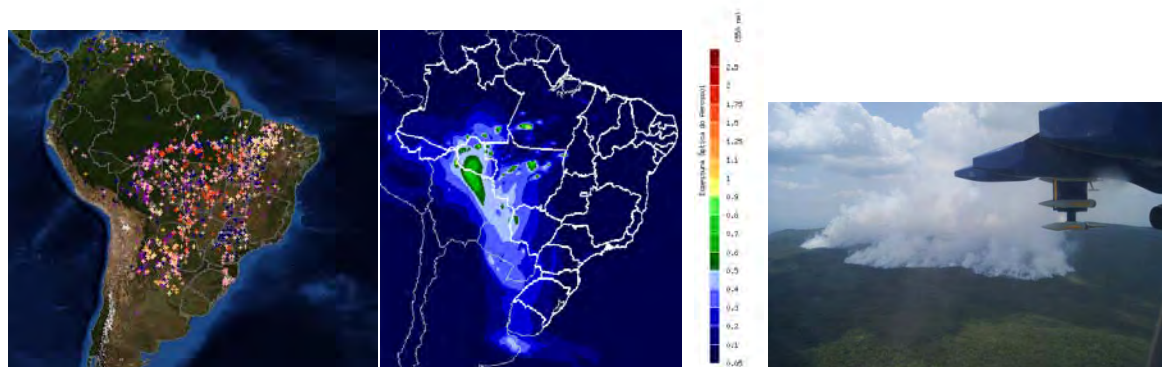


Fig 1: Left: Satellite observed fires in South America on 16 August 2012. Middle: CPTEC (Centro de Previsão de Tempo e Estudos Climáticos, Brazil) forecast of aerosol optical depths for the same day. Right: Fires observed by the BAe146 aircraft during the SAMBBA field campaign (photo: Will Morgan, University of Manchester).

The work will compare models, using both climatologies and different prognostic treatments of BBA, with observations, on both a case-study and a statistical basis, to evaluate BBA impacts. We will develop process understanding using high-resolution models and observations and take that understanding through to weather and climate model biases. The team has a strong track record of using this approach, e.g. in application to processes in West Africa in the AMMA and Fennec projects, which will provide opportunities for exchanges of ideas and collaboration. Within the ASCI project, in partnership with the Met Office, we are developing a cloud-resolving version of the Unified Model with fully coupled multi-moment aerosols (from UKCA) and multi-moment cloud microphysics. This will provide an exciting opportunity for research and collaboration in this rapidly developing field.

You will have a PhD (or be nearing completion) in a relevant branch of atmospheric or Earth System science; e.g. atmospheric composition, climate science, land-surface modelling. You will have proven experience in numerical programming as well as data visualisation. You will be expected to show demonstrable commitment to publication of original results at an international level.

University Grade 7 (£30,122 - £35,938 p.a) Please note that the funding limitations mean that an appointment above £30,122 p.a will probably result in a slightly shorter contract.

Informal enquiries may be made to Dr John Marsham, Tel: +44 (0)113 343 8668, Email: j.marsham@see.leeds.ac.uk.

Closing Date: 1st February

Start Date: 1 March 2013

Job reference :ENVEE0151.

To apply for this post go to:

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