

RGS-IBG Peter Fleming Award Recipients

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Advancing geography
and geographical learning

Year: 2009

Principal Investigator: Dr A. J. Hodson (University of Sheffield)

Co-Investigators: Dr T. Irvine-Fynn, Prof. C. Clark, Mr. H. Langford, Ms. Claire Plant, Dr. A.M. Osborn (All University of Sheffield)

Project Title: Microbial enhancement of glacier melt

Abstract: It has been suggested that some 10 million trillion microorganisms are liberated from glacier ice by melting every year. These dark cells attach themselves to other particles, grow and increase surface melt rates by absorbing solar radiation. This project believes that deglaciation is accelerated by this process, which also prepares the glacier forefield for ecological succession. The project team will quantify these fascinating feedbacks by integrating physical, chemical and biological process measurements during a field campaign in summer, 2009. Field measurements will constrain the deposition, release and fate of these particles and their microorganisms upon three Spitsbergen glaciers at various stages of retreat.

Year: 2008

Principal Investigator: Dr Andrew Thomas, Manchester Metropolitan University

Co-Investigators: Dr Stephen Hoon (Manchester Metropolitan University), Dr Andrew Dougill (University of Leeds)

Project Title: CO₂ and N₂O emissions from soils along a Kalahari rainfall gradient

Abstract: Climate change in the Kalahari will alter rainfall patterns and increase temperatures. Enhanced evapotranspiration will prolong soil aridity and affect biochemical processes controlling N and C cycles. Cyanobacteria soil crusts drive many of these processes, yet understanding of their sensitivity to rainfall and disturbance is limited. This research quantifies CO₂ and N₂O emissions from crusted soils at sites of contrasting aridity. It also determines flux sensitivity to disturbance and moisture. The data will help improve understanding of the soil-atmosphere-land use feedbacks required to predict regional environmental and climatic changes. Sites are located along an aridity gradient which extends the transect used in previous IGBP studies into the more arid portions of SW Botswana. At each site the team will determine how fluxes are affected by rainfall events of varying magnitude and disturbances associated with grazing. This will provide an analogue for the potential effects of climate change on soil biochemical processes. The data will be used to generate a model that will predict gaseous fluxes of CO₂ and N₂O from communal grazing areas on Kalahari Sands. The research will advance our understanding of the relationship between soil gaseous emissions, climate and grazing. This is important from a geographical perspective because ecological changes and ultimately the livelihood vulnerability of Kalahari pastoralists will be determined by these interactions in a future warmer, drier world.

Year: 2007

Principal Investigator: Dr Peter Langdon, University of Southampton

Co-Investigators: Stephen Brooks (Natural History Museum), Dr Ian Croudace (National Oceanographic Centre, University of Southampton), Dr Stephen Harrison (University of Exeter), Prof. Melanie Leng (NERC Isotope Geoscience Laboratory & University of Nottingham)

Project Title: Testing the Potential of Temperature and Precipitation Proxies from Recent Lake Archives in Patagonia

Abstract: This project had the main objective of developing high-resolution, multi-proxy, multi-lake reconstructions of climatic (and in particular hydroclimatological) variability over the last 500 years from Patagonia. The project tested the sensitivity of two proxies of climate change in this region, chironomids (non-biting midges) and stable isotopes, against instrumental and known past fluctuations in glacier extent, in order to assess their potential for reconstructing accurately climate change over longer (millennial scale) time periods. Fieldwork was based in the Rio Chacabuco region as this valley offered a range of lake types at altitudes from c.300-1000 metres, allowing the team to test the sensitivity of the different lacustrine systems. The study lakes were all of small-medium sized, medium depth (i.e. without significant periods of summer stratification) and were open systems. A total of 16 sediment sequences were recovered from six different sites. One short core from each site was brought back intact for analyses on the ItraX core scanner for geochemical profiles while the others were subsampled in the field. These core sediment lengths should provide enough material to cover the last ~500 years. Analysis of the samples in UK laboratories is ongoing.

Year: 2006

Principal Investigator: Dr Charlie Bristow, Birkbeck College, University of London

Co-Investigators: Dr Nick Drake (King's College London), Dr Simon Armitage (Oxford University)

Project Title: Paleolake Megachad Shoreline Chronology: Evidence for Humid Periods in the Sahara.

Abstract: The project aimed to determine the age of palaeolake shorelines in the southern Sahara. The shorelines around the lake contain a record of late Pleistocene and Holocene climate change because they record changes in precipitation and evapotranspiration.

Year: 2006

Principal Investigator: Dr Jos Barlow, University of East Anglia

Co-Investigators: Toby Alan Gardner (UEA), Dr Reinaldo Barbosa (Instituto Nacional de Pesquisas da Amazonia), Dr William Overal (Goeldi Museum), Dr Luiz Carlos Ruiz Pessenda (University of San Paulo)

Project Title: Biodiversity and Ecosystem Response to Forest Fires in Amazonian Forests

Abstract: The project aimed to research the longer-term effects of the current fire dynamic in tropical rainforests, providing information about biodiversity, climate-change and the long-term sustainability of the world's tropical forests. Fieldwork sites were conducted in Para (representing core Amazonian forest) and Roraima (representing transitional forest).

Year: 2005

Principal Investigator: Dr Philip Hughes, University of Manchester

Co-Investigators: Dr Jamie Woodward (Manchester University), Professor Tihomir Marjanac (University of Zagreb), Mrs Ljerka Marjanac (Croatian Academy of Sciences and Arts).

Project Title: Quaternary Glacial History of Montenegro.

Abstract: The aim of this fieldwork was to examine the evidence for Pleistocene glaciation in the Dinaric Alps in the Montenegro. Evidence of glaciation in this area was first reported over 100 years ago. However, since this time, little progress has been made in understanding the nature of the glaciation. The project planned to involve detailed mapping, sedimentological analysis and dating of glacial and periglacial landforms such as moraines, erratics, lakes and rock glaciers. Former glacial dimensions were to be reconstructed from field data to

allow detailed glacier-climate relationships. Combined with the detailed field mapping and sedimentological and geochronological analyses, this project aimed to enable a reconstruction of Mediterranean glacial climates unrivalled by any published work undertaken in this region.

Year: 2004

Principal Investigator: Dr Heather Viles, University of Oxford

Co-Investigators:

Project Title: Landscape Evolution and Hydroclimatic Change in the Cunene Sand Sea, NW Namibia.

Abstract: This geographical research expedition conducted the first integrated field survey of the hyperarid Cunene Sand Sea. The landscape in this region of Southern Africa is largely unknown due to its remoteness and proximity to the contested border with Angola; until now, access has been restricted to military personnel and comparatively little Quaternary research has been conducted in this part of the Namib Desert. In cooperation with the Republic of Namibia Directorate of Survey and the Desert Research Foundation of Namibia, the team initiated the first detailed ground-based geographical reconnaissance of northwestern Namibia.

Year: 2004

Principal Investigator: Dr Mike Searle, University of Oxford

Co-Investigators:

Project Title: Makalu-Barun Expedition 2005 (Formerly the East of Tsangpo 2005)

Abstract: The project originally aimed to carry out satellite photography interpretation and field mapping in the eastern Himalaya region of the Yarlung Tsangpo gorge in China. Two weeks before departure, sudden changes imposed by the Institute of Tibetan Plateau Research in Beijing forced its cancellation, and the relocation of the research to a similar river system. Seven weeks were spent in the field area, mapping and collecting over 80 rock samples to determine metamorphism timing and erosional history around the Barun glacier. Mapping, observations and measurements were then made of the complete transect along a four-week trek south to the Main Central Thrust near Hile. Subsequent the rocks collected were dated, and the study linked to the last six years of research of the Everest Massif with the aim of completing a multi-disciplinary study of the entire Nepal-South Tibet Himalaya.