Welcome to the Geography and Environment Palaeoenvironmental Laboratories at Southampton (PLUS) research group newsletter. In this bumper issue we have a range of interesting articles and information about the group and its activities including publications, grant success, media activity, and more....

Photo: Penguins in the Karukinka Reserve, Patagonia
High Profile PLUS Staff Publications

Over the last year member of PLUS have published a total of over 40 papers in international refereed papers as well as several contributions to books and conference volumes.

Of particular note is that over the same period several members of PLUS have published in the major international Science journals and here the authors comment on three of these papers:

**Mary Edwards & Heather Binney**


**Mary comments** “The Nature paper results from over five years of work in the large EU-funded Ecochange project. This element of the project involved seven key partner institutions, including Southampton. The team pioneered a method of extracting plant DNA sequences from soil and other sediments, which were collected from cliffs of frozen sediment in NE Siberia. DNA was also extracted from the guts of animals partially preserved in permafrost. The work makes use of so-called “next-generation” sequencing technology. The resultant data (about 11 million reads from over 300 samples) were processed into lists of species present and their relative abundances. The short sequences (the DNA is partially broken down by decay processes) were matched against a custom catalogue based on modern plant collections. The interpretations are underpinned by Quaternary palaeoecology and stratigraphy – Mary Edwards and Julian Murton (Sussex) went out to Cherskiy in northeast Siberia and collected over 100 samples for the study in 2009.”

**Plantsago canescens** (Northern Plantain), a forb whose DNA remains occur in Ice Age permafrost at Duvanny Yar, Siberia. (Source: Arctic Flora of Canada and Alaska: http://arcticplants.myspecies.info/)

**Rong Wang, John Dearing and Pete Langdon are authors of:**


**John Dearing writes:** “This paper combined empirical data from a lake-catchment system with a mathematical model to test ideas about how critical transitions may be preceded by early warning signals. We showed evidence for rising

variance starting 10–30 years before the transition to eutrophic lake conditions in both the empirical records and the model output – a phenomenon known as flickering. We concluded that if environmental regimes are sufficiently affected by large external impacts then early warning signals of transitions in modern social–ecological systems may be stronger, and hence easier to identify, than previously thought.”

Wang, Rong, Dearing, John A., Langdon, Peter G., Zhang, Enlou, Yang, Xiangdong, Dakos, Vasilis and Scheffer, Marten (2013) Reply to Carstensen,
Tonym Brown is lead author of:


Tonym comments: “This paper presents an analysis of the pattern of exceptionally rich Lower Palaeolithic sites in The British Isles and northern France – the pattern is striking in that they are almost without exception located in the downstream reaches of floodplains just above the maximum reach of the tidal during past warm periods (interglacials). We now know enough about these sites to know that even if they are not in situ (some are) they do represent dense areas of hominin activity – why. This paper uses palaeoecological data to argue that one cause is the diversity of nutrients that are present in this richest

Two members of PLUS, John Dearing and Tom Roland, as well as countless ex-PLUS people have contributed to this paper which is part of setting the future agenda in palaeoecology:


Wetterich, Sebastian; Guido Grosse; Schirrmeister, Andrei A. Andreev; Anatoly A. Bobrov; Frank Wetterich, Sebastian, Guido Grosse, Schirrmeister, Andrei A. Andreev; Anatoly A. Bobrov; Frank Wetterich, Sebastian, Guido Grosse, Schirrmeister; Andrei A. Andreev; Anatoly A. Bobrov; Frank Wetterich, Sebastian, Guido Grosse, Schirrmeister; Andrei A. Andreev; Anatoly A. Bobrov; Frank Wetterich, Sebastian, Guido Grosse, Schirrmeister; Andrei A. Andreev; Anatoly A. Bobrov; Frank Wetterich, Sebastian, Guido Grosse, Schirrmeister; Andrei A. Andreev; Anatoly A. Bobrov; Frank Wetterich, Sebastian, Guido Grosse, Schirrmeister; Andrei A. Andreev; Anatoly A. Bobrov; Frank Wetterich, Sebastian, Guido Grosse, Schirrmeister; Andrei A. Andreev; Anatoly A. Bobrov; Frank Wetterich, Sebastian, Guido Grosse, Schirrmeister;


News from the Front:

**PATAGON Fieldwork in Chile**

In January Paul Hughes and Tom Roland joined the third PATAGON expedition to Southern Patagonia, destined for Punta Arenas and Isla Grande de Tierra del Fuego. The aim of the expedition was to recover water table monitoring data and short peat cores from San Juan Bog and from the peat bogs of the wild and beautiful Karukinka National Park. Karukinka is only accessible by very rough trails, but the journey is well worth the effort. The uplands are swathed in old-growth southern beech (Nothofagus) forest where an astonishing abundance of lichens and mosses abound. High wind speeds ensure that dead wood habitats occur across the woodland floors. In the valleys vast expanses of Sphagnum magellanicum bog occasionally give way to dwarfed clumps of Nothofagus antarctica. Both the shrubs and the Sphagnum carpets are sculpted by the wind, which can suddenly rise and settle again as intense squalls blow through. With the coring and monitoring complete the expedition took the chance to visit the neighbouring king penguin colonies (see cover image), where again the chill mid-summer winds presented a considerable challenge to steady photography. After eight flights in three weeks and a stop-over in the Chiloe region of Patagonia we arrived back in Southampton with a wealth of new core material for the final phase of the PATAGON project. Months of analyses await.

**Paul Hughes on the impact of land management on carbon accumulation in Welsh blanket peats**

*(Joint Southampton – CEH – NRW - UCL project)*

Rob Collier recently started his PhD in PLUS examining how differing management practices (e.g. cattle grazing, ditching) can influence carbon accumulation rates in blanket peatland. This research supervised by Paul Hughes and, undertaken in conjunction with the Centre for Ecology and Hydrology in Bangor, Natural resources Wales and Prof. Neil Rose (UCL), will help inform Welsh Government strategy to best maintain this ecosystem service of considerable importance given concerns associated with contemporary climate change. Whilst the project involves the collection of fifty surface samples, initial fieldwork was completed in early December to acquire ten cores to undergo 210Pb dating at University College London to help provide a robust chronological framework for the study. And so, under sunshine more characteristic of mid-summer, Rob and Paul set off for Wales where they obtained several workable samples from sites including Lake Vyrnwy and the Plynlimon massif. The next stage involves analysing these cores for various measures, including plant macrofossils and carbon content, and to decide where the next forty cores are going to come from!
PLUS & The Anthropocene

Members of PLUS are actively involved in current research into and the status of the Anthropocene – the proposed new geological time period in which humans have had an overwhelming effect on nature. This involvement includes Tony Brown who is Chair of the British Geomorphological Societies Working Group on the Anthropocene and is the European editor of a new Elsevier Journal (The Anthropocene) and John Dearing who sits on the editorial board of another new journal (The Anthropocene Review) which is published by SAGE. PLUS has also had informal meetings during the year and members of PLUS will be involved in a meeting at the Geological Society of London to discuss the issue.

PLUS and Policy Advice

Keith Barber has been advising Natural England on the conservation and restoration of his ‘locus classicus’ Bolton Fell Moss. Besides many publications such as his 1981 book on the site he has a wealth of new historic photographs of the bog as it was in the 1960s and he has assisted in the writing of a new Geological Conservation Review, updating the published 2002 report. This should appear in 2014. Peat cutting and milling have now ceased and a big programme of rehabilitation is underway.

PLUS In The Media:

An article in the Sunday Independent (11th December) was based on Tony Brown’s PLoS ONE paper and he talked on Radio Solent about it.

A piece, with the awful journalistic title of “Enmired” in New Scientist (January 2014) also appeared about PLUS’s work (Tony & Paul’s) on mires and links to deforestation.

PLUS Meetings

PLUS at the 50th Anniversary QRA ADM, London, January

Mary Edwards gave a paper on and Pete Langdon, chaired a session presented a poster. Other PLUS posers were presented by Tom Roland, Helen Mackay, Kim Davies, Jon Hassall with Pete and David Sear, Martin van Hardenbroek, E. Hopla and was attended by Keith Barber and Heather Binney.

Back in June of 2013 Pete Langdon organised and hosted the 12th International Chironomid workshop, in the New Forest. This had 39 delegates and 30 paper were given over 2 days.


PLUS was also represented at a number of external meetings including:

Human evolution at the headwater of the Nile (EQUA) meeting, Jinja, August 2013 (Basell, Brown)
Socio-environmental Dynamics over the Last 12,000 Year: The Creation of Landscapes III, Kiel University, April. 2013 (Brown)
EGU Anthropocene Session April 2013 (Brown)
The European Palaeolitich Conference, British Museum February 2013 (Brown, Basell)
Geology Meets Archaeology, NERC Sponsored meeting, Leicester. February. 2013 (Brown)
“Stone Age Bogs” meeting, in Scania, Sweden, August (Brown)
Kenyan Wildlife Service workshop, Kenya December 2013 (Langdon, Ward)
FAR North workshop, Aberdeen, November 2013 (Langdon)
AGU, December 2013 (Mackay)
BOGS (British Organic Geochemistry Society Meeting), Plymouth, July 2013, (Mackay)

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PLUS Blogging & Tweeting:

In a drive to improve the online presence of the research group, the PLUS blog will be launched imminently. It will provide a short introduction to the research group and an overview of its research activities. It will also provide an informal avenue for PLUS members to communicate their science with the general public and current and prospective students. Likewise, the PLUS twitter account (now live) will predominantly focus on promoting the social media output of PLUS members. Since its creation, the account (@PLUSsoton) has already amassed over 100 followers.

Outreach:


Tom Roland and PLUS alumni Matt Amesbury have started a science communication website ‘Bogology’, which aims to introduce the science of peatlands and climate change to a broader audience. The website also features guest blog posts and contributions from PLUS members would be gladly received.

Grants Success:

John Dearing: co-PI Belmont Forum Consortium Grant ‘DELTAS: Catalyzing action towards sustainability of deltaic systems with an integrated modeling framework for risk assessment’ total grant value €2.6M, (€468K to Southampton)

Pete Langdon: UoS ILFS, TEWLS: Toolbox of Early Warning signals for Lake Systems £19,000

Tom Roland: QRA Quaternary Research Fund (£840) ‘Holocene tephrachronology in Southern Patagonia: development and incorporation of a cryptotephra framework’

Helen Mackay: awarded a QRA funded place on the Oxford Radiocarbon Short Course in March 2013 and was also received funding from the QRA New Research Workers Award for fieldwork in Newfoundland and Labrador, August 2013. During this time she also worked with the GEOTOP group in their labs in Université du Québec à Montréal. Helen received funding from the AGU to attend the Fall Meeting and the peatland carbon workshop. Helen Mackay and Paul Hughes received NERC funding for rangefinder dates on Helen’s Ph.D. core. They also were awarded time by NERC on the Edinburgh EMPA to look at North American tephras.

What’s Coming Up from PLUS?

John Dearing has been invited writing team member of IGBP Synthesis for Future Earth and will spend his research leave as Visiting Professor at the Academy of Sciences in Nanjing.

Tom Roland has been invited to give a talk at UCL’s Palaeoclimate seminar series in mid-March.

Tony Brown is co-organiser and a speaker at a session in honour of Karl W Butzer to be held at the Society of American Archaeologists Meeting in Austin Texas in April. He is also organiser of a workshop at the Institute of Field Archaeology meeting in Glasgow and the AGU Anthropocene Session at AGU also in April. In September he is co-convenor of a session the European Association of Archaeologists annual conference in Istanbul.

Helen Mackay has been invited to present at the Birmingham Molecular Climatology group seminar series in late March.

Dr Annika Herbert from the University of Macquarie will be visiting PLUS on the 5-7th June on after attendance and PMIP in Belgium. She works on climate calibration from pollen and will hopefully give a PLUS seminar.

Drosera uniflora from the PATAGON project
www.southampton.ac.uk/geography research/groups/palaeoenvironmental_lab.page
Tony.Brown@southampton.ac.uk
+44(0)23 8059 2204