



Institute of Science  
and the Environment

## **ANNUAL REPORT ON RESEARCH-RELATED ACTIVITIES, 2008- 2009**

### **General overview for the Academic Year**

This report summarizes research-related activities within the institute from 1 September 2008 to 31 October 2009. During this period some important changes have occurred. The new Head of Institute, Prof John Newbury arrived in October 2008. Two further appointments were made later in the year. Dr John Dutton joined us as Senior Lecturer in Ecology (to replace Dr Peter Alma) and he has been working to extend his network of contacts with regional agencies (such as county wildlife trusts and zoos) active in the field of the animal conservation ecology. Shelley Davies has been appointed as Lecturer in Human Biology and brings expertise in the physiology of pain and strong links to the pharmaceutical industry. She is developing research links within and outside the University and this includes the development of postgraduate training in Medical Communication. The Institute has also benefited greatly from the appointment of a member of support staff, Jo Dyson, who is greatly extending the application of Geographical Information System (GIS) technologies across a range of geographical, ecological and archaeological research projects. The complete list of academic/research staff members engaged in research and/or publishable scholarly activity in recent years is provided in Appendix 1.

During the year, the Institute received the results of the national Research Assessment Exercise and was pleased to note the sound performance of the five members of staff who had been submitted under the 'Geography and Environmental Sciences' unit of assessment. This augurs well for the (equivalent) Research Excellence Framework exercise to which submissions will be made in 2013. Submissions to the previous scheme were limited by the small size of the Institute and the consequent difficulty of defining groups of research active colleagues in cognate areas. With the arrival of new staff in the biology area, this will not be such a marked problem in the future.

The Geography and Archaeology sectors of the Institute have, for several years, had an active programme of research seminars to inform other academic staff and students of research-related activity in the Institute and to broaden their general knowledge through external speakers. The Biology side of the institute has also recently initiated a similar programme the first of which is scheduled for November 2009. The institute has also initiated a regular Newsletter for dissemination to students, staff and potential students at Open Days. In addition to general Institute news, the Newsletter serves to highlight research-related activities to a broader audience.

The new Head of Institute (HoI) has expended significant efforts on the research strategy of the Institute and on the revision of this strategy by the University. An independent Institute Research and Knowledge Transfer Sub-Committee has been developed and has been meeting and formulating strategy during the year. After open consultation with colleagues, the HoI has been carrying out the annual appraisals of all academic staff members; an important component of each discussion has been the research aspirations of each staff member and the support that can be offered by the HoI. Whilst full engagement with the Teaching and Learning processes of the University must remain a core objective of all academic staff, the importance of research and scholarly activities is being explicitly recognised and staff members are aware that there is a commitment to support their activities where resources allow. Staff members have been encouraged to develop a 3-4 year planning horizon with the appraisal meetings representing only the formal component of discussions of their development.

### **Summary of Research Centre activities**

The *Centre for Rural Research* (CRR) now comprises six members of academic staff led by Dr Nick Evans. Dr Alan Dixon has become a member of the Centre during the year bringing particular skills in wetland management as well as overseas experience. The past year has been quieter than usual in the trading activities of CRR largely because the recession has limited the numbers of contracts available. However, consultancy work was carried out on the following projects adding to the long list developed since the formation of the Centre in 1996:

- *St. Wulstan's Nature Reserve Visitor Survey* (KM, EC, DC, NE) For the Countryside Service, Worcestershire County Council.
- *The State of the Malvern Hills AONB: A Second Look* (NE) For the Malvern Hills AONB Partnership.
- *Geology and Art Feasibility Study*. (CJ, RD) For Natural England.
- *Geographical Endemism as a Definition of Endangerment in Farm Livestock Breeds* (NE) For the Rare Breeds Survival Trust.

The reduced activity in the commercial area has allowed members of the Centre to devote a larger proportion of their time to pure research activities and the group continues to make a very strong contribution to the lists of research outputs shown in the appendices. Nick Evans has also been busy disseminating information about rural matters through the media and during the last year has appeared on BBC Farming Today, ITN National News and BBC Midlands Today. The 57<sup>th</sup> Lovatt Lecture also fell within the rural area last year being given by Dr. Lewis Holloway, Department of Geography, University of Hull on *New Technologies In Farming: Remaking Animals, Knowledges and Agricultural Geographies*. A full report of the activities of the CRR is provided separately, but from an Institute viewpoint this is clearly a research focus that we wish to support and enhance.

The *Rivers Management Group* is not a fully constituted Research Centre but represents a strong second research focus within the Geography area. The limited size of the group, led by Dr. Ian Maddock, is in marked contrast to its reputation. Details of some of the activities of the group are given below since these do not appear in an independent report. Dr Maddock is engaged in a series of pieces of

collaborative research, many with overseas workers. For example, he has worked with Dr Monica Rivas-Casado in the Department of Natural Resources at Cranfield University since 2005 working on the characterization of in-stream hydraulics and they have published several jointly authored papers. Another collaboration is with Prof Alexander Milner in the School of Geography, Earth and Environmental Sciences at the University of Birmingham and this includes joint supervision of Megan Klaar, a PhD student jointly funded by the two universities. Work with Dr Natasa Smolar-Žvanut from the Institute for Water of the Republic of Slovenia on rapid mapping techniques of hydraulic and geomorphic habitats in rivers has been progressing since 2004, again resulting in several jointly authored papers and presentation of results at international conferences. Collaboration has also been taking place with Prof Mike Acreman and Mike Dunbar from the Centre for Ecology and Hydrology, Wallingford since the mid-1990s. This involves a research project on 'Rapid Assessment of Physical Habitat Sensitivity to Abstraction' funded by the Environment Agency from 2003-06. Dr Fleur Visser, of the same group, has also maintained her collaborative links with Dr Natasa Smolar-Zvanut, a researcher at the Institute of Water for the Republic of Slovenia. The two were project partners for a NERC equipment loan project on the detection of submerged vegetation. Dr Visser also collaborated with Dr Sue Charlesworth (Coventry University) and Dr Janet Jackson (University of Northampton) as project partners in a bid for a collaborative research studentship on low altitude remote sensing for monitoring and management of the ecosystems services provided by Sustainable Drainage (SUDS) retention ponds. She has also recently made contact with Ross Hill (Bournemouth University) with the aim of establishing collaborative work on extracting/mapping submerged macrophytes from a hyperspectral image of the River Frome in Dorset.

The CRR and Rivers Management research groupings are success stories in terms of research activity, outputs and reputation. This was clearly recognised in the RAE 2008 exercise. While the Institute's research strategy will be seek to support all staff members in their research and scholarly activities, we have a particularly strong commitment to supporting these two successful areas of geographical research. The new form of the RAE, which will be called the Research Excellence Framework (REF), takes place in 2013. An important strategy of the Institute is to build on the RAE success in Geography and develop a strong submission of active researchers in this discipline. If we can continue to increase our undergraduate student intake it may be possible to appoint further academic staff to support both the teaching and research aspirations in this area.

It has been an exciting but disrupted year for the staff of the **National Pollen and Aerobiology Research Unit** (NPARU) led by Prof Jean Emberlin. Research and commercial activities have continued at an impressive level centred around aerobiology – the study of organic materials in the air. As in previous years, these activities include a range of consultancy work in forensic science, the collection and analysis of pollen data allowing the development of pollen forecasts both nationally and across Europe, work not just on hay fever but also other allergies and tests for allergenic materials, testing devices such as vacuum cleaners, filters and air purifiers, clinical trials on potential treatments

for allergies, and a series of research projects mainly concerned with pollen. This list is not exhaustive and fuller details are provided in an independent annual report. The disruption during the year has been caused by the construction of the Charles Darwin building which adjoins the current NPARU facilities. The ground floor of this building comprises a suite of specialist laboratories, offices and other facilities that will allow the expansion of work in the Unit both in terms of throughput and the range of services and research that can be undertaken. A key component of the new facility is the environmental test chamber which is capable of recreating most climate types and environmental conditions worldwide. This will be a valuable resource for product testing (e.g. measuring the release of Volatile Organic Compounds (VOCs) from commercial products) as well as for use in pure research projects. The next year will be one of new opportunities for NPARU as it further enhances its international reputation.

During the year the decision was taken that the *Ceramics Research Centre* would cease to operate as a University Research Centre. There were several reasons for this not least the illness that has led to the retirement of Head of the Worcestershire Historic Environment and Archaeology Service (WHEAS). However, there was also the recognition that our colleagues in the WHEAS, where the key ceramics collection is held, are involved in a much wider range of research than ceramics analysis. In spite of this change of designation, staff within the ISE continue to have strong and valuable interactions with staff in the WHEAS.

### **Research outputs**

Research outputs arising from research activity of staff of the Institute in the period under review are listed in Appendix 2 and these show a further increase in activity year on year. For example, nine book chapters have been published this year; seven of these were produced by staff in Geography again demonstrating the strength in depth of this sector of the Institute. For peer-reviewed journal publications the split between disciplines is more equal with ten of the 22 articles written by geographers, nine by biologists and three by archaeologists. We only have two members of archaeology staff but their profile and reputation are high. Both have organised and given papers at conferences in the last year; they have produced peer-reviewed articles; received research funding; been awarded PhD studentships; worked collaboratively with colleagues from other HEIs and organised research-led excavation projects at internationally important sites. An important strategy within the Institute is to increase the size of the Archaeology sector by introducing a Masters course and, because of increased student intake, to appoint another staff member.

Collaborative research broadens the range of activities and experience of Institute staff and continues to provide benefits in terms of postgraduate student supervision and funding, access to facilities and research output. It is consequently pleasing to see the number of staff of the Institute engaging in collaborative work with both colleagues within the Institute and with other institutions and organisations. Some of these are briefly highlighted here and the interactions are often evident in subsequent publications.

Dr Alan Dixon has continued his collaboration with Prof Adrian Wood (University of Huddersfield) on Wetland Action research and consultancy activities. In July 2009 he was made co-director of Wetland Action, an organisation that seeks to support the sustainable management of wetlands in an ecologically sound and socially sensitive manner. He has also begun discussions with Dr Alec Thornton of the ADFA (Australian Defence Force Academy, University of New South Wales) with a view to submitting an application for a British Council funded DeLPHE (Development Partnerships in Higher Education programme) project that will aim to build capacity for urban agricultural research in Ethiopia.

Dr Chris Brown continues to maintain links with his former postgraduate student, Zanell Brand (Department of Animal Sciences, University of Stellenbosch and Klein Karoo Ostrich Experimental Farm, South Africa) and with Prof. Schalk Cloete (Institute for Animal Production, Elsenburg, South Africa). The collaborative efforts are currently focused on writing up for publication results from earlier collaborative research projects on aspects of ostrich biology. Dr John Dutton is currently in discussion with Dr Giovanna Massei (Food and Environmental Research Agency) regarding collaborative research on wild boar ecology and also with Dr Mark O'Connell (University of Bath) and Dr Phoebe Carter (Cotswold Water Park Society) regarding further collaborative research on the re-introduced European Beaver. John Newbury continues to collaborate with colleagues at Birmingham University on the central role of phloem in plant growth and as a feeding site for aphids.

Dr Helen Loney has collaborated as a ceramic consultant on the Terralba Rural Settlement Project, an archaeological investigation of Roman Republic and Punic settlement in Sardinia. The Principal Investigator is Prof. Peter van Dommelen (Department of Archaeology, University of Glasgow) and with Prof. Carlos Gomez Ballardo (Principal Investigator, University of Valencia) and the Society of Antiquities on Motor Memory and Punic Sardinia rural pottery production. Dr David Storey is collaborating with Michael Holmes (Liverpool Hope University) on 'Football and national identity in Ireland'. Dr Jodie Lewis collaborates with colleagues from Bath Spa (Prof Paul Davies) and Bournemouth Universities (Dr Mike Allen) as well as the National Trust (Dr Jeremy Milne) in her archaeological research and excavation projects.

Many staff members have acted as referees for peer-reviewed journals including: *Animal Welfare*, *British Poultry Science*, *Geopolitics*, *Journal of Environmental Management*, *Landscape Research*, *Finnish Journal of Rural Policy*, *Proceedings of the Prehistoric Society*, *Proceedings of the University of Bristol Spelaeological Society*, *Journal of Mediterranean Archaeology*, *River Research and Applications*, *Hydrology and Earth System Sciences*, *Hydrobiologia*, *Journal of River Basin Management*, *Plant Physiology*, *Theoretical and Applied Genetics*, *Journal of Experimental Botany*, *Geographical Journal*, *Methods in Ecology and Evolution*, *Anthozoos*, *Journal of Rural Studies*, *Sociologia Ruralis*, *Crime Prevention and Community Safety*, *Land Use Policy*, *Urban Morphology* and *Tijdschrift voor Economische en Sociale Geografie*. Prof Newbury has recently accepted the post of member of the editorial board of *Euphytica* (the international plant breeding journal).

Dr John Dutton is Leader of a project examining the public perception of wild boar in the Forest of Dean. The project started in July 2009 and is due to run until at least April 2010.

Conferences attended by staff and the nature of their participation are detailed in Appendix 3. It is encouraging to see the increase in the number of academic staff participating at conferences and some individuals have been particularly active. Such activities increase the research profile of the University, allow staff to keep up-to-date with research elsewhere and offer opportunities to establish professional contacts. As in previous years, conference attendance represents a mix of discipline-specific conferences and those directly related to the enhancement of the learning and teaching.

### **Research income and consultancy**

Details of research income are noted in Appendix 5. In December 2008, Dr Fleur Visser obtained an equipment loan from NERC's Field Spectroscopy Facility. While not directly research income, the loan value of the spectroradiometer equipment for a three week period was valued at £2790.

Dr Susanna Prankel, together with a project partner, successfully bid for funds for development of an 'Enhanced induction course' to Hereford and Worcester LLN and received £3000. Dr Prankel and Lorraine Weaver have also been awarded funding (£10,000) by the VETNET LLN for a project based on developing science-related sessions for potential applicants, particularly those from non-traditional entry routes. VETNET LLN is a National Network of Veterinary schools, Universities and Colleges committed to providing opportunities for students on vocational courses to obtain places in Higher Education. Lorraine.

Dr Alan Dixon was allocated TQEF money to develop a 3<sup>rd</sup> year virtual fieldcourse module based on his research interests and experience in Western Ethiopia.

Consultancy for Wetland Action in 2008 on their 'Striking a Balance' project (co-funded by Self Help Africa: total = £7265).

Dr Cheryl Jones has recently attracted 55K funding from Dudley PCT, jointly with Derek Peters, under the banner 'Let's Go Outside and get Active' for the purposes of upgrading public parks. This initial funding is to carry out a baseline survey of current activities within the parks and includes the use of questionnaire data. It is hoped that further funding can be attracted to survey the effect of the park upgrades on the activities of the public.

Dr Jodie Lewis has obtained £3,000 from the Society of Antiquaries and £1,000 from the Mendip Society to fund research associated with the Priddy Circles archaeological site. Dr Helen Loney was awarded £1,250 with Dr Andrew Hoan to allow the carbon dating of material collected during the Matterdale archaeological project.

Several other bids for funding have not been successful.

## **Postgraduate students & postgraduate student supervision**

The year has seen a further increase in the supervision of postgraduate research students often involving collaboration and co-funding from other universities. These jointly funded students reflect the value of the links with other institutions such as Birmingham, Cardiff and Coventry Universities. A list of current postgraduate students and their status can be found in Appendix 5. During the year under review, four students supervised by Institute staff successfully graduated, leaving eight more continuing with their research. A further five further students either initiated their research projects or are very soon to be appointed to studentships. Of these 17 students, there is an even split between the biological, geographical and archaeological subject areas; this serves to emphasise the strong research activity associated with the small archaeology group.

During the year, it has been possible to negotiate a jointly-funded PhD studentship scheme with the College of Life and Environmental Sciences at the University of Birmingham. The first two studentships are being developed: between a) Susanne Prankel and Susannah Thorpe on animal locomotion and b) Helen Loney and Mark Viant to identify chemical residues in ancient pottery fragments. We expect to develop more joint studentship projects over the next few years.

## **Activities related to professional bodies and learned societies**

Most academic staff are members or fellows of learned societies, and some are very actively involved. For example, John Newbury is a Director of the Biochemical Society and has been involved in strategic decisions about its new accommodation in Charles Darwin House in London along with two other learned biological societies and its interactions with the newly formed Society of Biology. Other staff play active roles in a wide variety of societies and special interest groups and these include: the Commonwealth Geographical Bureau, Royal Geographical Society, International Society of River Science, River Restoration Society, British Hydrological Society, Geographical Society of Ireland, Quaternary Research Association, The Association of UK Regionally Important Geological and Geomorphological Sites, British Society for Geomorphology, Remote Sensing and Photogrammetry Society, Wetland Action, Mammal Society, Countryside Management Association, British Veterinary Association, Botanical Society of the British Isles, British Bryological Society, Society for Experimental Biology, International Working Group on Flowering, Forensic Science Society, the Prehistoric Society and the Cumberland and Westmorland Antiquarian and Archaeological Society. Staff present papers at the conferences of these societies and/or are involved in running them.

## **Other research-related activities and notable achievements**

Several staff members have acted as referees for peer-reviewed journals including: *Animal Welfare*, *British Poultry Science*, *Geopolitics*, *Journal of Environmental Management*, *Landscape Research*, *Finnish Journal of Rural Policy*, *Proceedings of the Prehistoric Society*, *Proceedings of the University of*

*Bristol Speleological Society, Journal of Mediterranean Archaeology, River Research and Applications, Hydrology and Earth System Sciences, Hydrobiologia, Journal of River Basin Management, Plant Physiology, Theoretical and Applied Genetics, Journal of Experimental Botany, , Methods in Ecology and Evolution, Anthrozoos, Journal of Rural Studies, Socialia Rurialis, Crime Prevention an Community Safety and Tijdschrift voor Economische en Sociale Geografie.*

Prof. Newbury has recently accepted the post of member of the editorial board of *Euphytica* (the international plant breeding journal).

Dr John Dutton is Project Leader for a project examining the public perception of wild boar in the Forest of Dean. The project started in July 2009 and is due to run until at least April 2010.

Dr Chris Brown also acted as a reviewer for the South African National Research Foundation, evaluating the research output and national/international standing of researchers applying for rating.

Members of the Institute have also refereed many books and book chapters. Prof John Newbury has refereed grant applications from the BBSRC and DEFRA and Dr. Ian Maddock has provided this service for the British Council British-Polish Young Scientists programme and NERC.

## **Appendix 1 – Research–active staff in the Institute**

*Note: the list below includes only full-time academic staff*

Heather Barrett (BA, PhD)	Urban Geography and Conservation, PDP in Higher Education
Chris Brown (BSc, PhD)	Animal Physiology, Ostrich Biology
Peter Carruthers (BSc, PhD) (Senior fellow).	Rural communities
Shelley Davies (BSc, PhD)	Neurobiology of pain; Biomarkers and cardiovascular disease
Diana Dine ( BSc, PhD)	Soil and Water Pollution
John Dutton	Ecology, particularly Animal Conservation Biology
Alan Dixon (BSc, PhD)	Third World Development, Wetland Management, Sub-Saharan Africa
Nick Evans (BSc, PhD)	Agricultural Geography
John Fagg (BA, PhD)	Economic Geography, Retention in Higher Education

Rob Herbert (HND BSc, PhD)	Plant Cell and Molecular Biology
Kate Hiles	Forensic Biology
Debbie Holmes (BSc, DPhil)	Plant Biology
Cheryl Jones (BSc, PhD)	Unstable Landscapes, Geoconservation
Jodie Lewis (BA, MA, PhD)	Prehistoric Britain, Landscape Archaeology
Helen Loney (BA, MA, PhD)	British and European Archaeology, Ceramics
Ian Maddock (BSc, PhD)	Hydroecology, River Conservation and Management
Derek McDougall (BSc, PhD)	Glacial and Quaternary Geomorphology, e-learning
Denise Mortimore (BSc, PhD)	Human Nutrition
John Newbury (BSc, PhD)	Molecular Genetics, Biotechnology, Plant Biology, Evolution
Susanne Prankel (MPhil, PhD)	Animal Welfare and Ethics, Veterinary Science
David Storey (BA, MSc, PhD)	Rural and Political Geography
Laurence Trueman (BSc, PhD)	Plant Biology, Human Nutrition
Fleur Visser (MSc, PhD)	Hydrology, Fluvial Geomorphology, GIS and Remote Sensing
Lorraine Weaver, BSc	PDP in the Biosciences

## Appendix 2 – Research outputs

### *a) Chapters in books*

- Carruthers, S. P.** (2009). The land debate – ‘doing the right thing’: ethical approaches to land-use decision making. In: Winter, M. & Lobley, M. (Eds). *What is land for? The food, fuel and climate change debate*. London, Earthscan. (In Press).
- Dixon, A.B.**, Wood, A.P., Finlayson, M. and Halsema, G.E. (2008). Exploring agriculture–wetland interactions: a framework for analysis. In: *Scoping agriculture-wetland interactions: Towards a sustainable multiple response strategy*. Wood, A.P. and Halsema, G.E. (Eds), FAO, Rome. pp5-28.
- Dutton, J.S.** (2009). Principles of Ecology. In: *The complete textbook of animal health and welfare*, Williams, J. (Ed.). Elsevier, Oxford. pp282-300.
- Lewis, J.** and Mullin, D. 2009 “Mass Production: Neolithic Monuments on the Mendip Hills, Somerset” in Romero, A. (ed). *Archaeology for the masses: Theoretical and methodological approaches to a neglected identity category*. BAR International Series. Archaeopress. Oxford.
- Mylechreest, M.** (2009) Downton Castle and its walled garden. In: *The walled gardens of Herefordshire*. Grant, F. and Patton, J. (Eds), pp. 45-50. Logaston Press, Herefordshire.
- Storey, D.** (2008). Territory, space and society. In: Daniels, P., Bradshaw, M., Shaw, D. and Sidaway, J. (Eds) *An Introduction to Human Geography. Issues for the 21<sup>st</sup> Century* (3<sup>rd</sup> edition), Harlow, Prentice Hall, pp. 399-416.
- Storey, D.** (2009) Political Geography. In: Kitchin, R. and Thrift, N. (Eds) *International Encyclopedia of Human Geography*, Oxford: Elsevier.
- Storey, D.** (2009). Rural economic development. In: Kitchin, R. and Thrift, N. (Eds) *International Encyclopedia of Human Geography*, Oxford: Elsevier.
- Visser F.** (2008) The day roads became rivers: A GIS-based assessment of flash floods in Worcester. In: *Flood Risk Management - Research and Practice*. Samuels, P. Huntington, S. Allsop, W. and Harrop, J. (Eds.), Taylor & Francis Group, London, pp. 1617-1621.

### *b) Publications in peer-reviewed journals and conference proceedings*

- Brand, Z., Cloete, S.W.P., **Brown, C.R.** and Malecki, I.A. (2008). Systematic factors that affect ostrich egg incubation traits. *South African Journal of Animal Science* 38: 305-325.
- Buch, A. and **Dixon, A.B.** (2009). South Africa’s working for wetlands programme: A win-win situation for environment and development? *Sustainable Development*, 17, 3, 129-141.
- Daniels, M., Bale, J.S., **Newbury, H.J.**, Lind, R. and Pritchard, J. (2009). A sub-lethal dose of thiamethoxam causes a reduction in xylem feeding by the bird cherry-oat aphid (*Rhopalosiphum padi*), which is associated with dehydration and reduced performance. *The Journal of Insect Physiology*. In press.
- Dixon, A.B.** (2008). The resilience of local wetland management institutions in Ethiopia. *Singapore Journal of Tropical Geography* 29, 3, 341-357.
- Dixon, A.B.**, Hailu, A., Semu, T. and Taffa, L. (2009). Local responses to

- marginalisation: human-wildlife conflicts in Ethiopia's wetlands. *Geography* 94, 1, 38-47.
- Hunt, E. Gattolin, S., **Newbury, H.J.**, Bale, J.S., Tseng, H.-M., Barrett D.A. and Pritchard J. (2009) A mutation in amino acid permease AAP6 reduces the amino acid content of the *Arabidopsis* sieve elements but leaves aphid herbivores unaffected. *Journal of Experimental Botany*, *in press*.
- Kerton, M., **Newbury, H. J.**, Hand, D. and Pritchard, J. (2009). Accumulation of calcium in the centre of leaves of coriander (*Coriandrum sativum* L.) is due to an uncoupling of water and ion transport across the leaf. *Journal of Experimental Botany*, 60: 227-235.
- Klaar, M. J., **Maddock, I.** and Milner, A.M. (2009). The Development of Hydraulic and Geomorphic Complexity in Recently Formed Streams in Glacier Bay National Park, Alaska. *River Research and Applications* (In Press).
- Lewis, J.** (2008) Excavations east of Blackmoor, Charterhouse, Mendip Hills, Somerset. *Proceedings of the University of Bristol Spelaeological Society*, 24(2), pp 83-96.
- Lewis, J.** (2009) The long barrows and long mounds of West Mendip. *University of Bristol Spelaeological Society Proceedings* 24: 187-206.
- Maconachie, R., **Dixon, A.B.** and Wood, A.P. (2009). Decentralization and local institutional arrangements for wetland management in Ethiopia and Sierra Leone. *Applied Geography*, 29, 2, 269-279.
- Maddock, I.**, Smolar-Žvanut, N. and Hill, G. (2008). The Effect of Flow Regulation on the Distribution and Dynamics of Channel Geomorphic Units (CGUs) and Implications for Marble Trout (*Salmo marmoratus*) Spawning Habitat in the Soča River, Slovenia. *IOP Conference Series: Earth and Environmental Sciences*, 4 . pp. 1-10.
- Newbury, H.J.** (2009). A discussion of the use of classical characters and sequence data in the teaching of evolution. *Comparative Biochemistry and Physiology*. 153A, No. 2/suppl. P. S48
- Newbury, H.J.** (2009). Letter to Darwin. *The Biochemist*, Feb. 2009, p. 54-56.
- Smolar-Žvanut, N., **Maddock, I.** and Vrhovsek, D. (2008). Evaluation and Application of Environmental Flows in Running Waters in Slovenia. *International Journal of Water Resources Development* 24: 609-619.
- Storey, D.** and Connolly, E. (2008) A countryside for all? *Town & Country Planning* 77: 523-526.
- Storey, D.** (2009) Segregation and territoriality: comments on Waterman, *Irish Geography* 42: 253-255.
- Tseng H.-M., Gattolin S., Pritchard J., **Newbury H.J.** and Barrett D.A. (2009) Analysis of mono-, di- and oligosaccharides by a two stage derivatization method, capillary electrophoresis and laser induced fluorescence detection. *Electrophoresis*. *In press*
- Visser, F.** and Smolar-Žvanut, N. (2009). Detecting submerged macrophytes in a UK chalk stream using field spectroscopy. In: Proceedings of the Annual Conference of the Remote Sensing and Photogrammetry Society, 8-11 September 2009, Leicester, pp. 541-547.
- Weaver, L. & Holmes, D.S.** (2009). Personal development planning based on subject-specific QAA benchmark skills. In: Ward, R. (Ed.). *PDP and e-*

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<http://www.recordingachievement.org/pdpuk/newsletter/issue16.pdf>

**Prankel, S.** Cadmium and the welfare of animals. *Encyclopedia of Environmental Health* Elsevier, Oxford.

Van Dommelen, P., De Bruijn, N. **Loney, H.**, Moragón, R.P. and Roppa, A. (2008). Ceramica punica dal sito rurale di Truncu 'e Molas (Terralba, Sardegna) In: González, J., Ruggeri, P., Vismara, C. and Zucca, R. (Eds.). *L'Africa romana XVII*: 1617-1626.

**c) Other**

*Book reviews*

Storey, D. Review of S. Gupta and T. Omoniyi (eds) Cultures of Economic Migration: International Perspectives, *Gender, Place and Culture* 16 (1), 2009.

Storey, D. Review of S. Buzar Energy Poverty in Eastern Europe. Hidden Geographies of Deprivation, *Geografiska Annaler B* 91(2), 2009.

Storey, D. Review of G. M. Robinson (ed.) Sustainable Rural Systems. Sustainable Agriculture and Rural Communities, *Irish Geography* 42 (2), 2009.

Storey, D. Review of B. Graham and P. Howard. (eds) Ashgate Research Companion to Heritage and Identity, *Gender, Place and Culture* 16 (5) 2009.

Dr Alan Dixon, in collaboration with Prof. Adrian Wood at Huddersfield University (Wetland Action), developed a series of Policy Briefing Notes based on the outcomes of his 'Striking a Balance (SAB)' consultancy work. These are being disseminated widely throughout the wetland management community in Sub-Saharan Africa with the aim of placing rural livelihoods on the wetland policy agenda. (see <http://www.wetlandaction.org/SAB.html>)

Dr P. Carruthers - 'Inquiry into the future for England's upland communities'. Scoping and design of research-derived evidence base for CRC - outputs include CRC internal documents and design and management of a research seminar programme.

Dr S Prankel has written and delivered a course involving enhanced induction for students progressing from a HND (or similar qualification) off-site to a Top-up in the Sciences at UW. This will be made available to local LLN. Publications pending.

Dr S Prankel and Mrs L Weaver have written and delivered a course involving enhanced induction for students progressing from a HND (or similar qualification) off-site to a Top-up in the Sciences at UW. This will be made available to local LLN. Publications pending.

Loney, H. Excavations at Glencoyne Park 2005. Unpublished report for Cumberland and Westmorland Antiquarian and Archaeological Society.

### **Appendix 3 - Conferences attended, conference participation and/or organisation**

#### **Dr P Carruthers**

- Commission for Rural Communities, Uplands Inquiry Seminar: (Penrith, UK, 21 May 2009) – Convenor of four sessions on ‘The state of the uplands’, ‘The value and valuation of public goods in the English uplands’ and ‘Managing, developing, formulating policy for the English uplands’ and International experience of managing and developing uplands (Penrith, UK, 21 May 2009).
- Commission for Rural Communities, Uplands Inquiry Seminar: (Penrith, UK, 21 May 2009) – Three Oral paper - *Valuing people and nature in the uplands; Ethics, public policy and upland communities and ‘International experience of managing and developing uplands’*

#### **Dr D Dine**

- Heritage and the Environment Conference (November 2008, University of Worcester) Delegate only.
- Personal Development, Planning and Employability Day Conference ( January 2009, University of Worcester) Delegate only.

#### **Dr A Dixon**

- ‘People: lifelines for wetlands on the edge’. Meeting on ‘Wetland and aquatic ecosystems: their functions and values’ (25<sup>th</sup> November 2008, Oxford University) – Oral paper
- ‘Mapping the landscape with sticks and stones’. UW Research Focus event on "Landscape and Heritage" (3<sup>rd</sup> November 2008) - Poster.

#### **Dr J Dutton**

- Lecture at the monthly Bristol Zoo Research Colloquium (4<sup>th</sup> March 2009).
- Bristol Conservation and Science Foundation launch symposium (30<sup>th</sup> October 2008) - coauthor of oral paper presented.
- Mammal Society Easter Conference (17<sup>th</sup>-19<sup>th</sup> April 2009) - oral paper and poster.
- Association of Lowland Search and Rescue Inaugural Conference (21<sup>st</sup>-23<sup>rd</sup> August 2009) - oral paper.

#### **Dr J Lewis**

- Excavations at Bredon Henge, Worcestershire. Oral Paper (February 2009) Gloucestershire and District Archaeological Research Group
- Excavations at the Priddy Circles Somerset Oral Paper (February 2009) Somerset Heritage Group Annual Conference
- Theoretical Archaeological Group Annual Conference (December 2008) Delegate. University of Southampton
- Excavations at Chilcompton, Somerset 2008. Oral Paper (November 2008) Bronze Age Forum, University of Sheffield
- Pieces of Landscape: An Archaeological Perspective. Oral Paper. (November 2008) Landscape and Heritage Conference, University of Worcester
- Landscape and Heritage Conference, University of Worcester (November 2008) Conference Organiser and Lead Chair

**Dr H Loney**

- Garrod Seminar Series, (5 March 2009, McDonald Institute, Cambridge) Oral Paper 'Understanding Rural Punic ceramic production in Sardinia'.
- Landscapes and Identity: 3 November 2008, University of Worcester) – Oral Paper 'What's in a name: Landscape and Society in the Roman Iron Age of Northwestern England'.

**Dr I Maddock**

- National Meeting of the British Hydrological Society (Liverpool University, January 8<sup>th</sup> 2009) - Delegate.
- Flood Management 09. Public Service Events (The Barbican, London, June 25<sup>th</sup> 2009) - Delegate.
- International Society for River Science Symposium. Florida, USA (July 12<sup>th</sup>-17<sup>th</sup> 2009) - Oral Paper - Maddock, I., Smolar-Žvanut, N. and Hill, G. 'The effect of flow regulation on the distribution and dynamics of channel geomorphic units (CGUs) and implications for Marble Trout (*Salmo Marmoratus*) spawning habitat in the Soča River, Slovenia'. Oral Paper - Wallis, C., **Maddock, I.P**, Visser, F. & Acreman, M. (2009) An evaluation of the spatial configuration and temporal dynamics of hydraulic river habitats.

**Prof HJ Newbury.**

- 'The use of classical characters and sequence data in the teaching of evolution'. Society for Experimental Biology conference (Glasgow, June/July 2009).

**Dr S Prankel**

- University of Hertfordshire CABLE Project event on Stimulating Divergent Thinking (16 October 2008) – Delegate.
- Conference of the Animal Welfare Science, Ethics and Law Veterinary Association (AWSELVA) (29 October 2008) - Delegate.
- 'Best Practice: Principles, structures and models for University Research Ethics Committees', AREC University Sector Seminar 3 – Workshops (18th March 2009 Birmingham) - Delegate.
- British Small Animal Veterinary Association (BSAVA) Congress 3-4 April 2009) – Delegate

**Dr D Storey**

- Landscape and Heritage conference (Worcester, November 2008) - Oral Paper 'Rural development, heritage and place promotion'.
- Conference of Irish Geographers (Cork, May 2009) – Delegate.

**Dr F Visser**

- Annual Conference of the Remote Sensing and Photogrammetry Society (8-11 September 2009, Leicester) - Oral paper.
- FLOODrisk 2008: The European Conference on Flood Risk Management, Research into Practice (30 September - 2 October 2008, Oxford) - Oral paper.
- Landscape and Heritage - One Day Conference (3 November 2008, University of Worcester) - Oral paper.
- Object based landscape analysis (OBLA); meeting of the RSPSoc Land Cover/Land Use SIG, (7-8 April 2009, Nottingham) – Delege only.

- INTERCARTO INTERGIS 15: Sustainable development of territories: GIS theory and practice. (29 June - 1 July 2009, Perm, Russia) – Delegate only

### **Mrs L Weaver**

- Personal Development Planning and Employability Day Conference (January 2009, University of Worcester) - Delegate.
- Annual Residential Seminar of the Centre for Recording Achievement (20<sup>th</sup> - 21<sup>st</sup> November 2008, Manchester) – Oral paper.
- Learning and Teaching Conference (June 2009, University of Worcester) – Delegate.

## **Appendix 4 – Postgraduate students**

### *a) Worcester postgraduate students supervised/co-supervised*

#### **Dr D Dine**

- Jeremy Cox (PhD) (yet to transfer) first registered September 2003.

#### **Dr R Herbert**

- Natasha Spadafora (PhD) Joint with Dr. Dennis Francis and Dr. Hilary Rogers (both of Cardiff University and Dr. John Doonan (John Innes Centre, Norwich. Graduated 2009.

#### **D Holmes**

- Jeremy Cox. (PhD) The effect of supplementary lighting regimes on the allocation to sexual and asexual modes of reproduction in *Allium vineale*. First registered 2004, Part time.

#### **Dr J Lewis**

- Rebecca Williams PhD. (Registered 2008; second supervisor Dr Nick Evans). *From Malvern to Mendip: Bronze Age Funerary Landscapes of the Southern Severn Uplands*. University of Worcester fully funded PhD scholarship
- Rona Davis PhD. (Registered 2006, part-time) *The nature of Mesolithic activity at selected spring sites in south-west Britain*.
- Bob Ruffle PhD. (Registered 2006, part-time) *Pottery in the material culture of early modern England: a model from the archaeology of Worcester*

#### **Dr I Maddock**

- Graham Hill (PhD) – Co-supervised with Dr Fleur Visser (University of Worcester) and Dr Mike Acreman (Centre for Ecology and Hydrology, Wallingford). Year of first registration: 2005.
- Caroline Wallis (PhD) as above.
- Megan Klaar (PhD), University of Birmingham (joint funded with UW). Year of first registration: 2006.

#### **Prof HJ Newbury**

- Alison Evans (PhD) (first supervisor at University of Birmingham). Graduated 2008.

- Matt Kerton (PhD), University of Birmingham (co-supervised with Dr Jerry Pritchard). Graduated 2009.
- Tess Livermore (PhD), University of Birmingham (co-supervised with Dr Jerry Pritchard). Year of first registration: 2008.

**Dr D Storey**

- David Maund (PhD) - graduated November 2008.

*b) Postgraduate scholarships/studentships awarded*

**Dr A Dixon**

- With Dr James Bennett at Coventry University, awarded a joint Worcester-Coventry PhD studentship entitled 'Building resilient institutions for wetland management in Ethiopia'. Student starting September 2009.

**Dr J Lewis**

- Neal Johnson PhD. (Registered 2009; second supervisor Dr Helen Loney) *From Malvern to the Irish Sea: Bronze Age Funerary Landscapes of the Anglo-Welsh Border*. University of Worcester fully funded PhD scholarship

**Dr Helen Loney**

- Not yet appointed (PhD). Jointly funded studentship with University of Birmingham (Mark Viant).

**Dr I Maddock**

- Marie-Pierre Gosselin (PhD) August 2009.

**Dr Susanne Prankel**

- Not yet appointed (PhD). Jointly funded studentship with University of Birmingham (Susannah Thorpe).

*c) External examinerships*

**Dr J Dutton**

- MSc Animal Welfare - Moulton College, University of Northampton.
- FDSoc Wildlife and Conservation - South Devon College, University of Plymouth.

**Dr Jodie Lewis**

- External examiner for MPhil thesis, University of Birmingham

**Dr I Maddock**

- PhD student, University of Melbourne, October 2009

**Prof HJ Newbury**

- MSc Crop Improvement, University of Northampton.
- PhD students December 2008 & October 2009, University of Nottingham

**Dr S Prankel**

- Field External Examiner for Hartpury College (and University of West England) in the Animal Science area.

**Dr D Storey**

- External examiner for BSc Geography at Bath Spa University.

**Appendix 5 - Research funding applications**

**Dr Jodie Lewis**

- Bid for research funding for post-excavation analysis from Society of Antiquaries – successful - £3000
- Bid for research funding for post-excavation analysis from Mendip Society – successful - £1000
- Joint bid for research funding (with Bournemouth University) for post-excavation analysis from Maltwood Fund – successful - £1000
- Bid for two UW fully-funded research studentships (2008 and 2009) - successful

**Dr I Maddock**

- Member of the proposed team for the NERC Knowledge Exchange on Hydromorphology, led by Dr Andre Large (Newcastle University) and Dr Dave Gilvear (Stirling University). Bid unsuccessful.

**Dr S Prankel**

- Bid for development of an 'Enhanced induction course' to Hereford and Worcester LLN – successful - £3000 (together with project partner)
- Received funds to supervise joint PhD studentship with a lecturer from Birmingham University – recruitment ongoing.
- Bid for PhD studentship/research to Guide Dogs for the Blind. Bid unsuccessful
- A joint bid for money for Widening Participation project has resulted in an award of £10,000 by the VETNET LLN for a project based on developing science-related sessions for potential applicants, particularly those from non-traditional entry routes

**Dr F Visser -**

- Equipment loan from NERC Field Spectroscopy Facility. Granted 5 December 2008. Loan value of spectro-radiometer equipment £127/day \* 22 days ~ £2790.
- Bid for collaborative research studentship with Dr Sue Charlesworth of Coventry University: Low altitude remote sensing for monitoring and management of the ecosystems services provided by Sustainable Drainage (SUDS) retention ponds.