

**FURTHER PARTICULARS – Reference: ASS/2384**

**UNIVERSITY OF DUNDEE**

**School of Social and Environmental Sciences - Geography**

**SAGES Chair in Flood Science**

**The post**

An exciting opportunity for a Chair in Flood Science is available at the University of Dundee. The post arises as part of the Scottish Alliance for Geosciences, Environment & Society, a £22m investment across nine Scottish institutions. It invites the contribution of an exceptional individual in leading research on flood science within the wider context of earth system science and environmental change. Applications are invited from scientists working in the fields of hydrology, geomorphology and natural disasters. Knowledge transfer will be a major theme in helping maximise societal benefits from the research outputs. This post is also supported by a lectureship under the SAGES programme dedicated to research on aspects of socio-environmental vulnerability.

The post is part of a major investment in water-based research being undertaken by the University and complements a new Chair in Water Science being filled in the UNESCO Centre for Water law, Policy and Science.

**SAGES ([www.sages.ac.uk](http://www.sages.ac.uk))**

SAGES (Scottish Alliance for Geoscience, Environment and Society) is a new initiative where 9 universities are collaborating to build a world-leading capability in the study of global change and society. The aim is to understand and predict the processes and feedbacks which govern the interactions between climate change, the Earth system and human activity. The initiative, representing an investment of £22 million by the universities and the Scottish Funding Council, is founded in the belief that pooling skills and increasing resources will bring added research potential and benefit industry and society. The alliance involves the Universities of Aberdeen, Abertay Dundee, Dundee, Edinburgh, Glasgow, Paisley, St Andrews, Stirling, UHIMI (Scottish Association for Marine Science – SAMS); it also includes SUERC (Scottish Universities Environmental Research Centre).

SAGES brings together ecologists, environmental scientists, geographers, geologists, and atmospheric scientists to tackle pressing and fundamental problems concerning the interaction between humanity and the Earth's natural environment. The questions are tackled under three themes: *Landscape dynamics*, *Terrestrial carbon cycle*, and *Atmosphere, oceans and climate*. The themes will be linked by an integrative programme focused on a centre for Earth system modelling, which will be concerned with predicting climate change and its impacts at a range of scales from global to local. A second integrative programme aims to enhance knowledge transfer for policy and economic impact. A graduate programme is built around funded research studentships, supervised jointly between institutions, to provide a shared training environment and to stimulate new collaboration.

SAGES is a springboard for the future. By investing in some 30 new academic and research appointments across the consortium we expect to see a catalytic effect that will lead to further growth and additional research funding from UK, European and other sources (research councils, charities, government and industry). Such funding will build on the existing research themes, but also evolve new themes and new activities under the influence and leadership of the new positions.

### **School of Social and Environmental Sciences – Geography**

Geography at the University of Dundee has established itself as a centre of international and national research excellence (graded 4A in the 2001 Research Assessment Exercise). It also prides itself for high quality teaching (receiving the top grading of 'commendable' in all categories in our 2001 Quality Assurance Agency review). The University of Dundee has strongly underpinned our success with investments in staff and equipment and supports our ambitions to enhance our research profile.

### **UNESCO Centre for Water Law, Policy and Science**

The School has close links with the UNESCO Centre for Water Law, Policy and Science (founded in 2005), one of 10 UNESCO Water centres around the world and the only UNESCO Centre in a UK university. The vision of the Centre is to become the world leader in water law, policy and science to better equip states address the global water problems of the 21<sup>st</sup> century. Working at the interface of law, science and policy, the Centre undertakes research to assist national governments and international agencies meet the UN's Millennium Development Goals (MDGs) to alleviate poverty in regions of growing water scarcity and develop innovative models and practice for managing river basins. The Centre will also consolidate and enhance existing expertise in water-related research at the University and within Scotland. The Centre is currently filling a Chair in Water Science and opportunities will be available for the new Chair in Flood Science to become associated with the work of the Centre which includes many opportunities for joint international projects.

### **Environmental Systems Research Group (ESRG)**

The successful candidate will become a member of the Environmental Systems Research Group within the School of Social and Environmental Sciences whose aims are "to research environmental risk and the sensitivity of water bodies and glaciers to environmental change and to develop new techniques for assessment of environmental sensitivity".

The ESRG promotes research excellence through three research clusters: hydrological, coastal and lacustrine, and glaciological, and systems. Their common objective is to understand the sensitivity of environmental systems to natural and anthropogenic changes.

The ESRG comprises 20 scientists including full-time research staff (Ball, Black, Bragg, Brock, Cutler, Duck, Kirkbride, Reeves, Rowan, and Werritty), technicians, research assistants and postgraduate students. Clusters operate "fuzzy" boundaries across which ideas, methods and results flow, allowing synergy between fundamental and applied research. Cross-fertilisation is facilitated through Round Table meetings, fortnightly research seminars, and informal

monthly “Brown Bag” discussions. Significant research funding has been obtained from external sources such as UKRC, ESRC, NERC, Scottish Executive, DEFRA, SNIFFER, Carnegie Trust and private insurance companies.

Recent major advances have been registered in:

#### Flood science

Key achievements include the re-calibration of flood risk given uncertainties posed by climate change, and contributions to risk management. Proxy flood series combining instrumental, historical and sedimentological records across a number of UK sites yield better estimates of natural variability over the past two centuries and more robust estimates of flood risk (Werritty, Black and Rowan plus NERC-CASE studentship). Links between climatic drivers and regional differentiation of flood risk have been established (Black plus NERC-CASE studentship). Reports for OST (Foresight Project) and the Scottish Executive (Social impacts of flooding) have identified vulnerable populations and, quantification of potential flood losses have been pioneered (Werritty, Ball and Black). The threat posed by coastal flooding in Scotland has also been scoped in a SNIFFER-funded project (Ball, Werritty and Duck). The financial exposure of the insurance industry to flooding has been re-assessed (Black) and the respective roles of planning and insurance in mitigating the impacts of floods reviewed in a DEFRA-funded project (Ball and Werritty).

#### Environmental responses to rapid climate change

Achievements relate to improved understanding of climatic and human drivers for environmental change. Kirkbride has established a coherent Holocene glacier chronology for Iceland and its relation to North Atlantic climate proxies, making methodological advances in the use of tephrochronology. At larger scales, Brock and Kirkbride have quantified the topographic effects of Quaternary glaciation on the erosion of mountain belts, with implications for modelling landscape evolution.

In glaciology, Brock’s expertise in glacio-meteorology complement Kirkbride’s in sediment transport in their research into the response of debris-covered glaciers to warming climates. Brock, Cutler, and Kirkbride have recently received three NERC awards to investigate modelling of ice melting using remotely-sensed debris surface temperatures. Since 2004, Kirkbride has established a measurement programme of alpine glacier sediment fluxes (Royal Society of Edinburgh/ Caledon Research Foundation, NERC ARSF).

The ESRG has also been at the forefront of innovation in methods and techniques as evidenced by:

- NERC-JIF-funding for the Feshie catchment (part of the National Infrastructure for Catchment Hydrology Experiments) facilitates modelling of water and sediment fluxes at reach and basin scales (Werritty and Black).
- Methodological advances in catchment-scale sediment fingerprinting (Rowan) incorporate enrichment effects and uncertainty into predictions through multivariate unmixing models.

Achievements in all three clusters are underpinned by methodological and technological advances. Cutler’s development of the spatial and temporal transferability of algorithms in remote sensing feeds into many areas of the

group's activities (water-body ecology in relation to the WFD, rain forests, peat erosion, and marine ecosystems in Belize), including funded projects with five other ESRG members. Funding sources include NERC New Observing Techniques award, NERC/British National Space Centre SAR and Hyperspectral Airborne Campaign, two NERC SWIR instrument validation campaigns, and two ARSF awards. Brock's work on glacier ablation has improved the parameterization of energy balance models, pioneering their application to debris-covered glaciers. Kirkbride's development of dating techniques in environmental reconstruction (tephrochronology, rock weathering indices, cosmogenic  $^{10}\text{Be}$ ,  $^{14}\text{C}$  AMS) has been supported by the NERC Radiocarbon and Cosmogenics Committees.

#### Policy-driven research

Recent policy-driven research includes the development of tools and decision support systems for UK Governmental implementation of the EC Water Framework Directive, providing several funded projects for ESRG's ecohydrology cluster, working in different combinations according to the specific mix of expertise required. Rowan, Black, Duck, Reeves, Werritty, Cutler, Bragg and RAs have worked on WFD-driven projects funded by SNIFFER and the North-South Shore Project on lake hydromorphology in Ireland (Duck).

The group has established the model practice of assessment of lake and river hydromorphological condition to be adopted by central government. Duck and Reeves have developed innovative field and laboratory methods (side-scan sonar, nuclear magnetic resonance imaging) to advance understanding of sediment, pollutant and nutrient pathways in estuaries and lakes. In Portugal, Duck has shown how physical forcing of estuarine flows by anthropogenic influences impacts on seagrass ecology. Werritty and Black have helped the Scottish Executive/Scottish Government re-think the theory and practice of sustainable flood management, and Werritty has recently been appointed to the UN High Level Expert Panel on Water and Disasters which will report to the Fifth World Water Forum in Ankara in 2009.

#### **Staff Research Interests**

Tom Ball	Flooding, Environmental Change
Andrew Black	Flood risks and impacts, Hydrology
Ben Brock	Glaciology, GIS
Donna Brown	Urban and Social Geography
Mark Cutler	Remote Sensing, GIS
Robert Duck	Coastal and Estuarine Science, Sedimentology
Allan Findlay	Population, International Migration
Nick Fyfe	Urban Geography
Alistair Geddes	GIS and Socio-environmental vulnerability
Ed Hall	Medical Geography
Donald Houston	Economic and Welfare Geography
Martin Kirkbride	Glacial Geomorphology
Alison Reeves	Coastal and Estuarine Science, Aquatic Geochemistry
John Rowan	Fluvial Geomorphology, Environmental Management
Fiona Smith	Political and Cultural Geography, Eastern Europe
Alan Werritty	Hydrology, Fluvial Geomorphology

### **Research Fellows and Research Assistants**

Olivia Bragg	Ecohydrology, Wetlands
Vanessa Brazier	Environmental Management
David Crichton	Flood Hazards and Insurance
Alexandra Stam	Human Mobility

### **Research Resources available**

Software for flood risk analysis is supported by the Flood Estimation Handbook (NERC, 1999), Scotland's largest database of peak-over-threshold and annual maximum flood series, and a number of daily rainfall series extending over 100 years. An RDI Acoustic Doppler Current Profiler has recently been purchased for measuring high flows, and complements an Acoustic Doppler Velocity meter and a range of mechanical current meters used for measuring lower flows. The Physical Laboratory is equipped for water chemistry and sediment analyses, including a Coulter LS230 laser diffraction granulometer, an Ortek Low-AX gamma spectrometer, Perkin-Elmer gas chromatography and a range of magnetic susceptibility sensors. Topographic survey capability has recently been boosted by the purchase of a differential GPS, adding to an EDM system. The School has close links with the Remote Sensing Group of the School of Computing, and its NERC satellite Receiving Station from which images are received from several satellite platforms covering much of the northern hemisphere.

### **Research on Water and the Environment**

Research on Water and Environment in Scotland is enjoying a period of transformation which adds to the sense of opportunity presented by this position. There is an acute sense of societal vulnerability as a result of climate change predictions. The Scottish Government has substantially increased its capital spending on flood defence, but there is a real awareness of the uncertainty of flood risk estimates. Scotland's radical commitment to sustainable flood management also adds to the opportunity presented by this post: the School presently enjoys excellent links with the Scottish Government and contributes directly to its flood policy development.

Implementation of the EC Water Framework Directive also provides important research opportunities for the successful applicant. Monitoring and modelling lakes has historically been overlooked but has now assumed much elevated importance, with staff in the School taking a leading role. Abstraction licensing has recently been introduced, 45 years after introduction in neighbouring England & Wales, and now seeks to underpin an objective, scientifically-informed catchment management system. Again, Geography staff have been prominent in this work and the successful applicant will have opportunities to contribute to this ongoing work in future years.

Further hydrological work currently under way in Dundee includes a UK Research Councils fellowship (jointly with Law) on Sustainable Flood Management, experimental catchment research in Glen Feshie as part of the NERC/JIF-funded CHASM initiative, and interdisciplinary work on the social impacts of flooding and flood risk in Scotland.

## **Teaching**

At the postgraduate level, the School has a well focused group of doctoral students as well as a commitment to a range of taught postgraduate courses: an MSc in Managing Environmental Change (with the University of St Andrews), an MSc in Sustainable Catchment Management, an MSc in Remote Sensing and Computing, an MSc in Applied Population and Welfare Geography (ESRC recognised) and an MSc in Social Research Methods. The School has full ESRC recognition (Quota, 1+3 basis, full-time/part-time, Case studentship).

In terms of undergraduate teaching, staff teach a Single Honours degree in Geography, a single Honours degree in Environmental Science and Joint Honours degrees with a wide range of subjects.

## **School Location and Facilities**

The School is housed in a modern building at the very centre of the University campus. In addition to staff offices, it comprises dedicated teaching laboratories, a GIS laboratory and working space for the School's postgraduate community. An annexe, about 100m from the School, contains research laboratories for physical geography.

## **ACADEMIC POSTS – TERMS & CONDITIONS**

These are the general terms and conditions for full-time Academic staff. Part-time staff terms and conditions are pro-rata.

### Hours of Work

Working time is that reasonably required to fulfil the duties of the post.

### Annual Leave

39 days annual leave, this includes all public holidays. The leave year runs from 1 January to 31 December.

### Pay Scales

Payment is made on the Professorial salary range and is reviewed annually.

### Salary Payment

Payment is made monthly in arrears.

### Superannuation

Contributions are made by both the employee (6.35% of salary) and the University, with the University meeting the balance of the cost of the benefits, to the Universities Superannuation Scheme. Superannuation is a choice and is not compulsory for the employee; however you will be opted into the Scheme unless you inform the Pensions Office that you do not wish to join before you take up your employment. Employees with a contract for at least 3 months are eligible to join up to age 64, although there are additional contributions payable for those joining USS who are age 60 or above.

### Retiral

Academic staff will retire on 30 September following their 65<sup>th</sup> birthday but may retire at any time following their 60<sup>th</sup> birthday on giving due notice.

### Occupational Sick Pay Scheme

There is an occupational sick pay scheme where the period of entitlement to paid sick leave is based on the length of continuous service. After 5 years' service an employee is eligible for 6 months 'full pay' and 6 months 'half pay'.

### Family Friendly Policies

There is a range of policies designed to support staff to balance work and home life and deal with personal responsibilities, as well as some of life's major events. These include Adoption leave, Compassionate Leave – Bereavement, Family Leave – Children and Dependants, Fertility Treatment Leave, Flexible Working, Foster Care Leave, Jobshare / Part-time Working, Maternity Leave, Parental Leave and Paternity / Maternity Support Leave.

## **ADDITIONAL INFORMATION**

### Qualifications

The University's selection procedure requires that successful candidates for Academic posts have their qualifications validated. One or more of the institutions which have awarded the successful candidate a degree or professional qualification will be contacted, therefore, by Personnel Services.

### Disclosure Scotland Checks

The post for which you are applying is considered to be a child care position in terms of The Protection of Children (Scotland) Act 2003. It requires the successful applicant to undergo a satisfactory Disclosure check through Disclosure Scotland prior to appointment. This check is necessary to ensure that the University of Dundee fulfils its legal duties under the Act.

If you are successful in your application, the offer of employment will be subject to a satisfactory Disclosure Report. The University will make a Disclosure application to Disclosure Scotland which will reveal any past criminal convictions (spent or unspent) or inclusion on the Disqualified From Working with Children List. Any non-conviction information held locally by the police may also be disclosed should this be considered relevant to the position.

Please note it is a criminal offence to apply for a child care position if you are on the Disqualified From Working with Children List.

### No Smoking Policy

The University operates a no-smoking policy, with designated smoking areas available in some areas.

### Equal Opportunities

The University is committed to equal opportunities and welcomes applications from all sections of the community.

### Removal Expenses

The University makes a contribution towards relocation expenses incurred by newly appointed members of staff in moving to Dundee to take up their appointments. The reimbursement is subject to a maximum of the equivalent of one month's gross pay calculated on basic starting salary (this does not include any shift allowances, out of hours intensity supplements, distinction awards, etc). Additional assistance may be given in respect of removals from overseas. If

relocation expenses are paid and the member of staff leaves within two years, the University will require repayment of any such relocation expenses. Less than 2 years will be reimbursed on a fractional basis. Recovery will be at the rate of 1/24<sup>th</sup> for each month less than 2 years worked and will be automatically deducted from the final salary payment. Please see enclosed Relocation Expenses document for more detailed information.

## **APPLICATIONS**

Applications in the form of a CV (3 copies) and the Candidate Information Form with the names and addresses of 3 referees should be sent to Personnel Services, University of Dundee, Dundee, DD1 4HN, UK. It is the practice, in this University, that references are taken up before interviewing. If you do not wish us to contact any of your referees without your prior consent, please state this clearly on your CV and Candidate Information Form.

Closing date for applications is **13<sup>th</sup> October 2008**  
Please quote reference number: **ASS/2384**.