

Bush Telegraph

The House Magazine of the Edinburgh Consortium for Rural Research

THE YEAR GONE & THE ONE AHEAD

Since stepping into the shoes of Chris Browitt, the previous Scientific Director, I have had an interesting time developing the scientific programme and more especially engaging with the wide range of organisations that are within the ECRR. The Director's lunches have taken us out and about and have been an opportunity to see at first hand the wide range of scientific research that goes on in Scotland that is connected with the rural environment. For me the highlight was a trip around Little Cumbrae in the research vessel from **University Marine Biological Station Millport**. I was able to observe my old field mapping area in North Ayrshire from an entirely different perspective.

I hope that the scientific programme has also provoked members into looking at aspects of the rural environment from a different perspective. This was kicked off with the Peter Wilson Lecture which was given by Prof Jim McDonald on Energy : Opportunities and Challenges in which he explored the opportunities for renewable energies against the backdrop of low carbon technologies and the current state of the energy grid infrastructure.

An ECRR seminar entitled *The state we're in: society's responses to climate change* was organised with the ESRC

Genomics Policy & Research Forum which brought in a number of researchers in the social sciences to look at the climate change challenges facing Scotland.

A further workshop was held with **Edinburgh Napier University** on Ecotourism – Challenges and Opportunities which featured speakers from many ECRR member organisations involved with the recreational use of Scotland's natural resources.

Planning for the future scientific programme is already well in hand. Prof Tim Lang from the City University, London will be giving the Peter Wilson Lecture on 14th February 2011 on food security.

A workshop is planned to take place in Perth College on the issue of broadband provision in the rural environment which I hope will also include something on the issues around telemedicine.

2011 will also be the year for a seminar at Battleby which we hope will bring together some of the networks that are addressing different aspects of climate change in Scotland and beyond and foster amore joined up approach.

Professor Stuart Monro
ECRR Scientific Director

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SNH Battleby Centre – the venue for the May 2011 forum 'Climate change research – Making connections'
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James Hutton – Scientific Giant

James Hutton was born in 1726 into a wealthy Edinburgh family, his father William being a merchant who held the office of city treasurer and owned a 140 acre farm at Slighhouses about 7 km north of Duns and Chirnside.

In 1736, when he was ten years old, James entered Edinburgh High School. There he studied Latin, Greek and mathematics, and in November 1740, at the age of fourteen, he entered the University of Edinburgh. He graduated in the spring of 1743, still only seventeen years old.

After graduating, Hutton took a job as an apprentice to a solicitor, but his mind was not on the work and, with a particular interest in chemistry, he decided to return to the University of Edinburgh to undertake medical studies.

In 1747 Hutton left Edinburgh and went to Paris where he continued his studies at the University. After a year there he moved again, this time to complete his medical studies in Leiden from where he graduated in 1749. He returned from Leiden to live in London.

While in London, Hutton corresponded with James Davie who had been a school friend and was still living in Edinburgh. They had made a chemical discovery while



James Hutton

students in Edinburgh, discovering a way to make sal ammoniac, a chemical used in welding metal. In 1750 Hutton and Davie set up a chemical works which was an immediate success and provided Hutton with an income for the rest of his life.

Hutton inherited the farm at Slighhouses and planned to farm there but decided that first he would make a study of modern farming methods. In 1752 he moved to a farm in Norfolk where he spent two years. These were important years for Hutton, for it was during these years that his interest in geology began.

In the summer of 1754 Hutton moved to Slighhouses. It was the beginning of a period spanning thirteen years during which he spent most of his time farming and working on his theories of geology.

Hutton returned to live in Edinburgh in 1767, to a city which was undergoing a revolution in scholarship. Here he joined in the intellectual activity which was bursting out throughout the city. The most important of his friends were Joseph Black who discovered carbon dioxide, James Watt who made the first practical steam engine, and Adam Smith the economist.

In Edinburgh Hutton continued to pursue his theories of the history of the Earth. He looked at the rocks around him and realising that soil is caused by erosion of rocks, he also understood that there is a second mechanism creating rocks beneath the surface which are then elevated to form new land. He understood that this was a slow cyclic process and that the Earth therefore had to be extremely ancient.

During 1784 the Royal Society of Edinburgh invited Hutton to give two lectures on his theory. There was vigorous opposition to his views but Hutton's reaction was what one would expect of an outstanding scientist – he undertook trips to view rock formations to try to gain further evidence to prove that his theory was correct.

James Hutton is the Scottish 18th century scientist whose name is to be given to the new Institute that combines the Macaulay Land Use Research Institute and the Scottish Crop Research Institute. This brief biography is adapted from an article by JJ O'Connor and E F Robertson in the MacTutor History of Mathematics. See <http://www-history.mcs.st-and.ac.uk/>

Hutton wrote a treatise, *The theory of the earth*, which appeared in 1795 but sadly it was not nearly such a good book as it might have been since Hutton wrote it during a time of deteriorating health. One also has to add that, even before the severe health problems, Hutton always seemed much more successful in convincing his fellow scientists when he spoke to them than when he wrote. It remained to others, particularly his friend John Playfair, to present his views more successfully.

Hutton died on 26 March 1797 in Edinburgh.

As to Hutton's character, Playfair gives this account:-

His great liveliness, added to the aptness to lose sight of himself, would sometimes lead him into little eccentricities, that formed an amusing contrast with the graver habits of philosophic life. ... But it is impossible by words to convey any idea of the effect of his conversation, and of the impression made by so much philosophy, gaiety and humour, accompanied by a manner at once so animated and simple.

Scottish Crop Research Institute



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NEW INSTITUTE

The new "super research institute" to be formed from the Scottish Crop Research Institute and Macaulay Land Use Research Institute, is to be named in honour of the Scottish Enlightenment science pioneer, James Hutton.

The **James Hutton Institute** will bring together existing Scottish expertise in crop research, soils and land-use, and will make a major contribution to the study of key global issues, such as food and energy security, biodiversity, and how climate change will affect the way we use land and grow crops. The new organisation will begin operations in April next year.

James Hutton (1726–1797) was a leading figure of the Scottish Enlightenment, an eighteenth century golden age of intellectual and scientific achievements centred on Edinburgh. Hutton is internationally regarded as the father of modern geology and one of the first scientists to describe the Earth as a living system; his thinking on natural selection influenced Charles Darwin in developing his theory of evolution.

The **James Hutton Institute** will operate from the two existing sites in Invergowrie, Dundee and in Aberdeen and will employ more than six hundred scientists and support staff, making it one of the biggest research centres in the UK and the first of its type in Europe.

The institute will be one of the Scottish Government's main research providers in land, crop and food science. The Cabinet Secretary for Rural Affairs and the Environment, Richard Lochhead, said:

"By bringing together the talent and expertise of two such internationally respected bodies, it is entirely fitting that James Hutton is the inspiration behind the new name. As a geologist, physician, naturalist, chemist and experimental farmer, his life encapsulates the ambitious and wide remit that I am sure will be a hallmark of the James Hutton Institute."

The Chief Executive of the new organisation, Professor Iain Gordon, was appointed in July this year. He said: "As a distinguished and influential Scottish polymath with an international reputation, it is wholly appropriate that an interdisciplinary scientific research institute based in Scotland and seeking to operate and have impact



Scottish Crop Research Institute, Dundee

internationally should bear James Hutton's name.

"I believe this decision will have strong political resonance in Scotland today where the ambition is to once again have Scotland punching well above its weight."

LINKS WITH CHINA

SCRI has made a cooperation agreement with Zhejiang Academy of Agricultural Sciences (ZAAS) in China.

The formal Memorandum of Understanding was signed at SCRI in Invergowrie on Friday 19 November 2010. ZAAS is a major international centre for research on plants, foods, the environment and animal health.

The two sides hope the deal will identify and develop collaborative research programmes of mutual interest. It is also expected that the two centres will exchange staff and graduate students.

The main areas of common interest are plant pathology, sustainable methods of controlling pests and diseases and crop and environmental molecular biology and biotechnology.



Macaulay Land Use Research Institute, Aberdeen

The Roslin Institute, University Of Edinburgh



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EBRC/PFIZER LAUNCH

In October a new venture was officially launched, which involves the Easter Bush Research Consortium (members are The Roslin Institute, SAC, R(D)SVS and Moredun Research Institute) and Pfizer, the world's leading research-based animal health company. The launch took place as part of a series of events, attended by Her Royal Highness, The Princess Royal at the Royal (Dick) School of Veterinary Studies.

The Pfizer Partnership Platform (PPP) is believed to be the first of its kind in the animal health sector with industry and research consortium working together to promote excellence in veterinary research and education. The new initiative will be backed by a total funding of approximately \$2 million over five years. The partnership will encourage a greater understanding of issues affecting animal health as well as provide studentships for veterinary and science graduates to enhance their future careers. The EBRC-PPP main objectives include:

- Emphasise educational activities and promote veterinarians in postgraduate study and research
- Support early stage research, technologies and capability platforms
- Promote multi-disciplinary research teams, with contributions from different participating organisations

A joint management steering committee will provide overall direction and focus for the PPP, and have responsibility for major decisions. The review and recommendation of projects for investment, and of ongoing projects, will be handled by scientific review groups with expert representatives from EBRC-PPP members. Project teams will focus on driving approved projects on a day-to-day basis.

NEW POSTGRADUATE PROGRAMME

The Roslin Institute has launched a taught postgraduate programme, the MSc in Animal Biosciences, under the auspices of the University of Edinburgh. The aim of this full time postgraduate programme is to provide scientific knowledge and practical skills relating to applications of basic animal sciences to veterinary and human medicine, the livestock industry and food

security. Students will graduate with a wide experience of techniques in animal biosciences, leading to careers in research, industry, government and other areas.

Students will become part of The Roslin Institute and will attend seminars, lab meetings and other Roslin activities as well as following the formal taught programme. Students will receive formal practical training in laboratory skills in the first part of the programme, and then carry out a research project over thirty weeks

For more info contact Kim Summers (Email: roslin.mscstudies@roslin.ed.ac.uk).

PRIZEWINNER

Mairead Bermingham has been awarded the Douglas Falconer Prize for best MSc dissertation in the Quantitative Genetics and Genome Analysis class of 2010. Mairead is a post-doc working with Steve Bishop, John Woolliams and Liz Glass on genetics of bovine tuberculosis (bTB) in cattle.

During her first post-doc Mairead's group in Ireland and John's group in the UK independently demonstrated that susceptibility to bTB is heritable in cattle. In the current project the aim was to expand these findings by conducting a new quantitative study exploiting bTB surveillance data collected in Northern Ireland.

The aim of the MSc was to investigate the diagnostic properties of the single intradermal comparative tuberculin test (SICTT) and determine the likely impact on the heritability of bTB resistance. In order to do so, utilising Bayesian statistical methods, Mairead implemented and extended the classic Hui-Walter latent class model to estimate diagnostic test parameters from surveillance data. Her results give considerable insight into the control of bTB using SICTT responsiveness and will assist the potential development of strategies to control bTB.



Easter Bush Research Consortium / Pfizer Partnership Platform launch

Moredun Research Institute



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SOLVING A MYSTERY?

Bleeding calf syndrome (or bovine neonatal pancytopenia), is a haemorrhagic disorder of young calves. Now widespread across most of Europe, this syndrome is seen as an emerging disease across the UK, with over 200 UK farms affected to date. But so far the cause of this condition has remained something of a mystery - what exactly is bleeding calf syndrome and how is it caused?

The dramatic clinical signs, occurring in calves of less than 28 days old, are of widespread internal and /or external haemorrhage usually resulting in death. Common sites of bleeding are from the nose, from small wounds, such as ear tagging or injection sites, and into the intestine, causing blood in the faeces. Not all affected calves show obvious signs of bleeding however. In less typical cases bleeding is predominantly or entirely internal, with calves presenting

either as sudden deaths or found collapsed due to internal haemorrhage. A very small number of cases survive (approximately 10%) but for the majority death occurs between 1 and 7 days after the onset of clinical signs.

Since its first appearance in the UK in 2009, researchers from Moredun, SAC, VLA and the R(D)SVS have been working together to try to establish the reason for the bleeding, the sudden emergence of the disease and most importantly its cause.

With no signs of this disease abating, Moredun has invested some of its own money, through The Moredun Foundation Innovation Fund, in order to investigate this condition further.

In October of this year, Lottie Bell, a vet from the R(D)SVS, began a PhD at Moredun looking at the potential cause of bleeding calf syndrome. Jointly funded by Moredun and the University of Edinburgh, Lottie's PhD will be supervised at Moredun by Dr Kim Willoughby, Head of Moredun's Virus Surveillance Unit, and Dr Mara Rocchi, a Senior Research Scientist in Immunology.

One current line of investigation is the immunological relationship between the



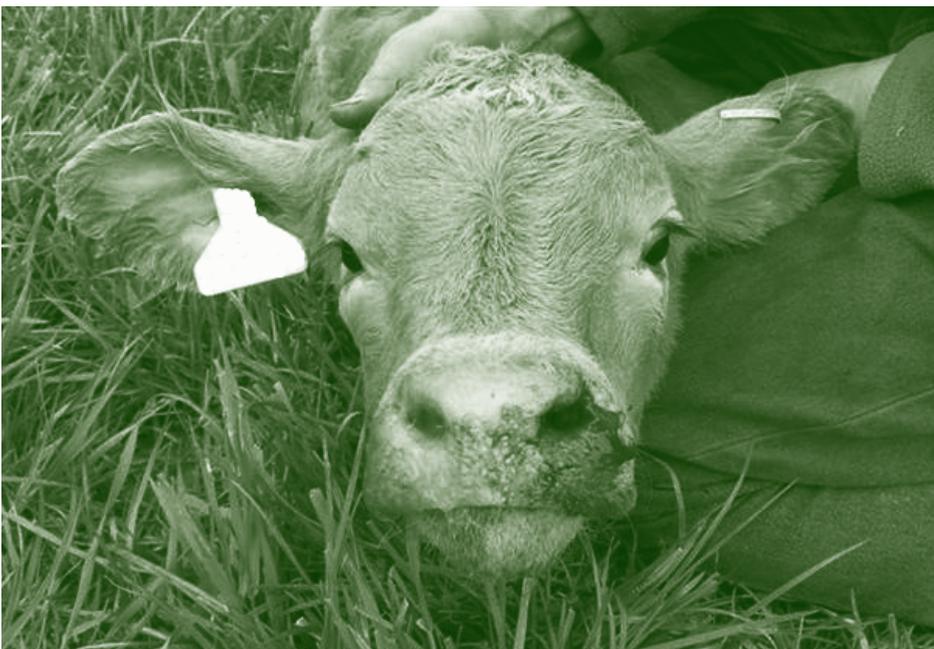
Charlotte Bell

calf and dam. There is growing evidence to suggest that the disorder could be associated with the period around the birth of the calf. Some evidence suggests that this could be linked to colostrum ingestion, whilst questions also remain over the possibility of a link with maternal vaccination. Many uncertainties remain, but one thing is for certain - Moredun is committed to getting to the bottom of this disease, whose cause has so far eluded the scientific and farming communities.

SCIENTISTS SHADOW POLICY MAKERS

Following a successful pilot scheme, this January, 13 more scientists from the Institutions providing research to the Scottish Government will experience the working life of their policy colleagues at first hand.

The successful pilot Scheme, which ran towards the end of 2009, improved the scientists' understanding of policy making and development and helped build closer links between the scientists and policy makers themselves.



A case of bleeding-calf syndrome

Royal Botanic Garden Edinburgh

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VALUING DIVERSITY

For too long valuing the diversity of life has been regarded as more or less impossible, since it isn't for sale and we can't put a price tag on it. But numbers talk, and a new approach known as TEEB (The Economics of Ecosystems and Biodiversity) led by economist Pavan Sukhdev has led to some mind-boggling revelations.

Perhaps most shocking of all is that the value of the earth's losses of natural capital by 2050 are estimated to be between US\$2 and 4.5 trillion per year, even greater than the monetary losses suffered in the financial crisis.

From a more positive perspective Scottish Natural Heritage recently estimated that nature-based tourism is worth at least £1.4 billion to the Scottish economy every year. Since knowing the value of things is the first step to protecting them RBGE asked DTZ to estimate the social and economic benefits provided by the Garden. Their study showed that for every £1 invested in the Garden the return to the Scottish economy is over £3.

However, DTZ pointed out that this was "just the tip of the iceberg"; most of the benefit of the work in research, conservation and education is, like nature itself, difficult to put a price tag on.

EARTH'S FORGOTTEN KINGDOM

The lights have gone down on the environmental summit at Nagoya, Japan. However, a new international movement of scientists steps up its campaign for the recognition and protection of a biological kingdom fundamental to life on Earth, but still largely ignored even by key environmental leaders. The International Society for Fungal Conservation (ISFC), formed this autumn following a ground-

breaking meeting in Edinburgh, has hailed the Nagoya "Conference of the Parties" summit for making the first steps towards recognition of the importance of fungi for all our lives.



Amanita muscaria, commonly known as the fly agaric or fly Amanita, is a poisonous fungus.

Fungi are neither animals nor plants, but form a separate and megadiverse biological kingdom. They are present in every major ecosystem - freshwater, marine and terrestrial. Their role as providers of ecosystem services, particularly in nutrient

recycling, is of critical importance for sustainable life on this planet. However, fungi have been almost totally overlooked by the conservation movement in general, and the Rio convention in particular: the convention's definition of biodiversity as comprising "animals, plants and micro-organisms" totally fails to take their unique character into account. This looks to be changed after lobbying by ISFC as the first society anywhere in the world to be explicitly and exclusively dedicated to protecting fungi.

"The news from Nagoya was that the Global Strategy for Plant Conservation has been changed to make it clear that fungi, including lichen-forming fungi, are not plants, but need a conservation strategy of their own", explained ISFC co-ordinator, David Minter a Research Associate with the Royal Botanic Garden Edinburgh. "That discussion may well be the first time fungi have been explicitly considered by the CBD as something separate from plants".

"Fungal conservation is an idea whose time has come. There has been significant development in fungal conservation over the past four years. In particular, the IUCN Species Survival Commission now correctly recognises fungi as organisms separate from animals and plants, and has more than doubled the number of specialist groups for fungi".

MILLIONTH LICHEN

A major collaboration of amateurs and professionals has been working for ten years to record the health of Britain's pollution-sensitive lichens, and is now celebrating the millionth record.

The British Lichen Society (BLS) is bringing together records made over the last 400 years. The database will identify where every one of the 1800 lichens native to Britain has been found.

The records chart the impact of decreasing levels of smoke and sulphur dioxide in the latter part of the 20th century which allowed lichens to recolonise our towns and cities. But, they also reflect a change in the pollution environment with nitrogen deposition now an increasing threat to some of our more sensitive and rarest species.

Lichens are the 'canaries' of the natural world and are often some of the first to respond to changes in air quality.

Edinburgh Napier University



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ECOTOURISM SEMINAR

Gross spend on wildlife tourism in Scotland is estimated at £276 million per annum and 7.4% of domestic tourism is primarily motivated by the chance to observe wildlife (University of Bournemouth, 2010).

Caroline Warburton of Wild Scotland was the first of three main speakers at the ECRR Seminar on Ecotourism that took place at Edinburgh Napier University on 20 October 2010. She presented the role that wildlife watching plays in the tourism industry in Scotland. Over 40 people attended the seminar which also included talks by Steve Duncan, of the Forestry Commission, Scotland, and Carron Tobin, of ruralDimension.

Steve Duncan explored the role that Scottish forests play in providing accessible outdoor activity and particularly the phenomenal success of the 7 Stanes initiative which has over 600,000 visitors per annum.

Carron Tobin described some of the downsides of nature tourism, graphically illustrating some of the problems encountered by Loch Lomond National Park staff as they try to deal with the anti-social behaviour and litter left by a minority of, but high impact, park visitors.

The talks were followed by three interactive workshops. Hugh Barron of the British Geological Survey gave an enlivened workshop on geological tourism including Scotland's geoparks and the International Appalachian Trail project which links Scotland's long-distance trails with those of North America.

Steve Taylor of UHI spoke about activity tourism in a stimulating workshop on adventure sports.

Hannah Levene (National Trust for Scotland) and Katy Chalmers (Historic Scotland)



Hannah Levene (National Trust for Scotland) and Katy Chalmers (Historic Scotland) responding to questions on the role urban ecotourism plays in education

illustrated the role urban ecotourism plays in education by taking their attendees on a nature walk which explored the variety of species found on the Canaan Lane campus.

The afternoon ended with a pre-launch celebration of the new Centre for Ecotourism and Wildlife Management, Institute for Health and Social Sciences, at Edinburgh Napier University.

The presentations are available on the ECRR web site (<http://www.ecrr.org.uk/>), but the seminar was about more than presentations. One attendee summarised it in a nutshell, 'usually it is the same suits, just in a different venue. These are all new suits; this has been a fantastic networking opportunity.' Thank you to Mike Talbot and Professor Stuart Monro of ECRR for helping to organise it, to the speaker for the excellent presentations and particularly to the attendees who made it such an interesting event.

NEW CAMPUS

Scotland's newest hub for health, science and sports education opened its doors to more than 5,000 students and staff in January 2011 at Sighthill in Edinburgh.

The new £60m campus is home to the Faculty of Health, Life & Social Sciences, who will be located under the same roof for the first time. It also houses a number of our professional service departments.

The new state-of-the-art campus provides a modern purpose-built sustainable building with premier teaching and learning facilities which includes a five-storey library, a state-of-the-art sports facility and 25 specialised teaching rooms, including clinical skills laboratories, six project rooms and five research rooms.

Centre For Mountain Studies

UHI Millennium Institute



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RESEARCH ON THE EDGE

Since March 2008 the Centre for Mountain Studies has been coordinating Clim-ATIC: Climate change – adapting to the impacts by communities in the northern periphery. This three-year international project is a practical demonstration of how communities across five countries in northern Europe have increased their capacity to adapt to the projected impacts of climate change, and implement real adaptations on the ground. Activities have included the use of data and projections, communication tools and techniques, decision-making processes, adaptation strategy development, energy security issues, flood and risk management, and adaptation solutions for the tourism and transport sectors.

A conference was held in Florø, Norway on October 26-28 2010 to present and celebrate the outputs. It included discussion and workshops on how to maximise the effectiveness of future access to, and continued use of, 30 case study posters and the 30 on-line interactive multimedia case studies that will be completed over the next few months.

There are three objectives:

- to establish links between the project website (www.clim-atic.org) and other existing or emerging climate change adaptation information portals (e.g., www.sccip.org.uk and www.climateguide.fi);
- to develop a generic adaptation training module to be downloaded and used at a regional level for specific adaptation themes (to be piloted in February 2011);
- to develop an informal network of international adaptation agencies that can share good practice.

If you would like to know more about the project or make use of the case studies, please contact Clive Bowman on clive.bowman@perth.uhi.ac.uk or view the web site at <http://www.clim-atic.org/>.

LAND REFORM

Calum Macleod at the CMS and partners have completed a study of the implementation of 'access', 'community right to buy' and 'crofting community right to buy'

provisions of the Land Reform (Scotland) Act 2003 for the Scottish Parliament's Rural Affairs and Environment Committee. It shows that the access provisions are generally working well and have led to increased confidence by recreational access takers in exercising their statutory rights. However, concern was expressed about the ongoing availability of resources to support access provision and the apparent reluctance of access authorities to pursue access disputes through the courts. The Community Right-to-Buy has been little used, due to the infrequency of eligible land coming onto the market, its administrative complexities, and a preference by community groups to conclude purchases outwith the Act if possible. The Crofting Community Right-to-Buy has yet to be used to complete a purchase; the contested efforts of the Pairc Trust on Lewis to buy the Pairc Estate are a test case. The full report and executive summary can be accessed from the Scottish Parliament's website: <http://www.scottish.parliament.uk/s3/committees/rae/currentInquiries.htm>

TENTH BIRTHDAY

The Centre for Mountain Studies at Perth celebrates its 10th anniversary this year. To commemorate this milestone, Colin Prior, Scotland's top landscape photographer, gave a special presentation: 'Mountains of Inspiration' at Perth Concert Hall on Wednesday 19 January 2011.

Since its inception, the CMS has celebrated a number of achievements on a global scale. In 2009, it gained prominence through the establishment of the UNESCO Chair in Sustainable Mountain Development, the first UNESCO Chair in Scotland.

In September 2010, the Centre coordinated an international science conference which attracted 450 people from 60 countries.



Participating regions in the Clim-ATIC climate change project

Scottish Natural Heritage



Dualchas Nàdair na h-Alba
Nàdar air fad airson Alba air fad

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UPDATING RESEARCH STRATEGY

SNH's Research Strategy, which explains our priorities in the short to medium term, has recently been updated and can be viewed at <http://www.snh.gov.uk/docs/B661777.pdf>. Accompanying this are a series of fifteen Research Action Plans which outline research proposals for the next three years for the fifteen research themes whose strategic aims are developed in the research Strategy <http://www.snh.gov.uk/docs/C265328.pdf>

The background to the revision is outlined in a Foreword to the report by Dr Joan Mitchell, Chairman of SNH's Scientific Advisory Committee and is given below.

"It is widely recognised and agreed that our wildlife, habitats and landscapes are among Scotland's greatest assets, and are a hugely valuable resource for us all. One of SNH's prime roles is to contribute to the care and management of these natural resources.

To do this well, we need sound evidence to inform our management and advice. Work on the ground to achieve effective conservation has to be supported by strong and relevant information on how to go about this work, and SNH has a strong track record of identifying, commissioning and using research to provide the best available evidence base.

The publication of the SNH Research & Development Strategy in 2007 set out our research needs to 2012, identifying those areas where SNH will take the lead, and those where we will encourage and support partners. However, this predated our Corporate Strategy, and the way in which our research aligned with SNH's current corporate priorities was not clear.

There is also a growing desire within Scottish Government to create a greater synergy between its environmental agencies and research bodies, through the development of a Co-ordinated Agenda for Marine, Environment & Rural Affairs Science (CAMERAS). This aims to increase co-operation, efficiency and integration in the work carried out across these sectors. By setting out what we consider to be the priorities for SNH against the wider natural heritage requirements in Scotland, we have sought to make clear the contribution that we will make to this agenda.

The Fifteen Research Themes reflect the five SNH Corporate Strategic priorities as follows:

Caring for nature 1. Protected areas 2. Biodiversity 3. Geodiversity	Conserving and managing Scotland's natural resources is central to our work.
Responding to climate change 4. Responding to climate change 5. Working with renewable energy	Tackling the adverse effects of climate change is one of the greatest challenges for the care and management of Scotland's natural heritage.
Delivering health and well-being 6. Public understanding, involvement and commitment 7. Recreation 8. Towns and cities 9. Landscape	Our natural heritage is an important resource for improving public health and wellbeing. Encouraging people to discover more about Scotland's nature is increasingly important to us.
Supporting the Scottish Economy 10. Rural land use 11. Fresh waters and wetlands 12. Coasts and seas 13. Tourism 14. Planning for sustainable use	Sustainable care and management of the environment is essential to Scotland's well-being. We need to understand and influence the links between social environmental and economic sustainability.
Delivering a high quality public service 15. Trends and indicators	Tracking the changes in Scotland's natural environment is essential for the development of timely policies and action.

Following the merger of the Deer Commission Scotland with Scottish Natural Heritage last year, a sixteenth theme, on wildlife management, which reflects the deer research agenda will be incorporated into the process, and these will be matched more clearly with the SNH Programmes, which are outlined in the research strategy.

Scottish Agricultural College



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Professor Geoff Simm, SAC, and Prof Bob Watson, Chief Scientist, Defra

DEFRA VISITOR

Professor Bob Watson, DEFRA's Chief Scientific Advisor, was impressed by SAC's climate change research when he visited Scotland recently. During his visit Professor Watson, whose own world-renowned research focuses on ozone depletion and global warming, took a tour of SAC's Bush Estate research facility near Penicuik. While at Bush, Professor Watson saw the new GreenCow equipment at the SAC Beef Research Centre, which is used to study greenhouse gas emissions from livestock. He also witnessed a demonstration of an autosampler for estimating nitrous oxide emissions from soils.

SAC's Academic Director Professor Geoff Simm led the SAC group that hosted the visit. Speaking of Professor Watson's reaction to SAC's work, Geoff said: "He was very animated about what he had seen and applauded the way SAC is addressing complex climate change issues in an integrated, interdisciplinary way."

Following his visit to Bush, Professor Watson delivered a seminar on climate change.

FOOD LEVELS MUST DOUBLE

Professor Bob Watson, warned that if the world's demand for food is to be met, availability must double by 2060. Professor Watson addressed an audience of around 200 SAC and University of Edinburgh students and staff at a seminar at the University of Edinburgh's Swann Lecture jointly organised by SAC and the Department of GeoSciences.

With the expansive title of 'Climate Change, Loss of Biodiversity and Ecosystem Services Degradation: Food and Water Security' the seminar examined the big global issues and prompted a host of questions and comments from audience members that could easily have continued well beyond the seminar's close. Professor Watson drew his seminar to an end by concluding that that sufficient food supplies can only be achieved by a move away from the 'business-as-usual policies, practices and technologies' in favour of an innovative approach in these three areas involving all stakeholders in the food chain.

MAKING MARKETS WORK FOR FARMING

Speaking to an invited audience in Edinburgh, Dominic Moran, SAC Professor of Environmental Economics said, "environmental challenges facing the rural sector should be regarded as market opportunities rather than regulatory threats".

In his lecture "Agriculture a Tale of Two Markets". Professor Moran suggested that

farmers should acknowledge the new challenges inherent in meeting new non-market or environmental demands. They should be given prominence in discussions on the reform of agricultural support. He explained that policy makers value clear guidance on how public good values can be estimated. It provides a better basis for evaluating the costs and benefits of policy.

Professor Moran's research focuses on applying economics to environmental management and bringing together experts from different branches of the natural and social sciences to tackle resource allocation problems. He and his colleagues work mainly on what are known as 'public goods' from agriculture and rural land use. This includes the demand for and supply of environmental amenity, clean air and water, biodiversity, and animal welfare.

Dominic Moran said:

"The emergence of environmental markets represents a challenge for many industries world wide and agriculture in particular, which is a man made adjunct to the environment. As such, production will have inevitable impacts and increasingly, it is how we deal with them that counts".

The Professor's early work on biodiversity valuation showed how public policy on conservation could be informed by the availability of economic information on both private and public costs and benefits. Previously decisions had relied on qualitative information or mere speculation. This new approach provides the basis for the creation of new markets that can emerge where suppliers



(e.g. land owners) can potentially transact with private companies and public agencies demanding conservation goods for their shareholders or the wider public.

Biodiversity markets (or payments for ecosystem services) are emerging in the wake of similar developments to tackle global climate change. Non-market valuation has been instrumental in developing a price for carbon dioxide (and other greenhouse gas) emissions that can be used as a market signal. More generally environmental economics has been the intellectual force behind the development and adoption of regional cap and trade carbon markets such as the European Union Emission Trading System.

According to Professor Moran, "The development of markets requires the clear definition and allocation of property rights over emissions or the protection of biodiversity. Such rights have traditionally been undefined or defined by default in favour of land owners. This is changing, and their clear definition provides the basis for compensatory transactions for the supply of public goods such as landscape, or punitive incentives to reduce negatives such as diffuse pollution to water or poor animal welfare.

Dominic Moran believes the definition of these new property rights presents a distinct challenge for the land based sector.

"Markets in agriculture can operate in distinct ways, but the sector is often too concerned with the issue of market power (e.g. in retail concentration) and pays insufficient attention to the issue of market failure (to provide public goods) and what the public expects in return for continued sector support".

"Correcting market failure opens up a range of potential market opportunities for the sector; e.g. in terms of selling carbon credits, the provision of other ecosystem services including landscape or the exploitation of near-market niches such as welfare-friendly products".

Professor Moran suggested that there is a clear direction of travel in terms of how support is increasingly allocated to public good cross-compliance. The challenge for researchers is to marry biophysical and economic data to provide the information for policy makers to understand the full costs and benefits of policy choices. This need is all the more pressing when public funds are being squeezed and where

unpriced environmental goods can easily be omitted from consideration.

SCOTTISH MODEL BEST

A House of Lords Committee has been told that the Scottish model for applying the latest scientific research has distinct advantages for promoting innovation in European agriculture. Addressing the Lords' EU Sub-Committee for Agriculture Fisheries and Environment, SAC's Professor John Oldham stressed, however, that greater recognition of the value of applied research and more effective public engagement are essential if innovation is to help agriculture rise to the challenges it faces.

Professor Oldham was invited to Westminster as part of the Sub-Committee's inquiry into how innovation in EU agriculture can be encouraged in the context of new challenges such as climate change, water scarcity and the need to encourage sustainable improvements in output. SAC's Rural Policy Centre also submitted an official consultation response in support of the inquiry.

In giving his evidence, Professor Oldham said that innovation - such as biotechnologies, the use of new machinery or commercial decisions to plant new crops - is critical to the growth and sustainability of European agriculture.

He said: "Faced with the likelihood of reductions in European support to agriculture in the long term it would make sense for European support to be used now to help foster innovations that will be needed for long term health and competitiveness."

Professor Oldham criticised the current research culture in the UK, saying, "While top quality basic research has, rightly, been valued, especially through University Research Assessment exercises, useful, applied research has not had the same recognition. This is wrong and unhelpful.

"While the next Research Assessment, the Research Excellence Framework, will give more weight to valuing research impact, it will not take place until 2014. Meanwhile many good scientists continue to be dissuaded from engaging in applied research for agriculture because funding for such research and career track opportunities are governed too much by the emphasis on academic quality as assessed only by fellow academics rather than assessed for practical value by user communities."

Speaking of the need to ensure that public perceptions about innovation are accurate, Professor Oldham said: "Innovations are often seen as having 'hidden dangers', with a perception that older methods of production are somehow more 'wholesome'. The stand against GM, objections to intensive farming practices and objections to the use of poly tunnels are all examples.

"Programmes that involve the public and raise awareness of the benefits of some of these methods, perhaps in terms of food affordability, reduced carbon footprint per tonne or the safety record of modern pesticides, would be beneficial in reducing the braking effect that public perception can have."



Professor Dominic Moran

British Geological Survey



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MODELLING VOLCANIC ASH PARTICLES

One of the factors influencing the characteristics of the volcanic ash plume reaching the UK following the Eyjafjallajökull eruption on Iceland in April/May 2010 was how ash particles stuck together to form larger aggregates. BGS scientists collected samples of ash in the UK and discovered some quite large particles (up to 200µm).



Dr Sue Loughlin, BGS Head of Volcanology, taking ash samples near the Eyjafjallajökull eruption, May 2010.

There are several mechanisms that can cause particles to stick together including electrostatic attraction, particle collisions, condensation of liquid films and secondary mineralisation. Aggregation removes very small particles from the plume and is one of the factors controlling how long ash particles stay in the atmosphere before falling to the surface.

The characteristics of the ash samples, such as particle size and shape, give clues to the processes taking place in the ash plume. BGS is working with partners to understand how the aggregation process

evolves by comparing aggregates that fell near to the volcano with those that fell from the plume 12 hours later in the UK. This will help refine models of ash plume dispersal for future eruptions.

YESTERDAY'S EARTHQUAKES TOMORROW'S DISASTERS?

Earthquakes in historical times that shook empty hillsides have the potential to repeat in the future and cause humanitarian disasters, where cities have since grown up unaware of the hazard.

The catastrophic earthquake that struck Haiti in January 2010 was at least the third deadliest earthquake in human history, and was widely described at the time as the 'perfect storm' earthquake. Every possible bad factor was there. The earthquake was large, it was shallow, it was close to a major city, and that city was badly built, full of weak structures that collapsed at once, burying and killing the inhabitants.

But there was one further factor: the earthquake hazard had not been recognised by the Haitian authorities and no protective measures were in place. This despite the fact that Port-au-Prince is next to a known major plate boundary fault and the city had been destroyed by previous earthquakes. Part of the problem is that the fault had not moved in centuries and the risk had faded in human memories.

To improve access to information on earthquake hazard a new online resource for the study of historical earthquakes has been completed by a team of seismologists and historians led by National Institute of Geophysics and Volcanology in Milan and including BGS in the UK. The Archive of Historical Earthquake Data (AHEAD) contains data on all the most significant damaging historical earthquakes in Europe. This initiative will be extended worldwide as part of the Global Earthquake Model (GEM) project and BGS scientists are heavily involved in that effort.

LESSONS FOR THE UK

One might think that this is not an issue in countries like the UK, but although the scale of the problem is far smaller, similar issues arise. Most people have no idea of the earthquake history of their country, and have no knowledge of past earthquakes beyond the scope of living memory. And the same issue of increased exposure to earthquakes applies just as much to Britain as to the rest of the world.

One of the strongest earthquakes to have affected Britain occurred on 6 April 1580; the magnitude, estimated from the size of the area shaken, was about 5.5, and the epicentre was in the Dover Straits. Although it was some distance away, London was quite strongly affected, probably because the soft Thames clays are susceptible to being shaken. A very similar earthquake in 1382 also caused damage in London.

What has happened twice before can happen again. This raises the question of what the effects of a similar event on the London of today would be. Modern London has a population about 40 times greater than in 1580 when two people were killed. A comparable earthquake today would certainly not cause a disaster on an international scale, but the level of shaking would come as an unpleasant shock in a country that tends to think of itself as immune from earthquakes.

For further information visit the BGS Earthquakes site [<http://www.earthquakes.bgs.ac.uk/>] or contact Dr Roger Musson.

Magnitude	UK earthquake frequency
5	1 every 20 years
4	1 every 3–4 years
3	3 each year
2	25 each year
1	100s each year

In Brief...

ENGAGING THE PUBLIC

RSE BELTANE PRIZE

Applications are currently invited, from all organisations and research disciplines across Scotland, for two prestigious RSE Beltane Awards which will recognize and promote excellence in Public Engagement.

Two prizes will be made in this the pilot year of the award.

- **The RSE Beltane Senior Prize for Public Engagement, awarded to a distinguished individual with long standing experience of this field, and;**
- **The RSE Beltane Innovators Award, for an emerging talent. Although this individual will not have a long history of engagement, they will show promise as an innovator in the field.**

Nominations are invited until 31st January 2011, and can be made by individuals in partnership with a Fellow of the Royal Society of Edinburgh. Edinburgh Beltane can suggest RSE Fellows to potential applicants, if required (info@edinburghbeltane.net).

More information, eligibility requirements and nomination forms can be found at http://www.royalsoced.org.uk/research_fellowships/beltane.htm

RESEARCH FUTURES

Edinburgh Beltane ran the first in a series of high-impact events at the Scottish Parliament in November 2010. This was the first of four 'Research Futures' events, designed to engage the public, policy makers and parliamentary researchers with cutting-edge Scottish research which is likely to affect devolved issues in the next decade.

These two-part events consist of a Monday evening 'café style' event, for wide public participation and general discussion. This is followed by a Wednesday afternoon policy briefing where researchers and representative members of the public can deliver key messages to MSPs and policy makers.

The first event featured research surrounding British Sign Language (BSL), which was discussed from a range of viewpoints. The policy briefing took forward key suggestions and new research-based insights, which will raise the understanding and profile of BSL.

Edinburgh Beltane is passionate about citizen participation and understanding of areas of research relevant to public policy. The Beltane network has expanded to include key contacts at Scotland's Futures Forum, who are instrumental in organising this series. The events also provide a good model for the budgets, timescales and potential pitfalls involved with organising similar high-impact events.

The next events are scheduled for January, March and June. If you would like to find out more about featuring your research at the Parliament, getting involved in the

Research Futures Series or coming along to these events- please contact info@edinburghbeltane.net (0131 650 4874/5).

*The Edinburgh Beltane –
Beacon for Public Engagement
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Edinburgh, Vitae*



Round-table discussion at the Scottish Parliament

News / Meetings / Notices / Events

MOVING ON

Professor David Hopkins is to leave the Scottish Crop Research Institute to take up the post of Head of the School of Life Sciences at Heriot-Watt University on 1 March 2011.

SCRI's Director and Chief Executive Professor Gregory said: "David has played a key role in coordinating the activities across our science programmes and in leading the diversification of our research funding.



Professor Peter Gregory

Professor Peter Gregory, himself, retires as head of SCRI in March. Under Peter's leadership SCRI has immensely strengthened its position as a world-class research organisation, broadening its focus from scientific excellence in plant science research to embrace the wider implications of its work for the environment, the economy and society at large.

NEW YEAR'S HONOURS

Professor Stephen Blackmore, Regius Keeper, Royal Botanic Garden Edinburgh was honoured in the New Year's Honours with the award of a CBE for services to plant conservation.

Also honoured with the award of OBE was:

- Professor Maggie Gill, Chief Scientific Adviser, Rural and Environment, Scottish Government

NEW MD FOR MOREDUN SCIENTIFIC

Professor Willie Donachie, Deputy Director at the Moredun Research Institute has taken up post as Managing Director of Moredun Scientific.

Moredun Scientific is a contract research organization providing research and testing services to the animal health, pharmaceutical and biotechnology industries supporting the development, registration and manufacture of veterinary and human medicine.

Professor Donachie is a visiting Professor at the University of Glasgow and an Honorary Fellow, Department of Veterinary Pathology, University of Edinburgh. He is the Chair of the Veterinary Advisory Committee of the Horserace Betting Levy Board and an International Member of the Molecular and Developmental Genetics Grant Selection Committee of the Natural Sciences and Engineering Research Council of Canada. In addition to his new position at Moredun Scientific he will continue to maintain his key role within the Moredun Research Institute.



Professor Stephen Blackmore who was awarded the CBE in the New Years Honours

CAMERAS

Make a note in your diaries now for the CAMERAS second annual conference that is exploring the theme of how risk and uncertainty in science is communicated. It is being held on the 2/3 March 2011 at Dynamic Earth, Edinburgh. An outline programme is coming soon. If you want to know more or share ideas contact paul@sniffer.org.uk.

CAMERAS stands for Co-ordinated Agenda for Marine, Environment and Rural Affairs Science. It was created by bringing together Scottish Government groups and closely related organisations whose work concerns marine, environment and rural affairs.

For more information see <http://www.camerasscotland.org/>

ECRR DIARY 2011

Date	Event	Venue	Time
Feb 7	Executive Committee Directors' lunch	BioSS, Edinburgh Host: Prof David Elston	11.00 12.30
Feb 14	ECRR Annual Peter Wilson Lecture	Royal Society of Edinburgh, George St., Edinburgh	18.00
Mar 7	Directors' lunch	SASA, Gogar, Edinburgh Host: Prof Gordon Machray	12.30
Mar 14	Workshop: Broadband for rural communities	Perth College, Perth	12.30

ECRR
Peter
Wilson
Lecture



At the Royal Society of Edinburgh (RSE)

Monday 14 February 2011

6.00pm

Food Security and Sustainability: One Can't Make an Omelette Without Cracking Some Eggs

Professor Tim Lang, Professor of Food Policy, City University, London

Sharp oil price rises have led an oil-dependent food industry to examine possible threats which have started a policy debate on food security that will not go away. Attention is focused on technical innovations such as GM, but societal issues such as restructuring food markets, rapid consumer behaviour change, reshaping cultural tastes and altering price signals should not be ignored. These require state intervention in markets and less consumer choice. The lecture will propose the need for open and democratic debate about food futures. It will warn against technical triumphalism and urge a more balanced integration of societal and supply chain change.

**Open to all and free to attend
Tickets Required**

www.royalsoced.org.uk

**For tickets and further information
contact the Events Department:**

Telephone: 0131 240 2780

Fax: 0131 240 5024

Email: events@royalsoced.org.uk



22-26, George Street
Edinburgh, EH2 2PQ

Portrait courtesy of Professor Lang
The Royal Society of Edinburgh, Scotland's National Academy, is Scottish Charity No. SC000470

ECRR Member Organisations

University of Edinburgh College of Science & Engineering College of Medicine & Veterinary Medicine College of Humanities & Social Science	www.ed.ac.uk
Scottish Agricultural College Research & Development Education & Training	www.sac.ac.uk
Heriot Watt University	www.hw.ac.uk
Napier University, School of Life, Sport & Social Sciences	www.napier.ac.uk/fhlss/SLS
University of Stirling, Institute of Aquaculture	www.aquaculture.stir.ac.uk
UHI Millennium Institute	www.uhi.ac.uk
University Marine Biological Station Millport	www.gla.ac.uk/centres/marinstation
Moredun Research Institute	www.moredun.ac.uk
Forest Research, Northern Research Station	www.forestresearch.gov.uk
The Roslin Institute, University of Edinburgh	www.roslin.ed.ac.uk
Biomathematics and Statistics Scotland	www.bioss.ac.uk
British Geological Survey	www.bgs.ac.uk
Centre for Ecology & Hydrology Edinburgh	www.ceh.ac.uk
MRC Human Reproductive Sciences Unit	www.hrsu.mrc.ac.uk
National Museums of Scotland	www.nms.ac.uk
Royal Botanic Garden Edinburgh	www.rbge.org.uk
Royal Society for the Protection of Birds – Scotland	www.rspb.org.uk
Science & Advice for Scottish Agriculture	www.sasa.gov.uk
Scottish Crop Research Institute	www.scri.ac.uk
Scottish Natural Heritage	www.snh.gov.uk
Scotland & N. Ireland Forum for Environmental Research	www.sniffer.org.uk

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FUTURE ISSUES

Contributions to the Bush Telegraph are welcomed. All contributions, comments and suggestions can be emailed to Mike Steele at mike.steele@bsas.org.uk

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ON THE WEB

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Deadline for copy in the next issue is 25 March 2011