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Bush Telegraph

The House Magazine of the Edinburgh Consortium for Rural Research

Starving People Don't Read 'Nature'

Professor John Oldham recently stepped down as Head of SAC Research. In an address to a gathering of Scotland's agriculture industry, research community and Government he challenged both the science community and policy makers. He pointed out that 2050 was just one research career away, yet by that time we had to virtually double food production and cut greenhouse gas emissions by 80%.

"It's not as far away as we might like to think" said Professor Oldham, " The question is are we making best use of what we already know and really thinking about what we don't know? Just as important, are we organised in a way that can put any answers into practice?

Welcoming the recent "Reaping the Benefits" report produced by the Royal Society he agreed with it's conclusion that, despite many remarkable advances in 'discovery science' too many of the necessary research skills for 'delivery' have been neglected in recent years. Areas like soil science and holistic skills in agronomy, livestock sciences and agricultural systems were now being recognised as important again, but the number of practicing experts is too few.

"How long has it been since a Nobel Prize was awarded for an advance in agriculture?" he asked.

Reminding his audience of some of the issues that had formed the background to his own 40 year research career, beginning as a dairy nutritionist, John Oldham cited a list of research policy reviews, reports and funding changes that have failed to give consistent direction to agricultural research. Until very recently UK policy makers have not appreciated the need for a regenerated capacity in agricultural research to meet the challenges to food, water and energy security that John Beddington, the Government Chief Scientific Advisor, has called a 'Perfect Storm'.

Professor John Oldham

"We have to rise to the challenges of the next 40 years", he said "We must be in a position to address them and maintain our focus on the main targets of increasing global food supplies, and improving diets, yet doing so in ways that will secure the resources and environment of our planet for the long term"

He suggested that it is not only policy makers who have to change their views on the value of science and research. Science that is valued only by other scientists is not enough. Recently published statistics show Scottish agricultural research at the top of an international table, well ahead of the USA, New Zealand and other countries with a strong interest in agriculture.

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While celebrating this Professor Oldham went on to show that in league tables showing how agricultural research had contributed to GDP, Scotland and the UK are well down on the list, below New Zealand.

"As well as doing science of high academic value we need to do better in using that science as part of the engine for sustainable economic development". He said.

"Starving people don't read Nature, or any other learned journals. Science is there for both discovery and delivery. It is important to have the right blend of skills to achieve both. At the moment the balance is not right leaving a gap between scientific excellence and economic impact".

Professor Oldham believed blue sky research remained vitally important and the work of those at the benches and in the labs should not be undermined. However the system whereby a scientific career is built on the number of research papers published and the number of times it is cited by other researchers does not guarantee policy makers and industry get the message.

"If we are to achieve those tough targets set out for us", he suggested "there needs to be a recognition that "delivery" or "applied" scientists are just as important as those involved in fundamental discoveries. We need people with holistic skills who can recognise the nature of practical problems, but who also understand what is going on in the labs and can devise and advise ways of delivering 'discovery' research into practice in a way that makes a difference. It does not need many of them, but we have too few at the moment. They are as important to the process of research success as the keystone of an arch is in delivering a useful structure from what otherwise would be a disorganised pile of stones".

In this respect, he believed, systems for evaluating the quality of science, like the Universities Research Excellence Framework, should give weight to the impact of research, as well as to its academic quality.

In a world recently rocked by economic crises John Oldham had a message for policymakers. When deciding how to spend limited research funds and formulating the questions they need answered they should look for a better balance between 'discovery' and 'delivery' scientists than we have at present and also look to re discover or re-search for what is already known. Often guidance on how to tackle today's problems is in research papers or reports lying, forgotten, on library shelves and is not on line.

Finally Professor Oldham appealed to the agricultural industry, researchers and policy makers to work more closely together. The benefits of research to the economy will only be felt if there is common purpose with new discoveries and technologies being adopted by producers. We need to be engaged.

"Together we can achieve a lot for Scotland and the world", he said. "We have an excellent science base which, in an academic sense, is often said to be world leading. We need more provision of top quality 'delivery science' for the rural sector. In tackling future challenges and exploiting opportunities the real test of 'World leading' research will be if it helps to lead the world to a more secure future".

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colleagues at Edinburgh University. Professor Van Gardingen holds the UNESCO Chair of International Development and is the Director of the Edinburgh International Development Centre (www.eidc.ed.ac.uk). They discussed:

- Remote sensing / mapping / resource assessment.
- Ecosystem Services / ecology / fluxes
- Carbon Management and forests.

The **University of Edinburgh** and **Heriot-Watt University** are collaborating closely in developing the '**Edinburgh Climate Change Centre**' and the Mexican link project is seen as one of the first collaborative activities of the Centre.

In a busy schedule, Drs Nahuat and Giorgana also met with Dr Toby Pennington at the **Royal Botanic Gardens Edinburgh (RBGE)** where Dr Pennington explained his Darwin Initiative work on the Projects "Tree diversity and agroforestry development in the Peruvian Amazon" and "Tree diversity, agroforestry development and reafforestation in the Peruvian Andes". The visitors were also interested to learn of the joint Edinburgh University/RBGE MSc course in Biodiversity and Taxonomy of Plants.

Drs Nahuat, Giorgana, and Rodriguez from the Instituto Tecnológico de Mérida in Yucatán, Mexico with Dr James Mair, Heriot-Watt University on a visit to the Scottish Oceans Institute at the University of St Andrews

In another meeting, Dr Ann Simpson from the **University of Strathclyde** explained about her very relevant Darwin Initiative projects "Preservation and Rehabilitation of Colombian Rainforest by Indigenous People" and "Indigenous Methods to Sustainably Manage Riverine Plantations, Amazon Region, Colombia, Peru and Brazil".

Heriot Watt University

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CLIMATE CHANGE MITIGATION

Drs Sara Nahuat, José Giorgana (both plant biochemists) and Luis Rodriguez (a marine biologist) from the Instituto Tecnológico de Mérida in Yucatán, Mexico visited UK collaborating colleagues in November 2009. This was part of the British Council funded Project "UK AMERLINKS Research Links". The Mexican researchers visited colleagues at the Universities of Heriot-Watt, Edinburgh and Strathclyde and at the Royal Botanic Gardens Edinburgh. The UK project co-ordinator, Dr James Mair from **Heriot-Watt** had visited Yucatan in June 2009 to initiate the project where a network of institutions is involved.

Dr James Mair, Dr Sara Nahuat, and Conor Snowden.

The overall objectives of the Initiative covers three projects looking at Climate Change mitigation in forest ecosystems, sensitivity of marine systems and potential technological adaptations to changes. The collaborating institutions aim to do this by establishing highly important research lines in the best interest of institutions and society in Mexico and the UK. The Mexican government is already funding several projects along these lines in Yucatan.

The main aims of this project called 'Climate Change Mitigation through the Conservation and Sustainable Use of Forestry Ecosystems' are:

- to build a cooperation research network with Scottish and UK institutions on Climate Change Mitigation.
- to critically revise scientific evidence on forest ecosystems of South-East Mexico and determine potential associations with Climate Change
- to identify and catalogue forest species with potential to add to mitigation, regional economic development and the sustainability of the ecosystem
- to propose technological strategies to exploit regional forest resources
- to develop human capital through research at both undergraduate and graduate level

Climate change has had a negative impact on the production and quality of forestry products, and this will continue. These resources are of paramount importance for local communities. Another important aspect is the negative impact of human activities, particularly the change on soil utilisation, which results in significant deforestation. This situation is highly notorious in the municipal area of Tinum, Yucatan, one of the surrounding areas of Chichen-Itza, UNESCO's World Heritage site since 1988.

The objective of the research is two-fold:

- to obtain information on the impact of climate change on forestry species and to assist in the mitigation of global warming and climate change by stopping local practices of deforestation
- to determine forestry species with potential to help to the economic development of Tinum and to propose sustainable technological solutions to exploit these species.

There is a range of local resources with such potential, including orchids (medicinal compounds) and Jathropa curcas (one of the best candidates for biofuel production and various sub-products). Priority will be given to clean processing alternatives such as CO2 supercritical extraction and biotechnological processes. The technical and economical limitations of the proposals will be assessed against their social and environmental benefits.

Dr James Mair of the **Centre for Marine Biodiversity and Biotechnology at Heriot-Watt University** hosted the Mexican visitors. Dr Mair had previously carried out two years research in Mexico and more recently led UK DEFRA Darwin Initiative projects in Ecuador, Colombia and Panama (see: http://striweb.si.edu/darwin_initiative) and in San Andres Archipelago, Colombian Caribbean http://darwin.defra.gov.uk/project/7147).

With Dr Luis Rodriguez plans are now advanced for Mexican students to register and study on Heriot-Watt University MSc Courses Climate Change: Impacts and Mitigation and Climate Change: Managing the Marine Environment. Heriot-Watt MSc students will be visiting Mexico in 2010 to carry out marine research dissertation work relevant to the project and contributing to their MSc degree.

Drs Nahuat, Giorgana and Rodriguez also visited Professor Paul van Gardingen and

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HOSTING A ROYAL VISIT

Her Royal Highness The Princess Royal met researchers at The Roslin Institute to find more about the ground breaking research that is being carried out.

It was the Princess Royal's first visit to The Roslin Institute since it became was incorporated with the Royal (Dick) School of Veterinary Studies at the University of Edinburgh.

She heard about plans for The Roslin Institute to move to a £60 million building, being funded by the Biotechnology and Biological Sciences Research Council, on the University's Easter Bush campus.

The building, which is due to be completed in 2011, forms part of a £100 million development on the campus, which includes a new teaching building for the Royal (Dick) School of Veterinary Studies.

During the visit on Thursday 5th November, HRH Princess Royal learned about pioneering work involving the manipulation of genes to create chickens resistant to infectious diseases. It is hoped that this approach will lead to development of chickens resistant to avian influenza infection.

She heard about plans for The Roslin Institute to move to a £60 million building, being funded by the Biotechnology and Biological Sciences Research Council, on the University's Easter Bush campus.

Professor Hume said of the visit, "It has been wonderful to show Princess Anne round The Roslin Institute and we hope to repeat the honour in the future as we expand the new Easter Bush site."

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HRH The Princess Royal on her visit to the Roslin Institute Photo: Norrie Russell

OLIVE WREATH AWARD

Matt Bishop of The Roslin Institute's Neuropathogenesis Division travelled to the NeuroPrion2009 meeting in Greece. Matt, who is based at the University of Edinburgh's CJD Surveillance Unit, completed his PhD earlier this year as a member of Professor Jean Manson's Roslin group.

Matt was presenting his poster, entitled "Serial Passage of sCJD in Humanised Transgenic Mice Indicates a Minimum of Two Major Transmission Strains of Infectious Agent". His poster was a hit and earned him one of the poster prizes and earned him an olive wreath trophy, a cash prize and the chance to present his research in an oral presentation.

Matt explained how he had used transgenic mice to assess whether variation seen in cases of sporadic CJD (sCJD) is due to the genetic makeup of an individual or due to the biochemistry of the normal. His results showed that the three commonly observed forms of sCJD, appear to be comprised of only two major sCJD transmission strains. In fact the important factors determining clinico-pathological phenotype disease in the mice were primarily the particular version of mutant prion protein (PrPSc) found in the mice and secondarily the genetic version of the mouse PrP gene that was present. This work was funded through EU funding from NeuroPrion.

WORKING WITH CHINESE SCIENTISTS

In September Chinese scientists and government officials visited The Roslin Institute and other University of Edinburgh groups with a view to forging closer collaborations.

The Chinese delegation visited The Roslin Institute and the MRC Centre for Regenerative Medicine to sign a collaborative agreement, which will enhance the development of a training and scientific exchange program in stem cell biology and regenerative medicine.

Professor David Hume, Director of The Roslin Institute, said: "This is an extremely exciting opportunity to establish close links with colleagues in China and to develop new and powerful scientific interactions that will progress our own stem cell research."

During the Chinese delegation's visit to The Roslin Institute they heard talks about the use of sheep models of cystic fibrosis and Roslin's development of transgenic chickens. The delegation were also shown around the Institute's farm as well as being shown the new Oncology and Imaging Centre at the R(D)SVS' Easter Bush campus.

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COMMUNICATING GROUNDWATER

SNIFFER is pleased to announce the addition of new groundwater images to its WFDVisual website www.wfdvisual.com. In November 2009, SNIFFER added a brand new suite of images for floodplain, karst, fluvial and coastal settings to WFDVisual. There are over 70 new images grouped together into storyboards to convey some commonly encountered hydrogeological scenarios. The jpeg images, which are accompanied by descriptive text, can be downloaded as a storyboard or individually.

"Being able to communicate complex hydrogeological conditions to a general audience has always been a challenge," says Kirsty Irving, SNIFFER Programme Manager. "But the images on this website give regulators and scientists tools that can readily be used to inform and educate both our colleagues and the public in general."

Example images from the new WFDVisual storyboard collection

WFDVisual has been developed by SNIFFER in partnership with the Environment Agency for England and Wales, the Geological Survey of Ireland, the Environmental Protection Agency (Republic of Ireland) and the Scottish Environment Protection Agency. The original website was launched in 2007, providing specialists and non-specialists with access to thousands of images depicting different groundwater pressures within varying topographic and geological settings. The new storyboard images have been developed to help communicate the complex processes underpinning the water environment and its management under the Water Framework Directive (WFD). SNIFFER intends that the images should be used by a broad audience to help convey the importance of hydrogeological processes in managing the water environment. To that end, all images on this website are freely available to the public for non-commercial, not-for-profit use.

IDENTIFYING SCOTTISH WETLANDS

SNIFFER, in partnership with Scottish Environment Protection Agency, Scottish Natural Heritage and the Environment Agency, has published a typology to help non-specialists identify Scottish wetlands in the field. Identifying wetlands and determining whether they are 'at risk' from licensed activities generally requires specialist knowledge. However, non-specialists also play an important role in risk screening and so need to be to be able to quickly identify different wetland types in the field. With existing wetlands typologies considered as being either quite general or too detailed for this task, SNIFFER commissioned work to develop a simple functional wetland typology. The typology is habitat-based and covers the range of habitats found in Scotland, including a variety of coastal, lowland, upland and montane wetlands. The wetland types are designed to be uniquely identifiable. To assist with identification, 'field indicators' such as landscape setting, hydrological features, soil type and vegetation types have been selected for each wetland type. The survey manual, field sheets and survey form are all available from the SNIFFER website (project search: WFD95). www.sniffer.org.uk

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NEXT 'BIG THINGS' IN ANIMAL SCIENCES

In September 2009, an audience of more than 60 gathered to hear experts speak about the future of Animal Sciences at "The Next Big Thing in Animal Sciences." The event was held by Nexxus, the networking organisation for life scientists in central Scotland, in conjunction with Edinburgh Science Triangle, and hosted by the Moredun Research Institute at the Pentlands Science Park near Edinburgh.

The evening focused attention on the opportunities for Scotland to be a global leader in animal health sciences. To address challenges such as the world's growing demand for food and learning and how to better combat human disease basic livestock science must be understood. Researchers can then translate this knowledge into useful applications such as improving animal breeding, developing new vaccines, minimising disease susceptibility and improving yields.

Chair **Chris Warkup** described the great potential for Scotland to capitalise on its existing expertise in animal sciences, a field in which Scotland has the largest concentration of experts in Europe. Chris heads the Biosciences Knowledge Transfer Network, a Roslin-based organisation that works to facilitate connections between the research base and industry in animal health and animal breeding in Scotland.

"We have the capability in animal sciences to be the best in the world, what do we have to do to make that happen and then capitalise on that?" he said.

Julie Fitzpatrick, Scientific Director and Chief Executive of Moredun Research Institute (MRI) spoke about the future of livestock sciences, saying, "I believe the next big thing is infectious disease and what we're going to do about it."

She emphasized that many infectious diseases – often viruses - have re-emerged as challenges for industry. Problems include the pathogens' ability to adapt and change, for example by developing drug resistance. In some livestock, a limited gene pool does not leave much leeway for breeding options that might help defend against disease-causing organisms.

Research projects at Moredun aim to address these challenges. Julie described work at MRI on a vaccine against *Haemonchus contortus,* a parasitic worm that infects ruminants, such as sheep. The vaccine is now in pilot trials in Australia. MRI scientists are also developing a diagnostic kit for detection of the mycobacteria associated with Johne's disease, a chronic infection of sheep and cattle, and are working towards an attenuated vaccine against cattle herpes virus. In addition, they are using genomics to identify vaccine candidates to protect against mastitis.

Julie suggested that future research should emphasise targeted surveillance of disease, remote-sensing, and vaccine development.

David Hume, Director of the Roslin Institute and Research Director of the Royal (Dick) School of Veterinary Studies near Edinburgh, discussed current research in enhancing animal health and welfare through knowledge of genetic factors affecting disease resistance. The Roslin Institute's projects aim to gain basic biological knowledge of livestock and to translate that information to make it applicable to human and animal health.

David described projects that include looking into genetics of heritable resistance to tuberculosis in cattle and comparisons of pig and human susceptibility to H1N1, the currently circulating influenza virus, to better understand the genetic basis of disease pathology. He said the big issues for the future include learning how innate immunity works, how genotype connects to phenotype and how to optimise knowledge transfer and translation.

David also predicted that transgenics and systems biology will factor heavily in the future of animal sciences.

"The field of systems biology, in which interconnected webs of genes and proteins are studied as a whole, rather than focusing on single genes or single processes, has become increasingly helpful in allowing scientists to see connections, causes and effects in vast networks but, David cautioned, the challenge will be in translating these spaghetti-like diagrams into real products.

As a reminder of the issues faced in taking a new drug product from the laboratory to market, **Colin McLean of Charles River Laboratories**' discussed the rules and regulations companies must comply with to bring a veterinary pharmaceutical into the market. This can take 5 to 11 years and cost tens of millions of dollars. Though regulations vary greatly across countries and regions, Colin mentioned that Japan, USA and Europe are working towards establishing global regulations. Consistent global requirements would contribute to minimising animal testing.

In a lively question and answer session, panellists discussed how public perception and acceptability of transgenics will change in the future as consumer demands grow. In the future, the research and development activity in this field may encompass a new discipline of population genomics and opportunities for disciplines such as livestock genomics and cell technologies to converge for the development of livestock breeds. For example, new breeding initiatives could help feed the growing global demand for meat, milk and eggs in more sustainable agricultural systems.

FRENCH APPROVAL

Moredun Scientific has been approved as a subcontractor for R&D projects by the French Ministry of Research. This approval enables private companies subject to corporate tax in France to claim R&D tax credits for work subcontracted to Moredun Scientific.

Royal (Dick) School of Veterinary Studies

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A WORLD WORTH INHERITING

On Friday 18th September 2009 the Royal (Dick) School of Veterinary Studies was privileged to have Professor Richard Leakey present the 2009 William Dick Memorial Lecture entitled: "Climate Change and Wilderness - Where Are We Headed?"

Spend less time in the shower, reduce waste! Richard Leakey's message urged that we can all take practical steps to reduce the impact of environmental change on the world's dwindling wilderness resources.

Richard Leakey, author, TV presenter, former politician and currently Professor of Anthropology at Stony Brook University, New York, started by questioning the commonly-held view that the environment is a single entity. Ask the coelacanth, he suggested, whether it has experienced any change in the ocean depths in recent years? Yet the evidence from polar weather stations is clear – the temperature is getting warmer and the ice-sheets are getting smaller.

The impact of humans goes far beyond global warming. The few wilderness areas that remain tend to be small with hard edges. The species they contain are often unable to leave. Even with the creation of buffer zones and corridors to allow free migration, the animals cannot carry with them the rest of the complex ecosystem of which they are a part. Professor Leakey believes that Africa is now more susceptible to drought than at any time during his lifetime and that the resulting depletion of wildlife is far greater than realised.

He went on to argue that this is one type of climate change that can be addressed. There is widespread wastage of water across the developed world, mostly in agriculture, but also by domestic consumers. This is something that individuals can change.

Professor Richard Leakey giving the 2009 William Dick Memorial Lecture

The pace at which the world is losing its wilderness is already too rapid to slow down in Professor Leakey's lifetime. So is it worth doing anything? Yes, was his message, and he concluded with some positive observations.

Even if it takes a hundred years for new initiatives to take effect, this would be a mere blink in the sight of evolution. Humans have been around for 70,000 years, what is a mere hundred? Even a lifetime is too short a time to be worth sacrificing the planet for. We need governments to take steps to preserve and restore areas of wilderness. Vets have a special role in preserving species and reintroducing them to repopulate wilderness areas.

The real problem is that politics operates on a much shorter timescale. Why do we allow our politicians to get away with negligent handling of the world? Recent history has witnessed the end of slavery, non-universal suffrage and apartheid in much of the World. All have fallen due to public pressure. If heads of state can now be tried for torture, why not also for abuse of the world's resources? Is that not also a crime against humanity? It is the unborn generations' right to inherit a healthy planet. Change is do-able, possible and realistic on a fifty- year time scale. Even if it takes a hundred years, we should not be deterred from leaving a world worth inheriting to our grandchildren.

You can view the Lecture at:
www.vet.ed.ac.uk/2009WDML.htm

British Geological Survey

NOVEMBER 2009 FLOODING

The British Geological Survey took to the air on 20 November 2009 in the aftermath of the flooding, which devastated homes and businesses in the North West England and South West Scotland, to find out how modern flooding compares to ancient flood areas. BGS photographer Fergus MacTaggart observed flooding from 600m (2000 ft) as he flew over the worst affected areas around Cockermouth, Lockerbie, Dumfries and Workington.

Areas which have been flooded in the past have deposits of clay, silt and sand left by the flood water. These areas are called floodplains and coastal plains and can be extracted from geological maps indicating areas with a potential to flood in the future.

The Geological Indicators of Flooding Team have compared photographs from the flight with the new BGS Geological Indicators of Flooding Map. A comparison of the photograph and geological maps shows a correlation between areas which have flooded and areas marked as alluvial deposits (with a potential to flood).

Flooding of the River Nith in Dumfries in November 2009

EARTH SCIENCES IN 21ST CENTURY

Many prominent geoscientists now think that a forward look in earth sciences in particular in relation to UK science strategies is a priority. Broad drivers for such an undertaking are to define:

- Where are earth scientists now in the UK science agenda?
- How well is earth science integrated into the current NERC strategy?
- What is the long-term outlook for earth science?
- How can earth science be better structured within NERC and UK and also within European and international networks?

Marjorie Wilson (University of Leeds), John Ludden (BGS) and Lynne Frostick (University of Hull and Geological Society, London; GSL) as representatives of a significant portion of the UK earth sciences community have agreed to co-ordinate a forward look or horizon scanning exercise culminating in a workshop event.

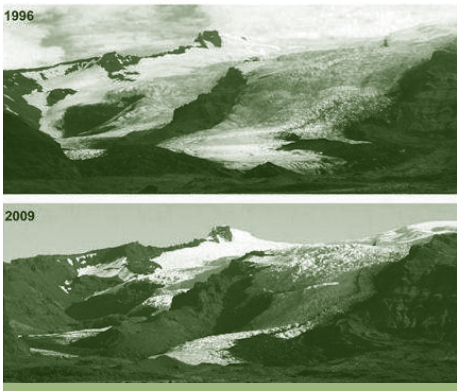
The event will involve around 100 members of the community (selected from the academic community, NERC, ERC Fellows and industry) who will be tasked with discussing and making recommendations on a series of themes relevant to Earth Sciences in the 21st century. Participants will be selected by application (www.bgs.ac.uk/ukgeoscience/getinvolved.html).

The event is to be held at the Geological Society in London, 18–19 January 2010. The final report will be published by 1 May 2010. The results of this exercise should provide scientific direction that will not only influence and inform future NERC strategy, but define earth science direction for the UK earth sciences community

ICELAND'S GLACIERS SHRINKING FAST

Recent data collected by the British Geological Survey, part of a long-term monitoring study at the margin of Iceland's most climatically sensitive ice cap, show stark evidence of accelerated glacier retreat.

Spanning more than a decade, photographic and volumetric evidence clearly demonstrate that Oraefajökull's outlet glaciers are now smaller that at any time in the last 100 years, and are shrinking at an increasing rate – faster than at any time in the last 100 years.



The Virkisjökull glacier, which flows from the highest mountain in Iceland – the Öraefajökull ice cap.

The images above, taken from the same location, span the last 13 years and show the steep outlet glacier Virkisjökull, which flows from the highest peak in Iceland – the Öraefajökull ice cap. Marked changes in its size and shape have taken place since 1996 when the glacier was in good health. These changes have been most dramatic in the last four years.

In the last 13 years it is estimated that over 1km of horizontal recession and 50m of vertical thinning has taken place at this glacier. To put this in perspective, the glacier has only retreated around 1km and thinned about 50m in the previous 100 years combined.

Many researchers believe that glaciers disappeared from Iceland during the relatively mild climatic optimum c. 5000–8000 years ago. Will it be long before the glaciers in Iceland disappear again?

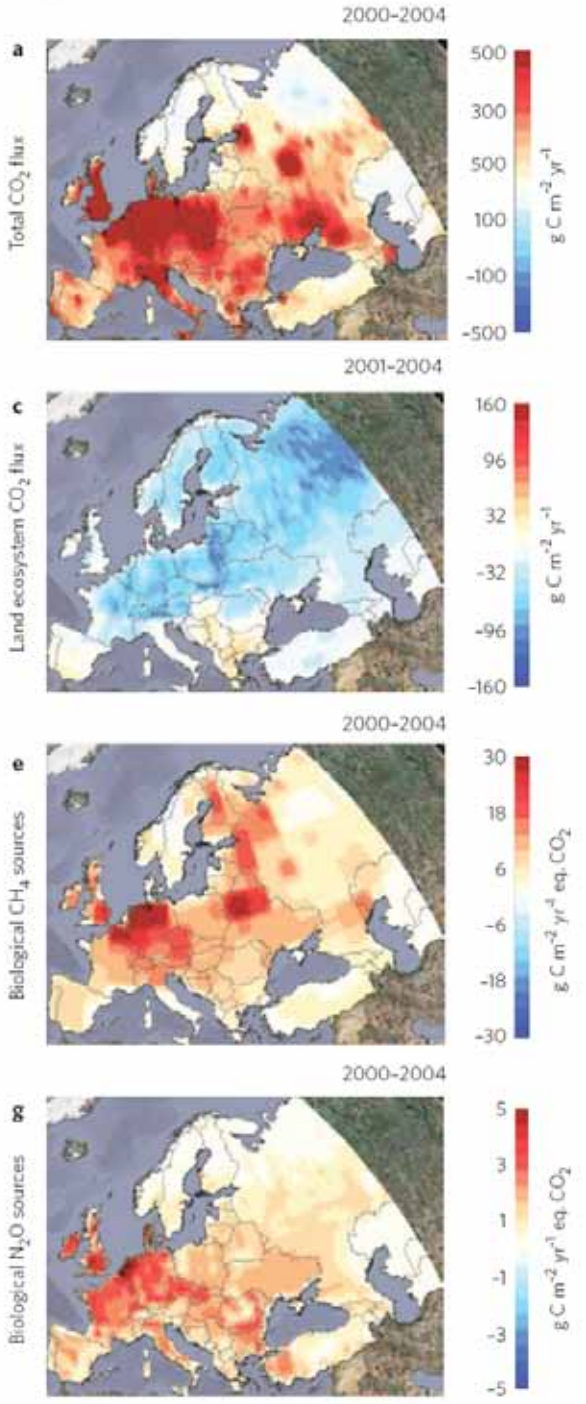
School of Geosciences, University of Edinburgh

INTENSIVE FARMING UNDER SCRUTINY

A new study by research partners from 17 countries, has shown that European forests and grasslands absorb as much as 19% of Europe's fossil fuel emissions. However, carbon dioxide is only one of the gases that contribute to global warming. Two others, methane and nitrous oxide, have also been considered by the scientists. They come from agriculture. Nitrous oxide is emitted by the soil when fertilizer or manure is added to speed up the growth of crops. And methane is produced from livestock, particularly from cattle. The important new finding is that these two gases are produced in such quantity to almost wipe out the 19 % benefit of the forests and grasslands.

Professors John Grace of Edinburgh University and Pete Smith of Aberdeen University were both research partners in this project. John Grace commented 'to meet national targets of greenhouse gas emissions, embodied in the UK Climate Change Act, we'll need to look very carefully at all forms of intensive land management'.

Reference: E.D. Schulze et al. (2009) Importance of methane & nitrous oxide for Europe's terrestrial greenhouse-gas balance. Nature Geoscience, Focus Progress Online Article, Dec 2009



The top figure shows the distribution of CO2 emissions. The next one shows the uptake of CO2 by forests and grasslands. The final two show the emissions of methane and nitrous oxide

UNESCO BACKING

UNESCO has backed a key post to further research into international development at Edinburgh University. The UNESCO Chair in International Development is awarded as the University launches a series of initiatives that will seek to benefit the developing world. The first Chair holder will be **Paul van Gardingen, Professor of International Development**. He joins a global network of academics supported by UNESCO - the UN agency for science, culture and education.

The University recently hosted a two-day international workshop on food security – which will aid the quest to ensure food is available in impoverished regions. The event will set the agenda for teaching collaboration between some of the world's leading universities and the developing world.

NEW ROLE

Martin Siegert has been appointed to the position of Assistant Principal for Energy and Climate Change. He will lead the University's plans to establish a world-leading multidisciplinary centre on climate change and carbon reduction solutions. The Centre, which will be a focus for both teaching and research, is being developed in collaboration with Heriot Watt University. It will be located in a purpose-designed building in the Old High School at High School Yards and will be a sustainable forum for learning, investigation and innovation, linking the academic community with industry, law, finance and government.

In Brief. . .

NEW RESEARCH VESSEL

The **University Marine Biological Station Millport** has ordered a new research vessel to replace its smaller vessel, RV Aplysia. The new vessel will be named RV Actinia (after the beadlet anemone common on the shores of Cumbrae). She will operate primarily from Millport in and around the Clyde Sea Area, but will also be able to operate in any coastal waters. Her main rôles will be taking students out to sea, hydrographic and benthic sampling, trawling, creeling, surveying and providing a platform for scientific divers.

The UMBSM's new research vessel Actinia under construction in October 2009.

BIOFUEL EXPERTS VISIT

On 27 November, a Brazilian delegation of biofuel experts visited Scotland to attend an event organised by Scottish Development International and **Edinburgh Napier University's Biofuel Research Centre**.

Professor Martin Tangney, Director of Edinburgh Napier's Biofuel Research Centre, said: "We are honoured to host such distinguished guests at Edinburgh Napier as part of the delegation's visit to Scotland. The Biofuel Research Centre is driving the development of sustainable biofuels. Brazil is the world leader in biofuel and meets over half of all its fuel requirements with biofuel. There is a huge amount that Brazil can teach us and this visit represents an important chance to establish valuable collaborations with both industry and

PEOPLE MAKE ANIMALS ILL

Globalisation and industrialisation are causing diseases to spread from humans to animals. Researchers from **The Roslin Institute** and the **Centre for Infectious Disease** have shown that a strain of bacteria has jumped from humans to chickens. It is thought to be the first clear evidence of bacterial pathogens crossing from humans to animals and spreading since the domestication of animals around 10,000 years ago.

The study identified a form of the bacteria Staphylococcus aureus - of which MRSA is a subtype - in chickens. The researchers then found that the bacteria originally came from humans. Genetic testing showed that the bacteria crossed over from one species to another around 40 years ago. This coincides with a move towards intensive poultry farming practices.

Roslin Institute's Dr Ross Fitzgerald said "The demand for meat has led to a poultry industry dominated by a few multinational companies which supply a limited number of breeding lines to a global market - thereby promoting the spread of the bacteria around the world."

The study was published in the Proceedings of the National Academy of Sciences. Further research will look at analysing other livestock for emerging pathogens and diseases that may have come from humans.

MORE POWER FOR WIND TURBINES

New technology developed at **Edinburgh University** is set to make wind power cheaper and more reliable. The technology replaces the complex gearboxes in existing wind turbines with a lightweight, direct drive system that is easier to manufacture and cheaper to maintain.

Researchers at **Edinburgh University's School of Engineering** say the new C-GEN technology is as much as 50 per cent lighter than current direct drive generator systems, leading to significant savings in manufacturing and operating costs.

Two prototype C-GEN generators have been demonstrated. A new company, called NGenTec, has been spun out of the University to commercialise the technology. The company is now seeking to raise £4 million in funding to develop the C-GEN technology for commercial use.

AWARDING COMMITMENT

Ian Maudlin has been made an Honorary Professor at the **University of Edinburgh**. Ian is head of the Department of Tropical Animal Health at **Edinburgh University's Centre for Tropical Veterinary Medicine**. His research has focused on trypanosomiasis (sleeping sickness). He is a member of the WHO Expert Advisory Panel on Parasitic Diseases and has been closely involved with development issues in Africa

From 1999-2006 he managed the UK Department for International Development (DFID) Animal Health Research Programme. He has recently been appointed Director of the DFID Research Into Use (RIU) programme. The RIU is designed to put the results of agricultural and natural resources research into use to reduce poverty and contribute to the Millennium Development Goals.

ECRR DIARY 2010

Feb 1	Directors' Lunch	National Museums of Scotland Host: Dr N Fraser	12.30
Feb 16	Annual ECRR Lecture	Royal Society of Edinburgh Speaker: Prof Jim McDonald	17.30
Mar 1	Executive Committee Directors' Lunch	Moredun Research Institute Host: Prof Julie Fitzpatrick	11.00 12.30
May 5	Main Board meeting Directors' Lunch Workshop Reception	Edinburgh University Genomics Forum Host: Prof S Yearley "Behavioural Change & Adaptation"	11.00 12.30 14.00 17.00
Jun 4	Executive Committee Directors' Lunch	TBA	11.00 12.30
Sep 6	Executive Committee Directors' Lunch	TBA RSPB Vane Farm, Fife Host: Prof J Wilson	11.00 12.30

FLOOD RISK MANAGEMENT CONFERENCE 2010

To be held at Our Dynamic Earth, Edinburgh
on Wednesday 10th & Thursday 11th February 2010

Purpose:

- To provide an update on the status of the Flood Risk Management (Scotland) Act and implementation of the Act.
- To provide an update on SEPA's Flood Warning Direct Programme.
- To provide an update on demonstration work and research on Sustainable Flood Management approaches.

Who should attend:
All those with an interest in flood risk management in Scotland (and across the UK) including:

- Policy & decision makers (councillors, elected members, planners and chief executives from local authorities).
- Senior practitioners'
- Researchers.
- Engineers & consultants.

To register: Please register by Friday 22nd January at www.rise-frm.org.uk/seminarreg .

This is a free event being organised by the **Scotland & Northern Ireland Forum for Environmental Research (SNIFFER)** and supported by the Scottish Government, SEPA & Scottish Water

ECRR Member Organisations

University of Edinburgh	www.ed.ac.uk
College of Science & Engineering	
College of Medicine & Veterinary Medicine	
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Scottish Agricultural College	www.sac.ac.uk
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Biomathematics and Statistics Scotland	www.bioss.sari.ac.uk
British Geological Survey	www.bgs.ac.uk
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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.sari.ac.uk
Scottish Natural Heritage	www.snh.org.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

DISTRIBUTION

For queries about Bush Telegraph distribution please contact Mike Talbot at m.talbot@bioss.ac.uk.

ON THE WEB

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COPY DEADLINE

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