

## Radical way to feed the world

How studying roots and the soil could help global food production

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## Fruit wines in the far north

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Tracking down the native varieties of popular vegetables

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## Better beef is in the breeding

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# scrr

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## Good food from good fieldwork

Scientific research makes an enormous contribution to Scotland's agriculture, says Prof Stuart Monro, scientific director of SCRR

AT THE HEART of Scotland's rural economy lies our ability to produce great food and drink, and so it is no surprise that 2015 has been designated as the 'Year of Food and Drink'.

While the agricultural industries will have the opportunity to make the wider public aware of their contributions to a vibrant Scottish economy, it must also be recognised that eating habits are the second most important factor in the poor health of the Scottish people after smoking. There is still controversy about what constitutes a 'healthy diet' and scientists are now aware that there is no single factor, or even a small group of factors, responsible.

Two recent meetings of SCRR brought together Scottish-based

scientists whose research focuses on metagenomics, the study of genetic material recovered directly from complex environmental samples. This includes environments such as those found within the gut of both humans and animals, as well as more obvious natural environments such as the soil. These studies give new insights into how microbial life within the environment of the gut contributes to both animal and human health, and how plant health is influenced by soil microbiology.

Scientific research being undertaken across the institutes associated with SCRR still has much to contribute to the wellbeing of Scotland's agricultural industries.

## This issue in unfamiliar words and phrases

**Transparent soil** is used to study how nitrogen reaches plant roots in research at JHI – **page 2**

**Salal** is a berry from the Pacific north-west of America being used to make Orkney wine – **page 3**

**Citizen science** means that volunteers play a crucial role in gathering data on tree diseases for Forest Research – **page 3**

**Solanum** is the genus of plants that includes potatoes, tomatoes and aubergines, being tracked down in the wild by RBGE – **page 4**

**EBVs** or 'estimated breeding values' can be used by farmers to improve particular characteristics of farm animals, such as resistance to bovine TB in research from SRUC – **pages 4-5**

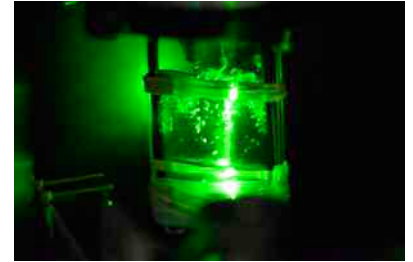
## About SCRR

**THE SCOTTISH CONSORTIUM FOR RURAL RESEARCH** exists to promote sharing of ideas and techniques among a group of organisations active in research into land, freshwater, coastal and marine resources, and their uses.

Our member organisations have bases throughout Scotland and are at work all over the world: details on the back page.

Members' reports

James Hutton Institute (JHI); Scotland's Rural College (SRUC)



The study combines principles of optics, chemical engineering, physics, chemistry and biology of soils. 'New model soil systems,' explains Dr Dupuy, 'could be used to unravel the spread of soil-borne diseases, the bio-remediation of contaminated soils and the mechanisms underlying soil biodiversity and activity.'

The new project builds on the development of transparent soils, and proposes to progress the technology further to visualise transport of nutrients in soils. The research will ultimately make it possible, for the first time, to unravel nitrogen pathways through soil at the microscopic scale.

Professor Iain Gordon, chief executive of the James Hutton Institute, said: 'Using innovative approaches, Lionel is shining a light on the ways that plant roots gather nutrients and water. Ultimately, his insights and findings will help address pressing challenges of feeding the world and saving the planet.'

At the 2015 Royal Highland Show, the James Hutton Institute will showcase the contribution of its research to the continuing success of Scottish farming, food and land-based industries. Visit the Institute's marquee on Avenue Q, stand 233.

## Unravelling the dark secrets of soil, roots and microorganisms

Research at JHI into artificial soils will examine what goes on under the surface

DR LIONEL DUPUY of the James Hutton Institute's Ecological Sciences group in Dundee has been awarded £1.98 million through a European Research Council Consolidator Grant to undertake research on a new generation of artificial soils, with the

aim of unravelling the hidden interactions of roots, soil and microorganisms. This is a key battleground in the fight for food security, particularly as 2015 is both the International Year of Soil and Scotland's Year of Food and Drink.

**Above right: optical analysis is used along with chemical and biological examination of soils**

## Diversification in rural economies

Ellie Brodie of SRUC reports on a discussion at the Cross Party Group in the Scottish Parliament on Rural Policy

THE THIRD MEETING of the 2014-15 session of the Cross Party Group in the Scottish Parliament on Rural Policy took place on February 18, 2015. The topic was 'Rural Economies: Diversify or Die'. The meeting enabled stakeholders from the public, private and community sectors to discuss how policy changes could help.

Invited speakers from four organisations described their approach to rural economic diversification: Loch Lomond and the Trossachs

National Park; GrowBiz, which offers community-based enterprise support in eastern Perthshire; Balcaskie Estate in Fife; and Go Rural, which provides information, suggestions and offers on Scottish rural activities and destinations.

Several key themes emerged. 'Micro finance' was seen as being critical to combat the stop-start nature of grant funding and the level of administration involved in processing grants such as LEADER. Providing personal and flexible support was

identified as the best way to capture people's enterprising dreams and ideas, along with business networks and peer-to-peer support.

Ways to overcome the rural/urban divide included: refreshing the Scottish Government's Economic Strategy to include the idea of 'inclusive growth'; providing a supportive environment for the hospitality sector to use Scottish produce; widening agritourism as a food policy; and through agencies such as Business Gateway doing rural outreach and events. The need to gather and share evidence about rural diversification was expressed.

[www.sruc.ac.uk/info/120597/group\\_meetings\\_2014-15/1380/meeting\\_3\\_rural\\_economies\\_diversify\\_or\\_die](http://www.sruc.ac.uk/info/120597/group_meetings_2014-15/1380/meeting_3_rural_economies_diversify_or_die)

## Developing fruit wines in Orkney from novel, locally grown fruit

Peter Martin of the Agronomy Institute, Orkney College UHI, describes a successful collaboration to produce new wines in Orkney

WITH FREQUENT STRONG winds, high winter rainfall and a cool growing season with reduced sunshine because of cloud and mist, Orkney's weather presents some major challenges for outside fruit production. Based on a field trial programme which started in 2002, the Agronomy Institute of the University of the Highlands and Islands has identified several cultivars of northern berries which have grown and fruited well in Orkney. Since 2012 the Institute has been collaborating with the Orkney Wine Company which specialises in the production of fruit wines and has always been keen to use locally grown fruit in its wines.

Using samples of fruit from the Institute's trials, the company has



Above: fruit of salal, which originated in the Pacific north-west of North America. Right: Orkney Rosé, a recently released wine containing fruit of several unusual Orkney-grown fruit species



assessed the most promising species in both single-fruit wines and in wines made from several fruit species. Testing has been helped by the two organisations linking up with researchers at The James Hutton Institute who have investigated the chemical composition of both the fruits and the wines and this has helped to explain the unique characteristics which some of the species bring to these special wines.

The collaboration has seen the release of Orkney White, which contains Orkney-sourced elderflower, rosehips and gooseberries; and, most recently, Orkney Rosé which contains local aronia (*Aronia melanocarpa*), salal (*Gaultheria shallon*) and cranberry (*Vaccinium macrocarpon*).

Using plants raised from the Agronomy Institute's trials, the company has recently planted its own fruit garden which will allow it to become self-sufficient in fruit from these species in the future. Further new wines and liqueurs made from these species are under development.

## 'Observatree' early warning system for tree health

Steve Penney of Forest Research on how citizen science will help prevent future tree diseases in the UK

THE OBSERVATREE PROJECT combines citizen science and new technology in the fight against tree disease. Launched on May 28, 2015 the project will help protect the UK's trees, woods and forests from harmful pests and diseases – existing or new.

The project is 50% funded by the EU's Life+ programme and also supported by Defra APHA and Natural Resources Wales. Over the past 12 months, more than 200 volunteers across the UK have been trained as part of the collaboration between Forest Research, the Forestry Commission, fera, the National Trust and the Woodland Trust.

Volunteers will, amongst other tasks, verify cases of tree disease recorded via the Forestry Commission's Tree Alert, an online reporting tool which allows anyone to report trees showing signs of ill-health. Tree health officers and forestry professionals are especially being encouraged to use Tree Alert to report possible sightings of pests and diseases at an early stage.

Two volunteer roles have been created: Tree Health Surveyors spot



Right: leaves are examined for signs of disease

the presence of specific pests and diseases on common tree species, while Tree Health Triage Verifiers contact landowners to collect additional information for tree disease records submitted through Tree Alert by the public and Tree Health Surveyors. Further opportunities to

become a trained volunteer will be available during the course of the project, which will run until the end of 2017.

To find out more about Observatree and how you can get involved, please visit [www.observatree.org.uk](http://www.observatree.org.uk)

Members' reports

Royal Botanic Garden Edinburgh (RBGE)



## Genetic analysis to bovine TB

Mike Coffey of SRUC explains why genetic selection could help in the long term battle against bovine tuberculosis

TB IS AN EXPENSIVE disease and, following decades of testing and control, the incidence is rising again. Coupled with the intense public scrutiny over the methods used to deal with TB, this increase leads us to consider whether genetic selection could help in the long term battle against this disease.

Preliminary work by Roslin Institute and Scotland's Rural College (SRUC) showed that UK national data on TB outbreaks and British Cattle Movement Service (BCMS) records could be combined with milk recording to produce data that is suitable for genetic analysis. That work showed there was sufficient genetic variance and a heritability of around 0.18 that meant genetic evaluations (ie identification of genetically resistant animals) were feasible.

DairyCo has funded work at SRUC's EGENES (Edinburgh Genetic Evaluation Services) to refresh the data, establish routine data flows and adapt national genetic evaluation routines to routinely calculate TB resistance estimated breeding values (EBVs) for use by dairy farmers.

The method of presentation to farmers is being discussed widely to ensure maximum utility and uptake of the EBVs. The message is not for farmers to select only for TB resistance since other valuable traits may be

## Hunting for the wild ones

Tiina Särkinen of RBGE maps the world of 'crop wild relatives' of the potato, tomato and aubergine (or eggplant)

CROP WILD RELATIVES (CWR) continue to provide important traits in breeding, including pathogen resistance and abiotic stress traits, and are essential for maintaining food security in the coming next decades. However their diversity and distribution remain poorly studied in many groups of plants.

The genus *Solanum* is agriculturally one of the most important flowering plant genera and includes three important global crops: potato, tomato and aubergine (eggplant). *Solanum* is also one of the largest genera of vascular plants with an estimated 1,500 species and keeping track of all these species is no easy task.

In a recent publication, Dr Tiina Särkinen from the Royal Botanic Garden Edinburgh, together with experts from the UK, US, Brazil, and Peru, mapped and catalogued all the currently known species of *Solanum* found in Peru, a centre of diversity for both wild potatoes and tomatoes. The study lists a total of 276 species, and shows that 82% of potato and 47% of tomato crop wild relatives are found in Peru alone.

The detailed distribution data gathered in the project will now be

used to strengthen *ex situ* collections of both potato and tomato wild relatives in global seed banks, a work led by the Global Crop Diversity Trust in collaboration with the International Centre for Tropical Agriculture (CIAT). The data will also be used for understanding drivers of plant extinction risk in the Andes, and for studying the evolution of pathogen resistance in the wild.

*Peruvian Biological Review:*  
[revistasinvestigacion.unmsm.edu.pe/index.php/rpb/article/view/11121](http://revistasinvestigacion.unmsm.edu.pe/index.php/rpb/article/view/11121)

**Above:** cultivating native potatoes high in the Peruvian Andes. **Below:** many wild potato species occur at high altitude and are threatened by climate change



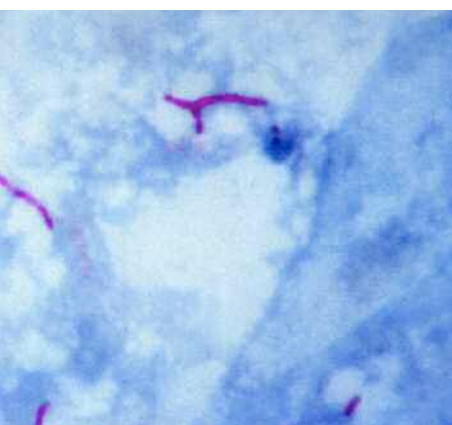
## of resistance

sacrificed in the attempt. Correlations are being calculated to allow the trait to be incorporated into the national selection index. Likewise, the units of the trait are of importance since farmers will (incorrectly) assume that after  $n$  rounds of selection they could have a herd of completely resistant cattle. The trait is currently expressed as the percentage of offspring diseased so continued selection will reduce the overall number of cattle with the disease. This will have an added effect of lowering the background level of infection, further reducing its spread.

Of course, once a genomic prediction equation is officially calculated (a so-called SNP Key) then animals at higher risk of being susceptible can be identified at birth from their DNA and removed from the herd before they have a chance to infect others. To enable the production of an SNP key, we are working with industry partners to gather semen straws for bulls that have an EBV for TB resistance but have not yet been genotyped.

Genetic and genomic tools to reduce the level and spread of TB are just that – tools. They are not a solution, nor are they a quick win. They are simply an added tool (albeit a particularly effective one) to combine with other tools such as biosecurity, controlled movements and continued testing to lead to a reduction in TB incidence. TB resistance EBVs are expected to be made available to industry during 2015.

*For further information on this project, please contact [mike.coffey@sruc.ac.uk](mailto:mike.coffey@sruc.ac.uk)*



## SRUC pioneers genomic breeding in beef cattle

Katy Jeffrey of SRUC describes how a combination of technologies can match consumer demand with beef cattle production

SRUC, IN COLLABORATION with the British Limousin Cattle Society and Anglo Beef Processors (ABP) are using a combination of technologies to better match consumer demand with beef cattle production in the UK.

The four-year project funded by Innovate UK will this year use new imaging technology and genomic testing to accurately measure the amount of meat a beef carcass provides, and will enable farmers to select the best animals for breeding cattle with favourable carcass attributes.

ABP abattoirs have installed video imaging technology (VIA) which more accurately shows how much quality meat there is on each animal. Currently farmers are paid based on the carcass weight and EUROP classification (conformation and fat class); however, within a group of animals previously valued the same, the retail value may vary by up to £100 between animals

**Above: the new research means higher-quality meat from Limousin cattle**

due to the quantity of the meat cuts. Adopting VIA will be more accurate, efficient and fair.

VIA provides phenotypic information of the carcass yield, which has then enabled genomic testing to be carried out to identify regions of DNA associated with heavier carcasses and higher meat yields.

From a DNA sample, the genetics of the animal's carcass yield can be established. This information is known as the Genomic Breeding Value (GBV) – for VIA primal cuts, around 40% of an animal's performance is controlled by genetics. With the GBV, farmers are able to make an informed decision on, for example whether to keep a calf or which bull to breed from, which in turn leads to targeted and improved breeding of beef cattle.

This will be the first GBV in the UK for beef cattle, which will place SRUC among the world leaders for genomic breeding in beef.

Special report

Heriot-Watt University

# Scottish Crucible welcomes SCRR researchers

Dr Ruth Neiland, director of Scottish Crucible, explains the benefits of Crucible programmes in inspiring new interdisciplinary research collaborations and networks

SCIENTISTS AND SOCIAL SCIENTISTS from member organisations of the SCRR are amongst a growing network of talented researchers seeking to enhance their creative capacity and research impact by taking part in an award-winning leadership and development programme for Scotland's 'research leaders of the future' – Scottish Crucible.

Launched in 2009 by Dr Ruth Neiland and Prof Alan Miller, Scottish Crucible runs an annual programme for the most promising early-career researchers in Scotland. Each year it enables 30 specially selected researchers from across the Scottish research base to come together to explore and expand their innovative potential through a series of intensive, two-day workshops (called 'LABs') held between April and June.

The LABs comprise a wealth of guest speakers, seminars, skills sessions, tours and informal discussions, all designed to stimulate interaction between participants, and forge new ideas for pan-Scotland collaboration in research and innovation. Together they focus on helping Scottish Crucible participants develop key academic attributes of collaboration, interdisciplinarity, innovation and leadership with the aim of inspiring researchers to be more

ambitious, creative and innovative not just in their research, but also in their interdisciplinary collaborations.

Participants in Scottish Crucible come from a broad range of subject areas including life, physical and environmental sciences, engineering, medicine, arts, design, social science and humanities. Researchers compete to win a place on Scottish Crucible via an annual application process overseen by the Royal Society of Edinburgh, with the composition of each programme cohort being carefully balanced to ensure appropriate representation of discipline, gender and institution.

The majority of applicants have come from researchers based in one of Scotland's 19 universities, but researchers from the James Hutton Institute, SRUC (Scotland's Rural College) and the National Museums of Scotland have all participated in Scottish Crucible in the past, and the Moredun Research Institute is one of the partner host institutions for Scottish Crucible 2015. More applications from researchers in these and other Scottish research institutes and SMEs is welcomed by Scottish Crucible in the future.

Since its establishment, Scottish Crucible has been supported by the Scottish Funding Council, Royal Society of Edinburgh, Scottish Government, Scottish Parliament and

Universities Scotland. Participants have a unique opportunity to broaden their networks, not only by meeting senior representatives of science, policy, government, media and business in Scotland, but also by forming an invaluable interdisciplinary network with their peers from across the Scottish research base.

This has led to the development of a variety of pilot research projects enabled through the Scottish Crucible collaborative research fund. A 'Scottish Crucible Conference' to showcase the on-going research achievements of Scottish Crucible Alumni will take place at Our Dynamic Earth in Edinburgh on September 4, 2015.

The Scottish Crucible Alumni Network has facilitated additional research and knowledge exchange activities involving former Scottish Crucible participants – eg 'Projects for Scotland' social research projects funded by ESRC; and the participation of delegations of Scottish Crucible Alumni in ESOF 2012 (Dublin) and ESOF 2014 (Copenhagen) European science conferences.

*Further details of Scottish Crucible, Heriot-Watt Crucible or Heriot-Watt Exchange Events are available at: [www1.hw.ac.uk/scottishcrucible/](http://www1.hw.ac.uk/scottishcrucible/) and [www.hw.ac.uk/research/ald.htm](http://www.hw.ac.uk/research/ald.htm) or by emailing [ScottishCrucible at: ResearchFutures@hw.ac.uk](mailto:ScottishCrucible@ResearchFutures@hw.ac.uk)*



**Scottish Crucible ESOF 2014 delegation at the Royal Danish Academy of Sciences and Letters, Copenhagen**



## Networks and centres of excellence

The Scottish Consortium for Rural Research (SCRR) is a consortium of organisations active in research into land, freshwater, coastal and marine resources, and their uses – including farming, forestry, aquaculture and recreation. Emerging within Scotland are a number of other networks which are relevant to rural research. Keeping up with them as they develop may be difficult, so here is a directory of some that may help.

### 2020, Scotland's 2020 Climate Group

aims to demonstrate leadership and facilitate collaboration across Scotland to help meet Scottish Government carbon targets, a reduction of 42% CO2 emissions by 2020. Businesses and organisations across Scotland can use the Group as a platform to learn, share best practice and work together to help deliver a reduction in carbon emissions across Scotland, involving all sectors of Scottish society.  
[www.2020climategroup.org.uk/](http://www.2020climategroup.org.uk/)

### Centre of Agricultural Informatics and Metrics of Sustainability (AIMS)

puts the UK at heart of the big data revolution in agriculture. The centre is another milestone for the Agri-Tech Industrial Strategy, enabling our food to be produced more efficiently and sustainably while creating jobs and growing the UK economy. It is a consortium of leading industry and academic partners including Scotland's Rural College (SRUC), Rothamsted Research, the University of Reading, and the National Institute of Agricultural Botany (NIAB).  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/227259/9643-BIS-UK\\_Agri\\_Tech\\_Strategy\\_Accessible.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/227259/9643-BIS-UK_Agri_Tech_Strategy_Accessible.pdf)

### CAMERAS, A Coordinated Agenda for Marine, Environment and Rural Affairs Science

aims to align and coordinate the scientific activity of its partner organisations to ensure best use of existing resource and enhanced support to Scottish Government policy development and delivery, primarily in the rural, environmental and marine areas.  
[www.camerasscotland.org/](http://www.camerasscotland.org/)

### CENSIS, the Innovation Centre for Sensor and Imaging Systems

is a new innovation centre in Scotland that brings together our world-class university researchers and the leading innovators in our companies to create a centre of excellence for Sensor and Imaging Systems (SIS) technologies.  
[censis.org.uk/](http://censis.org.uk/)

### CREW, the Centre of Expertise for Waters

delivers objective, robust research and expert opinion to support the development and implementation of water policy in Scotland and is a partnership between the James Hutton Institute and all Scottish higher education institutes.  
[www.crew.ac.uk/](http://www.crew.ac.uk/)

**CXC, ClimateXChange** provides research, advice and analysis to the Scottish Government as it develops and implements policies on adapting to the changing climate and the transition to a low carbon society.  
[www.climatexchange.org.uk/](http://www.climatexchange.org.uk/)

### EPIC, Epidemiology, Population health and Infectious disease Control

is an animal health project which brings together Scottish-based expertise under one umbrella to best prepare Scotland's livestock industry for animal disease outbreaks, providing evidence based advice to Scottish Government and relevant partners.  
[epicscotland.org/](http://epicscotland.org/)

**EPS, Edinburgh Plant Science** is committed to delivering fundamental and translational research, education and outreach so that new discoveries bring benefits for human health, society and the environment.  
[www.edinburghplantscience.co.uk/](http://www.edinburghplantscience.co.uk/)

**EScom, an Ecosystem Service Community for Scotland** aims to support better management of Scotland's natural resources. It hopes to help establish a community of practice between individuals and groups involved in sustainable ecosystem management.  
[escom.scot/](http://escom.scot/)

### MASTS, the Marine Alliance for Science and Technology for Scotland

is a consortium that represents the majority of Scotland's marine research capacity. Its objective is to facilitate better communication, collaboration and co-ordination within the marine research community.  
[www.masts.ac.uk/](http://www.masts.ac.uk/)

**Natural Capital Forum** – the inaugural World Forum on Natural Capital was the first major global conference dedicated to natural capital. It built on the significant private sector interest shown at the United Nations Earth Summit in Rio in June 2012 and the many developments that have taken place since. The next World Forum on Natural Capital is on November 23-24, 2015 in Edinburgh.  
[naturalcapitalforum.com/](http://naturalcapitalforum.com/)

**NCPF, the National Centre for Precision Farming** aims to provide information and a range of support initiatives that will enable visitors to the site to gain an ongoing understanding of precision farming, insight into precision farming developments and support services designed to assist farmers and associated stakeholders in applying precision farming methods. It is based at the Agricultural Engineering Innovation Centre at Harper Adams University.  
[www.harper-adams.ac.uk/initiatives/national-centre-precision-farming/](http://www.harper-adams.ac.uk/initiatives/national-centre-precision-farming/)

**SAIC, the Scottish Aquaculture Innovation Centre** supports the growth, sustainability and profitability of the Scottish aquaculture industry, providing solutions that tackle urgent industry issues, introducing more sustainable practices, and preparing the industry for the future. It fosters innovative, industry-relevant collaboration, which will also impact positively on the Scottish economy.  
[scottishaquaculture.com/](http://scottishaquaculture.com/)

**SAGES, the Scottish Alliance for GeoScience, Environment and Society** pools world-leading expertise in geoscience and environmental science from across Scotland's research base, creating an multi-disciplinary alliance at the forefront of earth and environmental research. We are a partnership between the Universities of Aberdeen, Abertay, Dundee, Edinburgh, Glasgow, St Andrews, Stirling, SAMS UHI, SUERC, and the West of Scotland.  
[www.sages.ac.uk/](http://www.sages.ac.uk/)

**Scotland's Futures Forum** was created by the Scottish Parliament to help its members – along with policy makers, businesses, academics and the wider community of Scotland – to look beyond immediate horizons towards some of the challenges and opportunities we will face in the future.  
[www.scotlandfutureforum.org/](http://www.scotlandfutureforum.org/)

## SCRR member organisations

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School of Engineering . . . . .	www.see.ed.ac.uk
School of GeoSciences . . . . .	www.ed.ac.uk/schools-departments/geosciences
School of History, Classics and Archaeology . . . . .	www.shca.ed.ac.uk/Research/
School of Social and Political Studies . . . . .	www.sps.ed.ac.uk
Biomathematics and Statistics Scotland . . . . .	www.bioss.ac.uk
British Geological Survey, Edinburgh . . . . .	www.bgs.ac.uk
Centre for Ecology & Hydrology, Edinburgh . . . . .	www.ceh.ac.uk
Crichton Carbon Centre . . . . .	www.carboncentre.org
Field Studies Council, Millport . . . . .	enquiries.sco@field-studies-council.org
Forest Research, Northern Research Station . . . . .	www.forestry.gov.uk/forestresearch
Heriot Watt University, School of Life Sciences . . . . .	www.sls.hw.ac.uk
University of Stirling, Institute of Aquaculture . . . . .	www.aquaculture.stir.ac.uk
James Hutton Institute . . . . .	www.hutton.ac.uk
Moredun Research Institute . . . . .	www.moredun.ac.uk
Napier University, School of Life, Sport & Social Sciences . . . . .	www.napier.ac.uk/fhlss/SLSSS
National Museums of Scotland . . . . .	www.nms.ac.uk
Roslin Institute, University of Edinburgh . . . . .	www.roslin.ed.ac.uk
Royal Botanic Garden Edinburgh . . . . .	www.rbge.org.uk
Royal Society for the Protection of Birds - Scotland . . . . .	www.rspb.org.uk/scotland
Royal Zoological Society of Scotland . . . . .	www.rzss.org.uk
Science & Advice for Scottish Agriculture . . . . .	www.sasa.gov.uk
Scotland's Rural College (formerly Scottish Agricultural College) . . . . .	www.sruc.ac.uk
Scottish Association for Marine Science, Oban . . . . .	www.sams.ac.uk
Scottish Natural Heritage . . . . .	www.snh.gov.uk
SNIFFER . . . . .	www.sniffer.org.uk
Society, Religion and Technology Project . . . . .	www.srtp.org.uk
University of Glasgow . . . . .	www.gla.ac.uk
College of Medical, Veterinary and Life Sciences . . . . .	www.gla.ac.uk/colleges/mvls/
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University of the Highlands and Islands (UHI) . . . . .	www.uhi.ac.uk
Agronomy Institute, Orkney College . . . . .	www.agronomy.uhi.ac.uk
Centre for Mountain Studies, Perth College . . . . .	www.perth.uhi.ac.uk/specialistcentres/cms
Centre for Remote and Rural Studies, Inverness College . . . . .	www.crrs.uhi.ac.uk
Environmental Research Institute, North Highland College . . . . .	www.eri.ac.uk
Lews Castle College, Stornoway . . . . .	www.lews.uhi.ac.uk/research
NAFC Marine Centre, Shetland . . . . .	www.nafc.ac.uk
West Highland College, Fort William . . . . .	www.whc.uhi.ac.uk

## Events

[www.scrr.ac.uk/events.php](http://www.scrr.ac.uk/events.php)

Please see the website for announcements.

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