

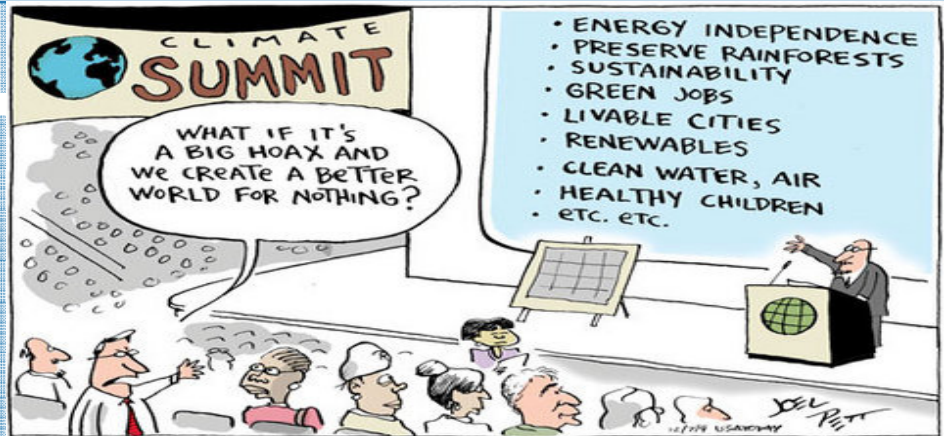


March 2010 Bulletin

www.sages.ac.uk

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Forthcoming

SAGES Workshop (Oban)	Leah Gibbs Date: 18-19th March 2010 'Methodologies in Society-Environment Research' Contact: Leah Gibbs Leah.Gibbs@ges.gla.ac.uk
SAGES Research Workshop (Edinburgh)	Andy Dugmore Date: 26th March 2010 'Global Human Eco-Dynamics' Contact: Andy Dugmore Andrew.Dugmore@ed.ac.uk
Coastal	Sue and Alastair Dawson Date: 27th April 2010 'Coastal and Sea-level workshop' Contact: Sue Dawson S.Dawson@dundee.ac.uk
AIMES	Mark Rounsevell and Matt Williams Date: 10-13th May 2010 Earth System Science 2010: 'Global Change, Climate and People' Mark.Rounsevell@ed.ac.uk
IMSC	Gabi Hegerl Date: 12-16th July 2010 International Meeting on Statistical Climatology

Weather versus Climate

Science, and in particular climate science, has been in the media glare rather more than it might wish for in recent months. Mark Reed considers this issue in his reflections piece on the last page.

Following our very cold winter in Europe, much has been made in the media of the distinction between weather and climate. And in particular, the year-to-year variation in weather that we observe against the backdrop of the longer term, and largely indiscernible, changes in climate.

SAGES members Sandy Tudhope, Gabi Hegerl and Simon Tett (all Edinburgh) have received over £0.5M to help us understand the largest source of year-to-year variations in global weather patterns, namely El Niño. The El Niño is a warm ocean current that appears off the coast of NW South America every 3-5 years. It results from a larger scale phenomenon, known as the El Niño Southern Oscillation, which is a natural cycle in circulation of atmosphere and ocean involving changes to the winds, rainfall, temperature and ocean currents across the whole of the tropical Pacific. Although this Southern Oscillation originates in the tropical Pacific, it has near world-wide impacts because of the way it affects the circulation of the atmosphere, and hence the winds and transport of moisture away from the tropics. Floods and droughts and changed incidence of storminess from El Niño directly affect the lives and livelihoods of well over a billion people, and major El Niño events are associated with tens of thousands of human deaths, billions of

pounds of damage, and devastation to some natural ecosystems such as coral reefs. Although we now understand quite well the basic mechanisms, we do not understand why some El Niño events are much stronger than others, why some decades show much stronger El Niño activity, or how El Niño will respond to climate change.

To help answer some of these questions, the team will reconstruct changes in El Niño over the past 5,000 years by analysing growth rings in the skeletons of old dead ("fossil") corals that lived in the Galápagos. The Galápagos Islands experience extreme changes in weather associated with El Niño. These changes are recorded in the chemistry of the skeletons of corals living in the surrounding ocean. These coral records can let us reconstruct the history of past changes of El Niño. To understand its causes, we need to use climate models. The team will use climate models to see if they can correctly replicate the coral records of El Niño. The models can explore the effect of changing volcanic eruptions, solar radiation and greenhouse gases. The model results will provide us with a better understanding of the climate system interactions that cause El Niño and the skill of climate models at predicting their strength. In this way the team hope to contribute to better predictions of the likely range and severity of El Niño events in coming decades.

More info from Sandy Tudhope:

Sandy.Tudhope@ed.ac.uk

Forthcoming Events

Earth System Science 2010: Global Change, Climate and People: May 10-13th

Edinburgh will host a major international conference about “Earth System Science: Planet and People” on 10-13th May 2010. Organised under the auspices of the IGBP-AIMES Programme by NCAR (US National Centre for Atmospheric Research) and UK’s QUEST Programme, this Conference is structured around:

- Earth system modelling
- Dynamics of biogeochemical cycles
- People and resources

Key issues for the conference are: (a) exploring across scales and disciplines; (b) the nature of the relationship between people and environment; and (c) the need to inform policy.

SAGES members **Mark Rounsevell** and **Mat Williams** are members of the organising committee. Up to 800 delegates are anticipated.

Opportunities still exist to lead sessions or to contribute a paper.

More details from:

Dr Mat Williams:
Mat.Williams@ed.ac.uk

Prof Mark Rounsevell:
Mark.Rounsevell@ed.ac.uk

ABSTRACT SUBMISSION DATE

for the conference is

19th March 2010

Society Theme Workshop—Methodologies in Society-Environment Research: March 18-19th

Contemporary environmental debates are characterised by complex society-nature interactions. Our understandings of global climate change, governance of fisheries, forests and fresh water, environmental risk and vulnerability (among a multitude of other concerns) are shaped by social, political, cultural, economic, ecological and physical systems, and the interconnections between these realms.

The complexity of socio-ecological systems and discourses requires rigorous and just research strategies. Importantly, research at the society-nature interface demands methodologies that extend beyond single-discipline or single-method approaches.

This workshop seeks to explore method-

ologies and methods for integrative environment-society research:

- explore research methods available to scholars working at this interface;
- consider the challenges presented by combining methods stemming from diverse epistemic traditions; and identify opportunities for developing new methodological approaches and analytical techniques.

The workshop will be held in Oban at SAMS on 18-19th March 2010. Any enquiries to **Leah Gibbs, Ruth Brennan** or **Andrea Nightingale**

Leah.Gibbs@ges.gla.ac.uk

Andrea.Nightingale@ed.ac.uk



Global Human Eco-Dynamics: March 26th

SAGES is hosting a meeting on the dynamics of the human-environment-climate interface in Edinburgh University’s Old College on 26 March.

Building on recent US workshops, it will explore the interaction of climate change, human environmental impacts, human-human interaction (politics, proto-globalization etc.) and integrative themes of rigidity traps, connectedness and path dependence. Profs. Peggy Nelson (Arizona State) and Tom McGovern (New York) will give keynotes.

More details from **Andy Dugmore**:

Andy.Dugmore@ed.ac.uk



International Meeting on Statistical Climatology: July

Gabi Hegerl is the Chair of the Scientific Committee hosting the 11th International Meeting of Statistical Climatology in Edinburgh 12-16th July. Topics include:

- Techniques for multi-model ensembles
- Understanding recent climate change
- Extreme events
- Predictions of climate change impacts
- Holocene reconstructions
- Statistical methods for climate data.

For more details, see: <http://ccma.seos.uvic.ca/msc/11imsc.shtml> or contact Gabi.Hegerl@ed.ac.uk

Coastal and sea level workshop: April 27th

The SAGES community has a wealth of experience in coastal and sea-level change research. Our aim is to create within SAGES a coastal research group that would develop links across different groups of earth system scientists. The workshop will focus on new research ideas in coastal and marine geosciences and will complement the newly-formed Marine Alliance for Science and Technology Scotland (MASTS) and its joint research theme on the ‘Coastal Zone’. The workshop will be held in Dundee and aims:

- to develop and enhance interdisciplinary

coastal and sea-level change research across the SAGES community, involving glaciologists, modellers and marine groups

- to prepare research funding proposals
- to create an active coastal and sea-level change research group
- to publish high-quality coastal research
- to promote coastal and sea-level change research findings at appropriate government levels.

For information, contact:

S.Dawson@dundee.ac.uk or

Stephanie.West@ed.ac.uk



Awards & News Snippets

Roderick Brown, Cristina Persano and Fin Stuart (SUERC) have been awarded a £513K NERC grant to use thermochronology for 'Resolving the age of the first order topography of Africa'

Colin Ballantyne (St Andrews) and Derek Fabel (Glasgow) have received a NERC award to work on 'Altitude and configuration of the last British-Irish ice-sheet'

Esperanza Munoz-Salinas and Paul Bishop (Glasgow) have also been awarded a NERC grant for their work on the 'role of resistant lithologies in the evolution of post-orogenic landscapes'

Zoe Shipton (Glasgow) was awarded the William Smith Fund by the Geological Society of London for 'excellence in applied and economic geoscience'.

Andrew Henderson and Zhenhong Li (Glasgow) and Simon Mudd (Edinburgh) all won NERC New Investigator Awards.

Susan Waldon (Glasgow) recently received a £282.5K NERC award to consider the impact of hosting a windfarm on peatland carbon balance

SAGES PhD student Reka-Hajnalka Fülöp (Glasgow) won a prize at the BGS Science Festival for the best poster.

Jeremy Wilkinson (SAMS) and Andrew Dale (SAMS) have both received a NERC standard grant for their work into Sea ice and Technology

Yit Arn Teh (St Andrews); Pete Smith (Aberdeen); Patrick Meir (Edinburgh) together with researchers from York and Stockholm received a NERC standard grant of £962K entitled 'Are tropical uplands regional hotspots for methane and nitrous oxide'

Richard Essery (Edinburgh) and colleagues won a NERC research grant to

examine the radiative properties of forested land and snow.

Doerthe Tetzlaff (Aberdeen) has won a prestigious German Fellowship in Freshwater Science, which will enable her to spend part of 2010 at the Leibniz Institute for Freshwater Ecology and Inland Fisheries in Berlin (www.igb-berlin.de). Doerthe Tetzlaff (Aberdeen) has also been invited to become an Associate Editor by the international journal "Hydrological Processes"

Kate Darlings's (Edinburgh) discovery in the year 2000 of foraminifera with near identical DNA off Iceland and off the Falkland Islands, which suggested recent mixing of species from opposite poles, was the subject of an article in Scientific American: <http://www.scientificamerican.com/article.cfm?id=same-species-polar-opposites>

Congratulations to Marian Scott, who has been appointed to the Scottish Science Advisory Committee.

Major International Projects

The CLIMSAVE Project

The project will develop and apply an integrated methodology for stakeholder-led climate impact and vulnerability assessments. It will focus on regional impacts - with Scotland as an exemplar region - with key sectors: agriculture; forests; biodiversity; coasts/floodplains; water resources; urban development and transport.

It is a €3 million collaborative research project, funded by the EU and begun on 1st January 2010, involving SAGES' Mark Rounsevell (Edinburgh). This project provides an ideal opportunity for working with and building effective assessment models for stakeholders in Scotland. Mark will be developing links with a range of stakeholders interested in developing adaptation plans.



Further details from Mark at: mark@rounsevell@ed.ac.uk

The SAFRASS Project

The Northern Rivers Institute, University of Aberdeen is a key partner in a new £900K project funded as part of the European Union's ACP (African, Caribbean and Pacific Group of States) programme. The SAFRASS (Southern African River Assessment Scheme) Programme led by the University of Glasgow, and also includes Universities and stakeholder groups in Zambia and South Africa. The project, involving **Chris Soulsby** and **Mike Kennedy**, will seek to develop an agreed, evidence-based methodology to aid the conservation of internationally important rivers and wetlands.



Doerthe Tetzlaff and **Chris Soulsby**, the Northern Rivers Institute, University of Aberdeen are Co-Investigators on a new research grant funded by the Swedish Research Council. The project is entitled "Hydrological transit times in boreal catchments: A foundation for understanding biogeochemical response to climate change in northern region" and involves collaboration with universities in Sweden and Switzerland. The purpose of the project is to develop new residence time models that will function across a spectrum of northern landscape.

Further details from Chris or Doerthe.

d.tetzlaff@abdn.ac.uk

c.soulsby@abdn.ac.uk

Graduate School Activities

Graduate Retreat

This year's graduate school retreat was once again held at The Burn House, near Edzel and organized with the help of SAGES Theme 3 students. External speakers included Professor Pete Smith (Aberdeen), Dr Tom Bradwell (British Geological Survey, Edinburgh), Professor Chris Hawkesworth (St Andrews) and Dr Jon Turner (Edinburgh) – all of whom contributed to an excellent programme.

Personal highlights included an evening wine tasting on the *Geoscience of Wine* (Mark Rounsevell, Edinburgh) and an introduction to the *Geology of the Esk Valley* (Kate Dobson, Glasgow). Particular thanks to the SAGES post-doctoral researchers Kate Dobson (Glasgow), Joanna Cloy and



Walter Geibert (Edinburgh), who shared their research career experiences.

Training

Training activity within the graduate school continues, including recent events such as Managing large documents (Glasgow) and forthcoming events on

Statistics (Glasgow), Small boat handling and accreditation (SAMS), Environmental Law (UNESCO Centre, Dundee) and Matlab (venue to be confirmed). Suggestions for graduate school training are most welcome at any time: please contact Bill Austin or Stephanie West.

Dates for the next graduate school retreat are confirmed as 10-12 November, 2010 and we are delighted that Professor Anne Glover (Chief Scientific Adviser for Scotland) will be among our guest speakers.

Ongoing discussions with the Scottish Government suggest that some SAGES students will be able to take three month secondments into Government policy teams - to learn about the policy making process - along the same lines as recently announced by NERC. More details forthcoming shortly. For more information, contact SAGES Director, Andy Kerr.

SAGES Activities

Flow Country (peat-land) collaborations

SAGES - through Yit Arn Teh (St. Andrews) - hosted a successful meeting of academics and stakeholders interested in developing research collaborations about the Flow country. Deliverables from the workshop include the development of a web presence and active networks; the creation of physical infrastructure or platform for future monitoring/research; annual meetings; and exploration of funding sources.

For further information and the website, please contact:

Dr Yit Arn Teh
(St Andrews)



Telford Institute-SAGES: Applied Sediment Dynamics

SAGES co-hosted an advanced research workshop with the Telford Institute (the equivalent engineering pool) on advanced sediment dynamics in January. Along with further ideas for collaboration, joint bids

have been submitted to develop these links between geosciences and engineering in tackling water resource issues and water-related hazards.

For further details contact Trevor Hoey (Glasgow) or Chris Soulsby (Aberdeen).



Palaeo-reconstruction of Scottish Highlands

Rob Wilson organised a 2 day workshop in January to consider the "state of the art" research in the study of long term (~8000 years) ecological and climate aspects of environmental change in Scottish Highlands.

Outcomes include the development of a list of palaeoclimate researchers; better co-ordination with archaeologists; better co-ordination of data; and research areas around reconstructing hydrological history, temperature history and ecological diversity through time.

For further information, please contact Rob Wilson (St. Andrews) or Bob McCulloch (Stirling)

Coupling landscape and climate models

CESD organised a short workshop examining the coupling of landscape evolution models and climate models. Speakers included Simon Tett, Simon Mudd, Mikael Attal, Jonathan Gregory and Rod Brown. For further details, please contact Mike Mineter at CESD.

Valuing Ecosystem Services

Mark Reed (ACES, Aberdeen) organised a lunchtime seminar hosted by SAGES and RELU for senior policymakers in Edinburgh in February, exploring issues of valuing ecosystem services. This is of particular interest to the Pack Committee, on which SAGES Theme Leader John Grace sits, as it grapples with how to revise the current agricultural payment system to land managers in Scotland.

For more information, please contact Mark Reed or Ioan Fazey (St. Andrews).

Mark Reed
M.Reed@abdn.ac.uk



Centre for Earth System Dynamics: News

Regional Climate Modelling



Over the last 3 months **Ian Mackenzie** has successfully deployed the regional climate model, HadRM3 for use by CESD. The model has been run for a whole-European region at 25 km resolution. This high resolution gives a significantly more realistic distribution of rainfall over complex topography than the parent global model HadCM3.

Working with **Mikael Attal**, the rainfall data are being used to drive the CHILD landscape evolution model to examine the impacts on the simulated geomorphic evolution. This gives SAGES the unique capability to explore links between climate and landscape evolution. Building on this work CESD has hosted a workshop to examine coupling between landscape evolution and climate.

If you have interest in finding out more, results, please contact Mike Mineter, cesd-mo@sages.ac.uk

Data Publication

It is increasingly important that data from research be made available to colleagues in other institutions. Climate modellers usually use BADC's archive for this purpose, but for diverse smaller datasets there is no subject-domain repository. Two new possibilities for SAGES are:

1. Spatial data can be added to ShareGeo

<http://edina.ac.uk/projects/sharegeo/> for example, a geospatial dataset from a paper or used in teaching.

2. We are also setting up a collection for SAGES in the Datashare repository for files of any format. <http://datashare.edina.ac.uk/dspace/>

For further information see the websites and email Mike Mineter at cesd-mo@sages.ac.uk



year NERC "blue skies" grant and aims to use a combination of modelling, instrumental, documentary and proxy data to understand the causes of European climate variability over the last 500 years. He hopes to quantify the relative contributions from human and natural forcing such as greenhouse gases, changes in solar irradiance and in volcanism. Before coming to Edinburgh Andrew was studying the evolution of galaxies in Trieste, Italy. **Gabi Hegerl** is the PI.

Alessio Bozzo is funded by NERC's National Centre for Atmospheric Science, and is working on understanding the causes of winter circulation anomalies following tropical volcanic eruptions. In addition to this research work he will soon be setting up and carrying a simulation of the last 1000 years of the UK's state-of-the-art climate model, HadGEM2. This simulation will be carried out at the joint NERC/Met Office super-computer and will form part of the UK's contribution to the next IPCC assessment. He came to Edinburgh after his PhD studies in Bologna and joined us last February. **Simon Tett** is PI.

Anders Lindfors is funded by NERC's National Centre for Earth Observations on a project to compare satellite infra-red measurements with those simulated by climate models. The aim of the project is to see if satellite data from the last 20-30 years can constrain future predictions of climate change. He joined the group in June on a leave of absence from the Finnish Met. Institute. The project requires Anders to work closely with the Met Office. **Simon Tett** is PI.

People

CESD would like to welcome **Amrita Shrivat** and **Andrew Schurer** who joined the group in January. They are joining **Alessio Bozzo** and **Anders Lindfors**, bringing the number of researchers to four. Helen Hanlon will also be joining us in April to work on the "End-to-end quantification of uncertainty for impacts prediction" (EQUIP) project with Prof. **Gabi Hegerl**.

Amrita Shrivat is working on a NERC-funded project to detect and attribute changes in the Atlantic overturning circulation. It is this circulation that keeps the North Atlantic and the UK warm (!). Amrita is spending her first 9 months at SAMS working with **Toby Sherwin**, looking at observations to test reconstructions of past changes in the overturning circulation. Amrita joins us from Oxford. **Simon Tett** is the PI.

Andrew Schurer is funded by a three

Office View

The last few months has seen a step-change in SAGES activities, as members took advantage of our enabling funding to develop ideas / workshops and research bids. We think we can add value most effectively when bringing together individuals from different disciplinary backgrounds and from different institutional and stakeholder groups, to challenge prevailing views. In recent weeks, we have hosted US speakers talking about eco-media opportunities as well as sponsored more traditional cross-research pool work-

shops. We look forward to seeing more diverse proposals along those lines.

Our second Annual Meeting, at the time of the Cumbria floods, sought to get members thinking "outside the box" on a few big topics; some of these approaches worked, others didn't...but the feedback was positive. We are planning our third Annual meeting for November - details shortly.

Meanwhile, the Research and Executive Committees are actively thinking about the next steps for SAGES. Our formal funding is due to end in 2011-2012. As a result,

much of my time is spent engaging with or presenting to different stakeholders - SFC, SEPA, the CAMERAs agenda, Chief Scientist Anne Glover, other research pools (or groupings such as Earth Scientists) to ensure that we can maintain our current momentum, ensure the best bits of SAGES are sustainable, and meet the various demands of funding agencies.

Any questions or thoughts around this agenda are welcome.

Andy Kerr, Director.

Reflections: Mark Reed, ACES (Aberdeen)

Scientists have taken quite a bashing recently. The questions that Prof Phil Jones from University of East Anglia took at the Commons Science & Technology Committee earlier this week, go right to the heart of how we do science – and how we make policy.

Prof Jones wasn't just passing the buck when he said that he and colleagues weren't the only ones who kept data and model codes to themselves. This is widely accepted practice amongst the natural science community. Can we really blame people who have spent years of painstaking work collecting data in the field, braving the elements and competing for scant money to keep their work going, for not wanting to give their data away so others can steal their glory?

But Prof Jones' questioners condemned this sort of behaviour as "anti-scientific". How can science move forward, they asked, unless others can fully replicate and intelligently interrogate our work? If full and immediate disclosure of data became the norm rather than the exception, it would be possible to uncover frauds like the Korean stem-cell scientist, Hwang Woo-suk. We could debate the evidence upon which we base policy. Faced with public outcry over potential policy implications of misleading climate science, Prof Jones was not alone when he conceded

that current practices may need to change.

This recognition goes right to the heart of how science is used to inform policy. Science cannot go unquestioned, blindly accepted on the recommendations of other (often like-minded) scientists (through the peer-review system). This then challenges the whole concept of "evidence-based policy". What do policy-makers do when the evidence-base is questioned, or when there are multiple, contradictory lines of evidence? And why should scientific evidence be given precedence over other lines of argument in shaping policy? What do we do, for example, if rational, scientific argument leads to socially unjust policies?

If we look at the history of science, these are questions we have grappled with for over a hundred years. I know no researchers who claim that science has all the answers. Instead, there is a growing recognition that different lines of scientific evidence must be interpreted in the context in which they are to be used, and in light of alternative, often non-scientific lines of evidence. These alternative lines of argument may for example be based on the lived experience or the moral preferences of those affected by the issues we research. As a result, there has been a shift that has gone un-noticed by many, from a focus on "evidence-based policy" to "deliberative democracy", where policies are shaped by

in-depth deliberations with a wide cross-section of people who may be affected by policies – including scientists as just one of many voices that need to be heard.

At the same time, there has been a growing recognition amongst the academic community that the complexity of the natural world, and our relationship with it, means we can never accurately predict what the future will hold. Despite the increasing precision of our computer models, events we have never dreamt of, may mean we are very precisely wrong. Instead, we need to focus on preparing policy-makers and the public for a range of plausible possibilities, and working out how we can best prepare for these different futures. Only in this way do we stand any chance of future-proofing our science, and the policy that it informs.

Rather than using our science to predict the future, we are using the science to tell stories. I recognise that these may or may not turn out to be true stories. The real world is too complex to be certain about anything. But I hope that by using science in this way, alongside other lines of evidence, policy-makers can draw upon and interrogate a far richer evidence-base. To quote Malcolm X, "the future belongs to those who prepare for it today".

Mark Reed: M.Reed@abdn.ac.uk

Director

Science Director

Theme 1 Research Leaders Landscape Dynamics

Theme 2 Research Leaders Terrestrial Carbon Dynamics

Theme 3 Research Leaders Atmosphere, Oceans and Climate

Theme 4 Research Leaders Society

Centre for Earth System Dynamics

Graduate School Director

Dr Andy Kerr

Prof. Trevor Hoey (Glasgow)

Prof. Paul Bishop (Glasgow)
Dr. Ruth Robinson (St. Andrews)

Prof. John Grace (Edinburgh)
Prof. Philippe Baveye (Abertay)

Prof. Sandy Tudhope (Edinburgh)
Dr. Mark Inall (SAMS)

Prof. Mark Rounsevell (Edinburgh)
Prof. Alan Werrity (Dundee)

Prof. Simon Tett (Edinburgh)

Dr. Bill Austin (St. Andrews)

SAGES builds on the earth and environmental research strengths of over 150 individuals in Scotland to address some of the grand challenges facing society today. SAGES is a £15 million partnership between the Scottish Funding Council and the Universities of Aberdeen, Abertay, Dundee, Edinburgh, Glasgow, St Andrews, Stirling, SAMS UHI, SUERC and the West of Scotland. Working together and with others we aim to improve understanding of interactions between society and our environment and improve predictions of the environmental response to human-induced change.

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SAGES

Scottish Alliance for Geoscience, Environment and Society