

Additional Papers for Information

INFORMATION PAPER 1: CHALLENGE STEERING GROUP UPDATES

Summary of progress of the Climate Challenge Steering Group for the May 2011 LWEC Partners' Board meeting

Terms of Reference: Basic document has been agreed, with a final section regarding the international nature of the Challenge currently being finalised.

Strap line: Finalised by the Group as “*Understanding the risks of climate change and assessing options for avoiding or managing such risks*”

Scope: Document currently being revisited, yet to be finalised.

Membership:

David Warrilow (Chair)	DECC
Mary Barkham (Directorate point of contact)	LWEC
Lisa Hole (Secretary)	NERC
Dan Osborn	NERC
Derrick Ryall	Met Office
Rupert Lewis	Defra
Peter Newman	Defra
Humphrey Crick	NE
Lisa MacDonald	WAG
Carolyn Roberts	ESKTN
Dave Gorman / Peter Singleton	SEPA

Current status: Strategic Framework workshop on the 18th May
Geoengineering meeting on the 20th May

Immediate tasks:

- Finalise Terms of Reference
- Assist with production of workshop report
- Finalise scope of Challenge
- Clarify boundaries with RCUK Cross-councils Energy Programme

Summary of progress of the Ecosystems Challenge Steering Group for the May 2011 LWEC Partners' Board meeting

Terms of Reference: Document currently being finalised by Group.

Strap line: Finalised by the Group as *“To manage ecosystem services for human well-being and to protect the natural environment in a changing world”*

Scope: Document currently being revisited, yet to be finalised.

Membership:

Pamela Kempton (Chair)	NERC
Andrew Watkinson (Directorate point of contact)	LWEC
Lizzie Jones (Secretary)	NERC
Peter Costigan	Defra
John Hopkins	NE
Owen Dowsett	ESRC
Dai Harris	WAG
Roger Owen	SEPA
Brian Harris	BBSRC
Carolyn Roberts	ESKTN

Current status: Strategic Framework workshop took place on 11th March 2011.

Immediate tasks:

- Assist with production of workshop report
- Finalise Terms of Reference for the Group
- Finalise scope of Challenge

Summary of progress of the Resources Challenge Steering Group for the May 2011 LWEC Partners' Board meeting

Terms of Reference: Document currently being finalised by Group.

Strap line: Finalised by the Group as “*to promote human well-being, alleviate poverty and minimise waste by ensuring a sustainable supply of water, food and other biological resources*”

Scope: Document currently being revisited, yet to be finalised.

Membership:

Brian Harris (Chair)	BBSRC
Nichola Badcock (Directorate point of contact)	LWEC
Jef Grainger (Secretary)	BBSRC
Catherine Wright	EA
Tim Wheeler	DFID
Pamela Kempton	NERC
Konrad Bishop	Defra
Paul Rouse	ESRC
Vicky Davies	WAG
Dave Harley	SEPA
Kerry Thomas	ESKTN
Sarah Gledhill	SG

Current status: Strategic Framework workshop on 21st June 2011.

Immediate tasks:

- Assist with production of workshop report
- Finalise Terms of Reference for the Group
- Finalise scope of Challenge
- Clarify potential overlaps with other multi-agency and cross-research council programmes (Global Food Security, Energy, Global Uncertainties etc)

Summary of progress of the Health Challenge Steering Group for the May 2011 LWEC Partners' Board meeting

Terms of Reference: Yet to be finalised – see ‘Status’ section

Strap line: Yet to be finalised; most likely change to “*To understand and protect human health in a changing environment*”

Scope: Yet to be finalised – see ‘Status’ section

Membership:

Ken O'Callaghan (Directorate point of contact)	LWEC
Steph Bentham-Green (temporary Secretary)	LWEC
Carolina Mailhos	MRC
Ursula Wells	DH
Sarah Gledhill	SG
Dan Osborn	NERC
Tim Williamson	Defra
Brian Harris	BBSRC
Dawn Woodgate	ESRC
Anne Miller	ESKTN
Dave Stone	NE

Current status: Awaiting result of MRC internal review before clarifying the most useful role for the Group. Most likely this will be a light-touch function – collecting and sharing information on intended research topics to allow for collaboration where possible and avoid duplication.

The Group decided that the remit of this Challenge should focus more on human health; the plant and animal health aspects which have previously been grouped within this Challenge will instead now be covered by the Resources Challenge Steering Group.

Immediate tasks:

- Finalise Terms of Reference for the Group
- Finalise scope of Challenge
- Nominate Chair

Summary of progress of the Infrastructure Challenge Steering Group for the May 2011 LWEC Partners' Board meeting

Terms of Reference: Document complete – see LWEC website.

Strap line: Finalised by the Group as “*To make infrastructure, the built environment and transport systems resilient to environmental change, less carbon intensive and more socially acceptable.*”

Scope: Document currently being revisited, yet to be finalised.

Membership:

Richard Miller (Chair)	TSB
Susan Ballard (Directorate point of contact)	LWEC
Sam Jones (Secretary)	DfT
Caroline Batchelor	EPSRC
Matthew White	DfT
Kate Hough	TSB
Dan Osborn	NERC
Simon Jackman	NERC
Peter Newman	Defra
Owen Dowsett	ESRC
Jonathan Abra	ESKTN
Mike Grace	NE

Current status: The Group were concerned that remit of this Steering Group should not duplicate that of the Infrastructure UK initiative. Several representatives of the Group are meeting are meeting strategy leads for Infrastructure UK on Friday 13th May to solve this issue.

The Group plan to hold the Strategic Framework workshop for the Infrastructure Challenge in September as this timing is most likely to suit stakeholder needs and allows key people to attend.

Immediate tasks:

- Finalise remit in accordance with Infra UK initiative
- Assist with planning of Strategic Framework workshop
- Finalise scope of Challenge

Summary of progress of the Societal Challenge Steering Group for the May 2011 LWEC Partners' Board meeting

Terms of Reference: Document currently being finalised by Group.

Strap line: Finalised by the Group as “*To understand the role of government, business and society in enabling all to live with environmental change.*”

Scope: Core themes have been agreed by the Group. Expanded text will be written after the Strategic Framework workshop.

Membership:

Rachel Muckle (Chair)	Defra
Ruth Welters (Directorate point of contact)	LWEC
Steph Bentham-Green (temporary Secretary)	LWEC
Jeremy Vincent	DCLG
Karl Cunion	DCLG
Paul Rouse	ESRC
Kate Hills	LGA
Pamela Kempton	NERC
Judith Hanna	NE
Barbara McLean	WAG
John Henderson	ESKTN
Ben Savage	DfT
Siobhan Campbell	DECC

Current status: Strategic Framework workshop on 12th May 2011.

Immediate tasks:

- Finalise Terms of Reference for the Group
- Assist with production of workshop report
- Find secretarial support for the Group

INFORMATION PAPER 2: UPDATE ON HORIZON SCANNING PROPOSAL

Update on Horizon Scanning Centre at Cranfield

In November the Partners' Board considered a proposal from Defra to support a joint horizon scanning centre based at Cranfield as part of the Risk Centre.

Subsequently, as the proposal was developed, all LWEC partners and some other stakeholders were invited to participate and contribute to funding the centre.

Partners involved to date are: Defra, EA, MMO, SG/SEPA, FSA, DECC, NERC, DfT, WAG and NE. Defra remain open to other Partners expressing an interest. Partners should contact Sarah Steiner (Sarah.Steiner@defra.gsi.gov.uk) if they wish to be involved.

There will be a meeting in June to agree terms of reference/ways of working, project (prioritisation to ensure that all funders have appropriate use of the centre's time), monitoring and evaluation of Cranfield as a supplier of the horizon scanning function.

Further progress with the development of the Centre and outputs from it will continue to be communicated to all LWEC partners.

In addition to developing an Horizon Scanning Centre at Cranfield, the original contract for the Risk Centre is also up for renewal. Professor Simon Pollard submitted a trans-disciplinary bid for new research funding to EPSRC at Easter. This builds on the research of the first three years of the Risk Centre at Cranfield University, and is focussed on advancing the analysis and management of systemic risk in technological and environmental systems, and examining how accountabilities and responsibilities for shared risk governance can be enhanced at the organisational, government, community and citizen levels.

The bid will go out for peer review and then probably go before EPSRC's Process, Environment and Sustainability subject panel. If it clears these hurdles, EPSRC will look to agree funding contributions from ESRC and NERC.

We anticipate the review process taking 4-5 months, so will not hear anything until after the Summer.

Defra, May 2011

INFORMATION PAPER 3: UPDATE ON STRATEGIC FRAMEWORKS

Vision

To develop multi-institutional strategic frameworks (for each of the LWEC strategic challenges) that will be informed by and placed within the context of both UK and international perspectives.

Purpose

With such a diverse range of Partners, and with environmental change touching all aspects of life, the LWEC Partners' Board identified the need for a strategic framework in each of the challenge areas within which to identify and prioritise the issues, needs and challenges for environmental evidence. The development of strategic frameworks will include engagement of all relevant beneficiaries, and will not be restricted to LWEC Partners, to achieve buy-in and deliver insights to maximise the impact and effectiveness of environmental research in UK. These frameworks will build on the work of the LWEC Programme Design Groups (PDG's, 2008), the full body of evidence that addresses these challenge areas (from the Environmental Research Database, ERD), and the activities that have been accredited to each challenge areas (2008 – ongoing).

Goals

Work on developing strategic frameworks will begin in January 2011 and aims to be complete by the end 2011. Two main areas of work will be developed.

- (1) Strategic frameworks that will identify and prioritise issues and needs for each of the challenge areas. These will be accompanied by:
- (2) Implementation plans that will recommend mechanisms for delivering against the identified needs. These implementation plans will drive the activity for LWECs enhanced delivery and provide clear pathways for impact.

Responsibilities

Coordination of the development of the strategic frameworks is being lead by the LWEC Directorate and Dominic Oughton from the Institute for Manufacturing with significant input from each of the challenge steering groups, who will ultimately own the resulting frameworks and implementation plans.

Current status

Initial workshops to develop frameworks have been held for the Ecosystems, Societal and Climate challenges. Workshops for the Resources and Infrastructure challenges are scheduled for later this year. Work on developing a framework for the Health Challenge is underway, although at this time it is unlikely that there will be a workshop in this area. In the autumn there will be two cross-cutting workshops that will aim to bring together the outputs from the challenge workshops and gap-analysis to decide the priority areas for LWEC going forward.

Contacts

For further information please contact: Jo Tudor, NERC, Polaris House, North Star Avenue, Swindon, SN2 1EU. Email: jot@nerc.ac.uk.

UK Water Research and Innovation Framework (UKWRIF)

Vision

The vision of the UKWRIF is that by 2030 the UK will have acted to ensure sustainable, secure and healthy global water resources for society and individuals, businesses and the natural environment.

Purpose

The framework aims to find out what research and knowledge already exists across water, align work that is going on and discover gaps in knowledge and expertise. This will lead to understand of requirements for research and innovation.

The remit of the framework is across *all* aspects of water from domestic and industrial uses, agriculture and across to extreme events, such as floods. A number of priority areas have already been discussed to target the framework and this is set in the context of (i) changing climate, population growth, (ii) competing land uses, (iii) aims to reduce energy consumption, protection of water resources and (iv) conservation of ecosystems. Although the framework is UK centric, it is impossible to entirely separate from global water issues (for example, imported food relies on water resources from elsewhere) and this overlap will also be part of the framework.

Goals

To produce a framework document by autumn 2011. This will set out priority actions for research and innovation over the next 20 years. The aim is that these findings and recommendations of the framework will be taken forward by a Water Research Partnership. As a *framework*, it will bring people together but allow flexible working without being prescriptive. The ongoing research and innovation can then contribute to policy making and understanding which can be disseminated throughout society. Overall, the overarching outputs by 2030 will be a number of economic and social aims related to increased sustainability, health and resilience, and improved international relations.

Responsibilities

This work is to be carried forward under LWEC, with secretariat support from NERC, BBSRC and UKCDS, together with Professor Sir John Beddington's office (Government Office for Science (GO-Science)). There is, however, expected to be further significant input from the research organisations, academia, government, NGOs and industry including the LWEC BAB and other partners.

Current status

Early drafts of the framework have begun and are under discussion with Partners. A synthesis of existing water report recommendations has been commissioned between UKWIR, UKCDS and LWEC. John Beddington will chair a further two meetings in July and October.

Contact

For further information please contact: Dr Lizzie Jones, NERC, Polaris House, North Star Avenue, Swindon, SN2 1EU. Email: elne@nerc.ac.uk. Telephone: 01793 418006.

Progress in developing an Environmental Information Framework

Introduction

1. This paper updates the Partners' Board on progress in developing the proposal for an Environmental Information Framework (EIF). The last meeting in November 2010 discussed a paper which set out how an LWEC led programme of work could enhance access to and use of environmental data and information.
2. Defra agreed to provide resource to scope a project to this effect and a delivery group (DG), including leading key partners – the Met Office, Environment Agency (EA), Natural Environment Research Council (NERC), LWEC and the British Library (BL) was formed. A Scottish Government representative has recently joined the group.

Activity to date

3. The DG has met fortnightly since late January and held a workshop in February. The EOF Data Advisory Group (DAG) has also provided input to the work. The Group has agreed a descriptive picture¹ of the landscape in which an EIF could operate and has started to focus on what such a framework would entail and the activities that would be required to put it in place.
4. The continuing involvement of all the partners and the progress the DG has made to date indicates that there is strong interest among the partners on the benefits of greater collaboration. However, there is still work to conclude on the nature of such collaboration, the priority action areas, and the benefits and costs, before a draft strategic business case could be put before a senior level Steering Group. The working assumption is that no major new costs could be incurred and that improved co-ordination would need to be sufficient to ensure that proposed investments on particular initiatives would be undertaken more efficiently than at present.
5. The DG's Vision for an EIF is:

"The EIF will provide ready access to a comprehensive body of environmental information, by implementing a collaborative network that draws on resources and activities across the UK environment sector, applies common standards and best practices, and demonstrates UK leadership in the field."
6. This would be achieved by creating a coherent, collaborative environmental information community that would:
 - make the information that exists more accessible to a wider audience;
 - encourage re-use of existing information to avoid duplication, identify and broker linkages and reduce costs;
 - promote the use of common standards, vocabularies and architectures applied to environmental information;
 - foster innovation;
 - deliver wider societal benefits; and

¹ See Annex 1

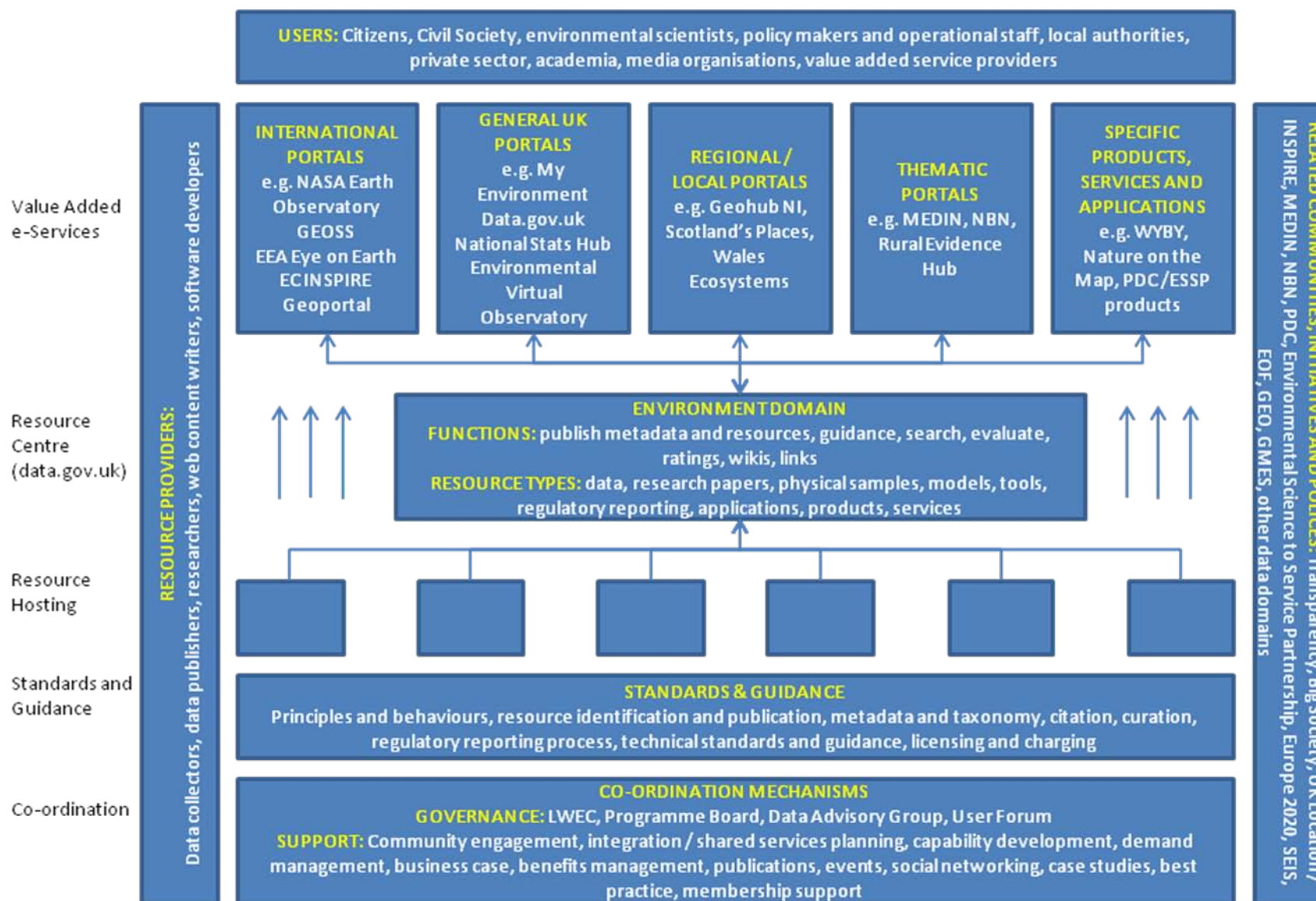
- take decisions on environmental information initiatives that take account of the needs of the sector as a whole.
7. The landscape is complex and changing rapidly. There are many initiatives but each one occupies only part of the landscape. Some are thematic in nature and some focus purely on data sharing. This is why an EIF would be useful in providing a more co-ordinated approach and facilitating the sharing of data, research and tools amongst government, specialist, commercial and public users.
 8. An EIF would enable the publication of details of different environmental information initiatives as well as case studies and exemplars, identify priority environmental science areas where resources could be shared and co-ordinate public engagement in environmental science activities and the development of citizen science.
 9. The DG envisages that establishing a Framework would involve co-ordinating a number of activities. The initial phase would involve intelligence gathering, communications and planning of priority areas for collaboration. Work will be needed to establish the standards, referencing schemes, and publication and access mechanisms for cross-sectoral information sharing. Shared activity in priority areas would start the build-up towards critical mass although, the DG agree that an EIF should be flexible; enabling a range of different partnerships to be linked in a core programme, so they could converge, increase value and develop best practice.
 10. The form of governance suitable for an EIF has not yet been determined but, in principle, the DG has agreed that it should involve a consortium of many interested bodies, wider than LWEC. This would imply the need for an active partnership to drive forward an agreed agenda, rather than just providing a forum for sharing intelligence and ideas (although that would be part of the process). Furthermore, it is anticipated that an EIF would be an inclusive and open network, bringing in a widening range of partners; and fostering compliance through accreditation rather than control and regulation. The Group agreed that if an EIF is to be delivered, it would need owned and led by all the consortium bodies, with different aspects being led by different bodies.

Next steps

11. Further work is required to convert these ideas into a Strategic Business Case. This would need to include specification of the quantitative benefits of a set of priority exemplars or action areas which demonstrate the value of an EIF to the partners and the wider environmental information community. The DG anticipates that this could be produced by the summer.
12. If an initial draft of the Strategic Business Case can be produced, a Steering Group would need to be set up to oversee its completion and agree a recommendation to the LWEC Partners Board. If the case were to be subsequently proven, and resources to support the co-ordination work made available, then such a Steering Group could direct the initial phase of establishing the Framework, which would include agreeing the nature of the consortium agreement and other governance matters.

Authors: Nicola Lloyd, Ray Boguslawski
Date: 6 May 2011

Annex 1: Environmental Information Landscape



INFORMATION PAPER 6: UPDATE ON LWEC DELIVERY GROUP

Delivery Group Report to LWEC Partners' Board 26 May 2011

The Delivery Group has met twice since it was agreed at the November Partners' Board (PB) meeting that it should be established. Dates of meetings and all papers relating to meetings will be available to PB and Partner Support Unit (PSU) members on the Central Desktop site and minutes are made available on the LWEC web site. Members are encouraged to raise issues for discussion with the secretary (Steph Bentham-Green) and are welcome to provide written input to meetings.

Attendance at both meetings to date was limited to the core group; Challenge Steering Group Chairs have been invited to attend the next meeting in June and probably to alternate meetings thereafter.

The main items of business have been:

Terms of reference and modus operandi

To agree how the Group could be most effective and its role vs that of the PB. The revised TOR and membership for the DG are at **ANNEX A**. These have been agreed with the PSU and will be made available on the web site following the PB meeting. The PB TOR have been revised and will be considered by the PB on 26 May.

Accreditation

Issues around accreditation, its benefits and how this can best be used to drive the delivery of LWEC's strategic objective have been discussed and revised guidance notes and form completed. These have been agreed by the PSU and will now be implemented. The Challenge Steering Groups will be encouraged to take an over view of accredited activities in their areas, mapping these against emerging priorities and ensuring connectivity between them. A workshop bringing together KE leads from accredited activities is taking place on 11 July. This will be an opportunity to highlight best practice in knowledge exchange to deliver co-design, co-production and co-delivery and the added value that Partners are seeking to achieve through LWEC.

Evaluation and business performance management

Following the previous agreement of an evaluation plan by the PB, an outline implementation plan for this has been developed and sent to BIS. The main evaluation currently planned is an international mid term review in 2013 and this will be led by RCUK. Partners will be invited to discuss and agree other evaluations once score card objectives and major deliverables have been agreed.

Further work has taken place on the LWEC strategy document, which is vital in conjunction with the LWEC web site to communicate LWEC's priorities. A high level score card to describe LWEC's strategy in one page and to define its major objectives has also been developed to improve ownership by the PB members and to drive both PB meetings and successful delivery of LWEC. Both documents have been discussed by PSU members and the score card will be discussed by the PB on 26 May. A copy of the final draft of the strategy document has been provided to Partners. Once agreed they will be published on the web site.

Future meetings

The next meeting of the Delivery Group will be held in June to consider:

- Progress with Challenge Steering Groups
- Prioritisation and where maximum impact could be achieved in LWEC and to recommend to the PB how this could be achieved.

Terms of reference and modus operandi for the LWEC Delivery Group

TOR

The Partners' Board is LWEC's top decision-making body. The role of the Delivery Group is to enable the Partners' Board and other LWEC governance structures to be better prepared to make their decisions and to provide a level of coordination between them to ensure added value. It will do so by supporting and challenging the Director and lead Partner organisations on delivery of LWEC objectives and, in particular, by:

Monitoring the key delivery processes in LWEC:

1. Taking an overview of the accreditation process and accredited activities, including monitoring of activities, to see if they are meeting the requirements and delivering the co-design, co-production, co-delivery principles of the LWEC partnership and achieving the outcomes and impacts they have identified.
2. Evaluating business performance by agreeing and implementing appropriate tools and processes to monitor the delivery of LWEC's objectives and strategic goal. This will include:
 - monitoring progress against delivery plan targets and against LWEC's strategic goal, including reporting on progress and updating the scorecard for Partners' Board meetings and providing information for interim reporting (e.g. to BIS, working with the RCUK lead)
 - commenting on the Director's annual report to the Partners' Board on the impact of LWEC including examples of good practice etc.
 - identifying activities/issues for review of strategic direction/decision by Partners' Board.
 - agreeing with Director how deviations from planned delivery can be resolved and how this affects forward planning.
 - reviewing progress against strategic frameworks and approving updates to these as needed

Providing a coordination function between the 6 Challenge Steering Groups and other Activities

3. Bringing together and challenging Chairs of Challenge Steering Groups/other projects in order to promote good communication and coordination between activities and maximise opportunities for added value between them.

Providing a 'focus' function to advise on where the LWEC partnership should invest its efforts to ensure that it is not spread too thin

4. Considering where maximum impact could be achieved and advising the Partners' Board on how this could be implemented.
5. Considering new opportunities for, and approaches made to, LWEC and whether these should be presented to the Partners' Board.

Modus Operandi

The Delivery Group will meet quarterly in London. Minutes of the meetings will be made available on the LWEC web site. In advance of meetings, all Partners will be invited to identify any issues that should be discussed via the Partner Support Unit mailing-list.

Membership

Representatives of Partners' Board (with their lead roles in brackets):

- Miles Parker (Chair)
- Dan Osborn (RCUK lead for LWEC)
- Simon Jackman (Knowledge exchange lead) NERC
- Gev Eduljee (Business lead) BAB
- John Rea (Policy lead) Defra
- Miranda Kavanagh (Delivery lead) Environment Agency

Chairs from the 6 Challenge Steering Groups, and other activities e.g. UK Environmental Observation Framework, strategy project boards or other groups, will attend as required based on timing of completion of deliverables, decision points or gateways.

In attendance:

- Director and Deputy Director of LWEC Andrew Watkinson and Mary Barkham
- Secretary Steph Bentham-Green

INFORMATION PAPER 7: PARTNER UPDATES

LWEC Partner Updates for the LWEC Partners' Board, May 2011

Arts and Humanities Research Council (AHRC)

In partnership with the British Library, Met Office and Higher Education Cell in India, AHRC organised a workshop on South Asian Historical Records and Climate at Divecha Centre for Climate Change, Indian Institute of Science, Bangalore, on 4th and 5th March 2011. 10 UK arts and humanities researcher attended along with counter-parts to discuss the opportunities for future UK-India collaborative research on climate change histories. Follow-up applications will be encouraged through a highlight in AHRC's networking scheme. AHRC is also considering a broader highlight notice in our grants scheme for larger collaborative projects on the theme of histories of environmental change and their contribution to understanding contemporary and future environmental issues, including the potential to learn from past adaptations and to enhance public engagement. We would be keen to engage with any interested LWEC partners in taking forward this area.

A number of initial development activities have been supported under the new cross-Council Connected Communities Programme which has identified sustainable community environments, places and spaces as one of its key themes. This includes a review of research on community participation initiatives on the environment, with a particular focus on understanding the processes that can undermine their success particularly in terms of connections to political and democratic processes (Dr Claire Waterton, Lancaster University), a networking meeting of researchers working on communities and sustainability in September 2011 (Dr Rebecca Wade, University of Abertay Dundee) and scoping projects on issues as diverse as community gardening and agriculture and urban parks. Provisionally, Culture, Communities and Sustainability has been identified as a possible topic for a research development workshop in 2012 which would seek to create new research partnerships to form consortia for a small number of large follow-up research grants. We would be keen to engage with any interested LWEC partners in developing plans for this event.

Negotiations with the European Commission are at an advanced stage about funding for taking forward the next stages in developing the major EU Joint Programming Initiative on Cultural Heritage and Global Change, which currently involves 15 countries as partners (plus 8 observers). Given UK research leadership in this area through the (LWEC-accredited) AHRC/EPSRC Science and Heritage Programme, the plan is for the AHRC to lead the work-package on the development of the strategic European research agenda for the JPI. This will of course include the inter-relationships between climate and environmental change and cultural heritage. We would welcome input from partners on the development of the strategic research agenda which will shape future joint research calls between partner countries.

Natural Environment Research Council (NERC)

NERC will invest a total of £305m in LWEC over the CSR period 2011-15. This includes £15m of LWEC research to be closely integrated with the Global Food Security (GFS) Programme and £20m with the Research Councils' Energy Programme (RCEP) – in both cases this is additional to NERC's direct investment in those RCUK programmes. This will ensure environmental change can be fully taken into account across the full range of RCUK Themes. NERC, through actions such as Land

Based Renewables, is also helping to deliver an early promise of LWEC – to align closely with the RCEP and help researchers attract business funding.

NERC, working with TSB, is heavily invested in the LWEC Business Advisory Board that is identifying business priorities and innovation opportunities for environmental research.

NERC's leadership role in LWEC and in the 'Belmont Forum' of international funders presents a very strong opportunity for international leverage of NERC funding, notably with nations benefiting from increased spending on science. NERC seeks to accelerate and strengthen UK opportunities for international collaboration. Several Belmont initiatives are likely to be relevant to LWEC.

Selected LWEC deliverables 2011-15 that NERC is contributing to

- 1. Climate change foresight and tools for policy-makers and businesses** to provide information at the local, regional and national scales to inform mitigation, adaptation and resilience through probability estimates.
- 2. Valuation of ecosystems and their beneficial services for people** to enable local and national decision-making on the multi-functional use of land, freshwater and sea, and to optimise the services provided by the environment (food, water, energy, building material, etc). Many NERC researchers have contributed to the UK National Ecosystem Assessment.
- 3. Transformed understanding of links between environment and human health** so that the role of environmental change in infectious diseases and pollution are built into public health plans and outcomes.
- 4. Completion of Virtual Observatory pilot and extension to marine areas** demonstrating how novel technology can be used to intelligently monitor the multiple variables needed to understand environmental complexity and dramatically improve the efficiency of environmental monitoring.
- 5. UK hosting of international conference in 2012: Planet under pressure which will attract 2,500 global change researchers, policy makers, NGOs, development experts and business leaders to the UK, raising the international profile of UK research and strongly informing the subsequent UN Earth Summit in Rio de Janeiro.**

BIS has identified £324m of efficiency savings to be achieved across the Science Budget through pay restraint and by implementing the recommendations of the Wakeham report. RCUK and NERC are committed to playing their role in delivering these savings.

During 2011-15 the **programme budget will reduce by 3% in cash terms, or approximately 12% when inflation is taken into account**. NERC will increase its investment in strategic research and reduce the share invested in national capability whilst maintaining the share invested in responsive mode and knowledge exchange. **By 2013 the capital budget will reduce by 50% in cash terms**, excluding the effects of inflation. NERC's capital programme comprises scientific projects (some with partner organisations), major research platform and facility projects, plus research centre equipment and site maintenance. Implementing the steep reduction in the capital budget is challenging, and constrained by existing contractual commitments. NERC is allocated an **administration budget will reduce by 14% in cash terms**. We are currently exploring ways to achieve this.

Welsh Assembly Government

The Welsh Assembly Government continues to develop and implement a range of initiatives which are associated with developing the evidence base for Wales. Notable among these are the Natural Environment Framework (NEF), a new Science Policy for Wales and the Wales Environmental Research Hub (WERH).

- The Natural Environment Framework (NEF), recently launched by the Welsh Assembly Government, will define how biodiversity and wider environmental outcomes can be achieved under the central organising principle of sustainable development. The NEF which seeks to embed an ecosystems services approach will draw on principles contained in the Wales Environment Strategy, Biodiversity Framework and aims to add context to existing legislation.
- A Science Advisory Council for Wales (SACW) was established in 2010 to support the Chief Scientific Adviser for Wales. The SACW will advise on a broad range of scientific issues and science-related policies; addressing the scientific evidence needs of Wales in tackling the problems and opportunities it faces; and enhance Wales as a nation engaged with and supportive of science. In addition, the Chief Scientific Adviser for Wales is responding to emerging challenges through the development of a new Science Policy for Wales.
- The Wales Environment Research Hub (WERH) has developed a new delivery plan. The WERH promotes collaboration between research providers in universities and research institutes, and users of research – primarily policy-makers within government and its agencies. The WERH provides a focus for environmental research in Wales, and helps support the development of an appropriate environmental evidence base for key policy initiatives.

Also to note, Wales will be holding its Assembly elections in May of this year and the Welsh Assembly Government is currently reviewing its Agencies and their role in the provision of environmental evidence, advice and regulation in Wales. This review includes the Countryside Council Wales, Environment Agency Wales and Forestry Commission.

The Scottish Government

The Scottish Government has now commissioned its two major research programmes from its Main Research Providers (MRPs). The ‘Environmental Change’ programme is directly aligned with and contributes to the objectives of LWEC. The ‘Food, Land and People’ programme is aligned with BBSRC’s ‘Global Food Security’ programme.

Scottish Environment Protection Agency (SEPA)

Overview: SEPA continues its transformational change agenda. Operational science budget cut by 21% over 1.5 years but protection given to R&D and training. New areas of work also being pursued: citizen science, airborne hazard response, microbial tracking, collaborative marine monitoring, carbon assessments on peat, and sustainable flood management."

Additional info: SEPA is leading, on behalf of the Scottish Government and its agencies, on developing “Scotland’s Environment website”, the partners involved include the Scottish Government and its Research Institutes, the Convention of Scottish Local Authorities, Forestry Commission Scotland, Historic Scotland, Marine Scotland, and Scottish Natural Heritage. This is designed to produce a “living” commentary on the state of Scotland’s environment, support by an online GIS system drawing data from across a wide partnership of public agencies. The website will also give access to wide range of data and reports held by the organisations involved, including the ability to map many of them on a GIS type interface. The first phase of this project will be available from October 2011. The project also covers the development of Scottish Monitoring Strategy. A €6m Life

+ bid has been submitted to expand the partnership and its horizons e.g. expand partnership to include academic and educational institutions, engage with the public – SEPA should hear if the bid is successful in May. The long-term aim of the project is to provide a gateway to environmental information and data on the Scottish environment, including the ability to input and see “citizen science” information.

SEPA continues to directly fund a small amount relevant research and development, and to influence and contribute to a much larger portfolio of research funded by the Scottish Government, other agencies and research organisations across the UK and Europe

Department for Transport (DfT)

DfT is just completing a restructuring exercise – final decision will be made by May 2011. The Department will be slimmer with about 20% reduction in staff costs achieved. A further 5% will be achieved over the CSR period. The Department’s current Chief Scientific Adviser’s term of office also ends in May. It has not yet been decided how the role will be delivered in future. In parallel there will be review of what is known as the Science and Research Building block (Chief Scientific Adviser’s Unit as was).

DfT has two overarching objectives:

- to focus on developing the vital transport infrastructure that will support the national economic recovery, and facilitate long-term, sustainable growth;
- to work to achieve a sustainable transport system, with a particular aim of reducing the carbon footprint of transport.

Priorities will include:

- High speed rail (London, Heathrow, Birmingham, Manchester and Leeds)
- Secure sustainability of the UK railway system
- Ultra low carbon vehicles
- Effective use of strategic road (congestion and safety)
- Sustainable local travel
- Sustainable aviation.

More information can be found in the DfT Business Plan:

<http://www.dft.gov.uk/about/publications/business/plan2011-15/pdf/plan2011-2015.pdf>.

In terms of the environment:

- The department will refocus its research programmes on those projects which directly support the development of a green economy, and which deliver robust information to guide our policy making and international negotiations.
- The functions of the Renewable Fuels Agency have been transferred to the Department.
- DfT will focus financial support on key priorities that will reduce transport emissions and support low carbon economy growth.
- DfT is providing over £400m for measures to promote the uptake of ultra-low carbon vehicle technologies, including supporting consumer incentives for electric and other low emission cars throughout the life of this Parliament. It will continue to monitor the most effective way to deliver this investment, with the first review of the Plug-In Car grant in 2012, and continue investment in electric vehicle recharging infrastructure (Plugged-In Places).

- Support the key elements of the carbon-saving transport programmes that are delivered by the Energy Saving Trust and Low Carbon Vehicle Partnership, while working with both organisations to achieve efficiencies.

Department for Communities & Local Government (DCLG)

The DCLG business plans sets out leading role within government for setting the agenda for decentralisation and localism and our role in delivering the Big Society. Our purpose is to make a radical redistribution of power and funding from government to local people to deliver what they want for their communities, transforming public services.

The new major infrastructure planning regime is still in its early stages with the first applications under the Planning Act 2008 having only recently been accepted for examination. The Government's commitment to create a Major Infrastructure Planning Unit with all decisions taken by Ministers will restore democratic accountability to the system whilst retaining the existing approach, expertise and statutory timetables of the current major infrastructure planning system.

On 8 March, DCLG and Research Councils UK (RCUK) signed a new concordat. The Concordat will provide a framework to allow easier access for DCLG to researchers and experts to share knowledge feed existing evidence into the policy process, and stimulate further research. In doing so, it will make the best use of combined resources and enhance the economic and societal impact of research.

Budgets for externally commissioned research over the spending review period are expected to be around £15 million per year. Internal analytical capacity is facing some cuts due to the general restructuring of the Department, falling from 161 to 133 in the period up to October 2012.

The Forestry Commission

Our mission is to protect and expand Britain's forests and woodlands and increase their value to society and the environment.

The Forestry Commission is a cross-GB Department with devolved policy functions in England, Scotland and Wales. At the GB level, we are a non-ministerial Government Department, providing shared services to the devolved administrations. In each country, the FC is principally responsible for leading the delivery of policy for trees woods and forests. In England, the FC is part of the "Defra family"; in Scotland the FC is part of the Scottish Government; and in Wales the FC is part of the Welsh Assembly Government. FC England and Scotland have separate policy and operational functions; the latter is delivered through Forest Enterprise agencies. In Wales, the FC is a single entity delivering both policy and operations.

Within the GB Department, Corporate and Forestry Support division provides evidence and information services to the three national offices of the Forestry Commission, supports the United Kingdom's international policy on forestry and forest products, and sets standards for the management of the UK's forests. Through the GB plant health service we develop and implement regulation at EU and GB levels to protect our trees, forests and timber from harmful pests and diseases.

Our GB priorities are outlined in the Corporate plan and are focussed on four key areas – ensuring a healthy and resilient forest resource, providing a robust and timely evidence base, ensuring that

Britain's forests play their full role in mitigating and adapting to climate change, and developing standards to support sustainable forest management.

The SR10 exercise has required us to deliver 25% savings over the next four years. We have considered our research programme carefully, and have determined the key priority areas which will contribute to the delivery of our corporate objectives. The number of our research programmes will fall from 42 to 18, with some being merged, and others closed over the next 2-4 years.

Technology Strategy Board (TSB)

Technology Strategy Board is still awaiting confirmation of the budget for the new spending review period; we are expecting Treasury to confirm the new tasking programme very shortly. The two significant new activities, Technology & Innovation Centres and Grant for R&D, have been formally announced by Government and work is underway to implement these programmes (further details below). We are anticipating a manageable cut to our core budget.

As we begin a new funding period, Technology Strategy Board is currently carrying out a strategy review, building on our experience over the previous spending review period, and taking into account the current circumstances and the challenges and great opportunities that lie ahead. The revised strategy will be published by May 2011.

Technology & Innovation Centres

In October 2010 it was announced that over £200m will be invested in a network of elite technology and innovation centres, to be established and overseen by the Technology Strategy Board.

These centres will be an important part of the UK's innovation system. They will allow businesses to access equipment and expertise that would otherwise be out of reach, as well as conducting their own in-house R&D. They will also help businesses access new funding streams and point them towards the potential of emerging technologies.

The new investment will further bridge the gap between universities and businesses, helping to commercialise the outputs of Britain's world-class research base. The centres will also complement and link with the other programmes which the Technology Strategy Board already manages to promote collaboration between universities and business, and to drive innovation and the commercialisation of new technology and ideas.

On 17th March Technology Strategy Board announced the first technology & innovation focusing on high value manufacturing. The new centre will provide an integrated capability and embrace all forms of manufacture using metals and composites, in addition to process manufacturing technologies and bio-processing. Seven partners, with expertise in different areas of high value manufacturing, will work together to form the new technology and innovation centre. The partners are the Advanced Manufacturing Research Centre (University of Sheffield), Nuclear Advanced Manufacturing Research Centre (Universities of Manchester and Sheffield), Manufacturing Technology Centre (Coventry), Advanced Forming Research Centre (University of Strathclyde), National Composites Centre (University of Bristol), Centre for Process Innovation (Wilton & Sedgfield) and the WMG (University of Warwick).

Expressions of interest are being sought in May for the second technology & innovation centre, to focus on cell therapies technology. The new centre will focus on cell therapies and advanced therapeutics and will help support the development and commercialisation of these medicinal products as well as providing the underpinning technologies for manufacturing, quality control, safety and efficacy challenges for new treatments.

In May we will publish a strategy and implementation plan which will provide details of the next stage of the programme including:

- the process to create the cell therapies centre
- our assessment of the many suggestions for new areas for centres
- how the programme will be taken forward
- the new oversight committee which will help us manage the whole programme
- a summary of the main points made in the responses to the Prospectus

We will continue to discuss potential areas for centres with interested parties as we prepare for the next stage of the programme.

Grant for R&D

The Grant for Research & Development has recently (4th April) been introduced by Technology Strategy Board, previously offered through the Regional Development Agencies. The scheme provides funding for small companies to enable them to research and develop new products, processes and services.

The Grant for Research and Development scheme will offer SMEs three types of grant:

- Proof-of-market grants will enable companies to assess commercial viability through, for example, market research, market testing and initial planning;
- Proof-of-concept grants will help companies to explore the technical feasibility and commercial potential of a new technology, product or process through, for example, a feasibility study, basic prototyping and specialist testing;
- Development of prototype grants will be used by companies to develop a technologically innovative product, service or industrial process. This might include small demonstrators, intellectual property protection, market testing and product design.

The maximum funding available will be £25,000 for proof-of-market grants, £100,000 for proof-of-concept grants and £250,000 for development of prototype grants.

Local Government Association (LGA)

The Local Government Association is one of six organisations that comprise the Local Government Group. The Group currently has two top priorities:

- Representing and advocating for local government and making the case for greater devolution
- Helping councils tackle their challenges and take advantage of new opportunities to deliver better value for money

The Group is currently undergoing a major restructure in order to ensure it is best placed to continue to support, promote and improve local government in the new financial climate. Although the Group is undergoing significant changes, the new structure will continue to include a strong research function.

The Group works across all areas of relevance to local government, including the environment.

Recent environment related activity includes:

- Memorandum of understanding: In March 2011 the LG Group and the Department of Energy and Climate Change signed a historic agreement setting out how local and central government will work together to tackle climate change.
- Leadership Academy Climate Change Programme: The Leadership Academy is a training programme which enables politicians in the top levels of local government to learn about the latest thinking in political and community leadership. In recognition that local authorities have a key role in leading action to adapt and mitigate climate change within their areas, the Leadership Academy now offers a module focusing on the local leadership needed to tackle climate change.
- Talking about extreme weather: getting more value from fewer resources: This recent workshop looked at how local authorities can communicate and engage better with their local communities on climate change to influence people's behaviour.

For a fuller summary of environment related work from the LGA see:

<http://www.lga.gov.uk/lga/core/page.do?pageId=18285> and
<http://www.local.gov.uk/lgv2/core/page.do?pageId=430167>

The Environment Agency

In March 2011 we launched our corporate plan for 2011-2014. It shows the environmental priorities that we are committed to in our Corporate Strategy, Creating a Better Place. The plan reflects the outcomes that we have been set by Government/WAG and sets out how we will deliver these in light of our financial settlement. We will

- Reduce the consequences of climate change
- Reduce the risk of flooding and its consequences
- Protect and improve water quality including through land management
- Ensure there is sufficient water resources
- Work with businesses to reduce their impacts on the environment and provide a level playing field

It contains specific targets and outcomes and outlines the changes in the way in which we deliver them. It also identifies those activities that we will stop. There is an emphasis on working in partnership and it outlines what localism and The Big Society means for the Environment Agency. The new Corporate Plan will be available from April 2011.

To support the delivery of the corporate plan we are developing a number of Evidence Action Plans. They will be valuable to our external partners because they will show where we are now, the direction we are travelling and the evidence that we will need to achieve our goals. The plans will be living documents that will be updated to reflect changes in our business and reviewed on an annual basis.

To date three plans have been developed. They are Land and Water; Sustainable Places and Regulating Business.

In March the Environment Agency hosted Exercise Watermark, a Defra-led project the aim of which was 'to conduct a wide ranging and publicly engaging exercise that tests the arrangements across England and Wales to respond to all aspects of severe, wide-area flooding'. The exercise involved over a thousand people from emergency response teams including local authorities and emergency services. Community groups tested their own local flood plans and many businesses and utility companies took the opportunity to test their flood resilience in independent bolt-on exercises. We are now evaluating the exercise and we will be reporting our findings to Environment Agency Board, Defra and the Welsh Assembly Government.

We are working with Defra, WRAP, WAG and DECC to develop the structure and governance of a joint Waste and Resources Management (WaRM) evidence Programme. The programme is expected to launch in April 2011. The programme will promote closer working to achieve greater efficiency and effectiveness.

We are part of the Defra led 'Joining Up on Futures Research' Working Group which aims to coordinate futures work across government. The horizon scanning work previously carried out by the Environment Agency will now be incorporated into the Centre of Excellence for Environmental Risk and Futures which Defra has established at Cranfield University.

We are working with Natural England to adapt the Government Chief Scientist Guidance on use of scientific and engineer Evidence for use across the Defra network.

The Environment Agency Head Office in Bristol has now relocated to the city centre. The address of the new building is Horizon House, Deanery Road, Bristol BS1 5AH. 0117 934 4001

Economic and Social Research Council (ESRC)

The Economic and Social Research Council (ESRC) is undertaking an important review of its strategic priorities following the publication of its new [Delivery Plan](#). This Plan introduced for the first time three priorities:

- economic performance and sustainable growth;
- influencing behaviour and informing interventions; and,
- a vibrant and fair Society

These are rooted within seven extant challenges, which included 'Environment, Energy and Resilience', and therefore reflect the longer-term issues for social sciences as a whole that were identified through a process of consultation in 2008.

Once the content of these priorities have been refined through a further consultation process, they will provide a focus for maximising the impact from our existing portfolio of research, resources and training investments, realigning the activity of investments working in relevant areas and directing a proportion of our budget towards new activities. However, we also remain committed to supporting the best ideas generated by the research community through our responsive-mode funding opportunities, which are not directed although they may in future include some steers.

Until these new priorities have been fully developed ESRC has chosen not to make any new large scale investments or decisions regarding future investments in the LWEC, or other areas. We will however move quickly to develop such investment activity once the process is concluded in May.

Since the last Partners' Board meeting ESRC has made some important changes to its funding schemes, the key changes include:

- we no longer have small grants, postdoctoral fellowships or mid-career development fellowships schemes;
- we intend to announce a new future leaders scheme for early-career researchers in May 2011; and,
- we have increased the lower threshold for standard grant proposals to £200,000, and increased the upper threshold to £2million.'

Met Office

The Met Office is unique in having world-class weather forecasting and climate prediction in the same organisation, using the same Unified Model system. Our Science strategy document '[Unified science and modelling for unified prediction](#)', sets the agenda required to meet the challenge of maintaining the Met Office as a world-leading scientific organisation and for delivering world-class weather and climate services. Increasingly those services are multi-disciplinary and delivered in partnership, reflecting the critical role of weather and climate information in environmental hazard management.

The Met Office provides data, products and services that help Government, the public and commercial customers achieve their goals through:

Enabling protection: protecting lives, infrastructure and the natural world

Improving well-being: improving quality of life and well-being, now and in the future

Increasing prosperity: enabling UK economic growth and international competitiveness

We provide services for:

- i) General Public; to meet the public's need for information about weather, climate and its impacts
- ii) Defence and Security; to enable the Defence and Security communities to gain the maximum advantage from Met Information and Intelligence at all levels of decision making
- iii) Aviation; to support a global need for safe and efficient aviation services
- iv) National Hazard and Resilience Management; to improve the UK's ability to manage and respond to natural hazards
- v) UK Climate Service; to support a global need for climate information which addresses user requirements, builds resilience to climate variability now and guides decisions around adapting to a changing climate in the future.

Natural England

Natural England's Spending Review (SR) 2010 settlement is a £42m reduction in our Grant in Aid which is a 30% reduction in the portion of our budget of £140m which is in our direct control. The other portion of our budget represents recharges from Defra for the use of IT, Estates and back office services. The £42m budget reductions are cumulative over the SR 2010 period: 2011/12 - £13m; 2012/13 - £23m; 2013/14 - £33m; 2014/15 - £42m

In order to respond to this challenge Natural England established a Performance and Efficiency Programme to deliver the required savings. This programme has defined a new business model and new ways of working to which Natural England Staff have been assigned from 1 April. This model included the removal of regional structures and the alignment of our people management and performance management to give clear lines of accountability via the brigading of our delivery through four Executive Director led groups with supporting functions (Science & Evidence, Delivering with Communities, Customer Services and Capability).

Our new business model will enable us to operate with an overall reduction of 400 FTE staff (15% of the current workforce), from as early as possible in the 2011/12 financial year, with the majority leaving by June 2011. In April 2010 Natural England had a staff of 2,700, and we have lost 167 FTEs this year, leaving 2533 posts. We are planning on a further 400 FTEs leaving during 2011/12.

Our strategy beyond 2011/12 is that we will be holding vacancies (which might equate to 100 FTE's per year) unless they are in business critical roles. We will put together a workforce plan to identify skills/posts needed until the end of Spending Review period based on our Corporate Plan priorities but which will be influenced by the Natural Environment White Paper and the England Biodiversity Strategy. We can then identify how many staff we need and the level of any further staff reductions.

Arms Length Body Review

Following the conclusion of the Arms Length Body (ALB) Review In October 2010, Defra set out a set of ambitions for closer working between its ALBs; in effect providing a starting statement for what the department was looking for in terms of the 'substantially reform' requirement set out for Natural England and others.

We have developed our own measures of success for Natural England's 'substantial reform' to meet Defra's and our own expectations. We are clear about the way the Defra family is expected to reform, with less emphasis on each body working independently, particularly with common customers and stakeholders; and for us to focus on our delivery role and exercise more caution in the way we engage with Government in policy discussions. Substantial reform has been identified as our 30% budget reduction, cessation of policy and lobbying activities and improved customer focus and care.

Delivery of our response through our Arm's Length Body (ALB) work has been to:

- Embed specific elements of the ALB agenda into the design of the new Natural England management arrangements through our Performance and Efficiency Programme;
- continue to work with Defra and our partner bodies to progress specific ambitions for closer working, and;
- confirmed the accountability (in terms of relevant new Natural England functions) both of the continuing ALB implementation projects and of the exploratory work on further opportunities.

We plan to establish a joint non executive group with the Environment Agency and the Forestry Commission to focus on the broader and longer term opportunities for ALB collaboration.

Science and Evidence

Our 2010/11 budget for evidence was £7.6m, comprising £6.0m on monitoring (which includes environmental monitoring, surveillance and evaluation) and £1.6m on wider research.

Within the organisation, we have a range of technical and scientific skills. During 2010/11 we reviewed our specialist coverage to ensure we are equipped to deal with our needs as an evidence based organisation. We now have 120 national environmental specialists located across our functions, including eight Heads of Profession. These specialists maintain the currency of our expertise and provide broader training for our wider staff, as well as providing technical advice to Government and others and supporting the development of the evidence base through monitoring and research projects.

As a result of the Spending Review and Arm's Length Bodies review, we will have a smaller, more focussed evidence programme with a budget of £3.6m. The majority of funding will be targeted on statutory monitoring and surveillance (£3.3m) and the remainder will be spent on data licences (excluding OS licences). We will not be funding any wider research.

We will continue to work closely with Defra and its delivery network; sharing and evolving our evidence priorities, exploring ways in which we can work together to meet these needs and sharing the evidence and data that we already have to ensure we secure full value from it.

In response to the Government's Big Society agenda we are working closely with the VCOs in monitoring the natural environment and developing our dissemination of evidence to support localism.

Biotechnology and Biological Sciences Research Council (BBSRC)

BBSRC has recently undertaken or initiated several notable activities under the auspices of LWEC. These include:

- With co-funding support from the Scottish Government, a responsive mode highlight call to encourage proposals that investigate aspects of 'effects of environmental change of the soil-water interface: implications for food production and water supply'. Proposals were received in Jan '11 and will be assessed at the Research Committee meetings in May, alongside other responsive mode applications.
- Jointly with NERC, a workshop on 'impacts and consequences of climate change on flowering time' held on 31 Jan 2011 at the Wellcome Collection in London. The aim was to bring together leading academics to consider the research challenges and scientific opportunities associated with the impacts and the consequences of climate change on flowering time in plants, for agricultural and horticultural production and food webs and biodiversity in "natural" ecosystems. This will be followed up, in coming months, by a responsive mode highlight call, to stimulate submission of proposals that seek to meet key research challenges identified for this area.
- A workshop on 'biological approaches to enhanced carbon storage in agricultural soils', to be held on 27 May 2011 at the Wellcome Collection. This workshop is being organised with NERC co-leadership and with co-support from Defra, DECC and Scottish Government. It will explore the nature of interactions within the atmosphere-plant-microbe-soil continuum, aimed at improving understanding of the potential for biological strategies to enhance soil carbon storage for greenhouse gas mitigation. In doing so, it will draw upon the considerable expertise and experience gained in allied research on unmanaged soil systems.

In addition, BBSRC is currently developing the following upcoming activities:

- A planned responsive mode highlight call on ‘effects of environmental change on the incidence and spread of invertebrate pests and disease vectors of crops and livestock’, in follow up to a community workshop that was held on this subject on 24 March ’10 at the Royal York hotel, York with co-support from the Scottish Government.

We are discussing with other funders ideas for a workshop to bring together climate scientists with land-based researchers to consider the effects of climate change at the farm/field scale. Key to the success of any activity in this space will require joining together of communities across funders and disciplines, and bringing new thinking to the important challenges round the effects of climate change at the individual farm scale.

Medical Research Council (MRC)

The heart of our mission is to improve human health through world-class medical research. To achieve this, we support research across the biomedical spectrum, from fundamental lab-based science to clinical trials, and in all major disease areas.

The Medical Research Council is committed to supporting research that plays a role in society’s ability to adapt in order to maintain levels of human health and wellbeing during periods of environmental change. The relationship between humans and the environment in areas such as air and water pollution, changing patterns of infectious disease, allocation of natural resources, housing, food security, obesity and traffic all require cross-disciplinary solutions.

A key MRC objective is to explore the impacts of changes in our environment on health and wellbeing. In order to meet this objective MRC is involved in the following activities:

-the NERC-led Environment and Human Health programme

-the MRC-led Environmental and Social Ecology of Human Infectious Diseases Call (ESEI)

- ESEI aims to establish novel inter-disciplinary approaches to studying the ecology of infectious diseases and to use a holistic systems approach which takes into account the ways in which the natural and social environments affect the emergence (emergence, re-emergence, and development of drug resistance) and spread of infectious disease.
- The Call is being managed in two phases - Phase I (March 2010) awarded 12 Catalyst Grants to allow PIs to bring together consortia to address novel interdisciplinary approaches to studying the ecology of infectious diseases. A further 8 groups were not awarded funding but were invited to apply to Phase II. In Phase II, £10-11m will be available for Research Consortia grants. A workshop was held in October 2010 for Catalyst grant holders and those groups who have been invited to apply.
- Funding recommendations of full research consortia grants will be made by a bespoke Scientific Advisory Panel with members appointed by each of the funders in July 2011 (17-18 of the groups from Phase I are expected to apply).

-encouraging innovative, high-quality research applications in nanotoxicology

-funding a national programme of training and capacity building in integrative toxicology

-supporting UK Biobank, which is linking genetic and environmental factors that cause or prevent human disease

-creating in partnership with the Health Protection Agency, a new Centre for Environment and Health at Imperial College and King's College London which aims to improve the science base underlying the development of environmental health policy. In addition the MRC Centre for Outbreak Analysis and Modelling was established in 2007 at Imperial College London as a centre of excellence for research on the epidemiological analysis and modelling of novel infectious disease outbreaks.

Further information about our activities can be found in our Strategic Plan, our Delivery plan, Annual Report and Annual Review in our website www.mrc.ac.uk

Professor Sir John Savill was appointed chief executive and deputy chair of the MRC in October 2010, succeeding Sir Leszek Borysiewicz. Prior to taking up the post of chief executive, Sir John was the first vice-principal and head of the College of Medicine and Veterinary Medicine, University of Edinburgh. He will retain an ongoing, research-active involvement with the University of Edinburgh part-time throughout his appointment as chief executive.

The MRC Head office relocation is now complete. There is one office in London and one office in Swindon. The decision to move has been made in response to the Lyons Review, which was commissioned by the Government to advise ministers on the relocation of public sector organisations out of London and the South East. We set up a Shared Service Centre (SSC) in Swindon in 2006 to provide transactional administrative support to all MRC staff and establishments. The next phase of this is the move to the common SSC across all UK research councils, again based in Swindon. As part of the harmonisation process across the research councils, MRC moved to the JeS/NGBO grant processing system in March 2011.

Department for Environment, Food and Rural Affairs (Defra)

Evidence Investment Strategy Refresh

The "Evidence Investment Strategy (EIS) 2010-13 and beyond" was published in early 2010 and set out Defra's priorities for evidence. It also identified a number of recommendations for improving our evidence base, and our ways of working.

The aim of the Refresh document is to re-visit Defra's EIS in light of the changing political landscape, Defra's Business Plan and the 2010 Spending Review. It highlights the progress made in implementing the EIS, and summarises the work that has been done on evidence programmes, indicative budgets and the big evidence challenges facing Defra and its network.

The EIS Refresh will be launched on 27th April and available via the Defra website at <http://www.defra.gov.uk/publications/2011/04/27/pb13471-evidence-investment-strategy/>.

Evidence Plans

The EIS identified a need to develop clear links between evidence activities and policy objectives. Each of the 35 business areas of Defra with a substantial evidence base has developed an *Evidence Plan* to show this 'line of sight'.

One page summaries of all the Evidence Plans are provided within an Annex to the EIS. As evidence needs and priorities evolve, Evidence Plans and summaries will be updated and made available on the Defra website.

Evidence Plans outline:

- the policy context and alignment to Defra's objectives and big evidence challenges;
- an overview of current knowledge;
- the objectives of Defra's investment in new evidence;
- a prioritisation of evidence needs;
- access to expertise;
- opportunities for funding partnerships; and
- the overall approach to meeting evidence needs.

These Evidence Plans have already been used to inform the prioritisation of investment. They will continue to inform the annual allocation process, but also have value as public statements of Defra's high level evidence needs and priorities.

The National Ecosystems Assessment and Natural Environment White Paper

The National Ecosystems Assessment (NEA) will form a key part of the evidence base for the Natural Environment White Paper.

The independent co-chairs of the NEA have, in agreement with all funders, decided that the NEA will be published in June to allow key stakeholders to be briefed on the study, to allow for some additional analysis, and to help allow for further engagement with Devolved Administrations following their elections.

The Natural Environment White Paper will therefore now be published in June, after the NEA, to allow for full inclusion of the evidence it provides.

Department of Energy and Climate Change (DECC)

Following the Business Planning process, DECC's purpose has been confirmed as heading off the twin risks of catastrophic climate change and a shortfall in UK energy supplies. DECC's vision is that the UK makes a safe and secure transition to low carbon electricity, low carbon homes and buildings, and low carbon transport and industry.

The recent review of DECC's budgets and planning has resulted in changes to DECC's structure and the number of Directors General being reduced from five to four. The new groupings and responsibilities can be seen in the organogram on DECC's website at:

<http://www.decc.gov.uk/en/content/cms/about/about.aspx>

The Chief Scientific Advisor's Directorate is undergoing some reorganisation but the details are not yet finalised. However, the outcome of the Business Planning round is broadly that staff numbers and research budgets are being held level.

Engineering and Physical Sciences Research Council (EPSRC)

EPSRC has recently undertaken an internal refocus and now has some dedicated resources for LWEC. The main focus for EPSRC will be the engineering and physical science challenges related to water and infrastructure.

During the last year EPSRC ran two sandpits aligned to these focus areas: *Large Scale Solutions to Water Scarcity* in which 3 projects at a value of £2.5M were supported and *Achieving Adaptable Assets: Sustainable Integrated Infrastructure* in which 5 projects were supported, in collaboration with industry, at a value of £2.3M. Funded projects are listed in the Annex.

Prof Jim Hall from University of Oxford has been awarded £4,430k for a large programme grant: UK Infrastructure Transitions Research Consortium (ITRC): Long term dynamics of interdependent infrastructure systems. *“The aim of the UK Infrastructure Transitions Research Consortium is to develop and demonstrate a new generation of system simulation models and tools to inform analysis, planning and design of NI. The research will deal with energy, transport, water, waste and ICT systems at a national scale, developing new methods for analysing their performance, risks and interdependencies. It will provide a virtual environment in which we will test strategies for long term investment in NI and understand how alternative strategies perform with respect to policy constraints such as reliability and security of supply, cost, carbon emissions, and adaptability to demographic and climate change.”*

In May 2010 EPSRC funded the final tranche of SUE (Sustainable Urban Environment) projects which it is hoped will be accredited to LWEC. The 4 projects funded are listed in the annex. The overall spend through the SUE programme now exceeds £45M, with projects being actively managed as we seek to maximise the impact of the investment.

In addition, three research projects concerned with the *adaptation and resilience of energy generation and transmission systems* in the context of current climate and projected changes were recently funded by the Research Councils Energy Programme. The projects, which are part of ARCC and hence will be accredited to LWEC, are:

- Adaptation and Resilience In Energy Systems (ARIES) (£1.3 million), involving Edinburgh and Heriot Watt Universities and led by Dr G Harrison of Edinburgh.
- Adaptation and Resilience of Coastal Energy Supply (£1.3 million), at the University of Liverpool and led by Professor AJ Platter.
- Resilient Electricity Networks for Great Britain (RESNET) (£1.4 million), involving Manchester and Newcastle Universities and led by Professor K Anderson of Manchester.

Annex:

Large Scale Solutions to Water Scarcity grants:

- Biodesalination: from Cell to Tap, Dr Anna Amtmann, Glasgow (£1,040k)
- Transforming Water Scarcity Through Trading, Dr Keith Weatherhead, Cranfield (£584k)
- A Global Solution to Protect Water by Transforming Waste, Dr Gavin Collins, Glasgow (£908k)

Achieving Adaptable Assets: Sustainable Integrated Infrastructure grants:

- Land of the MUSCOs (Multi-utility Service Companies). Dr Julia Steinberger, Leeds. 3yr project - £650k
- Undermining Infrastructure. Dr Phil Purnell, Leeds. 2yr project - £495k
- All in One. Dr Fatih Camci, Cranfield. 18month project - £505,000 FEC
- Transforming Utility Conversion Points. Dr Liz Varga, Cranfield. 18month project - £404k
- Shock (NOT) Horror. Dr Stephanie Glendinning, Newcastle. 2yr project - £297k

Sustainable Urban Environment grants:

Challenging lock-in in urban energy systems (CLUES), Prof Y Rydin, University College London (£791k)

What is the contribution to carbon reductions at a national scale that can be achieved by the greater deployment of urban energy initiatives having regard to the need to integrate energy systems across the scales? And what are the implications of this promotion of urban energy systems for change in urban environments to 2050 and for the sustainability of urban areas?

Re-Engineering the City 2020-2050: Urban Foresight and Transition Management, Prof M Eames, Cardiff University (£2,169k)

Developing the knowledge and capability to overcome the separation between the ‘what’ and ‘how’ of urban scale retrofitting in order to promote a managed socio-technical transition in built environment and urban infrastructure.

Sustainable transport evidence and modelling paradigms: cohort household analysis to support new goals in engineering design (STEP-CHANGE), Dr M Tight, University of Leeds (£1,267k)

Examining how we can most effectively bring about a step change in our understanding of the travel behaviour of individuals and organisations and in the way in which these are represented in transport models, thus enhancing the long term sustainability of the urban environment.

Self conserving urban environments (SECURE), Prof M Bell, University of Newcastle (£2,224k)

Delivering a step change in thinking by enabling integration of resource-supply-demand-waste systems across city-to-regional scales to create scientifically informed, strategic, integrated policies and planning driven by efficient transport; use of land as a resource; using waste as an asset; microgeneration of energy and upscaling Systems management from a local/city to regional level.

Brief summaries of LWEC accredited activities as at 10th May 2011, grouped according to the primary LWEC challenge covered

Challenge A: Understanding the risks of climate change and assessing options for avoiding or managing such risks

1. Joint Weather and Climate Research Programme (Met Office and NERC)

The overarching aim of the JWCRP is to ensure that, in areas of common interest to the Met Office and NERC, the UK maintains and strengthens its leading international position in climate science, and hence in climate forecasting and provision of advice for climate policy. The programme (£13.6M) was launched in April 2009.

2. Methods for Quantifying Uncertainty in Predictions of Regional and Local Climate Change and Climate Impacts (NERC, EA, Met Office)

Approximately £1.5M was made available to the climate science community (in addition to that under the Joint Climate Research Programme) to address the key issue of uncertainty in climate modelling. Unless we can better quantify uncertainty – or become more confident in the way we handle uncertainty in predictions of change – it will be difficult to develop effective mitigation or adaptation strategies. UK scientists aim to use this work to have a major impact on the work of the IPCC. The quantifying uncertainty programme will be delivered by a single collaborative award – End-to-end Quantification of Uncertainty for Impacts Prediction (EQUIP), which involves numerous universities and partners.

3. Avoiding Dangerous Climate Change (DECC and Defra lead with other partners)

The £1.3M Avoiding Dangerous Climate Change (AVOID) programme is to be delivered by a consortium including the Met Office and research centres. The three main outputs will be policy-relevant evidence and research needed to achieve international agreement on greenhouse gas emission reductions, core research for understanding dangerous climate change and its implications and a framework that will further encourage the integration and communication of scientific and socio-economic research on climate change.

4. Centre for Climate Change Economics and Policy (ESRC funds with non-LWEC partners)

The primary focus on the Centre, which is chaired by Lord Stern, is to improve climate-change policy and to increase the capacity of decision makers (both public and private) to respond to one of the most critical challenges facing the world today. £7.3M of the Centre's funding forms the portion of work accredited by LWEC.

5. Tyndall Centre for Climate Change Research (NERC, EPSRC, ESRC)

The internationally renowned Tyndall Centre for Climate Change Research that contributed significantly to the IPCC assessments on climate change adaptation and mitigation has been provided with an additional £2.4M of funding. This is to help orientate and engage the UK climate change research community to deliver more effectively on the LWEC environmental change objectives.

6. Met Office Hadley Centre Climate Programme (Defra and DECC)

This is a five year programme with just over £72M funding. The aim of the programme is to provide tailored climate change advice to UK government, and supporting DECC and Defra in developing policy to tackle climate change.

7. Integrated Research Programme to assess the Impacts of Climate Change in the UK and Adaptation Options (Defra, EA and non-LWEC partners)

The projects within this programme (total budget ~£1.6M), have been designed to collectively produce a portfolio of work that makes excellent use of the UK's climate change projections (UKCP09). Individually, but more so together, they provide a substantial body of evidence on which to develop robust adaptation policies, and outputs will be integrated in to the Adapting to Climate Change Statutory National Climate Change Risk Assessment.

8. The Collaborative Centre of Excellence in Understanding and Managing Natural and Environmental Risks (EPSRC, ESRC, NERC, Defra)

LWEC partners identified risks and the way we deal with them as a cross-cutting aspect of LWEC. This £1.2M centre, with its headquarters at Cranfield University, will enable improved management of risk through a focus on better understanding the ways the public responds to perceived risks in areas such as natural and man-made hazards, extreme events and new and emerging diseases. The LWEC RCUK Theme Leader sits on the advisory board.

9. Icesheets and Sea Level Rise (NERC (BAS), Met Office & 22 other partners)

This £7M programme is the NERC component of a large EU FP7 programme: **Ice2Sea**.

Ice2Sea is an integrated programme that includes:

- targeted studies of key processes in ice sheets in both polar regions (Greenland and Antarctica);
- improved satellite determinations of changes in continental ice mass;
- development and implementation of ice-sheet/glacier models to generate detailed projections of the contribution of continental ice to sea-level rise over the next 200 years.

These results will be delivered in forms accessible to scientists, policy-makers and the general public, which will include clear presentations of the sources of uncertainty.

10. Identification and modelling of the processes that govern climate on multi-decadal to centennial time-scales; quantification and reduction of the uncertainty in predictions for the next century (NERC (NCAS), Met Office & other non-LWEC partners)

Climate change on centennial time scales is a major scientific, societal and policy issue. The work here (total £16.2M) is geared to addressing the key science questions and providing information for evidence-based decision making to the relevant stakeholders, including government departments (Defra and DECC). It will feed into the international research and policy arenas through contribution to IPCC and WMO/UNEP assessments. It will be closely aligned to the NERC Theme Action Plans (TAPs) e.g. the Joint Weather & Climate Research Programme (JWCRP), and will involve wide collaboration with the Met Office.

11. Agriculture GHG R&D Platform (Defra, SG, WAG and NI Executive)

The overarching aim for the £12.6M GHG platform is to track, understand and predict future changes in greenhouse gas emissions from agriculture. This requires significant reduction in the uncertainties in the agricultural GHG inventory and development of country-specific emission factors to be used in combination with national statistics in order to better characterise and allocate GHG emissions from agriculture. The projects will be managed by Defra in collaboration with the above partners and a Research Advisory Group (RAG) will be responsible for providing quality assurance.

12. Using earth sciences to understand climate changes and to predict their environmental responses (NERC (BGS), Defra, EA, BBSRC (Rothamsted Institute) and many other UK and International non-LWEC partners)

This ~£4M collaborative programme (otherwise known as the BGS Climate Change programme) is addressing climate change issues through a variety of focused efforts. The aim is to:

- observe past and present climate;
- to understand those observations, and ultimately;
- to predict future climates and the environmental responses to those climates.

13. Developing geoscience technologies for environmental monitoring (NERC (BGS), Defra, EC Environment DG and EC Space DG)

This £1.26M collaborative programme (otherwise known as the BGS Geoscience Technologies programme) is designed to develop the tools needed by all of the other BGS science programmes to map, measure, monitor and model the geological environment. Major application areas for these tools include resources (groundwater, energy, minerals and the land as a resource), geological hazards (landslides, subsidence, earthquakes, volcanoes and the geological aspects of flooding) and geo-environmental management (waste materials, pollutants and the impacts of climate change).

Challenge B: To manage ecosystem services for human well-being and to protect the natural environment in a changing world

14. National Ecosystem Assessment (Defra, SG, WAG, NERC, ESRC)

This world-leading, £1.2M initiative will produce the world's first national assessment of its kind. Following the Millennium Ecosystem Assessment chaired by Professor Robert Watson (Chief Scientific Adviser for Defra) it will provide an assessment of the current state of all of the ecosystems in the UK. The study will provide the evidence foundation of the ecosystems approach to policy that Defra are leading across Whitehall, identifying both threats and opportunities.

15. UK Ocean Acidification Research Programme (NERC, Defra, DECC)

The overall aim of this £12.4M Research Programme is to provide a greater understanding of the implications of ocean acidification (as a result of the absorption of anthropogenic carbon dioxide) and its risks to ocean biogeochemistry, biodiversity and the whole Earth System. SG and WAG have also been consulted in the design phase of the programme.

16. Designing a Programme to Address Evidence Gaps in Greenhouse Gas and Carbon Flux from UK Peatlands (NE, Defra, DECC, SG, WAG, SEPA)

The importance of peatland management to the releases of green house gases has been recognised globally, however a recent review indicated significant gaps in monitoring data. This £40k project, led by JNCC, aims to address this problem.

17. Pilot Review Scheme – Objective B (Defra, NERC)

Defra and NERC commissioned 6 pilot reviews (total fund £10k) to better understand existing data and highlight trends and gaps in our knowledge of managing ecosystems for human well-being and how to protect the natural environment as the environment changes. These reviews covered areas such as biological and environmental limits, environmental protection, catchment management and ecosystem resilience.

18. Demonstration Test Catchments (Defra, EA, WAG)

The Demonstration Test Catchments will develop an evidence-base for wider application to the management of river catchments across England and Wales.

The £8M project will initially set up three instrumented catchments with an integrative data infrastructure to provide a shared-use network as the framework for collaborative analysis. Research and mitigation actions in other catchments will also be drawn in and supported where relevant, to enhance the developing evidence base.

19. OPAL (Open Air Laboratories) (Lottery fund to Imperial College London, with additional contributions from Defra & EA)

Open Air Laboratories - OPAL is a ~£12M multi-disciplinary programme that seeks to encourage and support collaboration between the academic, statutory, voluntary and community sectors in pursuit of excellence in environmental science focusing on the issues of loss of biodiversity, environmental degradation and climate change.

20. Marine predators as indicators of the integrity and health of marine ecosystems (SMRU (NERC), SG, Defra, SNH, Natural England)

The £20M research programme at the Sea Mammal Research Unit aims to fulfil a need for information within government and industry about the upper end of marine food chains. Marine mammals reflect underlying process within a complex ecosystem and are vulnerable to anthropogenic effects.

21. The Continuous Plankton Recorder (CPR) survey (NERC Defra & many non-LWEC UK and International contributors; run by NERC (SAHFOS))

The CPR survey is the world's most geographically extensive and longest-running (started 1931) large-scale plankton biodiversity monitoring activity (with current funding of approximately £1.2M per year). The survey determines the abundance and distribution of microscopic plants (phytoplankton) and animals (zooplankton) in our oceans and shelf seas. Using ships of opportunity from ~20 shipping companies, it obtains samples at monthly intervals on ~30 trans-ocean routes. The survey is internationally-funded with a wide consortium of stakeholders.

22. Character and Quality of England's Landscapes (CQuEL) (NE, Defra and English Heritage)

The ~£1M CQuEL Project (Character and Quality of England's Landscapes) aims to assess change in the character and quality (the form and the function) of England's landscapes. CQuEL seeks to provide 'place-based' evidence about the character and function of landscapes and the provision and quality of selected ecosystem services delivered by England's natural environment, where the natural environment is understood through the concept of landscape. The project seeks to develop a better understanding of the ways in which different landscapes are changing and what this means for the ecosystem services these places provide.

23. Knowledge-based Sustainable Management for Europe's Seas (KnowSeas) (NERC (SAMS), NERC (SAHFOS), Defra (Cefas), and many non-LWEC UK and International partners)

KnowSeas is a large-scale integrating EU FP7 collaborative project with 30 partners from 15 countries, coordinated by the Scottish Association for Marine Science (SAMS), a NERC Collaborative Centre. The total project cost is £6,335,740, with a total EU contribution of £4,923,570. Europe's four regional seas have suffered severe environmental degradation due to human pressure. The Ecosystem Approach to management, a management paradigm that encompasses humans and the supporting ecosystem, offers a means of sustainably managing our seas to optimize both ecological and social well being. However, the science base for this approach needs strengthening and practical tools must be developed and tested for policy implementation. The KnowSeas consortium will strengthen the science base for managing Europe's seas through the practical application of systems thinking.

24. Southern Ocean Fisheries and Climate Change (NERC, FCO)

Work on Southern Ocean fisheries and Climate Change is delivered through the ~£5.5M Ecosystem Science into Policy (ESP) programme which focuses on the maintenance of, and potential threats to, Ecosystem Services derived from the Southern Ocean. ESP is specifically targeted at providing policy makers, particularly the Foreign & Commonwealth Office (FCO) that leads on UK policy for Antarctica, with the information they require concerning management of ecosystems in a changing environment. ESP is the NERC/UK contribution to the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

25. Network for Valuing Biodiversity, Ecosystem Services & Natural Resources (NERC, with possible involvement from ESRC, Defra, SG and NE)

The aim of the proposed £0.6M research network is to create partnerships to promote and develop research capacity in the valuation of biodiversity, natural resources and ecosystem services. Capacity will be created by establishing cross-disciplinary collaborations between the natural and social science communities designed to:

- Articulate the nature of the valuation problem we currently face in relation to understanding the contribution that natural capital makes to human well-being; and,
- Identify and develop the underpinning natural science knowledge that would enable robust monetary and non-monetary valuation to be achieved.

26. Macronutrient Cycles Programme (NERC, EA, Defra, SG, WAG)

This is a major new £9.5M programme that aims to understand the interactions between Carbon, Nitrogen and Phosphorus Cycles in the environment. The research will assess the fate and distribution of these nutrients and the likely changes due to man-made impacts such as climate change, land use change, population changes and changing pollution gradients across the UK and Europe.

27. Marine Renewable Energy (NERC, Defra)

This £3.7M programme will contribute to the evidence base to predict the environmental implications of future marine renewable energy options at appropriate scales, and to the research capacity to deliver decision support about the biophysical properties of coastal and marine environments to promote offshore and near-coastal renewables development with enhanced environmental benefits.

28. Algal Bioenergy Special Interest Group (NERC, TSB)

The key goal of this £0.77M network is to understand the opportunities and risks to the quality of freshwater and marine environments of using algal biomass as a source of renewable energy. The network will enable early evaluation of the environmental and economic impact of algal bioenergy through development of a 'sustainability framework' using analogues developed for terrestrial bioenergy deployments. The network will also ensure close engagement with technological developments in this area.

29. BioMara (Sustainable Fuels from Marine Biomass) (NERC (SAMS) lead, SG Agency and other non-LWEC partners including EU Framework funding, Universities and Irish and Northern Irish Departments and Institutes)

This €6 million UK and Irish joint project (funded through Interreg IVA, Highlands and Islands Enterprise and the Crown Estates) aims to demonstrate the feasibility and viability of producing third generation biofuels from marine biomass, using both macroalgal (seaweeds) and microalgal (single celled plants) sources as an alternative to agri-fuels production from terrestrial land plants. It focuses on Scotland, Northern Ireland and the border part of Ireland, aiming to provide the region with access to a more economically and environmentally sustainable local renewable fuel source, whilst also helping to service local public transport infrastructure and build on the regions' technology-base.

30. Sustainable Marine Bioresources (NERC, Defra and other non-LWEC partners including SEERAD/FRS and AFBI)

This collaborative 5-year programme is a response to the Prime Minister's Strategy Report on the future for UK fishing (2004), which called for Research Councils, universities and government agencies to pool their scientific expertise to help deliver the knowledge and understanding needed to progress the objectives and practice of ecosystem-based fisheries management. Funding includes £1.4M cash with a further £0.9M in kind contributions.

Challenge C: To promote human well-being, alleviate poverty and minimise waste by ensuring a sustainable supply of water, food and other biological resources

31. Ecosystem Services for Poverty Alleviation - ESPA (NERC, ESRC, Defra, DFID)

This £40.5M programme will address key environmental vulnerabilities in areas of the world where poverty is worst. The aim is to find ways in which poverty can be reduced by accounting

for regional variations in climate, weather patterns and land use without causing or worsening enduring environmental problems.

32. Changing Water Cycle Programme (NERC with other Partner input)

This programme will develop an integrated, quantitative understanding of the changes taking place in the global water cycle, involving all components of the earth system. It will address the urgent needs to understand the changes taking place now; predict changes that will take place over the next few decades; and, through LWEC, work with partners to build resilience, mitigate problems, and develop adaptive solutions. The EA, Met Office and Defra have all been involved in the development stages of the programme. The current funding figure is £10.1M, which is likely to increase once contributions from other stakeholders are confirmed.

33. The Waste of the World (ESRC)

This £3M programme of six linked projects aims to produce a defining social science study of waste, for academics, policy makers and stakeholders. Its overarching aims are to reconceptualise the place of waste and how we think about waste within social science. The programme has three objectives.

- Provide the first investigation of newly emerging global waste economies, focusing particularly on hazardous waste, its trade, management and disposal.
- Offer a radical reconceptualisation of waste within productive activities. Rather than locate waste as the end point of production-consumption, we argue that surplus and loss (and therefore waste) is fundamental to all economic activity.
- Provide the first empirical examination of the disposal rituals surrounding the excess of economies in key parts of the world, within the EU and in India.

34. BGS Groundwater Science (BGS (NERC), Defra, EA, SEPA, DFID & other non-LWEC partners)

The ~£6M Groundwater Science programme focuses on providing an improved understanding and characterisation of the fundamental properties of groundwater systems and on investigating/forecasting the impacts of a changing environment (from both a quality (chemical) and quantitative perspective) on groundwater and on other parts of the aquatic and terrestrial environments directly dependent on groundwater, e.g. rivers and wetlands.

35. BGS Minerals and Waste theme (BGS (NERC), DCLG, Defra & other non-LWEC partners)

The drivers for the ~£8M Minerals and Waste theme/programme within the overall BGS Strategy are the need to secure a sustainable supply of minerals and energy, in the face of the twin challenges of population increase and climate change. The research outputs focus on the need to move towards a low carbon economy as set out in the UK Climate Change Act 2008 which sets legally binding emission reduction targets of 34% (by 2020) and 80% (by 2050).

Challenge D: To understand and protect human health in a changing environment

36. Urban Atmospheric Science Research Programme entitled ‘Clean Air for London (ClearfLo)’ (NERC, Defra, EA, Met Office)

Poor air quality, particularly in urban areas, has a demonstrable effect on human health, but the processes responsible for producing the main pollutants, namely particulate matter, ozone, nitrogen dioxide and heat are not well understood and are poorly predicted. The aim of this £2.9M NERC-led programme is to provide integrated measurements of the meteorology, composition and particulate loading of London's urban atmosphere.

37. Environmental and Social Ecology of Human Infectious Diseases Initiative – ESEI (MRC, NERC, ESRC, BBSRC)

As identified by the Foresight Detection and Identification of Infectious Diseases (DIID) Project, we need to respond to the threat from new and emerging pathogens so that we are better able to

anticipate, prepare for, and control future outbreaks. This ground-breaking £10M MRC-led initiative aims to establish novel inter-disciplinary approaches to studying the ecology of infectious diseases.

38. Environmental Exposure and Health Programme (NERC, MRC, DH, ESRC, Defra)

EEHI is led by NERC and also supported by the MRC, DH, ESRC and Defra. Between £8-10M is available to fund 4-6 large interdisciplinary research programmes for up to 4 years. It will provide important new knowledge on the interconnections and pathways between environmental pollutants and interacting stressors, exposure routes and health effects in humans, including variations in susceptibility and the definition of health risks.

39. MRC-HPA Centre for Environment and Health (MRC, DH/HPA)

This new £5.4M multi-disciplinary grouping using a mix of more traditional and leading edge techniques is centred around Imperial and Kings Colleges in London. It aims to identify and understand health impacts of a range of environmental changes on the scales that influence management policies and practices.

40. Insect Pollinators Initiative – IPI (BBSRC, Defra, NERC, SG)

This initiative (which also includes a significant contribution from the Wellcome Trust) will invest almost £10M in determining the importance of factors that lie behind the declines in pollinators (such as honeybees and bumblebees). Possible causes include disease, chemicals (such as pesticides), habitat change and a range of management practices. The research will aim to identify solutions that will help reverse the declines in this economically important group of organisms.

41. Detection and Identification of Infectious Agents Innovation Platform (TSB, DH)

Infectious diseases are a constant threat to the health and wealth of the nation. The research and development that will be funded by the Innovation Platform will be aimed at producing new rapid diagnostic tests and Point of Care (POC) devices for the detection and identification of infectious agents in both humans and animals. The range of diseases and areas chosen were prioritised by government (DH and Defra). This platform (currently £55M) may also potentially involve ESRC, EPSRC, BBSRC, Defra and MRC contributions.

42. Scoping of Reducing Uncertainty in Models for Environmental Decision-Making (NERC, Defra)

NERC, in collaboration with Defra is supporting a scoping study on ‘Reducing Uncertainty in Models for Environmental Decision-Making’. With the overall aim of enhancing the performance of environmental models, this £80k study will focus on identifying priority science questions that a future research programme on this topic should seek to address, together with possible funding mechanisms for such a programme.

43. Increasing resilience to natural hazards in volcanic and earthquake-prone regions (NERC, ESRC)

This £6.7M interdisciplinary programme aims to build resilience in earthquake-prone and volcanic regions by reducing risks from multiple natural hazards, increasing population resilience to high impact events, particularly as they increase in severity and frequency. A strong interdisciplinary approach to research throughout this programme aims to improve forecasting and uptake of scientific advice and increase understanding of vulnerability and risk.

44. Ecology of Infectious Diseases (EID)–US-UK Collaboration (ESRC, BBSRC, NSF, NIH)

This international £7.95M collaborative programme supports the development of predictive models and the discovery of principles governing the transmission dynamics of infectious disease agents, with a strong focus on interdisciplinarity. The funders are particularly keen to receive proposals for studies to better understand animal reservoirs as a source of infectious diseases, how animal pathogens spill-over into human populations, and the spread of those pathogens through

and between communities in the UK or other parts of the world. The aim is to fund research into pathogens that are considered to be a significant threat to public health now or in the future.

Challenge E: To make infrastructure, the built environment and transport systems resilient to environmental change, less carbon intensive and more socially acceptable

45. Adaptation and Resilience to a Changing Climate - ARCC (EPSRC, ESRC and Defra, with potential interest from DCLG and other Partners as the programme develops)

This programme will enable the design of urban systems that are more resilient to climate change. In May 2009 six new projects were funded. In addition a network for £0.4m was supported (operated by UKCIP) which brings together these projects with previously funded other climate change projects to give a programme of 13 projects with total funding in excess of £12M.

46. Intelligent Transport Systems and Services Innovation Platform (TSB, DfT, EPSRC)

This £56M platform is designed to, over 7+ years, help UK businesses develop innovative products and services in response to new market opportunities that may result from government interventions in transport. Through a series of strategic interventions, its aim is to encourage private-sector R&D with the potential to improve efficiencies in the overall transport network and/or promote lower-carbon travel choices.

47. Low Carbon Vehicles Innovation Platform (TSB, DfT, EPSRC)

This £89M platform aims to maximise the benefit to UK-based businesses of the rapidly-developing low carbon vehicles market, and to help accelerate the adoption of low carbon vehicles in the UK. The platform currently supports two key activities: 'The Low Carbon Vehicles Integrated Delivery Programme' and 'The Ultra Low Carbon Vehicle Demonstration Competition', both of which also involve key input from RDAs.

48. Low Impact Buildings Innovation Platform (TSB, NERC, ESRC, EPSRC, DCLG)

The UK cannot meet its declared environmental targets without dramatically improving the life-cycle environmental cost of buildings. This £53M platform aims to help the UK construction industry deliver buildings with a much lower environmental impact, responding to growing demand from customers and regulators.

49. Cross-government Biofuels Executive Research Board (DfT, Defra, DECC)

The biofuels executive research board brings together Chief Scientific Advisors from across Government and so provide a forum through which to monitor and manage research into biofuels and facilitate successful engagement with experts outside UK government. The three sponsoring Departments are expected to contribute £2million pa to biofuels research.

50. Land Based Renewables (NERC, NE plus Shell UK)

By 2020, the proposed EU requirement is that the UK meets 15% of its final energy demand from renewable sources, which equates to around 40% for electricity. There is an urgent research need to understand the environmental implications of this requirement, as the recent controversy over biofuels shows. Up to £2.4 million has been invested to date in support of collaborative grants to address this topic, including a financial contribution from Shell UK of £350k. Natural England is contributing support in kind to the research programme which has included expertise helping define the scope.

51. Science and Heritage Programme (AHRC, EPSRC)

This £8M programme takes forward recommendations made by the House of Lords Science and Technology Select Committee report on science and heritage of November 2006 which concluded that there was a compelling need for a comprehensive national strategy for heritage science which covered both immovable and moveable heritage. The joint five year research programme has a dual purpose: it will provide funding opportunities for high quality research to increase our understanding, and improve the resilience of cultural heritage in the face of 21st century

environmental change. It will also develop the heritage science community by funding networks and other awareness-raising and capacity building activities.

Challenge F: To understand the role of government, business and society in enabling all to live with environmental change

52. Social and Environmental Economic Research (SEER) into Multi-Objective Land Use Decision Making (ESRC, Defra)

This deliberately ambitious £1.8M research project examines arguably the most fundamental of all resource problems: the optimal use of land. It seeks to assess this using a novel methodology intended to undertake simultaneous economic assessment of both (a) the primary effects of policy, market or environmental change upon land use and (b) the second round, dynamic consequences of that change which may in turn generate multiple feedback effects upon various other environments.

53. Adapting Rural Living and Land Use to Environmental Change (RELU Phase IV) (ESRC, NERC, BBSRC, Defra, SG)

The RELU Programme is to fund (£1.2M) projects under a fourth call on the above theme, co-designed with LWEC. The projects will tackle two objectives. First: to build networks and capacity for creative knowledge exchange with a view to strengthening adaptive capacities. Second: to explore and promote novel approaches and partnerships for interdisciplinary research and analysis on living with environmental change in rural contexts.

54. ESRC Climate Change Leadership Fellowships (ESRC)

These six leadership fellows, involving a total of £2M funding, propose innovative approaches and application of leading edge social science to addressing key research issues in mitigating and/or adapting to climate change. Other LWEC partners have been involved in the peer review of the applications, and will be working with the fellows as their work evolves and findings are disseminated.

55. Flood, vulnerability and urban resilience: a real-time study of local recovery following the floods of June 2007 in Hull (ESRC, EPSRC, *EA*)

This £0.22M research used diaries, interviews and group discussions to follow the recovery experiences of people across Hull after the floods of June 2007 which affected over 8,600 households across the city. It had the following objectives:

- To identify and document key dimensions of the longer term experience of flood impact and flood recovery, including health, economic and social aspects.
- To examine how resilience and vulnerability were manifest in the interaction between everyday strategies of adaptation during the flood recovery process, and modes of institutional support and the management of infrastructure and the built environment.
- To explore to what extent the recovery process entailed the development of new forms of resilience and to identify the implications for developing local level resilience for flood recovery in the future.
- To develop an archive that will be accessible for future research into other aspects of flood recovery.

56. Resilient development in social science ecological systems (ESRC)

Research under this £0.25M fellowship will develop a deeper and broader social science understanding of resilience and how the concept is applied to linked social ecological systems. It will do this by drawing on theory across a range of social science disciplines, synthesising recent research findings, and undertaking new empirical investigation of resilience. It will produce a book provisionally titled 'Towards Resilient Development' and a series of scientific papers targeted to social science and interdisciplinary journals.

57. Centre for Business Relationships Accountability, Sustainability and Society (BRASS) (ESRC)

BRASS is a ~£5.2M joint venture between Cardiff University's School of City and Regional Planning, Business School, and Law School. It pursues high quality, interdisciplinary social science research and engagement with research users, to create knowledge and tools that will promote more sustainable stakeholder relationships amongst and within businesses, society and the environment. Environmental change is a common theme across BRASS projects, either as an influence of businesses, communities, organisations and consumers and their behaviour, or as a consequence of the activities of businesses and their stakeholders within our production and consumption systems.

58. Low Carbon Communities Challenge (DECC, Defra, DCLG, WAG)

The £10.9M LCCC is an innovative approach to policy development being taken forward by DECC, working alongside a number of government departments.

Recognising that Government doesn't necessarily know the best means of helping people cut their carbon emissions, the LCCC is a two-year research programme designed to test delivery options through practical delivery on the ground at community level. Through the project, Government is providing up to £500,000 to 22 test communities in England, Wales and Northern Ireland. Its aim is to support both technical innovation and understand the social changes that are needed to help meet carbon reduction targets.

59. Sustainable Practices Research Group (ESRC, Defra, SG)

The essence of this £1.6M programme of work is to enhance the social scientific understanding of habitual behaviour in areas of everyday consumption with consequences for environmental sustainability.

The Sustainable Practices Research Group (SPRG) will put particular emphasis on better understanding consumption - on the grounds that changing personal behaviour of billions of individuals provides the greatest of challenges to the achievement of sustainability. The Programme involves seven work packages which will deliver a multi-level analysis of three environmentally-sensitive practices - eating, water-use and sheltering.

60. Sustainable Lifestyles Research Group (ESRC, Defra, SG)

This £1.76M Group aims to achieve new and relevant understandings of the processes which lead to changes in people's behaviours and practices and to provide advice on realistic strategies to encourage more sustainable lifestyles. It will be coordinated through the University of Surrey under the direction of Professor Tim Jackson. Other key partners included the University of Bath, the University of Sussex and the institute of Fiscal studies.

61. Landscape and Environment Programme (AHRC)

The ~£6.6M Landscape and Environment Programme was created to support research from an arts and humanities perspective on issues related to landscape and environment. The core challenge for this programme was to advance knowledge, critically and creatively, of the cultural forms and processes shaping, and shaped by, landscape and environment.

LWEC accredited activity funding details as at 10/05/2011

LWEC Accredited Activity	LWEC Partner Contribution (£m or in kind (IK))																				Non LWEC contributions	Total Allocation (£m)	LWEC Challenge							
	NERC	ESRC	EPSRC	BBSRC	MRC	AHRC	Defra	DFID	DCLG	DfT	EA	WAG	SG	NE	SEPA	LGA	TSB	DECC	DH	Met Office			NIEA	FC	Climate	Ecosystems	Resources	Health	Infrastructure	Societal
1 Joint Weather and Climate Research Programme	8.1																			5.5			13.6	x						
2 Quantifying Uncertainty	1.43										0.025									0.08			1.546	x						
3 Avoiding Dangerous Climate Change						0.653												0.653					1.306	x	x		x	x		
4 Centre for Climate Change Economics and Policy		3.84																					7.34	x		x	x	x		
5 Tyndall Centre for Climate Change Research	1.271	0.331	0.764																				2.366	x		x	x	x		
6 Met Office Hadley Centre Climate Programme							40.4151											31.83					72.246	x		x	x	x		
7 Integrated Research Programme to assess the Impacts of Climate Change in the UK and Adaptation Options						tbc					tbc												1.044	x	x		x	x		
8 The Collaborative Centre of Excellence in Understanding and Managing Natural and Environmental Risks	0.3	0.3	0.3			0.3																	1.2	x	x		x			
9 Icesheets and Sea Level Rise	3.872085																			0.456			2.6958	7.0241	x		x	x	x	
10 Identification and modelling of the processes that govern climate on multi-decadal to centennial time-scales (NCAS Challenge II)	12.8																			2.8			0.6	16.2	x			x		
11 Agriculture GHG R&D Platform						10.8					IK	1.3											0.6	12.6	x					
12 Using earth sciences to understand climate changes and to predict their environmental responses	3.4			IK		0.03				IK													1.278	4.708	x	x		x	x	
13 Developing geoscience technologies for environmental monitoring	1.055					0.045																	0.16	1.26	x	x	x	x		
14 National Ecosystem Assessment	0.2	0.1				0.67482					0.04	0.23	IK								0.028			1.27	x	x	x			
15 UK Ocean Acidification Research Programme	7.7					3.7												1						12.4	x	x	x			
16 Designing a Programme to Address Evidence Gaps in Greenhouse Gas and Carbon Flux from UK Peatlands						0.005				IK	0.01	0.007	IK					0.005				0.005	0.008	0.04	x	x				
17 Pilot Review Scheme – Objective B	IK					0.01																		0.01	x					
18 Demonstration Test Catchments						7.7				IK	0.3													8	x	x	x			
19 OPAL (Open Air Laboratories)						0.04				IK													11.75	11.79	x	x	x	x		
20 Marine predators as indicators of the integrity and health of marine ecosystems	12					3						4	0.2									1	20.2	20.2	x	x	x			
21 Continuous Plankton Recorder (CPR) survey	1.99					1.635																2.33	5.955	5.955	x	x				
22 Character and Quality of England's Landscapes (CQEL)						IK							0.95								IK		0.95	0.95	x			x		
23 Knowledge-based Sustainable Management for Europe's Seas (KnowSeas)	0.15					0.08																6.1116	6.3357	6.3357	x	x	x		x	
24 Southern Ocean Fisheries and Climate Change	4.06																					1.425	5.485	5.485	x	x	x	x		
25 Network for Valuing Biodiversity, Ecosystem Services & Natural Resources	0.60																						0.6	0.6	x				x	
26 Macronutrients Cycles Programme	9.55					IK				IK	IK	IK											9.55	9.55	x	x	x	x		
27 Marine Renewable Energy	2.40					1.30																	3.7	3.7	x					
28 Algal Bioenergy Special Interest Group	0.73																0.04						0.77	0.77	x		x			
29 BioMara (Sustainable Fuels from Marine Biomass)												0.84										5.1604	6	6	x			x		
30 Sustainable Marine Bioresources	0.7					0.7																IK	1.4	1.4	x	x				
31 Ecosystem Services for Poverty Alleviation	10	3.5				IK		27															40.5	40.5	x	x	x	x	x	
32 Changing Water Cycle Programme	10.1																						tbc	10.1	10.1	x	x	x		
33 The Waste of the World		3.00242																					3.0024	3.0024		x	x	x	x	
34 BGS Groundwater Science	5.09					0.102	0.28				0.3				0.09								0.102	5.964	5.964	x	x	x		
35 BGS Minerals and Waste theme	3.4					0.75		0.85															3.065	8.065	8.065	x	x	x		x
36 Urban Atmospheric Science programme "ClearLo"	2.9					IK				IK										IK		IK	2.9	2.9	x		x	x		
37 Environmental and Social Ecology of Human Infectious Diseases Initiative	4	1.5		2	4.2																			11.7	11.7		x			
38 Environmental Exposure and Health	3	0.75			3			0.1											1.1				7.95	7.95		x				
39 MRC-HPA Centre for Environment and Health					3														2.4			IK	5.4	5.4		x				
40 Insect Pollinators Initiative	1.5			2.5		2.6						0.5											2.5	9.6	9.6	x	x	x		
41 Detection and Identification of Infectious Agents Innovation Platform		tbc	tbc	tbc	tbc	tbc											50			5				55	55		x			
42 Scoping of Reducing Uncertainty in Models for Environmental Decision-Making	0.04					0.04																		0.08	0.08		x			
43 Increasing resilience to natural hazards in volcanic and earthquake-prone regions	5.5	1.2																						6.7	6.7		x	x		
44 Ecology of Infectious Diseases (EID) – US-UK Collaboration		0.8		1																		6.15	7.95	7.95	x	x	x	x	x	
45 Adaptation and Resilience to a Changing Climate	IK		12			0.4																		12.4	12.4	x		x		
46 Intelligent Transport Systems and Services Innovation Platform			3							3													50	56	56	x		x		
47 Low Carbon Vehicles Innovation Platform			7							27													50	89	89	x		x		
48 Low Impact Buildings Innovation Platform	1	1	1					tbc															50	53	53	x		x		
49 Cross-government Biofuels Executive Research Board						0.25			1.5									0.25						2	2	x		x		
50 Land Based Renewables	2.1											IK											0.35	2.45	2.45	x	x	x		
51 Science and Heritage Programme			4.04			4.54																		8.58	8.58	x	x		x	
52 Social and Environmental Economic Research (SEER) into Multi-Objective Land Use Decision Making		1.822				IK																		1.822	1.822		x		x	
53 Adapting Rural Living and Land Use to Environmental Change (RELU Phase IV)	0.7056	0.2704		0.291		0.0416						0.13												1.44	1.44	x	x	x	x	x
54 ESRC Climate Change Leadership Fellowships		1.556																						1.556	1.556				x	x
55 Flood, vulnerability and urban resilience: a real-time study of local recovery following the floods of June 2007 in Hull		0.10634	0.044								0.07													0.2203	0.2203				x	x
56 Resilient development in social science ecological systems		0.2502																						0.2502	0.2502		x	x		
57 Centre for Business Relationships Accountability, Sustainability and Society (BRASS)		5.23385																						5.2339	5.2339	x	x	x	x	x
58 Low Carbon Communities Challenge (LCCC)								IK			IK							10.5					0.32	10.92	10.92	x	x	x	x	x
59 Sustainable Practices Research Group (SPRG)		1.35				0.15						0.1												1.6	1.6	x	x	x		
60 Sustainable Lifestyles Research Group (SLRG)		0.15				1.51						0.1												1.76	1.76	x	x	x		
61 Landscape and Environment Programme						6.679																		6.679	6.679	x			x	
TOTAL	121.64	27.06	28.15	5.79	10.20	11.22	77.13	27.28	0.85	31.50	0.40	0.34	7.21	1.16	0.09	0.00	200.04	44.24	8.50	8.84	0.03									