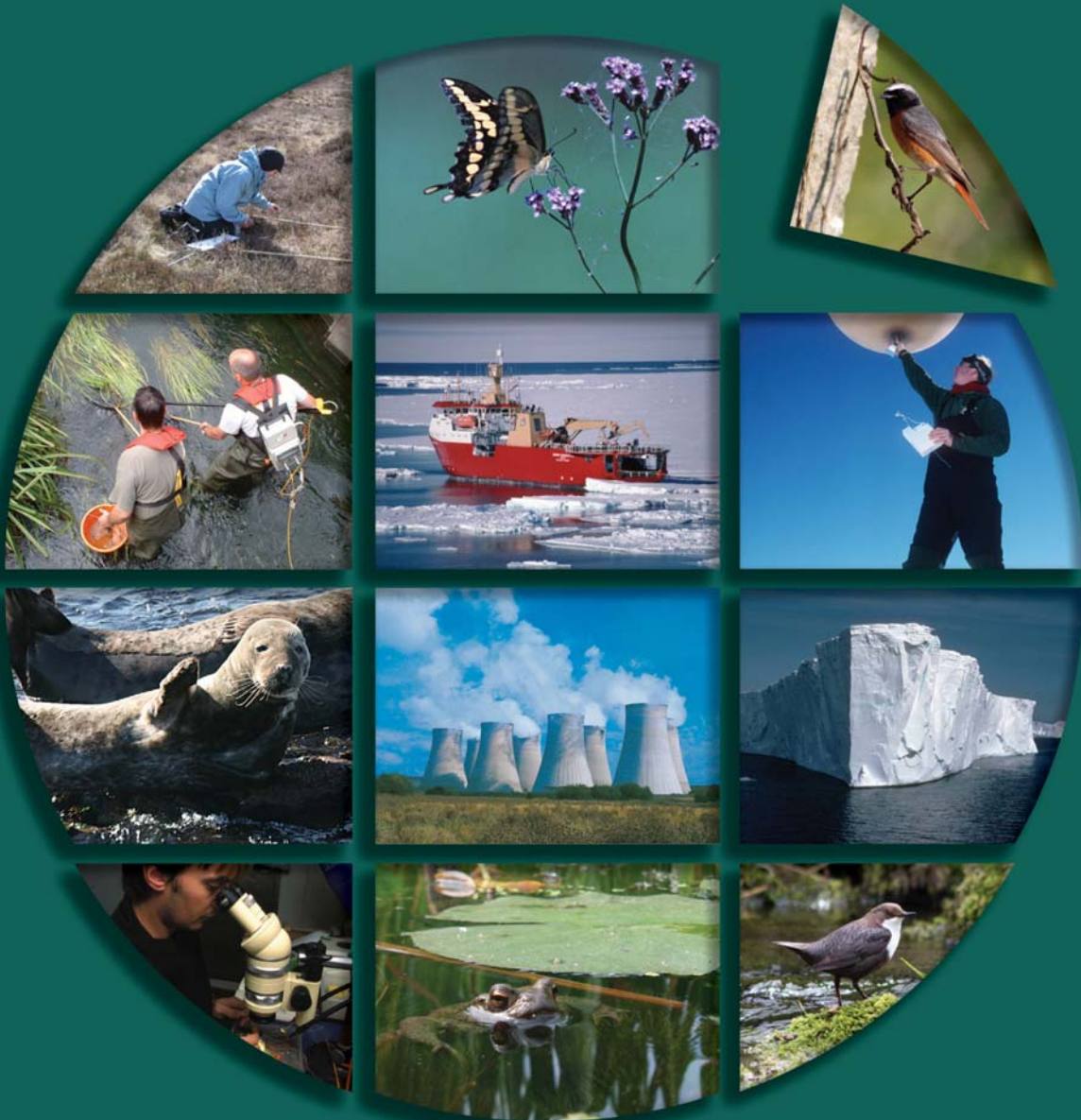


UK Environmental Observation Framework



Launch and Inaugural Workshop Report 2008



**Environment Research
Fundings' Forum**

The UK-EOF is a programme within the Environment Research Fundings' Forum

Acknowledgements

ERFF and the UK-EOF team Beth Greenway, Debbie King, Andrea Leedale and Gemma Truelove would like to thank the key speakers; Bob Watson, Alan Thorpe, Maggie Gill, Doug Wilson, Andy Shaw, Chris Reid, Alec Tang and Lawrence Way, The UK-EOF Management Group; Ian Davidson, Peter Costigan, Liam Kelly, Doug Wilson, Lawrence Way, Andy Shaw, Alan Whitelaw, Michael Schultz, Keith Porter, Paul Rose, Helen Sellars, Steve Aston, Lawrence Way, and the facilitators; Arwyn Davies, Steven Hill, Stephen Malcolm, Matthew Frost, Zof Stott, John Custance, Robert Lawson, Alec Tang, Ruth Kellman and Kesia Trench. Without their help and enthusiasm we would not have been able to conduct such a successful launch and workshop.

Executive Summary

Professor Bob Watson, Chief Scientific Advisor for Defra, launched the UK-Environmental Observation Framework, on 17th July 2008. This was followed immediately by the inaugural workshop.

There were over 160 attendees from a large range of organisations including senior representatives from the major funding bodies. Professor Alan Thorpe, NERC, Professor Maggie Gill, Scottish Government and Doug Wilson, the Environment Agency, supported Professor Watson in highlighting the need for overarching coordination of environmental observations in the UK. They each outlined the contribution the UK-EOF could make to their own organisations and the ability of the UK as a whole to input into international programmes. Further support for the UK-EOF was illustrated by the key speakers who explained how the framework will help to increase awareness between organisations and will allow the UK to gain a better understanding of their observation investments and encourage collection and reuse of high quality data.

The inaugural workshop gave delegates an opportunity to familiarise with the structure and outcomes of the framework and input directly into workstream 5 which is identifying who the observation community is and how best this can influence and drive the UK-EOF, and workstream 1 which is beginning the difficult task of articulating what the UK needs and/or wants to observe. Presentations from community members highlighted some of the challenges and considerations facing the UK-EOF.

The first breakout sessions focused on how best to cluster the community. Delegates were presented with three potential models. It was concluded that no one model would provide a definitive solution, each had their strengths and weaknesses but could be used in combination or for different purposes. It was suggested that the clusters should not be static groups nor should organisations be confined to one 'cluster' alone.

Discussions on the second day focused on the Statement of Need (Work stream 1, Collective Aspirations). Delegates were asked various questions regarding why we take environmental observations and what is needed? The task of producing a statement of need was acknowledged as very difficult. The first Statement of Need will be high level and then over time, more specific needs will be articulated. These needs will be mapped onto existing work in order to develop actions either by the UK-EOF or the members themselves. At all stages in the process the community will be consulted.

In conclusion, the launch and workshop generated appreciation of the need for the UK-EOF and for the complex and challenging agenda that it faces. It also illustrated the diversity of the community and the breadth of environmental observations undertaken in or on behalf of the UK. Both the support from senior representatives of partner organizations and the enthusiasm of the community was noted. This support and momentum will be used to drive the UK-EOF forward over the next few years. Over the coming year the UK-EOF will publish a delivery plan, produce guidelines for costing environmental observations, improve the metadata catalogue of observations and facilitate and encourage issues of data sharing policy to be addressed.

Further information on the UK-EOF can be found on the ERFF website: <http://www.erff.org.uk/activities/uk-eof.aspx>

Contents

Acknowledgements	i
Executive Summary	ii
Contents.....	1
1. Introduction	2
2. Launch of the UK-EOF.....	2
2.1 Bob Watson, Chief Scientific Advisor, Defra	2
2.2 Alan Thorpe, Chief Executive, NERC.....	3
2.3 Doug Wilson, Head of Monitoring and Assessment, Environment Agency ...	4
2.4 Maggie Gill, Chief Scientific Advisor for Rural Affairs within the Scottish Government ..	4
2.5 Beth Greenaway, UK-EOF Programme Manager	5
2.6 Question and Answers	5
3. Media Coverage.....	7
4. Inaugural Workshop	8
4.1 Introduction to the UK-EOF team	8
4.2 Breakout 1: ‘Icebreaker’ who we are and what are the issues?	9
4.3 Observation Clusters Strawman.....	10
4.4 Breakout 2: Shaping the Observation Clusters	10
4.5 Summary and Conclusion of Day One of the inaugural workshop	12
4.6 Day Two of the inaugural workshop	13
4.7 Inspirational Presentations	13
4.8 Statement of Need.....	14
4.9 Breakout 3: Developing the Statement of Need	15
5. Conclusions.....	18
6. Next Steps.....	19
Appendix A: Agenda	20
Appendix B: Delegate List.....	23
Appendix C: Material for Group Breakout Sessions.....	30
1. Breakout 1: Icebreaker maps and questions	30
2. Breakout 2: Shaping the Clusters models	31
3. Breakout 3: Developing the Statement of Need	33
Appendix D: Facilitators and Reporters	35
Appendix E: Press Release	36

1. Introduction

Professor Bob Watson, the Chief Scientific Advisor for Defra, launched the UK-Environmental Observation Framework on 17th July 2008. The event was attended by over 160 members of the diverse environmental observation community; participants included representatives from government departments, agencies, non-governmental bodies, research councils, universities, consultancies, and industry. Over 130 delegates stayed on for the inaugural workshop. The 2-day workshop familiarised delegates with the framework and provided an opportunity for the community to voice their opinions.

The detailed outputs from the workshop will be fed into the various workstreams being taken forward under the framework. This report is an overview of the issues raised.

2. Launch of the UK-EOF

Delegates gathered in the lecture theatre in Savoy Place where Ian Davidson welcomed all to the Launch of the UK-EOF and invited Bob Watson to officially launch the initiative and outline the key messages that need to be tackled. This was followed by presentations from senior representatives of the major funding organisations and a questions and answers session.

The following is a brief summary of each talk. The presentations can be found on the UKL-EOF launch page on the ERFF website (<http://www.erff.org.uk>).

2.1 Bob Watson, Chief Scientific Advisor, Defra

Bob Watson began by explaining the importance of scientific evidence, on both a global and local scale, to inform and formulate policy. Reliable datasets are required to assess trends and changes in the environment, test or initialise theoretical models and also to monitor the effectiveness of policies.

Bob continued by providing some background to the development of the UK-EOF. In 2006, an ERFF review of environmental monitoring showed that within the UK, environmental monitoring is currently fragmented, uncoordinated and lacks strategic direction. Issues such as funding of long-term datasets, data accessibility and missed



Professor Bob Watson

observation opportunities were also raised. The UK-EOF was developed in response to the main recommendation that there is a need for overarching coordination of environmental observations within the UK.

To illustrate how observations can shape policy, Bob presented examples, including Atmospheric ozone, in which the detection of ozone depletion led to changes made under the Montreal convention; Ecological observations, where both ground and satellite observations have been used to monitor deforestation, flood boundaries and marine and coastal environments; and Climate Change, where observations have aided our understanding of the causes and consequences.

Bob then discussed forthcoming challenges such as the Marine Bill, the Climate Change Bill, environmental change and the new ecosystem services approach. To address these changes many sources of information and data will be required, we therefore need to work together across the public, voluntary and industrial sectors, to generate and share this information. The UK-EOF provides an opportunity to achieve this and the initiative is fully supported by Debra. Bob himself, has taken on the role of government champion and Ian Davidson is chairing the UK-EOF Management Group. Many others across Defra will be included as the programme progresses.

2.2 Alan Thorpe, Chief Executive of NERC

Alan Thorpe followed Bob with a presentation on the NERC perspective of environmental observations. NERC spends approx £100 million per annum on observations for research purposes, this includes: satellite measurements, ground based remote sensing, *insitu* measurements from platforms such as vessels (ships, aircraft), laboratory instrumentation, analytical facilities (available to the community) and discipline based data centres (e.g. atmospheric, oceanographic, geological etc).

Investment in science and technology has led to improved understanding and accuracy of environmental observations; Alan used the thermometer as an example. A fluctuation in the temperature record after WWII, was not due to a decrease in temperature but due to using non standardised data, this understanding has led to improved precision in data handling and accuracy of records. Alan also highlighted the importance of information gained from satellite technology and the ability to provide daily records from highly variable datasets. The Atlantic Meridional Overturning Circulation (MOC) is highly variable, however by collecting daily observations over long time periods it is now possible to view the overall trends. This data will aid our understanding and prediction of the effects of climate change.

NERC is not working in isolation, it is also involved in partnerships such as the Countryside Survey, which by using high quality standardised protocols and satellite imagery, is providing a view of large scale rural change over the last 30 years.

The priority for NERC is to undertake observations for research purposes, however often research observations are highly policy relevant. The challenge is to transfer research based observations to operational, the UK-EOF may provide some help in achieving this. It will also help to provide an understanding of other organisations' portfolios. The framework will contribute to work that NERC is doing under the National Capability Funding Stream, and will provide evidence to help NERC prioritise their funding of long-term measurements.

2.3 Doug Wilson, Head of Monitoring and Assessment, Environment Agency.

The Environment Agency welcomes the initiative. Currently there are many emerging pressures and challenges that need new information. Environmental observations should drive the priorities for agencies. The UK-EOF provides an opportunity for all to see how their work fits into the UK programme as a whole. This will help to develop adaptive observation programmes, drive and inform priorities, gain better understanding of the costs (or investments) and will encourage the collection and reuse of high quality data.

Data collection and sharing should be efficient so that the data can be used many times. Reuse of data is an issue; generally data quality is not known and so it is often recollected rather than reused. There are various solutions; we must ensure quality data is collected and also change our mindset towards reusing the data.

The EA is leading the UK-EOF workstream 4a, the aim of which is to reduce the vast uncertainty in our understanding of the current spend on observations (currently estimated as between £88 –500 million).

2.4 Maggie Gill, Chief Scientific Advisor for Rural Affairs and Environment within the Scottish Government



Professor Maggie Gill

Maggie gave an overview of the aims and achievements of the Environment Research Funders' Forum, and the use of evidence for policy.

ERFF has 19 public sector partner organisations who all have an interest in funding environmental science. A common aim is to improve the understanding of each other's objectives and develop effective programmes. The UK-EOF is one of a number of projects that ERFF is running, including research coordination, horizon scanning, science into policy and a skills need review.

ERFF aims to facilitate the constant dialogue that is needed between policy makers and scientists to ensure that the evidence being gathered is relevant and useful. This is important as various bills evolve; Scotland,

England and Wales may have separate bills but we do not want to duplicate data collection. The

evidence requirement does not stop at policy development, policy implementation such as the impact of the policy on land/water managers, users and industries must also be considered.

ERFF is working to form effective functioning partnerships which will help to integrate science (across time, spatial scales and science disciplines) to inform evidence based policy. ERFF has helped to develop progression of work from the forum into programmes such as Living with Environmental Change. In this way it is forging partnerships that can help to address emerging issues.

2.5 Beth Greenaway, UK-EOF Programme Manager

In the final presentation Beth summarised the background and key concepts of the UK-EOF. The framework has resulted from recommendations of a review of environmental monitoring within the UK.

The framework aims to “*develop a holistic picture of what the overall evidence needs are and the role of observation in providing this information*”. The outcomes will be achieved in a series of workstreams which will address the questions we are trying to answer, who is collecting the data, how it is being used, the investments being made and the decision making processes.

Forthcoming outputs will include:

- A high-level Statement of Need (discussed in the workshop)
- A Data Think Tank, led by Bob Watson (September 2008)
- Outputs from a short-term project on guidelines for costing environmental observations.
- An inventory of existing activities (the observations catalogue).

There is a large task ahead and a core team of three who have joined the ERFF secretariat to facilitate the work. The aims and outcomes will only be realised with extensive engagement and input from the member organisations and the observation community.

Beth gave a short overview of the workshop, which followed the Launch and made delegates aware of the four stalls which were on display. These covered existing coordination of marine observations (UKMMAS), global observation programmes, biodiversity observations and ERFF itself.

2.6 Questions and Answers Session

Ian Davidson invited delegates to direct any questions to the panel of Key Speakers.

Q. *Would Professor Watson, have prioritised the measurement of ozone back in 1978, when at the time the British Antarctic Survey were questioning whether the measurements should be continued? To what extent should the UK-EOF focus on international collaboration?*

A. We need to be ready for surprises, therefore we do need to look at UK observations in an International/European context. Coordination now is better than it was 20 years ago, however we must ‘get our own house in order first’, and understand what and why we are undertaking monitoring, before we move onto how we can collaborate internationally.

Q. *How will the social scientist/science policy interface work, can we afford to leave out the rest of the British Isles whilst concentrating on the UK and Devolved Administrations?*

A. In some places the science/policy interface works well. Sir David King introduced Chief Scientific Advisors (CSAs) to all government departments; most CSAs have science advisory councils, which do include advisors from universities.

Good practise has been demonstrated in IPCC, Millennium Ecosystem Assessment and the Agricultural Assessment, where science has provided input/evidence to the policy assessment, made by policy colleagues. For policy it is a question of what information is useful. Both LWEC and ERFF provide the mechanisms for dialogue to discuss science/policy challenges. Wider academia (research institutes etc)

which are not members of ERFF are included, their engagement is also achieved via contracts to answer policy specific questions. We need to focus on understanding each other's portfolios, and how various timescales we operate on impact on different communities.

Q. *Does the panel agree that the financing of environmental observations should be considered as an investment rather than a cost?*

A. Yes. We should talk of investments, assets and the significant rate of return rather than cost, which is often viewed as a burden. We must speak the language of the Treasury – they want to know the value for money.

Q. *We are committed to a climate change risk assessment in 2011, how will data be pulled together to support this (and how will the UK-EOF help in this process)? These assessments are often on a short timescale. How can we encourage socio-economic data to come forward?*

A. Defra is tendering a study to understand the scope of the 2011 assessment and how to undertake cost-benefit analysis. A literature review will be undertaken, however we are aware that observation data may not be available for the first assessment in 2011. By 2016, we will hope to have a more coherent observation base. Both the Climate Change Bill and the subsequent risk assessments are mentioned in the Framework document. At present no-one has an overview of global climate observations - the Framework may help to address this. An aim of the UK-EOF is to bring together the metadata and even though different partners have different requirements, by bringing the community together, we will be able to achieve a more coherent view of the needs. The Marine Climate Change Impact Partnership has done much work to mobilise this in the marine area.

Q. *Government departments and agencies have a statutory focus, while the research councils tend to carry out international initiatives. Today there has been much talk of the importance for the UK to undertake strategic monitoring within a global context. Is this 'model' sustainable - should the agencies take on more global observations?*

A. LWEC includes an international direction, therefore it is moving towards breaking down the divide of solely observing the UK. DFID are involved in both ERFF and LWEC and they provide an international perspective. The EA is linked with Wales, and SEPA in Scotland however there is a need and opportunity to look at what is happening at the European level and forge the relevant links.

The British Government structure is not ideal for supporting long-term observations. It is very different from the USA, where long-term observations are carried out by specific agencies, e.g. Space is covered by NASA, who develop the platforms and NOAA who operationally use the platforms. This system does not exist in the UK and there is the perpetual question of who should fund the long-term programmes. The UK-EOF provides a chance to ask whether the current UK structure enables delivery of its observation needs. High-level discussions will be needed to address this.

Q. *Is there a cultural difference between compliance and research monitoring?*

A. It is not a question of cultural difference, different scientists just have different mind-sets, researchers may want to answer exciting short-term questions, however long term trends are just as important as short-term discoveries. Defra science is generally focussed on short-term policy questions. Therefore responsibility for funding long-term observations is uncertain. It currently falls into a gap, which does need to be addressed. Getting the balance between all types of observations is the long-term aim of the UK-EOF.



Key Speaker panel (From right to left: Bob Watson, Alan Thorpe, Maggie Gill, Doug Wilson and Beth Greenaway).

3. Media Coverage

A press release was written by ERFF on behalf of its sponsors (see Appendix E). ERFF is aware of the following coverage:

- Defra News Release (<http://www.defra.gov.uk/news/2008/080717a.htm>)
- News Distribution Service for Government and the public sector (<http://nds.coi.gov.uk/imagelibrary/detail.asp?MediaDetailsID=247386>)
- Habitat: Daily wildlife and environmental news from the British Isles (<http://www.habitat.org.uk/17078.htm>)
- Info4localgov.uk
- Ecology and Policy website (<http://ecologyandpolicy.blogspot.com/2008/07/uk-environmental-observation-framework.html>)
- Water Briefing (<http://www.waterbriefing.org/>)
- Environmental Expert.com
- British Embassy in the USA: (http://www.britainusa.com/science/energy_environment/index.asp)
- JNCC press release (<http://www.jncc.gov.uk/page-9>)
- CEH website (http://www.ceh.ac.uk/news/news_archive/Eventsandawards.html)
- Smarter Science.com
- Oil and Gas Environmental Legislation Website: (<http://www.ukooaenvironmentallegislation.co.uk/>)
- Scoop.co.nz

4. Inaugural Workshop

After the Launch, over 130 delegates returned for the UK-EOF inaugural workshop. The workshop, held over 2-days, provided delegates with more information about the initiative. Delegates were invited to provide their opinion and input during facilitated group sessions on shaping the observation clusters and development of the Statement of Need, held on Thursday afternoon and Friday morning respectively.

The following is an overview of the discussion and initial conclusions, the details are being considered by the UK-EOF team.

All the presentations for the workshop are available on the UK-EOF launch and inaugural workshop pages of the ERFF website (<http://www.erff.org.uk>)

4.1 Introduction to the UK-EOF Team

Ian Davidson welcomed all delegates to the Inaugural workshop and invited the UK-EOF Programme manager, **Beth Greenaway**, to **introduce the team and present the concepts, outcomes and structure of the new framework.**

The UK-EOF was formed as a result of a recommendation from a review of terrestrial and freshwater environmental monitoring, a summary report of this work is available on the ERFF website: <http://www.erff.org.uk/publications/reports/2007-02-enviro-monitoring.aspx>. The UK-EOF is being taken forward as a programme of work under the Environment Research Funders' Forum. It has similarities and overlaps with other areas of ERFF's portfolio, such as the Coordination of Research, Horizon Scanning and Skill Needs Review.

The outcomes of the UK-EOF will be delivered in five workstreams. The first workstream will address the Statement of Need, which was discussed on Day two of the workshop. Workstream 2 concerns data, for clarity it has been split into three related areas: Gemma Truelove will take forward 2a, which will upgrade and further populate the current monitoring database. 2b Data sharing policy will be taken forward by Debbie King and will address the complex issues of data sharing. The third part, 2c will generate a data suitability tag.

Workstream 3, which will commence in 2009, concerns assessment coordination and knowledge transfer. Financial mechanisms will be addressed in two parts under workstream 4. The first part, to develop guidelines on how to cost environmental observations, is being undertaken by Assimila Ltd. The short project is currently being finalised, this will be followed by inviting organisations to update the costing information of known observation programmes in a more uniform manner. Workstream 4b will look at the issues surrounding long term, multiagency or international financing mechanisms. The final workstream (WS5), will ensure that the community is involved in the framework. The community will be organised into clusters, how they will be organised was the subject of the second group session (see below). Within WS5 'champions for observations' will be identified in each organisation to act as the catalyst for ownership, communication and transfer of best practice.

During 2008/09 the UK-EOF will produce a Statement of Need and an options paper for financial models. It will start addressing data policy issues, begin work on the metadatabase and develop a data suitability tag. The Management Group and Secretariat are already in place, community clusters will be organised to take the programme forward.

Presentation: Andy Shaw (BNSC and NERC)

Andy gave a short presentation to highlight some of the international observations being funded by the UK and their role in responding to our changing environment.

The changes (and challenges) to the global environment were discussed, such as melting polar ice caps, increasing desertification etc. The importance of the international and the European response to address the issues were presented, (Global Earth observation System of Systems (GEOSS) and GMES/ESA respectively, as was the role that the UK is currently playing and could play in the future.

4.2 Breakout 1: 'Icebreaker', who we are and what are the issues?

The first group breakout session was designed to familiarise the delegates with the breadth of organisations and observations that the UK-EOF community cover. It also provided the community a chance to share the issues that they would like the UK-EOF to address.

Delegates were split into twelve groups and asked the following:

- Please identify yourself to the group and describe your role.
- What is your sphere of interest, geographically and technically?
- What are the key issues that concern you about environmental observations?

Delegates were given two differently coloured post its and were asked to write down their role/interest on one colour and their main concerns with obtaining environmental observations on the other. The delegates then introduced themselves to the group and stuck the post its onto the relevant location of a UK or global map.

The visual aids used in this breakout can be found in Appendix C1.



Feedback from Breakout 1

The facilitators from each of the twelve icebreaker groups reported a) the range of people they had in their group and b) the three main issues that their group had discussed.

The background and interests of delegates ranged widely from government departments, agencies, research councils, trusts, universities, SMEs and private companies. The majority of delegates were working within the UK, however a significant number worked on observations that had links to international or global programmes.

Many issues were raised. The most frequently discussed included:

- Data (intellectual property rights, quality, is it fit for purpose)
- Funding (continuity of funding for projects/long-term programmes),
- The need to breakdown barriers to working across organisations or topic areas.
- Inclusion of the private and volunteer sectors as stakeholders
- The need to improve integration of UK and international observation programmes with respect to global coverage.

Other concerns surrounded duplication of information or ongoing initiatives, the efficient transfer from research to operational schemes, consideration of the unknown unknowns and skills that will be required in the future. Delegates also highlighted that we should not overlook the fact that observation programmes may need to increase in some areas but may be redundant in others.

4.3 Observation Clusters Strawman

From the icebreaker it was clear that the UK-EOF covers a broad and diverse observation community. For the UK-EOF to succeed it is essential that the community is allowed to play a role. **Beth Greenaway introduced the idea of observation clusters**, as a method of organising and communicating with the community.

Observation clusters are proposed under the UK-EOF structure in order to:

- Respond to and influence the UK-EOF
- Articulate the needs of the community
- Match the needs to existing activities and identify the gaps
- Ensure that a diverse community is involved
- Share tools, techniques, improve operational efficiency and celebrate and share results.

The type of observations or organisation can be grouped (clustered) in a number of ways. Three potential cluster models were suggested (see Annex C2) these included 1) using organisational type such as the PSVI (Policy, Science, Voluntary and Industry), 2) by domains (e.g. what in), and 3) clustering by observations which answer particular Questions (several existing initiatives e.g. NERC themes, LWEC, UKMMAS, ERFF EPICS (Earth Systems, Pressures, Impacts, Consequences and Solutions) were used as examples). The list is not exhaustive and other suggestions were welcomed.

A strawman was presented to stimulate discussion and debate:

“The UK-EOF observation clusters should, for practical and pragmatic reasons be based on the major domains. The key questions being answered will be captured in the Statement of Need and the Management Group will have an overview of the cluster activities and how they match to the questions. Where issues need to be resolved at organizational level the PSVI model will be most helpful”

4.4 Breakout 2: Shaping the Observation Clusters

After the presentation the second group session aimed to obtain the opinion of the community with respect to how the community, which undertakes the monitoring programmes, could be clustered.

Delegates were split into 4 breakout groups. Each group was asked to discuss the pros and cons of each of the 3 theoretical models and indicate when it would be most appropriate to use the model in question. They were asked to write their views down on ‘post-its’ and attach them to the relevant model. The facilitator summarised the information to provide feedback to all delegates.

The visual aids used in this breakout can be found in Appendix C2.

Feedback on Shaping the Observation Clusters

Detailed information from the group discussion was captured on post-it notes. This information will be analysed by the UK-EOF and considered in future 'observation cluster' discussions. Facilitators were asked to present the main pros and cons for each model, this reported information is captured below.

None of the groups thought that any one model gave the definitive solution, each has their pros and cons, and the constraints (as illustrated below) should be considered. However it was suggested that they could be used in combination or individually at different stages of the programme.

Domains model:

Pros	Cons	Potential Use
<ul style="list-style-type: none"> • Many data-centres are organised by domains. • Networks (which could be used as domains) already exist, therefore people can readily identify with the domains model 	<ul style="list-style-type: none"> • The Domain groupings could create silos or isolation of groups • The model is a very simplistic view of the community • Some networks already exist, therefore using this model will not add any value to what we already have in place. • Problems may arise at the interfaces between the domain groupings. • Questions may be generated which will cross over with the questions/issues model. 	<ul style="list-style-type: none"> • It is likely there would be more ownership of the data, therefore the model could be used when addressing long-term data continuity.

PSVI Model

Pros	Cons	Potential Use
<ul style="list-style-type: none"> • The model brings together people with similar interests • The model is easily understood. 	<ul style="list-style-type: none"> • The model may encourage the formation of silos and lead to fragmentation • Problems could arise at the interfaces between policy, science, voluntary and industry groupings 	<ul style="list-style-type: none"> • The model could be used as an analytical tool to address specific issues • It could be used in combination with another model to give a wider picture. • The model could be used to implement solutions which may need to be tailored to different sectors

Big questions/issues model

Pros	Cons	Potential Use
<ul style="list-style-type: none"> • The model provides similarities (and thus allows comparability) with GEOSS Societal Benefits 	<ul style="list-style-type: none"> • Questions are time limited (however they could be rephrased to increase their lifespan). • Questions are often policy 	<ul style="list-style-type: none"> • The model could be used to address short-term policy issues.

<ul style="list-style-type: none"> • The Big Questions model will permit the community to come together to focus on and provide solutions to key issues. 	<p>focussed and therefore short term, science questions must also be included.</p> <ul style="list-style-type: none"> • Several delegates thought industry would find it difficult to map onto this model. 	
---	---	--

Some general issues were raised about the models and clustering:

- If the UK-EOF is to succeed then it must ask the big questions, it was understood that these would be addressed in the Statement of Need.
- A concern of using clusters is that groups may work in isolation, this is contrary to the aims of the UK-EOF. It was suggested integration should be encouraged and organisations not limited to a sole cluster. The clusters should not be static, permanent entities.
- Many networks already exist. Could these be built upon and knowledge transfer networks set up to facilitate integration between the existing networks?
- A variation on the domains model could be to use functional groupings e.g. data users vs providers. However this may lead to complications when stakeholders sit within both groups.
- Several groups highlighted that GEOSS had already done work along these lines, therefore it was suggested that a similar model of societal benefits should be considered. The GEOSS model could be used to articulate key questions/issues.
- The UK does need an interface with the international networks but it must also be UK specific. Monitoring is involved in tracking changes in the environment therefore could we take direction from the Millennium Ecosystem Assessment to fit into an international model?
- The UK-EOF needs to address the barriers that effect the development of an integrated system (and the corresponding tools), therefore it was suggested that holding a separate workshop on funding and accessibility might be of benefit.

4.5 Summary and Conclusion of Day One of the inaugural workshop

Ian Davidson thanked all the delegates for their input and enthusiasm.

The UK-EOF has engaged with a wide range of stakeholders and although some may still be missing it is clear that there are common issues such as, funding, data access and the role of the UK on an international level, which need to be addressed. It is reassuring that the UK-EOF workstreams consider the issues raised.

Discussions indicated that the skills agenda and whether the right skills exist within the community are important. ERFF is currently carrying out work in this area, therefore the UK-EOF community should forge links into this.

Some monitoring and observations are carried out on different timescales (for example, soil surveys and geology), it is essential that all areas are included. The UK-EOF should also ensure that the unknown unknowns are addressed.

Ian closed the day by inviting all delegates to a social networking event on the Tattershall Castle.

4.6 Day Two of the inaugural workshop

Peter Costigan opened the second day of the workshop. The focus for the second day of the workshop was to discuss how the needs will be articulated and expressed in order to obtain a robust, holistic view of the observations needed.

4.7 Inspirational presentations

Peter welcomed key speakers to give examples of where observation programmes and initiatives can inspire best practise and use of long time series.

Chris Reid, SAHFOS

Chris introduced the Continuous Plankton Recorder, the longest running marine dataset in the world. Examples of how the data are used were presented and emphasis placed on how time series data often asks the questions, thus highlighting the importance of undertaking research in parallel to the monitoring.

The issue of funding long-term data sets was raised. The CPR faced closure in the 1980's due to a lack of funding, during this time a regime shift in the plankton was recorded, if the programme had been terminated this shift would have been missed. Both the CPR and ARGO floats, which provide (limited) global coverage, are funded from research rather than monitoring budgets*.

There is a historical bias towards terrestrial observations. The oceans respond more rapidly than land, therefore it is a good indicator of what is happening, however it is poorly observed. CPR activities are concentrated in the North Atlantic where it has been shown that the planktonic ecosystem is rapidly changing however it is unknown what is happening elsewhere. Plankton are a good indicator of climate change and understanding the ocean should be a high priority for mankind.

The major funders (NERC and Defra) do not have provision for long term monitoring (decadal scale) in their research budgets therefore there is an urgent need for a longer term funding system.

Alec Tang, Environmental Knowledge Transfer Network (E-KTN)

Alec introduced the general aims of a KTN and explained how they transfer technological knowledge to UK based businesses. There are currently twenty-three KTNs in the UK, and Alec explained that the UK-EOF would feed into the eighth priority area (Environmental Monitoring and Forensics) of the Environmental-KTN. Within the E-KTN there are currently ten priority areas, including Carbon Capture and Storage and Rapid Tool Assessments. The priority areas are still evolving and inclusion of other areas such as micro-production of power may occur at a later date.

The EMF priority technology area has two main aims; the first is to reduce costs associated with generating fit for purpose, robust environmental data; and the second is to focus regulatory and industrial knowledge on the joint understanding of environmental needs so that in the future, the range of measurements expected for regulatory drivers meets our requirements.

* The difference between these budgets was discussed. There is a legal differentiation between research and monitoring. Research is exempt from the procurement directive but monitoring is not. There is also a different classification for reporting to the OECD.

Lawrence Way, JNCC

Lawrence introduced the delegates to the Statement of Need for biodiversity and the considerations that were required during its development.

Lawrence explained that the Statement of Need should answer questions such as ‘Why monitor abc?’ It must be connected to the drivers for observations (which relate to the understanding of what we are doing and why?) and should include any ongoing observation schemes. Drivers can gain evidence from many observation schemes and schemes can provide evidence to many drivers. Drivers will not be static, they will generally be 3-5 year strategies, therefore they will change and when they do, the exercise must be repeated.

When developing the Statement of Need, JNCC undertook a number of steps:

1. Turn the drivers into questions.
2. Compare the questions between different drivers; is there duplication or overlaps?
3. From the questions determine the required measurements.
4. Compare the measurements with what is already being measured; are they the same or similar?
5. Develop a robust framework of observation schemes to meet current and future needs.

Alongside the development current observation schemes should be examined to see if they could increase the range of questions that they are answering. Other factors should also be considered for example horizon scanning for future requirements. During the development of a Statement of Need many challenges will be faced, some people or organisations may feel threatened because essentially you will be reviewing what is needed and whether the current evidence base is sufficient.

The overall goal, which may have different meaning for different stakeholders, should be translated into the Statement of Need. From this a framework of observation measurements will enable the detection of impacts, assessment of which, will permit the measurement of performance against the obligation.

Lawrence’s presentation provided much background thought for the next session of the workshop, development of the UK-EOF Statement of Need.

4.8 Statement of Need

Martin Griffiths, from Pillion Consulting Ltd, has been working as a consultant to the UK-EOF to help develop the Statement of Need. He presented the background to, and overview of, the emerging Statement of Need. The requirement to gain a common understanding of the key questions and issues was discussed along with the major outcome, which is the **“development of a holistic picture of what the overall evidence needs are and the role of observations in providing this information”**

To date, initial assumptions have been tested and some preliminary analysis undertaken to develop an outline structure. This is stage 1 where our obligations, the key questions (science and policy) we need to answer and the assessments we need to make will be captured and fed into the Statement of Need. Stage 2 of the process will be to refine the high level statements and then map the Needs to the existing initiatives and activities to establish what actions could and should be taken to fulfil the needs.

With respect to environmental observations, the Statement of Need will include:

- Overall principles
- Key factors that generate questions
- Our need to undertake observations
- Core obligations and the organisations that determine the relevant observation programmes.

The Statement of Need will be developed through August and a first draft presented to the Management Group in August/September. Before this can be done the observation community must be given an opportunity to feed their opinions and thoughts into what is required from the UK-EOF, this was the subject of the final group breakout session

4.9 Breakout 3: Developing the Statement of Need

The aim of the session was to provide an opportunity for the community to input into the development of the Statement of Need. Community knowledge will be used to fill in the gaps, provide access to information and test the thinking.

Delegates were split into six groups. Each group moved around three stations; at each they discussed a different question with the designated 'station' facilitator and recorder.

The questions can be found in the feedback below and Appendix C3.



Feedback from Breakout 3

Each of the six facilitators provided feedback on their specific question. Since there were two facilitators asking the same question the responses have been amalgamated below.

More detailed information from this session was captured on post-it notes, although this is not reported here the information will be analysed and used in the development of the Statement of Need.

General points from Question 1 – Why are environmental observations taken? What are the key science and policy questions that we need to answer, now and in the future?

- The questions being addressed by environmental observations (and therefore the reasons behind taking them) are vast and can be asked in many different ways; issues, domain basis and GEOSS societal benefits.
- The questions fall into categories of
 - To detect change, specifically “changes we fear in things that we care about”
 - To detect change as a basis for action
 - For evidence in changing behaviour

- To engage citizens' interest in the environment
- To influence government
- Both groups tried to list the questions and these came at various levels of complexity e.g. what is the effect of increasing population on land use? How does the natural environment process carbon? How clean are our seas?
- Some areas such as climate have well articulated needs, however more attention is needed on the interaction between the global and UK view.
- A plethora of different sorts of information would be useful, however it will be difficult to draw it all together.
- Systems for observation data collection must be adaptable so that they can be used for other purposes.
- Some of the overlaps may be in areas not covered by the UK-EOF e.g. health, social science and national security issues, these barriers need to be managed.
- The importance of public perception was discussed, along with the effectiveness of policy and regulation. We must ensure that the evidence being collected is driving better policy and regulation and ultimately behaviours.
- Monitoring/observation programmes must enable us to address future issues for example the unknown unknowns.
- We should remember that the data themselves will often drive the questions.

General points from Question 2 - What are the national and international commitments that drive international obligations and commitments.

It was decided that simply listing all our commitments was not a good use of time, therefore delegates were asked to make a short list of current obligations and possible future requirements with a view to how these could be integrated. They were also asked to write down sources of information if this exercise has been completed for sectors.

There was much discussion on what is a commitment? The UK government has signed up to treaties, but non-compliance would not lead to legal action. Many raised the issue of moral commitments, activities that are carried out for the 'good' of the UK knowledge base, such activities often provide crucial evidence for understanding the planet.

Much of the discussion focused on data.

- Data is often collected for a specific reason however subtle changes to programmes, which already have significant costs, may result in benefits for a different policy area. For example, the accuracy could be improved or a second measurement taken, which would allow the data to be used for other purposes.
- It is understood that policy funders often ask for the minimum level of accuracy, however if the motivation for improving the quality or accuracy is clear, this could be considered as an investment decision.
- Data collection is often driven by environmental regulations, but generally the data is not accessible for reuse.
- The monitoring requirements of directives are often fixed and time bound, however if the measurements were extended over a longer term then the data could be used for other purposes.
- Reporting methods and data information centres already exist. These should be included/used where possible, for example, WISE, INSPIRE, etc.
- Future requirements could be met with information from the past.
- Volunteers collect much environmental observation data and their needs should not be ignored within the UK-EOF Statement of Need. Data flow from the voluntary sector tends to be one way (i.e. fed into assessments). If the data flow

were two ways then it would improve engagement with the public and show that their contributions are valued.

Informing and educating the public is a legal and moral commitment. There will be increasing pressures to report at regional and sub-regional levels.

It was asked whether *a percentage of a project/programme cost should be allocated to monitoring?* It was thought that this was not practical, different departments have different obligations and requirements, therefore the percentage may not cover monitoring required in some areas, and may be too much in others.

General points from Question 3 - What assessments do we need to make?

There are many different types of assessment (ecosystem assessments, impact assessments, large scale multiple information assessments), each of which may focus on a broad range of topics (fragile environments, hotspots, tipping points, socio-economics, biological recording). It would therefore be beneficial if generic definitions were available.

Large-scale multi-parameter background assessments are vital to help us identify natural variability. Routine assessments also have importance and strategic assessments such as Environmental Impact Assessments, which require strong evidence from observing systems, are vital for evidence based policy-making.

Improved coordination regarding which assessments are carried out, at what scales and timeframes is needed. A nested approach, which joins up small-scale assessments into a regional/national/global picture was suggested. Charting Progress, an integrated marine assessment, was put forward as a good example.

Assessments are costly (in time and resource), but are not always effective in terms of influencing decision-making. Translating assessments to draw out the conclusions is essential and mechanisms need to be in place to encourage the adoption of recommendations. Presentation of the evidence is essential as this can affect how the information is interpreted. We need to be able to assess the 'value' of the data and when presenting it, consider the messages that we are portraying with regard to the state of the environment.

The future requirements for undertaking assessments could be considered and if possible built into observation programmes. The collection of baseline data is important if we are to define the 'state of the environment'. We should make use of our current programmes (our 'asset base'), and reanalyse data.

To make full use of long-term datasets funding needs to be available. This support will be based upon long-term use and support from the public. Therefore the principles surrounding the public use of evidence should be considered.

Outcomes of global and regional scale assessments affect the UK and its interests around the world, therefore the UK's stake at the global level should be considered.

Summary of the Statement of Need discussions

The task of producing a 'Statement of Need' document that articulates all the aspirations of the diverse community is not easy. The discussions highlighted some of the numerous perspectives that exist on what observations and assessments are needed and the UK-EOF team must now make sense of some of these.

The first document that is produced may well not contain all the details captured today but these will be used in later stages. It will be important that the community continue to engage in the discussions so that we can articulate aspirations which are truly shared.



5 Conclusions

Peter Costigan, Ian Davidson and Beth Greenaway summed up the two-day event and thanked the organisers and the facilitators.

The UK-EOF has now been launched and has a complex and challenging agenda. The breath of the discussions and the positive engagement of the community have been very encouraging in that, whilst the UK-EOF will not in itself be the answer to everything, it will provide a forum for discussion, in which issues can be clarified, owned and addressed where possible.

Success of the UK-EOF will be measured against its ability to articulate the issues and take forward the recommendations. The framework has support from the top of partner organisations and a high level of engagement from experts within the observation community. This support should be used to drive the framework forward.

The delegates were thanked for their input and enthusiasm but reminded that continued engagement would be required especially at the 'boundaries' of overlapping disciplines such as socio-economics.

The workshop provided a good opportunity for dialogue, however some questions remain unanswered and the need to gain a common understanding is required before the full answers can be found.

6 Next Steps

The UK-EOF team will reflect upon and consider the issues raised in the workshop.

The UK-EOF will:

- Produce a summary report of the workshop for web publication.
- Use information generated in the group sessions to progress the Statement of Need and the observation cluster models.
- Progress each of the five workstreams and specifically in 2008/9:
 - Improve the content, scope and accessibility of the meta-database.
 - Facilitate careful consideration of data sharing policies
 - Produce the first Statement of Need and then begin to map the needs to the current activities
 - Ask the community to update the value of the UK's investment in observations so that the estimated range (£80-500m) can be reduced.
- Make the UK-EOF Delivery Plan available on the web. This document will be owned by the Management Group and will be updated periodically to show future programme plans and activities.

Delegates were asked to complete a feedback form and to consider how they will continue to engage with the UK-EOF in the future. Any further information, ideas or questions should be directed to the ERFF / UK-EOF team at office@erff.org.uk.

Appendix A: Launch and Workshop Agenda

UK-Environmental Observation Framework Launch

Institute of Electrical Engineering, Savoy Place, London
Thursday 17th July 2008

N.B. Registration will be held on the 3rd Floor, Riverside Room. The Launch will take place in the Lecture Theatre on the Ground Floor.

09.45 – 10.20 Registration and Refreshments Riverside Room, Level 3

10.30 – 12.30 **Launch of the UK-EOF** Chair Ian Davidson

10.30 – 10.35 Ian Davidson, Deputy Director, Evidence Programme, Defra
Welcome and Introduction

10.35 – 11.10 Bob Watson, Chief Scientific Adviser, Defra
Launching the UK-EOF

11.10 – 11.25 Alan Thorpe, Chief Executive, NERC
Next Generation Environmental Observations

11.25 – 11.40 Doug Wilson, Head Monitoring and Assessment, EA
Observations –our window on the environment.

11.40 – 11.55 Maggie Gill, Chief Scientific Adviser for Rural Affairs and Environment,
within The Scottish Government
ERFF and the use of evidence for policy

11.55 – 12.10 Beth Greenaway, UK-EOF Programme Manager
What the UK-EOF will deliver

12.10 – 12.30 Q&A Panal with speakers as above Chair Ian Davidson

12.30 –13.30 *Lunch* *Riverside Room Level 3*

UK-Environmental Observation Framework Inaugural Workshop

Institute of Electrical Engineering, Savoy Place, London
17th and 18th July 2008

N.B. Plenary sessions will be held in the Lecture theatre on the ground floor

Thursday 17th July 13.30 – 17.00

Chair Ian Davidson

13.30 – 14.00 Plenary

13.30 – 13.45 Introduction to UK-EOF Team and
the workstreams of the programme

Beth Greenaway &
UK-EOF Team

13.45 – 14.00 International activities & responding to
the changing environment

Andy Shaw

14.00 – 14.30 Breakout 1

“Who we are and what are the issues”?

14.30 – 15.30 Plenary

14.30 – 15.00 Breakout 1 Reporting

Nominated rapporteurs

15.00 – 15.20 Community Clusters Strawman

Beth Greenaway

15.20 – 15.30 Q&A session

15.30 – 15.45 Refreshments

Riverside Room

15.45 – 16.30 Breakout 2

Shaping the clusters

16.30 – 17.00 Plenary

16.30 – 16.50 Breakout 2 feedback

Facilitators

16.50 – 17.00 Conclusion and Close of Day 1

Ian Davidson &
Beth Greenaway

17.00 – 19.00 **Social Event**

Tattershall Castle,

Friday 18th July 09.00 – 12.30

Chair Peter Costigan

All plenary sessions will be held in the Council Chamber.

08.30 – 09.00 Refreshments

Riverside Room

09.00 – 10.00 Plenary

09.00 – 09.10 Inspiration from 77yrs of plankton records Chris Reid, SAHFOS

09.10 – 09.20 The Market for Innovation Alec Tang, E-KTN

09.20 – 09.30 Applying and Developing a Statement of Need for Biodiversity Lawrence Way, JNCC

09.30 – 09.35 Q&A

9.35 – 10.00 UK-EOF Statement of Need Martin Griffiths

10.00 – 11.40 Breakout 3 – Developing the Statement of Need

10.00 – 10.30 Session 1

10.30 – 10.55 Session 2

10.55 – 11.15 Refreshments

11.15 – 11.40 Session 3

11.40 – 12.30 Plenary

11.40 – 12.15 Breakout 3 reporting & Conclusion of Statement of Need Discussion Facilitators

12.15 – 12.30 Roundup & overall workshop conclusions Beth Greenaway
Ian Davidson

12.30 Close

12.30 – 13.30 Lunch

Riverside Room

Appendix B UK-EOF launch and workshop delegates list 2008

Title	Firstname	Surname	Affiliation	Job Title	Email address
Dr	Michael	Abberton	IBERS, Aberystwyth University	Programme Leader, Plant Breeding and Genetics	m1a@aber.ac.uk
Professor	Tim	Allen	Local Government Association	Programme Director: Analysis and Research	tim.allen@lgar.local.gov.uk
Mr	Victor	Anderson	Sustainable Development Commission	Higher Economic Analyst	victor.anderson@sd-commission.gsi.gov.uk
Mr	David	Askew	Natural England	Head of Science Services	david.askew@naturalengland.org.uk
Mr	Stephen	Aston	Northern Ireland Environment Agency	Head of Strategy	Stephen.Aston@doeni.gov.uk
Ms	Sam	Austin	ERFF		sast1@nerc.ac.uk
Dr	Nichola	Badcock	Natural Environment Research Council	Science Programme Officer	nsba@nerc.ac.uk
Professor	Steven	Banwart	University of Sheffield	Professor of Environmental Engineering	s.a.banwart@sheffield.ac.uk
Dr	Mary	Barkham	Environment Research Funders Forum		maryb@erff.org.uk
Dr	Nadia	Barsoum	Forest Research	Leader of Intensive Forest Monitoring Programme UK	nadia.barsoum@forestry.gsi.gov.uk
Mrs	Marion	Bartholomew	ERFF	ERFF database project manager	marionb@erff.org.uk
	Rick	Battarbee	University College London		r.battarbee@UCL.ac.uk
Dr	Clive	Bealey	Natural England	Specialist-Evidence	Clive.Bealey@naturalengland.org.uk
Professor	John	Beddington	Imperial College		j.beddington@imperial.ac.uk
Mr	Adrian	Belton	Central Science Laboratory	Chief Executive	adrian.belton@csl.gov.uk
Dr	Penny	Blackmore	ERFF Secretariat	Database Contents Support Officer	pennyb@erff.org.uk
Dr	David	Boorman	Centre for Ecology and Hydrology	Head of Strategic Data, Water Science Programme	dbb@ceh.ac.uk
Dr	Robert	Bradburne	Defra	Ecosystems Approach Policy Advisor	robert.bradburne@defra.gsi.gov.uk
Dr	Tom	Brereton	Butterfly Conservation	Head of Monitoring	tbrereton@butterfly-conservation.org
Dr	Peter	Bridgewater	Joint Nature Conservation Committee		june.swift@jncc.gov.uk
Professor	Peter	Brimblecombe	UEA		p.brimblecombe@uea.ac.uk
Mr.	David	Brooks	Rothamsted Research	Research Scientist (Ecologist)	david.brooks@bbsrc.ac.uk
Dr	Juan	Brown	BODC/NERC	Director, BODC	jbrown@bodc.ac.uk
Miss	Gill	Calder	Scottish Wildlife Trust	Biodiversity Data Manager	gcalder@swt.org.uk
Dr	Bruce	Callander	Ministry of Defence	Strategy Technical Lead - Env	sit-raoinfogd@defence.mod.uk
Professor	Colin	Campbell	Macaulay Institute	Science Leader Soils Group	c.campbell@macaulay.ac.uk

Miss	Helen	Campbell	British Antarctic Survey	AEDC Manager	hcamp@bas.ac.uk
Dr	Andree	Carter	UKCDS	Director	a.carter@ukcds.org.uk
Dr	Mark	Charlesworth	BODC		mecha@bodc.ac.uk
	James	Clarke	ADAS Boxworth	Chairman of the UK Pesticides Forum Indicators Group	James.Clarke@adas.co.uk
Dr	Peter	Costigan	Defra	Natural Environment Science Co-ordinator	peter.costigan@defra.gsi.gov.uk
Dr	David	Cotton	MEDIN (Marine Environmental Data and Information Network)	Coordinator	dcott@oceannet.org
Mr	Mark	Crick	JNCC	Habitat Surveillance Project leader	mark.crick@jncc.gov.uk
	Susan	Crown	Defra		susan.crown@defra.gsi.gov.uk
Dr	Faith	Culshaw	NERC	Team Leader, Public Sector Liaison	faith.culshaw@nerc.ac.uk
Mr	John	Custance	Defra	Head of Environment Statistics	john.custance@defra.gsi.gov.uk
DR	Ian	Davidson	Defra	DEPUTY DIRECTOR	ian.davidson@defra.gsi.gov.uk
Dr	Arwyn	Davies	British National Space Centre	Director, Earth Observation	arwyn.davies@nerc.ac.uk
Dr	Linda	Davies	Imperial College	OPAL Project Director	linda.davies@imperial.ac.uk
Dr	Janet	Dixon	Defra	Senior Scientific Policy Advisor	janet.dixon@defra.gsi.gov.uk
Ms	Nathalie	Doswald	Parliamentary Office for Science and Technology	POST Fellow	doswaldn@parliament.uk
Mr	James	Doughty	Diass Limited	Consultant	james@diass.co.uk
Mr	Richard	Drummond	Defra	Deputy Director	richard.drummond@defra.gsi.gov.uk
Mr	Jeremy	Evans	The Macaulay Institute	Business Development Manager	j.evans@macaulay.ac.uk
Prof	Les	Firbank	North Wyke Research	Head of Site	les.firbank@bbsrc.ac.uk
Dr	Nigel	Fox	National Physical Laboratory	NPL Fellow	nigel.fox@npl.co.uk
DR	Matthew	Frost	Marine Biological Association	MECN coordinator & Executive Secretary of the MBA	matfr@mba.ac.uk
Dr	Rob	Fuller	British Trust for Ornithology	Director of Habitats Research	rob.fuller@bto.org
Dr	David	Gibbons	The RSPB	Head of Conservation Science	david.gibbons@rspb.org.uk
Dr	Andy	Gibson	British Geological survey (NERC)	Head of Science - Land Use and Development	agibson@bgs.ac.uk
Mr	Jeremy RA	Giles	British Geological Survey	Information Manager	jrag@bgs.ac.uk
Professor	Maggie	Gill	Rural Affairs and Environment, The Scottish Government	Chief Scientific Adviser	maggie.gill@scotland.gsi.gov.uk
Professor	John	Grace	University of Edinburgh	Professor	jgrace@ed.ac.uk
	Beth	Greenaway	ERFF	UK-EOF Programme Manager	bethg@erff.org.uk

Mr	Philip	Greenish	The Royal Academy of Engineering	Chief Executive	philip.greenish@raeng.org.uk
Dr	Martin	Griffiths	ERFF	Consultant	martin.griffiths@pillon.co.uk
Mr	Nick	Grout	Government Office for Science	Head, Energy & Environment Issues Team	nick.grout@dius.gsi.gov.uk
Mr	Nick	Grout	Government Office for Science	Head, Energy & Environment Issues Team	nick.grout@dius.gsi.gov.uk
Dr	David	Harris	Royal Botanic Garden Edinburgh	Deputy Director of Science	d.harris@rbge.org.uk
Professor	Roy	Harrison	University of Birmingham	Professor of Environmental Health	r.m.harrison@bham.ac.uk
Professor	Paul	Hart	University of Leicester	Professor of Fish Biology and Fisheries	pbh@le.ac.uk
Professor	Louise	Heathwaite	Lancaster Environment Centre	NERC Theme Leader	louise.heathwaite@lancs.ac.uk
Mr	Robin	Higsons	Sensors & Instrumentation KTN	Technology Translator	robin.higsons@qi3.co.uk
Professor	Edward	Hill	National Oceanography Centre, Southampton	Director	ehill@noc.soton.ac.uk
Dr	Steven	Hill	RCUK Strategy Unit		Steven.Hill@rcuk.ac.uk
Professor	Patrick	Holligan	University of Southampton	Emeritus Professor	pmh1@noc.soton.ac.uk
Dr	Robert	Jefferson	The Medical Toxicology Centre	Deputy Director	robert.jefferson@ncl.ac.uk
Dr	Cathy	Johnson	Department for Environment Food and Rural Affairs		cathy.johnson@defra.gsi.gov.uk
Mr	Jim	Jones	People's Trust for Endangered Species	Development Officer	jim@ptes.org
Dr	Liam	Kelly	The Scottish Government		liam.kelly@scotland.gsi.gov.uk
Dr	Ruth	Kelman	NERC	Science Programme Officer	rkel@nerc.ac.uk
Dr	Sarah	Kemmitt	the British Library	Research Officer - Environmental Science	sarah.kemmitt@bl.uk
Prof	Mark	Kibblewhite	Natural Resources, Cranfield University	Head of Department, Professor of Soil Science	m.kibblewhite@cranfield.ac.uk
Mrs	Deborah	King	Environment Research Funders' Forum	Data Policy Advisor	deng@erff.org.uk
Dr	John	Kupiec	Environment Agency	Science Manager - Monitoring	john.kupiec@environment-agency.gov.uk
	Simon	La Roche	Defra	UKMMAS	simon.laroche@DEFRA.GSI.GOV.UK
Dr	Thomas	Lankester	Infoterra Ltd.	Systems Engineer	thomas.lankester@infoterra-global.com
Dr	Bryan	Lawrence	Science and Technology Facilities Council	Head of BADC & NEODC	B.N.Lawrence@rl.ac.uk
Mr	David	Lee	Defra	Statistician	david.j.lee@defra.gsi.gov.uk
Miss	Andrea	Leedale	ERFF	ERFF Secretariat Support	aned@erff.ac.uk
Mr	David	Lister	Climatic Research Unit, School of Environmental Science	Research Officer	d.lister@uea.ac.uk
Professor	Robert	Low	University College London		robert.low@ucl.ac.uk

Mr	Robert	Lowson	European Environment Agency	GMES Coordinator	robert.lowson@eea.europa.eu
Prof	John	Ludden	British Geological Survey	Executive Director	jiludden@bgs.ac.uk
Dr	Stephen	Maberly	Centre for Ecology & Hydrology	Head of Lake Ecosystem Group	scm@ceh.ac.uk
Dr	Andrew	Macdonald	Rothamsted Research	Research Scientist	andy.macdonald@bbsrc.ac.uk
Dr	Colin	Mackechnie	Center for Ecology and Hydrology	Business Development Manager	cmackechnie@ceh.ac.uk
	Bev	Mackenzie	Imarest	Manager, Technical Affairs	bev.mackenzie@imarest.org
Mr	Edward	Mackey	Scottish Natural Heritage	Policy & Advice Manager, Trends & Indicators	ed.mackey@blueyonder.co.uk
Dr	Stephen	Malcolm	Cefas		stephen.malcolm@cefas.co.uk
Mr	Stuart	Marsh	British Geological Survey	Head of Spatial Geoscience Technologies	shm@bgs.ac.uk
Prof	Paul	Mason	University of Reading		p.j.mason@reading.ac.uk
	David	Matthews	EADS Astrium Satellites		david.matthews@astrium.eads.net
Mr.	Sean	McCarthy	QinetiQ plc	Energy & Environment Manager	smccarthy@qineti.com
Mr	Greg	McCleary	Environment and Heritage Service	Higher Scientific Officer	Greg.McCleary@doeni.gov.uk
Mrs	Wendy	McKinley	Environment and Heritage Service	Senior Policy Advisor	Wendy.McKinley@doeni.gov.uk
Dr	Elizabeth	Milsom	Royal Society of Chemistry	Environment and Energy Policy Manager	milsome@rsc.org
Prof	Andy	Moffat	Forest Research	Head of Environmental and Human Sciences Division	andy.moffat@forestry.gsi.gov.uk
Mr	Don	Monteith	NERC Centre for Ecology and Hydrology	Environmental Change Network Research Coordinator	donm@ceh.ac.uk
Dr	Mike	Morecroft	Centre for Ecology and Hydrology	Head of Ecology and Environmental Change Group	mdm@ceh.ac.uk
Dr	Jan Marco	Muller	CEH - Centre for Ecology & Hydrology	Head of Business Development	jmuller@ceh.ac.uk
Dr	James	Munford	National Biodiversity Network Trust	Programme Director	j.munford@nbn.org.uk
	Jo	Myers	Defra		jo.myers@defra.gsi.gov.uk
Professor	John	Murlis	University College London	Hon. Visiting Professor in Environmental Policy	john.murlis@btinternet.com
Professor	Paul	Nathanail	University of Nottingham	Head, Land Quality Management	paul@lqm.co.uk
Mr	Phil	Northing	Central Science Laboratory	Team Leader, Agro-Ecology and Crop Management Team	p.northing@csl.gov.uk
Professor	Patricia	Nuttall	Centre for Ecology & Hydrology	Director	jecu@ceh.ac.uk
Professor	Alan	O'Neill	NCEO		j.e.fillingham@reading.ac.uk
	Dan	Osborn	NERC		dano@nerc.ac.uk
Mrs	Jacqueline	Parker	Team Projects	Consultant - environmental monitoring	jacqueline@teamprojects.co.uk
Dr	Miles	Parker	Defra	Deputy Chief Scientific Advisor and Head Science	miles.parker@defra.gsi.gov.uk

Dr	Terry	Parr	Centre for Ecology and Hydrology	Section Head	twp@ceh.ac.uk
Professor	Lloyd	Peck	Theme Leader - Biodiversity	Theme Leader - Biodiversity	lptl@nerc.ac.uk
	Sam	Peplar	BADC and NEODC Curation Manager		S.J.Pepler@rl.ac.uk
Mr	David	Pirie	SEPA	Head of Chemistry	david.pirie@sepa.org.uk
Dr	Keith	Porter	Natural England	Principal Specialist GI	keith.porter@naturalengland.org.uk
Professor	David	Raffaelli	University of York	Head of the Environment Department	dr3@york.ac.uk
Professor	Philip	Rainbow	Natural History Museum	Keeper of Zoology	p.rainbow@nhm.ac.uk
Mr	Callum	Rankine	The Mammal Society	Chief Executive Officer	crankine@mammal.org.uk
Professor	Philip (Chris)	Reid	SAHFOS	Senior Research Fellow	sahfos@sahfos.ac.uk
Professor	Alan	Rodger	British Antarctic Survey	Head of Science Programmes	a.rodger@bas.ac.uk
Mr	Paul	Rose	JNCC	Head of Biodiversity Information Service	paul.rose@jncc.gov.uk
Mr	Shaun	Russell	Environment Centre Wales	Director, Wales Environment Research Hub	s.russell@bangor.ac.uk
Miss	Flavie	Salaun	Defra	Sc Coordination	flavie.salaun@defra.gov.gsi.uk
Dr	Michael	Schultz	Natural Environment Research Council	Head of National Capability	mgs@wpo.nerc.ac.uk
Professor	Marian	Scott	University of Glasgow	Professor of Environmental Statistics	marian@stats.gla.ac.uk
Lord	John	Selborne	House of Lords	LWEC	selbornejr@parliament.uk
Dr	Helen	Sellars	Forestry Commission	Specialist Advisor	helen.sellars@forestry.gsi.gov.uk
Mr	Andrew	Shaw	British National Space Centre	Science & Innovation Manager, Earth Observation	anaw@nerc.ac.uk
Dr	Peter	Shaw	Roehampton university	Director, centre for research in ecology	p.shaw@roehampton.ac.uk
Prof.	Jonathan	Silvertown	The Open University	Professor of Ecology	j.silvertown@open.ac.uk
Ms	Nadine	Smith	Defra	Policy Advisor	nadine.smith@defra.gsi.gov.uk
Mr	Ron	Smith	CEH	Statistician	ris@ceh.ac.uk
Dr	Tim	Smyth	Plymouth Marine Laboratory	Theme Leader: Western Channel Observatory	tjasm@pml.ac.uk
dr	Denise	Smythe-Wright	NOCS		dsw@noc.soton.ac.uk
Prof	Tim	Sparks	Centre for Ecology and Hydrology Monks Wood		ths@ceh.ac.uk
Dr	Andrew	Stott	Defra	Science Adviser	andrew.stott@defra.gsi.gov.uk
Dr	Zofia	Stott	Assimila Limited	Director	zof.stott@assimila.eu
Professor	Rowan	Sutton	NERC	NERC Climate System Theme Leader	r.sutton@reading.ac.uk
Mr	Alec	Tang	Environmental KTN	Knowledge Transfer Manager	alec.tang@earth.ox.ac.uk
Mr	Kerry	Thomas	Environmental Knowledge Transfer	Assoc Director for Research & Training	kerry.thomas@earth.ox.ac.uk

			Network		
	Mark	Thorley	NERC	Data Management Co-ordinator	mrt@nerc.ac.uk
Professor	Alan	Thorpe	NERC	Chief Executive	hqpo@nerc.ac.uk
Mrs	Kesia	Trench	Defra EO Team	GMES Coordinator	kesia.trench@defra.gsi.gov.uk
	Gemma	Truelove	ERFF		
Mr	Bruce	Truscott	Met Office	Deputy Observations Programme Manager	bruce.truscott@metoffice.gov.uk
Dr	Christine	Tuckett	Environment Agency	Head of Science Strategy	Christine.tuckett@environment-agency.gov.uk
Dr	Sarah	Turner	Centre for Ecology & Hydrology	Science Co-ordinator Biodiversty Programme	sltu@ceh.ac.uk
Dr	Huw	Tyson	Biotechnology and Biological Sciences Research Council	Strategic Reviews Manager	huw.tyson@bbsrc.ac.uk
	Pauline	Van Der Sanden	ERFF		
Dr	Nick	Veck	Infoterra	Director, Space business development	nick.veck@infoterra-global.com
	Neil	Veitch	ERFF		
Dr	Malcolm	Vincent	JNCC	Director of Science	malcolm.vincent@jncc.gov.uk
Dr	Stuart	Wainwright	Defra	Head of Evidence Strategy	stuart.wainwright@defra.gsi.gov.uk
Mr	Richard	Walmsley	Environment Agency	Monitoring Policy Manager	rich.walmsley@environment-agency.gov.uk
Professor	Bob	Watson	Defra	Chief Scientific Advisor for Defra	
Dr	Niall	Watson	Defra	Data Strategy Manager	niall.watson@defra.gsi.gov.uk
Mr	Lawrence	Way	JNCC	Programme Leader Surveillance and Monitoring	lawrence.way@jncc.gov.uk
Mr	David	Webbe-Wood	Food Standards Agency	Senior Scientific Officer	david.webbe-wood@foodstandards.gsi.gov.uk
Mr	David	Wembridge	People's Trust for Endangered Species	Surveys Co-ordinator	david@ptes.org
Dr	Jonathan	Wentworth	Parliamentary Office of Science and Technology	Environment and Energy	wentworthj@parliament.uk
Dr	Alan	Whitelaw	ESYS Limited	Consultant	awhitelaw@esys.co.uk
Dr	Phillip	Williamson	NERC/UEA	Science Coordinator	p.williamson@uea.ac.uk
Mr	Paul	Willis	AEA	Project Director - Air Quality	paul.willis@aeat.co.uk
Dr	Chris	Wilson	NERC Proudman Oceanographic Laboratory	Sea-level modeller / physical oceanographer	cwi@pol.ac.uk
Dr	Douglas	Wilson	Environment Agency	Head of Monitoring and Assesment	doug.wilson@environment-

					agency.gov.uk
Mr	Ian	Woiwod	Rothamsted Research	Principal Research Scientist	Ian.Woiwod@bbsrc.ac.uk
Miss	Ruth	Wolstenholme	SNIFFER	Managing Director	ruth@sniffer.org.uk
Mrs	Jacky	Wood	National Oceanography Centre, Southampton	Head, National Marine Co-ordination Office	jkwo@noc.soton.ac.uk
Mrs	Sally	Wood	Eco Europe (Oxford Brookes BS)		sally.wood@tesco.net
Dr	Andrew	Woolf	STFC e-Science Centre	Environmental Informatics	A.Woolf@rl.ac.uk
Mr	Charles	Wrench	Science & Technology Facility Council	Head, Chilbolton Facility for Atmospheric Research	c.l.wrench@rl.ac.uk
Miss	Weigang	Yan	Grus Monacha International Aid	Project Assistant	y628_wg@hotmail.com

Appendix C – Material for the Group Breakout Sessions

C1. Breakout 1: Ice breaker maps and Questions

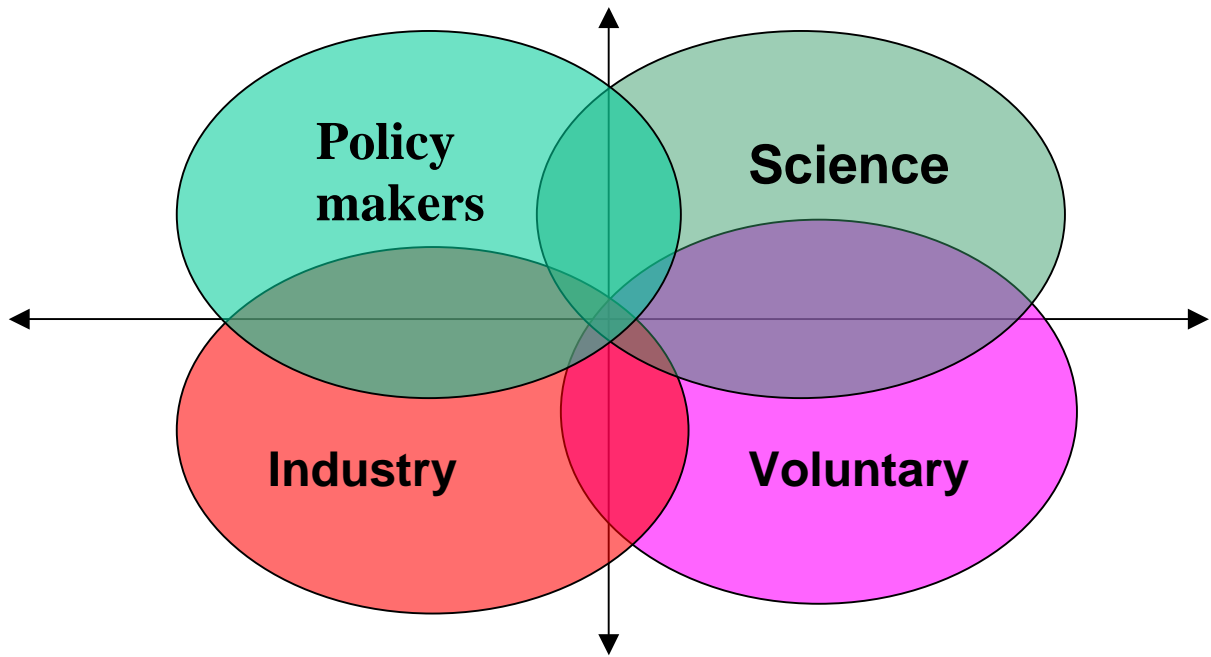


Questions

- Please identify yourself to the group and describe your role.
- What is your sphere of interest, geographically and technically?
- What are the key issues that concern you about environmental observations?

C2. Breakout 2 – Shaping the clusters

a. PSVI Model



b. The Domains Model

- **Climate and weather processes and systems**
- **Lithosphere**
 - Land and landscape
 - Soil and sediments
 - Geology
- **Hydrosphere**
 - Freshwater
 - Salt water
 - Brackish water
 - Snow and ice
- **Atmosphere**
 - Troposphere
 - Stratosphere
 - Mesosphere and thermosphere
- **Space**
- **Biosphere**
 - Biological processes which are not species-specific
 - Species/families eg. Fish, amphibians and reptiles, birds, arthropods, plants, fungi and lichens, algae and viruses
 - Microbiological (cellular-level)
 - Habitats
 - Ecosystems and ecology

c. 'The Big Questions' Model

E.g.

- Are our seas healthy and biodiverse? (UKMMAS)
- How is biodiversity affected by climate change and air pollution?
- How polluting is and industry?

Please focus on the pros and cons of this model rather than agreeing the questions themselves - this will be explained tomorrow.

C.3 Breakout 3 - Developing the Statement of Need

Question 1

Why are environmental observations taken?

What are the key (science and policy) questions that we need to answer, now and in the future?

Consider viewpoints and roles of:

- **Government and policymakers**
- **Executive Agencies and Government delivery bodies**
- **Science**
- **Business**
- **NGOs**
- **Voluntary organisations**
- **Public and individuals**
- **Others?**

Question 2

What are the national and international obligations and commitments that drive environmental observations?

Consider for example:

- **sustainable development**
- **statutory obligations**
- **international obligations**
- **competent authority**
- **research/science**
- **assessing environmental condition**
- **reporting on key environmental issues**
- **informing decision making**
- **investigational monitoring**
- **Others?**

Question 3

What assessments do we need to take?

Consider for Example:

- **Understand baselines/ status**
- **Global Indicators**
- **Natural Variability**
- **Assess Natural Resources**
- **Assess Human Impact**
- **Now and in the future**

- **Weather forecasts, trends, variability...**
- **Develop and test option for protection/remediation**
- **Provide information to inform decision making**
- **Investigational monitoring**
- **Others?**

Appendix D: Facilitators and Reporters

Our thanks are expressed to all of those that helped to facilitate the various sessions of the Launch and Inaugural workshop:

Launch Chair: Ian Davidson, Defra

Workshop Chairs: Ian Davidson, Defra and Peter Costigan, Defra

Group Session 1 – Ice Breaker

Group number	ERFF/community member	Facilitator
1	Mary Barkham, ERFF	Liam Kelly, Scottish Government
2	Debbie King, ERFF	Arwyn Davis, BNSC
3	Penny Blackmore, ERFF	Andy Shaw, BNSC/NERC
4	Marion Bartholomew, ERFF	Alan Whitelaw, Eysis
5	Neil Veitch, ERFF (EA)	Michael Schultz, NERC
6	Andrea Leedale, ERFF	Keith Porter, Natural England
7	Gemma Truelove, ERFF	Paul Rose, JNCC
8	Helen Sellars, Forestry Commission	Martin Griffiths, ERFF (Pillon Ltd)
9	Zof Stott, Assimila Ltd	Doug Wilson, EA
10	Kesia Trench, Defra	Peter Costigan, Defra
11	Alec Tang, E-KTN	Steve Aston, NIEA
12	Matt Frost, MBA	Lawrence Way, JNCC

Group Session 2 – Shaping the Community Clusters

Group	Facilitator	Reporter
1. Clubs	Stephen Malcolm, Cefas	Gemma Truelove, ERFF
2. Hearts	Steven Hill, RCUK	Marion Bartholomew, ERFF
3. Spades	Robert Lowson, EEA	Debbie King, ERFF
4. Diamonds	John Custance, Defra	Neil Veitch, ERFF (EA)

Group Session 3 – Developing the Statement of Need

Station	Facilitator	Recorder
A1 (Question 1)	Ian Davidson, Defra	Debbie King, ERFF
B1 (Question 1)	Michael Schultz, NERC	Mary Barkham, ERFF
A2 (Question 2)	Liam Kelly, Scottish Government	Andrea Leedale, ERFF
B2 (Question 2)	Doug Wilson, EA	Gemma Truelove, ERFF
A3 (Question 3)	Andy Shaw, NERC	Neil Veitch, ERFF (EA)
B3 (Question 3)	Lawrence Way, JNCC	Penny Blackmore, ERFF

Appendix E: Press Release

17th July 2008

UK-ENVIRONMENTAL OBSERVATION FRAMEWORK

Sharing the observation challenge

With the ever-growing challenges of climate change, over 150 environmental observers are meeting for the first time today in central London to debate and discuss issues and shared aspirations. Their current activities and a vision for the future are published today as part of a new, five-year UK-Environmental Observation Framework (UK-EOF).

UK-EOF is a partnership between Government departments, Research Councils and agencies. As we place more and more reliance on using the planet's natural resources, and become more aware of the way our climate is changing, there is an ever increasing need to take observations, to record the changes and predict what will happen.

The UK invests an estimated £500 million per year in environmental observations and this is a long-term commitment since for some measurement very large and complex tools are needed such as ships and satellites which take many years to plan and build.

All those who measure our environment on a regular basis have agreed to work together to make the best of the resources available to take the measurements, and to make better use of information once it has been collected.

Professor Bob Watson, Chief Scientific Adviser to Defra and 'champion' for the UK Environmental Observation Framework, said:

"We have never been more aware of the impacts of human activity on our planet. We are seeing loss of species, depletion of natural resources and the many issues associated with climate change. I hope the UK-EOF will enhance our ability to work together – across Government administrations, research councils, agencies and voluntary bodies – to tackle the technical, institutional and economic challenges associated with observing our constantly changing natural environment."

"These will require a great deal of commitment and new thinking but I am confident that we can make the UK even better at understanding the planet, and provide our scientists and policy makers with a solid platform from which to influence the global and international aspects of environmental change, as well as those closer to home."

The UK-Environmental Observation Framework comes from a recognition of the need to address the issues surrounding the collection and sharing of long-term datasets. The Environment Research Funders' Forum (ERFF), itself a partnership of UK Governments, research councils and agencies, carried out an analysis of the known environmental research and monitoring being funded throughout the UK.

From that analysis, at a workshop in 2006, the ERFF partners identified the need to greatly improve monitoring, observation and surveillance mechanisms.

The UK-EOF aims, by 2013, to find solutions to the long-standing issues of funding

and sharing the datasets, and to enable the UK to achieve a robust evidence base by contributing to many national and international programmes such as Living With Environmental Change.

Dr Peter Bridgewater, chair of the Joint Nature Conservation Committee, one of the key organisations in the preparation of this Framework, noted:

“The world leaders accepted in 2002 to slow the decline in biodiversity loss by 2010 - yet without good observational and monitoring data we will have no idea if we have succeeded in this aspiration, or where challenges will lie in future. Public bodies cannot achieve this level of monitoring on their own; they must work with the voluntary sector. While volunteer work on bird observation is well-known, less understood are the millions of hours work to observe butterflies, plants - even animals like woodlice and litter on our beaches. JNCC's hope is this new UK-Environmental Observation Framework will strengthen and develop the partnership between public and voluntary sectors, give us all new energy, and provide a focus and long term view of environmental conservation and management data needs, while promoting the vision that understanding and managing the environment is everyone's responsibility.”

Benefits to partner organisations within the Framework will include better operational planning, improved data quality from sharing best practices, and far less duplication of effort and its associated costs. In the longer term UK-EOF will provide a clear market for observations, encouraging technological innovations in industries that develop sensors, instrumentation and networks, and in climate modeling.

More information www.erff.org.uk

Notes for Editors

1. A copy of the 33-page document is available from www.erff.org.uk or the Defra press office.
2. The UK-EOF is the UK –Environmental Observation Framework. Initially this is a 5 year programme of coordinated activities to address the challenges associated with collecting observations of the environment. These challenges are outlined in the Framework which is published today.
3. The UK-EOF initial sponsors are: CCW, Defra, NIEA, EA, FC, JNCC, NE, NERC, SEPA, SG and SNH.
4. The ERFF Environment Research Funder's Forum is funded by

BBSRC Biotechnology and Biological Sciences Research Council
Defra Department for Environment Food and Rural Affairs
DFID Department for International Development
DfT Department for Transport
EA Environment Agency
ESRC Economic and Social Research Council
FC Forestry Commission
JNCC Joint Nature Conservation Committee
MRC Medical Research Council
NE Natural England
NERC Natural Environment Research Council
NIEA Northern Ireland Environment Agency
SEPA Scottish Environment Protection Agency
SG Scottish Government
WAG Welsh Assembly Government

EPSRC Engineering and Physical Sciences Research Council
FSA Food Standards Agency
HSE Health and Safety Executive
Met Office Met Office

5. Living With Environmental Change (LWEC) is an unprecedented partnership of 17 research and policy-making organisations working together to find ways to cope with the environmental changes that are already starting to affect people's well being and livelihoods. The programme will address environmental change in the short-term and at regional level as well as the longer term global changes. A key objective is to provide the evidence-base that policy-makers and people need to make timely decisions about the future.