

The UK Environmental Observation Framework Delivery Plan



A working document of the UKEOF Management Group

Version: February 2014

UKEOF is a core activity of Living with Environmental Change

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This Delivery Plan is a working document of the UKEOF Management Group and will be updated as the programme progresses. It describes how the **United Kingdom Environmental Observation Framework (UKEOF) will be delivered**. Further details of the programme itself can be found at: <http://www.ukeof.org.uk/>.

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Last Updated: February 2014

Executive Summary

The UK Environmental Observation Framework (UKEOF) provides a strategic framework to improve coordination of the observational evidence needed to understand and manage the changing natural environment. It was launched in 2008 in response to the long term issues that surround environmental monitoring, observations and surveillance and is a self-contained programme of the Living With Environmental Change (LWEC)¹ Partnership. The programme is funded by the major sponsors of environmental observations in the UK and delivered via a series of interlinked activities.

The first phase of the programme focused on the development of tools (Section 2.2) for use by partners and stakeholders to support transparent and evidence-based decision making for environmental observations. UKEOF has now moved into a second phase of promoting the uptake of the tools by partners and focusing on a number of priority areas. UKEOF underwent a review in 2013 and is now operating on a 'business as usual' basis.

The UKEOF secretariat manages the multi-dimensional programme to ensure that between themselves and the partners they can:

- 1) Respond to the needs of organisations; create opportunities and a neutral space in which discussions can be held on the relevance and efficiency of environmental observation programmes.
- 2) Work with UKEOF partners and Stakeholders to encourage the use of the UKEOF tool kit, particularly focusing on the upgrade and subsequent re-launch on the Environmental Observation Catalogue.
- 3) Work towards the UK's long term vision for data sharing and encourage a cultural shift in the reuse of environmental observation evidence, focusing delivery through the UKEOF Data Advisory Group.
- 4) Provide evidence and support to the Government Chief Scientific Adviser's Observations Committee towards removing issues around funding of observations.
- 5) Work in partnership with the UKEOF organisations to undertake short, detailed projects to address specific questions in priority areas. Initial topics to be covered include: Understanding Citizen Science, Finding monitoring efficiencies through coincidence mapping, and Coordinating Climate Observations.
- 6) As part of the LWEC partnership, work towards LWEC objectives surrounding observations and environmental information.
- 7) Support and provide advice where necessary to relevant groups and initiatives.
- 8) Raise awareness of UKEOF and increase the recognition and value of longer term observation activities amongst funders, users and potential users via newsletters, the website, workshops and regular Management Group meetings.

These activities will build upon the work delivered by UKEOF in the first 5 years of the programme (Section 4).

¹ LWEC merged with the Environment Research Funders Forum (ERFF) in June 2010, before this date UKEOF was a programme under the ERFF.

1. Overview of the UK Environmental Observation Framework

1.1 Background

1.1.1 This framework was set up in 2008, following acknowledgment of the long standing issues surrounding monitoring, observations and surveillance at the September 2006, ERFF workshop on environmental monitoring².

1.2 Aim

1.2.1 UKEOF is a partnership of public sector organisations with an interest in using and providing evidence from environmental observations. It aims:

- To achieve effective partnership working in environmental observations
- To maximise the benefits of observations to the UK including for science, policy and economic growth.

1.2.2 UKEOF provides a strategic framework to improve coordination of the observational evidence needed to understand and manage the changing natural environment.

1.2.3 Working with partners and with direction from the Management Group the aims will be met by achieving the following outcomes/objectives:

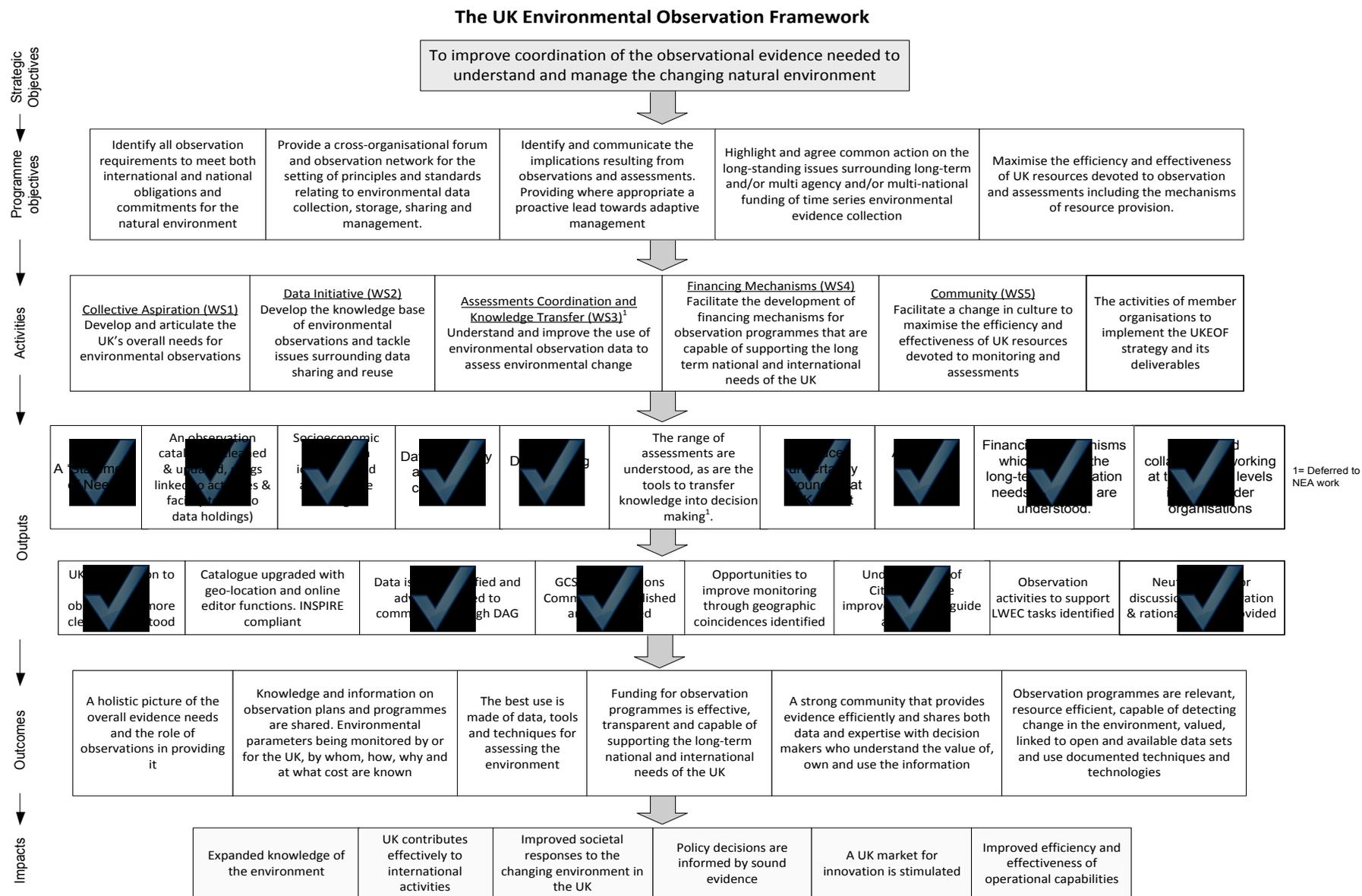
1. Develop a **holistic picture** of what the overall evidence needs are and the role of observations in providing this information. This will enable and empower the UK, and each agency, department or observation initiative to make a clearer contribution to existing and anticipated national and international programmes, optimise its investments, recognise dependencies and work in partnership.
2. **Share knowledge** and information on observation plans and programmes so that we will know what environmental parameters are being monitored by or for the UK, by whom, how, why and at what cost. We will have a greater understanding of what we can do with the information and how to access the data.
3. Enable effective and transparent **decision-making processes** by embedding the tools developed under the other objectives and encouraging good practice³. Understanding the use of data is a key component of the decision criteria.
4. Enable **funding** for observation programmes to be effective, transparent and capable of supporting the long-term information needs of the UK and the role of the UK in a global perspective.
5. Build a strong **community** providing evidence in the **most efficient and effective** manner and sharing both data and expertise with decision makers who understand the value of, own and use the information. Technological innovations will be encouraged where appropriate.

1.2.4 The objectives, activities and outcomes are illustrated in the Logic Chart of Figure 1.

² Strategic Analysis of UK Environmental Monitoring Activity. ERFF Report 02. August 2002, 24pp

³ N.B. this objective has been revised since the inception of UKEOF, the original objective (as outlined in the Framework document) included understanding the range of assessments that use observation data however this is being taken forward by the National Ecosystem Assessment & via LWEC objectives. In the current economic climate partners' focus has also shifted to being able to make effective decisions regarding the observation programmes that they are funding.

Figure 1: Logic Chart for UKEOF. This summarises the objectives and the planned activities to achieve the outcomes, which in turn will create the stated impacts. Ticked outputs have been achieved.



1.3 Structure and Management

- 1.3.1 The UKEOF work programme is split into interlinked areas of work. These are discussed further in Chapter 2. Progress on each is not carried out in isolation, there are many cross linkages and much of the work done on behalf of the community involves multiple outputs.
- 1.3.2 UKEOF is a core activity of the LWEC Partnership and reports to its Executive Management Committee. A Management Group guides the delivery of the Framework and transfers the outcomes to each partner organisation.
- 1.3.3 The UKEOF secretariat provides everyday programme and project management, communication and co-ordination between the interlinked work areas.
- 1.3.4 Each on-going work activity has at least one dedicated Management Group champion who is responsible for guiding the work and will report progress to the rest of the group.
- 1.3.5 The UKEOF budget is approximately £240k (0.08% of the estimated £300 million a year currently spent on collecting environmental observations). Funding was reduced from £450k in 2010. In addition, partners provide in-kind support.
- 1.3.6 The funders and initiators of UK environmental observations have agreed to work together to implement this framework. Their priorities for UKEOF are listed in Annex 1. In order to achieve the outcomes UKEOF will draw upon and bring together the expertise and experience of a wide range of stakeholders across the public, commercial and voluntary sectors.
- 1.3.7 Terms and References for the UKEOF groups can be found in Annex 2.

1.4 Programme Review

- 1.4.1 Five years after the start of the programme the two main funders, NERC and Defra, commissioned a review of UKEOF that reported in April 2013. There was full support from the Management Group of the recommendation to continue UKEOF and it is now operating on a 'business as usual' basis. This means that UKEOF will continue, under periodic review, and is no longer a time limited programme. New areas of interest to multiple partners are currently being scoped to add to the work plan.

2 Work Areas

2.1 Work Programme

2.1.1 When set up in 2008 the UKEOF work programme was divided into 5 distinct streams each with its own programme of work and deliverables. This first phase of the programme focused on the development of tools (Section 2.2) for use by partners and stakeholders to support transparent and evidence-based decision making for environmental observations.

2.1.2 As the programme progressed the requirements of the partners and stakeholders changed, resulting in the need to accelerate the progression of some activities and postpone others. During 2010 the programme therefore developed into a more flexible model and UKEOF moved into a second phase of promoting the uptake of the tools by partners and focusing on a number of priority areas. The new structure of work has been mapped onto the original work streams in Annex 3.

2.1.3 The UKEOF Review in 2013 supported this new structure of work, where priority areas are identified. It also recommended that, apart from the catalogue, the tools should not be developed further although the secretariat will still support their uptake and use.

2.1.4 In the current structure of work, core UKEOF activities have been determined. These are activities that are considered to be of relevance to all UKEOF partners:

- Management Group
- Data Advisory Group
- Environmental Observation Catalogue
- Support to Observations Committee
- Communications and Community engagement

In addition time-limited projects in priority areas are undertaken. These activities are short, detailed studies to address questions in specific areas (Section 2.3.3). Projects are of interest to multiple partners, but may not be of interest to all partners. Together, these components aim to meet the outcomes/objectives of UKEOF (Table 1).

Table 1: Current work programme mapped against UKEOF Objectives/Outcomes (*includes upgrade)

UKEOF Objective/Outcome	Tool	Activity
1. Develop a holistic picture of overall evidence needs	Environmental Observation Catalogue* Statement of Need	
2. Share knowledge and information on observation plans, programmes and data	Environmental Observation Catalogue*	Management Group Data Advisory Group Coordinating Climate Observations Citizen Science Working Group Finding Monitoring Efficiencies LWEC 'Access to Data' activities
3. Enable effective and transparent decision making processes	Decision Support Framework Assessment Tool Environmental Observation Catalogue* Statement of Need	
4. Enable funding for observation programmes to be effective, transparent and capable of supporting the long-term needs of the UK	Statement of Need Cost Guidance Decision Support Framework	Support to Observations Committee
5. Build a strong community that provides evidence in an efficient and effective manner	Environmental Observation Catalogue* Data Advisory Group	Finding Monitoring Efficiencies Citizen Science Guide and Report Communication & Community Engagement. All UKEOF Groups

2.2 The UKEOF 'Tool Kit'

2.2.1 UKEOF has developed a 'tool kit' for use by the partners and stakeholders to support transparent and evidence based decisions and investments with regard to environmental observations. The tool kit consists of:

2.2.2 **Environmental Observation Catalogue** (Management Group Champion: Rich Walmsley, EA)
The Catalogue is an online searchable metadata (i.e. knowledge of who is doing what, where and why) database of over 1200 activities. The Catalogue is freely available on the UKEOF website. It offers the only UK overview of observation activities.

The Catalogue is currently being upgraded to allow easier access to more up to date information on the UK's observation activities. Additional information about geo-location will be populated and through a map function users will be able to visualise where observations are being carried out. The upgrade will also make it easier and quicker to update information by allowing organisations to update their information themselves using an online editor tool. The new Catalogue will be INSPIRE compliant.

2.2.3 **Cost Guidance**

In order to better understand the scale of investment made in environmental observations it is necessary to collate the costs that organisations attribute to these activities. However, costs can be determined in a number of ways and so this guidance has been developed to provide a standard methodology for submitting cost information, to help provide consistency between organisations.

2.2.4 **Towards a Statement of Need**

This report reviews all the environmental observation requirements for the UK, including national and international commitments and the evidence required to answer major environmental issues and scientific questions. It should be used to ensure that the most appropriate information is gathered to address the challenges.

2.2.5 **Assessment Tool**

This tool, within the Catalogue, allows for activities to be assessed against need or other criteria as required by the partners.

2.2.6 **Decision Support Framework**

Through this structured framework partners are helped to make transparent decisions and look at the broader UK picture when considering their internal investment priorities.

2.3 Activities

2.3.1 **Data Initiative**

One of the objectives of UKEOF is to work with partners and organisations to achieve a long-term vision for data sharing and a cultural shift in the reuse of information. Initially a Data Initiative was set up to achieve this; however elements of this were put on hold in 2011, due to the development of an Environmental Information Framework (EIF) by Defra and LWEC.

A key activity of the Data Initiative that was taken forwards was the establishment of the UKEOF **Data Advisory Group** (DAG). This collaborative forum allows organisations to come together to discuss the various data sharing initiatives at the UK, EU and global levels - including GEO, INSPIRE, SEIS, the UK Location Strategy etc. Following the curtailment of EIF the activities of the Data Initiative are now being taken forwards through the DAG.

2.3.2 Sustainable Funding Mechanisms

This activity aims to remove barriers to financial mechanisms so that the long term national and international needs of the UK can be met. To achieve this, it is necessary to understand both the needs for environmental observations and how much the UK is investing.

Together with the Government Office for Science (GO Science), UKEOF provides evidence and secretariat support to the GCSA cross departmental Observations Committee. The aim of the Committee is to help ensure that the UK's crucial long term environmental observational information needs can be met for science, society and the economy.

UKEOF will also work to better determine the estimated spend by the UK's major public funders of environmental observations.

2.3.3 Community – Facilitating Collaboration and Communication

For the framework to succeed, 'buy-in' and ownership from the diverse community with an interest in observations is essential. Part of this activity will be achieved through raising awareness of UKEOF and increasing the recognition and value of longer term observation activities amongst funders, users and potential users. This will be achieved via newsletters, the website, workshops and regular Management Group meetings. In addition time-limited projects in priority areas will be undertaken:

Priority Areas

UKEOF will work in partnership with the Management Group members to identify and undertake projects in priority areas, which will build upon the tools developed and evidence already gathered. The initial projects are on:

- Understanding Citizen Science
- Finding monitoring efficiencies through coincidence mapping (Management Group Champion: Andy Nisbet, NE)
- Coordinating Climate Observations (Management Group Champion: Cathy Johnson, DECC)

Other areas that were identified and are currently on hold are:

- Assessing water observations – awaiting further development of the UKWRIP
- Legislative Observations – awaiting the outcome of the Defra Strategic Alignment Project

A project has been carried out on the inclusion of socio-economic data and activities in UKEOF work (see Annex 5, 2.3 a).

UKEOF will also provide support and a **neutral space** for organisations to discuss efficiencies and collaborative working.

2.3.4 LWEC Partnership

As a separately funded activity of the Living With Environmental Change partnership, UKEOF will contribute both directly and indirectly to LWEC objectives and is their core activity on observations. Key activities that have been identified are:

- Realising Nature's Value: LWEC Ecosystem Task Force – Action 3 Monitoring for Biodiversity and Ecosystem Services
- UK Flood and Coastal Erosion Risk Management (FCERM) Research Strategy – Improving access to data and information

2.4 Additional initiatives and cross-cutting work

Some UKEOF time will be spent addressing the linkages with other initiatives and cross-cutting issues.

Other initiatives that UKEOF has shared interests with include (but are not limited to):

- Coordinated Agenda for Marine, Environment and Rural Affairs Science (CAMERAS)
- Global Monitoring for the Environment and Security (GMES)
- Group on Earth Observations (GEO)
- Infrastructure for Spatial Information for Europe (INSPIRE)
- Marine Science Coordination Committee (MSCC)
- National Biodiversity Network (NBN)
- National Ecosystems Assessment (NEA)
- Shared Environmental Information System (SEIS)
- The UK Location Strategy
- UK Marine Monitoring and Assessment Strategy (UKMMAS)

In addition there are several strategies or action plans that are relevant to UKEOF:

- Defra Ecosystems Approach Action Plan
- Defra Evidence and Investment Strategy
- The Natural Choice: securing the value of nature [Natural Environment White paper], 2011
- NERC Strategy
- Transparency Agenda
- Water for Life [The Water White paper], 2011

3. Current Work Plan

No.	Activity	Output/expected output	Timescale	Resource	RAG Status
1. Environmental Observation Catalogue					
1.1	Upgrade Catalogue to provide mapping and user update functions	Easier access to up to date information on the UK's observation activities. INSPIRE compliant.	Spring 2014	£200k contract to CEH Lancaster. Management by UKEOF secretariat and project board	G
1.2	Assess UK Satellite entries in the Catalogue and establish a coherent method for their inclusion	Up to date, and comprehensive listing of UK Satellite environmental observing activities included in the Catalogue	Spring 2014	UKSA, Space Applications Catapult, UKEOF secretariat	G
2. Data Initiative					
2.1	Facilitate DAG	Provide forum for understanding the data initiatives landscape and sharing knowledge and expertise. Circulation of information generated by the group.	Ongoing – Quarterly as necessary	UKEOF secretariat, DAG Chair, Community provide updates and attend	G
2.2	Support the community in the implementation of the INSPIRE Annex III EF Theme	UK realises the benefits of the INSPIRE Directive in a timely manner	On-going	DAG, UKEOF secretariat, UKLP (Defra)	G
2.3	Produce a series of Advice Notes	Community supported by relevant information on key data issues	On-going	DAG, UKEOF secretariat	G
3. Sustainable Funding Mechanisms					
3.1	Support to Observations Committee	Finding solutions and breaking the barriers to long term funding of observations	On-going	UKEOF secretariat and GO Science	G
4. Community - Facilitating Collaboration and Communication					
4.1	Raise awareness of UKEOF and increase the recognition and value of longer term observation activities	4.1.1 Produce new set of standard UKEOF materials	Complete - December 2013	UKEOF secretariat and Management Group	G
		4.1.2 Redesign website	Complete - November 2013		
		4.1.3 Monitor and report UKEOF	On-going		

		impact			
4.2	Understanding Citizen Science	4.2.1 Impact of guide and report promoted and monitored	March 2014	Citizen Science Working Group, UKEOF Secretariat	G
		4.2.2 Options investigated for sharing best practice	May 2014		
		4.2.3 Online resource developed to signpost available guidance	April 2014		
		4.2.4 Peer review publications assessing value of citizen science produced	April 2014		
4.3	Finding Opportunities to Improve Monitoring: Pilot in Hampshire-Avon catchment	4.3.1 Workshop for monitoring organisations in the area	Complete – October 2013	UKEOF Secretariat, Steering Group, Monitoring community	G
		4.3.2 Collaborations following workshop monitored	April 2014		
		4.3.3 Final report on pilot	May 2014		
4.4	Coordinating Climate Observations	4.4.1 Project to identify UKs contribution to climate observations	Complete - February 2014	Contract to Team Projects £31k	G
		4.4.2 Work plan developed for CCOG	June 2014	Coordinating Climate Observations Group, UKEOF secretariat	
4.5	LWEC Partnership	4.5.1 LWEC Ecosystem Task Force – Action 3 Monitoring for Biodiversity and Ecosystem Services	TBC	UKEOF secretariat, and relevant LWEC partners	G
		4.5.2 FCERM Research Strategy – Improving access to data and information			

4. Outputs and Outcomes to date

A full listing of the progress made by the programme is at Annex 5. Please refer to the UKEOF website for documents and reports www.ukeof.org.uk.

4.1 Outputs

Some of the major outputs from the UKEOF programme to date include:

- production of a **catalogue** of observation programmes and activities in the UK. The Catalogue is being recognised as best practice internationally and means we can begin to understand: *What is being observed, Who funds UK observations, Who leads, Why, How long observations have been continuing?*;
- building and population of **tools** to support UK funders in making transparent decisions on the use and funding of observations: the Statement of Need, a Decision Support Framework, an assessment tool and guidance for costing the investments made in observations and monitoring;
- an **analysis of UK observation programmes** and activities. For example we now know there are over 1200 on-going activities, funded by at least 100 different organisations. The best estimate shows that at least £300m per year is invested in observations by the public sector and volunteers contribute at least an additional £50m;
- **advice** to a range of stakeholders as UKEOF became the focal point for national and international discussions;
- a **review** of the cost and extent of coordination of environmental physical samples collected for or by the UK, including **recommendations** as to how to coordinate and facilitate the discovery of physical samples to encourage re-use of physical samples and their associated data;
- a practical **guide** to developing, implementing and evaluating **citizen science**, and a comprehensive report from the UKEOF commissioned review 'Understanding Citizen Science and Environmental Monitoring';
- the first of a series of **Advice Notes**, 'The Principles of Good Data and Information Management', from the UKEOF Data Advisory Group.

4.2 Outcomes

UKEOF's outcomes will develop further over time but there have already been some significant outcomes, with UKEOF changing the way monitoring and observations are managed in the UK and further afield. Some of the initial outcomes include:

- The establishment of a Government Chief Scientific Adviser (GCSA) chaired Observations Committee. As a result of discussion between UKEOF and the GCSA, a group was set up to look at the issues surrounding the funding of long term observation, concluding with the formation of the Observations Committee;
- An influential response to the consultation on the implementation of the Environmental Monitoring Facilities Theme (EF) of INSPIRE⁴ Annex III was able to be produced, utilising the network and knowledge of UKEOF;

⁴ INSPIRE is a European directive establishing an infrastructure for spatial information in Europe to support Community environmental policies, and policies or activities which may have an impact on the environment.

- A user focal point to support the implementation of the INSPIRE EF Theme is being provided through the Data Advisory Group (DAG). This is one of the few Themes with such a support mechanism. The DAG has been charged to act as this focal point by the UK Location Programme (UKLP) as a result of the key role it plays in coordination for the major environmental data initiatives including SEIS, GMES and INSPIRE;
- The UKEOF partners have a strong evidence base to support their activities in environmental observations e.g.
 - The Systematic Observations section of the UK's Sixth National Communication, a report required of Parties to the UNFCCC (UN Framework Convention on Climate Change) was drafted for DECC by drawing on the UKEOF Catalogue, and work by the UKEOF Secretariat and a contractor, to provide a comprehensive overview of UK activities making observations of the climate system;
 - The UKEOF Catalogue has been used as a key evidence base for the Consolidated Evidence work stream of the Defra network Strategic Alignment project;
 - The Statement of Need evidence has been used by the UK Space Agency to highlight the opportunities for the use of remote sensing to provide key evidence streams;
 - The Natural England mapping of monitoring sites was greatly facilitated by the existing network UKEOF provides and the UKEOF Catalogue was a source of key evidence. The project allowed members to look at their monitoring networks alongside Natural England's and investigate collaborative opportunities.
- There is a neutral space for public bodies to discuss collaboration and efficiencies in environmental observations through the UKEOF Management Group;
- UKEOF is admired across Europe and internationally as having the framework and tools to coordinate monitoring. The South Australia state is looking to UKEOF as a role model for co-ordination of their observations.

5. Risk Log

PM = Programme Manager pm = Project Managers MG = Management Group
 Score = Impact (H=3, M=2, L=1) x Probability (H=3, M=2, L=1)

ID	Owner	Risk	Impact	Probability	Score	Mitigating Actions	Contingency	Status
1	PM	Funding: Committed funds not realised/ met	H	M	6	Co-funding agreement in place. Gain early confirmation before start of financial year. Plan ahead and realign work	Scale down tasks and re-prioritise as far in advance as possible with revised funding schemes	A
2	PM & MG	Funding: Multiple partners impacted by funding constraints	H	M	6	Maintain good communication with MG members throughout the year to ensure any issues are identified early	Re-prioritise and investigate different funding models to support project activities	A
3	PM	Personnel: Team sickness delays progress (small team)	H	L	3	Ensure team are aware of progress in all areas, so that urgent matters can be taken up & resolved by another member of the team	Reprioritise the work loads of the team to ensure that critical tasks are delivered	G
4	PM	Personnel: Team members leaving	H	M	6	Ensure team are aware of progress in all areas, and work backed up on central systems. Advertise vacant posts quickly	Reprioritise workloads to for critical tasks. Employ temporary cover until replacements can be found.	G
5	PM	Personnel: Unable to use secondment mechanism / recruitment freeze	H	M	6	Ensure flexibility within the team to pick up urgent matters. Reprioritise workloads to cover critical tasks and re-programme milestones	Employ temporary staff to fill gaps or contract work out	G
6	PM	Programme: UKEOF duplicates work of other groups	M	L	2	Strong communication with MG and their organisations. Outreach to wider community	Adjust work programme to avoid duplication and ensure it adds value	G
7	PM & pm	Programme: Slippage	M	M	4	Strong project/ programme management. Review progress regularly	Realign work plan. If necessary/ possible increase resources to meet targets	G
8	PM & MG	Programme: Creep	M	M	4	Allow a degree of flexibility in the programme, and review regularly with the MG	Realign the work plan to accommodate new priorities and reset goals	G
9	PM	Programme: Outputs/	H	L	3	Progress transparent and directed by partners.	Withdrawal of	G

ID	Owner	Risk	Impact	Probability	Score	Mitigating Actions	Contingency	Status
	& MG	recommendations incorrectly interpreted				Outputs/ recommendations signed off by the MG. Caveats should be clearly stated.	outputs/recommendations or rewording to clarify the issues	
10	MG	Management: Too many bosses – management by committee	M	L	2	Empower the secretariat for day to day decisions. Have clear work programmes and MG Champions to support work and report to MG meetings	Create a smaller executive to make timely decision where necessary	G
11	MG	Partners: Lack of engagement / time input from senior staff	H	M	6	Keep LWEC EMC informed of progress. Maintain good engagement with the MG representatives. Have clear tangible milestones	Arrange meetings to discuss the relevance to organisations and the need for their support	G
12	PM	Partners: Organisational changes	H	M	6	Swift engagement with new personnel to maintain network	Ensure that contact is maintained and new personnel identified	G
13	MG	Partners: Organisations do not take ownership of the work / outputs/ engage	H	M	6	Ensure that any work is fully supported by the MG and resources are available to provide the required information	Understand why there is a lack of engagement & if necessary alter the focus of the work to ensure it meets the MG needs	G
14	MG	Partners: Engagement lost from Devolved Administrations with a perceived London-centric or one size fits all approach	H	M	6	Be aware of and open to the issues. Ensure that activities are based UK wide, including MG meetings. Demonstrate value of UK approach where appropriate	Encourage policy makers to consider the benefits of coordinated observation programmes and include this in their policies	G
15	PM	Community: Events not well attended	M	L	2	Canvass for dates & advance advertising. Good organisation, set clear objectives and target the audience needed to achieve the outcome. Seek feedback	Alter the focus of the workshops. Provide incentives for attendance and input	G
16	PM & MG	Community: Scepticism based on previous experience	M	M	4	Maintain good communication with stakeholders: Newsletters, Website and Workshops etc. Illustrate the benefits of outputs & maintain momentum	Work with non sceptics to influence those who are sceptical.	G

Annex 1: Priorities of the UKEOF Funders and Management Group Members

(Revised February 2014)

Organisation	Top UKEOF Priority
CEH	To collaborate in creating a flexible, long-term UK environmental surveillance system that informs evidence-based decision making from local to global scales by linking data from hydrological, biogeochemical, ecological and socio-economic observations.
DECC	A complete picture of UK activity relating to the GCOS (Global Climate Observing System) Implementation Plan and oversight and coordination of UK (GCOS) activities.
Defra	Providing a basis for making informed decisions on investments (increasing/decreasing/redeploying) in environmental observation activities and to promote improved coordination and information exchange.
DOENI (NIEA)	Deliver a mechanism that enables UK environmental bodies to readily share and use data to develop more co-ordinated and effective observation activities.
EA	To enable the EA to achieve more for the environment in England by sharing information, expertise and data relating to environmental observations.
EEA	To use UKEOF as a means to maintain an overview of UK input to relevant EU activity, particularly SEIS and GMES.
ESRC	To ensure links between the social science and environmental science communities are facilitated through opportunities to share information, expertise and skills relating to observation data.
Forestry Commission	To facilitate better co-ordination, awareness and collaboration across organisations funding environmental observation activities.
JNCC	To improve the knowledge and sharing of information between domains and funders to help JNCC make appropriate use of monitoring data outside its remit in combination with biodiversity data to provide advice, and to provide a means to aid multi stakeholder decisions on the future of monitoring programmes and achieving efficiency.
Met Office	Providing a framework to facilitate increased collaboration between members to maximise the benefit obtained from our investments in environmental observation activities.
Natural England	Stronger buy-in from environmental agencies and engagement with UKEOF.
NERC	Providing a basis for making informed decisions on investments (increasing/decreasing/redeploying) in environmental observation activities.
NRW	To facilitate collaboration and access to information and expertise around environmental observations to assist us in shaping our contribution to an evidence base that supports effective decision-making about the natural resources of Wales.
SEPA	To promote development of practical new environmental monitoring technologies and provide an evidence base which will enable SEPA to amend its monitoring programmes to optimise its contribution to Scotland's and the UK's statutory and UK national monitoring requirements, without duplicating the work of other organisations.
Scottish Government	Provide a basis for making informed investment decisions and increase accessibility and use of the data collected.
SNH	Readily accessible catalogue (comprehensive rather than complex) of biodiversity and related environmental data sources to: a) support statutory surveillance and reporting responsibilities; b) underpin policy analysis & evaluation; and c) inform & facilitate joint action throughout Scotland.
UK Space Agency	To help UKSA understand the public sector's needs for earth observation information with a view to improving how the Space Sector can help serve that need.
WG	To facilitate better co-ordination, awareness and collaboration across organisations but within a mechanism that allows sharing of results of our research activities in a way that makes them useable on the ground rather than something that is just for funders or observatories.

Annex 2: Terms of Reference for UKEOF groups

An illustrated structure of UKEOF can be found in the Framework document, Figure 2, page 22.

Champion

Champion: Under discussion

Reports to:

Purpose:

- To champion the vision for better integration and co-ordination of observation activities
- To promote the objectives and role of UKEOF with CSAs across Government
- To support the UKEOF aims of:
 - achieving effective partnership working in environmental observations
 - maximising the benefits of observations to the UK including for science, policy and economic growth

LWEC Executive Management Group

Chair: Iain Gillespie, NERC Director Science

Reports to: LWEC Partners

Membership: Key funders, senior policy players across government and the Devolved Administrations.

Directorate: LWEC (hosted at NERC Swindon Office)

Purpose:

- Ensure that UKEOF activities are aligned to those of LWEC
- Be consulted on the strategic direction of UKEOF
- Take a leading position on UK environmental data stewardship
- Agree to outputs from the programme and advice from the Management Group

Frequency of meetings: Two per annum

UKEOF Management Group

Chair: Doug Wilson

Reports to: LWEC Executive Management Committee

Membership: Scientific and policy representatives (Grade 7/Band 4) drawn from sponsoring Agencies and Institutes. Representatives from other relevant parties may be included in activities as appropriate.

Secretariat: UKEOF

Purpose: Programme overview

- Define and co-ordinate the UKEOF programme and ensure that it is supported by the appropriate structures, processes and strategies.
- Monitor progress, high-level risks and issues, take decisions and provide strategic guidance and direction to meet the outcomes/objectives.
- Regularly review the likelihood of the Programme meeting its goals and take appropriate action.

Resources Input

- Approve major deviations from the Programme Plan and allocate resources accordingly.

Add expertise

- Define and articulate the international and national obligations and commitments, including operational forecasts, which require environmental observations, looking across all of the UKEOF domains.
- Provide overall direction to observation programmes ensuring that the maximum efficiency and effectiveness is made of UK resources devoted to observations and assessments.

- Assign a champion to each area of work/ project to guide the activities, liaise with the secretariat and represent the activity at Management Group meetings.

Outreach and Communications

- Identify and highlight to the appropriate board any emerging issues.
- Ensure alignment between the Programme and their organisation's strategies (transfer the outcomes of UKEOF and embed them within these strategies).
- Engage with other stakeholders (non member organisations) to encourage the uptake and adoption of UKEOF outcomes.
- Provide a platform for discussion of UK interests in observations.

Frequency of meetings: 3 per year as necessary potentially April, July, Dec

UKEOF Programme Manager and Secretariat

PM: Helen Beadman

Reports to: LWEC and UKEOF Management Group

- Duties:**
- Responsible for the health of the programme
 - Responsible for coherence and coordination between the work areas
 - Identifies key cross-cutting issues
 - Plans the programme and monitors overall progress
 - Resolves issues and initiates corrective action
 - Ensures quality assurance and overall integrity of the Programme
 - Manages third party contributions
 - Stakeholder communications
 - Manages project dependencies and interfaces
 - Coordinates/facilitates risk management activities
 - Progress reporting to the Management Group and others

A secretariat⁵ (the UKEOF team) will support the Programme Manager. Where appropriate team members will have project manager duties which include:

- Responsibility for the timely delivery of outputs to the agreed cost & quality
- Monitoring progress
- Use of appropriate project management techniques

The secretariat will provide programme and project management, communication and facilitation between the work areas, services and research to enable delivery.

Data Advisory Group (Full Terms of Reference available at www.ukeof.org.uk)

Chair: Stefan Carlyle (EA)

Reports to: UKEOF Management Group, LWEC and where appropriate Defra environment sector data and information governance group(s)

Membership: Representatives of the broadest environmental data and information community and /or those with specific technical and/or policy relevant roles in observation and monitoring at a UK, European or international level

Secretariat: Provided by UKEOF (Andrea Turner)

Purpose: To deliver Transparency and Open Data across the Environment Sector with a particular focus on observation and monitoring, facilitated by exchange of knowledge on local, national and international data and information initiatives

Frequency of meetings: Quarterly

⁵ The full Secretariat team initially consisted of a Programme Manager, Data Initiative Manager, an Observation Coordinator, an Observation Requirements Analyst, a Decision Support Coordinator and an Administration Assistant. From 2012 this was reduced to a Programme Manager two FTE project managers and a part time administration post.

Coordinating Climate Observations Group (Full Terms of Reference available at www.ukeof.org.uk)

Chair: Cathy Johnson (DECC)

Reports to: UKEOF Management Group

Membership: CEH, DECC, DFID, Met Office, NERC, STFC

Secretariat: Provided by UKEOF (Andrea Turner)

Purpose: To provide an 'executive' function, overseeing coordination of UK Global Climate Observing System (GCOS) activities

Frequency of meetings: 3 per year

Citizen Science Working Group (Full Terms of Reference available at www.ukeof.org.uk)

Chair: Rob Grew (EA)

Reports to: UKEOF Management Group and to members' organisations where appropriate

Membership: Public sector organisations with an interest in Citizen Science

Secretariat: Provided by UKEOF (Sophie Isaacs)

Purpose: To provide a forum where member organisations ('partners') can share good practice and discuss future needs and plans for using volunteers to provide environmental observation data

Frequency of meetings: Twice a year and communicate regularly by telephone conference

Observation Community (see Annex 4 for a definition of the 'Community')

The observation community will be asked to provide input to consultations/workshops to ensure that progress is in line with their needs. In the long-term this will ensure greater integration of existing evidence collection and co-ordination of initiatives and assessments. Ad hoc groups or workshops to facilitate the work areas will be arranged where necessary.

Annex 3: Tools and Work Activities (past and current) mapped onto original (2008) work streams

Original Work stream	Original Sub-work stream	Tools and Work Areas
Work stream 1: Collective Aspiration	WS1a Statement of Need	Statement of Need Inclusion of socio-economic observations
	WS2b Decision Support Framework	Decision Support Framework
Work stream 2: Knowledge Base (and subsequently Data Initiative)	WS1a Environmental Observation Catalogue	Environmental Observation Catalogue
	WS2b Data Suitability	Data Initiative - DAG
	WS2c Data Status Table	
	WS2d Focal Point	
	WS2e Data Policies	
WS2f Infrastructure & Resources		
Work stream 3: Assessment, Coordination and Knowledge Transfer		Assessment Tool Note: Integrated assessments are being taken forward by the National Ecosystem Assessment and also under LWEC, therefore the responsibility has been transferred from UKEOF
Work stream 4: Financing Mechanisms	WS4a Assessing our Investments	Cost Guidance Understanding the Investments made to observations
	WS4b Barriers and Scoping Study	Support to the GCSA Observations Committee
	WS4c Implementation	Decision Support Framework
Work stream 5: Community		Communications – website, newsletter, workshops and meetings Priority Areas: - Understanding Citizen Science - Finding Monitoring Efficiencies - Coordinating Climate Observations A neutral space for discussion

Tools in **bold**

Annex 4: Terminology, Definitions and Acronyms

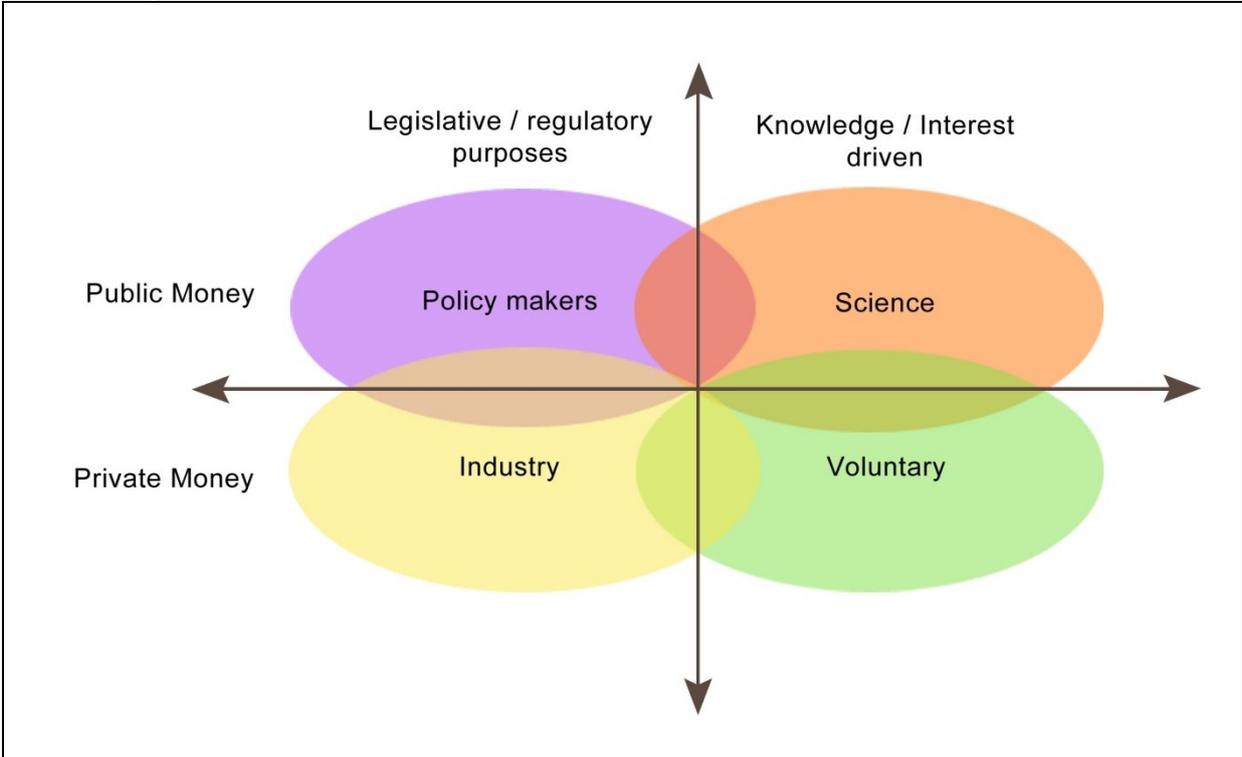
There are many different ways of describing the activities which take measurements of the environment. Depending on the scientific discipline, policy community or private sector, this results in many different understandings of the words monitoring, observation and surveillance. Some definitions in current use are described in Box 4. For the purposes of the UKEOF we will use the following initial definitions:

Observations: *the taking, on a reasonably regular basis, of any form of observations relative to the status of the environment, regardless of frequency of, or purpose for which the observations are made, or however they are made (from satellites, ships, etc). Such observations are designed to meet a wide range of societal needs by providing a variety of products and services. Surveys are in scope for some work areas.*

Environmental: *the broadest sense of observations from the natural environment concerning physical (including geological), chemical and biological properties of the environment. This includes observations collected on land, in air, in ice, in freshwater and in the coastal and marine environment, compliance or statutory information, earth observations from space and the effects of humans on the environment and vice versa⁶.*

The Observation Community: includes all players with an interest in collecting, funding and using observations. The community ranges from senior government officials to field scientists and modelers and from large organisations to individuals. For the purposes of UKEOF, the community and their interactions are illustrated in the 'PSVI' model (Policy, Science, Voluntary and Industry) (Figure 3).

Figure 3: The Policy, Science, Voluntary and Industry (PSVI) model: clustering the observation community and understanding its interactions



⁶ The scope of UKEOF has been altered since the inception in 2008. Originally social information was excluded, however following on from Towards a Statement of Need, the scope was increased to include environmental socio-economic information that is required to fully address environmental issues and questions.

Glossary of Acronyms

ADAS	Environmental Consultancy firm
BGS	British Geological Survey
CAMERAS	Coordinated Agenda for Marine Environment and Rural Affairs Science
CEH	Centre for Ecology and Hydrology
DECC	Department of Energy and Climate Change
DOENI	Department of the Environment Northern Ireland
EA	Environment Agency
EEA	European Environment Agency
EIF	Environmental Information Framework
EF	Environmental Monitoring Facility (Annex III of INSPIRE)
Envia	Environmental Information Access and Discovery
EPICS	Environmental, Pressures, Impacts, Consequences and Solutions (LWEC Classification Scheme used for research & observations within Envirobase)
ERFF	Environment Research Funders Forum
ESRC	Economic and Social Research Council
GCOS	Global Climate Observing System
GCSA	Government Chief Scientific Adviser
GEO	Group on Earth Observations
GEOSS	Global Environmental Observation System of Systems
GMES	Global Monitoring for Environment and Security (also known as Copernicus)
INSPIRE	Infrastructure for Spatial Information in Europe
JNCC	Joint Nature Conservation Committee
LWEC	Living with Environmental Change
MEDIN	Marine Environmental Data and Information Network
Met Office	Meteorological Office
MSCC	Marine Science Coordination Committee
NBN	National Biodiversity Network
NCEO	National Centre for Earth Observation
NERC	Natural Environment Research Council
NIEA	Northern Ireland Environment Agency
NGO	Non-Governmental Organisation
NRW	Natural Resources Wales
SEIS	Shared Environmental Information System
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SoN	Statement of Need
STFC	Science and Technology Facilities Council
UKDMOS	United Kingdom Directory of Marine Observing Systems
UKEOF	UK Environmental Observation Framework
UKLP	UK Location Programme
UKMMAS	United Kingdom Marine Monitoring and Assessment Strategy
UNFCCC	United Nations Framework Convention on Climate Change
UKWRIP	UK Water Research and Innovation Partnership
WG	Welsh Government
WERH	Wales Environment Research Hub

BOX 4 from the Framework document⁷ sets out the terminology used by the observation community (the definitions used by UKEOF are set out on p. 44 in this document)

BOX 4: TERMINOLOGY CURRENTLY USED BY THE OBSERVATION COMMUNITY

There is as yet no agreed set of definitions in use across the diverse observation community. However, a useful general definition is "the taking, on a reasonably regular basis, of any form of observations relative to the status of the environment, regardless of frequency of, or purpose for which, the observations are made" (Portmann, 2000).

Such monitoring is designed to meet a wide range of societal needs by providing a variety of products and services.

Within this definition there are two main categories of monitoring:

- **Statutory monitoring**
That monitoring which is required under the various legislative directives and the UK must demonstrate it is undertaking. **Compliance monitoring** is a subset of statutory monitoring and refers to demonstrating compliance with statutory programmes or against a defined target e.g. reduction of inputs of hazardous substances. Note that this is often confused with statutory monitoring but it is the results of the compliance monitoring which are key rather than the taking of the measurements themselves.

- **Investigative monitoring**
The investigative monitoring programme is analogous to a scientific investigation where the hypothesis under test is whether the targets have been achieved or a cause of failure is unknown. A monitoring programme could therefore make a series of measurements to test the hypothesis by a discrete data gathering exercise or one that may require several field visits.

Many members of the observation community have adopted more specific definitions which tend to reflect the nature of their operations: for example, MECN time series data falls within Portmann's definition of monitoring.

Water Framework Directive Monitoring Definitions

Under this Directive, there are 3 types of monitoring required:

- **Surveillance** – to validate the risk assessments, detect long-term trends in natural conditions and long-term changes in widespread anthropogenic activity, assess impacts and design the monitoring strategy;
- **Operational** – to classify those water bodies which are at risk of failing good status; to monitor the elements most sensitive to the pressures on the water body and assess the change resulting from the programme of measures; this monitoring is risk based.
- **Investigative** – to ascertain the cause and effects of a failure when either the reason for exceeding the limit is unknown or the magnitude of accidental pollution is unclear.

The Environment Agency is moving towards using these definitions to brigade all of its observation activities.

Earth Observation:

Earth Observation is defined overall as the measurement and monitoring of the planet from space using satellites.

OECD Definition:

"Environmental Monitoring refers to the continuous or frequent standardized measurement and observation of the environment (air, water, land/soil, biota), often used for warning and control."

JNCC have previously used the following definitions:

"Monitoring is an intermittent (regular or irregular) series of observations in time, carried out to show the extent of compliance with a formulated standard or degree of deviation from an expected norm" (Hellowell (1991), modified by Brown (2000)).

In line with this definition, there is a need to define the state desired in terms of objectives or targets, and then undertake monitoring to assess whether these objectives are being met.

Monitoring, in the sense used here, is distinct from surveillance, which is a repeated survey, using a standard methodology, undertaken to provide a series of observations over time. (This distinction is also made by Natural England and MECN.) Surveillance can yield valuable information on trends in the state of biodiversity and Earth science, but does not by itself establish whether objectives or standards have been met. Information derived from surveillance may be used to inform judgments on the condition of features on sites.

The E-KTN has an industry-facing definition as follows:

To industry, environmental monitoring is a multi-disciplinary activity that will increasingly require the effective integration of three key technology areas:

Measurement and Sampling devices (both in-field and laboratory based) to collect and analyse contaminants or parameters of concern;

Network communication technologies to enable the creation of distributed monitoring systems and enhance the cost-effectiveness of data gathering; and

Environmental modelling and data management software to inform the effective placement of monitoring points and efficiently interrogate monitoring data.

⁷ ERF Report 04: UK Environmental Observation Framework. July 2008. 33pp

Annex 5: Progress 2008-14

Please refer to the UKEOF website for documents and reports www.ukeof.org.uk

1. Tools

2.1 Environmental Observation Catalogue

- 2008: ERFF Monitoring database released on web
- 2008 February: Community consultation re: requirements for a catalogue.
- 2008 May –June 2009: Interim Catalogue developed, populated and showcased at the Data Solutions workshop
- 2009 June: Environmental Observation Activity Catalogue released on the web
- 2009 Winter: Catalogue technical and information updates
- 2009 Winter: Blueprint and information model development for upgrading the Catalogue⁸
- 2010 Winter: Major catalogue content upgrade
- 2011: Catalogue content cleaned, back end merged with LWEC's Envirobase and observations 'coded' as per the EPICS Classification
- 2011: Catalogue content report
- 2012 March: Collaboration with JNCC and NBN to improve accessibility to biodiversity data through the Catalogue
- 2012: Specification for Catalogue upgrade agreed by Management Group and DAG
- 2012 September: Addition of relevant Socio-Economic activities to the catalogue
- 2013 January: Start of Catalogue upgrade project by CEH Lancaster
- 2013 June: Data supplier workshop

2.2 Cost Guidance

- 2008 August: Developed a common method of reporting investments to observations

2.3 Towards a Statement of Need

- 2008 July: Preliminary consultation with the community
- 2009 June: Version 6.1 Towards a Statement of Need released for consultation
- 2009 Summer: Observation Requirement information collected in a series of domain based workshops
- 2010 February: Towards a Statement of Need revised and released

2.4 Assessment Tool

- 2011 March: Tool built to enable analysis of observation activities

2.5 Decision Support Framework

- 2009 October –January 2010: Initial scoping and development of Framework
- 2010 Spring: Framework Trials - Management Group, MSCC (Long Term Monitoring Working Group), NERC (National Capability Advisory Group)
- 2010 March: Release of Draft Tools and Concepts document onto the web

2. Activities

2.1 Data Initiative

- 2008 July: Issues surrounding data investigated

⁸ Following the development of the Blueprint, government restrictions on IT spend meant that UKEOF were not able to progress the upgrading of the Catalogue in 2010.

- 2008 September: Brief to Bob Watson and senior Government Officials at a Data Think Tank
- 2008 December: **Data Advisory Group (DAG)** established
- 2009 March: Review of existing standards and practices; recommendations presented to the DAG and UKEOF Management Group
- 2009 January – June: Business case, PID and draft vision developed and presented to the Location Council
- 2009 June: Data Solutions workshop held to inform and engage with the community
- 2010: Programme Manager becomes UK lead for GEO Data Sharing Working Group (responsibility taken over by Defra in June 2012)
- 2010 Summer: An assessment of organisation's ability to provide/manage metadata completed
- 2011: Data Initiative put on hold due to the development of the Environmental Information Framework (Note: EIF not taken forwards and Data Initiative activities now progressed through the DAG)
- 2011 March: Contribution to the Government review of data, via the Defra return
- 2011 Autumn: Provided response to the INSPIRE Annex III, Environmental Monitoring Facilities Theme (EF) consultation
- 2013 February: Joint workshop with UKLP on INSPIRE EF theme specification
- 2013 September: Release of first Advice Note 'The principles of good data management'
- 2013 September: Joint workshop with SEPA and CAMERAS on 'New Technologies for Environmental Monitoring' with a focus on personal and low-cost monitoring systems

2.2 Sustainable Funding Mechanisms

- 2008 October: Bob Watson invited the 18 major funders of environmental observations to provide their investment information
- 2009 March – November: Using the guidance, investment information collected and the estimate of investments to observations refined
- 2009 Summer: Short case studies to identify current financing mechanisms and barriers to funding activities conducted (with SAHFOS, the Met Office and EA)
- 2009 September: Meeting with Bob Watson to discuss financial issues
- 2011: Discussions held with John Beddington's office, GO Science, regarding sustained funding for multi-funded long term observations
- 2011 November: Collation of investments made to observations (update of 2009 information) are stored within a secure part of the catalogue
- 2012: Evidence, including six case studies and a list of critical monitoring activities, provided in support of three GCSA meetings on Funding Mechanisms for Observations
- 2013 February: Evidence and secretariat support to first GCSA chaired Observations Committee meeting

2.3 Community – Facilitating Collaboration and Communication

a. Socio-economic observations

- 2009 September - June 2010: Initial meetings to determine scope held with Defra, ESRC and EA; PID developed
- 2010 September: Workshop to identify the needs for socio-economic observations held and recommendations for future work made
- 2011 May: Document published that has links to other useful socio-economic information sources which are outside of the UKEOF remit but may provide supporting or additional evidence when addressing key questions and issues
- 2012 May: Meeting with RELU to scope potential for case study development
- 2012 September: Addition of relevant socio-economic activities to the Catalogue

b. Understanding Citizen Science

- 2011 June: Citizen Science workshop
- 2012 February: MBA hosted Citizen Science workshop
- 2012 November: Citizen Science Report and Guide published
- 2013 May: Citizen Science Working Group established

c. Finding monitoring efficiencies through coincidence mapping

- 2011 December: Coincidence mapping workshop
- 2013 February: Pilot project on the Hampshire-Avon catchment initiated
- 2013 October: “Finding Opportunities to Improve Monitoring Activities” workshop held in the Hampshire Avon catchment

d. Coordinating Climate Observations

- 2011 Summer/Autumn: Collation of a UK view on GCOS recommendations to feed into the UK Response to the GCOS Implementation Plan
- 2012 September: Coordinating Climate Observations Group (CCOG) established
- 2013 December: Drawing on the project commissioned by CGOG and the Catalogue, the Systematic Observations section of the UK’s Sixth National Communication, a report required of Parties to the UNFCCC (UN Framework Convention on Climate Change) was drafted for DECC
- 2014 February: Publication of report identifying UK contribution to climate observations

Below are listed the activities which fall outside of the individual projects:

- 2008 July: Launch of UKEOF and inaugural workshop
- 2010/2011: Attending meetings and liaising with CAMERAS Scottish Monitoring Strategy
- 2010 March–August: Assistance, advice and tool provision in the Defra Network Monitoring Review
- 2010 May: Scoping Study of specimen archiving activity in the UK and potential for a UK Environmental Specimen Bank produced for UKEOF by CEH
- 2010 August: Website revamped
- 2011 November: Support and assist in the development of the British Library’s Envia (Environmental information, access and discovery) project
- 2012 September: Final report ‘A study to examine the operation and function of a virtual UK Environmental Specimen Bank’ produced for UKEOF by CEH
- 2012 October: Input to Defra Strategic Alignment Project (Consolidated Evidence)
- 2013 May-September: Revision of UKEOF communications including website re-development
- Quarterly: Newsletters circulated to over 900 subscribers
- Quarterly: Management Group Meetings to report progress, discuss members priorities and future action by UKEOF

2.4 LWEC partnership

- 2010 August–September: LWEC Flood Research Strategy (use of the UKEOF tools)
- 2011 Summer: Input and participation in the LWEC Challenge workshops
- 2013 July: Input to Ecosystem Task Force monitoring action
- 2013 May-September: Input to development of ‘Improving Access to Data and Information activity of the FCERM