UK-EOF Data Solutions Workshop

WELCOME

Mary Barkham
Head ERFF
‘Maximising the coherence and effectiveness of UK environmental research funding’
Today’s Aims

• Share and get your input to UKEOF data initiative plans
• Update on INSPIRE and SEIS
• Discuss and share best practice for sharing environmental data
• Session 1 – Vision
• Session 2 – Steps towards vision
• Session 3 – Your views in 4 key areas
• Session 4 – Some inspiration!
  – Stalls and demos
  – Acronym buster
  – Initiatives map
  – Comments / questions board
UK-EOF Data Solutions Workshop

A Common Vision

Beth Greenaway
Contents

• UK-EOF and its overall vision
• Deliverables 2009/ 2010
• The Catalogue and the Data Initiative
• Today’s aims
The picture in 2007

- FRAGMENTED
- UNCOORDINATED
- LACKS STRATEGIC DIRECTION
- NO OVERALL OWNER

Risk of
  - Missed opportunities for knowledge
  - Poor data sharing
  - Funding stopped for key time series data
  - Duplication of effort

UK Environmental Observation Framework

ERFF review of Environmental Monitoring 2006

To UK-EOF
Development of the UK-EOF

- Environmental Observations are an essential part of the evidence base

- At least 5yr initiative within ERFF

- 13 organisations sponsor but community much wider

Officially launched and published
17th July 2008
Outcomes for Observations by 2013

- Develop an holistic picture of the overall evidence needs of the UK and the role of observations in providing the information
- **Share Knowledge & Information** i.e. who is investing in what, where, how.
- Understand the range of assessments using observation data & the tools for knowledge transfer
- Enable funding mechanisms for long-term observation needs
- Strong community **sharing data & expertise**
UK-EOF Structure

ENVIRONMENT RESEARCH FUNDERS’ FORUM MAIN BOARD

- Own framework, collective aspiration and outputs. Ask for the evidence and use the outputs
- Biannual meetings
- Key funders and senior policy players across government and the Devolved Administrations.
- Champion of the UK- EOF Professor Bob Watson, Defra

UK-EOF Management Group
Decision making group to facilitate the workstreams and initiate, advocate and champion the issues.
Responsible for active project management of the work streams, UK-EOF accounting and guidance of the Programme Manager
All parts of the community represented.
Up to 4 meetings per year

Central Coordination
UK-EOF Programme Manager and Secretariat

Data Advisory Group

Work Programme

WORKSTREAM 1
Collective Aspiration
Articulating the questions
Decision-making framework

WORKSTREAM 2
Knowledge Base
Metadata
including costs and quality
Data policy
Sound Science

WORKSTREAM 3
Assessments co-ordination and Knowledge Transfer
Assessments catalogue

WORKSTREAM 4
Financing Mechanisms
Internal
Inter-Departmental
International
Long-term

WORKSTREAM 5
Community
Communications
Annual Conference
Website
Newsletter
Who’s Who

Evidence Groups e.g. Marine, Land
Issues e.g. Data management, Technology e.g. Satellites
The Community: in clusters delivering efficient and effective evidence.
2009 Strategic Analysis

Will provide an overview of:
  • Why the UK observes the environment
  • What questions we want/need to answer
  • Where the gaps and opportunities in capability are to collect the evidence we need
  • How much we invest and in what
  • The risks/financial security of observations

In order to develop:
  • A framework in which to make joined-up decisions
  • Initial recommendations – action plan for 2010 – 2012
UK-EOF Capability Analysis – Example – One per Issue e.g. climate

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If full Capability then:

- **T**: Technology available (to use) to meet the requirements
- **A**: Activities are funded (& therefore programmes are in place).
- **P**: People; there are adequate numbers of people with the appropriate skills and knowledge.
UK-EOF Deliverables for 2009

• ‘Towards a Statement of Need’ document and workshops (WS1) - *articulating what observations we need for each domain and fundamental issue*

• The Observation Activity catalogue (WS2a) - *what observations are being undertaken and by whom?*

• Business Case for Data Sharing and workshop to stimulate solutions

• The Investment Study (WS4a) — understanding how much we are currently spending on observations and where. Financial Mechanisms (W4b) — what are the issues that organisations have identified in funding observation activities?

• Conceptual Decision Making Framework (WS1b)
Challenge 1: Statement of Need
We need scientific expertise and strategic thinking to capture needs and match to current capability
Very large numbers of players (funders and do-ers) with numerous needs ....
The UK needs a balanced suite of environmental observations to tackle the challenges associated with our changing natural environment. The balanced programme must span all environmental media, accommodate temporal and spatial variability, and allow changes to be assessed in the short, medium and long terms, in local, national and international contexts.
Environmental observations

Vital source of evidence from global to local scale for:

- understanding and managing our changing environment
- guiding current and future policy, science and innovation
- economic benefit and quality of life

Includes all monitoring/surveillance, all technologies from satellite data to butterfly counts or genomics - for or by the UK
Challenge 2: Knowing what's going on now and what we spend

we need information from across 250 organisations

- In the right format
- At a useful level of aggregation
- Financial and Scientific
- We are building a catalogue to store and share this
Discovery Catalogue

Users requiring a strategic overview of activities e.g. are we investing the right areas of science to address the big societal issues?

Users requiring information about specific activities e.g. To join up activities and share platforms and resources

Users requiring access to the outputs and data the activity generates

UK-EOF Observation Activity Catalogue
### UK Environmental Observation Framework

**Environmental Observation Activity Catalogue**

**WHO:** All  
**WHAT:** (Environmental domain) Atmosphere  
**WHERE:** All  
**WHY:** All

Your search matches 91 records in the catalogue.

<table>
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<th>Lead Funder</th>
<th>Domain</th>
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[EDIT EXCEL]
Title: UK Acid Deposition Monitoring Network

Description: Rainfall chemistry has been monitored systematically in the UK since the mid-1980s, with a varying number of sites across the country. Two types of sites were originally defined: primary sites with daily collection, the data used for attribution of sources (linked to meteorology and validation of models); and secondary sites with lower frequency sampling for mapping purposes. Analysis undertaken of major ions in rainwater (sodium, ammonium, sulphate, nitrate, free acidity, magnesium, calcium, potassium) and electrical conductivity. Data are quality controlled for ion balance and comparison of measured and theoretical conductivity. The current measurement activity on [http://www.airquality.co.uk/archive/reports/2004/06012004issue1.pdf](http://www.airquality.co.uk/archive/reports/2004/06012004issue1.pdf). 38 sites across the UK - Details of sites in [http://www.airquality.co.uk/archive/aciddep_sites.xls](http://www.airquality.co.uk/archive/aciddep_sites.xls). Water samples are returned to a central laboratory for chemical analysis. Data collection frequency varies with site from daily, fortnightly to monthly.

Type of Activity: Rainfall chemistry has been monitored systematically in the UK since the mid-1980s, with a varying number of sites across the country. Two types of sites were originally defined: primary sites with daily collection, the data used for attribution of sources (linked to meteorology and validation of models); and secondary sites with lower frequency sampling for mapping purposes. Analysis undertaken of major ions in rainwater (sodium, ammonium, sulphate, nitrate, free acidity, magnesium, calcium, potassium) and electrical conductivity. Data are quality controlled for ion balance and comparison of measured and theoretical conductivity. The current measurement activity on [http://www.airquality.co.uk/archive/reports/2004/06012004issue1.pdf](http://www.airquality.co.uk/archive/reports/2004/06012004issue1.pdf). 38 sites across the UK - Details of sites in [http://www.airquality.co.uk/archive/aciddep_sites.xls](http://www.airquality.co.uk/archive/aciddep_sites.xls). Water samples are returned to a central laboratory for chemical analysis. Data collection frequency varies with site from daily, fortnightly to monthly.

Lead Organisation: ADAT

Lead Funder: Defra

Status: Ongoing

Environmental Domains: Atmosphere

Reasons for Collection: Basic science
- Characterising environmental issues/solutions
- Complying with legislation
- UK Contribution to pan-European Programme

Variables/Parameters: Conductivity
- base cations in aerosol
- hydrogen citrate
- inorganic anions in aerosol
- major anions in rain
- major cations in rain
- nitric acid
- nitrogen dioxide
Environmental Data - Terminology

Programme

Observation Activity Catalogue in 2009

Activity

Observation Activity Catalogue in 2010

Series e.g.
- Geo co-ordinates
- Parameters
- Equipment

Outputs e.g.
- Datasets
- Reports
Challenge 3: Data Sharing
We want to enable data to be reused
but are not the only ones trying to do this…
• Unanimous agreement at senior Gov level – there are complex and challenging problems across the UK
• Existing / forthcoming legislation tackles only part of the story but the new ‘Location Strategy’, INSPIRE and SEIS will help
• Senior leadership is essential to change the culture and organisational issues
• A project is required to realise the objectives – this is called the UK-EOF: DI
A vision for success

People/organisations in UK plc actually share and reuse environmental observation data to inform policy decisions, expand knowledge, improve their responses to a changing environment, contribute to international activities and stimulate markets for innovation.
Change areas

Discovery
Technical
Organisational
Governance
From the Catalogue users are able to connect directly with the collectors or data warehouses to access and retrieve data.

Data Service Providers e.g. NBN, EA, NERC, etc

Data stored close to source with easy to use licence conditions

Users interrogate the discovery catalogue to identify what observations have been done, why, where & how much invested etc.

Users requiring a strategic overview of activities e.g. are we investing in the right areas of science to address the big societal issues?

Users requiring information about specific activities e.g. to join up resources and share platforms

Users requiring access to the data the activity generates

Some users continue to connect directly with collectors to access and retrieve data

CONTRACTS & STANDARDS (via Location Council)

Activity Catalogue as part of the UK-Location Programme

~ 250 Collectors

Private Sector
UK-EOF Concept “valuing observations for all needs”

- **Expand knowledge**
- **Contribute to International activities**
- **Improve responses to the changing environment**
- **Improve Operational Capabilities**
- **Stimulate a market for innovation**
- **Inform policy decisions**

**INTEGRATED ASSESSMENTS**

**OBSERVATION COMMITMENTS - ORIGINAL USE**
- Responsive Monitoring
- Investigative Monitoring
- Routine Monitoring
- Compliance & Statutory Monitoring
- Modelling

**OBSERVATION TYPES**
- Evidence Collection
- Data Handling

**Observation Programmes**
- e.g. UN/GEOSOS
- e.g. EU State of Environment
- e.g. National Assessments
UK - EOF Summary

- Ambitious programme but much enthusiasm across all stakeholders
- Will enable better decision making and more data sharing
- Now need to understand and cost what really needs to change to achieve the vision
Contacts

Contact us:

bethg@erff.org.uk
ukeof@erff.org.uk
Session 2

Steps to achieve the vision
Session 3
Breakout Sessions
Breakout Sessions

- 13.30 – 14.30 First session
- Tea break – and move
- 14.45 – 15.45 Second session
- Plenary
Breakout Sessions Feedback

A: Quality – Doubleday Room - Kieran
B: Metadata – Brace Room Sam
C: Infrastructure – Hills Room - David
D: Legal – Marr Room – Miles
Session 4
Key Note
Ian Townend HR Wallingford
Conclusions

Next Steps
Key Conclusions:
Next Steps – UK

– Workshop summary on website
– Breakout sessions
  • A : Report and DAG to discuss next steps
  • B: The catalogue upgrade take account of feedback
  • C: Fundamental to business case
  • D: Report and DAG to discuss next steps
– UKEOF DI Business Case – October
  • Please send comments on the PID and brief to davidl@erff.org.uk by 31st July
Next Steps – EU

SEIS

GMES

GEOSS
Next Steps - You

- You spread the word and good practice
- Comment on the PID
- Contact DAG or MG rep

TALK TO US !!
‘Towards a Statement of Need’

**Aim**

- Holistic picture of overall current and future natural environmental evidence **needs** & role of observations in providing this.

**Why?**

- Inform future phases of the UK-EOF (infrastructure, skills, funding, gap identification).
- Inform strategic decision making within and across funders who between them spend up to £500m per year
If/when a UK picture is needed e.g.:
- Data issues
- Financial models
- Strategic Analysis

Note this is schematic
Statement of Need: process and structure

The next stage of developing a useful decision making tool
UK-EOF: Scope

• Quality and Access Standards – Best Practice:
  – Coordination with other initiatives e.g. INSPIRE, Location Strategy, SEIS, GEOSS etc.
  – Translating and promoting best practice standards and guidelines across the diverse community
  – Providing points of contact/ simple tools.
  – Scoping study (Atkins) to define way forward in this area
• **Data Protocols:**
  
  - Working with data funders, collectors, users and storage organisations to promote and help implement a data protocol
  
  - Organisations to enforce own policy but will be given tools and examples of best practise (and compliance) be ‘encouraged’ to adopt standard language and clauses.
  
  - Transparency and clarity are key
  
  - Reporting and enforcement to Location Council using Data Status Table
UK-EOF: Scope

- National Environmental Data Infrastructure:
  - Identify requirements for infrastructure for EDI to achieve vision
  - Identify how existing and planned capability can be harnessed
  - Develop a costed plan for filling the gaps – Business Case Oct 2009
EDI: Implement & Enforce

- Data Policy implemented through contract and citation (carrots and sticks)
  - Contract clause, similar to MEDIN, required to be included in all future environmental data gathering contracts. Existing contracts encouraged to adopt new clause.
  - Data citation system implemented to bring reward to researchers who share good quality data
  - Both require/stimulate a change in attitude to data
The observing process

- **Definition and planning**
  - Requirements analysis
  - Trade-offs analysis
  - Feasibility studies
  - Pilot projects
  - Inter-calibration

- **Implementation**
  - Major capital items and One-off start-up costs
  - Buy/make platforms (eg ships, aircraft, satellites)
  - equipment, labs
  - Training
  - Guidance documents
  - Detailed procedures

- **Operations - data gathering**
  - Taking measurements
  - Laboratory analysis
  - Maintaining assets

- **Operations - data handling**
  - Quality control
  - Quality assurance
  - Archiving, curation
  - Dissemination

- **Primary use**
  - Research and development on new observing and data handling technology

- **Secondary use**
  - Assessments
  - Reporting
  - Applications
  - Research
  - Services

- **Excluded from the definition of the observing process**
1a Discovery Catalogue
(Interim June 2009. First full catalogue June 2010)

1b Quality & Access Standards –
Best Practice for data collection,
vocab control etc.

1c Data Policy – transparent and
published, check list established

1d Defining storage and national environment data infrastructure
(costed Sept 2009)

1e Business Case

Phase 1
To April 2010

Phase 2
April 2010 to April 2013

Phase 3
From 2013

Data Policy – Implemented through contract and citation process

Implement infrastructure using UK-SDI and ongoing development of the Catalogue

SCOPE

IMPLEMENT & ENFORCE

STEADY STATE
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. Improve understanding of what we can do with the information and how to access the data.
Phase 1
The Observation Activity Catalogue in 2009

~ 250 Collectors

Private Sector

Funders
Activity information

Information about programmes & activities

Observation activity metadata supplied by collectors

Users

Users requiring strategic information

Users requiring information about activities

Users requiring access to the data
Phase 1
The Observation Activity Catalogue in 2010

- Users
  - Users requiring strategic information
  - Users requiring information about activities
  - Users requiring access to the data

- Observation Activity Catalogue
  - Information about programmes & activities allowing discovery of data
  - Observation activity metadata supplied by collectors either directly or via funders

- Funders
  - Activity information

- Data Service Providers e.g. NBN, EA, NERC, etc.

- Collectors
  - ~ 250

- Users requiring information about activities

- Other

- Private Sector
9 issues: How can observations help us understand .......

- Pressure on the environment in the light of population growth and associated pollution.
- Reconciliation of economic growth with sustainable use of natural resources.
- Future States of the Earth and particularly the Carbon Cycle
- The effects of environmental change on agriculture, food security and water supply.
- Consequences of environmental change for human health, wealth and well being
- Extreme Events and Disasters
- Impacts of environmental change on biological diversity, ecosystems and ecosystem services
- Climate variability & Climate Change: Challenges in Earth System Science
- Stimulation of Scientific & Technological Advance and Innovation
A tool for discovering information about programmes and activities collecting environmental observations in or on behalf of the UK. It will also point to how to access the data generated and its suitability for re-use.

Summer 2009 – Information we have now

Summer 2010 – More detailed information and pointing to data
UK-EOF DATA INITIATIVE –
Enabling value from environmental data

Phase 1c & d – Data Protocols & Infrastructure planned

Phase 1b – Quality & standards developed

Phase 1a – Discovery Catalogue

Phase 3 – Steady State Governance

Phase 2 – Implement & Enforce Contract, Citation process & Infrastructure

Key:
D = Discovery
O = Organisation
T = Technology
E = Economic