

# UK Environmental Observation Framework

## Assessing our investments in observing our environment

Guidelines for submitting cost information



Version 2 May 2009

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# 1. Introduction

## 1.1 Background

The UK Environmental Observations Framework (UK-EOF) is committed to understanding and addressing the barriers to effective funding and use of environmental observations for the UK.

At present our best estimate is that the UK spends over £100 million and up to £500 million per year on observation activities and infrastructure. Much of the uncertainty is a result of different costing methods in different organisations. There is a need to understand this wide range of estimates and to narrow uncertainties through the development of a consistent, commonly agreed method for costing which is applicable to the very wide range of activities undertaken. We are asking your organisation to help us to revise this estimate by providing information about your investments in environmental observation activities. This will enable us to move forward with actions and to make funding mechanisms in the UK more sustainable.

## 1.2 A common reporting method – making costs comparable

The UK-EOF and UKMMAS have developed a common reporting method with agreed principles on what resources we believe should be included as costs for environmental observation activities. We are now asking organisations to help us apply the guidelines and provide revised estimates of their investments in environmental observations.

## 1.3 Addressing funding issues for environmental observations

The cost information will be used by the United Kingdom Environmental Observation Framework (UK-EOF), managed by ERFF, to address strategic issues surrounding environmental observations made for and by the UK. We will use this information in order to:

- Develop a generalised understanding of the UK's investment in environmental observations and its financial value.
- Allow us to plan for sustainable observational infrastructure which meets current and future needs
- Develop an understanding of the status and security of funding for the UK's environmental observation activities.

## 1.4 Relating cost information to observation activities

It is important that, in the future, this revised estimate of the investment in environmental observations can be related to an up-to date list of what activities are being undertaken by and on behalf of the UK. To this end and in parallel to our work on funding mechanisms, the UK-EOF is creating an Environmental Observations Catalogue which will contain metadata

on all the environmental observation activities carried out by or for the UK that can be included under the UK-EOF classifications of 'environmental' and 'observation', which are:

**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 streams.*

**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. Note the exceptions are social science and human health data*

You organisation has already been asked to submit information about the environmental observation activities it is involved with. This activity information will be transferred to the new catalogue. This catalogue will be updated on an annual basis and will be made available to the whole community on the ERFF website in summer 2009. Our future aim will be to have accurate cost estimates for each environmental observation activity contained within the Environmental Observations Activity Catalogue and in the future will make this information public where agreed.

## 1.5 Progress to date

In November 2008, 18 organisations were contacted in the first phase of this study and were asked to submit information about the environmental observation activities their organisation invests in and how much these activities cost.

We asked for detailed breakdowns of these costs according to FEC and the stage of the observing process (see Section 2). Organisations found this information very difficult to produce but by May 2009 16/18 organisations were able to submit an overall cost of environmental observations for 2008/09.

## 1.6 2009 Strategic Analysis

More detailed information is now required for the 2009 UK-EOF Strategic Analysis. By September 2009, as part of this analysis the UK-EOF have to answer:

- How much the UK is investing in observation activities;
  - In what key areas and;
  - Identify what is at risk?

We need to report this information for the following environmental domains:

- Atmosphere
- Cryosphere
- Biosphere

- Freshwater
- Groundwater
- Marine
- Lithosphere (inc. soils)

In order to do this we need you to send us cost information at the lowest level of aggregation possible – ideally for each observation activity - so that we can make understand spend on environmental observations per key area.

This information will be used as evidence for the 2009 Strategic Analysis in order that we can move forward from an anecdotal understanding of the status of environmental observations in the UK to one based upon accurate evidence.

## **1.7 Summary**

This information is part of the ongoing work on the UK-EOF to understand the financial investment the UK makes in environmental observations.

We are asking you for more detailed information about the costs of the observation activities your organisation carries out in order that we may understand what the value of the UK's investment is, in what key areas and whether there are any risks to the funding of these activities.

The study began in November 2008 and we have made considerable progress towards understanding the overall investment of the UK. However, for the 2009 Strategic Analysis we need to begin to break this overall figure into key environmental domains.

We have simplified the guidance to highlight the key information required for this analysis. You will be asked to provide us with information about the costs of environmental observations - ideally at activity level – according to FEC and including costs incurred at all parts of the lifecycle of the activity.

## 2. What to include within the cost information

We want to understand the full investment organisations make in environmental observations and therefore we spend per activity to include costs incurred at all parts of the observing process – from planning to first use of the results.

**We want your cost figures to include spend on all parts of the observing process but only as an overall figure.**

### 2.1 The life cycle of the observing process

Observing activities develop over several stages.

The life cycle of the observing process is illustrated, in simplified form, below (Figure 1). All elements within the pink “observing process” box are included for costing purposes. The observing process starts with a requirement and ends with quality controlled data, fit for purpose and available to meet the meet its primary objective. It is recognised that the process may, in practice, be iterative or cyclic.

The “Definition and planning” and “Implementation” parts of the process include all the one off start up costs of a new activity, including the purchase of new infrastructure such as ships, aircraft, instrumentation and laboratories. The “Operations” parts of the process represent the repeated operational data gathering, analysis and data handling. Increasingly there is also an overarching “Policy, coordination, command and control” effort across a wide range of observing activities. Critically we also want to capture the costs of good data management and archiving.

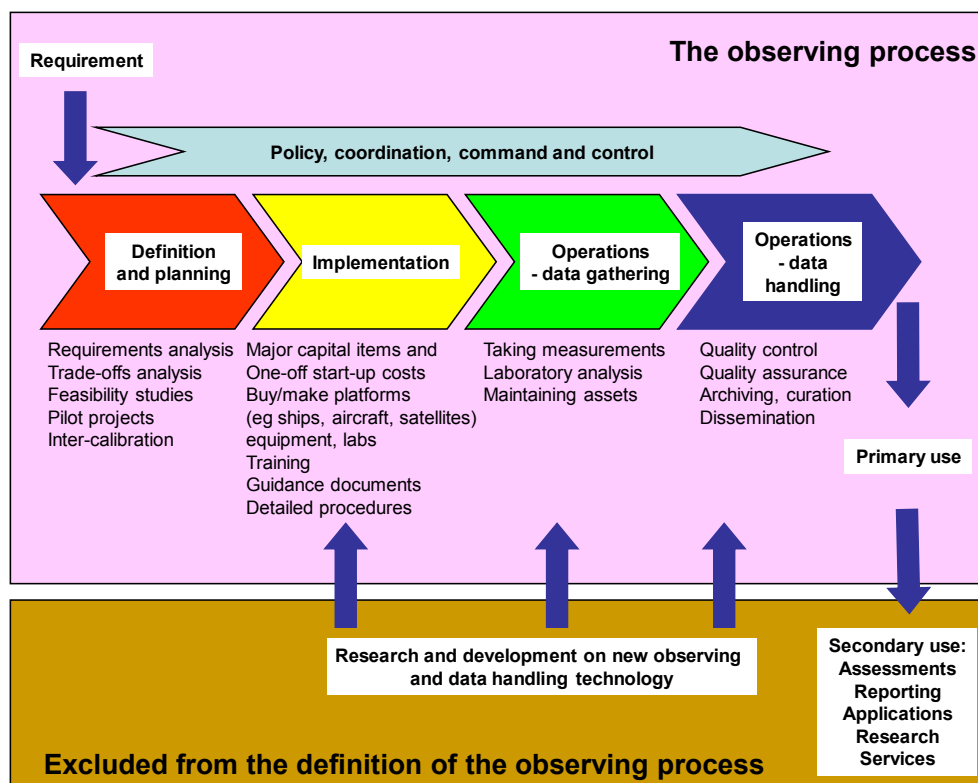


Figure 1: The life cycle of the observing process

In more detail a specific activity has four main parts:

- **Definition and planning:** The “Definition and planning” part of an activity takes place in the early stages. It includes requirements analysis and examination of observation trade-offs. In the context of new European Directives and Environmental Strategies and International Environmental Treaties this can be a lengthy process, requiring significant staff resources to consider the implications of what is being proposed, and to investigate and negotiate the type and level of observations required. The “Definition and planning” activity may also include feasibility studies and pilot projects to test observing options and inter calibration between proposed techniques, before final choices are made and rolled out on a national scale or agreed in an international context.
- **Implementation:** Once the observing requirements have been finalised implementation can take place. This part of the process includes all the one-off start up costs for a new activity. Observing platforms (e.g. satellites, ships, and aircraft), instruments and equipment need to be bought and assembled, facilities developed, procedures finalised and staff trained. If the decision has been made to procure services through third parties contracts, these will need to be finalised and service level agreements negotiated.
- **Operations – data gathering:** At the end of the implementation process, operations will start. This part of the process includes observing and taking measurements, analysis of samples and ongoing costs associated with maintaining equipment and facilities.
- **Operations - data handling:** Finally the data collected will be quality controlled, archived and made available for use by primary and secondary users. This part of the process

includes costs associated with, for example data centres used to store the results of the measurements.

In addition to these parts of the process attributable to specific activities, increasing there are more general coordination activities. These are shown in Figure 1 as **Policy, coordination, command and control** to capture overarching activities, either within organisations, for particular sectors (e.g. UKMMAS secretariat) or across the UK (e.g. UK-EOF).

The current ERFF and UKDMOS databases have been centred on capturing a description of the operations – data gathering phase. **In this activity the UK-EOF is intending to broaden the scope (compared to previous activities), and to cover all environmental observations made for or by the UK (see definition below<sup>1</sup>) and to capture all the resource input across the life cycle of the observing process.**

Figure 1 also shows what has been excluded from the definition of the observing process (brown box). At present the following activities are excluded:

- Research and development into new observing and data handling technology
- Secondary use of the data, e.g. assessments (such as using data to make the Charting Progress II assessment), research using the data (e.g. research activities associated with the National Centre for Earth Observation), environmental services derived from the data (e.g. early warning, forecasts, analysis of trends etc). It is recognised that there may be some ambiguity here regarding what should be included (primary use) and what should be excluded (secondary use) – **if in doubt include it and it can always be deleted later if considered beyond the scope of the costing exercise.**

## 2.2 Full Economic Costing

This information should be based on FEC and include e.g.:

- Pay costs of personnel
- Capital items (e.g. platforms, equipment, instruments, laboratories)
- Outsourced services
- Maintenance costs, consumables
- Travel and subsistence

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<sup>1</sup> *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 streams.

*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. Note the exceptions are social science and human health data



- Overheads
- VAT if applicable and not refundable

Where organisations do not have their own guidelines for this they can be found in Appendix A.

## 3. Instructions for submitting cost information

### 3.1 Summary of the information requested

#### 1. PROVIDE

Figures for your organisation's spend in 2008/09 AND;

Your annualised spend on environmental observations AND;

Where appropriate figures for any contributions in kind

#### 2. USING

The method outlined here AND;

FEC costing guidelines where possible, indicating clearly what has NOT been included in any figures

#### 3. FOR

Individual observation activities OR;

Programmes of observation activities OR;

Using another grouping that we can relate to the main environmental domain areas. **Please contact Gemma to discuss this.**

### 3.2 The information and guidance provided

In addition to this guidance document (which details what we information the secretariat is asking for and why) we have provided:

- **A PowerPoint presentation** - this highlights the key information that the UK-EOF secretariat needs for the 2009 Strategic Analysis and may be useful to share with colleagues who are involved with providing this information.
- **A spreadsheet to fill in**– this is the format in which we would like the information submitted. The first worksheet is the template to fill-in and the second worksheet provides an explanation of the information required in each field. The fields are detailed in Section 4 with further definitions and explanations.

## 4. Details of spreadsheet fields and further guidance

The fields in each main block are discussed below, with definitions and explanations given.

<b>1. Your organisation</b>	
Name	The name of the organization completing the spreadsheet.
<b>2. Activity information</b>	
Title	Please enter titles of activities as they appear in the information you have given us about activities for the population of the UK-EOF Environmental Observations Catalogue. We need to be able to cross-match activities in the catalogue with these cost figures.
UK-EOF Domain	Please chose one of the 7 domain areas in use by the UK-EOF which is most appropriate to the purpose of the activity: <ul style="list-style-type: none"> <li>○ Atmosphere</li> <li>○ Biosphere</li> <li>○ Lithosphere</li> <li>○ Freshwater</li> <li>○ Groundwater</li> <li>○ Marine</li> <li>○ Cryosphere</li> </ul>
Is the funding at risk?	Please indicate if you are aware of any risks to the funding of the activity.
Details of risks to funding	Please enter any details of the risks to the continued funding of this activity.
<b>3. 2008/09 Costs of activities</b>	
2008/09 costs	The 2008/09 financial year cost should be given as an actual cost or an estimate to the nearest £10k. It should be provided at Full Economic Costs and include: <ul style="list-style-type: none"> <li>• Pay costs of personnel</li> <li>• Capital items (platforms, equipment, instruments, laboratories)</li> <li>• Outsourced services (including sub-contracts for consultancy)</li> <li>• Maintenance costs, consumables</li> <li>• Travel and subsistence</li> <li>• Overheads</li> <li>• VAT if applicable and not refundable</li> </ul> See Appendix A for details of FEC. Contributions in kind (e.g. voluntary sector) should be recorded separately and NOT included in this annualised cost figure - see Appendix B.
2008/09 contributions in kind (If applicable)	This field should record, for example, the contribution of the voluntary sector see Appendix B. The costs included here should be IN ADDITION to those above.

<b>4. Annualised cost of activities</b>	
Annualised cost (excluding contributions in kind)	<p>If the activity is a one off, of finite duration the annualised cost should be calculated as: total cost/number of years. For example the cost of the definition and planning of the XXX Network is £1,000,000 and will last 4 years. The annualised cost will be £250,000.</p> <p>If the activity is repeated annually (i.e. regular operations with the same spend) the 2008/09 cost should be reused.</p> <p>If the activity is repeated annually but the costs fluctuate please provide an annualised cost based on the last 5 years spend on the activity.</p> <p>If the frequency of the activity is less than yearly, the annualised cost should be calculated as: cost of one complete activity/interval of the activity. For example, the XXX Survey takes place every 5 years. The cost of one complete survey is £25, 000. The annualised cost is £5,000.</p> <p>The cost information should be presented as an actual cost or if actual costs are difficult to provide, then estimate to the nearest £10k.</p> <p>It should be provided at Full Economic Costs and include:</p> <ul style="list-style-type: none"> <li>• Pay costs of personnel</li> <li>• Capital items (platforms, equipment, instruments, laboratories)</li> <li>• Outsourced services (including sub-contracts for consultancy)</li> <li>• Maintenance costs, consumables</li> <li>• Travel and subsistence</li> <li>• Overheads</li> <li>• VAT if applicable and not refundable</li> </ul> <p>Contributions in kind (e.g. voluntary sector) should be recorded separately and NOT included in this annualised cost figure - see Appendix B.</p>
Annualised estimate for contributions in kind (If applicable)	<p>This field should record, for example, the contribution of the voluntary sector see Appendix B.</p> <p>The costs included here should be IN ADDITION to those above.</p>

## 4.1 Additional guidance notes

- **Timescales:** 2008/2009 financial year costs should be included. Where activities are finite, one-off or of a fixed duration or where the current costs are likely to fluctuate, please also include an annualised cost for the activity (cost of total activity/duration or last 5 years spend if ongoing). Please include notes of any likely changes, e.g. due to new legislation. Recently completed activities may also be included if relevant to building up accurate cost profiles for the future, for example, recently completed procurements of major capital items.
- **Attribution of items and activities to “observing the environment”:** Some major cost items may serve a number of purposes. For example ship cruises may include elements of observing, research and logistical support. Likewise data centres may be used for quality control, archiving and dissemination of observation data (included in the definition of the observing process) and archiving and dissemination of research results and related documents (outside the definition of the observing process). Respondents are asked to judge regarding the attribution of costs to observing.
- **VAT:** VAT should be included where paid and not reclaimed.

- **Inflation:** Cost profiles should be on a “cash” basis and issues such as inflation, discount rates etc may be ignored.
- **Estimated versus actual costs:** If available, the actual costs should be provided. Otherwise estimates should be given which are correct to the nearest £10,000. It is suggested that organisations with large and varied activities should concentrate on the large activities, first.
- **Annual costs:** Where relevant, annual costs should be based on a financial year (i.e. April to March).
- **Avoiding double counting:** All organisations providing cost information should avoid double counting.
- **Definition of “annualised cost”:** If the activity is a one off, of finite duration the annualised cost should be calculated as: total cost/number of years. For example the cost of the definition and planning of the XXX Network is £1,000,000 and will last 4 years. The annualised cost will be £250,000. If the activity is repeated annually (i.e. regular operations) the current annual cost should be used. If the frequency of the activity is less than yearly, the annualised cost should be calculated as: cost of one complete activity/interval of the activity. For example, the XXX Survey takes place every 5 years. The cost of one complete survey is £25, 000. The annualised cost is £5,000.

# A Appendix A - Full economic cost guidelines

## A.1 Introduction

Organisations that do not have their own methods for estimating the size of their investments in observing our environment can use the following definitions which are in line with NERC and Defra standards.

## A.2 Pay costs of personnel

This category should include the **annual costs of personnel working directly on the activity**, including salary, National Insurance and superannuation. Pay calculations on the basis of average pay costs for the grades of staff working on the activity are acceptable. If members of staff work part-time on the activity, then annual costs should be allocated pro rata, on the basis of 215 working days per year.

## A.3 Capital items (platforms, equipment, instruments, laboratories)

This category covers the procurement of all capital items. Once procured the ongoing running and maintenance costs will fall under one of the other funding categories (either outsourced services, maintenance or overheads). Some illustrative examples of typical capital investments include:

- Replacement / major upgrade of building stock such as laboratories, bases and monitoring sites
- Replacement / major upgrade of ships and aircraft
- Major IT procurement exercises (e.g. high performance computing, cluster computers)
- Additions / replacements to the equipment pools
- Laboratory equipment
- Vehicles purchased for field based research.

## A.4 Outsourced services (including sub-contracts for consultancy)

In some cases activities may be outsourced to outside agencies or the private sector.

## A.5 Maintenance costs, consumables

Maintenance costs could include items such as running cost of scientific infrastructure (e.g. maintenance costs for ships, mariner's salary costs on the ships, servicing of equipment). In general these are costs **directly attributable to the observing activity**. For some

organisations these cost may be included either as outsourced services or overheads. **The important issue is to include costs somewhere, if applicable and not to double count; rather than worry unduly about the cost category.**

Consumables are for example office and scientific laboratory supplies, (e.g. glassware, chemicals) which are purchased from third parties and replaced regularly. Consumables may also include fuel for vehicles including ships and aircraft.

## **A.6 Travel and subsistence**

These are annual travel and subsistence costs incurred by personnel working directly on the observing activity (i.e. the travel and subsistence costs associated with staff in the “pay of personnel” cost category).

## **A.7 Overheads**

Overheads **may** cover the direct costs of the use of services and facilities that underpin the observing activities, if these are not including in the outsourced services and maintenance categories above.

Overheads **shall** include indirect costs which cannot readily be uniquely assigned to a particular observing activity, but nonetheless contribute to the overall costs of the organisation carrying out the observing activity. These may include:

- Financial services such as accounting, tendering, marketing
- Personnel services
- Estate costs
- General staff facilities such as health and safety, training, welfare
- Departmental services such as administration, library, secretarial, printing
- Staff management and cover for maternity and long term sickness benefit.

The indirect costs should be calculated for discrete areas of activity if appropriate (i.e. different costs for different sites) and allocated to activities on the basis of one or more cost drivers such as square metres (for attributing the costs of laboratory or other large facilities) or time of direct staff (for contributing all other indirect costs). Salary/pay costs should not be used as a driver for indirect costs.

For universities and public sector establishments, overheads represent part of the full economic costs of the observing activity proposal. Our investment in observing the environment should include full economic costs.

## **A.8 Ineligible costs**

The following are excluded from eligible costs:

- interest charges;
- hire purchase interest and any associated service charges;
- profit earned by a subsidiary or by an associated undertaking on work subcontracted under the activity;
- Contingency allowances expressed as an arbitrary percentage overall addition to eligible costs.



## B Appendix B - Contributions in kind

Contributions in kind arise from two sources:

- An observing activity receives contributions from other organisations, at no cost to the main observing activity. For example, the POL Coastal Observatory is funded mainly by NERC. NERC costs can be accurately recorded by staff running the Observatory. The Observatory also receives “contributions in kind” from other organisations such as CEFAS, University of Bangor, and University of Liverpool. NERC personnel can make an estimate for the value of contributions in kind but the entry will need to be checked for double counting and/or accuracy by ERFF staff once all the returns have been made.
- Some activities, particularly in the biodiversity area, are carried out by members of the public or voluntary organisations. It is suggested that an attempt is made to calculate the total value of volunteer effort for each activity annually, either for the most recent year or averaged over all years since the activity commenced. JNCC currently uses calculations based on £35.00 per hour for skilled surveyors and £11.04 per hour (twice minimum wage) for less difficult surveys. A typical overhead of ~100% can be added. The calculation used to derive annual figures should be described, e.g. number of volunteers per year (N), time per volunteer per year in hours (T), hourly rate used (HR) and overheads (O%) added. The total contribution per year is therefore  $N \times T \times HR \times (1+O\%/100)$ .