



## Invitation to Tender

### Scoping Study: Reducing Uncertainty in Models for Environmental Decision-Making

**The deadline for the receipt of proposals by NERC is 4pm on 8<sup>th</sup> January 2010**

1. The Natural Environment Research Council (NERC), in collaboration with the Department for Environment, Food and Rural Affairs (Defra), invites tenders for the provision of consultancy services to undertake a scoping study on the subject of 'Reducing Uncertainty in Models for Environmental Decision-Making'.
2. Many of the models currently used in environmental policy have large uncertainties in their outputs and there is a recognised need to obtain the knowledge and data necessary to enhance their performance.
3. The purpose of this scoping study is to identify the priority research areas, with particular relevance to NERC's Environment, Pollution and Human Health Theme, requiring investment that will take this agenda forward. A key aspect of the scoping study will involve working with stakeholders to make recommendations to the funders for both the scientific and financial scope of the research effort required.

#### Scope

4. NERC is seeking an individual or a small team from a Higher Education Institute, Research Organisation or limited company to provide consultancy services over a period of approximately 5-6 months, between February 2010 and July 2010. The successful organisation will be engaged following a competitive selection process. Funds will be awarded by contract and paid quarterly in arrears upon receipt of an invoice and subject to the satisfactory completion of agreed milestones. NERC's standard terms and conditions for consultancy contracts will apply. The contract and its deliverables must be satisfactorily completed by 31<sup>st</sup> July 2010.
5. Tenders for up to £80k total cost will be accepted. Please note that the upper limit is not an indicative figure, and all costs must be fully justified within the approach to the scoping study proposed. This scoping study is being jointly funded by NERC and Defra.
6. The steering group for this contract will comprise the NERC Theme Leader for Environment Pollution and Human Health, the NERC Science & Innovation Manager for Terrestrial & Freshwater Sciences and the Defra Contract Officer. A wider consultative group of key stakeholders, appointed by the steering group, will also operate.
7. Activities to be undertaken as part of the scoping study include: liaising with the steering group and consultative group, stakeholder consultation, and meeting/ workshop convening & facilitation, in order to identify the high priority research areas, scale of investment required, and potential partnerships, and report preparation to summarise the results of the consultation.

## Background

8. A large number of numerical models are used in environmental policy support or regulatory decision-making. Generally, these models have been developed to meet a specific purpose and have used the best science available at the time. In some cases, further work has been commissioned to remedy well recognised weaknesses, but in many cases the models continue to be used despite recognition of large uncertainties in their outputs.

The basis of most numerical models used for policy or regulatory action, where pollutants and pathogens pose a significant risk of harm to human health or the wider environment, is the source-pathway-receptor pollutant linkage. Uncertainties can arise at any, and often many, points along this pollutant chain and can be reduced through targeted research. Discussions with model users have revealed that they are aware of areas in which large uncertainties lie within their models. Relevant examples include:

- lifetimes of pathogens in the soil environment, and the determining factors;
- release rates, atmospheric persistence and dispersion of bioaerosols from composting operations;
- uptake of trace elements by humans from contaminated land;
- temperature and solar radiation dependence of biogenic VOC emissions from vegetation (and consequent impact upon tropospheric ozone formation);
- releases of nitrous oxide from soils as a result of denitrification processes; and
- climate-dependence of models predicting environmental partitioning and transport of industrial chemicals.

NERC and Defra are seeking advice on the individual environmental processes or properties, or the way in which they are described within models, that require (or would significantly benefit from) future investment, with a view to enhancing the ways in which these models simulate the natural environment. The scoping study will therefore contribute to Challenge 2 of NERC's EPHH Theme: 'To improve knowledge of processes and models of the dynamics of transport and transformation of pollutants and pathogens in the environment'<sup>1</sup>.

Models for the prediction of climate are outside the scope of this study, however discrete models or sub-components of models designed to predict the impacts of climate change on human health, would be considered within scope.

9. This scoping study is being undertaken as part of the Living With Environmental Change (LWEC) partnership, contributing to Objective D - 'To protect human, plant and animal health from diseases, pests and environmental hazards'<sup>2</sup>. Any future research investment arising from this scoping study is also expected to operate as part of LWEC. The NERC contribution is being led by the NERC EPHH Theme and any future research programme is expected to seek NERC support via that theme, with the potential for further contributions from other NERC Science Themes should the scoping study report opportunities of broader relevance. Defra, as a key stakeholder, is co-funding this scoping study and may participate in any future research programme depending on the scoping outputs.
10. NERC is also undertaking or contributing to a number of other activities relating to the development of environmental modelling. These include: developing and implementing a 'National Strategy for Earth System Modelling'<sup>3</sup>, the Data and Applications for

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<sup>1</sup> <http://www.nerc.ac.uk/research/themes/tap/documents/tap-environment.pdf>

<sup>2</sup> <http://www.lwec.org.uk/>

<sup>3</sup> <http://www.nerc.ac.uk/research/themes/climatesystem/events/audit-ukesm-capability.asp>

Environmental Modelling (DAEM) project led by BGS<sup>4</sup> and the UK Environmental Observation Framework (UK-EOF) - launched by the Environmental Research Funders Forum (ERFF) in July 2008<sup>5</sup>. This scoping study on *Reducing Uncertainty in Models for Environmental Decision-Making* has a distinct remit within this portfolio; it should operate with awareness of these other activities and seek to complement them as far as possible.

## Requirements

### **Scientific & Technical**

11. The consultant(s) will work within guidance provided by the steering group. They will be required to undertake the tasks listed a-e below using appropriate methods. Meetings and other engagement activities may be undertaken via video- or tele-conference if deemed effective.
  - a. Engage with officials of Defra, the Environment Agency and other relevant stakeholder bodies (e.g. SEPA) via the consultative group and more broadly with the research community to (i) elicit ideas for specific areas of research that address issues where large uncertainties lie within operational environmental models used in regulation or policy formulation and (ii) inform stakeholders of research programmes that are already planned or being developed.
  - b. Evaluate the extent to which proposed research areas meet the following criteria:
    - the processes or properties to be studied have a demonstrably important influence on the output of models used in policy development or regulation;
    - research can plausibly generate a reduction in and/ or quantify better and/ or lead to an improved understanding of that uncertainty; and
    - there is a willing partner within the user community.
  - c. Provide an assessment of the capacity and capability of the research community to deliver the research issues identified in (a) above.
  - d. Provide estimates of the scale of investment required to deliver the priority areas for research and advice on whether the user community is interested and willing to co-design, co-produce and/ or co-deliver them.
  - e. Prepare and submit interim and final scoping study reports to the agreed schedule, content and standard. These must clearly summarise the findings of the scoping study and make effective recommendations for potential future research investments.

### **Deliverables**

12. A kick-off meeting with the steering group is expected within the first month of the contract. A detailed Implementation Plan will also be required. This plan must include details on the approach to be used, and timetable, for achieving the scoping study objectives.
13. A programme of consultation with stakeholders (model users and the research community); this may be delivered via workshops or other suitable methods.
14. An interim report to be submitted to the steering group by 30<sup>th</sup> May 2010. The required report content is as follows:

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<sup>4</sup> <http://daem.wikidot.com/>

<sup>5</sup> <http://www.erff.org.uk/activities/uk-eof.aspx>

- description of the priority research areas identified and their relationship to the key criteria;
- an analysis of the capacity and capability of the research community to deliver the research areas identified and the impacts of potential future investment on the model user community;
- recommendations on the scope, size, and duration of a potential future research investment(s).

15. A final scoping study report incorporating feedback from the steering group to be submitted to NERC and Defra by 31<sup>st</sup> July 2010. The final report must include the sections listed above along with an executive summary of findings and recommendations. The final report must be of a content and format suitable for publication on the NERC website. Full details of the scoping study data should be included in report annexes.

### ***Skills and experience***

16. The ideal applicant(s) will:

- have a broad knowledge of relevant research sectors and current regulatory/ policy activity in the UK
- be personable and proactive, and able to engage effectively with stakeholders
- be familiar with NERC and Defra strategy and the funding of collaborative research programmes
- be familiar with analysis of strategic priorities
- be experienced in report writing and editing
- have experience of meeting/ workshop facilitation

### ***Governance and Performance Management***

17. The consultant(s) will report to the Steering Group. Activities and outputs will be reviewed on a regular basis and any changes to the work plan must be agreed in advance with the steering group.

18. Payment will be in arrears upon receipt of an invoice and subject to the satisfactory completion of agreed milestones. Suggested milestones include:

- Kick off meeting with steering group – February 2010
- Stakeholder consultation
- Interim report – May 2010
- Final report – July 2010

### ***Procurement Process***

19. This opportunity is open to all at legitimate Higher Education Institutes, Research Organisations or limited companies who are able to provide technical support consultancy services.

20. A selection panel comprising of representatives from NERC and Defra, as well as independent experts, will identify the preferred bidder. The principal selection criteria will be:

- Fit to and understanding of requirements
- Appropriateness of approach
- Track record of the applicant(s)
- Cost effectiveness

21. Short-listed applicants may be invited to meet with NERC and Defra before a contract is issued.
22. The provisional timetable for the procurement process is:
- 27<sup>th</sup> November 2009: Invitation to Tender published
  - 8<sup>th</sup> January 2010: Closing date
  - January 2010: Contract placed
  - February 2010: Work commences and kick-off meeting with steering group
23. Tenders should be submitted to NERC via e-mail to **Blanche Coleman (blle@nerc.ac.uk)** by 4pm on the closing date 8<sup>th</sup> January 2010.

### **Format and Content of Tender**

24. Review proposal (Part A) should be no longer than 4 pages and include:
- Proposed approach to delivering the scoping study and reports
  - Proposed detailed milestones
  - Gantt chart summarising the work plan and effort
  - Approach to ensuring quality of the deliverables and risk management

A separate curriculum vitae/ track record up to 2 pages, summarising relevant skills and expertise and references from similar projects, should also be submitted

25. Financial proposal (Part B) should be no longer than 2 pages and include:
- Day rate(s) for staff including overheads
  - Breakdown of days required to complete each of the proposed milestones
  - Proposal and justification for consultant travel and subsistence costs
  - Meeting/ Workshop costs if appropriate (including venue costs, travel and subsistence for participants)
  - Justification of the resources requested and how VAT will be handled (if applicable)
  - Breakdown of the total cost by contract quarter period
  - Contact details of the contracts officer at the host organisation
26. Proposals must be completed in single-spaced typescript of minimum font size 11 point with margins of at least 2cm. Applicants referring to websites should note that the selection panel may choose not to use them.
27. Tenders should be valid for 90 days

### **Contact Details**

28. Queries may be directed to Blanche Coleman (blle@nerc.ac.uk 01793 442635) in the first instance, or Sarah Collinge (saco@nerc.ac.uk 01793 411936).