

NATURAL ENVIRONMENT RESEARCH COUNCIL

EVALUATION PANEL REPORT

**Evaluation of progress with delivering NERC's
Environment, Pollution & Human Health (EPHH) Theme**

October 2011

*This document reports the conclusions of a Panel of experts.
The views expressed are entirely those of the Panel.*

INTRODUCTION

1. This evaluation was commissioned by NERC's Director, Science Delivery (DSD), to meet a high priority need for evidence on progress with implementing the science themes set out in NERC's strategy. The Environment, Pollution & Human Health (EPHH) theme is the sixth theme to be evaluated; the intention is to evaluate each theme every two years via a rolling programme.
2. EPHH is one of seven science themes set out in NERC's strategy *Next Generation Science for Planet Earth*¹. The ultimate objective of the theme is 'to reduce the burden of human disease linked with environmental causes, and to anticipate new threats to public health before they become serious'. To achieve this, NERC has defined four challenges:

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| <ol style="list-style-type: none">1. Improve measurement and monitoring of the distribution of pollutant and pathogens at required time and space scales.2. Improve knowledge of processes and models of the dynamics of transport and transformation of pollutants and pathogens in the environment.3. Improve assessments of pollutant and pathogen exposure and risk to humans4. Understand the impacts of waste management activities on the environment and human health |
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3. The evaluation was designed to meet the evidence needs of DSD (the main customer for the evaluation) and other key stakeholders, including the Science and Innovation Strategy Board (SISB) and the Head of Strategic Management. The design incorporated lessons learned from the preceding theme evaluations.
4. The customer and stakeholders requested evidence that will:
 - Provide information to SISB and Council on progress with delivering the EPHH theme;
 - Inform strategy and investment planning, including future Theme Action Plans (TAPs) and refreshes of NERC strategy, and decisions on management of current investments;
 - Provide evidence of achievements and highlights for publicising to external audiences, including government, the research community, and research users.
5. The evaluation was conducted by a Panel comprising representatives from key stakeholder groups (**Annex A**) and met for one day, in October 2011. The Theme Leader (TL) and NERC lead on the EPHH theme attended *ex officio*. An interview with the Head of Molecular & Cellular Medicine at the MRC provided additional evidence for the Panel. The Panel's objective was:

<p>To undertake a high-level overview of progress with delivering the EPHH theme at this stage, nearly 3 years into implementing the strategy.</p>

6. The Panel's Terms of Reference are attached as **Annex B**. They covered:
 - Inputs: the extent to which each challenge, and the whole theme, is being addressed;
 - Outputs: the extent to which each challenge and the whole theme has been achieved; and
 - Performance: the extent to which investments are being effective in meeting theme challenges and delivering outcomes.

¹ <http://www.nerc.ac.uk/publications/strategicplan/nextgeneration.asp>

7. The evaluation concentrated on investments current at, or planned since, July 2008, when implementation of the strategy commenced, with the approval of the first TAPs. However, the Panel was provided with additional information relevant to the theme², listed in **Annex C**. Key facts about the major investments contributing to this theme are included at **Annex D**.
8. This report summarises the Panel's findings against their ToR, with proposals for ways in which delivery of the theme might be strengthened. The report will be considered by SISB, and copied to Council along with a management response setting out any actions in response to the Panel's proposals. Both report and response will be published on NERC's website.

² Including Research Programmes managed by Swindon Office, Research Programmes managed by NERC Research Centres, and Responsive Mode grants.

TOR 1: INPUTS

9. The Panel was asked to evaluate the extent to which the theme is being covered by current and planned investments, in the three ways presented below (1a - 1c). The Panel concluded that the EPHH theme has made well-targeted investments and is on track to deliver against each challenge, building on pre-theme investments which have built capacity for research in some key areas. There are no major risks to delivery at this stage, however the ultimate societal outcomes from the theme's investments are likely to be felt in decades, rather than years.
10. The EPHH theme relies on interdisciplinary working, and close partnerships with other stakeholders. The theme's impressive co-funding achievements are testament to the ability of the TL and SIM to bring in partners and demonstrate a widespread recognition of the importance of collaborations in successful delivery of the research. The theme is assembling a science community not previously used to working together, which is therefore vulnerable at this relatively early stage, and will require ongoing support. The EPHH theme is providing NERC with the opportunity to continue to help drive the field's research agenda.

1.a The extent to which each challenge is being addressed by relevant investments

Challenge	Panel comments (<i>acronyms – Annex E</i>)
<p>1. Improve measurement and monitoring of the distribution of pollutant and pathogens at required time and space scales.</p>	<p><i>While there has been a good portfolio and level of investment to meet this challenge, the link to the Technologies theme and technology development could be made clearer.</i></p> <p>Although the EPHH theme's interest in technology is orientated towards application, rather than development, both the development and utilisation of new technology will be crucial to the theme's success, and is the essence of the theme's Challenge 1.</p> <p>Technology development has not proceeded at the pace anticipated by the theme's strategy development report. While the Technologies theme-led Technology Proof of Concept (TPOC) and Networks of Sensors programmes have contributed well to this challenge, progress has not been rapid in all areas. For example, high resolution chromatography of classical air pollutants has developed well, but other pollutant detection technologies have yet to demonstrate improved sophistication. The exploitation of novel EPHH-relevant technology should be encouraged, and monitored. Conservative thinking amongst some researchers poses a hindrance to the uptake of cutting edge technology in some cases.</p> <p>Proposal 1: To enable TLs to track the development and exploitation of novel technologies, grant applicants to EPHH programmes could be required to state how they will make use of technologies to address their projects' scientific challenges. A good example of how to integrate technology into a RP was set by the Macronutrient Cycles programme.</p> <p>The nature and broad scope of the theme makes it open to the development and application of new technologies. The Technologies theme's TPOC and Networks of Sensors programmes have serendipitously funded projects of potential relevance to EPHH, but there is currently no plan to undertake a joint action with</p>

Challenge	Panel comments (<i>acronyms – Annex E</i>)
	<p>the Technologies theme dedicated to EPHH-oriented technology. The Panel recognise that it is not possible to presume the success of technologies at early TRL stages, and that any such action should not have an expectation of success..</p> <p>Proposal 2: In order to focus delivery of technology for the direct benefit of the EPHH theme and EPHH Challenge 1, the EPHH TL should consider the benefits of pursuing a joint technology development action with the Technologies theme.</p> <p>Challenges 1 and 2 address chemical pollutants and biological pathogens. Pollutant studies outnumber those of pathogens in NERC grants awarded, both RP and RM, significantly. The TL considers this to reflect the relative interest and size of each community in the NERC sphere; other funding agencies support biological pathogen studies (e.g. BBSRC, MRC) whereas NERC dominates the chemical pollutant funding arena.</p> <p>Proposal 3: In order to ensure that the balance of emphasis between pollutant-, particle- and pathogen-related work of relevance to the theme is appropriate, to the TL’s judgement, NERC should consider conducting a light-touch review of the levels of investment across these areas, including initiatives led by other funders.</p>
<p>2. Improve knowledge of processes and models of the dynamics of transport and transformation of pollutants and pathogens in the environment.</p>	<p><i>This theme challenge benefits from a history of being central to NERC’s science remit. Like Challenge 1, it is also being addressed by a wide portfolio of investments, and is central to most of the EPHH investments to date.</i></p> <p>In addition to the EPHH investments, this challenge is strongly supported through pre-theme investments and on-going Responsive Mode and NERC Centre activities.</p> <p>Key to successfully addressing this challenge is ensuring proper collaboration between human health and environmental science communities. This has been achieved well where MRC is a programme co-funder, e.g. EHH, ENI, EEHI, ESEI, but has been more difficult for those programmes in which MRC has not been a partner.</p> <p>Proposal 4: To encourage better integration with the human health research community, NERC should consider asking grant applicants submitting to EPHH programmes to illustrate how their research would be relevant to the human health aspects, and to give evidence of collaboration or consultation with human health researchers.</p> <p>Observation 1: The interface between ‘indoor’ and ‘outdoor’ exposure remains difficult to manage, and could impede progress. This risk must be addressed with caution.</p>
<p>3. Improve assessments of pollutant and pathogen exposure and</p>	<p><i>This Challenge is being met through a strong investment portfolio. The awards made in this area are concentrated the area of air pollution, reflecting the maturity of the field and a legacy of NERC support. Without further investment, momentum built up from capacity building in other areas risks being lost.</i></p>

Challenge	Panel comments (<i>acronyms – Annex E</i>)
risk to humans	<p>There has been little funding in this challenge area by NERC, except through the EPHH theme and the pre-theme joint EHH programme that established capacity . Because of the opportunity for NERC, through collaborations, to add significant value to research investment in this area, attention to this challenge must be sustained.</p> <p>‘Omics is an area of relative underinvestment by the theme, to date; it is also an area of great interest to the medical community. This is an area of potential future co-investment with the MRC and within the EU, where there is extensive on-going research through, for example, the ERANET on Environmental Health.</p> <p>Proposal 5: There is an ongoing gap, and collaboration opportunity, in EPHH: investment in ‘omics to address gene-environment interactions and health-related exposure-response relationships. NERC should consider a means to address this, for example through an ‘EHH phase two’.</p> <p>Observation 2: The use of non-human sentinel species in radioactive waste monitoring is an emerging and important area of study. NERC is well positioned to collaborate with agencies such as the US EPA for studies in this area.</p>
4. Understand the impacts of waste management activities on the environment and human health	<p><i>Although offering less scope for interpretation than the other challenges, this is an exciting area, addressing the needs of new waste management and manufacturing processes. It is an opportunity for NERC to engage strategically in fundamental and applied science.</i></p> <p>This area offers good opportunities for collaboration with partners, in particular EPSRC and industry, investigating the potential environmental and health threats posed by new manufacturing and waste management processes. These collaborations require much greater strengthening.</p> <p>Resource Recovery from Waste is an impressively forward-looking action, preempting the potential consequences of enhanced recovery of valuable resources from waste. However, greater clarity is desirable to contextualise the environment and human health elements of the programme.</p> <p>A significant current gap in this challenge area is incineration, landfill and illegal waste. Public interest and policy impetus are driving many potential partner organisations to increase research in this area, e.g. HPA, Defra, EA. There is an opportunity for NERC to leverage considerable buy-in from these agencies in this area, and to help set the research agenda. Any research programme in this area should include epigenetics, biomarker studies, wildlife and human exposure and epidemiology.</p> <p>Proposal 6: Environment and human health issues related to both existing and new waste management practices require better definition and gaps such as the health related concerns on incineration, landfill and illegal waste, should be considered.</p>

1.b The extent to which the whole theme (sum of challenges) is being addressed

11. The portfolio of investments is strong, and all challenges are being met to some extent. The spread and quality of investments is appropriate with good examples of cross theme and cross council activity. The theme has been very successful in leveraging co-funding and partnerships, most notably from the US EPA, the MRC, and more recently with the Environment Agency and the Nuclear Decommissioning Authority
12. The Panel did identify some areas for concern regarding capability, capacity and sustainability (see above). The pre-theme EHH programme established a research community not traditionally used to collaborative working. The EPHH theme has subsequently utilised this community with strong support from the MRC. Government challenges set out in recent white papers (the Natural Environment White Paper & the draft Water White Paper), and the National Ecosystem Assessment will require considerable research effort in the area of environment and human health.

Proposal 7: NERC should recognise the vulnerability of the community and need for commitment from the research councils, if capability and capacity are to be sustained, including a commitment to train the next generation of researchers.

Observation 3: The focus of the theme has been on health risks through environmental exposures. There are also health and well-being benefits derived from our environment and from recreational activity and access. The Panel recognised that research in these areas is of importance (strong component of the UK National Ecosystem Assessment) but more related to ESRC areas of interest.

13. The skills required for successful delivery of this theme are generally available, but in some areas there is a continued need to encourage different disciplines to work together.

Observation 4: The capacity for radioactive field monitoring is in decline; the application of existing skills, e.g. geophysics and geochemistry to radioactive processes could be enhanced.

14. Good collaborations are being built and, where mature, are already showing results. Strengthened partner buy-in is needed in some areas, e.g. HPA participation in **Radioactivity and the Environment**.

1.c The extent to which new investments are on track

15. The TAP1 investments were relatively slow to progress to award of grants, but this was true of all themes and was due, in part, to adoption of the new commissioning processes and developing new partnerships. The **Radioactivity and the Environment** action's cut from the proposed £15M to £5M has forced a rescoping exercise and a delay. **ESEI's** initial catalyst period was a pre-requisite designed to foster strong inter-disciplinary proposals but delayed awards by nine months; this is an example of a necessary and planned delay while collaborations are established. Overall, the Panel was satisfied that the majority of the investments are on track.

TOR 2: OUTPUTS

16. The Panel was asked to evaluate the extent to which the outputs of the relevant investments have achieved the theme objective. Because the theme is relatively recent, the theme actions are too immature to have given rise to sufficient outputs to evaluate their

performance on this criterion robustly. However, many of the pre-theme investments have produced outputs which have contributed to delivery against the challenges.

2.a The extent to which each challenge has been achieved

Challenge(s)	Achievements (<i>acronyms – Annex E</i>)
<p>1. Improve measurement and monitoring of the distribution of pollutant and pathogens at required time and space scales.</p>	<p>There is good evidence of new methodologies being developed and applied. There have been a number of high quality outputs relevant to this challenge in the development of sensors and test kits, particularly in the areas of air quality and human health through TPOC and EHH.</p> <p>DU delivered against its objectives and contributed to improved methods of measuring uranium isotopes in the environment.</p> <p>ENI The emergence of nanoparticle manufacturing identified a need for improved methodologies to measure and assess their environmental impact. The research agenda has responded quickly and provided significant advances in nanoscale measurement, microscopy and spectroscopy.</p> <p>A number of programmes have added value to investment through the development of infrastructure. The UAS programme is funding extensions to major atmospheric measurement facilities in London. Infrastructure such as this is crucial to the success of many EPHH projects, and can add value to routine monitoring projects by partners. Later investments, such as projects funded under EEHI, will exploit this new measurement capability. Long-term monitoring studies are likewise crucial to the delivery of much of this theme, but are increasingly a burden on NERC’s centres.</p> <p>Proposal 8: Commitments to fund long-term monitoring programmes need more cross-council and cross-Government consideration if they are to be sustained</p>

Challenge(s)	Achievements (<i>acronyms – Annex E</i>)
<p>2. Improve knowledge of processes and models of the dynamics of transport and transformation of pollutants and pathogens in the environment.</p>	<p>There are a number of good examples of outputs relevant to this challenge from pre-theme investments and a substantial number of publications from NERC Centres; relevant theme programmes are still maturing.</p> <p>The Biogeochemical Gradients and RADionuclide transport (BIGRAD) RM consortium has already begun to deliver methodological developments in high alkalinity, carbonate free systems, and modelling.</p> <p>ENI Phase 1 was a very important capacity-building project which helped to establish the nanoscience research community in the UK.</p> <p>EHH was the first programme to build capacity in its area; it has also made significant contributions to meeting this challenge, including:</p> <ul style="list-style-type: none"> • demonstrating the dynamics of nanosilver in a human food-chain model including invertebrates, fish and mammals. • determining environmental pathways for pathogenic viruses • assessing the bioavailability of environmental contaminants (arsenic and polyaromatic hydrocarbons) in a simulated human gut environment <p>UAS is generating long-term measurements for future analysis to determine the meteorological and chemical processes that control air quality and heat content in the urban environment.</p> <p>RELU generated very useful pathogen-related outputs, e.g. guidance on the recognition of environmental diseases, policy and practice notes on pathogen transport mechanisms, and modelling advances.</p>
<p>3. Improve assessments of pollutant and pathogen exposure and risk to humans</p>	<p>NERC investments have made good progress in building capability in this area, through capacity-building and the establishment of cross-disciplinary partnerships, largely through collaborations with the MRC. Because there is a greater dependency on the EPHH theme actions to meet this challenge, there are fewer outputs; outcomes in this area can be expected to be very long term.</p> <p>EHH built some of the first partnerships between environmental and medical researchers and exposure and risk was a feature of many of their projects. Examples include:</p> <ul style="list-style-type: none"> • assessment of the health benefits and risks of organic food • determining the gene and protein response of human lung tissue challenged with real urban air particulates • addressing the health risks posed by widespread presence of MRSA and other antibiotic-resistant microbes in the environment <p>ENI generated nanoparticle exposure outputs. New research points towards a possible cost-effective way to remove nanoparticles during sewage treatment</p> <p>RELU provided outputs which are being used to help reduce harmful <i>E. coli</i> exposure and risk in rural communities, and preventative methods to reduce incidence of Lyme disease.</p>

Challenge(s)	Achievements (<i>acronyms – Annex E</i>)
4. Understand the impacts of waste management activities on the environment and human health	<p>The EPHH theme actions relevant to this challenge are very immature; outputs to date are entirely from non-EPHH investments, including centre programmes.</p> <p>BIGRAD and DU are contributing very useful outputs in the management of radioactive waste.</p> <p>Other outputs relevant to this challenge: EHH (bioaerosols from biocomposting); ENI (nanomaterials in sewage sludge); CEH has recently studied the fate of nanosilver and drugs in sewage.</p>

2.b The extent to which the whole theme (sum of challenges) has been achieved

17. As detailed above, outputs at this time are mostly derived from mature investments which pre-date the theme actions. Where theme actions have contributed to the challenges already, these are helping to meet challenges 1 and 2. Overall, the investments made through the EPHH theme are delivering against the theme’s objectives as specified in the theme strategy report.

2.c The extent to which larger investments have been effective in delivering outcomes

18. The limited outputs of the larger theme actions, let alone their outcomes, makes it more practicable to judge the intent of the theme actions at this stage. The success of this theme is dependent on a strong trans-disciplinary community and in some cases infrastructure development. Current and pre-theme investments have established the necessary building blocks to help shape the research effort in Environment & Human Health and to progress both national and international societal and technical challenges described in recent Government White Papers.
19. The impressive pre-theme investments have delivered well against the challenges, including in some surprising areas (e.g. challenge 4). The air pollution community have been particularly successful at winning grants in broad-remit funding opportunities. This is due to the relative strength in this field. The theme has brought together communities needed to achieve the long-term outcomes. This, in itself, is a long-term beneficial output.
20. There is an ongoing need for medical/environmental trans-disciplinary scientists. It is not always possible to identify where training and trans-disciplinary skills in this area are being developed, e.g. by the NHS.

3. Overall Performance

21. While the majority of theme investments are still immature it is difficult to draw strong conclusions about quality of performance. The panel were encouraged by the spread of investments and are confident that they will meet the challenges. The performances of pre-theme investments give reasons for encouragement. The theme’s agenda is good, and its strong emphasis on capacity building should be maintained. The popularity of programmes such as ESEI and EEHI demonstrate the large appetite from the research community for work in this area.

PANEL MEMBERSHIP

Position	Name	Organisation
SISB member (Chair)	Dr Jim Wharfe	Environment Agency
Chair of the original Strategy Development Panel	Prof Mike Pilling	University of Leeds
NERC Centre representative	Prof Roger Pickup	Lancaster University (CEH Honorary Fellowship)
HEI representative	Prof Paul Elliott	Imperial College
HEI representative	Prof Tamara Galloway	University of Exeter
User representative	Dr Ovnair Sepai	HPA

Attending *ex officio*

Prof Roy Harrison, EPHH Theme Leader

Dr Caroline Culshaw, NERC Lead on the EPHH theme

Interviewee

Dr Nathan Richardson, Head of Molecular & Cellular Medicine, MRC

Panel secretary

Will Thomas, Evaluation Project Manager, NERC Swindon Office

PANEL TERMS OF REFERENCE

Purpose

Based on the evidence presented, the Panel is asked to undertake a high-level overview of progress in delivering NERC's Environment, Pollution & Human Health (EPHH) theme at this stage, three years into implementing the strategy.

Objectives

1. Inputs: Evaluate the extent to which the theme is being covered by current and planned investments
 - a) The extent to which each **challenge** is being addressed
 - b) The extent to which the **whole theme** (sum of challenges) is being addressed
 - c) The extent to which new investments are on track
2. Outputs: Evaluate the extent to which the outputs of the above investments have contributed to the theme objective
 - a) Progress made with each theme **challenge**
 - b) Progress made with the **whole theme** (sum of challenges)
 - c) The extent to which larger investments have been effective in delivering outcomes

EVIDENCE PROVIDED TO THE PANEL**Strategic Material**

- Next Generation Science for Planet Earth (NERC Strategy 2007 – 2012)
- NERC Technology Management Plan (2007)
- EPHH Theme Action Plan 1 (2008)
- EPHH Theme Action Plan 2 (2009)
- Verbal update on Theme Action Plan 3

Investments Information

Summary-level information (dates, % relevance to the theme, £ associated with theme, mapping to challenges) for the following, where relevant to the theme:

- TAP Actions (RPs)
- Directed Programmes active at July 2008 and onwards
- Research & collaborative centre programmes
- Consortia

Detailed information for the above, comprising

- PI (or equivalent) questionnaire response submissions to the evaluation process, including details of progress to date & outputs
- Relevant programme publications, AOs, business cases etc. as appropriate (one or two supporting documents per programme)

Number, and value of contribution towards theme, of non-Consortium RM grants active at July 2008 and onwards

Spend per challenge for RP, centres & Consortia

LWEC response to the following two questions: To what extent is the theme delivering LWEC's needs?; Could the delivery of the theme be improved in terms of contributing to LWEC's challenges?

SMT commentaries for progress with the EPHH theme, 08/09 to present

EPHH theme highlights from NERC Annual Reports, 08/09 & 09/1

EPHH THEME: MAJOR CURRENT INVESTMENTS

Tables 1-4 summarise the investments listed at Paragraph 2, which total **£53.3m**, plus **£2.2m** in '09/'10 Research Programme spend at Centres, which equates to **£11.2m** over 5 years (for broad comparison). Paper 5 contains more detailed information about each of these investments.

Table 1: TAP actions (RPs) relevant to the theme, and Directed Programmes, managed by Swindon Office where led by the theme and/or >£0.5m investment relevant to theme

Action	Start date	End date	% EPHH ¹	£m EPHH
Radioactivity and the environment	2013 / 14	2017 / 18	100	5.0
Resource recovery from waste	2012	2014	50	3.0
Macronutrient Cycles	2011/12	2014/15	19	1.8
Environmental & Social Ecology of Human Infectious Diseases (ESEI)	2009	2017	100	4.0
Environmental Exposure & Health Initiative (EEHI)	2009	2015	100	3.0
Environmental Nanoscience Initiative (ENI) Phase 2	2009	2013	100	2.0
Urban Atmospheric Science (UAS)	2009	2012	100	2.9
Ecosystem Services & poverty Alleviation (ESPA)	2007	2016	15	1.5
Environment & Human Health (EHH)	2007	2009	100	5.0
Environmental Nanoscience Initiative (ENI) Phase 1	2006	2008	100	1.0
Aerosol Properties, PProcesses And InfluenceS on the Earth's climate (APPRAISE)	2005	2011	10	0.6
Rural Economy & Land Use (RELU)	2004	2011	15	1.7
Post-Genomics & Proteomics (PGP)	2003	2009	10	1.1
Depleted Uranium (DU)	2003	2008	100	1.0
Polluted Troposphere (PT)	2001	2007	50	1.5
Centre for Population Biology (CPB)	1989	2011	20	1.0
Total				

Table 2: Research Programmes managed by Centres

These programmes are mostly five years in duration, ending in 2012 or 2013.

Centre	£m EPHH '09 / '10	Major programmes (<i>where 0910 spend >£0.1m</i>) ²	% EPHH	£m EPHH '09 / '10
National Centre for Atmospheric Science (NCAS)	0.98	Improving predictive capability for decadal and regional climate change	5	0.11
		Improving prediction for human exposure to air pollution	25	0.46
		Improving predictive capability for high impact weather	20	0.37
Marine Centres ³	0.52	Shelf & coastal processes	10	0.29
		Ocean prediction	10	0.22
Centre for Ecology and	0.33	WA-2: Ecohydrological Processes	20	0.13

¹ As mapped by NERC's Portfolio Planning team in consultation with the Theme Leader or amended by programme managers.

² Equating to £0.5m over 5 years, to allow broad comparison with other funding modes.

³ National Oceanography Centre, Southampton (NOCS), Proudman Oceanographic Laboratory (POL), Plymouth Marine Laboratory (PML), Scottish Association for Marine Science (SAMS), Sea Mammal Research Unit (SMRU), Marine Biological Association (MBA) and Sir Alister Hardy Foundation for Ocean Sciences (SAHFOS)

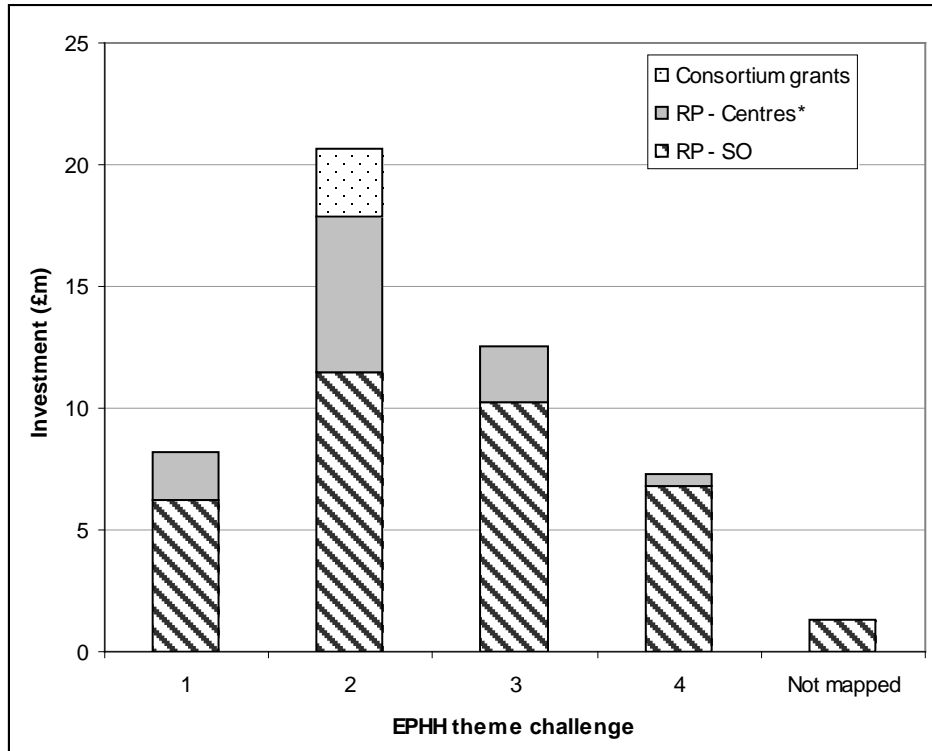
Hydrology (CEH)				
British Geological Survey (BGS)	0.29	Science resources & infrastructure	9	0.19
National Centre for Earth Observation (NCEO)	0.12			
British Antarctic Survey (BAS)	nil			
Total	£2.23m			

Table 3: Responsive Mode: summary of grants current at, or started since, July 08, with >£100k relevant to the EPHH theme

Grant scheme ⁴	No. grants ⁵ (%)	EPHH £m (%)
Standard grants	71 (89%)	15.92 (92%)
Masters training grants	4 (5%)	0.65 (4%)
Postdoctoral fellowships	3 (4%)	0.41 (2%)
Advanced fellowships	2 (3%)	0.26 (2%)
Total	80	£17.25m

Figure 1 presents the investments divided by challenge (for the 72% of spend that has been mapped by challenge; this does not include the majority of Responsive Mode grants).

Figure 1: Distribution of investments that have been mapped by challenge



* 0910 spend by Research Centres multiplied by 5, to be broadly comparable with the other investment categories

⁴ Description of the schemes available at www.nerc.ac.uk/funding/available. Doctoral training grants are not included as they are not classified by topic. Grants not relevant to the EPHH theme were excluded.

⁵ Split grants are combined and treated as one.

LIST OF ABBREVIATIONS

BBSRC	Biotechnology & Biological Sciences Research Council
BIGRAD	Biogeochemical Gradients & RADionuclide Transport Consortium grant
CEH	Centre for Ecology & Hydrology
Defra	Department for Environment, Food & Rural Affairs
DSD	(NERC) Director, Science Delivery
DU	Depleted Uranium Research Programme
EA	Environment Agency
EEHI	Environmental Exposure & health Initiative Research Programme
EHH	Environment & Human Health Research Programme
ENI	Environmental Nanoscience Initiative
EPHH	Environment, Pollution & Human Health theme
EPSRC	Engineering and Physical Sciences Research Council
ERANET	European Research Area Network
ESEI	Environmental & Social Ecology of Human Infectious Diseases Research Programme
HPA	Health Protection Agency
LWEC	Living With Environmental Change (Research Programme)
MRC	Medical Research Council
NC	National Capability
NERC	Natural Environment Research Council
NHS	National Health Service
RELU	Rural Economy & Land Use Research Programme
RM	Responsive Mode
RP	Research Programme
SISB	(NERC) Science & Innovation Strategy Board
SIM	Science and Innovation Manager
TAP	Theme Action Plan
TL	Theme Leader
TPOC	Technology Proof of Concept Research Programme
TRL	Technology Readiness Level
UAS	Urban Atmospheric Science Research Programme
US EPA	US Environmental Protection Agency