

Changing Water Cycle

Call for proposals

Closing date 16:00 on 8th April 2010

This document must be read in conjunction with the [CWC Science and Implementation Plans](#), which detail the full scope of the programme.

1. Summary

Proposals are invited as part of the initial investment phase of a major new research programme on the **Changing Water Cycle**. This 5 year, £10m programme directly relates to the delivery of NERC strategy (in particular Climate System, Sustainable Use of Natural Resources and Natural Hazards Science Themes) and UK Government's strategic goals with respect to the adaptation to, and mitigation of, climate change. This programme is Living With Environmental Change (LWEC) accredited and will deliver towards objectives on climate change, ecosystems and human well-being.

This call is for proposals to deliver the programme's Science Goals and address the questions posed within four programme themes. Up to £5m is available for this call and we anticipate making four to five awards.

A workshop will be held in London on 3rd February 2010 to address the call and allow those intending to submit proposals to get together, form collaborations and multidisciplinary links, and discuss ideas with NERC and the Programme's Science Plan Writing Group. Attendance at the workshop will not be a prerequisite for proposal submission, nor a guarantee of funding from the subsequent grants round. Applications to attend the workshop are invited under a [separate call](#).

Proposals for this call are invited from UK researchers; see the NERC [Research Grants Handbook](#) for eligibility.

The closing date for proposals is 16:00hrs on 8th April 2010.

2. Background

The Changing Water Cycle programme is a 5 year initiative which will address key issues under four main **Programme Themes**:

1 Land-Ocean-Atmosphere Interactions: Understanding how feedbacks within the water cycle directly affect hydrological stores and fluxes.

- The impact of the land surface on the persistence of large-scale rainfall anomalies.

- The impacts of changing ocean surface state and atmospheric water vapour and precipitation patterns.
- Feedbacks between the atmosphere and natural and anthropogenic changes and interventions.

2 Precipitation: Improve our understanding, observations and modelling to underpin the prediction of ongoing and future changes in precipitation and evaporation, their variability and impacts, from global to regional and local scales.

- Sources of precipitation in the global water cycle.
- Improved understanding of precipitation formation physical processes
- Role of large-scale circulation changes in determining regional evaporation and precipitation changes.
- Changes in extreme precipitation events.

3 Detection and Attribution: To quantify and understand causes of changes in water cycle components over periods of record; and to use this understanding to work towards delivering robust prediction of changes in water cycle components.

- Development of techniques
- Quantification and understanding of change
- Application of results

4 Consequences of the changing water cycle: The implication of change in climate and land use for the assessment of water related hazards to and effects on human and natural systems.

- New and innovative ways of using existing and emerging climate science to estimate potential consequences of climate and other changes on catchment systems, the sustainable use of natural resources, and natural hazards.
- Consequences that are currently highly uncertain

This work will contribute to the delivery of four **Programme Goals**:

1. To develop an integrated, quantitative understanding of the changes taking place in the global water cycle, involving all components of the earth system – the atmosphere, ocean, land surface and geosphere, cryosphere and biosphere.
2. To improve predictions for the next few decades of regional precipitation, evapotranspiration, soil moisture, hydrological storage and fluxes, focusing on the requirement to quantify and narrow the uncertainty in predictions.
3. To understand how local to regional scale hydrological and biogeochemical processes are responding and will respond to changing climate and land use, together with their consequent impacts on the sustainable use of soil and water.
4. To understand the consequences of the changing water cycle for water-related natural hazards, including floods and droughts, and to improve prediction and mitigation of these hazards.

The programme will operate at two scales: global and regional. Improved understanding and representation of some aspects of the changing water cycle requires a *global perspective*, particularly in terms of (but not restricted to) global ocean-atmosphere-climate interactions with water and energy cycles. The *regional scale* focuses, within the global context, on Northern Europe, especially in relation to the UK, and this call has a particular geographic focus in this area. A second Announcement of Opportunity, published at a later date, will

have a regional focus on South Asia, taking advantage of international collaboration opportunities.

The programme will be fully interdisciplinary, aiming to bring science understanding across the four themes in a fully integrated way in order to deliver the outcomes specified by the programme's four goals.

This programme will address the urgent need to understand the changes taking place now; predict changes that will take place over the next few decades; and through LWEC, work with partners to build resilience, mitigate problems, and develop adaptive solutions.

Full detail of the background, science questions, partnerships and potential impacts of the programme can be found in the Programme Science Plan.

3. Scope of the call

This document must be read in conjunction with the [CWC Science and Implementation Plans](#), which detail the full scope of the programme. Up to £5m is available for this call; it is anticipated that around four to five projects will be funded.

Proposal requirements: Proposals submitted to the call will be required to address how their research will deliver the objectives detailed in the science themes and contribute to the programme's Science Goals (see Section 2 above). **Projects are encouraged to be interdisciplinary, cutting across more than one theme (/set of sub-themes) and potentially addressing more than one programme goal.** Please refer to the CWC Science and Implementation Plans which provide detail of the cross cutting deliverables.

'The programme will support inter-disciplinary cutting edge science, coordinating and integrating across the relevant communities. It aims to fund projects which build on observational evidence and process understanding to support predictive models and consider key uncertainties and thresholds relevant to improving model predictive capability. Projects will not necessarily provide direct predictions, but concentrate on funding the fundamental science that will underpin predictive capability and quantify and improve uncertainty in predictions. Projects will thus be welcome which (i) enable a better understanding of changes currently taking place; or (ii) focus on timescales to improve predictive capability 10-60 years into the future. Thus, the focus is not looking at initialising decadal prediction models, nor into the period of equilibrium response that climate stabilisation achieves past ~+60 years.'

This initial call is open to proposals that address either the global or regional perspective as detailed above (Northern Europe, particularly in relation to the UK, for the latter). One further funding opportunity addressing (a) specific gaps not targeted in project resulting from this round, and (b) focussed on South Asia (see the Programme Implementation Plan [LINK]) will be issued at a later date.

Please refer to the programmes [Science and Implementation Plan](#) documents for further information.

Out of scope: Any activities covered by the [NERC Storm Risk Mitigation](#) research programme are excluded from this call.

An open workshop will be held in London on February 3rd 2010 to enable discussion and formulation of joint consortia and multidisciplinary links, and to discuss ideas with NERC and the programme's Science Plan Writing Group. Attendance at the workshop will not be a prerequisite for proposal submission, nor does it guarantee funding from the subsequent grants rounds. An expression of interest form to attend the workshop and further details can be found at: <http://www.nerc.ac.uk/research/programmes/cwc/events/ao-workshop.asp>

Projects will also be brought together by the programme coordinating body following the awarding of funds via a dedicated workshop for awardees. This workshop will also set up cross-theme Working Groups which will foster inter-theme working, fully integrating across programme activities and ensuring the delivery of the four interdisciplinary high-level programme goals. Funded science project participants will be required to participate in these Working Groups. Funds will be available for the Working Group activities and the groups will be expected to bid for these funds by outlining the activities they will undertake and added value they will bring in delivering the programme in an interdisciplinary and coordinated way.

Awards made by NERC shall have conditions attached that ensure that the funded projects contribute in a timely manner to the CWC deliverables. Specifically, funded proposals will be up to 3 years in duration unless cases for different durations are given and accepted by the Grants Moderating Panel, and awardees will be expected to participate in the relevant Working Groups.

Project start dates must be August 2010 or sooner, and it is therefore anticipated that successful proposals would start by early 2011.

A second, and final, funding round in 2010/11 will address any outstanding gaps that remain in the delivery of the science plan following award of grants from round one and also the South Asian regional perspective.

4. Collaboration Opportunities

The Changing Water Cycle is part of the broader Living with Environmental Change Partnership www.lwec.org.uk. Collaborations with LWEC partners to deliver the programme are welcome. The Met Office, Defra and the Environment Agency, in particular, have expressed interest in collaborating with PIs on the Changing Water Cycle.

NERC and the Met Office have established a Joint Climate Research Programme to strengthen the UK's world-leading reputation in climate science through a number of joint projects. As part of this, a new joint Met Office NERC supercomputer (MONSooN) is now available to facilitate collaborations between NERC and Met Office scientists.(contact: Andy Parsons andy.parsons@metoffice.gov.uk). The Met Office has an aligned programme with a focus on "Improving Hydrological Predictions" on global and regional scales in the next generation of climate models (HadGEM3).

If you would like to discuss collaboration with the Met Office, please contact:

- Understanding key uncertainties and improving physical processes in predictions of the Changing Water Cycle: Peili Wu peili.wu@metoffice.gov.uk

- Impacts of the Changing Water Cycle: Pete Falloon pete.falloon@metoffice.gov.uk.

There are also significant synergies between the Changing Water Cycle Programme and Defra and the Environment Agency's policy programmes. We welcome project proposals that consider how they align and coordinate with other initiatives to deliver multiple benefits and ensure effective knowledge exchange. The Defra-EA Demonstration Test Catchment Programme is a 5-year programme to study the interaction between multiple diffuse pollutants to water and air, and the effectiveness of on-farm mitigations at catchment scale. A network of Demonstration Test Catchments has been established to cover a representative range of land uses, soils, geologies, climatic regions and river types. There is an excellent opportunity for projects under the CWC programme to utilise the infrastructure, databases and partnerships provided by the Demonstration Test Catchments to facilitate and accelerate work. Similarly, there is a strong alignment of the objectives of the CWC programme with the Defra-EA Joint Flood and Coastal Erosion Risk Management Programme (FCERM), providing opportunities for improved collaboration.

If you would like to discuss collaboration with these programmes please contact:

- Demonstration Test Catchment Programme: Dan McGonigle daniel.mcgonigle@defra.gsi.gov.uk
- Flood and Coastal Erosion Risk Management Programme: <http://www.defra.gov.uk/environment/flooding/research/index.htm>

Potential collaborators and alignment with other initiatives are detailed in the Science Plan (Section 5).

5. Eligibility

Applications are invited from eligible UK researchers (see the NERC [Research Grants Handbook](#) for eligibility).

6. Application Procedure

Applications must be submitted using the Research Councils Joint Electronic Submission system (Je-S). Please select the Scheme – 'Directed' and the Call – 'Changing Water Cycle'

To use this system, the applicant's Research Organisation must be registered as a Je-S user. Full details are available on the Je-S website. Further information can also be obtained by contacting the Je-S Helpdesk by email at JeSHelp@rcuk.ac.uk or by telephone on 01793 444164.

Applicants must ensure that their application is received by NERC by 4pm on the closing date. Applicants should leave enough time for their application to pass through their organisation's Je-S submission route before this date. Any application that is received after the closing date, is incomplete, or does not meet the eligibility criteria, will be returned to the applicant and will not be considered.

The Principal Investigator must submit form Je-SRP1 (NERC) detailing the financial request, together with the Case for Support and other attachments. All attachments submitted through the JeS system must be completed in single-spaced typescript of minimum font size 11 point, Arial font, with margins of at least 2cm.

The **Case for Support** should comprise:

- Previous Track Record. This must not exceed 2 sides of A4.
- Description of the Proposed Research. This must not exceed 8 sides of A4 (including all necessary tables, references and figures).
- Justification of Resources. This should be completed as a separate section. Up to an additional 2 sides of A4 may be used for this purpose. The JoR for applications should also include full justification of all sea-time, HPC and facility costs included as estimates on applications plus application forms for any NERC Facility/Ship-time requested.
- A description of the proposed project management structures and plans (including data management), participant responsibilities, and scheduling chart. This should not exceed 2 sides of A4.
- CVs are required for all Principal and Co-Investigators, for all named research staff post and Visiting Researchers, (up to 2 sides A4 for each CV).

Applications must include an Impact Plan which, amongst other issues, could relate to the work being done in the project on societal impact, policy-related outcomes and knowledge exchange coordination and management. Full guidance on writing and submitting Impact Plans can be found at: <http://www.nerc.ac.uk/funding/application/impactplans.asp>
The overall programme will also have an Impact/Knowledge Exchange plan which successful project impact plans will be expected to contribute to.

International collaborations and partnership funding will be encouraged and supporting documentation from collaborators should be included in the application (n.b. international collaborators will benefit from access to data, but will not receive NERC funding).

For further details please refer to the NERC [Research Grants Handbook](#) .

7. Assessment

Proposals will be assessed against the following criteria under the Research Programmes Funding category:

Scientific Excellence
Fit to Requirements
Risk-Reward
Cost Effectiveness
Impact

Details on the funding categories can be found in the Background and Guidance Notes for Reviewers at: <http://www.nerc.ac.uk/funding/application/referee/>

The full proposals will be internationally peer-reviewed and final funding recommendations made by a moderating panel, consisting of members of the Programme Advisory Group (PAG) plus other independent experts. Depending on the number of proposals received, there

may be a sifting stage where the top proportion will be invited to the moderation panel stage. PIs will be given the opportunity to provide a written response to Peer Reviewer feedback prior to moderation. Final funding recommendations made by a Grant Moderating Panel (GMP) PAG members and others directly involved in proposals being considered will be excluded from sitting on the GMP to avoid vested interest issues.

The moderating panel will also advise the Programme Executive Board on measures to ensure that the overall range of science that is funded is not focussed too narrowly on a subset of the programme goals or science themes.

It is anticipated that funded proposals would start in early 2011.

Feedback will be available to applicants upon request once the funding decision process has been completed.

Project start date stipulated on applications **must be August 2010.**

8. Timeline

AO Published: Dec 2009

Discussion workshop: February 3rd 2010

Proposal Deadline: April 8th 2010

Outcome Published: July/August 2010

Approx. budget: Up to £5M

9. Programme Management and Reporting Requirements

Programme Management details can be found in Section 4 of the [Implementation Plan](#).

Following the award of projects a workshop will be held to bring all the PIs together and coordinate activities. Attendance from project PIs will be compulsory. The workshop will:

- give PIs a chance to present on their project plans;
- enable the CWC programme advisory board and science management group to advise on links between projects;
- start to identify additional programme activities that would complement and build on the awarded projects.
- through all of the above, build the basis of cross-theme Working Groups and define their activities for which additional programme funding will be made available.

All awards issued as a result of this call will have detailed terms and conditions that reflect the directed nature of the Changing Water Cycle call.

Projects funded under this call must:

- comply with standard NERC reporting requirements;
- contribute to the programme's *Knowledge Exchange* activities;
- comply with NERC's data management policy (sufficient budget (ca.5%) should be written into projects for this);

- collaborate with other participants in the *Changing Water Cycle Programme* (at least in part via cross-theme Working Groups);
- identify collaborations with other national and international programmes where appropriate;
- include milestones and deliverables to ensure the science outputs are delivered effectively

For further information or queries, please contact Sally Reid

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