



Joint Weather and Climate
Research Programme
(JWCRP)
A partnership in weather and
climate research.

Joint Programme on Understanding and Representing Atmospheric Convection across Scales Announcement of Opportunity

Issued:	18th May 2015
Expressions of Interest (Eoi) proposal deadline:	16.00 (GMT +1) on 9th July 2015
Full proposal deadline:	16.00 (GMT +1) on 24th Sept 2015

1 Summary

The Met Office and the Natural Environment Research Council (NERC) invite Expressions of Interest for a new Research programme on Understanding and Representing Atmospheric Convection across Scales. This is a new programme funded through NERC's Joint Strategic Response process¹. NERC is making a £5M investment over 5 years (80% FEC). The Met Office will be committing matched resources to the programme.

Weather and climate models are a critical tool to deliver reliable predictions. The representation of convection remains the key error in weather and climate models, and limits confidence in predictions and their usefulness for decision-making on timescales from days to decades. This proposed research aims to achieve a step change in the representation of convection in weather and climate models, which is an essential requirement for improving predictions of weather related hazards and climate change and their impacts on society.

The key objective of this Research programme is: ***to make significant improvements in the representation of convection in the UK's weather, climate and Earth system models across a range of spatial scales.***

The programme will be delivered in two phases - an initial 'exploratory' phase that lasts three years and a 'consolidation' phase for the final two years. This call is for expressions of interest for the 'exploratory' phase for three year grants in the range of £200k - £800k (80% FEC). The total available budget for this phase is £3m (80% FEC). **The deadline for expressions of interest is 16:00 on 9th July 2015.**

2 Background

Weather and climate models are critical to society's ability to reduce the impacts of hazardous weather and inform decisions regarding mitigation of and adaptation to climate change. The representation of convection and its associated precipitation remains the key error in weather and climate models, which limits our confidence in predictions and thus their value for decision-making on timescales from days to decades.

Global models used for weather prediction, seasonal forecasting and climate modelling use grid cells that are too coarse to resolve individual convective clouds and rely on physically based parametrizations of convection to represent the associated heating transport of moisture and momentum, and the production of precipitation. Developments to convective parametrizations in

¹ <http://www.nerc.ac.uk/research/portfolio/strategic/joint/>

the last 30-40 years have been largely incremental, and have not kept pace with the demand for more skilful and reliable weather forecasts and climate predictions, in which realistic simulations of convection and the regional water cycle are of fundamental importance.

Recent breakthroughs in kilometre-scale modelling used in short-range regional weather forecasting, in which convective systems can be resolved explicitly, have opened up routes to resolving many of the long-term issues for convection in global models. However, now and into the future, the affordable horizontal resolution for global weather and climate models will remain too coarse to fully resolve individual convective systems, resulting in errors in the initiation, development, intensity, and spatial scale of convective precipitation and its organisation (e.g. ²Stein et al., 2014) unless a breakthrough in the parametrization of convection can be achieved.

NERC and the Met Office have a long history of collaboration on climate and weather research and this has been strengthened in last few years through the Joint Weather and Climate Research Programme (JWCRP). A meeting was organised by JWCRP to lay the groundwork for a new strategy on convection studies and modelling in the UK (³Holloway et al., 2013). This agreed strategy outlines the key science questions that need to be addressed and has informed the development of this proposal.

The main aim of this programme is to improve the representation of convection across a range of gridscales (primarily 1 to 100 km grid lengths) in the U.K's global weather, climate and Earth system modelling systems. In order to achieve this, the project needs to improve the fundamental understanding of convective processes and their interactions with atmospheric flows. This has the potential to exploit advances in HPC performance to develop suites of process-based simulations to act as a virtual laboratory in combination with the latest Earth Observation and in-situ measurements. New approaches to convective parametrization will be developed which reflect our latest understanding of convective processes and their spatial and temporal characteristics, and that lead to improvements in our modelling systems.

3 Scope of Call

The programme aims to support projects that take a range of different approaches to addressing this issue, with awards ranging in size from £200k to £800k (80% FEC). This can include significant Principal Investigator time. There is a total of £3m available for this call (80% FEC). Awards will be for up to three years in duration and it is anticipated that between 5 and 8 projects will be funded.

Funding will be available for proposals covering at least one of the following areas:

- i. **The dynamics and thermodynamics of convective systems.** Development of the theory of convective dynamics and thermodynamics, including the characterisation of processes and timescales significant to convective systems, e.g. those governing convective transport; controls on convective initiation and development of divergent outflows.
- ii. **Scale interactions of convective activity.** Characterising the transfer of information across spatial and temporal scales by convective processes, identifying the key physical interactions

² Stein et al, 2014: The three-dimensional morphology of simulated and observed convective storms over southern England. *Monthly Weather Review*, **142**, 3264–3283.

³ Holloway et al, 2013: Understanding and representing atmospheric convection across scales: recommendations from the meeting held at Dartington Hall, Devon, UK, 28–30 January 2013. *Atmospheric Science Letters* DOI: 10.1002/asl2.508

that are required to capture larger-scale synoptic variability (e.g. MJO and monsoon behaviour) and understanding the interactions that lead to the development of organised convective systems.

- iii. **Convection interaction with the resolved model scale.** Addressing the role of resolved model transport in convection representation, and development of scale-aware, grey-zone parametrizations.
- iv. **Novel techniques in convection parametrization.** Including formulations that move beyond single column, equilibrium, or deterministic paradigms, and specifically aim to address the biases currently found in global climate and numerical weather prediction (NWP) models.
- v. **Delivery of high-resolution reference simulations to inform understanding of atmospheric convective processes.** This area will include: the design and running of the simulations; clear statements of computing costs and how they will support the programme; the development of tools to facilitate their analysis and the development of the infrastructure required to make data easily accessible to the science community, both for the purposes of this programme, and beyond.

In all areas, the proposed work must include a component that is focussed on the translation of scientific understanding into practical formulations that could be implemented in global climate and NWP models. A key additional challenge will be the interaction of any new convection scheme with the other physical parametrizations in the model (e.g. boundary layer, cloud, microphysics, radiation), and projects will need to demonstrate how they plan to take account of this.

Due to the constraint on the size of the programme the scope cannot include the collection of new observational data.

Associated studentships may be included as part of the proposal but the cost must remain within the overall limit specified above. An Associated Studentship should constitute a distinct project, providing added value to the research grant. The main research grant project should still be viable without the studentship and should have distinct objectives that are not reliant upon the studentship. The student is expected to be able to develop novel research ideas while benefiting from working in a group environment. NERC will not accept proposals where a student is the only dedicated researcher/staff member on a grant, including individual component grants of joint proposals. All Associated Studentships must also meet the success criteria, which are available on the postgraduate section of the website: <http://www.nerc.ac.uk/funding/available/postgrad/>

4 Call Process Overview

The grants funded under this programme will be awarded in two phases. This call is for expressions of interest for phase 1.

Phase 1

The first 'exploratory' phase will fund grants of three years duration. A budget of £3m (at 80% FEC) has been allocated to this first phase and it is anticipated that between 5 and 8 projects will be funded. Applicants will not be constrained in terms of whether they wish to address single or multiple science areas outlined above.

In this Expression of Interest stage applications must demonstrate fit to the objectives of the call. Applicants must identify how they plan to collaborate with the Met Office. Proposals should be

costed on the basis that they are ‘stand-alone’ projects but should identify areas where the work could be done more efficiently in collaboration with other groups.

Applicants that are successful at the EoI stage will be invited to submit full proposals (see section 7.2). The case for support must include details of the proposed collaboration with the Met Office. The proposals will be assessed by external peer review and ranked by a moderating panel. The programme executive (NERC and the Met Office) will decide which proposals it plans to fund. A workshop will be held at this point, and before the awards have been made. The aim of this workshop will be to share and discuss the proposals and identify how the projects will work with each other and the Met Office to deliver a coordinated programme of work. Some funding will be held back for additional integrative activities, but applicants may also need to amend their proposals to deliver this coordinated programme.

Phase 2

The second ‘consolidation’ phase will be two years in duration and start after the end of phase 1. It will have a budget of approximately £2m (at 80% FEC). It will be open only via those who have been funded in the first phase, but there is no guarantee that those supported in the first phase will receive further funding. The ‘consolidation’ phase will probably have fewer workstreams and focus on those that have been shown in the first phase to have the highest potential to deliver significant improvements to the representation of convection in atmospheric models. This work should aim to deliver advances that it will be possible to implement in to the Unified Model following this phase.

The proposals for the second phase will need to be prepared and assessed during the final year of phase 1 so that there is not a break in funding and potential loss of key staff.

5 Programme Requirements

5.1 Scientific and non-scientific objectives

In assessing the fit to call of the proposals being reviewed, two criteria will be considered: the ‘scientific’ and ‘non-scientific’ objectives. The fit to the ‘scientific’ objectives relates to the five areas set out in the scope section above. The ‘non-scientific’ objectives will be judged on the potential of the proposal to address the broader goal of the programme *‘to make significant improvements in the representation of convection in the UK’s weather, climate and Earth system models across a range of spatial scales.’*

5.2 Knowledge Exchange and Impact

Successful proposals should have the potential to advance our understanding of atmospheric convective processes and deliver significant improvements to the representation of convection in the Unified Model (UM). In particular, improvements should be made across grid scales ranging from 1 to 100 km and to long-standing biases related to convective processes. The main priority will be to deliver significant improvements to modelling systems which should be ready for implementation at the end of the five year programme. However, proposals that can lead to substantial breakthroughs over ten years will be also considered.

While it is expected that new insights and parametrizations from this programme will be applicable generically to large scale models, these should be tested initially in the UM, with consequent benefits for the UK’s wider Earth System Modelling capability. This does not preclude the use of other models in the projects.

Post-award, NERC and the Met Office will make available additional resource to deliver a broader integrated programme and deliver activities with greater impact. Applicants must be willing to engage with the programme to design and undertake these joint activities.

5.3 Data Management

The NERC Data Policy must be adhered to, and an outline data management plan produced as part of the proposal. Applicants are advised to contact the relevant data centre to discuss their requirements. NERC will pay the data centre directly on behalf of the programme for archival and curation services, but applicants should ensure they request sufficient resource to cover preparation of data for archiving by the research team.

5.4 NERC Facilities

Significant access to HPC is expected to be required for much of the work in this programme. HPC is free at the point of use for NERC-funded researchers, but requests for large amounts of resource should be discussed with the relevant HPC consortia leader prior to application. Contact details and full guidance can be found on the following webpage:

<http://www.nerc.ac.uk/research/sites/facilities/hpc/>

5.5 Management and Governance

The successful projects will be managed as a single coordinated programme of work. Successful project teams will be expected to work with NERC Swindon Office and the Met Office in forming the programme governance, management and advisory structures. Additional funds will be made available to facilitate this post-award, but applicants should be aware that modest additional staff time will be required.

Projects funded as part of this programme will need to follow the Joint Weather and Climate Research Programme (JWCRP) Agreement between NERC and the Met Office (see Annex A). This provides the basis for research carried out as part of this partnership. It provides a mechanism for sharing Intellectual Property (IP) generated from jointly funded research.

6 Eligibility and Funding

This opportunity is open to individuals and organisations eligible for NERC research grant funding, i.e. applicants based in UK Higher Education Institutions (HEIs), NERC Research & Collaborative Centres, and Independent Research Organisations (IROs) approved by NERC. Please refer to the NERC Research Grants Handbook for details. Potential applicants should contact NERC well in advance of the submission deadline if they have any queries concerning their eligibility. Individuals are limited to involvement in no more than two proposals submitted to this call; only one of these may be as the lead Principal Investigator.

7 Application Process

This call has a two-stage application process:

- i. Expressions of Interest
- ii. Full proposals.

7.1 Expressions of Interest

Closing date: 9th July 2015

The expression of interest stage will be used to identify projects that will be invited to submit a full proposal. Any sift of proposals will be made on the basis of the likely fit of proposals to both the scientific and non-scientific requirements of the call.

Expressions of interest must be submitted using the 'Understanding and Representing Atmospheric Convection across Scales' proforma, which may be downloaded from the NERC website, and emailed to atmospheric@nerc.ac.uk.

Applicants must ensure that their expression of interest is received by NERC by 16.00 (4pm) on the closing date. Any proposal that is received after the closing date, is incomplete, or does not meet the eligibility criteria of this call for proposals, will be returned to the applicant and will not be considered.

For all proposals, the Principal Investigator must submit a completed expression of interest form.

The expression of interest form should include the expected Co-Investigators and their Research Organisations. If successful, some of the Co-Investigators would then become the Principal or Co-Investigators on the component grant proposals and not be named on the lead grant proposal.

A Justification of Resources attachment is not required, but it is the responsibility of applicants to undertake sufficient planning at the expression of interest stage to determine that the full costs of research proposed (including any facility costs) can be accommodated within the fixed financial limits of the scheme. The Resources indicated at the expression of interest stage are considered as estimates only and may be amended in a subsequent full proposal, within the financial limits of the scheme. No CVs or project partner letters should be submitted at the expression of interest stage.

Proposers should be informed in late July 2015 if they are to be invited to proceed to the full proposal stage.

7.2 Full Proposals

Closing date: 24th Sept 2015

You must previously have submitted an expression of interest that has been invited to proceed to the full proposal stage in order to submit a full proposal. We would expect proposals to evolve between submitting the expression of interest and the full proposal (including personnel), but major aspects are expected broadly to remain the same.

Full proposal applications must be submitted using the Research Councils' Joint Electronic Submission system (Je-S). Applicants should select Proposal Type '*Standard Proposal*' and then select the Scheme '*Directed Research Programmes*' and the Call '*Understanding and Representing Atmospheric Convection across Scales SEP 2015*'

Applicants must ensure that their proposal is received by NERC by 16.00 (4pm) on the closing date. Applicants should leave enough time for their proposal to pass through their organisation's Je-S submission route before this date. Any proposal that is received after the closing date, is incomplete, or does not meet NERC's eligibility criteria, will be returned to the applicant and will not be considered.

For all proposals for NERC research grants, the Principal Investigator must submit the completed Je-S pro-forma, together with a Case for Support. All attachments submitted through the Je-S system, including the Case for Support, must be completed in single-spaced typescript of minimum font size 11 point (Arial or equivalent), with margins of at least 2cm. Applicants referring to websites should note that referees may choose not to use them.

The **lead** component of each proposal should include the documents detailed below.

i. **Case for Support**, which is comprised of three parts:

Part A – a common **Previous Track Record** (up to **2 sides of A4** in total for all Research Organisations)

The Previous Track Record should:

- provide a summary of the results and conclusions of recent work in the technological/scientific area that is covered by the research proposal, including reference to both NERC and non-NERC funded work and details of any relevant past collaborative work with other beneficiaries should also be given;
- indicate where your previous work has contributed to the UK's competitiveness or to improving the quality of life;
- outline the specific expertise available for the research at the host organisation and that of any associated organisations and beneficiaries.

Part B – a common Description of the Proposed Research.

This must not exceed **8 sides A4** (including all necessary tables, figures and references) and should address the following points:

- underlying rationale, scientific and technological issues to be addressed;
- relationship to programme objectives;
- description of the proposed collaboration with the Met Office.
- relationship to other NERC and LWEC partner research programmes;
- description of the proposed research – please describe why the work is strategically important, the key research objectives and how these will be achieved; and

Part C - a description of the Proposed Management Structure and plans, participant responsibilities, and scheduling chart for this project together with how it proposes to interact with the other elements of the programme (up to **2 sides A4**). The Management structure may change following the integration workshop. Successful project teams will be expected to work with NERC Swindon Office and the Met Office in forming the programme governance, management and advisory structures.

- ii. A common **Justification of Resources** of up to **2 sides A4** for all Research Organisations involved, for all Directly Incurred Costs, Investigator effort, use of pool staff resources, any access to shared facilities and equipment and requests for capital costs between £10,000 and the OJEU threshold, being sought. As a public funding organisation, NERC must ensure that funding is allocated on a basis that ensures best value for money. For further information of what to include in the Justification of Resources, see section F in the NERC Research Grants Handbook.
- iii. An outline **Data Management Plan (up to 1 side of A4)** Includes information on how the project will manage data produced and submit to the relevant centres..
- iv. A **Pathways to Impact Plan (up to 2 sides A4)**, detailing:
 - those who may benefit or make use of the research;
 - how they might benefit and/or make use of the research;
 - what will be done during and after the project to increase the likelihood of the research reaching the identified beneficiaries and maximise the likelihood of the identified benefits being achieved
 - suggestions for impact activities that could be undertaken with the Met Office and other partners and delivered at a programme level. These will be further refined at a closed workshop post-award.

Any costs associated with project-level activities in the Pathways to Impact plan should be integrated into the proposal costings within the total budget available for this call and justified in the Justification of Resources section. The suggestions for programme-level activities should be

accompanied by cost estimates, if appropriate, but not integrated into the proposal as they will be further refined and funded separately.

- v. **Letters of Support** from named Project Partners to confirm that support and facilities will be made available for associated collaborations and co-funding (up to **2 sides A4** each). The Met Office will be a strategic partner co-operating with all complementary projects funded under this opportunity, therefore letters of support from the Met Office for individual projects are not required.

Each **component** proposal (including the lead) will additionally require the following attachments:

- vi. A CV of up to 2 sides of A4 for each named PI, Co-I, research staff post and Visiting Researcher.
- vii. Application forms for access to NERC Services and Facilities, if applicable.

Applications involving NERC facilities : PIs wishing to use a NERC facility will need to submit a mandatory 'technical assessment' with their proposal (including aircraft but excluding ships and HPC). For NERC, this means a quote for the work which the facility will provide. A full list of the Facilities requiring this quote can be found here:

<http://www.nerc.ac.uk/research/sites/facilities/apply/facilities-requiring-technical-assessment.pdf>

- viii. Price quotations for equipment costing more than £25k, if applicable
- ix. A Business Case of up to 2 sides A4 per item, for items of equipment above the OJEU threshold, if applicable. Further guidance regarding capital equipment costs may be found in the NERC Grants Handbook.

Where support is requested for Associated Studentships (formerly Project Studentships), these must be justified fully in the case for support. All costs for the student's travel and subsistence, consumables etc. must be itemised on the grant proposal form. Further information on Associated (Project) Studentships is found in the NERC Grants Handbook.

Please note that on submission to council ALL non PDF documents are converted to PDF, the use of non-standard fonts may result in errors or font conversion, which could affect the overall length of the document. Additionally where non-standard fonts are present, and even if the converted PDF document may look unaffected in the Je-S System, when it is imported into the Research Councils Grants System some information may be removed. We therefore recommend that where a document contains any non-standard fonts (scientific notation, diagrams etc), the document should be converted to PDF prior to attaching it to the proposal"

8 Assessment Process

All expressions of interest received will be assessed by an assessment panel to shortlist those that will be invited to submit full proposals. The assessment criteria to be used for the expression of interest stage will be as follows:

- Fit to Programme Requirements: Scientific
- Fit to Programme Requirements: Non-Scientific

Feedback will be provided to both successful and unsuccessful EoI submissions.

Full proposals will be internationally peer-reviewed and final funding recommendations made by a moderating panel consisting of independent experts and members of the NERC Peer Review College. Applicants will be given the opportunity to provide a written response to peer review comments prior to the moderating panel. Applicants may be invited to give a presentation at the moderating panel.

The assessment criteria to be used for the full proposal stage will be as follows:

- Research Excellence
- Fit to Programme Requirements: Scientific
- Fit to Programme Requirements: Non-Scientific

In ranking the proposals the moderating panel will take account of all three criteria. They will also be asked to consider the range of topics being addressed so that the programme addresses as many as possible of the areas of science detailed in the scope section.

Feedback will be provided on unsuccessful proposals at the full proposal stage.

NERC and the Met Office are ultimately responsible for determining which proposals will be funded and will use the recommendations of the moderating panel to inform their decision about which set of projects would best meet the overall aims of the programme.

9 Timetable

Closing date for expressions of interest: 9th July 2015

Successful expressions of interest invited to proceed: 31st July 2015

Closing date for full proposals: 24th Sept 2015

Decision communicated to applicants: late January 2015

Date	Event
18 May 2015	Call for Expressions of Interest
09 July 2015	Expressions of Interest call closes
By 20 July 2015	Office sift of Expressions of Interest
By 31 July 2015	Full proposals invited / Call opens in Je-S
24 Sept 2015	Full proposal call closes
25 Sept – 02 Oct 2015	Proposals work through Je-S into Siebel
02 Oct – 20 Nov 2015	External Peer Review
25 Nov - 04 Dec 2015	PI Response
By 11 Dec 2015	Papers to Moderating panel
04 January – 15 January 2016	Moderating panel meeting (location tbc)
Mid –late January 2016	PI's informed of outcome and which proposals it is anticipated will be funded.
Late February 2016	Integration workshop
March 2016	Applicants amend proposals to reflect the outcome of the integration workshop.
April 2016	Grants awarded
May 2016	Grants begin

Projects are expected to commence by May 2016.

10 Contact

For all enquiries: Simon Howe atmospheric@nerc.ac.uk

Annex A – JWCRP Agreement

This annex details the special conditions that are applied to the grants awarded as part of the ‘Understanding and Representing Convection across Scales’ programme. These special conditions are in place as this programme has been awarded under the Joint Weather and Climate Research Programme (JWCRP).

SPECIAL CONDITIONS FOR JOINT WEATHER AND CLIMATE RESEARCH PROGRAMME GRANTS

These Conditions apply in addition to the standard Terms and Conditions of Research Council FEC Grants (“Standard Conditions”). If there is any inconsistency between these Conditions and the Standard Conditions, these Conditions will prevail to the extent necessary to resolve the inconsistency.

1. The Joint Climate and Weather Research Programme (JWCRP) is a research programme in the field of climate and weather research which is jointly managed and funded by NERC and the Met Office in accordance with the terms of the JWCRP Agreement made between Met Office and NERC, a copy of which can be requested from the JWCRP manager (jemma.gornall@metoffice.gov.uk). The JWCRP Agreement is in the process of being updated following some structural changes to the programme. Associates and Collaborators will be kept informed of any changes that may affect them. Until the updated Agreement has been formally accepted by the JWCRP Science Programme Board, conditions from the existing Agreement will remain.
2. In these Conditions words and phrases starting with capital letters, other than the phrase “Research Organisation” and any other term that is otherwise defined in these Conditions will have the same meanings as they are given in JWCRP Agreement (including its schedules). In particular, (but without limitation to the previous sentence), when used in these Conditions the term “Principal Investigator” has the meaning given to it in the JWCRP Agreement and may not be the same person as the principal investigator under NERC’s Standard Conditions.
3. The research being undertaken under this grant award has been designated as a Project and the successful Research Organisation’s will be admitted as either an Associate or Collaborator under the JWCRP Agreement. In order to remain as an Associate, the Research Organisation must continually provide at least one Principal Investigator to work on the Project and make a significant contribution of resources to that or one or more other Projects, typically in the order of one man year of effort in each year of the JWCRP. In order to remain as a Collaborator, the Research Organisation must continually provide at least some resources to the Project.
4. The JWCRP is managed by a Strategic Programme Board (“SPB”) and a Joint Facilities Group (“JFG”), each comprising members representing NERC and the Met Office and a Programme Manager. Each Project is managed by a Principal Investigator.

The Research Organisation will co-operate with the SPB and the JFG, the Programme Manager and with the Principal Investigator of any Project in which it is involved (unless it employs or engages the Principal Investigator).

5. Where the Research Organisation employs or engages the Principal Investigator for a particular Project, it will ensure that the Principal Investigator will:
 - a. Promptly after the commencement of its use in the Project (as applicable), notify the Programme Manager of all IP Materials in which Background IP is or could be claimed and which the Research Organisation wishes to introduce (or has introduced) to the Project;
 - b. provide to the SPB written reports on the progress of the Project at least annually, or as may otherwise be requested by the SPB, during the period of the grant;
 - c. disclose to the Programme Manager promptly after their creation all results of the Project and all IP Material in which Foreground IP is or could be claimed;
 - d. maintain a register relating to his/her Project which includes a list of the items of IP Material which are made available for the Project and in which NERC, the Met Office or any Collaborator or Associate does or could claim Background IP (together with the identity of the person or body which does or could claim such Background IP) and shall update such register from time to time during the Project (“the Project Register”);
 - e. update the Project Register from time to time during the Project to list the items of IP Material in which any Foreground IP is or could be claimed;
 - f. inform the Programme Manager if, at any time, it does not or knows that it will not in the future employ or engage at least one Principal Investigator on a Project and/or that it will not be contributing any resources to any Project; and
 - g. comply with all obligations on the Principal Investigator under the JWCRP Agreement (including its schedules).

6. If the Research Organisation:
 - a. having been admitted as an Associate has, for a period of six months or more, no Principal Investigator or less than one full time equivalent person working on one or more Projects; or
 - b. having been admitted as a Collaborator has, ceased to contribute any resources to any Project for a period of six months or more; or
 - c. having been admitted as either an Associate or a Collaborator fails to comply with any of its obligations under these Conditions and does not remedy that failure within thirty days after being requested to do so in writing by NERC;

NERC may terminate the grant to the Research Organisation for the relevant Project or Projects and/or recommend to the SPB that the name of the Research Organisation be removed from the list of Associates or Collaborators (as applicable) under the JWCRP Agreement which means that the Research Organisation will immediately lose the

benefit of Condition 8 and of any other licences granted to it by NERC, the Met Office and/or other Associates under the JWCRP Agreement.

7. The Research Organisation can elect at any time to cease to be an Associate or Collaborator under the JWCRP Agreement by giving written notice to the SPB. If it does so, it will automatically and immediately lose the benefit of Condition 8 and of any other licences granted to it by NERC, the Met Office and/or other Associates or Collaborators under the JWCRP Agreement.

8. If the Research Organisation has been admitted as an Associate, NERC hereby grants to the Research Organisation a sub-licence to use the Software as defined in and on the conditions set out in Schedule 5 to the JWCRP Agreement. The Research Organisation will comply with all obligations of the Associates set out in the Licence.
 - a. This sub-licence will automatically terminate if the Met Office terminates the Licence or requires NERC to terminate the sub-licence to the Research Organisation in accordance with Condition 11 of the Licence.
 - b. Subject to early termination in accordance with Condition 8(a), this sub-licence will remain in force until whichever of the following two periods ends earlier: (i) the period for which the Research Organisation's name remains on the list of Associates at Schedule 3 plus two (2) years; and (ii) the Term of the JWCRP Agreement plus two (2) years.

On termination of the Licence or of the sub-licence to the Research Organisation, the Research Organisation will immediately on the request of NERC or the Met Office either return or destroy all copies of the Software remaining in its possession or under its control.

9. To the extent that the Research Organisation makes use of the sub-licence granted under Condition 8, the Research Organisation will keep NERC and the Met Office fully and effectively indemnified against all damages, liabilities, costs and expenses (including reasonable legal costs and expenses) that may be incurred by either of them arising from any action, claim, or proceeding brought against them by any third party arising from the Research Organisation's use of the Software for Commercial purposes, provided that this indemnity will not apply to the extent that the claim arises as a result of any negligence or breach of the Licence on the part of the party wishing to be indemnified and that the aggregate liability of the Research Organisation to NERC and the Met Office under the indemnity will not exceed £750,000.

10. The Research Organisation will:

- a. acknowledge the JWCRP and the contribution of NERC and the Met Office in any publication that arises wholly or partly from the Project;
- b. contribute, as requested by the Programme Manager, to any publication, publicity, exhibitions or events relating to JWCRP being produced or organised by NERC or the Met Office;
- c. use in relation to all JWCRP Projects and/or publications any JWCRP branding, logos and/or other statements relating to JWCRP that may be supplied to it at any time by the Programme Manager, NERC or the Met Office;
- d. refer all media enquiries relating to any Project or JWCRP generally to the NERC press office.

11. The Research Organisation warrants to NERC, the Met Office and all other Associates and Collaborators under the JWCRP Agreement that, save as expressly disclosed to NERC, to the best of its knowledge and belief (but without having conducted any specific searches or enquiries):

- a. it is the owner of the Background IP and related IP Material referred to at Condition 5(a) and/or is duly licensed to use such Background IP and related IP Material (as the case may be) in the Project; and
 - b. the use of such Background IP and related IP Material as contemplated in the Project will not infringe any intellectual property rights or other proprietary rights of any third party.
12. The Research Organisation hereby grants to NERC and the Met Office a royalty free, non-exclusive licence (with the right to sub-license to all Associates and Collaborators under the JWCRP Agreement) to use the IP Material which is identified in a particular Project Register, together with the related Background IP, solely for the purpose of conducting the Project to which the particular Project Register relates.
13. To the extent that such rights have been granted to NERC by the Met Office and the Associates and Collaborators to the JWCRP Agreement, NERC hereby grants to the Research Organisation a royalty-free, non-exclusive sub-licence to use the IP Material which is identified in a particular Project Register, together with the related Background IP, solely for the purpose of conducting the Project to which the particular Project Register relates.
14. The Research Organisation hereby assigns and agrees to assign all of its right, title and interest in the IP Material which it creates (whether solely or jointly with NERC, the Met Office or any other Associate or Collaborator) in the course of contributing to a Project and which is identified in the relevant Project Register and to all of its Foreground IP relating to such IP Material into the joint names of NERC and the Controller of HMSO and Queen's Printer (on behalf of the Met Office) to be jointly owned in equal and undivided shares with full title guarantee for the full duration of such rights, wherever in the world enforceable. The Research Organisation will refrain at all times from any action prejudicial to the emergence or subsistence of such IP Material and related Foreground IP.
15. To the extent that such rights have been granted or assigned to NERC by the Met Office and the Associates and Collaborators to the JWCRP Agreement, NERC hereby grants to the Research Organisation, a perpetual, irrevocable, non-exclusive, royalty-free and fully paid-up worldwide right and licence (with the right to sub-license) to produce, re-produce, copy, publish, develop, adapt, offer for sale, sell and/or distribute or otherwise use all Foreground IP which relates to IP Material identified from time to time in any Project Register for any purpose (including without limitation commercial exploitation) for the full duration of such rights.
16. The Research Organisation will:
 - a. execute and/or procure that any other person it engages in relation to any Project, including without limitation all staff, officers, employees, students, agents, or sub-contractors, will execute all documents and assignments; and

- b. do and/or procure that any other person it engages in relation to any Project, including without limitation all staff, officers, employees, students, agents, or sub-contractors, will do all such things; as may be necessary or desirable in order to be able to give effect to the provisions of these Conditions.

The Research Organisation will procure waivers of moral rights arising as a result of any Project from any person it engages in relation to any Project, including without limitation all staff, officers, employees, students, agents, or sub-contractors.

- 17. The Met Office is an Executive Agency of the Department for Business, Innovation and Skills for the United Kingdom and Northern Ireland and has Crown Status. Material created and/or produced by officers or servants of the Crown in the course of their duties is protected by Crown Copyright and remains so upon assignment to third parties. Her Majesty the Queen is the first owner of all Crown Copyrights. If, under the JWCRP Agreement, the Research Organisation is given access to any IP Material that belongs to the Met Office it will ensure that it acknowledges Crown Copyright in any reproduction of that IP Material by way of the following acknowledgement (which may be varied by written notice from the Met Office from time to time):

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- 18. The Research Organisation will keep confidential and not disclose to any third party, or use itself other than for the legitimate purposes of a Project or as otherwise permitted by these Conditions (including for the purpose of enjoying the benefit of the rights and licences granted in accordance with Conditions 13 and 15) any confidential or secret information belonging or relating to NERC or the Met Office that is disclosed to it pursuant to or in the course of these Conditions, the JWCRP Agreement or any Project. However, the Research Organisation may disclose such confidential information to those of its staff, officers, employees, students, agents and/or sub-contractors to whom, and to the extent which, such disclosure is necessary for the purposes contemplated under these Conditions provided that such recipients are subject to ongoing obligations of confidence in respect of it.

- 19. The Met Office will be entitled under the Contracts (Rights of Third Parties) Act 1999 to directly enforce against the Research Organisation any of these Conditions that are expressed to be for its benefit and all obligations on the Associates as set out in the JWCRP Agreement itself.