UK Climate Resilience - Second UKRI funding opportunity	
Closing date	4pm on 5 December 2019
Funding available	£3.5 million
Funding mode/stream	Strategic Priorities Fund (SPF)
NERC Core or UKRI/Collective Fund budget	UKRI
Project duration	Start date: 1st May 2020 (up to 28 months)
Funding partners (if applicable)	Met Office, UKRI (EPSRC, ESRC, AHRC)
Start date requirements (if applicable)	1 May 2020
Call aims and objectives	Two topics are available: A. Enhanced Climate Change Risk Assessment capability This topic aims to produce improved UK spatial modelling of climate-related risks, characterisation of interdependent risks and representation of adaptation strategies in integrated assessment models of impact and adaptation. B. Governing Adaptation This topic aims to enhance our understanding of the behaviour, capacity and governance of individuals, organisations and policy, and the interactions between them, in delivering adaptation that is just.
Eligibility criteria	Standard UKRI eligibility, plus SPF eligibility (Public Sector Research Establishments (PSREs) with 10 or more researchers with PhDs (or equivalent) are eligible to apply.)
Call specific requirements	Applicants can only apply to topic A or topic B as described in the Announcement of Opportunity.
Contact	climateresilience@nerc.ukri.org

Strategic Priorities Fund: UK Climate Resilience - Second UKRI funding opportunity

Announcement of Opportunity

Topic A: Enhanced Climate Change Risk Assessment capability
Topic B: Governing Adaptation

Issued: September 2019
Available in Je-S: 4 October 2019
Proposal deadline: 4pm on 5 December 2019
Latest start date: 1 May 2020

1. Summary

UK Research and Innovation (UKRI) is inviting proposals to their second funding opportunity through the UK Climate Resilience programme, funded through the Strategic Priorities Fund (SPF) Wave 1. The programme aims to draw together fragmented climate research and expertise to deliver robust, multi- and inter-disciplinary research into climate risks and adaptation solutions. This will help to ensure that the UK is resilient to climate variability and change, and powerfully positioned to exploit the opportunities of adaptation and green growth.

It is widely expected that society will face serious challenges from projected changes in average climate conditions and climate variability; however, our understanding of potential impacts and necessary approaches to adaptation in the UK requires improvement. This programme has been devised to improve our understanding of how the UK can enhance its resilience to climate change and variability.

The UK Climate Resilience programme is a £18.6 million collaboration between UKRI (led by NERC) and the Met Office, with the Engineering and Physical Sciences Research Council (EPSRC), the Economic and Social Research Council (ESRC) and the Arts and Humanities Research Council (AHRC).

In this second UKRI funding opportunity, up to £3.5 million is available across two topics, up to 28 months in duration, as detailed in this Announcement of Opportunity:

Topic A: Enhanced Climate Change Risk Assessment capability

This topic aims to produce improved UK spatial modelling of climate-related risks, characterisation of interdependent risks and representation of adaptation strategies in integrated assessment models of impact and adaptation.

Up to **one interdisciplinary proposal** will be funded in this topic area up to the value of £2m (at 80% FEC) for up to 28 months in duration. Applications are anticipated to include researchers across the natural, physical, engineering, health, arts and social sciences.

<u>Topic B: Governing Adaptation</u>
This topic aims to enhance our understanding of the social, institutional and cultural contexts, including behaviour, capacity and governance of individuals, organisations and policy, and the interactions between them, in delivering adaptation.

This topic will be delivered through a maximum of **two projects**, each up to the value of £750,000 (at 80% FEC) and up to 28 months in duration.

Projects should have a start date no later than 1 May 2020.

An open Town Hall meeting will be held on 3 October 2019 to further communicate the remit and objectives of the programme, and the specific requirements of this call, and bring together researchers from a variety of disciplines with interests in climate impacts and resilience in the UK. Attendance to the meeting is not mandatory for applicants.

2. Background

2.1 Strategic Priorities Fund

The Strategic Priorities Fund (SPF) has been set up to build upon the vision of a 'common research fund' set out in Sir Paul Nurse's [independent review](#) of the Research Councils. The fund will drive an increase in high-quality multi- and interdisciplinary research and innovation, ensure that UKRI's investment links up effectively with Government departments' research priorities and opportunities, and ensure that the system is able to respond to strategic priorities and opportunities.

2.2 UK Climate Resilience

This Programme aims to draw together fragmented climate research and expertise to deliver robust, multi- and inter-disciplinary climate risk and adaptation solutions research ensuring the UK is resilient to climate variability and change and powerfully positioned to exploit the opportunities of adaptation and green growth.

Climate change and variability affect all aspects of society through impacts on both human and natural systems. Effective adaptation builds capacity to respond to this variability and change and is one of two broad and increasingly important strategies (along with mitigation) for the management of risk from climate (Moss et al. 2013, Science 342). Even under the

most optimistic mitigation scenarios there is an urgent need to build resilience and accelerate adaptation to climate variability and change (IPCC 2018). Informing the extensive range of actions needed to manage climate risks, reduce damage without exacerbating existing inequalities, and realise emerging opportunities, is a critical scientific, societal and cultural challenge.

It is widely recognised that single disciplinary approaches will not be able to 'solve' this complex challenge; what is needed are multi- and inter-disciplinary research efforts, that include the natural, physical, engineering, health, arts and social sciences. Addressing this challenge also requires the engagement and involvement of a wide range of stakeholders, comprising industry, other practitioners and policy-makers.

The Strategic Priorities Fund (SPF) provides an opportunity to improve climate risk assessment and enhance UK resilience by encouraging and funding high-quality multi- and interdisciplinary research and innovation using integrative approaches that cross-traditional disciplinary boundaries. It provides space for pioneering research, laying the foundation for future capability and aims to link effectively with Government departments' research priorities and opportunities.

3. Scope

3.1 Programme objectives

The overarching objectives of the UK Climate Resilience programme seek to drive innovative multi- and inter-disciplinary research within the UKRI and Met Office communities to address the knowledge gaps identified above. The central objectives of the programme are:

1. Characterising and quantifying climate-related risks
2. Managing climate-related risks through adaptation
3. Co-producing climate services

Further details about the programme scope are found in the UK Climate Resilience Joint Science Plan. The plan was informed by consultation with UKRI and Met Office communities and climate resilience stakeholders from public, private and third sectors, consideration of past and on-going programme activities, Government departments' research priorities, the evolving UK climate resilience research landscape and the state-of-the-art in relevant disciplines.

It is strongly recommended that all applicants read the UK Climate Resilience Joint Science Plan in advance of applying to either topic outlined in this document.

3.2 Call scope

This Announcement of Opportunity comprises two topics. Applicants must align to the aims of **only one** of the topics:

Topic A: Enhanced Climate Change Risk Assessment capability

Driven by the UK Climate Change Act (2008), the UK government undertakes a Climate Change Risk Assessment (CCRA) every five years to identify priority climate risks which informs its National Adaptation Programme (NAP). While the underlying science base underpinning the CCRAs has progressed over recent years, there is not yet a consistent platform for assimilating scientific knowledge on a continuous basis to support each cycle of CCRA. A coherent platform would enable the exploration of different future scenarios consistently (including climate and socio-economic scenarios), coherent treatment of uncertainty across different climate impact models and testing of adaptation options.

The analysis of climate risks and adaptation responses is inherently spatial, hence the importance of developing UK spatial modelling capability that links different sectors together (e.g., natural environment, human health and infrastructure) and shows the geographical distribution of risks. This geospatial modelling capability must be capable of characterising interdependencies between sectors and risks, and representing adaptation strategies in models and assessments.

This research will provide an open, innovative, flexible and continuously evolving platform for UK-scale integrated assessment modelling for climate change risk assessment. This platform will benefit future CCRAs and NAPs by highlighting geographical hotspot areas and priority risks in a more systematic way, whilst also enabling generation of research insights, for example, into interdependent climatic risks in the UK.

This research topic primarily addresses the Programme's Research Theme 1 'Characterising and quantifying climate-related risks', which aims to provide a step change in capability and filling of knowledge gaps to enable robust characterisation and quantification of hazards and risks, including how they are communicated within the research communities and more widely. In addition, it aims to provide a platform for testing adaptation options (linking to Research Theme 2 on 'Managing climate-related risks through adaptation') and a tool for climate services (linking to Research Theme 3 on 'Co-producing climate services').

Topic B: Governing Adaptation

Climate change impacts society directly and indirectly in many different ways: more frequent extreme weather events, including extreme heat and flooding; higher risk of coastal erosion; loss of species, habitats and heritage; the arrival of new and different pests and diseases; disruption to transport and communications infrastructure; challenges to the viability of investments and the sustainability of entire communities. Not all impacts will be negative. There are likely to be fewer cold related deaths and new crops will become viable.

Climate change in the UK is characterised by complexity, uncertainty and high decision stakes with potential for significant impacts especially when combined with other drivers of change. Adaptation strategies need to align with strategies to achieve other social goals, for example, improving well-being, reducing biodiversity loss, recognising and protecting heritage, protecting people and developing sustainable infrastructure for a growing population.

It is increasingly clear that responding to changing climate risks, requires the ability to respond with agility, at individual, group, community, regional and national scales simultaneously and as other policy is being enacted. In such complex contexts, multiple stakeholders with diverse interests, needs and motivations, need formal and informal mechanisms to support dialogue and navigate competing claims in order to develop successful adaptation pathways. Responding effectively requires capacity to work across and between scales to identify signals of change, to co-design adaptation strategies, to be sensitive to the evolving evidence and to enhance resilience through adaptation options, acknowledging that we are continuously adapting. The framing of climate change as a 'wicked' problem implies:

1. looking at climate change and its implications holistically;
2. developing flexible approaches that course correct over time as new information becomes available;
3. working across organisational, sector and agency boundaries
4. bringing all relevant stakeholders into a process of understanding the problem and identifying meaningful ways to make improvements.

We have a critical knowledge gap in terms of understanding how to adapt and build resilience to a complex and intractable issue such as climate change as well as a gap in developing effective 'praxis' (theory informed practice). Despite this, we need comprehensive formal and informal strategies, which acknowledge uncertainty, to enable appropriate and equitable adaptation as we move into an unknown future, recognising the vital role of learning and reflection in adaptive decision-making.

This research topic focuses on improving understanding of adaptation in the UK, particularly in terms of organisational capacity, policy and how this influences action, the interactions between these arenas and how progress is monitored over time. The research topic primarily addresses the Programme's Theme 2 'Managing climate-related risks through adaptation', which recognises the multi-faceted, multi-scalar, dynamic and reflexive nature of climate-related decisions needed to strengthen national resilience.

4. Programme requirements

4.1 Programme funding

The funding in this Announcement of Opportunity will be delivered through the two topics. All applications submitted under both opportunities should start no later than 1 May 2020 and have a duration of no more than 28 months.

Applications <u>must</u> indicate whether they are applying to topic A or topic B in the title of their application.

> Topic A: Enhanced Climate Change Risk Assessment capability
> Up to **one interdisciplinary proposal will be awarded**. Applications are anticipated to include researchers across the breadth of the proposal covering natural, physical, engineering, health, arts and social sciences. One project will be funded in this topic area up to the value of £2 million (at 80% FEC).

> Topic B: Governing Adaptation
> This topic will be delivered through a maximum of **two projects**, each up to the value of £750,000 (at 80% FEC).

4.2 Proposal requirements

Applications **must** align with the aims of **one** of the two topics in this Announcement of Opportunity:

Topic A: Enhanced Climate Change Risk Assessment capability
Proposals are invited to develop, test and apply a national, spatially explicit modelling platform that links different climate impact models to enable an integrated assessment of climate risk that includes interactions between sectors and testing of adaptation strategies. This will provide a step change in capacity for future Climate Change Risk Assessments and a legacy which can be continuously improved.

Applications must address the following questions:
- What are the geographical hotspots of climate risk in the UK at present and in the future?
- What is the impact of interactions between sectors on climate risks?
- What is the effect of adaptation strategies in reducing climate risks across sectors and different spatial areas?

It is anticipated that the platform will:
- include spatially explicit models of flooding, water resources, agriculture, biodiversity and land use, providing good coverage of CCRA/NAP themes: natural environment; people and the built environment; infrastructure; and relevant sectoral business

- facilitate and demonstrate the integration of existing models within an integrated framework.
- include at least one sector where spatial modelling is not well established in climate impacts research (e.g., health or business).
- enable the assessment of interactions between different sectors
- include spatially explicit climate impact models able to represent some national or regional level adaptation options in order to test their robustness against future drivers.
- be tested and evaluated against past data before applying present and future data including climate and socio-economic scenarios and other relevant drivers.
- enable the spatial visualisation of single and multiple climate risks (including their uncertainty/confidence) across timescales (e.g., present, near-term, 2050s, 2080s) and under different degrees of global warming (e.g., 2 and 4 degrees).

It is vital that the platform links up with relevant other work in this area, for example the Geospatial Commission and the Defra group initiatives on geospatial mapping and monitoring, to prevent silos and duplication. To ensure longevity and to be a continuous and dynamic evidence source for CCRAs, it is essential that the platform is able to take advantage of the rapid innovation in geospatial and climate research, both in terms of data availability and updates to models.

The proposal should outline how the platform can be accessed by and be useful to decision-makers, researchers and other stakeholders. As the principal aim of the platform is to inform future CCRAs and, in turn, the adaptation plans of government and devolved administrations, design should be made with this primary audience in mind. Applicants should engage with these groups, or show evidence for how they will, if funded, to ensure impact and interoperability with their systems. Further secondary audiences may also be considered. The platform should be developed as an open source software project and link with existing data repositories (e.g., JASMIN).

To further support the Enhanced Climate Change Risk Assessment funded project, the UK Climate Resilience Champions will establish and chair a project Advisory Board drawing membership from the UKCR programme Steering Committee (Defra, CCC, Met Office and others) and beyond. Where appropriate, applicants are encouraged to link with ongoing and forthcoming UKCR funded projects (e.g., on UK socio-economic scenarios).

Topic B: Governing Adaptation
This research topic addresses the social, institutional and cultural contexts that underpin the governance of adaptation in the UK. It will examine the degree to which the UK's current governance of adaptation through existing policy, institutions and organisations, is able to respond to the 'wicked' problem of a changing climate. Key questions focus on whether we have the capability to work holistically; to learn from experience and course correct as new information becomes available; to bring relevant stakeholders into decision-making

processes; to work across sectoral and agency boundaries; and develop new, more appropriate, formal and informal arrangements for governing adaptation.

Whilst it may not be realistic to expect 'best' or 'good' practice guidance on how to create effective governance of adaptation in complex situations, lessons can be learnt about what works in practice from real situations and case studies of climate change adaptation. This research will need to focus not only on governance of adaptation but of governance of wider relevant issues (such as environmental governance, planning and others) and consider how best to embed adaptation into these areas.

Applications are invited which focus on **two or more** sectors. It is recommended that applicants may wish to focus on sectors which are currently lagging in planning for a changing climate (as described in the 2019 [CCC Progress report).](#) For example, transport, health, built environment and infrastructure (with overheating and interdependencies a specific focus). Applicants may also focus and other sectoral industries related to the scope of the programme (with the sectoral system boundaries clearly delineated).

Applicants should consider analysis across different spatial scales e.g. local to national, to:
  i.   explore how these sectoral systems are **currently** responding to climate risks already being experienced; and
  ii. describe the near, medium and long term, **future actions or adaptation pathways** that are needed to enable these sectors to become more resilient over time.

Applications should include a focus on at least two of the following:
  • how history has shaped the responses currently available, including examples of path dependency, and how this has compromised future collective action and moments when transformative change occurred;
  • who has, and who should have, a voice in decision-making processes on adaptation, who has access to data, what kind of information is privileged in decision-making and what mechanisms are available to support inclusion in decision making and collective action;
  • the changes in organisational, institutional and policy practice needed to overcome barriers within and between existing sectors in the UK
  • viable and equitable trajectories for the way that adaptation is to be governed and future decisions made to ensure inequalities are reduced and that it aligns with other relevant governance reforms as we leave the EU.

The UK Climate Resilience Champions and programme Steering Committee will provide guidance and support to the awarded Governing Adaptation projects.

As well as being assessed on research excellence and potential impact, the two successful projects will be selected so that they are complementary to each other. All projects are expected to examine adaptation that has occurred in the past and provide insights to **enhance the governance of current and future climate risk and through this build the resilience of UK society as a whole**.

Bids must have **strong stakeholder engagement** throughout the project. Applicants therefore need to demonstrate how they are working in partnership with relevant groups and/or other stakeholders (or show evidence for how they will, if funded) in all stages of the research process.

4.3 Knowledge Exchange and Impact

Knowledge exchange (KE) is vital to ensure that environmental research has wide benefits for society, and should be an integral part of any research.

All applicants must consider how they will or might achieve impact outside the scientific community and submit this with their application as a Pathways to Impact statement, with associated delivery costs where relevant. Pathways to Impact activities do not have to be cost-incurring; it is not a requirement to include funded activities. Any funds required to carry out any proposed, outcome-driven activities identified within the Pathways to Impact **must** be fully justified within the Justification of Resources statement.

The Pathways to Impact will identify those who may benefit from or make use of the research, how they might benefit or make use of the research, and methods for disseminating data, knowledge and skills in the most effective and appropriate manner.

An acceptable Pathways to Impact is a condition of funding. Grants will not be allowed to start unless unacceptable Pathways to Impact are enhanced to an acceptable level within one month of notification of the panel outcome.

All funded projects may also be required to engage with programme-wide KE activities, in which case appropriate funding for which will be provided by the programme.

4.4 Data Management

The UKRI Data Policy must be adhered to, and an outline data management plan produced as part of proposal development. Details of NERC and ESRC data centres are found in the embedded links. UKRI 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.

4.5 UKRI and Met Office facilities

Prior to submitting a proposal, applicants wishing to use a UKRI service or facility must contact the facility to seek agreement that they could provide the service required in the short time frame of these awards and receive a quote for work which the facility will provide, then submit a mandatory 'technical assessment' with their proposal.

A list of NERC and EPSRC facilities can be found at the imbedded links. The costs for the service or facility (excluding HPC costs) must be included within the Directly Incurred Other Costs section of the Je-S form and within the facilities section of the Je-S form.

Applicants wishing to utilise the Met Office/ NERC supercomputing facility Monsoon2 should use the following link to find out how to apply.

4.6 Programme management

UKRI and the Met Office jointly deliver the UK Climate Resilience programme. The Programme is managed and overseen by a UKRI/Met Office Programme Board, which is advised by a Steering Committee. Funded grants will be required to work with the UK Climate Resilience Champions and engage with cross-programme activities.
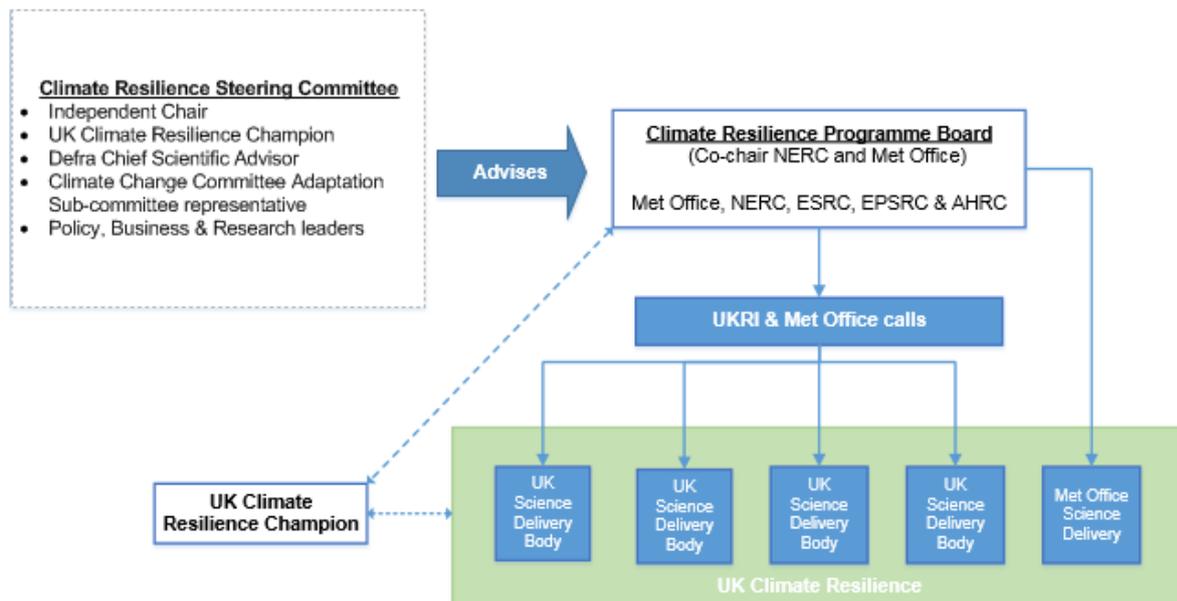
Further details of the governance structure as well as Steering Committee membership can be found on the programme website here.

4.7 Linking to UK Climate Resilience activities

Successful applicants will be expected to collaborate with the Met Office and other activities funded through the UK Climate Resilience programme. Applications to the topics detailed in this Announcement of Opportunity should not include Met Office as a partner on their application. Cross-programme collaborations with Met Office activities will be developed between the Met Office and successful applicants.

4.8 Reporting requirements

As with all UKRI grant holders, there will be a requirement to report through the UKRI reporting system ResearchFish; this is required annually and continues for up to five years post grant end.

UKRI and the Champions may also require funded projects to respond to specific and other ad hoc queries for information as required.

5. Application process

5.1 How to apply

Closing Date: 5 December 2019

Full proposal must be submitted using the Research Councils' Joint Electronic Submission system (Je-S). Applicants should select

Council: NERC
Proposal Type: 'Standard Proposal'
Scheme: 'Directed'
Call: 'UK Climate Resilience DEC 2019

Please note, the call in Je-S will be visible and open for applicants from **4 October 2019**.

Please note: applications **must** indicate whether they are applying to Topic A or Topic B in the title of their application.

The call will close on Je-S at 4pm on 5 December 2019 and it will not be possible to submit to the call after this time. 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 incomplete, or does not meet NERC's eligibility criteria or follow NERC's submission rules (see [NERC Grants Handbook](#)), will be office rejected and will not be considered.

Proposals for this call should be submitted standard grant format following the requirements outlined in Section F of the [NERC research grant and fellowships handbook](#). Case for Support length will differ between topics as below:

Topic A (up to £2m at 80%FEC): Applicants Case for Support document should be no longer than 12 sides A4. Incorporating the previous track record (up to 3 sides A4), and description of proposed research, which should include how the research fits to the UK Climate Resilience call (up to 9 sides A4).

Topic B (up to £750K at 80% FEC): Applicants Case for Support document should be no longer than 8 sides A4. Incorporating the previous track record (up to 2 sides A4), and description of proposed research, which should include how the research fits to the UK Climate Resilience call (up to 6 sides A4).

All attachments, with the exception of letters of support and services/facilities/equipment quotes, submitted through the Je-S system must be completed in single-spaced typescript of minimum font size 11 point (Arial or other sans serif typeface of equivalent size to Arial 11), with margins of at least 2cm. Please note that Arial narrow, Calibri and Times New Roman are not allowable font types and any proposal which has used either of these font types within their submission will be rejected. References and footnotes should also be at least 11 point font and should be in the same font type as the rest of the document. Headers and footers should not be used for references or information relating to the scientific case. Applicants referring to websites should note that referees may choose not to use them.

Applicants should ensure that their proposal conforms to all eligibility and submission rules, otherwise their proposal may be rejected without peer review. More details on NERC's submission rules can be found in the [NERC research grant and fellowships handbook](#) and in the [submission rules](#) on the NERC website.

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.

No associated studentships can be requested under this call.

The expected start date for projects funded under this Announcement of Opportunity is 1 May 2020.

5.2 Eligibility

Public Sector Research Establishments (PSREs) with 10 or more researchers with PhDs (or equivalent) are eligible to apply. If PSREs wishing to apply have not previously applied for UKRI funding and are not currently designated IRO status they will be required to complete an [eligibility form](#) to ensure they have the required research capacity, systems and controls in place to manage the research and grant funding. PSRE applicants should contact [avril.allman@nerc.ukri.org](#) at the earliest opportunity to discuss their interests in applying.

Individual and organisational eligibility is detailed in on the [UKRI eligibility](#) web pages. UKRI research and fellowship grants for all schemes may be held at approved UK Higher Education Institutions (HEIs), approved Research Council Institutes (RCIs) and approved Independent Research Organisations (IROs). Full details of [approved RCIs and IROs](#) can be found on the UKRI website.

Investigators may be involved in no more than two proposals submitted to this call (not to each topic), only one of these may be as the lead Principal Investigator. E.g., applicants cannot be both a PI on topic A as well as a PI and Co-I on topic B.

6. **Assessment Process**

Proposals will be internationally peer-reviewed and final funding recommendations made by a moderating panel consisting of independent experts across the disciplinary breadth of the programme.

Applicants will be given the opportunity to provide a written response to peer review comments prior to the moderating panel.

The assessment criteria to be used will be as follows:

- **Research Excellence:** relates to the originality and quality of the proposed research and the importance of the questions being addressed;

- **Fit to Scheme:** Proposals will be directly scored against the degree to which they address the objectives and scope of the UK Climate Resilience call. (Details of these can be found in section 3 '*Scope*'). Proposals which do not strongly meet the criteria of the call will not be considered for funding.

7. **Timetable**

- Announcement published: September 2019
- Available in Je-S   4 October 2019
- Deadline for submission of proposals: 5 December 2019
- Moderating panel meets: March 2020
- Latest start date for projects: 1 May 2020

8. **Contact**

For all enquiries, please contact Joseph Taylor: climateresilience@nerc.ukri.org