Digital Solutions

Announcement of Opportunity

Issued on: 19th September 2019
Outline Proposals deadline: 4pm on 7th November 2019
Full Proposals deadline: 4pm on 28th February 2020

1. Summary

The Natural Environment Research Council (NERC) invites applications to lead and deliver a programme that will exploit environmental and other data to create innovative digital services that deliver economic, societal and environmental benefits.

Digital Environment – NERC’s strategic vision

Environmental science has long understood the data revolution. Forecasting and climate modelling have driven the need for ‘big data’ and the evolution of HPC, while Earth Observation data has been exploited for decades. The continued growth of communication systems and bandwidth, coupled with advances in miniaturisation and battery technologies, provides new potential to visualise processes in the environment at all scales. This puts digital capacity right at the heart of the drive to deliver leaps in understanding in environmental science and the formulation of solutions.

By harnessing the power of supercomputing, we can create detailed virtual environments to simulate alternative futures, opening up the exploration of options for environmental regulation, management and investment. With autonomous platforms we can extend our reach in hostile environments, from the polar regions to the edge of space, collecting vast data sets more efficiently and sustainably. With advances in battery technology, miniaturisation and wireless communications, we can add ‘nowcasting’ to our forecasting capability to enable decision-making based on real-time feedback from the environment.

2. Background

2.1. Opportunity

In 2013 the direct value of UK public sector information was estimated at around £1.8bn with wider societal and economic benefits increasing the value up to around £6.8bn.¹ Since then, the volume of

publicly available environmental\(^2\), health, social and administrative data has mushroomed. The NERC-funded Environmental Data Service (EDS) currently alone holds over 30 petabytes of environmental data from NERC-funded research and third-party sources, which represents a unique record of state and trend of the environment. The Environmental Data Service (EDS) has two components:

i) The NERC Core Data Centre Functions which underpin the service and which continue to maintain and evolve discipline-specific expertise, comprising the British Oceanographic Data Centre (BODC), Centre for Environmental Data Analysis (CEDA), Environmental Information Data Centre (EIDC), Polar Data Centre (PDC), National Geoscience Data Centre (NGDC) and Archaeological Data Service (ADS) (the latter two are subject to a different funding model), and

ii) Technical data integration activities and associated infrastructure, across all NERC Data Centres, to enable research and impact users to access EDS data seamlessly.

One of NERC’s ‘Digital Environment’ strategy ambitions is to combine environmental data with economic, health, social science and administrative data to unlock insights, create digital services, contribute to smart cities and improve outcomes for people as well as the environment.

Hence the NERC Digital Solutions programme aims to work with business and public sector users to exploit the rich diversity and potential of public, and possibly commercial, data to create innovative digital services that deliver economic, social and environmental benefits. We see this as an interdisciplinary and translational challenge involving data providers, researchers, innovators and end-users. The programme will support the further delivery of the Government’s Industrial Strategy\(^3\), including (but not exclusively) the, ‘Clean Growth’, and, ‘AI and Data Economy’, Grand Challenges.

3. Programme requirements

3.1. Programme Outcomes

The Digital Solutions programme will deliver broad, lasting impact through the delivery of economic and societal benefits from data held both by NERC and third parties. To achieve this it will work closely with stakeholders across the non-academic community in order to generate a step-change in the availability and usefulness of data products to users, particularly the business and public sector user base, allowing them to readily exploit this information.

The programme will facilitate access to not only environmental data, but also new and exciting multi-disciplinary datasets. Data will be able to be easily found and accessed by new users from the business and policy communities. Implementation of the FAIR\(^4\) principles for data management will provide a foundation upon which data can be used to unlock new insights. The programme will take interdisciplinary and collaborative approaches to the provision of solutions.

The Digital Solutions programme will deliver impact, both in policy and economic terms from the use of data improving outcomes for people as well as the environment. Evidence of this will be provided through the use of case-studies, narratives and data journeys. The programme will be widely regarded as having listened sensitively to the needs of existing and potential users, to have built a cohesive and

\(^2\) Here environmental data means any data that can be geo-located in space and time.


expanded research, business and policy user community, and to have worked proactively to overcome barriers to uptake and impact. It will become synonymous with fostering service innovation.

3.2. Delivery Team

The track record and expertise of the institution will be highly relevant to achieving the programme outcomes described above. The proposal must be able to demonstrate a critical mass of capability that has been developed within the institution, across relevant disciplines, with strong leadership and a skilled support team to address this challenge. Applicants should seek to create an integrated approach, managed at the institutional level, which does not divide funding into disaggregated activity across departments.

3.3. Funding

The total funding available to support this programme, to be controlled by the programme leader, includes:

- NERC strategic research and innovation programme investment: up to £5.0m over 5 years.
- NERC capital investment: up to £3.0m over 5 years.
- NERC Environmental Data Service (EDS) costs to support this programme: up to £0.4m pa.
- Plus any further direct or in-kind investment made or leveraged by the host institution.

NERC investment will be phased as follows:

- An initial 6-9 month scoping stage, supported with c£20k (subject to agreement), to allow the successful institution, programme leader and team to develop and submit a strategy and plan for the remaining 4+ years. This proposal should identify communities and users who can generate challenges, opportunities and impact through the use of data, and a plan for achieving this. NERC will provide support throughout the scoping stage.
- NERC gateway decision on the costed plan.
- Remaining funds described above will be released as agreed by NERC and justified in the plan.

Given the partnership required to deliver impact using data, NERC expects that a minimum of one third of the programme budget will be sub-contracted to other partners for collaborative activities. Collaborative partners must meet NERC eligibility criteria for funding, where partners are delivering a service sub-contracted parties must comply with UKRI procurement guidance. NERC programme funds may be used to support staff and other costs in the host institution, and to commission collaborative activity involving data provider(s), users and third party services (including the programme leader’s institution), subject to justification in the plan and agreement by NERC.

The plan should also include consideration of how to manage demand, activity, leveraged funding and IP generated by the programme.

3.4. Relationship with NERC Environmental Data Service

NERC’s environmental data centres operate collectively, with common management, to ensure that data holdings are readily available to end-users even when these span traditional discipline boundaries, organisational ownership, have different formats or have different conditions on usage. Together the data centres collectively form NERC’s Environmental Data Service.

The EDS is working to a five year plan to support the needs of data end-users, adopting the most up to date data service standards and ensuring single points of contact for complex requests. The EDS will provide the underpinning infrastructure and data science expertise to support the growing
requirements of the Digital Solutions initiative and in particular its ambition to support engagement with non-academic user communities.

The Digital Solutions programme will work closely with the NERC EDS\(^5\) and other data providers to integrate activities and direct the funding so that data is made available in response to the demands created by the programme.

NERC will convene a Town Hall meeting on 17\(^{th}\) October in Birmingham to describe the programme vision and EDS capability to potential applicants, and answer questions.

3.5. Management and Governance

Strong leadership and management is essential to the successful delivery of the programme. Representatives from the different elements of the programme – including service users and providers – should be included within governance structures to ensure involvement in the decision making throughout the programme and to ensure continued relevance and delivery to the data users. An ongoing and close working relationship will be required between the programme and NERC HO.

The proposal should outline robust and transparent governance arrangements, which may include formal partnership agreements, communication plans and systems for monitoring the programme’s overall progress and success. The successful applicant will discuss and finalise governance arrangements with NERC.

Applicants wishing to use a NERC service or facility should refer to further information on the NERC website. Although this programme is intended to exploit rather than generate large datasets, a Data Policy for archival and curation services should form part of the full proposal where relevant. Much of the programme will focus on creating impact from existing data sets. As a result there may be movement, sharing or integration of large data sets which the data management plan should address, beyond the usual archival and creation elements. This should include a clear approach for addressing such opportunities and overcoming potential problems.

3.6. Reporting and Evaluation

The proposal should outline an efficient reporting process for the programme which ensures:

- The senior leadership maintain oversight of activities to inform reporting within governance structures.
- Progress reports are submitted at agreed intervals to the governance team. Programmes are expected to self-monitor on a regular basis and alert NERC and other relevant parties within the governance structure to areas of concern. NERC reserves the right to stop a programme at any time if significant issues arise that cannot be resolved.
- As with all NERC grant holders, there will be a requirement to report through the UKRI reporting system.

NERC will maintain regular contact with the programme, in order to monitor progress and take action where necessary to aid the programme in planning and delivery of the desired outcomes.

The proposed programme of work will set out key milestones and metrics using the desired programme outcomes specified in Section 3.1 as a guide of what success will look like. These metrics will be a key tool for monitoring the performance of the programme. Evaluation of performance against these metrics should form part of the regular contact with NERC and the reporting structure. Evaluation

\(^5\) The close working relationship will EDS will centre around the integration activities and associated infrastructure, across all NERC Data Centres, to enable research and impact users to access EDS data seamlessly.
processes should be robust, allowing wider impacts of the programme to be tracked and quantified. Expertise and examples of prior success in programme evaluation should be used to justify the approach taken.

Programmes will be expected to participate in or provide input to meetings to raise awareness of the programme of activity and publicise the innovative outputs resulting from the award.

4. Proposal Requirements

We seek applications from grant-eligible institutions that can demonstrate both vision and capability to establish and deliver the programme as follows.

4.1. Outcomes

Applicants will demonstrate how they will develop, lead and manage an ambitious Digital Solutions programme that delivers the programme outcomes and requirements outlined in Section 3.

4.2. Expertise and skills

A successful programme will require expertise in and experience of delivery through a variety of skill sets. The institution, programme leader and support team must collectively demonstrate a strong track record of:

- Working successfully with business and policy communities to deliver impact using data. The proposal should outline the main stakeholders and stakeholder groups the initiative would engage with.
- Effective delivery and facilitation of access to multi-disciplinary data sets from a range of sectors to create synergies, add value, deliver and evidence impact.
- Acting as a champion, convener, facilitator and broker, effectively communicating the opportunities associated with the use of data, the barriers faced by user communities, and creative solutions to these issues.
- Excellent senior level leadership, partnership-building and influencing capability.
- Sufficient level of technical expertise and understanding of data science, data infrastructure and capability within the UK. The successful candidate will be able to understand user opportunities and needs, how they can be delivered and how data providers can meet these needs.
- Use of marketing and business development skills to deliver uptake of novel offerings in a data context.
- Excellence in the delivery of postgraduate training programmes in a relevant field.

The programme leader and their institution as a whole will demonstrate relevant strengths, capability, capacity and partnerships, plus an identified leader and support team, to successfully plan and deliver an ambitious Digital Solutions programme. Key roles will include:

**Marketing** – Actively seek innovators and user communities who can build and deliver digital services, raise awareness of the richness of environmental and other data available for this purpose, identify opportunities and build effective collaborations to deliver impact.

**Brokerage and facilitation** – Bring together NERC and wider data providers with innovators and users to identify opportunities, understand technical needs and overcome barriers.
Programme development, management and delivery – Generate, enable and ensure delivery of a focussed portfolio of user-led projects that will deliver impact and evaluation enabling impact to be demonstrated.

Programme monitoring and evaluation – Monitor and report progress in achieving project and programme goals. Build in customer feedback and learning to support continual improvement of data service provision and programme delivery.

Evidence of impact – Work with data providers and users to create ‘data stories’ and evidence of impactful outcomes (economic, social and environmental benefits).

Where there are skills gaps, these can be accessed from other parts of the host institution or sub-contracted in as required. Further guidance on research and innovation grant associated studentships can be found on the NERC and UKRI websites. The focus on one institution for the delivery of this programme reflects the desire for there to be single, coherent oversight of user engagement and the delivery of the programme. This approach will allow applicants to have oversight of not only in-programme activities but also other initiatives in this space. With this overview, applicants will be able to identify synergies and potential opportunities for collaboration as well as avoiding duplication of efforts in this area. Applicants are expected to propose an integrated approach managed at the institutional level, which does not divide funding into disaggregated activity across departments.

5. Application process – How to apply

5.1. Eligibility

Normal individual eligibility applies and is in Section C of the Research Organisation eligibility rules are in Section C of the handbook.

NERC 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 eligibility can be found on the UKRI website.

Investigators may be involved in no more than two proposals submitted to this call and only one of these may be as the lead Principal Investigator.

5.2. Outline Proposals

Closing date 7th November 2019

The outline proposal stage will be used to identify projects that will be invited to submit a full proposal. The outline proposals will be assessed by NERC. No more than 15 outline proposals will be invited to submit full proposals. Any sift of proposals will be made on the basis of the likely fit of proposals to requirements of the call. The panel will provide brief feedback to applicants summarising why their proposal was successful/unsuccessful. No further feedback will be available.

One outline proposal submission is required for each proposed project; this should be submitted by the lead Principal Investigator and cover all consortium components.

Outline proposals must be submitted using the Research Councils’ Joint Electronic Submission system (Je-S). For all proposals please select Proposal Type - ‘Outline’ and then select Scheme - ‘NERC outline’ and the Call - ‘Digital Solutions’.

The Outline call will close on JeS at 4pm GMT on 7th November 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 the eligibility criteria of this call for proposals, will be office rejected and will not be
considered.

For all proposals, the Principal Investigator must submit a completed outline proposal form together
with a Case for Support.

The outline proposal 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.

For all proposals the Principal Investigator must submit a completed Je-S Outline proforma together
with a Case for Support. All documents should be completed in single-spaced typescript of minimum
font size 11 point Arial font or other sans serif typeface of equivalent size to Arial 11, with margins of at
least 2 cm. Please note that Arial narrow and Calibri are not allowable font types as they are smaller
and any proposal which has used either of these font types within their submission will be rejected.
References and footnotes must also be presented in minimum font size 11 point 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 further assessment. 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.

Outline proposals must contain:

Case for support which addresses the announcement of opportunity [up to 4 sides A4, including a track
record and a short statement from an appropriate senior member of the lead organisation].

It is the responsibility of applicants to undertake sufficient planning at the outline proposal 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 outline proposal 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 outline proposal
stage.

Applicants will be informed by 20th December if they are to be invited to proceed to the full proposal
stage. The full proposals will be sent to reviewers for comment and all the full proposal teams will be
interviewed to determine the awards. Further guidance on the submission of full proposals will be
provided to applicants who are successful at the outline stage.

5.3. What can be requested

Proposals should be submitted on a full economic cost basis, and the award will be made at 80% FEC.
They can include reasonable costs for:

• Administration and coordination
• Salaries
• Travel and subsistence
• Meetings and events
• Consumables
• Sub-contracting of services
5.4. What activity can be included

This initiative is designed to be flexible to encourage applicants to be innovative in their approach. Proposed activity can therefore be broad and diverse but should still represent a coherent, focused, co-designed and co-delivered programme. Activities should be aimed at achieving outcomes that deliver high impact. Applicants must propose an integrated approach managed at the institutional level, which does not divide funding into disaggregated activity across departments.

The types of activity that would be considered eligible include, but are not limited to:

- Activity that supports user access to data
- Translation of existing data, knowledge and/or expertise into tools, solutions and approaches that meet user needs
- Decision-support tools incorporating data, knowledge and know-how
- Model synthesis, merging and manipulation that addresses specific challenges, needs or opportunities
- Commercialisation focused upon taking research community outputs further towards exploitation for likely economic return
- Community building activities to support the longevity of programme outcomes and impact
- Training
- Studentships

The following activities are considered ineligible, although programme funded activity can be aligned with these types of investments where appropriate and beneficial to achieving the purpose:

- Fundamental research
- Capital investment (but see information in Section 3.3)
- The research community acting as consultants for commercial third parties
- Activity between only different sections of the research community
- Activity between only the research community and the general public

5.5. Assessment Process – Outline Stage

The outline proposals will be assessed by a panel made up of independent experts and NERC head office representation that will be co-chaired by NERC and an independent chair. Any sift of proposals will be made on the basis of the likely fit of proposals to requirements of the call. The panel will provide brief feedback to applicants summarising why their proposal was successful/unsuccessful. No further feedback will be available.

Outline Proposals will be assessed on:

- Fit to the stated purpose and outcomes, as expressed in the call.
- Potential for excellence and impact.

Further information on the assessment process for the full proposal stage will be provided to the applicants successful at the outline stage.
6. Timetable

- Announcement published: 19th September 2019
- Town hall meeting: 17th October 2019
- Deadline for submission of outline stage: 7th November 2019
- Outline stage assessment panel meets: Mid December
- Notification of invitation of full proposals: 20th December 2019
- Deadline for submission of full proposals: 28th February 2020
- Moderating panel meets: Early June 2020
- Announcement of successful bid: Late June 2020
- Latest start date for projects: 10th August 2020

7. Contact

For further information on the Digital Solutions Programme please contact the NERC Digital Environment team at: digitalsolutions@nerc.ukri.org