

UKRI Strategic Priorities Fund: Constructing a Digital Environment**Announcement of Opportunity: Membership of the Expert Network**

Issued on: 27th August, 2019 with a closing date of 18th October (selection interviews from 28th October).

1. Summary and Overview

The NERC/UKRI ‘Constructing a Digital Environment’ Programme (www.digitalenvironment.org) is an exciting opportunity set to develop for the first time the thinking and practice around a ‘digitally enabled environment’, providing benefits for policy makers, businesses, communities and individuals. The programme will help sustain and advance the UK’s leading position in both environmental, observational and computer/data sciences, and will help build the opportunity to create a digitally enabled environment through more integrated networks of sensors (*in-situ* and remote sensing based), together with methodologies and tools for assessing, analysing, monitoring and forecasting the state of the natural environment.

We seek to develop an ‘expert network’ to join us to help identify best practices in ‘digital environment’ and really influence UK environmental policy thinking, drawing on your expertise in the methodologies and tools for assessing, analysing, monitoring and forecasting the state of the natural environment. The network will help develop approaches supporting responses to acute events, but will also inform our understanding of, and planning for, long-term environmental change. The successful construction of a digital environment will require multi-disciplinary and inter-disciplinary research and innovation (MIDRI), and it is expected that the activities of the expert network will include multidisciplinary themes extending beyond those currently funded typically by NERC.

NERC is inviting applications for membership of the **Expert Network** within the Constructing a Digital Environment Programme. The members of this network will help support the Digital Environment programme activities, working closely the existing Digital Environment Champions and other programme members.

The Network of Experts will provide input to the successful operation of the Programme, initiating or contributing to scientific and knowledge exchange initiatives and related events, public engagement, creating and generating a legacy of resources that will be accessible after the programme ends, signposting existing digital resources and being involved with any other relevant activities that will further future impact and development of the digital environment.

Acting on behalf of NERC, Cranfield University, who host the Digital Environment Championship programme, will be responsible for managing and administering the network.

Application to the membership of the expert network is two-stage. Following submission of the application form, shortlisted individuals will be invited to interview. We are flexible on the means to conduct interviews and will offer in person meetings at Cranfield University campus, or Skype and telephone communication. Dates for the application process to membership of the expert network are provided at the end of this document.

We are seeking **24 experts** in total, all contributing to the network over a one-year term, with the potential for ongoing renewal over the three-year Digital Environment project. There are three membership categories of Experts we seek for the network:

Early-Career Stage Fellows

We will assemble 8 UK-based early career stage Fellows, who are employed or affiliated with a UK university. These individuals will become “UKRI NERC Digital Environment Fellows”. For these positions, a **£10k** supporting grant will be made available.

UK-Based Experts

We will assemble 8 UK-based experienced experts, with a proven track record in the digital environment themes. Experts can be drawn from across the digital environment sector and wider. For these positions, we will cover all reasonable costs up to the sum of **£4k**.

International Experts

We will assemble 8 International experts, with a proven track record in the digital environment themes. Experts can be drawn from across the digital environment sector and wider. For these positions, we will cover all reasonable costs up to the sum of **£10k**.

2. Background

The Expert Network positions are part of the UKRI Strategic Priorities Fund (SPF) Programme ‘Constructing a Digital Environment’. The SPF is a collective fund operating across UK Research and Innovation (UKRI), which aims to better enable investment in cross-departmental research and innovation priorities across UKRI, thus increasing high quality multi-disciplinary and inter-disciplinary research and innovation (MIDRI) and positioning UKRI to be able to respond to strategic priorities and opportunities.

Advances in digital technology have led to a rapid increase in the volume of data being captured, curated and managed on a daily basis. Alongside this, new technologies have enabled a step-change in global capacity for integrated monitoring, analysis, modelling and visualisation of the Natural Environment at potentially transformative spatial and temporal scales which could be used more efficiently to inform policy making and benefit businesses, communities and individuals. By harnessing these advances in technology the programme will draw together input from across the fields of environmental science, computer science, data science and behavioural science with a focus on supporting public policy making. The programme seeks to identify best practices in ‘digital environment’, together with the methodologies and tools for assessing, analysing, monitoring and forecasting the state of the natural environment. Today, with advances in battery technology, miniaturisation and wireless communications, we can also add ‘nowcasting’ to our forecasting capability, to enable decision-making based on real-time feedback from the environment. This will be delivered at higher spatial resolutions and at a higher frequency than before, allowing greater ability to explain to and engage with stakeholders than has been previously possible. As such a ‘Digital Environment’ will deliver the capacity to improve the understanding of near real-time and longer term environmental change and the prediction of events over a range of timescales, drawing on techniques such as The ‘Digital Twin’ to represent environmental processes and characteristics. In turn these new approaches will benefit a range of public and private sector users, and provide evidence to support both decision-making and operational activities within government Departments and arm’s length bodies.

3. Objectives and Scope**3.1. Requirements for the Expert Network members**

UKRI NERC is supporting the Expert Network to facilitate communication, knowledge exchange and integration across the Constructing a Digital Environment Programme which will bring together

environmental researchers, data and observational experts with researchers working on for example statistics, modelling, machine learning and AI, computer and data science; behavioural science and public policy making. Together with the Digital Environment Champions, the Network of Experts will play a key role in contributing to discussions shaping ideas for potential future calls that address the current status and development of sensor networks and technology, informing the development of the digital environment.

The benefit and opportunity for the experts:

The Expert Network offers an exciting and highly topical opportunity to help shape the UK landscape in 'digital environment'. Our experts will be influencers and thought leaders, joining at the start of a new scientific approach that will have profound impacts on public policy, environmental stewardship and management, and operating at the nexus of SMART thinking (e.g. Smart Cities; Smart environment), Artificial Intelligence and public policy making. Experts will have the ear of senior members of key organisations in government (e.g. Defra), in public bodies (e.g. the Environment Agency), as well as scientific groups and business. This opportunity is therefore a powerful career springboard for the early-career stage experts, and a chance for the network members to create real impact.

Successful members will be able to draw across their experience including:

- Awareness and understanding of the current research landscape and emerging issues in environmental science in the digital space.
- Knowledge of the needs of research, policy and commercial users and the implications for the development of the digital environment.
- Knowledge and ability to assimilate information of relevant research, inter/multi-disciplinary approaches and policy pertaining to the programme.
- Ability to communicate effectively and persuasively with people in various parts of the programme and beyond, encouraging communication and collaboration at all levels.
- Ability to contribute to a combination of synthesis reviews, early-stage opportunity studies, workshops and demonstration projects.
- Knowledge of existing data networks, infrastructure, emerging technologies and their collective potential moving forward.
- Publication and/or demonstrable record of impact in your area, e.g. environmental science; data and computational science; social and behavioural science; and public policy making.

Guided by the Champions, the dedicated Network of Experts will offer guidance where appropriate and will ensure that the programme helps us to understand how we can meet the following objectives for a Digital Environment:

1. *To enable the unprecedented construction and access of integrated networks of (long term, high frequency) real-time and near real-time sensors across the natural environment from terrestrial (including freshwater and subsurface) to atmospheric, marine and polar;*
2. *To develop new infrastructure to provide dedicated conditioning, storage and access to the many different data streams which will enable delivery of data that can be readily combined, interpreted and reused by research, policy and business;*
3. *To manage, manipulate, automate and interrogate big data utilising technology-enabled approaches to intervene intelligently in complex, multi-factor issues (helping government and businesses respond to the needs of local communities and individuals);*
4. *To model and visualise the natural environment at high resolution spatially and at a higher frequency (both for the short and long term) (4 dimensional);*

5. *Leverage existing UK investments and enable a challenge-focused multidisciplinary community to work together.*

The programme forms part of a wider strategic aspiration for harnessing the power of emerging technologies with increasing amounts of data across the whole NERC and wider UKRI remit and under the focus area of 'Digital Environment'. In order to meet the ambition of increasing Multi and Interdisciplinary Research and Innovation (MIDRI), funded Programme projects will reach further than existing funded research and bring together combinations of natural environment, data, computational and statistical science expertise, thus establishing the multidisciplinary community required to deliver novel approaches to the collection, integration and use of environmental data.

Defra (Department for Environment, Food and Rural Affairs) support this programme as its outcomes could be of benefit to supporting the evidence needs of the UK Government's 25-year environment plan (25YEP). In particular Defra are supporting activities in;

- Exploring new approaches to tackling long-term evidence challenges through the best available data and enabling technologies;
- Opportunities that new monitoring and data collection technologies can offer to increase the understanding of how complex environmental systems work and goals interact, in terms of offering new opportunities to predict and evaluate interventions that they make at a range of spatial scales.

Defra provides support to relevant projects, through access to data and evidence sources; facilitation of partnerships with the department and across its Arm's Length Bodies; access to departmental analytical advice and expertise; alignment to Defra research programmes and platforms.

4. Programme Requirements

4.1. Programme Term and Funding

The term of the membership of the network is for 12 months, with the potential option to renew over the duration of the three-year project. Supporting funds will be administered by Cranfield University on behalf of NERC.

Funding support can be used for activities that enable the effective planning, integration and delivery of the programme, and will include for example:

- Communication support and outreach, maintaining social media presence;
- Helping organise and attend select events during the year;
- Travel and networking with academic community, industry, stakeholders, users and the wider network of experts, as well as 'Constructing a Digital Environment' grant holders;
- Development of case studies, thought pieces, materials and prototypes and examples of best practice;
- Helping to influence your community.

4.2. Implementation and Delivery

Applications must be submitted by email to spfdigienv@cranfield.ac.uk.
The call closes at **18th October, 2019 noon**.

The successful candidate(s) is/are expected to start on or by **December, 2019**.

4.3. Programme Management and Knowledge Exchange

The overall 'Constructing a Digital Environment' is a NERC led programme, with three funding rounds; however, the UKRI funded programme will be delivered in partnership with EPSRC and Defra. Defra's interests in the programme are outlined in Section 3.1.

Key to the Programme will be the creation of a multi-disciplinary community around the Digital Environment. With the guidance of the Digital Environment Champion roles, supported by the network coordinator, the expert members will encourage and promote the sharing of objectives, learning and outcomes, with and between 'Constructing a Digital Environment' grant holders, and the wider environmental science community.

The network will be actively coordinated and managed by the network coordinator. Within this network and supported by the network coordinator experts will collaborate with the Digital Environment Champions to understand where the Constructing a Digital Environment Programme could benefit (and therefore have impact) with a variety of users beyond academia, including Defra and other stakeholders. The experts will collaborate proactively with policy, industry, non-governmental organisations and other stakeholders to develop an understanding of their information needs and will help shape knowledge exchange (KE) activities accordingly to maximise the impact and potential benefits of the programme.

4.4. Reporting Requirements

The Expert Network members will engage with the Digital Environment Champions, supported by the network coordinator, on a regular basis through a range of communications approaches. We intend to have meetings in person at the start and end of the 12-month term, and use electronic means of communication, discussion and reporting throughout on a regular basis, through the Slack online team platform managed by the Cranfield team.

4.5. Governance

Operational (day-to-day) coordination of the Expert Network and its members shall be provided via the Digital Environment Champion roles. A '*Terms of Reference*' will guide the activities of the expert network. NERC Swindon Office, on behalf of partners, retains the overall executive authority for the governance and management of the programme. It will be responsible for:

- the overall Research Programme budget, including the high-level budget management and allocation of resources, e.g. profiling of funds within the programme budget, awards for research and funds for procurement of services.
- commissioning, delivery and management of key funding opportunities, including authorisation of funding decisions, issuance of awards, post-award administration and payments, and award completion.

The Programme Board will provide the strategic direction for the programme and will be the ultimate decision-making authority. The Programme Board will be chaired by the NERC Head of Digital Environment and will include representative(s) from the EPSRC, Defra and STFC.

5. Application Process

Closing Date: 18th October, 2019, 12:00 noon

Applications must be submitted by email to the 'Digital Environment Champions' using the email address spfdigienv@cranfield.ac.uk. A confirmatory email will indicate receipt.

Membership applications for this call should complete the **attached membership application form** (also available at www.digitalenvironment.org). Shortlisted applicants will be interviewed from **28th October 2019**.

6. Assessment

6.1. Process

An initial sift of the membership applications will be conducted by a panel chaired and appointed by the Digital Environment Champions, with assessment of applications made according to the assessment criteria below. The Panel will involve both academic and end-user experts.

6.2. Criteria

The evaluation panel will take into account the following:

1. Quality and appropriateness of proposed approach for delivering the responsibilities of the role:
 - Demonstrable understanding of the aims and objectives of the programme.
2. Track Record:
 - Relevant research and/or impact credentials and in the digital environment space.
 - Experience of team and collaborative work.
 - Proven track record of communication to research and lay audiences.
 - Network of contacts relevant to environmental data, informatics and/or computer science.
 - Knowledge and ability to assimilate information of relevant research, inter/multi-disciplinary approaches and policy pertaining to the programme.
3. Impact
 - Demonstrable understanding of the potential stakeholders and impact.
 - Realistic and appropriate plans for engagement with stakeholders and shaping of KE activities to maximise impact from the programme.

7. Application timeline

<p>Application opens: 27th August, 2019 Application closes: 18th October, 2019 Shortlisting: 21-25th October, 2019 Interviews: from 28th October, 2019 Announcement of Expert Network: 29th November, 2019 Preferred start date: December, 2019 (12 month term)</p>
--

8. Permission to enter the UK (for individuals based outside the EEA)

Please note that members from outside the EEA may be required, either in advance before travel to the UK or at the UK Port of Entry, as appropriate, the correct visa permissions to enter and remain in the UK.

9. Contact information and further information

Any queries regarding this call should be directed to the Coordinator Expert Network:

Coordinator Expert Network: Dr Kenisha Garnett
k.garnett@cranfield.ac.uk +44(0)1234 754292

Professor Ron Corstanje
r.corstanje@cranfield.ac.uk +44(0)1234 754817

Dr Stephen Hallett
s.hallett@cranfield.ac.uk +44(0)1234 750111 x2750

Kirsten Dutton in the NERC Digital Environment Team
digitalenvironment@nerc.ukri.org +44(0)7892 700207 or +44(0)1793 411930

See the Programme web portal also for further details:
<https://digitalenvironment.org/>

ends.