Press release

UK to receive earlier flood and drought warnings using high-tech sensors and real time monitoring

Researchers across the UK to use latest tech and major data bank to provide better flood and drought warnings.

From: Department for Science, Innovation and Technology, Department for Environment, Food & Rural Affairs, UK Research and Innovation and The Rt Hon Peter Kyle MP

Published 31 August 2024

New tech predicts extreme weather to help protect homes and businesses.

- Researchers across the UK to use latest tech and major data bank to better predict where devastating floods and droughts will strike
- innovators will also pioneer new ways of tackling the worst of extreme weather to halt damage and cut eye-watering cost to the economy

- sensors in UK rivers and real time monitoring will gather priceless data that goes towards modelling the potential impact and likely flashpoints

Predicting where future flooding and droughts will strike next in the UK will be made easier under a new project for scientists using the latest tech and real-time data, Science and Technology Secretary Peter Kyle has announced today (Saturday 31 August).

It will help key bodies, like local authorities and the Environment Agency, to stem the worst of extreme weather's impact on communities, saving lives, homes, and businesses, and helping to cut the devastating cost of such events to the UK economy, estimated at £740 million a year.

The Floods and Droughts Research Infrastructure, led by the Natural Environment Research Council (NERC) and the UK Centre for Ecology & Hydrology (UKCEH) and backed by £40 million, will be the first UK-wide network focused on understanding the impact of extreme weather conditions across the country, pinpointing where incidents are likely to occur and planning to limit their impact.

The complexity of Earth's climate makes forecasting floods and droughts a major challenge, with climate change only further complicating the picture. Researchers will use the latest technologies including sensors and real time computer monitoring, plus a huge bank of data including river profiles and near real-time monitoring of information including on atmospherics, ground saturation, water movement, abstraction and storage – taken together, this will form a clearer impression of where and when extreme weather will strike.

Floods wreak havoc on communities by destroying homes, public infrastructure, and livelihoods like farming which in turn costs consumers. Similarly, droughts have a major impact on the water supply and UK eco-system, harming wildlife and their natural habitats which rely on regular rainfall.

Researchers will be based at UK Centre for Ecology & Hydrology's offices throughout Great Britain, with further input from researchers in the British Geological Survey, University of Bristol and Imperial College London.

Findings from the project will be shared with key bodies like the Environment Agency to steer the UK response to extreme weather. It will also act as a hub for researchers to pursue new innovations with discoveries shared across the world and marking the UK as a leader in the field.

Science and Technology Secretary, Peter Kyle, said:

> Flooding and droughts can devastate UK communities, from leaving people stranded, to destroying homes, gardens, roads and businesses, and even claiming lives.
>
> With climate change sadly making extreme weather events more common and adding an eye-watering cost to the economy, there is no time to waste in backing our researchers and innovators to ensure we are better prepared for floods and droughts striking.
>
> This project will help drive that progress, with dedicated teams using the most advanced tech to crunch data gathered from our rivers and paint a clear picture of its likely impact – using the power of science and tech to keep the public safe.

The new measures build on £5.6 billion of government investment into flooding from 2021 and 2027, with over 100 and coastal risk management projects helping to better protect thousands of people and properties from flooding from the sea, rivers and reservoirs.

We will also shortly launch a new Flood Resilience Taskforce to turbocharge the delivery of new flood defences, drainage systems and natural flood management schemes, which will ensure we're prepared for the future and help grow our economy.

Floods Minister Emma Hardy said:

> In the case of extreme flooding and drought, preparation and prediction are everything.
>
> Our new institute will bring together a team of world-leading researchers and the latest technology to ensure our communities, businesses and farms are protected from these devastating events.

Today's funding also builds on wider UKRI projects tackling extreme weather in the UK and abroad, including support for businesses to ensure against its risks.

It includes a project sponsored by the NERC linking the frequency and intensity of storms over Northern Europe using mathematical models that enable more accurate pricing of storm-related risks. Meanwhile the Lisflood-FP computer model developed by the University of Bristol has helped over one million Zambian farmers to insure themselves against drought risk through daily rainfall estimates for the continent of Africa.

Another team at Bristol has pioneered the development of high-resolution flood prediction models, which has resulted in Fathom: a spin-out company with an annual turnover of more than £4 million. Its work includes protecting infrastructure valued at over $1 trillion, thanks to improved flood risk management in the UK and across the world.

Executive Chair of NERC, Professor Louise Heathwaite, said:

> Earth's changing climate means the number of extreme floods and droughts will increase in the UK, impacting homes, businesses and services. But predicting their location and measuring their intensity and impact needs the sort of scientific advances that this programme will bring to overcome the data and analytical constraints that are currently very challenging.
>
> The project will transform the way we understand the impact of these events by building a significant bank of data and improving our monitoring capability, and so helping to protect those affected.
>
> This is an example of how NERC is responding to climate challenges with research and innovation investments that will accelerate the green

economy and deliver solutions to national priorities.

Notes to editors

The Natural Environment Research Council (NERC) has awarded £38 million from the UKRI Infrastructure Fund to establish the new institute.

A further £1.2 million of funding from the Engineering and Physical Sciences Research Council will go towards a three-year project to slash the time and cost involved in running computer models of projected flooding out to the year 2100. This will enable detailed assessments of a much wider range of potential scenarios than currently possible, taking into account the nature and extent of the impact on extreme weather in these areas, informing solutions much better matched to the specific needs of different parts of the UK.

Between April 2022 and March 2023, the government worked with other risk management authorities to complete around 120 flooding and coastal risk management projects.

These projects better protected people and properties from:

- sea and tidal flooding (16,800 properties from 27 projects)
- river flooding (6,500 properties from 59 projects)
- surface water flooding (900 properties from 21 projects)
- coastal erosion (1,100 properties from 7 projects)
- reservoirs (1,100 properties from 1 project)
- groundwater (35 properties from 2 projects)

DSIT media enquiries

Email press@dsit.gov.uk

Monday to Friday, 8:30am to 6pm 020 7215 300