Prospectus 2025

An update on the new FDRI
Digital Research Infrastructure

FDRI
FLOODS & DROUGHTS RESEARCH INFRASTRUCTURE

What is FDRI?

UK-wide monitoring and innovation infrastructure, covering a range of spatial and temporal scales.

FDRI - ***Floods & Droughts Research Infrastructure*** - is designed to **advance our understanding of how, when and where floods and droughts occur**, enable new science to predict and address their impacts, promote technical innovation, and encourage collaborative working, training and skill-sharing

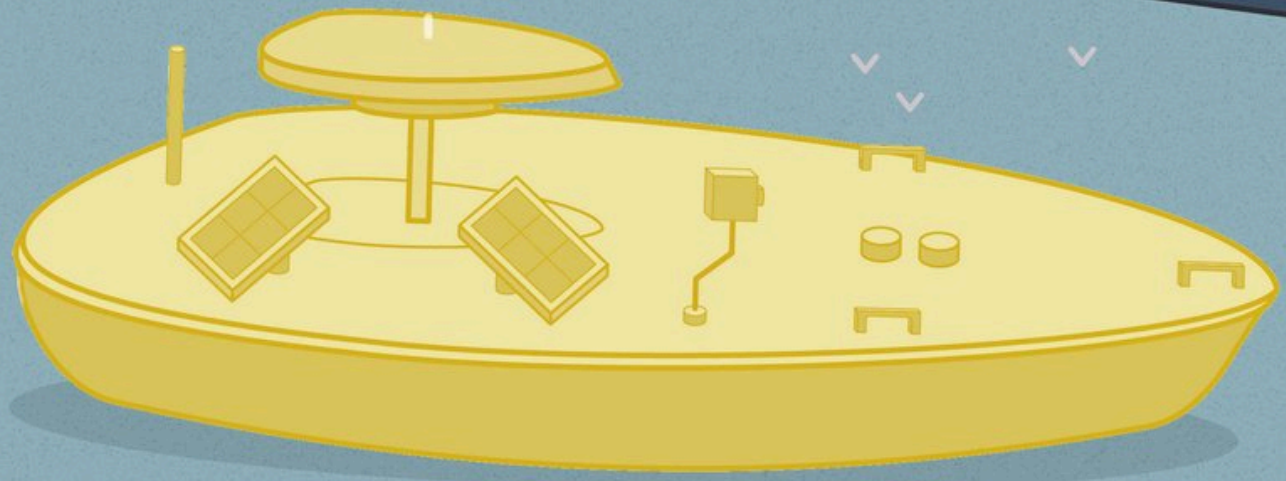
FDRI will **increase UK resilience to future flood and drought events** by providing new measurements, more joined up data on water and climate in the UK, and new opportunities for data-driven hydrological science.

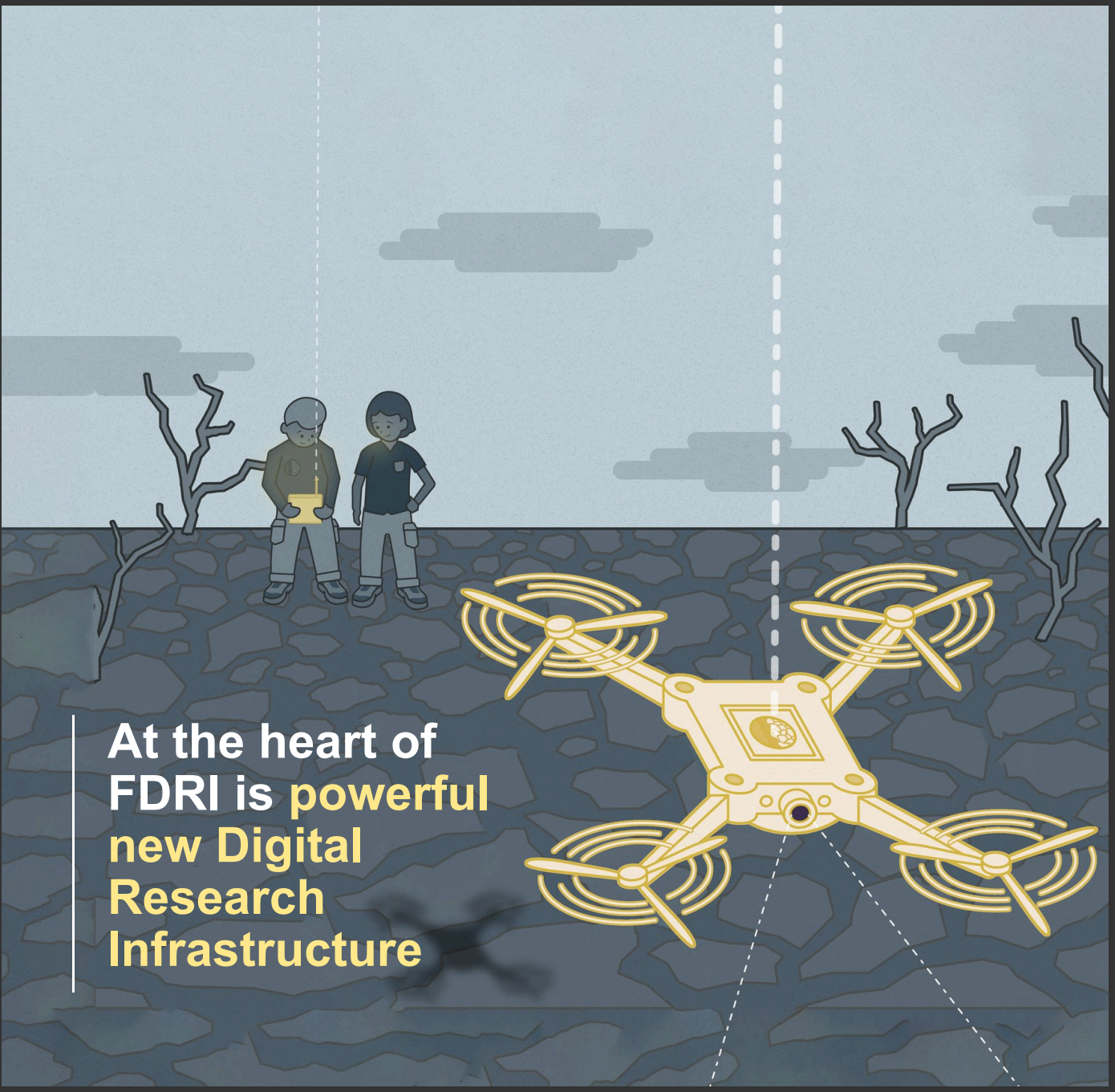
http://fdri.org.uk

Digital Reseach Infrastructure →

Digital Research Infrastructure

Aims and Principles





At the heart of FDRI is powerful new Digital Research Infrastructure

This new **Digital Research Infrastructure** will:

Deliver new monitoring data, including real-time data from remote sensors.

Provide platforms for integrated, data-driven research.

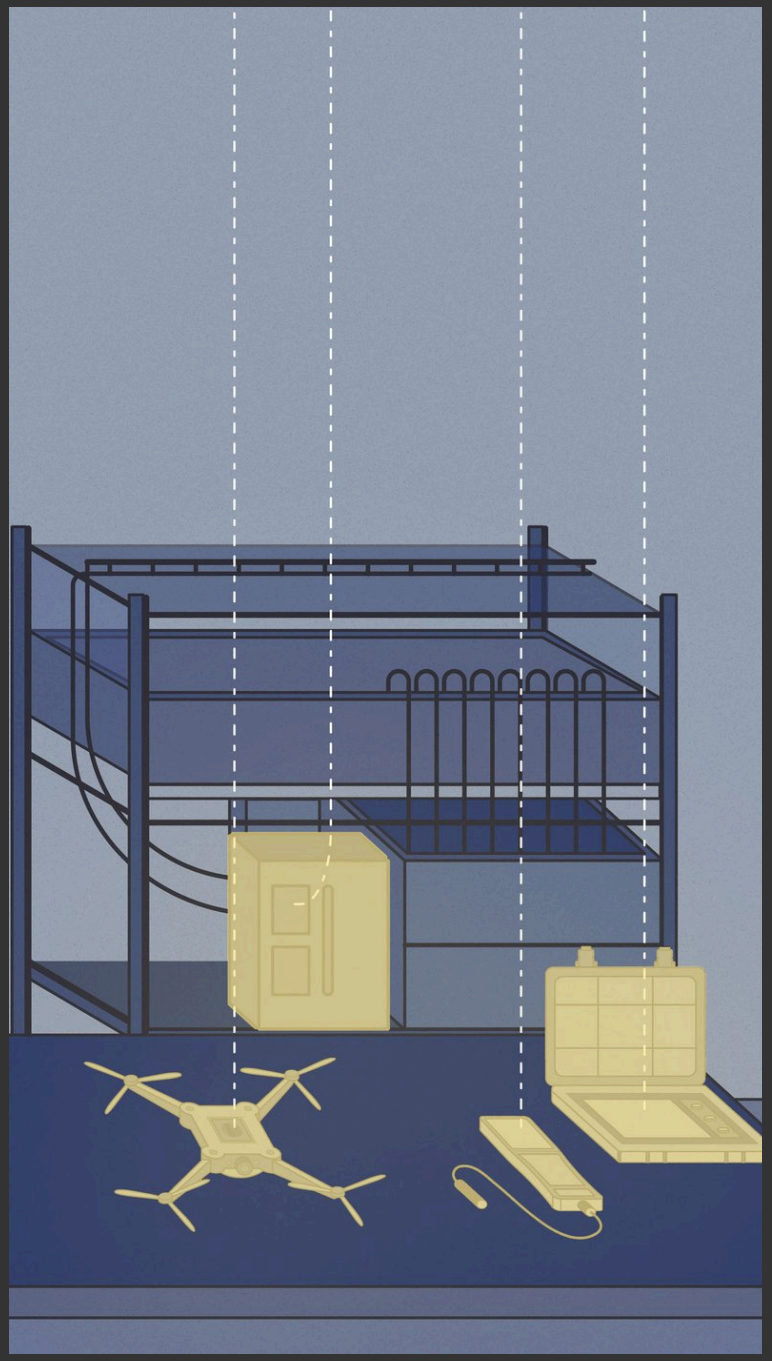
Enhance access to existing data, including key national and historical datasets.

Support **collaboration** across the hydrology community and beyond.

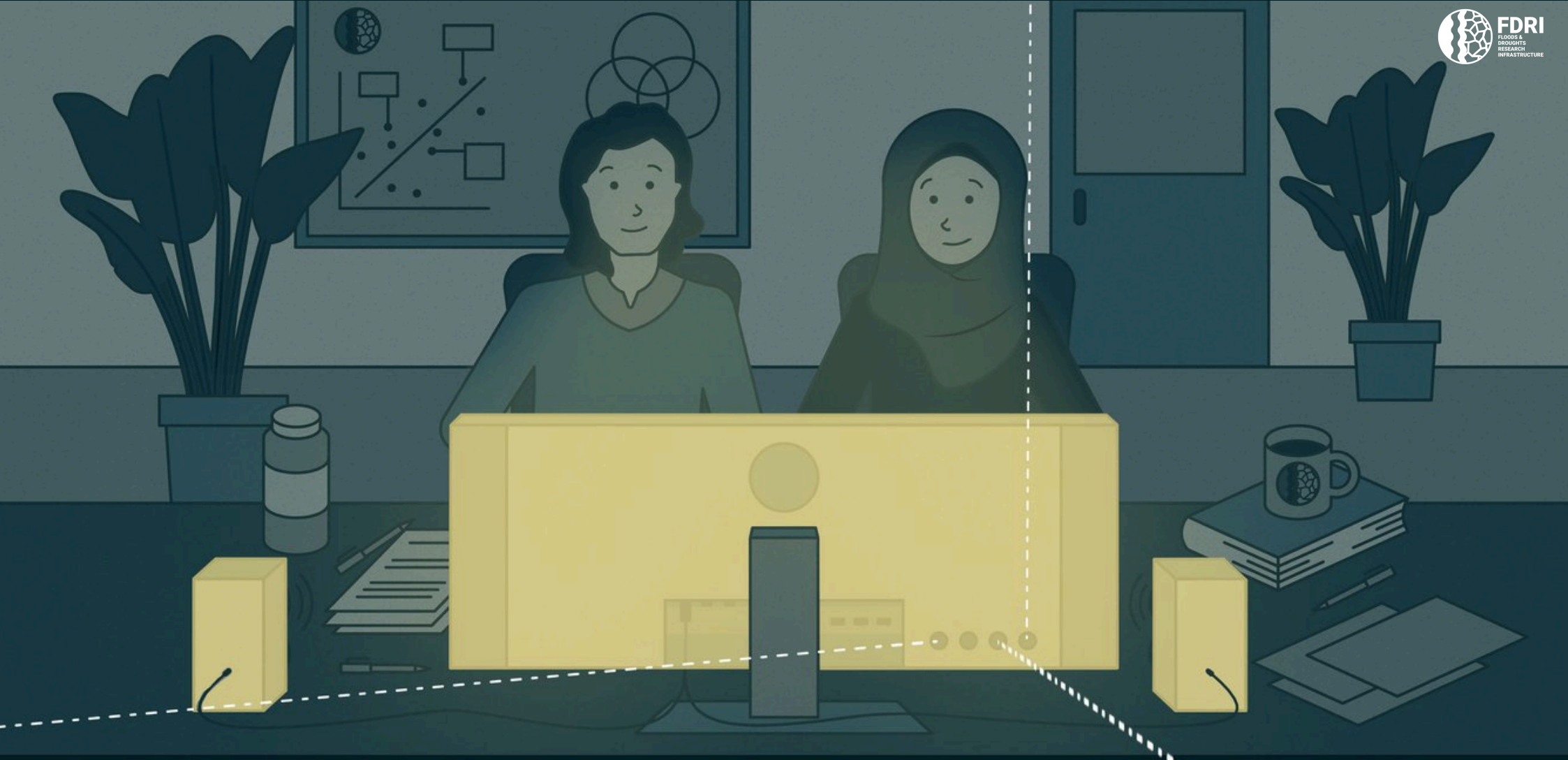
DRI Principles →

The new Digital Research Infrastructure is designed to be modular, portable, and scalable.

It will use open standards, guided by data access and storage principles including **FAIR*** **(Findable / Accessible / Interoperable / Re-usable)** to ensure that both humans and information systems can effectively discover, use, and share digital resources.



** Wilkinson, M., Dumontier, M., Aalbersberg, I. *et al.* **The FAIR Guiding Principles for scientific data management and stewardship**. *Sci Data* **3**, 160018 (2016). https://doi.org/10.1038/sdata.2016.18



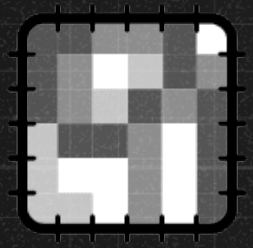
What can the new Digital Research Infrastructure offer?

Data

The new FDRI **Digital Research Infrastructure** is designed to handle a wide range of **data types** from a variety of **sensors** and **sources**.

Timeseries data

Access ***real-time*** data from remote sensors, updated as often as every 15 mins.



Gridded data

Gain **detailed insights** from gridded datasets, including rainfall and elevation data.

Aerial data

Insights from a range of sensors (e.g. LiDAR, infra-red, thermal) mounted on **unmanned aerial vehicles** (UAVs).

Geospatial data

Explore **high-resolution** geospatial data with up to 1m² detail across the UK.

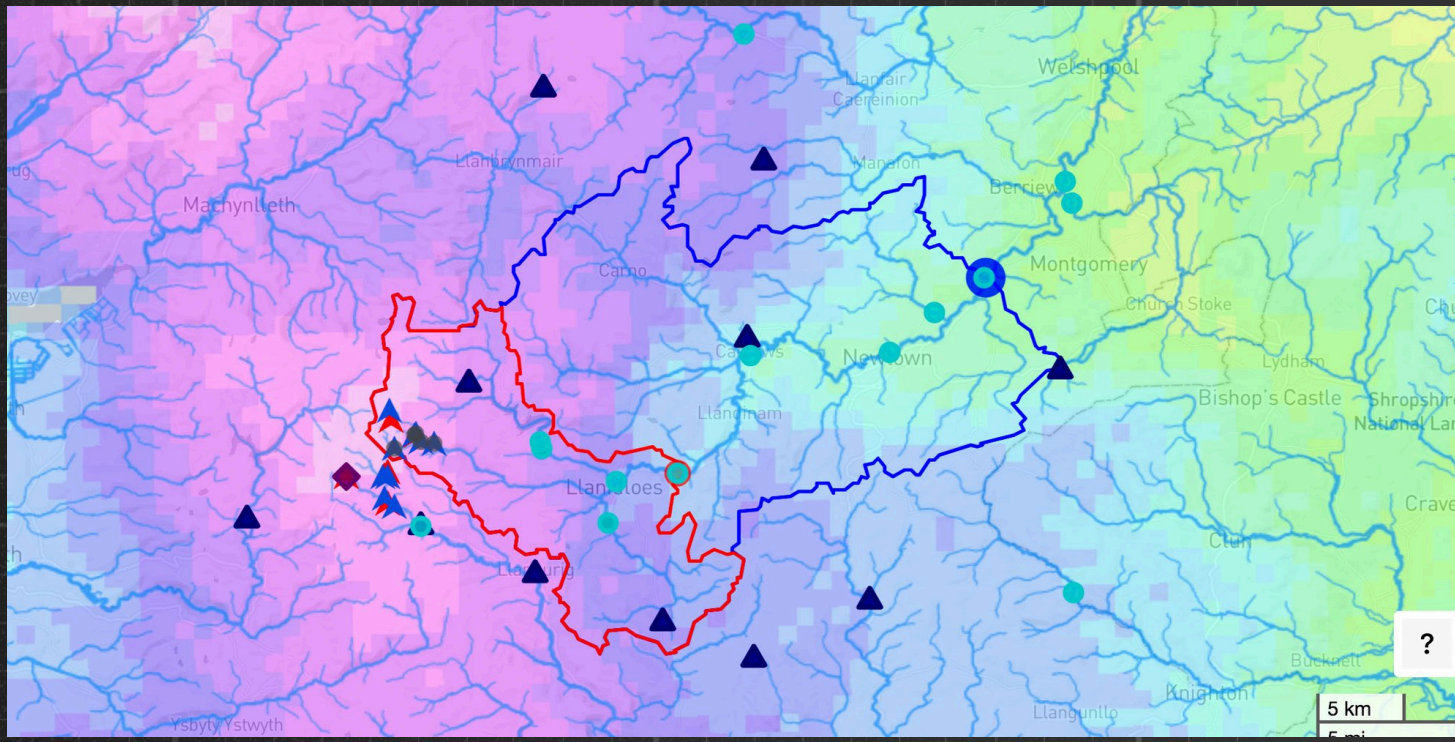
Image / Video data

Automatically monitor water levels, floodplains, and land cover with **image-based** data.

Read on for examples →

Catchment Data Collections

Collections of data within FDRI catchments, as well as at the national scale, to enhance understanding of floods and droughts, from water companies, citizen scientists and other research monitoring activities



The Upper Severn sub-catchment (red outline), with its network of rainfall sensor sites (dark blue triangles) and river level sensors (light blue circles).

National scale high resolution river flow and level data

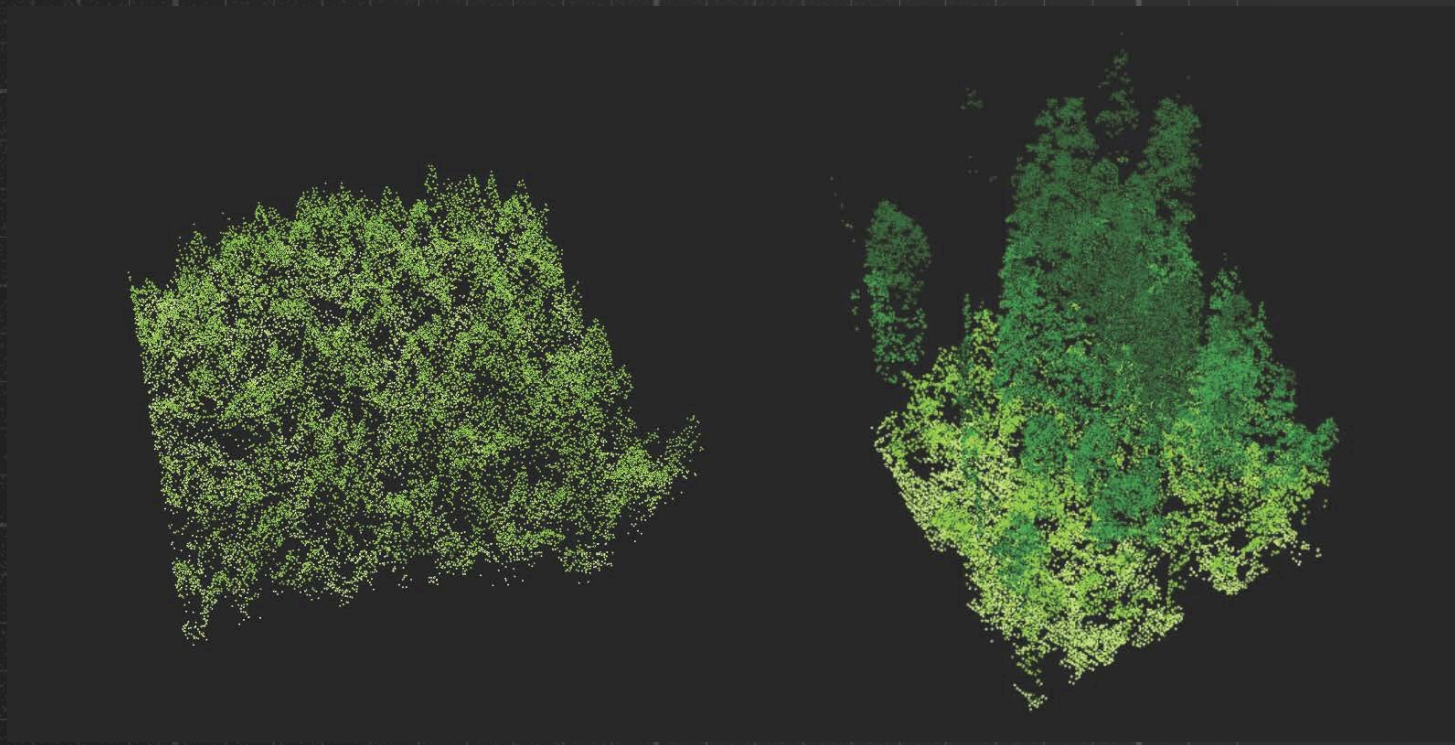
A quality controlled and updated dataset of 15-minute river levels and flows from measuring agencies across the UK, and an hourly CAMELS-GB data cube

CAMELS GB →

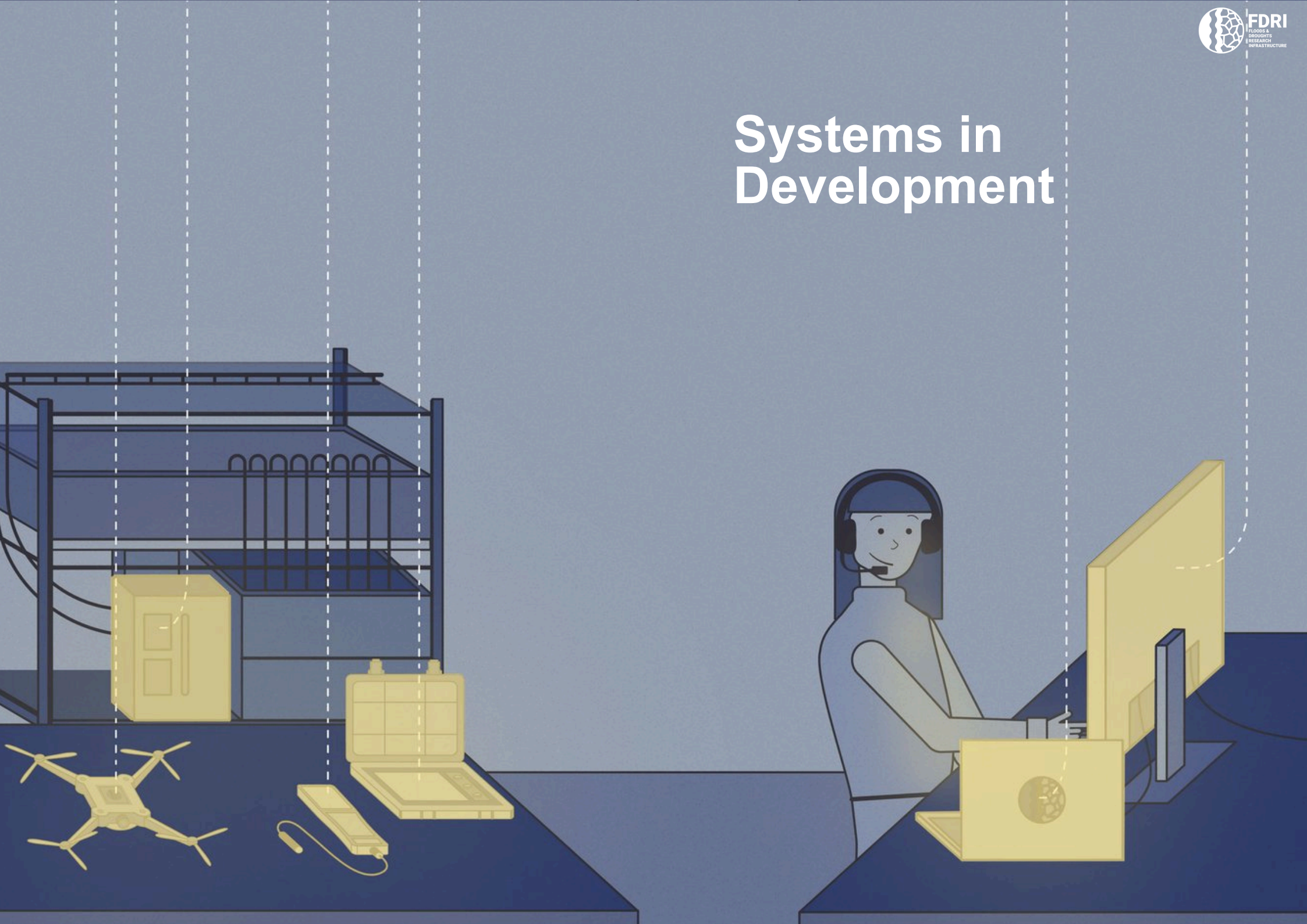
LiDAR* Data Management & Tools

*Light Detection And Ranging

An accessible combined dataset for England and Wales of 1m height data from LiDAR data. Includes web-based tools for processing this for hydrological analysis.



Systems in Development



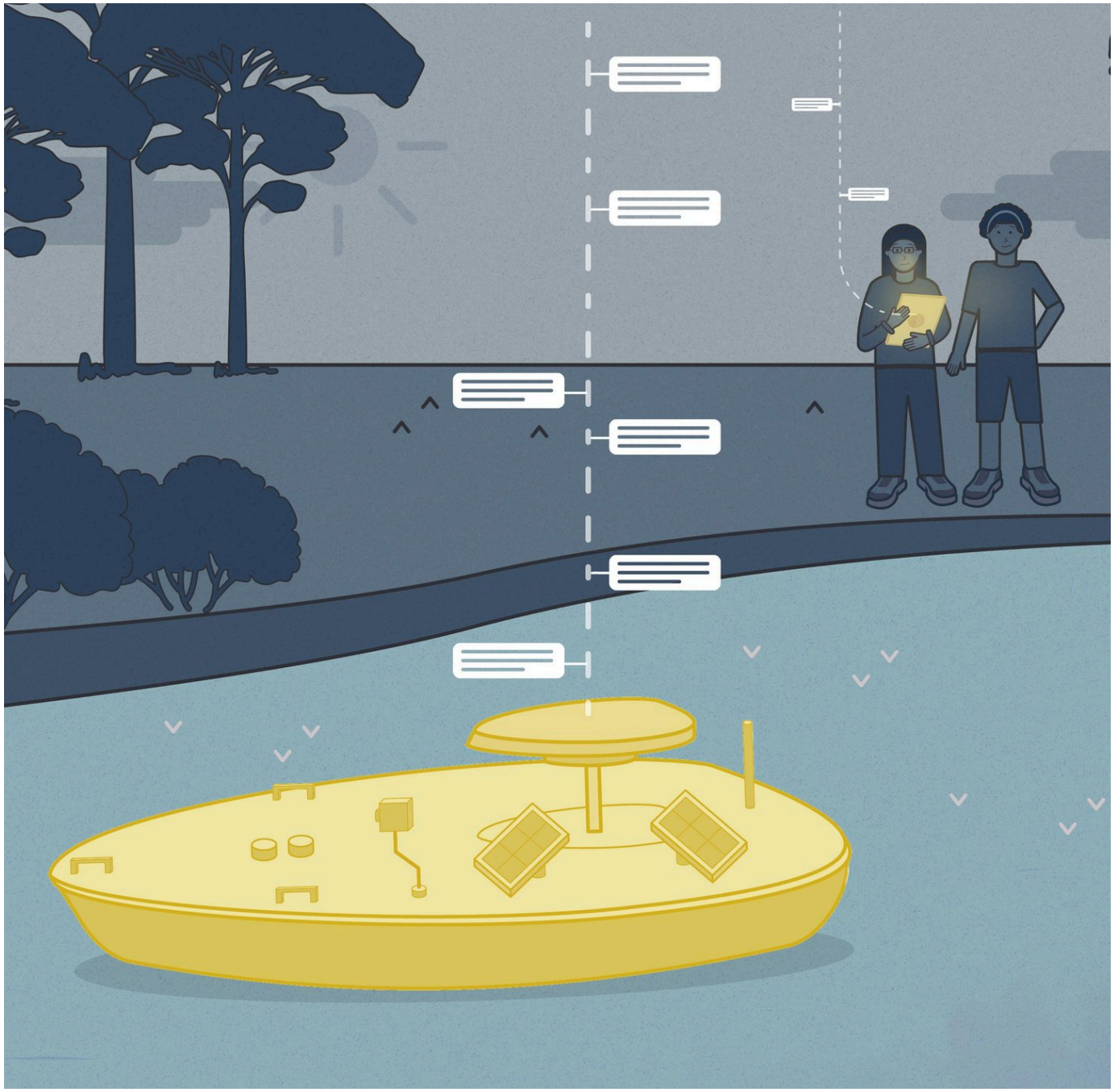
Example 1

Sensor registration + management system

A database of hydrological sensors, instruments, platforms and devices.

Includes information about their provenance and history, as well as technical details such as makes, models, measurement accuracy, etc.

Full list of infrastructure



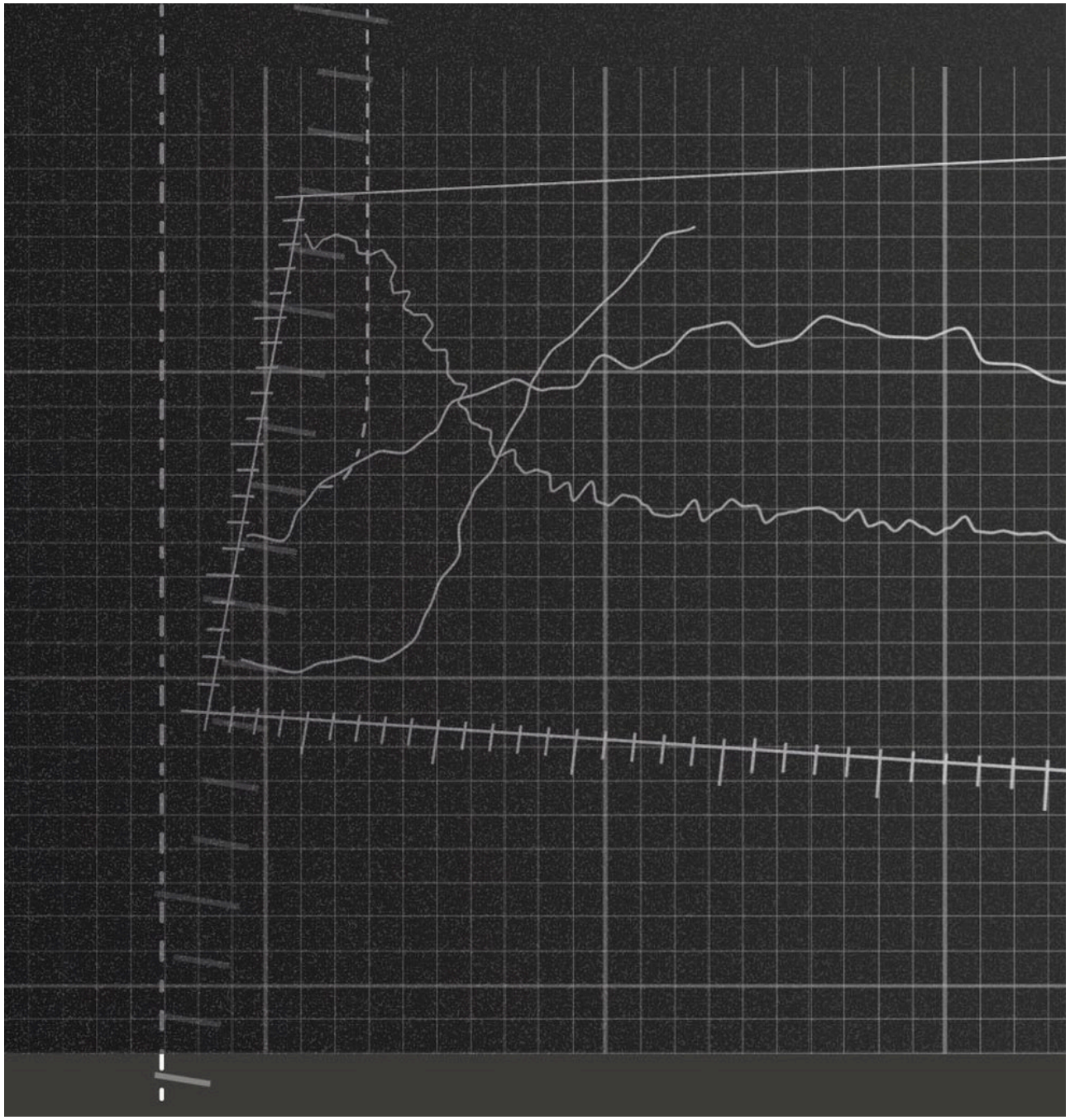
Example 2

Metadata management system

A database containing information about data and measurements.

Designed to help people find the data they are looking for, as well as detailed information about those data.

Full list of infrastructure



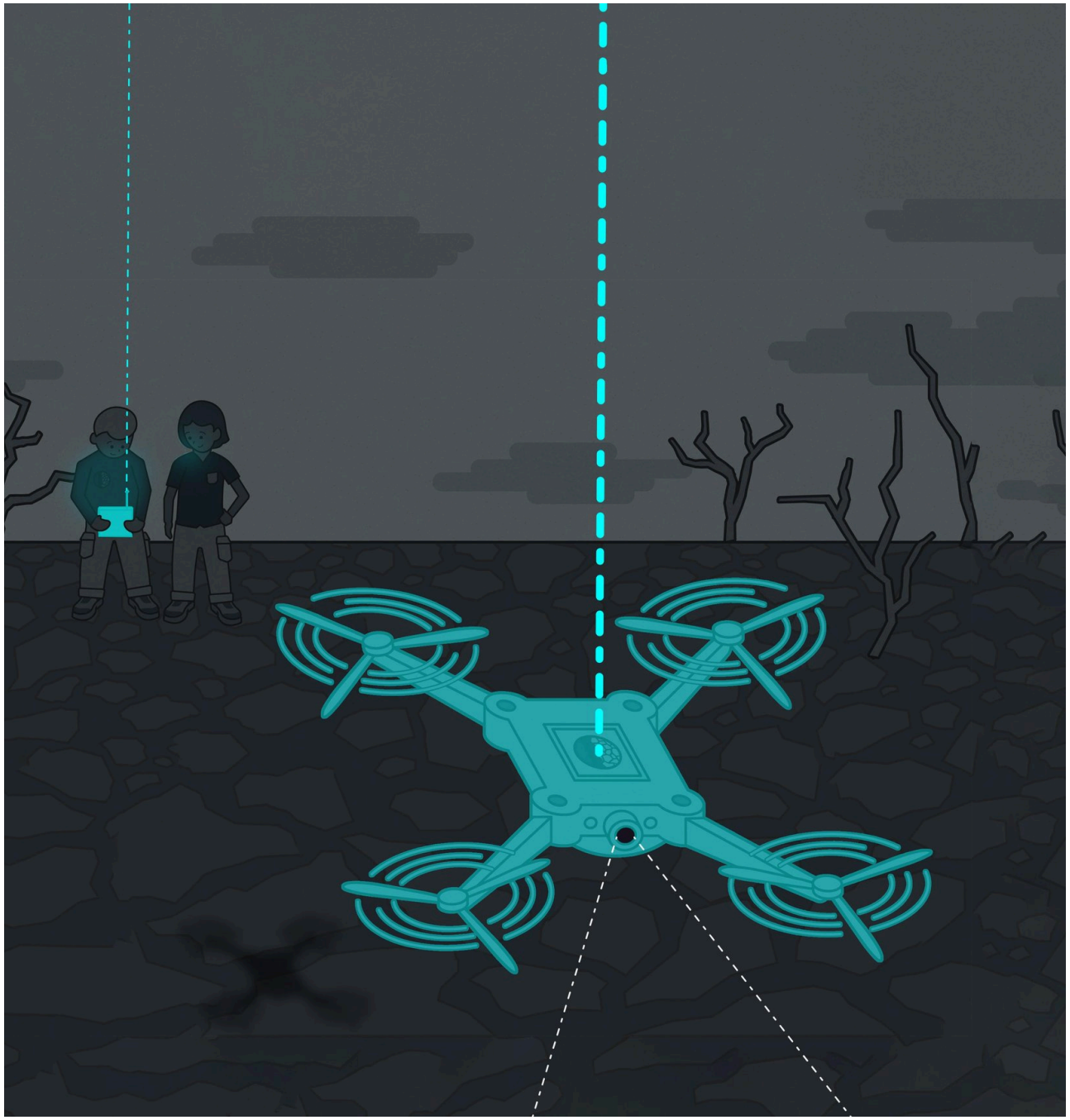
Example 3

Time series data management and processing system

An automated cloud-based data processing system that ingests, stores and processes time series data.

Includes automated quality control and infilling of time series data from FDRI sensors and other networks e.g. COSMOS-UK so that it can be discovered and used by the metadata service.

Full list of infrastructure



Example 4

UAV Data Management Systems

A catalogue to allow UAV surveys to be searched for, accessed, and visualised.

Full list of infrastructure

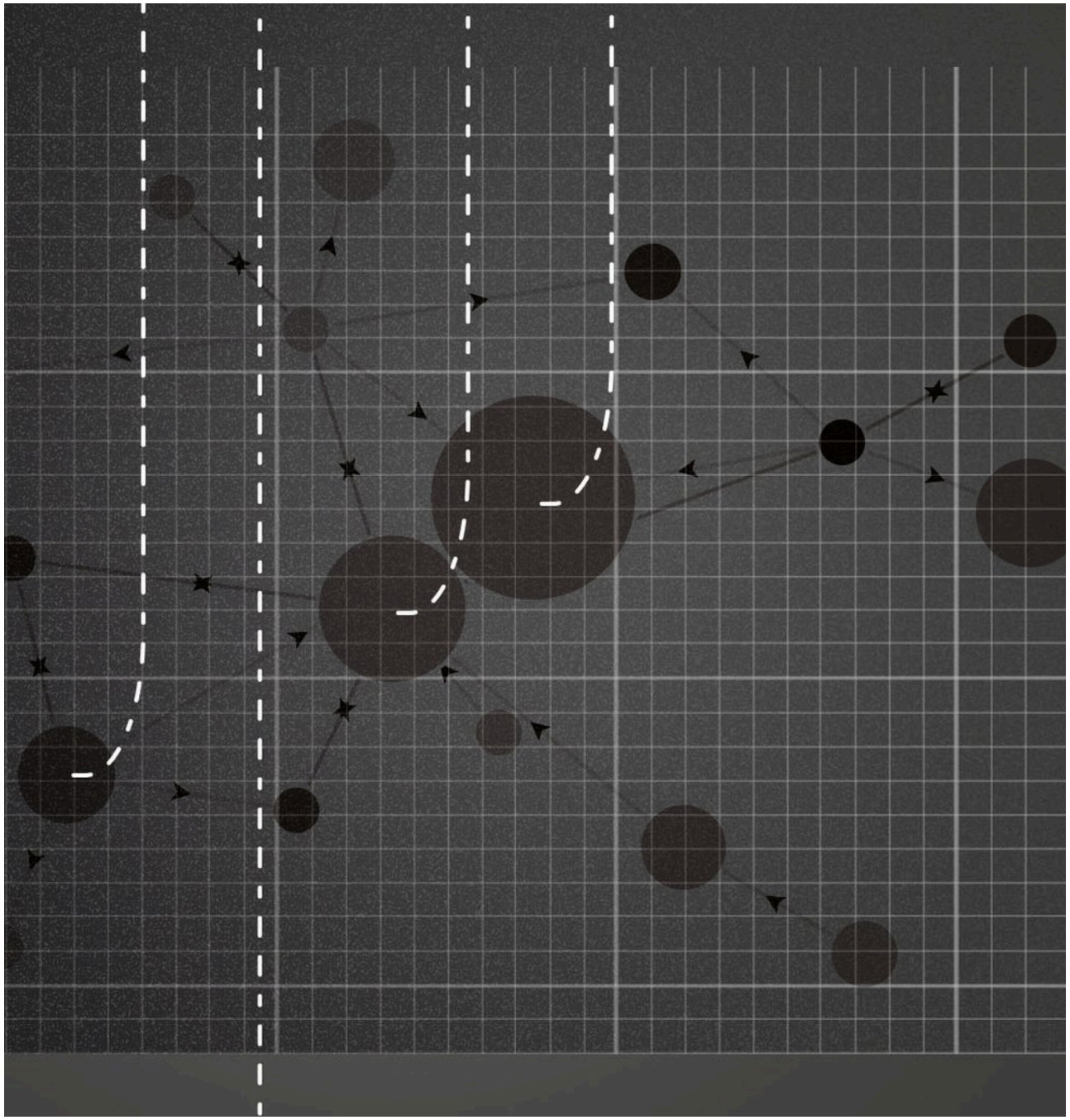
Example 5

ADCP Data Management Systems

Systems to allow ADCP survey data to be searched for, accessed, and visualised.

ADCP is a hydroacoustic technique used to measure water velocity and flow patterns in oceans, rivers, and lakes. ADCPs can be mounted on boats to provide data on river cross-sections, velocities, flows, and sediments.

Full list of infrastructure



Example 6

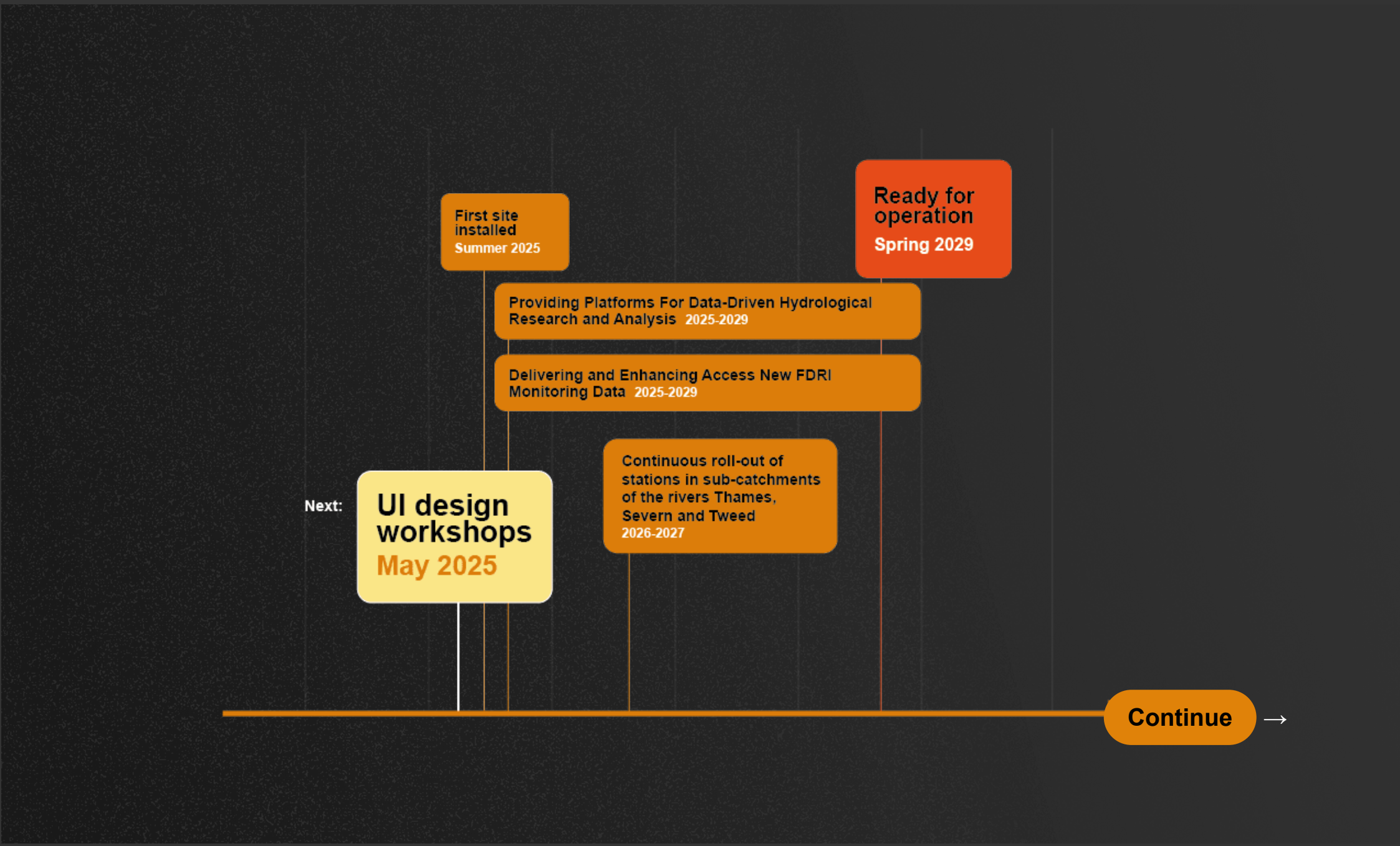
DataLabs

A virtual lab platform with collaborative tools for data analysis.

Based on Jupyter Notebooks. Allows access to integrated data sets from FDRI and high-performance computing via NERC's JASMIN system.

Full list of infrastructure

What's next?


First site installed
Summer 2025
Ready for operation
Spring 2029
Providing Platforms For Data-Driven Hydrological Research and Analysis 2025-2029
Delivering and Enhancing Access New FDRI Monitoring Data 2025-2029
Continuous roll-out of stations in sub-catchments of the rivers Thames, Severn and Tweed
2026-2027
Next:
UI design workshops
May 2025
Continue

We need your input into the design of the user interfaces (UI) to the new Digital Research Infrastructure.

How would you like to be able to interact with FDRI Digital Research Infrastructure?

Which features of existing systems that you find useful would you like to see included?

What new features would you like to see in the interfaces to the new systems?

Continue →

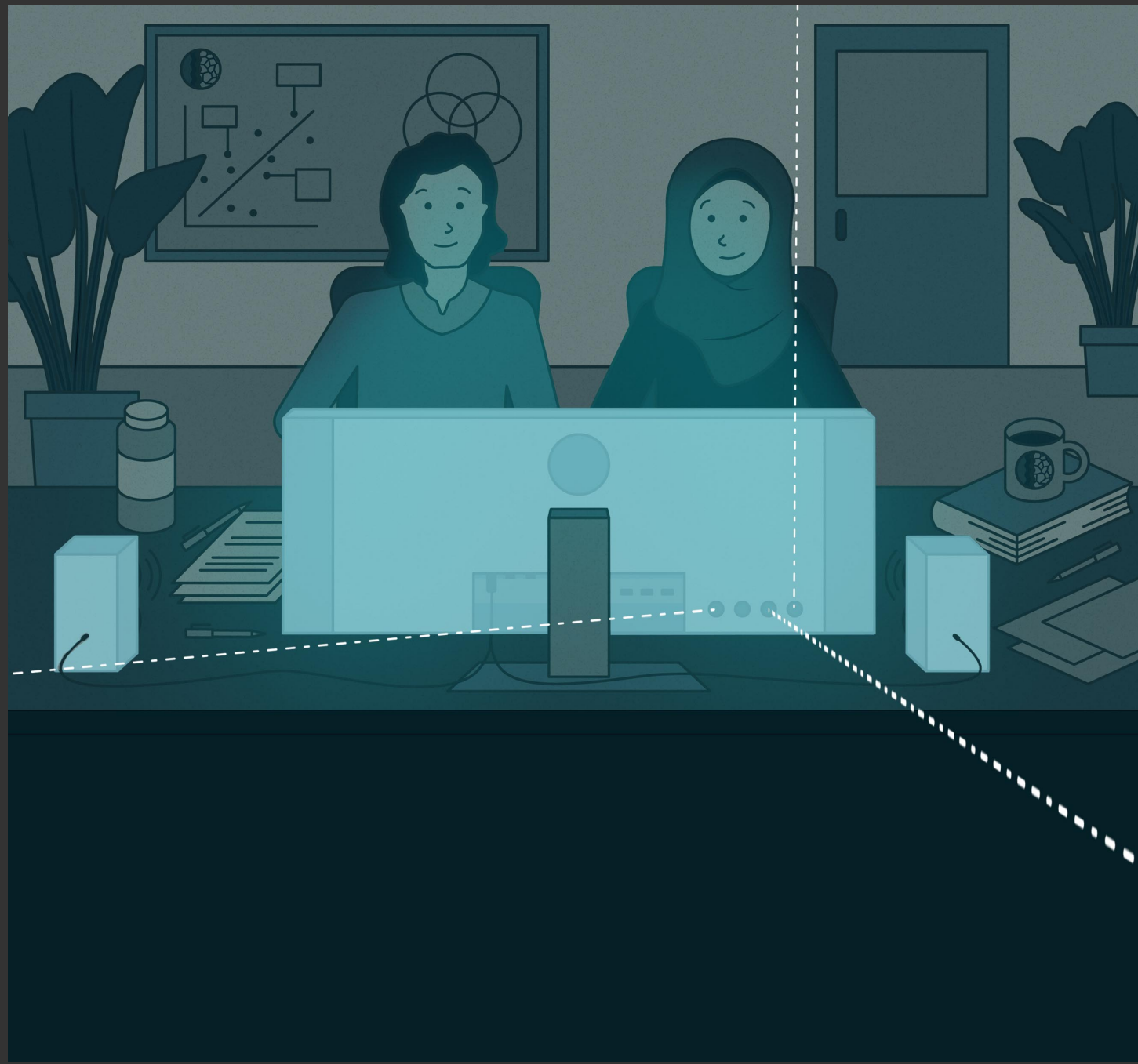
We are hosting a series of **User Interface Design workshops** in **Spring / Summer 2025** to explore the User Interface (UI) design of the new FDRI Digital Research Infrastructure.

We want to involve as many different stakeholder groups as possible to ensure that the new Digital Research Infrastructure meets the needs of everyone who might use it.

If you are interested in signing up to take part in these workshops, please click here:

Workshop registration

Sign up for updates



To find out more + stay up to date

Sign up to the FDRI mailing list