Drought impact forecasting in the UK

MONARK: MONitoring AgRicultural Drought Impacts in the UK

IRIS: IndicatoRs to Impacts for drought Surveillance

Lucy Barker (lucybar@ceh.ac.uk), Maliko Tanguy (malngu@ceh.ac.uk), Jamie Hannaford (jaha@ceh.ac.uk)

UKCEH Wallingford

Ladybower Reservoir, November 2022
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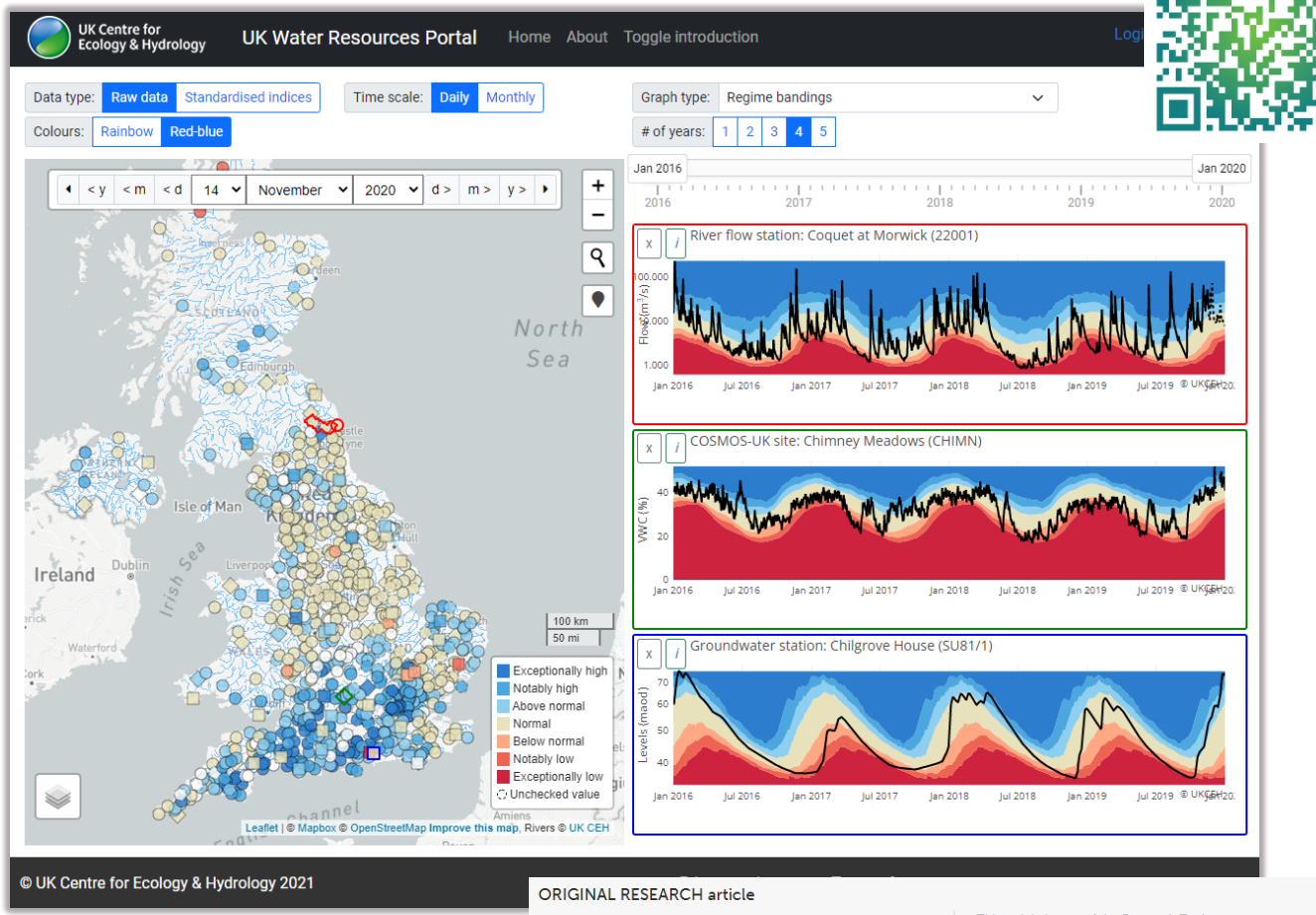
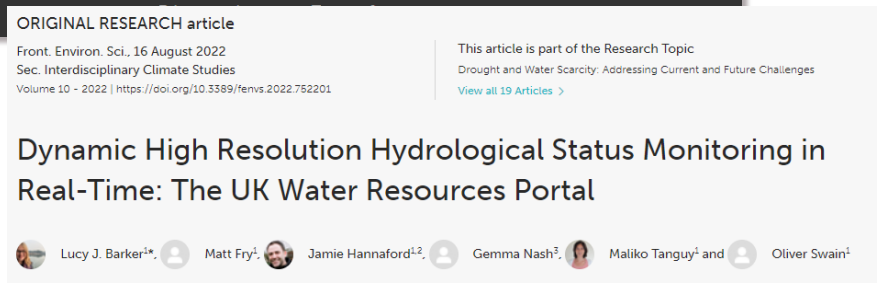
UK Water Resources Portal: monitoring droughts in near-real time

In the past ~10 years, many advances in the field of drought monitoring and early warning:

- Multiple datasets and indices
- Near real-time updates
- Stakeholder co-design
- Demonstrator July 2019
- Operational March 2020



eip.ceh.ac.uk/hydrology/water-resources/



https://doi.org/10.3389/fenvs.2022.752201

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About Drought
Maximising the impact of UK research on drought & water scarcity

Historic Droughts

driver

Working out what happens next: drought impact forecasting

Are you working on drought impact forecasting and/or developing impact functions?

MONARK: MONitoring AgRicultural Drought Impacts in the UK

Lead: Maliko Tanguy

Funding: UKCEH

2023

Focus: Predicting agricultural drought impacts using remote sensing data and high resolution yield data

IRIS: IndicatoRs to Impacts for drought Surveillance and management

Lead: Lucy Barker

Funding: Natural Environment Research Council

2023-2024

Focus: Developing drought impact functions to predict drought impacts using a range of different impact data types, and testing forecasts with stakeholders

Long-term goal:

Operational drought impact forecasting for the UK linked to operational monitoring (UK Water Resources Portal) and seasonal forecasting (Hydrological Outlook UK)

MONARK: predicting agricultural impacts

Review of existing Vegetation Indicators

VCI = Vegetation Condition Index
VHI = Vegetation Health Index
Others?

Automation of RS images acquisition and VI calculation

High resolution validation

assist data

ML methods

Drought impact prediction

FUTURE WORK

Include in UK Water Resources Portal + User guidance

Links with other projects:

AgZero+

IRIS

If time allows:

Drought impact on natural vegetation?

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ML = Machine Learning

IRIS: Forecasting drought impacts…

WP1: Gather and update **drought indices** (SPI, SPEI, SSI, Soil moisture…) **and impact data** (remote sensing: wildfires, vegetation condition etc.; EDII, high resolution crop yields, drought incident data from regulators)

WP2: Develop **Drought Impact Functions** e.g. using conventional and Machine Learning methods such as Random Forests and extend it by exploring other techniques

WP3: Test impact forecasts with **stakeholders** to assess how useable the forecasts are for drought management and impact mitigation