

# MOT4Rivers:

Monitoring, modelling and mitigating pollution impacts in a changing world: science and tools for tomorrow's rivers

<sup>1</sup>Andrew Tyler, Nigel Willby, Peter Hunter, Daniel Chapman, David Oliver

<sup>2</sup>Marian Scott, Claire Miller, Adrian Bass, Karen Cameron, Ruth O'Donnell

<sup>3</sup>Linda May, Phil Taylor, Amy Pickard, Steve Thackery, Don Monteith, Ellie Mackay

<sup>4</sup>Miriam Glendell, Zisis Gagkas, Zulin Zhang, Eulyn Pagaling, Lisa Avery

<sup>5</sup>Lindsay Beevers

<sup>1</sup>University of Stirling

<sup>2</sup>University of Glasgow

<sup>3</sup>UKCEH

<sup>4</sup>James Hutton Institute

<sup>5</sup>University of Edinburgh

NERC Freshwater Quality Programme

## Kick-off meeting

20 February 2023

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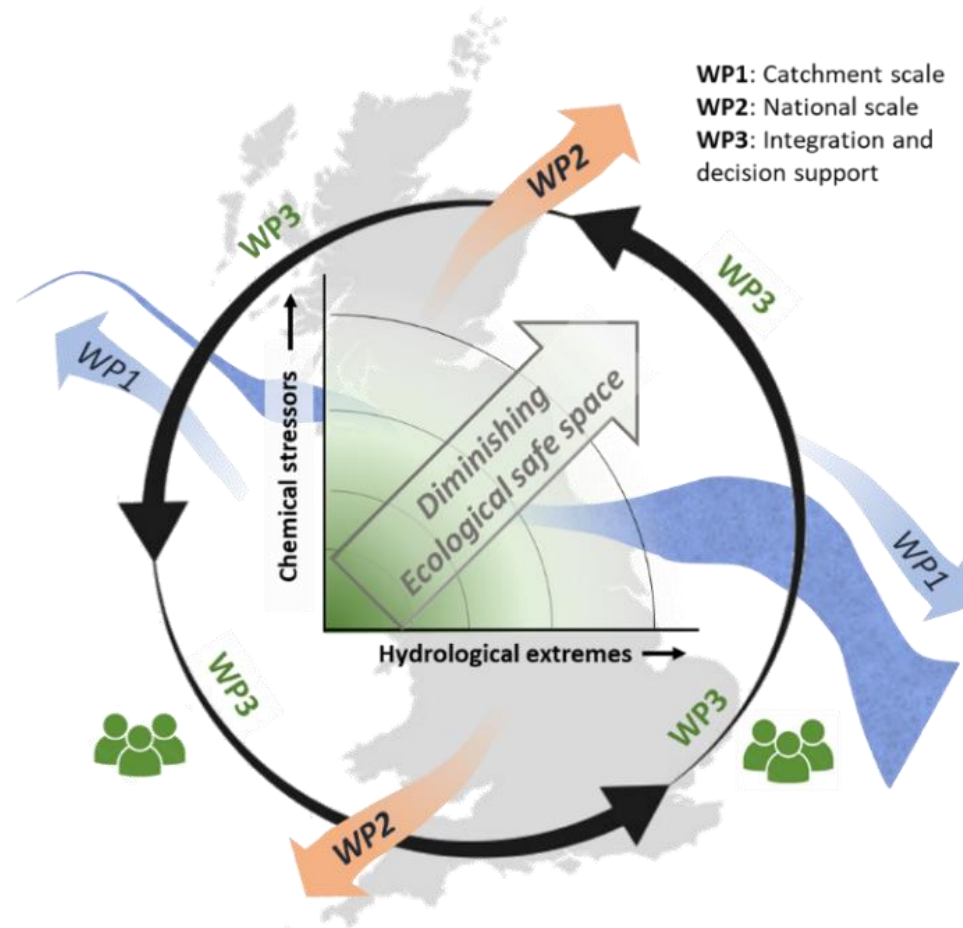
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# MOT4Rivers: Vision and key outputs

To explore the *Ecological Safe Space* where ecosystems can thrive under changing hydrological, chemical and biological stressors.



We will apply *state-of-the-art* science and *next generation* technology - from catchment to national scale - to deliver:

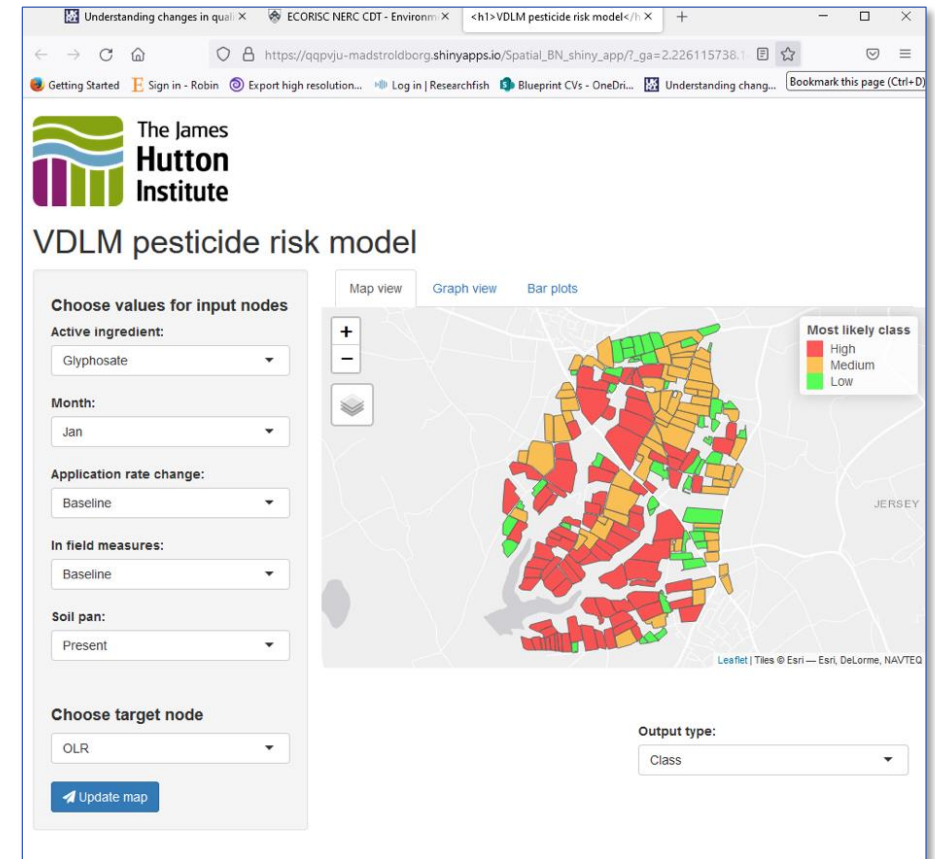
- 1) Intelligence on hydro-climatic controls on the **fate** and impact of pollutant **cocktails**
- 2) Understanding of different components of ecosystem **sensitivity**
- 3) Decision Support Tools for assessing risk and testing mitigation options

# Research themes

**Theme 1:** Hydro-climatic controls on fate of pollutants at catchment to national scale

**Theme 2:** Impacts of pollutant mixtures & exposure regimes (acute/chronic) on freshwater ecosystems

**Theme 3:** Probabilistic Decision Support Tool to explore adaptation, mitigation & detection of risks to river quality (current & future)

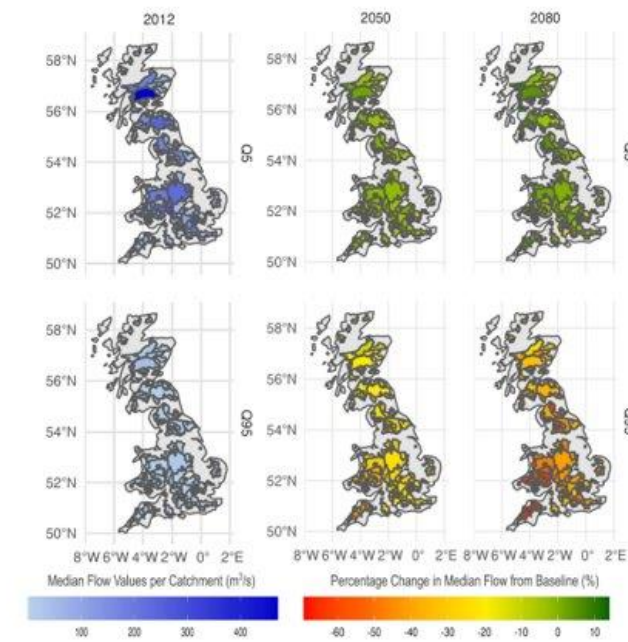
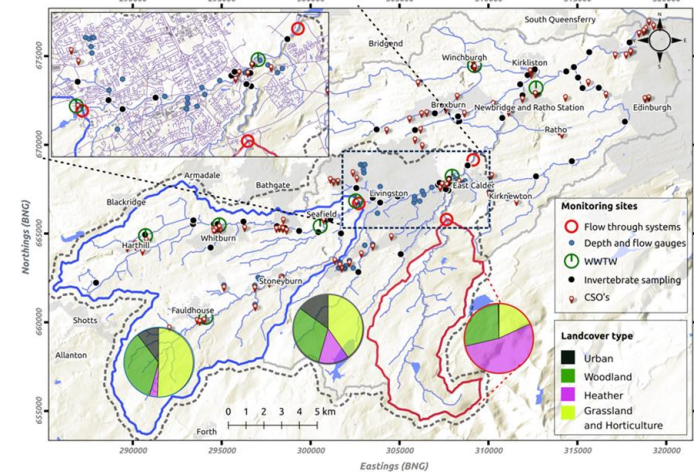


Example Decision Support Tool for catchment scale pesticide risk model

Troldborg et al. 2022 HESS, Moe et al. 2020 J. Integrated Env. Assessment & Management

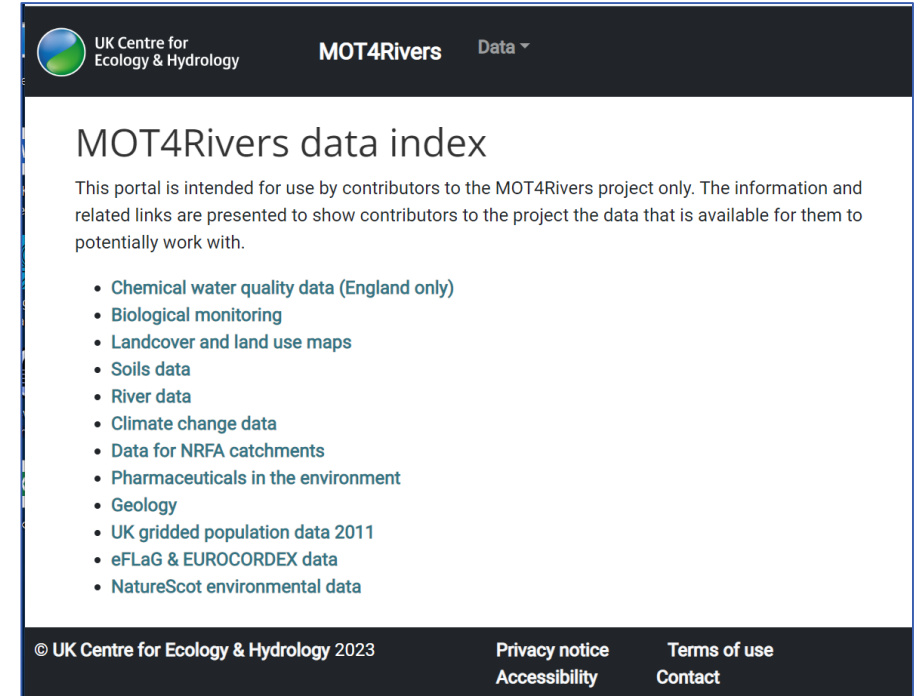
# Novelty

- ‘**Ecological Safe Space**’ concept to position pollutants within overall river habitat template
- Sensor networks and next generation sensors, via SW co-investment, alongside conventional sampling as key to **process-based understanding**
- Transformative data science approaches applied to LT national datasets – bridge **catchment** to **national scale** divide
- Using actual & forecast flows to integrate **climate change impacts** on exposure and sensitivity
- Probabilistic **Decision Support Tool** focussed on risks to water quality and how best to mitigate these



# Potential connections with other FWQ projects

- Shared data sources and derived QA'd datasets [All projects; MOT4Rivers data portal]
- Knowledge of pollutant effects on relevant species, bio-availability modifiers and risks [Boxall]
- Impacts of changes in society and climate on chemical impacts [Bell & Lofts]
- Ecological impacts of wastewater on microbial systems [Read]
- Effects of livestock waste on amenity value [Johnes]
- Opportunity to align case studies [All]
- Tool development – including consistency of messages to stakeholders [All]



The screenshot shows the MOT4Rivers data index webpage. The header includes the UK Centre for Ecology & Hydrology logo, the text 'UK Centre for Ecology & Hydrology', 'MOT4Rivers', and a 'Data' dropdown menu. The main heading is 'MOT4Rivers data index'. Below this is a paragraph: 'This portal is intended for use by contributors to the MOT4Rivers project only. The information and related links are presented to show contributors to the project the data that is available for them to potentially work with.' A bulleted list of data categories follows: Chemical water quality data (England only), Biological monitoring, Landcover and land use maps, Soils data, River data, Climate change data, Data for NRFA catchments, Pharmaceuticals in the environment, Geology, UK gridded population data 2011, eFLaG & EUROCORDEX data, and NatureScot environmental data. The footer contains copyright information: '© UK Centre for Ecology & Hydrology 2023', and links for 'Privacy notice', 'Accessibility', 'Terms of use', and 'Contact'.

