# MOT4Rivers:

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

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NERC Freshwater Quality Programme

Kick-off meeting

20 February 2023

University of Stirling
University of Glasgow
The University of Edinburgh
UK Centre for Ecology & Hydrology
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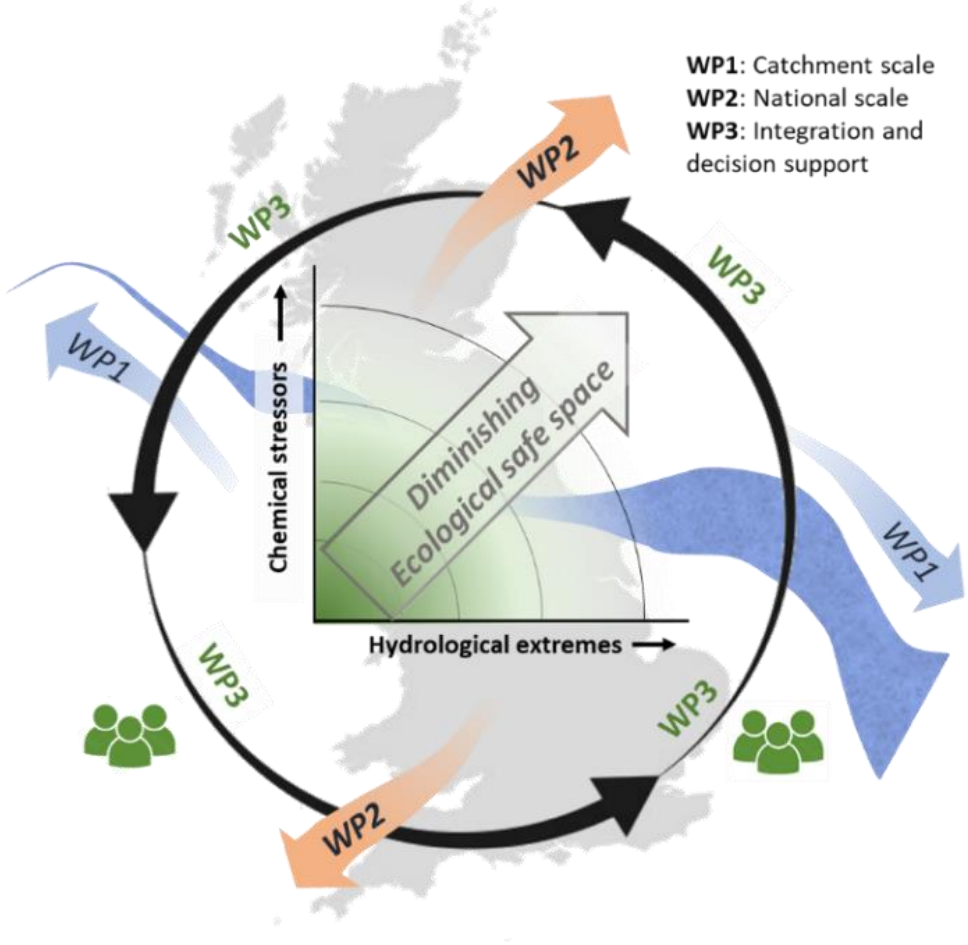
# MOT4Rivers: Vision and key outputs

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:

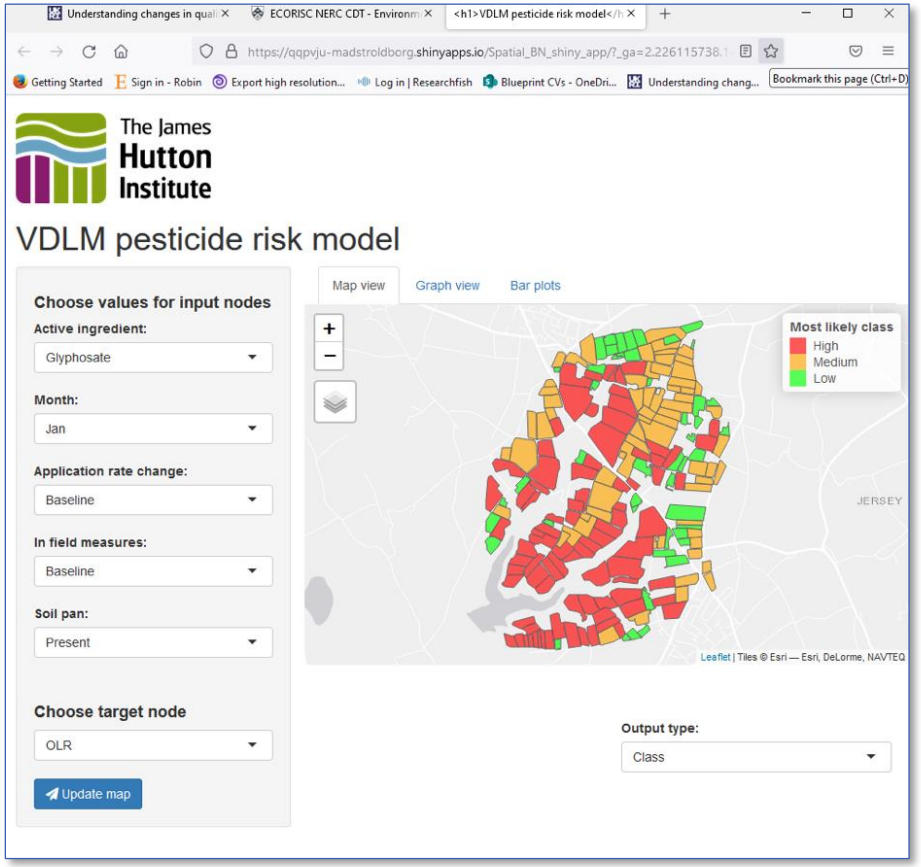
1) Intelligence on hydro-climatic controls on the **fate** and impact of pollutant **cocktails**
2) Understanding of different components of ecosystem **sensitivity**
3) Decision Support Tools for assessing risk and testing mitigation options

# 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)

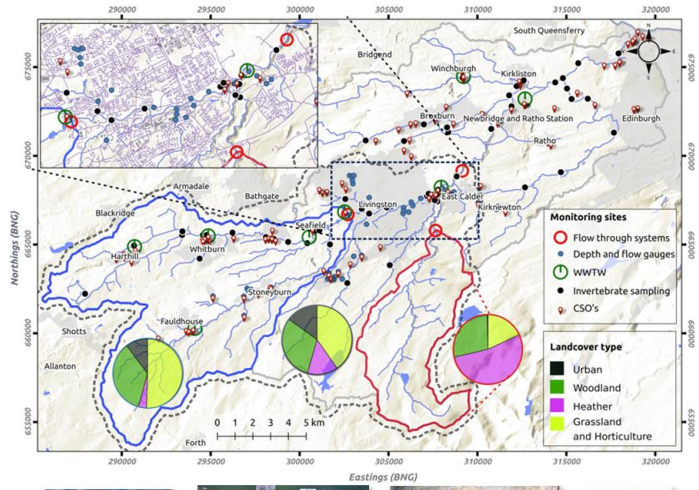



Example Decision Support Tool for catchment scale pesticide risk model

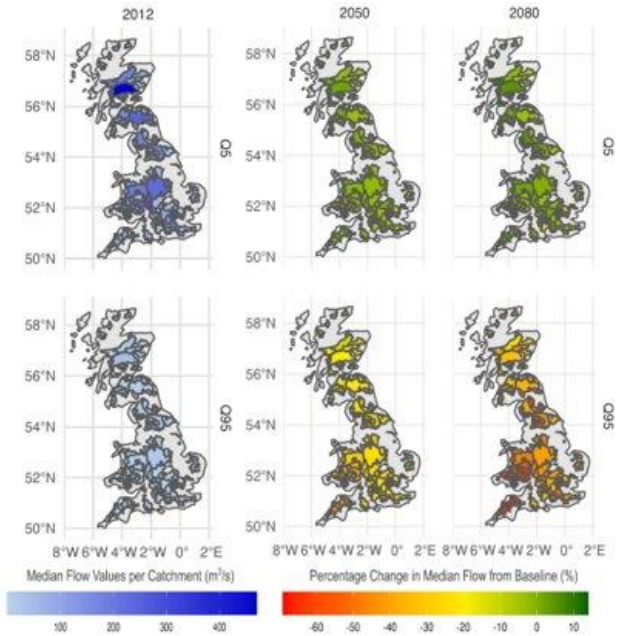
Troldborg et al. 2022 HESS, Moe et al. 2020 J. Integrated Env. Assessment & Management

# 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

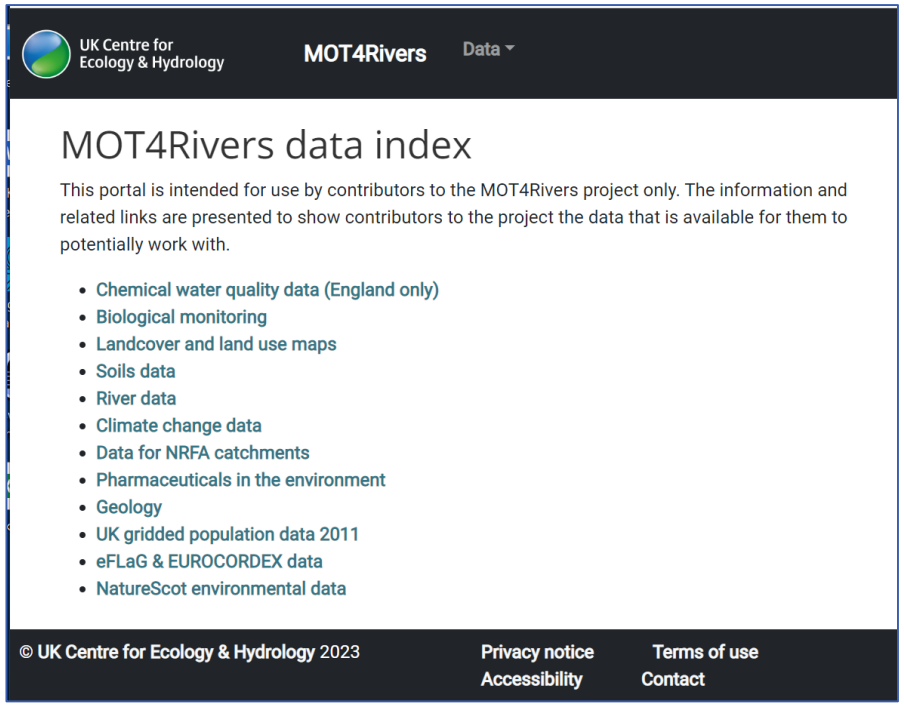


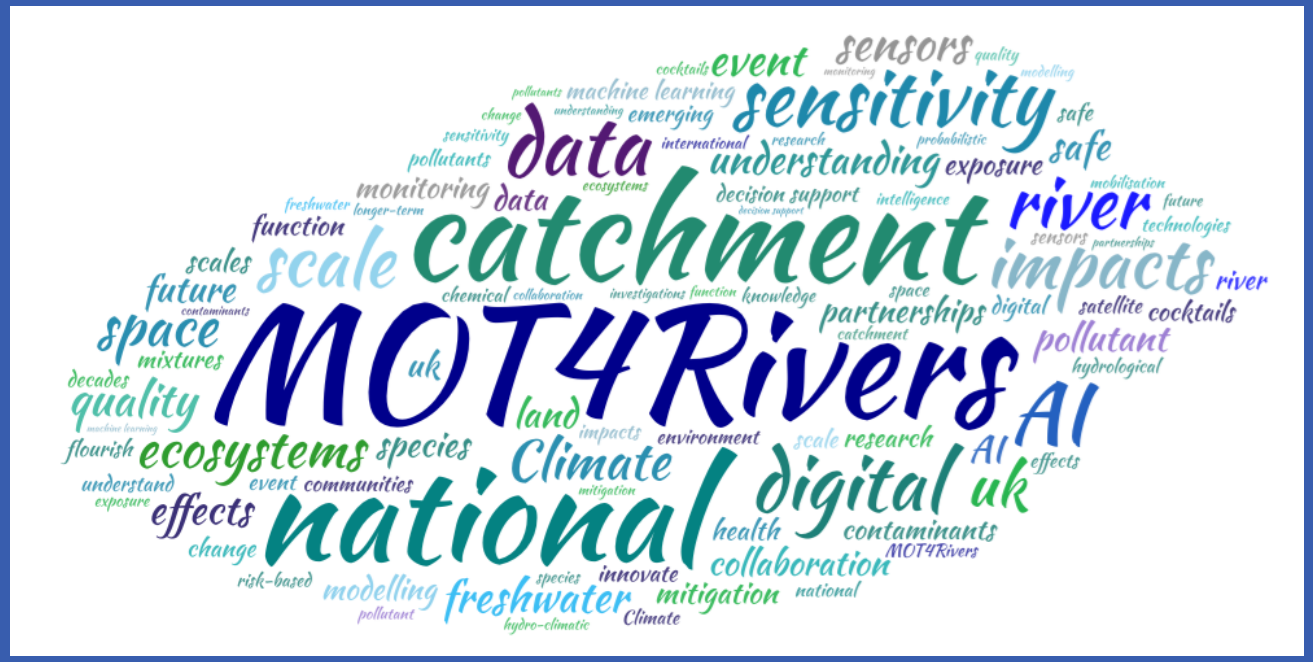




# Potential connections with other FWQ projects

- 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]






# Thank you!

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