Durham University

UNIVERSITY of York

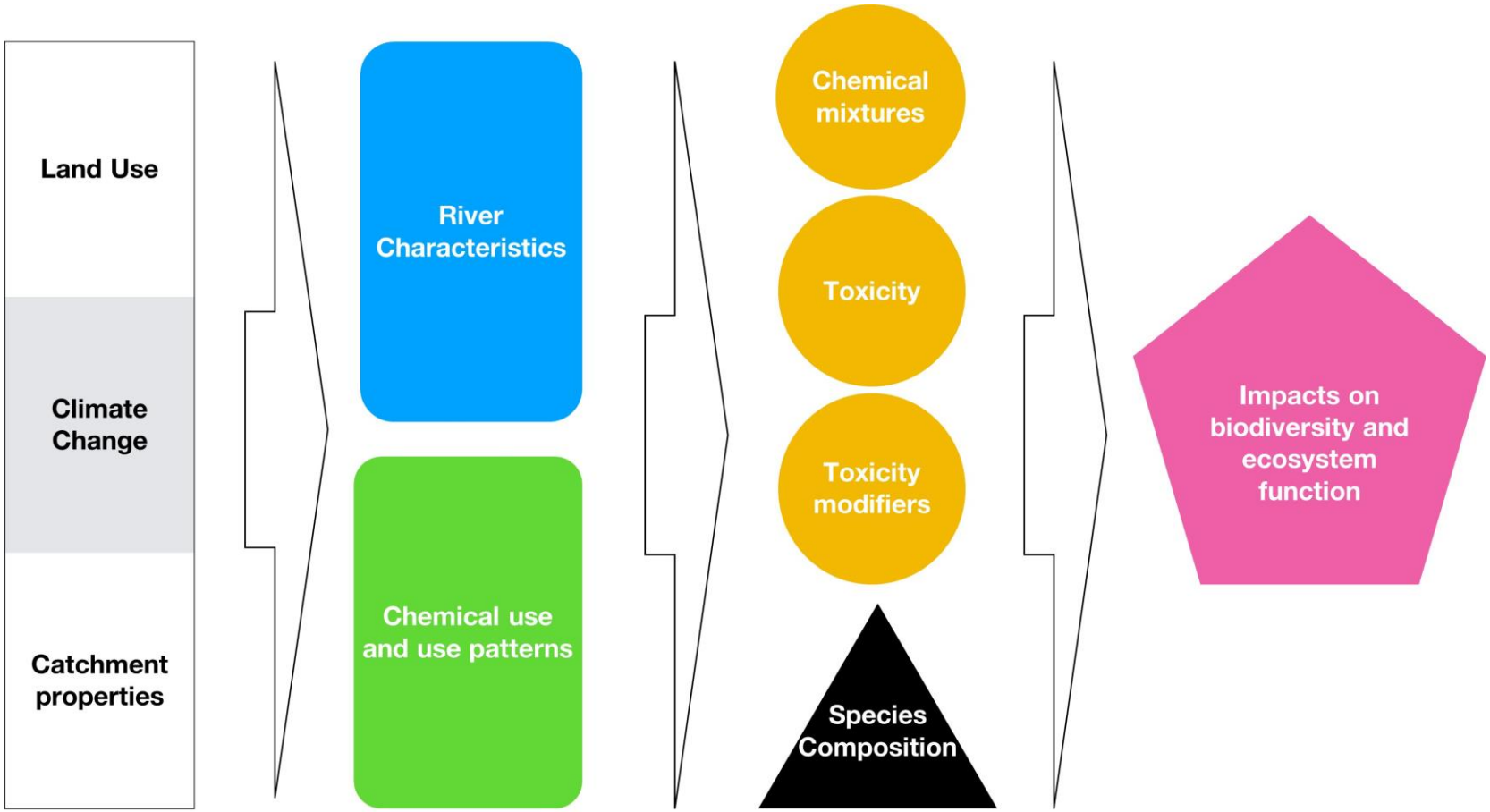
The University Of Sheffield.

# Assessing and Managing the Impacts of Mixtures of Chemicals on UK Freshwater Biodiversity in a Changing World

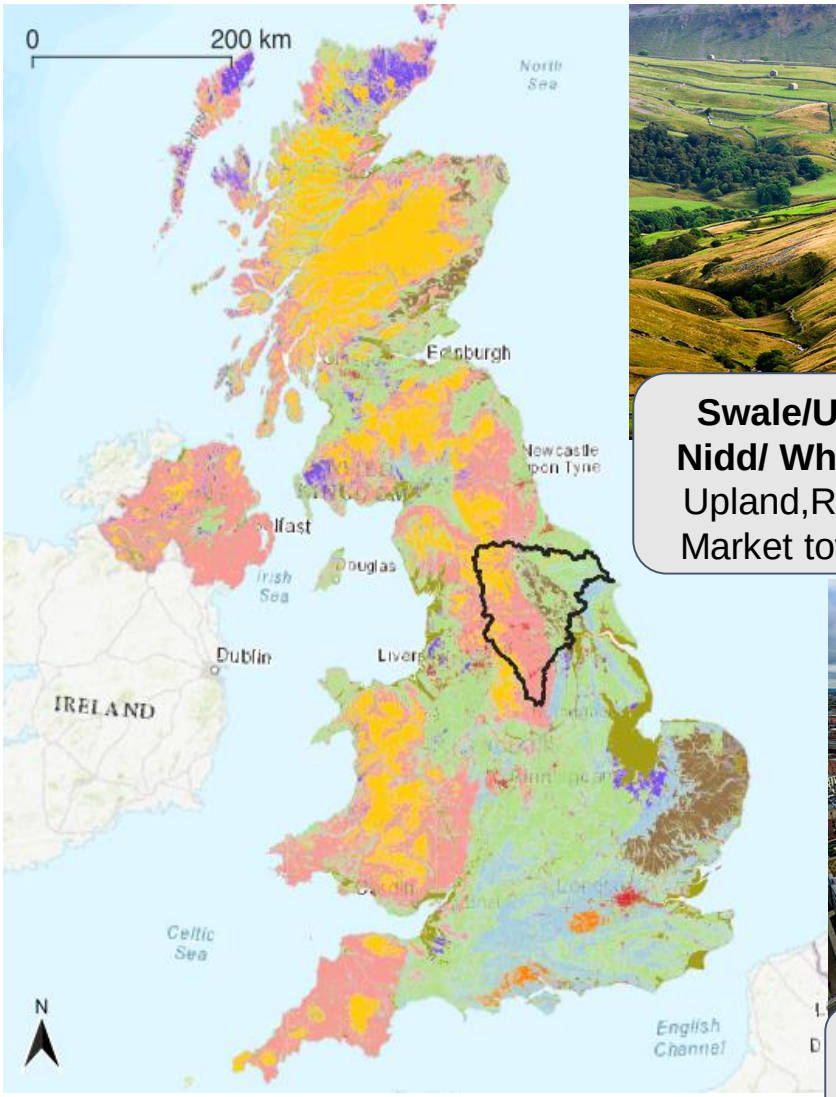
# *A new transformative catchment-based approach that:*

- Assesses impacts of mixtures of chemicals and co-stressors on the structure and functioning of species assemblages at high spatial resolution
- Considers the current situation and looks to the future to account for the effects of global megatrends on chemical sources, fate processes, exposure and effects
- Allows us to target interventions where they are going to have maximum impact allowing us to benefit from the use of chemicals while protecting biodiversity

# *Our assessment framework*



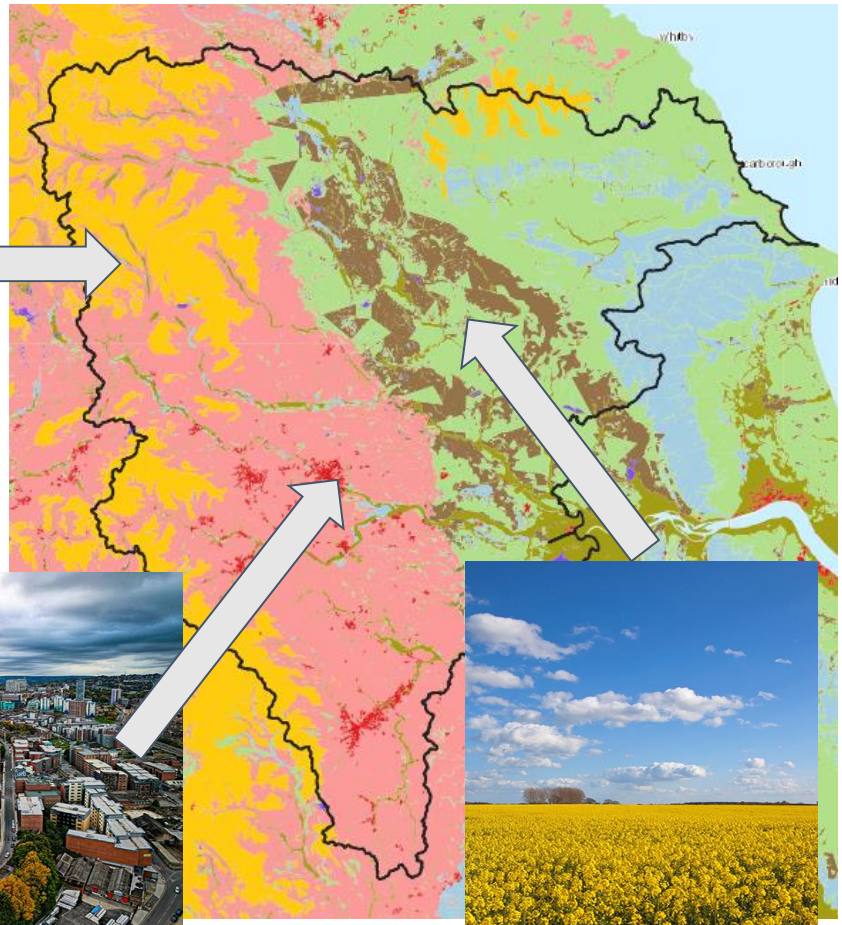
# *9 catchments (10,770 km²) – Representing 86% of the UK*
# *350 locations - 30-40 chemicals of actual concern*

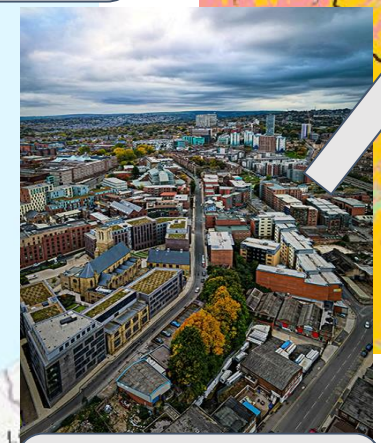



UK Map of Geoclimatic zones



**Swale/Ure/ Nidd/ Wharfe**
Upland,Rural
Market towns

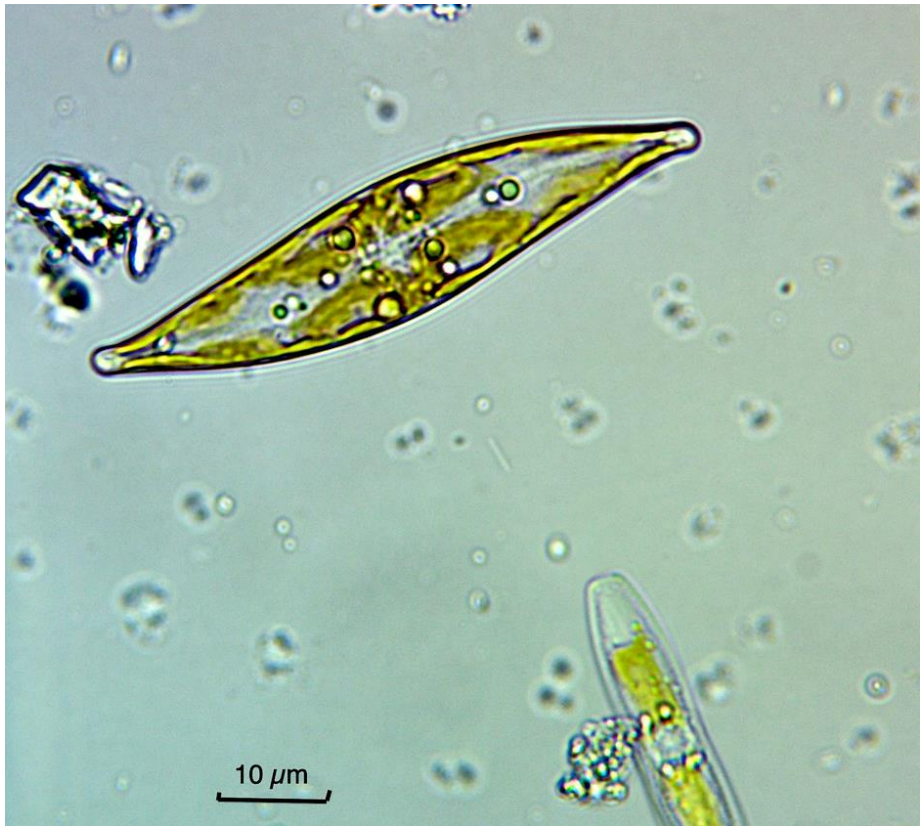




**Aire/Calder/Don**
Large cities, industry
heavily modified



**Derwent**
Rural, arable
Market towns





# *Our main receptors*

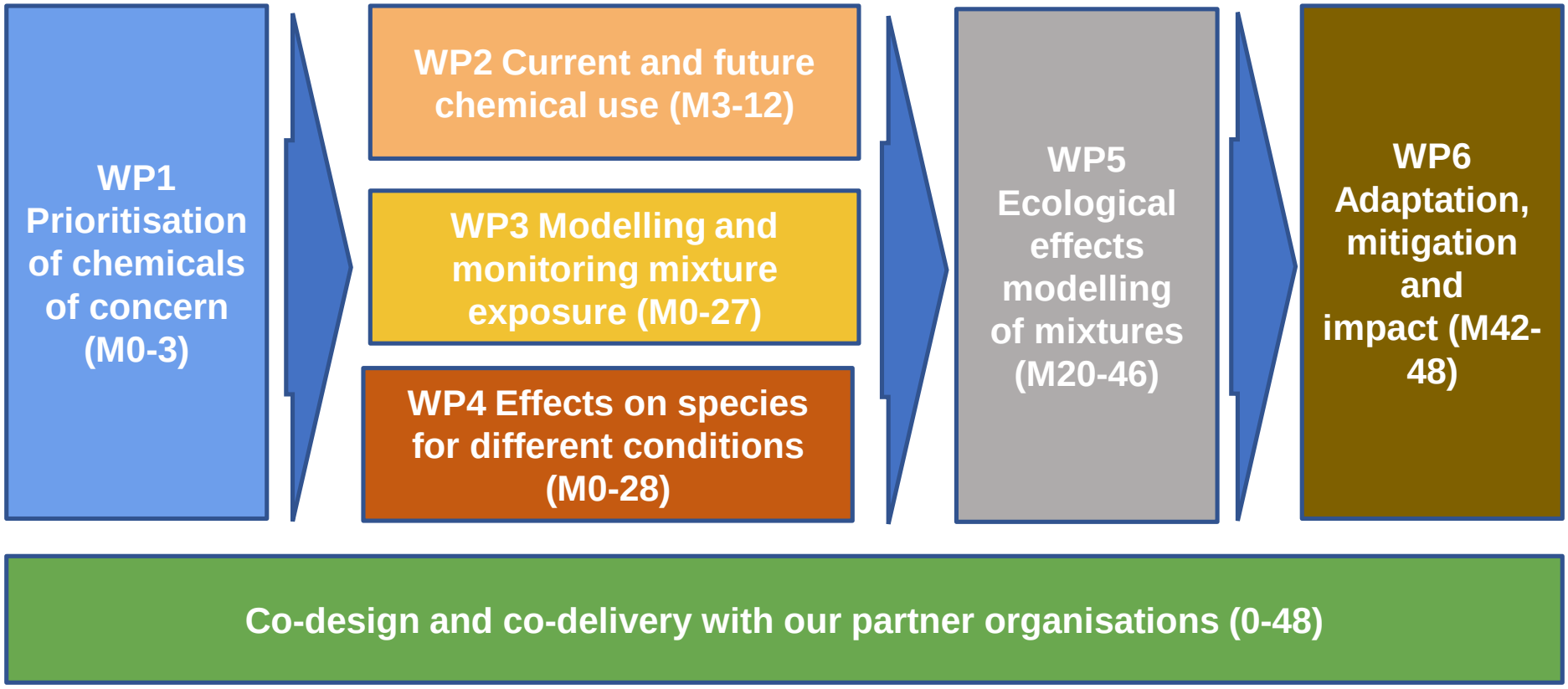
# Multiple Chemicals from Multiple Sources





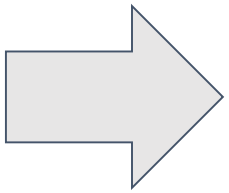


# *Delivered over 4 years through 6 Work Packages*



# *Delivering innovative science*

- Future chemical use scenarios
- A high-resolution, systems-based mixture exposure model
- Models for the effects of toxicity modifiers on bioavailability
- Read-across methodology to extrapolate mode of action related effects across species of interest
- Models for assessing the impacts of chemical mixtures and co-stressors on biodiversity



A new integrative assessment framework allowing mitigation/adaptation approaches to be targeted where they will have the greatest benefit

**This partnership will drive a transformation of current chemical assessment approaches helping to halt the decline in UK freshwater biodiversity while maintaining the societal benefits from chemical use**