



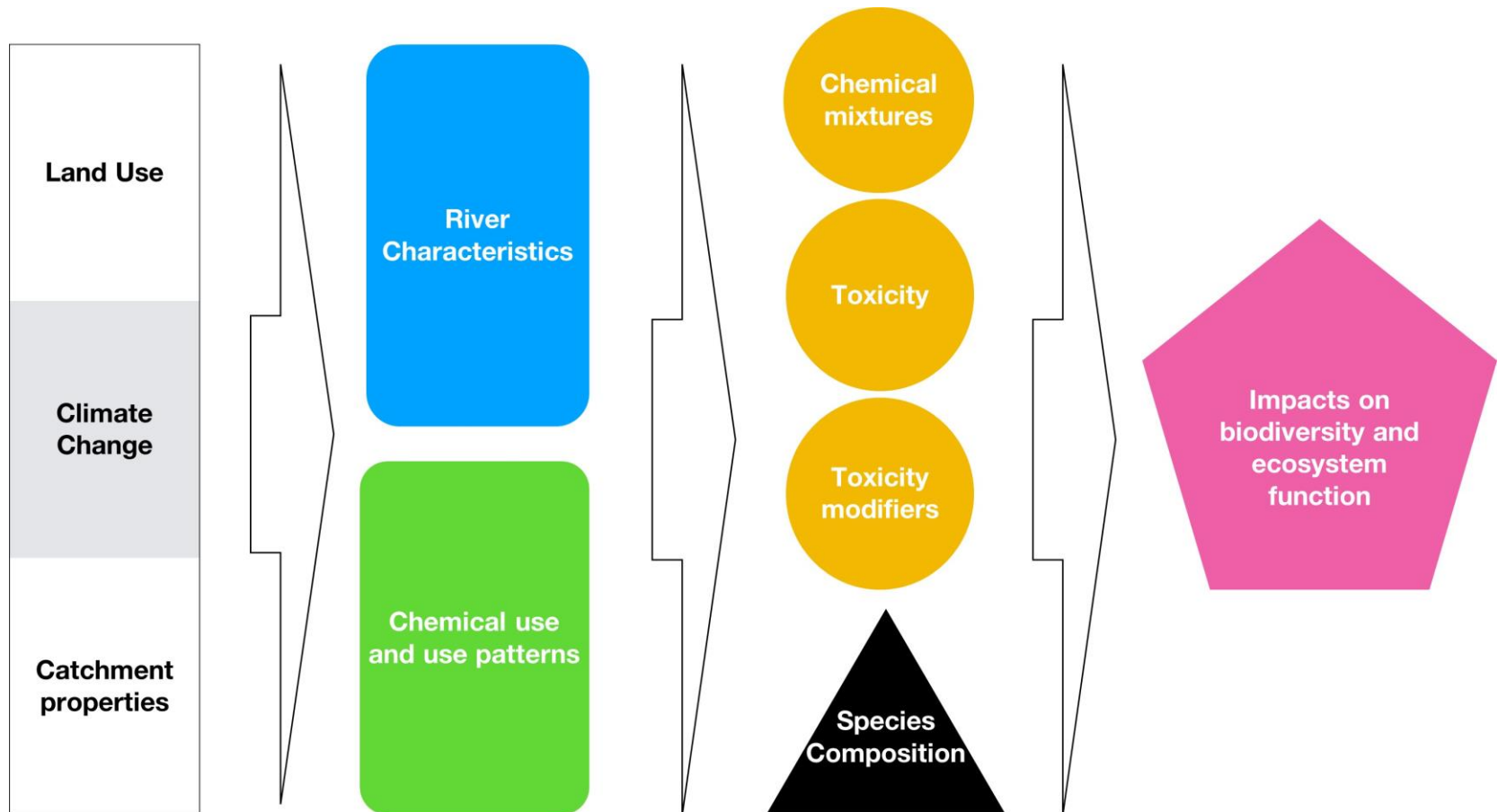
Assessing and Managing the Impacts of Mixtures of Chemicals on UK Freshwater Biodiversity in a Changing World



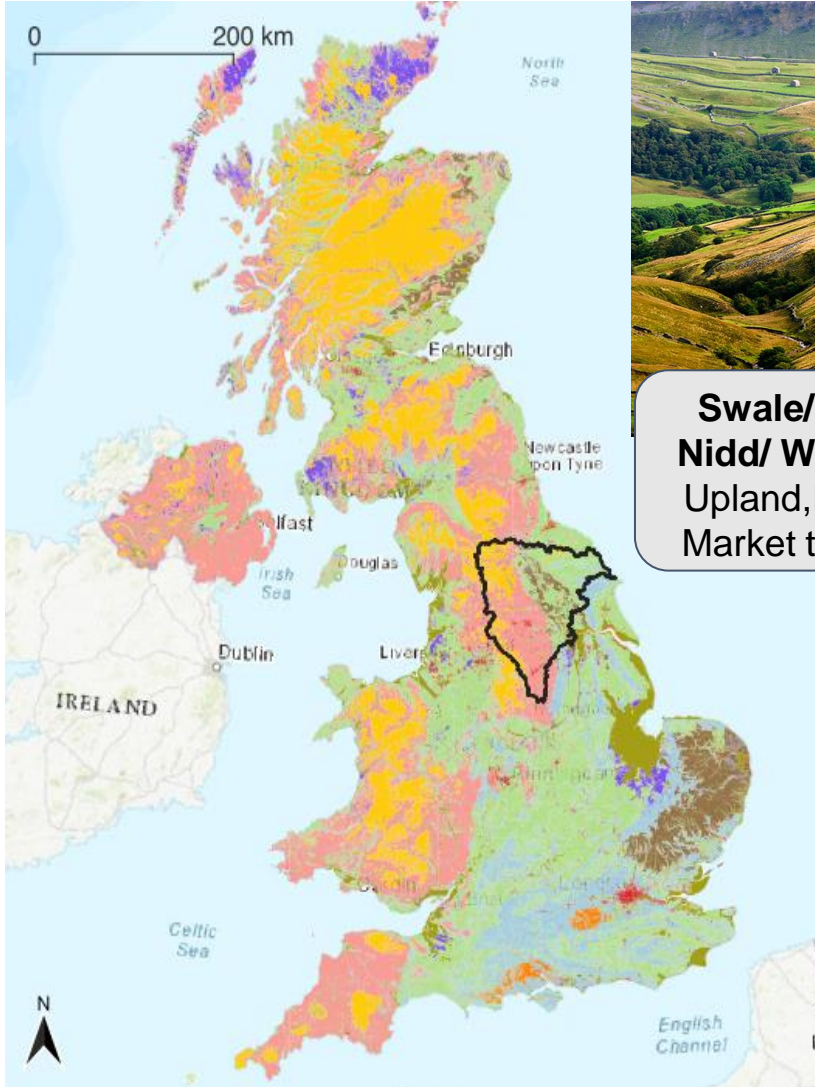
A new catchment-based approach that:

- 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



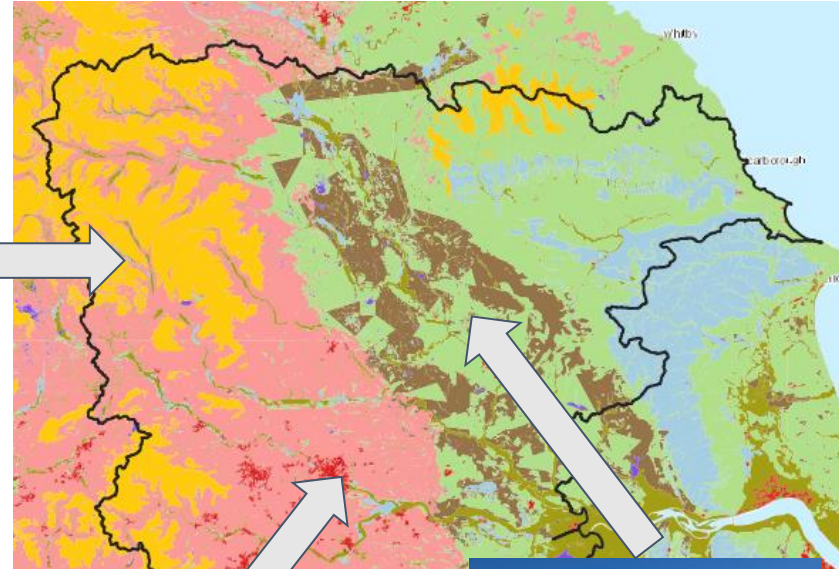
9 catchments (10,770 km²) – Representing 86% of the UK



UK Map of Geoclimatic zones



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



Aire/Calder/Don
Large cities, industry
heavily modified

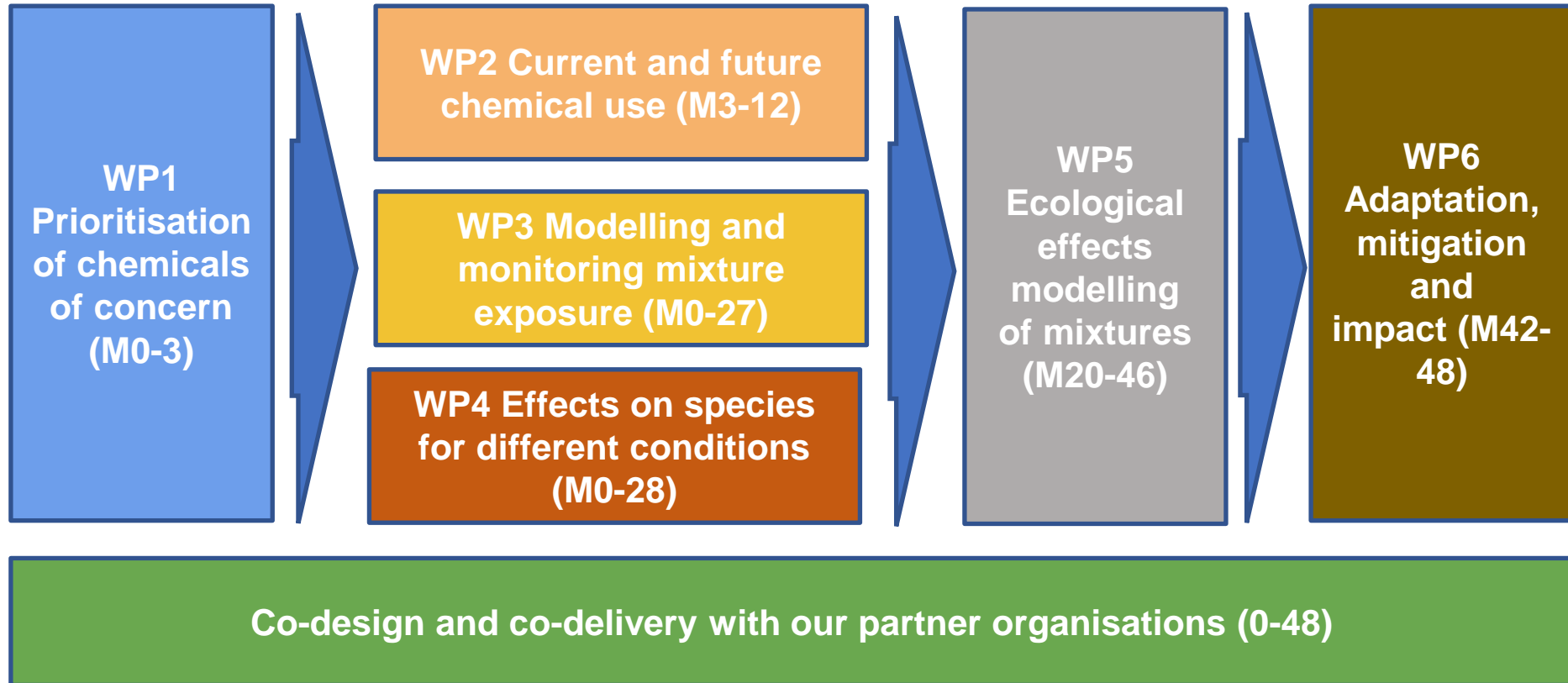


Derwent
Rural, arable
Market towns



Our main receptors

Delivered over 4 years through 6 Work Packages



Our priority chemicals



Fipronil, Imidacoprid,
Permethrin, Moxidectin,
Deltamethrin



Tebuconazole, Azoxystrobin,
Triallate, Metazochlor,
Cypermethrin, Trifloxystrobin,
Pyraclostrobin, Dimoxystrobin,
Difenoconazole, Cu, Flufenacet



Ivermectin, Doramectin,
Eprinomectin, Moxidectin,
Deltamethrin, Tylosin,
Lincomycin, Cu, Zn



Miconazole, Fluconazole,
Azithromycin, Erythromycin,
Diclofenac, Ibuprofen,
Venlafaxine, Metformin

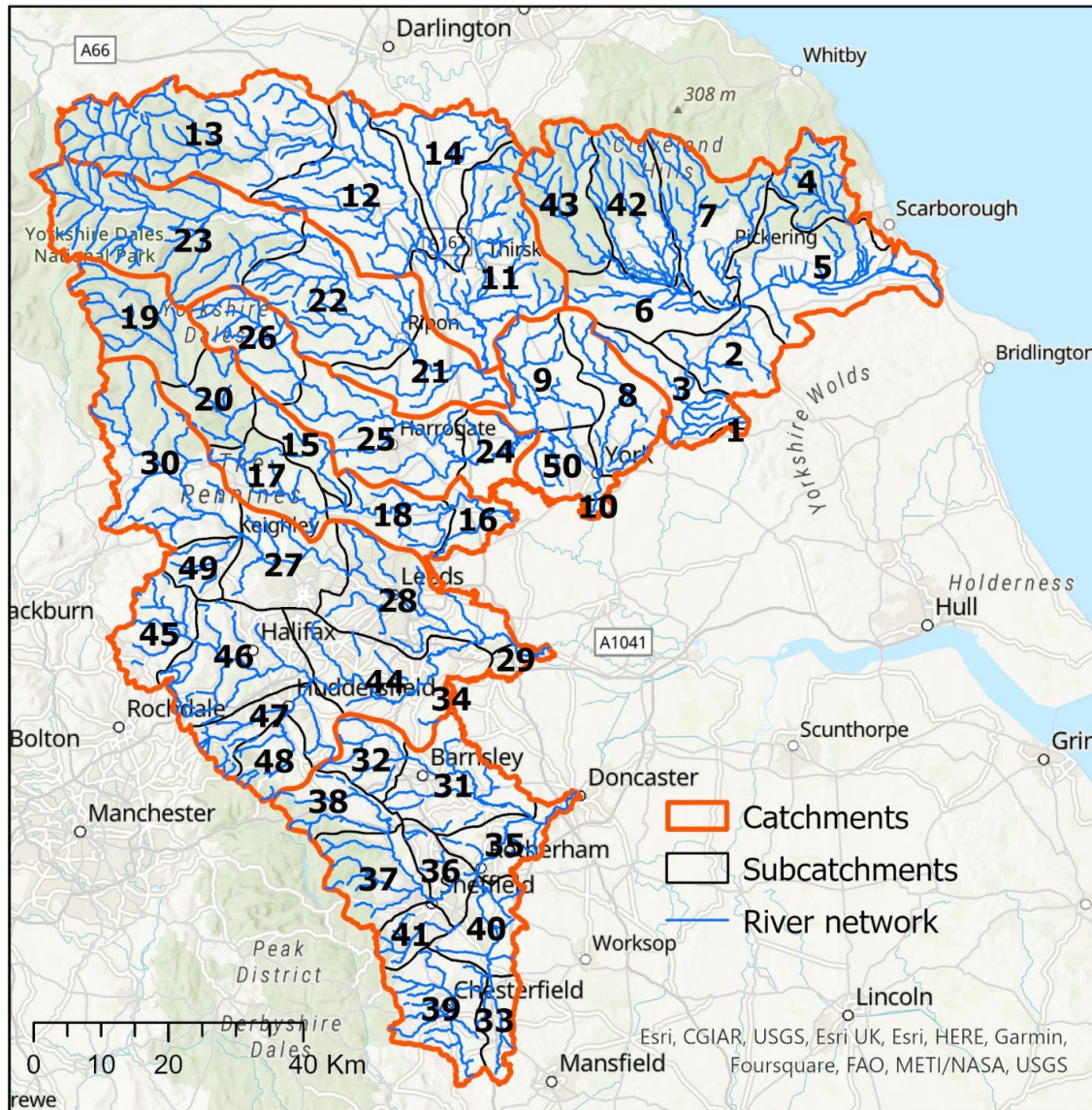


Octenidine HCl, Kathon CG,
Homosalate, Octocrylene,
Tinosorb S, Zn

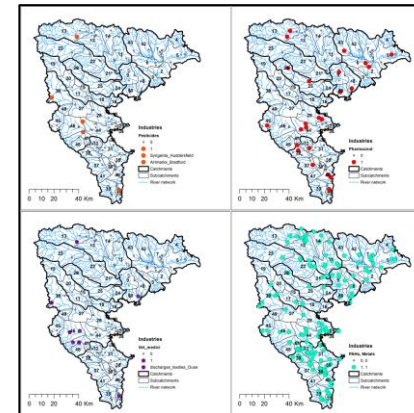
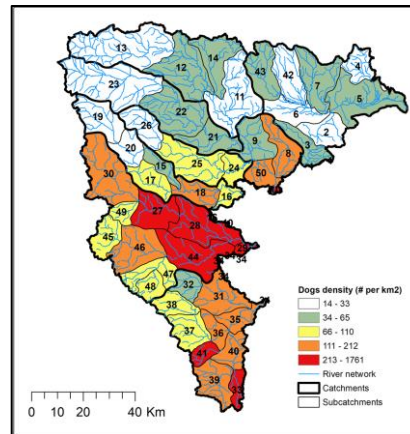
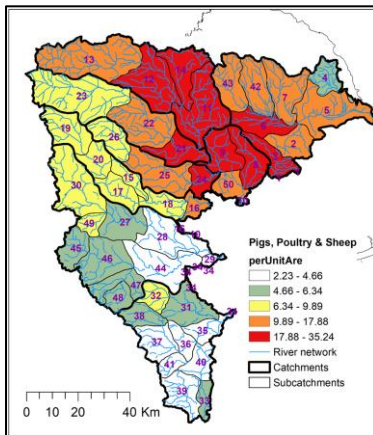
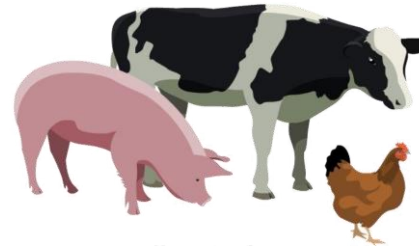
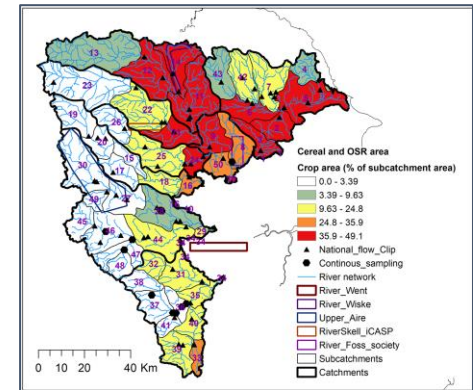
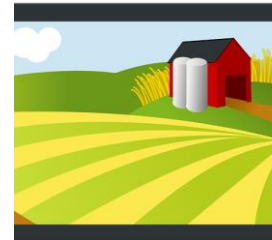
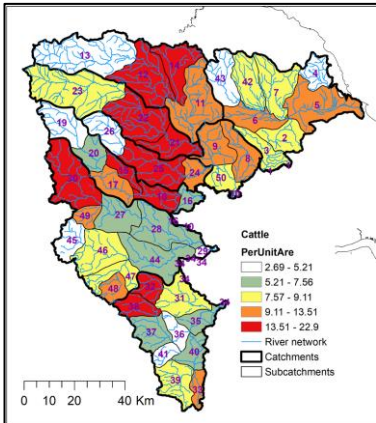
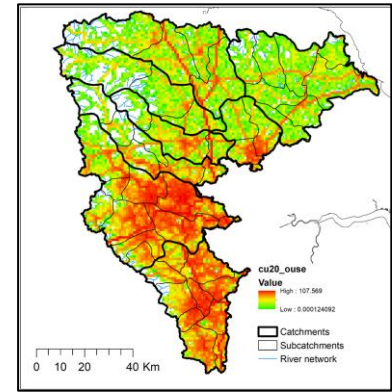
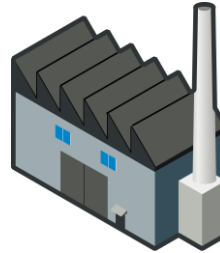
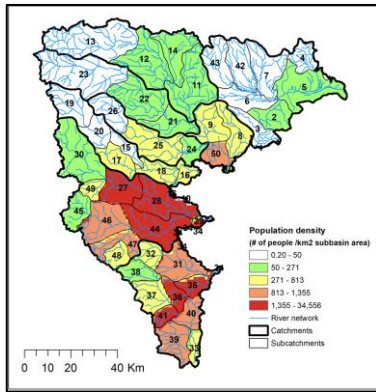


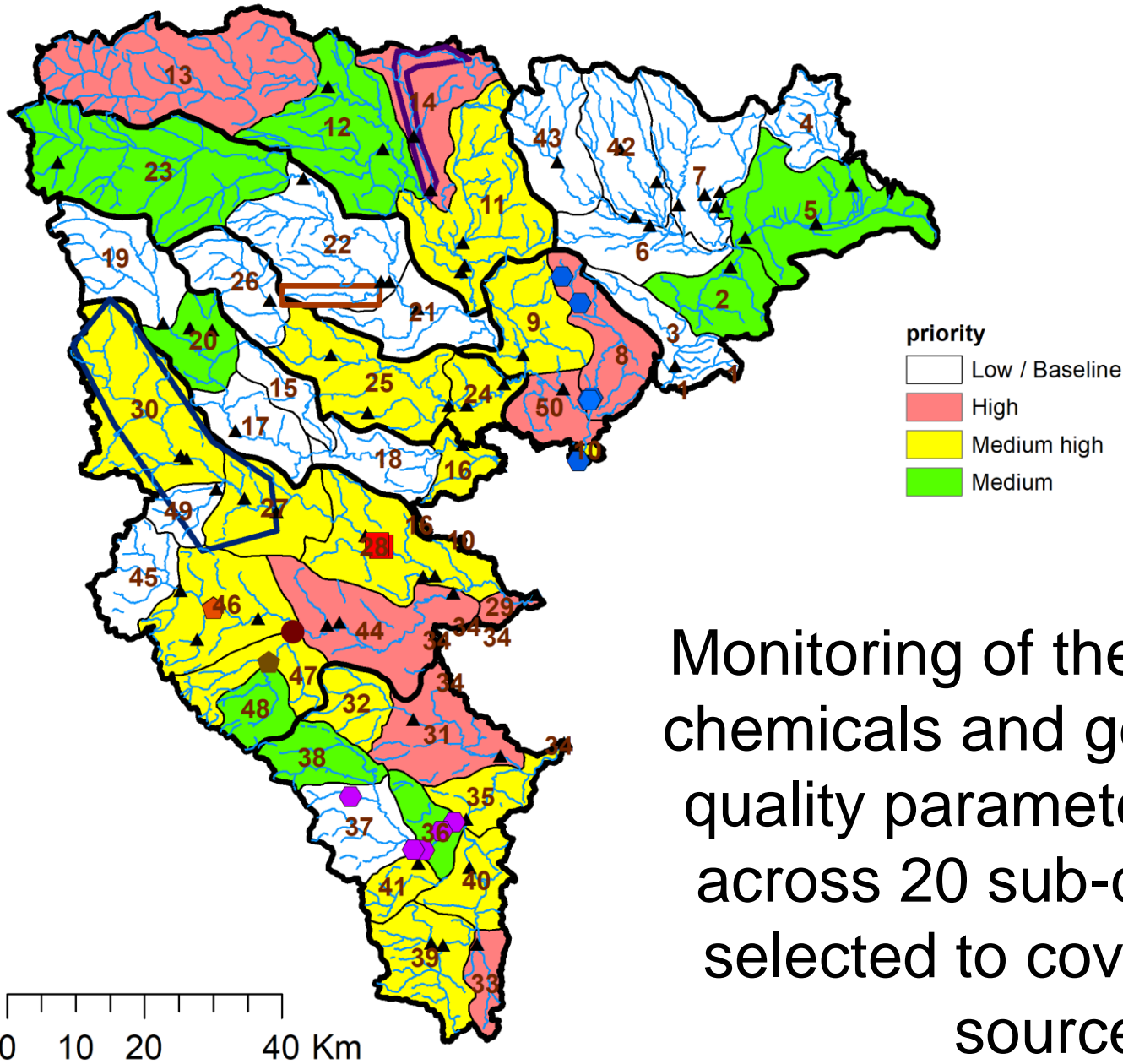
Fluoranthene, Benzo(a)anthracene,
Pyrene, Fluoranthene, 6-PPD, Cu,
Zn

43 Subcontracts



Source mapping

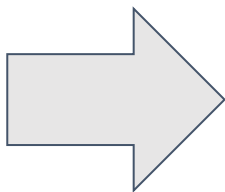




Monitoring of the case study chemicals and general water quality parameters planned across 20 sub-catchments selected to cover different sources

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

**My contact details:
Alistair.boxall@york.ac.uk**