LTLS
FRESHWATER
ECOLOGY

Long Term Large Scale Freshwater Ecology

A NERC Freshwater quality collaborative project

Project team

UKCEH: Vicky Bell, Stephen Lofts, David Cooper, Gemma Nash, Richard Ellis, Sam Harrison + PDRA

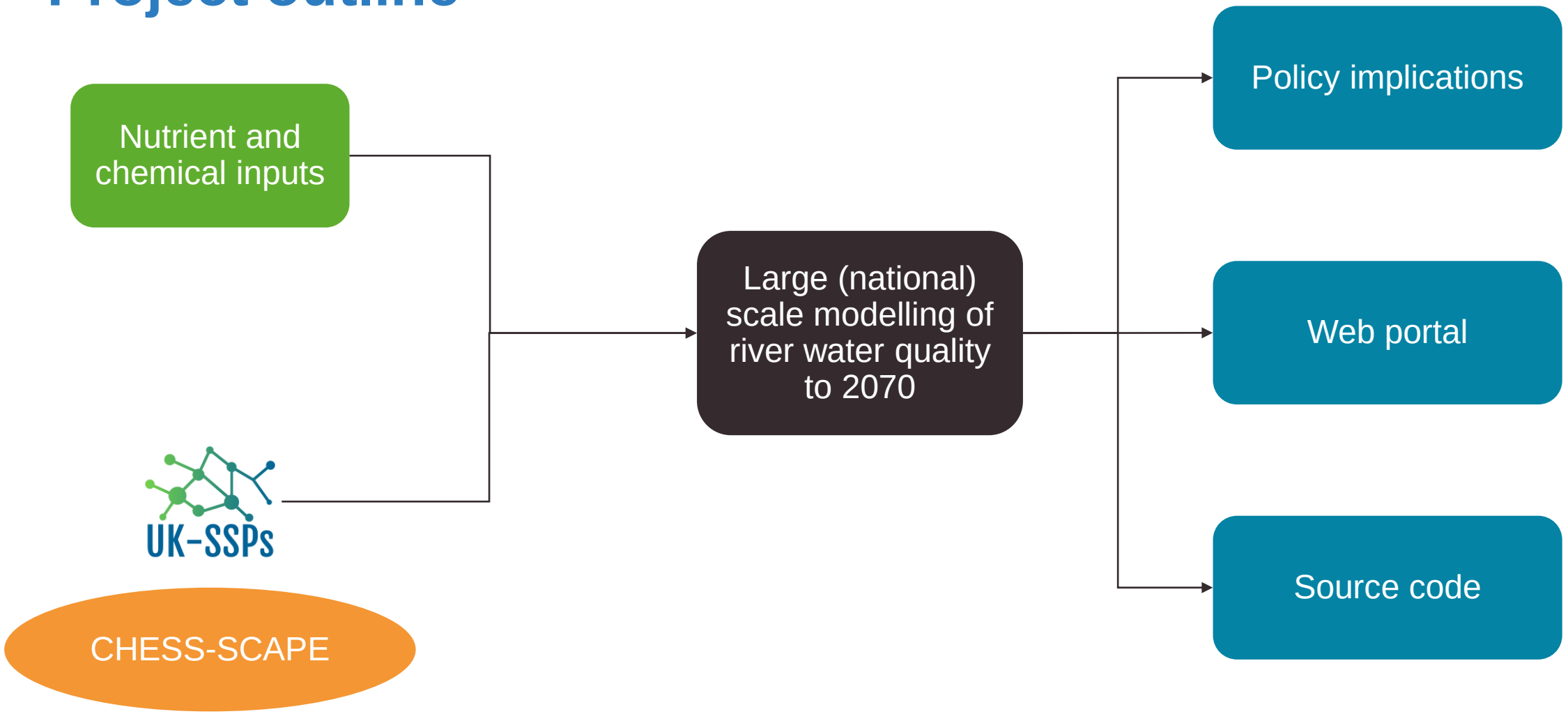
Rothamsted Research: Alice Milne, Andy Whitmore, Ryan Sharp

Cardiff University: Ian Vaughan + PDRA 

British Geological Survey: Dan Lapworth, Matt Ascott, Marco Bianchi

Bowburn Consultancy: Martyn Kelly

Project outline



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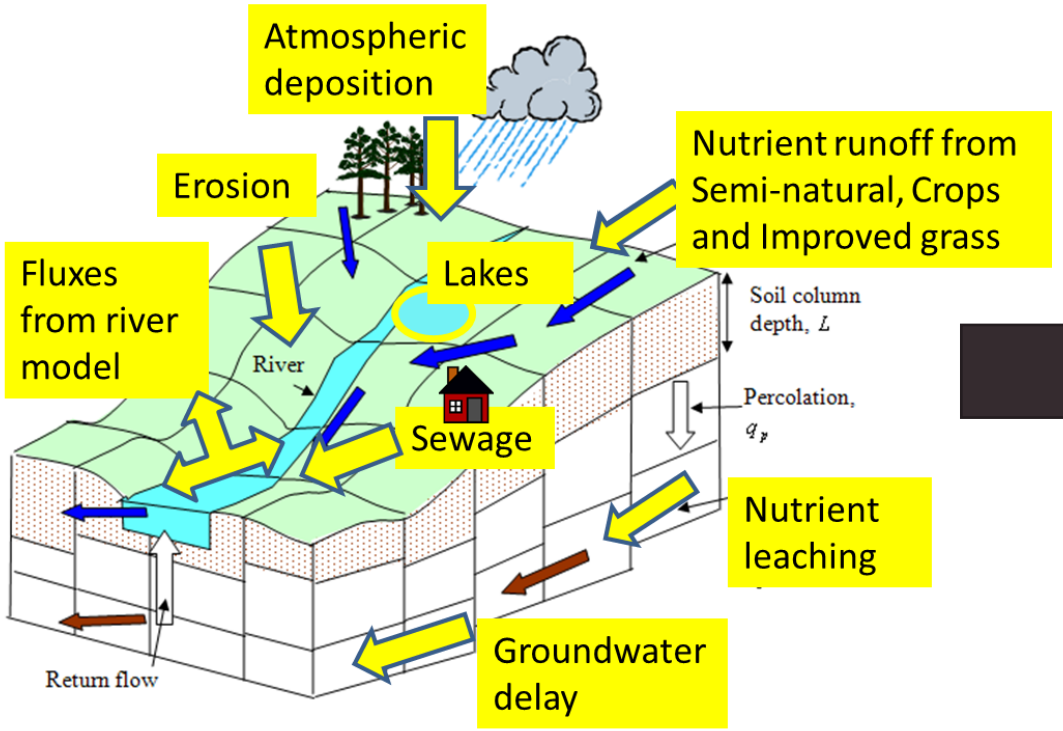
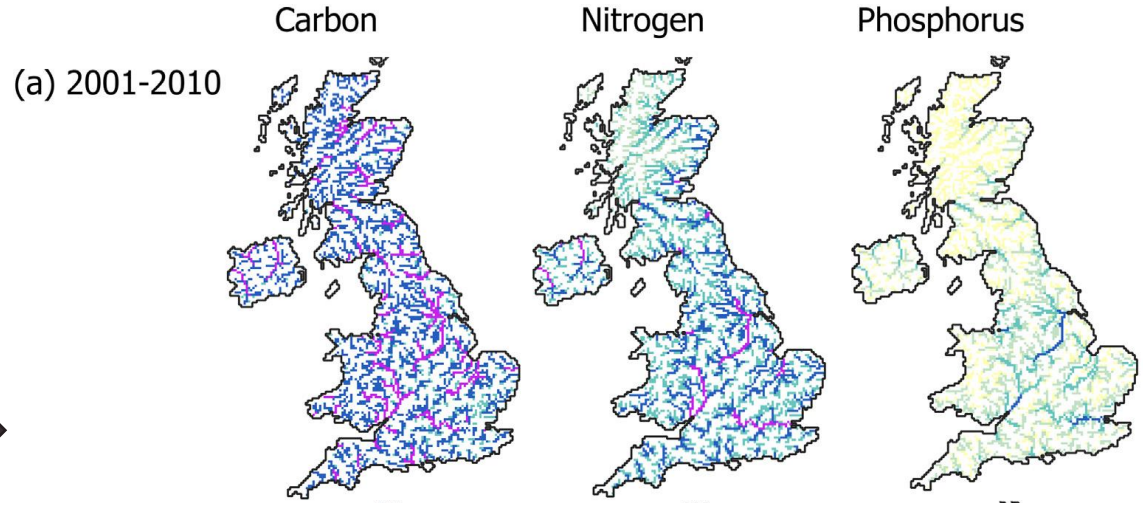
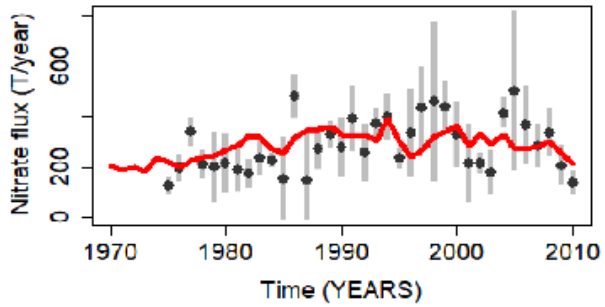
Project outline – LTLS model





Afon Conwy



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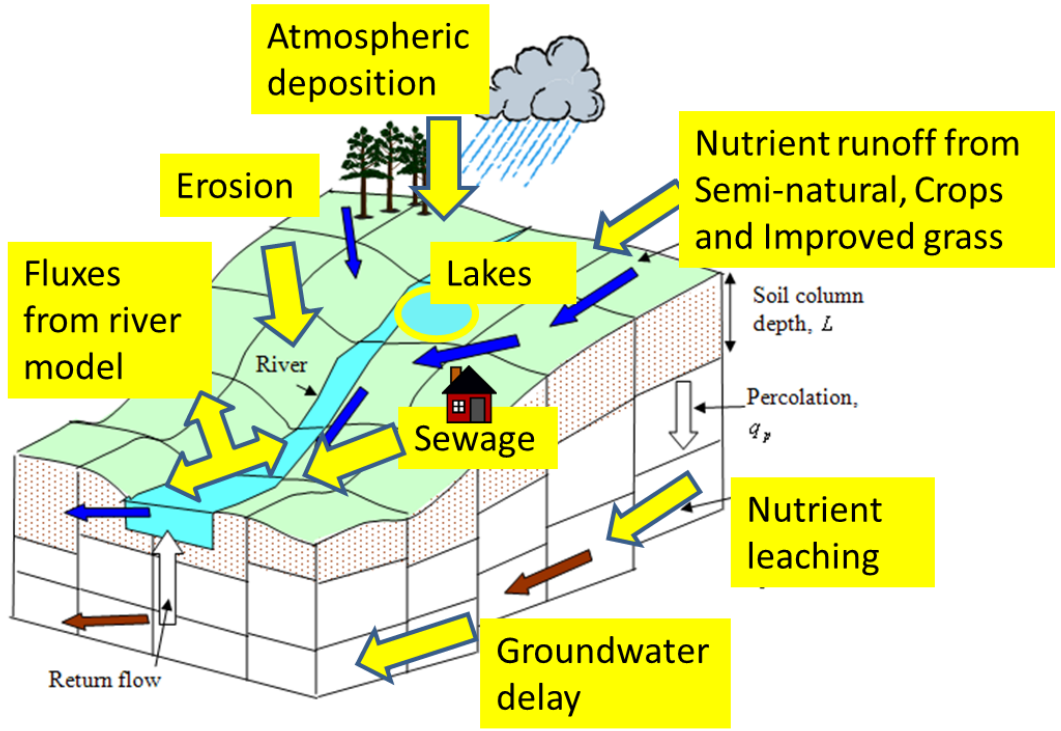
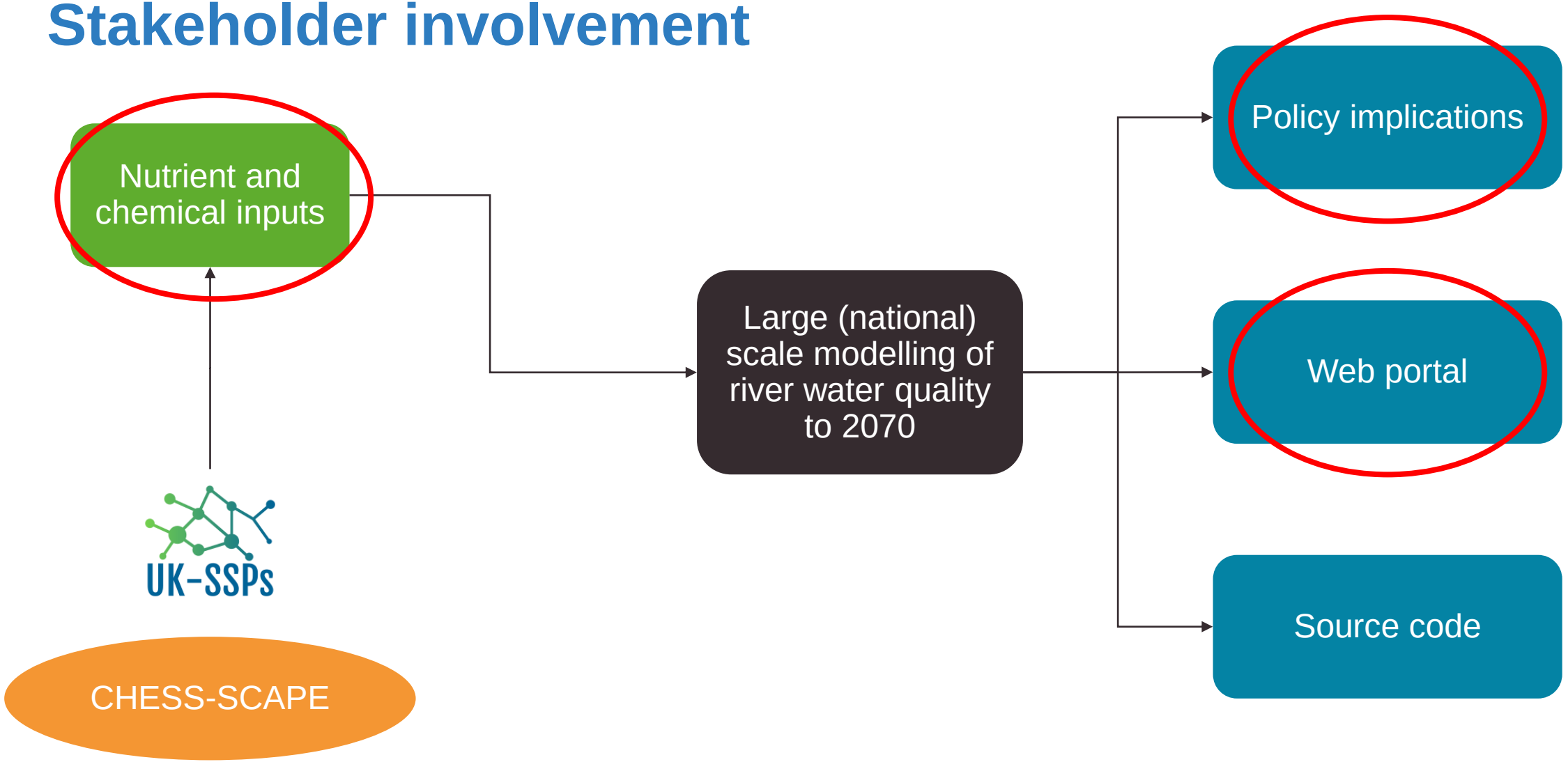
LTLS to LTLS-FE



- Inputs of chemicals
  - domestical/industrial (point) vs agricultural (diffuse)
  - Substance-specific e.g. abandoned mines
- Chemical modelling
  - Partitioning, degradation
- Impacts assessment
  - Benthic macroinvertebrates
  - Diatoms

Stakeholder involvement



Chemical prioritization

Medicinal substances (pharmaceuticals) and personal care products

Priority 1	Fipronil Caffeine Cetirizine Lamotrigine Telmisartan N,N-Diethyl-m-toluamide (DEET) Carbamazepine Triclosan
Priority 2[1]	Clarithromycin Diazinon Venlafaxine* Cefalexin* Clindamycin* Ofloxacin* Benzophenone-3*,[2]

Industrial chemicals

Priority 1	Tris (1,3-dichloroisopropyl) phosphate Triphenyl phosphate (TPPA)
Priority 2	Bisphenol A DEHP (Bis(2-ethylhexyl) phthalate) Perfluoro Octanoic Acid (PFOA) Perfluorooctane sulfonic acid (PFOS) Pentabromodiphenyl ethers Fluorotelomer alcohols*,[3] Decabromodiphenyl ether* Polychlorinated biphenyl (CB)118*

Polyaromatic hydrocarbons

Priority 1	Fluoranthene Pyrene
Priority 2	Benzo(a)pyrene

Agricultural pesticides - authorised

Priority 1	Dimethenamid (SAN 582H) Bentazone Boscalid (Nicobifen)
Priority 2	Cypermethrin Thiamethoxam*,[4] Clothiandin*,[5] MCPA and precursors/degradation products*

Agricultural pesticides - banned

Priority 1	Rotenone Diuron
Priority 2[6]	*Atrazine* *Hexachlorobenzene* *Hexachlorocyclohexane*

Other substances, including those already selected

Priority 1	Nitrogen Phosphorus pH Biochemical oxygen demand Aluminium Nickel Copper Zinc Cadmium Lead Manganese*,[7] Faecal coliforms
Priority 2	Arsenic* Tributyl tin* Silver*

[1] Selected by stakeholder survey (at least 80% of respondents), or was a specific suggestion not on the proposed list (marked *)
[2] Representative of UV sunscreen filter substances
[3] Precursor compounds to PFOA, frequently detected alongside PFOAs.

[4] Representative of neonicotinoids
[5] Neonicotinoid and degradation product of thiamethoxam
[6] No banned pesticide was voted for by 80% of stakeholders, so the three substances with 60% votes have been selected
[7] Suggested by stakeholder, had been wrongly omitted from the original list of

- Necessary to prioritise chemicals to be modelled
  - Prioritisation done with stakeholder input
  - Basis: likelihood of causing impacts, pragmatic need to limit numbers

Chemical inputs – data sources

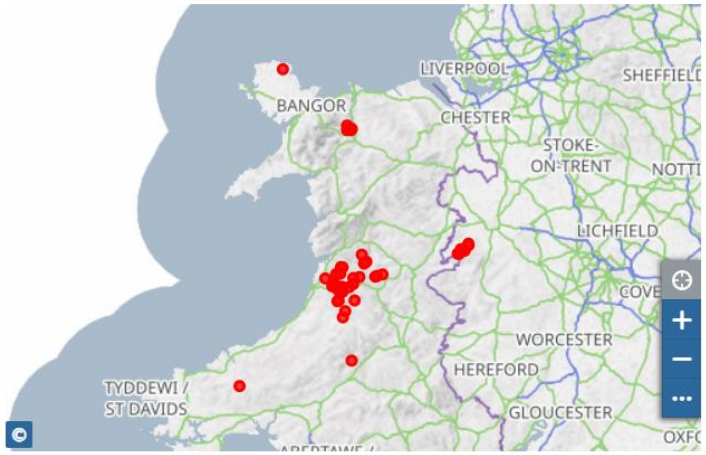
DataMapWales

Sign in

Home > Data catalogue > Inventory of Closed Mining Waste Facilities

Inventory of Closed Mining Waste Facilities

Natural Resources Wales



Display in map viewer >

Or display data on an existing map >

Type:	Spatial data
Category:	Environment >
Publication date:	20 April 2017
Licence:	Open Government Licence for Public Sector Information (OGL) >
Keywords:	features, NRW_MINING_WASTE_CLOSED_SITES
Point of contact:	opendata@naturalresourceswales.gov.uk

The European Mining Waste Directive (2006/21/EC) requires Member States to create an inventory of closed or abandoned mine waste facilities causing serious environmental impacts, and to make this inventory available to the public. A waste facility means any area designated for the accumulation or deposit of extractive waste.

Read full metadata

Department for Environment Food & Rural Affairs — Data Services Platform

Environment Agency — Water Quality Archive — Home Download Documentation Explore

We would welcome your feedback to help us make future improvements.

Water quality data archive

This data is updated regularly

The data is updated within two working days of a new sample being added. We also do a complete data refresh each month which may include corrections to earlier data.

The data was last updated on **26 June 2023** and the latest complete refresh was on **19 June 2023**

About this service

The Water Quality Archive provides data on water quality measurements. Samples are taken at sampling points around England and can be from coastal or estuarine waters, rivers, lakes, ponds, canals or groundwaters. They are taken for a number of purposes including compliance assessment against discharge permits, investigation of pollution incidents or environmental monitoring. The archive provides data on measurements and samples dating from 2000.

Only *complete* samples, where all analyses have been completed, are included. Currently the dataset does not include all groundwater or third party data. In addition, where measurement results are reported as text, we are currently unable to display the results due to size limitations. Examples where this may happen are for some location data at default sampling sites and gas chromatography mass spectroscopy or metals scans. These results are available on request. Data may also be subject to change after publication.

Download
Download water quality archive datasets to your computer.
Download

Understand
Documentation on the structure of data in this archive, and the meanings of the terms used.
Understand

Explore
Explore the data to find water sampling points at a particular location and their associated data.
Explore

Scenario development → chemical input futures

UK-SSP1: **Sustainability**

UK-SSP2: **Middle of the Road**

UK-SSP3: **Regional Rivalry**

UK-SSP4: **Inequality**

UK-SSP5: **Fossil-fuelled Development**

"Stories about what happened in the future"

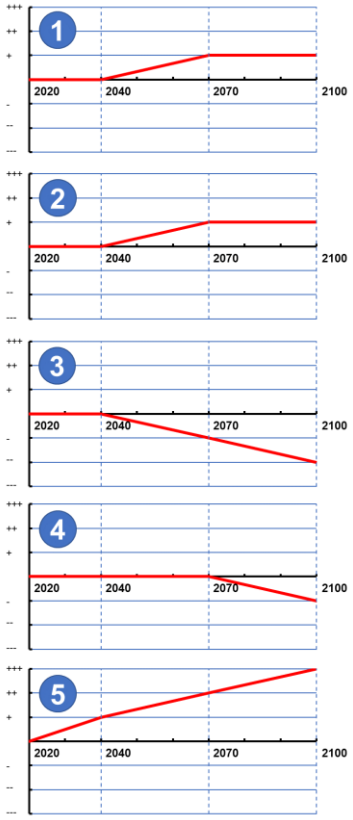
Exploratory scenarios, downscaled from global and European SSPs

Five plausible but contrasting future societal directions

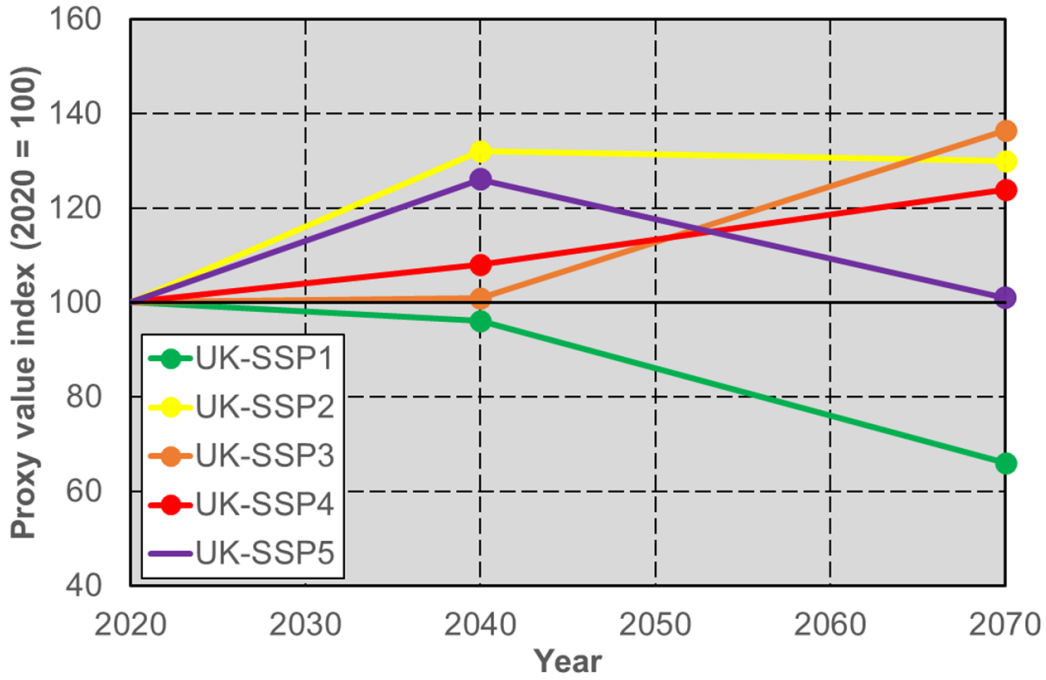
Elements co-developed with UK stakeholders

Used to identify key drivers of outcomes and impacts, challenge policy development

Population (IIASA)



Proxy trends workshop – September 2023



Spatiotemporal chemical input patterns to 2070

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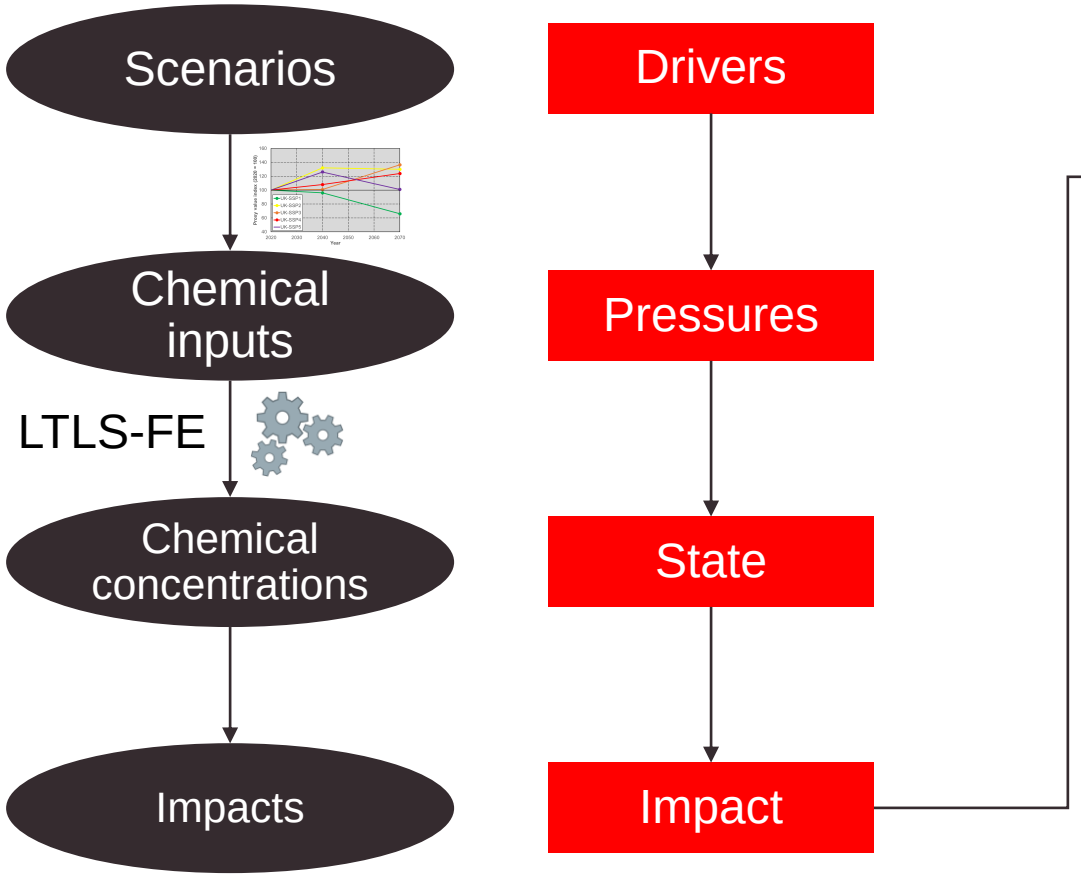
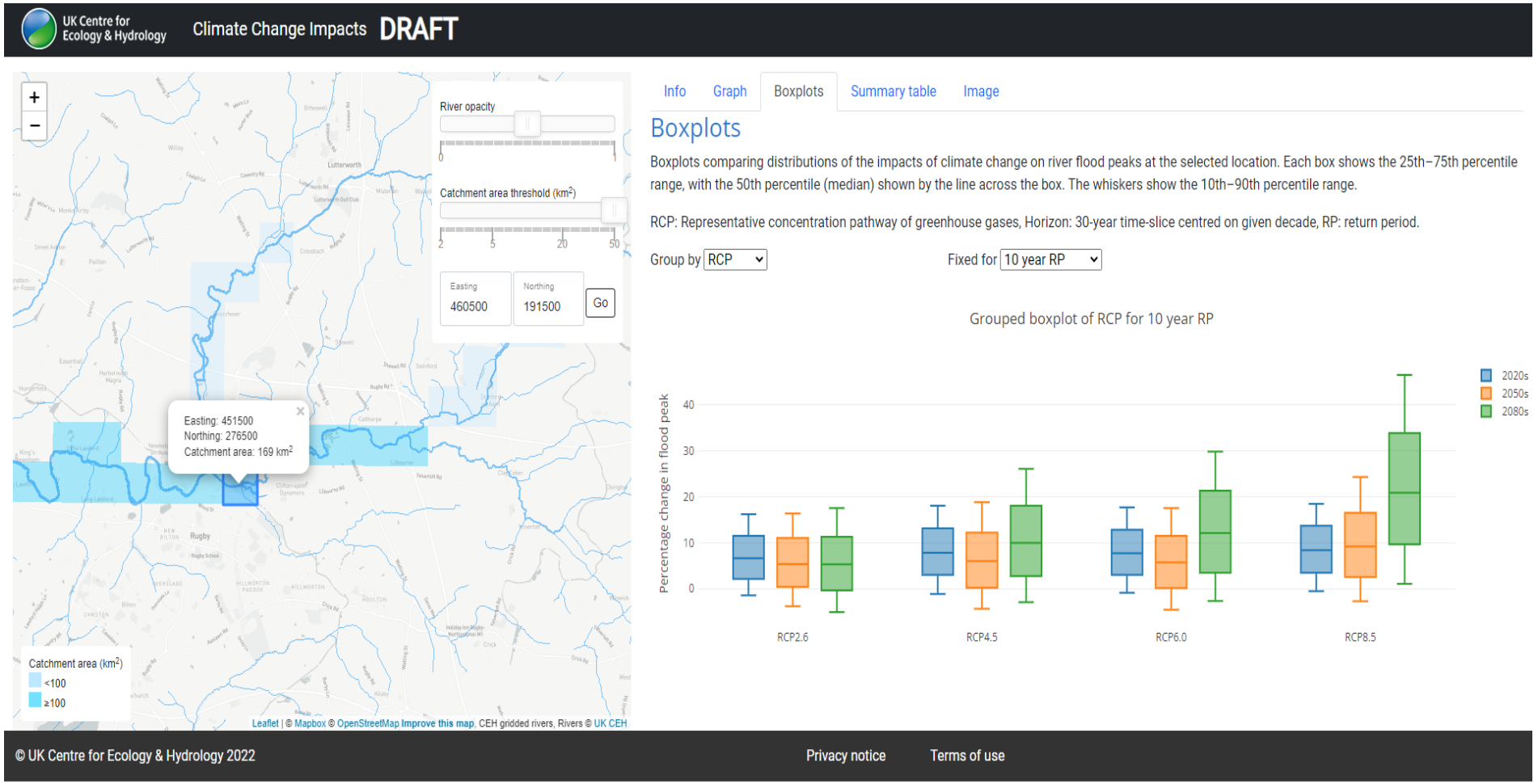
Scenario outcomes → policy challenge



"What policies would you develop and implement to manage the FWQ situation in 2040?"

Modelling outcomes → web portal



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Thank you!

https://www.ceh.ac.uk/our-science/projects/long-term-large-scale-freshwater-ecosystems-future-scenarios-analysis

UK-SSPs:

https://www.camecon.com/uk-socioeconomic-scenarios/

CHESS-SCAPE:

https://uk-scape.ceh.ac.uk/our-science/projects/SPEED/future-climate-projections

LTLS:

Bell, VA et al. (2021). Sci. Tot. Environ., 776, 145813

https://doi.org/10.1016/j.scitotenv.2021.145813