Co-designing the UK Environmental Exposure Hub: findings and next steps

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The challenge

- Difficulty integrating exposure data over spatial and temporal scales.
- Integration workflows are often not reproducible.
- The need to connect data to understand the sources, pathways, sinks and effects of pollution on human and ecosystem health.

The solution:

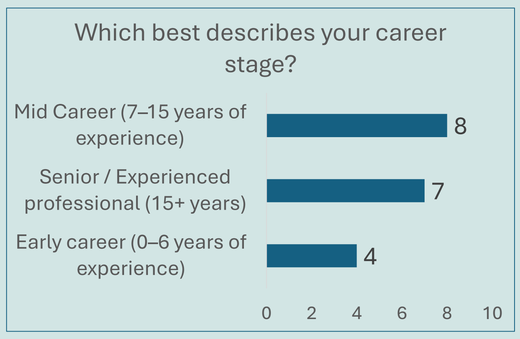
- Through co-design we are developing a UK knowledge hub for atmospheric, aquatic, & terrestrial chemical pollution relevant data, and other resources (e.g. data, models, methods,...)

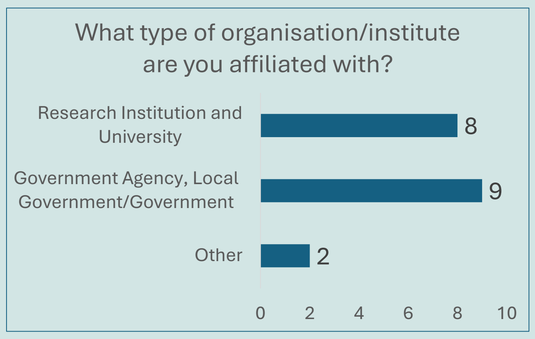
Our vision: The UK-EEx Hub:

- Will offer a suite of resources (tools, datasets, web apps) to enable the community to explore the chemical state of the UK environment.

Co-design with community

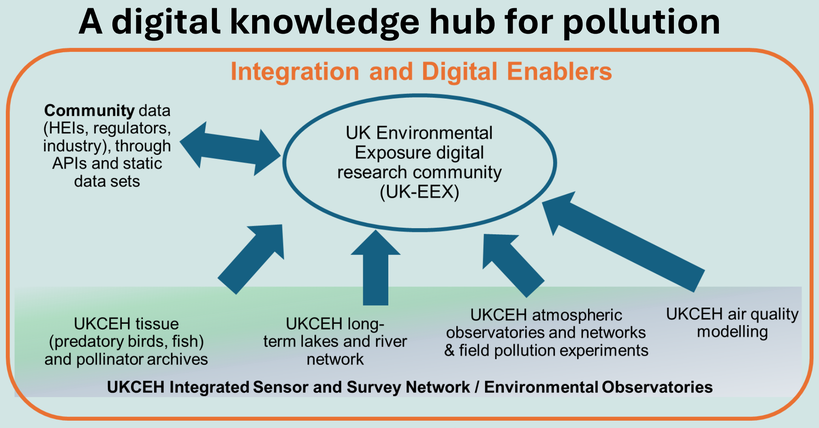
- 'Community Conversation' online event held December 2025.
- Included a set of presentations, followed by polls and group breakout discussions.
- Attendees (n=40) were invited to complete a post-event survey (n=19).





The UK Environmental Exposure Hub

A digital knowledge hub for pollution



We showcased tools and methods for inclusion in the UK-EEx Hub at our community conversations. Published methods are available from the Environmental Data Science Toolbox.

Methods for data integration across compartments (air, water, soil, biota)

Methods for exploring place-based chemical exposure

Methods for visualising Non-Target Analysis (NTA) data

Next steps

Guiding the Next Phase of UK-EEx Hub Development

Advance data integration and visualisation methods across priority exposure resources, with a focus on high-priority chemicals (identified by participants).

Define metadata requirements to enable thematic links and integration across air, biota, water, and soil, and to support improved archiving practices.

Develop user interfaces that surface metadata connections, enabling users to explore related exposure resources and reflect real user journeys.

Grow collaborative opportunities with the environmental science community to build on current UK-EEx Hub developments.

Findings from community conversations

	Pillar 1: Cross-Domain Integration	Pillar 2: Data Quality & Reliability	Pillar 3: Systems-Thinking Approach	Pillar 4: Metadata & Provenance	Pillar 5: Exploration & Visualisation of Data
Community needs	Users need to combine datasets seamlessly across traditional domain boundaries to build a picture of environmental exposure.	Users need confidence in the accuracy, origins, and trustworthiness of the data they rely on.	Users want to move beyond isolated metrics and siloed data practices so they can capture the full complexity of environmental exposures.	Users need clear provenance information on data origins, creation processes, and processing history to interpret and trust results.	Users need intuitive ways to explore and visualise data to reveal patterns, trends, and relationships.
Implications	The UK-EEx Hub must prioritise interoperability and integration to bridge aquatic, atmospheric, and terrestrial data sources.	The UK-EEx Hub must implement rigorous quality standards (e.g. CREED) so that data and methods are reliable and credible.	The UK-EEx Hub must support a systems thinking approach to help users understand interactions and causal relationships across the exposure landscape.	The UK-EEx Hub must provide robust metadata and provenance records so users can validate findings and reproduce results with confidence.	The UK-EEx Hub must provide accessible, flexible visualisation tools that help users interrogate data, compare domains, and generate insights.

Workshop report:

Agyei et al. (2026) Report on Community Conversation #4: enhancing discoverability & access to environmental exposure data and methods. NORA

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