JNCC System Level Indicators visual tool manual (January 2025)

The tool allows users to visually integrate pollutant and environmental datasets based on user inputs.

Contents

Top-level Tabs

Spatial Trends – for visualising point and gridded datasets.

Indicator – State of the environment indicator map and charts.

Data Sources – Data and thresholds used for the state of the environment tab.

Data Catalogue – Details and links to the sources of the data used in this tool.

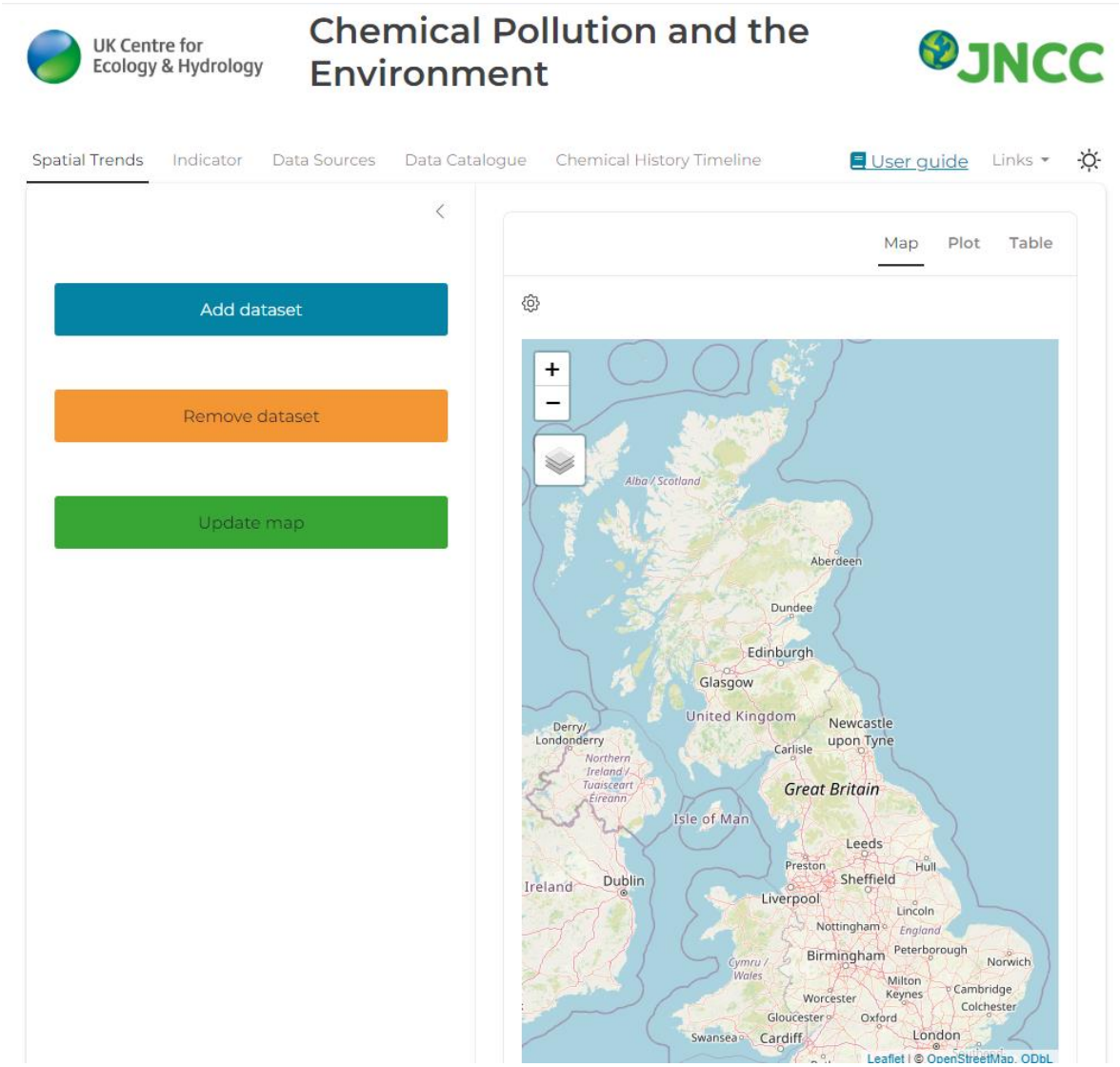
About – Details and links to contacts and various compliance notices.

Note that, currently, the inputs from the top-level tabs are *independent* to each other.

Quick start:

- Click Add dataset
- Make dataset selections
- Click Update map

Figure 1. The home screen when the tool is opened:



Adding data in the Spatial Trends tab

Click the **blue 'Add dataset' button** and choose a dataset from the dropdown list. The user interface will change depending on the dataset selection.

In the example below using PFAS data, the user can select the range of years, the matrix in which the measurements were taken, the specific PFAS substance, the log transform method applied to the data colour map, and whether to show the data as a heatmap (as opposed to individual points).

Once you are happy with your selections click the **green 'Update map' button** to show the data on the map.

You can add up to five datasets at one time, each will have a different colour map applied. The last dataset can be removed by clicking the **orange 'Remove dataset'** button.

Note that on the map subsequent dataset are laid over the top of each other. For example, Dataset 2 is overlaid on top of Dataset 1, and so on.

Figure 2a. Dataset 1 with options selected

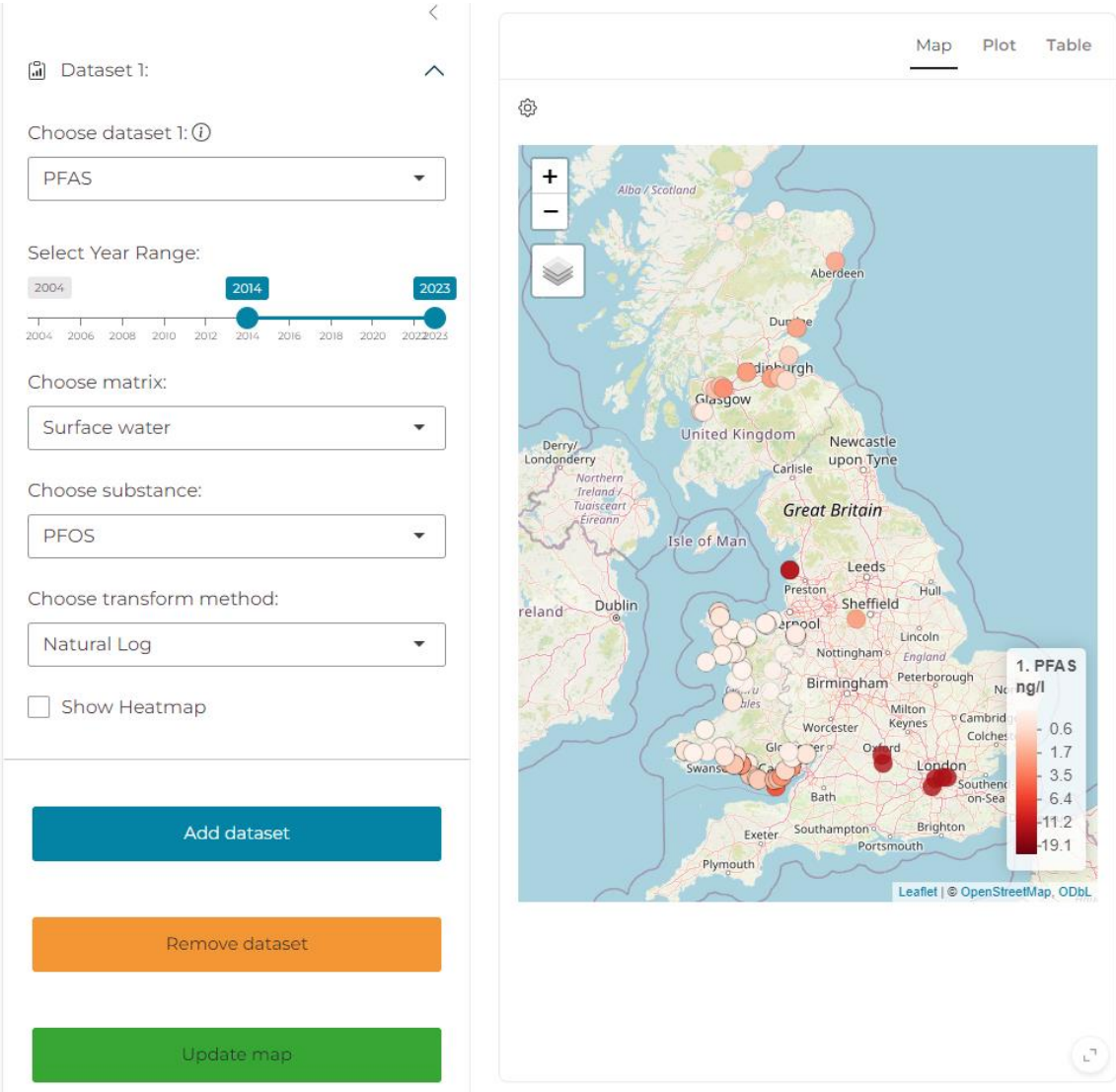
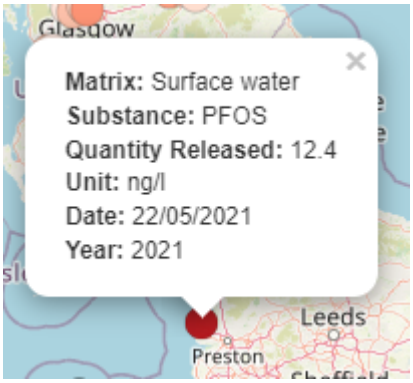
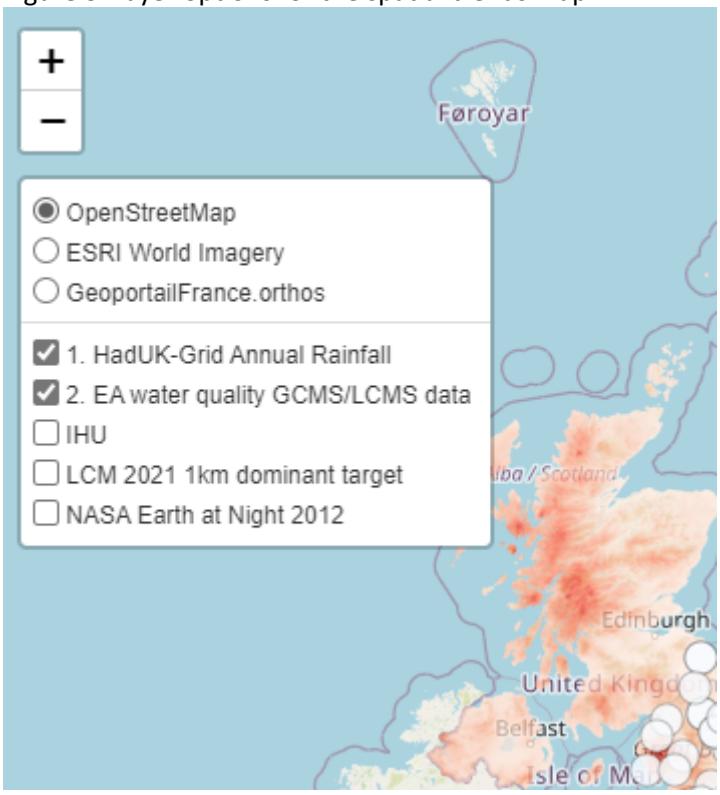


Figure 2b.
Click on a circle marker to show further details for that data point:



The **layers button** in the top left of the map has several functions. A different basemap can be selected, the currently selected datasets can be added or removed, additionally contextual datasets can be added such Integrated Hydrological Units or the UKCEH Land Cover Map.

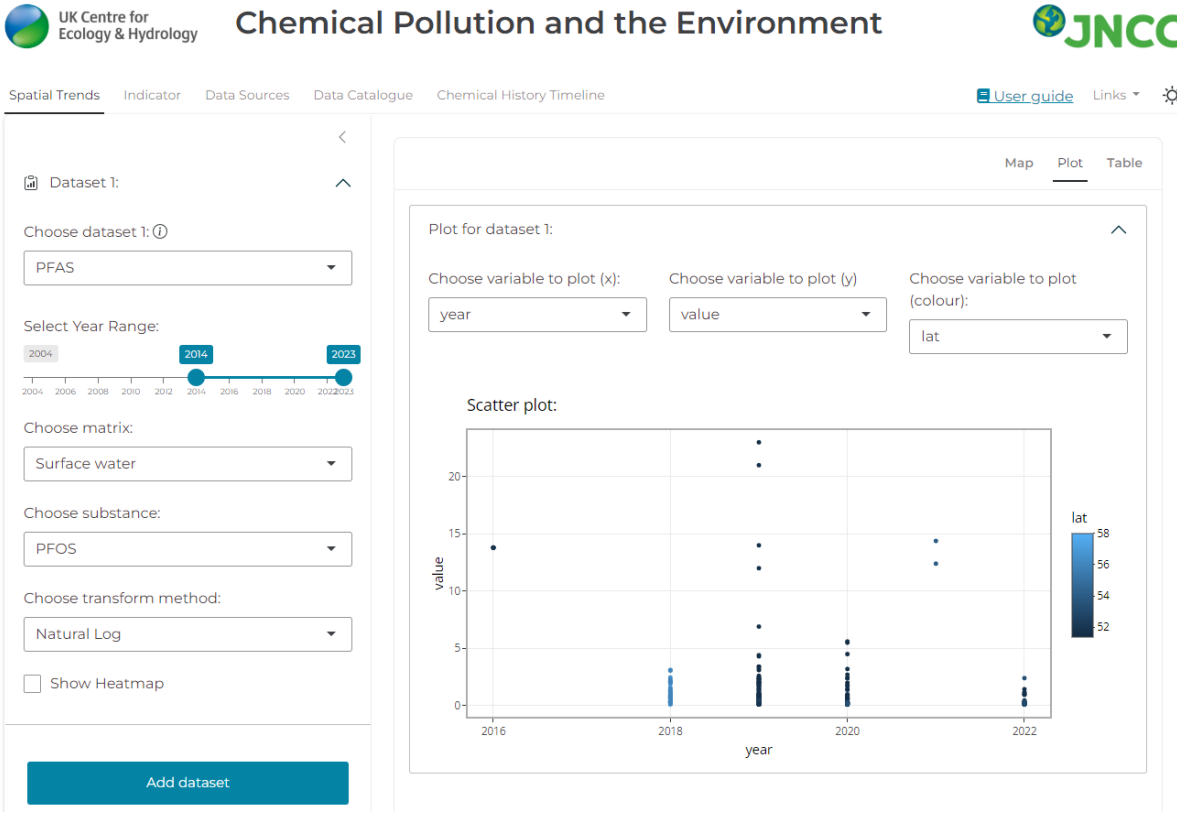
Figure 3. Layer options for the spatial trends map.



Plot and Table sub-tabs

In the top-right of the map, the **Plot tab** allows you to plot two numeric variables from the current data selection against each other on a scatter plot, and to colour by a third variable. Note that this functionality is not available if the dataset is a raster layer.

Figure 4. Plot sub-tab within the Spatial Trends tab. Plot is selected in the upper right corner. Surface water PFOS values are plotted against year and coloured by latitude.



The **Table tab** shows the raw data of the current data selection in a table. This can be filtered using the search bar in the top right. Again, this functionality is not available for raster layers.

Note: The **Plot tab** and **Table tab** are updated on-the-fly with your input selections, even without hitting the **Update Map** button.

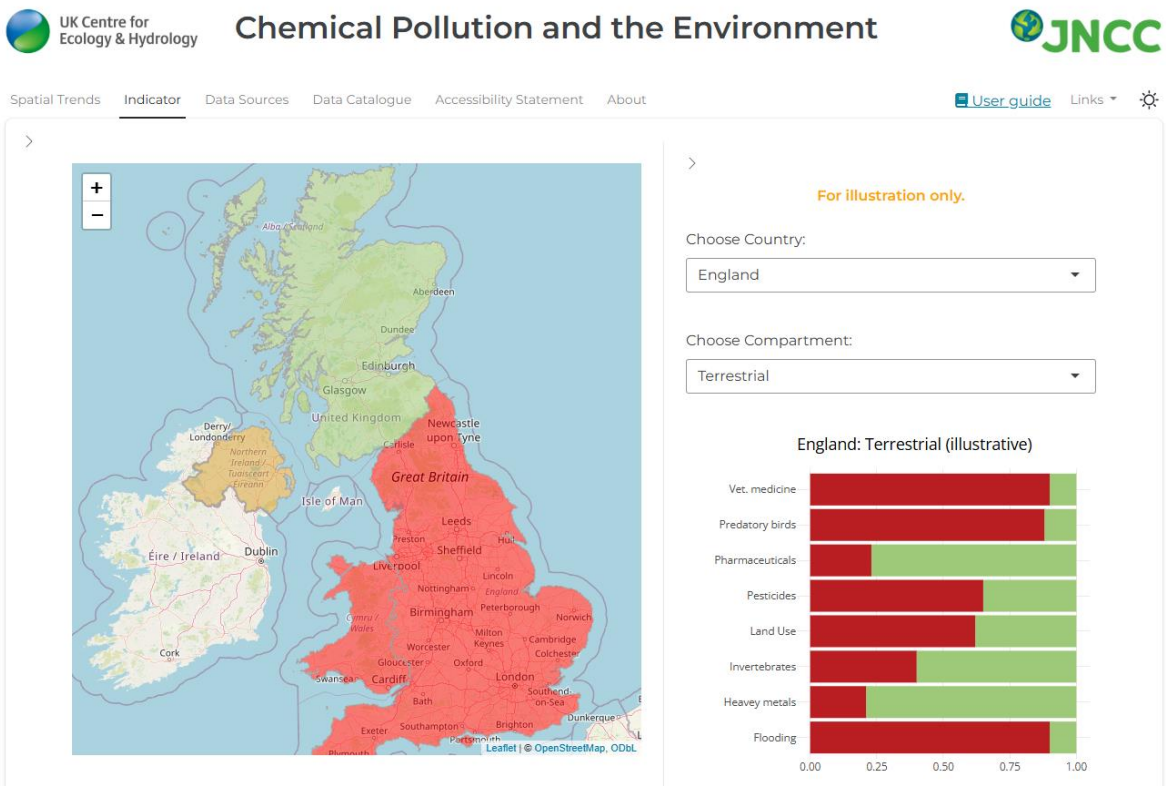
Indicator tab

A demonstration of how environmental and pollutant data can be grouped and summarised to indicate the state of the environment across different countries, compartments and sectors. While real data has been used, it has been applied in a way that is illustrative rather than meaningful, so the visualisation should only be viewed as a conceptual example.

On the map, the colour indicates overall state of the environment for a region. Hover over a region and a pop-up bubble shows percentage 'health' of all sectors for a country, as well as some statistics for specific pollutants in different settings.

On right-hand-side you can choose a country and choose a compartment – terrestrial, freshwater, marine, or air. The bar chart indicates the 'health' of that sector for the chosen country and compartment. Hovering over the bar with the mouse gives the exact value.

Figure 5a. Indicator tab, with the state of the environment feature.



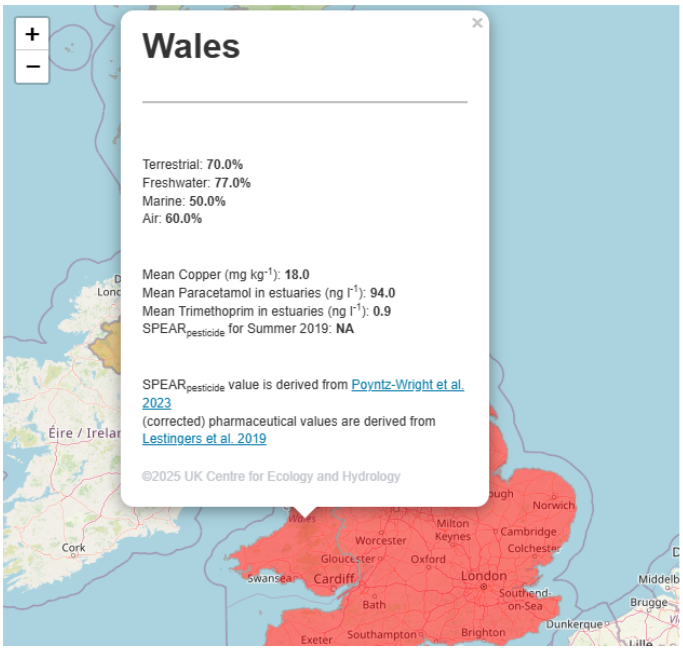


Figure 5b. Pop-out bubble showing state of the environment percentages for Wales. Also listed are mean concentration of copper, paracetamol and trimethoprim, and species at risk (SPEAR) index for the sensitivity of species to pesticide exposure.

Data Sources

This tab provides the data sources and thresholds used to report the overall status of the environment. Intended to replicate the EU Soil Observatory dashboard sources page. The thresholds for this tool are not yet developed.

Data Catalogue

A catalogue of the datasets included in this tool.

Accessibility Statement

An accessibility test was carried out and the statement prepared using the WAVE Web Accessibility Evaluation Tool on 27th February 2025.

About

General information about the tool, contact details and compliance.

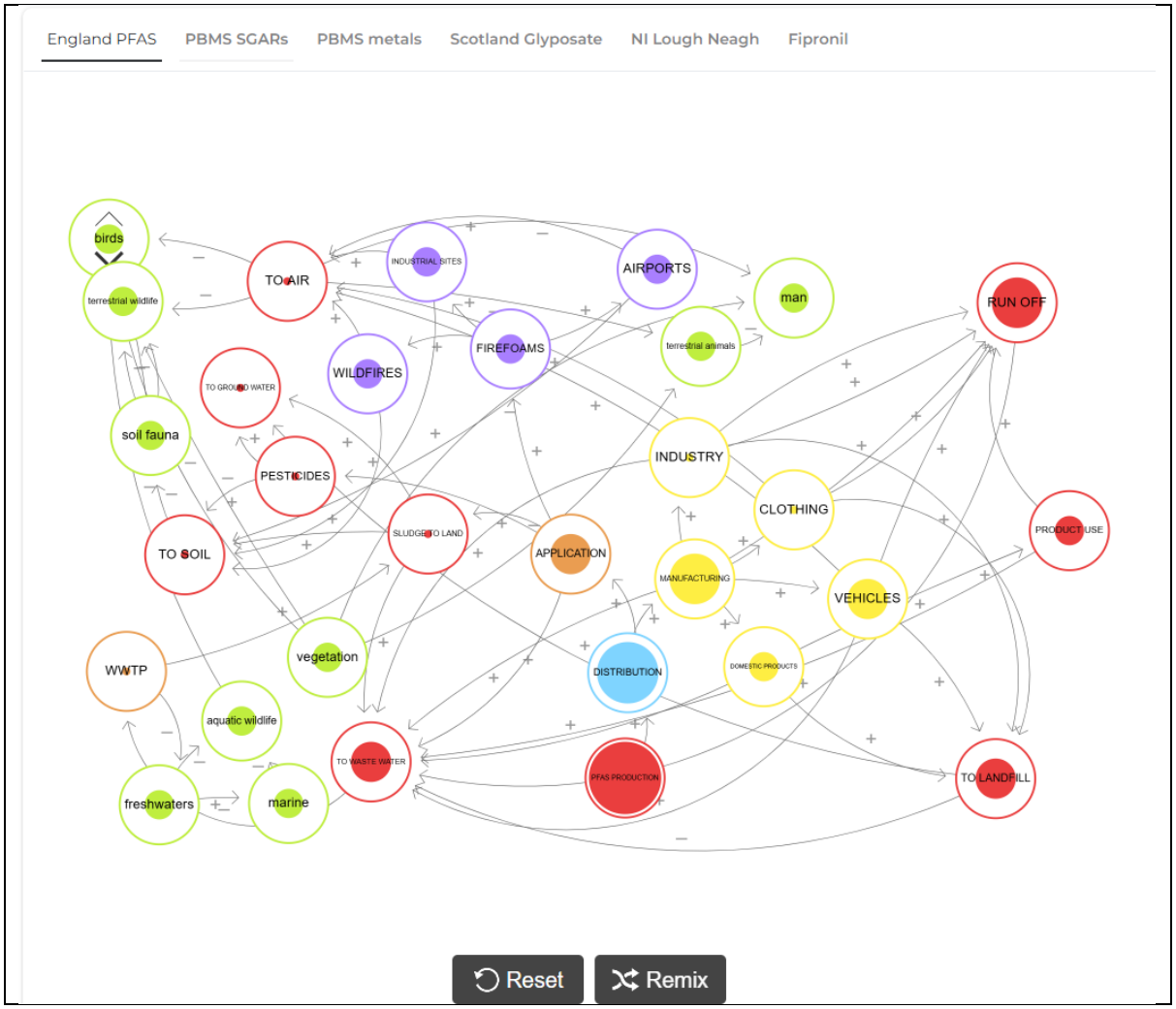
Case study causal loop diagrams

Found in the 'About' tab, causal loop diagrams help to visualise systems thinking for the case studies. These were made in LOOPY.

Each node represents a variable in the system. Arrows between nodes show the relationships and indicate the direction of influence. Arrows marked as positive represent positive feedback loops and amplify changes in the system, while those marked as negative counteract changes and stabilise the system. Adjust node values by clicking on the up and down arrows within the circle.

Click the reset button to return to the default starting point. The remix button takes you to the diagram on the LOOPY website where you can edit it yourself. User the tortoise-to-hare slider to change the speed.

Figure 6. PFAS causal loop diagram



Other features.

In the top right, links to this user guide and the code on GitHub can be found, alongside the option to switch between light and dark mode.

Known issues

- Hiding and unhiding the same dataset may result in duplicate legends. This happens when user press 'update map' more than once for the same dataset but with different selections. To overcome it, choose a different dataset and press update map first, and then switch back to . In the long run, we will update the way legends are named in the background.
- The Plot and Table preview in 'Spatial Trends' does not work for raster table (e.g. HadUK rainfall, AgZero+ Input to Yield ratio, Cats and Dogs density). Error message handling for this is under development.
- Starting up of app is quite slow (sometimes > 10s)
- Updating map is quite slow (sometimes takes a few seconds)

Troubleshoot:

- I get an error after I press ‘add dataset’ and ‘update map’
    - Please expand the Dataset 1 (or 2-5) tab to load the data. For some reason beyond our control, the data selections don’t get passed on unless you have done so.

Frequently asked questions

- How many datasets can I add in the Spatial Trends tab?
    - Currently, a user can add up to 5 datasets. Note that Dataset 2 is overlaid on Dataset 1, and so on.