Using R Shiny to visualise and share your data
A UK drought story

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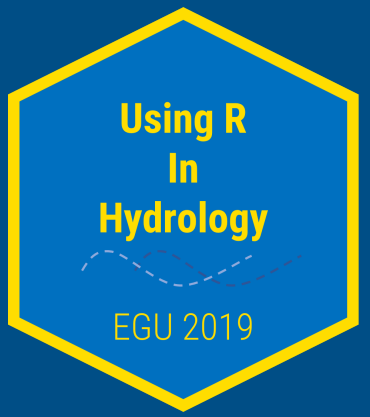

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What is Shiny?

"Shiny is an R package that makes it easy to build interactive web apps straight from R. You can host standalone apps on a webpage or embed them in R Markdown documents or build dashboards. You can also extend your Shiny apps with CSS themes, htmlwidgets, and JavaScript actions."

https://shiny.rstudio.com/

Getting started!

Install the **shiny** package from CRAN:

```
install.packages("shiny")
```

Check out https://shiny.rstudio.com/ for tutorials, a gallery and cheatsheet.

Why did I need Shiny?

I was analysing 125 years of reconstructed flow data and extracted hydrological droughts using:

- 303 catchments
- 24 accumulation periods
- 3 event extraction thresholds
- at least 4 plot types per combination

87264 individual plots (not accounting for multi-panel plots)

Why did I choose Shiny?

Initially it meant I could:

- easily use dynamic plotting (like dygraphs)
- view data and all plot types for each catchment at the same time
- easily change the catchment, accumulation period or event extraction threshold

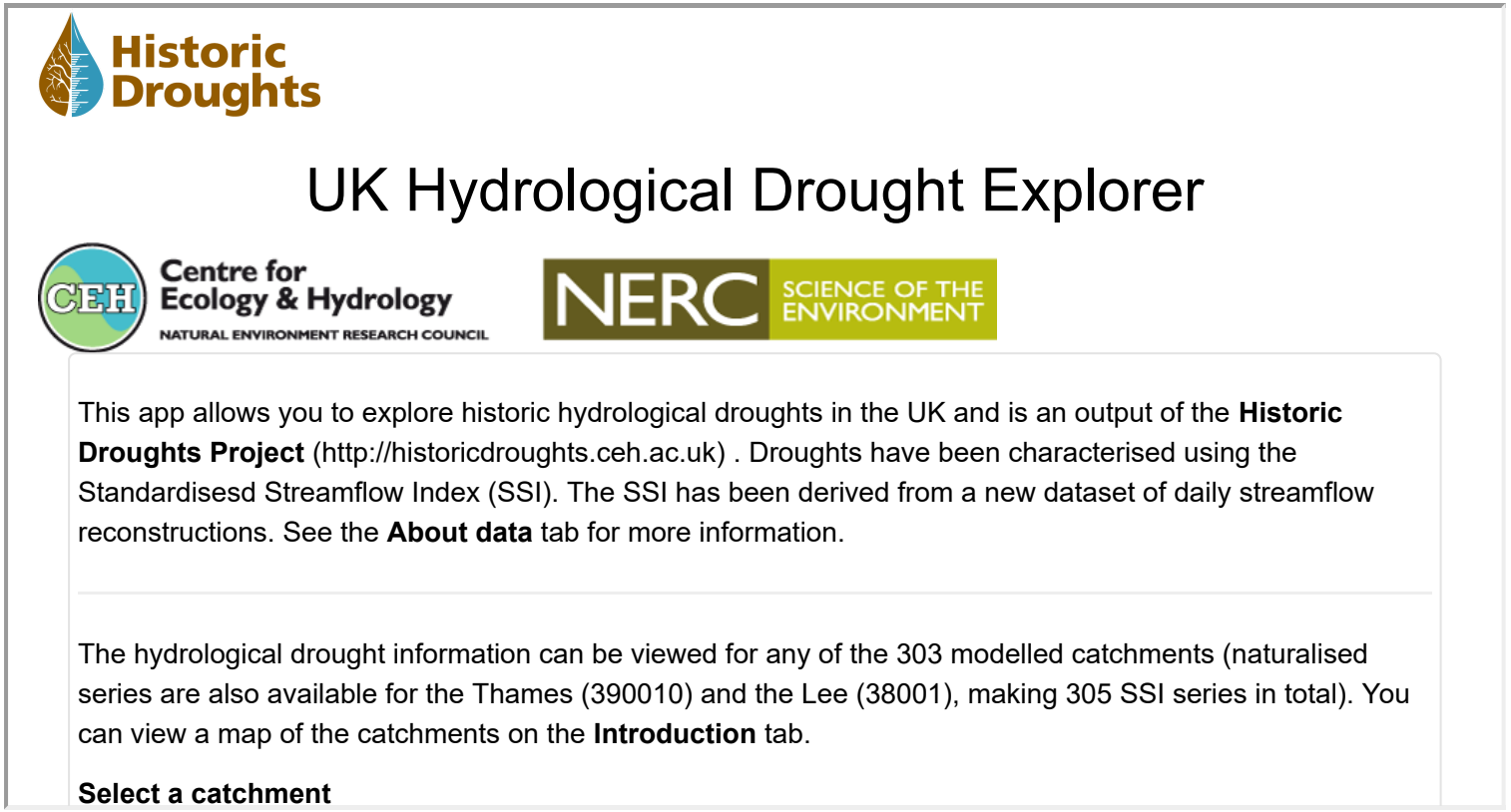
Now it means:

- People can explore hydrological drought data for 303 catchments across the UK over the last 125 years
- You can explore the published dataset before downloading it from the Environmental Data Information Centre (EIDC):

Barker, L.J. et al. (2018). Historic Standardised Streamflow Index (SSI) using Tweedie distribution with standard period 1961-2010 for 303 UK catchments (1891-2015). NERC Environmental Information Data Centre. https://doi.org/10.5285/58ef13a9-539f-46e5-88ad-c89274191ff9

UK Hydrological Drought Explorer

UK Hydrological Drought Explorer



UK Hydrological Drought Explorer

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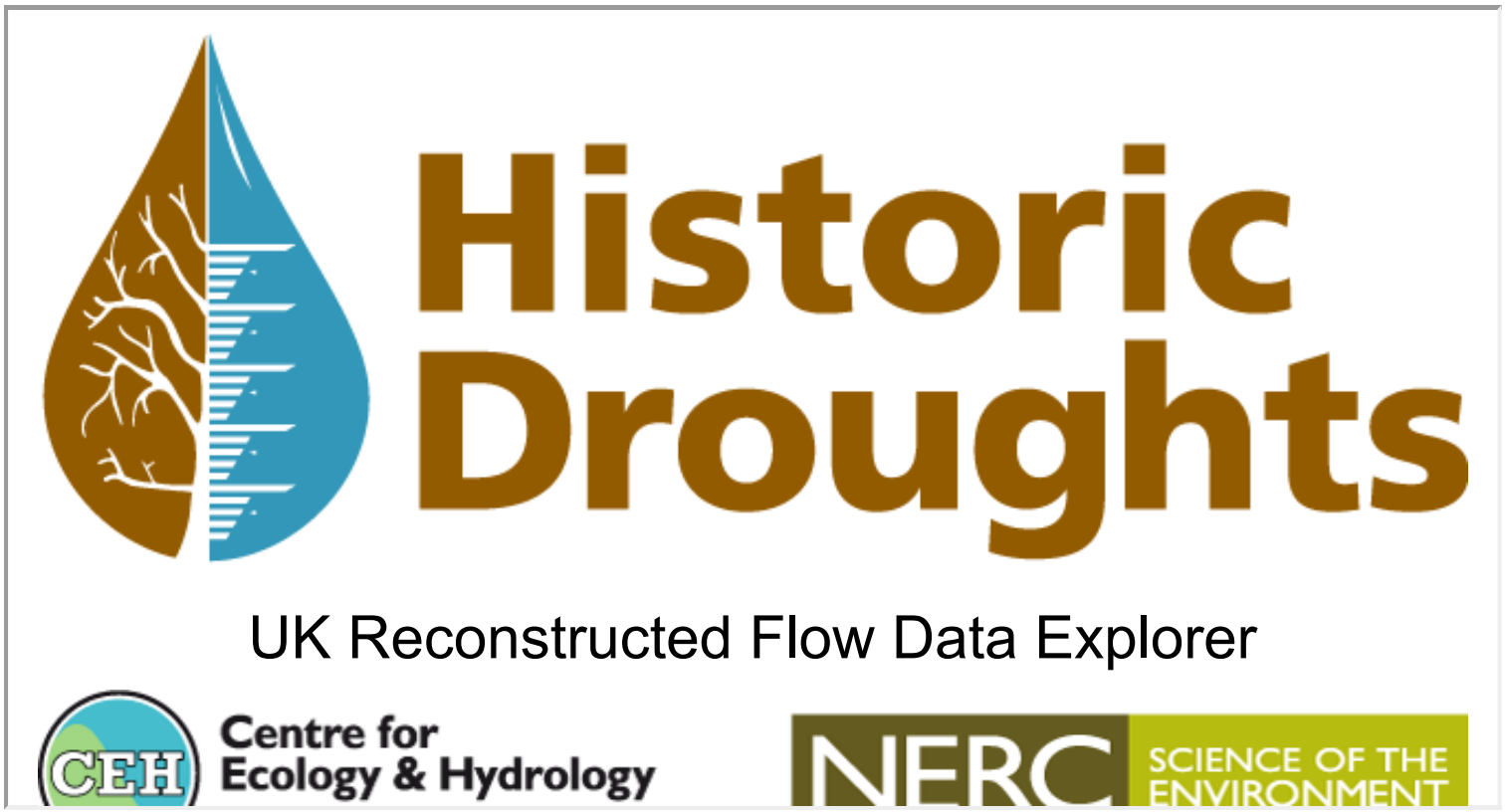
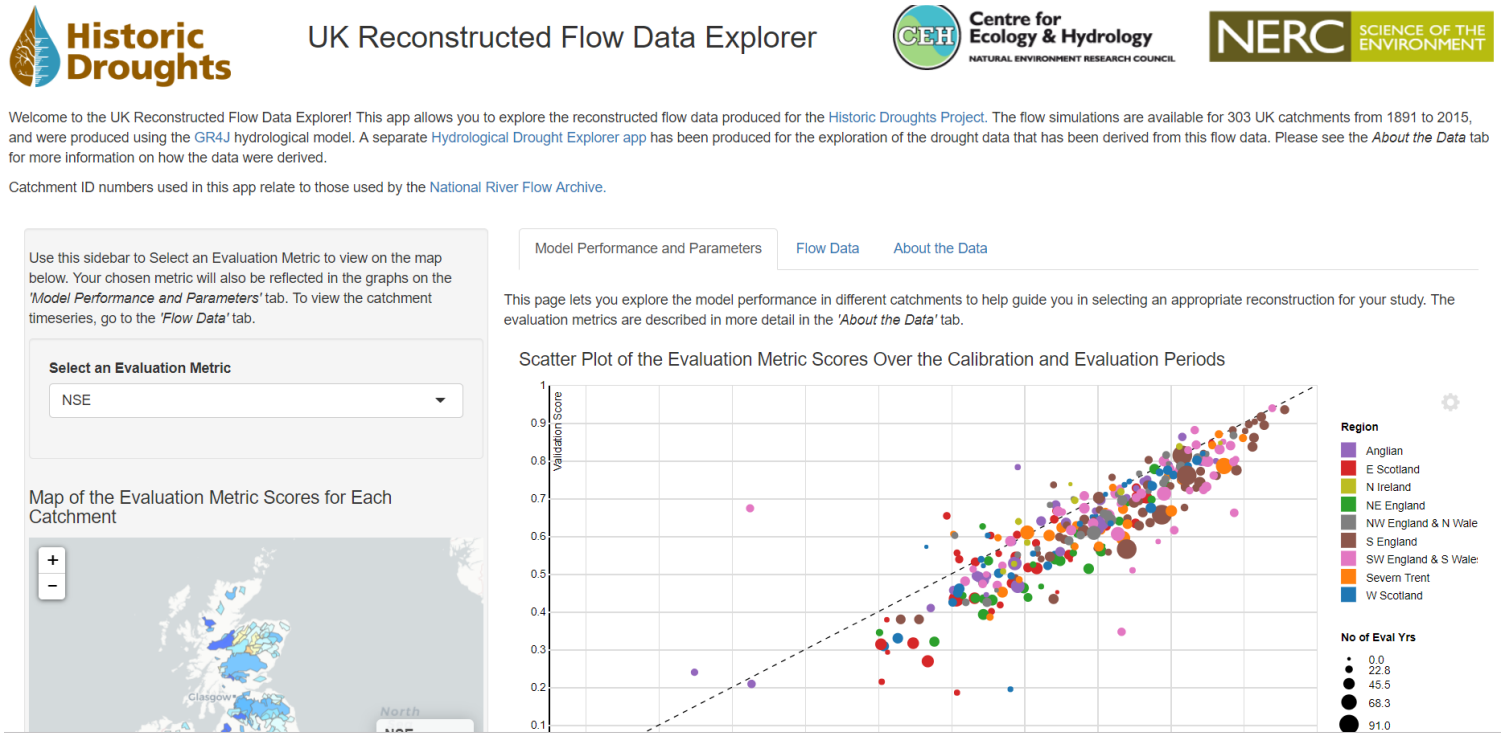
UK Reconstructed Flow Data Explorer

UK Reconstructed Flow Data Explorer

A companion Shiny app which shows the reconstructed flow data and the model evaluation metrics for the 303 catchments



UK Reconstructed Flow Data Explorer



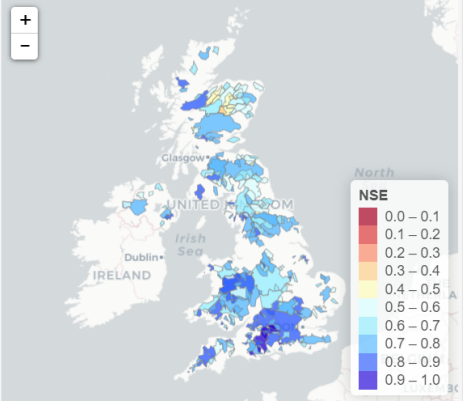
UK Reconstructed Flow Data Explorer

Use this sidebar to Select an Evaluation Metric to view on the map below. Your chosen metric will also be reflected in the graphs on the *'Model Performance and Parameters'* tab. To view the catchment timeseries, go to the *'Flow Data'* tab.

Select an Evaluation Metric

NSE

Map of the Evaluation Metric Scores for Each Catchment



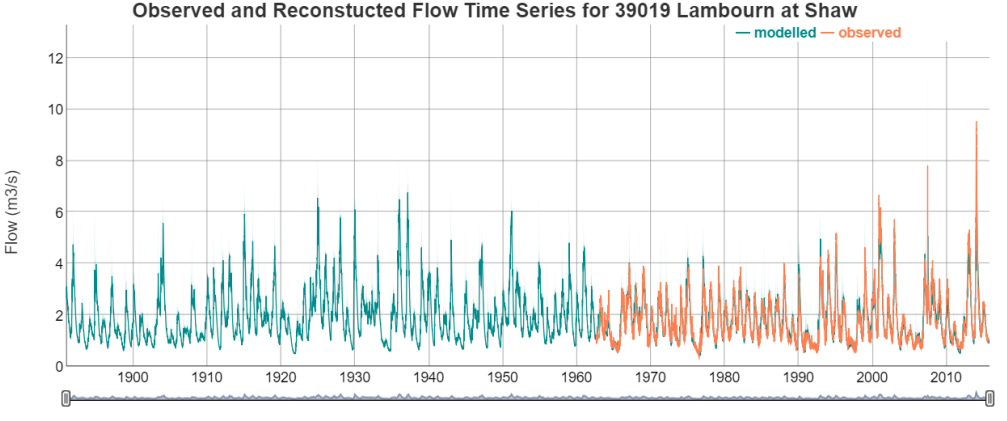
Model Performance and Parameters | Flow Data | About the Data

This page lets you view the timeseries data interactively. Select a catchment using the drop-down below.

Select a catchment

39019 Lambourn at Shaw

Please be patient, this graph takes a while to load as it processes 125 years of daily data.



This graph displays both the single best model run (turquoise line), and the range of the 500 ensemble members (shaded turquoise). The flow observations are

Shiny demonstration

Data

From the UK National River Flow Archive: www.nrfa.ceh.ac.uk/data/search

Downloaded data for Thames at Kingston, Lambourn at Shaw & Coln at Bibury (all SE England):

- Gauged Daily Flows
- Catchment Daily Rainfall
- Shapefile