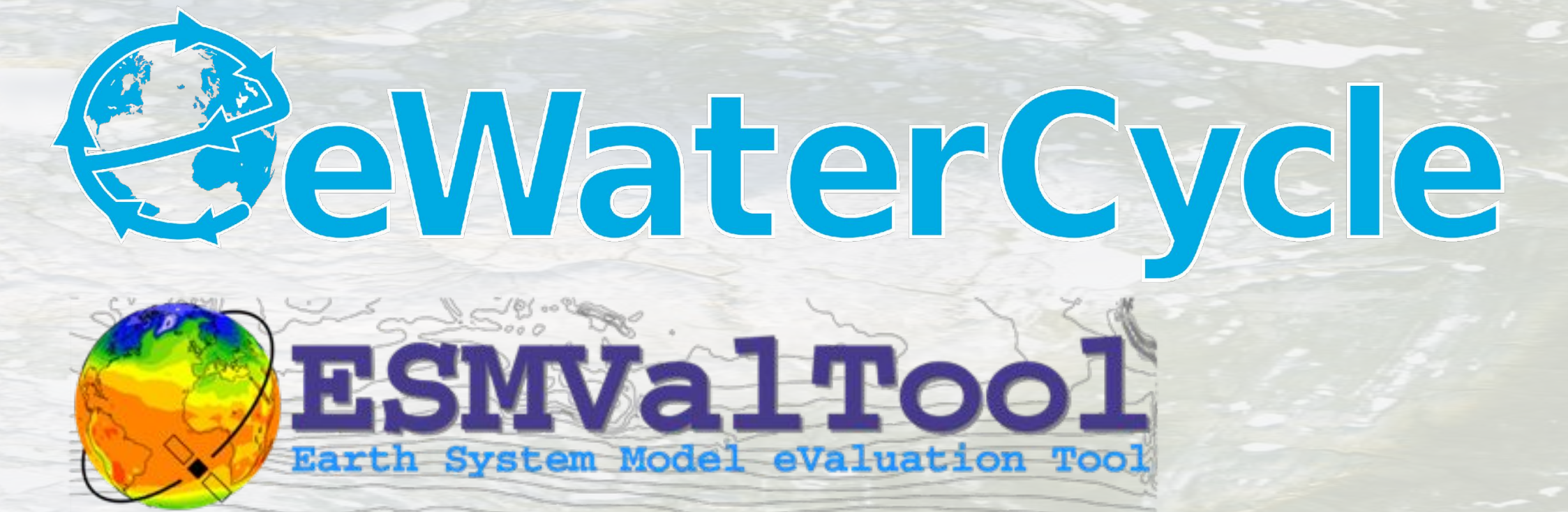


The eWaterCycle platform for FAIR and Open Hydrological Modeling



Niels Drost¹, Jaro Camphuijsen¹, Rolf Hut², Nick van de Giesen², Ben van Werkhoven¹, Jerom Aerts², Inti Pelupessy¹, Berend Weel¹, Stefan Verhoeven¹, Ronald van Haren¹, Eric Hutton³, Maarten van Meersbergen¹, Fakhreh Alidoost¹, Gijs van den Oord¹, Yifat Dzigan¹, Bouwe Andela¹, Peter C. Kalverla¹

¹Netherlands eScience Center, Amsterdam, Netherlands ²Delft University of Technology, Faculty of Civil Engineering and Geosciences, Delft, Netherlands ³Community Surface Dynamics Modeling System, Boulder, CO, United States



Abstract

The eWaterCycle platform is a fully Open-Source platform built specifically to advance the state of FAIR and Open Science in Hydrological Modeling.

eWaterCycle builds on web technology, notebooks and containers to offer an integrated modelling experimentation environment for scientists. It allows scientists to run any supported hydrological model with ease, including setup and preprocessing of all data required.

eWaterCycle comes with an easy to use explorer, so the user can get started with the system in minutes, and uniquely lets the user generate a hydrological model notebook based on their preferences.

The eWaterCycle platform uses Jupyter as the main interface for scientific work to ensure maximum flexibility. Common datasets such as ERA-Interim and ERA-5 forcing data and observations for verification of model output quality are available for usage by the models.

To make the system capable of running any hydrological model we use docker containers coupled through gRPC. This allows us to support models in a multitude of languages, and provide fully reproducible model experiments.

Based on experiences during a FAIR Hydrological Modeling workshop in Leiden in April 2019 we have created a common pre-processing system for Hydrological modeling, based on technology from the climate sciences, in particular ESMValTool and Iris. This pre-processing pipeline can create input for a number of Hydrological models directly from the source dataset such as ERA-Interim in a fully transparent and reproducible manner.

More Info

See more information in our website:

<https://www.ewatercycle.org>

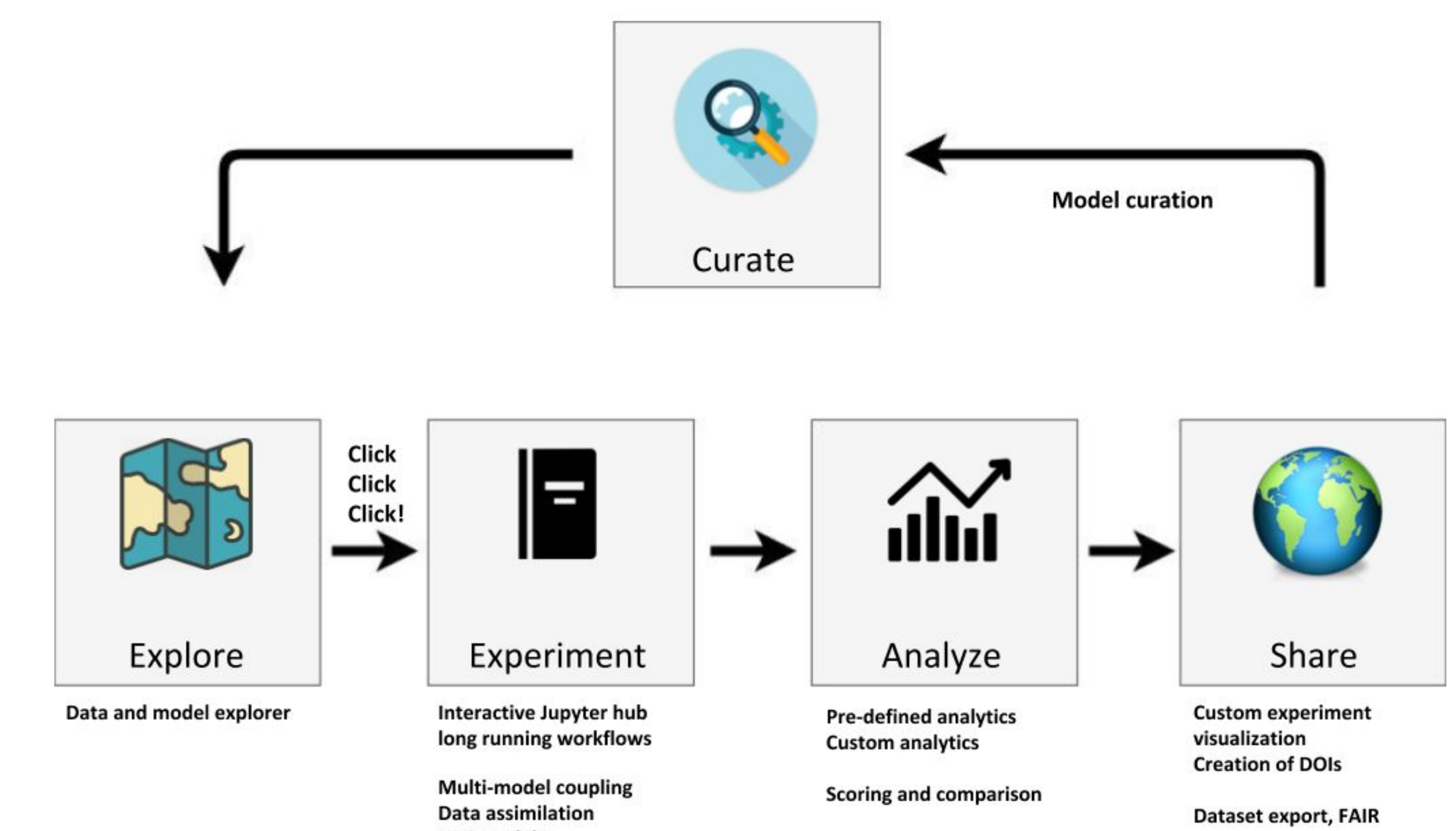
See our code sources at GitHub:

<http://github.com/eWaterCycle>

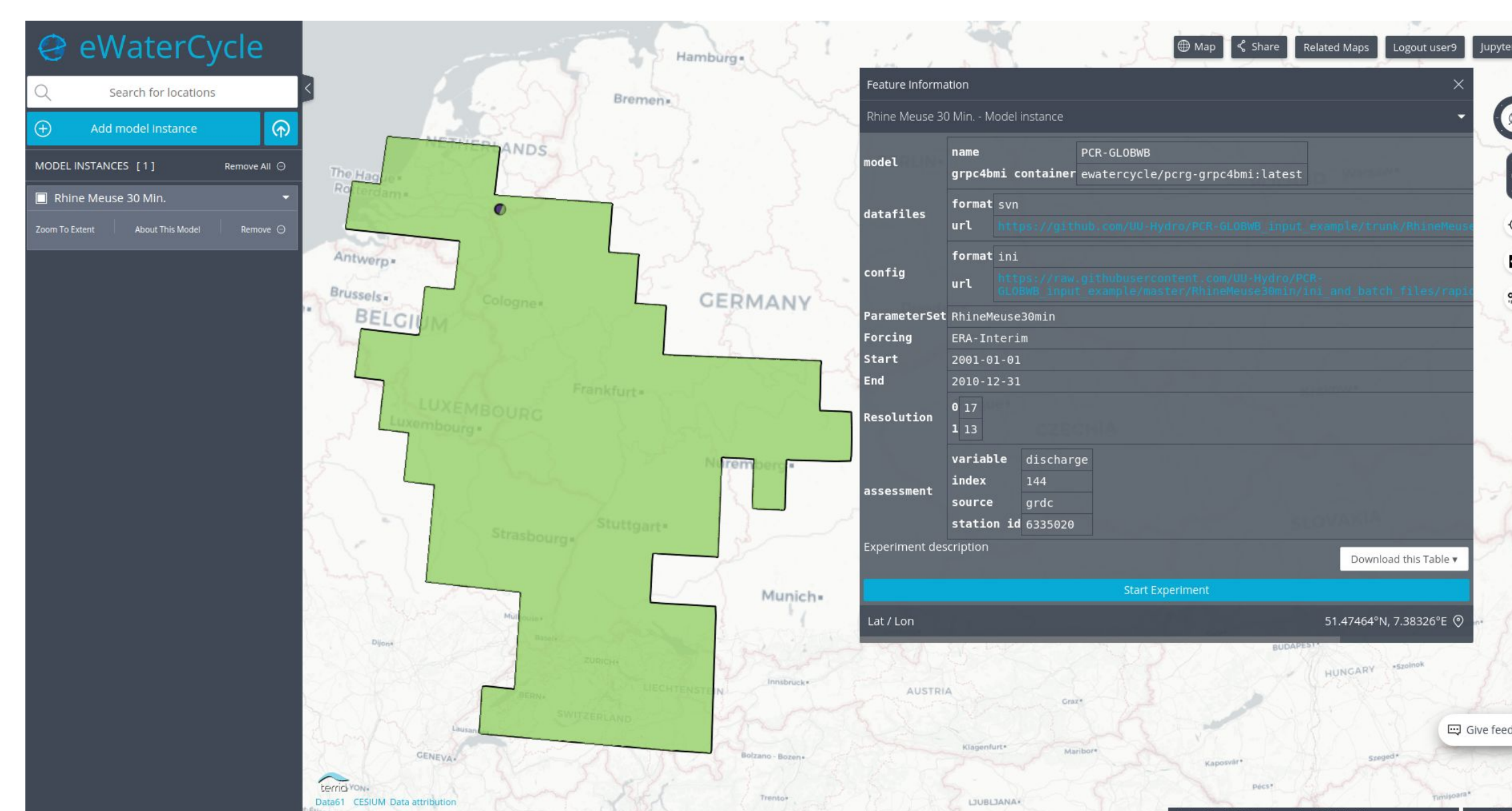
Contact us at:

ewatercycle@esciencecenter.nl

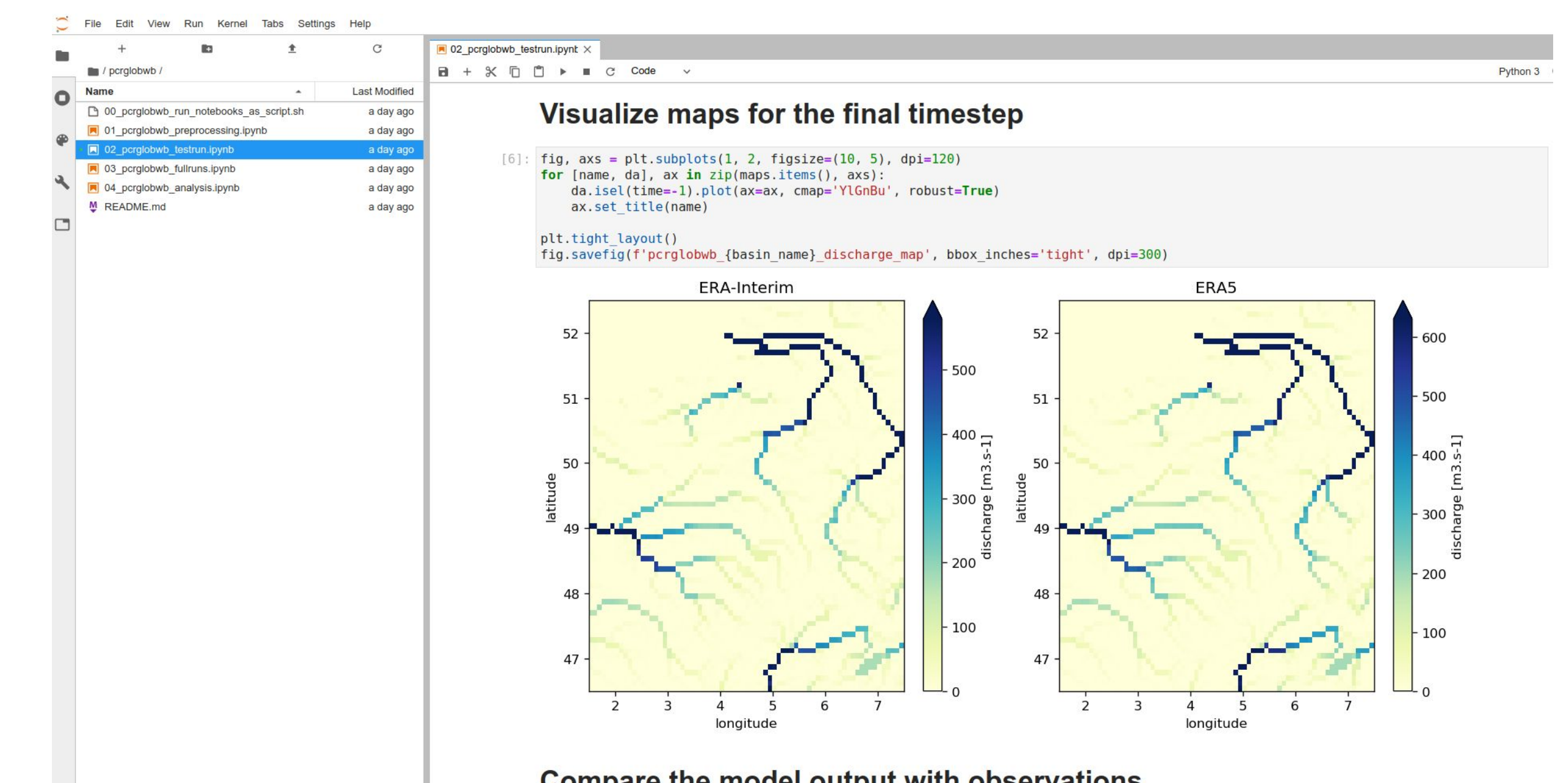
About eWaterCycle



eWaterCycle is a framework in which hydrological modelers can explore, experiment with, analyze, and share hydrological models.



A model can be found using our explorer, and turned into a live running version of that model with a few clicks.



The experiment runs in a Jupyter notebook, the model runs in a container, in any programming language, communicating through grpc4bmi, developed in our team.