

Lowering Barriers to Computing in Hydrology

PROBLEM

Hydrologists face significant hurdles when using computing in their work. This inhibits conducting research, collaborating with others, and publishing reproducible findings.

STARTING POINT

CUAHSI JupyterHub lets hydrologists easily run Python and R code right in their web browser. It is intended to integrate with HydroShare, CUAHSI's repository for sharing data and models, but there is currently no easy way to sync data between the two.

INVESTIGATION

We interviewed and co-designed with over 20 hydrologists, both virtually and in-person at the American Geophysical Union Fall Meeting conference in San Francisco. This helped us gain an understanding of what their computing needs were and what user experience paradigms they preferred.

SOLUTION

We built a web app that allows users to easily manage their data in both HydroShare and CUAHSI JupyterHub. A beta version of this web app is being deployed by CUAHSI for preliminary testing.

CUAHSI

My Resources

A resource is a collection of files on HydroShare, a place for sharing code and water data. These files can be code (e.g. Python or R), data (e.g. .csv, .xlsx, .geojson), or any other type of file.

The list below shows the resources that exist in HydroShare and in JupyterHub. Resources only in HydroShare can be synced to JupyterHub, and then you can run code and edit data. All changes should be made in JupyterHub and then synced to HydroShare. Think of JupyterHub as your workspace and HydroShare are your sharing or archival space.

deleting as all of your work will be lost.

Search	New Resource Del	ete Remove from workspace		
	Name	Last Modified on HydroShare	Owner	Copied to workspace
	Household Outor Funoff Ecotoxicity Ar	May 3, 2020	Kyle Combes	True
	Modeling Snow nelt at Olin College	December 7, 2019	Combes, Kyle	False
	Permeability Analysis of Crushed Concr	May 3, 2020	Kyle Combes	False
	Sources of Oil Pollution in Upstate NY R	May 3, 2020	Kyle Combes	False
	Street Runoff in o Local Streams in Bar	May 3, 2020	Kyle Combes	True

Users can now easily manage their files in their CUAHSI JupyterHub workspace and in HydroShare. Files can be copied between the two by simply dragging and dropping.

Clicking on a Jupyter notebook file (.ipynb) opens the notebook in CUAHSI JupyterHub, allowing users to easily run their own code and code published by others on HydroShare.



Kyle Combes Student

Emily Leper Student

Streamlining the Integration of CUAHSI JupyterHub and HydroShare

Back to all my Resources

Here is a list of your HydroShare resources. To open one, simply click on its name.

To begin, click the **New Resource** button to create a new resource or click on an existing resource in the list to view files in that resource. Delete: This will delete a resource from your workspace and from HydroShare. Please save any files you want to your desktop before

Clicking on a resource name opens the page for that resource.

Instructions for running models can be put in the README. This makes it easier for hydrologists to reproduce each others' work published in HydroShare.



Contributors





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OUR WEB APP

CUAHSI 😂

Abstract

Back to all my Resources

Household Gutter Runoff Ecotoxicity Analysis

Last Modified Sharing Status Kyle Combes May 3, 2020 May 3, 2020 Private edit Kvle Combe

An investigation into the effects of runoff from roof tiles into nearby ponds.

For help getting started with using Jupyter notebooks or using HydroShare data, please consult this Helper Notebook

Please note that data stored in your workspace is temporary and will be automatically deleted after 30 days of inactivity. When you are done working, please save your work in HydroShare by dragging and dropping your files and folders over Visit My Resources to delete unused workspaces.

Workspace Files			💭 Jupyter <mark>hub</mark>	н	ydroShare Files			HYDROSHARE	
Filter		New Upload	Jpload Delete Filter			Delete	Open in HydroShare		
	Name	▼	Туре	Size	•	Name	▼	Туре	Size
	Analysis		ipynb	47KB	0	Analysis		ipynb	47KB
	▼ Data		folder	48KB	0	▼ Data		folder	48KB
	Fish-lifespans		CSV	іікв	0	Fish-lifespans		CSV	ІІКВ
	Measurements		CSV	36KB	0	Measurements		CSV	36KB
	README		md	267B					

Display from **Workspace** HydroShare

Acid rain, roof tiles, and aquatic life

This (faux) analysis quantifies the impact of acid rain and roof tiles on nearby aquatic life.

Running the model

- 1. Open Analysis.ipynb 2. Run all of the cells
- Kyle Combes (<u>website</u>)







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