



***CUAHSI Services for the
Water-Education Community***

**Dr. Jerad Bales, Executive Director
November 5, 2020
NAGT – CUAHSI Webinar Series**



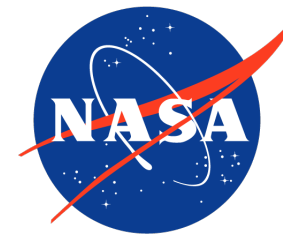
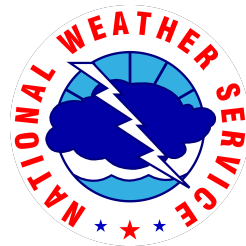
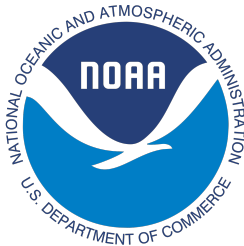
CUAHSI
UNIVERSITIES ALLIED FOR WATER RESEARCH

“[The discipline of hydrology] is now called upon to integrate across an enlarged inter-disciplinary water science with fields such as geography, social sciences, public health, engineering, and advanced monitoring technologies to solve an increasing number of water sustainability problems.” Montanari et al., 2015 in

**Fifty years of Water Resources Research:
Legacy and Perspectives for the Science of Hydrology**

What is CUAHSI? (kuh – WAH – see)

- CUAHSI is a non-profit consortium of about 130 U.S. academic institutions, non-profits, and international universities.
- Mission is to advance water science by:
 - Strengthening interdisciplinary collaboration in water-sciences
 - Providing critical community infrastructure
 - Promoting education in the water sciences at all levels
- Activities
 - Community Services, such as workshops, community meetings, training, etc.
 - Data and Model Services to support FAIR data principals.



CUAHSI is committed to growing diversity and equity in our community.



<https://www.cuahsi.org/library/diversity-equity-and-inclusion/>

CUAHSI Offers Funding Opportunities for Students:

Grants

Workshop and Travel Support

Competitions



***CUAHSI's Summer Institute:
A 7 – Week Residential
Program at the National
Water Center in
partnership with National
Weather Service.***



CUAHSI Provides Online Education Resources



AGU100 ADVANCING EARTH AND SPACE SCIENCE 

Join Us for a Panel Discussion on:
Managing Manuscripts
Writing Manuscripts Reviews and Responding to Reviewers
April 24th, 2020 at 12pm EST

 Holly Michael
University of Delaware

 Barret Kurylck
Dalhousie University

 Yu-Feng Forrest Lin
University of Illinois

Part of the seminar series
Navigating Academic Waters:
Essential Skills to Thrive as a Student and Early Career Scientist

<https://www.cuahsi.org/education/hydrology-guest-lectures/>

CUAHSI Supports Data-Driven Education



Data and Model Driven Hydrology Education

List of Units

List of Steps

About this Project

Contribute

Data and Model Driven Hydrology Education

<https://serc.carleton.edu/hydromodules/index.html>



Data Science in Earth and Environmental Sciences

SyracuseUniversity

EAR601

This course is designed to teach students how to apply emerging data mining tools in resolving Earth and Environmental Sciences problems.

<https://www.hydrolearn.org/>

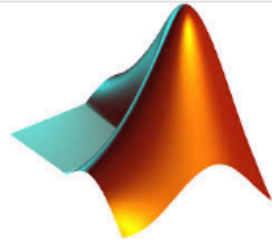
HYDR**LEARN**

CUAHSI Provides a Gateway to Online Computing



Community examples using the Python programming language. This includes both Python scripts as well as Python Jupyter notebooks.

[Python Gallery](#)



Community examples using the MATLAB programming language. This includes MATLAB *.m scripts as well as MATLAB Live scripts.

[MATLAB Gallery](#)



Community examples using the R programming language. This includes R Jupyter notebooks, R scripts, as well as R Shiny web applications.

[R Gallery](#)

Browse examples by sub-category for the chosen programming language.

HYDROSHARE HOME MY RESOURCES DISCOVER COLLABORATE APPS HELP Create

Introduction to TauDEM

Authors: David Tarboton
Owners: David Tarboton
Resource type: Composite Resource
Storage: The size of this resource is 54.2 MB
Created: Dec 08, 2019 at 12:17 a.m.
Last updated: Dec 08, 2019 at 3:52 p.m. David Tarboton
Citation: See how to cite this resource
Content types: Geographic Feature Content Geographic Raster Content

Sharing Status: Public
Views: 69
Downloads: 28
+1 Votes: Be the first one to +1 this resource.
Comments: No comments (yet)

Open with...
HydroShare GIS
CUAHSI JupyterHub
OPeNDAP
CyberGIS-Jupyter for Water
MATLAB Online

Abstract

The Jupyter Notebook and data in this resource illustrate the use of Terrain Analysis Using Digital Elevation Model (TauDEM) software deployed on JupyterHub for watershed delineation.

js-168-155.jetstream-cloud.org/user/demo/tree/Downloads/18984997bf8f44dd99a246d4fbec903/18984997bf8f...

jupyter Logout Control Panel

Files Running Clusters

Select items to perform actions on them. Upload New

| Name | Last Modified | File size |
|-----------|------------------------|-----------|
| .. | seconds ago | |
| TauDEM.py | Running 13 minutes ago | 17.8 kB |
| logan.tif | 13 minutes ago | 56.8 MB |
| logan.vrt | 13 minutes ago | 1.73 kB |

jupyter TauDEM (unsaved changes) Logout Control Panel

File Edit View Insert Cell Kernel Widgets Help Not Trusted Hydro-Python3

Hydrologic Terrain Analysis Using TauDEM

The purpose of this notebook is to introduce **Terrain Analysis Using Digital Elevation Models (TauDEM)** software for Hydrologic Terrain Analysis in Jupyter. TauDEM is a free and open source set of Digital Elevation Model (DEM) tools for the extraction and analysis of hydrologic information from topography as represented by DEM. This software is developed at Utah State University (USU) for hydrologic digital elevation model analysis and watershed delineation.

CUAHSI Supports FAIR Data

- **Findable**: Data have sufficient metadata and a unique, persistent identifier to make data discoverable on the Web
- **Accessible**: Metadata and data are understandable to humans and machines and are available via a trusted repository
- **Interoperable**: Metadata use formal community standards
- **Reusable**: Data have clear metadata, usage license, and information about provenance




The extent to which data are FAIR affects their **value and extent of reuse.**

Wilkinson, M. D. et al. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific Data*, 3:160018, <https://doi.org/10.1038/sdata.2016.18>.

CUAHSI Supports FAIR Data

Catalog Statistics

| Number of Data Sources | Properties Measured | Number of Time Series | Number of Locations | Number of Observations |
|------------------------|---------------------|-----------------------|---------------------|------------------------|
| 94 | 479 | 2,885,271 | 1,122,037 | 148,454,349,348 |



MY RESOURCES DISCOVER COLLABORATE APPS HELP ABOUT

How it works

- 1**
Create data
Collect your data using the same methods you use now. HydroShare supports a broad set of hydrologic data types.
- 2**
Upload to HydroShare
Upload your data files to HydroShare through the web user interface. HydroShare will automatically extract as much metadata as it can from the files you upload.
- 3**
Describe with metadata
Use HydroShare's simple metadata entry forms to finish describing your data so that your colleagues can find, access, and interpret it.
- 4**
Share with colleagues
You choose who has access to the data and models you have uploaded to HydroShare. You can share with individual users or publish your resources for everyone to access.

SEARCH

Select Dates

All Dates
 Date Range

Data Service(s)

All

Keyword(s)

All

Advanced Search

All

Search Now

Time Series Found

3,613,410

Filter Results

Some Key CUAHSI Educational Resources

- Discover and download time-series data, Hydrologic Information System: <http://data.cuahsi.org/>
- Discover, download, publish, and share all types of water data, models, and workflows, HydroShare: <https://www.hydroshare.org/home/>
- Summary of online education resources (<https://www.cuahsi.org/education/resources-for-online-education/>) including
 - Cyber seminar archive: <https://www.cuahsi.org/education/resources-for-online-education/>
 - Science Education Resources Center Hydrology Collection: <https://serc.carleton.edu/hydromodules/units.html>
 - HydroLearn: <https://www.hydrolearn.org/>
 - 2017 Atlantic tropical cyclone flood archive: <https://www.cuahsi.org/projects/hurricanes-2017-data-archive>
 - Archived lectures, blogs, and other resources.
 - Guest lecture database: <https://www.cuahsi.org/education/hydrology-guest-lectures/>
- Curated online education resources: <https://www.hydroshare.org/resource/148b1ce4e308427ebf58379d48a17b91/>
- Quick Start guide for adding new online education resources to HydroShare: <https://www.hydroshare.org/resource/966be547450544d1bc253d770406a6c6/>
- CUAHSI Virtual University: <https://www.cuahsi.org/education/cuahsi-virtual-university/>
- CUAHSI report archive: <https://www.cuahsi.org/library/library-archive/>
- CUAHSI Grants: <https://www.cuahsi.org/funding-opportunities> and <https://www.cuahsi.org/education>



Thank you
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