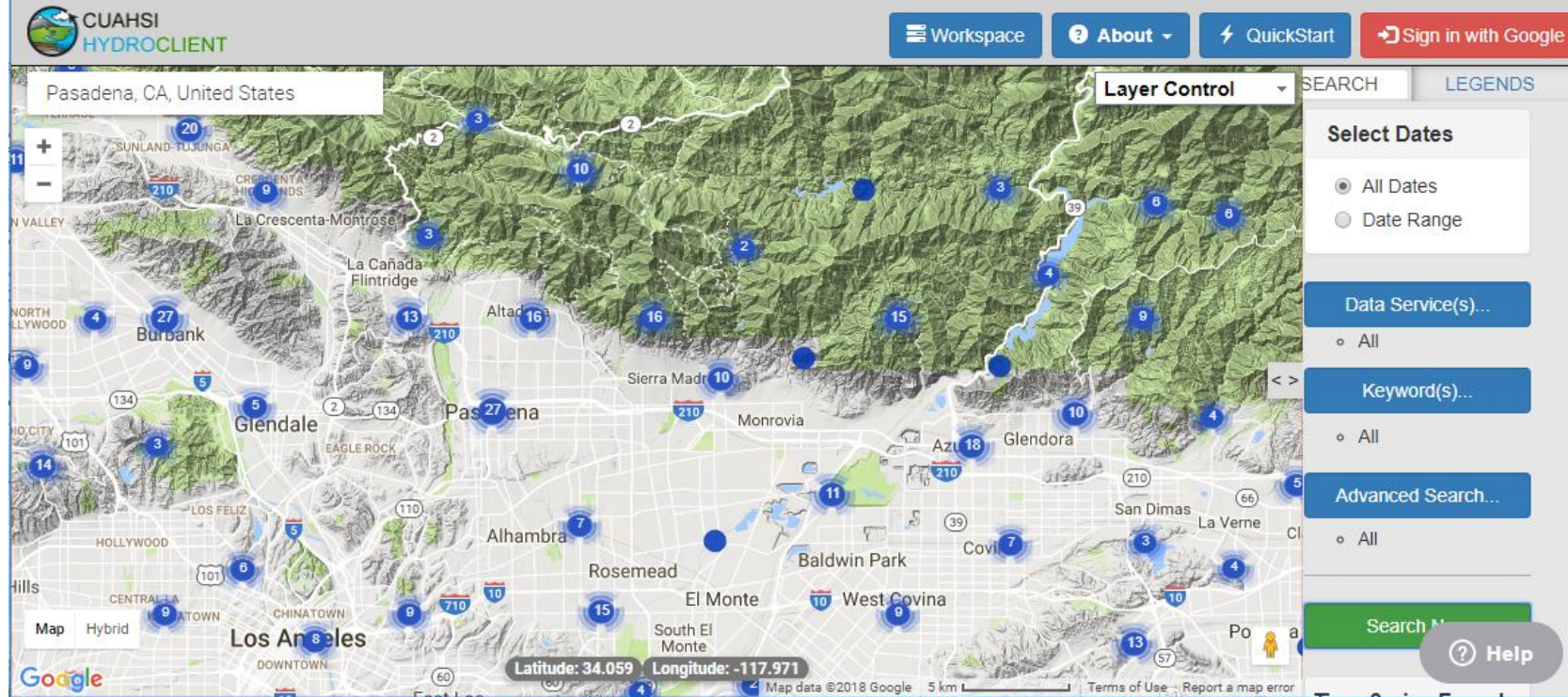


CUAHSI Water Data Services



Dr. Jerad Bales

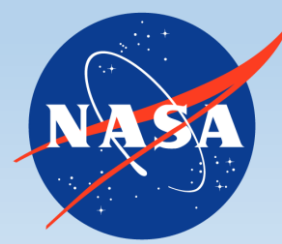
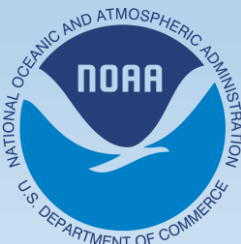
Executive Director, CUAHSI

18 January 2018

**WSWC Water Information Management Systems Workshop
Pasadena, CA**

What is CUAHSI?

- **CUAHSI is a 501(c)3 Non-Profit Consortium of about 130 U.S. Academic Institutions, Non-Profits, and International Universities**
- **Mission is to shape the future of water science by:**
 - Strengthening interdisciplinary collaboration in the water-science community
 - Empowering the community by providing critical infrastructure
 - Promoting education in the water sciences at all levels
- **Key Activities**
 - Community Services
 - Data and Model Services



Find and Publish Time-Series Data: HydroClient

The screenshot displays the HydroClient web application interface. At the top, the CUAHSI HYDROCLIENT logo is on the left, and navigation buttons for 'Workspace', 'About', 'QuickStart', and 'Sign in with Google' are on the right. The main map area shows a topographic view of Pasadena, CA, with numerous blue circular data points labeled with numbers (e.g., 2, 3, 4, 5, 6, 7, 9, 10, 11, 13, 14, 15, 16, 18, 20, 27). A search bar at the top left contains the text 'Pasadena, CA, United States'. On the right side, there is a 'Layer Control' dropdown menu and a 'SEARCH' panel. The 'SEARCH' panel includes a 'Select Dates' section with radio buttons for 'All Dates' (selected) and 'Date Range'. Below this are three blue buttons: 'Data Service(s)...', 'Keyword(s)...', and 'Advanced Search...', each with a radio button for 'All'. At the bottom of the search panel is a green 'Search' button and a grey 'Help' button. The map interface includes a 'Map' and 'Hybrid' toggle at the bottom left, a Google logo, and a status bar at the bottom showing 'Latitude: 34.059', 'Longitude: -117.971', and a 5 km scale bar.

Publish Time-Series Data

- Load metadata to uploader template using controlled vocabulary database for required metadata.
- Upload data—drag and drop
- Register service on CUAHSI Catalog—optional.

Catalog Statistics

Number of Data Sources	Properties Measured	Number of Time Series	Number of Locations	Number of Observations	Last Updated on
93	413	4,677,460	734,846	432,932,305,205	09/27/2017

Find, Publish, and Operate on Water Data: HydroShare



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.

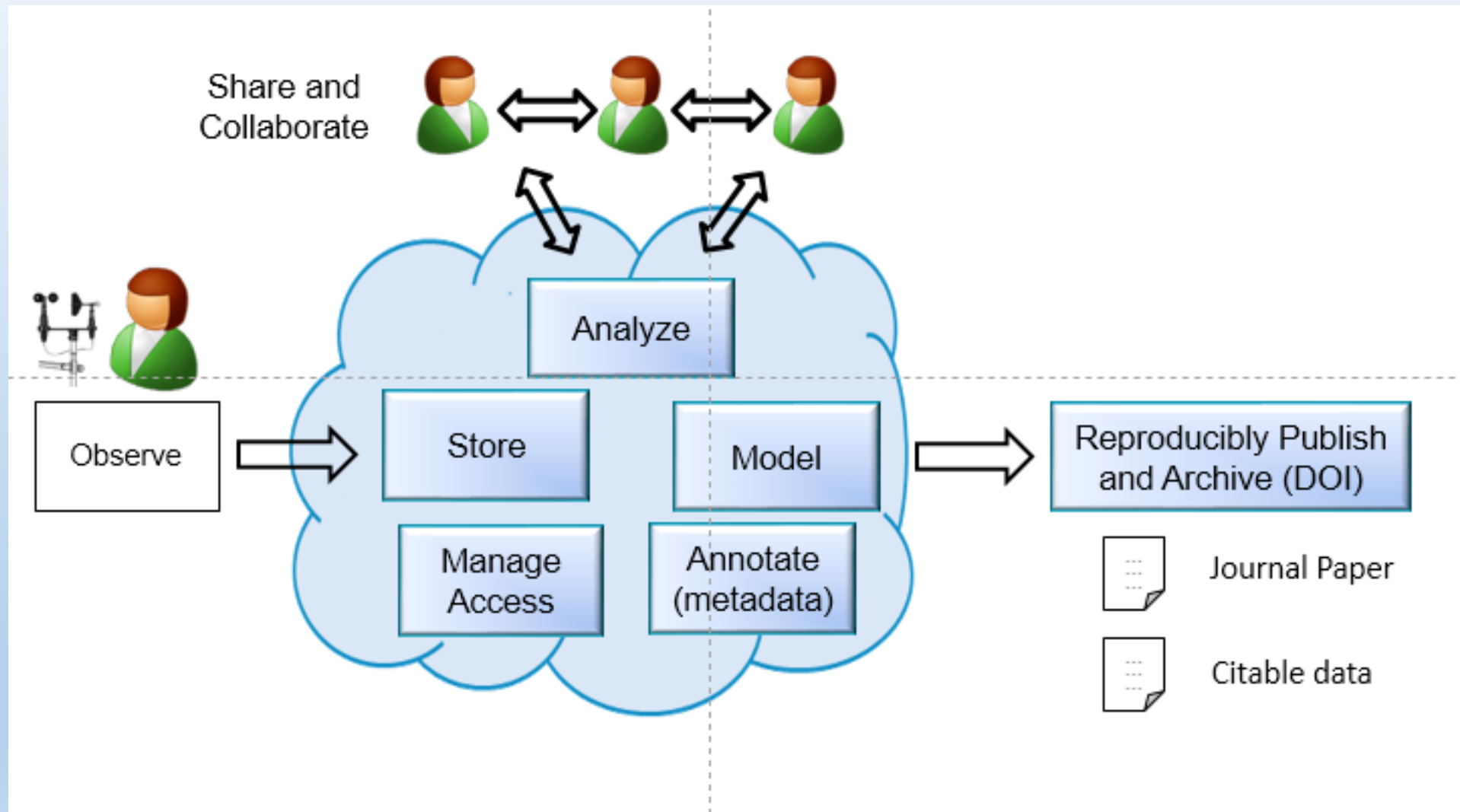
4

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.

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

Collaborative data analysis and publication



Tarboton, 2017

Apps Used to Visualize, Analyze, and Utilize Data

HYDROSHARE MY RESOURCES DISCOVER COLLABORATE **APPS** HELP

HydroShare Apps Portal Apps demo07966db1aed947d5

Apps Library

SWAT Soil & Water Assessment Tool
SWATShare App

jupyter
Jupyter Python Notebook at NCSA

Snow Inspector

CUAHSI Data Series Viewer

CYBERGIS
Cybergis TauDEM App

National Water Model Forecast

EPA WATERS Services

Data Rods Explorer

HydroShare GIS

Open with... ▾

- TauDEM CyberGIS Hydro...
- JupyterHub-NCSA
- HydroShare GIS

Use of Cloud

- Most data on CUAHSI hardware or at super-computing centers.
- Some data served via webservices from host
- Some cloud computing for large operations.

Volunteer Monitoring, Citizen Science, and Crowd-Sourcing are Growing in Importance

- Declining or flat agency budgets.
- New, robust, simple sensors.
- Apps for recording information and uploading data.
- Educated, engaged public.
- Incidental data.
- Machine learning for QA.



In Wisconsin 50 organizations monitor 45 sites

Meeting the Needs of NWM Users—CUAHSI's Role

- Work with NCAR on governance.
- Provide community tools through HydroShare, including documentation and version control of apps and tools.
- Provide community data sets for selected use cases through CUAHSI Water Data Services. (Harvey/Irma and Maria RAPID awards).
- Continue with Summer Institute.
- Organize and host NWM Community Users Meetings.



Value to This Community

- **Find Data**
- **Download Data from Multiple Sources in a Common Format**
- **Collaboration with WaDE and IoW**
- **Potential Database for Citizen Science Data in Your State**
- **Share your Data**
- **Model Applications via apps: NWM, SWAT, HSPF**
- **CUAHSI's Community Services—short courses, workshops, cyberseminars, community conferences**



Thank you
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CUAHSI

UNIVERSITIES ALLIED FOR WATER RESEARCH

Brochdale, England, 2001

<http://www.euwfd.com/html/groundwater.html>