



Cyberinfrastructure

Promoting Collaborative Publication, Interoperability, and Reuse
of iUTAH Data and Research Products

Jeffery S. Horsburgh

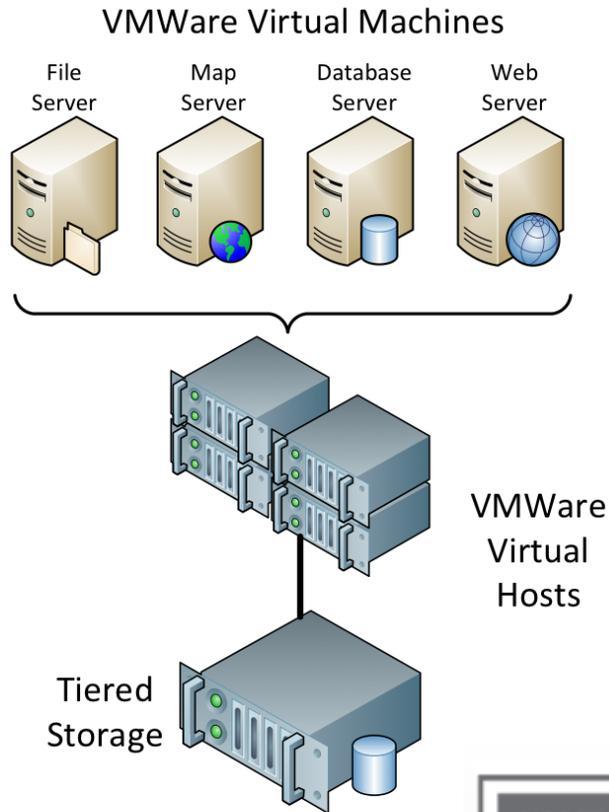
Amber Jones and the iUTAH CI Team

Fall 2016 All Hands Meeting
“Focus on Facilities”

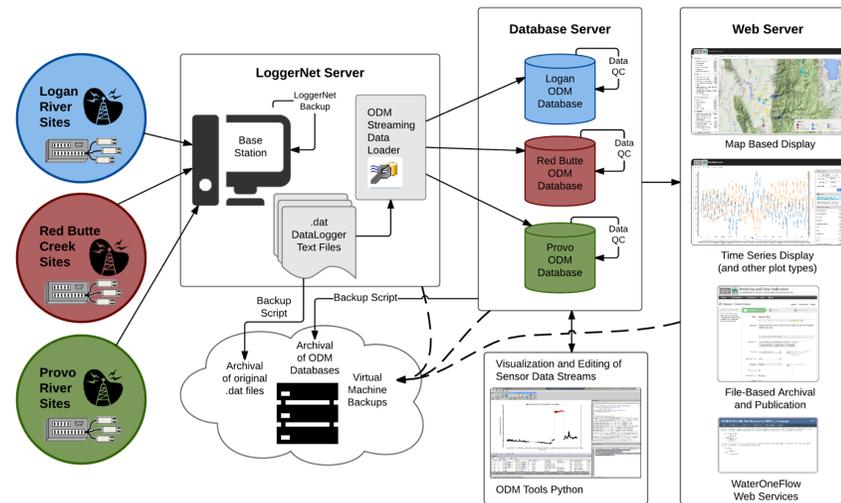
Major CI Components

Software for Data Sharing, Publication, and Visualization

Hardware (Servers and Storage)



Operational Data Management (GAMUT Workflow)



This block contains three screenshots of software interfaces. The top screenshot shows the 'Modeling and Data Federation' website, displaying a dataset for 'Knowlton Fork, RBC, soil nitrogen data'. The middle screenshot shows the 'Utah Water Survey' interface, featuring a 'Water Quality Rating' table with various data points and a 'Map Based Display' showing a geographical map. The bottom screenshot shows the 'Time Series Analyst' interface, displaying a line graph of 'Specific Conductance (uS/cm)' over time, with a legend and summary statistics.



Modeling and Data Federation

innovative Urban Transitions and Aridregion Hydro-sustainability

iUTAH Data Repository

<http://repository.iutahepscor.org>

- Dataset upload and publication
- Dataset landing page
- Permanent URL and citation
- Limited curation process
- Limitations
 - Not flexible (enough)
 - Hard to maintain
 - No real collaboration capabilities
 - No DOI for published resources

The screenshot displays the iUTAH Data Repository website. The header includes the iUTAH logo and the text 'Modeling and Data Federation' with the tagline 'Innovative Urban Transitions and Aridregion Hydro-sustainability'. Navigation links for Home, Development, Data, and About are present, along with Log in and Register buttons. The breadcrumb trail shows the path: Home / Organizations / iUTAH / Knowlton Fork, RBC, soil ...

The main content area is titled 'Knowlton Fork, RBC, soil nitrogen data'. It shows 0 followers and an 'Organization' section with the iUTAH logo and EPSCoR branding. The organization's description states: 'iUTAH, innovative Urban Transitions and Aridregion Hydro-sustainability, is a statewide effort dedicated to maintaining and improving water sustainability in Utah. Funded by the... read more'.

Below the organization info are social media links for Google+, Twitter, and Facebook, and a License section for Creative Commons Attribution with an 'OPEN DATA' button.

The dataset page includes a 'Dataset' tab, an 'Activity Stream' icon, and a 'Related' icon. The title 'Knowlton Fork, RBC, soil nitrogen data' is followed by a checkbox for 'Agree to data use agreement for data preview/download.' The description states: 'This dataset includes measurements of soil nitrogen pools and fluxes from two vegetation types (forest and herbaceous) and two landscape positions (upper and lower slopes) in the Knowlton Fork sub-catchment of Red Butte Creek watershed. Sites are located near the iUTAH Knowlton Fork Climate Station, and measurements were made during June, August, and October of 2015. The dataset includes concentrations of inorganic nitrogen, soil nitrate isotope values, bulk concentrations and stable isotope values of soil organic carbon and nitrogen, concentrations of soil microbial biomass carbon and nitrogen, and nitrate leachate from below the rooting zone. Also included are carbon and nitrogen concentrations and isotope values from leaves.'

The 'Data and Resources' section lists several files:

- KF Four plots.GPX**: GPS file showing the four study sites where soil nitrogen data has been...
- Sampling & Data Analysis Methods**: This file contains detailed descriptions of field sampling and analytical...
- KF_VariablesReported.csv**: List of all variables reported in this dataset, including definitions and...
- KF_PlantSoilN_AllData.csv**: Soil and plant nitrogen data from Knowlton Fork study plots collected during...
- KF_ResinN_AllData.csv**: Resin nitrogen data, assayed with two methods (resin cores and free resins),...

Tags for the dataset include: forest, hillslope, isotope, leaching, microbial, nitrogen, plant-microbe inter..., and soil.

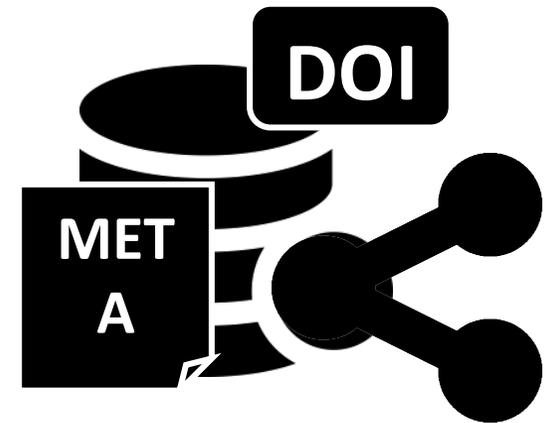
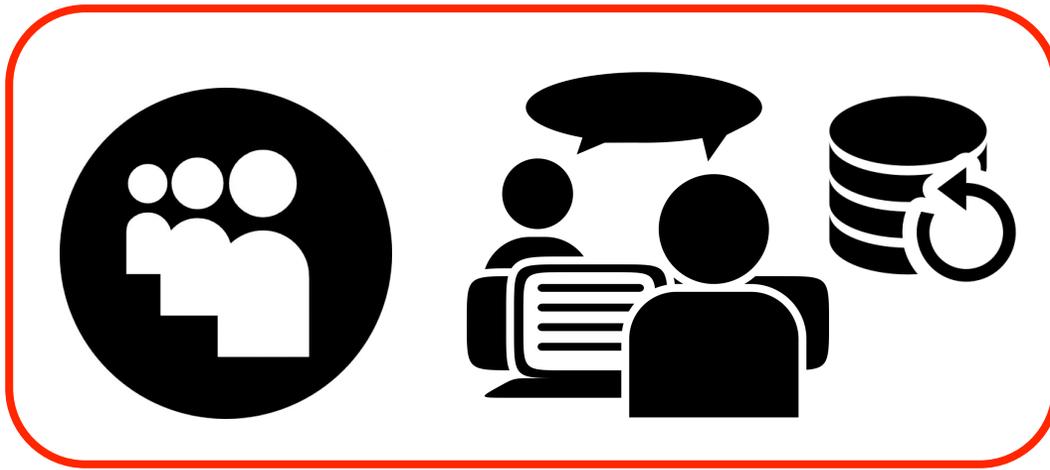
The citation is: Weintraub, S. (2016), Knowlton Fork, RBC, soil nitrogen data, 1.0, iUTAH Modeling & Data Federation, <http://repository.iutahepscor.org/dataset/knowlton-fork-rbc-soil-nitrogen-data>

At the bottom, there are tabs for 'General', 'Spatial', 'Temporal', 'Variable & Method', 'Contact', and 'Additional'. A table provides metadata:

Purpose	Research
Language	english
Research Focus Area	RFA1
Access Information	No limitation

What do we want to do?

- Easily create a digital instance of a dataset or model
- Quickly share it with colleagues (perhaps privately at first)
- Add value through collaboration, annotation, and iteration
- Describe with metadata
- Eventually...share publicly or formally Publish

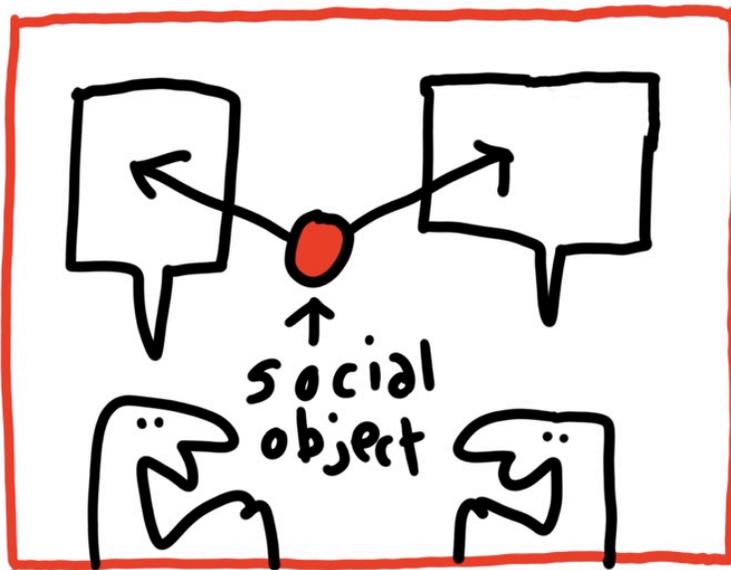


Data and models are “social objects” shared among scientists

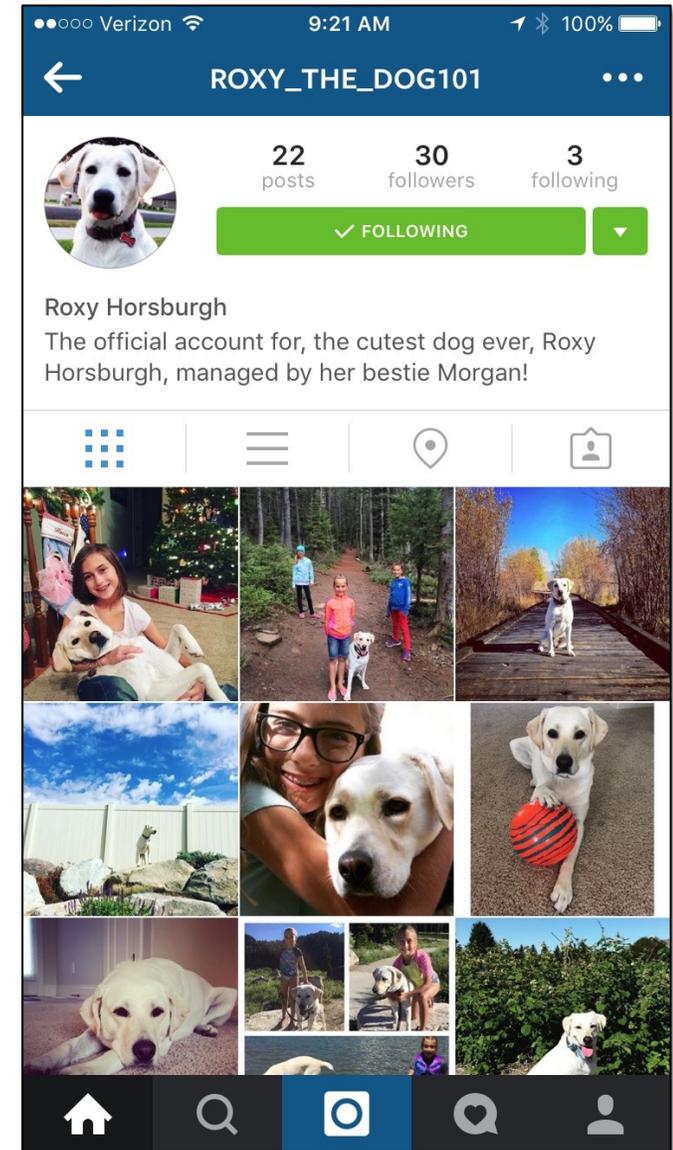
Social Objects

“Objects around which social networks form”

Jyri Engeström



Hugh MacLeod
<http://sharinglab.dk/what-is-a-social-object/>





HYDROSHARE

<http://www.hydroshare.org>

- Collaborative development project that started about the same time as iUTAH
- Sharing and collaborating around diverse data types used by water scientists

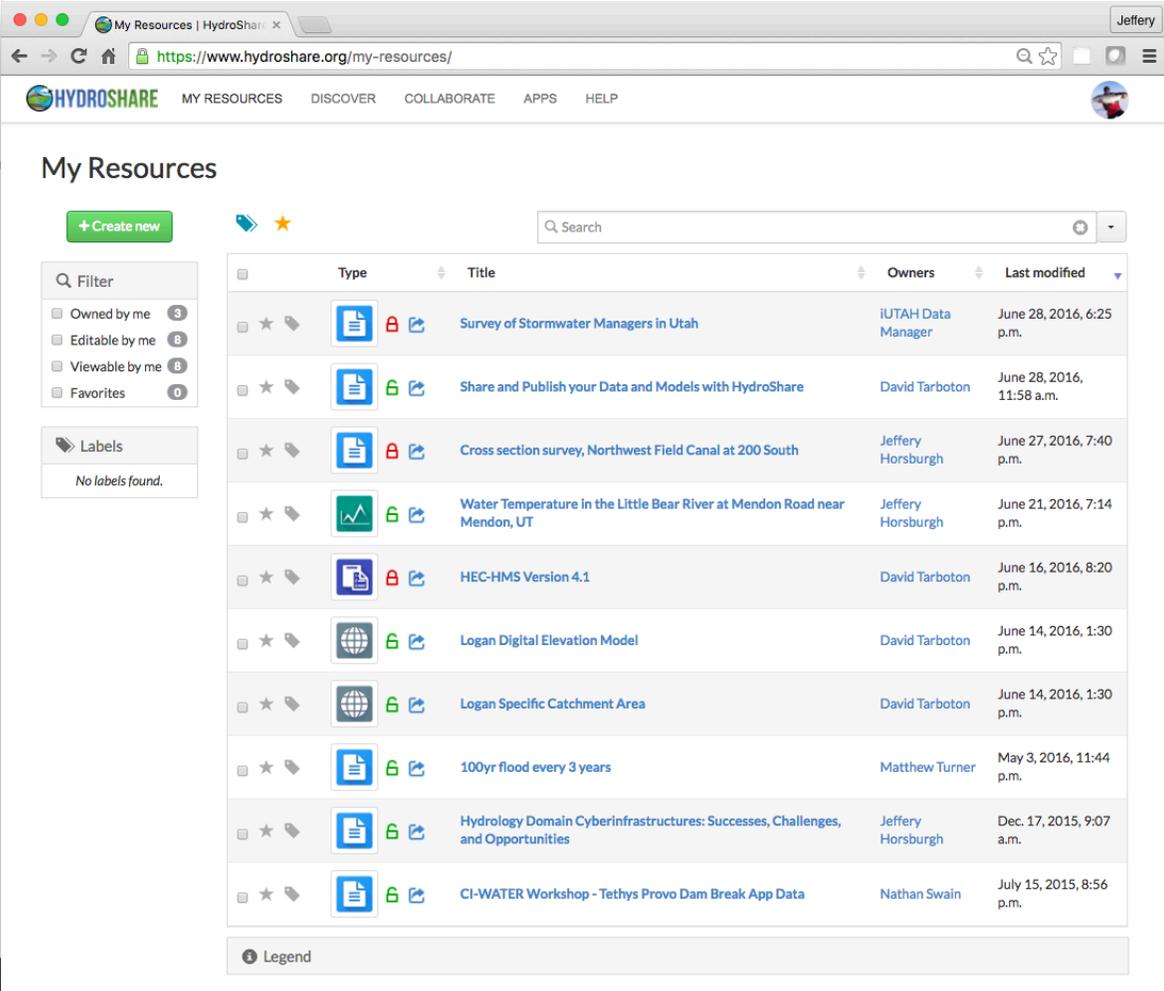
HydroShare's goal: Enable scientists to create **social objects** that add value

The image shows a screenshot of the HydroShare website. The top navigation bar includes the HydroShare logo, "MY RESOURCES", "DISCOVER", "COLLABORATE", "APPS", and "HELP". A user profile for "Jeffery" is visible in the top right. The main banner features a background image of a river with snow and the text "Share your data and models with colleagues" and "Upload, share, and access a broad set of hydrologic data types and models. Manage who has access to the content that you share." Below this, a resource page is displayed for "Water Temperature in the Little Bear River at Mendon Road near Mendon, UT". The page includes a "What you can do" section with a list of actions: "Share your data and models", "Manage who has access to your data", "Share, access, visualize, and download your data and models", "Use the web services to access your data", "Publish data and models to the web", "Discover and access data and models", and "Use web apps to visualize your data". The resource details section shows: "Authors: Jeff Horsburgh, Amber Jones", "Owners: Jeff Horsburgh", "Resource type: Time Series", "Created: June 6, 2015, 3:57 a.m.", and "Last updated: June 6, 2015, 4:25 a.m. by Jeff Horsburgh". The "Abstract" section states: "This dataset contains observations of water temperature in the Little Bear River at Mendon Road near Mendon, UT. Data were recorded every 30 minutes and represent the average values over the preceding time interval. The values were recorded using a HydroLab M55 multi-parameter water quality sonde connected to a Campbell Scientific datalogger. Values represent quality controlled data that have undergone quality control to remove obviously bad data." The "Subject" section has tags for "Temperature", "Water", "Water quality", "Little Bear River", and "Utah". The "How to cite" section provides the citation: "Horsburgh, J., A. Jones (2015). Water Temperature in the Little Bear River at Mendon Road near Mendon, UT, HydroShare, <http://www.hydroshare.org/resource/1a25b11fa1354773b6edb9495e754f4e>". The "Sharing" section shows the resource is set to "Public" and is shared under the Creative Commons Attribution CC BY license. A "Manage access" button is visible at the bottom.

HydroShare “Resources”

- **Resource** = primary unit of digital content
 - Create
 - Share
 - Own
 - Access
 - Filter
 - Discover
 - Publish

Resources can be datasets, models, or other digital content



The screenshot displays the 'My Resources' page on the HydroShare website. The page features a navigation bar with 'HYDROSHARE', 'MY RESOURCES', 'DISCOVER', 'COLLABORATE', 'APPS', and 'HELP'. Below the navigation bar, there is a search bar and a '+ Create new' button. A filter sidebar on the left allows users to filter resources by ownership (Owned by me, Editable by me, Viewable by me, Favorites) and labels (No labels found). The main content area is a table listing resources with columns for Type, Title, Owners, and Last modified. The resources listed include 'Survey of Stormwater Managers in Utah', 'Share and Publish your Data and Models with HydroShare', 'Cross section survey, Northwest Field Canal at 200 South', 'Water Temperature in the Little Bear River at Mendon Road near Mendon, UT', 'HEC-HMS Version 4.1', 'Logan Digital Elevation Model', 'Logan Specific Catchment Area', '100yr flood every 3 years', 'Hydrology Domain Cyberinfrastructures: Successes, Challenges, and Opportunities', and 'CI-WATER Workshop - Tethys Provo Dam Break App Data'. The footer contains contact information, social media links, and open source information.

Type	Title	Owners	Last modified
Document	Survey of Stormwater Managers in Utah	IUTAH Data Manager	June 28, 2016, 6:25 p.m.
Document	Share and Publish your Data and Models with HydroShare	David Tarboton	June 28, 2016, 11:58 a.m.
Document	Cross section survey, Northwest Field Canal at 200 South	Jeffery Horsburgh	June 27, 2016, 7:40 p.m.
Figure	Water Temperature in the Little Bear River at Mendon Road near Mendon, UT	Jeffery Horsburgh	June 21, 2016, 7:14 p.m.
Document	HEC-HMS Version 4.1	David Tarboton	June 16, 2016, 8:20 p.m.
Dataset	Logan Digital Elevation Model	David Tarboton	June 14, 2016, 1:30 p.m.
Dataset	Logan Specific Catchment Area	David Tarboton	June 14, 2016, 1:30 p.m.
Document	100yr flood every 3 years	Matthew Turner	May 3, 2016, 11:44 p.m.
Document	Hydrology Domain Cyberinfrastructures: Successes, Challenges, and Opportunities	Jeffery Horsburgh	Dec. 17, 2015, 9:07 a.m.
Document	CI-WATER Workshop - Tethys Provo Dam Break App Data	Nathan Swain	July 15, 2015, 8:56 p.m.

Resource Types in HydroShare

- Generic
- Multidimensional (NetCDF)
- Collections
- Geographic
 - Raster
 - Feature (ESRI Shapefiles)
- Time Series
 - Time Series
 - Referenced Time Series
- Modeling
 - Model Program
 - Model Instance
 - SWAT Model Instance
 - MODFLOW Model Instance
 - Script

Specific Resource types have:

1. A specific metadata description
2. An expected file format and structure

HYDROSHARE MY RESOURCES DISCOVER COLLABORATE APPS HELP

Storm Water Management Model (SWMM) Open with...

Authors: Lewis Rossman · Trent Schade · Daniel Sullivan · Robert Dickinson · Carl Chan · Edward Burgess
Owners: [Mohamed Morsy](#) · [Anthony Castronova](#)
Resource type: Model Program Resource
Created: June 3, 2015, 7:17 p.m.
Last updated: June 2, 2016, 7:12 p.m. by [Mohamed Morsy](#)

Abstract

The EPA Storm Water Management Model (SWMM) is a dynamic rainfall-runoff simulation model used for single event or long-term (continuous) simulation of runoff quantity and quality from primarily urban areas. The runoff component of SWMM operates on a collection of subcatchment areas on which rain falls and runoff is generated. The routing portion of SWMM transports this runoff through a conveyance system of pipes, channels, storage/treatment devices, pumps, and regulators. SWMM tracks the quantity and quality of runoff generated within each subcatchment, and the flow rate, flow depth, and quality of water in each pipe and channel during a simulation period comprised of multiple time steps. SWMM was first developed back in 1971 and has undergone several major upgrades since then. The current edition, Version 5, is a complete re-write of the previous release. Running under Windows, EPA SWMM 5 provides an integrated environment for editing drainage area input data, running hydraulic and water quality simulations, and viewing the results in a variety of formats. These include color-coded drainage area maps, time series graphs and tables, profile plots, and statistical frequency analyses.

How to cite

Rossman, L., T. Schade, D. Sullivan, R. Dickinson, C. Chan, E. Burgess (2016). Storm Water Management Model (SWMM), Version 5.1.010 with Low Impact Development (LID) Controls, <http://www2.epa.gov/water-research/storm-water-management-model-swmm>, accessed 6/2/2016,

And describe the model program as a resource

Resource Sharing in HydroShare

- You control who has access
- 5 Options:
 - **Private** – Only individual users you have given access can view metadata or access content
 - **Discoverable** – Anyone can view the metadata, but only users with permission can access content
 - **Public** – Anyone can view the metadata and access content
 - **Published** – Same as public, but the resource is made immutable and a DOI is assigned
 - **Shareable** – Other users can grant access at their same level of access

Select a license ⓘ
Creative Commons Attribution CC BY

CC BY

Statement
This resource is shared under the Creative Commons Attribution CC BY.

Url
http://creativecommons.org/licenses/by/4.0/

Sharing status: Public Discoverable **Private**

Shareable

Share with individuals or groups

Manage access

Use this window to share your resource with specific HydroShare users. You can give other users the ability to view or edit this resource. You can also add additional owners who will have full permissions.

Who has access

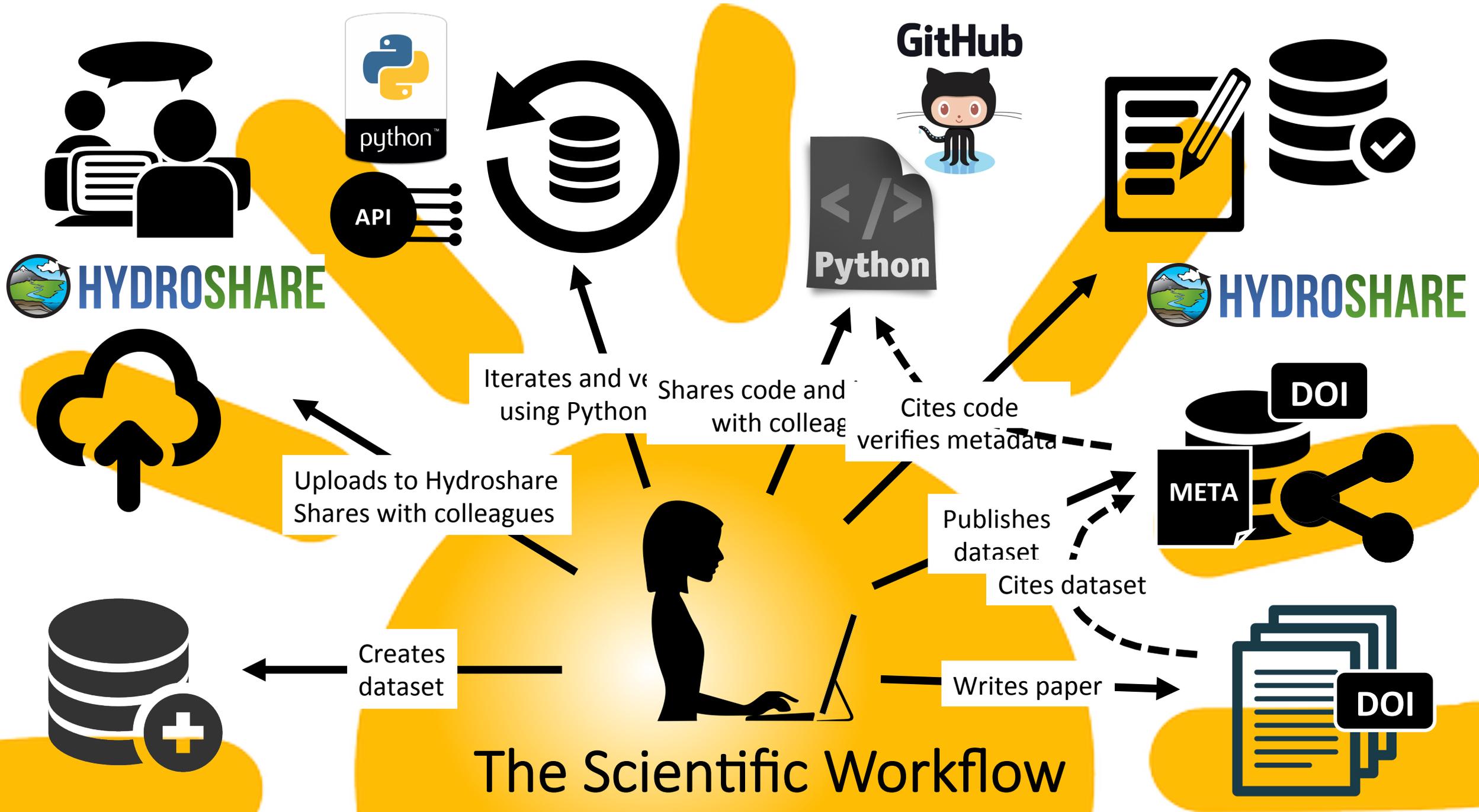
 Jeffrey Horsburgh jeff	Is owner	
 Urban Water Systems Group (Group)	Can view -	✕

Invite: **Users** Groups

Search by name or username

Can view - **+ Add**

Close



The Scientific Workflow

iUTAH Resources in HydroShare

GAMUT Raw and QC1 Datasets

HYDROSHARE MY RESOURCES DISCOVER COLLABORATE APPS HELP

iUTAH GAMUT Network Raw Data at Knowlton Fork Basic Aquatic Site (RB_KF_BA)

Open with...  

Authors: iUTAH GAMUT Working Group
Owners: [iUTAH Data Manager](#)
Resource type: Generic
Created: July 8, 2016, 1:29 p.m.
Last updated: Oct. 28, 2016, 9:42 a.m. by [iUTAH Data Manager](#)

Abstract

This dataset contains raw data for all of the variables measured for the iUTAH GAMUT Network aquatic site on the Knowlton Fork tributary to Red Butte Creek (RB_KF_BA). Each file contains a calendar year of data. The file for the current year is updated on a daily basis. The data values were collected by a variety of sensors at 15 minute intervals. The file header contains detailed metadata for the site and the variable and method of each column.

How to cite

Group, I. G. (2016). iUTAH GAMUT Network Raw Data at Knowlton Fork Basic Aquatic Site (RB_KF_BA), HydroShare, <http://www.hydroshare.org/resource/d41a2fbc2e4422682a3fbd552620c32>

This resource is shared under the Creative Commons Attribution CC BY. <http://creativecommons.org/licenses/by/4.0/>

Sharing status: **Public & Shareable**

You have been given specific permission to edit this resource.

Subject

Red Butte Creek | GAMUT | raw data | time series | water quality

Content

- data/contents/iUTAH_GAMUT_RB_KF_BA_RawData_2013.csv (2.1 MB)
- data/contents/iUTAH_GAMUT_RB_KF_BA_RawData_2014.csv (6.5 MB)
- data/contents/iUTAH_GAMUT_RB_KF_BA_RawData_2015.csv (5.6 MB)
- data/contents/iUTAH_GAMUT_RB_KF_BA_RawData_2016.csv (2.8 MB)

Download All Content as Zipped BagIt Archive [Learn more about the BagIt archive format](#)

Authority Coverage Web Apps Extended Met...

GAMUT Discharge Rating Curves

HYDROSHARE MY RESOURCES DISCOVER COLLABORATE APPS HELP

Discharge Rating Curve at Red Butte Creek near Foothill Drive Advanced Aquatic Site (RB_FD_AA)

Open with... 

Authors: iUTAH GAMUT Working Group
Owners: [iUTAH Data Manager](#)
Resource type: Generic
Created: July 19, 2016, 10:03 p.m.
Last updated: Oct. 25, 2016, 7:50 p.m. by [iUTAH Data Manager](#)

Abstract

This dataset contains a stage-discharge relationship developed for the iUTAH GAMUT Network aquatic site on Red Butte Creek near the Foothill Drive Bridge (RB_FD_AA). Discharge measurements were collected by a SonTek FlowTracker. Measured stage and discharge and the curve are contained in the Rating Curve file. Information on the site conditions and any issues with discharge measurements are documented in the README file. Files associated with each measurement (e.g., output by the FlowTracker instrument) are contained in the zip directory. This rating curve was used to generate discharge data through 12/31/2015. New versions of these files may be loaded when new flow measurements are taken. Resulting discharge data is published in the iUTAH GAMUT operational databases and may be accessed via <http://data.lutahepscor.org/tsa>.

How to cite

Group, I. G. (2016). Discharge Rating Curve at Red Butte Creek near Foothill Drive Advanced Aquatic Site (RB_FD_AA), HydroShare, <http://www.hydroshare.org/resource/cf8d94ef3796fa3a10f69ce4b9f9586>

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Sharing status: **Public & Shareable**

You have been given specific permission to view this resource.

Subject

Discharge | Flow | FlowTracker | GAMUT | Rating Curve | Red Butte Creek | Stage-Discharge

Content

- data/contents/rb-fd-aa-dischargemeasurements-160222.zip (43.9 KB)
- data/contents/rb-fd-aa-ratingcurve-160222.xlsx (16.5 KB)
- data/contents/rb-fd-aa-ratingcurve-readme-160222.pdf (3.7 MB)
- data/contents/iUTAH_GAMUT_RB_FD_AA_RawData_2016.csv (4.8 MB)
- data/contents/flowtracker-variable-definitions.pdf (44.1 KB)

Download All Content as Zipped BagIt Archive [Learn more about the BagIt archive format](#)

Individual Investigator Datasets

HYDROSHARE MY RESOURCES DISCOVER COLLABORATE APPS HELP

iUTAH precipitation ions and nitrogen stable isotope composition

Open with... 

Authors: Steven Hall
Owners: [iUTAH Data Manager - Steven Hall](#)
Resource type: Generic
Created: Aug. 3, 2016, 11:52 p.m.
Last updated: Sept. 7, 2016, midnight by [iUTAH Data Manager](#)

Abstract

Ion concentrations and precipitation amount were measured at 14 sites in the Salt Lake and Cache Valleys from December 2013 to February 2014. Sample collection was sporadic at several sites. The goal of this study was to identify land use impacts on nitrogen deposition to the iUTAH watersheds. A subset of samples was analyzed for 15N and 18O of NO3 and 15N of NH4. Methods and findings are described in the associated JGR-B manuscript

How to cite

Hall, S. (2016). iUTAH precipitation ions and nitrogen stable isotope composition, HydroShare, <http://dx.doi.org/10.4211/hs.7ce47150ee344d4e95f2fd7bb4f660ac>

This resource is shared under the Creative Commons Attribution CC BY. <http://creativecommons.org/licenses/by/4.0/>

Sharing status: **Published**

You have been given specific permission to view this resource.

Subject

Logan River | Red Butte | ion | nitrogen | precipitation chemistry | sulfate | nitrate | phosphate | chloride | fluoride | magnesium | calcium | potassium | sodium | stable isotope | 15N | nitrogen isotope | Utah

Content

- data/contents/160127-lutah-precip-nh4-15n.csv (5.0 KB)
- data/contents/160127-precip-no3-isotopes.csv (1.8 KB)
- data/contents/160127-lutah-precip-data.csv (38.5 KB)
- data/contents/160125-hall-lutah-n-deposition-jgrb.pdf (4.2 MB)
- data/contents/160127-lutah-precip-sampling-sites.csv (375 bytes)

Download All Content as Zipped BagIt Archive [Learn more about the BagIt archive format](#)

Collaborative Groups

- Create a collaborative group
- Share resources with a group
- Manage group membership
- Find groups you are interested in
- Request group membership

HYDROSHARE MY RESOURCES DISCOVER COLLABORATE APPS HELP

Find Groups My Groups

Find Groups

+ Create Group



Freshwater

Freshwater is led by the University of Washington with support of the Mountain to Sea Strategic Research Initiative for advancing freshwater research in the Pacific Northwest and the world. (<http://freshwater.uw.edu/>)

Freshwater researchers create positive change through scientific discovery and technological innovation. This is community resource for education, data and tool sharing for overcoming the global challenges in water quality, resource management, and access.

MEMBERS



and 3 others have joined

Ask to join

Landlab is a Python-based modeling environment that allows scientists and students to build numerical landscape models. Designed for disciplines that quantify earth surface dynamics such as geomorphology, hydrology, glaciology, and stratigraphy, it can also be used in related fields.

Symposium to access and share materials used in the workshop and to explore HydroShare collaboration functionality

Join us from 1:30-3:30 on July 26, 2016 at the CUAHSI biennial symposium in Shepherdstown, WV to learn how CUAHSI's data access and analysis tools can be incorporated into your teaching and research. During the first half the workshop,

Collaborative Capabilities of HydroShare

- Dataset/model creation as a “Resource” – **the Social Objects!**
- Resource sharing (public and private)
- Collaborative groups and sharing within groups
- Resource versioning
- Formal Publication of resources and assignment of DOIs
- Rating and commenting on resources

Moving iUTAH Repository to HydroShare: Next Steps

- Your data collection plans are still valid and your datasets still need to be published
- Modelers – there is now a way for you to share your results!
- If you had a dataset in <http://repository.iutahepscor.org> - we have moved it to HydroShare for you
 - **You will receive an email from the iUTAH Data Manager** with specific instructions for:
 - Creating an account in HydroShare
 - Asserting ownership of your resource
 - Publishing your dataset
- If you have not submitted your data yet
 - Work directly with Amber to get it set up in HydroShare
 - We'll be making some instructional videos



Reusability of CI Components

- We have worked hard to ensure that what we have developed for iUTAH is reusable
- All of our source code is in open source code repositories in GitHub
- We have published papers about many of the things we have done



GitHub

Environ Monit Assess (2015) 187:348
DOI 10.1007/s10661-015-4594-3

A data management and publication workflow for a large-scale, heterogeneous sensor network

Amber Spackman Jones · Jeffery S. Horsburgh ·
Stephanie L. Reeder · Maurier Ramirez ·
Juan Caraballo

January 2015 / Accepted: 5 May 2015
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It is common for hydrology researchers to use *in situ* sensors at high frequencies, extended durations, and with spatial distributions. These data volumes require infrastructure for management, and sharing. The availability of these data in addressing scientific questions related to water availability, water quality, and ecosystem health relies on effective cyberinfrastructure for the transformation of raw sensor data into products. It also depends on the ability of users to share and access the data in useable formats and terrestrial sites for continuous monitoring of common meteorological variables, snow accumulation and melt, soil moisture, surface water flow, and surface water quality. We present the overall workflow we have developed for effectively transferring data from field monitoring sites to ultimate end-users and describe the software tools we have deployed for storing, managing, and sharing the sensor data. These tools are all open source and available for others to use.

Environmental Modelling & Software 70 (2015) 32–44

Contents lists available at ScienceDirect

Environmental Modelling & Software

journal homepage: www.elsevier.com/locate/envsoft

Open source software for visualization and quality control of continuous hydrologic and water quality sensor data

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Keywords:
Data management
Open source software
Sensor data
Python
Hydrologic observations
Quality control

ABSTRACT

It is common for *in situ* hydrologic and water quality data to be collected at high frequencies, extended durations. These data streams, which may also be collected across many sites, require infrastructure for data storage and management. The Observations Data Model (ODM) is a standard data model in which hydrologic and water quality data are stored and described. In this paper we describe ODM Tools Python, an open source software application that allows users to query and export, visualize, and perform quality control on time series of environmental observations data stored in an ODM data model. The software is implemented in Python scripting that records the corrections and adjustments made to data sets and ensures data editing steps are traceable and reproducible. © 2015 Elsevier Ltd. All rights reserved.

Software availability

Name of software: ODM Tools Python
Developers: Jeffery S. Horsburgh, Stephanie L. Reeder, Amber Spackman Jones, Jacob Meline, and James Patton
Contact: jeff.horsburgh@usu.edu
Year first available: 2014
Hardware required: A personal computer
Software required: Microsoft Windows, Mac OSX, or Linux operating system
Software availability: All source code, installers, example ODM databases, and documentation for the ODM Tools Python software application can be accessed at <https://github.com/mjcaraballo/ODMToolsPython>.
Cost: Free. Software and source code are released under the New Berkeley Software Distribution (BSD) License, which allows for liberal reuse of the software and code.

1. Introduction

Environmental monitoring with *in situ* sensors presents many challenges for data management, especially for large-scale networks consisting of multiple site personnel. Over the past decade, there has been a shift in the use of automated data collection in scientific research using sensor data streams. Researchers need tools for data import and storage as well as management. In addition to addressing the challenges of managing the sheer quantity of data, managers need practices to ensure high data quality and standard procedures and software tools for data editing and quality control.

In this paper we describe a workflow for scripted editing of continuous, *in situ* time series datasets and the functionality of an open source software application that implements this workflow. ODM Tools Python that implements this workflow enables users to query and export, visualize

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E-mail address: jeff.horsburgh@usu.edu (J.S. Horsburgh).

<http://dx.doi.org/10.1016/j.envsoft.2015.04.002>
1364-8152/© 2015 Elsevier Ltd. All rights reserved.

CrossMark

This repository Search Pull requests Issues Gist

UCHIC / WEBTSA

Code Issues 14 Pull requests 0 Projects 0 Wiki Pulse Graphs Settings

A web application for visualizing time series of environmental observations. — Edit

285 commits 2 branches 0 releases 4 contributors BSD-3-Clause

Branch: master New pull request Create new file Upload files Find file Clone or download

- [mjcaraballo77](#) Fixed unicode decoding error for datasets resource. Latest commit #963362 9 days ago
- [doc/images](#) Initial repository setup. 3 years ago
- [src](#) Fixed unicode decoding error for datasets resource. 9 days ago
- [.gitignore](#) Changed project structure for Django library upgrade. a year ago
- [LICENSE](#) Update LICENSE 3 years ago
- [README.md](#) Added the project dependencies. 2 years ago
- [TSADeploymentGuide.pdf](#) Added deployment guide. a year ago
- [requirements.txt](#) Changed project structure for Django library upgrade. a year ago

README.md

WEB TSA

A web application for visualizing environmental time series data.

Sponsors

This project is receiving or has received support from a number of agencies and complementary efforts including:

This material is based on work supported by the National Science Foundation Grant EPS 1208732 awarded to Utah State University. Additional support was previously provided by National Science Foundation grant EAR 0622374. Any opinions, findings, and conclusions or recommendations expressed are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Opportunities

- Better tools for working with heterogeneous data
- Software/apps/systems that enhance our “personal cyberinfrastructure”
- Freedom to move data and models from one platform/app/software to another
- Training a next generation of “cyber-savvy” engineers and scientists

An enhanced, cloud connected, and social scientific workflow