



CUAHSI
allied for water science

**2021 ANNUAL
MEMBERSHIP REPORT**

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LETTER FROM THE PRESIDENT

Dear Friends:

Like many of you, CUAHSI is adapting to a new hybrid work environment. Rather than being centrally located in Cambridge, MA, we now have staff in New Hampshire, New York, North Carolina, Rhode Island, Utah, and Vermont, as well as in Massachusetts. Please take a moment to visit our staff page to learn about our excellent team.

Because our current office space is being converted to a biotechnology laboratory (imagine that happening in Boston), CUAHSI offices will be moving 2 miles west to Arlington, MA. Our new office footprint will more closely match our current utilization, thereby reducing costs, while fully supporting our hybrid work environment.

Thanks to leadership from the CUAHSI Board of Directors and support from our Members, CUAHSI bylaws were revised in 2021 to permit full CUAHSI membership for primarily undergraduate institutions (PUI). We recently welcomed our first two PUI Members – Prairie View A&M University and Fort Lewis College, both of which are minority-serving institutions. I believe this is a major step toward a more diverse, equitable, and inclusive water-science community.

Thanks to all of you for supporting our new CUAHSI – AGU Hydrology Section joint hydrologic sciences meeting, known as the Frontiers in Hydrology Meeting. We received more than 100 session proposals, including town halls and workshops. Many of the proposed sessions are quite innovative in format and content, which was our intent as we created the meeting with the goal of a unique experience for participants. Based on the number of session proposals, we expect about 2,000 participants, which greatly exceeds our initial expectations. The community called for this meeting and has responded in kind. I hope to see you in San Juan in June 2022.

CUAHSI began significant new partnerships on two major cyberinfrastructure projects in 2021. I-GUIDE, or the Institute for Geospatial Understanding through an Integrative Discovery Environment at the University of Illinois Urbana-Champaign, is one of the five new Harnessing the Data Revolution Institutes recently awarded by NSF. CUAHSI is one of ten collaborating institutions which will support the mission of I-GUIDE. CUAHSI also is part of the CoMSES.Net team, which recently received funding for a five-year NSF-CSSI project led by Arizona State University to support and enable innovative next-generation modeling of human and natural systems, including reproducible workflows.

We are excited to roll out a completely revamped, modern web page in early 2022, which will be simpler to navigate and will provide easier access to CUAHSI water data and computing services. The new CUAHSI website will complement our new CZNet web pages that came online in 2021 to support the Critical Zone Collaborative Network. We also are excited about our modernized HydroClient service, which will be released in stages during 2022. Expect new functionality, including easier data search and data upload capabilities. We were pleased to add our 100th data service to the HydroClient in 2021.

We are striving to create an organization that is both helping to serve the water science community, while also providing scientific leadership in partnership with you. Let us hear from you on how we are doing. All the best for a healthy and rewarding 2022.

Take care,

Jerad Bales

President and Executive Director

ABOUT CUAHSI

The Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI) supports the advancement of interdisciplinary water science. CUAHSI fosters a diverse and dynamic water science community enabled by shared scientific infrastructure that facilitates an integrated understanding of the interactions among water, earth, ecosystems, and society. CUAHSI's programs and resources are available to everyone and have been used by students, educators, volunteer scientists, outreach coordinators, environmental and watershed

organizations, corporate entities, and more. CUAHSI is a membership-based organization and attempts to be responsive to member needs. However, anyone involved in any aspect of water science, water-resources management, or water-resources protection and enhancement is a part of the CUAHSI community. CUAHSI's programs and services are available to everyone - many free of charge - regardless of membership status. YOU are an integral part of CUAHSI and we hope you will take advantage of our many diverse programs and services.

IN 2021

1,474 NEW HYDROSHARE RESOURCES CREATED

192 FORMALLY PUBLISHED RESOURCES WITH A DIGITAL OBJECT IDENTIFIER (DOI)

2,584 NEW HYDROSHARE USERS

22,544 VIEWS ON YOUTUBE

TWITTER FOLLOWERS INCREASED BY

32%

5 NEW STAFF MEMBERS JOINED CUAHSI

14 STUDENTS PARTICIPATED VIRTUALLY IN THE 6TH NATIONAL WATER CENTER INNOVATORS PROGRAM SUMMER INSTITUTE

CUAHSI's mission is to advance water science by strengthening interdisciplinary collaboration in the water science community, to empower the community by providing critical infrastructure, and to promote education in the water sciences at all levels.

CUAHSI DIVERSITY, EQUITY, & INCLUSION STRATEGIC PLAN

CUAHSI is committed to ensuring that diversity, equity and inclusion are core values reflected in our internal culture and practices. Our vision is that CUAHSI's commitment to Diversity, Equity and Inclusion (DEI) will strengthen interdisciplinary collaboration among water scientists by promoting the acceptance of diverse ideas and perspectives in the hydrologic sciences. The strategic plan seeks to align CUAHSI's DEI strategy with our overall strategic planning process and to coordinate DEI throughout CUAHSI programming and services.

In alignment with the DEI Strategic Plan, CUAHSI:

- Established a DEI Standing Committee.
- Implemented DEI training at semi-annual Board of Directors meetings and a workshop for staff.
- Is currently developing a code of conduct for CUAHSI events in collaboration with the DEI Standing Committee.
- Updated the Standing Committee volunteer recruitment policies.
- Updated communication strategies.

To learn more about our Strategic Plan, visit our website.



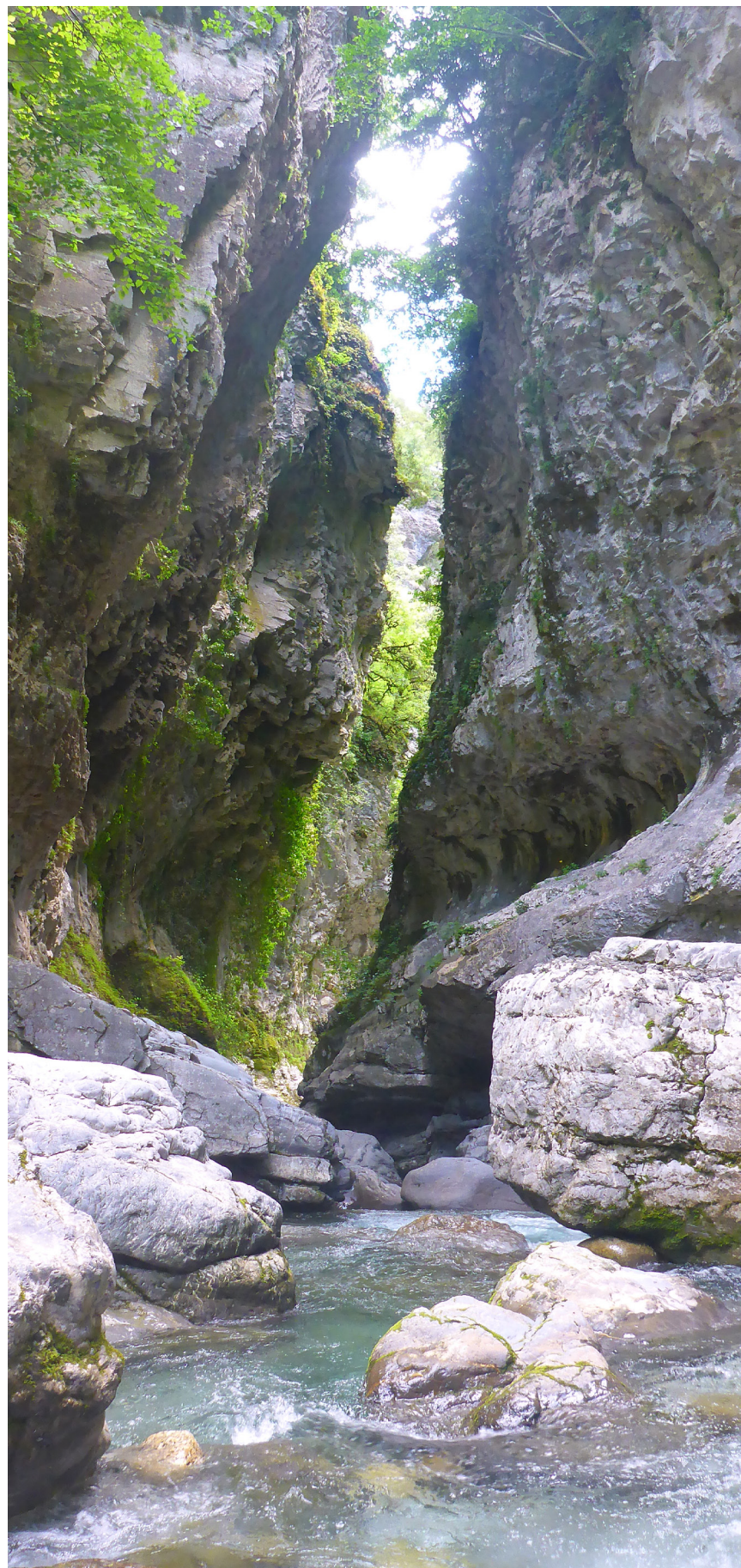
CRITICAL ZONE NETWORK (CZNET) COORDINATING HUB

CUAHSI is the Coordinating Hub for the Critical Zone Network (CZNet).

The 5-year cooperative agreement for the operation of the Hub includes four primary tasks:

1. Enhance and integrate existing data services operated by CUAHSI, EarthChem, and others to support the Critical Zone (CZ) community.
2. Support discovery through community synthesis activities and via access to community data and modeling cyberinfrastructure.
3. Broaden the CZ community through outreach and education activities to create a broader, more inclusive community dedicated to CZ research.
4. Enhance collaboration among the CZ Thematic Clusters through coordination, sharing, community meetings, and outreach.

CUAHSI's CZ Hub activities substantially enhance existing CUAHSI data services, broaden the CUAHSI community, and build on CUAHSI's strengths of education and community support. To learn more about the Critical Zone Network and subscribe to their newsletter, visit <https://criticalzone.org/>.



NEW IN DATA SERVICES

Facilitating Collaboration & Community with HydroShare

The BuPuSa Community was created to facilitate sharing transboundary water data between Mozambique and Zimbabwe the Buzi, Pungewe, and Save River Basins; this work was supported by the U.S. Army Corps of Engineers with additional support from UNESCO. HydroShare communities enable groups to share resources more seamlessly, fostering data sharing and access. The CUAHSI HydroShare team is currently working on enhancements to the existing HydroShare Community functionality that will provide additional value and make the communities feature easier to use. New HydroShare Groups for each of the CZNet Thematic Clusters also were added in 2021.

Supporting Education in the Cloud

CUAHSI's cloud-based platforms to support educational events-- JupyterEdu and MATLAB Online -- were enhanced in 2021. These services can be tailored to the specific classroom or event requirements including, but not limited to, an isolated deployment that is accessible to only event participants, specialized cloud configurations, and custom software installation. The primary goal of this work is to alleviate educators of cyberinfrastructure tasks so that the focus is on science and education. To date, we've supported a number of classroom activities and workshop events, such as an international 100-person graduate course hosted by Dr. Martyn Clark at the University of Saskatchewan, a coupled data-model integration workshop at the Community Surface Dynamics Model System (CSDMS) annual conference, and a MODFLOW workshop at the 47th International Association of Hydrogeologists Congress in Brazil.

Please contact us at help@cuahsi.org to learn more about how we can support your upcoming classroom or workshop event.



Floods, fires, and land building: tackling transdisciplinary hydrologic problems with data, models, and mindsets.

Nicole M. Gasparini (she/her)
Tulane University
ngaspari@tulane.edu
[@NMGasparini](https://twitter.com/NMGasparini)

TUESDAY JULY 20, 2021

Session 2: Bascom Lecture

Dr. Nicole Gasparini, Tulane University: *Floods, Fires, and Land Building: Tackling Transdisciplinary Hydrologic Problems with Novel Data, Models, and Mindsets.*

CUAHSI BIENNIAL COLLOQUIUM

Converging Ideas and Expanding Approaches in the Hydrologic Sciences

The 2021 CUAHSI Biennial Colloquium aimed to include a diversity of views and holistically address the grand challenges posed by a rapidly developing world and changing hydroclimate.

Six virtual sessions were held over three days and an asynchronous webinar occurred prior to the conference. In addition to the established Eagleson and Wolman named lectures, this Colloquium featured the debut of the Bascom Keynote Lecture, named after Florence Bascom (1862-1945), who is considered to be America's first woman geologist. We reached a broad audience with more than 160 participants from all over

the world. The agenda included pop-up sessions, a panel on the future of hydrologic education, and presentations from CUAHSI grant awardees. We are grateful to all the moderators, panelists, and participants who supported this event. We are glad to provide a platform for these important conversations and to enable the sharing of ideas as educators and innovators on ways to explore meeting water science challenges in different ways.

All seven sessions from the 2021 Biennial can be viewed on our YouTube channel. For a detailed recap of this successful event, visit our website.



Celebrating 20 Years of Water Science Community

TWENTY YEARS OF CUAHSI

CUAHSI celebrated 20 years of service to the community in 2021. As part of this, we published articles prepared by previous and current members of CUAHSI's Board of Directors. You can read those reflections here. CUAHSI also thanked previous members of the Board with small gifts that celebrate CUAHSI's 20 years of service.

CUAHSI HELPS WITH THE ENTIRE DATA LIFE CYCLE

CUAHSI supports all aspects of the data management life cycle, from collecting, storing, and analyzing data, to sharing, publishing, and citing data, thereby enabling reproducibility in the water sciences.

Discovery & Planning:

- Visit hydroshare.org and data.cuahsi.org to search thousands of hydrologic, biogeochemical, and geographic data sets available for immediate download.
- Obtain training on CUAHSI's data management resources.

Data Collection:

- Add additional field sites to graduate research with CUAHSI Pathfinder Fellowship support (see Pathfinder Fellowships on Page 16).
- Learn new data collection techniques or instrumentation with hands-on training and Instrumentation Discovery Travel Grants (see Trainings and Workshops Page 14 and Instrumentation Discovery Travel Grants Page 17).

Documentation & Processing:

- Describe data sets using CUAHSI's standard metadata templates in HydroShare.
- Receive metadata training and guidance from CUAHSI staff.

Analysis & Modeling:

- Collaborate with partners by publicly or privately sharing data and analyses in HydroShare.
- Use Jupyter Notebooks or MATLAB Online to analyze data stored with CUAHSI in HydroShare.
- Prepare model simulations for the National Water Model and ParFlow-CONUS using the CUAHSI Domain Subsetter and share them with colleagues using HydroShare.

Publication:

- Credit your collaborators with shared authorship in HydroShare.
- Obtain a permanent link (DOI) to cite data resources in literature in HydroShare or in HIS.

Maintenance & Storage:

- Increase project sustainability by archiving your data and models with HydroShare and HIS.
- Maintain data sets with long-term infrastructure care provided by CUAHSI.

Sharing:

- Share your data publicly so that the data are discoverable through applications such as Google datasets search and others.
- Promote and disseminate your work through activities like cyberseminars (See Page 13), scientific conferences, and training workshops (See Page 14).
- Develop education and outreach activities with CUAHSI resources to share new approaches, research results, and methods with the community.



VISIT

cuahsi.data-models.org
or contact help@cuahsi.org
to learn more about how
CUAHSI's data tools and
resources can be implemented
to meet your needs.

DATA & CLOUD COMPUTING SERVICES

CUAHSI provides free and open source software that supports managing, archiving, sharing, discovering, publishing, and analyzing all types of water data. These services support documentation of workflows and enable hydrologic modeling in a collaborative environment. In this section, some of our new features, services, and applications added in 2021 are highlighted.

HydroShare

2021 was another year of growth for HydroShare. The number of HydroShare users increased by 35%, the number of resources increased by 15%, and the total disk size increased by 29%.

This is an indication that HydroShare is a core service for data management needs within the community.

The CUAHSI Hydroshare team added additional functionality and improved reliability:

- Delivered 11 major and 10 minor releases addressing more than 80 issues.
- Added functionality to enable editing of certain metadata fields of a published resource making it easier for a user to update metadata for publisher resources.
- Implemented a load testing process to improve responsiveness and improves scalability.
- Implemented a spam identification and remediation process for users and resources.
- Implemented OGC compliant web services for resources that contain shapefiles or geotiffs and corresponding tutorials to simplify sharing and visualization of spatial data.
- Updated the THREDDS implementation to improve the access to multidimensional files.
- Became a MemberNode for DataONE and it is now a part of the growing family of repositories sharing their data through DataONE's services.
- Submitted an application to become a CoreTrustSeal certified repository to increase confidence and ensure compliance with common data management standards.
- Applied numerous updates to the core system components to enhance security and keep the system up-to-date.
- Created extensive documentation to support operation and development.
- Developed a comprehensive approach to identify and prioritize work on HydroShare through an open and transparent issue tracking project on github.

Hydrologic Information System (HIS)

Our long time timeseries centric data management system experiences a continued steady growth and use. We added 4 new services and reached a milestone of 100 services accessible through the platform. Users can now search more than a million sites with more than 5 million time series containing more than a billion observations.

Community JupyterHub

CUAHSI's Community JupyterHub is a cloud computing service that enables users to execute scientific code and explore, modify, and interact with data inside a remote execution environment using Python and/or R programming languages. It is integrated with the CUAHSI HydroShare and HIS data repositories, making it easy to leverage community datasets, collaborate, and disseminate research workflows with peers. This service is equipped with a constantly evolving array of pre-configured environments for researchers to choose from, each of which provides an assortment of preinstalled scientific libraries and models to expedite and simplify their experience. All users are provided persistent storage for saving completed and ongoing research. New features added to CUAHSI JupyterHub in 2021 include a Jupyter interface for exploring and synchronizing data stored in HydroShare, as well as exploratory Binder implementation to support reproducible and replicable science applications. Currently, HydroShare resources can be launched into computing environments directly on MyBinder.org, however we're extending this work to provide a seamless integration between cloud computing environments and HydroShare that encourages replicable and reproducible published scientific workflows.



Please contact us at help@cuahsi.org to learn more about how JupyterEdu and MATLAB Online can support your classroom or workshop activity.

per month. All users are given a persistent disk allocation to save data and code, as well as free access to the MATLAB programming language and 20 toolboxes that range from curve fitting and optimization to machine and deep learning.

Please contact us at help@cuahsi.org to learn more about how JupyterEdu and MATLAB Online can support your classroom or workshop activity.

Web Applications

CUAHSI has established a hosting solution for community developed web applications. Our primary focus is to alleviate the hosting responsibilities for scientific and educationally-focused web applications so researchers can focus on science rather than cyberinfrastructure. We're currently focusing on web applications written in the Python and R programming languages using the StreamLit and RShiny frameworks, respectively. In 2021, we added several applications, including dissemination of science p (RiverColor, Synthetic SWOT Generator), data discovery (Macrosheds), and educational tools (WaterBalance).

Please contact us at help@cuahsi.org to get involved or learn more about how CUAHSI can host your web application.

JupyterEdu Support for Educational Cloud Computing

CUAHSI created JupyterEdu to provide cloud computing resources specifically aimed at educational events and use cases. JupyterEdu is a variation of CUAHSI's community JupyterHub designed to enable event-specific customization for up to 100 participants. This includes an isolated deployment on the Google Cloud that is accessible to only event participants, specialized cloud configurations, custom software installation, and more. JupyterEdu was used in 2021 to support a number of community activities including a modeling-focused workshop at the CSDMS annual meeting, a MODFLOW workshop at the 2021 IAH conference in Brazil, and numerous activities at the 2021 Summer Innovators (SI) program at the National Water Center. We're looking to expand support for additional events in the next year.

MATLAB Online

CUAHSI has continued our partnership with MathWorks to offer a cloud-based computational modeling platform using MATLAB software, known as MATLAB Online. Together, CUAHSI and MathWorks are supporting practical quantitative thinking and exploration in water science research and education. The CUAHSI MATLAB Online is integrated with the HydroShare repository to provide access to data and code, and leverages the MATLAB compute environment for analyzing data and reproducing research findings. This capability provides a convenient and freely accessible mechanism for data discovery, collaboration, and reproducibility, and is relevant to a wide range of water-resources professionals.

In 2021 this service was moved to the Google Cloud Platform and deployed using the Kubernetes orchestration framework which enables us to scale with demand up to 50 concurrent users. Since this migration in late June, there have been approximately 411 total active instances; approximately 80

CUAHSI Domain Subsetter

CUAHSI collaborates with the community to build a service for collecting static model domain datasets for continental-scale (CONUS) water science models. The goal of this work is to closely align community research efforts around CONUS models with their respective operational and core development activities. The CUAHSI subsetter currently supports the National Water Model (versions 1.2.2 and 2.0) and ParFlow-CONUS (version 1.0). By leveraging a combination of modern cyberinfrastructure techniques and state-of-the-science modeling tools, model users have access to the NWM and ParFlow-CONUS domain data that would otherwise require extensive computational resources and expertise to generate. In 2021, this service was integrated with HydroShare to provide data hosting capabilities, as well as CUAHSI's cloud computing efforts to enable remote model simulation. This service was also integrated with a high performance computing framework developed as part of the NSF HydroFrame project to support a wide array of hydrologic modeling activities using the ParFlow model (hydroframe.org). The CUAHSI Domain Subsetter is also supporting scientific research studies investigating streamflow predictions using multi-model and multi-precipitation forcings (see Seo et al., 2021), and continental hydrologic intercomparisons (see Tijerina et al., 2021). To learn more about how it can support your research activities, visit the Domain Subsetter website.



EDUCATION & TRAINING

CUAHSI provides continual learning opportunities for researchers and practitioners at every career stage by facilitating programs and services beneficial to students, early career scientists, and advanced career professionals alike.

Due to the ongoing changes surrounding COVID-19, CUAHSI has adapted educational activities to better support water science educators and learners in a virtual setting.

CUAHSI Virtual University

The CUAHSI Virtual University (CVU) is a unique inter-university online education experience that enables students to participate in specialized online hydrology course modules taught by leading faculty at universities across the country. CVU:

- Enhances the depth and breadth of graduate course offerings for participating universities;
- Enables graduate students to experience new research and courses not offered at their home university;
- Facilitates networking among the hydrologic community.

Seventeen universities and 228 students have participated in the CVU since its founding in 2017. The unique format enables students to receive course credit for participating in the CVU through their home university.

In 2021, 63 students are participating in the CVU, with each student participating in three modules of the student's choosing.

The modules are:

Advances in Drone-Based Hydrology

Instructor: Scott Tyler, University of Nevada – Reno

Applying Geographic Information Systems for Terrain and Watershed Analysis in Hydrology

Instructor: David Tarboton, Utah State University



Environmental Objectives in Water Management Models

Instructor: Sarah Null, Utah State University

Hydrological Catchment Modeling

Using Bucket-Type Models

Instructor: Jan Seibert, University of Zurich

Introduction to Open Channel Flow Modeling

Instructor: Ehab Meselhe, Tulane University

Open and Reproducible Research Computing

Instructor: Alejandro Flores, Boise State University

Seminal Papers in Flood Hydrology

Instructor: Daniel Wright, University of Wisconsin – Madison

Snow and Snow Cover Physics

Instructor: Matthew Sturm, University of Alaska

Snow Hydrology: Focus on Modeling

Instructor: Jessica Lundquist, University of Washington

Urban and Stormwater Hydrology

Instructor: Anne Jefferson, Kent State University

Watershed Reactive Transport Processes

Instructor: Li Li, Pennsylvania State University

Cyberseminars

CUAHSI Cyberseminars feature presentations, panels, and virtual events with experts on new or timely topics of interest. The program enables researchers to share their work and contribute to an archive of over 200 lectures available to the public. For the first time in 2021, CUAHSI hosted two series that included a discussion portion with breakout sessions for attendees.

Presentations from CUAHSI's 2021 Cyberseminar Series are available to view on the CUAHSI YouTube Channel.

The 2021 series included:

Introduction to Snow Hydrology

Convened by SINTER - Snow International

Research and Observatory Catchments:

The Legacy and the Future

Convened by Jamie Shanley (U.S. Geological Survey), Stephen Sebestyen (USDA Forest Service), Julia Jones (Oregon State University), and Theresa Blume (GFZ Potsdam)

Virtual Town Hall with

NSF Hydrologic Sciences Program Directors

Speakers: Laura Lautz, Elizabeth Boyer, and Justin Lawrence (Program Directors, Hydrologic Sciences, National Science Foundation)

Critical Conversations: Why Integrated Earth and Environmental Science Might Define Your Future

Convened by the Critical Zone Research Collaboration Network in collaboration with the National Association of Geoscience Teachers (NAGT)

Navigating Academic Waters:

Academic Job Applications Cyber Workshop

Convened by AGU Hydrology Section Student Subcommittee (H3S) Professional Development Team

Introduction to Critical Zone Observatories and Watershed Sites

Convened by the CZN Early Career Network in partnership with the Critical Zone Collaborative Network

Perspectives on Urban Flood Resilience: How Different Fields Tackle One of the World's Most Prevalent Disasters

Convened by Kristen Raub (CUAHSI & Northeastern University)

Tools for Integrating and Synthesizing Data from CZOs and Watershed Sites

Convened by the CZN Early Career Network in partnership with the Critical Zone Collaborative Network

Digital Hydroconnectivity

Convened by Sudarshana Mukhopadhyay (Cornell University), Sankar Arumugam (North Carolina State University), and Jerad Bales (CUAHSI)



**INTERESTED
IN TEACHING A
MODULE FOR A
FUTURE CVU?**

Visit cuahsi.org/education/cuahsi-virtual-university/ for information.



EDUCATION & TRAINING

Hydrology Guest Lecturer Database

CUAHSI's Guest Lecturer Database connects scientists and lecturers with virtual classrooms across the country. Instructors can use the database to connect with colleagues who have volunteered to give lectures on a subject of their expertise, and invite them to give a virtual guest lecture in their classroom.

"I'll echo this guest lecture database @CUAHSI is a great resource. Utilized it last fall and had an awesome guest speaker come in for a talk students really engaged with - even led to a student choosing to do grad school with them!"

Scott Hamshaw from @sdhamshaw

Workshops

CUAHSI facilitates workshops and short courses that provide interdisciplinary perspectives on specific technologies or topics that may not be available through any single institution. Along with building new skills, CUAHSI workshops create opportunities for community collaboration and relationship building between participants and instructors from different institutions.

In-person workshops were further postponed in 2021, but we look forward to hosting them again when circumstances allow.

2021 Workshops

Open Hydrological Sensor Technologies: DIY Stream Sensor Networks Virtual Workshop

September 2021

Lead Instructor: Chet Udell (Oregon State University, OPEnS Lab)

The Community WRF-Hydro Modeling System Abridged Virtual Training Workshop

October 2021

Lead Instructor: David Gochis (NCAR)

ARE YOU INTERESTED IN ORGANIZING A WORKSHOP?

CUAHSI provides funds to seed workshop development and assists with organizing, advertising, and executing workshops. Proposal guidelines can be found here. Contact Julia Masterman at jmasterman@cuahsi.org for more information

Support water science education and educators by volunteering to give a virtual lecture here.

"This document by @CUAHSI on promotion guidance in Covid times is a must-read. Even without COVID, it provides a great framework for considering candidates. E.G. "listen to candidates". Can you imagine how great it'd be if we all listened more? cuahsi.org/uploads/pages/..."

Nicole Gasparini From @NMGasparini

SUPPORTING HYDROLOGY FACULTY

In 2021, the CUAHSI Board of Directors and Officers published a statement to the community: "CUAHSI Board Statement on Holistic Evaluation of Research in Hydrologic Sciences." The statement can be accessed here, and is free for sharing to the entire community. The document intends to provide context on norms within the hydrologic science community to provide a framework for understanding what research products and processes are valued by the academic hydrologic sciences community.

The document is accessible in HydroShare at <https://doi.org/10.4211/hs.21e61fe839004fd399439a2a3391a763>.



These students collaborated virtually to complete impressive and ambitious projects over the summer on hydroinformatics, coastal storm surge modeling, and watershed modeling.

The NWC-SI 2021 Projects were:

Theme: **Coastal Coupling and Total Water Prediction**

Theme Advisors: Ehab Meselhe, Tulane University; Celso Ferreira, George Mason University; Kelin Hu, Tulane University

Theme: **Model and Process Module Development and Testing for the Next Generation National Water Model**

Theme Advisors: Fred Ogden, NOAA Federal; Hilary McMillan, San Diego State University

Theme: **Hydroinformatics Related to Generation, Visualization and Dissemination of Flood Inundation Information**

Theme Advisor: Kyle Mandli, Columbia University

Theme: **Novel Water Prediction Applications of Machine Learning**

Theme Advisor: Jonathan Frame, National Water Center & University of Alabama

CUAHSI and the NWC intend to hold the 2022 SI in person at the National Water Center. Additional information, including application details and a technical report that highlights 2021 student projects, can be found at cuahsi.org/education/summerinstitute/.

GRANTS & FELLOWSHIPS

CUAHSI supports activities to extend research and develop new products. All programs accept proposals once per year. Submission deadlines are announced on the CUAHSI newsletter and website.

Hydroinformatics Innovation Fellowship

The Hydroinformatics Innovation Fellowship supports projects that result in a hydroinformatics product that can be broadly shared and used. Past awardees have developed software products, data products, and technical manuscripts. Students and scientists at U.S. universities and colleges are eligible for this grant. Applications are accepted in the fall.

An Open-source, Community Toolbox for Stream Solute Tracer Interpretation

Tyler Balson, Indiana University

Annual Water Temperature Signal Analysis for Evaluating Groundwater Contributions to Streams Across Scales: Web Application

Danielle Hare, University of Connecticut

SnowClim: A High Resolution Snow Model and Data for the Western United States

Abby Lute, University of Idaho

A Geo-processing Tool for Co-locating the Dependency of Critical Infrastructure with Hydrologic Information Network

Sudarshana Mukhopadhyay, Cornell University

Geo-CUeNCA: Managing Hydroclimatic Changes Impacting Water Use and Hazard Risk in the Andean Cryosphere

Forrest Schoessow, Ohio State University

Voices of the Future Award

The Voices of the Future Award recognizes students who demonstrate outstanding potential in the field of water science. Applications are accepted in the spring.

The Relationship Between Socioeconomic Status and Access to High Quality Water Resources

Madison Coleman, Columbus State University

Envisioning a Future of Water-Human Networks: Digital Solutions to Link Water Management and Human Behavior

Morgan DiCarlo, North Carolina State University

Pathfinder Fellowship

The Pathfinder Fellowship program provides travel funds to graduate students in hydrology and related sciences to enhance their research by adding a field site to conduct comparative research, collaborating with a research group, or working with researchers on adding an interdisciplinary dimension to a project. Applications are accepted in the fall.

The Pathfinder Fellowship was not offered in 2020 due to travel restrictions imposed by the pandemic.

If you are a previous CUAHSI Grant recipient, reach out and let us know how you're doing - we would love to hear how your Pathfinder experience has impacted your career!

Let's Talk About Water

The Let's Talk About Water (LTAW) program provides funds to support events that promote water and earth science education by using film and panel discussions to engage audiences and encourage critical thinking. The new format for LTAW includes funding options for virtual events, communication workshops, and creating a short film about your research or a water issue in your community. Applications are accepted in the fall.

Talk About Water Virtual Livestream Film Fest

Stacey Sloan Blersch, Columbus State University

Attack of the Evil Fatbergs! An Animated, Short Film

Paula R. Buchanan, Tulane University and Jacksonville State University

Keepers of the Water

Alexandra Lakind, University of Wisconsin – Madison

Let's Talk about Lead in Water: A SciComm + Movie Night Virtual Event

Itzel Marquez, Central Michigan University

Watershed Stories: Communicating Watershed Science through Storytelling

Katherine Meierdiercks, Siena College

Let's Talk About Mercer County, NJ's Water

Indrani Pal, City University of New York/City College and Columbia University

Eagles, Let's Talk About Water!

Rachel R. Rotz, Florida Gulf Coast University

Instrumentation Discovery Travel Grant

The Instrumentation Discovery Travel Grant (IDTG) program enables scientists to learn the details of hydrologic instrument installation, operation, maintenance, and data processing by visiting experts or scheduling reverse site visits. Applications are accepted in the spring.

New York State Mesonet's Ground-based Gamma Radiation SWE Sensors for Snow Hydrology Research

Eunsang Cho, NASA Goddard Space Flight Center & University of Maryland College Park

Building Electrical Resistivity Equipment for Hydrogeological Research

Rachel R. Rotz, Florida Gulf Coast University

Hydrologic Monitoring of Wetlands to Support Remote Sensing Driven Carbon Measurements

Anthony J Stewart, University of Washington



MEMBERSHIP

Become a Member

CUAHSI's membership includes over 150 U.S. universities, colleges, nonprofit affiliates, and international affiliates who recognize the need for interdisciplinary collaboration and innovative thinking to advance water science and solve society's most pressing water issues.

Through CUAHSI membership,
your institution can:

Support the growing national and international
water science community;

Contribute to innovations in
water science and education;

Designate representatives for
your organization to participate in community
governance;

Receive registration discounts on
CUAHSI events and workshops.
Anyone affiliated with a member organization
is eligible for the member discount.

READY TO BECOME A CUAHSI MEMBER?

Learn more online at
www.cuahsi.org/about/membership
or contact Maddie Scranton at
mscranton@cuahsi.org

CUAHSI is now accepting membership
from Primarily Undergraduate Institutions (PUI).
Check our website for more information.



WELCOME TO CUAHSI

A special welcome to new CUAHSI Members of 2021:

University of California - Riverside, Fort Lewis College and Prairie View A&M!

Members

Boise State University
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2022 FRONTIERS IN HYDROLOGY MEETING

SAVE THE DATE

June 19th to 24th, 2022
San Juan, Puerto Rico

The Frontiers in Hydrology meeting will test innovative approaches to convene the water community, communicate science and its integration in other disciplines, and design engaging conference experiences. Leveraging collaborations between co-sponsors, the American Geophysical Union (AGU) Hydrology Section and CUAHSI, the conference will include engineering, urban planning, social science, and affiliated science communities.

Visit www.agu.org/FIHM for the most up to date information regarding this joint AGU and CUAHSI meeting.



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