2022 ANNUAL MEMBERS REPORT

CUAHSI

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CUAHSI
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LETTER FROM
THE PRESIDENT

Dear Friends:

CUAHSI continues to adapt to a hybrid work environment. Rather than being centrally located in Cambridge, MA, we now have staff in New Hampshire, New York, North Carolina, Utah, Vermont, and Washington, as well as in Massachusetts. We also no longer maintain on-site servers, but instead, we use private services for our various activities. Please take a moment to visit our staff page to learn about our excellent team.

In early 2022, we relocated 2 miles west from Cambridge to Arlington, MA. Our new office is a flexible space. CUAHSI has three rooms for workstations and meetings, plus common use areas. The new footprint more closely matches our current utilization, thereby reducing costs, while supporting our hybrid work environment. Most remote staff visit the CUAHSI office monthly.

We were excited to roll out completely revamped, modern website in early 2022, which we believe provides easier access to CUAHSI water data and computing services. The new CUAHSI website complements our CZNet website that came online in 2021 to support the Critical Zone Collaborative Network. We also are excited about our modernized HydroClient service. We are releasing a minimum viable product to selected users for testing in late 2022. Expect new functionality, including easier data search and data upload capabilities in 2023. We are using the Dendra cyberinfrastructure, which was developed through an NSF EarthCube and a CZO project, to support our new sensor observation service.

Thanks to all of you for supporting our new CUAHSI – AGU Hydrology Section joint Frontiers in Hydrology Meeting (FIHM). Please read more in the article below. The second FIHM is planned for June 2024 in St. Paul Minnesota.

Finally, CUAHSI completed a successful management review in Spring 2022.

The panel found that

CUAHSI is respected and valued by the hydrologic science community and is having a positive impact on the broader water science community. The panel commends CUAHSI for its excellent service to these communities through its modernized water data services; broad array of scientific meeting, workshop, training, and educational opportunities; and its recent inclusion of PUIs as eligible CUAHSI members. Through these activities, CUAHSI is serving and impacting a growing and more diverse community. CUAHSI's diversification of funding sources is substantial and reflects upon its healthy growth to date.

The panel also offered recommendations for focusing future efforts. We thank the panel for their good work and are working to implement their recommendations, especially through development of our 2024 - 2029 CUAHSI Strategic Plan, which we will complete in early 2023.

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 2023, as we welcome new CUAHSI Executive Director, Dr. Jordan Read. Read more in our November newsletter, here.

Take care,

Jerad Bales

President and Executive Director

ABOUT CUAHSI

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. Learn more about our programs and services at www.cuahsi.org.

In 2022

5,981 NEW HYDROSHARE RESOURCES CREATED

306 NEW DIGITAL OBJECT IDENTIFIERS (DOIS) ISSUED

4,416 NEW HYDROSHARE USERS

17 HYDROSHARE RELEASES

19,398 VIEWS ON YOUTUBE

03 NEW STAFF MEMBERS JOINED CUAHSI

22 STUDENTS PARTICIPATED IN THE 7TH NATIONAL WATER CENTER INNOVATORS PROGRAM

TWITTER FOLLOWERS INCREASED BY **22.7**%

15.3% INCREASE IN NEWSLETTER SUBSCRIBERS

78 HELP TICKET REQUESTS ANSWERED

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.

Photo : Hill

CUAHSI Diversity, Equity, and Inclusion

CUAHSI strives to ensure that Diversity, Equity and Inclusion (DEI) are core values reflected in our culture and practices. Our vision is that CUAHSI's commitment to DEI will strengthen interdisciplinary collaboration among water scientists by promoting the acceptance of diverse ideas and perspectives in the hydrologic sciences.

In 2022, CUAHSI took a decisive step in our commitment to an open and welcoming environment for everyone through the creation of the CUAHSI Code of Conduct.

This Code of Conduct details professional, ethical, and inclusive conduct expectations for participants in all CUAHSI activities. CUAHSI now asks all participants, leaders, volunteers, and staff to review and agree to follow these important standards. This policy was fully in place and implemented in time for CUAHSI's first in-person workshop this year.

To learn more about the Code of Conduct, please 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. Please visit the CZNet Data Submission Portal to learn more, including best practices, a quick start guide, and more.

2. Support discovery through community synthesis activities and via access to community data and modeling cyberinfrastructure.

3. Expand 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.

In 2022, the Coordinating Hub funded two data synthesis projects, and supported travel for students to CZ and other professional meetings. 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/.

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New In CUAHSI Data Services:

Facilitating Collaboration and Community with HydroShare

HydroShare's Communities functionality has undergone continued development to increase its usefulness to the HydroShare Community, and further improvements are expected in 2023. HydroShare Communities enable groups to share resources more seamlessly, fostering data sharing and access. The HydroShare team completed the work on the enhancements to the Communities functionality to improve functionality and simplify administration. New HydroShare groups for each of the CZNet Thematic Clusters also were added in 2022.

(!) **Please contact us at help@cuahsi.org to learn more about how CUAHSI's data tools and services can be used to support your upcoming classroom or workshop event.**

Supporting Education in the Cloud

CUAHSI's cloud-based platforms to support educational events -- JupyterEdu and MATLAB Online -- 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. Our primary goal is to alleviate the cyberinfrastructure burden so that educators can focus on science and education, and provide equitable access to cloud computing capabilities. In collaboration with our community, we've been able to support a number of activities and workshop events, such as international virtual graduate courses, coupled data-model integration research workshops, groundwater modeling workshops, and intensive research training events such as the NWC Innovators Summer Institute.

Frontiers in Hydrology Meeting 2022

CUAHSI and the American Geophysical Union co-hosted the first joint hydrologic sciences meeting in June, the Frontiers in Hydrology Meeting (FIHM). FIHM took place in San Juan, Puerto Rico from June 19-24, with the theme, "The Future of Water." The meeting featured 600 on-site attendees and 338 virtual participants, with 867 presentations across 231 sessions. A goal of the meeting was to create more opportunities for engagement with colleagues than what typically exists at larger conferences. To accomplish this, we reserved time for discussion at the end of each oral session; each daily plenary session consisted of panels discussing a wide range of topics; and poster sessions were held when there were no concurrent oral sessions. The new meeting also allowed us to experiment with new session formats, such as the Connect-and-Collaborate sessions (a total of 23 sessions), which permitted meeting participants to create spur-of-the-moment sessions that became part of the official meeting programs. Collectively, we also provided a total of $86,000 in travel support for a total of 83 students, early-career individuals, attendees from low to low-middle income nations, and attendees from Caribbean nations.

Frontiers in Hydrology   AGU ADVANCING EARTH AND SPACE SCIENCE   CUAHSI allied for water science

CUAHSI SUPPORTS 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 12 and Instrumentation Discovery Travel Grants Page 16).

Documentation & Processing:
- Describe data sets using CUAHSI's standard metadata templates in HydroShare.
- Receive metadata training and guidance from CUAHSI Staff.
- Learn about community data best practices with data best practices documentation initially created by and for the Critical Zone Collaborative Network, and available to all.

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 dataset search and others.
- Promote and disseminate your work through activities like cyberseminars (See Page 13), scientific conferences, and training workshops (See Page 12).
- Develop education and outreach activities with CUAHSI resources to share new approaches, research results, and methods with the community.
- Easily learn to use HydroShare's many features through the HydroShare How To Youtube Playlist.

SHARING

DISCOVERY & PLANNING

COLLECTION

DOCUMENTATION & PROCESSING

ANALYSIS & MODELING

PUBLICATION

MAINTENANCE & STORAGE

Photos : Boisrame, Perdrial & Piske

DATA AND 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 2022 are highlighted.

HydroShare

2022 was another year with substantial growth for HydroShare. HydroShare added almost 6,000 new resources to HydroShare. Over 300 new DOI's were requested and issued through Crossref, which represents an almost 50% increase above last year's count. The size of the data held by Hydroshare also increased substantially to now more than 4.2 TB which represents a more than 25% increase over 2021. These numbers indicate a growing adoption and acceptance of the repository by the community.

The HydroShare team delivered 17 releases, closing more than 200 GitHub issues. Key improvements and new functionality include the following:

- Private link sharing: This capability enables a user to keep resources private, and share the resource with journal paper reviewers while a paper citing the resource is under review.

- Linked spatial data: A new feature was developed in collaboration with the Internet of Water that allows a user to use Geoconnex (a system for connecting water data from different data providers via geographic location) to add linked data to any HydroShare resource, thereby improving spatial metadata and discoverability.

- HydroShare instructional videos: 16 short HydroShare instructional videos were added to the CUAHSI youtube channel explaining how to perform key tasks in HydroShare.

- Resource migration: Resource types were consilidated to improve usability, stability, and maintainability of the system.

- Scalability improvements: Several performance improvements were made for loading large datasets and a larger number of files across the application.

Hydrologic Information System (HIS)

CUAHSI's time series centric data management system,

HydroClient, experienced a continued growth in resources and use. Three new services were added to the system including, the modernization of the platform with goals to increase scalability, reliability and add new functionality. The new system will be fully cloud-based and will replace the current system over time. We expect to deliver the first phase in the Spring of 2023, focused on a redesigned data storage and data delivery implementation. In addition we're adding the ability to stream data and improve sensor management capabilities.

Community JupyterHub

CUAHSI's Community JupyterHub is a free, general-purpose, cloud computing service that enables users to execute scientific code as well as explore, modify, and interact with data inside a remote execution environment using Python and/or R programming languages. It is integrated with 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 users, each of which provides an assortment of preinstalled scientific libraries and models to expedite and simplify user experience. All users are provided persistent storage for saving completed and ongoing work. CUAHSI-maintained tools and libraries such as the *hsclient* library and *HydroShare-on-Jupyter*, to make it easy to explore and synchronize data between HydroShare and JupyterHub.

JupyterEdu - Support for Educational Cloud Computing

JupyterEdu is an initiative to provide event-specific cloud computing infrastructure for educational events, and is part of CUAHSI's ongoing effort to provide equitable access to cloud computing resources for water science research and education. Using the same underlying cyberinfrastructure as the Community JupyterHub, CUAHSI is able to provide pre-configured computing environments for custom education-focused events that require event-specific tools, software, and custom hardware configurations. In the past several years, we've provided computing capabilities for events of up to 100 participants, specialized computing hardware for machine learning research, terabyte-scale data storage, and customized software configuration. JupyterEdu instances feature an isolated deployment in the cloud that is accessible to only event participants. CUAHSI is always looking to expand support for additional events.

Photos : Adler & Boisrame

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.

Web Apps

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. CUAHSI is currently hosting web applications written in the Python and R programming languages. Several popular web applications focus on the dissemination of science visualization (RiverColor, Synthetic SWOT Generator), data discovery (Macrosheds), and science education tools (WaterBalance).

CUAHSI Domain Subsetter

CUAHSI has continued our CUAHSI Domain Subsetter, which provides a service for collecting static model domain datasets for continental-scale (CONUS) hydrologic 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 Domain 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.

This service is integrated with a high performance computing framework developed as part of the NSF (EAR-1835818) HydroFrame project to support a wide array of hydrologic modeling activities using the ParFlow model (https://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).

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

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EDUCATION AND TRAINING

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

This year marked a return to in-person events, with CUAHSI exhibiting at several conferences, offering a series of workshops, and holding the 2022 Summer Institute at the National Water Center.

> **"** CVU allowed me to interact with a diverse group of graduate students at other universities. It was awesome getting to know them and their research, and think through how I could also support their education. **"**

Alejandro Flores, Boise State University
Chair, CUAHSI Board of Directors
Faculty, CUAHSI Virtual University (Fall 2022)

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 offered by faculty in specialized research niches across leading institutions. 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.

! **Interested in teaching a module for a future CVU?**
Visit cuahsi.org/education/cuahsi-virtual-university for information.

Twenty universities and 282 students have participated in the CVU since its initiation in 2017. The unique format enables students to receive course credit for participating in the CVU through their home university.

In Fall 2022, 54 students participated in the CVU, with each student enrolled in at least one module of their choosing. The modules are:

Applications of Drones and UAS in 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

Crop-Groundwater Interactions
Instructor: Steve Loheide, University of Wisconsin - Madison

Hydrological Catchment Modeling Using Bucket-Type Models
Instructor: Jan Seibert, University of Zurich

Hydrologic Data Visualization
Instructor: Samuel Zipper, University of Kansas

Modeling Watershed Dynamics Using Landlab
Instructor: Erkan Istanbulluoglu, University of Washington

Open and Reproducible Research Computing
Instructor: Alejandro Flores, Boise State University

Stream Solute Tracers: What, Why, & How?
Instructor: Adam Ward, Oregon State University

Cyberseminars

CUAHSI Cyberseminars feature presentations, panels, and virtual events with experts on new or timely topics of interest. The program enables individuals to share their work and contribute to an archive of over 200 lectures available to the public. In 2022, CUAHSI hosted a series that included a discussion portion with breakout sessions for attendees.

Presentations from CUAHSI's 2022 Cyberseminar Series are available to view on the CUAHSI YouTube Channel. The 2022 series included:

Town Hall with NOAA's National Water Center: Programmatic Update and Opportunities for Collaboration
Convened by the National Water Center

Introduction to the NSF's Hydrologic Sciences Program: A Virtual Town Hall Meeting
Speakers: Laura Lautz, Elizabeth Boyer, and Hendratta Ali(Program Directors, Hydrologic Sciences, National Science Foundation)

Hydrologic Science and Indigenous Voices
Convened by Maribeth Kniffin, University of California Irvine and Riverbytes, LLC

Navigating Academic Waters: Succeeding as a Postdoc
Convened by AGU Hydrology Section Student Subcommittee (H3S) Professional Development Team

Navigating Academic Waters: Non-Academic Jobs in Hydrology
Convened by AGU Hydrology Section Student Subcommittee (H3S) Professional Development Team

Navigating Academic Waters: Postdoctoral Grant Writing Workshop
Convened by AGU Hydrology Section Student Subcommittee (H3S) Professional Development Team

Making Waves in Water Science: Open Source Tools
Convened by Clara Cogswell, CUAHSI Community Support Hydrologist

Workshops

CUAHSI facilitates workshops 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 2022, CUAHSI was excited to host in-person workshops again for the first time since 2020.

2022 Workshops

Hands-on Hydrogeodesy: Combining GPS and Hydrologic Datasets
July 2022
Location: University of Montana, Missoula, Montana
Lead Instructors: Dr. Ellen Knappe (University of California, San Diego/ Scripps Institution of Oceanography) and Dr. Alissa White (University of Montana)

Surface Water Field School
August 2022
Location: University of Oregon, Eugene, Oregon
Lead Instructor: Dr. J. Toby Minear (University of Colorado, Boulder)

Open Source Electronics for Water Research and Real Time Water Monitoring
September 2022
Location: Stroud Water Research Center, Pennsylvania
Lead Instructors: Scott Ensign and Shannon Hicks (Stroud Water Research Center)

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.

Supporting Education in Water Science

CUAHSI is expanding services and programs for undergraduate students. Many universities do not have specific hydrology departments which can make it difficult for students interested in furthering their education in water science to know where to start. CUAHSI has compiled a list of graduate programs in water science to use as a starting point. The list includes institutions from all over the country and includes programs for earning varying degrees and certifications.

Visit www.cuahsi.org/students/graduate-programs-in-water-science for more information.
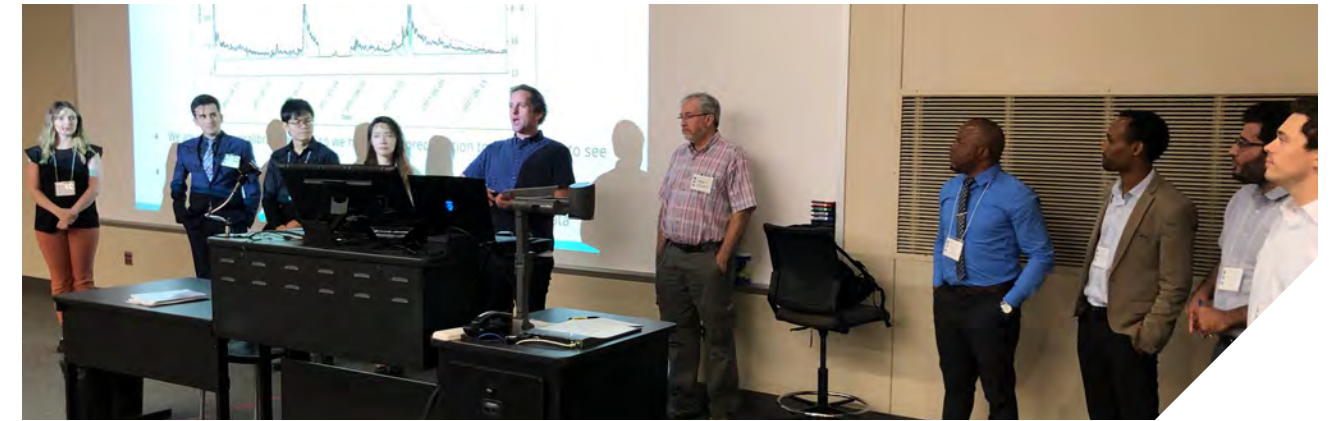
National Water Center Innovators Program: Summer Institute

In 2015, the National Weather Service, in partnership with CUAHSI, established the National Water Center Innovators Program to engage the academic community in research to advance the mission of the National Water Center (NWC). The primary activity of the program is a seven-week Summer Institute which takes place at the NWC in Tuscaloosa, Alabama and brings together graduate students, and NWC staff to work on projects designed to improve water-related products and decision-support services. Since the first Summer Institute in 2015, about 180 students have participated in the program, which continues to play an important role in developing and refining the National Water Model.

After a hiatus due to the COVID-19 Pandemic, the 2022 Summer Institute was held in person at the NWC. The 2022 Summer Institute cohort consisted of 22 graduate students - 6 M.S. students, and 16 Ph.D. candidates from 21 universities across the United States.

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

The NWC-SI 2022 Themes were:

Theme: **Coupling Inland and Coastal Hydraulics**
Theme Advisors: Celso Ferreira, George Mason University; Kyle Mandli, Columbia University

Theme: **Next Generation Hydrologic Model Framework**
Theme Advisors: Fred Ogden, NOAA Federal; Jonathan Frame, Cloud to Street

Theme: **Hydroinformatics**
Theme Advisor: Sagy Cohen, University of Alabama; Chaopeng Shen, Pennsylvania State University

Additional information, including application details and a technical report that highlights student projects can be found at https://www.cuahsi.org/summer-institute.
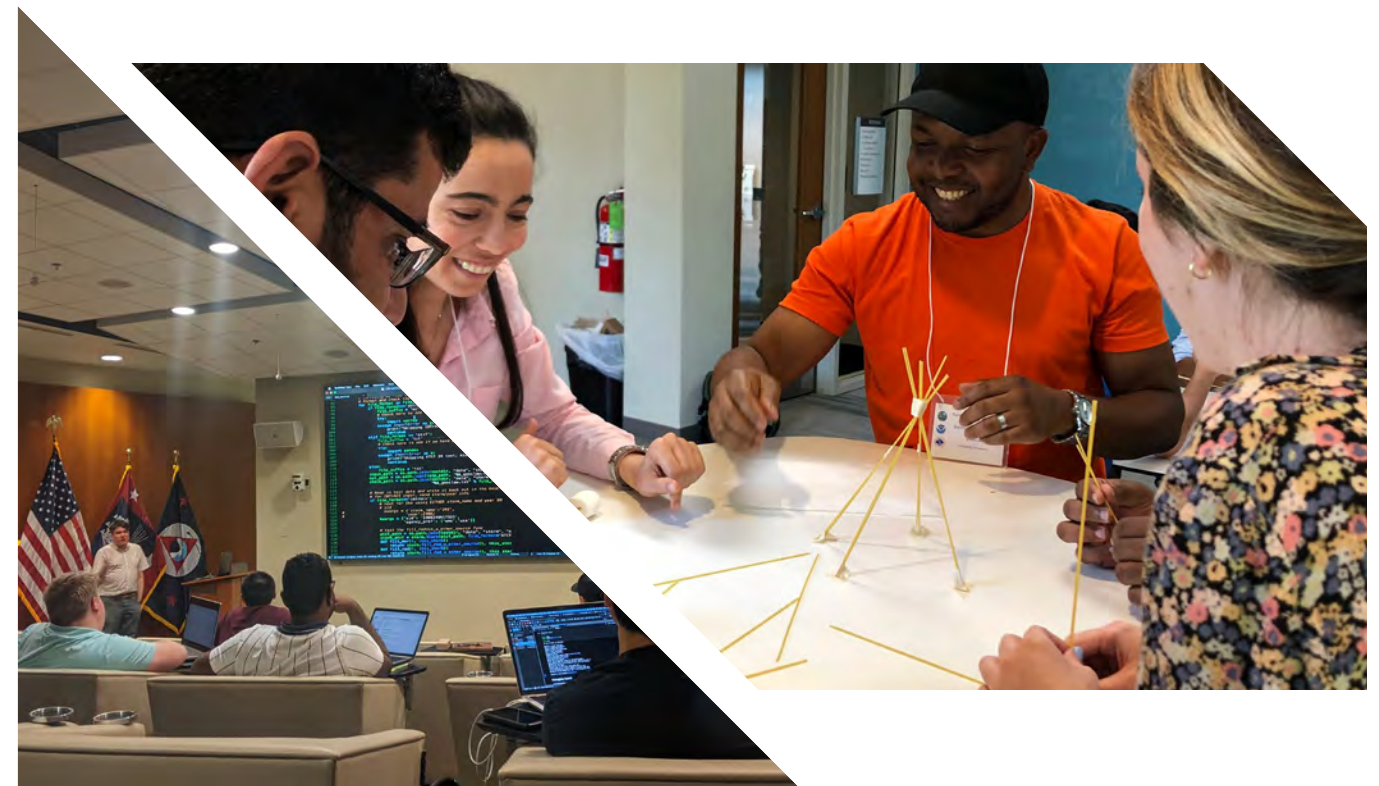
GRANTS AND FELLOWSHIPS

CUAHSI supports activities to extend research and develop new products. All programs accept proposals once per year. Submission deadlines are announced via 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. Current awardees are:

- The Critical Zone Biogeochemistry and Hydrology Data Pipeline: A tool that synchronizes multi-decadal watershed scale critical zone attributes
  Desneiges Murray
  University of New Hampshire

- Advancing a Community Groundwater Model Portal (GroMoPo)
  Samuel Zipper
  Kansas Geological Survey, University of Kansas

- HydroLang: An Open-Source Web-Based Framework for Environmental and Hydrological Analyses
  Carlos V. Erazo Ramirez
  University of Iowa

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. Current awardees are:

- Examining Interactions Among Vegetation, Soil, and Water Following Land-Cover Change
  Karla M. Jarecke
  Oregon State University

- Field Weighing Lysimeters for Water Balance in Austria and Virginia
  Jaclyn C. Fiola
  Virginia Polytechnic Institute and State University

- Smart Rock Deployment and Sensor Data Logging for Wetland and Salt Marsh Hydrology Applications
  Marcela Strane
  University of Houston

- Ground-Penetrating Radar for Snow Measurement Applications
  John Tarricone
  University of Nevada - Reno

- Field Instrumentation and Monitoring of Green Stormwater Infrastructure
  Aida Yahyavi Rahimi
  Florida International 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 annually, in the Fall. Current awardees are:

- Post-Fire Export of Dissolved Organic Carbon and Dissolved Black Carbon from Paired Headwater Catchments
  Riley Barton
  Rensselaer Polytechnic Institute

- Understanding the Global Circulation of Microplastics Through Atmospheric Deposition in North American Alpine Environments
  Aleksandra Karapetrova
  University of California - Riverside

- Improving Snow Distribution Modeling in Avalanche Zones Near Turnagain Arm, AK
  Christina Aragon
  Oregon State University

- Isotopic Assessment of Hydrologic Flowpath Activation in Tropical Landscapes Under High-Flow Conditions
  William Larsen
  Rice University

- Investigating Risk Dynamics In Coastal Areas Using an Integrated Modeling Approach That Accounts for the Physical and Social Drivers of Flooding
  Lauren E. Grimley
  University of North Carolina - Chapel Hill

- Delta Growth and Lake Infilling in the Peace-Athabasca Delta, Alberta, Canada
  Julianne Davis
  University of North Carolina - Chapel Hill

- Quantifying the Extent and Drivers of Geomorphic Heterogeneity in Dryland Ephemeral Watersheds
  Julianne Scamardo
  Colorado State University

- Hot vs. Cold Desert Carbon Sequestration: Examining the Role of Dust, Water, and Soil Parent Material in Providing Calcium for Soil Inorganic Carbon
  Zahra Ghahremani
  Boise State University

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. Current awardees are:

- Social Responsibility in Water Science for the Greater Global Good
  Samuel Smidt
  University of Florida

- Biodiversity of Freshwater Mussels: Community Science in Action
  Danelle Haake
  Lewis and Clark Community College

- Following Water in the San Joaquin River Delta
  Tina Korani
  San Jose State University

- Kids on the River
  Sarah Fisher
  National Great Rivers Research and Education Center and Lewis and Clark Community College

- The Manifestation of Water in Natural Disasters
  Janine Baijnath-Rodino
  University of California - Irvine

MEMBERSHIP

Become a Member

CUAHSI's membership includes more than 150 U.S. universities, 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 2022:
National Environmental Engineering Research Institute of India, Santa Clara University, Smith College and University of Missouri

Members

Brigham Young University	Portland State University	University of Kansas
Boise State University	Prairie View A&M University	University of Kentucky
Carnegie Mellon University	Princeton University	University of Memphis
Clemson University	Rutgers University	University of Minnesota
Colorado School of Mines	Smith College	University of Missouri
Colorado State University	Southern Illinois University	University of Montana
Dartmouth College	State University of New York - Buffalo	University of Nebraska
Drexel University	State University of New York - ESF	University of Nevada - Reno
Fort Lewis College	Syracuse University	University of New Mexico
George Mason University	Temple University	University of North Carolina System
Georgia State University	Texas A&M University	University of Notre Dame
Idaho State University	University of Alabama	University of Oklahoma
Iowa State University	University of Arizona	University of Pittsburgh
Kent State University	University of Arkansas	University of South Florida
Louisiana State University	University of California - Irvine	University of Tennessee - Knoxville
Marquette University	University of California - Merced	University of Texas - Austin
Michigan State University	University of California - Riverside	University of Utah
Michigan Technological University	University of California - Santa Cruz	University of Vermont
Mississippi State University	University of Central Florida	University of Wisconsin - Madison
Montana State University	University of Colorado - Boulder	Utah State University
Northeastern University	University of Delaware	Vanderbilt University
Northern Arizona University	University of Florida	Virginia Tech
Northwestern University	University of Hawai'i	Washington State University
Oregon State University	University of Illinois	West Virginia University
Pennsylvania State University	University of Iowa	

International Affiliate Members

Cadi Ayyad University	Suez Canal University	University of New Brunswick
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SAVE THE DATE

2023 BIENNIAL COLLOQUIUM

June 11th - 14th, 2023
Tahoe City, CA

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Every two years, CUAHSI hosts a Biennial Colloquium focused on developments in the hydrology sector of the Earth Sciences. The symposium offers a unique opportunity and a casual environment for participants to discuss ideas and interact with colleagues from different disciplinary fields from all over the country. Students are especially encouraged to attend!

The theme for the 2023 biennial is, Discovering New Horizons in Water Science.

The broad field of Water Science is making important strides in addressing critical environmental and societal challenges in the face of growing stressors. As the connector among essentially all key systems on our planet, Water Science continues to reshape and evolve in its own unique way to address disciplinary and interdisciplinary challenges. The 2023 CUAHSI Biennial Meeting will focus on new horizons in Water Science that include: new ways of doing inclusive and collaborative research, new perspectives, new knowledge frameworks, new ways of learning, new tools, and new metrics of success. This will be the first in-person gathering of our CUAHSI community since the last Biennial in 2018. Please join us in sharing your discoveries and inspirations in Water Science as we continue to build towards sustainable water futures for all.

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