AGU HYDROLOGY

AGU HYDROLOGY SECTION NEWSLETTER

Members of AGU's Hydrology Section are concerned with the cycling of continental water at all scales, and with physical, chemical and biological processes driven by that cycling.

JUNE 2026

FROM THE SECTION SECRETARY

Jennifer Druhan

University of Illinois Urbana-Champaign

An Evolving Landscape of Technical Committees

Within the AGU Hydrology Section, it might be easy to view our organizational structure as a set of fixed boxes on a chart. But in reality, our Technical Committees (TCs) are anything but static. They are the primary mechanism through which our section evolves and adapts. These are entities that emerge, develop, and occasionally sunset in response to the shifting frontiers of hydrologic science and the collective energy of our membership. In this sense, TCs are not simply organizational units; they are signals of where our field is going.

The recent formation of our Distributed Sensing Technical Committee is a clear example. This group did not arise from a top-down directive, but from a critical mass of researchers recognizing that advances in fiber optics, sensor networks, and high-resolution environmental monitoring are fundamentally reshaping how we observe hydrologic systems. What began as a set of conversations and sessions evolved into a shared identity, and ultimately into a TC that now serves as a focal point for collaboration, synthesis, and community building. This is exactly how TCs should work: as community-driven responses to emerging science.

This evolution is essential to keeping our section vibrant and relevant. Whether it is a long-standing group like Groundwater or a newer initiative such as Water & Society, each TC exists because members have identified a need and stepped forward to meet it. TCs are the primary engines for organizing Fall Meeting sessions, leading synthesis efforts, and fostering the professional networks that sustain our community throughout the year.

This issue:

How to Shape Our Future

For those looking to get involved, there are many pathways. Existing TCs are always open to new participants, whether through organizing sessions, contributing to webinars or white papers, or helping shape the direction of the committee. These are accessible, high-impact ways to engage with the hydrology community.

At the same time, we encourage members to think more expansively: what is missing? New TCs typically begin as informal clusters of researchers organizing sessions or town halls around a shared theme. When sustained interest emerges, particularly around a distinct scientific or technological frontier not fully captured by existing committees, that momentum can be translated into a proposal, developed in collaboration with Section leadership and grounded in clear community need and vision.

Ultimately, the vitality of our TCs depends on participation. They are one of the most direct ways for members to shape the trajectory of the Hydrology Section, not only by contributing to existing efforts, but by helping define what comes next.

Announcements

Call for Editors-in-Chief: Water Resources Research & JGR: Oceans

AGU is seeking Editors-in-Chief for Water Resources Research and JGR: Oceans, with terms beginning 1 January 2027. These roles offer an opportunity to shape research quality, editorial direction, and community standards.

We encourage you to apply or share with colleagues. **The application deadline has been extended to 14 June 2026.**

View the calls and apply:
- Water Resources Research Editor-in-Chief search
- JGR: Oceans Editor-in-Chief search

For general questions, contact pubmatters@agu.org

Water Resources Research Search Committee:
- Venkataraman Lakshmi (Chair) – vlakshmi@virginia.edu
- Fiona Johnson – f.johnson@unsw.edu.au
- Yi Zheng – zhengy@sustech.edu.cn
- Sara Goeking – sara.goeking@usda.gov
- Taikan Oki – taikan@iis.u-tokyo.ac.jp
- Kamini Singha – ksingha@mines.edu
- Jaime Gomez-Hernandez – jaime@dihma.upv.es

AGU26 Timeline: Save the Dates

Planning for AGU26 is underway! If you submitted a session proposal, keep an eye on your email for notification of acceptance in the coming weeks.

Abstract submissions will open in mid-June—watch for the official announcement and be ready to submit.

Key Dates
- **Mid-June** – Abstract submissions open; session proposal decisions released
- **5 August** – Abstract submission deadline

Stay tuned to AGU communications for updates and next steps.

Members of Indigenous Communities: Apply for No-Cost Registration and Waived Abstract Submission to AGU26

Members of Indigenous Communities: AGU offers no-cost registration to attend the AGU26 Annual Meeting in December to 100 AGU members who self-identify as members of an Indigenous Community anywhere in the world. Applications are now open and will close on 30 July 2026. If your application is accepted, you'll use the registration portal to register for the meeting at no cost.

Learn more and apply now.

Announcements

Bridges to Future Student Grants Program

Celebrating the past and future of hydrology, the AGU Hydrology Bridges to the Future Program is intergenerational. Bridges connects foundational work in our field with the expanding range and diversity of students interested in water, and honors those who've made an impact in our field. The program program provides $2,000 grants to support undergraduate, master's, and doctoral students facing financial barriers in pursuing careers in hydrology. Funding can be used for activities like attending scientific meetings, visiting research groups, or engaging in career development.

Who Can Apply

Students enrolled full- or part-time at two-year colleges, four-year universities, or graduate programs, with a demonstrated interest in hydrological sciences. Preference is given to undergraduate students, but all career stages are eligible.

Application Materials Include

A current CV, two-page essay describing your hydrology interests and proposed activity, budget explaining how the grant makes the activity feasible, and one letter of reference confirming your qualifications and potential impact

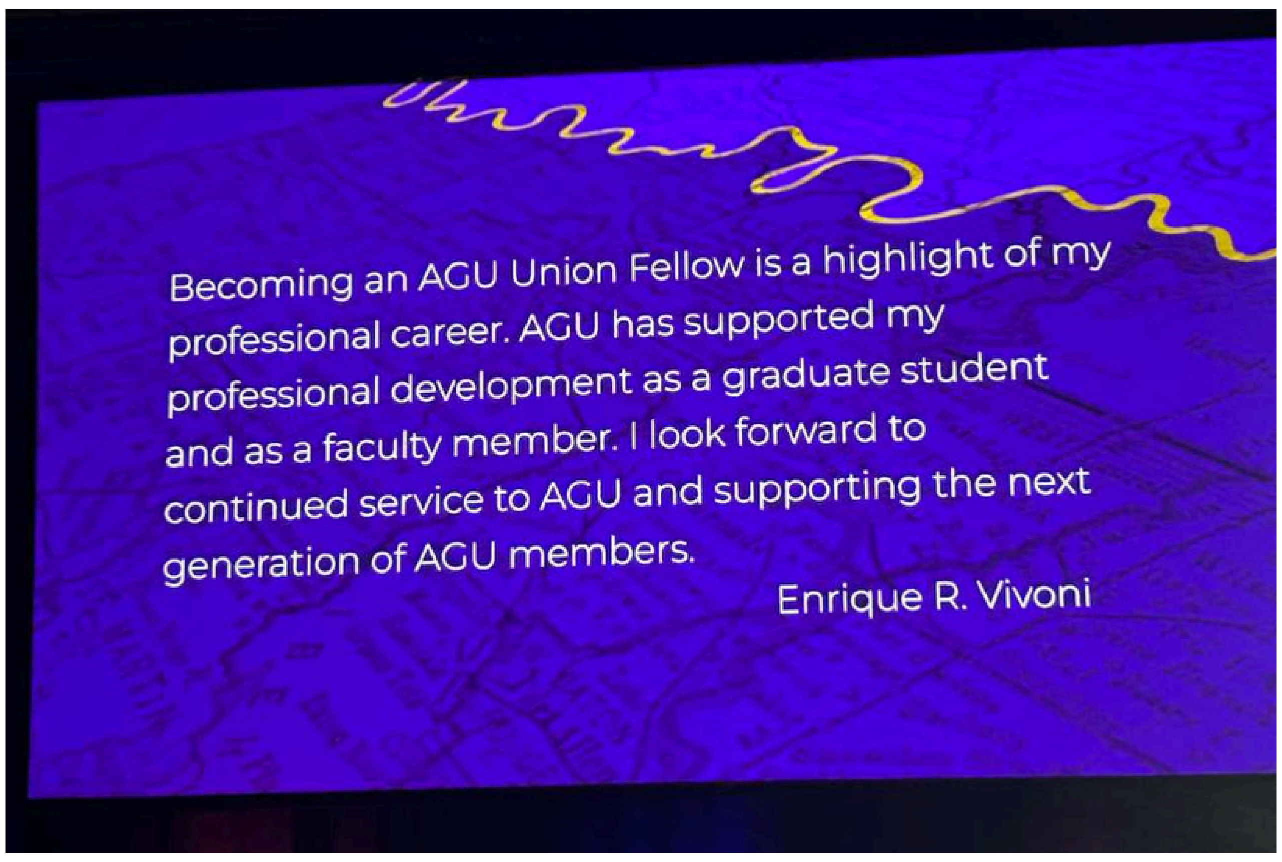
How to Apply

Submit your application to Venkataraman Lakshmi, Hydrology Section President (vlakshmi@virginia.edu), who can also be contacted for additional information. **Applications are due by October 15**. Award announcements will be made in November.

Enrique R. Vivoni

Center for Hydrologic Innovations,
Arizona State University

Several months before the award ceremony, I was asked to write a short note on my reaction to being elected an AGU Fellow. At the time, I wrote the statement shown in Photograph 1. Shortly after the ceremony, I was invited to contribute to the AGU Hydrology Fellow Speaks series - the occasion for this reflection.



Photograph 1. Reflection displayed during the AGU25 Fellows ceremony, written shortly after being elected an AGU Fellow.

When I wrote that earlier note, I had not anticipated the range of emotions I would experience during the ceremony. Those feelings were focused on others. I was excited to be among newly elected Fellows whose work I have long admired - Ashish Sharma, Marco Marani, Zong-Liang Yang, and Binayak Mohanty. I felt deep joy in sharing the moment with students and staff from Arizona State University, whose contributions make achievements like this possible (Photograph 2). Above all, I felt gratitude toward colleagues and lifelong friends - Rafael Bras and Valeriy Ivanov - who, together with my wife and biggest supporter, Amapola, reminisced about our years at the Ralph M. Parsons Laboratory at MIT.

Much has changed since my graduate studies at MIT - hydrology as a discipline, science as an enterprise, and the world itself. What has not changed is a shared desire within the AGU Hydrology community **to make a meaningful difference**. For many of us, this reflects a deeper commitment: to serve society using science and engineering as vehicles for impact. For reasons this readership knows well, that societal call has grown more urgent. If hydrologists are needed, how should we respond?

Photograph 2. Celebrating the AGU Fellows ceremony with students and colleagues from Arizona State University, whose contributions make achievements like this possible.

This question warrants reflection. In my case, I have adopted an approach I describe as **Water Resources for Public Impact**. The phrase is intentionally broad, encompassing many topics within the AGU Hydrology community while making the intent explicit: to improve society in meaningful ways. Within this framework, research priorities are shaped by the needs of those positioned to implement the knowledge and solutions we generate, including government, non-profit, and private-sector partners. Some may view this as applied research; others may question whether it strays from basic science. I would argue that the scale and pace of hydrologic change demand this orientation and that advancing fundamental understanding and serving societal needs are not mutually exclusive.

CONTINUED ON PAGE 05

Enrique R. Vivoni

Center for Hydrologic Innovations,
Arizona State University

Arizona State University
Center for Hydrologic Innovations

CONTINUED FROM PAGE 04

Three years ago, we established the Center for Hydrologic Innovations at Arizona State University to put this approach into practice. Together with colleagues - Profs. Margaret Garcia, Jay Famiglietti, Upmanu Lall, Saurav Kumar, Giuseppe Mascaro, Tianfiang Xu, Dave White, and Ruijie Zeng - we have cultivated a culture of hydrology in service to others. This effort has yielded meaningful outcomes, including a more purpose-driven work environment, stronger connections to the practitioner community, and expanded career pathways for our students and staff. As a collaborative team, we meet the research needs of partners in water management while contributing to the scientific community.

To illustrate this approach, consider the ongoing crisis in the Colorado River. At no previous time has water management in the western United States so urgently required the talents and creativity of the AGU Hydrology community. How will we respond? At the Center for Hydrologic Innovations, we are translating research tools into operational products used by water management agencies. For example, we have shown that soil moisture observations from NASA's SMAP mission can serve as early indicators of streamflow in the following water year. This relationship - linking fall soil moisture to subsequent runoff - was established through numerical experiments using the VIC model. Such foresight is valuable to both researchers and practitioners making decisions, including curtailments that affect entire economies.

"At no previous time has water management in the western United States so urgently required the talents and creativity of the AGU Hydrology community. How will we respond?"

The question, then, is how hydrologists choose to engage. For me, being named an AGU Fellow is a reminder of the responsibility to serve more intentionally in the years ahead. Aligning our science with societal needs offers a path that is both impactful and fulfilling. While our challenges are significant, so too is the capacity of our community to respond with creativity, rigor, and purpose. I remain optimistic that, in the years ahead, we can make a meaningful difference to society through hydrology.

"While our challenges are significant, so too is the capacity of our community to respond with creativity, rigor, and purpose."

AWARDEE SPEAKS

Niko Wanders

James B. Macelwane Medal

Utrecht University

When I started my PhD, I never thought I would one day receive an AGU award. Along my scientific journey I have been very lucky to work with inspiring mentors that all taught me in different ways what it means to be a good scientist. How to come up with good research ideas, how to build a network, how to create a team and how to make impact in society. Those valuable lessons will not be forgotten and will be with me the rest of my career.

Niko Wanders teaching in a primary school about the water cycle

Team Science

At this stage in my career, I'm very proud that I can be part of the scientific journey of many young scientists in and outside of my group. The work of the PhDs and postdocs in my team has been crucial in advancing our understanding of hydrological extremes. They are putting in the hours and doing most of the work. It is only because of them that we can sit together and discuss their scientific discoveries. I would say the most joyful part of my job is to see them grow, see them become independent and learn from them. They also stimulate critical thinking and reflection on how to be a good mentor.

Collaborations

Another thing that has made this scientific journey a joy has been the collaborations with early career peers. I learned that you don't always have to work with the senior experts in the field. It can also be refreshing if you team up with early career peers. It brings energy if you try together, fail together, or even better, succeed together in obtaining funding or publishing scientific research. The shared suffering and success add another layer to the scientific journey. It can create long-lasting friendships and go beyond the science. Admittedly writing successful proposals can be hard and success rates are too low, so that is why it is good to have support around you. That is also why meetings like the AGU fall meeting are great: you get to connect with peers and meet new people.

"It brings energy if you try together, fail together, or even better, succeed together in obtaining funding or publishing scientific research."

Impact

Making impact on society through science was something that sounded very daunting to me when I was a PhD. However, I also learned that societal impact can be something big like a radio or TV interviews, but equally rewarding is a visit to your local school to share your work and geoscience knowledge with kids. To be honest the latter is often more rewarding, nothing beats the enthusiasm and curiosity of kids!

Finally, I have been fortunate enough to enjoy this scientific journey. It is not always easy, it is not always fun but working in geosciences also brings a lot of joy in this amazing community.

EARLY CAREER SPOTLIGHT

Aashutosh Aryal

Postdoctoral Research Associate (Climate Fellow), University of Virginia Environmental Institute

I grew up in Nepal, where water is everywhere — rivers rushing down mountains and hills, filling rice paddies, and powering the hydroelectric projects that light up entire valleys. Hydroclimatic extremes were not abstract statistics to me growing up in Nepal; they disrupted communities, washed out roads, and reshuffled lives. That lived reality ultimately led me to pursue civil engineering and, eventually, to one of hydrology's most pressing frontiers: understanding how extreme hydroclimatic events unfold in the world's most vulnerable and least-monitored regions. I studied civil engineering with a focus on hydropower at Kathmandu University, Nepal. I later received an Erasmus Mundus scholarship to pursue a joint master's degree in hydroinformatics and water management across Europe and the UK, which eventually landed me at the Potsdam Institute for Climate Impact Research in Germany to conduct my master's thesis. My master's thesis compared how well global hydrological models captured river behavior in Pan-Arctic basins, which was a far cry from the monsoon-fed rivers I had grown up with, but also a lesson that water challenges do not respect borders.

After completing my master's, I returned to Nepal and worked for several years as a water resources engineer, designing recharge wells, managing urban water supply infrastructure, and coordinating rainwater harvesting projects in Lalitpur. I also did consulting work at an international firm, which meant I suddenly found myself doing climate vulnerability assessments in Central Asia and hydraulic modeling of wetlands in North Africa. Looking back, those years were formative — they kept me honest about what it takes to manage water at the community level, and that perspective has never really left me.

In 2022, I joined Professor Venkataraman Lakshmi's HydroSense Research Lab at the University of Virginia (UVA) for my PhD. My research focused on using satellite remote sensing to investigate hydrological processes and flood risks in data-scarce regions of South Asia — essentially, places where extreme floods and droughts cause serious harm, but ground-based monitoring is sparse or nonexistent. I worked on everything from evaluating satellite precipitation products for streamflow modelling in Nepal's Gandaki Basin to piecing together the factors that drove the catastrophic 2022 Pakistan floods, which submerged nearly a third of the country. I also enhanced a satellite-based flood-inundation map for greater accuracy to study a major embankment breach in Bihar, India — the kind of event that displaces millions of people and underscores why better flood-mapping tools matter. It was a great reminder that the tools we build and the analyses we conduct can be applied to a wide range of problems — and that satellites really do function as our virtual field stations across regions we could never monitor on the ground alone.

Satellite observations offer a remarkable opportunity to serve as virtual field stations over regions where conventional monitoring networks are sparse or absent.

CONTINUED ON PAGE 08

EARLY CAREER SPOTLIGHT

Aashutosh Aryal

Postdoctoral Research Associate (Climate Fellow), University of Virginia Environmental Institute

CONTINUED FROM PAGE 07

I completed my PhD in 2025 and am now a Climate Fellow and Postdoctoral Research Associate at UVA's Environmental Institute, working with Dr. Julianne Quinn and Dr. Kathleen Schiro on compound flooding in coastal urban areas. We have developed a deep learning surrogate model of a physics-based coupled hydrodynamic model — including how subsurface stormwater infrastructure behave during extreme events — to improve flood prediction in places like Norfolk, Virginia. Norfolk is a fascinating and sobering testbed: storm surge, heavy rainfall, and accelerating sea-level rise are all converging there at once, and the engineering standards that protect the city were built for a different climate. Our goal is to advance physics-informed data-driven modeling and explainable AI frameworks to improve the predictive interpretability and robustness of infrastructure to deeply uncertain hydroclimatic extremes.

From the mountain watersheds of Nepal to the tidal floodplains of coastal Virginia — the thread connecting it all is trying to turn observations into decisions that protect people.

Going forward, I am excited about where physics-informed machine learning is heading — particularly its potential to bridge satellite observations, process-based models, and actionable flood risk information that communities and decision-makers can use. Whether I am looking at Himalayan watersheds or Chesapeake Bay coastlines, the goal is always the same: to understand hydroclimatic extremes and help the people who live with them.

LinkedIn | Google Scholar

My visit to Lake Tahoe, California, on a winter evening in December.

Forest protection as flood mitigation for urban Hawaiʻi

Yinphan Tsang, Yu-Fen Huang, Conrad Newfield, Nathan DeMaagd, Jean Fujikawa, Leah Bremer, Nate Dube, Serene Smalley, Erin Bishop, Kimberly Burnett, and Emma Yuen

Department of Natural Resources and Environmental Management (NREM), Water Resources Research Center (WRRC), Institute for Sustainability and Resilience (ISR), UH Economic Research Organization (UHERO), Oʻahu Invasive Species Committee (OISC) & Koʻolau Mountains Watershed Partnership (KMWP), Pacific Cooperative Studies Unit (PCSU), University of Hawaiʻi at Mānoa; Department of Land and Natural Resources, Division of Forestry and Wildlife, State of Hawaiʻi.

Invasive Species as a Flood Hazard

The Ala Wai watershed on Oʻahu, Hawaiʻi, is characterized by steep, forested uplands in Mānoa, Pālolo, and Makiki valleys, transitioning through dense residential mid-watershed areas before draining into the Ala Wai Canal and ultimately Waikīkī — one of the most economically dense urban areas in the Pacific. The U.S. Army Corps of Engineers estimates that a 100-yr flood event in this watershed would cause nearly $1.2 billion in structural damage, with a current Expected Annual Damage of $68 million per year.

Two highly invasive plant species are actively worsening this risk. Albizia (*Falcataria falcata*), a fast-growing canopy tree, produces brittle branches that fall during storms, physically blocking stream channels and creating dangerous backwater flooding. In 2004, a debris jam largely composed of Albizia limbs at the Woodlawn Bridge forced the stream out of its channel, resulting in $85 million in damage. Miconia (*Miconia calvescens*), considered one of the world's worst invasive species, has enormous leaves that concentrate rainfall into high-energy throughfall drops, roughly doubling the kinetic energy of precipitation reaching the soil and dramatically accelerating erosion and sediment delivery downstream.

Both species also block sunlight from native plants beneath their canopies, with the Albizia canopy allowing for understory growth but leaving significant gaps in the midstory/subcanopy layers. Miconia's massive leaves and aggressive reproduction suppress understory growth, creating barer ground along stream banks and steep upland slopes. Shallow root systems promote topsoil loss during rain events, compounding obstacles to diverse vegetation needed for healthy forests. Dense miconia infestations form monotypic stands known to completely prevent understory plants from growing, further reducing infiltration and increasing sediment runoff. Despite the known ecological impacts of both species, the specific hydrological consequences had not been quantified — until now.

Field Monitoring Paired with Scenario Modeling

Our study integrates two complementary approaches. First, we leveraged the existing USGS stream gauge network across sub-watersheds to conduct a before-and-after observational analysis, comparing streamflow and turbidity records from the unmanaged baseline period (pre-2021) against the post-management period (post-2023), following major Albizia and Miconia removal operations. Second, we used a calibrated SWAT+ hydrological model to simulate a 10-year unmanaged spread scenario — projecting watershed conditions if invasive species control does not occur.

CONTINUED ON PAGE 10

Forest protection as flood mitigation for urban Hawai‘i

Yinphan Tsang, Yu-Fen Huang, Conrad Newfield, Nathan DeMaagd, Jean Fujikawa, Leah Bremer, Nate Dube, Serene Smalley, Erin Bishop, Kimberly Burnett, and Emma Yuen

Department of Natural Resources and Environmental Management (NREM), Water Resources Research Center (WRRC), Institute for Sustainability and Resilience (ISR), UH Economic Research Organization (UHERO), O‘ahu Invasive Species Committee (OISC) & Ko‘olau Mountains Watershed Partnership (KMWP), Pacific Cooperative Studies Unit (PCSU), University of Hawai‘i at Mānoa; Department of Land and Natural Resources, Division of Forestry and Wildlife, State of Hawai‘i.

CONTINUED FROM PAGE 09

At Makiki — the primary removal site — log-log regression analysis shows a clear downward shift in both streamflow and turbidity after management: the same rainfall now produces measurably less runoff, and the same streamflow carries measurably less sediment (Figure 1). These improvements indicate reduced runoff generation and sediment mobilization following vegetation change. Notably, these changes emerged within just one to two years of management, suggesting the hydrological system responds relatively quickly to invasive removal.

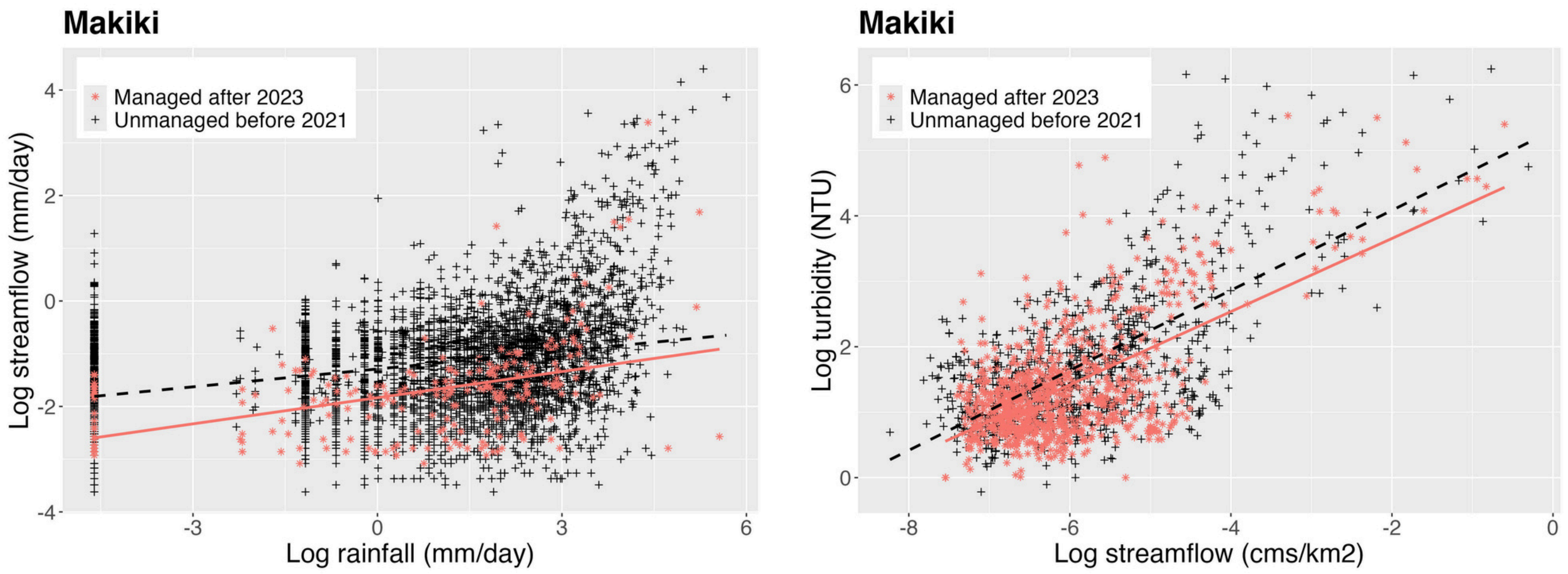


Figure 1. Makiki sub-watershed before-and-after monitoring results. **Left**: Log streamflow vs. log rainfall — the downward shift in the post-management regression line (pink, post-2023) relative to the baseline (black dashes, pre-2021) indicates less runoff for the same rainfall. **Right**: Log turbidity (NTU) vs. log streamflow — the downward shift indicates less sediment suspended in the water for the same streamflow. Both panels show improved hydrological conditions within one to two years of Albizia and Miconia removal.

CONTINUED ON PAGE 11

Forest protection as flood mitigation for urban Hawaiʻi

Yinphan Tsang, Yu-Fen Huang, Conrad Newfield, Nathan DeMaagd, Jean Fujikawa, Leah Bremer, Nate Dube, Serene Smalley, Erin Bishop, Kimberly Burnett, and Emma Yuen

Department of Natural Resources and Environmental Management (NREM), Water Resources Research Center (WRRC), Institute for Sustainability and Resilience (ISR), UH Economic Research Organization (UHERO), Oʻahu Invasive Species Committee (OISC) & Koʻolau Mountains Watershed Partnership (KMWP), Pacific Cooperative Studies Unit (PCSU), University of Hawaiʻi at Mānoa; Department of Land and Natural Resources, Division of Forestry and Wildlife, State of Hawaiʻi.

CONTINUED FROM PAGE 10

The modeling results tell the complementary story of inaction. Under the 10-year unmanaged spread scenario, peak flows increase — particularly at Woodlawn and Waihi, the sub-watersheds with the greatest projected Miconia expansion. The rainfall threshold required to trigger a 26-yr flood at Woodlawn drops from a 26-year event (266 mm) to a 12-year event (210 mm), meaning catastrophic flooding becomes roughly twice as likely in a given year (Figure 2).

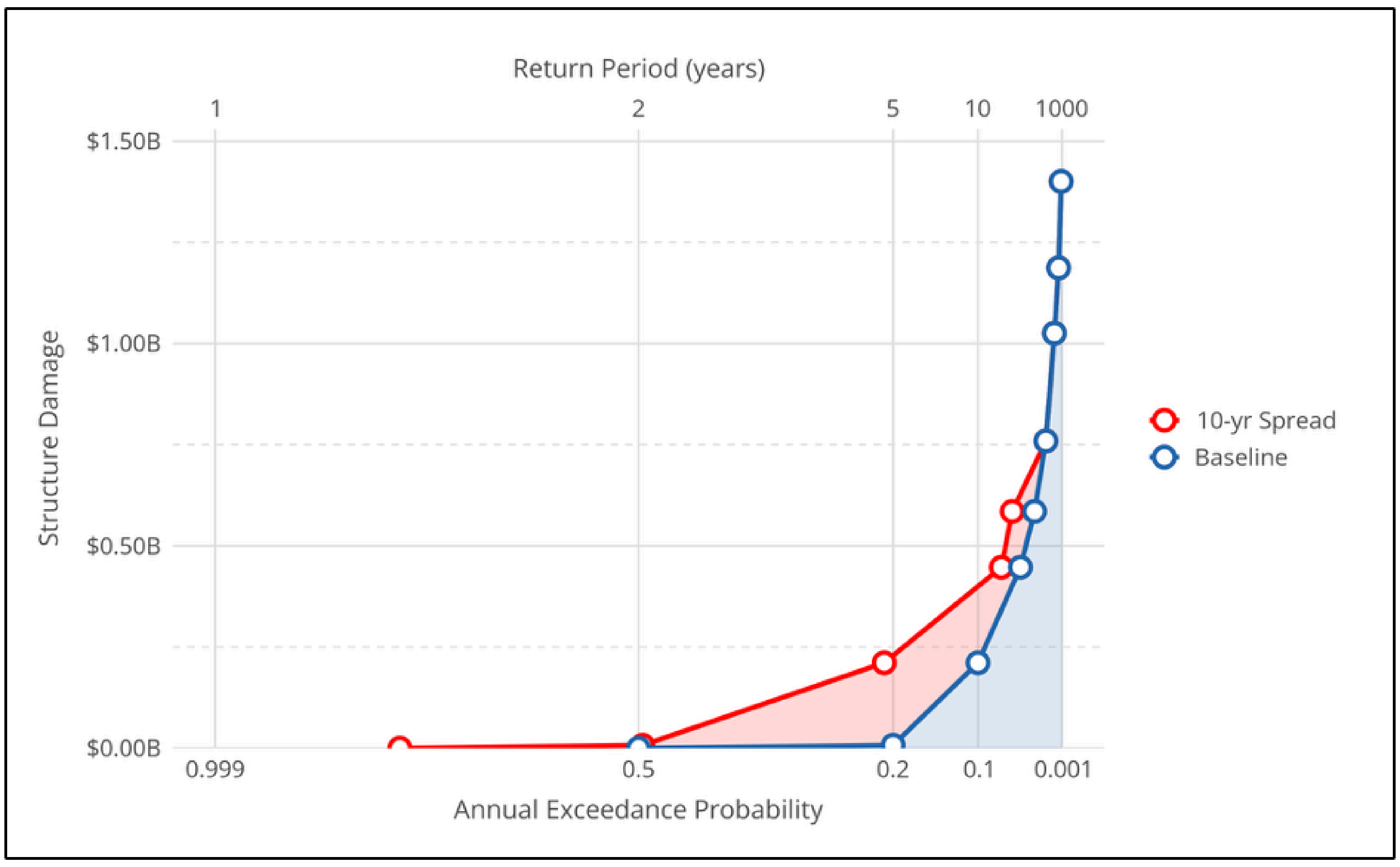


Figure 2. Structure damage (billion $) versus annual probability of exceedance for the Ala Wai watershed. Blue = managed baseline; red = 10-year invasive spread scenario. The shaded area between the curves represents the additional expected damage under unchecked invasive spread. Under the spread scenario, significant structural damage occurs at higher exceedance probabilities — meaning costly flood events become more frequent.

From Hydrology to Policy

Unchecked invasive spread in the Ala Wai watershed is projected to increase Expected Annual Damage by $66 million per year and raise annual dredging costs by roughly $2.1 million annually, from a current baseline of $1.8 million. By contrast, the current management program — operated by the Oʻahu Invasive Species Committee (OISC) and the Koʻolau Mountains Watershed Partnership (KMWP) — costs approximately $500,000 per year, covering treatment of 670 acres of Albizia and survey and control of Miconia across 4,000 acres. However, this funding is grant-dependent, and sustained, stable support will be essential to maintain the hydrological benefits documented here.

This study demonstrates that invasive species management is highly effective for flood mitigation. It also offers a case study in translating watershed science into actionable management decisions — and evidence that the upland forests above our cities are, when protected, functioning flood control infrastructure.

The Kakhovka Dam break flood: An unprecedented view of Earth's most powerful floods

Karin Lehnigk (NASA GSFC), Tamlin Pavelsky (UNC Chapel Hill), and Karl Lang (Georgia Tech)

Floods can happen for many reasons, from relentless precipitation to subsiding landscapes. Some of the most destructive floods happen when stored water is suddenly released, either from a human-made reservoir or a natural water body. But the localized and energetic nature of these floods, known as outburst floods, makes it extremely challenging to learn from real-world events when they do occur, and to verify the models used to predict the impacts of future floods.

Spotting Floods from Space

Three years ago, a huge outburst flood caused widespread damage along the Dnipro River in Ukraine when the Kakhovka Dam failed, releasing most of its 18 km^3 capacity downstream. The NASA/CNES Surface Water and Ocean Topography (SWOT) satellite captured daily maps of water surface elevation which covered nearly all of the flood route, providing the most extensive and detailed observations of an outburst flood to date.

A view of the city of Kherson, Ukraine, taken when floods peaked on June 10, 2023. The Kakhovka Dam break flood inundated multiple cities, causing multiple fatalities as well as significant infrastructure damage and lingering agricultural consequences. (AP/CNN)

Putting Models to the Test

SWOT's maps created an opportunity to test the way we use hydraulic models to simulate outburst floods against real-world data. Outburst floods are frequently simulated using the two-dimensional depth-averaged shallow water equations to simulate flood evolution following release from a reservoir. But even with the best available data for initial conditions like reservoir bathymetry, the modeled flood could, at best, match either the timing of the flood pulse or the maximum flood height—not both.

Expanding our view

SWOT revealed a concerning shortcoming in the models used to simulate outburst floods. But by capturing detailed and highly accurate maps of water surfaces, SWOT is providing the real-world data we need to improve our modeling capabilities to the point where they can be used to realistically reproduce past and future outburst floods. And SWOT won't be alone; the NASA-ISRO Synthetic Aperture Radar (NISAR) satellite, which launched last July, will be able to identify and map water surface extents and detect changes in water levels, and other missions designed to detect terrestrial surface water are also in development. As we expand our view from space to see more places more often, we increase the odds that these satellites will capture more outburst floods, and revolutionize the way we understand and live with them on our dynamic planet.

Reference: Lehnigk, K. E., Pavelsky, T., Lang, K. A. (2026). SWOT satellite observations of the Kakhovka Dam break flood highlight limitations of outburst flood models. *Geophysical Research Letters*, *53*(8), e2025GL120832. https://doi.org/10.1029/2025GL120832

TECHNICAL COMMITTEE

Growing the Catchment Hydrology Community

Christa Kelleher (Lafayette College)

Greetings from the Catchment Hydrology Technical Committee (TC). Our primary mission is to build community and to support the next generation of catchment hydrologists.

Standing with the US Forest Service

The field of catchment hydrology has been profoundly shaped by scientists at the US Forest Service (USFS). Our committee members are therefore dismayed to see news of recommended USFS research facility closures. These closures will likely result in diminishing or even ending research programs due to the loss of place-based research facilities and lack of staffing. Closure of these research facilities, many of them collocated with experimental forests, spells unclear outcomes for the continued collection of long-term datasets at these locations. Such datasets inform water supply forecasts, flood and drought prediction, timber policy, carbon storage estimates, atmospheric deposition, wildfire impacts and post-fire ecosystem recovery. We realize this is a time of uncertainty and upheaval for our forest service colleagues. Our hope is that all of AGU Hydrology will join us in advocating for the value of the USFS at large, specifically the incalculable contributions of Forest Service hydrologists to public understanding, to our scientific knowledge base, and to the global hydrology community.

Supporting early career hydrologists

As part of our TC mission, we create opportunities for early career hydrologists to interact with our group and to share their knowledge and enthusiasm for catchment hydrology. To support this, we typically hold an annual competition that engages early career hydrologists in sharing an article that they enjoyed reading that meets varying criteria. For instance, this past year, we invited early career hydrologists (undergraduate students, graduate students, and postdoctoral scholars) to share a hydrology paper focused outside the US or Europe that they would recommend to other hydrologists. We received 44 submissions from around the world (Figure 1), and randomly selected five submissions to receive awards from our committee. We hope you'll take a few minutes to check out the many submissions we received to our Padlet (click here to access).

Our upcoming competition, which opens at the end of May 2026, asks early career hydrologists to share a seminal paper from the hydrology literature published before the year 2000 that led to a paradigm shift in our understanding of hydrological processes. We welcome submissions from undergraduate students, graduate students, and postdoctoral scholars. For more information and to enter, please see the post on our website (www.hydrocatch.weebly.com). Submissions will be accepted through August 31, 2026, and winners will again be randomly selected from across the submissions.

Submissions from the AGU Catchment Hydrology TC's 2025 'Favorite Paper' competition

CONTINUED ON PAGE 14

Growing the Catchment Hydrology Community

Christa Kelleher (Lafayette College)

CONTINUED FROM PAGE 13

Get ready to share your catchment hydrology science at AGU 2026!

Our technical committee is gearing up for AGU 2026 in San Francisco. We have several technical committee-supported sessions that we hope you keep an eye out for when submitting your abstract this July and August.

- Runoff Generation Processes: From Fundamental Mechanisms to Disturbance Responses (Conveners: A. Nanda, N. Singh, B. Stewart, and K. McGuire)
- Hydrological and Biogeochemical Responses to Disturbances (Conveners: N. Singh, S. Godsey)
- Catchment and Critical Zone Science – Understanding Ecosystems through Monitoring, Analysis, and Experimentation (Conveners: S. Sebestyen, J. Duncan, A. Bergstrom, R. Rioux)

Connect with us

If you are interested in learning more about our technical committee, please find us on BlueSky, on X, and on LinkedIn maintained by our stellar social media team of José Gescilam Uchôa, John Morgan, and Dr. Aliva Nanda. We also share updates and information on our early career competition on our website (hydrocatch.weebly.com), maintained by Dr. Zhaozhe Chen. We hope you connect with us now or in the future!

SISTER ORGANIZATION

NASA Earth Science Division

Craig R. Ferguson, Hydrosphere Research Program Manager, NASA Earth Science Division

In FY26, NASA's Earth Science Division (ESD) underwent a major reorganization that reshaped funding and programmatic structures across its Earth Science Technology Office (ESTO), Flight, Earth Science Data Systems (ESDS), Earth System Science Research Program (ESSRP), and Earth Action program elements. Many principal investigators (PIs), including those affiliated with MEaSUREs (Making Earth System Data Records for Use in Research Environments), MAP (Modeling, Analysis and Prediction), and post-prime mission science and applications teams such as SMAP (Soil Moisture Active Passive), may have noticed changes in Technical Officers reflecting updated funding priorities and organizational restructuring.

As part of this transition, NASA established three major new project offices: the Integrated Modeling Virtual Institute, the Multisource Integrated Observatory, and Foundational Data Products. Although these offices are not expected to be fully operational until FY27 or later, they represent key components of NASA's evolving Earth system science strategy. Collectively, they will support end-to-end Earth system modeling, facilitate the next generation of mission-specific and cross-mission Data, Applications, Research, and Technology Teams, and produce long-term Earth system records for critical environmental variables and processes.

The reorganization also reflects a broader shift away from historically segmented approaches toward more integrated collaboration across ESD programs. This integration supports NASA's Earth Science to Action (ES2A) Strategy, which emphasizes stronger connections between Earth observations, foundational science, applications, and decision-making. For example, NASA's Hydrosphere Research and Water Resources Applied Science programs co-convened a 2025 AGU session titled "Science in Action: NASA Earth Observations Enabling Advances in Water Management" and have proposed a joint AGU 2026 session focused on SMAP-related science and applications. The same programs also supported the addition of two NASA scientists—David Mocko (NASA Goddard Space Flight Center) and Jonathan Case (NASA Marshall Space Flight Center)—to the U.S. Drought Monitor (USDM) authorship board, strengthening connections between NASA Earth observations, operational drought monitoring, and future product development (Figure 1).

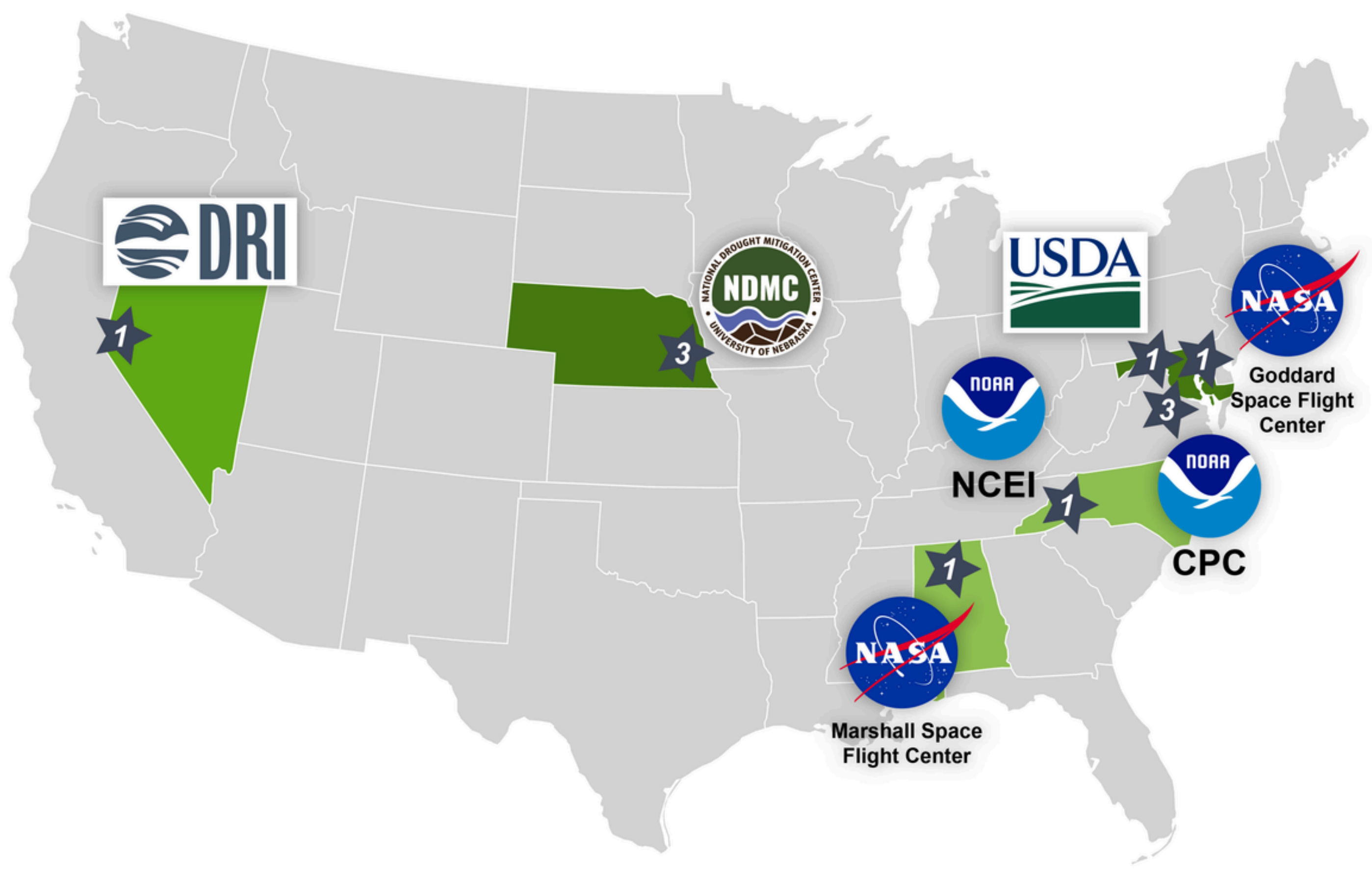


Figure 1. Institutional distribution of contributors to the U.S. Drought Monitor (USDM) authorship board, including the recent addition of two NASA scientists.

Within ESD's Research element—now renamed the Earth System Science Research Program and led by Associate Director for Research Barry Lefer—research programs have been reorganized into five interconnected science spheres: hydrosphere, geosphere, cryosphere, atmosphere, and biosphere, along with one enabling capabilities workgroup. Notably for the hydrology community, the former Terrestrial Hydrology, Ocean Physics, and Precipitation Science programs have merged into a unified Hydrosphere program. Consolidated ROSES solicitations associated with this structure are expected soon.

CONTINUED ON PAGE 16

SISTER ORGANIZATION

NASA Earth Science Division

Craig R. Ferguson, Hydrosphere Research Program Manager, NASA Earth Science Division

CONTINUED FROM PAGE 15

To help investigators navigate these changes and shape research priorities for the coming decade, each science sphere will host an Investigator Meeting in 2026. NASA-funded researchers are encouraged to participate in these meetings, carefully review updated research webpages and ROSES solicitations, and engage with NASA Center collaborators who may be more familiar with evolving NASA infrastructure and programmatic capabilities.

One activity helping inform priorities for the upcoming Hydrosphere Investigator Meeting is a recent community engagement effort led by Julie Vano of the Aspen Global Change Institute: "Opportunities for Space-Based Observations to Advance Priorities for Water Cycle Science and Applications in the Next Decade." This initiative brought together interdisciplinary teams spanning remote sensing, hydrologic modeling, data science, and decision support to identify emerging priorities related to droughts, floods, water supply, water demand, and water quality. The process began with a broad community survey, followed by synthesis activities conducted by thematic working groups and discussions among thematic leads during an in-person workshop. An advisory board then refined the resulting priorities in the context of NASA capabilities and infrastructure. Findings from the effort will be summarized in a forthcoming report.

Figure 2. Participants in the Aspen Global Change Institute workshop, "Opportunities for Space-Based Observations to Advance Priorities for Water Cycle Science and Applications in the Next Decade."

One of the highest priorities identified within the Hydrosphere program is the development of multi-sensor seasonal snow remote sensing and modeling capabilities to better support water management in snow-dominated basins of the western United States. Seasonal snow science sits at the intersection of major remote sensing advances—including lidar, Ka/Ku-band radar, and synthetic aperture radar (SAR)—and growing societal needs related to water supply forecasting and water security. This work builds upon more than two decades of strategic investments led by former program manager Jared Entin. These include the SnowEx field campaign, which demonstrated the feasibility of using NISAR L-band SAR observations to retrieve key snow metrics, and the North American Land Data Assimilation System (NLDAS), which established NASA's capability to assimilate satellite-derived snow products into near-real-time land analysis systems.

Additional areas of ongoing programmatic emphasis include drought monitoring and prediction, land–atmosphere interactions, and improved characterization of regional water and energy stores, fluxes, and associated uncertainties.

Community Resources

Unlock powerful resources to help you grow in your career

Take full advantage of tools and opportunities designed specifically to support your professional growth—don't miss out!

- Learn and Develop | AGU: Grow your skills and career with learning tailored for Earth and space scientists
- Resource Guides:
  - Careers in Geosciences Resource Guide
  - Graduate School Resource Guide
- AGU Weekly eNewsletter: delivered to your inbox every Thursday!

Impacted AGU Member Support Community

AGU has set up a community on AGU Connect for members impacted by job and funding losses. Participants can use this forum to share information and resources with one another. If you have any questions, please contact AGU's Section Support Team (agu-SectionHelp@agu.org).

Interviews with Interesting Hydrologists

The AGU Hydrology Section offers a video series featuring interviews with eminent hydrologists reflecting on key achievements in the field during the 20th century. These videos highlight the progression of hydrological science and offer valuable insights for scientists and educators alike.

Community Resources

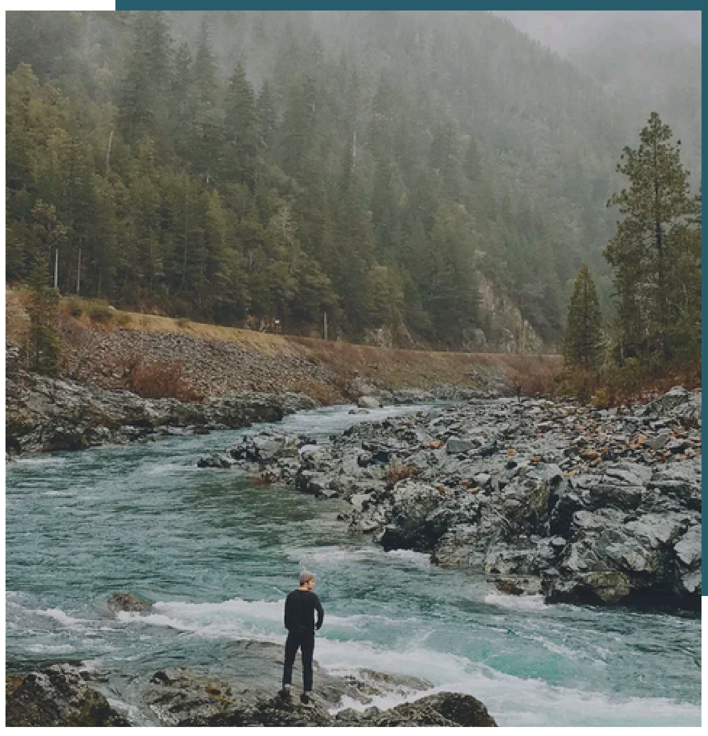
HydroShare Data Repository

HydroShare is CUAHSI's free, open-source water data repository, built to support open data sharing and collaboration in alignment with FAIR (Findable, Accessible, Interoperable, and Reproducible) data principles. It enables users to store, manage, share, and publish a wide variety of data and model formats in a citable and discoverable manner, including the option to permanently publish research products with a citable Digital Object Identifier (DOI) to meet funder and journal requirements.

CUAHSI Job Board

The CUAHSI job board is a shared resource for both job recruiters and job seekers looking for opportunities relevant to the broader water science community. Please fill out this form to post open opportunities.

Community Links



AGU Hydrology Section

Website: connect.agu.org/hydrology
BlueSky: @hydrology-agu.bsky.social
X: @Hydrology_AGU

Technical Committee Links

Catchment Hydrology
Website: hydrocatch.weebly.com
BlueSky: @agucatchhydro
LinkedIn: AGU Catchment Hydrology
X: @AGUCatchHydro

Distributed Sesning
Website: connect.agu.org/hydrology/about/tc-committees/sensing
BlueSky: @agu-sensing.bsky.social

Ecohydrology
Website: connect.agu.org/hydrology/about/tc-committees/ecohydrologymain
X: @AGUecohydro

Groundwater
Website: connect.agu.org/hydrology/about/tc-committees/groundwater
X: @AGU_GWHydro
LinkedIn: AGU Groundwater Hydrology

Hydrologic Uncertainty
Website: connect.agu.org/hydrology/about/tc-committees/hydro-uncertainty
X: @AGU_HU

Hydrology Section Student Subcommittee (H3S)
Website: agu-h3s.org
X: @AGU_H3S
LinkedIn: American Geophysical Union Hydrology Section Student Subcommittee (H3S)

Hydrogeophysics
Website: connect.agu.org/hydrology/about/tc-committees/hydrogeophysics
X: @AGUhydrogeophy
Instagram: @aguhydrogeophysics

Justice, Equity, Diversity, and Inclusion (JEDI)
Website: connect.agu.org/hydrology/about/tc-committees/hydrojedi

Precipitation
Website: connect.agu.org/hydrology/about/tc-committees/pretech
Facebook: AGU Precipitation
BlueSky: @aguprecip.bsky.social
Instagram: @AGU_precipitation
Linkedin: AGU Precipitation

Remote Sensing
Website: connect.agu.org/hydrology/about/tc-committees/remote-sensing
LinkedIn: AGU Hydrology Section's Remote Sensing Technical Committee group

Soil Processes and Critical Zone
Website: connect.agu.org/biogeosciences/tc-committees/soils-spcztc

Unsaturated Zone
Website: connect.agu.org/hydrology/about/tc-committees/unsat
X: @UnsatHydro

Water and Society
Website: connect.agu.org/hydrology/about/tc-committees/water-and-society
X: @AGU_WS
Google: groups.google.com/agu-water-and-society

Water Quality
Website: aguwaterquality.org/
X: @AGU_WQ