



TRACING WATER

AGU HYDROLOGY
SECTION NEWSLETTER

*About the theme:
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MARCH 2026



From the Annual Meeting Program Chair

Viviana Maggioni



The [2025 AGU Annual Meeting](#) was held from December 11–19 in New Orleans, Louisiana, welcoming more than 21,000 attendees. Of these participants, 31% were students and 31% were first-time attendees, underscoring the meeting’s strong appeal to early-career scientists and newcomers to the AGU community. The meeting also reflected AGU’s global reach, with 26% of attendees traveling from outside the United States; the largest international representation came from China, India, Korea, Japan, and Canada. An additional 9% attended the meeting virtually, further expanding access and engagement.

The Annual Meeting Program Committee was pleased and excited to witness firsthand the results of several months of careful planning and collaboration. The meeting successfully brought together a diverse and global community of scientists, students, educators, and stakeholders, reflecting AGU’s commitment to advancing Earth and space sciences for the benefit of humanity. The theme, “Where Science Connects Us,” proved especially timely, highlighting the essential role of scientific collaboration in addressing shared challenges across disciplines, regions, and cultures.

The scientific program was extensive, featuring 3 plenary sessions, more than 950 oral sessions, more than 900 poster presentations, and 29 GeoBurst sessions. In addition, the program included 83 town halls and 9 scientific workshops, along with plenary and union sessions, and numerous networking opportunities. Together, these offerings provided a vibrant and inclusive forum for exchanging ideas, sharing discoveries, and cultivating new collaborations across the Earth and space science community.

The Hydrology section received a total of 3,538 submissions, representing 17% of all abstracts and making it the section with the highest number of submissions. These contributions were organized into 153 oral sessions, 131 poster sessions, and 2 GeoBurst sessions. Replacing the previous eLightning format, GeoBurst sessions featured concise 5-minute presentations followed by an associated poster session, enabling presenters to engage more directly with attendees and foster one-on-one discussions in the poster hall. Designed with early-career scientists in mind, these sessions provided a high-visibility platform to showcase research, build confidence in public speaking and connect with potential collaborators, mentors, and the broader geoscience community.

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About the theme

This issue’s theme, “Tracing Water,” reflects the many ways hydrologists track water’s movement through the atmosphere and across landscapes. The research featured here traces water through storage, exchange, and transport processes, spanning remote sensing, hydrogeophysical characterization, geochemical analysis, and numerical simulation.

From the Annual Meeting Program Chair

Viviana Maggioni

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One Hydrology GeoBurst session highlighted work by students, postdoctoral researchers, and early career scientists, with topics ranging from laboratory flume experiments to hydrogeology and cold-season processes. A second GeoBurst session focused on the integration of big data and machine learning with physics in the geosciences, exploring both the challenges and opportunities associated with applying AI and ML approaches in the field.

The Walter Langbein Award this year honored Dr. Chris Soulsby. His lecture emphasized the growing role of tracer hydrology in providing an evidence base for managing water resource systems under increasing pressure from societal demands and climate change.

The Paul A. Witherspoon Lecture recognized the contributions of Dr. Lixin Wang. In his lecture, he proposed an approach that integrates stable isotopes, remote sensing, and meta-analysis to study ecohydrological processes across scales, highlighting the importance of such methods for understanding and managing water stress in both natural and agricultural systems.

The Annual Meeting Program Committee is already hard at work planning the [2026 meeting](#). Notably, this meeting will mark the final opportunity for at least the next decade for the AGU Annual Meeting to be hosted in San Francisco, making it a truly special occasion.

With exciting scientific programming, meaningful opportunities for connection, and a memorable setting, the 2026 Annual Meeting promises to be an event not to be missed. We look forward to welcoming the community—make sure you are there!



The AGU25 Walter Langbein Lecture by Dr. Chris Soulsby. Photo credit: Dr. Lisa Milani



The AGU25 Paul A. Witherspoon Lecture by Dr. Lixin Wang. Photo credit: Dr. Lisa Milani



If you have any suggestions, please feel free to email our Annual Meeting Chair Viviana Maggioni (vmaggion@gmu.edu).



Announcements

Honors Nominations Now Open: Recognize Achievements in Earth and Space Sciences

AGU recognizes individuals and teams who have made outstanding contributions to the Earth and space sciences through scientific research, education, science communication and outreach. Whether for your own contributions and accomplishments or those of a remarkable mentor or colleague, recognize the excellence of a worthy candidate by nominating them for an AGU Honor! See important deadlines below:

- Union Medals, Awards & Prizes due Monday, 2 March.
- Hydrology Section Awards & Lectures due Monday, 2 March (only for Hydro Section).
- Fellows, Section Awards & Lectures, Scholarships & Grants due Friday, 13 March.

[Nominate today.](#)

Call for Papers: Connecting Water Science Across the Terrestrial Hydrosphere

Water Resources Research invites submissions to a special collection focused on connecting water science across the terrestrial hydrosphere. The collection seeks contributions that advance integrated understanding of water movement, storage, and interactions across surface water, groundwater, soils, ecosystems, and human systems. Submissions are encouraged that bridge traditional subdisciplines, link observations and models, or offer new perspectives on coherence across scales.

This special collection marks the journal's 60th anniversary and highlights research that addresses grand challenges in understanding, predicting, and managing water in a changing world.

Manuscripts are due by **31 March 2026**.

[Learn more and submit your paper.](#)

Call for Contributions

We are seeking contributions for our 2026 issues of the AGU Hydrology Section Newsletter. Nominate yourself or a colleague to be featured in one of our regular columns by emailing agu.hydro.news@gmail.com.

Column opportunities include:

- **Science to Solutions** – Hydrologic research connecting science to policy, practice, and community outcomes.
- **Hydrology Horizons** – Emerging tools, datasets, methods, or technologies shaping the future of hydrology.
- **Early Career Spotlight** – Profiles of early career hydrologists highlighting research, career paths, and reflections.
- **Student Spotlight** – Short features showcasing undergraduate or graduate students' research, fieldwork, or academic journeys in hydrology.
- **Other** – Have a piece that doesn't quite fit? Let's find a space for it or create one



Announcements

New! AGU Circles – Member-Only Peer Cohorts

AGU Circles is a new, members-only online space designed for small groups of scientists to connect globally around shared research interests, career paths, and professional challenges.

Participants meet regularly in small cohorts built for candid exchange and collaboration—not lectures—so you can share real challenges, gain new perspectives, and move your career forward.

Open to graduate students, postdocs, early- and mid-career scientists, and anyone seeking a trusted peer space.

The next cycle runs March–May. **Space is limited—register early.**

Browse or propose a Circle: <https://www.agu.org/advancement/mentoring>

Free Online Training for HEC-HMS and HEC-RAS Now Available Through UNESCO

The U.S. Army Corps of Engineers' Hydrologic Engineering Center (HEC) has long been known for its hydrologic, hydraulic, and reservoir simulation models (HEC-HMS, HEC-RAS, and HEC-RESSIM, respectively). These models are technologically up to date, well documented and reviewed, and freely downloadable, contributing to their global popularity.

While HEC has expanded documentation for these models in the form of guides, tutorials, manuals, and references, formal courses have historically been limited outside of USACE. In collaboration with UNESCO's Intergovernmental Hydrological Programme (IHP), online courses for HEC-HMS and 2D HEC-RAS have now been developed on UNESCO's Open Learning Platform (<https://openlearning.unesco.org>).

After free registration on the site, the courses can be accessed and taken one lesson at a time, beginning at your convenience. They may be completed individually or incorporated into a semester-length university course. College-level coursework in hydrology and hydraulics is recommended prior to enrollment.

If you encounter any issues during registration, please contact openlearning@unesco.org.

Additional open learning courses, including HEC-RESSIM, may become available in the future.

Lixin Wang

Paul A. Witherspoon Lecture (AGU25)



INDIANA UNIVERSITY
INDIANAPOLIS

Indiana University Indianapolis

I am deeply grateful to the AGU Hydrology community for the recognition of the Witherspoon Lecture. I sincerely thank my nominators, Drs. Maria Cristina Rulli and Gabe Filippelli, as well as Drs. Kelly Caylor, Matt McCabe, and Brad Wilcox —scientists I truly admire —for supporting my case. I owe immense gratitude to my mentors and collaborators, especially my Ph.D. advisors, Drs. Paolo D’Odorico and Steve Macko, whose exceptional guidance laid the foundation for my work in hydrology and biogeochemistry. I am equally thankful to all my former and current lab group members, the true heroes behind this recognition. Finally, my heartfelt thanks go to my parents, my wife, and my son for their unwavering love and support.

My main research interest is ecohydrology, which has significant implications for many societal challenges, such as food security and climate mitigation.

Ecohydrology examines water-vegetation interactions across scales, often requiring diverse tools and approaches. My lab integrates stable isotopes, meta-analysis, modeling, and remote sensing to quantify these interactions across



Wang group lunch (2025)

space and time. Our research centers on three interconnected themes: The first explores how environmental change affects vegetation water use and carbon cycling, revealing, for instance, increasing vegetation water limitations across the Northern Hemisphere over the past 30 years ([Jiao et al., 2021, Nature Communications](#)) and demonstrating that acid deposition amplifies vegetation water use at the watershed scale ([Lanning et al., 2019, Science Advances](#)). The second investigates the hydrological drivers of ecosystem changes in global drylands using stable isotopes ([Kaseke et al., 2017, Science Advances](#); [Tian et al., 2019, GCA](#); [Li et al., 2025, Earth’s Future](#)), meta-analysis ([Lu et al., 2016, Scientific Reports](#)), remote sensing ([Qiao et al., 2022, 2024, GRL](#)), and modeling ([Li et al., 2018, Adv. Water Resources](#); [Adhikari and Wang, 2020, Journal of Hydrology](#)). The third examines agricultural resilience and the mitigating effects of different agricultural practices on climate change, resulting in several widely cited publications (e.g., [Daryanto et al., 2017, Agricultural Water Management](#); [Peng et al., 2024, Field Crops Research](#)).

Mentoring students and early-career scientists is my greatest professional joy. All of the publications mentioned above were led by either my students (Bishwodeep Adhikari, Wenzhe Jiao, Farai Kaseke, Matt Lanning, Bonan Li, Xuefei Lu, Yu Peng, Na Qiao) or postdocs (Stefani Daryanto, Yue Li, Chao Tian). Working with them each day remains the most rewarding part of my academic journey, and I am forever grateful for such an opportunity.

“Mentoring students and early-career scientists has been my greatest professional joy.”

José Gescilam Uchôa

Horton Research Grant

São Carlos School of Engineering, University of São Paulo

I grew up in the Brazilian Drylands, in the state of Ceará, listening to my grandparents' stories about drought. They told me about the migration of families to the state capital in search of water and food, and about the suffering and conflicts that often followed. At school, I read many works of fiction inspired by droughts, often based on the authors' own experiences. Even though the fear of drought is deeply embedded in the memory, culture, and literature of my region, I personally did not experience its harshest consequences. This was largely thanks to decades of efforts by government, civil society, and private initiatives, including the massive construction of reservoirs throughout the region.

This history helped make Ceará one of the most advanced states in Brazil in terms of public policies and strategies for coping with drought and managing water resources. Strong institutions, combined with close collaboration among universities, communities, and the private sector, created an environment in which water was always an important topic. Talking about water resources was part of everyday life: at home, at school, and with friends. Naturally, this sparked in me a deep interest and passion for the subject.

Because most of the rivers I saw growing up were intermittent or ephemeral, I became interested during my master's studies in understanding the distribution of losing rivers in Brazil, rivers that predominantly supply water to underlying aquifers. In this process, I came across a study by Professor Scott Jasechko (UC Santa Barbara), Professor Ying Fan (Rutgers University), and their collaborators. With the support of Brazilian researchers and my advisors, Professor Edson Wendland and Professor Paulo Tarso, I was able to adapt a methodology developed in the United States to the Brazilian context. The results were so meaningful that we ultimately published the study in *Nature Communications*.

Today, I am a PhD student at the São Carlos School of Engineering at the University of São Paulo, where I continue studying the interactions between rivers and aquifers, now across multiple scales, from the plot scale to the basin scale. The experience from my master's research and my collaborations with inspiring scientists gave me the confidence to pursue new questions during my doctorate. My hope is that our work can contribute to improving integrated water resources management in Brazil and in other regions facing rapid agricultural expansion, to help support long-term water and food security.

In 2025, I was deeply honored to receive the Horton Research Grant, something I never imagined would be possible for me. The visibility and support associated with this award have been incredibly important for the development of my doctoral research, especially in strengthening international connections and collaborations.

For this reason, I would like to express my sincere gratitude to the entire Hydrology community of the American Geophysical Union (AGU). The support I have received during my early career has meant a great deal to me. I truly feel welcome in this community. Now, as a member of AGU, I hope to give back by contributing through the Catchment Hydrology Technical Committee and the Hydrology Section Student Subcommittee, just as the organization and its members have contributed to my growth—not only as a researcher, but also as a person.



Receiving the Horton Research Grant from Professor Venkataraman Lakshmi, President of the AGU Hydrology Section.

Precipitation

Yagmur Derin (Chair), Daniel Watters (Deputy Chair)

AGU PRECIPITATION TECHNICAL COMMITTEE



The AGU Precipitation Technical Committee's structure and leadership team.

The AGU Precipitation Technical Committee (AGU Precip) is dedicated to fostering a vibrant, inclusive, and diverse community of researchers focused on precipitation science. With expertise spanning precipitation remote sensing, snow microphysics, and hydrologic applications, our 48 members represent 31 institutions across 4 countries. New membership applications are accepted annually during December. AGU Precip is organized into three subcommittees, each with elected Chairs and Deputy Chairs serving two-year terms. The newly elected leadership team began their service on January 1st, 2026.

Our three active subcommittees drive the TC activities throughout the year:

The **Annual Meeting Subcommittee** reviewed nine session proposals spanning topics from space-based precipitation observations and AI/ML applications to drought risk, urban hydroclimate, and lake-atmosphere interactions. Eight sessions were accepted for the Hydrology Section Precipitation TC-supported submission, with one transferred due to better alignment with Atmospheric Sciences. Several sessions were co-organized with other technical committees, including Global Change, Atmospheric Sciences, and Natural Hazards. The subcommittee also developed marketing materials to promote abstract submissions, resulting in 178 abstracts across the nine precipitation-focused sessions.

The **Awards Subcommittee** continues to recognize outstanding researchers in our field with nominations for Hydrology Section and AGU Union awards. The subcommittee activities were focused on guaranteeing that at least one scientist working on precipitation has a nomination submitted for the AGU awards. This year, the subcommittee is working on three nomination packages and is assisting the precipitation community by providing information about the submission process and helping to review documentation when requested.

The **Early Career Scientists and Students (ECSPrecip) Subcommittee** supports young scientists by promoting visibility and fostering collaborations through initiatives such as monthly newsletters, a quarterly seminar series, and the AGU Annual Meeting Precipitation Student Award.

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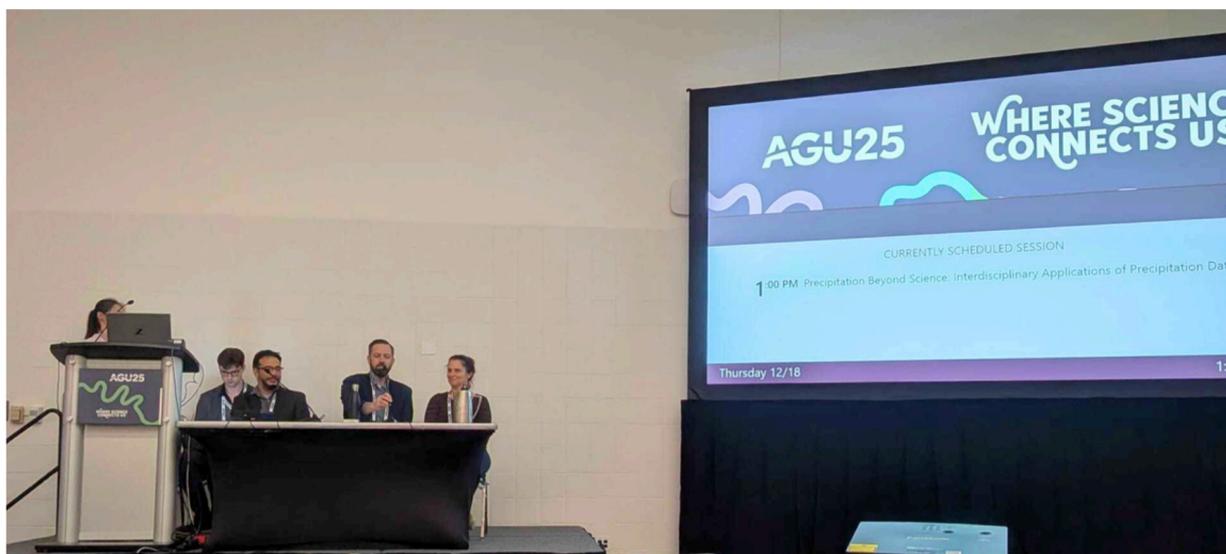
Precipitation

Yagmur Derin (Chair), Daniel Watters (Deputy Chair)

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ECSPrecip organized the AGU25 Precipitation Student Award to recognize outstanding student presentations in precipitation science at the AGU Annual Meeting 2025. A total of 24 applications were received worldwide from the United States, India, Australia, Singapore, Italy, Ethiopia, South Korea, and Saudi Arabia. Five students were selected to receive a monetary prize and an invitation to present their research in upcoming ECSPrecip webinars. This year's awardees are Debjit Paul (Indian Institute of Technology Delhi), Andres Monsalve (University of Texas at El Paso), Ayodeji Olatunde (University of California, Santa Barbara), Nazak Rouzegari (University of California, Irvine), and Zhixiao Niu (National University of Singapore).

In 2025, ECSPrecip organized three webinars to highlight innovative precipitation research. The first two featured presentations by the previous year's AGU Precipitation Student Award recipients, highlighting a diverse range of precipitation research topics. The third webinar brought together three experts in precipitation science to discuss past, present, and future perspectives on precipitation research. In addition, ECSPrecip organized a town hall at AGU25 titled "Precipitation Beyond Science: Interdisciplinary Applications of Precipitation Data," which brought together precipitation scientists and end users of precipitation data. The event was widely attended by students and scientists across multiple career stages. All the webinars are available online on our [YouTube channel](#).



Precipitation TC Town Hall at the AGU Annual Meeting 2025 (New Orleans). From left to right: Kaidi Peng (moderator), Daniel Watters (moderator), Humberto Vergara (panelist), Kevin Reed (panelist), and Anna Wilson (panelist).

ECSPrecip continues to highlight the contributions of early career researchers and students through its monthly "Precip Folks" and "Science Highlights" features. [Precip Folks](#) includes interviews with early career scientists and students, while [Science Highlights](#) showcases recent publications led by early career researchers and students. A monthly newsletter is published on the fourth Monday of each month on our webpage and circulated to our mailing list, featuring ECSPrecip activities along with a curated list of relevant events and job opportunities.

As we look ahead to 2026, we are excited to showcase the dynamic activities of the precipitation community both in-person and with online interactions. Stay connected with our TC events by following us on our [webpage](#), [LinkedIn](#), [Instagram](#), [Facebook](#), [BlueSky](#), or by subscribing to our [mailing list](#).

Translating Subsurface Science into Safer Groundwater Recharge

John Ogunleye, Virginia Tech

Managed aquifer recharge (MAR) is rapidly expanding as a tool to stabilize groundwater supplies in drought-stressed coastal regions. While recharge provides clear benefits for water security and climate resilience, its long-term success depends on understanding how injected water redistributes pressure within complex geologic systems and whether that pressure could extend downward to depths where seismicity might be triggered. My recent research bridges subsurface science and practical design guidance to support responsible MAR implementation.

In a first study, I used high-resolution numerical modeling calibrated with field data to examine how fluid pressure generated during MAR propagates downward from a confined coastal aquifer into the underlying crystalline basement. Ensemble simulations show that pressure changes capable of influencing stress conditions in deeper rocks can occur under high-rate injection scenarios, particularly where subsurface permeability is uncertain. Crucially, these pressure responses were spatially localized and highly sensitive to injection strategy, suggesting opportunities for risk-aware design rather than blanket restrictions on recharge activity ([Ogunleye et al., 2026, Hydrogeology Journal](#)).

Building on this work, a second study explicitly incorporates aquifer heterogeneity, focusing on discontinuous clay layers common in coastal plain stratigraphy. The models demonstrate that clay interbeds can act as natural pressure buffers, significantly reducing downward pressure transmission when recharge is targeted above them. These results show that injection depth, rate stability, and stratigraphic positioning can be adjusted to limit pressure reaching deeper units where seismicity concerns are greatest, offering actionable levers for safer MAR design ([Ogunleye et al., 2025, Groundwater for Sustainable Development](#)).

Recent science reporting has drawn attention to the possibility that replenishing heavily depleted aquifers could trigger small earthquakes under certain conditions, particularly where fluid injections alter subsurface stress regimes ([Richter, 2025, Science](#)). Together, these studies align with that concern while moving beyond risk identification toward design-oriented solutions. By integrating uncertainty analysis, stratigraphic characterization, and pressure management early in project planning, subsurface models can help balance recharge efficiency with geomechanical safety.

As MAR scales to meet mounting water demand, translating subsurface science into design practice will be essential to ensure that groundwater recharge remains both effective and safe.



John next to an injection well.

“As MAR scales to meet mounting water demand, translating subsurface science into design practice will be essential”

Mapping Transient Snowpacks with CubeSats

[Zhaocheng Wang](#), [Center for Hydrologic Innovations](#),
Arizona State University

Snowpacks in arid and semi-arid regions like Arizona are often transient, forming and disappearing over short time scales. Understanding when and where snow accumulates is critical, as snowmelt and rainfall from watersheds deliver over 244 billion gallons of water annually to 2.5 million residents in the [Salt and Verde valleys](#). This intermittency poses a major observational challenge, as traditional satellite products involve a trade-off between spatial resolution and temporal frequency, limiting their ability to capture short-lived snow events relevant to water management.

Through the U.S. Bureau of Reclamation's [Snow Water Supply Forecasting Program](#), we applied an emerging approach that combines high-resolution CubeSat imagery with deep learning to address this gap. Commercial CubeSat constellations, operated by [Planet Labs](#), provide near-daily imagery at ~3 m spatial resolution, enabling mapping of intermittent snow cover at spatial and temporal scales previously unavailable. Results from this work were published in [Geophysical Research Letters](#) in collaboration with the Salt River Project.

Beyond mapping snow cover, CubeSat-derived snow metrics provide important insights into hydrologic processes. Spatially continuous snow cover observations enable estimation of snow persistence at 3-m resolution (Fig. 1), helping bridge the gap between sparse point measurements and spatially distributed hydrologic models. This improved spatial representation supports more robust model evaluation in regions with transient snowpack. In addition, the snow disappearance date derived from CubeSat imagery integrates accumulation and melt dynamics and serves as a key indicator linking snow conditions to subsequent soil moisture and runoff responses. These advances align with national priorities articulated in the Snow Water Supply Forecasting Program Authorization Act of 2020 ([H.R. 8041](#)), which emphasizes the integration of emerging technologies to improve snow monitoring and water supply forecasting.

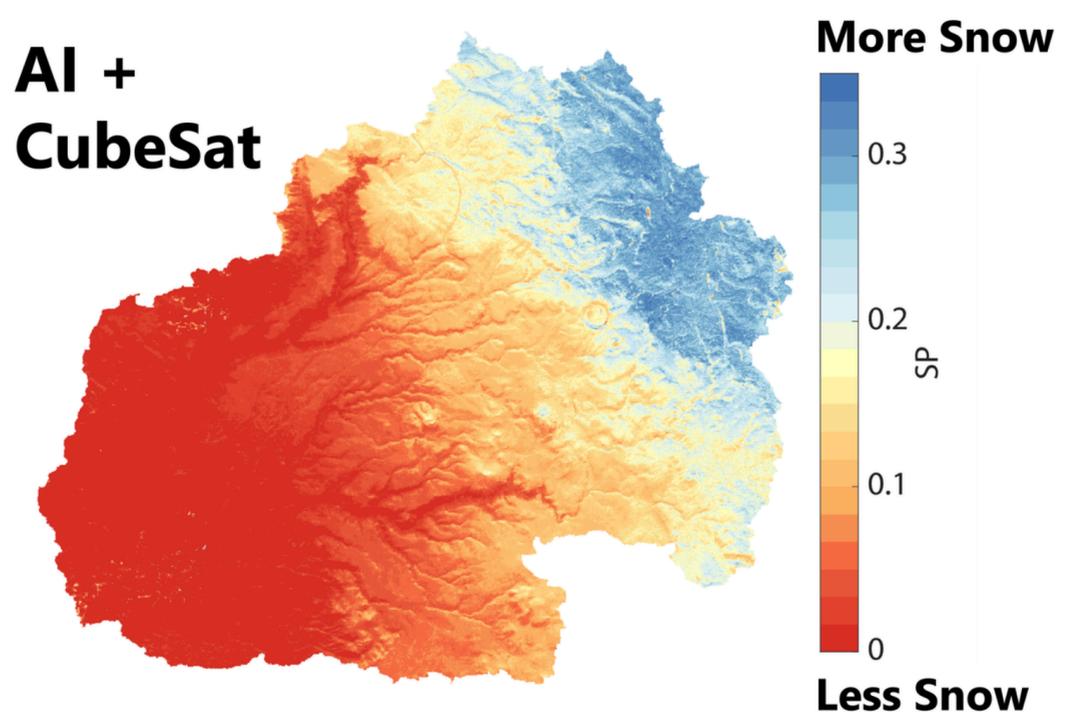


Fig. 1 Snow persistence (SP) during winter derived at 3 m from CubeSat Imagery.

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Mapping Transient Snowpacks with CubeSats

[Zhaocheng Wang](#), [Center for Hydrologic Innovations](#),
Arizona State University

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A recent update of this project involves the [airborne snow LiDAR campaign](#) conducted in the Salt River watershed. Through collaboration among Arizona State University, Salt River Project, and [Airborne Snow Observatories, Inc.](#), airborne data were collected to generate spatially continuous maps of snow conditions across the landscape at spatial resolutions similar to CubeSat imagery (Fig. 2). These airborne measurements will be integrated with CubeSat observations to further improve characterization of transient snowpacks and to strengthen understanding of their contribution to runoff generation.



Fig. 2. Snowpack conditions in the Salt River watershed observed from airborne imagery (left; ASO) and CubeSat imagery (right; Planet Labs PBC).

Reference: Wang, Z., Jaya Baskar, J. V., Sistla Naga Sai, M. S., Svoma, B., & Vivoni, E. R. (2025). Spatiotemporal patterns of intermittent snow cover from PlanetScope imagery using deep learning. *Geophysical Research Letters*, 52(13), e2025GL116582. <https://doi.org/10.1029/2025GL116582>

Hydrogeophysics and Groundwater Vulnerability in Flood-Affected Coastal Communities

Ifeanyi Emmanuel Anyanwu, Texas A&M University–Corpus Christi

As extreme flooding events increase along the Texas Gulf Coast, groundwater systems, which are critical drinking water sources for many rural communities, face rising contamination risks. My doctoral research focuses on developing a mechanistic understanding of how flood-driven infiltration processes influence contaminant transport into shallow aquifers. By integrating cutting-edge subsurface hydrogeophysical tools with hydrogeochemical analyses, my work aims to improve our ability to identify vulnerable recharge pathways and inform groundwater protection strategies in flood-prone environments.

My research applies a novel, high-resolution integration of cone penetration testing (CPT), hydraulic profiling tool (HPT), and nuclear magnetic resonance (NMR) techniques that have traditionally been used independently, coupled with a Geoprobe 7822DT System to characterize subsurface stratigraphy, hydraulic properties, porosity, formation permeability, and mobile water content, among others. When combined, these tools generate complementary, multidimensional datasets that capture fine-scale stratigraphic features, such as preferential flow paths, zones of enhanced recharge, and areas susceptible to contaminant accumulation that are often overlooked by conventional well-based approaches.

A central component of my work involves coupling these hydrogeophysical datasets with solute analyses, including bacteria, nitrates, trace metals, and emerging contaminants such as PFAS. This combined hydrogeophysical–geochemical approach provides new insight into how sediment compaction, fluid conductivity, and geologic layering interact with hydroclimatic forcing to govern contaminant fate and persistence in groundwater systems.

Preliminary results indicate that intervals with high tip resistance and low electrical conductivity (indicative of permeable coarse sediments) often correspond to zones of enhanced recharge; in contrast, fine-grained, low-resistance units (indicative of impermeable clayey lithologies) are associated with slower flow and greater retention. These findings highlight the importance of resolving subsurface heterogeneity when evaluating groundwater vulnerability after extreme precipitation events.

The findings contribute to improved risk assessment for groundwater contamination, supporting evidence-based decision-making related to well siting, monitoring design, and post-flood management strategies. Significantly, the methodological framework developed through this work is transferable and can be adapted to other flood-prone regions facing similar hydrogeologic and climate-related challenges.



NMR data acquisition using the Geoprobe 7822DT System at Nueces County, Texas.

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Hydrogeophysics and Groundwater Vulnerability in Flood-Affected Coastal Communities

Ifeanyi Emmanuel Anyanwu, Texas A&M University–Corpus Christi

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Community engagement and science communication are also integral to my work because they help build trust, strengthen local awareness, and promote meaningful participation in water-resource decision-making. Through outreach activities, I strive to bridge the gap between technical research and public understanding of groundwater systems by presenting subsurface concepts in ways that are accessible, relevant, and community-centered. As Secretary of the Society of Exploration Geophysicists (SEG) Student Chapter at Texas A&M University–Corpus Christi, I have led K–12 outreach programs that introduced students to Earth systems, groundwater resources, and geophysical tools. These experiences reinforce my commitment to broadening participation in the geosciences and fostering early scientific literacy, while also supporting long-term community resilience by empowering future generations to engage with groundwater challenges and solutions. Ultimately, this outreach strengthens confidence in science-informed approaches and contributes to a more informed public that can actively engage in conversations about groundwater protection and sustainability.

By integrating hydrogeophysics, geochemistry, and machine learning, my research seeks to connect subsurface science with real-world challenges. As climate variability continues to reshape coastal systems, developing high-resolution, process-based tools for groundwater assessment will be essential for protecting water resources and promoting resilience in susceptible communities.

My research is funded by the National Science Foundation (NSF) Dynamics of Integrated Socio-Environmental Systems (DISES) Program (DISES-2307996).

For more details regarding my work, connect on [LinkedIn](#).

Lei Yan

University of Wisconsin-Madison

My interest in hydroclimate extremes began long before I formally entered hydrology. Growing up in China, I was deeply affected by news coverage of the devastating 1998 floods in the Yangtze River basin. Years later, while studying in Beijing, I witnessed one of the city’s most extreme rainfall events in decades. Together, those experiences left a lasting impression and continue to shape the questions I pursue as a scientist.

My training in hydrology at Wuhan University first led me to nonstationary flood and rainfall frequency analysis under changing climate and human influences. Later, during my postdoctoral work at Columbia University, I shifted toward understanding the physical drivers of hydrometeorological variability, with a particular focus on ENSO dynamics and their teleconnections with hydroclimate extremes, as well as renewable energy supply and demand. More recently, I have been exploring how AI can help reveal the nonlinear and complex links between ENSO and hydroclimate extremes, as well as how ENSO influences energy drought risk, including the mitigating role of pumped-storage hydropower. More broadly, ENSO teleconnections provide an important source of predictability for subseasonal-to-seasonal (S2S) forecasting.

I am currently a research scientist in the [Hydroclimate Extremes Research Group](#) at the University of Wisconsin-Madison, where I work on probabilistic flood risk assessment as part of FEMA’s Future of Flood Risk Data initiative. An interesting twist in my career is that I now work with another “SST”—Stochastic Storm Transposition—rather than sea surface temperature. My current research applies SST to large watersheds and complex terrain to better represent rainfall space-time structure and improve rainfall frequency analysis and flood hazard characterization across multiple spatial and temporal scales.

Looking ahead, I am excited about hybrid approaches that combine physical understanding, climate dynamics, and AI. I see strong potential for physics-informed machine learning to improve prediction, attribution, and risk assessment across the climate–water–energy nexus.



“My interest in hydroclimate extremes began long before I formally entered hydrology.”

“ENSO teleconnections provide an important source of predictability for subseasonal-to-seasonal forecasting.”



Lei at Horseshoe Bend along the Colorado River near Page, Arizona — a landscape shaped by hydroclimate extremes.

American Water Resources Association (AWRA)

Ariel Wise (Interim Chief Executive Officer),
Bangshuai Han (President-Elect)



AMERICAN
WATER RESOURCES
ASSOCIATION

Community. Conversation. Connection.

For more than six decades, the **American Water Resources Association (AWRA)** has advanced the understanding and management of water resources by providing a multidisciplinary forum for education, professional development, and information exchange. Since its incorporation, AWRA has brought together professionals and students from academia, government, and private industry to address complex water challenges through collaboration and shared expertise.

AWRA's diverse membership includes engineers, scientists, educators, policy specialists, regulators, and more. This breadth allows AWRA to adapt quickly to emerging issues, evolving technologies, and the changing needs of the water resources community.

Our Mission

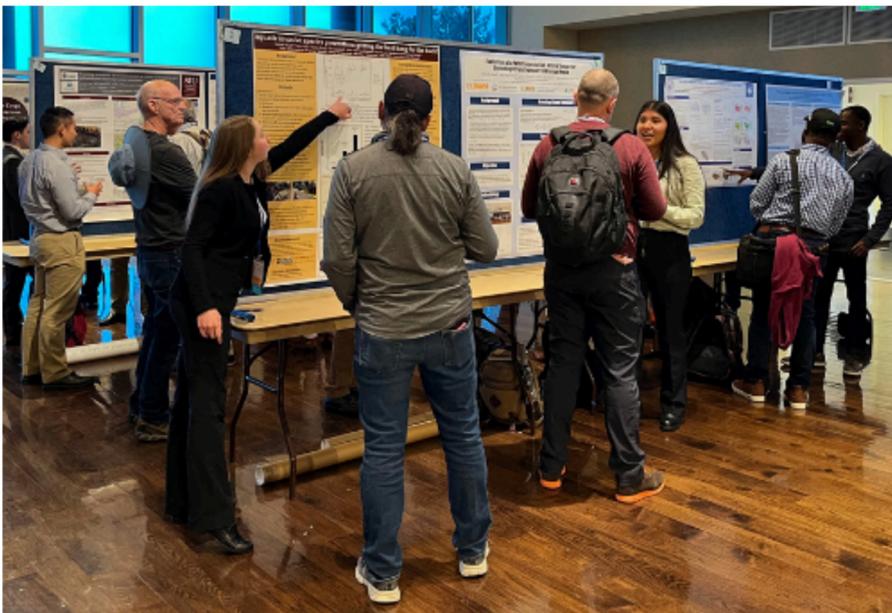
AWRA is the primary multidisciplinary association for information exchange, professional development, and education about water resources and related issues. Our mission is to advance multidisciplinary water resources education, management, and research.

Our Vision

To be recognized as the pre-eminent multidisciplinary association for information exchange, professional development, and education about water resources and related issues: to be recognized as a unique, natural connector and convener of disciplines, professionals, and organizations—bringing the industry together.

Mentorship

A cornerstone of AWRA's mission is engaging and supporting future generations of water professionals. AWRA proudly supports [20+ Student Chapters](#) nationwide, offering students meaningful opportunities to develop public speaking, technical communication, and professional skills through conferences, webinars, poster sessions, and student-led events.



"...AWRA is a great program that has been able to help us understand and learn from different people that we might not ever get the chance of really being able to converse with. It is a community of people being able to come together to figure out how to best apply certain research opportunities."

Quoted from a student from the Florida Gulf Coast University Student Section

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American Water Resources Association (AWRA)

Ariel Wise (Interim Chief Executive Officer),
Bangshuai Han (President-Elect)



AMERICAN
WATER RESOURCES
ASSOCIATION

Community. Conversation. Connection.

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AWRA's commitment to mentorship continues throughout a member's career. Through its [Career Center](#), national conferences, and committee involvement, AWRA supports students, early-career professionals, and emerging leaders alike. Many members begin as student section participants and progress into leadership roles at the state and national levels—illustrating AWRA's long-term impact as a professional community that supports continuous growth and leadership development.

Collaboration and Engagement

[AWRA's 23 State Sections](#) provide local networking, events, and mentorship opportunities, while national conferences—held two to three times each year—are recognized for their inclusive, multidisciplinary approach.

[The Journal of the American Water Resources Association \(JAWRA\)](#) is a bi-monthly, peer-reviewed journal, featuring original papers that examine the multidisciplinary and complex issues surrounding water resources.

Together, AWRA members work to elevate the profession, support lifelong learning, and inspire current and future leaders dedicated to sustainable water resources management.

UPCOMING EVENTS: JOIN US!

May 18-20, 2026 | [Geospatial Water Technology Conference](#) | Niagara Falls, NY

November 9-11, 2026 | [Annual Water Resources Conference](#) | Philadelphia, PA

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 Links

AGU Hydrology Section

Website: connect.agu.org/hydrology

BlueSky: [@hydrology-agu.bsky.social](https://bsky.app/profile/@hydrology-agu.bsky.social)

X: [@Hydrology_AGU](https://twitter.com/Hydrology_AGU)

Technical Committee Links

Catchment Hydrology

Website: hydrocatch.weebly.com

BlueSky: [@agucatchhydro](https://bsky.app/profile/@agucatchhydro)

LinkedIn: [AGU Catchment Hydrology](https://www.linkedin.com/company/agu-catchment-hydrology)

X: [@AGUCatchHydro](https://twitter.com/AGUCatchHydro)

Distributed Sensing

Website: connect.agu.org/hydrology/about/tc-committees/sensing

BlueSky: [@agu-sensing.bsky.social](https://bsky.app/profile/@agu-sensing.bsky.social)

Ecohydrology

Website: connect.agu.org/hydrology/about/tc-committees/ecohydrologymain

X: [@AGUecohydro](https://twitter.com/AGUecohydro)

Groundwater

Website: connect.agu.org/hydrology/about/tc-committees/groundwater

X: [@AGU_GWHydro](https://twitter.com/AGU_GWHydro)

LinkedIn: [AGU Groundwater Hydrology](https://www.linkedin.com/company/agu-groundwater-hydrology)

Hydrologic Uncertainty

Website: connect.agu.org/hydrology/about/tc-committees/hydro-uncertainty

X: [@AGU_HU](https://twitter.com/AGU_HU)

Hydrology Section Student Subcommittee (H3S)

Website: agu-h3s.org

X: [@AGU_H3S](https://twitter.com/AGU_H3S)

LinkedIn: [American Geophysical Union Hydrology Section Student Subcommittee \(H3S\)](https://www.linkedin.com/company/american-geophysical-union-hydrology-section-student-subcommittee-h3s)

Hydrogeophysics

Website: connect.agu.org/hydrology/about/tc-committees/hydrogeophysics

X: [@AGUhydrogeophy](https://twitter.com/AGUhydrogeophy)

Instagram: [@aguhydrogeophysics](https://www.instagram.com/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](https://www.facebook.com/AGUPrecipitation)

BlueSky: [@aguprecip.bsky.social](https://bsky.app/profile/@aguprecip.bsky.social)

Instagram: [@AGU_precipitation](https://www.instagram.com/AGU_precipitation)

LinkedIn: [AGU Precipitation](https://www.linkedin.com/company/AGU-Precipitation)

Remote Sensing

Website: connect.agu.org/hydrology/about/tc-committees/remote-sensing

LinkedIn: [AGU Hydrology Section's Remote Sensing Technical Committee group](https://www.linkedin.com/company/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](https://twitter.com/UnsatHydro)

Water and Society

Website: connect.agu.org/hydrology/about/tc-committees/water-and-society

X: [@AGU_WS](https://twitter.com/AGU_WS)

Google: groups.google.com/agu-water-and-society

Water Quality

Website: aguwaterquality.org/

X: [@AGU_WQ](https://twitter.com/AGU_WQ)

