AMERICAN WATER RESOURCES ASSOCIATION

The following topical sessions and workshops have been selected for the conference. Please enter the Topical Letter Code (which is the letter before each title of the session or workshop) when submitting your abstract (example: A, B, C, AA....).

CODE: A
PRESENTATION TYPE: Panel
TITLE: Strategies and Successes in Pressure-testing System Water Resilience

The Air Force approach to integrating mission, energy, and water resilience against climate change hazards and external threats brings valuable insights to the AWRA Conference in areas of policy and management, practical programs toward ensuring water resilience, and the importance of partnerships to achieve short- and long-term goals. The Air Force Installation Energy program delivers the necessary policies, tools, and oversight to ensure the resilience of energy and water systems that enable key capabilities and execution of critical activities, even in the face of increasing impacts of climate change, large-scale natural disasters, and growing threats of physical and cyber-attacks on our utilities. Panelists in this session will be able to speak to the Air Force's strategy to integrate water resilience into our strategic focus on mission-centric, climate-informed, and partnership-supported policies and programs. This panel on the Air Force approach to water resilience brings to the AWRA Conference an opportunity for panelists and audience to interact on perspectives on risk management in the diverse environment that DAF navigates for broader lessons-learned across multiple sectors and professions outside the defense arena with experts in water resilience logistics, policy, and strategic mission integration in the face of diverse hazard and threat environments.

CODE: B DO NOT USE THIS CODE
PRESENTATION TYPE: Technical
TITLE: District Minimum Flows and Levels

Florida law states that the Water Management District's Governing Board "shall use the best information and methods available to establish limits which prevent significant harm to the water resources or ecology." District Minimum Flows and Levels (MFLs) are typically determined based on evaluations of topography, soils and vegetation data collected within plant communities and other pertinent information associated with a given priority water resource.MFLs take into account the ability of wetlands and aquatic communities to adjust to changes in hydrologic conditions. MFLs allow for an acceptable level of hydrologic change to occur. When water withdrawals shift hydrologic conditions of priority water bodies below levels defined by MFLs, significant ecological harm can occur.Novel geospatial tools are needed to help water resource scientists develop and assess meaningful criteria to ensure significant harm does not occur at priority water bodies. This session will focus on the application of geospatial tools to help evaluate the impact of lake level reduction on ecological and human use water resource values.

CODE: C
PRESENTATION TYPE: Technical
TITLE: Groundwater Management for Sustainability in Hardrock Terrains

Groundwater is a crucial natural resource for a nation/region. However, its contamination and unsustainable utilization is leading to depletion of groundwater resources, land subsidence and destabilization of ecosystem. The proposed session aims at providing a platform to bring together the industry professionals, practitioners, academicians and researchers to discuss the pressing groundwater issues and their corresponding solutions. The main theme envisaged in the proposed session is sustainable groundwater development under changing climate. The solutions encompass methods such as managed aquifer recharge, groundwater management terrestrial and coastal environment, applied groundwater flow and contaminant transport modelling, remediation of polluted groundwater sites etc.

CODE: D
PRESENTATION TYPE: Panel
TITLE: Delivering Decision-driven Data in a World of "Data-driven" Decisions

The USGS and other federal science agencies are uniquely qualified to lead the effort in building the next generation of open science discovery and decision support tools on the web that not only serve data, but also: (1) explicitly help guide decision-making and learning for priority users and (2) enable the science to reach a broad audience. In this session, we invite discussions of research and development efforts that facilitate the creation of open science discovery, decision support, and data delivery platforms. Specific topics may include but are not limited to the following: how to present the interpretation and guidance users need to understand data limitations and appropriate applications; how to reach new and diverse users; how to synthesize and apply user research; best practices in agile and user-driven web product development; how to create user-centered metadata schemas; how to create effective interactive visualizations; how to effectively use plain language to explain complicated science on the web; and more. Delivering decision-driven data in a world of "data-driven" decisions (Katrina Alger)National Water Census User Outreach: Developing relationships and a stakeholder registry (Dionne Zoanni)National Water Census User Research: Learning from users (Shirley Leung) National Water Census Delivery: Moving from raw data to decision support (Megan Hines) National Water Census Development: Creating data access methods and data processing pipelines (Alice McCarthy) Usability Testing: A user-centered design method (Kaycee Faunce)Moderator (Jennifer Rapp).

CODE: E
PRESENTATION TYPE: Technical
TITLE: Community Engagement in Understanding the Applicability of the National Water Model for Resilience Planning

Water is integral to community health and well-being - too much (flooding) or too little water, (drought), the quality of that water, or who is impacted or has access to it. In order to address these challenges, communities are increasingly turning to resilience- planning, which is frequently a challenging and time-consuming process. Technical research that provides science-based models and data can play a critical role in generating, disseminating, and implementing the information necessary for communities to evaluate their options and make decisions about water. However, too often these tools do not find their way into general application because the end-users are not aware of them or don't understand how they can support their needs. The key to increasing the efficacy of scientific information and data is through effectively engaging the target end-users as part of a co-development effort. This requires an understanding of the principles of effective community engagement and being able to design tailored approaches that take into account the distinct attributes of a given community. This session will highlight the value of, and lessons learned, from community engagement around water resilience from three studies: 1. The engagement of resilience-related planners in U.S. communities on their use and potential use of the National Water Model, 2. The engagement of Salinas, Puerto Rico on the community's use and potential use of NASA Earth observation data to address their flood-related environmental (in)justice concerns, and 3. the application of equity-centric community-engaged methods to address water-related island resilience in the U.S. Virgin Islands.

CODE: F
PRESENTATION TYPE: Technical
TITLE: Assessing the Climate Resilience of Community-managed Water Supply Systems in Chitwan, Nepal

The dependency on the groundwater aquifer has been accelerating being one of the readily available water sources throughout the globe. The aquifer is under intense pressure due to the extraction while the replenishment actions are dimly implemented. The dropping of the groundwater table has been witnessed throughout the globe. The over-extraction of the groundwater has increased the land subsidence. The sustainable extraction of the groundwater is possible by implementing the measures of recharging the groundwater where climate resilient water safety tools can guide the water users committee.

As the groundwater is reducing, different parts of the world have been facing severe precipitation and temperature variations. The recent trend of the European heat waves, Australian and Canadian forest fires, and Asian drought are real-time evidence. So, the surface weather variability has directly affected the groundwater abundance and volume of water availability.

This topical session has aimed to unite the researchers working in the field of groundwater, the resilience of water supply, and the impact of microclimate on water supply. Experts will come together with the adaption practices they are implementing to revive the groundwater aquifers in the different parts of the research field.

CODE: G
PRESENTATION TYPE: Technical
TITLE: Urban and Rural Water Resilient: Living with Water

Rapid urbanization especially the Coastal Cities increased these cities' vulnerability to water related risks like flash floods, water supply issues and polluting water bodies - affecting both surface and ground. During recent years we have seen increasing flood fatalities (https://www.weather.gov/arx/usflood). The intensity and frequency of water related impacts have been alarming in recent years, not only affecting big cities but also smaller towns as seen by the recent flooding in Kentucky in 2022 (https://www.weather.gov/jkl/July2022Flooding). To overcome these challenges, strategic measures are being and recognized to be adopted by the cities to build water resilience. One such example is Houston City in Texas (https://www.houstontx.gov/mayor/Resilient-Houston-20200518-single-page.pdf) .

Becoming water resilient, starts, not after an water related event, but in anticipation of such impacts, which can lead to much better preparedness and reduced risk to the citizens and property of the nation. Such preparedness leads to better and improved actions in the event of water related events or to say a "Resilient City" or even "Resilient Neighborhood". To start with we need to look at multiple factors which can impact the citizens and improve their quality of life.

Urban and Rural Water Resilient: Living with Water session at AWRA 2024 Spring Conference Topical Session, is to bring people such lawmakers, policymakers, forecasters, first responders, and researchers from within the United States and International Community.

CODE: H
PRESENTATION TYPE: Technical
TITLE: NOAA Office of Water Predictions Flood Inundation Mapping Framework Development

Flood Inundation Mapping (FIM) is a key element of flood forecasting, response, and analysis frameworks. Efforts toward the development of large-scale (national to global) and high-fidelity flood prediction frameworks have highlighted key knowledge and technical gaps. Improvements in the efficiency of numerical solvers and data processing tools offer unprecedented capabilities for scaling FIM solutions over large domains at high spatial and temporal fidelity. Exciting advancements in hydraulic modeling, high-resolution terrain processing, and high-resolution remote sensing have the potential to advance FIM capabilities and enable robust flood impact analysis, especially in urban and coastal environments, which are pressing societal concerns. We invite presentations on recent advances in FIM, including modeling, remote sensing, and impact analysis, and explore the implementation or potential scaling of these tools within large-scale and/or operational frameworks, which is of particular interest.

CODE: I
PRESENTATION TYPE: Panel
TITLE: Justice, Diversity, Equity, and Inclusion (JEDI)

Executive Order 12898 directs federal agencies to identify and address disproportionate environmental burdens of government programs and policies on low-income and minority populations. Federal science agencies are in a unique position to provide empirical evidence and new tools to support this goal. The proposed Panel Session provides an interdisciplinary view of how the U.S. Geological Survey integrates Environmental Justice into its water-science. The panel will present case studies from research conducted by the Water Resources Mission Area, Integrated Information Dissemination Division to understand factors of social vulnerability and institutional resiliency related to water security in the western U.S. Panelist will discuss how considerations for justice, diversity, equity, and inclusion (JEDI), and changing climatic norms shaped development of social vulnerability indicators, factors of water crises and conflict, and metrics of institutional resiliency in key water-use sectors. We hope for discourse that helps to shape the next generation of water resources modeling.

CODE: J
PRESENTATION TYPE: Technical
TITLE: Testing Model-structure in Representing Dominant Hydrological Processes

Large-scale hydrological models are frequently used in water resources planning considering various factors such as climate change, socioeconomic growth, and water management strategies. Despite tremendous efforts over the years, most large-scale hydrological models have been developed by mapping solution to a particular form of data. The Next Generation Water Resources Modeling Framework (NextGen Framework) promotes model interoperability, establishes standardized data and model setup workflows, and simplifies implementation and evaluation of various modeling options. This session provides an opportunity to discuss the challenges and achievements on integrating into the NextGen Framework and evaluating large-scale hydrological modeling formulations for the simulations of dominant hydrological processes. We encourage contributions in these areas: (a) model developments and improvements that addresses different hydrological processes (e.g., snowmelt, prairie runoff, slow flow), (b) efforts and challenges in integrating models into the NextGen Framework, (c) model evaluation strategies to evaluate model configurations within the framework, and (d) development of meteorological forcing, satellite products, and other data for improving the model performance.

CODE: K
PRESENTATION TYPE: Technical
TITLE: An Overview of Alabama's Regional Coastal Water Quality Program

Coastal Alabama's RESTORE Regional Water Quality Program.

Together with its partners, the Alabama Department of Conservation and Natural Resources (ADCNR) is using funding from the Deepwater Horizon Settlement to establish a Water Quality Program in Alabama's two Gulf-fronting Counties. In 2021 the Gulf Coast Ecosystem Restoration Council (known as the RESTORE Council) approved $35 million for water quality projects in Mobile and Baldwin Counties.

The program supports the primary RESTORE Comprehensive Plan goal to restore water quality and quantity. The proposed session would highlight some of the projects resulting from that funding as well as ongoing and future work. The projects selected for implementation are dispersed throughout both counties and address a variety of water quality issues. Including stormwater management, sanitary sewer overflow reduction, sedimentation, and septic to sewer conversion.

Multiple stakeholder forums in coastal Alabama have prioritized the improvement of water quality for promoting ecosystem health as an important driver of restoring the environment and economy of coastal Alabama.

The proposed topic and projects lend themselves to a technical session. However, it could be done as a panel session if that is a better fit for the agenda. Three 20-minute talks are proposed for this session that will include an overview of the topic by ADCNR (Amy Hunter and Will Underwood); Water Quality and Sediment Monitoring (John Lehrter and Melissa Partyka); and Technical Operation and Data Management of Alabama's Real-Time Coastal Observing System (ARCOS) (Pat David). Other similar projects could be selected if those speakers are not available to attend the conference. Dr. Amy Hunter, ADCNR Deepwater Horizon Restoration Coordinator commits to moderating the session and populating it with quality speakers and topics.

Alabama's Regional Water Quality Program demonstrates an important collaboration between government and academia to facilitate interaction between agency funders, academic researchers, and project end-users and beneficiaries.

CODE: L
PRESENTATION TYPE: Technical
TITLE: Knowledge Guided Machine Learning for Operational Hydrologic Forecasting

Assimilation of observed data, and of multiple modeling paradigms, into a "best" forecast is a key question within operational hydrology. Traditional approaches to data assimilation are time-consuming, and include considerable uncertainty. To align observed and simulated streamflow when they diverge, a forecaster may alter model states manually to assimilate observed streamflow data; alternatively, computationally intensive assimilation routines are necessary, which are often prohibitive for short-fuse operations over large areas. Statistical postprocessing of generated forecasts also can act to assimilate data via directly changing forecasts according to recent observations. Beyond the scale of assimilating real-time data into forecasts, several hydrologic models are often used for the same location, sometimes representing rival and incommensurable paradigms of the underlying physical process. It is thus critical to know how to assimilate entire models to generate the most accurate forecast. Our session will be focused on next generation approaches to data and model assimilation, including Artificial Intelligence and Machine Learning, the most recent advances in traditional assimilation, and forecast postprocessing. The overarching goal of session talks should communicate how specific next generation approaches can synthesize, select between, or learn from multiple models and/or the most recent observed data to generate more accurate and adaptive models.

CODE: M
PRESENTATION TYPE: Technical
TITLE: Advancing Resilience in the Face of Increasing Flood Risk across the Appalachian Landscape

Flooding is the most common and destructive of natural disasters across the Appalachian region, used here broadly to encompass the Appalachian Mountains and surrounding landscape extending from Mississippi and Alabama in its southwest extent through New England and into Canada to the northeast. Throughout the region, flooding has consistently resulted in the loss of life, destruction of communities and infrastructure, lasting economic hardship and social stresses and inequities, and environmental degradation. These floods are driven by complex factors, such as dynamic climatic patterns, natural landscape features (e.g., geology and topography), as well as legacy and ongoing land uses and resource extraction. Flood risks also are influenced by social circumstances and myriad policies, programs, and institutions at different levels of governance and are further exacerbated by changing climate, often manifesting as less predictable events of increasing magnitude and intensity.

Given this diversity and complexity of issues, resilient solutions to the risks and consequences of flooding across the Appalachian region will necessarily have localized expressions. However, opportunities can emerge from identifying and highlighting common factors that underlie increasing flood risk across the region. Toward this objective, this session will engage a mixed panel of researchers and practitioners representing diverse disciplines. The session will discuss the state of knowledge relating to Appalachian flood risks and consequences, identify critical knowledge gaps, and explore potential solutions for enhancing resilience across the region. The session will include remarks from the panelists, facilitated panel discussion, and Q&A with the audience.