Arkansas Water Resources Conference
July 18-20, 2023

State Priorities for Water Resources Management

The Arkansas Water Resources Conference, July 19-20, 2023, formed working groups on the last day of the conference to reflect on discussions held during the first two days and identify needs and priorities to better manage the State's water resources. Working group themes were identified in advance and included 1) watershed management technology (e.g., best management practices, drinking and wastewater, stream restoration); 2) workforce development (e.g., how to build capacity, where do we need more capacity, equity & inclusion); 3) mobilizing funding (e.g., innovative financing mechanisms, private and public sources of financing); 4) monitoring and research; 5) and "other" which was intended to prioritize ideas not discussed in one of the other work groups. Below are brief summaries of the working group priorities and discussions. Raw notes from the sessions are included as Annex A and should be referenced if interested in the summarized content below.

Watershed Management Technology, facilitated by Becky Roark, Beaver Watershed Alliance.
Participants identified proven complex and low-tech rural and urban best management practices, as well as identified needs to further expand implementation. The following practices were repeated throughout group sessions and were identified as working and/or needed more resources to implement: septic system repair and maintenance program, active forestry management, unpaved roads program expansion, agriculture practices such as improved irrigation (especially in the Delta), cover crops, 2-stage ditches and cattle exclusion, natural flow regimes and peak flow reduction using ponds and state-of-the-art detention practices, beaver dam analogs/wetlands, and Low Impact Development in urban areas/residential areas.

The following challenges/opportunities were identified: opportunity for pervious paver maintenance programs and creation of "tool/equipment library," need for updated assessments of streambank restoration priorities in multiple watersheds and making the Bank Erosion Hazard Index (BEHI) as the streambank erosion standard, need to increase/include karst BMPs, revisit USDA payment amounts to adjust for inflation, research on long-term data and consistent quantification of sediment and pollutant reductions from BMP implementation, and the need to look at ways to incentivize BMPs throughout the urban and rural context.

Workforce Development, Chandler Barton, Arkansas Forestry Commission.
Workforce needs identified focused on physical workforce needs, volunteer workforce needs, and targeted education needs across the state. The physical workforce is in high demand and contractors with specialized expertise, e.g., natural channel design, have limited availability. Opportunities to build in-house staff capacity, e.g., within municipalities, and provide more on-site training and certified professionals is needed. Volunteers are also in high demand with successes noted in collaborating with Master Gardeners and Master Naturalists. Volunteer programs need to suit capabilities and be engaging. Further professional development for a water-focused workforce is needed including providing mentorship opportunities and water-focused internships. Strengthening existing outreach, recruitment, and communication channels e.g., Arkansas Energy and Environment Association (AEEA), university environmental and biological engineering degree programs, Project WET, and providing more scholarships and recognition e.g., water quality recognition/award is needed. Further understanding of barriers to entry into the workforce such as through recruitment through veteran's workforce programs, AmeriCorps or American Conservation Experience (ACE) Conservation crews, and other opportunities need to be accessed.

Monitoring and Research, Facilitated by Dr. Brian Haggard, Arkansas Water Resources Center. Discussion focused on specific data gaps as well as general areas that lacked information and compounds and contaminants of emerging concern that require further research and investment. Specific data gaps included BMP, unpaved roads, and stormwater BMP efficiencies, especially forest, agriculture, and LID, improved understanding of karst hydrology/flows, uniformity in water quality monitoring across hydrologic events, especially storm sampling, and more data 12- and 14-digit HUC levels. General priorities included the need for information on optimal riparian buffer width to improve water quality, improved quantification of the benefit and value of well-managed forests, the need for long-term and integrated seasonal datasets on water quality and quantity, improvements to ground and surface water interactions and reporting e.g., withdrawals under 50,000 gallons/day, and improved data on LULC change. Emerging areas of concern for prioritized research included water infrastructure inventories, e.g., led pipe distribution, additional and better research and baseline understanding of interactions between pesticides and water quality, emerging contaminants of concern including pharmaceuticals, PFAS/PFOS, endocrine disrupting compounds, and microplastics and their chronic and acute toxicities. Participants also identified the need for a clearinghouse for academic datasets on water quality across the state, improved behavioral change characterization in BMP implementation/adoption and other areas, and the need to develop better "citizen science" tools and training.

Mobilizing Funding, Facilitated by Tate Wentz, Arkansas Natural Resources Division. Participants identified several sources of funding as well as priorities for better utilizing funding. Examples of successfully accessing State budget included legislative Act 158 of 2023 in the Illinois River, the Arkansas Unpaved Roads Program, and AGFC Stream Habitat program. Federal priorities, at this time, include the Bipartisan Infrastructure Law Joint Chiefs Initiative, NRCS Farm Bill including EQIP and PL-566, the Inflation Reduction Act including RCPP, ACP, and CSP, 319(h), Sewer Overflow and Stormwater Reuse Municipal Grants Program, State Revolving Funds, and USACE Section 206 focused on Aquatic Ecosystem Restoration. Private sector resources mentioned included possibly crowd sourcing e.g., social media campaigns, local businesses, corporate sponsorships, and potential conservation brokers for accessing carbon credits. A couple funding leverage opportunities were identified including using forest thinning as a sustainable funding stream and match towards grants or State Revolving Fund (SRF) loan repayments and using mitigation banking, both of which have been used successfully in Arkansas. A funding data portal that centralizes State-specific funding mechanisms like the Funding Integration Tool Four Source Water (FITS) would be helpful. It was recommended that additional funding be made available and prioritized for headwaters areas to ensure protection of downstream water quality.

Other Priorities, Facilitated by Joy Wasson, Arkansas Forests and Drinking Water Collaborative There were several recommendations for increasing focus on proactive rather than reactive approaches in water resources management. These included working with county judges to identify recurring bridge/road issues and develop a plan to be shovel-ready when and if FEMA assistance is granted; working with cities and counties to integrate LID into development codes; improving collection and synthesis of success stories and challenges for increased public understanding/awareness and policy change; and developing a better cross-section of stakeholders e.g., developers, hunters, fisherman, women, tribal communities, and farmers. Several information resources and ideas focused on reaching a broader audience and better communicating important water quality messages including radio spots, a phone app, glossary of terms, more/improved educational signage around rivers and lakes.

Annex A: Raw Working Group Notes

Watershed Management Technology, Facilitated by Becky Roark, Beaver Watershed Alliance.

- Pervious paver maintenance
- Natural flow regimes - Peak flow reduction BMPs e.g., ponds and detention
- Verification of efficiency (monitoring data)
- WWT - failed septic ~ technical components, train technicians
- Agricultural > fencing cattle out and alternative water resources
    - NWA/North Central - expand to other parts of State
- Update assessments for streambank restoration
    - Future technology - drones
    - Find hotspots
- Low-technical, cost-efficient stream practices
- Wetlands
- Floodplain vs. riparian
    - Include several BMPs
- Education on various BMP terms
- Beaver dam analogs

Technical, drinking water, WWTP, general

- Lawn management - less lawns
- Urban agriculture - incentivize native landscapes/LID (USDA program)
- Large-scale urban agriculture? Does it exist
    - Multi-family incentives
- Land conservation - funded at greater level
- Active forest management
- Irrigation (especially Delta) e.g., cover crops, 2-stage ditch, less water over ground
- Stream restoration
- Cattle exclusion/pasture fencing/not grazing (1 mile = $40K, cost-share needs increased)
- Unpaved Roads
- Biofiltration - bioswales, rain garden
- Quantifying reductions - consistent
- Long-term monitoring
    - Adaptive management
- BEHI - us as a standard for prioritizing stream restoration
- LID ~ expand acres state/incentivize
    - State level requirements/templates for communities
- Grantees - O&M more consideration/enable (WWTP, landscapes, ag., stream)
- Septic systems (new tech) gray water systems
    - P&N reduction
- BMPs for Karst!!
- Cover crops - more funding
    - 1st time adopter - increase incentives (vs. based on income)
    - Education funding to do this
- Riparian area - funding technologies ~ floodplain scale too
- Funds for stormwater “streams are stormwater network”
- Street technology - sweepers

- Pavers and O&M
- Identify - do we have long-term data for BMPs?
    - Funding for long-term data
- BMPs - groundwater (agriculture and urban)
- Equipment library (government issues equipment)

Workforce Development, Chandler Barton, Arkansas Forestry Commission.
Physical workforce in high demand to accomplish what staff cannot

- Contractors (with specialized expertise) limited
    - Can municipalities build in-house staff? Or train existing staff?
    - Take advantage of Low-Impact Development Conference
- More on-site training needed, incentivize with accreditation

Volunteer workforce

- Previous successes with university, Master Gardeners, and Master Naturalists.
- Coordinators in high demand ("bus drivers")
- Activity should provide a sense of accomplishment and fun
- Work should suit the capabilities of volunteers

Targeted education

- Marketing to increase interest in water quality workforce; many don't know about these careers
    - Make it engaging for parents too
- Aid university/comm. College education for environmental and biological engineering degrees
    - Provide mentorship opportunities and water-based internships
- Boost Arkansas Water Stewards usage
- AEEA as an avenue for reaching grade school
    - Project Wet instructors
    - Host field trips and interactive outdoor education opportunities (outdoor summer camps too)
    - Create a "one-stop-shop" for STEM educators to access water quality information
- Burn and forest health trainings with water partners involved
- Awards and scholarships
    - Create a category award for achievement in water quality in science fairs

Miscellaneous things to better understand:

- Understand the barriers preventing individuals with criminal convictions from entering workforce
- Veteran workforce potential
- AmeriCorps or ACE Conservation Crews?
- Professionals need to look back and share their career development story

Monitoring and Research, Facilitated by Dr. Brian Haggard, Arkansas Water Resources Center.

- Need for long-term, seasonal datasets on WQ/Q, integrate datasets
- Water use data, projections
- Remote sensing data, fact sheet for sources
    - Unpaved roads, LULC, forest management
- ADEQ data gaps, spatially
- BMP efficiencies, especially forest, agriculture and stormwater, LID
- Legacy effects, geology, soils, background (see below too)

- Riparian buffer width needed to improve WQ, economic value

Lack of Information on GW, SW

- NPS BMPs, WQ impacts, reduction efficiencies
- WQ monitoring across hydrologic events, especially storm sampling
- WQ monitoring across HUCs, not just watershed outlet but HUC 12s, 14s
- WQ across Nutrient Reduction Strategy Tier 2 Watershed, where and how many sites?
- Water use, water use projections
- Depths
- WQ, in general
- Karst, how fast things move
- GW and SW interactions, implications for WQ, pollutant sources
- Make the above 'living' datasets, give temporal resolution at appropriate scale
- Stormwater, LID practices, reduction efficiencies
- Expand understanding of source waters, not just 'finished' waters

Water infrastructure inventories, e.g. lead pipe distribution, etc.

Clearinghouse for academic datasets

Flooding, area of repetitive loss

- ID areas
- Evaluate flooding sources

Understand and quantify background water quality data [better job]

- Naturally occurring constituents, elements
- Nutrient targets

Pesticides, period!

- More monitoring, new compounds
- Update baseline information for SW, GW
- Benthic invertebrate health, food chain

Emerging contaminants of concern (EMC)

- Pharmaceuticals, PFAS/PFOS, endocrine disrupting compounds, microplastics
- Synergistic, antagonist effects
- Acute and chronic toxicity

Erosion, sedimentation inventory

- Sources, including construction, culverts, unpaved roads, streambank, row crops, pastures, etc.
- What is proportional source across various watersheds?
- Effects of BMPs, efficiencies

How to better integrate citizen science, volunteer monitory?

- Training, next generation
- Quality assurance project plans, inventory of examples
- Data use, regulatory assessments

Forests, fires, and management practices

- Management areas, spatial representation of forest management practices
- WQ impacts, short- and long-term effects
- Hydrologic impacts
- Drinking water treatment impacts
- Economic benefits of well-managed forests (e.g., can we tie to reduce treatment costs?)

Social, people factors

- More research on changing behaviors, e.g. why people implement BMPs or not?
- Equity in WQ monitoring
- Expanding trained workforce, citizen science
- Certified lab availability, costs

Other Priorities, Facilitated by Joy Wasson, Arkansas Forests and Drinking Water Collaborative

- ID Lack of data (ex: lack of accurate reporting on groundwater use in Eastern AR, only those capable of withdrawing 50,000 gallons/day are required, many under or over-report for fear of future regulation or water use limits)
- We need to organize LULC data statewide rather than piece meal for consistency and to reduce redundancy of efforts
- Increase funding for unpaved roads program (currently at $300k annually)
- Shift to a proactive rather than reactive approach to several strategies:
    - FEMA flooding: get ahead of times when we have extreme flooding across the state, work with county judges to identify recurring bridge/road issues & develop plan that can be shovel ready when and if FEMA assistance is granted during extreme events.
    - Work Low Impact Development design criteria into city and county codes
    - Pool educational resources among groups statewide to leverage outreach.
    - Disseminate surveys, collect success stories and challenges from stakeholders, archive and use for policy change/awareness, develop story map of these across the state of AR. (AWRC can spearhead this and house this data, then it is more likely to be uploaded to scholar works)
    - Ensure a good cross section of the community, including non-traditional partners, are integrated into stakeholder watershed groups and take time to communicate to these partners early on (ex: developers, farmers) so they're invested, their knowledge is acknowledged and ideas are involved, and they're likely to advocate for the achievement of goals.
- How to reach a wider audience with important watershed messages:
    - NPR River Blips - like "Here's to your health" w/ Dr. Tagen Paint
    - Implement calendar contest "12 sexiest places in AR" to emphasize aesthetic and tourism values in our watersheds
    - Develop an app that helps identify what watershed you are in
- We need an acronym glossary and a flowchart of agencies/roles
- We need more signage around our rivers and lakes, include designated uses, where does it drain?
- Hunters, fisherman and women, and tribal communities, how do we bring them into stakeholder groups more? American Indian Science and Engineering Society (aises.org)