



Maurice Hall
Vice President Climate Resilient Water Systems
Environmental Defense Fund

June 14, 2022

The Honorable Joe Manchin
Chairman
Senate Committee on Energy and Natural
Resources
304 Dirksen Senate Building
Washington, D.C. 20510

The Honorable John Barrasso
Ranking Member
Senate Committee on Energy and Natural
Resources
304 Dirksen Senate Building
Washington, D.C. 20510

Re: Statement of Maurice Hall, Vice President of Climate Resilient Water Systems for Environmental Defense Fund, at Senate Energy and Natural Resources Committee Hearing on *Short and Long Term Solutions to Extreme Drought in the Western U.S.*

Dear Chairman Manchin, Ranking Member Barrasso, and Committee Members:

Thank you for the opportunity to testify at today’s Hearing to Examine Short and Long Term Solutions to Extreme Drought in the Western U.S. I commend this Committee for its leadership in drawing attention to this critically important issue.

I am Vice President of Environmental Defense Fund’s (EDF) Climate Resilient Water Systems Initiative. EDF’s mission is to build a vital earth for everyone. Our work is focused on ensuring that our water supply systems continue to provide the water we need for cities, farms, rural communities, fish and other wildlife. These crucial systems include the extensive networks of reservoirs, canals, wells, and pipelines that we’ve built over the decades, but also, importantly, an amazing natural infrastructure system — the watersheds, streams, rivers and groundwater aquifers that collect and store rain and snowmelt and deliver water to where it is needed for our varied uses.

Collaboration is central to our work. We work with farmers, water managers, and decision-makers across the West to develop new tools to inform water management, test new approaches, and then adjust practice and policies to make it easier for the farmers, ranchers,

and water managers who get up every day making water decisions to contribute to the long-term resilience of their communities, natural surroundings, economies and bottom lines.

The Urgency of the Moment:

For the past three decades, since my graduate work in water resources at Colorado State University, I have focused my career on sustainable water management in the western United States. I have learned to accept as reality what John Wesley Powell warned us about more than a hundred and twenty years ago: Drought in the West is always lurking behind the ample rains and snows in any given year. **Yet, what we've experienced over the last few years is different**, and it truly scares me. The driest first three months of the year on record in California, even after massive storms in the Sierras in December of last year. The first ever shortage declaration on the Colorado River. Unprecedented fallowing of rice fields in the Sacramento Valley. Deadly record-breaking heat in the Pacific Northwest. The western United States is facing an unprecedented drought emergency. Our water supplies for communities, agriculture and wildlife are now dwindling at a truly alarming rate.

A Drought above Ground, Below Ground, and Across the West:

A great deal of attention has rightfully focused on the dire conditions of the Colorado River Basin. The symptoms may look a bit different in different places, but the short-term and long-term drought conditions that we see vividly in the bathtub rings of Lake Mead and Lake Powell are prevalent all across the West — in the remote farming basins of Nevada, the small communities of northeastern New Mexico, the Tribal lands of the Colorado Plateau, and across the Central Valley of California. While the drought is especially evident where surface water reservoirs have plummeted to record low levels, I want to emphasize that the drought conditions are similarly severe in our less visible groundwater aquifers, which underpin our rivers and streams and supply water to many of our rural communities that have no other options for water supply.

A Portfolio – Employing the Full Suite of Tools for Building Resilience:

The urgency of the situation is clear. And, while we can't "fix" the drought, we do thankfully have options for responding to drought and reducing the water supply risks, community impacts, economic disruptions and ecosystem damage. The basic problem is that of matching supply and demand. Like with a checking account, if you continue to spend more than comes in, at some point, the imbalance will come back to bite you. This is the same with a river basin or a groundwater aquifer. You can only take out more than goes in for so long. At some point, you will have to come into balance, or your account goes to zero, with unfortunate side effects. However, our historic approach of establishing a long-term supply and then divvying out allocations accordingly is no longer realistic. We can no longer depend on the steady income of rain and snow in the West to refill our water account. So, our toolbox must include tools for adjusting the supply and the demand and increasing flexibility to more strategically deploy water when and where it's needed most urgently for multiple benefits. In a word, we must build **resilience**.

Our Shared Challenge – The Importance of Collaboration and Good Data

Historically, water challenges in the West have too often migrated toward conflict, pitting rural against urban, irrigated agriculture against cities, farms versus fish, or even neighbor against neighbor. These opposing postures have rarely resulted in good outcomes for any one stakeholder, much less for the community of which we all are a part. In our water work at EDF,

we see our water challenges as shared ones, and the solutions we need in a continuously changing future are most likely to come from good faith collaboration. I have personally worked alongside farmers, ranchers, local water agency staff, researchers, and state and federal agencies for decades, and I honor the unique perspectives and inventiveness that each brings to the table.

The more quickly we can get different stakeholders together and develop a shared understanding of our water supply situation and trajectory, the more quickly and efficiently we can deploy our limited resources and energies to develop the innovative approaches that we desperately need.

Critical to getting on the same page — and to designing successful approaches — is accurate monitoring and measurement technologies that allow water users, providers and administrators to comprehensively understand surface and ground water supplies. Best available data in forecasting, modeling, and monitoring of water availability and consumptive water use are critical to proactive decision-making and drought response. This need has led EDF to engage with partners in development and improvement of information tools like [OpenET](#) and an open source [groundwater accounting platform](#). Maintaining and improving the long-standing programs of USGS' stream-gaging network and the NRCS' SNOTEL system are similarly important sources of water data, even as public-private partnerships can improve the data analysis and forecasting from these key data sets.

Resilience Strategies

To start with, targeted investments in our water infrastructure are an important component of a comprehensive portfolio to build resilience. Infrastructure investment creates jobs and supports economies. Federal infrastructure investment multiplies federal dollars invested by creating long-term water sustainability, with ripple effects on local economies and communities. This investment should include long-needed repairs and upgrades to conveyance canals, municipal infrastructure and irrigation systems. In some cases, additional storage or upgrades to existing reservoir storage to improve flexibility may also be helpful. These investments should be assessed carefully to ensure that the benefit gained is truly worth the often high costs. We should also rethink how existing facilities can be operated differently, or “re-operated,” to provide additional benefits beyond those originally envisioned when the facilities were designed and built.

Infrastructure investments must also extend to our **natural infrastructure**, which has long been neglected. This includes the forested, rangeland, and agricultural watersheds that collect rain and snowmelt and deliver it to streams and rivers. It also includes the amazing natural infrastructure of our groundwater aquifers, which filter, collect, store and deliver water to millions of wells across the West for irrigation, communities, and households. Urgently needed investments in natural infrastructure include:

- Restoring the ability of watersheds to retain and release water to bolster resilience to drought and flood.
- Protecting and restoring watersheds, especially headwater systems.
- Investing in groundwater monitoring wells and information systems to improve our understanding of the condition and trajectory of groundwater aquifers.
- Enabling proactive groundwater management, including managed aquifer recharge.

Proactive groundwater management is an especially urgent need for rural regions of the West. In my recently adopted home state of New Mexico, for instance, 95% of rural and small-town

residents outside the Albuquerque and Santa Fe metropolitan areas are completely dependent on groundwater for their basic water needs. With groundwater levels plummeting, the economic and cultural future of these rural areas is dependent on careful management of their limited groundwater supplies.

While targeted investments to increase supply are an important part of a comprehensive portfolio, water is simply overallocated in many regions of the West. We have come to expect more water to be available than we can reasonably expect to see in the future. In these regions, a broad portfolio of demand adjustment strategies is also critical. These strategies include:

- Municipal water conservation.
- Municipal water recycling and re-use.
- Water-saving agricultural practices, such as switching to lower water use crops and deficit irrigation.
- Voluntary, compensated transactions.

A 2021 report ([Ten Strategies for Climate Resilience in the Colorado River Basin](#)) developed by a coalition of conservation organizations highlights a spectrum of possible strategies that can help mitigate and adapt to climate change driven drought and aridification. While the report focused on the Colorado River Basin, these strategies, which range from the innovative to the well tested, provide a spectrum of options to help build much needed resilience in different parts of the West. Strategies, for example, that advance management, restoration, and enhancement of natural water infrastructure in mountain forests help recharge groundwater flows, provide natural wildfire breaks, and allow for slow-timed releases and filtration to rivers and streams that are used for drinking water, irrigation and habitat. Incentives to improve agriculture infrastructure and practices (i.e., installing on-the-ground technologies, switching to drought-resistant crops, promoting regenerative practices) that enhance soil health and advance water conservation also have the potential to produce long-term benefits for building resilience to drought and climate change and improving overall water supply.

Investments from the Infrastructure Investment and Jobs Act (IIJA) have helped kickstart these and other useful strategies to help build resilience throughout the West. For example, the IIJA includes \$100 million for natural infrastructure projects through the WaterSMART program, \$2.1 billion for forest ecosystem restoration and \$100 for multi-benefit watershed health projects. The challenge now is to streamline the processes and eliminate barriers for maximizing the opportunities to access and implement the funds for the benefit of communities and the environment.

An example of applying a portfolio approach with a long-term commitment to collaborative planning and then executing projects is playing out in arid eastern Washington's Yakima River Basin. The Yakima Basin's Integrated Plan is a high-priority IIJA investment because its projects are planned and prioritized as important contributions to the economic and water security of the basin as a whole — including the basin's robust agricultural community, Tribal community, and the recovery of its imperiled fish and wildlife. For example, Trout Unlimited has partnered with the Kittitas Reclamation District on canal lining and piping, which then allows conveyance of that conserved water during drought to streams key to the survival of imperiled salmon and steelhead. The story, [here](#), of this on-going project illustrates the important economic multiplier of well-designed projects like this one that are part of the Yakima Integrated Plan implementation. Similarly, [stories of collaboration](#) to restore headwater meadows in the Sierra Nevada Mountains to recharge and retain groundwater and, in Utah's Bear River basin to improve fish passage and irrigation efficiency, illustrate the array of solutions to prepare for and build resilience to drought in the West.

Multibenefit Land Repurposing, an example from California's Central Valley

One example of a valuable resilience strategy has emerged from the work of EDF and a range of partners in California's San Joaquin Valley. Even with some possible supply enhancements, studies indicate between 500,000 and 1 million acres of agricultural land — about 15% of farmland in California's San Joaquin Valley, or roughly the size of Yosemite — are expected to go out of agricultural production over the next couple decades.

We, along with a number of thoughtful stakeholders in the Central Valley, realized that unmanaged, this transition will put many farm workers out of work and could mean large areas of the Central Valley could transform into a dust bowl, characterized by a patchwork of dusty fields with invasive weeds and pests, further impairing air quality in a region that has some of the worst air quality and asthma rates in the country.

To avoid this devastating outcome, the state of California has recently launched an innovative new Multibenefit Land Repurposing Program (MLRP). Through this program, California aims to transform the Central Valley into a water-resilient agricultural region by supporting the repurposing of previously irrigated land into a mosaic of vibrant new land uses that require less water, like habitat corridors, wildlife-friendly groundwater recharge areas or outdoor recreational spaces for families that can exist alongside productive agricultural lands.

The MLRP, established last year with \$50 million in initial funding, will enable farmers to receive payments for voluntarily conserving groundwater and repurposing some of their land to new beneficial and less water intensive uses that communities need and want. In May, the California Department of Conservation announced the first local projects to receive block grants through this new program. It's important to note that grant requests exceeded funding by more than 120% in this first round of applications, demonstrating strong interest and the need for even more funding. In addition, it's imperative to couple this program with efforts to expand job training programs as rural regions undergo this transition.

The creation of the MLRP has been an incredible collaboration, with broad support from a wide variety of interests. The long list of supporters included Friant Water Authority, Turlock Irrigation District, Association of California Water Agencies, San Luis Delta Mendota Water Authority, UC Merced, UC Kern Groundwater Authority, Grasslands Water District, Tri-County Water Authority, Southwest Kings Groundwater Sustainability Agency, East Kaweah Groundwater Sustainability Agency, Tulare Irrigation District, Tulare County, Madera County, Westlands Water District, Madera-Chowchilla Resource Conservation District, McMullin Area Groundwater Sustainability Agency, UC Collaborative Extension, Leadership Counsel for Justice and Accountability, Self Help Enterprises, CivicWell, Sequoia Riverlands Trust, The Nature Conservancy, Sustainable Conservation, American Farmland Trust, Ceres, Sierra Club, Audubon CA, UC Merced, CA Waterfowl, and RCRC.

Solutions that can provide benefits across agricultural, environmental and rural community sectors and community engagement are key elements of the MLRP. The program is prioritizing projects that deliver a combination of benefits rather than just one, such as groundwater recharge projects that also provide wildlife habitat. In addition, the program is ensuring that there is meaningful input from farmers, ranchers, disadvantaged community members and Tribes in the development and implementation of land repurposing plans and projects.

Importantly California's MLRP was developed, and will continue to evolve, with the specific conditions of the Central Valley in mind. However, the general concept is adaptable to a range

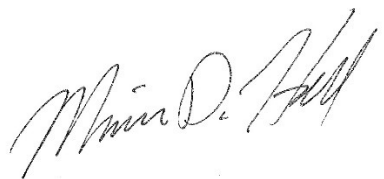
of conditions throughout the West. Working together, stakeholders with different interests can develop similar approaches that address the unique physical, cultural, and economic conditions of their state, watershed or groundwater basin.

Conclusion

I'm hopeful that the coming weeks will bring a healthy monsoon season to my community in northern New Mexico and this next winter will bring heavy snows and ample supplies to my farming friends and to fish and wildlife in California's Central Valley. I pray that a wet winter in 2022-2023 over the beautiful peaks of Colorado, Utah and Wyoming halt the frightening drop in levels at Lake Powell. But even if this or next year provides a little breathing room, drought is lurking somewhere in the near future. Failure to act now would be a huge mistake and missed opportunity. The conditions we are seeing today should be a blazing wakeup call for bold, innovative action. How we respond now will shape the future of agriculture and rural communities across the West and the health of our major cities and overall economy.

Again, we thank Chairman Manchin, Ranking Member Barrasso, and the members of Committee for giving urgent attention to drought solutions in the western United States.

Sincerely,

A handwritten signature in black ink, appearing to read "Maurice D. Hall". The signature is fluid and cursive, with the first name "Maurice" being the most prominent.

Maurice Hall
Vice President
Climate Resilient Water Systems
Environmental Defense Fund