

**Written Testimony**  
**Earl Lewis, Chief Engineer**  
**Kansas Department of Agriculture, Division of Water Resources**  
**On behalf of the**  
**WESTERN STATES WATER COUNCIL**

**Submitted to the**  
**Senate Agriculture Committee**  
**Subcommittee on Conservation, Climate, Forestry and Natural Resources**

**June 7, 2022**

Chairman Bennet and Ranking Member Marshall, thank you for the opportunity to appear today to discuss The Western Water Crisis: Confronting Persistent Drought and Building Resilience on our Forests and Farmland. My name is Earl Lewis. I serve as the Chief Engineer of the Kansas Department of Agriculture's Division of Water Resources and as a member of the Western States Water Council.

The Western States Water Council (WSWC) appreciates the opportunity to submit testimony. The Council is a government entity, an instrumentality of each and every one of the 18 participating States. Member state representatives are appointed by and serve at the pleasure of their respective governors, advising them on a wide range of water policy issues and initiatives. The WSWC charge is to ensure that the West has an adequate, secure and sustainable supply of water of suitable quality to meet its diverse economic and environmental needs now and in the future. These are difficult times for water in the West and an unprecedented time for agriculture.

All levels of government must prioritize the collection, analysis and open sharing of reliable data regarding water availability, quality, and usage given its importance to research for sound science and data driven decision making. We encourage the Subcommittee to consider the U.S. Department of Agriculture's (USDA) role and the resources needed for USDA to participate in and benefit from building a national water data network, as well as partnerships to advance the use of water information to serve the needs of agriculture.

Water is the lifeblood of the West. This is most apparent in the agricultural sector, which consumes the predominant share of the freshwater resources throughout western states. Agriculture sustains many rural economies, provides important employment opportunities, and is a vital national industry. Federal funding is critically important for many agricultural communities, and USDA plays a crucial role in implementing programs that deliver assistance. USDA programs help to provide water and wastewater infrastructure, technical assistance, financial assistance, and conservation measures that ensure water is available to allow the agricultural industry to survive, if not thrive.

Periodic drought and competing demands for scarce water resources threaten the sustainability of the agricultural economy, highlighting the need to promote efficient water use that achieves net water savings while still maximizing production. In some cases, there is a need for assistance to transition from irrigated to dryland farming. The USDA's Conservation Title

Programs provide solutions for water supply reliability through efforts such as conservation practices and groundwater recharge to preserve long-term ground and surface water resources. The WSWC supports collaborative, targeted, and voluntary conservation actions to address water resource concerns on private and public lands, and urges Congress and the Administration to provide sufficient funding for these programs.<sup>1</sup> (See attached WSWC Position #455.)

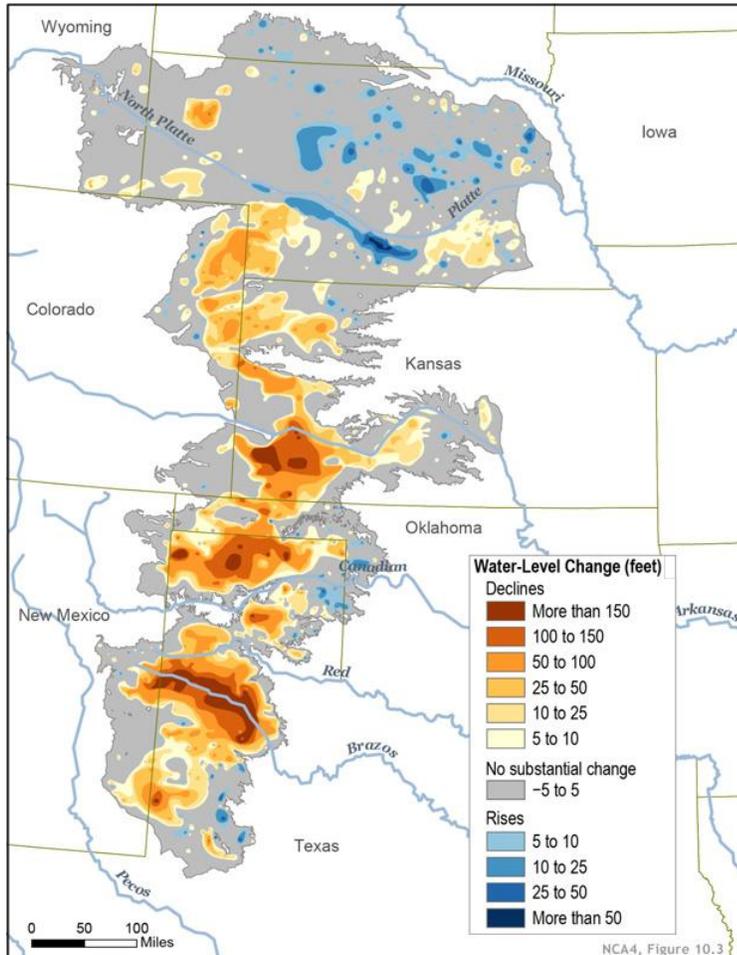
Much of the West is arid and water availability is an ever-present constraint defining our economic and environmental wellbeing and quality of life. The Council recognizes the increasing demands on often scarce water resources. The current historic drought threatens the West and its agricultural base, as well as the communities built on that base. (For some brief examples of recent state efforts to grapple with drought in 2022, see Appendix A.)



<sup>1</sup> WSWC Position #455, USDA Conservation Programs and Water Resources (10-15-2020) attached.

“Since 2000, historically dry conditions have added stress to the Colorado River’s already over-allocated water resources. The Colorado River provides water to almost 40 million people in two countries, seven states, 29 federally recognized Indian tribes, and 4 million acres of farmland. According to a University of Arizona study, the Colorado River supports \$1.4 trillion in annual economic activity – equivalent to 1/12th of total U.S. gross domestic product – and 16 million jobs in Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. The drought has impacted regional water supplies and other resources, such as hydropower, recreation, and ecological goods and services.”<sup>2</sup>

In the Great Plains, the Ogallala Aquifer underlies about 112 million acres, or 175,000 square miles, in parts of eight states, including: Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas and Wyoming. It is the principal water source for agriculture, public water supply, industry, and the environment. USDA indicates that 30 percent of all groundwater pumped in the United States is pumped from the Ogallala Aquifer. The Aquifer serves as an extensive underground reservoir providing water to grow cash crops making up the difference between crop needs and precipitation.



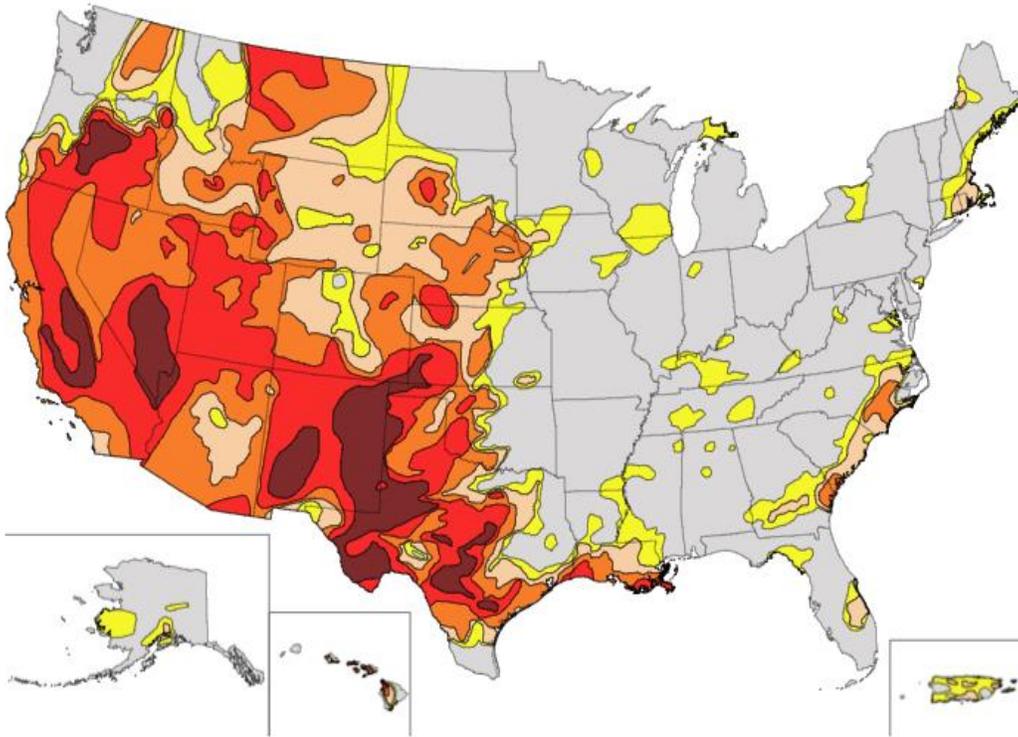
Drought by its very nature reduces precipitation requiring producers to pump more water for irrigation to ensure a reliable food and fiber supply. The correlation is clear that as we have more and longer droughts, the amount of water pumped from the Ogallala Aquifer increases as do the related water level declines. The Ogallala is not an inexhaustible supply as many of the early users believed that it would be. The USGS map on this page shows the levels of decline across the aquifer from predevelopment (roughly the 1940s) through 2015. There are many localized areas where the aquifer is effectively dewatered to the point that it is no longer useful for agriculture. Without additional action at all levels of government and by individuals, we will see this critical resource eliminated.

<sup>2</sup> [www.drought.gov/watersheds/colorado](http://www.drought.gov/watersheds/colorado)

## National Integrated Drought Information System (NIDIS)

NIDIS is a multi-agency partnership that coordinates drought monitoring, forecasting, planning, and information at national, state, and local levels across the country. The U.S. Drought Monitor (USDM) is a multi-agency product updated each Thursday to show the location and intensity of drought across the country. Drought categories show experts' assessments of conditions related to dryness and drought including observations of how much water is available in streams, lakes, and soils compared to usual for the same time of year.

### U.S. Drought Monitor



#### U.S. Drought Monitor Category

- D0 - Abnormally Dry
- D1 - Moderate Drought
- D2 - Severe Drought
- D3 - Extreme Drought
- D4 - Exceptional Drought

#### % of U.S.

- 51.5%
- 41.4%
- 30.9%
- 16.8%
- 4.6%

Source(s): NDMC, NOAA, USDA  
Updates Weekly - 05/31/22

**Drought.gov**

Over half the country is abnormally dry, with nearly a third suffering from severe, to extreme, to exceptional drought – according to the U.S. Drought Monitor (see figure below). Given its coarse resolution, the Drought Monitor is an important but imperfect tool, particularly for assessing eligibility for USDA farm and livestock assistance programs.

Improvements to the Drought Monitor to make it a more accurate and effective tool for both members of the agriculture community and policy makers, was part of the NIDIS reauthorization, championed by Senator John Thune (R-SD) in 2018. The legislation also included development of a strategy for a national coordinated soil moisture monitoring network. Drought and its impacts vary from region to region, and NIDIS also involves the development and implementation of regional drought early warning systems (DEWS) that allow for responsiveness to particular geographic and hydrologic circumstances. NIDIS will again need to be reauthorized in Fiscal Year 2023.

The WSWC supports NIDIS and other federal programs and actions designed to improve our drought forecasting and response capabilities.<sup>3</sup> NIDIS is directed by an Executive Council that is co-chaired by USDA, NOAA and the WSWC.

Senator Thune said, in 2018, “Congress must do everything it can to update and modernize drought tools like NIDIS, which our farmers and ranchers depend on to stay up-to-date and fully informed on drought conditions in their area.”<sup>4</sup>

### **Sub-Seasonal to Seasonal Precipitation Forecasting**

The 2018 NIDIS reauthorization legislation also amended the Weather Research and Forecasting Innovation Act of 2017 to among other things authorize NOAA to create one or more pilot programs for assessing new or innovative information and technology capabilities and services (132 STAT. 54578). Subsequently, a 2020 NOAA report to the Congress recommended four pilot projects focused on improving sub-seasonal to seasonal (S2S) precipitation forecasting, that is, beyond present 5–15 day weather forecasts to extend out several weeks or months, even one or two years. (<https://repository.library.noaa.gov/view/noaa/27408>)

The purpose of the pilot projects is to improve S2S precipitation forecasting. As the report noted, NOAA pilot projects were necessary “...based on the existence of major climate phenomena that have huge economic impacts and for which current S2S predictive skill is too low to be effectively used by many stakeholders.” Persistent drought conditions across the West highlight the need for better forecasting tools to allow federal, state and local water agencies, soil and water conservation districts, irrigation districts, farmers and ranchers to better prepare for and respond to drought. Forecasts at S2S time scales are needed to support farming decisions, such as seed and fertilizer purchases, field preparation and planting, and equipment investments, as well as water shortage contingency planning, reservoir management, water project operations, etc.

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<sup>3</sup> WSWC Position #474, Drought Preparedness, Prediction and Early Warning Programs (9-16-2021) attached.

<sup>4</sup> <https://www.thune.senate.gov/public/index.cfm/press-releases?ID=DE2EA7DC-37F8-4B0A-81D4-9545AA82A84A>

NOAA's Climate Prediction Center has been issuing S2S precipitation outlooks since the mid-1990s. Their skill for the western U.S. has been minimal, just slightly better than predicting average weather conditions, and has shown little improvement over time. Forecasting precipitation at S2S timescales is scientifically challenging and has historically received little federal research support. The WSWC has actively supported a \$15 million programmatic increase in the U.S. Weather Research Program line item within NOAA's Office of Oceanic and Atmospheric Research appropriations account for S2S pilot projects toward improving our understanding of the science and opportunities to improve the skill of S2S outlooks.<sup>5</sup>

## **Snow Survey and Water Supply Forecasting**

In the West, water is a critical, vital resource and sound decision-making demands accurate and timely data on evapotranspiration, soil moisture, groundwater, precipitation, rain, snow, snow depth, snow water content, streamflow, water quality and similar information.<sup>6</sup>

USDA's Snow Survey and Water Supply Forecasting Program is administered by the National Water and Climate Center (NWCC) in Portland, Oregon, and funded through USDA's Natural Resources Conservation Service (NRCS). Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the fall, winter and early spring seasons. As snowpack accumulates each year, NRCS hydrologists measure the snow and estimate the runoff that will occur when it melts. To predict this annual runoff, the NWCC manages and maintains a comprehensive network of manually-measured snow courses and automated Snow Telemetry (SNOTEL) monitoring sites throughout the West that collects and distributes timely, quality-controlled snowpack, water supply, and soil climate data to users westwide.

Funding for the program is critical, but has been flat at around \$9 million annually for about 20 years, while equipment, travel and staffing costs have increased leading to challenges due to understaffing and delayed or inadequate system maintenance. An anticipated 50% increase in the President's draft FY2023 budget and related appropriations did not materialize.

Such an increase would allow for expansion of the SNOTEL network, including implementation of an Objective Network Design approach for optimizing placement of new stations and sensor suites within the existing network configuration. This would include improving the accuracy and precision of core observations (air temperature, precipitation, snow water equivalent, and snow depth).

More funding would allow for expanded measurement of new and secondary elements (net radiation, relative humidity, soil moisture, soil temperature, and wind speed). Other possible actions dependent on funding include deployment of gap filling and nested monitoring schemes in both horizontal and vertical space to capture core hydrologic gradients at multiple scales.

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<sup>5</sup> On June 21, 2021, the WSWC submitted to the Senate Appropriations Committee's Subcommittee on Commerce, Justice, Science, and Related Agencies written testimony regarding the National Oceanic and Atmospheric Administration's (NOAA)/National Weather Service's (NWS) U.S. Weather Research Program appropriations in support of improving subseasonal-to-seasonal precipitation forecasting.

<sup>6</sup> WSWC Position # 473, Federal Water and Climate Data Collection and Analysis Programs (9-16-2021) attached.

Increased funding would also help address monitoring solutions in high rugged alpine areas, as well as permitting challenges for stations in Designated Wilderness Study Areas.

Increased funding would accelerate data reliability efforts such as telemetry reliability upgrades (moving away from the use of Mmteorbust technology, which only NWCC uses). Other improvements that would be accelerated include data storage and data quality processes (in early stages of development), as well as mitigation of climate and watershed non-stationarities in forecasting processes (also in early stages).

Western Governors and the WSWC have historically supported the program and continue to be deeply interested in the long-term health and capability of the program's data, products, and services and its role in generating vital snowpack and water-related information. Data on present and future water supplies are critical, as are data on present and future uses, if we are to balance supplies and demands during drought.

### **Open Evapotranspiration Information**

Water resources managers and agricultural interests across the western United States are reliant on evapotranspiration (ET) information for irrigation scheduling, managing water deliveries, water supply planning, water rights administration, and hydrologic modeling and prediction. Some state agencies and agricultural enterprises use simplified methods to estimate ET that rely on crop coefficients and outdated irrigated area maps to estimate consumptive use volumes, while others rely on manual processing of satellite data over limited areas, making processing and coverage for all irrigated lands difficult and costly, and based on available staff, expertise, and agency funding.

Satellite-based ET data may already exist for some regions, but it is often not readily usable for modeling or decision making at the watershed scale. Consistency is also important in ET approaches and products, including irrigated lands identification that spans across political boundaries and covers the entire western U.S. Rapid accessibility and usability of field- and watershed-scale ET summary data is lacking for efficient integration into water management processes.

Additionally, there is a need for ET data from a trusted source that can easily be integrated with water rights information to assess and compare consumptive use for irrigated lands. For example, many state water agencies want to assess if hydrographic basins are truly over appropriated with respect to actual consumptive water use based on ET, rather than simply comparing total water right appropriations to system yield estimates.

The WSWC has expressed our support for an OpenET proposal to leverage the work of a broad network of collaborators to develop and provide credible, transparent, automated, and easily accessible data on evapotranspiration (ET) and consumptive use (CU) using satellite-based sensors and cloud computing.<sup>7</sup> For many years, the Council has supported the use of satellite imagery to estimate ET and CU under actual field conditions over large areas, particularly the use of thermal infrared imaging data available from Landsat 7 and Landsat 8.

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<sup>7</sup> Ibid.

OpenET addresses an urgent need for an operational system that can produce accurate consumptive use estimates that are available for automated data transfer to federal, state, and local water agencies that can also be used with irrigation management information systems.

Senator Cortez Masto has introduced S. 2568, the Open Access Evapotranspiration Data Act.

## **Agrimet**

WSWC also supports the Bureau of Reclamation's Agrimet network of weather stations that provide data for irrigation scheduling. Agrimet also serves as an important and efficient means for ground-truthing, calibration, and model validation tool for analysis of information products derived from satellite platforms such as OpenET. Agrimet provides basic data on precipitation, temperature, solar radiance, wind speed and humidity required to calculate reference evapotranspiration (ET) and inform remote-sensing platforms. The Agrimet weather observing network suffers from the challenges of aging instrumentation infrastructure, deferred maintenance, need for technology upgrades, and funding that fails to keep up with these needs, making it difficult to maintain data continuity and coverage for users.<sup>8</sup>

## **Western States Water Data Exchange**

A fundamental principle of the WSWC mission and vision is that all levels of government must prioritize the collection, analysis and open sharing of reliable data regarding water availability, quality, and usage given its importance to research for sound science and data-driven decision making. One of the West's and the nation's most pressing challenges is addressing gaps in data and information to enable us to more sustainably manage our water resource. To address this challenge, the WSWC aimed to formulate a strategy and to develop a framework for its member states to begin to share important water supply, water use, and water administration datasets with each other, with federal partners and with the public. For over a decade the WSWC has been working to create a Water Data Exchange.

Taking a principles-based approach, the Council has sought to articulate and put into action its vision for sharing water data. These principles include making transparency, openness, discoverability, and accessibility the default for public water data, while also ensuring the highest levels of security and privacy for stakeholders. Whenever possible, data is shared using developed standards and machine-readable formats – including thoroughly documented metadata – to promote interoperability, regional analyses, and user flexibility.

Since 2012, the WSWC has been laying the foundation for an effective program. This includes the mundane tasks of surveying and offering outreach to data providers, procuring additional resources for states who needed assistance, forming partnership to oversee the funds and other governance, development of the WaDE code and application, extensive assistance for implementation with state partners, and ongoing maintenance and updates. It's not glamorous work, but cumulatively it represents a tremendous step forward in not only the data-sharing and

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<sup>8</sup> Written testimony submitted to the Senate Committee on Appropriations, Subcommittee on Energy and Water Development, and Related Agencies, regarding U.S. Bureau of Reclamation FY2022 Appropriations, June 24, 2021.

publishing practices within the states, but in the way we value the information we have concerning our resources. We are starting to think of water data beyond its limited and specific mission, and beginning to see the limitless value of high-quality data shared in a way that is easily discoverable and accessible. (<https://westernstateswater.org/wade-updates>)

### **Western States Water and Data Assessment and Analysis Tool**

The WSWC is developing WestDAAT, a dashboard that will be an online operational decision support and planning tool supporting user-friendly design choices. While a prototype has been built, its final operational functions will be driven by outreach that will involve the development of use cases that represent a range of stakeholders and water managers or decision-makers that include governors, state water right administrators [state engineers], state water planners, river basin managers, farmers and ranchers, and local irrigation district and groundwater managers. States and stakeholders are helping identify applications or deriving insights for water management and planning scenarios (e.g., simulating water calls during shortages, promoting water marketing, shepherding conserved water downstream, tracking water use for planning purposes, and administering water rights under state law, interstate compacts, and international treaties). WestDAAT will help make western states' water data more FAIR (Findable, Accessible, Interoperable, and Reusable). At present, data for over 2.5 million water rights is accessible through WestDAAT.

### **Internet of Water Coalition**

The Internet of Water (IOW) Coalition is a group of organizations working together with federal, state, and local government partners to build foundational water data infrastructure across the U.S. and create a community of people and organizations using water data to make better decisions. The Coalition is a multi-sector collaboration co-led by five non-profit organizations: Duke University's Nicholas Institute for Environmental Policy Solutions, the Lincoln Institute of Land Policy's Center for Geospatial Solutions (CGS), the Western States Water Council's Water Data Exchange (WaDE), the Consortium of Universities for the Advancement of Hydrologic Sciences, Inc. (CUAHSI), and the Water Data Collaborative (WDC).

Successfully modernizing our nation's water data infrastructure requires all of us: public agencies, utilities, NGOs, and private industry, working together toward this common goal. "Addressing that challenge, however, requires not just innovative new data discovery and access tools, but also a coordinated effort across the whole water data community to use common standards and share and exchange water data in common formats. We also need to stay close to the needs of water decision-makers and the wider community of water stakeholders to realize the vision of the Internet of Water: equitable and resilient water management outcomes," says Peter Colohan, the IOW Coalition Chair. The WSWC Executive Director is the vice-chair.

At present, IOW includes a network of organized water data hubs across the U.S. that increases the amount of data being shared by public agencies within and across jurisdictions in accessible and interoperable ways. The Environmental Protection Agency and U.S. Geological Survey (USGS) are IOW hubs. IOW public agency water data inventories include more than

500 water data platforms across nine states and the federal government. Public agencies hold large amounts of data. A data inventory is the first step in understanding data fragmentation and identifying areas for improvement.

IOW also hosts a Peer-to-Peer (P2P) Network of nearly 1000 individuals in 40 states. From membership in our P2P Network to collaborative project partners to membership on our listservs, the IOW seeks to grow our connections. Members of this community of practice share their successes, challenges, and lessons learned. It is a network of people committed to improved water data management.

A significant challenge in sharing water data is the myriad use of different terms and definitions used to describe the data. Coming to Terms is the IOW's Water Terminology Collection that tracks definitions, synonyms, and homonyms of water-related terms used by public agencies. There are 7,400 terms in the collection, which continues to grow.

Geoconnex is a framework for data providers to allow their data to be easily found alongside relevant data from other organizations. Five organizations are now participating, providing geospatial information for four million data points, such as water diversions, USGS streamgages, EPA water quality monitoring sites, etc. Geoconnex provides persistent identifiers for real-world locations, allowing multiple data providers to publish their data tied to a specific location identified in the same manner across agencies.

Agricultural interests and organizations are welcome to join these efforts to expand and magnify the sharing and use of water data to improve decision making.

## **Federal Water Data Legislation**

New Mexico Senators Martin Heinrich and Ben Ray Lujan, together with Representative Melanie Stansbury, have introduced legislation to establish a national water data framework. The WSWC welcomes the introduction of the Water Data Act and supports coordination and leveraging state and federal resources within a national framework consistent with IOW principles.

The Water Data Act will:

- Establish a national water data framework for sharing, integrating, and utilizing water data and supporting the development of innovative water data technologies and tools.
- Develop common standards for water data to unlock the power of existing and future data for use in countless tools and technologies to empower water users and managers.
- Organize and direct federal agencies that generate and use water data to work together.
- Support consultation, coordination, and partnerships with stakeholders by permanently authorizing the Advisory Committee on Water Information.
- Establish a new grant program under the Department of the Interior to invest in improving water data in partnership with state, local, and other organizations.

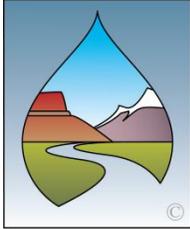
- Invest in next-generation water data technologies and tools to transform water management.

The Water Data Act would be a catalyst to organize and direct federal agencies that generate and use water data to work together, as well as support non-federal consultation and coordination. It would establish a new grant program under the Department of the Interior to invest in improving water data in partnership with state, local, and other organizations, which is an important step. Permanently authorizing the Advisory Committee on Water Information, of which the WSWC was a member, will also encourage the development of next-generation water data observations, technologies and tools to transform water management.

Critical and vital information is gathered and disseminated through a number of important federal programs under various agencies, including USDA agencies. Such information is used by federal, state, tribal, and local government agencies, private entities and individuals to forecast rainfall, snow, streamflow, flooding, drought and other climate-related events, as well as estimate future water supplies for agricultural, municipal, industrial uses, hydropower production, recreation, and environmental purposes. The WSWC has a long history of support for federal data-related observation, analysis, assessment and dissemination efforts. More needs to be done.

Again, we encourage the Subcommittee to consider USDA's role and the resources needed for USDA to participate in and benefit from building a national water data network, as well as partnerships to advance the use of water information to serve the needs of agriculture. Also, we want to emphasize the importance of maintaining and expanding the NRCS snow survey and water supply forecasting program.

Thank you for the opportunity to testify and I am happy to respond to any questions.



**POSITION  
of the  
WESTERN STATES WATER COUNCIL  
regarding  
USDA CONSERVATION PROGRAMS  
and  
WATER RESOURCES**

**Fall No Host - Virtual Meeting  
October 15, 2020**

**WHEREAS**, water is the lifeblood of the West and this is most apparent in the agricultural sector, which accounts for the predominant share of consumptive water use westwide; and

**WHEREAS**, agriculture sustains many rural economies and provides important employment opportunities both directly and indirectly; and

**WHEREAS**, increasing demands on often scarce water resources and periodic drought threaten the West and its agricultural base and the communities built on that base; and

**WHEREAS**, many agricultural producers in the West rely on irrigation surface water delivery systems that are shared among multiple producers and operated by an irrigation district, canal company, mutual ditch company, or acequia while others rely on overdrafted and or overallocated groundwater basins; and

**WHEREAS**, maintaining a sustainable agricultural economy in the West requires promoting efficient water use and achieving net water savings, while maximizing production and in some cases assisting in the transition from irrigated to dryland farming; and

**WHEREAS**, U.S. Department of Agriculture (USDA) conservation programs focus on conservation of ground and surface water resources, as well as reductions in nonpoint source pollution, including nutrients, sediment, pesticides and salinity; and

**WHEREAS**, many agricultural producers in the West voluntarily participate in USDA programs to implement conservation practices that improve water use efficiency, water quality and wildlife habitat; and

**WHEREAS**, the Farm Service Agency (FSA), Rural Development (RD), Natural Resources Conservation Service (NRCS), and National Water and Climate Center (NWCC) administer many water-related programs; and

**WHEREAS**, multiple USDA farm financial assistance programs are particularly important to producers and rural communities, water users and water quality managers, including the Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP),

Conservation Stewardship Program (CSP), Emergency Watershed Protection Program (EWPP), Environmental Quality Improvement Program (EQIP) and its Conservation Innovation Grants (CIG) and Colorado River Salinity Control Program (CRSCP), and Regional Conservation Partnership Program, and others such as watershed protection and planning programs; and

**WHEREAS**, special EQIP funding also covers a number of initiatives, including the Drought, Ogallala Aquifer, National Water Quality, Resiliency to Climate Change, and WaterSMART Initiatives; and

**WHEREAS**, the Western States Water Council (WSWC) supports USDA Conservation Program funding levels based on need rather than baseline budget targets; and

**WHEREAS**, the WSWC supports collaborative, targeted and voluntary conservation actions to address locally identified farm, range, forest and water resource concerns on private and public lands; and

**WHEREAS**, the WSWC supports actions to address secure water supplies, improved water quality, and drought and wildfire resilience, as well as wildlife habitat conservation and invasive species threats; and

**WHEREAS**, the WSWC supports the role of Conservation Title Programs in providing solutions to resolve water supply reliability, water quality impairments, groundwater recharge, and other water resource concerns facing agricultural water users and agricultural producers; and

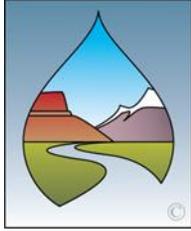
**WHEREAS**, the WSWC supports the continued efforts of Rural Development to provide financial assistance for drinking water, wastewater facilities and other services to rural communities.

**NOW, THEREFORE BE IT RESOLVED**, that the Western States Water Council strongly supports USDA Conservation Programs, and urges the Administration and the Congress to provide sufficient funding to address water conservation, flood protection and water quality remediation needs.

**BE IT FURTHER RESOLVED**, that the WSWC supports regional cooperative agricultural programs such as EQIP Initiatives, the Colorado River Salinity Control Project, and the Regional Conservation Partnership Program.

**BE IT FURTHER RESOLVED**, that, the WSWC supports the work done by Rural Development to bring clean, safe drinking water and sanitation to rural communities.

**BE IT FURTHER RESOLVED**, that the WSWC supports investment in voluntary, incentive-based conservation programs, including when appropriate assisting in the transition from irrigated to dryland farming, that are implemented in coordination with state and local governmental partners, while providing the maximum flexibility possible and opportunity for innovation to create efficiencies, coordinate funding and achieve real water savings.



Position No. 474  
Revised and Readopted  
(formerly Position No. 429, October 26, 2018, No. 386, October 9, 2015,  
and No. 346, October 12, 2012)

**POSITION  
of the  
WESTERN STATES WATER COUNCIL  
regarding  
DROUGHT PREPAREDNESS, PREDICTION AND EARLY WARNING PROGRAMS  
Deadwood, South Dakota  
September 16, 2021**

**WHEREAS**, the Western States Water Council is a policy advisory body representing eighteen states, and has long been involved in western water conservation, development, protection, and management issues, and western states have a long history of promoting drought preparedness, planning and response programs, in cooperation with federal agencies; and

**WHEREAS**, in the West, water is often scarce even in “wet” years and drought is a recurring threat to our environment, economy and way of life – affecting not only the West, but also the Nation; and

**WHEREAS**, according to the National Centers for Environmental Information (NCEI), from 1980-2020, there have been 28 drought events costing over \$1B/event with total economic losses of \$258.9B due to drought, or an average of \$9.2B/event, also leading to an average of 95 deaths/year, with drought contributing to another \$102.3B in wildfire losses, and 10 deaths/year, and NCEI noting a rise in vulnerability to drought and wildfire in the western states<sup>1</sup> and

**WHEREAS**, continuing exceptional, extreme and severe drought conditions afflict the West and elsewhere, highlighting the need for greater attention to developing more comprehensive and coordinated drought prediction, preparedness, planning and response programs at all levels; and

**WHEREAS**, there is a need for maintaining and improving existing monitoring networks that help provide drought early warning signals, as well as for tracking the impacts of drought; and

**WHEREAS**, there is a continuing need for developing new monitoring technologies, such as remote sensing, that provide more timely data on water availability and better spatial coverage for assessing drought impacts; and

**WHEREAS**, early drought warning systems facilitate early drought assessment and mitigation efforts to minimize drought impacts; and

**WHEREAS**, there is a need for continuing federal research to develop new predictive capability for precipitation at subseasonal to seasonal time scales as described in the report to Congress prepared by NOAA pursuant to Title II of PL 115-25; and

**WHEREAS**, there is a continuing need for a permanent federal role in coordination of research programs related to drought early warning and prediction; and

**WHEREAS**, the collection and monitoring of basic data on streamflow, snow pack, groundwater levels, and weather and climate data are essential to understanding water availability and interpreting the early signs of drought.

**NOW THEREFORE BE IT RESOLVED**, that the Western States Water Council urges the Administration and the Congress to support federal programs including but not limited to the National Integrated Drought Information System (NIDIS), under the National Oceanic and Atmospheric Administration (NOAA), and other efforts designed to improve our forecasting and response capabilities.

[2020 U.S. billion-dollar weather and climate disasters in historical context | NOAA Climate.gov](https://www.noaa.gov/news/2020-u.s.-billion-dollar-weather-and-climate-disasters-in-historical-context)



Position No. 473

(See also No. 428, 385, 345, 320, 284, 256, and 235)

Adopted as revised September 16, 2021

**POSITION  
of the  
WESTERN STATES WATER COUNCIL  
regarding  
FEDERAL WATER AND CLIMATE DATA COLLECTION AND ANALYSIS PROGRAMS  
Deadwood, South Dakota  
September 16, 2021**

**WHEREAS**, the Western States Water Council is a policy advisory body representing eighteen states, and has long been involved in western water conservation, development, protection, and management issues, and the member states and political subdivisions have long been partners in cooperative federal water and climate data collection and analysis programs; and

**WHEREAS**, in the West, water is a critical, vital resource and sound decision-making demands accurate and timely data on precipitation, temperature, evapotranspiration, soil moisture, snow depth, snow water content, streamflow, groundwater, water quality and similar information; and

**WHEREAS**, the demands for water and related climate data continue to increase, and this information is used by federal, state, tribal, and local government agencies, as well as private entities and individuals to: (1) forecast flooding, drought and other climate-related events; (2) project future water supplies for agricultural, municipal, and industrial uses; (3) estimate streamflows for hydropower production, recreation, and environmental purposes, such as for fish and wildlife management, including endangered species needs; and (4) facilitate water management and administration of water rights, decrees, and interstate compacts; and

**WHEREAS**, without timely and accurate information, human life, health, welfare, property, and environmental and natural resources are at considerably greater risk of loss; and

**WHEREAS**, critical and vital information is gathered and disseminated through a number of important federal programs including, but not limited to: (1) the Snow Survey and Water Supply Forecasting Program, administered by the National Water and Climate Center (NWCC) in Portland, Oregon, and funded through USDA's Natural Resources Conservation Service (NRCS); (2) NWCC's Soil and Climate Analysis Network (SCAN); (3) the U.S. Geological Survey's (USGS) Groundwater and Streamflow Information Program (GWSIP) and National Streamflow Network, which are funded through the Department of Interior; (4) Landsat thermal data, archived and distributed by the USGS, and other remotely-sensed data acquired through the National Atmospheric and Space Administration (NASA) and its water-related missions; (5) the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service and Climate Programs Office; (6) the Environmental Protection Agency's National Environmental Information Exchange Network (NEIEN); and (7) the Bureau of Reclamation's Agrimet System and similar weather station networks; and

**WHEREAS**, state-of-the-art technology has been developed to provide real or near real-time data in formats that can be shared and used by different computer programs with the potential to

vastly improve the water-related information available to decisionmakers in natural resources and emergency management, and thus better protect the public safety, welfare and the environment; and

**WHEREAS**, these federal programs and newly proposed projects and programs provide useful products to assist in visualizing and interpreting data on water and snow, water use, evapotranspiration and other parameters making water supply, demand and availability information more accessible and easy to interpret; and

**WHEREAS**, over a number of years, the lack of capital investments in water data programs has led to the discontinuance, disrepair, or obsolescence of vital equipment needed to maintain existing water resources related data gathering activities; and

**WHEREAS**, there is a serious need for adequate and consistent federal funding to maintain, restore, modernize, and upgrade federal water, weather and climate observation programs, not only to avoid the loss or further erosion of critical information and data, but also to address new emerging needs, with a primary focus on coordinated data collection and dissemination; and

**WHEREAS**, wildfires, floods, and other natural disasters have led to the significant loss of monitoring capabilities and require timely action to restore, maintain, and upgrade sensors and observing systems and networks.

**NOW THEREFORE BE IT RESOLVED**, that the Western States Water Council urge the Administration and the Congress to give a high priority to the allocation and appropriation of sufficient funds for these critical, vital programs, which benefit so many, yet have been or are being allowed to erode to the point that it threatens the quantity and quality of basic data provided to a myriad, growing and diffuse number of decisionmakers and stakeholders, with significantly adverse consequences.

**BE IT FURTHER RESOLVED**, that the Western States Water Council supports efforts to enhance and expand the availability of and access to consistent and comprehensive water supply, demand and water use data and information, such as, but not limited to, the Open Access Evapotranspiration (OpenET) data program and related federal authorizing legislation and appropriations.

## Appendix A

Several of our western states have been grappling with emergencies related to ongoing and worsening drought conditions in 2022. While this is by no means an exhaustive list, it provides a small sample of some of the challenges across the West, culled from recent articles in the WSWC weekly newsletter. (See <https://westernstateswater.org/past-newsletters/>)

- California Governor Gavin Newsom expanded drought measures in March, calling on urban water suppliers to meet the requirements of water shortage contingency plans, and calling on state water agencies to enforce laws against illegal water diversions and waste and to engage in activities that improve water supply sustainability.
- Idaho Governor Brad Little and the Idaho Department of Water Resources issued an emergency drought declaration in April, and a curtailment notification in May for water users with priority dates junior to 1979.
- Kansas has seen an average one-foot drop in aquifer levels in the past year as drought conditions continue.
- In New Mexico, Governor Michelle Lujan Grisham has issued emergency declarations for both extensive drought and wildfires.
- Oregon Governor Kate Brown declared drought emergencies across multiple counties in March and April due to low snowpack, low reservoir levels, and low streamflow, with forecasted water supply and precipitation not expected to improve.
- Utah Governor Spencer Cox declared a statewide drought emergency in April, noting the volatile water year, with late spring precipitation unable to make up for the winter snowpack shortages.
- Several states and federal agencies (particularly the Department of the Interior's Bureau of Reclamation) have worked together in an effort to manage water resources for agricultural and urban areas through the worsening drought conditions.

### California

On March 28, Governor Gavin Newsom (D-CA) signed an Executive Order (N-7-22) expanding measures to address the ongoing drought emergency in California. It called on urban water suppliers to move Water Shortage Contingency Plans to Level 2, based on a projected shortage of up to 20%, and encourage voluntary activation of Level 3 requirements based on a shortage level up to 30%. The order directed the State Water Resources Control Board (SWRCB) to adopt emergency regulations defining “non-functional turf” and ban its irrigation in commercial, industrial, and institutional sectors. It directed the Department of Water Resources (DWR) to develop strategies to improve conservation, including technical and financial assistance.

The order directed SWRCB to “expand inspections to determine whether illegal diversions or wasteful or unreasonable use of water are occurring and bring enforcement actions....” Further, it suspended ordinances and regulations that prohibit hauling water outside a basin of origin to facilitate hauling water by truck for domestic use to communities with degraded water quality or supply due to drought. To increase the resilience of state water supplies, the order directed DWR to “prepare for the potential creation and implementation of a multi-year transfer program pilot project for the purpose of acquiring water from willing partners and storing and conveying water to areas of need.”

To facilitate and protect the use of groundwater during drought, the order directed DWR to work with other agencies to expedite regulatory pathways to repair or reconstruct small community public supply wells. It prohibits local agencies from issuing new permits for groundwater wells – other than domestic wells less than two acre-feet per year – in basins “subject to the Sustainable Groundwater Management Act [SGMA] and classified as medium- or high-priority without first obtaining written verification from a Groundwater Sustainability Agency [GSA]” that the proposed well would not interfere with the local GSA’s sustainability plan.

The order directed state agencies to “collaborate with tribes and federal, regional, and local agencies on actions related to promoting groundwater recharge and increasing storage.” It directed SWRCB and the Regional Water Quality Control Boards to prioritize “water right permits, water quality certifications, waste discharge requirements, and conditional waivers of waste discharge requirements to accelerate approvals for projects that enhance the ability of a local or state agency to capture high precipitation events for local storage or recharge, consistent with water right priorities and protections for fish and wildlife.” It suspends various statutes and regulations to address the need to recharge groundwater during the drought. See <https://www.gov.ca.gov/wp-content/uploads/2022/03/March-2022-Drought-EO.pdf>.

## **Idaho**

On April 29, with approval from Idaho Governor Brad Little (R), the Idaho Department of Water Resources (IDWR) issued an emergency drought declaration for southern Idaho. The declaration allows temporary water right changes in the point of diversion, place of use, and purpose of use for valid, existing water rights, when it is determined that such changes can be accomplished without harming other existing water rights. The declaration may also help with the eligibility requirements for federal drought assistance.

IDWR Director Gary Spackman noted that all Idaho counties south of the Salmon River are classified as being in moderate to severe drought and are experiencing below-normal snowpack. The press release said: “Specifically, total cumulative snow water equivalent (SWE) levels in these basins as of April 1, 2022, ranged from 50 to 78 percent of median. The April-to-September streamflow forecasts for most locations south of the Salmon River are between 25 and 75 percent of median. As of April 1, 2022, storage in most reservoirs serving the southern half of Idaho were between 20 to 65 percent of capacity, increasing the chances that many reservoirs will not fill.” <https://idwr.idaho.gov/news-releases/>

On May 6, the IDWR issued a methodology order, predicting a 162,600 acre-foot shortfall for senior priority surface water users on the Eastern Snake River Plain (ESPA) for the 2022 irrigation season. IDWR will begin curtailing more than 328 junior groundwater users with priority dates junior to 1979, unless they have joined one of seven approved mitigation plans or can otherwise demonstrate how their water use will not cause injury to senior surface water users. Past water litigation on the Snake River, between surface water and groundwater users, resulted in settlement agreements. The IDWR Director is required to issue an order at the beginning of the irrigation season and again in July to determine any shortfalls and curtailment obligations.

Mathew Weaver, IDWR Deputy Director, said: "By law, we have to keep people with senior water rights whole, and we want to make the junior ground water pumpers aware that despite the settlement agreements...if junior ground water pumpers are not participating in an approved mitigation plan, they could be subject to curtailment this year." <https://idwr.idaho.gov/wp->

<content/uploads/sites/2/news-release/IDWR-order-predicts-162600-acre-foot-water-shortfall-on-Snake-River-FINAL.pdf>

## **Kansas**

On March 24, the University of Kansas published preliminary data compiled by the Kansas Geological Survey (KGS) showing that average groundwater levels dropped by more than a foot in 2021. "The KGS, based at the University of Kansas, and the Division of Water Resources (DWR) of the Kansas Department of Agriculture measure about 1,400 wells every year to monitor the health of the High Plains aquifer and other aquifers in western and central Kansas. Those measurements showed an overall average decline of 1.01 feet last year. Most parts of the region saw below-average precipitation for the year, especially during the summer growing season for agricultural crops.... The 2021 decline followed an overall drop of 0.93 feet in 2020, which was another abnormally dry year. Dry years lead to increased pumping demands, primarily for irrigation, which in turn typically cause greater declines in water levels." Most of Kansas continues to experience drought conditions in 2022. The article noted that most of the wells monitored by KGS and DWR are located in Groundwater Management Districts.

## **New Mexico**

On April 25, New Mexico Governor Michelle Lujan Grisham (D) declared a statewide emergency for severe drought and fire conditions. The executive order noted that 93% of New Mexico was experiencing severe to exceptional drought conditions, and that significant fire danger "has increased throughout the State due to warmer temperatures, lower humidity, high winds, and an abundance of dry, fine fuels." According to the National Interagency Fire Center, New Mexico is currently fighting six large fires across more than 235,000 acres. Governor Lujan Grisham has issued five other emergency declarations in April regarding the various fires. <https://www.governor.state.nm.us/about-the-governor/executive-orders/>

On May 4, Governor Lujan Grisham submitted a request for a Presidential Disaster Declaration through the Federal Emergency Management Agency (FEMA), as well as applied for a hazard mitigation assistance grant. In a press release she said: "The state has aggressively pursued a Presidential Disaster Declaration for New Mexico, using every available tool and technology to document the damage that we know New Mexico communities have sustained and are still experiencing in order to expedite the process. I am laser focused on getting New Mexicans the disaster relief they need and deserve, and I am confident that FEMA and the President will grant our request." <https://www.governor.state.nm.us/press-releases/>

## **Oregon**

On March 4, Governor Kate Brown (D-OR) declared a severe, continuing drought emergency in Klamath County based on the low snowpack, low reservoir levels, low streamflow, and forecasted water supply conditions that are not expected to improve. "Drought is likely to have a significant economic impact on the farm, ranch, and natural resources sectors, as well as an impact on drinking water, fish and wildlife, important minimum flows for public instream uses and other natural resources dependent on adequate precipitation, stored water, and stream flow in these areas. Extreme conditions are expected to affect local growers, increase the potential for fire, shorten the growing season, and decrease water supplies." The Executive Order 22-02 directs state interagency coordination for mitigation efforts. See [https://www.oregon.gov/gov/eo/eo\\_22-02.pdf](https://www.oregon.gov/gov/eo/eo_22-02.pdf).

On April 25, Governor Brown signed an executive order declaring drought across four counties with low snowpack, low reservoir levels, and low streamflow. "Forecasted water supply conditions and precipitation levels are not expected to improve. Drought is likely to have a significant economic impact on the farm, ranch, vineyard, recreation, tourism, and natural resources sectors, as well as an impact on drinking water, fish and wildlife, and important minimum flows for public instream uses and other natural resources dependent on adequate precipitation, stored water, and streamflow in these areas. Extreme conditions are expected to affect the local growers and livestock, increase the potential for fire, shorten the growing season, and decrease water supplies." The order directs agencies to coordinate and provide assistance to water users, to understand the impacts of water availability on wildlife, to assess and mitigate emergency activities, and to assist with federal resources to mitigate drought conditions and agricultural recovery.

[https://www.oregon.gov/gov/eo/eo\\_22-07.pdf](https://www.oregon.gov/gov/eo/eo_22-07.pdf)

## **Utah**

On April 12, Salt Lake City, Utah announced that it would start the peak season of water demand at Stage 2 of its 5-stage Water Shortage Contingency Plan. The Plan's five water shortage stages are triggered by water supply levels, streamflows, and water demand. Under Stage 2, actions are focused on augmenting current water supplies and saving for prolonged shortages, while water customers are asked to meet a 5% reduction in daily water use, and municipal water users, parks, and city-owned buildings will be required to take specific actions to reduce overall water use and adjust lawn watering frequency. The Department of Salt Lake City Public Utilities (SLCDPU), tasked with monitoring water conditions, noted that Utah remains in severe or extreme drought, with many reservoirs below capacity. The snowpack is below normal, although soil moisture has improved, and forecasts indicate a season of higher temperatures and lower precipitation. See <https://www.slc.gov/mayor/2022/04/12/salt-lake-city-starts-peak-demand-season-under-stage-2-of-its-water-shortage-contingency-plan/>.

On April 21, Governor Spencer Cox (R-UT) declared a state of emergency due to drought. He said: "We've had a very volatile water year, and unfortunately, recent spring storms are not enough to make up the shortage in our snowpack. Once again, I call on all Utahns – households, farmers, businesses, governments and other groups – to carefully consider their needs and reduce their water use. We saved billions of gallons last year and we can do it again."

The press release noted that Utah has been in drought eight of the past ten years, and that this year's snowpack is 25% below normal. The Utah Department of Natural Resources reported that: (1) 99.39% of the state is in severe drought or worse, with 43.46% of Utah in extreme drought; (2) statewide snow water equivalent (SWE), or how much water would be in the snowpack if it melted, peaked at 12 inches (75% of the typical median peak of 16 inches for our water year); (3) nineteen of Utah's largest 45 reservoirs are below 55% of available capacity, with overall statewide storage at 59% of capacity (compared to 67% capacity at this time in 2021); (4) soil moisture – critical for effective spring runoff – is 4% higher compared to normal for this time of year; (5) of the 94 measured streams, 59 are flowing below normal despite spring runoff, and two streams are flowing at record low conditions. See: [https://governor.utah.gov/2022/04/21/drought-emergency-order/#:~:text=SALT%20LAKE%20CITY%20\(April%2021,triggers%20increased%20monitoring%20and%20reporting.](https://governor.utah.gov/2022/04/21/drought-emergency-order/#:~:text=SALT%20LAKE%20CITY%20(April%2021,triggers%20increased%20monitoring%20and%20reporting.)

## **State-Federal Efforts**

### *California Water Projects*

On March 18, the Bureau of Reclamation (USBR) and California Department of Water Resources (CDWR) jointly filed a Temporary Urgency Change Petition (TUCP) with the State Water Resources Control Board to modify requirements in water right permits and licenses for the Central Valley Project (CVP) and State Water Project (SWP) between April 1 and June 30. The requested changes are in response to a historically dry January, February, and first half of March, typically California's wettest months, and a third consecutive year of critically dry conditions. The changes are expected to conserve upstream reservoir storage for critical needs later in the year, including public health and safety, and environmental needs.

After a series of strong December storms, USBR and CDWR hoped Folsom and Oroville reservoirs would provide adequate water supplies and a TUCP would not be necessary. However, following the extraordinarily dry January and February, Folsom and Oroville are seeing unprecedented declines in inflow forecasts and cannot support Delta outflows as expected. There is not enough storage in other CVP and SWP reservoirs to meet water supply and environmental needs later in the year.

USBR Regional Director Ernest Conant said: "Reclamation and DWR, along with the federal and state fish agencies, have been coordinating throughout the winter to address increasingly challenging hydrologic conditions for environmental flows and water supply. We all recognize what a difficult year this is going to be for everyone. It's definitely another roll-up-your-sleeves, all-hands-on-deck water year." CDWR Director Karla Nemeth said: "DWR has been planning for conditions to remain dry since the start of the water year on October 1. We are facing tough but important decisions about how to manage the system for a third year of drought." "We are taking critical steps like submitting the [TUCP] in coordination with our federal and state partners, to balance the needs of endangered species, water supply conservation, and water deliveries to Californians."

Additional projects operational flexibility is needed to: (1) support minimum health and safety water supplies; (2) preserve upstream storage for release later in the summer to control saltwater intrusion into the Sacramento-San Joaquin Delta; (3) preserving cold water in Shasta Lake and other reservoirs to maintain cool river temperatures for Chinook salmon and steelhead; (4) maintain protections for state and federally endangered and threatened species; and (5) meet critical water supply needs. CDWR also plans to refill the notch in the Emergency Drought Salinity Barrier in the Delta to reduce the amount of saltwater intrusion and the need for releases from upstream reservoirs to conserve water storage. <https://www.usbr.gov/newsroom/#/news-release/4137>

### *Colorado River*

On January 28, the Bureau of Reclamation (USBR) and Colorado River Upper Basin States presented their draft Drought Response Operations Plan for public review and comment. The 2019 Colorado River Drought Contingency Plan (DCP) included a Drought Response Operations Agreement (DROA) between the Department of the Interior and the Upper Basin States to develop a plan to protect critical water elevations at Lake Powell. The DROA establishes a coordinated and collaborative process for considering implementation of two potential strategies: (1) working within the Glen Canyon Dam annual release volume by changing the timing of monthly water releases to temporarily retain more water in Lake Powell; and (2) increasing water releases from the upstream

Colorado River Storage Project Act Initial Units of Flaming Gorge, Aspinall, and Navajo to improve the downstream elevation of Lake Powell.

The Drought Response Operations Plan includes: (1) a framework document naming various reservoirs upstream of Lake Powell, with provisions for the development of yearly plans in the event of drought; and (2) attachments with current hydrological information for each reservoir that would be updated annually to inform the drought operations in the yearly plan.

The initial page of the plan noted that it would be ready to implement as early as April 2022 if needed. "It does not contain specific Drought Response Operations for 2022 but instead describes the process and the decision-making framework the DROA Parties intend to follow as they develop a Plan for 2022 and the following years.... The DROA Parties request a review of this draft document now...as an initial opportunity to obtain input regarding the more durable process and decision-making framework provisions." Following consideration of input, they will develop a plan for 2022 if needed. "No Plan can be developed until more information becomes known such as precipitation, snowpack, runoff, reservoir elevations, and other variables during the winter and spring of 2022." <https://www.usbr.gov/dcp/droa.html>

On March 4, the USBR announced Lake Powell was expected to temporarily decline below a 3,525-foot target elevation, given the abnormally dry winter. The target is part of the 2019 Drought Contingency Plan Agreements, specifically the Drought Response Operations Agreement. Elevation 3,490 feet is the minimum power pool elevation, the lowest point at which Glen Canyon Dam can generate hydropower. The target elevation provides a 35-foot buffer and allows time for response actions to help prevent Lake Powell from dropping below the minimum power pool.

A very dry January and February led to a drop in projected unregulated inflows into Lake Powell for Water Year 2022 by approximately 2.2 million acre-feet (and 2 to 3 feet below the 3,525-foot target in March). Lake Powell's elevation is expected to recover through the course of the spring runoff season, likely in May. Reclamation, the Upper Colorado River Commission, and the Upper Division States are preparing additional measures to implement later this year to help maintain the elevation above 3,525 feet.

"This year the Colorado River Basin has experienced extremely variable conditions with a record high snowpack one month, followed by weeks without snow," said Reclamation Acting Commissioner David Palumbo. "This variable hydrology and a warmer, drier west have drastically impacted our operations and we are faced with the urgent need to manage in the moment."

Under the Drought Response Operations Agreement, Reclamation, in consultation with the Upper Colorado River Commission, has implemented proactive drought response operations that together have helped protect Lake Powell's target elevation by: (1) sending an additional 161,000 acre-feet (af) of water from Blue Mesa and Flaming Gorge reservoirs downstream to Lake Powell; and (2) temporarily reducing monthly releases from Glen Canyon Dam in order to hold back 350,000 af for release later in the year. These proactive actions ensured that Lake Powell will avoid dropping significantly below 3,525 feet during the Spring of 2022.

"Reclamation is not planning to take further action to address this temporary dip below 3,525 feet because the spring runoff will resolve the deficit in the short term," said Upper Colorado Basin Regional Director Wayne Pullan. "However, our work is not done. Lake Powell is projected to drop

below elevation 3,525 feet again later this year. Reclamation and the Upper Division States continue to collaborate with stakeholders and partners to develop and implement additional actions....”

“We appreciate the collaboration among Reclamation and the Upper Basin States at this critical time to develop the 2022 Drought Response Operations Agreement and Operations Plan. We are optimistic these actions will provide additional protection to critical elevations in Lake Powell,” said Chuck Cullom, Executive Director of the Upper Colorado River Commission.

Reclamation is closely monitoring basin snowpack and runoff projections, while actively engaging with the Upper Division States, Tribes, and federal agencies such as the National Park Service, U.S. Fish and Wildlife Service and Western Area Power Administration, water users, non-governmental organizations and key stakeholders to protect the elevation of Lake Powell.

<https://www.usbr.gov/newsroom/#/news-release/4117>

On April 8, Tanya Trujillo, Assistant Secretary for Water and Science, Department of the Interior, sent a letter to representatives of the Governors of Arizona, California, Colorado, New Mexico, Nevada, Utah, and Wyoming outlining the most recent impacts of drought and low runoff in the Colorado River Basin, as well as the finalization of the 2022 Drought Response Operations Plan in the coming month. She expressed additional concerns about hydropower operations. The letter said: “Notwithstanding these robust, ongoing efforts...we believe that additional actions are needed to reduce the risk of Lake Powell dropping to elevations at which Glen Canyon Dam releases could only be accomplished through the river outlet works (i.e., below elevation 3490’ mean sea level (msl)), or hydropower operations infrastructure at Glen Canyon Dam would be adversely impacted.... In such circumstances, Glen Canyon Dam facilities face unprecedented operational reliability challenges, water users in the Basin face increased uncertainty, downstream resources could be impacted, the western electrical grid would experience uncertain risk and instability, and water and power supplies to the West and Southwestern United States would be subject to increased operational uncertainty.”

The letter continued: “Glen Canyon Dam was not envisioned to operate solely through the outlet works for an extended period of time and operating at this low lake level increases risks to water delivery and potential adverse impacts to downstream resources and infrastructure. In addition, should Lake Powell decline further below elevation 3490 feet, we have recently confirmed that essential drinking water infrastructure supplying the City of Page, Arizona and the LeChee Chapter of the Navajo Nation could not function. Given our lack of actual operating experience in such circumstances since Lake Powell filled, these issues raise profound concerns regarding prudent dam operations, facility reliability, public health and safety, and the ability to conduct emergency operations.” The letter requested that the States consider further conservation efforts and potentially reducing Lake Powell releases by 500,000 acre-feet, to 7.0 million acre-feet for the 2022 water year, under the terms of the 2007 Interim Guidelines.

On May 3, the USBR announced two operational changes to keep the Lake Powell surface water elevation above 3,490 feet, the lowest point at which Glen Canyon Dam can generate hydropower. The actions will increase flow from upstream reservoirs and release less water downstream. Under the terms of the 2019 Drought Contingency Plan (DCP) and the 2022 Drought Response Operations Agreement (DROA), approximately 500,000 acre-feet of water will be released from Flaming Gorge Reservoir, which is at 78% of its storage capacity. Another 480,000 acre-feet will be left in Lake Powell by reducing Glen Canyon Dam’s annual release volume from 7.48 million acre-feet (maf) to 7.0 maf, as outlined in the 2007 Interim Guidelines. Further supplemental upstream

releases from Blue Mesa and Navajo reservoirs may be required later this year. Similar upstream releases were made during the summer of 2021.

Assistant Secretary for Water and Science Tanya Trujillo said: “Today’s decision reflects the truly unprecedented challenges facing the Colorado River Basin and will provide operational certainty for the next year. Everyone who relies on the Colorado River must continue to work together to reduce uses and think of additional proactive measure we can take in the months and years ahead to rebuild our reservoirs.” Reclamation Acting Commissioner David Palumbo said: “Reclamation applauds the quick response and support from across the Basin for these actions. As we focus on these short-term response actions, we recognize the importance of simultaneously planning for the longer-term to stabilize our reservoirs before we face an even larger crisis.” <https://www.usbr.gov/newsroom/#/news-release/4196>

### *Klamath Basin Project*

On February 11, the Department of the Interior (DOI) announced the conclusion of stakeholder engagement sessions on drought in the Klamath Basin that took place between January 24 and February 10 with federal and state officials, tribes, and local stakeholders. DOI said in its press release: “Over the past 20 years, the Klamath Basin has met unprecedented challenges due to ongoing drought conditions, limited water supply and diverse needs. The Bureau of Reclamation and U.S. Fish and Wildlife Service have diligently sought collaborative solutions for water availability with partners and those intimately connected to land and water conditions. Through this recent series of engagement sessions, the Department demonstrated its commitment to transparency and ongoing review of best practices as we continue to address climate change and work towards long term solutions in the Klamath Basin for current and future generations.... The sessions included focused discussions on critical path issues for the basin, including dam removal, Klamath Power and Facilities Agreement implementation, hydrology issues, and project and National Wildlife Refuge water supply. The discussions also focused on an overview and alignment regarding funding of aquatic habitat and water quality priorities, and water supply reliability in the Klamath Basin.”

On February 10, DOI Secretary Deb Haaland, Governor Gavin Newsom (D-CA) and Governor Kate Brown (D-OR) delivered remarks at the conclusion of the engagement process, calling for “enhanced coordination and more efficient decision making on water management, Tribal, fisheries, and related natural resources issues, particularly in times of sustained drought.” The Interagency Drought Relief Working Group, co-chaired by the Departments of the Interior and Agriculture, “is actively working to identify and disburse immediate financial and technical assistance for impacted irrigators and Tribes.”

The Investments in Infrastructure and Jobs Act provides \$162M to restore the Klamath Basin ecosystem and identifies opportunities to support water resilience and infrastructure. “Congressional leaders, including U.S. Senators Jeff Merkley (D-OR) and Ron Wyden (D-OR), and Representatives Cliff Bentz (R-OR), Jared Huffman (D-CA), and Doug LaMalfa (R-CA) voiced their commitment to find economically and environmentally sustainable solutions for the basin and articulated a clear picture of the federal and state resources available to help develop these solutions.” See <https://www.doi.gov/pressreleases/interior-department-concludes-robust-klamath-basin-stakeholder-engagement-sessions>.

On April 11, the Bureau of Reclamation released the Klamath Project 2022 Temporary Operating Procedures to adaptively manage supply, including flushing flows for migrating salmon,

and other ecosystem, agricultural, and tribal culture benefits. It announced the initial water supply allocation of 50,000 acre-feet for limited irrigation in the Klamath Project, based on the Natural Resources Conservation Service's (NRCS) inflow forecast. Reclamation also announced \$20M in aid for the 2022 irrigation season, and another \$5M in technical assistance for tribal-led projects.

Reclamation Acting Commissioner David Palumbo said: "The Klamath Basin is experiencing prolonged and extreme drought conditions that we have not seen since the 1930s. We will continue to monitor the hydrology and adaptively manage conditions in close coordination with Project water users, Tribes and state and federal agency partners. Reclamation is dedicated to collaborating with all stakeholders to get through another difficult year and keep working toward long-term solutions for the Basin." <https://www.usbr.gov/newsroom/#/news-release/4168>