2023 Hydrology Summary

Overview

Weather Forecast Office
Albuquerque, NM
Issued January 26, 2024 1:48 PM MST

Hydrologic Summary: Active Spring Runoff and Bank Erosion Issues

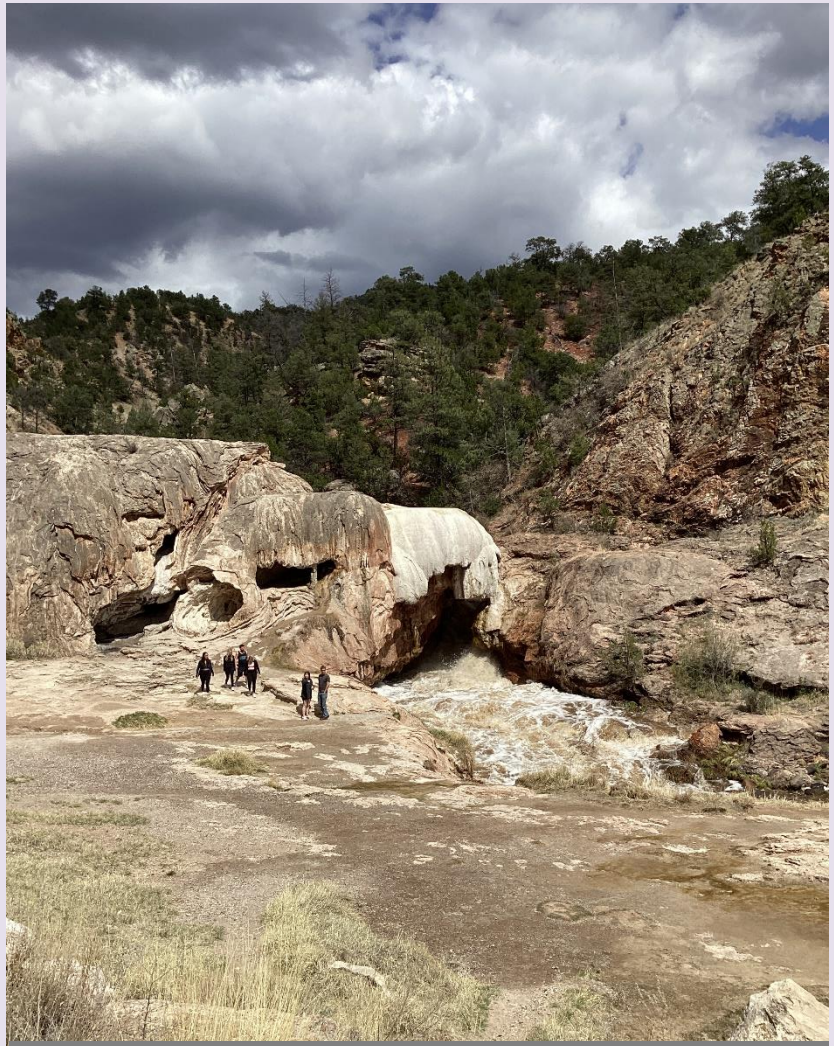

Photo Courtesy of Todd Shoemake 04/12/2023

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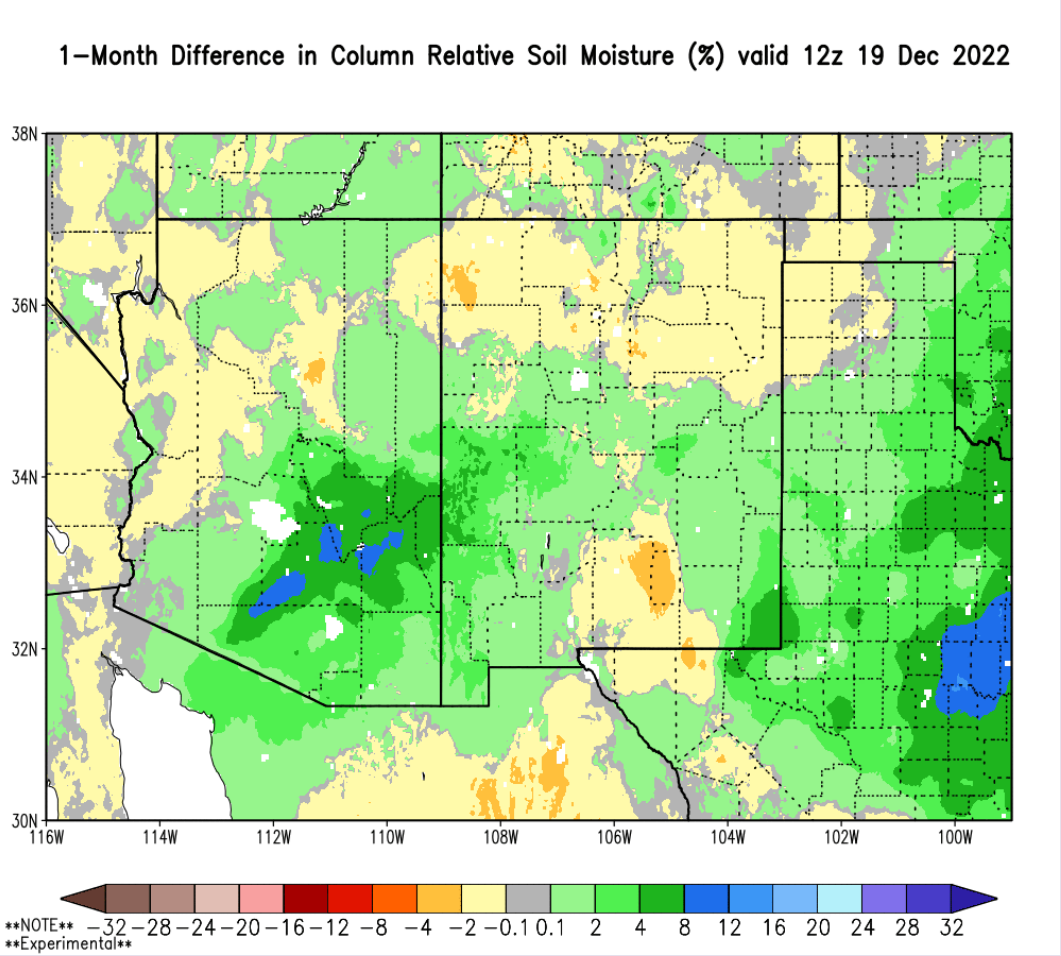
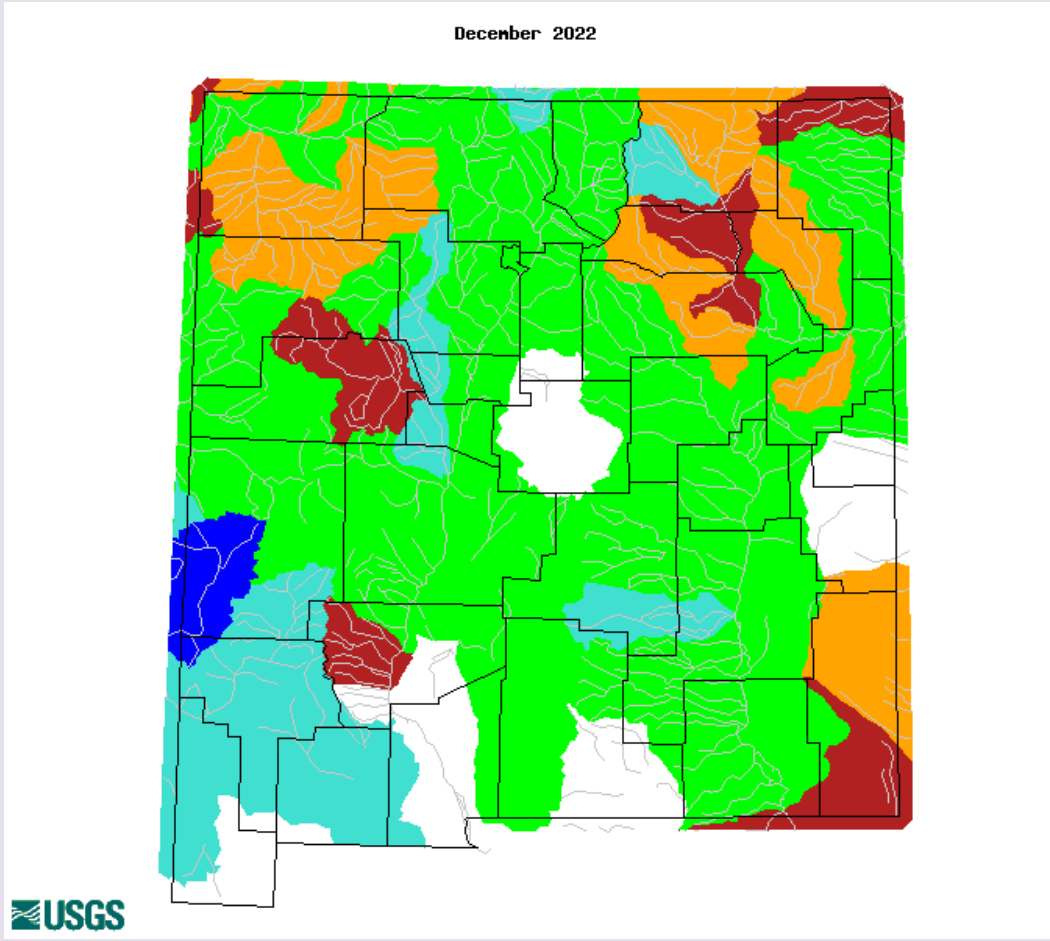
Photo Courtesy of Todd Shoemake 04/12/2023

Photo Courtesy of Andrew Mangham 06/08/2023

Setting the Stage: Soil Moisture and Streamflow Heading into Winter

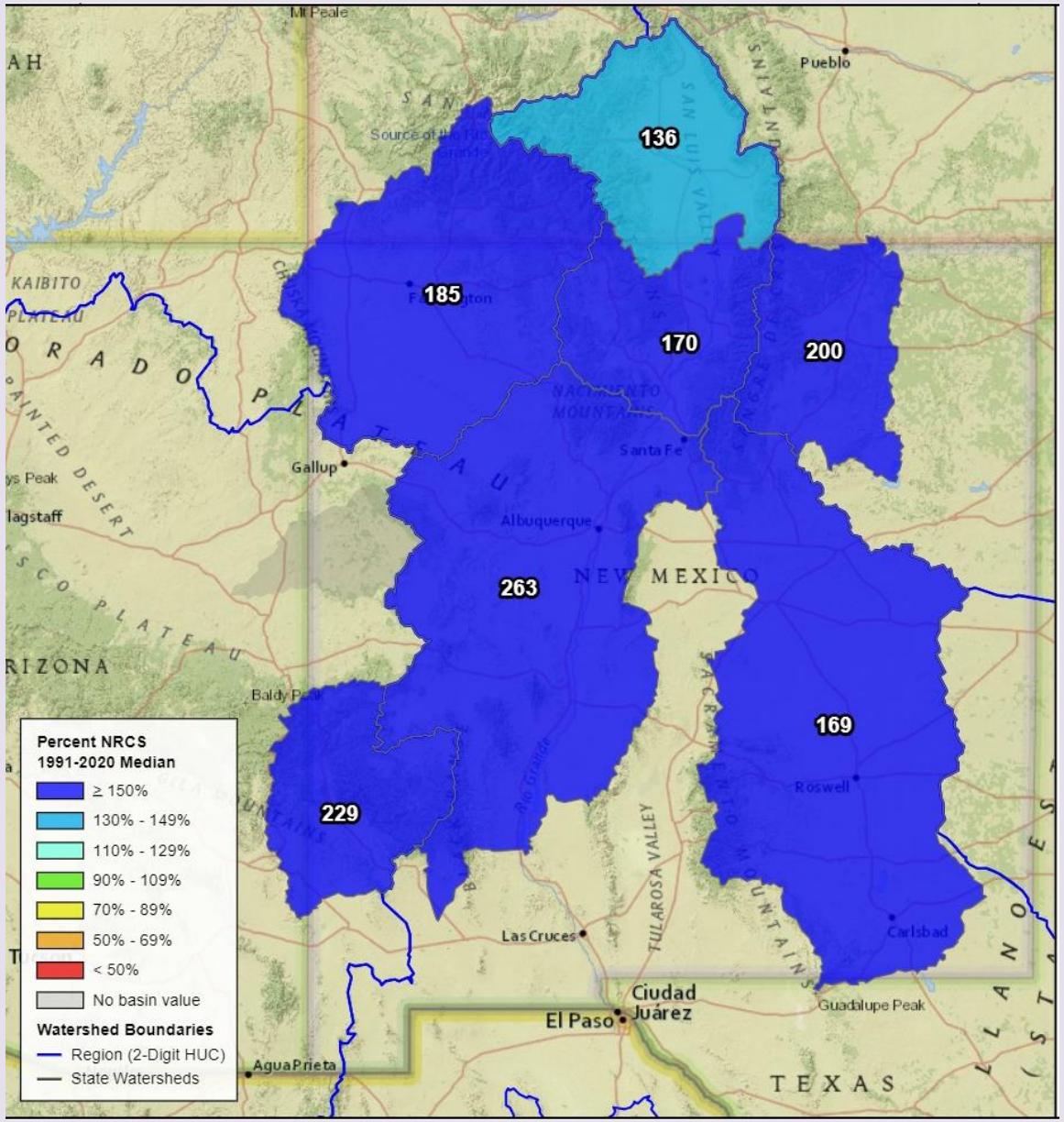


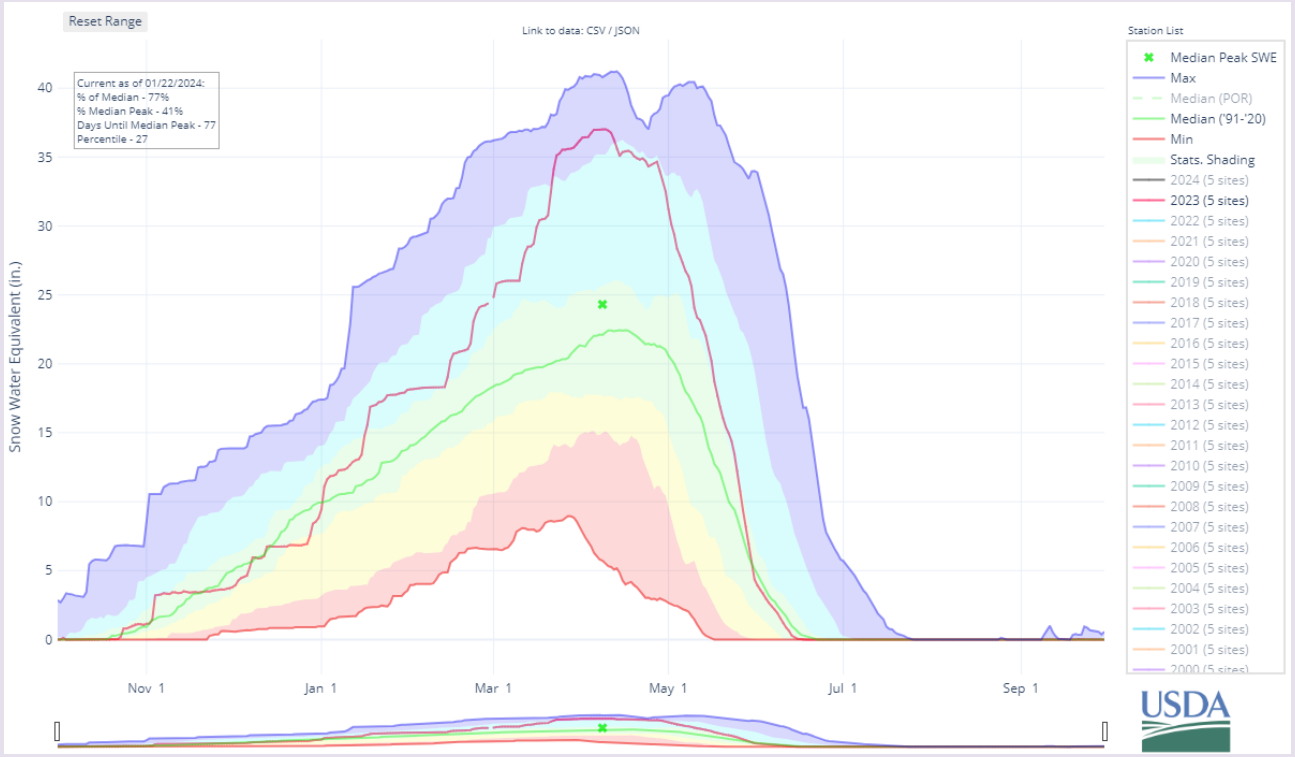


Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Heading into winter, New Mexico saw remarkable wet conditions develop. The image above shows soil moisture increasing in much of the state from mid November to mid December. The image to the right shows that most of the streams in the state were normal to above normal in terms of flow. Starting off with wet conditions like these sets the stage for a responsive runoff season in the following spring.

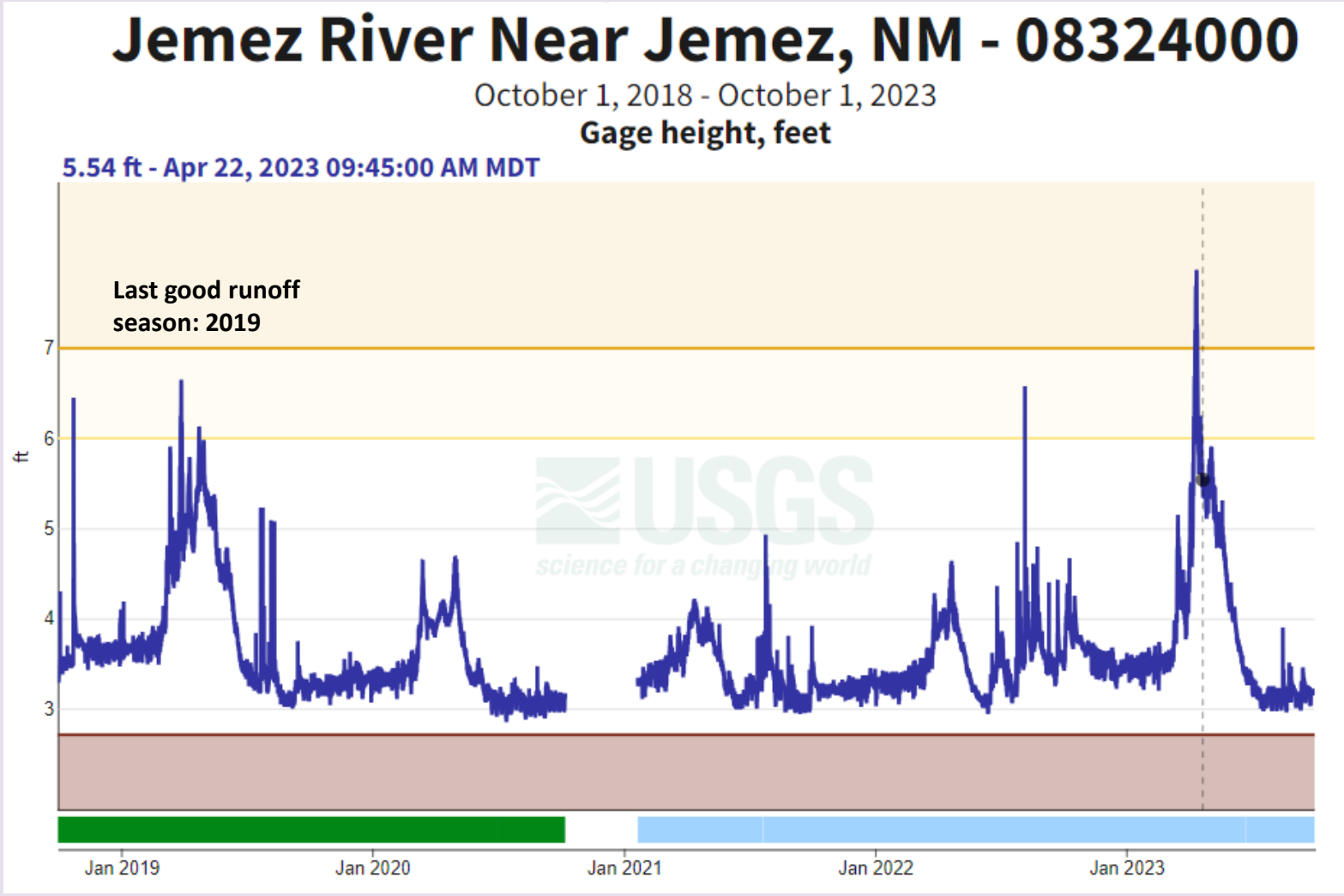
2023 Spring Snowpack





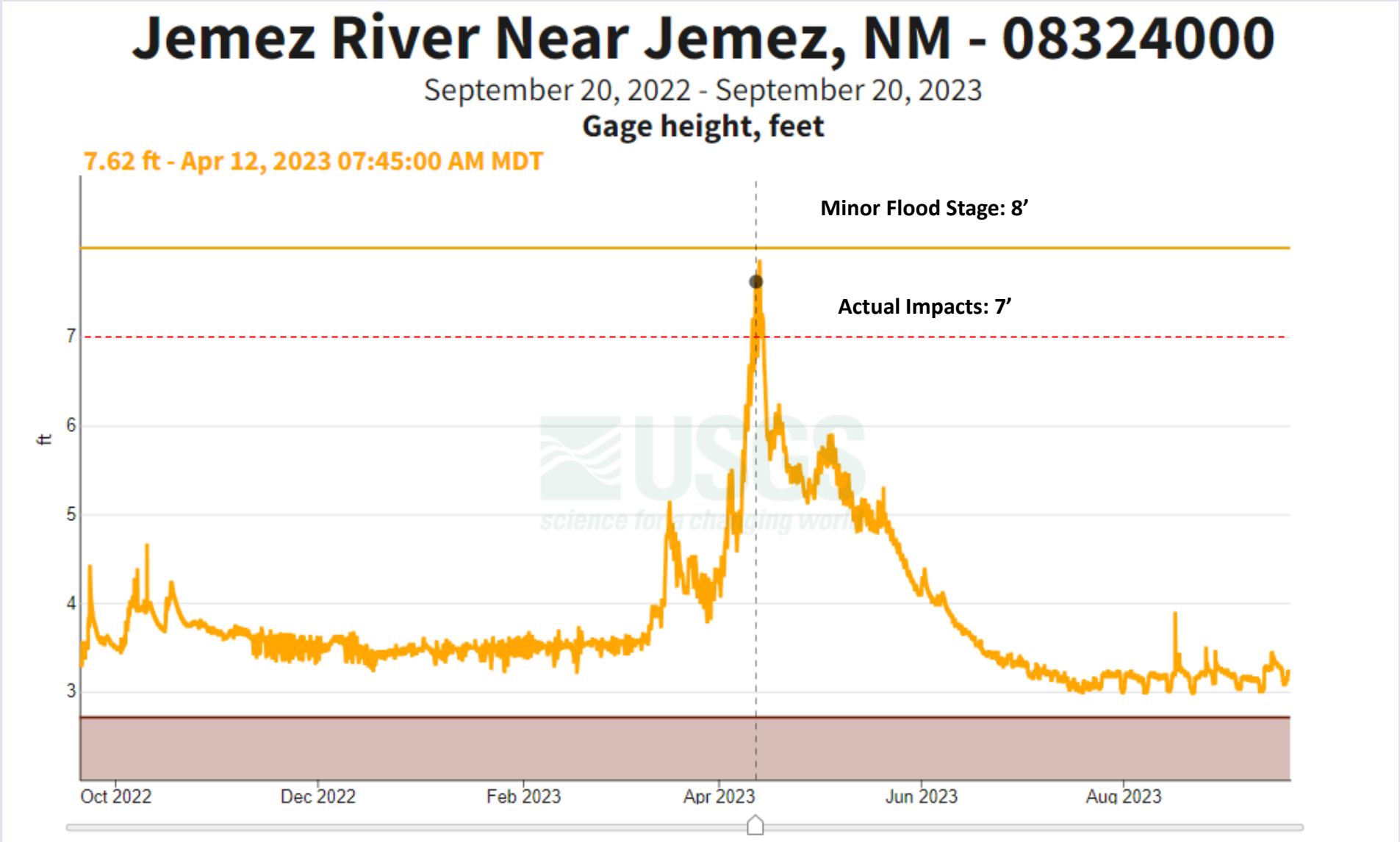
The winter of 2022-2023 was remarkably wet across the western United States. Some states saw record breaking snowpacks accumulate. Many basins that affect rivers in New Mexico, such as the Upper San Juan shown above, saw snowpack approach record levels. The Snow Water Equivalent, as a percent of the 1991-2020 median, is shown on the left and shows that all of the relevant basins in New Mexico contained ~1.5 to 2.5 times the normal amount of moisture seen in the last 30 years. Combined with the wet antecedent conditions across the state the conditions were excellent for a busy spring runoff season and were very welcome by the water supply managers across the state.

2023 Jemez River Runoff in Context



One of the challenges New Mexico faces is the nature of the flows in its rivers. Monsoon storms provide brief, intense pulses of sediment rich flows in rivers throughout the state. Prolonged flows only occur during snowmelt runoff or during a prolonged release of flows from a dam. The plot above shows 5 years of gage history in the Jemez River. The last period of really good prolonged flow was in 2019. However, there were many monsoon storms that occurred in the last five years that brought short bursts of flow. The consequence of going several years with only short bursts of sediment rich runoff is that the morphology of the riverbed changes. Without prolonged flows to scour out the channel, islands can form and riverbeds can rise. Then, when prolonged flow finally does occur, that flow can be pushed to the river banks, which may not be very well consolidated and cause rapid erosion. We can also see impacts occur at levels we don't expect them.

Snowmelt Flooding and Damage: Jemez Springs



Prior to 2023, Minor Flood Stage for the Jemez River as set at 8'. Due to changes in riverbed morphology after years of nothing but short bursts of sediment rich flow and no prolonged flows to scour out the channel, we saw significant flooding impacts occurring at 7', a full foot below our warning criteria.

Snowmelt Flooding and Damage: Jemez Springs

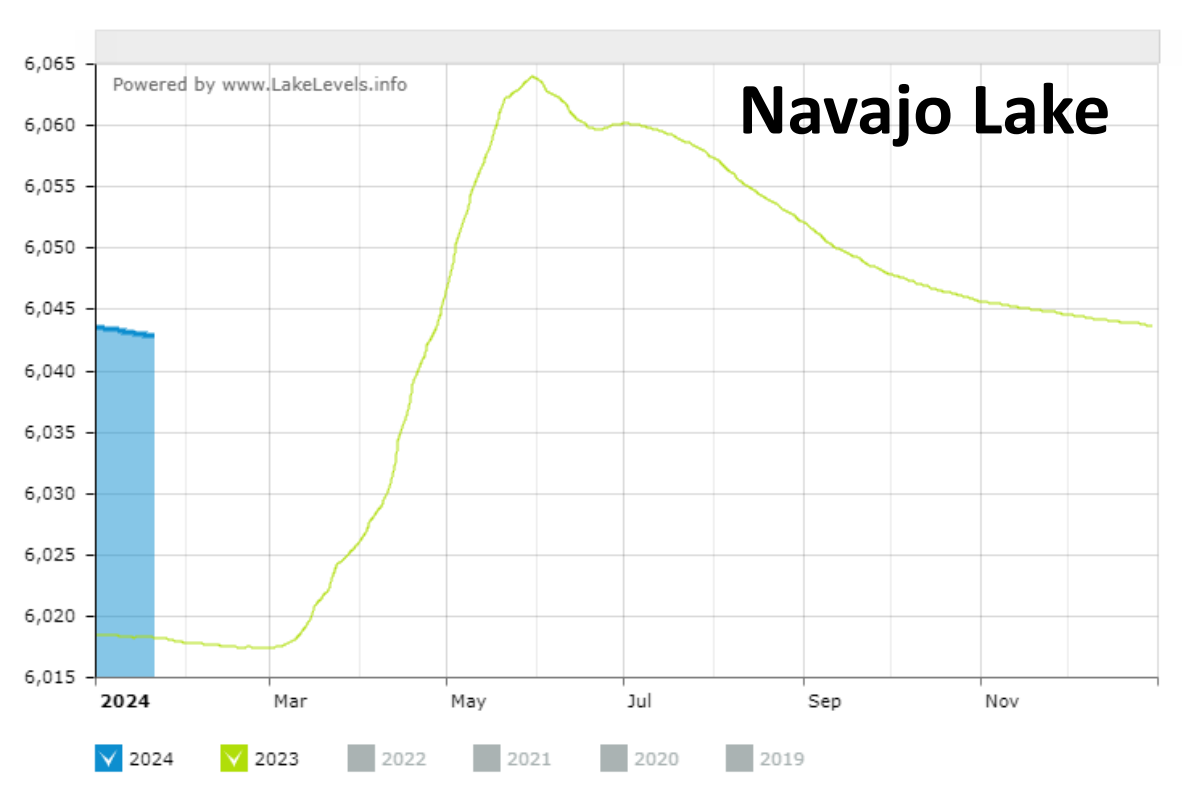
Photo Courtesy of Todd Shoemake 04/12/2023

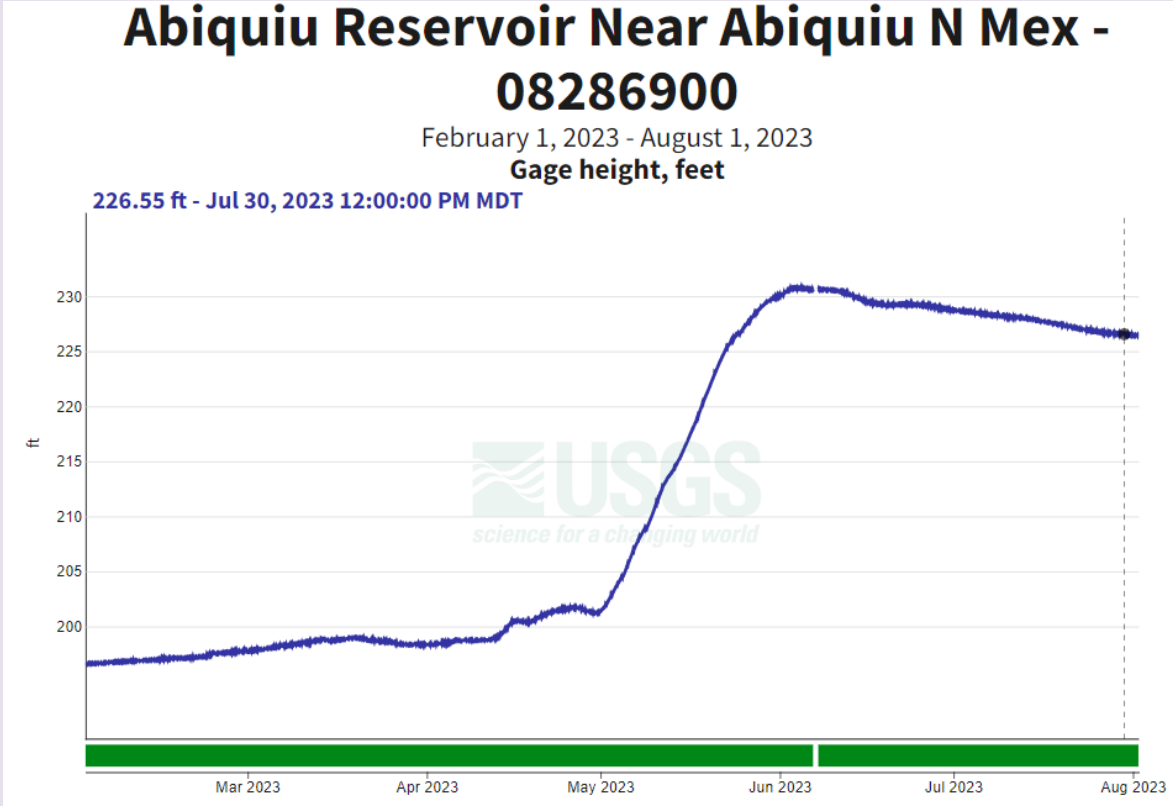
Photo Courtesy of Todd Shoemake 04/12/2023

Impacts up and down the Jemez River Valley were numerous.

- **High up in the valley a small bridge was badly damaged and convenient access to several homes.**
- **At the low end of the valley, a small levee failed and flooded out farmland in San Ysidro.**
- **The bosque was completely flooded and all campground, picnic grounds and fishing spots were closed for several weeks.**
- **Water flooded out Highway 4 at several spots. Thankfully that was fairly short lived and access to the river valley was restored within a day.**
- **The most expensive impact occurred in the town of Jemez Springs, when rushing waters found their way into the wastewater treatment system and completely overwhelmed the inlet. This destroyed the wastewater treatment plant and flushed sewage down the river. A county disaster was declared largely because of the loss of this treatment plant. With assistance from other plants, the WWTP in Jemez Springs came back online within a month.**

Meanwhile, In Our Reservoirs….



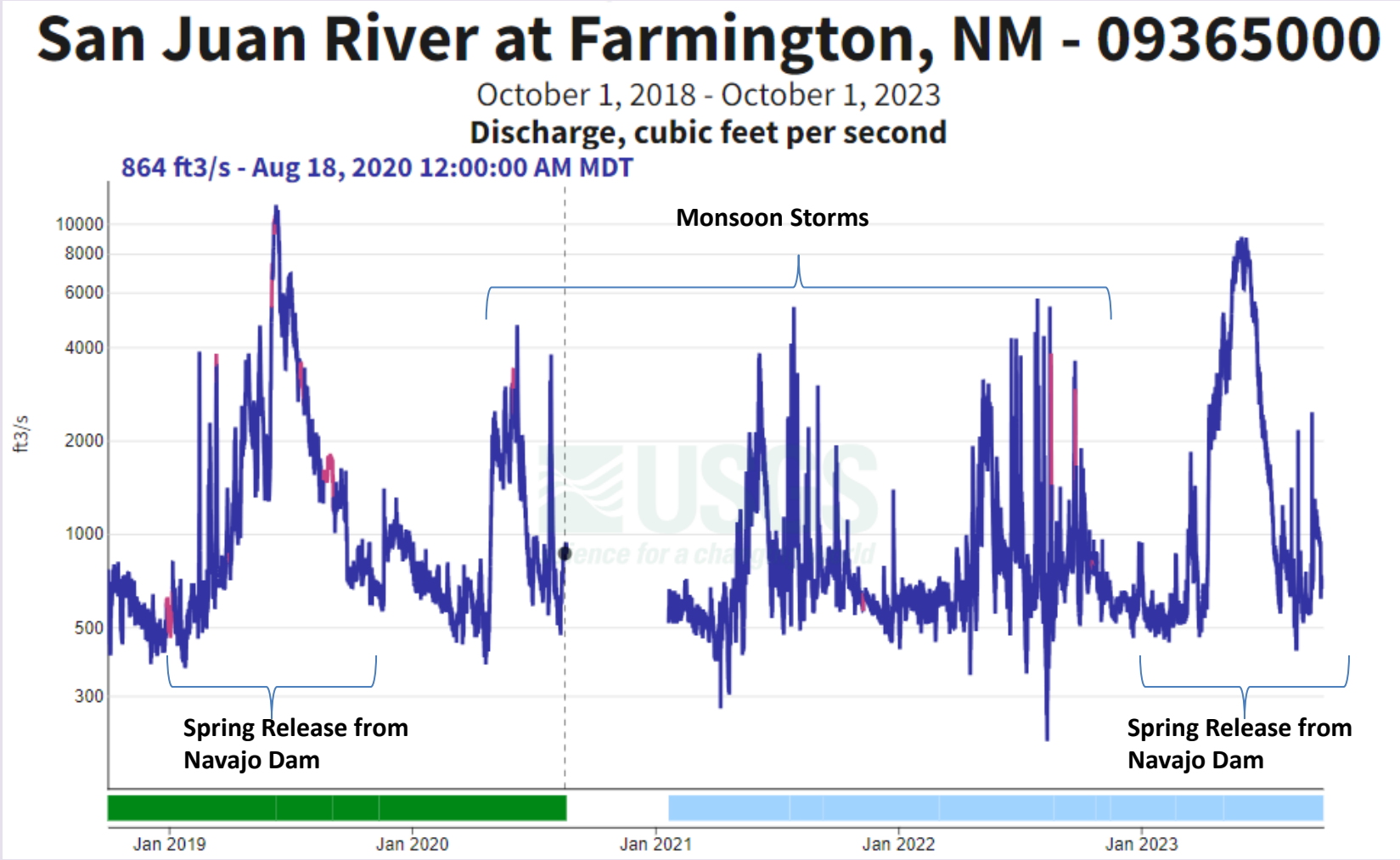


Two of the most important reservoirs that can be directly impacted by snowmelt runoff are Navajo, which controls flows in the San Juan River and Abiquiu, which controls flows along the Rio Chama, a major tributary of the Rio Grande. Both of these reservoirs saw remarkable rises in their lake levels:

- **In Navajo, we saw lake levels rise ~46 feet.**
- **In Abiquiu we saw lake leves rise ~33 feet.**

As a result of these rises, Navajo was able to perform a spring release, a prolonged period of flow meant to support endangered species. Likewise Abiquiu needed to perform a prolonged release to send water downstream to the Rio Grande as part of the Rio Grande compact. Just as we saw with the Jemez River, having a good long release like this after several years of either not being able to at all or only having a release that lasted one week instead of eight came with some consequences.

Spring Release on the San Juan vs Monsoon Flows in the River.



The plot above highlights the differences between prolonged flow and rapid bursts of monsoon runoff in the San Juan River. The spring release from Navajo was the first one that occurred since 2019, due in large part to lackluster winter snowpack. However, Monsoon storms carried on in the summers. Just as we saw with the Jemez River, we saw impacts at levels we were not expecting them, including significant bank erosion.

Controlled Release and Effects on Bank Erosion

Photo Courtesy of Andrew Mangham 06/08/2023

Photo Courtesy of Andrew Mangham 06/08/2023

A riverfront property in Bloomfield saw sever erosion of its banks with logs and bushes tumbling into the river as the banks gave way. At this location the homeowner was attempting to prevent further erosion by securing those logs with cables so they would stay in place and act as armor against he flows.

Controlled Release and Effects on Bank Erosion

Photo Courtesy of Andrew Mangham 06/08/2023

Photo Courtesy of Andrew Mangham 06/08/2023

A rancher in Farmington saw a 100 foot stretch of riverbank on the northern edge of one pasture lose an estimated 10 feet of depth, causing fences to collapse into the river.

Controlled Release and Effects on Bank Erosion

Photo Courtesy of Andrew Mangham 06/08/2023

Photo Courtesy of Andrew Mangham 06/08/2023

One family in Farmington with riverfront property had their entire property flooded out. They had to sandbag the banks and the entrances to keep the water out of their residence. Nonetheless, their septic tank was damaged and a propane tank was washed a short way downstream. Several other properties along this stretch of the San Juan River met similar fates, with varying degrees of damage.

These are all pictures of flooding associated with the release from Navajo Lake. Similar impacts occurred on the Rio Chama, downstream of the point where water released from Abiquiu dam was joined by uncontrolled and very high flow from the Rio Ojo Caliente. As a result Abiquiu had to drop the flows it was releasing and keep that release going for several weeks longer than they projected.

Changes to Service

Updates and Changes to Services:

Jemez River:

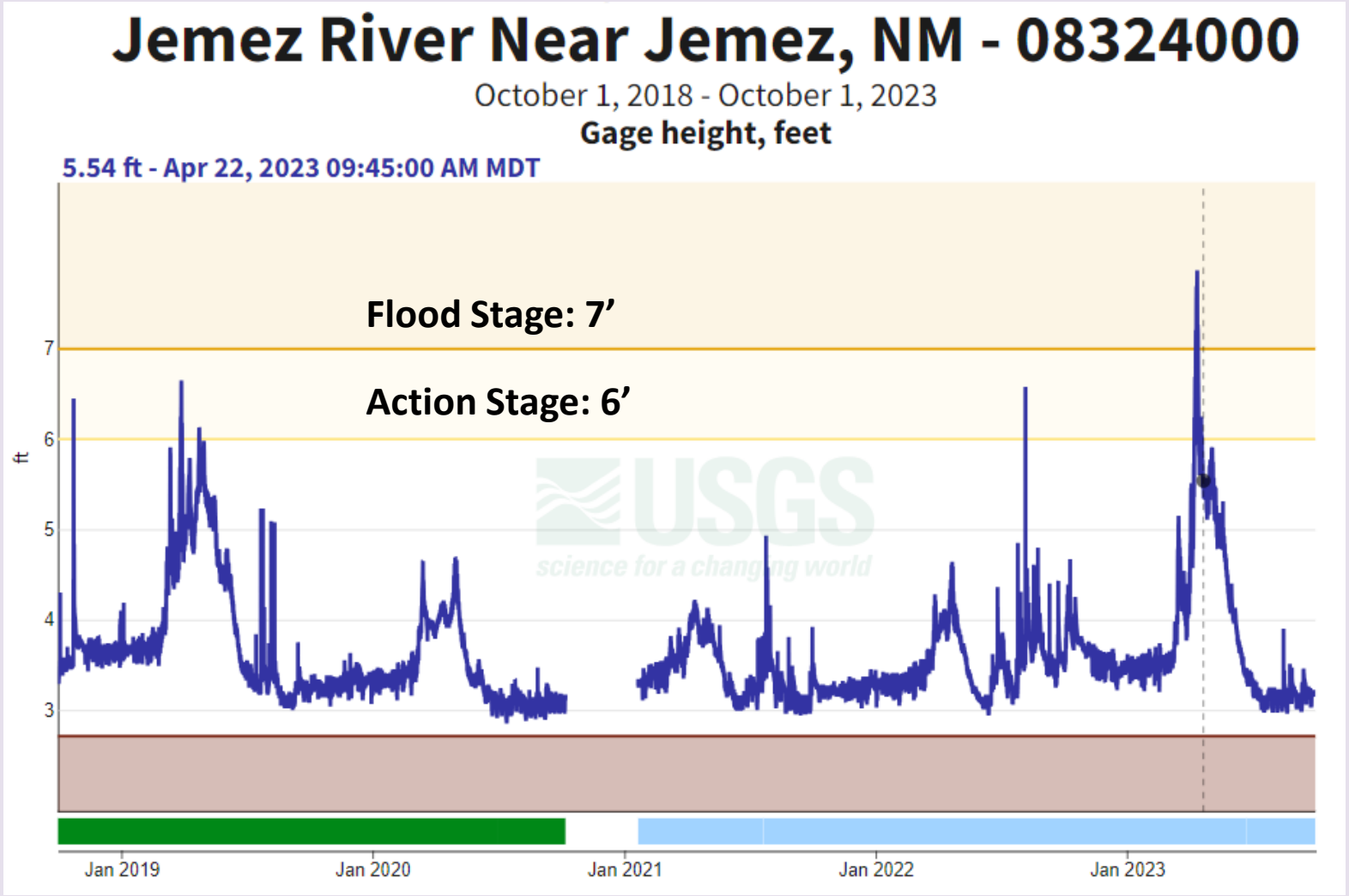
- **Specific impacts added to the flood warnings based on experiences during the runoff.**
- **Flood and Action stage lowered by a foot to provide better service in the future.**

San Juan River:

- **Specific impacts added.**
- **Negotiating flood levels with community and BOR.**

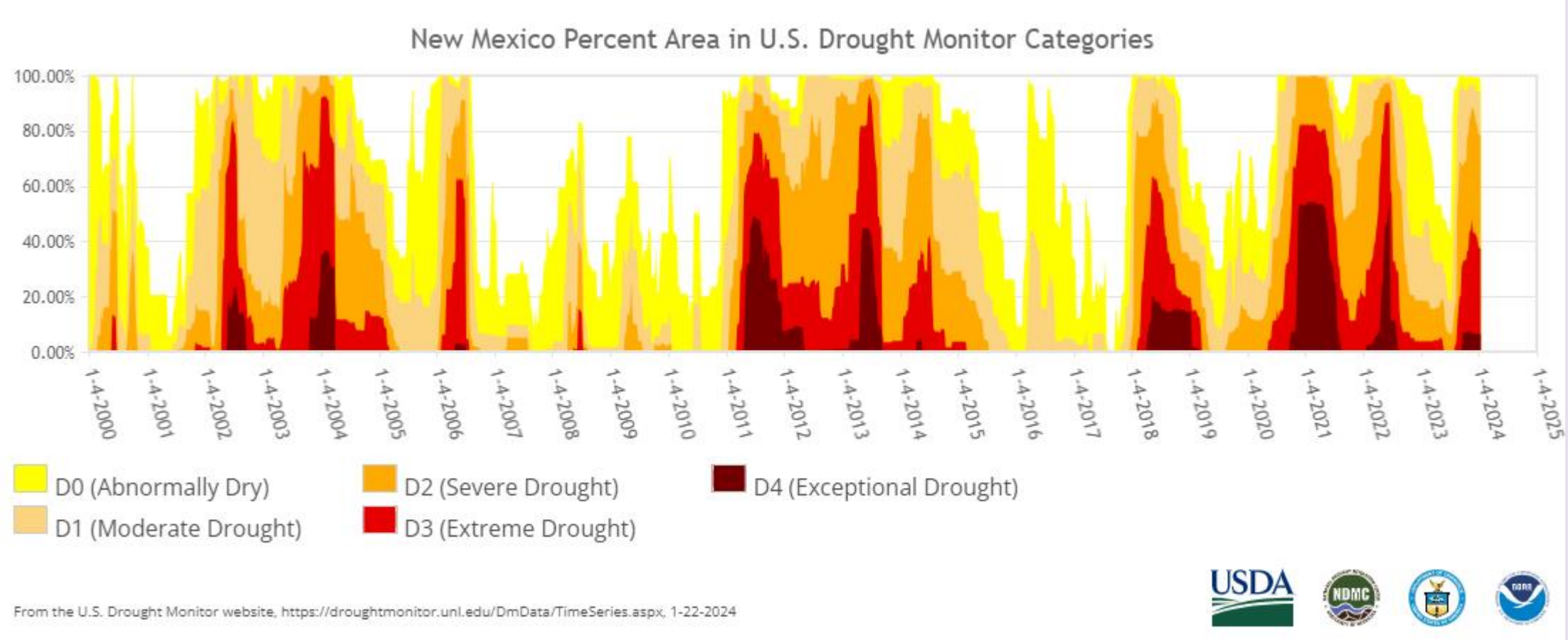
Rio Chama:

- **Specific impacts added to several gages.**
- **Flood and Action stages dropped by a foot for the Rio Chama at Chamita.**



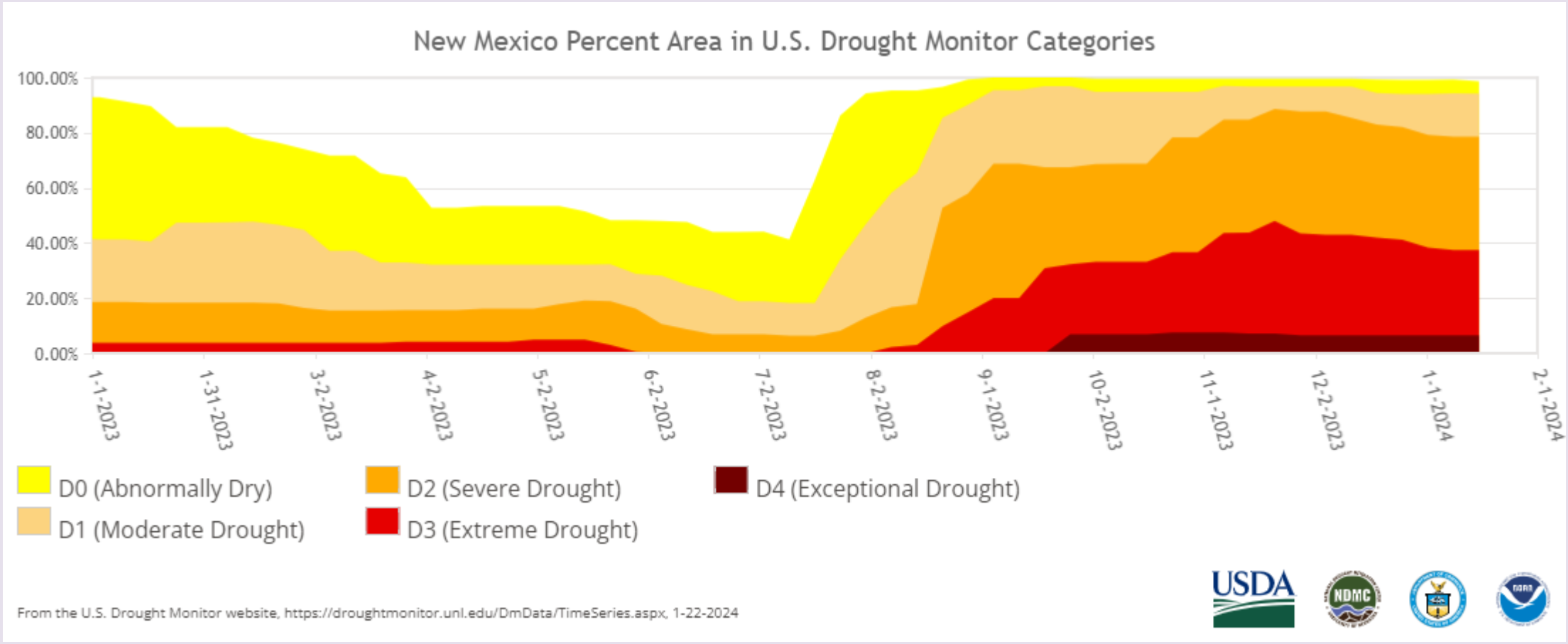
2022-2023 Drought Status

The chart below illustrates the progression of drought within New Mexico dating back to 2000. The coverage of exceptional drought conditions was greatest in 2011-2012 and during 2020-2022. A remarkably robust 2022 Monsoon season followed by near record snowpack in the winter of 2022-2023 dramatically improved drought conditions throughout the state.



2023 Drought Status

Despite the remarkable improvements seen in 2022 and through the spring runoff season of 2023, drought conditions have returned to New Mexico after an extremely disappointing Monsoon season that brought very hot temperatures and very little actual precipitation.



2023 Drought Status

Improvements peaked in early June, driven by the strong spring runoff and active weather that brought several rounds of moisture in May. However the tap turned off and we saw an extremely hot and dry summer and early fall. This drove widespread degradation of drought conditions throughout the state. It remains to be seen how much improvement we will see by the end of spring 2024.

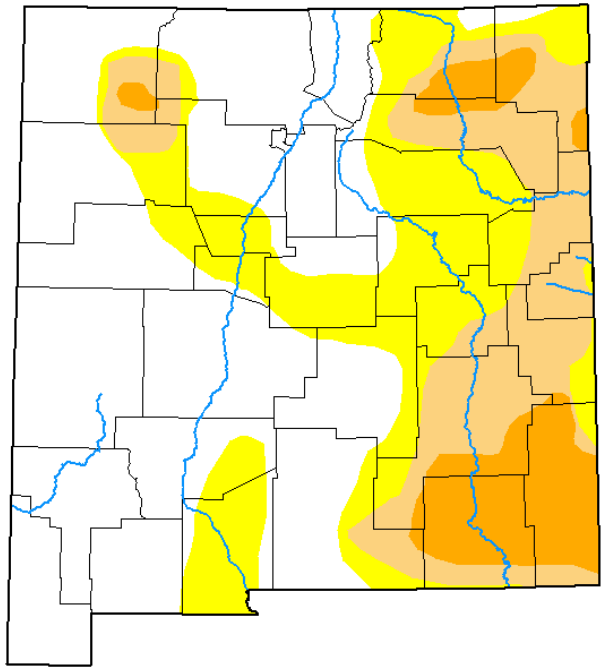
U.S. Drought Monitor

New Mexico

June 13, 2023

(Released Thursday, Jun. 15, 2023)

Valid 8 a.m. EDT



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

Adam Hartman
NOAA/NWS/NCEP/CPC

droughtmonitor.unl.edu

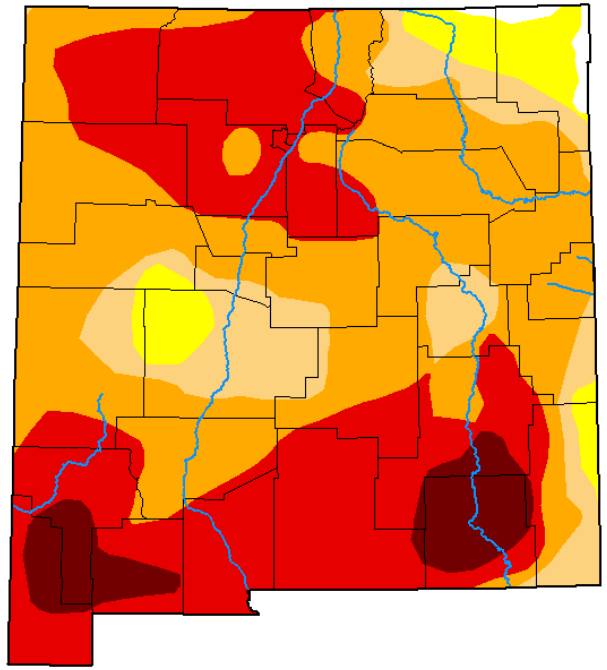
U.S. Drought Monitor

New Mexico

December 26, 2023

(Released Thursday, Dec. 28, 2023)

Valid 7 a.m. EST



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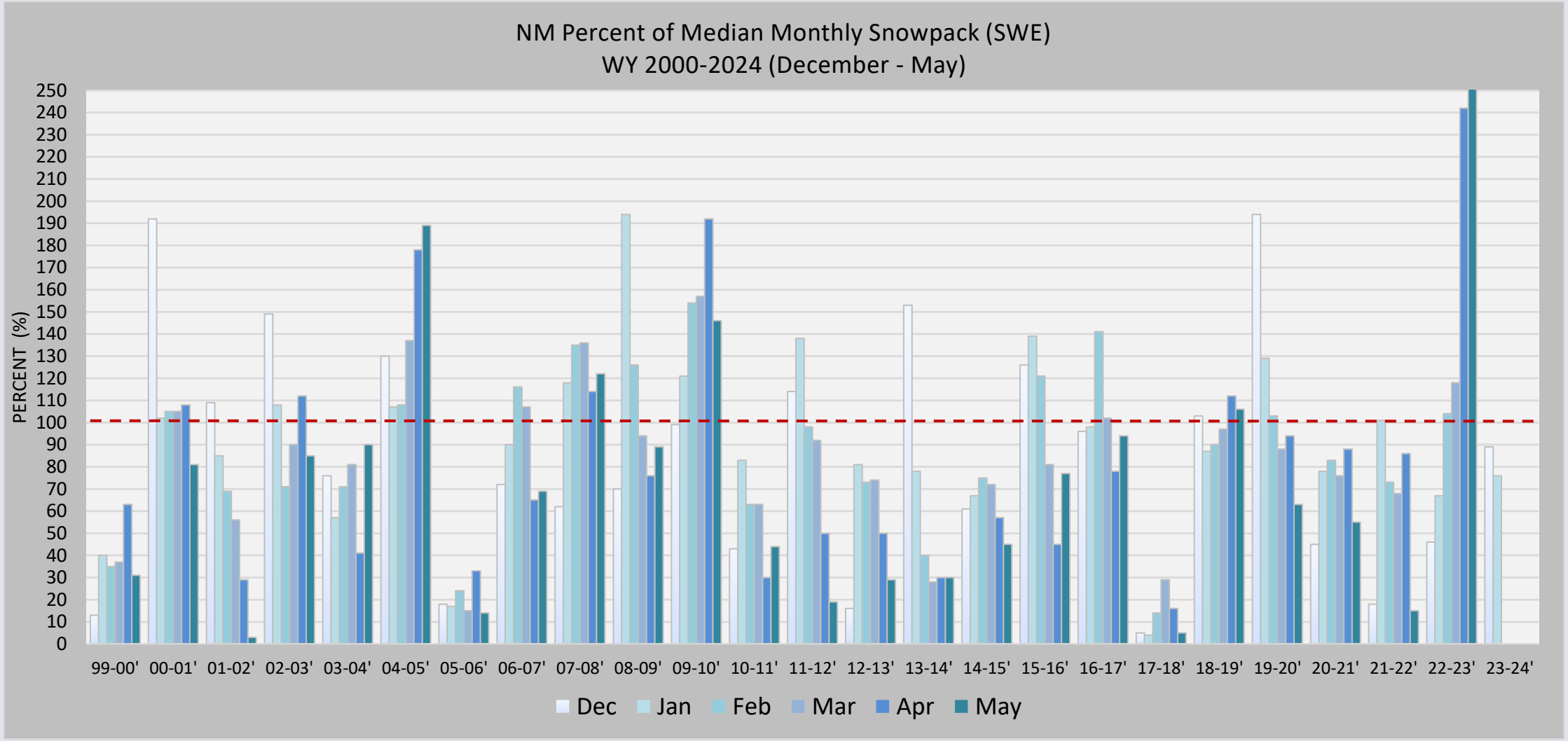
Author:

Rocky Bilotta
NCEI/NOAA

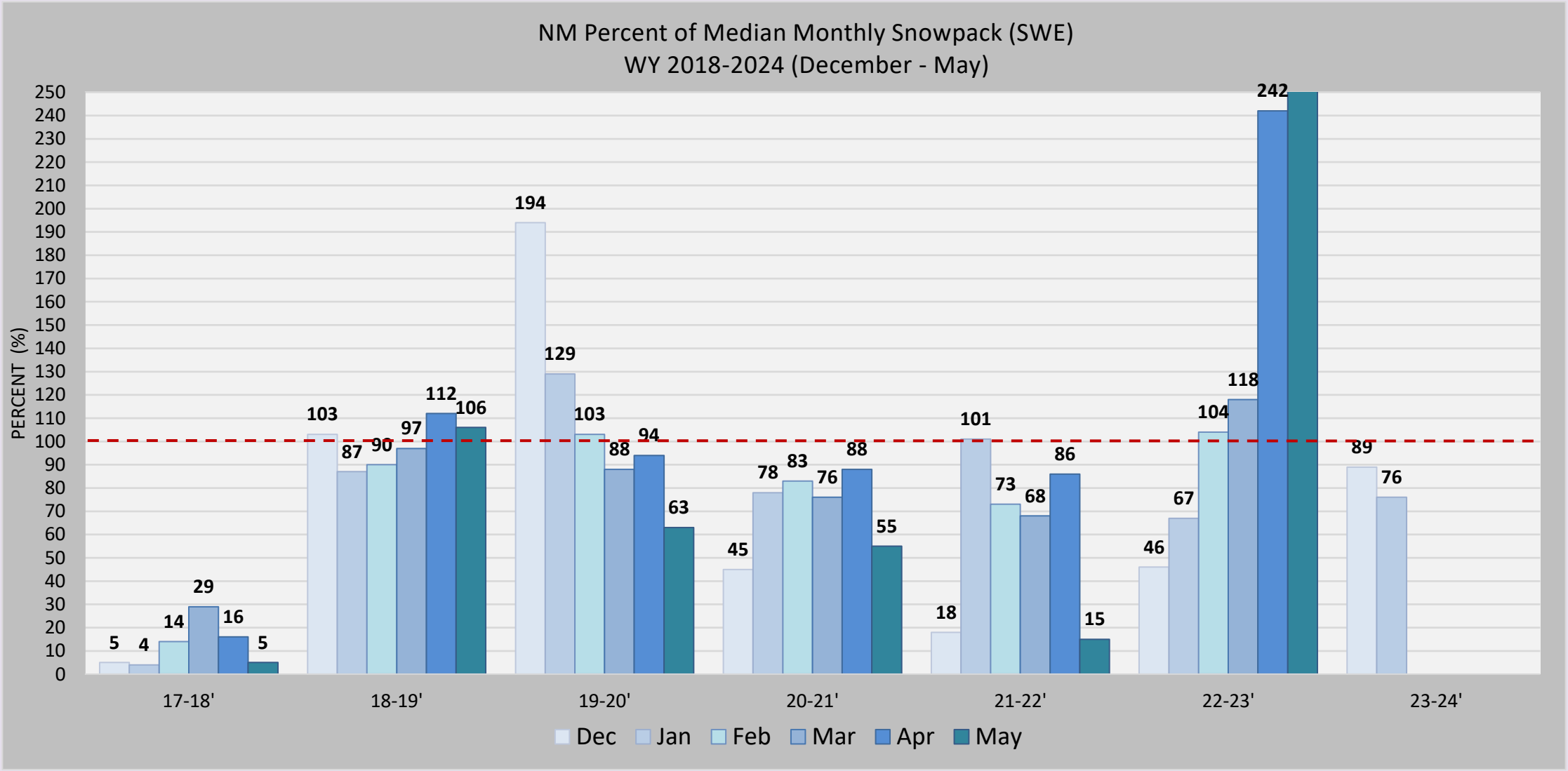
droughtmonitor.unl.edu

2000-2024 New Mexico Median Monthly Snowpack



The chart above shows the percent of median monthly snow water equivalent (SWE) since 2000 for NM (1981-2010 climatology). The past 23 winter seasons have seen considerable variability with overall below median snowpack most years. Of the 145 months illustrated above, only 32% have seen above median SWE. This expansive snow drought has resulted in significant drawdown of New Mexico reservoirs. Several back-to-back heavy snow years will be needed for a notable recovery. 2022-2023 was the best seasonal snowpack across the region since 2009-2010. The May 2023 SWE value was literally off the chart.

2018-2024 New Mexico Median Monthly Snowpack



The chart above is the same as the previous slide but for 2018 to 2024. The 2017-2018 season was practically snow-free. The following 2018-2019 season made a big comeback with close to median snowpack through the entire season. 2019-2020 started out great then trailed off by late spring. 2020-2021 was fair followed by more struggles in 2021-2022. The 2022-2023 season ramped up January with very good SWE by the spring. 2023-2024 is off to a fair start with more active weather expected in February.

Resources

- USGS Water Dashboard
- NM Water Data Dashboard
- US Drought Monitor
- NM Drought Status
- USGS Water Data
- USGS Groundwater Watch
- City of Albuquerque Groundwater Monitoring
- NRCS Basin Data Reports
- Office of the State Engineer – Hydrology Bureau
- Healy Collaborative Groundwater Monitoring Network
- Questions?: sr-abq.webmaster@noaa.gov
- NWS Albuquerque Facebook
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