

The Importance of Snowpack as a Water Source for California

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Recommended Citation

Ives, Keagan and Price, Matt, "The Importance of Snowpack as a Water Source for California" (2023).
2023 Symposium. 13.
https://dc.ewu.edu/srcw_2023/works_2023/works_2023/13

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The Importance of Snowpack as a Water Source for California

By Keagan Ives and Matt Price

Abstract

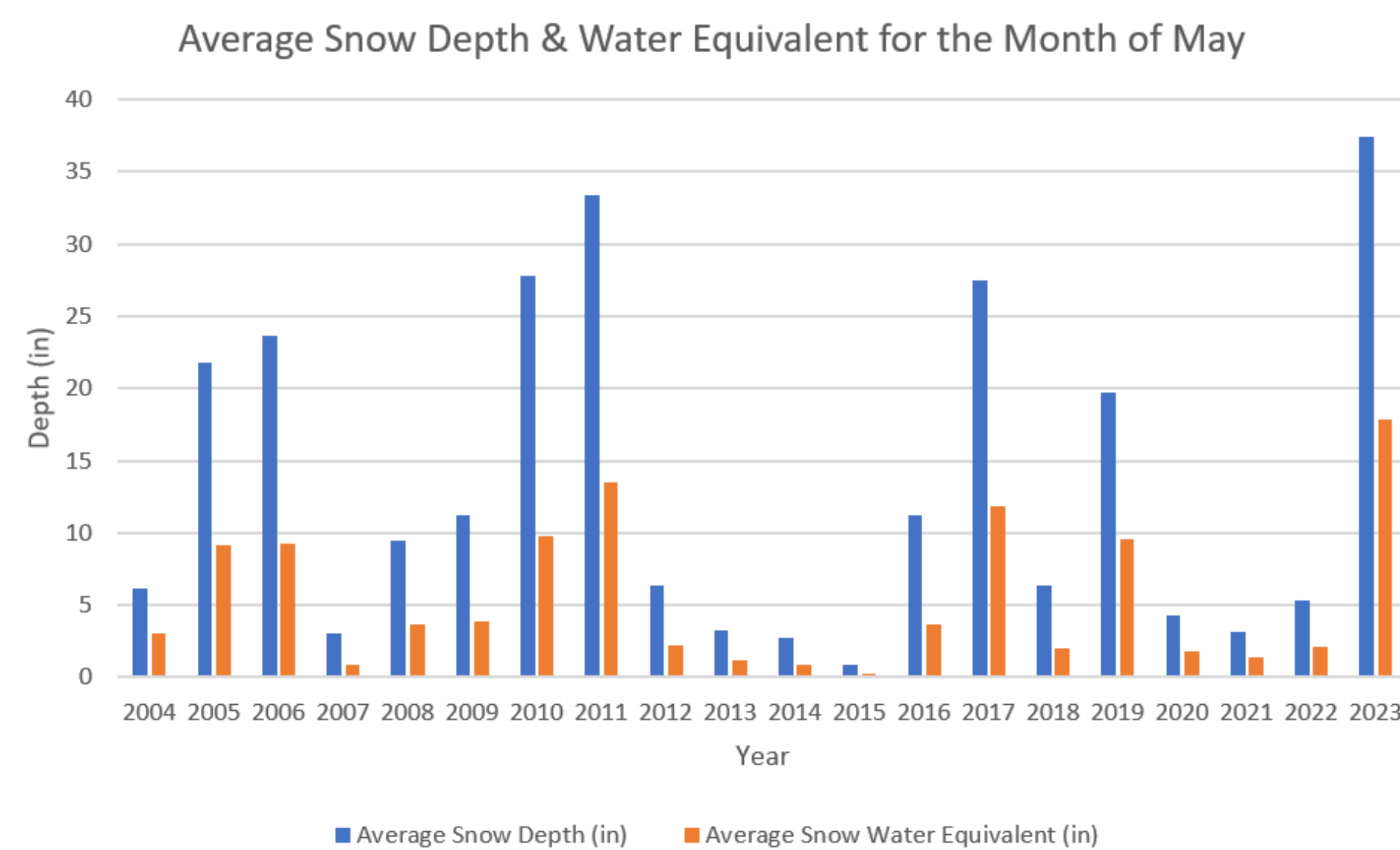
Mountain snowpack is one of the most important factors in supplying water for all of California, especially during the dry fall and summer seasons. Snowpack is a vital source of water and has significant positive or negative impacts on water availability given the amount of snow in a particular winter. Over the past decade, drought related to lessened mountain snowpack in California has caused increased water restrictions and unfavorable conditions for residents of the state. However, the 2023 snowpack reached record levels due to atmospheric rivers bringing heavy snowfall to California from the Pacific Ocean, leading to a forecast of significant drought reduction for the state in the coming summer. We discuss current conditions as well as the overall importance of snowpack to water resource availability in the entire state.



The Sierra Nevada Mountain Range, a significant source of water for California.

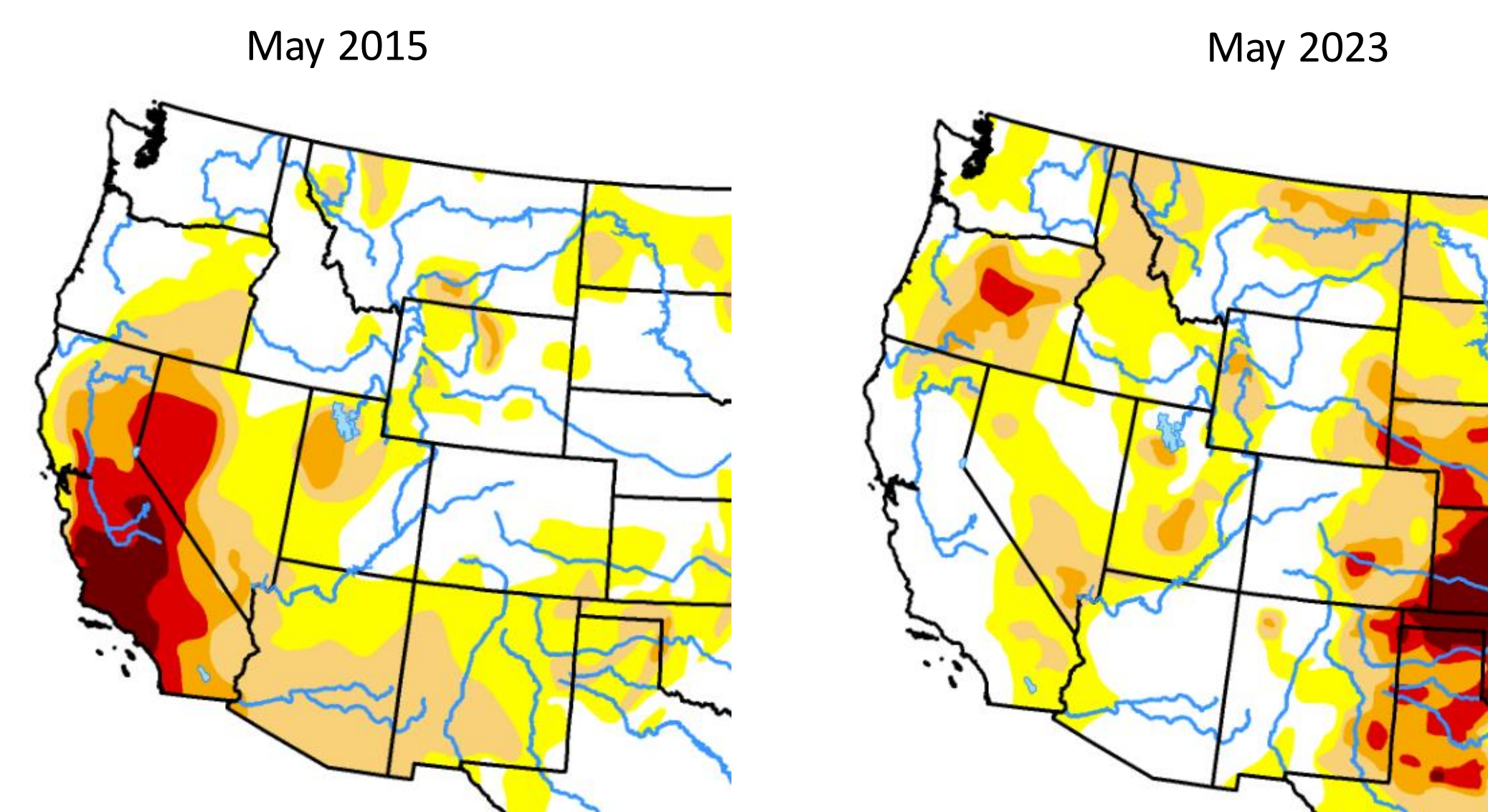
Snowpack & Snow Water Equivalent Data

The snowpack in California is a direct predictor of severe drought within the state. The Sierra Nevada mountain range receives the most snow on earth, providing Californians with the vital snowpack they rely on for all aspects of their lives. The slow melt of the snowpack refills reservoirs and recharges streams that Californians use daily. Low snow years have significant impacts to water supply for all of California, leading to potentially devastating effects.



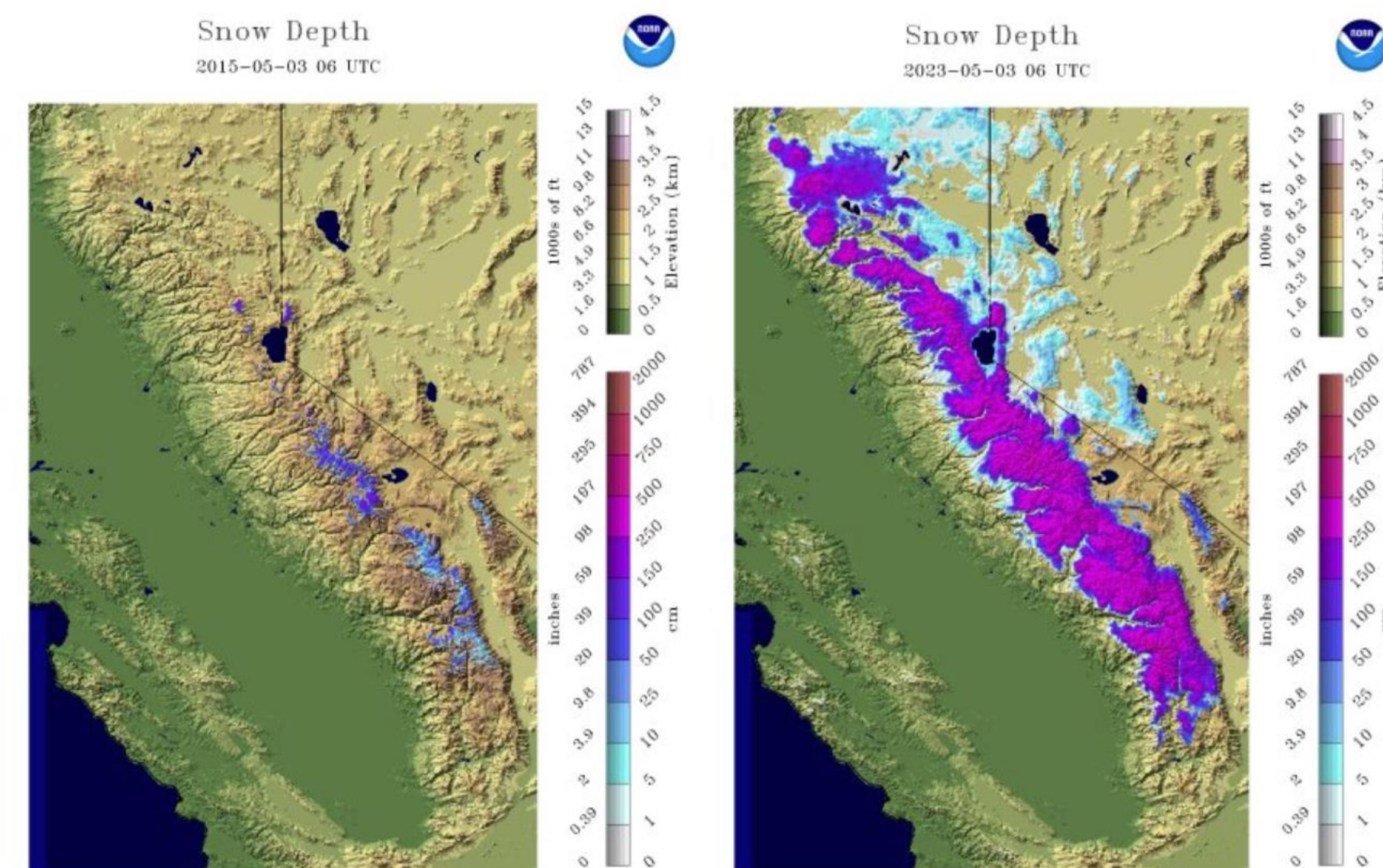
Above is a clustered column chart created with NOAA data on average snow depth and snow water equivalent.

Drought Map



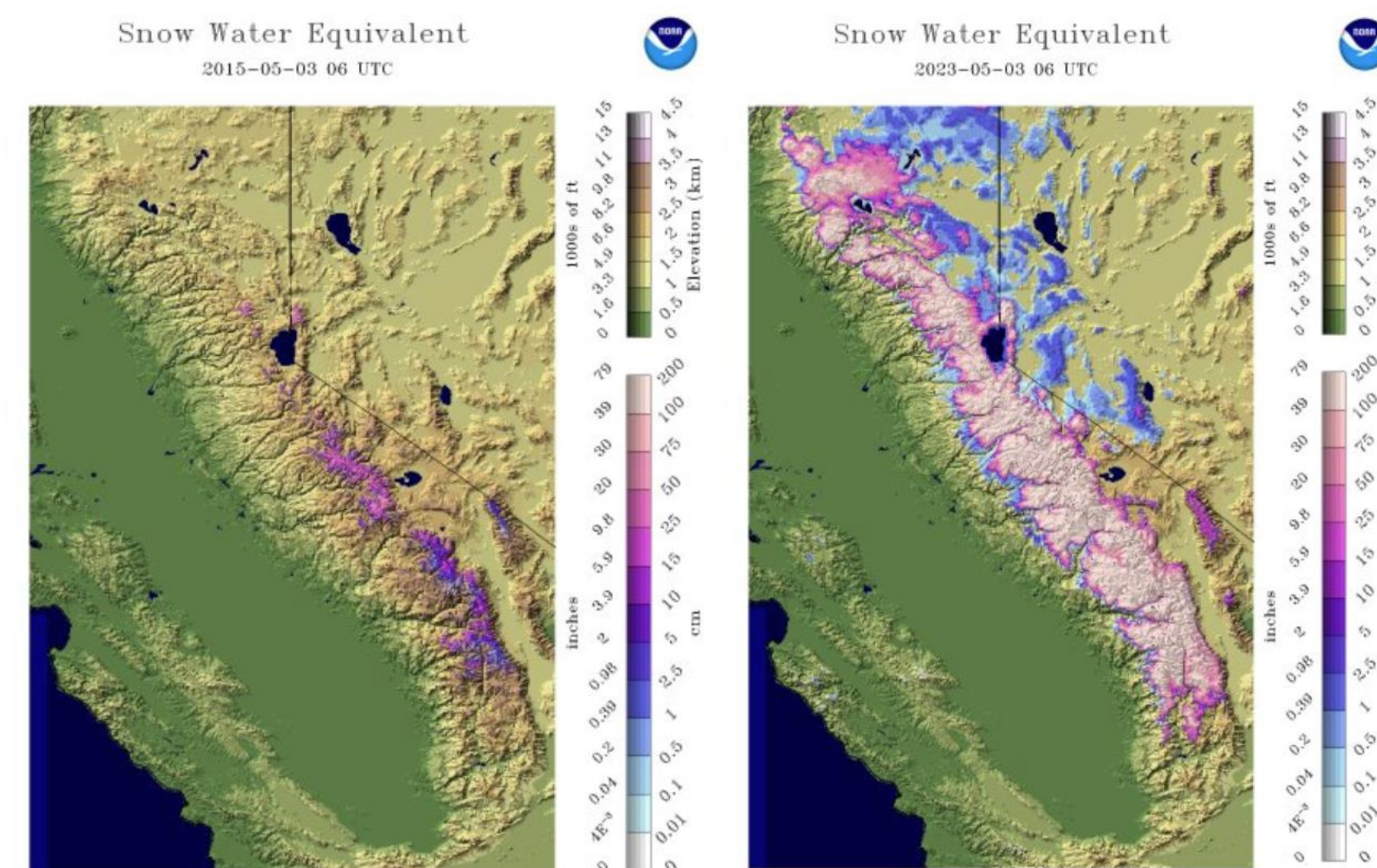
Above is a current drought map (right) compared to a drought map from 2015 (left) from the National Drought Mitigation Center.

Snow Depth Map



Above is a current snow depth map (right) compared to a snow depth map from 2015 (left) from NOAA.

Snow Water Equivalent Map



Above is a current snow water equivalent map (right) compared to a snow water equivalent map from 2015 (left) from NOAA.

2023 Record Snowpack In Sierra Nevada's



A road in Lake Tahoe showing the record winter snowfall.

Conclusion

In conclusion, California's fresh water supply is directly correlated to the snowpack that the Sierra Nevada mountain range receives. The Sierra Nevada mountain range stretches over 400 miles north to south along the eastern edge of California. Snowpack stores water through the winter months and slowly releases it through the spring and summer melting season, providing irrigation and freshwater to California in times when that melt off water is desperately needed. We can see that in 2015, the lesser snowpack contributed to a great drought in the state of California. We also see that in 2023, manual surveys of the Sierra Nevada's snowpack at Phillip's Station showed a level that of 241% of the average for this area according to the California DWR. This should help combat recent drought conditions in California and restore water levels in California's reservoirs in the short term.

References

- [Comparison Slider | U.S. Drought Monitor \(unl.edu\)](#)
- [National Snow Analyses - NOHRSC - The ultimate source for snow information \(noaa.gov\)](#)
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