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**Sent:** Friday, May 12, 2023 4:29 PM

**To:** Delta Council ISB <[DeltaCouncilISB@deltacouncil.ca.gov](mailto:DeltaCouncilISB@deltacouncil.ca.gov)>

**Subject: 2023 California flooding -- some background**

**From yours truly:** [Analysis: Proposed state investments inadequate to address increase in catastrophic flood risk – California Water Research](#)  
(cah2oresearch.com)

This blog post urges the state to do scenario analyses for extreme flooding, stating:

The inconvenient truth is that state and federal investments in flood risk reduction are utterly failing to keep up with the nonlinear increase in flood risk due to climate change. European researchers looked at changes in daily rainfall records and found that the frequency has "started to deviate significantly and increasingly from that of a stationary climate" since about 1990 (Robinson et. al. 2021).

**From the Center for Western Weather and Water Extremes:** [The West Braces for the Most Epic Snowmelt in 40 Years - Scientific American](#)

Chad Hecht, a meteorologist with the Center for Western Weather and Water Extremes in San Diego says that this year could "possibly be like 1983, when the average statewide snow water content was 60.3 inches in May.

That was a rough year, with flooding and mudslides in several parts of the West and extensive crop damage."

## How fast the snowpack melts: San Joaquin Basin

In California's San Joaquin Basin, the snow water equivalent – a measure of snowpack – was 289% of the 1991-2020 median (dotted line) as it neared its peak in early April 2023, well above the past 40 years.

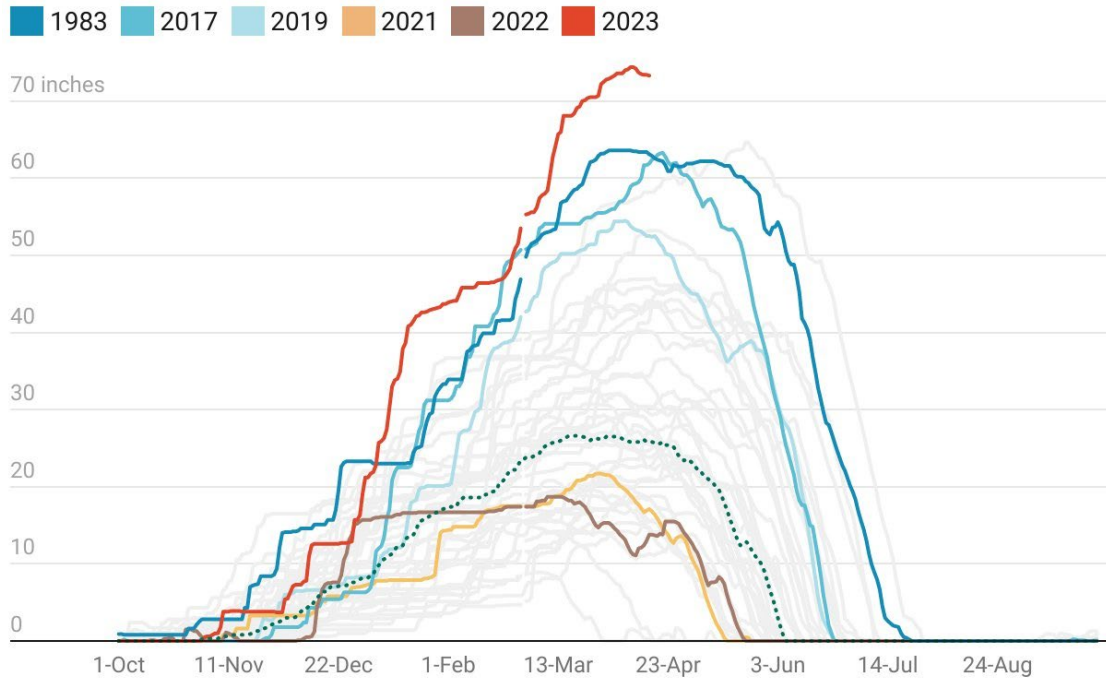


Chart: The Conversation/CC-BY-ND • Source: NRCS/USDA • Created with Datawrapper

**From flood historian John Austin, [Floods and Droughts of the Tulare Lake Basin](#) --** inflows to Tulare Lake in 19 wettest years. (It doesn't show the inflow to the lake in 1997, when 57,000 acres flooded.)

Table 7. Flow measurements for the 19 largest runoff years: 1850–2011.

Water Year	Total runoff of 4 major rivers <sup>1</sup> (acre-feet)	Total inflow to Tulare Lake <sup>2</sup> (acre-feet)
1853	<sup>3</sup>	5,096,000
1862	<sup>3</sup>	6,290,000
1868	<sup>3</sup>	5,360,000
1906	7,195,240	1,530,000
1909	5,689,840	1,175,000
1916	6,512,710	1,041,700
1938	5,773,470	126,000
1952	5,375,050	583,000
1967	6,253,344	94,300
1969	8,379,585	1,155,000
1978	6,078,925	<sup>4</sup>
1980	5,821,879	<sup>4</sup>
1982	5,201,438	<sup>4</sup>
1983	8,746,222	1,069,000
1986	5,692,766	<sup>4</sup>
1995	5,814,847	<sup>4</sup>
1997	4,931,557	<sup>4</sup>
1998	5,990,549	<sup>4</sup>
2011	5,910,342	<sup>4</sup>

<sup>1</sup>This is the total runoff of the Kings, Kaweah, Tule and Kern Rivers.

<sup>2</sup>See Table 18 for examples of exports that have been made in recent decades to keep floodwaters out of the Tulare Lakebed.

<sup>3</sup>No runoff data is available for these rivers prior to 1894.

<sup>4</sup>There were some relatively small inflows to Tulare Lake in each of these years, but no measurements are available.

**From the Public Policy Institute of California** interview with Lois Henry: [The Toll of the San Joaquin Valley Floods: "It's Not Pretty" - Public Policy Institute of California \(ppic.org\)](http://ppic.org)

**Center for Watershed Sciences on restoring Tulare Lake as an adaptation to increased flooding**

**Peter Moyle.** [Lake Tulare \(and its fishes\) shall rise again | California WaterBlog](#). Moyle wrote,

as the lake arises again, the same question persists: why is it legal to drain Tulare Lake for private gain? And shouldn't the descendants of the Yokuts bands who had their lake and lands stolen from them have something say about what happens to their ancestral home? Is Nature is telling us that a new Lake Tulare paradigm is needed, featuring the return of the lake to a more natural ecosystem?

**Jay Lund.** [Tulare Basin and Lake – 2023 and their future | California WaterBlog](#)

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California Water Research  
Integrative scientific synthesis



"We aren't just failing to address the growing climate crisis to come; we're unprepared even for the impacts already here—in part because they keep surprising us with their intensity and in part because we can't seem to fathom our genuine vulnerability." – David Wallace Wells

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