

## 2021 Drought and Agriculture in California

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### Droughts and this drought in California

- California has more hydrologic variability than any state in the US, meaning that we have more drought and flood years per average year than any other state. This is a problem, but has also meant that we have designed for droughts, which are always testing us.
- 2021 is the 3<sup>rd</sup> driest year in more than 100 years of precipitation record. 2020 was the 9th driest year in the precipitation record.
- Much warmer temperatures are further reducing streamflows and aquifer recharge, and lengthen and deepen the wildfire season.
- Large reductions in surface water available for agriculture, especially in the San Joaquin Valley, but also in the Sacramento Valley and smaller river valleys statewide.
- Much more groundwater pumping reduces agricultural impacts, but affects rural wells.
- Also major forest and aquatic ecosystem impacts, especially for wildfires and salmon runs, and problems for rural wells and some urban areas.

### Implications

- If next year is also dry, agricultural and environmental impacts will increase and urban impacts will expand.
- Warmer temperatures from climate change are worsening droughts, reducing the amount of precipitation that arrives at reservoirs and aquifers, lengthening wildfire seasons, and worsening conditions for cold-water fish species, such as salmon. We need to further adapt water and land management for these changes.
- Another dry year is likely. Very dry watersheds, very low reservoir levels, falling aquifers, and higher temperatures mean more precipitation is needed to make next year not dry.
- Need to repay additional pumped groundwater under SGMA, meaning some reductions in lower-valued crops in wetter years so aquifers can recover to sustain permanent crops in future droughts. Few basins can sustain aquifers with managed aquifer recharge alone; many will need deep aquifer pumping reductions in wetter years.
- Further urban water conservation helps a bit, but sizable long-term reductions in irrigated area seem unavoidable in parts of the San Joaquin Valley.
- A more formal state water accounting system is needed to support tighter surface water right administration, SGMA planning and implementation, and environmental uses. Water right curtailments are likely to become routine in more basins.

### Further Reading

Lund, J.R., J. Medellin-Azuara, J. Durand, and K. Stone, "[Lessons from California's 2012-2016 Drought](#)," *J. of Water Resources Planning and Management*, Vol 144, No. 10, October 2018. [CaliforniaWaterBlog.com](http://CaliforniaWaterBlog.com)