



UC Center Sacramento Policy Brief

Volume 06 Issue 06

● November 1, 2023

Navigating Extremes: Challenges and Opportunities for California Water Policy and Management

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Like other areas of the western United States, California experiences a great deal of variability in its climate from year to year, with dry and wet seasons, years, and eras. Recently, California has seen some of its driest and wettest years, with extreme abundance and absence of snowpack, streamflow and even tropical storms. The exacerbation of California's already extreme-prone climate brings new challenges for water policy and management.

This talk addresses some of these challenges and suggest some promising directions for adapting California's water management to worsening climate extremes.

California's climate is becoming more variable and a little drier. Statewide, California is experiencing higher temperatures, rising water levels in coastal and delta regions, and longer fire seasons. Our state is also experiencing greater precipitation variability, including more floods and droughts and an overall reduction in our snowpack, characterized by more runoff and water flow in the winter and less in the spring and summer.

Human water use has also changed. Over the last three decades, California's urban areas have used less water, but water use for agricultural purposes has increased for several reasons, including because the share of permanent crops, such as those grown in orchards, has increased. Our ecosystem continues to rapidly evolve as the human population continues to change, technologies continue to advance, and the structure of our economic system continues evolving through increased globalization and other changing methods of production.

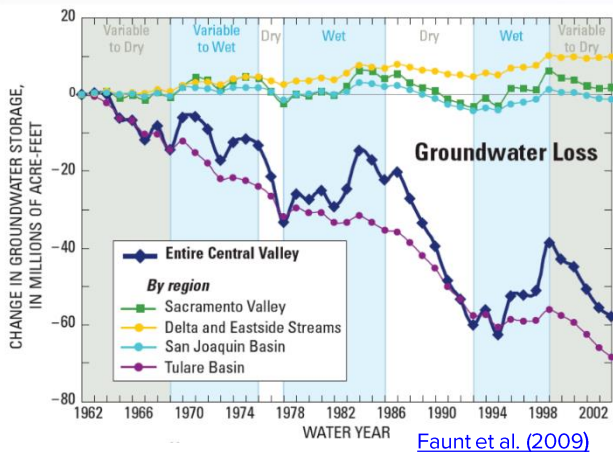


Figure 2. Residential Consumption in Gallons per Day per Capita (R-GPCD) in California (1994–2019)

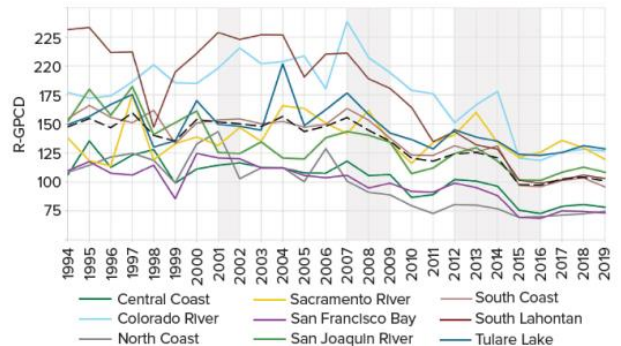
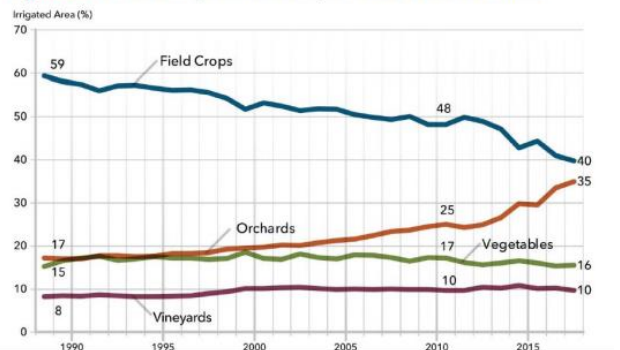


Figure 2-16 Orchards Replaced Field Crops in Water Years 1988-2018



Multiple objectives shape local and statewide strategies to manage climate extremes and water conservation efforts. These include public health, economic prosperity, ecosystem health, equity, and social stability objectives. While a wide range of near-optimal solutions exist on a societal level, many of these strategies are less optimal for specific individuals and groups. Several **broad categories of solutions** encompass efforts to manage our state's supply of water, including **creating additional water storage sites** such as surface reservoirs and aquifers, **reducing water demands** through permanent reductions or drought year conservation efforts, and **adding supplies** through methods such as importing water during droughts and investing in technologies for water desalination and reuse.

Historically, successes in California's water management policies have been motivated by responses to previous failures. For example, future efforts to improve water management compensate for the costs of droughts ([Pinter et al. 2019](https://pinter.ucdavis.edu)).

Outlook for the 2023-24 year

- Great reservoir storage
- Better (but imperfect) groundwater storage
- Precipitation forecast and the effects of El Niño unknown.
- Even if we have a dry season, it'll probably be alright.