



What Really Happened During State's Drought?

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California's three-year drought, which ended with this season's cool and wet weather, had complicated impacts that have been poorly understood. The Pacific Institute just completed a nine-month assessment of new data from California's agricultural, energy and environmental sectors to evaluate consequences of the drought for the state.

Analysis of local, state and federal data finds that contrary to much of the media reporting, California's agricultural community proved flexible and resilient, generating gross revenues in 2007, 2008 and 2009 that were the highest on record. Growers employed a diverse suite of response strategies, including shifting crops, groundwater pumping and water transfers to buffer the drought's impacts. Local impacts were more varied, with some San Joaquin Valley counties reporting increased gross revenues or planted acres, and others reporting declines in both.

It is clear that there were job losses and suffering throughout the Central Valley during the drought, yet the data show that these losses were concentrated in construction and other sectors that do not have a strong link to water supply. Despite increasing unemployment, agriculture-related occupations remained a stable portion of total jobs available in areas directly impacted by water supply restrictions. And in 2010, a wet water year with increased water supplies, unemployment continued to rise in all San Joaquin Valley counties.

During the drought, some representatives of special interests pointed to high unemployment rates as evidence of the severe impacts of water supply restrictions. Now, these interests are unhappy with more comprehensive analyses of unemployment figures – they argue that the same measures of unemployment that they relied upon do not accurately account for undocumented workers.

It is true that a portion of California's labor forces is undocumented and that undocumented workers are more difficult to include in federal and state data-gathering efforts. Yet even if we double UC Davis and University of the Pacific's estimates of agricultural job losses in the San Joaquin Valley, the doubled agricultural job losses are still less than construction job losses in Fresno County alone. All of this suggests that there were other factors, besides water supply, driving high unemployment rates. For example, the drought period coincided with the foreclosure crisis and a national and global recession.

Less frequently reported were the substantial impacts on energy production and aquatic ecosystems during the drought. Multiple factors play a central role in ecosystem health and affect

fisheries, water availability, river flow timing, water volumes and quality – and all were affected by the drought. Unlike the agricultural sector, ecosystems have fewer coping strategies to maintain health and productivity.

The Pacific Coast salmon fishery was closed in 2008 and 2009; populations of endangered and threatened fish – that serve as the basis of the food web – were also at record lows. In addition, many of the state's environmental flows went unmet during the drought period, affecting aquatic ecosystems and decreasing protections for endangered species. And the salinity in the Bay Delta in 2008 was the highest on record since 1992, worsening water quality for in-Delta users and affecting waterfowl and wildlife refuge and fisheries habitat.

During the drought California hydropower was roughly cut in half. This lost hydropower was made up with the purchase and combustion of additional natural gas. We calculate that electricity ratepayers spent an additional \$1.7 billion to purchase natural gas over the drought period, emitting an additional 13 million tons of CO₂ – about a 10 percent increase in total annual CO₂ emissions from California power plants.

More severe drought is inevitable, yet California has not reformed drought monitoring, evaluation, planning and response strategies the way other countries and regions have. To become more resilient to future droughts, it will be critical to shift from crisis-driven responses to long-term mitigation strategies and forward-looking policy. And we must make genuine efforts to understand drought impacts, rather than misuse them to divert attention from systemic problems.

New drought management strategies capable of addressing the risks of longer and more severe water shortfalls must include: improving water efficiency, enhancing groundwater recharge, establishing longer-term water transfer programs and systems for monitoring and evaluating those transfers, restoring critical ecosystem flows and habitat, planting drought-resistant crops, adjusting grazing schedules and intensity, improving soil moisture management, expanding energy conservation and efficiency programs, and diversifying the state's energy portfolio with a focus on renewable energy sources.

Pray for rain every year – or use our understanding of drought impacts to develop robust strategies to cope with future droughts? Is there really a choice?