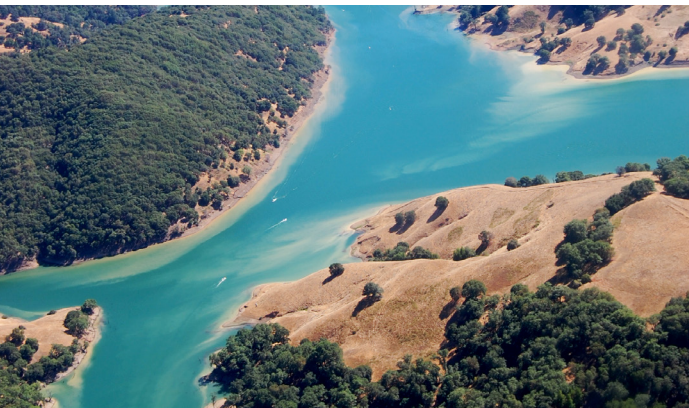


## How Local Health Departments can Assist in Response to the California Drought



Lake Sonoma reservoir, Sonoma County

### Introduction

On Jan. 17, 2014, California Governor Edmund G. Brown declared a State of Emergency and directed state officials to take necessary actions to prepare for drought conditions in the state. The governor also directed state agencies to use less water and hire more firefighters and encouraged the public to implement a voluntary 20-percent reduction in water usage.

The state identified 40,000 individuals, living in 17 rural communities (spanning 10 local health department (LHD) jurisdictions), which risk running out of water within 60 to 120 days. With record-low rainfall over the past three years, California faces the potential of experiencing the driest period in over 400 years. Warming has already contributed to decreases in spring snowpack, and future warming is projected to produce more severe droughts in the Southwest region. Combined with a history of severe drought and the current uncertainty about the exact causes of these past droughts, the Southwest must be prepared for droughts resulting from multiple causes.<sup>1</sup> The National Association of County and City Health Officials (NACCHO) has prepared this fact sheet to assist LHDs with their response efforts to the droughts in California.

### IMPACTED JURISDICTIONS

- » Jackson Valley Irrigation District (Amador County)
- » Shaver Lake Heights Mutual Water Company (Fresno County)
- » Sierra Cedars Community Services District (Fresno County)
- » Boulder Canyon Water Association (Kern County)
- » Cypress Canyon Water System (Kern County)
- » Lake of the Woods Mutual Water Company (Kern County)
- » Camp Condor (Kern County)
- » Bass Lake Water Company (Madera County)
- » Whispering Pines Apartments (Mariposa County)
- » City of Willits (Mendocino County)
- » Redwood Valley Community Water District (Mendocino County)
- » Brooktrail Township Community Services District (Mendocino County)
- » Washington Ridge Conservation Camp (Nevada County)
- » Ophir Gardens (Placer County)
- » Lompico County Water District (Santa Cruz County)
- » City of Cloverdale (Sonoma County)
- » Healdsburg (Sonoma County)

## Impacts on Public Health

Drought is a slow-onset, long duration, spatially diffuse emergency, rather than a sudden, high-impact event (such as a flash flood or earthquake), and has multiple long-lasting effects. Below are some of the various ways drought may impact the public:

### Agriculture

Impacts of drought are typically felt by those most dependent on annual rainfall. The drought has already begun impacting California's \$45 billion agriculture industry. During drought, the quality and quantity of water being used for agricultural purposes decreases, and major economic impacts include a decrease in food and fiber production leading to a drop in income to farmers; increase in production and food costs; and increase in unemployment, specifically among temporary farm laborers.

### Energy

A drop in California's hydroelectricity production is a potential outcome of reduced water availability, resulting in higher energy costs for California consumers. Drought can affect the production of electricity when water levels in lakes, rivers, or reservoirs fall below intakes used for drawing water for cooling of power plants, and again when surface water becomes too warm to be used for cooling.<sup>2</sup> Consequently, vulnerable groups dependent upon power to sustain their healthcare needs may be adversely affected.

### Water Quality

Decreased water availability is a defining feature of most droughts. Dilution capacity can be subsequently reduced, resulting in higher concentrations of pathogens, chemicals, nutrients, and solid particles and lower dissolved oxygen.<sup>3</sup> Water quality can further worsen when intense rainfall follows a long dry spell and chemicals accumulated on the ground or roads wash out to the rivers.<sup>4</sup>

Research suggests that drought has negatively impacted the mental health of people in rural communities whose livelihoods depend on rainfall.

### Air Quality

Drought is often associated with dusty, dry weather conditions, heat waves, and wildfires, which can negatively impact health, especially among those with chronic conditions. Wildfire and dry vegetation increase particulates in the air, such as pollen, smoke, and fluorocarbons, which can irritate bronchial passages and lungs. Such irritation further exacerbates chronic respiratory illnesses like asthma and increases risk of acute respiratory illnesses like bronchitis. Climate change may make it difficult for cities in California to attain air quality standards.<sup>5</sup>

### Infectious Diseases

Precipitation changes affect the reproduction, development, behavior, and population dynamics of mosquitoes, their pathogens, and non-human vertebrate reservoirs. Recent research suggests droughts can reduce mosquito predators and competitors, leading to subsequent increases in mosquito numbers and disease outbreaks the following year. Valley Fever, a fungal disease, shows the complex relationship with drought and



Image Credit: [www.sxc.hu/profile/biborg](http://www.sxc.hu/profile/biborg)

can be distributed during dust storms. It is caused by a fungus, *Coccidioides*, which lives in the soil of dry, low rainfall areas and is acquired by breathing in spores from the air. Previous outbreaks in California were associated with heavy rains following a drought.<sup>6</sup>

### Behavioral Health

Research suggests that drought has negatively impacted the mental health of people in rural communities whose livelihoods depend on rainfall. Severe drought can result in financial impacts that can contribute to business-related pressures and consequent emotional stress. Further, prolonged droughts can create chronic stress situations that may exacerbate health problems, particularly in populations already suffering from mental health or stress-related disorders



**California Rural Water Association**  
[www.cadroughtprep.net](http://www.cadroughtprep.net)

**Centers for Disease Control and Prevention: Drought and Health**  
[www.cdc.gov/nceh/drought/](http://www.cdc.gov/nceh/drought/)

**When Every Drop Counts: Protecting Public Health During Drought Conditions. A Guide for Public Health Professionals**  
[www.cdc.gov/nceh/ehs/publications/drought.htm](http://www.cdc.gov/nceh/ehs/publications/drought.htm)

**National Library of Medicine: Disaster Information Management Research Center: Droughts and Health**  
<http://sis.nlm.nih.gov/dimrc/drought.html>

**Environmental Protection Agency**  
[www.epa.gov/natureevents/drought.html](http://www.epa.gov/natureevents/drought.html)

**World Health Organization: Droughts**  
<http://who.int/hac/techguidance/ems/drought/en>

**National Integrated Drought Information**  
[www.drought.gov](http://www.drought.gov)

## Local Health Department Roles

Droughts occur slowly, which provides opportunities to develop and implement short- and long-term strategies. LHDs' response efforts may include the following:

- Communicating the importance of hand hygiene and offering alternatives to hand washing when water quantity and quality are severely limited;
- Educating local healthcare providers and tracking the reported incidents of Valley Fever;
- Educating local healthcare providers about the effects of poor air quality on individuals with chronic respiratory conditions;
- Monitoring permit requests for new wells or requests to dig existing wells deeper;
- Providing education on water conservation techniques, especially in jurisdictions where homes/businesses do not have water meters installed;
- Offering targeted outreach to populations particularly impacted by drought (e.g., the elderly, those with chronic conditions);
- Preparing for an influx of public health service requests, including responding to needs of individuals who have temporarily lost employment due to water shortages; and
- Anticipating potential declines in tax revenues stemming from the financial impacts of the water shortage.



# [FACT SHEET]

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## FOR MORE INFORMATION, PLEASE CONTACT:

**Andrew Roszak, JD, MPA, EMT-P**  
Senior Director  
Environmental Health, Pandemic Preparedness,  
and Catastrophic Response  
[aroszak@naccho.org](mailto:aroszak@naccho.org)

**Lisa Brown, MPH**  
Program Analyst  
Pandemic and Catastrophic Preparedness  
[lbrown@naccho.org](mailto:lbrown@naccho.org)

# NACCHO

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1100 17th St, NW, 7th Floor Washington, DC 20036

P 202-783-5550 F 202-783-1583

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