



HEALTH IN ALL POLICIES: WATER WATER SECURITY

Water security refers to the availability of water for basic needs, such as for drinking, bathing, sanitation, and agriculture. Water quality and water quantity are both critical aspects of water security. Stakeholders responsible for ensuring water security are accustomed to cross-sector collaboration, and this guide will illustrate how stakeholders from non-health sectors have already incorporated health considerations into their policies and programs. This document will also identify opportunities for public health to collaborate with external partners to mitigate and protect against emerging threats to our water supplies. Partnerships and collaboration are key to successful HiAP initiatives. Identifying which sectors are vying for the same limited water resources provides a ready list of partners who could work together to devise a solution to this problem. Although health may not be the bottom line for all relevant stakeholders, their use of this life-sustaining, finite resource must not supersede health.

Introduction

Threats to water security can be broken down into two major categories: those that target water quality, and those that target water quantity. Until relatively recently, water security was likely not a topic most Americans thought about often. However, several recent water-related incidents have piqued public concern about the safety and security of our water supplies.

Water quality concerns captured the public's interest in 2014 when Ohio Gov. John Kasich declared a drinking water ban that impacted 400,000 people after a massive harmful algal bloom.¹ Severe drought conditions in the American West and Midwest have also heightened concerns about dwindling national water sources: as of July 2015, California was experiencing its worst drought in recorded history.² And both water quality and quantity were compromised in 2012 when flooding from Superstorm Sandy overwhelmed drinking and wastewater infrastructure in several states in the Northeast, leaving thousands without running water and others with contaminated water.³

This guide will focus mainly on the water quantity concerns affecting states. An accompanying guide on Source Water Protection discusses many of the threats to water quality.

Threats to Water Quantity

There is growing concern that diminishing water resources will leave communities without an adequate water supply. In June 2015, NASA released data showing that human use is responsible for depleting one third of the global ground water supply.⁴ Global warming, prolonged drought, and population growth contribute to water scarcity around the world. In the United States, water scarcity is most commonly the result of either drought or the overuse and insufficient replenishment of water resources.

Drought

The protracted drought impacting western states has inspired much concern about water scarcity in the United States. In its spring 2015 outlook, the National Oceanic and Atmospheric Administration's Climate Prediction Center forecasted that the western United States will

continue to experience drought conditions, which will likely worsen.

Unlike other natural disasters, droughts occur slowly over time and do not have well-defined beginnings or ends, making their impacts chronic in nature. Because of this, many of the public health impacts of drought are difficult to identify. For example, we know that lack of water will lead to death, but long-term water scarcity is likely to impact health through less direct, more-varied economic, social, dietary, or psychological pathways.

The full range of impacts and extent to which chronic water scarcity affects health is still unknown. CDC notes that there is a “less than optimal” overall understanding of how water shortages affect public health at the community level.⁵ Recognizing the need to fill in these gaps, CDC has produced [guidance](#)⁶ for public health professionals to understand and subsequently prepare for drought.

Possible Public Health Implications of Drought⁷

- Compromised quantity and quality of drinking water.
- Increased recreational risks.
- Effects on air quality.
- Diminished living conditions related to energy, air quality, and sanitation and hygiene.
- Compromised food and nutrition.
- Increased incidence of illness and disease.

Public health is not the only sector impacted by water scarcity. Many sectors are creating policies, programs, tools, and resources aimed at addressing the impacts of water scarcity. Nowhere in the United States is this more noticeable than in California, where agriculture, energy, and personal water use compete for dwindling water resources.

California is the largest agricultural exporter in the United States, producing almost two thirds of the country’s fruits and nuts, and generating more than \$18 billion in annual revenue.⁸ The state’s agriculture sector uses vast quantities of water, but record drought is threatening this

practice. Researchers at the University of California, Davis found that drought conditions in 2014 caused the “greatest absolute reduction in water availability for California agriculture ever seen.”⁹ The current drought in California highlights the competing multi-sector demand for groundwater: water that could be used for myriad purposes like personal use, to supply extensive irrigation systems, or to generate more sustainable sources of energy, like hydroelectric power.¹⁰

California’s Interagency Drought Task Force

In December 2013, California Gov. Jerry Brown formed a drought task force to assess the state’s drought preparedness. One month later, Gov. Brown declared a drought state of emergency, and directed state officials to take all necessary actions to prepare for water shortages.¹¹ Gov. Brown ordered the task force to work with local, state, and federal agencies to address water shortages and protect public health and the environment.¹² Recognizing that representatives from agriculture, energy, health, and other sectors have key roles in formulating a drought strategy, the interagency task force includes members of the California Departments of Fish and Wildlife, Food and Agriculture, General Services, Parks and Recreation, Public Health, Social Services, and Water Resources, along with the California Energy Commission, the Governor’s Office of Emergency Services and Tribal Liaison, and the State Water Resources Control Board.¹³

Since its formation, the task force has met with city, county, and regional officials and agency staff throughout the state to learn how drought is impacting different communities.^{14,15} Task force members have also served as spokespersons, responding to public and media inquiries regarding various statewide drought actions.¹⁶ Several task force agencies have also taken action to combat drought: for example, in July 2015, the California Department of Parks and Recreation shut off all outdoor rinse stations at state parks and beaches. The department estimated that this particular measure could save upwards of 18 million gallons of water annually.¹⁷



Strategies to Address Water Shortages

Even areas with plenty of rainfall and large water reservoirs can experience water shortages. Water shortages are especially common during the summer months, when heat causes increased evaporation and water supplies are funneled into harvesting seasonal produce, recreation, and home lawn and garden care.¹⁸ These factors are especially challenging to small water systems. States have used a number of strategies to address these shortages, including water reuse, water reclamation, and use of rainwater catchment systems and grey water recycling.

Reuse

The United States Geological Survey estimates that each American uses between 80 and 100 gallons of water each day.¹⁹ Most of that water, used for personal and domestic purposes, flows down the drain to be treated and released back into surface waters for possible re-entry to the water cycle. This process may sound simple, but is in fact complex and resource intensive. Many water reuse and recycling strategies can reduce the amount of water disposed of, thereby freeing up scarce water resources for essential needs and services.

Water reuse primarily aims to decrease the total amount of water each household uses. Some water reuse options offer additional benefits, including household cost savings, decreased burden on aging infrastructure, and decreased energy use because of fewer instances of treatment needed or less intensive water treatment. These benefits could be hugely impactful, considering that Americans only use 1 to 3 percent of the reclaimed water available to them.²⁰

Reclaimed Water

Water reclamation, sometimes referred to as water recycling, is a promising strategy for conserving precious water resources. Reclaimed, or recycled, water is wastewater from household activities, including toileting, which can be used to meet various domestic, agricultural, and commercial water needs after

undergoing treatment to remove solid waste and other impurities.²¹ The extent and complexity of treatment depends on the specific reuse activity, and can range from very low tech rain water collection systems to more advanced treatment technologies.²² Ensuring the safety of recycled water is paramount, regardless of the complexity of the reuse system.

Rainwater Catchment

Rainwater (sometimes called stormwater) collection is a great water conservation strategy. Although rainwater can be treated and used as drinking water, simple catchment systems are ideal (if properly plumbed in) for a variety of domestic activities like toilet flushing, watering home lawns and gardens, and even larger scale landscaping and irrigation uses.²³ During the summer, as much as 40 percent of household water is used to water lawns and gardens.²⁴ Using rainwater to water home lawns and gardens saves money for residents, reduces strain on municipal infrastructure, and conserves water. Farmers can reap these benefits, as well, and may additionally choose to rely on catchment systems to irrigate crops when water restrictions are in effect. Catchment systems can be as simple as an open container or bucket, or include more elaborate cisterns or rain barrels. Some rain barrels are capable of holding dozens of gallons of rainwater, and can be connected to downspouts to collect water. In areas that are not served by municipal water systems, rain harvesting systems may be a primary source for drinking water.

Hawaii's Veterans Affairs Home Loans Following Guidelines for Rainwater Catchment

Many residents in rural Hawaii cannot access municipal water systems and must rely on rainwater catchment for household and domestic use.²⁵ Rainwater catchments systems have not prevented most homebuyers in these areas from securing mortgages. However, until recently, the U.S. Department of Veteran's Affairs (VA) Home Loan program denied mortgages on homes with rainwater catchment systems. In February 2014, VA announced that it would offer loans on homes that use rainwater catchments systems as long as the systems meet the local health authority requirements, or

in their absence, the maximum contaminant levels established by EPA. In addition, residents must receive a printed copy of University of Hawaii guidelines on rainwater catchment systems.²⁶

Although the Hawaii State Department of Health (HSDOH) does not regulate water catchment systems, the agency has determined that water catchment systems can be made safe for household use if certain guidelines are followed. Those guidelines include carefully designing and constructing catchment systems, as well as regularly performing maintenance and testing.²⁷ HSDOH also recommends that homeowners consider installing a treatment system and perform screening tests for E. coli bacteria, turbidity, and lead and copper using a HSDOH approved laboratory.²⁸ The rule change was the result of collaboration between elected officials, and local, state, and federal agencies.²⁹

Greywater Reuse

Another water reuse strategy is using greywater, or water that has been used during household activities like bathing, showering, hand-washing, and laundry. Greywater does not include wastewater from kitchen sinks, dishwashers, bidets, urinals, or toilets.³⁰ Like rainwater, greywater can be used to flush toilets, water lawns and gardens, and restore depleted aquifers—each use requiring a specific degree of treatment.³¹ Although there is no national policy regulating greywater use, most states have developed their own rules and regulations on acceptable uses and treatment requirements.³² The primary drawback to greywater reuse is the potential health risk associated with exposure to bacteria and other pathogens and pollutants.

Colorado's Regulation 86

In 2013, citing the need to reduce the per capita consumption of water and reduce water and wastewater treatment-related costs, Colorado Gov. John Hickenlooper signed into law a measure authorizing cities and counties to start their own programs to reuse greywater for non-drinking purposes.³³ In order for a locality to establish a greywater program, it must pass a

resolution allowing greywater use in the jurisdiction and also meet the minimum requirements set forth by the Colorado Department of Public Health and Environment (CDPHE), also known as "Regulation 86."³⁴ Although not required, Regulation 86, published in May 2015, recommends that a locality coordinate, and consider entering into a memorandum of understanding, with the local board of health, local public health agencies, and water quality and wastewater service providers and authorities prior to adopting a greywater resolution.³⁵

Other Water Conservation Strategies

Residents can employ many other water conservation practices to help prevent water shortages and mitigate the impacts of drought. Residents can make small changes that will save vast quantities of water, like turning off the faucet while they brush their teeth, collecting the water wasted while waiting for the shower to come to temperature, and only running the dishwasher when it is full.³⁶

Another simple water saving solution is repairing household plumbing leaks. According to the California Rural Water Association, a faucet leaking one drop per second wastes roughly 2,400 gallons per year.³⁷ Through small behavior changes, residents can conserve water and help mitigate the impacts of drought down the road.

Water-Saving Fixtures and Appliances

EPA estimates that showers account for 20 percent of total household water use. To reduce this percentage, individuals can consider using water-saving showerheads and faucets, also called low-flow fixtures, which are now affordable and easy to find in stores. Residents can replace a standard showerhead, which releases 4.5 gallons of water per minute, with a low-flow showerhead, which dispenses 2.5 gallons of water per minute, for less than \$5, saving 20,000 gallons of water per year in a four-person household.³⁸ In addition to water-saving fixtures, low-flow appliances like toilets, washing machines, and dishwashers are great conservation tools. According to figures

published by the Washington State Department of Health, installing a WaterSense low-flow toilet could prevent a family of four from wasting 16,000 gallons of water per year over the lifetime of each toilet, a \$2000 in savings on water utility bills.³⁹

Many water suppliers offer rebates and other incentives to their consumers when they install low-flow fixtures. For example, the Seattle Public Utilities offers free toilets for low-income homeowners and multi-family housing providers who serve low-income residents who want to replace water-wasting toilets with more efficient models.⁴⁰

WaterSense

EPA's WaterSense partnership program encourages consumer and commercial stewardship of the nation's water resources. Partners include state and local agencies, builders, retailers, manufacturers, and licensed certification providers. WaterSense's 400 local and state agency partners include the Connecticut Department of Public Health, the New York State Department of Health, the South Carolina Department of Health and Environmental Control, the Virginia Department of Health, the Washington State Department of

Health, Colorado's Boulder County Public Health Department, and Illinois' Kendall County Health Department.⁴¹ The WaterSense label helps consumers identify products and services that meet EPA's criteria for water efficiency.⁴² As an added incentive to purchase and install WaterSense products, some partners offer rebates on specific products. Visit EPA's [WaterSense web page](#) for more information.

Conclusion

The novel water saving policies and programs presented above highlight just a few of the myriad water conservation strategies that can prevent water shortages and protect public health. Some of the strategies addressed in this guide are incentive based, but other strategies aimed at increasing awareness, like water-metering, may also encourage water users to conserve. Similarly, fee-and rate-based strategies encourage conservation by helping residents avoid costly water bills.

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