



HEALTH IN ALL POLICIES: WATER

SOURCE WATER PROTECTION

For most Americans, drinking water comes from rivers, streams, springs, and underground aquifers. Keeping these source waters safe and reliable is critical for sustaining life. Consequently, source water protection requires public health's attention and engagement in cross-sector collaboration. When applied to source water protection, a HiAP approach offers unique opportunities to identify water contamination's root causes and prevent pollution. This guide will discuss threats to our water supplies and examples of collaborative efforts to protect them.

Access to safe water is threatened when drinking water sources become contaminated. Despite efforts to keep drinking water clean and safe through protective drinking water standards, rigorous testing and monitoring, and expensive treatment technologies, water supplies remain vulnerable. Even large water supplies like the Great Lakes can become contaminated, such as in Milwaukee (Cryptosporidium),¹ or Toledo (cyanobacteria toxins).² These examples represent opportunities to cultivate partnerships and consider healthier policies and programs. Perhaps most importantly, government agencies can use a HiAP approach to determine the root cause of problems and prevent their reoccurrence.

Safe Water Oversight

Ever since John Snow identified the Broad Street water pump as the source of London's cholera epidemic in 1854, public health has been associated with protecting water. Yet most state and territorial health agencies (S/THAs) do not currently regulate drinking and ground water. According to the Association of State Drinking Water Administrators, only 16 of state drinking water programs are housed in state health departments, and three are housed in mixed health/environmental departments.

In 1974, President Gerald Ford signed the Safe Drinking Water Act—the main federal law that ensures the safety of drinking water

in the United States. At the time, most, if not all, drinking water programs were located in public health departments.³ Since then, state drinking water programs have steadily moved into environmental and natural resources departments, largely due to their functional and funding similarities to environmental protection programs. In general, the state department of environmental conservation, environmental protection, or natural resources now oversees the protection of drinking and groundwater sources. Regardless of which agency has authority over it, however, source water protection requires cross-sector collaboration to achieve mutually beneficial goals. New York provides a recent example of this type of cross-sector collaboration.

New York State Department of Health Partners to Make Major Water Infrastructure Improvements

As of June 2015, New York State's budget included \$200 million for drinking water and wastewater infrastructure upgrades.⁴ The 2015 appropriation also requires the New York State Department of Health, Department of Environmental Conservation, and the New York Environmental Facilities Corporation to work together to complete these upgrades.

The funding will go to projects that improve environmental health, combined sewer

overflows, and extreme weather resiliency. At the time of the budget announcement, New York State Health Commissioner Howard Zucker said, "Ensuring the delivery of safe drinking water is an essential step in building healthier communities. The overwhelming majority of people in New York State receive their drinking water through a public water supply system. These grants will enable localities to make necessary upgrades to their water infrastructure to guarantee that future generations have the same clean drinking water we have today."⁵

Public Health and Source Water Protection

Providing safe drinking water at the tap requires a multi-barrier approach. The first barrier is protecting ground and surface drinking water supplies, with water treatment facilities and distribution systems acting as the second barrier.

There are numerous, multifaceted threats to our drinking water supplies, which can be exacerbated by extreme weather events. Contaminants introduced into drinking water supplies can be regulated contaminants, or unregulated emerging contaminants for which no convenient historical data nor regulatory protocols exist (e.g., algal toxins released from harmful algal blooms [HABs]). Many threats to source water pose significant threats to public health, but there are a variety of public health programs and tools that can help protect source water. The following examples highlight the ways in which public health is working across sectors to protect source waters.

Extreme Weather

The risks associated with climate change threaten nearly every aspect of our environment, including our access to safe water. Extreme weather events, such as heavy rains and flooding, increase opportunities for contamination because

they can carry contaminants from roadways and agricultural lands into source waters.⁶ Heavy rain and flooding can also overwhelm sewers and wastewater infrastructure, resulting in water-borne disease outbreaks like legionella and cholera.⁷ Extreme weather can also result in too little precipitation. Prolonged drought can force communities to seek out alternative water supplies, which may not have been as extensively treated as their normal water supply.

Milwaukee's Flooding Study Task Force

Milwaukee's Flooding Study Task Force illustrates how cross-sector collaboration can help protect source water from the impacts of extreme weather. In 2010, Milwaukee experienced severe floods that resulted in sewer overflows and residential and commercial property damage.⁸ In response, the city convened the Flooding Study Task Force to investigate the existing infrastructure weaknesses and devise a plan to prepare for the risks posed by climate change and future flooding. The task force identified factors that contributed to the flooding, such as aging infrastructure and outdated building codes. In its recommendations to prevent future flooding, the task force urged the city to incorporate climate change models into its sewer design, consider green infrastructure strategies like porous pavement to divert rain water, and evaluate, and where necessary separate, combined sewer systems or pipes that carry storm water runoff, as well as domestic and industrial wastewater.^{9,10,11}

Harmful Algal Blooms

Global warming and drought disrupt rivers' and streams' normal functioning. A warming climate results in increased water temperatures, which then impacts the natural balance of various microorganisms.¹² For example, naturally occurring blue-green algae, also referred to

as cyanobacteria, thrive in warm waters, and rapid, uncontrolled growth of blue-green algae results in HABs.¹³ This, warmer lakes, rivers, and coastal areas are more vulnerable to increased incidence of HABs.¹⁴ Excess nutrients from storm water or agricultural run-off also contribute significantly to the incidence and growth of HABs.

Ensuring Water Safety in Oregon¹⁵

When natural resource and environmental agencies and residents noticed an increase in HABs in Oregon's waters, they contacted the Oregon Public Health Division (OPHD) for information about the associated health impacts. There was little information available on the topic at the time, so partners came together to seek help from OPHD in developing evidence-based standards for health advisories and providing risk communication to local communities on health impacts. The stakeholder group included residents, the Oregon Lakes Association, two universities, and governmental agencies, such as local parks and recreation departments, state environmental and natural resource agencies, the state drinking water program, U.S. Army Corps of Engineers, and U.S. Forest Service.

Through CDC funding, OPHD developed much-needed educational materials, including [best practices for advisories](#).¹⁶ The funding also allowed partners to build relationships with new stakeholders through convening regular meetings and an annual conference, as well as provide training to environmental health specialists. Despite the loss of program funding years later, partner agencies still use the guidelines and educational materials, and the relationships between OPHD and stakeholders who work on HABs have continued.

Hydraulic Fracturing

Hydraulic fracturing, or fracking, is a natural gas extraction technique that has been used since the 1940s, but more extensively over the past decade due to drilling technology advances.¹⁷ Fracking sends large quantities of water, sand, and unknown chemicals deep into shale formations through cracks and crevices to force natural gas up through the well.¹⁸ The debate about whether fracking is safe centers on its environmental impacts, particularly on groundwater.¹⁹ The exact chemicals in fracking fluid are often unknown, and many companies do not have to disclose them because they're confidential business information. However, some states and the Bureau of Land Management require chemical disclosure, and many companies voluntarily provide the list of chemicals they use, though not in exact quantities.

Health impact assessments (HIAs) have been used to help address some of the health concerns associated with fracking. A HIA can incorporate health considerations into decisionmaking in non-health sectors, and is often considered a good tool in a HiAP approach. HIAs have helped localities to evaluate risks associated with existing and proposed energy projects, including natural gas extraction, as well as helped bring about new stakeholder engagement through a semi-structured process.

Health Impact Assessment for Battlement Mesa, Garfield County, Colorado

In 2010, Colorado's Garfield County Board of County Commissioners requested that the Colorado School of Public Health, in conjunction with the Garfield County Public Health Department, conduct a HIA to explore the health risks associated with a proposed natural gas development and production plan. A natural gas company's proposal included 200 natural gas wells on nine pads, a centralized water storage facility with a covered and lined waste pit, and an eight-mile water and gas pipeline to

be built within the residential planned community, Battlement Mesa.²⁰

The HIA explored a variety of potential impacts, including those related to air, water and soil quality, traffic, noise, and community wellness, as well as economic considerations.²¹ In its assessment of potential water impacts, the HIA team found that the primary drinking water source for Battlement Mesa was not likely to be impacted by the company's proposed project. The HIA was unable to determine the risk posed to ground water wells, but it did find that any water impacts would likely be community-wide and take years to remedy.

At the national level, fracking has brought together several non-health agencies to address public health concerns. In spring 2015, the U.S. Department of the Interior's Bureau of Land Management issued new rules that require companies to disclose more information about the chemicals they use in the fracking process, citing the public health concerns of ground water contamination.²² In June 2015, EPA released its draft assessment of potential impacts of fracking on drinking water sources.²³ The assessment found that fracking has not caused widespread impacts on drinking water sources, but that there are important vulnerabilities—such as fracking in shale formations that also contain drinking water resources, and spills of fracking fluid and wastewater—that must be addressed.²⁴ These formal statements acknowledge the need for health considerations in future policies and projects, which behoove multiple sectors to use HiAP approaches.

Collaboration: Breaking through Silos

Source Water Collaborative

In 2006, a diverse group of membership organizations came together to form the Source Water Collaborative (SWC) to raise

awareness about the need to protect our drinking water sources. SWC is comprised of 26 national organizations, representing public utilities, drinking water administrators, federal agencies, conservation districts, and other relevant partners.²⁵ ASTHO is a SWC member, and ASTHO's State Environmental Health Directors peer group is actively engaged SWC's efforts.

Through the group members' collective strength, SWC developed online tools and resources to help stakeholders improve water quality and source water protection. One resource is an online toolkit aimed at facilitating collaboration among diverse stakeholders.²⁶ The toolkit offers conversation starters, activities, and examples of successful collaboration that can help initiate new partnerships for source water protection, further develop existing relationships, and maintain productive partnerships.

Source Water Protection Call to Action

With more than two dozen national organizations and hundreds of state and local supporting organizations, SWC has adopted many components of HiAP in its "[A Call to Action: A Recommitment to Assessing and Protecting Sources of Drinking Water](#)."²⁷ The Call to Action leverages the authorities, resources, and expertise of diverse partners committed to working together to protect drinking water sources.²⁸ Recognizing the challenges of collaboration, such as learning to communicate effectively and overcoming institutional barriers, the Call to Action serves as a reminder that collective action can be more effective than acting independently.

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