



Secure Tomorrow Series

Scenario Narrative #1:

Water Woes

Publication: June 2024
Cybersecurity and Infrastructure Security Agency

The Cybersecurity and Infrastructure Security Agency produced these scenarios to initiate and facilitate discussion. The situations described here are hypothetical and speculative and should not be considered the position of the U.S. Government. Aside from historical references, all names, characters, organizations, and incidents portrayed in these scenarios are fictitious. Any positions expressed by fictional characters herein regarding any particular issues or technologies do not represent the positions of CISA or the federal

MY ISSUE WITH THE ISSUE

Water Woes

October 25, 2029

36 Comments

When I was growing up, my mom was a proponent of “everything in moderation,” especially around the holidays. Those who follow this blog regularly might figure it had something to do with my dad’s tendency to overindulge each December. Lately, the adage has been on my mind for entirely different reasons. We’ve been exposed to a constant barrage of news about extreme weather, most recently Hurricane Emily, which washed nearly a million people out of their homes. It has me wishing Mother Nature would show more moderation.

The United States increasingly seems unable to find the Goldilocks zone between too much water and too little. The weather map is a patchwork of regions either inundated with floods and hurricanes or parched by drought and choked by wildfires.

Meanwhile, global leaders have been all too moderate in addressing three issues that might have mitigated our water woes. Chief among these is our greenhouse gas emissions. With nations set to convene on climate on the 15-year anniversary of the Paris Agreement, I find myself frustrated that many nations, ours included, have taken a measured approach toward mitigating climate change. Another problem is our aging water infrastructure, which is ill-equipped for modern threats. And finally, breakdowns in public trust have eroded our social resilience, affecting our ability to address our water challenges. A more moderate future will require an immoderate effort in these areas today.

ATMOSPHERIC EXTREMES

Earlier this year, the Climate Change Panel of the League of Aligned Nations released a synthesis report of its Seventh Assessment on Climate Impacts. Unsurprisingly, a central theme of the report is how efforts have fallen well short of what’s necessary to limit global warming to below 1.5 °C. The panel called for drastic action to curb even more damaging effects from climate change.

To many, the Seventh Assessment doesn’t really say anything new. As one climate expert put it to me, “We could have just relabeled ‘Sixth’ with ‘Seventh,’ then inserted ‘very’ everywhere to emphasize that things will be even worse and that we need to do even more.” Nevertheless, for many Americans, the report comes at a time when they find it much easier to see the impacts of climate change in their own backyards. The term “extreme weather” feels more and more like a misnomer since extreme has become normalized. To date this year, there have been more than 160 presidential disaster declarations. The vast majority of these disasters are linked to problems with water:

- **Atmospheric rivers.** Ten years ago, few people knew what an “atmospheric river” was. Today, it has become a dreaded phenomenon on the West Coast, releasing longer and more intense bursts of rain. The phenomena captured national headlines in 2025, when a sequence of atmospheric rivers triggered more than 800 landslides, forced tens of thousands to evacuate, and killed at least 40. Since then, two additional winters of severe atmospheric rivers have assaulted the Pacific Coast. And some researchers worry the next “Big One” will be a megaflood that could unleash devastation three times as costly as a major San Andreas earthquake.
- **Drought.** We are closing out our third decade of megadrought in the Southwest. As crop yields and power generation have suffered, tensions over access to water are on the rise. The drought is undoubtedly at least partly responsible for increasing suicide rates among farmers. Yet another shutdown of barge traffic on the Mississippi River last fall backed up thousands of barges and caused major delays in getting agricultural exports to market.
- **Hurricanes.** Hurricanes pounded the United States this year, with Hurricane Emily being the fourth to make landfall. The season literally left no port in the Southeast untouched, causing billions of dollars in damage and lost productivity.
- **Wildfire.** The annual fire season has all but disappeared, with tens of thousands of wildfires consuming millions of acres year-round. This decade has already claimed three of the top five years in terms of acreage burned. Major fires in one North Central state in 2027 and the Adirondacks in 2028 shut down two major cities for days and ended any sense that forest fires were just a concern for Westerners.

THE DIFFICULT PATH TO NET ZERO

It’s no secret that the United States will fall short of its pledge to reduce greenhouse gas emissions by 50 percent to 52 percent below 2005 levels in 2030. According to the most recent outlook, the United States is on track to achieve a 35 percent emissions reduction. Even this progress was partly unearned because of slower-than-projected economic growth. Some underlying factors in key sectors include the following:

- **Transportation sector.** Despite forecasts that electric vehicles (EVs) would overtake gasoline cars by 2030, they currently account for just 38 percent of sales. Resistant buyers cite cost constraints (sticker prices only reached parity with gasoline cars this year), supply constraints, and persistent concerns over access to fast charging stations. Building a national network of EV charging stations took longer than expected, slowed by supply chain shortages and the need for grid improvements. Although nearly a half-million charging stations have been built, vandalism, maintenance, and equitable access to charging have been persistent issues.
- **Energy sector.** Progress has been uneven, with areas such as the Gulf Coast seeing slower progress toward renewables implementation at scale. Efforts to establish a Gulf-wide council to coordinate energy transition efforts never gained traction, hindering the ability to maximize federal incentives and resources. For example, workforce development and reskilling to support the energy transition has lagged, suffering from fragmented and duplicative efforts. As a result, carbon capture and geothermal companies complain of a skills shortage despite layoffs in oil exploration.
- **Industrial sector.** One bright spot has been the implementation of advanced manufacturing techniques to increase energy and operational efficiencies in manufacturing, chemicals, and

oil and gas. But new materials and greener processes haven't substantially moved the needle on greenhouse gas emissions yet.

Collectively, these and other challenges have led to a widening gap between projected versus realized emissions reductions.

AGING INFRASTRUCTURE

Another key factor contributing to our country's water woes is the poor state of existing water infrastructure. Pumping equipment and pipes in more than half of our major cities are working well beyond their intended operational lifetimes. Stressed by events such as extreme rainfall, they fail, pressure becomes intermittent, and water becomes undrinkable. In the past five years, 11 of the 25 largest U.S. cities left hundreds of thousands of residents without access to safe drinking water for weeks at a time. And water treatment plants have been challenged by new risks like cyberattacks and the "forever chemicals" perfluoroalkyl and polyfluoroalkyl substances, or PFAS. Meanwhile, the increasing frequency of massive, harmful algae blooms have made clogged infrastructure an almost annual problem for some water treatment plants.

This decade started on an optimistic note, with federal laws that included funding to upgrade water infrastructure. But the billions allocated were not enough to spread around more than 148,000 public water systems. And later in the decade, facing an economic slowdown and fearful of foreign supply chain dependencies, Congress prioritized incentivizing investment in human and physical capital for manufacturing of critical technologies such as semiconductors. Federal support for water infrastructure once again slowed to a trickle, and usage fees—which experienced only modest increases nationwide on average—couldn't compensate. Those shortfalls also slowed the development of the water workforce, even as retirements drained water utilities of critical knowledge. Water authorities reverted to the reactive status quo: operate until failure.

The 2028 shutdown of the XYZ semiconductor megaplant served as a reminder that advanced manufacturing still depends on investments in water infrastructure. The poster child for America's reemergence in semiconductor fabrication, producing some 60,000 wafers a month, XYZ was forced to shut down because of a cyberattack that targeted the standalone water treatment facility that provided essential, ultrapure water and water recycling. Like many water treatment facilities, it lacked sufficient cybersecurity, allowing criminal hackers to damage critical equipment in the water plant, which in turn crippled the factory.

AN ABSENCE OF TRUST

Access to water is considered a human right, and denial of water access has led to severe breakdowns in trust, particularly between underserved communities and government. Longstanding environmental injustice, punctuated by historic water crises created a legacy of mistrust. In 2026, the Great Lakes city of Wirlingston was struck by a 500-year rainfall event that knocked out power and water. In the days that followed, a prolonged heatwave further stressed power restoration and led to large-scale sheltering and water distribution operations for more than a week. Civic leaders and environmental justice advocates angrily denounced the systemic failure to provide safe drinking water. Three years later, a utility payments boycott threatens the local utility with bankruptcy.

In the drier West, mistrust is further complicating problems with inaccurate accounting of water, groundwater overallocation, and water rights. Two recent incidents illustrate the rising tensions. In the first, a large-scale expansion of the JKLMNO manufacturing facility was met with strong protests

about water consumption despite company promises to recycle nearly 100 percent of water used. After malicious actors vandalized a water diversion system, officials admitted they could not guarantee the physical security of water infrastructure given the large networks involved in transporting water. Instead, they focused on public education about the planned expansion. One Cybersecurity and Infrastructure Security Agency official commented, “Given the lack of trust that exists in the country about water rights, we’re concerned that individuals may be more susceptible to influence by opportunistic foreign adversaries.

A second incident of mistrust shows rising tempers over the foreign acquisition of farmland and its associated water rights. Anger has led to recent bills attempting to broaden existing state prohibitions on foreign adversaries owning American farmland. Much of this ire focused on the export of “virtual water” in the form of water-intensive commodities. Two people were even caught attempting to set nearly 100 hay bales of alfalfa for export on fire.

FINAL THOUGHTS

Climate change, aging infrastructure, and public trust all represent longstanding, tough-nut problems. They have been exacerbated by a lack of dedicated, well-resourced attention. The upcoming climate change meeting represents another opportunity to take bold steps toward addressing at least one of these problems. Moderate progress is no longer enough if we want to address our country’s current problems with water. A colleague reminded me that my mother had left out a key part of the quote. It should be: “Everything in moderation, including moderation.”