

White House Water Security and Climate Resilience Roundtable

October 31, 2024

Opportunities for the Adoption of Water Conservation Technologies and Practices

The United States is facing urgent water challenges. Water quantity is declining in many places, while demand continues to stress limited freshwater resources. Water quality concerns, especially from emerging contaminants, are also multiplying. Warming climates not only increase the demand for water but also threaten its quality. The natural circular water cycle has been disrupted by our linear, “take, use, dispose” approach to water resource management, driven by increasing urbanization and industrialization, as well as unsustainable agricultural practices. The current state of regulation, policy, and financing for water does not encourage conservation. Further complicating this challenge, a pending wave of retirements in the water sector, the “silver tsunami,” threatens the ability to respond quickly and effectively.

While these water challenges may seem daunting, opportunities for progress exist. Solving it will require the large-scale adoption of circular water principles, new approaches to financing innovation, and a highly skilled workforce.

Advancing the circular water economy

Increasing urbanization and industrialization have led to greater demand for water resources. The AI revolution is placing further strain on these resources, with data centers and semiconductor factories consuming a rapidly growing share of America’s water supply. Additionally, nearly half of water used in the United States is for agriculture. While surface waters meet a large portion of America’s needs, groundwater is an important and over-exploited resource. Many major aquifers are in decline. Although they may require hundreds or even thousands of years to recharge naturally, the use of groundwater is almost entirely unregulated or even monitored.

The circular water economy provides a way forward. A circular approach to water ensures that every drop of water is used to its most efficient and equitable purpose. Circular water reduces the costs of treatment by improving energy efficiency and provides new sources of revenue by converting waste into valuable resources. Finally, it results in a more resilient water sector, strengthening the ability to manage floods and droughts, and contributes to healthier ecosystems.

Technological innovation is needed for circular water. However, the shift towards the circular water economy is not primarily a technological challenge. Rather, it will require investment, and new ways of thinking about how we apply existing technologies as well as a new cohort of water professionals.

Redefining the economics of water

Water is critically undervalued. Water rates have been locally politicized and do not reflect water’s true cost and value. As a result, there is no incentive to conserve. Current agricultural water management practices use large amounts of water inefficiently. Underinvestment in municipal water infrastructure leads to leaking water pipes and crumbling sewage lines. Water-intensive data centers currently do not invest in reuse.

In addition to water scarcity, undervaluing water contributes to the climate crisis. The water sector generates twice as much greenhouse gas emissions as the aviation sector. Water is also the primary channel for climate impacts, including flooding and increasingly severe storms. Combined storm and

sewer overflows lead to untreated sewage entering our waterways. Our current infrastructure is not climate-resilient, but there is little incentive to upgrade until disaster strikes.

Finally, the undervaluing of water leads to inequity. Underinvestment in infrastructure impacts underserved communities at a higher proportion. Without incentives to conserve and operate efficiently, utilities increase rates to “replace-in-kind” rather than investing in conservation technologies. This results in higher costs for lower-quality services.

To overcome these water challenges, we must value water at what it is worth. Making this shift requires new ways of funding, financing, and regulating water. Economic incentives can encourage more efficient use of water and drive investment. For example, subsidies and tax credits can support the development and adoption of conservation technologies. Rate-setting processes could prioritize conservation measures and incorporate the full social and environmental cost of water. More effective monitoring and regulation of groundwater could encourage more efficient use. Innovative approaches to procurement could allow utilities to incorporate new technologies more easily. A new way of thinking about water and its value can spur the transformation to a circular water economy. However, this transformation will not happen without the people in place to support it.

Creating the next-generation water workforce

A skilled, dynamic and diverse water workforce is key to both water security and a strong and sustainable economy. However, a large cohort of skilled utility operators will be retiring soon, and many utilities, particularly those in rural and underserved communities, are struggling to replace them. Additionally, strong competition from other industries is a serious hiring constraint. Addressing the most acute supply gaps is critical, but it is equally important to adapt to changing demographics and workforce expectations. Finally, both new and existing workers will need more advanced skills to support the circular water economy transformation.

To support innovation and build water security, we must identify and train the next generation of water professionals. The first step is making sure jobseekers are aware of the opportunities in the water sector. Water jobs are well-paid, stable, and provide a clear career pathway. Water jobs are also green jobs, helping support a healthier population and a more resilient planet. While raising awareness of these job opportunities, a coordinated effort to link jobseekers, educational institutions, and employers is also needed.