

H₂O Outlook: Virginia

The Path to Advance
Drinking Water Equity



February 2023



Virginia
Health Catalyst
The Intersection of Overall
Health and Oral Health

Preface

Virginia Health Catalyst believes everyone in the Commonwealth deserves to be as healthy as possible. Founded in 2010, Catalyst's roots are in oral health advocacy and education, with a mission to ensure equitable access to comprehensive healthcare that includes oral health for all Virginians. Battles for policy changes, like Medicaid expansion (2019) and an adult dental benefit for Medicaid members (2021), and countless learning opportunities for clinicians and community advocates built a strong network of partners for Catalyst and proved our ability to affect meaningful change in Virginia.

In the oral health community, we know that drinking tap water that contains the proper amount of fluoride, a naturally occurring mineral, can reduce cavities in children and adults and keep teeth strong. Catalyst works to ensure proper fluoridation in Virginia's public drinking water so everyone can access this inexpensive and effective intervention. Over the years, we began to understand that drinking water is more complex than we realized. We learned trust in tap water is declining so fewer people are drinking their tap water, and that access to safe water is not guaranteed.

We broadened our efforts to ensure equitable access to safe, affordable, and fluoridated drinking water that is trusted and preferred by all Virginians.

We searched for a Virginia-specific group or organization that was working to systemically address drinking water challenges with the goal of improving health. While we did not find such a group, we met many experts working in different aspects of drinking water who were more than ready to tackle these issues with an interdisciplinary team. As a result, the Water Equity Taskforce (WET) was born. WET is the only statewide collective of water advocates working towards a healthier Virginia by advancing drinking water equity.

Since 2019, WET has worked to understand the complexity of drinking water in Virginia and identify possible solutions, culminating in this H2Outlook report. Catalyst staff and members of WET developed this report to provide a path forward for the Commonwealth to ensure that more Virginians can afford, trust, and drink safe tap water.

Key Definitions

Water equity means all individuals have equal and fair access to safe, affordable drinking water that they can trust.

Virginia's Water Network includes all the various stakeholders that manage and maintain and depend on water. This includes individual and private wells, well drillers, water utility staff, governmental agencies, technical support staff, and more.

Executive Summary

Water is the healthiest beverage available. Drinking water is one of the simplest and least expensive ways to maintain and promote health. Drinking an adequate amount of water ensures our bodies function effectively, and fluoridated water prevents dental cavities. Water is essential to life.

Virginia has some of the safest drinking water in the nation. Most people have reliable access to this vital resource, but safe, affordable tap water is not a guarantee for everyone. Across the country, water crises that leave communities without clean water garner national attention. As a result, trust in and consumption of drinking water suffer.

We, as advocates for a healthier Virginia, must apply focus, commitment, and investment in Virginia's drinking water network. By improving access to safe, affordable drinking water that is trusted and preferred, we can advance water equity in the Commonwealth.

Now is the time to protect our drinking water.

The H2Outlook report provides a path forward to achieve three recommendations to improve drinking water equity in Virginia. These recommendations build upon a foundation of state support to develop sustainable solutions to ensure safe, affordable drinking water for all Virginians – for current and future generations.

Members of Virginia's Water Equity Taskforce (WET) developed the H2Outlook report. WET, facilitated by Virginia Health Catalyst, is the only statewide collective of water advocates working towards a healthier Virginia by advancing drinking water equity.

This is a call to action: join the Water Equity Taskforce (WET) in our mission to ensure equitable access to safe, affordable, and fluoridated drinking water that is trusted and preferred by all Virginians.

Recommendations to Advance Drinking Water Equity

1 Advance drinking water equity through cross-sector collaboration.

Partners in Virginia's drinking water network must collaborate to ensure sustainability and strength. This work demands an unapologetic eye for equity and community engagement to build trust in Virginia's drinking water.

2 Maximize Virginia's current drinking water network.

Policies that support safe, affordable water for all Virginians must invest in infrastructure, technical assistance, workforce development, and public education.

3 Plan for and invest in the future of drinking water in Virginia.

To plan for the future, we must build a network that meets our current needs and fosters resilience in the face of a changing climate.



Background

Safe, fluoridated drinking water is essential to individual health.

Water is the healthiest drink for children and adults and keeps our bodies functioning effectively.

- Proper hydration improves concentration and focus, supports the immune system, and reduces fatigue.¹
- Staying hydrated is essential for everyone, particularly young kids - water makes up a much higher proportion of their bodies (as much as 78%).²

Water has no calories, so it can also help manage body weight and reduce calorie intake when substituted for drinks with calories, such as sweet tea or regular soda.

- Sugary drinks are the single largest source of added sugar in the U.S. diet³ and contribute to obesity, which affects roughly 1 in 8 Virginia high school students.⁴
- People who drink two or more sugary drinks daily have a 21% higher risk of early death from heart disease or other causes.⁵

Community water fluoridation is the process of adjusting the amount of fluoride, a naturally occurring mineral, in drinking water to a level recommended for preventing tooth decay. At a time when 75 million Americans lack dental insurance, community water fluoridation offers an easy, inexpensive preventive strategy to improve and promote oral health.

- Drinking fluoridated water can reduce tooth decay by as much as 25% in children and adults.⁶
- Nearly 6.7 million Virginians benefit from receiving optimally fluoridated drinking water from public sources.⁷

Encouraging more Virginians to make fluoridated tap water their preferred beverage may improve health outcomes across the Commonwealth. Yet, too few Virginians are drinking it.

We have the right to safe drinking water.

The United Nations ratified the Human Right to Water and Sanitation in 2010, and Virginia codified the Human Right to Water in 2021.⁸ This resolution affirms the right to clean, potable, and affordable water for all Virginians. It paves the way for the Commonwealth to act against threats facing drinking water equity, like unaffordable water bills, aging infrastructure, and the impacts from extreme weather events.

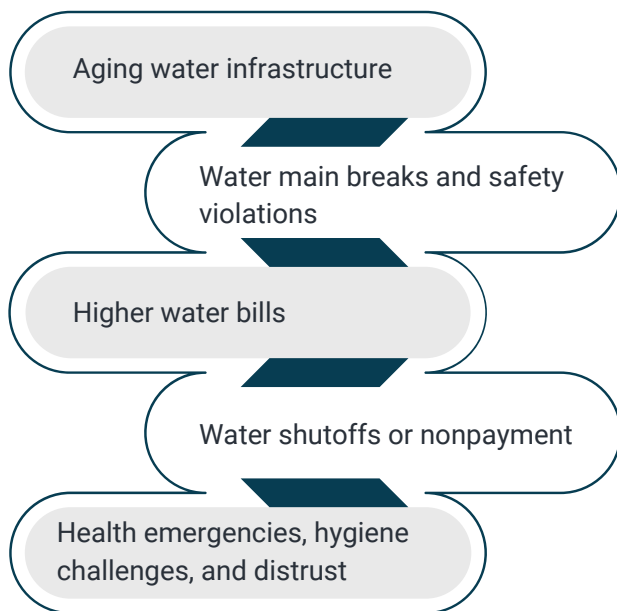
Yet, the guarantee of safe, affordable drinking water for everyone in the Commonwealth remains elusive. Our water infrastructure is aging; leaks, delivery failures, and deteriorating pipelines are real risks communities face today. In addition, climate change adds pressure to infrastructure and communities through intense weather events (like flooding, power outages, and sea-level rise).

Initiatives at the federal level are working to alleviate a few specific issues. The Bipartisan Infrastructure Act provides grants for lead pipe replacement and other infrastructure investments. The Environmental Protection Agency is working to improve regulations for chemical and physical pollutants, like issuing new recommendations like PFAS.⁹

However, there is still much work to be done to impact change at the systems level and improve all aspects of drinking water. Understanding the history of water inequities and the decisions that created these issues will guide us towards the solutions.

Communities face various forms of drinking water stress.

When drinking water is inaccessible, unsafe, unaffordable, not fluoridated, or untrusted, these stressors are connected and multiply with each added layer. Communities of color are more likely to be impacted by these multi-layered stressors.¹⁰



While a lack of investment puts water quality and access at risk, climate change exacerbates the problem further. Extreme weather events like flooding and drought add stress to an already fragile water infrastructure.

As these stressors accumulate, a drinking water crisis is more likely to occur. The fragility of the nation's drinking water perpetuates uncertainty and distrust continues to grow.¹¹

Communities experiencing these crises are right to not trust a system that fails them. And, as these stories are shared, distrust spreads across the nation. The challenge is that when these problems are corrected, the distrust remains. An estimated 59 million Americans, who have access to safe tap water, avoid it.¹²

As we develop strategies to address issues relating to water access, affordability, and quality, we need to remember building trust is a never-ending process, and that all parts of a community should be involved in finding solutions.

A community that is frequently overlooked are renters; 33% of Virginians rent their home.¹³ Landlords are required to ensure each residence has hot water, but water quality is not the landlord's responsibility. If tenants have a water quality concern, they have few protections and little leverage to get the landlord to address water safety or quality issues.¹⁴ There is no public information about renter water quality concerns.

Until data about drinking water insecurity in Virginia exists, we rely on national and global data to provide insight into these challenges.

Affordability

- Water utility bills grew more than twice as fast as inflation between 1996 and 2018,¹⁵ and rising water rates are most likely to impact communities of color.¹⁶
- The lowest 20% of earners in America pay almost one-fifth of their monthly income on water.¹⁷
- For those who rely on private wells, the costs associated with maintenance and installation can be prohibitive.

Access

- More than two million Americans live without running water and basic indoor plumbing, and over 30 million Americans live in areas with water systems that violate water quality standards.¹⁸
- Public water systems that regularly violate the Safe Drinking Water Act are 40% more likely to serve people of color and take longer to come back into compliance among communities of color.¹⁹

Trust

- Nearly 60 million Americans don't drink or prefer tap water.²⁰
- Since the pandemic, 25% of Black Americans drank more bottled water, while fewer than 10% of white Americans changed their habits.²¹
- Black and Hispanic households nationwide were more likely not to drink tap water after the Flint water crisis.²²

We must not overlook the unique challenges of those dependent on private water sources, such as wells.

Not everyone has access to municipal water; many Virginians (approximately 20%)²³ rely on private water, most commonly a drilled well. Wells exist everywhere, in rural, urban, and suburban areas. Every county in Virginia has residents who rely on private wells for drinking water. Even though many people rely on wells, there are a lot of misconceptions about private well water.

Wells are expensive to build and maintain. The owner is responsible for testing, maintenance, and repair. People who can't afford these measures are at risk of having no water or poor water quality.

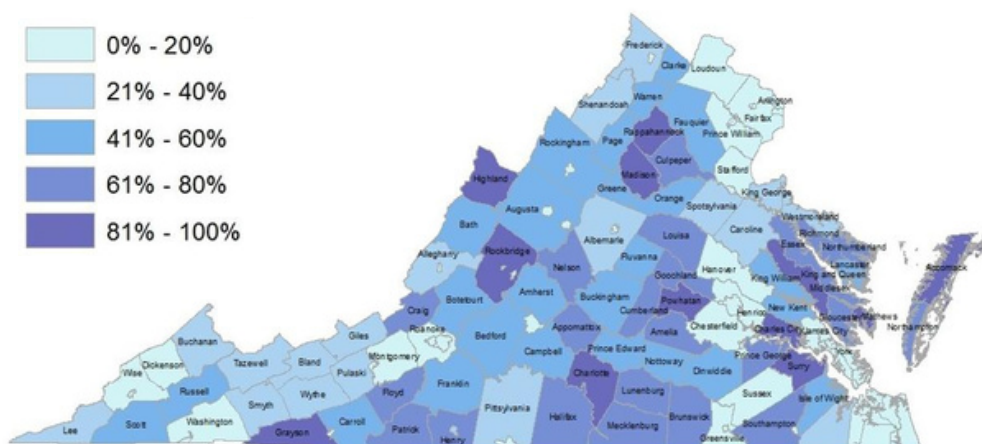
There is no national or state program that monitors water quality in private wells. In Virginia, the construction and location of private wells are regulated by the Virginia Department of Health, but well water is only required to be tested once – right after the well is drilled—regardless of how long the well has been used for drinking water.

Very few well owners test their well water as frequently as recommended. The Virginia Household Water Quality Program at Virginia Tech finds that water from private wells often fails to meet the standards set by the Safe Drinking Water Act (SDWA).²⁴ Furthermore, the SDWA, the primary federal law governing the health of the nation's drinking water, does not apply to private drinking water wells. As a result, approximately 42 million people in the United States rely on unregulated drinking water, primarily from private wells.

Private water systems are especially at risk to changes that may occur due to climate change. Unlike public systems, private water users cannot rely on utilities to prepare and plan for extreme weather or rising sea levels.

Well owners may have difficulty finding public information regarding the safety well water. Although public, county records are often outdated, incomplete, or do not contain basic information, such as the year the well was drilled and tested, and furthermore only apply to wells constructed after 1990. Virginia's Office of Environmental Services provides resources to support private well owners, but their capacity and funding for technical assistance, testing, remediation, and replacement is limited.

Percent of Population on Private Wells by County



1. Advance drinking water equity through cross-sector collaboration.

Drinking water needs more advocates and support.

Most people don't think about drinking water until there's an issue. Drinking water infrastructure is out of sight and mind, so it is easy to forget about problems like inadequate funding and deteriorating infrastructure. We need to continue building a network of drinking water advocates to improve drinking water equity.

Ninety-five percent of water infrastructure spending occurs at the community level²⁵ While state and federal agencies are integral in regulation and funding, communities must be at the core of decisions made about water. Ensuring that folks are aware of utility board elections, local policies, or infrastructure decisions, can make the system more equitable. Change happens at the community level, and we must all be part of the solution.

Community members play a vital role in decision-making.

Utilities must establish a relationship and communicate regularly with the communities they serve. These connections can help utilities reach customers in meaningful and lasting ways. Communities can share issues they experience with their utility and help consider possible solutions.

For example, communities are rarely involved in the decision to set drinking water rates for water bills. These are usually determined by a municipality or utility board (the SEC regulates rates for private water companies). These organizations may not always reflect the communities they serve.²⁶ Utility rates are projected to increase by approximately 4% per year from 2022 through 2026.²⁷

While the funds from water bills support repairs and upgrades at utilities, ratepayers often don't know or are not told, what that money is used for. Engaging customers in rate-setting discussions is a way to increase understanding and transparency.

We need to rebuild trust in tap water.

Most Virginians have safe drinking water. Trust in the safety of that water is critical to actually drinking it. Several drinking water emergencies that received national attention led to a decline of trust in tap water, which has implications beyond individual health.

When people trust that the government can and will provide this essential service, it can lead to more social investment. Seeing the connection between their water utility bill and the quality of drinking water in their homes can increase support for changes to improve and fortify the drinking water system.

"To equitably and successfully carry out [drinking water] solutions, it's imperative to directly engage with community members to deeply understand how the problems directly impact them. Likewise, to formulate solutions that are equitable and truly work—and to get utilities and city officials to prioritize equitable investments in under-invested areas—you must directly engage with members of the community when identifying solutions."

-River Network



We can improve communication about drinking water.

There are many misconceptions about drinking water, and finding the facts can be difficult. Water utilities have only one required communication with their customers (other than in times of emergency); the Consumer Confidence Report (CCR) is an annual water quality report, and is mandated by the Environmental Protection Agency (EPA). CCRs are often hard to understand. A national review of CCR's found that they are written at an 11th-grade reading level, far higher than the recommended 8th-grade reading level for the general public. Some CCRs may even cause people to trust their water *less* after reading them.^{28, 29}

Start today to improve communication and trust.

We can address misconceptions about tap water and promote consumption by incorporating drinking water educational opportunities in already existing systems; these are a few examples.

- Children need access to safe drinking water at schools. Provide reusable water bottles and filling stations to promote health and develop healthy habits at a young age.
- Dentists can serve as an advocate for public water systems by asking patients where their water comes from and recommending fluoridated tap water over bottled (if possible and safe).
- As trusted community voices, midwives and doulas can share information on drinking water with new and nursing parents. Safe tap water is recommended for infant formula and nursing parents to improve the health of parents and babies.



Strategies to advance drinking water equity through cross-sector collaboration:

- Promote drinking water as a public health necessity through education and community engagement.
- Develop and improve effective communications to build trust in tap water.
- Build relationships between water utilities and the communities they serve.
- Gather support for drinking water in Virginia's legislature and identify key decision-makers.
- Establish a coalition of drinking water advocates in the public, private, and philanthropic sectors to implement the strategies identified in this report.

2. Maximize Virginia's current drinking water network.

Providing safe drinking water is one of the government's fundamental responsibilities.

People rely on water every day – it's a vital resource. Local, state, and federal governments share the management of the complex systems that keep drinking water safe. While most people aren't likely to think of it as a government service, drinking tap water is one of the most personal and frequent ways people interact with their local government.

Most people in America have reliable, safe drinking water in their homes. Unfortunately, some drinking water systems lack adequate support, oversight, and funding, preventing the guarantee of safe water for communities through leaks, system failures, old lead service lines, etc. Black and Brown communities receive fewer investments than White communities and experience higher rates of water insecurity.³⁰ Despite a history of community members voicing concerns and predicting impending crises, these calls for help often go unaddressed. The lead crises in Washington, DC, and Flint, MI, and the crumbling infrastructure of Jackson, MS, and Duquesne, PA are not alone. Water systems are failing everywhere, in every state.

How we got here; the complexity of the American drinking water system.

The drinking water funding and infrastructure crisis did not occur overnight. Support for the infrastructure, technology, and workforce necessary to maintain systems that deliver safe water to our homes is expensive. Years of inadequate funding and support have crippled this system, but it didn't start this way.

The American drinking water system, as we know it, was born with the Safe Drinking Water Act (SDWA). Passed in 1970, the SDWA was the first federal legislation establishing drinking water quality protections. To meet these new standards, states needed to invest heavily in utilities. The federal government developed the Drinking Water State Revolving Fund (DWSRF) to support states with loans to meet these standards.

The DWSRF funds have greatly diminished over time, and states have had to try to make up the difference. Adjusted for inflation, the federal cost-share of water utility capital investment has fallen from 63% in 1977 to less than 10% in recent years.³¹ As water systems work to provide reliable, safe drinking water, they can struggle to make necessary infrastructure investments to ensure future operations. We see the implications of this today as most of the nation's water infrastructure was built over 70 years ago.

The federal government is working to rectify this. The Bipartisan Infrastructure Act (BIA) allocated \$63 billion to water nationally.³² While this is five times greater than historic funding,³³ it is far less than what is needed. For example, the BIA provides a quarter of the funding needed to replace lead service lines nationwide and perhaps 10% of the total investment required for drinking water infrastructure repairs alone.

In 2021, the federal government funded the Low-Income Household Water Assistance Program (LIHWAP), the first program to support low-income families with their water and wastewater bills.³⁴ This assistance is much needed as water and wastewater bills continue to rise, however, despite being widely successful, LIHWAP is a temporary emergency program set to end by December 31, 2023.³⁵

Virginia's Drinking Water Program works to provide safe drinking water.

Virginia is fortunate to have some of the safest drinking water in the nation. We must work continuously to bolster our drinking water program, managed by the Virginia Department of Health - Office of Drinking Water (ODW). The role of ODW is to protect public health by ensuring all drinking water is safe and meets SDWA requirements. ODW accomplishes this by working with local governments and health districts to support water utilities, monitor water quality, and administer state and federal grants and loans to utilities in need of help.

ODW sees the financial burden on Virginia's local governments and customers to maintain federal standards. For example, the latest assessment of Virginia's public drinking water shows that the Commonwealth needs nearly \$8.1 billion to maintain drinking water systems over the next 20 years.³⁶ Between 2000 to 2012, Congress awarded Virginia \$200 million in federal assistance, less than 10% of the state's total needs.

There has been a recent change in the tide of water funding. Virginia received \$88 million for drinking water in the first year of the BIA funding.³⁷ Larger utilities with staff focused on securing funding opportunities can take advantage of these funds more easily than smaller ones. Small utilities often have very few staff and can struggle to secure funding due to limited capacity. Resources and support are needed to ensure water operators can manage small utilities effectively.

Community water fluoridation protects oral health.

Today, 96% of Virginias whose homes are served by public water systems receive fluoridated water. Since the 1950s, fluoride administered through community water fluoridation (CFW) programs has drastically reduced tooth decay³⁸ throughout the Commonwealth of Virginia - and across the nation. CWF is a safe, effective, and common public health intervention. CWF is recommended by the Community Preventive Services Task Force (CPSTF),³⁹ the American Dental Association, the American Academy of Pediatrics, the US Public Health Service, the World Health Organization, and others.

Virginia should maintain and protect its CWF program; and, continue to serve as a model for other states across the US. The national program Healthy People has set its 2030 objectives to include increasing the national proportion of those served by community systems with optimally fluoridated water (OH-11) from 72.8% to 77.1%.⁴⁰



Strategies to maximize Virginia's current drinking water network:

- Invest in Virginia's Office of Drinking Water to ensure every water system has the resources (workforce, technology, infrastructure, funding) needed to provide safe drinking water consistently; and has the support and capacity required to meet the needs of the changing public water sector.
- Invest in training all utility owners (public and private) and utility board members (including town councils) on waterworks management.
- Secure community water fluoridation for all public drinking water systems.
- Invest in the systems that support private well owners, such as the Virginia Office of Environmental Health which oversees private wells to ensure they have the resources (workforce, technology, infrastructure) to meet the needs of well owners; and the water quality testing programs that provide affordable testing and education about well water maintenance.
- Ensure Virginia's budget, policies, codes, and regulations are designed to support and fortify an equitable drinking water network.

3. Plan for and invest in the future of drinking water in Virginia.

A changing climate continues to put our drinking water supplies at risk.

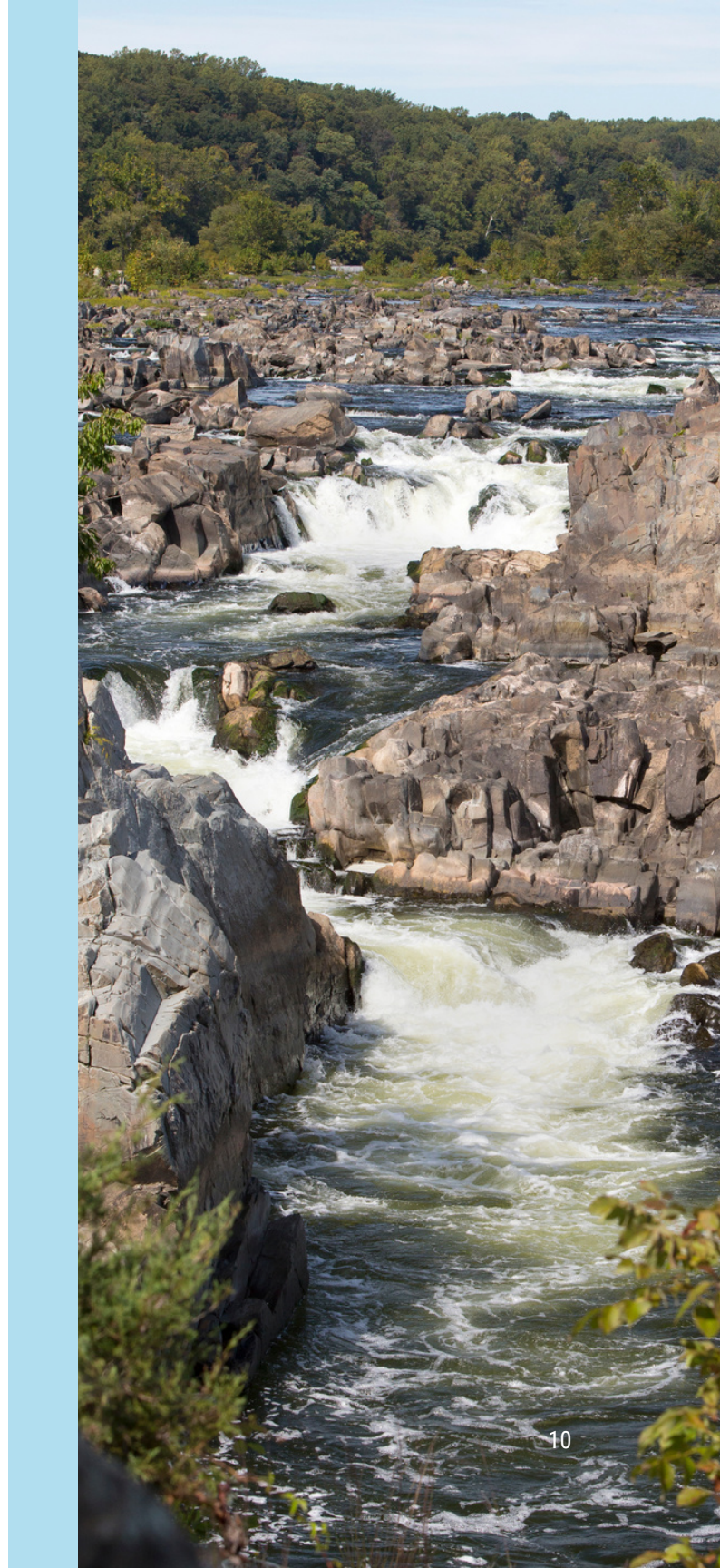
Water comes from either groundwater (below ground) or surface water (above ground) sources. Many of the nation's larger water systems use surface water sources such as lakes, reservoirs, rivers, and streams; and most well water is extracted from groundwater aquifers. The Department of Environmental Quality and the Department of Forestry work to protect water at the source, but more extreme weather patterns risk compromising drinking water for millions of Americans.

We directly experience the effects of climate change through our water resources. Around 74% of natural disasters between 2001 and 2018 were water-related, including droughts and floods.⁴¹ These events complicate a utility's ability to provide water and add stressors to communities that rely on private wells.

If our water network is unprepared – or underfunded to prepare for these disasters – those already at risk will be hit hardest. Any effort to secure safe and affordable water for Virginians needs to consider the impacts of climate change.

Drinking water must be a priority because bottled water is not a permanent solution.

If people need to supplement their water source in an emergency, they turn to bottled water, but bottled water is not a permanent solution. Not only is bottled water much more expensive than tap water – up to 300 times more expensive⁴² – it is also not guaranteed to be safer than tap water.⁴³ Bottled water is not regulated the same way or by the same agency as tap water and is monitored and tested less frequently than tap water.⁴⁴ It is also generally not fluoridated and adds to plastic waste.



We need to learn more about Virginians' experiences.

To increase our understanding of water insecurity in Virginia, we need to understand the scope of the problem. That means investing in the collection and dissemination of Virginia-specific drinking water data, such as:

- How many Virginians do not have reliable access to safe drinking water in their home?
- How many Virginians experience water shutoffs?
- How many Virginians struggle to pay private well maintenance and repair costs?
- Do any regions disproportionately struggle to afford drinking water?

This information is crucial to engaging communities and identifying equitable solutions to water insecurity.



Strategies to plan for and invest in the future of drinking water in Virginia:

- Investigate and research drinking water concerns to determine which communities already experience water access challenges and what water systems are vulnerable to future crises.
- Identify and support the implementation of innovative technologies necessary for an equitable water future.
- Develop a water affordability plan that meets the needs of Virginians and ensures sustainable funding for utilities.
- Advocate for policies that ensure Virginia can protect our drinking water system and proactively plan for future needs, such as re-imagined water rates informed by community voices, and funding streams to ensure water systems can deliver safe water and make necessary capital improvements to build a resilient system.
- Support well owners by improving access to and fortifying resources, such as water testing, well remediation, and well replacement funding.
- Protect water quality at the source through environmental measures such as vegetated buffers, prevention of industrial discharges immediately upstream of water intakes, and other similar measures.

Conclusion

The Water Equity Taskforce (WET) has examined the issues surrounding our drinking water systems in Virginia:

- A history of inequitable investment in infrastructure,
- A lack of trust in safe tap water, and
- The unique challenges of public and private drinking water.

No one person or organization can tackle these alone – and there isn't a silver bullet to fix every issue around drinking water. However, WET provides a path forward through the collaborative implementation of the recommendations in this report. We believe in a future of equitable access to safe, affordable, and fluoridated drinking water that is trusted and preferred by all Virginians.

Support drinking water today!



Read and share this report with partners; and invite them to join us.



Talk to your friends, family, and professional network about drinking water. Do they trust and drink their tap water? Why or why not?



Advocate for local and state policies to advance drinking water equity.



Be part of the solution. Join us by contacting Chloe Van Zandt to learn more about the Water Equity Taskforce.



Many thanks to the members of the Water Equity Taskforce who gave time and insight to develop this report. See the back of the report for a full list of members.

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