

State of the Water Industry



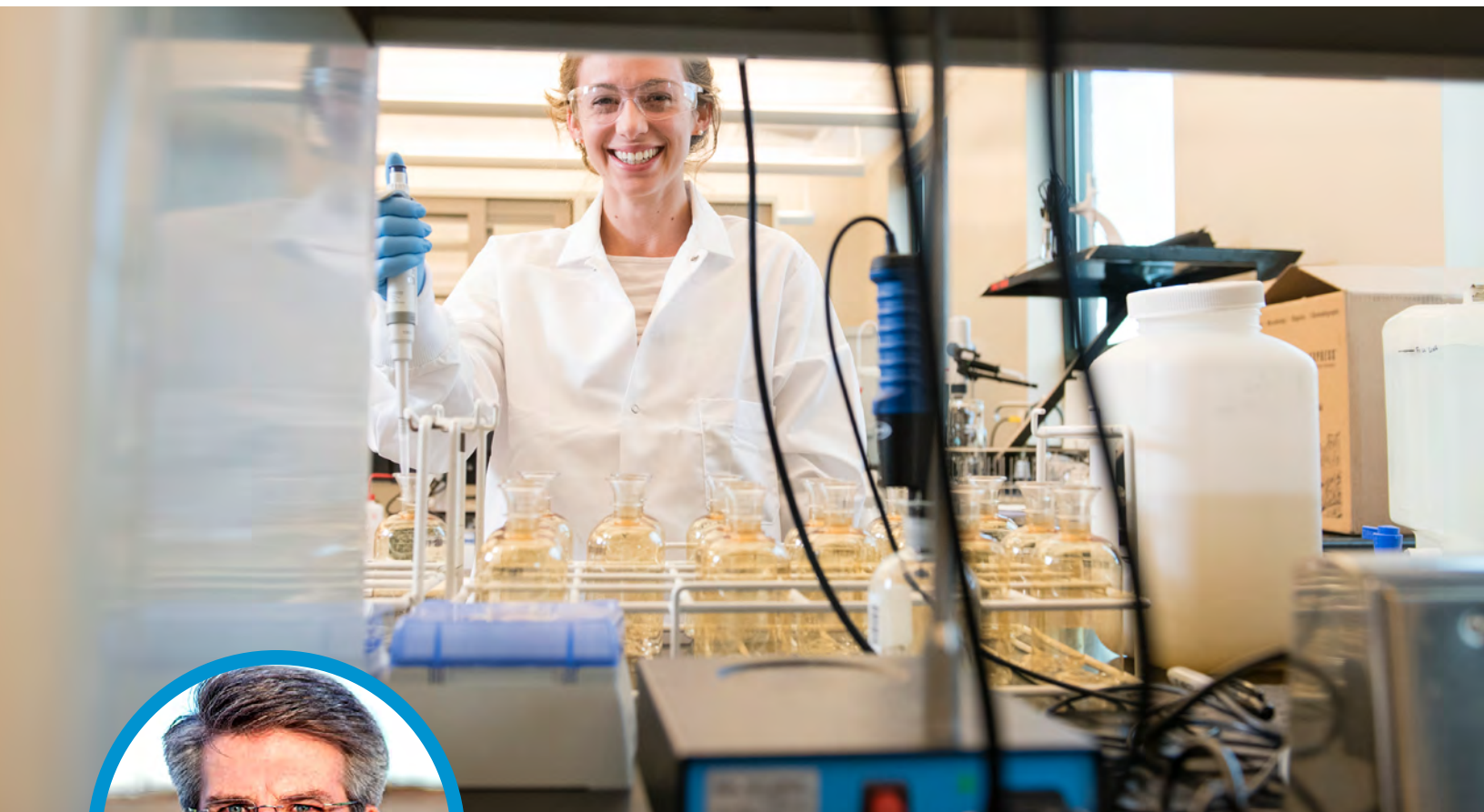
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**American Water Works
Association**

Dedicated to the World's Most Important Resource®

2020



“I strongly believe in the truth of this data, even though optimism may seem questionable now as the water sector wrestles with the COVID-19 pandemic. Let’s remember this survey reflects our feelings in 2019. More importantly, let’s remember that even in the face of this year’s broad health concerns with COVID-19, utilities continue providing the vital service of keeping safe water flowing 24/7. So, yes, we should be optimistic. Our place in society is essential to the health and prosperity of each community, and we have the expertise, professional collaborations, knowledge, and access to technical resources to solve water’s challenges—today and tomorrow. I suspect next year’s results will again prove this is the case.”

— David LaFrance, AWWA Chief Executive Officer

Inside

THE STATE OF THE WATER INDUSTRY survey is designed to identify water sector challenges and to investigate the underlying causes and drivers. As water professionals know, it is complex. In this year's report, the glass is half full. There were no surprise responses to the big questions of what the water community is most worried about and what factors impact those issues. The water sector is focused.

When the survey closed in November 2019, an unprecedented 3,351 water professionals had shared their opinions by responding to the survey. This is notably up 39% from 2019.

For the third year in a row, water professionals responded positively, indicating they felt very good about their business now and in the future. We are happy to report that the response for the 2020 SOTWI survey (4.90 on a scale of 1–7) is the most optimistic in the 16 years of the survey.

The current regional health of the sector as rated by respondents is 5.22; looking forward five years, the anticipated soundness of the

water sector in the region where the respondents worked most often was rated 5.10. This local optimism is likely driven by a better understanding of the water systems in the areas in which respondents work, and perhaps they are working to support those same systems.

The top 10 issues facing the water sector remain similar to past years with infrastructure renewal and replacement—and finding the money to make that happen—topping the list. Utilities are indicating that infrastructure needs will be the largest expenditure in 2020, and there is a plan for financing and funding these improvements.

Extreme weather events were identified as the most negatively impactful large-scale phenomena for a second year in a row. The good news: Utilities are prepared with 90% of respondents indicating they have started or are in the process of implementing an emergency preparedness plan.

Service providers, an important segment of water professionals, weighed in on their concerns for the North American market and business abroad. When asked what they believed held the most promise for innovation, a majority indicated advanced water treatment technologies related to potable water reuse.

AWWA thanks everyone who so generously gave of their time to participate in the survey. We look forward to your input later this year. The Technical and Research Program team welcomes your feedback. You can reach us at research@awwa.org.

Executive Summary

SINCE ITS INCEPTION IN 2004, the State of the Water Industry (SOTWI) survey has focused on three primary objectives:

- To develop valuable insights regarding key water sector issues
- To identify important issues not being adequately addressed to raise awareness and assign a higher priority for these issues
- To identify and track significant water sector trends

In addition to these objectives, the SOTWI survey is fundamentally focused on using the data collected to guide the sector toward greater soundness, help water professionals perform essential roles more effectively, and get ahead of emerging issues before they develop into a crisis.

When the survey closed in November 2019, an unprecedented 3,351 water professionals had shared their perspectives of the water sector. As in previous years, the individuals who responded to the SOTWI survey tended to be seasoned water professionals, with 45% reporting 20 or more years of experience. The largest group

of respondents (62%) represented water utilities, followed by 16% of respondents representing consulting firms/consultants (i.e., firms or individuals providing technical and engineering services to the water sector). The remaining respondents were individuals associated with the water community through service providers, academia, science, and regulatory bodies, as well as retired water professionals.

The SOTWI survey starts by asking respondents to rate the overall health of the water sector today as well as their expectations of soundness five years in the future. For the third year in a row, water professionals responded positively, indicating they felt very good about their business now and in the future. We are happy to report that the response for the 2020 SOTWI survey is the most optimistic it has ever been in the 16 years of the survey. No direct cause has been determined. However, respondents continue to be slightly cautious about the future of water.

The issues and challenges reported remain similar to previous years. Aging infrastructure and how to finance the much-needed renewal and/or replacement (R&R) of infrastructure once again topped this year's list of water sector concerns, followed by long-term water supply availability. Utilities indicated that they see their access to capital has been declining since 2017; 46% of utilities reported their access to capital is as good as or better than any time in the past five years. Utility executives and financial officers indicated that a variety of sources will be used for capital improvement funding in 2020, with rate increases being the most mentioned revenue source.

Utilities face resistance to rate increases, noting that all customers would react negatively to them. Communication issues continue to be a low priority.

Extreme weather events ranked as the most negatively impactful phenomena challenging utility risk and resilience. Recognizing

this, more than 90% of responding utilities have implemented or are in the process of developing an emergency preparedness plan, and 69% have implemented or are in the process of developing a community risk and resilience assessment.

Utilities are also concerned about nonpoint pollution and per- and polyfluoroalkyl substances (PFAS); they remain reasonably confident of current water supplies and indicated minor movement toward exploring alternative water sources.

New in 2020: The SOTWI survey asked those doing business in the water sector what impacts are of concern, where in the world they see viable water markets, and what are the roadblocks to developing those overseas business interests. Cost, pricing, and low-bid mentality were the highest-ranked concerns for doing business in the North American market. This group of water professionals also sees advanced water treatment related to potable water reuse as holding the most promise for innovation.

State of the Water Industry

THE SOTWI IS AWWA'S ANNUAL SURVEY that provides an industry-wide self-assessment, gathering information to support the water community's major tenets, which include safeguarding public health, supporting and strengthening communities, and protecting the environment.

As has been done since the beginning of the survey in 2004, the 2020 survey asked participants for their opinion of the current and future health of the water sector through the following questions. The scale is from 1 to 7, where 1 is "not at all sound" and 7 is "very sound."

In your opinion, what is the current overall state of the water industry?

Looking forward, how sound will the overall state of the water industry be five years from now?

Figure 1 shows the trend of the average scores as rated by all participants in response to these two questions since 2004. The current health of the water sector as rated by all respondents is 4.90, marking the most positive response on the state of the water industry since the inception of this survey in 2004. This value is also up from a low of 4.34 in 2017, marking a third year with scores on the rise. No specific reasons are associated with the increase. Looking forward five years, the anticipated soundness of the water sector also saw an incline from 4.34 in 2017 to 4.71 in 2020.

Although the minimum error associated with these responses cannot be estimated, it is reasonable to report that there has not been a great difference in the scores related to the water industry's health over the past several years. However, based on more than 3,100 responses to these two questions, the overall health or state of the water industry for 2020 is above the running average of 4.6.

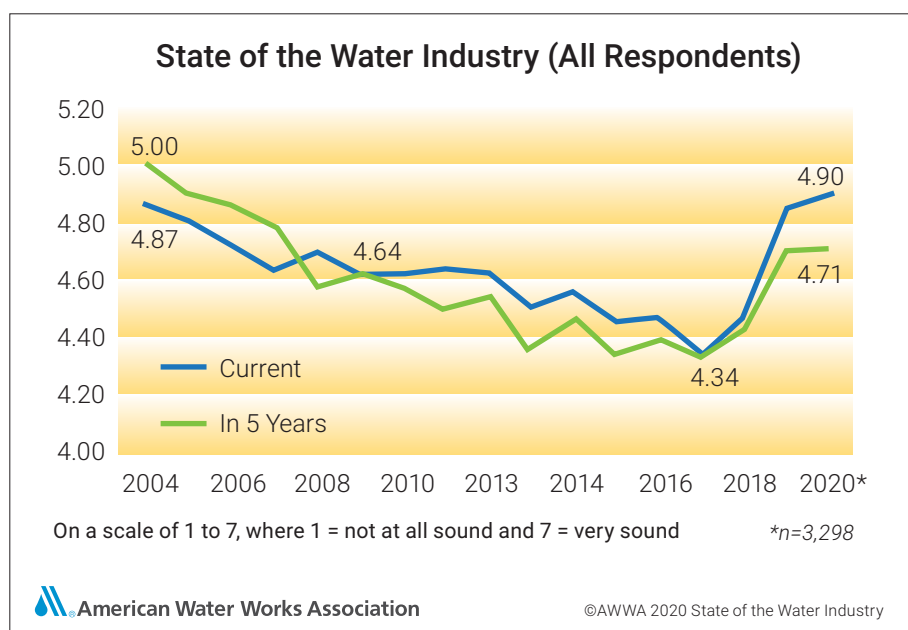


Figure 1. State of the water industry – all respondents 2004–2020

The optimism displayed in Figure 1 is encouraging. This represents what AWWA has seen in the water sector: positive attitudes and the ability and desire to address the challenges.

In addition to asking about the overall soundness of the water sector, the 2020 SOTWI survey also posed the following questions to better capture perspectives on regional soundness (focusing on the region in which respondents work most often). Again, the scale is from 1 to 7 where 1 = not at all sound and 7 = very sound:

 In your opinion, what is the current state of the water industry in the region where you work most often?

 Looking forward, how sound will the water industry be five years from now in the region where you work most often?

The current regional health of the water sector as rated by respondents ($n = 3,098$) is 5.22; looking forward five years, the anticipated soundness of the water industry in the region where they worked most often was rated 5.10.

The region-specific scores are typically higher than the general scores. The reasons for the regional results are not immediately apparent. However, one explanation is that people likely have a better understanding of the water systems in the areas in which they work; perhaps they are working to support the same systems, so their opinions are naturally biased.

Water Sector Challenges

TO DETERMINE AND RANK THE MAJOR issues currently facing the water sector, participants were asked to rate the importance of several challenges on a scale of 1 to 5, where 1 = unimportant and 5 = critically important. **Table 1** shows the top 20 issues as ranked by 2020 SOTWI respondents. In addition to the average scores, the percentage of respondents who scored the issue as critically important (i.e., 5 on the scale of 1 to 5) is also presented.

A closer look at the top 10 concerns for all respondents, **Table 2** shows renewal and replacement of aging water and wastewater infrastructure ranked as the most pressing issue facing the water sector; 2020 is the eighth year this challenge has been ranked No. 1. Financing these

Issues Facing the Water Industry in 2020

2020 RANKING	CHALLENGE	WEIGHTED AVERAGE	% RANKED AS CRITICAL
1	Renewal and replacement of aging water and wastewater infrastructure	4.51	59.2
2	Financing for capital improvements	4.43	55.2
3	Long-term water supply availability	4.32	49.6
4	Public understanding of the value of water systems and services	4.17	40.4
5	Watershed/source water protection	4.14	38.9
6	Public understanding of the value of water resources	4.11	34.4
7	Aging workforce/anticipated retirements	4.06	40.4
8	Emergency preparedness	4.05	31.4
9	Compliance with current regulations	4.02	29.7
10	Groundwater management and overuse	3.99	30.1
11	Compliance with future regulations	3.98	28.5
12	Cost recovery (pricing water to accurately reflect the cost of service)	3.96	27.3
13	Governing board acceptance of future water/wastewater rate increase	3.94	29.0
14	Public acceptance of future water and wastewater rate increases	3.90	25.7
15	Talent attraction and retention	3.88	25.5
16	Cybersecurity issues	3.87	27.4
17	Water conservation/water use efficiency	3.83	27.2
18	Asset management	3.80	31.4
19	Improving customer, constituent, and community relationships	3.77	21.1
19	Data management	3.77	21.1
20	Drought or periodic water shortages	3.72	21.9

Table 1. Issues facing the water industry in 2020 as ranked by all respondents (n = 3,087)

capital improvements has also been identified as the second-most significant issue for eight years running. While the order has shifted slightly, the top six issues have been consistent for many years. In 2020, compliance with current regulations emerged in the ninth spot. This is

the first we have seen this challenge mentioned in the top ten. Cost recovery (pricing water to accurately reflect cost of service) dropped to No. 12.

Looking at water sector challenges from the utility perspective, **Table 3**

indicates that all utility respondents agree on the top three issues and there are slight differences on what is important at No. 4. All utilities are concerned about aging infrastructure as well as an aging workforce.

Top 10 Issues Facing the Water Industry, 2016–2020						
	2020		2019	2018	2017	2016
1	Renewal and replacement of aging water and wastewater infrastructure	↔	Renewal and replacement of aging water and wastewater infrastructure	Renewal and replacement of aging water and wastewater infrastructure	Renewal and replacement of aging water and wastewater infrastructure	Renewal and replacement of aging water and wastewater infrastructure
2	Financing for capital improvements	↔	Financing for capital improvements	Financing for capital improvements	Financing for capital improvements	Financing for capital improvements
3	Long-term water supply availability	↔	Long-term water supply availability	Public understanding of the value of water systems and services	Long-term water supply availability	Public understanding of the value of water systems and services
4	Public understanding of the value of water systems and services	↔	Public understanding of the value of water systems and services	Long-term water supply availability	Public understanding of the value of water systems and services	Long-term water supply availability
5	Watershed/source water protection	↔	Watershed/source water protection	Public understanding of the value of water resources	Public understanding of the value of water resources	Public understanding of the value of water resources
6	Public understanding of the value of water resources	↔	Public understanding of the value of water resources	Watershed/source water protection	Watershed/source water protection	Watershed/source water protection
7	Aging workforce/ anticipated retirements	↑	Groundwater management and overuse	Aging workforce/ anticipated retirements	Emergency preparedness	Public acceptance of future W/WW rate increases
8	Emergency preparedness	↑	Aging workforce/ anticipated retirements	Public acceptance of future W/WW rate increases	Cost recovery (pricing water to accurately reflect cost of service)	Water conservation / water use efficiency
9	Compliance with current regulations		Emergency preparedness	Emergency preparedness	Public acceptance of future W/WW rate increases	Cost recovery (pricing water to accurately reflect cost of service)
10	Groundwater management and overuse	↓	Cost recovery (pricing water to accurately reflect cost of service)	Governing board acceptance of future W/WW rate increases	Water conservation / water use efficiency	Groundwater management and overuse

Table 2. Top 10 issues facing the water industry as ranked by all participants, 2016–2020

Small Systems (0–3,300)			
	INDUSTRY ISSUE	WEIGHTED AVERAGE	RESPONDENTS n =
1	R&R of aging infrastructure	4.48	274
2	Financing for capital improvements	4.43	273
3	Long-term water supplies	4.30	274
4	Watershed/source water protection	4.16	268

Medium-Sized Systems (3,301–10,000)			
	INDUSTRY ISSUE	WEIGHTED AVERAGE	RESPONDENTS n =
1	R&R of aging infrastructure	4.62	254
2	Financing for capital improvements	4.52	254
3	Long-term water supplies	4.31	253
4	Public understanding of systems and supplies	4.19	253

Large Systems (10,001–100,000)			
	INDUSTRY ISSUE	WEIGHTED AVERAGE	RESPONDENTS n =
1	R&R of aging infrastructure	4.56	673
2	Financing for capital improvements	4.47	673
3	Long-term water supplies	4.35	673
4	Public understanding of systems and supplies	4.22	674

Very Large Systems (100,001–150,000+)			
	INDUSTRY ISSUE	WEIGHTED AVERAGE	RESPONDENTS n =
1	R&R of aging infrastructure	4.57	377
2	Financing for capital improvements	4.50	233
3	Long-term water supplies	4.35	377
4	Watershed/source water protection	4.23	374

Table 3. Top water sector challenges by utility size, on a scale of 1 to 5, where 1 = unimportant and 5 = critically important.

Very Important but Not Listed

THE 2020 SOTWI SURVEY PROVIDED an open-ended question asking participants whether there were any other issues they felt ranked at least “very important” but were not listed. Of the 517 write-in responses, the three most mentioned issues were operator education and certification, compounds of emerging concern, and small-systems issues. Some of the responses:

OPERATOR EDUCATION AND CERTIFICATION

- “Quality training and continuing education for operators.”
- “Education of current workforce on new technologies.”
- “The value of a certified operator to an organization. Proper training and experience required to obtain certification.”
- “Start programs to train like apprentice so operators will be ready to step up when retirement wave hits its peak. Must start now to be ready for tomorrow.”

CONTAMINANTS OF EMERGING CONCERN

- “Emerging contaminants being regulated before treatment is able to be available to treat them.”
- “Emerging compounds of concern; PFAS and PFOA and micro-plastics. As an industry we need to be able to address the concerns/questions of our citizens and customers. Public awareness is growing quickly, and education on these subjects needs to take place from the utility to the customer.”
- “PFAS in groundwater issue is getting difficult due to the CA state’s anticipated lowering response level (RL) at 10 parts per trillion for combined or each level of PFOA and PFOS.”

SMALL-SYSTEMS ISSUES

- “Decreasing customer base in small/rural systems.”
- “Lack of certified operators, especially for rural communities.”
- “Training and education of workforce experts in small communities.”
- “Many “small” water systems, whether towns or rural water boards, serving 500 to 5,000 people lack the professional planning/management staff to make a water system sustainable over the 20 to 50 years.”
- “Availability for funding for infrastructure upgrades for very small water systems.”



"After decades of deferred maintenance, the water sector has a lot of catching up to do regarding renewing and replacing deteriorating and aging infrastructure. Because of the substantial costs involved, long-term financing is needed to manage these investments. AWWA and its volunteers have been instrumental in bringing attention to the challenges of aging infrastructure, limited funding, and impacts of agriculture on drinking water sources. This has supported growth in loan programs through the Water Infrastructure Finance and Innovation Act (WIFIA) and Drinking Water and Clean Water State Revolving Funds (DWSRF and CWSRF). The 2018 Agriculture Improvement Act, known as the Farm Bill, also offers excellent opportunities for drinking water systems to use conservation title funds to protect their source water."

— Chi Ho Sham, AWWA Incoming President-Elect

Large-scale Phenomena

TO UNDERSTAND THE POTENTIAL IMPACTS OF several large-scale phenomena on the water sector, all SOTWI survey participants were asked to rank a list of issues on a scale from 1 to 5, where 1 = significant negative impact and 5 = significant positive impact.

Table 4 provides a ranking of these large-scale phenomena. Results show that water professionals believe all listed phenomena will have some degree of negative to neutral impact on the water sector. Extreme weather events, pollution, and political instability occupy the top three spots again this year.

Extreme Weather Events

The National Centers for Environmental Information (NCEI) tracks and evaluates climate events in the United States and globally that have great economic and societal impacts. Focusing on extreme weather events, NCEI reported that the United States has sustained 258 weather and climate disasters since 1980 where overall damages/ costs for each event have reached or exceeded \$1 billion. The total cost of these 258 events exceeds \$1.75 trillion.

In 2019, NCEI recorded 14 weather and climate events with losses exceeding \$1 trillion, including three major floods, eight severe storms, two tropical cyclones, and one wildfire event. This is in keeping with the annual average of 13.8 events for the years 2015 through 2018.

2019 is the fifth consecutive year in which 10 or more billion-dollar weather and climate disaster events have impacted the United States.

Water and wastewater utilities are also impacted by drought, changing precipitation patterns, reduced snowpack, and sea level rise. Increased understanding of these events is important for resilience of the water sector.

AWWA's policy states that two principal goals for water utilities in addressing impacts due to climate change and inherent variability are to assess risk and uncertainty, and to develop and take actions that improve resiliency and sustainability in utility management, facilities, and water sources.

Large-scale Phenomena Impact on the Water Sector in 2020		
	MACRO PHENOMENA	WEIGHTED AVERAGE
1	Extreme weather events	2.11
2	Pollution	2.13
3	Political instability	2.25
4	Climate change	2.27
5	Chemical costs	2.37
6	Terrorism	2.40
7	Labor costs	2.41
8	War	2.42
9	Inflation	2.44
10	Wealth inequality	2.48
11	Energy Costs	2.57
12	Agriculture	2.68
13	Urbanization	2.69
14	Unemployment	2.72
15	Population growth	2.77
16	Housing markets	2.94
17	Stock markets	2.96
18	Bond markets	3.05
19	Business/Industrial Activities	3.19
Scale: 1 = Significant negative impact, 2 = Slight negative impact, 3 = No impact at all, 4 = Slight positive impact, 5 = Significant positive impact		
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Table 4. Large-scale phenomena impact on the water sector in 2020 (n = 2,395)

Assessing Risk and Uncertainty

As stewards of public health and the environment, water professionals are aware of the risks associated with securing reservoirs and wells to protect the water supply, guarding materials at their facilities from theft and sabotage, and planning for routine and extreme events. By incorporating resilience into a risk management framework, a utility can improve its response and recovery strategies, thereby mitigating the potential for loss of service.

According to Section 2013 of America's Water Infrastructure Act (AWIA) of 2018, resilience is

the "ability of a community water system or an asset ... to adapt to or withstand the effects of a malevolent act or natural hazard without interruption to the asset's or system's function, or if the function is interrupted, to rapidly return to a normal operating condition." For more information, see "Priority Action on Risk and Resilience," *Journal AWWA*, Feb. 2019 (<https://doi.org/10.1002/awwa.1229>).

AWIA requires community water systems serving populations of 3,300 or more to perform two tasks: (1) conduct a risk and resilience assessment, and (2) prepare or

Utility Progress Assessing Risk and Resilience and Emergency Planning

PLAN AND/OR PROGRAM	COUNTS (n =)	FULLY IMPLEMENTED	IMPLEMENTATION IN PROGRESS	INTERESTED	% FULLY IMPLEMENTED AND IN PROGRESS
EMERGENCY PREPAREDNESS PLAN					
All utility respondents	1,388	715	540	133	90.4%
Small utilities	241	113	92	36	85.1%
Medium utilities	231	114	90	27	88.3%
Large utilities	584	287	250	47	92.0%
Very large utilities	324	198	104	22	93.2%
RISK AND RESILIENCE ASSESSMENT (RRA)					
All utility respondents	1,111	230	534	347	68.8%
Small utilities	182	25	67	90	40.5%
Medium utilities	191	35	74	82	57.1%
Large utilities	472	93	247	132	72.0%
Very large utilities	259	76	143	40	84.6%

Table 5. Utility progress assessing risk and resilience and emergency planning

revise an emergency response plan on a prescribed schedule every five years, starting in 2020.

The 2020 SOTWI survey asked utility respondents if their utility has considered and/or implemented programs and plans related to assessing risk and resiliency and emergency preparedness. **Table 5** summarizes the responses.

The 2019 SOTWI survey had closed in October 2018, coinciding with the signing of S.3021, America’s Water Infrastructure Act of 2018 (AWIA), into law. For the 2019 survey, when asked about programs and

planning, 33% of utility respondents (*n* = 217) indicated they had fully implemented a community risk and resilience assessment, and another 37% were in progress (*n* = 283). For the 2020 survey, when asked the same questions, 20.7% of utility respondents (*n* = 230) indicated they had fully implemented a community risk and resilience assessment, and another 48.1% were in progress (*n* = 534).

These numbers are in line with the upcoming deadlines for complying with AWIA risk and resilience provisions shown in **Table 6**.

Deadlines for Complying with AWIA Risk and Resilience Provisions			
POPULATION SERVED*	ESTIMATED NUMBER OF IMPACTED COMMUNITY WATER SYSTEMS	RISK AND RESILIENCE ASSESSMENT, BEFORE	EMERGENCY RESPONSE PLAN
≥ 100,000	435	Mar. 31, 2020	Sept. 30, 2020
50,000 – 99,999	594	Dec. 31, 2020	June 30, 2021
3,300 – 49,999	8,295	June 30, 2021	Dec. 30, 2021
*Wholesale systems use total population			
Source: <i>Journal AWWA</i> , Mar. 2019, Via, S. https://doi.org/10.1002/awwa.1247			
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Table 6. Deadlines for complying with AWIA (America’s Water Infrastructure Act of 2018) risk and resilience provisions



“During my years as AWWA Treasurer and a Water Utility Council member, I have often heard, and continue to hear, that replacement of aging infrastructure and financing of capital improvements are the biggest challenges our members face. In response, AWWA focused on these concerns two decades ago and has made great strides. The development of Asset Management Planning coupled with AWWA’s leadership in creating WIFIA, advocating for increased SRF funding, and other longstanding practices have provided a robust set of effective tools to manage water infrastructure needs. While the challenges continue, clearly these tools provide a larger and stronger arsenal to handle our aging infrastructure and financing needs more effectively, now and in the future.”

— Aurel Arndt, AWWA Treasurer, retired chief executive officer at
Lehigh County Authority

System Stewardship

IN GENERAL, THE WATER SECTOR PLANS, builds, operates, maintains, and replaces the typically large and expensive assets that provide water services, including potable water, wastewater, stormwater, and reuse. System stewardship is how water and wastewater systems are operated, maintained, and replaced.

Viewing system stewardship from the more traditional view of asset and financial management, specific issues identified regularly through the SOTWI surveys include renewing and replacing aging infrastructure, financing capital improvements, and ensuring cost recovery (i.e., pricing water to accurately reflect its true cost). These issues continue to be important because many water and wastewater systems built and financed by previous generations are approaching or have exceeded

their useful lives and are facing the need for R&R.

RENEWAL AND REPLACEMENT

Specific to infrastructure R&R, the 2020 SOTWI survey asked all participants to rate the importance of specific R&R challenges currently facing the water sector on a scale of 1 to 4, where 1 = unimportant and 4 = very important.

As shown in **Table 7**, the most important issue identified was infrastructure reliability, with

WHAT INVESTMENT IS NEEDED?

"The US Environmental Protection Agency's 6th Drinking Water Infrastructure Needs Survey and Assessment shows \$472.6 billion is needed to maintain and improve the nation's drinking water infrastructure over the next 20 years for thousands of miles of pipe as well as thousands of treatment plants, storage tanks, and other key assets to ensure the public health, security, and economic well-being of our cities, towns, and communities" (USEPA 2018).

77% of respondents rating this issue as very important (i.e., 3.76 out of 4), followed by financing these improvements and access to funding.

Renewal and Replacement Challenges				
RANKING	RENEWAL AND REPLACEMENT CONCERNS	WEIGHTED AVERAGE	% VERY CONCERNED	RESPONDENTS n =
1	Infrastructure reliability	3.76	77%	2,762
2	Financing renewal and replacement	3.67	70%	2,757
3	Access to funding	3.65	67%	2,714
4	Maintaining levels of service	3.63	66%	2,767
5	Justifying R&R programs to ratepayers	3.62	67%	2,746
6	Justifying R&R programs to oversight bodies	3.60	65%	2,737
7	Prioritizing R&R needs	3.54	58%	2,734
8	Coordinating R&R with other activities	3.44	54%	2,724
9	Customers' expectations	3.24	37%	2,761
10	Regulatory constraints	3.23	37%	2,714

Table 7. Renewal and replacement challenges ranked in order of importance

WHAT IS THE
ESTIMATED RETURN
ON INFRASTRUCTURE
INVESTMENTS?

"If the estimated investment gap were closed, it would result in over \$220 billion in total annual economic activity to the country. These investments would generate and sustain approximately 1.3 million jobs over the 10-year period.

Furthermore, the value of safe provision, delivery, and treatment of water to customers results in significant avoided costs for businesses that would otherwise have to provide their own water supplies. These investments would save US businesses approximately \$94 billion a year in sales in the next 10 years and as much as \$402 billion a year from 2027 to 2040." (The Economic Benefits of Investing in Water Infrastructure, The Value of Water Campaign, 2017).

INFRASTRUCTURE
RELIABILITY

Utilities should adopt a proactive, sustainable, solution-oriented approach to manage assets in a manner that will help maximize the value of service delivery to customers without compromising the ability to meet the needs of future generations. Managing assets incorporates a full life-cycle approach, starting with effective planning and design and continuing through optimized operation and maintenance, appropriate rehabilitation, replacement, and asset disposal.

The Water Resources Reform and Development Act (WRRDA) of 2014 and the reauthorization of the Water Resources Development Act (WRDA) combined with legislation and the Safe Drinking Water Act encourages

the use of asset management planning (AMP) by both water and wastewater utilities. In 2017, a study done by AWWA found that while 79% of state revolving fund agency respondents (*n* = 41 Drinking Water State Revolving Fund and *n* = 43 Clean Water State Revolving Fund) had implemented an AMP requirement, most of the requirements applied only to assets for which funding was sought.

The 2020 SOTWI survey asked utility respondents the following:

Has your utility considered and/or implemented any of the following plans or programs? – Asset management plan

Twenty-nine percent of utility respondents (*n* = 1,320) indicated they have fully implemented an asset management plan, while another 53% indicated that implementation is in progress. **Table 8** takes a closer look at asset management planning by utility size.

FULL-COST PRICING

AWWA holds that the public can best be provided water services by self-sustaining enterprises that are adequately financed with rates and charges based on sound accounting, engineering, financial, and economic principles. Revenues from service charges, user rates, and capital charges (e.g., impact fees, system development charges) should

Asset Management Planning by Utility Size

	COUNT	FULLY IMPLEMENTED	IMPLEMENTATION IN PROGRESS	INTERESTED
ALL UTILITY RESPONDENTS	1,320	29%	53%	18%
SMALL UTILITY (0–3,300)	228	22%	48%	30%
MEDIUM-SIZED UTILITY (3,301–10,000)	217	21%	53%	26%
LARGE UTILITY (10,000–100,000)	557	29%	56%	15%
VERY LARGE UTILITY (>100,000)	310	40%	53%	8%

Table 8. Asset management planning by utility size

be sufficient to enable utilities to provide for the full cost of service, including the following:

- Annual operations and maintenance expenses
- Capital costs (e.g., debt service, other capital outlays)
- Adequate working capital and required reserves

Full-cost pricing—i.e., charging rates and fees that reflect the full cost of providing water and/or wastewater services—should include R&R costs for treatment, storage, distribution, and collection systems. Some utilities have previously kept their rates low by minimizing or ignoring R&R costs, but as the useful lives of our infrastructure systems come to an end, managers and the communities they serve are forced to address these costs, sometimes through painful and unexpected rate increases. Issues related to equity and affordability must be considered as rates are adjusted, and each system has its own unique rate-setting challenges based on current conditions as well as recent developments and long-term history.

Full-cost pricing is, in many ways, a utility-specific issue defined by the community a utility serves. To explore the issue at this level, utility personnel who identified as

executive/management and financial officer only were asked the following:

Is your utility currently able to cover the full cost of providing service(s), including infrastructure renewal and replacement and expansion needs, through customer rates and fees?

Given your utility's future infrastructure needs for renewal and replacement and expansion, do you think your utility will be able to meet the full cost of providing service(s) through customer rates and fees?

The responses are shown in **Figure 2**. Combining those who are not at all able and those who are slightly able, 29% of utilities are currently struggling to implement full-cost pricing. In addition, 36% of respondents believe they will struggle to cover the full cost of service in the future. Both values

are consistent with previous years, considering different response groups.

Of the results in Figure 2, the most notable is that nearly 10% of respondents felt that their utilities were currently not at all able to cover the full cost of providing service, which is the same as reported in 2019. The percentage of respondents who felt their utilities were currently fully able to cover the cost of providing service through rates and fees was 19.1% in 2020. Similar numbers were reported in the past four surveys.

Utility executives are perhaps still expecting challenges ahead, as the percentage of respondents who felt that their utilities would be fully able to cover the cost of providing service in the future decreased from 19.1% to 13.9%.

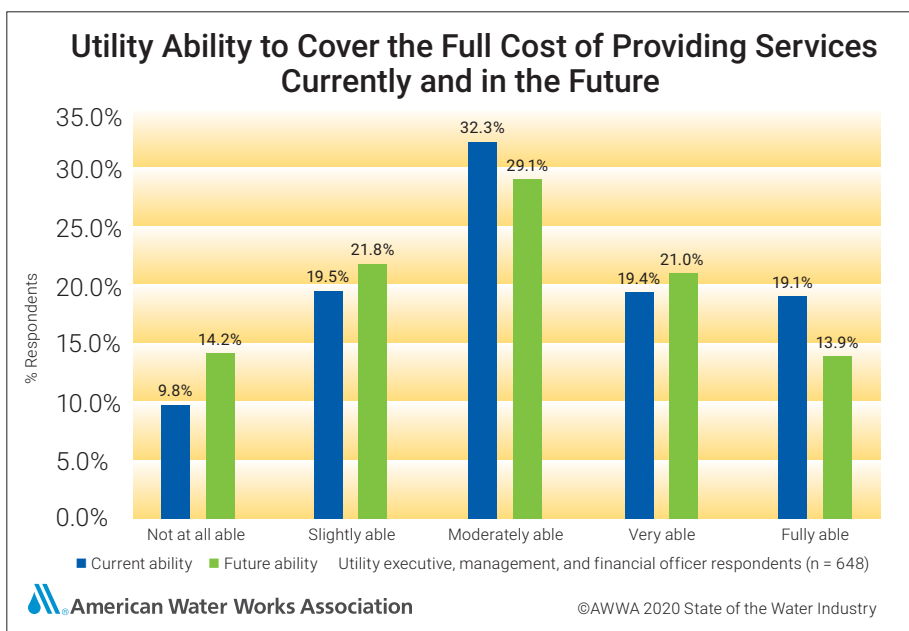


Figure 2. Utility ability to cover the full cost of providing services currently and in the future

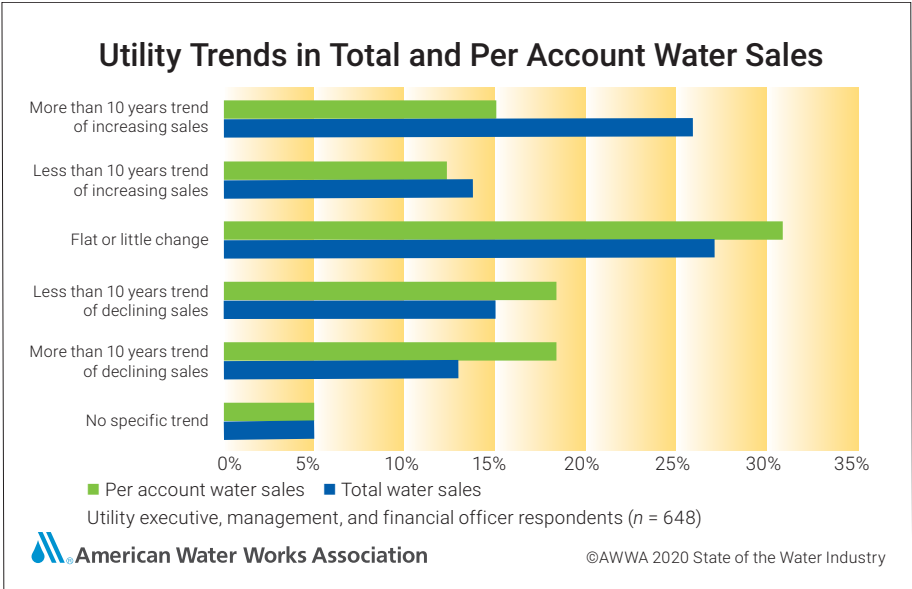


Figure 3. Utility trends in total and per account water sales

CHANGING WATER DEMANDS

Although more efficient use of water is a major goal of the water sector, in areas where customer growth is slow or nonexistent, declining water use left unaddressed can decrease operating revenue and affect how costs are recovered through rates and charges. In some cases, utilities must explain to customers that their rates must go up even as their community uses the same amount of water or less water.

To explore this issue, utility personnel identifying with job titles of executive/management and financial officers were asked a series of questions about their utilities’ trends in water sales. Results regarding trends in total water sales, as shown in **Figure 3**, reveal that 28% of these respondents are seeing declining total water sales (either a >10-year or <10-year trend) while

27% of respondents reported their total water sales were flat or little changed in the past 10 years.

In 2020, 40% of these respondents reported their utility saw an increasing trend in total water sales (either a >10-year or <10-year trend), which is an increase from previous years.

Results from respondents regarding their trends in per account water

sales are also shown in Figure 3. This figure indicates that 36% of respondents reported their utility was experiencing declining per account water sales (either a >10-year or <10-year trend), while 31% of respondents reported flat or little change in per account water sales. Twenty-eight percent of utilities reported increasing per account water sales (either a >10-year or <10-year trend).

RESPONDING TO COST RECOVERY NEEDS

Fifty-five percent of utility executive/management and financial officer respondents indicated they have flat or declining total water sales, and 67% indicated their utility is experiencing flat or declining per account water sales. To explore the issue further, utility personnel who identified as executive/management and financial officers were asked the following:

Cost-Recovery Methods	
RANKING	COST-RECOVERY METHODS RANKED BY MENTIONS (n = 595)
1	Shifting more of cost recovery from consumption-based fees to fixed fees within the rate structure
2	No changes needed
3	Changes in growth-related fees (e.g., system development charges, impact fees or capacity charges)
4	Shifting rate design to increasing block-rate structure
5	Increasing financial reserves
6	Implementing rate stabilization reserves
7	Revenue diversification

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Table 9. Cost-recovery methods indicated by water utilities

How is your utility responding to its cost-recovery needs in the face of changing water sales/consumption patterns?

Recognizing a utility will employ many cost-recovery options, respondents were asked to choose all provided options that applied.

Table 9 shows the cost-recovery methods ranked by most often mentioned, either as a singular methodology or in combination with other methods.

Respondents had more to say in the related open-ended question which allowed for a write-in response:

How is your utility responding to its cost-recovery needs in the face of changing water sales/consumption patterns?

Replies fell into the following general categories:

- Rate study
- Rate restructuring
- Water use efficiency measures
- Expanding goods and services
- Monthly billing
- Recapitalization
- Governing bodies that would not support rate hikes left many respondents few options.

Increasing financial reserves was mentioned more often as a part of a

cost-recovery portfolio as opposed to a stand-alone solution. The survey did not differentiate the type of reserves (e.g., operating, capital) but rather asked if, in general, increasing financial reserves is an action for their utility.

As one might expect, the types and levels of reserves maintained by utility systems vary significantly. Utilities are highly encouraged to establish cash reserve policies; properly designed reserve policies are an integral component of financial sustainability.

ANTICIPATED UTILITY SPENDING IN COMING YEAR

Recognizing that utilities are balancing competing financial needs, the 2020 SOTWI survey asked those who identified as executive/management and financial officers the following:

In the coming year, what will you be spending on as percent of capital budget?

Utility capital spending trends responses shown in **Figure 4** indicate that utilities are focused on infrastructure renewal and replacement.

This question was asked in the first survey in 2004 with utilities indicating then that spending would be for new capacity and infrastructure.

FUNDING SOURCES

Utilities and state and local governments that want to invest in infrastructure can do so by either funding it directly (spending reserves) or by financing it (taking out loans or issuing bonds to obtain funds that will be repaid over time.) Financing can allow infrastructure to be paid over a period that more

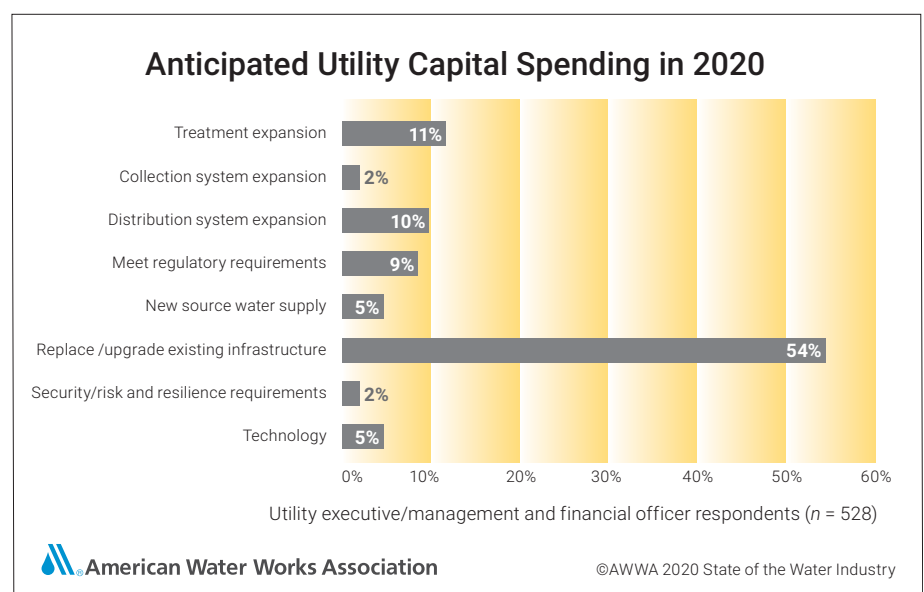


Figure 4. Anticipated utility capital spending in 2020

closely matches its useful life and make money available to pay for projects sooner. Financing can also add to grants and other funding for infrastructure projects. In the long run, revenues committed to paying back funds borrowed today will be unavailable for projects in the future.

Even with the most diligent planning efforts, utilities must handle the unplanned or accelerated capital projects due to asset failures. When asked about overall issues facing the water sector, financing for capital improvements is ranked second as seen in Table 1. When respondents were asked about issues specific to renewal and replacement, financing renewal and replacement ranked second on the list of concerns as seen in Table 7. The 2020 SOTWI survey asked utility personnel who identified as executive/management and financial officers the following:

What are your utility capital funding sources and/or strategies?

Respondents were asked to choose all that applied. Rate increases were mentioned by all utility sizes as the primary capital funding source.

The 2020 SOTWI survey asked the following open-ended question and allowed for write-in responses:

How is your utility responding to its cost-recovery needs in the face of changing water sales/ consumption patterns?

The replies from utility executive/ management and financial officer respondents indicated bank loans, private equity, and lines of credit would also be considered as funding sources.

For historical reference, this question was asked of all respondents in the 2004 survey. Respondents indicated, in order of preference, that they would look to bonds, rate increases, and operational savings.

VALUE OF WATER

Results of the 2020 SOTWI survey highlight the water sector’s concern about communicating with stakeholders, in particular regarding the public’s understanding of the value of water systems/ services and resources (the fourth and sixth most important issues in Table 2, respectively) and improving customer, constituent, and community relationships (the 19th most important issue in Table 1). The need for communities to invest in their water systems, and ultimately for their customers to pay for these investments, is captured in the 12th most important issue in Table 1—namely, cost recovery.

Effectively communicating infrastructure and water supply challenges to customers and key decision-makers is vital, and the water industry has tried collectively to inform the public of the value of water services and resources for decades. However, while the concepts of safeguarding public health, ensuring customer satisfaction, and protecting the environment are popular, the public frequently does not support the required levels of funding to provide safe and reliable water service.

To explore the perceptions of communication with various groups, the 2020 SOTWI survey asked the following question twice—once of all respondents, which includes

Utility 2020 Funding Sources	
RANKING	UTILITY FUNDING SOURCES RANKED BY % MENTIONS
1	Rate increases (25%)
2	Bonds (18%)
3	Grants (14%)
4	Operational savings (13%)
4	Reserves (13%)
4	State Revolving Funds (SRFs) (13%)
5	Water Infrastructure Finance and Innovation Act (WIFIA) (4%)

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Table 10. Utility 2020 funding sources

utility and nonutility personnel, and a second time of utility personnel only:

How would you rate the effectiveness of your utility's communication or outreach to the following groups?

The results in **Figure 5** show that the utility-only group believes utilities' efforts are, on average, 23% more impactful with all customer groups than what was indicated by all water sector respondents combined. This number is likely larger as the optimism of utility respondents is included in the overall response.

When asked about plans and programs, 27% of the responding utilities indicated they had a customer communications plan fully implemented (n = 1,223).

Table 10 shows that utilities anticipate leaning on rate increases for cost recovery and funding needs. Taking a closer look at how

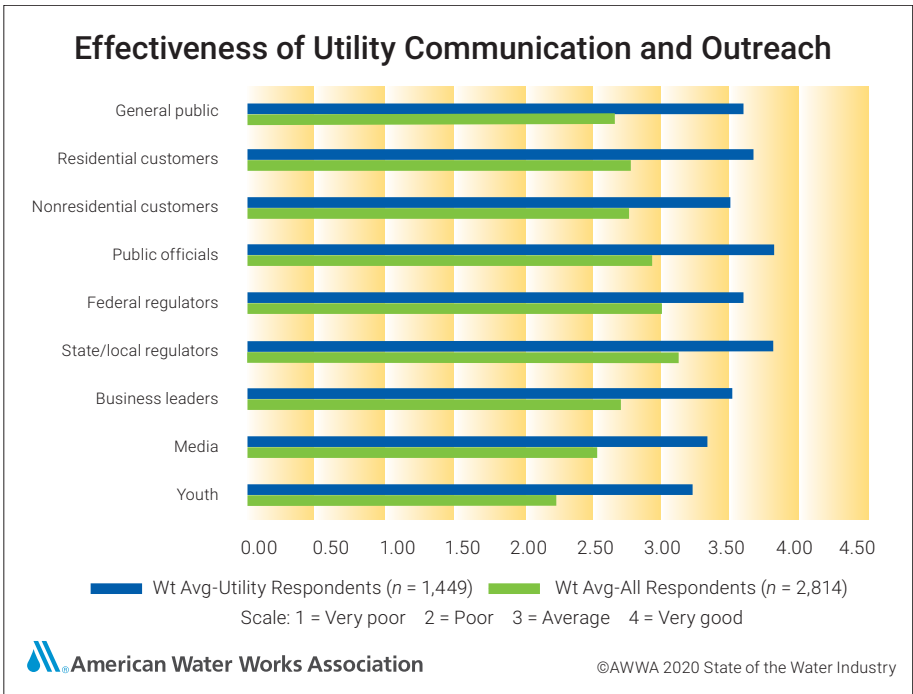


Figure 5. Effectiveness of utility communication and outreach

customers might feel about these rate increases, the 2020 SOTWI survey asked all participants:

If your utility was to consider a rate increase in the coming year, how do you think it would be received by the following groups? (**Table 11**)

ACCESS TO CAPITAL

To help clarify the current financing environment for the water sector, utility personnel who identified as executive/management and financial officers were asked the following:

If you can make an assessment, how would you rate your utility's current access to capital for financing infrastructure renewal/replacement projects?

As shown in **Figure 6**, 54% of utility personnel identifying as executive/management and financial officers reported that their utility's access to capital was as good as or better than at any time in the past five years. Based on 635 responses in 2020, this value is slightly higher than the running average of 53%.

Anticipated Customer Reaction to a Rate Increase			
CUSTOMER GROUP	FELT THIS GROUP WOULD RESPOND NEGATIVELY	FELT THIS GROUP WOULD RESPOND INDIFFERENTLY	RESPONDENTS n =
General public	51%		1,482
Residential customers	56%		1,491
Nonresidential customers	44%		1,461
Public officials		37%	1,451
Business leaders	40%		1,419
Consumer advocates	43%		1,383
Media		40%	1,392

Table 11. Anticipated customer reaction to a rate increase

Nine percent reported that their utility's access to capital was as bad as or worse than any time in the past five years, which is in keeping with historical trends.

Water Resource Management

LONG-TERM WATER SUPPLY AVAILABILITY

Participants highly rated several issues related to water resources management in the 2020 SOTWI survey (as shown in Table 2), including "Long-term water supply availability" (third most important issue), "Watershed/source water protection" (fifth most important issue), and "Groundwater management and overuse" (10th most important issue), as well as other topics (e.g., desalination, climate change, water reuse).

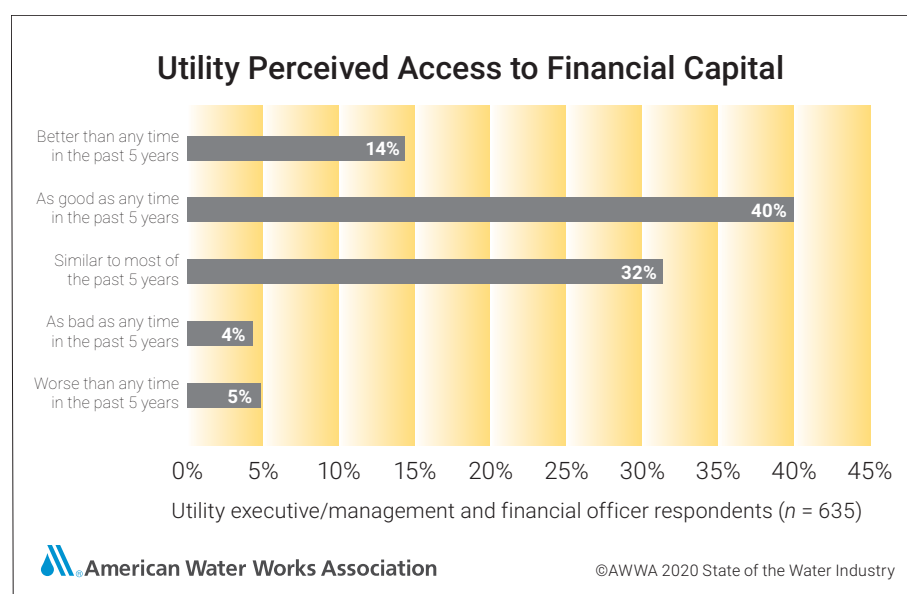


Figure 6. Utility perceived access to financial capital

To understand the issue of long-term water supply availability, utility personnel were asked the following:

How prepared do you think your utility will be to meet its long-term water supply needs?

The summary presented in **Figure 7** shows that 12% of utility personnel

responding indicated their utility will be challenged to meet anticipated long-term water supply needs (i.e., not at all or only slightly prepared), compared to 12% in 2019, 6% in 2018, and 10% in 2017.

In addition, 57% of participants indicated that their utilities are very or fully prepared; that is up from 55% reported in 2019, down from 67% reported in 2018, but closer to the five-year average of 59% (2015–2019).

WATER SHORTAGES

Shifting from long-term to near-term water supply, water systems are dramatically affected by shortages resulting from drought—the severity of which will likely be influenced by climate variability and extreme weather events moving forward.

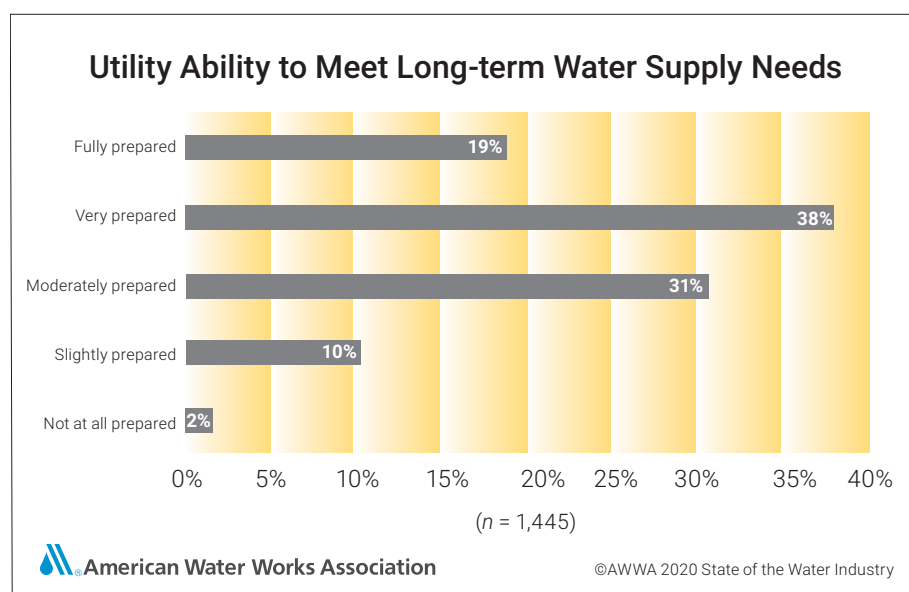


Figure 7. Utility ability to meet long-term water supply needs

To gauge the effects of water shortages, utility personnel were asked how many years in the past decade their utilities had implemented voluntary or mandatory water restrictions. The responses summarized in **Figure 8** reveal that 69% of responding utilities have implemented voluntary water restrictions zero to one years in the past decade and 78% of responding utilities have instituted mandatory restrictions zero to one years in the same period. Sixteen percent of utility personnel responding indicated their utilities had five or more years of voluntary restrictions in the past decade, and 11% had five or more years of mandatory restrictions in the same period.

WATER SUPPLY SUSTAINABILITY

As communities evaluate their water shortage preparedness, there is also an opportunity to gain an improved understanding of regional water supply sustainability. In addition to reliability during water shortages, utilities and the communities they serve can also evaluate or determine their policies and practices for water conservation and alternative water supplies such as desalination of brackish groundwater or seawater, nonpotable reuse, potable reuse, and stormwater capture and reuse. The responses found in **Figure 9** show that augmentation of water supplies

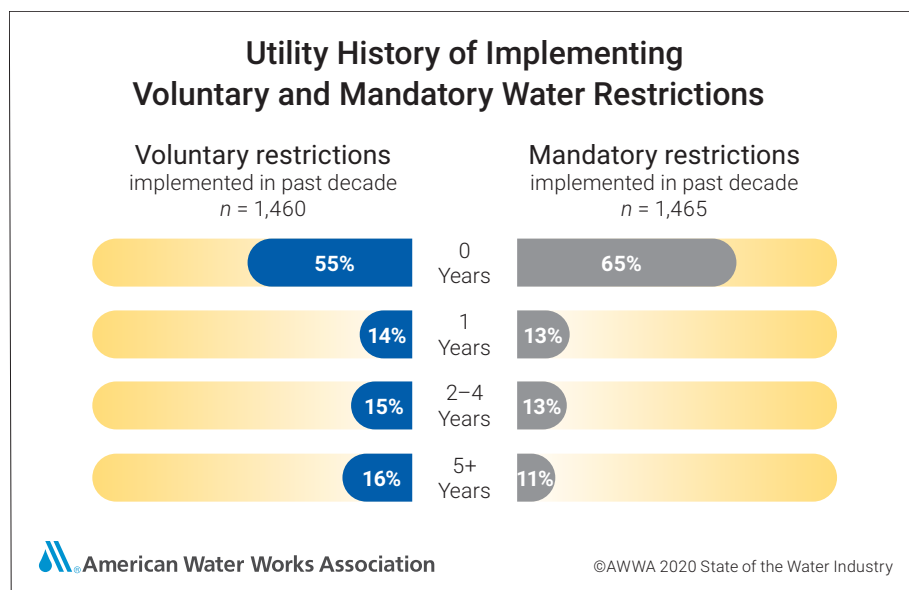


Figure 8. Utility history of implementing voluntary and mandatory water restrictions

is not a concern for the majority of utility respondents.

Although water restrictions can be a useful short-term management tool, most utility-sponsored water conservation programs emphasize lasting long-term improvements

in water use efficiency while maintaining quality of life standards.

To understand the status of conservation planning at water utilities, the 2020 SOTWI survey asked participants whether their utility has any type of water

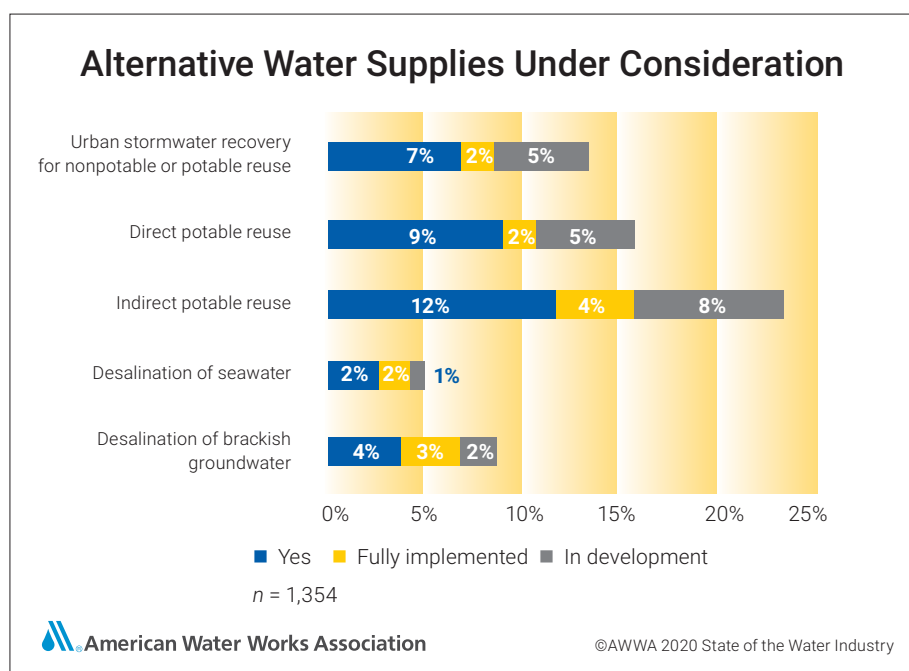


Figure 9. Utility interest in alternative water supplies



“We had to find a way to bring surface water into the city because our demands were quickly reaching the amount of physical availability of groundwater in our area. We capitalized on our unused shares of the Colorado River by partnering with the Salt River Project in central Arizona to transport the water across the valley, building a five-mile pipeline, pump station and treatment facility. The surface water project is part of a much larger master plan that calls for aggressive water conservation and reclamation.”

— *Barbara Chappell, Deputy Public Works Director,
City of Goodyear, Ariz.*

conservation or water shortage planning programs. The survey indicated that 38% of all utility participants have a fully developed drought management or water shortage contingency plan, and 37% of utility respondents indicated they have fully implemented a water conservation program. Data also show that larger utilities are leading this effort.

In addition to water conservation, another nontraditional source of water supply is seawater or brackish groundwater. Utility participants were asked whether their utilities were considering desalination of either brackish groundwater or seawater to augment existing drinking water supplies. Of the 1,354 responses, 5% reported having or developing some type of desalination project.

PROTECTING WATER AT THE SOURCE

Source water protection is the mitigation of potential risks and impacts to drinking water supplies. It is one of the first critical barriers against drinking water

contamination and other risks to drinking water supplies. A strong source water protection program can be one of the most cost-effective methods for maintaining, safeguarding, and improving source water—and drinking water—quality and quantity.

In most cases, states are responsible for implementing the regulatory requirements that impact water protection under the Safe Drinking Water Act and the Clean Water Act. States are also responsible for establishing initiatives to provide technical and financial assistance to drinking water systems pursuing source water protection activities.

The 2020 SOTWI survey asked utility participants the following:

Has your utility considered and/or implemented any of the following plans or programs? – Source water protection program

Seventy-six percent of utility respondents ($n = 1,154$) say their utility has fully implemented or is in progress of implementing a source water protection program. This

number increases to 89% for very large utility respondents ($n = 274$).

Groundwater management and overuse rose to significance in the 2019 SOTWI survey after droughts and wildfires taxed these resources. In the 2020 survey, groundwater management and overuse remains in the top 10 water sector challenges (Table 1) but dropped from seventh to 10th in issues facing the water industry as noted in Table 2.

Groundwater resources are essential and AWWA supports proper management and use of groundwater resources to protect the long-term quantity and quality of groundwater. AWWA also supports proactive planning and education efforts.

The 2020 SOTWI survey asked all utility respondents the following:

Has your utility considered and/or implemented any of the following plans or programs? – Groundwater management plan

Seventy percent of utility respondents ($n = 884$) indicated they had fully implemented a plan or that implementation was in progress.

PERFLUORINATED COMPOUNDS

Perfluorinated compounds (PFCs), also referred to as perfluorinated alkyl substances (PFAS), are a large group of environmentally persistent manufactured chemicals used in industrial applications and consumer products. PFCs are very stable, slow to degrade in the environment, and can lead to potential adverse health effects in humans and wildlife.

The US Environmental Protection Agency (USEPA) has identified PFCs as an emerging contaminant because they have a pathway to enter the environment, may pose a human health or environmental risk, and do not have federal regulatory standards. In addition, individual states have begun to develop state PFC guidelines for monitoring and reducing PFCs in the environment.

For more information, download USEPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan or visit www.awwa.org/Resources-Tools/Resources-Topics/PFAS.

Regulations

The importance of current and future regulatory compliance remained a concern for utility respondents in the 2020 SOTWI survey. Referring to Table 2, "Compliance with current regulations" was rated ninth and "Compliance with future regulations" (not included in the table) was rated 11th in the current survey.

All survey participants were asked about their levels of concern regarding the water sector's ability to comply with current regulations, and their responses are summarized in **Table 12**. Scores are on a scale of 1 to 5, where 1 = not at all concerned and 5 = extremely concerned.

Current regulations regarding PFAS and nonpoint source pollution were

the top two concerns. Nonpoint source pollution and disinfection byproducts were identified as the top two concerns in 2019 and 2018.

Lead and copper enter drinking water mainly from corrosion of plumbing materials that contain lead and copper. While the use of lead in plumbing materials has been banned for more than a quarter century, the release of lead into drinking water remains a serious concern. Lead and copper appear as the seventh regulatory concern in Table 12.

The USEPA proposed revisions to the Lead and Copper Rule in November 2019. The proposal would make significant changes to the current rule, including requiring

Regulatory Concerns Ranked by All Respondents

RANKING	REGULATORY CONCERN	WEIGHTED AVERAGE	% EXTREMELY CONCERNED	RESPONDENTS n =
1	Per- and polyfluoroalkyl substances	3.49	22%	2,476
2	Nonpoint source pollution	3.29	15%	2,534
3	Point source pollution	3.23	15%	2,585
4	Chemical spills	3.18	15%	2,613
5	Cyanotoxins	3.12	13%	2,391
6	Combined sewer overflows	3.12	14%	2,541
7	Lead and copper	3.09	15%	2,682
8	Nutrient removals	3.08	12%	2,562
9	Pathogens	3.05	15%	2,652
10	Perchlorates	2.91	9%	2,345
11	Arsenic	2.85	10%	2,584
12	Radionuclides	2.83	10%	2,415

Table 12. Regulatory concerns ranked by all survey respondents

water systems to develop lead service line (LSL) inventories and LSL replacement plans.

The 2020 SOTWI survey asked utilities the following:

Has your utility considered and/or implemented any of the following plans or programs? – Lead service line replacement program

- Overall, 72% of utility respondents ($n = 802$) indicated their utility has fully implemented or is in the process of implementing an LSL replacement program.

Service Providers Weigh In

The SOTWI survey classifies as a utility any entity—public or private—engaged in water production or water/wastewater treatment, including water wholesalers. The service provider category consists of manufacturers, distributors, distributors’ representatives, technical service companies, and consultants—in essence, anyone supplying products and services to utilities. This is a broad group representing diverse business interests.

GLOBAL MARKETS

Service providers were provided a list of countries or areas outside the United States and were asked about doing business in these world markets. Looking globally, service providers were asked the following:

What key markets outside the United States are of interest to your company for potential water industry business development?

Please rate the importance of the following issues to developing water-related markets outside North America.

Figure 10 is a map showing the key water markets identified by these respondents ($n = 543$). Key markets consist of North America, Central America, the United Kingdom, China, India, Australia, and the European Union. Those markets receiving a mention are represented by dots on the map.

Service providers indicated the largest obstacles to developing business outside the United States

were financing and financial concerns, followed by contract risks and overall cost. **Table 13** is a summary of the barriers to foreign commerce identified by survey respondents.

For comparison, service providers were asked this same question in the first State of the Industry survey in 2004. The 2004 service provider respondents indicated then that they were mostly doing business in

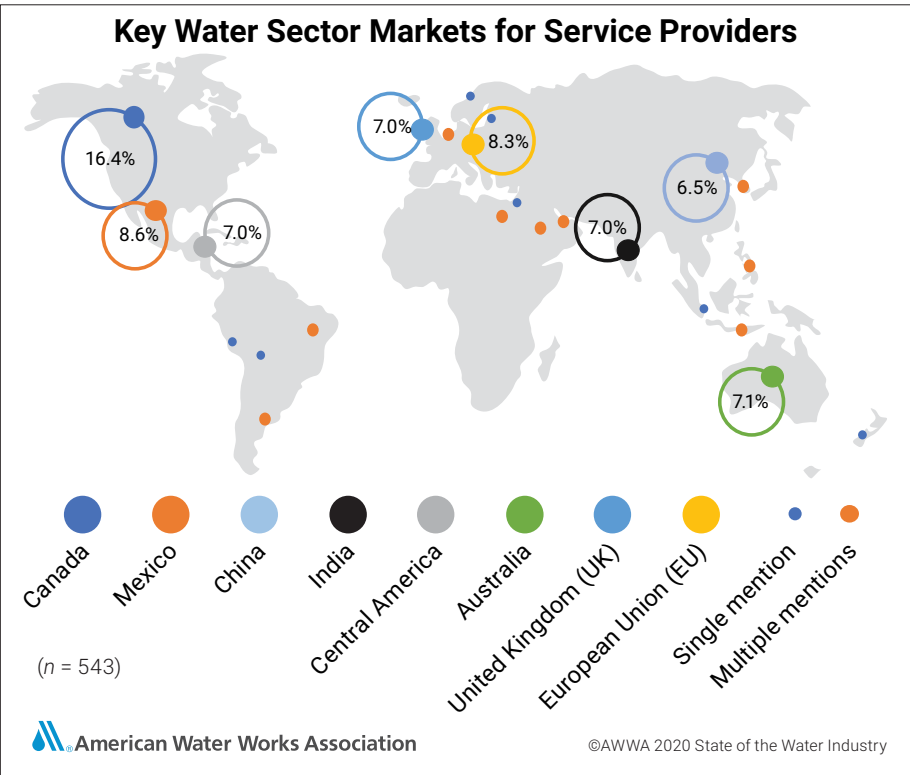


Figure 10. Key water sector markets for service providers



“We know customers are much more satisfied with their utility’s service when the utility proactively communicates with them, so survey results showing that just over a quarter of utilities have a plan to do this are concerning. Communicating to our customers and our stakeholders requires strategy and planning to ensure that those who rely on you for service, and those who rely on you to be a community partner, get the information they need consistently and in a way that resonates with them. Absent a strong, proactive communications effort, utilities put themselves at risk of a reputational challenge and loss of support for critical infrastructure and funding needs.”

– Melissa Elliott, AWWA President-Elect

English-speaking regions, and the top two foreign market business obstacles were also financing and financial concerns.

THE NORTH AMERICAN MARKET

Doing business in North America presents its own set of business challenges. To better quantify what service providers are thinking, they were asked the following:

How concerned are you with the following as they relate to water industry business development in the North American market?

In your opinion, how important are the following to the North American water and wastewater market growth?

What single water industry issue do you feel holds the most potential for innovation?

The survey provided a list of potential water sector development concerns for North American markets. As shown in **Table 14**, service providers see low-bid mentality as the greatest challenge to doing business, followed by utility budgets. Notably, competition was not considered an extreme concern by service providers.

Foreign Market Concerns				
RANKING	FOREIGN MARKET CONCERN	WEIGHTED AVERAGE	% CRITICALLY CONCERNED	RESPONDENTS n =
1	Financing	3.53	14.9	476
2	Financial concerns	3.45	12.5	471
3	Contract risks	3.39	13.7	468
4	Overall cost	3.36	8.8	468
5	Distribution	3.21	7.7	465
6	Divergent standards	3.18	6.2	471
7	Foreign exchange risks	3.05	6.6	470
8	Redundant test/compliance	2.79	3.6	466
9	Language barriers	2.75	4.9	468
10	Tied aid	2.72	2.9	454

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Table 13. Water industry service providers indicate foreign market concerns

North American Market Challenges				
RANKING	NORTH AMERICAN MARKET CHALLENGES	WEIGHTED AVERAGE	% EXTREMELY CONCERNED	RESPONDENTS n =
1	Cost/price/low-bid mentality	3.84	31.5	520
2	Budgetary issues faced by utilities	3.70	22.7	519
3	Federal funding	3.39	19.7	517
4	Regulatory (including permitting, certifications)	3.23	12.9	520
5	Policy	3.20	14.9	504
6	Industry attitudes toward change	3.19	12.2	523
7	Financial performance of the water sector	3.01	7.3	505
8	Availability of good market data	2.84	6.9	506
9	Competition	2.76	5.7	513
10	Venture capital or equity	2.75	7.1	465
11	Specifications	2.66	7.9	495

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Table 14. North American water market challenges as indicated by water sector service providers

North American Water Market Growth				
RANKING	IMPORTANT TO NORTH AMERICAN MARKET GROWTH	WEIGHTED AVERAGE	% CRITICALLY IMPORTANT	RESPONDENTS n =
1	Water quality issues	3.95	30.2	529
2	Water scarcity	3.92	34.5	528
3	Innovation	3.86	26.7	531
4	Advanced treatment technologies	3.68	20.8	523
5	Greater efficiency	3.65	20.2	530
6	Regulations	3.64	20.5	527
7	Secondary and tertiary WW treatment	3.60	15.7	511
8	Research	3.47	16.0	526
9	Smart water market	3.46	16.7	509
10	Solids removal technologies	3.43	13.3	503

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Table 15. Issues ranked by importance to North American water and wastewater market growth

In **Table 15**, water quality and water scarcity ranked as the biggest concerns for North American water and wastewater utilities, followed closely by innovation.

When asked what single water sector issue they believed held the most potential for innovation, the majority of service providers indicated advanced water treatment technologies related to potable water reuse.

The Canadian Perspective

The 2020 SOTWI survey had 154 respondents, or 5% of all survey respondents, representing nearly all provinces of Canada. This response rate is similar to previous surveys but is too small for statistical significance. This report includes the responses from all participants in all figures and tables and breaks out the Canadian perspective, as applicable, on given topics. **Figure 11** indicates the Canadian responses by province from the 154 providing that information to the 2020 SOTWI survey question; **Figure 12** shows the breakdown of respondents by job category.

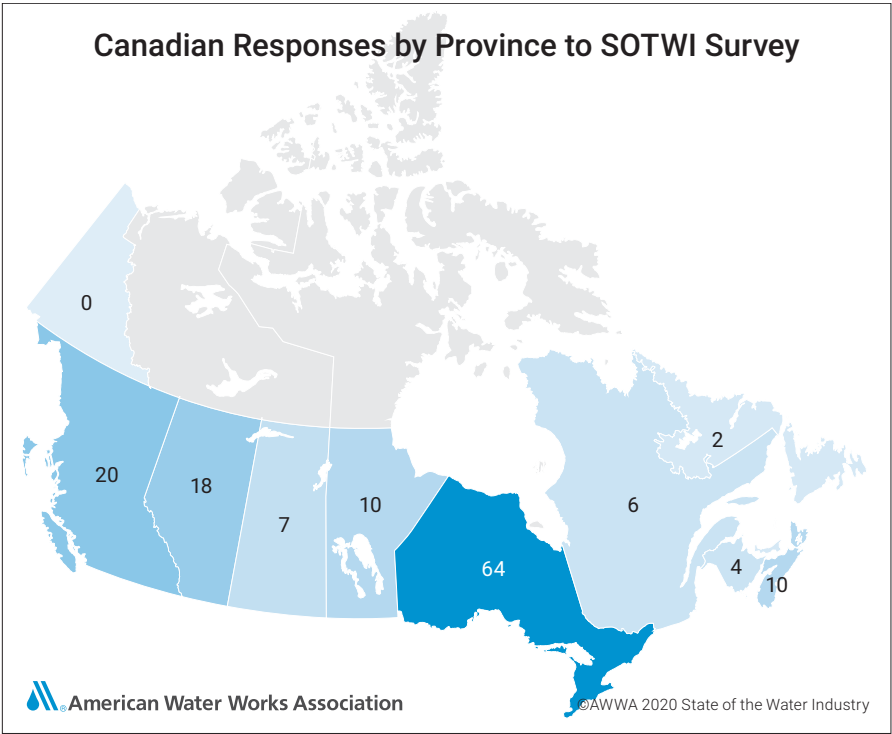


Figure 11. Canadian responses by province to SOTWI survey

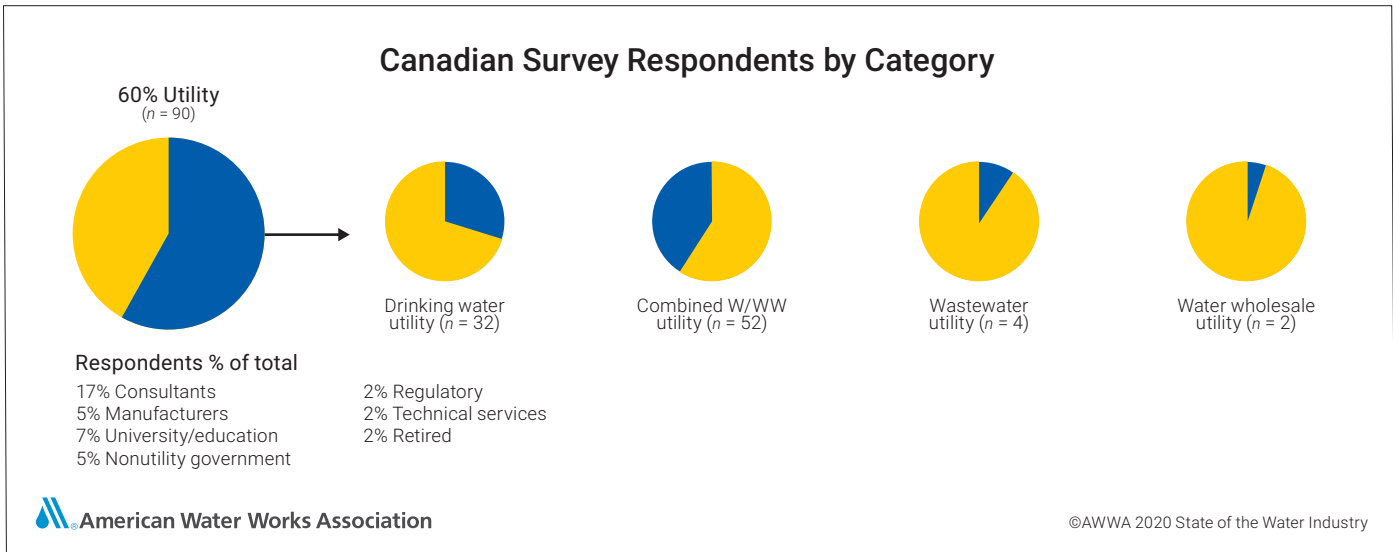


Figure 12. Canadian survey respondents by category



“Because our most pressing regulatory issues, such as PFAS and lead, are pervasive across the water sector and each utility’s circumstances are different, there is a significant need for diverse knowledge and resources to facilitate compliance. AWWA is uniquely able to fill this need, drawing on its volunteer corps of 5,500 experienced and committed professionals. Through a wide array of focused committees, they generate the trusted and reliable content that AWWA is widely known for, including manuals of practice, books, standards, articles, educational materials, webinars, and conferences, available in both traditional and digital formats.”

— Brent Alspach, Director of Applied Research, Arcadis

Figure 13 shows the average health of the water sector as rated by Canadian participants. The 2020 SOTWI data indicate Canadians are more optimistic about the present and future health of the water sector; they recorded 5.4 for the current health and 5.6 for the future health of the water industry on a scale of 1–7, where 1 = not at all sound and 7 = very sound.

To determine and rank the major issues currently facing the water sector, Canadian participants were asked to rate the importance of several challenges on a scale of 1 to 5, where 1 = unimportant and 5 = critically important. The top 10 issues as ranked by respondents are shown in **Table 16**.

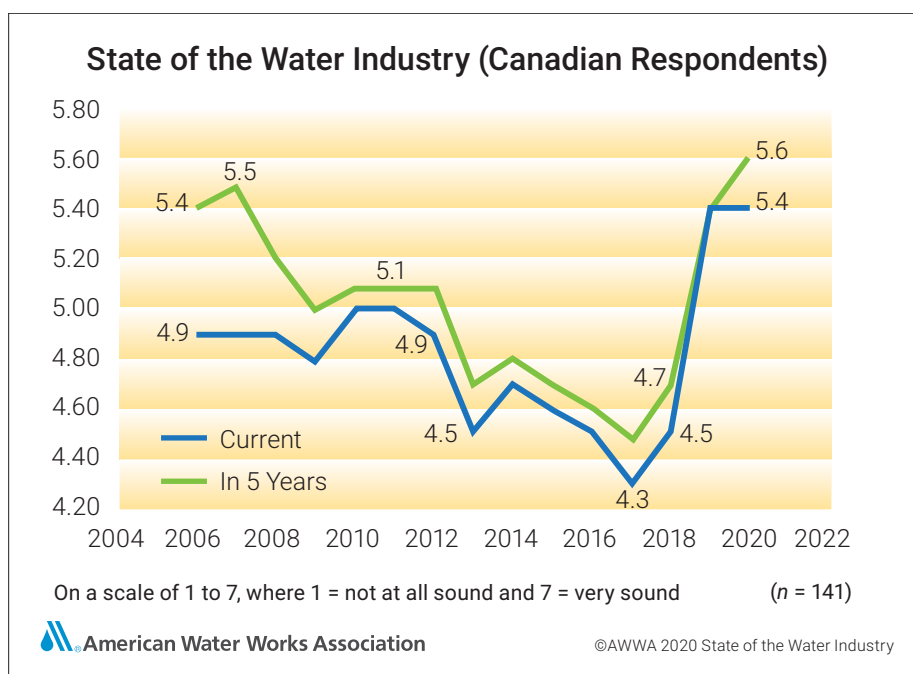


Figure 13. State of the water industry – Canadian responses (2006–2020)

A closer look at the top 10 concerns for all Canadian respondents, Table 16 shows renewal and replacement of aging water and wastewater

infrastructure ranked as the most pressing issue facing the water sector followed by financing and emergency preparedness.

Canadian Water Sector Challenges		
2020 RANKING	CANADIAN WATER SECTOR CHALLENGES	WEIGHTED AVERAGE
1	Renewal and replacement of aging W/WW infrastructure	4.37
2	Financing	4.21
3	Emergency preparedness	4.09
4	Watershed/source water protection	4.08
5	Long-term water supply availability	4.00
6	Compliance with current regulations	3.97
7	Compliance with future regulations	3.96
8	Public understanding of the value of water systems and services	3.90
9	Public understanding of the value of water resources	3.89
10	Cost recovery	3.82

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Table 16. Water sector challenges ranked by Canadian respondents on a scale of 1 to 5, where 1 = unimportant and 5 = critically important.



“You’ve heard me before reference the water profession as a ‘vocation of distinction.’ In these difficult times, it is also a vocation of heroism. Rarely seen but always on the job, you are a quiet army protecting our communities in ways they do not fully understand. Whether you are a distribution operator repairing a broken water main in frigid temperatures, or a chemist assuring the community water supply is safe to drink, or a wastewater worker freeing a clogged sewer system, or a customer service representative helping a concerned citizen with a difficult question, or a technology provider developing solutions that make our magnificent water systems even better—you are all essential in keeping our communities safe and healthy.”

— Jim Williams, AWWA President, message during COVID-19 pandemic

2020 SOTWI Respondents

THE 2020 SOTWI SURVEY ASKED PARTICIPANTS a series of demographic questions. Responses were not required, and not all participants chose to provide information. All data are self-reported.

Figure 14 shows the total number of participants based on the type of organization they work for. Sixty-two percent of all participants ($n = 1,990$) indicated they worked for a utility; another 24% ($n = 781$) identified

as service providers (consulting firms/consultant, manufacturer, and technical services/contractors).

Taking a more detailed look at the utility respondents in **Figure 15**, we

see that the largest respondents were the large utilities serving a population between 10,001 and 100,000. Nearly all responding utilities (88%) are publicly owned entities; those identifying as executive/management and operations and maintenance personnel were the largest group of respondents.

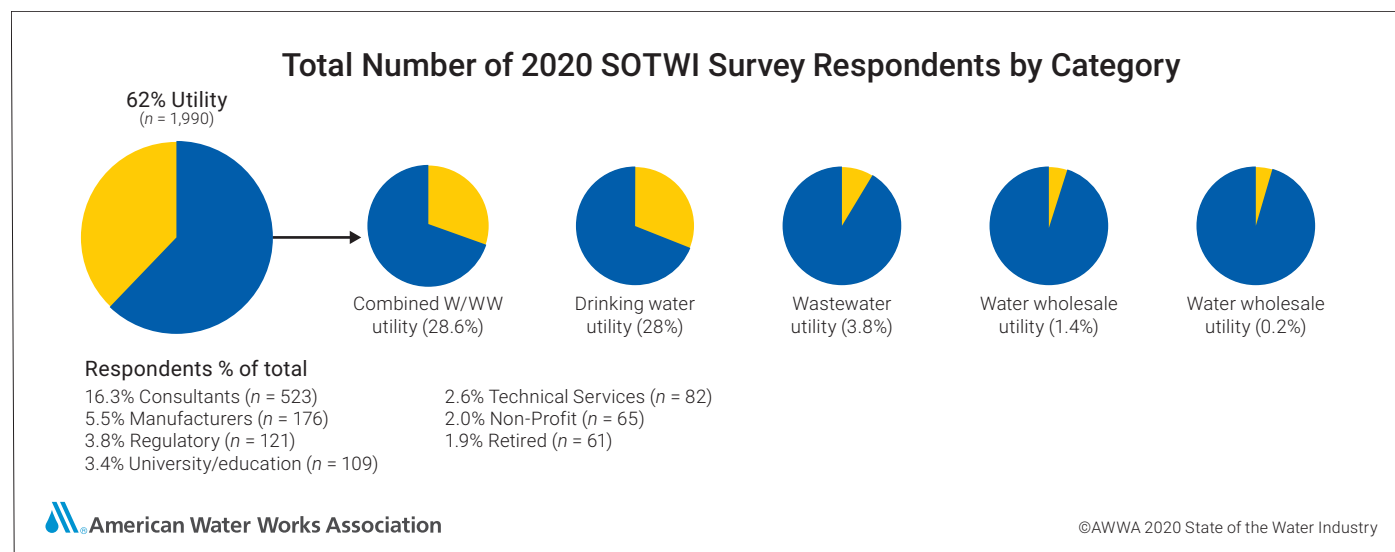


Figure 14. Total number of 2020 SOTWI survey respondents by category

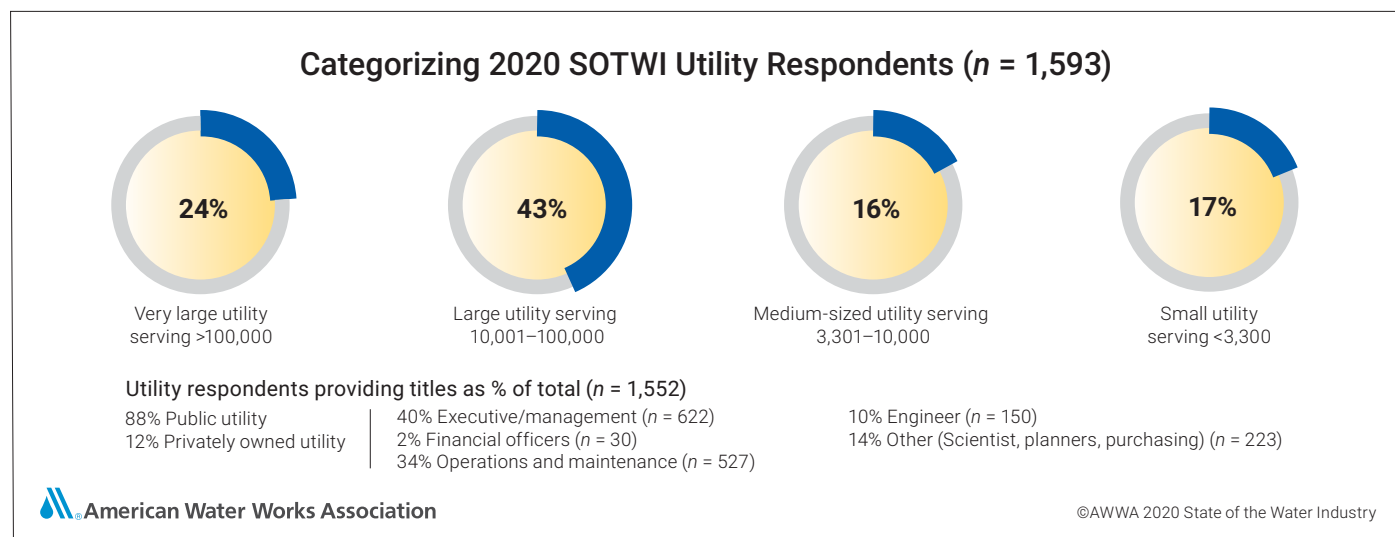


Figure 15. Categorizing 2020 SOTWI utility respondents

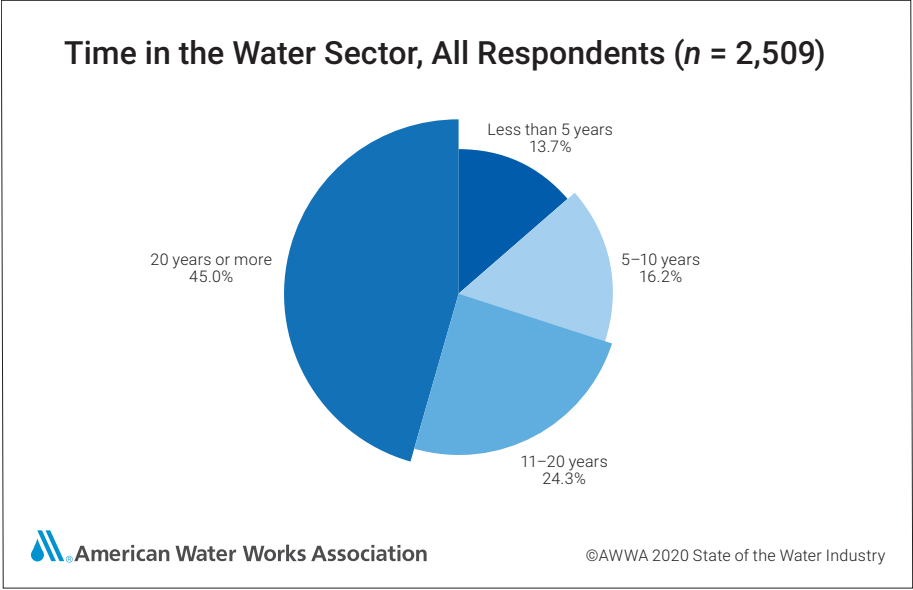


Figure 16. Time in the water sector, all respondents

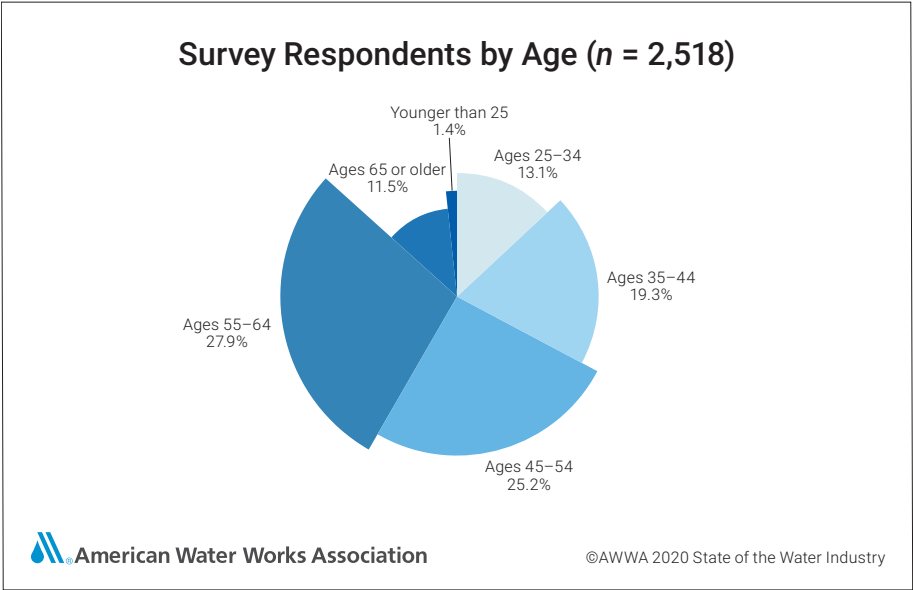


Figure 17. Survey respondents by age

SURVEY METHODOLOGY

The SOTWI survey population includes all water professionals—i.e., those with a working understanding of the issues facing the entire water sector. The SOTWI survey classifies participants on the basis of which of the following 15 categories best describes the type of organization for which they work:

- Drinking water utility
- Wastewater utility
- Combined water/wastewater utility (may include other services, too)
- Water wholesaler
- Reuse/reclamation utility
- Stormwater utility
- Consulting firm/consultant
- Manufacturer (including products, representatives, and/or distributors)
- Technical services/contractor
- Regulatory authority/regulator

- Nonutility government (e.g., municipal, federal)
- University/educational institution
- Nonprofit organization
- Retired
- Other (please specify).

AWWA made deliberate efforts throughout the 2020 SOTWI study to anticipate and minimize errors from coverage, sampling, nonresponse, and measurement. The 2020 SOTWI sample frame consisted of a general list of AWWA members and nonmember contacts. The survey primarily reflects water industry concerns in the United States, but participants from Canada and Mexico also contributed.

On Sept. 16, 2019, initial e-mail invitations were delivered to more than 152,707 e-mail addresses on the basis of the criteria described. Subsequently, two follow-up e-mails

were sent to this same group between Oct. 7, 2019, and Nov. 5, 2019. Links to the survey were also posted on AWWA social media. After removing wholly incomplete responses (i.e., surveys submitted with no responses at all), the total number of 2020 SOTWI survey participants was 3,351—a 2.2% response rate.

Of those 3,351 participants, all answered some questions, but many skipped questions or were not shown certain questions, meaning that not all charts will add up to 3,351. Data points such as percentages were calculated based on number of responses received for that particular question. Data were analyzed using Qualtrics statistical tools from November through December of 2019. All data points addressed on the survey were included in this report.

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