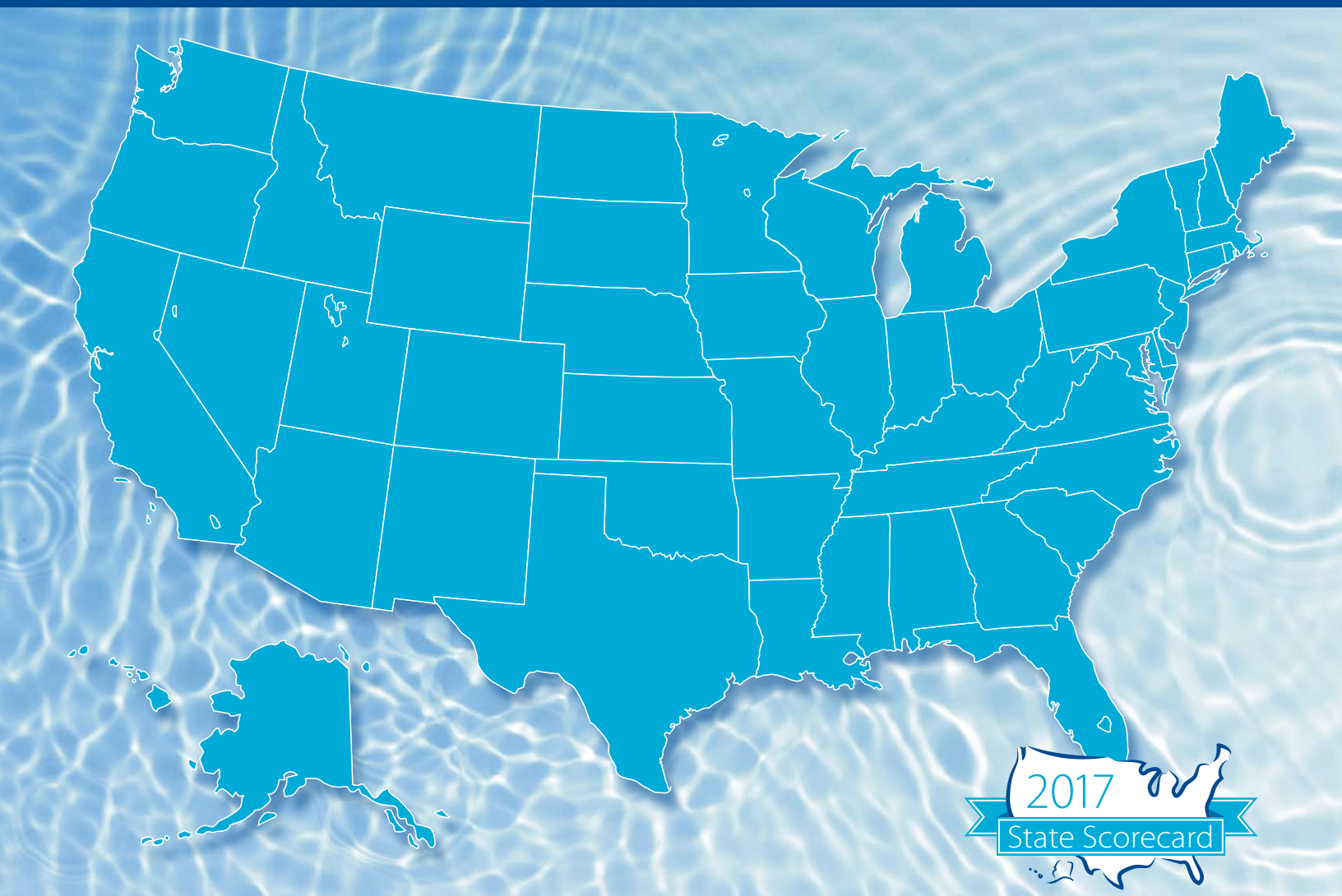
The Water Efficiency and Conservation State Scorecard:

An Assessment of Laws



Alliance for Water Efficiency

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Full Report

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Project Collaborators

Alliance for Water Efficiency

The Alliance for Water Efficiency (AWE) is a nonprofit dedicated to the efficient and sustainable use of water across North America. Based in Chicago, AWE advocates for water efficient products and programs, and provides information and assistance on water conservation efforts. AWE works with more than 400 member organizations, providing benefit to water utilities, business and industry, government agencies, environmental and energy advocates, universities, and consumers.

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Project Advisory Committee

The project team was privileged to have input and guidance from an esteemed advisory committee comprised of professionals working on water efficiency and conservation at the state level. It extends its gratitude to:

Charlotte Ely | *California State Water Resources Control Board*
Kevin Reidy | *Colorado Water Conservation Board*
Bennett Weinstein | *Georgia Environmental Protection Division*
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State Agency Employees

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Additional Resources Available on the AWE Website

Supplement materials including expanded versions of the scorecards, fact sheets, state-by-state materials, and the surveys underlying the scorecards are all available in the AWE Resource Library.

The Water Efficiency and Conservation State Scorecard:

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2017 State Scorecard

Contents

Figures and Tables

I. Executive Summary

This report provides a comprehensive review of some of the most powerful means of promoting the efficient use of water: state laws. It is a five-year update to the Alliance for Water Efficiency's (AWE) 2012 report *Water Efficiency and Conservation State Scorecard: An Assessment of Laws and Policies.*

Why Look at State Laws?

All 50 States were surveyed.

The sustainable management of our fresh water resources is fundamental to the stability and long-term growth of our communities and economies. In failing to pursue every avenue of water conservation and efficiency, many communities will face greater supply challenges in the future. Thus, how state laws deal with the subjects of water efficiency, conservation, and climate resiliency provides an important window into how each state manages its water resources.

Conducting the Survey

Using lessons learned from the development of the 2012 report, the AWE project team enhanced the survey underlying the project in order to gain a deeper understanding of state-level laws that promote water conservation and efficiency. As with the 2012 report, all 50 states were surveyed.

Although the 2012 and 2017 surveys are not identical, they generally cover the same topical question areas. The primary difference is the depth at which each topic is explored. For example, in the 2012 report, the AWE project team asked whether the state had any laws or policies regarding water loss in utility distribution systems. The 2017 report includes a very similar question but with many sub-questions, such as whether there is a water loss limit and requirements for leak correction. These additional questions enabled the project team to gain better insight into what states have done, and it will help gauge a state's progress in future reports. This report does not account for agricultural efforts in conservation and efficiency. Rather, it focuses on urban efforts and non-agriculture efforts in rural communities.

This report and its underlying research do not review efficiency and conservation in the agriculture industry. In addition, though the project team saw signs of more serious efforts in implementing different programs and laws since 2012, this report does not evaluate or grade actual program implementation.

Adding Climate Resiliency

Each state received a grade for efficiency and conservation, and a separate grade for climate resiliency.

How states are now coping with the water resource impacts of climate change became an issue the AWE project team wished to cover in the 2017 scorecard. Three short survey questions were added. Although these questions do not provide the same level of detail as the questions in the rest of the report, the state responses do illustrate how states are beginning to equip themselves to be water resource resilient when faced with the impacts of climate change. More specifically, the questions attempt to measure how states anticipate managing water supplies in the context of climate change.

Scoring the States

Each state received a grade for efficiency and conservation and a separate grade for climate resiliency. The methodology used to score the states is described in section III of the report. These state reviews, along with the Report's review of exemplary laws, can be a resource for lawmakers and other professionals active in the water industry and can provide a catalyst for change. Similar scorecard reports on energy efficiency conducted by the American Council for an Energy Efficient Economy have prodded states into a friendly competition to improve their energy efficiency scores. The AWE project team is hoping for the same result here.

The Survey Findings

The 50 states together earned an average "C" grade in both surveys. Only 11 states received either an "A" or "B" in both surveys.

In the water conservation and efficiency survey, the 50 states earned an average of 19 points, which equates to a "C" grade. Two states earned an "A" grade (California and Texas), and there were 17 "B's," 14 "C's," and 17 "D's."

In the climate resiliency survey, the 50 states earned an average of 7 points, which also equates to a "C" grade. Two states earned an "A" grade (California and Oregon), and there were 17 "B's," 9 "C's," and 22 "D's."

All the state scores and corresponding grades for each survey are summarized below in **Table 1**.

Only 11 states received some combination of "A"s and "B"s for both conservation and efficiency laws and climate resiliency planning plans and laws. Those states are: California, Colorado, Connecticut, Massachusetts, Minnesota, New Hampshire, North Carolina, Oregon, Rhode Island, Washington and Wisconsin.

Table 1 – Summary of Efficiency and Conservation Grades and Climate Resiliency Grades

	EFFICIENCY AND CONSERVATION		CLIMATE RESILIENCY	
STATE	POINTS	GRADE	POINTS	GRADE
Alabama	10.5	C-	5	C
Alaska	2	D	10.5	B-
Arizona	41.5	B+	0	D
Arkansas	12.5	C-	0	D
California	52.5	A-	19	A-
Colorado	32.5	B	13	B
Connecticut	26	B-	12.5	B
Delaware	16.5	C	11	B-
Florida	24.5	C+	13.5	B
Georgia	40.5	B+	0	D
Hawaii	16	C	11.5	B-
Idaho	7	D+	9	C+
Illinois	18	C	2.5	C-
Indiana	13	C-	0	D
Iowa	8.5	D+	0	D
Kansas	10.5	C-	8.5	C+
Kentucky	30	B-	0	D
Louisiana	9	D+	0.5	D+
Maine	4	D	11.5	B-
Maryland	14	C-	16	B+
Massachusetts	28.5	B-	13	B
Michigan	3	D	9	C+
Minnesota	34	B	16	B+
Mississippi	4	D	0	D
Missouri	3	D	0	D
Montana	8	D+	11.5	B-
Nebraska	7	D+	0	D
Nevada	37.5	B	0	D
New Hampshire	35.5	B	10.5	B-
New Jersey	29	B-	0	D
New Mexico	16	C	8.5	C+
New York	23.5	C+	8.5	C+
North Carolina	26	B-	13	B
North Dakota	5	D	0	D
Ohio	9	D+	0	D
Oklahoma	7	D+	0.5	D+
Oregon	37.5	B	21	A
Pennsylvania	6	D+	16	B+
Rhode Island	29.5	B-	16.5	B+
South Carolina	12.5	C-	0	D
South Dakota	5	D	0	D
Tennessee	13	C-	0	D
Texas	51.5	A-	0	D
Utah	26	B-	8	C+
Vermont	8.5	D+	0	D
Virginia	33.5	B	9.5	C+
Washington	35	B	16.5	B+
West Virginia	12	C-	0	D
Wisconsin	27	B-	11	B-
Wyoming	1	D	0	D

Measuring Progress Since 2012

More states achieved an "A" or "B" grade in 2017 than they did in 2012.

One goal of updating this report every five years is to track progress and changes made in state law. **Table 2** below reflects changes in state grades in 2017 as compared to 2012. Because the 2017 survey was expanded in scope, a state score comparison with 2012 is not necessarily a straight and easy one. However, the scoring scale in the 2017 Scorecard aligns closely with the 2012 survey scale. Comparing the 2012 and 2017 grades is useful as a starting point for deeper analysis into changes occurring in the last five years.

Table 2 – Change in Efficiency and Conservation Grades

EFFICIENCY AND CONSERVATION GRADE CHANGES*					
STATE	2017 GRADE	2012 GRADE	STATE	2017 GRADE	2012 GRADE
Alabama ↑	C-	D	Montana ↑	D+	D
Alaska	D	D	Nebraska ↑	D+	D
Arizona	B+	B+	Nevada ↑	B	B-
Arkansas	C-	C-	New Hampshire ↑	B	B-
California	A-	A-	New Jersey	B-	B-
Colorado ↑	B	B-	New Mexico	C	C+
Connecticut ↑	B-	C+	New York ↑	C+	C+
Delaware ↑	C	C-	North Carolina ↑	B-	C+
Florida ↑	C+	C	North Dakota	D	D
Georgia ↑	B+	B	Ohio ↑	D+	D
Hawaii ↑	C	D	Oklahoma ↑	D+	D
Idaho ↑	D+	D	Oregon ↑	B	B-
Illinois ↑	C	C-	Pennsylvania ↑	D+	D
Indiana	C-	C-	Rhode Island	B-	B-
Iowa	D+	C	South Carolina	C-	C-
Kansas	C-	C	South Dakota	D	D
Kentucky ↑	B-	C+	Tennessee ↑	C-	D
Louisiana ↑	D+	D	Texas	A-	A-
Maine	D	D	Utah ↑	B-	C+
Maryland	C-	C	Vermont	D+	C-
Massachusetts ↑	B-	C+	Virginia ↑	B	B-
Michigan	D	D	Washington	B	B-
Minnesota ↑	B	C+	West Virginia ↑	C-	D
Mississippi	D	D	Wisconsin	B-	B-
Missouri	D	D	Wyoming	D	D

*A ↑ indicates that the state's grade went up.

A broad observation is that more states achieved an "A" or "B" grade in 2017 than they did in 2012. The same two states again earned "A" grades (California and Texas), but the number of "B" grades moved to 17 from 11, the number of "C" grades moved to 14 from 18, and the number of "D" grades moved to 17 from 19. Overall, 27 states had grades that went up, while six had grades that went down.

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It is useful to take a closer look at those states whose grades moved by more than one step (keeping in mind that the expanded survey and additional points available under new questions may have impacted the 2017 grade relative to the 2012 grade). For example, Minnesota moved two steps from a "C+" to a "B". This is partly attributable to new requirements in both drought planning and conservation planning unrelated to water rights allocations/permitting. As another example, Hawaii moved an entire letter grade from a "D" to a "C" largely because of its robust new law regarding water losses in utility distribution systems.

Moving beyond specific states, some trends emerged regarding changes in each of the topic areas. The topic areas that saw the most change were water loss control and drought planning. Within each category, six states made advancements.

Detailed information on specific issues follows.

Water Loss Control

With respect to water loss control, there was no apparent geographic uniformity as to the states advancing this issue. However, water loss control proved to be a particularly active endeavor beyond the state level. In working with water loss professionals at Cavanaugh in formulating the survey questions, their application, and the point assignments, the AWE project team learned that even as states begin to require measures supporting water loss control, pilot projects and rules at more local levels of government, as well as at the initiative of utilities, are also increasing in number. The results of these efforts are critical in demonstrating both the benefits of water loss control and the fundamental elements to be included in a set of water loss control laws. With this is in mind, the AWE project team is hopeful that an even greater number of states will have comprehensive laws on this issue within the next five years.

Drought Planning

Only 19 states obligated suppliers to create and/or implement drought plans.

With regard to drought planning, only 19 states obligated suppliers to create and/or implement drought plans. Most states that had these requirements in place also had rules for plan reviews, stakeholder engagement, update requirements and other features that amounted to a robust process. However, of the states that made strides in drought planning requirements for their water suppliers, four of the six were in the southeastern U.S., and the other two were also east of the Mississippi river, but in different geographic regions.

Plumbing Fixture and Appliance Standards

Of all the topic areas asked about, plumbing fixture and appliance standards and the related building and plumbing codes are arguably the easiest areas in which states could make improvements and pick up points in the Scorecard analysis. Improvements here require little investment and relatively little in the way of non-monetary resources, especially when compared with more labor-intensive efforts such as water loss control, technical assistance, and funding for urban water conservation programs.

Two states picked up points for building and plumbing codes.

However, only a handful of states produced any changes here, and did so to varying degrees. Two states picked up points for building and plumbing codes. New York was the most notable of these, since more efficient standards for toilets, urinals, faucets, and showerheads are now required in its building codes (see Section IV, *Question 7: Building and Plumbing Codes*). The project team is hopeful that more states will take advantage of opportunities here and implement standards that contribute to passive, on-going water conservation and efficiency.

Planning and Programs

Oregon and Florida have taken steps to link conservation and efficiency to water permitting.

Only two states saw changes in the topic area of water suppliers planning and implementing conservation and efficiency programs in order to receive or maintain a water right permit/use permit. Oregon and Florida (both of which saw upward movement in their grades) have taken steps to link conservation and efficiency to water permitting, and the sufficiency of the plan is pro-actively evaluated for compliance before a permit is issued.

There were promising gains in supporting implementation of conservation and efficiency (again without any geographic distinction). The number of states providing technical assistance for urban water conservation programs grew by five, now totaling 30. The degree and type of assistance varied, but it is still a clear move in the right direction. No states that reported providing technical assistance in 2012 stopped doing so.

Funding

In 2012, 22 states offered financial support from sources other than State Revolving Funds for utilities to use in urban water conservation projects. In 2017, only 18 states offered this kind of assistance. This is a significant problem.

In 2012, 22 states offered financial support from sources other State Revolving Funds for utilities to use in urban water conservation projects. In 2017, only 18 states offered this kind of assistance.

Some of the states that previously had additional funding available did so through limited term initiatives. However, the availability of financial support is an increasingly large hurdle to overcome for water suppliers and communities that want to pursue urban conservation and efficiency projects. Sound water management requires continued, substantial investment, and so continuous funding opportunities at the state level are necessary. For example, the State Water Implementation Fund in Texas offers on-going financial assistance in the form of low-interest loans (and some flexibility in repayment terms) for projects included in the state water plan. It provides a considerable sum to these projects, having committed more than $5.6 billion for the fiscal year 2017 alone. While not every state can offer this level of financial support, all states should consider ways in which they can provide on-going financial support to utilities and communities working to advance conservation and efficiency.

Metering and Billing

Across states, 62% require metered customer connections, but only 22% require volumetric billing practices and 16% demand the use of conservation inducing rate structures.

Questions 14 through 16 of the 2017 survey are viewed by the project team as building block steps, in that metering connections enables volumetric billing, which in turn allows for conservation-oriented rate structure requirements. Questions 14 (mandatory metering at customer connections to public supplies) was phrased differently in the 2012 survey: what percent of publicly supplied connections are metered. The question was not scored in 2012 due to difficulty in verifying answers. Although comparisons cannot be drawn between the 2012 and 2017 reports on this topic, it is useful to know that 31 states do have some kind of requirement for metering connections, albeit to varying degrees.

Question 15 (volumetric billing requirements) was phrased similarly to its 2012 version. The results of the 2017 survey show that three states saw progress in the intervening five years, resulting in a total of 11 states with a volumetric billing requirement.

Question 16 (rate structures designed to encourage water conservation) was new in the 2017 survey, and survey results show that 8 states require suppliers to implement rate structures that send a conservation signal. When this information is aligned, it reveals an interesting gap. Across the states, 62 percent require metered customer connections, but only 22 percent require volumetric billing practices and 16 percent demand the use of conservation-inducing rate structures. Thus, only about half of all states that currently have a direct path to requiring conservation-oriented rate structures do so.

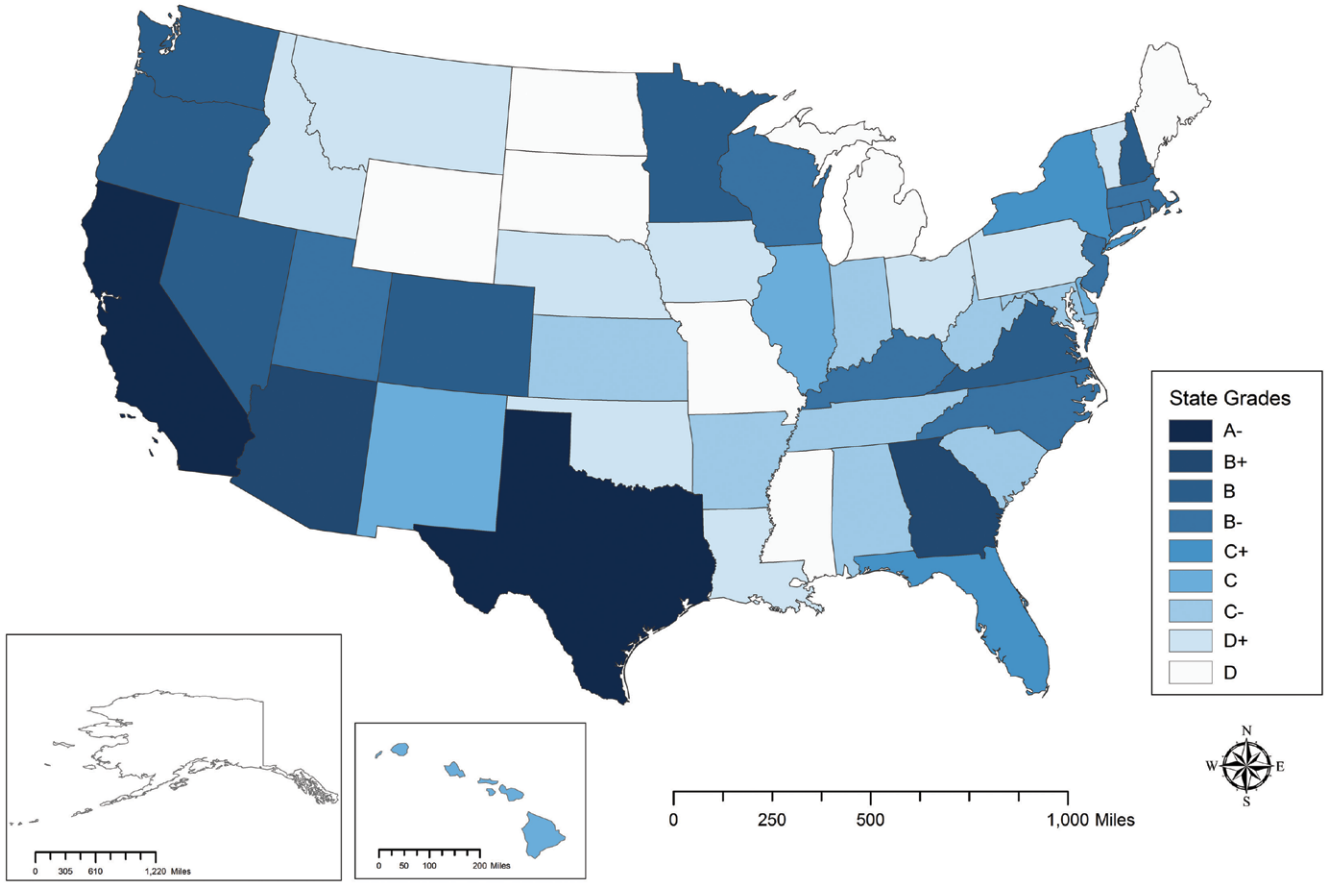
Geographic Comparison

A large swath of the central U.S. could improve in urban conservation and efficiency.

The geographic display of conservation and efficiency grades presented in **Figure 1** shows that significant advancements are possible. A large swath of the United States stretching from the Pacific Northwest to the Southeast could improve in conservation and efficiency. The states comprising this corridor are: Alabama, Arkansas, Idaho, Illinois, Iowa, Kansas, Louisiana, Mississippi, Missouri, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, Tennessee, and Wyoming. All of these states experienced abnormally dry or some type of drought condition ranging from moderate to exceptional in 2012. The same is true of these states in 2017.

However, while there is still tremendous opportunity to improve, it is notable that of the states falling in this corridor in the central U.S., nine saw some improvement in their grades. Those states are: Alabama, Idaho, Illinois, Iowa, Louisiana, Montana, Nebraska, Oklahoma, and Tennessee.

Figure 1 – Water Efficiency and Conservation State Scorecard Grades (2017)



Climate Resiliency

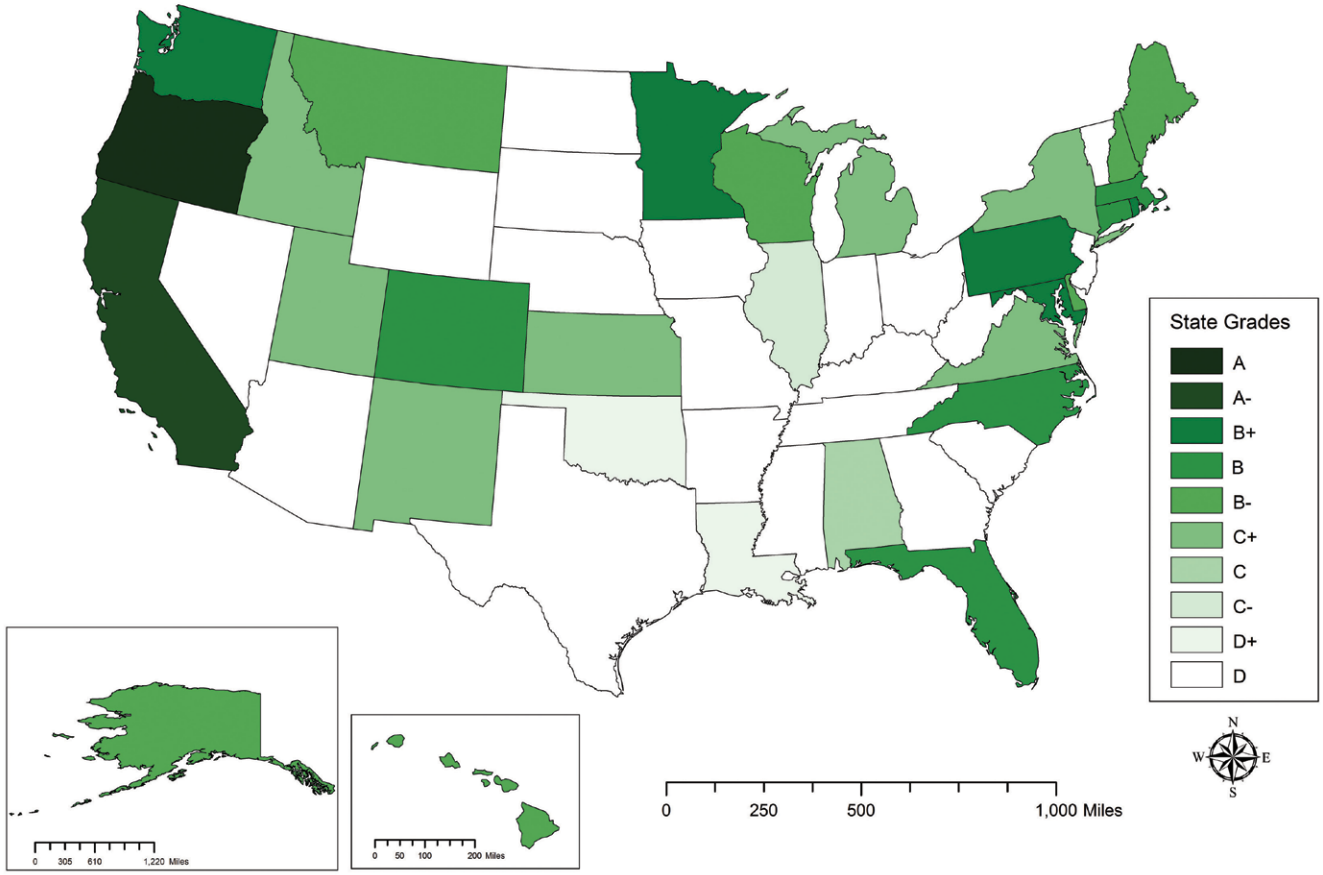
23 states had no plans of any kind to address resiliency planning for climate adaptation.

Looking more closely at climate resiliency, a few things emerged from the survey that indicate how much room there is to improve resiliency preparedness at the state level. In this scorecard analysis, points were awarded to resiliency plans and laws if their effect was to mitigate the impact of conditions associated with climate change. This means that even if the words "climate" never appeared in the language, a plan or law could still fall within the Scorecard's consideration. For example, elements of a drought plan might be considered if they addressed increased prolonged drought or more unpredictable weather patterns in the future, where climate change is a driving factor of these changes. Despite the broad spectrum of plans and laws that could be considered, 23 states had no plans of any kind regarding resiliency and climate adaptation.

Of those states that do have a plan in place, only six require regular updates every five years or fewer: California, Idaho, Maryland, Minnesota, Oregon, and Pennsylvania. Only five states have required or voluntary benchmarks, all of varying degree and approach: California, Oklahoma, Oregon, Hawaii, and Washington."

When asked what water supply-related impacts of climate change the state was focusing on through a plan or laws, responses spanned a diversity of topics and followed no geographic pattern. Drier conditions, reduced precipitation, reduced snowmelt, more frequent and/or longer droughts, large storms and related flooding, groundwater declines and recharge reductions, and saltwater intrusion in groundwater supplies, were the most common responses. Despite this, only three states had any kind of guidance or provisions in place requiring action on the part of water or wastewater systems to plan for climate change related drought, flooding and system stability and capacity: Rhode Island, Louisiana and Pennsylvania.

Figure 2 – Climate Resiliency State Scorecard Grades (2017)



While the same number of states scored "A"s and "B"s on the resiliency portion of the report as the efficiency and conservation portion (two and 17, respectively), there is a much less clear geographic connection between which states are preparing to be climate change resilient and which are not, as evidenced at left in **Figure 2**. Additionally, there is an opportunity to work toward better alignment between those states that received high marks for conservation and efficiency and those that received high marks for climate resiliency planning.

Final Observations

All states can improve their laws regarding water efficiency, conservation, and climate resiliency.

States hold a unique legal position in which they are able to design high-level laws that apply statewide, but which are better tailored to their needs and challenges than federal laws might be. This is true of a broad range of urban conservation and efficiency and water supply needs, as well as climate resiliency planning. When states do take action on these critical issues, they help advance the nation and contribute to securing the future of our communities and economies.

While some states received high marks in this report, their work should not be viewed as finished: All states can improve their laws regarding water efficiency, conservation, and climate resiliency. Continued progress and innovation will move the finish line for all states and will help ensure secure supplies of freshwater for the future.

In an effort to help move the finish line, the full 2017 report includes sections that review the exemplary laws and examples found across states for each of the topic areas asked about in the survey. This section has the potential to be a foundational resource for planners, policy makers, and water professionals who want to improve their state's approach to managing fresh water resources. The project team hopes that in better exposing the great work that has already been achieved at the state level, more states will be motivated to improve their commitment and perspective to water supply management and resiliency planning.

II. Introduction

Five years ago AWE released its first State Scorecard on Water Efficiency and Conservation. At the time the 2012 Scorecard was completed, the U.S. Drought Monitor indicated that the majority of the Midwest was under exceptional drought conditions—the highest intensity listing. Also at that time New Mexico, Texas, and much of the Southeastern United States were grappling with long-term severe drought conditions. In the five years that have passed, designations have changed, but the regular occurrence of extreme drought conditions has not. In fact, no state was unaffected by some level of drought or abnormally dry conditions in 2017.[1]

Moreover, the expectation of water shortages is growing nationally. A 2003 U.S. General Accounting Office survey on water shortage found that 36 states expected water shortages by 2013. In the 2014 update, 40 states indicated an expected water shortage by 2023. Owing to drought and shortages, the last decade has also seen insufficient supplies halt housing developments in Pismo Beach, East Palo Alto, and the Lake Arrowhead Community Services District in California, as well as the West Yellowstone community in Montana. In addition, the every-day-lives of residents in Orme, Tennessee and Spicewood Beach, Texas were turned upside down when they ran out of water.

In the face of such critical supply challenges, state-level laws and policies are a powerful means of achieving water conservation and efficiency. By extending supplies, water conservation and efficiency ensure the health and vibrancy of communities and businesses nationwide. They also enhance preparedness and build resiliency for broad climatic shifts and for the impacts of extreme weather events, which are occurring with increasing frequency and duration.

For nearly a decade, AWE has been working to identify and raise awareness about state-level laws that encourage water conservation and efficiency. AWE began this effort with an 11-prong state survey issued in 2009. The 2011 survey expanded the focus and served as the foundation for the 2012 Scorecard. Now five years later, AWE has updated the survey again, with more specific questions and an adjusted scoring methodology, to rank the states and identify those with standout laws. As in past iterations, this effort does not attempt to analyze the actual program implementation within each state. Instead it focuses on legal requirements that are fundamental to successful water conservation and efficiency management.

This report begins with a discussion of the project background and survey questions. Next, the data collection process and scoring methodology used to assign grades are explained. Following the scoring methodology is a summary of the results and two sections that provide detail on the most rigorous and robust water efficiency and conservation laws and climate adaptation plans in the context of each survey question.

With respect to the scoring methodology, it is important to note that the number of points available in the conservation and efficiency survey was significantly expanded from the 2012 iteration due to the use of numerous sub-questions. The sub-questions were instituted so that the project team could more exactingly elicit the information it sought, and thereby produce grades that more completely represent the accomplishments of each state than it did in 2012. However, the sub-questions also created some challenges when it came to assigning fair and representative grades. First, the number of points available in the 2017 iteration was almost double the number available in 2012. There also was more opportunity for extra credit in the 2017 report. Second, while the use of sub-questions allowed the project team to better evaluate the strength and comprehensiveness of a state's laws, they also had the potential to skew the final grades in ways that suggest change when there was none or no change when it had occurred. Last, the sub-questions created weighting challenges for each of the broader questions. The project team was sensitive to all of these challenges and worked to address them in developing a fair point scale. A few states did receive slightly lower grades in this report than they did in the 2012 report, due in part to the amended questions and point scale but often because of changes to law, funding, or technical support or a corrected categorization of a law vis-à-vis the questions.

This report also features a section on climate resiliency. This year, in addition to the water conservation and efficiency questions, the survey included three questions regarding climate adaptation plans and other state resiliency requirements. From an analysis of these answers, each state received a resiliency score, in addition to the efficiency and conservation score. The questions and methodology regarding resiliency are explained in a special section below. Lastly, project challenges are addressed prior to the concluding remarks.

The results demonstrate that state-level water efficiency and conservation laws and climate adaptation plans vary significantly across the United States. Importantly, there is still significant opportunity for many states to strengthen their approaches. It is AWE's hope that by providing this information in a clear and concise way, the exemplary approaches identified will serve as a catalyst to those states that still have ground to gain in this area of water resource management. AWE also intends for this report to spur dialogue about current and future water efficiency and conservation laws and adaptation plans, and to create friendly and healthy competition among states.

1 US Drought Monitor. *Annual animation map for 2017*. http://droughtmonitor.unl.edu/data/gif/2017.gif.

III. Background and Methodology

This section provides a brief history of AWE's data collection efforts, and presents the data collection and scoring methodologies.

A. 2009 and 2011 Surveys

In 2009, AWE surveyed states to identify water efficiency and conservation laws using an 11-prong questionnaire. The questionnaire broadly addressed whether the state required or offered fundamental conservation planning, such as *Does the state regulate drinking water supplies and require conservation as part of its permitting process or water right permit process?*[2]

Having received significant interest and feedback on the 2009 survey, AWE expanded this work.

In 2011, AWE formed a project advisory committee comprised of agency staff from six states to update the 2009 questions. The 2011 survey contained 20 questions in total. Four were new, the rest were reworked from the 2009 questions in order to better elicit the information sought. The project advisory committee met twice to develop and vet the survey, which was finalized on April 22, 2012. Finalizing the survey was no small effort. In addition to requiring the committee to review changes and provide feedback between and after meetings, many additional useful questions were proposed. However, the committee very intentionally sought to avoid a survey that would be too resource intensive for both agency staff and the project team. The final questionnaire is shown in **Figure 1**.

Figure 1: AWE 2011 State Survey Questions

1.	What state agency or agencies are in charge of drinking water conservation/ efficiency?
2.	Does the state have a water consumption regulation for toilets that is more stringent than the federal standard?
3.	Does the state have a water consumption regulation for showerheads that is more stringent than the federal standard?
4.	Does the state have a water consumption regulation for urinals that is more stringent than the federal standard?
5.	Does the state have a water consumption regulation for clothes washers that is more stringent than the federal standard?
6.	Does the state have a water consumption regulation for pre-rinse spray valves that is more stringent than the federal standard?
7.	Does the state have mandatory building or plumbing codes requiring water efficient products that exceed the federal standard?
8.	Does the state have any regulations or policies for water utilities regarding water loss in the utility distribution system?
9.	Does the state require conservation activities as part of its water permitting process or water right permit?
10.	Does the state require preparation of drought emergency plans by water utilities or cities on any prescribed schedule?
11.	Does the state have a mandatory planning requirement for potable water conservation/efficiency separate from drought emergency plans?
12.	Does the state have the authority to approve or reject the conservation plans?
13.	How often does the state require the water utilities to submit a potable water conservation plan (not part of a drought emergency plan)?
14.	If the state has a mandatory planning requirement for potable water conservation separate from drought emergency plans, is there a framework or prescribed methodology?
15.	Does the state require water utilities to implement conservation measures, beyond just the preparation and submittal of plans?
16.	Does the state offer financial assistance to utilities, cities, or counties for urban water conservation programs such as a revolving loan fund? Grants? Bonds? Appropriations?
17.	Does the state offer technical assistance for urban water conservation programs?
18.	Does the state require volumetric billing?
19.	What percentage or number of publicly supplied water connections (residential and nonresidential) are metered in your state?
20.	Does the state provide statewide ET microclimate information for urban landscapes?

2 The 2009 survey questions can be found in the 2012 report available at http://www.allianceforwaterefficiency.org/final-scorecard.aspx.

B. 2017 Survey

In 2017, with the support of a project advisory committee comprised of seven state-level officials, the project team revisited the 20 questions used in the 2012 report. The project team added, removed, revised, and refined questions to create a very intentional and more thorough survey. The most significant changes are the removal of questions regarding ET microclimate information, the answers to which were very difficult to verify, the addition of a question on rate structures that promote conservation, as well as the addition of a series of three questions on climate resiliency. In addition, several questions were expanded to include multiple sub-questions that prompted greater specificity in answers and better facilitated scoring. The entire 2017 water conservation and efficiency survey is detailed in **Figure 2**.

The data collection and scoring methodology is described in the next section.

Figure 2: AWE 2017 State Survey Questions

1.	What state agency or agencies are in charge of drinking water conservation/ efficiency?
2.	Does the state have a water consumption regulation for toilets? a. If yes, what is the standard? b. Where in state law is it?
3.	Does the state have a water consumption regulation for showerheads? a. If yes, what is the standard? b. Where in state law is it?
4.	Does the state have a water consumption regulation for urinals? a. If yes, what is the standard? b. Where in state law is it?
5.	Does the state have a water consumption regulation for clothes washers? a. If yes, what is the standard? b. Where in state law is it?
6.	Does the state have a water consumption regulation for pre-rinse spray valves? a. If yes, what is the standard? b. Where in state law is it?
7.	Does the state have mandatory building or plumbing codes requiring water efficient products? a. If yes, what is the requirement? b. Where in state law is it?
8.	Does a state statute(s)/regulation(s) limit water loss in a utility distribution system? a. If yes, is it a: requirement, requirement only in order to receive state funding, or a voluntary target? b. To what water suppliers do the laws apply? c. If there is a numeric limit on leakage or a formula for calculating acceptable levels of leakage, what is it? d. Is submitting audit information required? e. If yes, at what frequency must it be submitted? f. If yes, is audit data validation required? g. Is leak detection required? h. Is leak correction required? i. Where in state law are these details located?

9. Does a state statute(s)/regulation(s) require water suppliers to plan and/or implement conservation measures as a condition of a water right permit?

a. If yes, to what water suppliers do the laws apply?
b. Is preparing a water conservation plan a prerequisite to obtaining a water right permit?
c. Does a state statue(s)/regulation(s) identify required contents of that plan?
d. Does a state statute(s)/regulation(s) identify the supplier to incorporate stakeholder input in the plan development process?
e. Does a state statute(s) or regulation(s) require the state to evaluate the sufficiency of that plan in determining whether to issue a water right permit?
f. Does a state statute(s)/regulation(s) identify criteria for evaluating the sufficiency of that plan?
g. Does a state statute(s)/regulation(s) require that plan to be incorporated into the permit as an enforceable condition?
h. Does a state statute(s)/regulation(s) condition approval of municipal water permits/licenses on adoption and/or implementation of water conservation measure?
i. Where in state law are these details located?

10. Does a state statute(s)/regulation(s) require utilities, municipalities, regional water authorities, or other water suppliers to develop a drought preparedness plan?

a. If yes, is it required: as part of a general emergency plan, independent of a general emergency plan, or only in the course of the permitting process?
b. Does a state statute(s) or regulation(s) identify required content regarding drought in such a plan?
c. Does a state statute(s)/regulation(s) require the water supplier to incorporate the stakeholders in the plan development process?
d. Does a state statute(s) or regulation(s) require the state to evaluate the sufficiency of the drought plan?
e. Does a state statute(s)/regulation(s) identify criteria for evaluating the sufficiency of that plan?
f. How often must a drought preparedness plan be updated?
g. Where in state law are these details located?

11. Independent of a water right permitting process and drought plans, does a state statute(s)/regulation(s) require utilities, municipalities, regional water authorities, or other water suppliers to develop plans for water conservation and/or efficiency?

a. If yes, to what water suppliers does this requirement apply?
b. Does a state statute(s)/regulation(s) identify required contents of those plans?
c. Does a state statute(s)/regulation(s) suggest contents of those plans?
d. Does a statute(s)/regulation(s) require a state agency to draft guidelines to assist water suppliers in preparing those plans?
e. Does a state statute(s)/regulation(s) require the water supplier to incorporate stakeholders in the plan development process?
f. Does a state statute(s)/regulation(s) require the state to evaluate the sufficiency of those plans?
g. Does a state statute(s)/regulation(s) identify criteria for evaluating the sufficiency of those plans?
h. How often must those plans be updated?
i. Does a state statute(s)/regulation(s) explicitly require implementation of those plans or other water conservation measures?
j. Does a state statute(s)/regulation(s) require water suppliers to prepare any of the following: implementation schedules for those plans, identify the financial resources and/or legal authorities necessary to implement the plan, and/or submit reports to the state regarding plan implementation progress?
k. Does a state statute(s)/regulation(s) allow the state to penalize, fine, revoke permits from, or withhold privileges from a water supplier for not implementing those plans?
l. What in state law are these details located?

12. Does the state offer financial assistance other than Drinking Water State Revolving Funds (e.g., another revolving loan fund, grants, bonds, appropriations) to utilities, cities, or counties for urban water conservation programs?

a. If yes, please briefly describe it.

13. Does the state offer technical assistance for urban water conservation programs?

14. Does a statute(s)/regulation(s) require water connections that are part of a public supply to be metered?

15. Does a statute(s)/regulation(s) require water suppliers to implement volumetric billing?

16. Does a statute(s)/regulation(s) require rate structures explicitly designed to encourage water conservation?

C. Survey Questions Discussion

Water Efficiency and Conservation

While states were scored on their responses to the survey questions set out above, the following question-by-question discussion has collapsed some of the sub-questions. This is done for simplicity in reviewing the questions in this report and is not a reflection of any changes or alterations made in the scoring. Complete Surveys are available in the AWE Resource Library.

1. What state agency or agencies are in charge of drinking water conservation/ efficiency?

This question aims to identify the state agencies that are responsible for drinking water efficiency and conservation. These responsibilities commonly are divided among multiple agencies in a state. This question remained unchanged from the previous survey.

2. Does the state have a water use regulation for toilets?

The objective of questions 2 through 6 are unchanged from the 2012 survey, that is to discern which states have laws that place more stringent requirements on specific water fixtures and appliances than the federal standards created by the Energy Policy Act of 1992 or the Energy Policy Act of 2005 and Energy Independence and Security Act of 2007. The structure of the questions was simplified vis-à-vis the 2012 survey, only asking for the state standard, if one exists, rather than asking the respondent to compare the state standard to the federal standard. Standards for water-using fixtures and appliances are extremely effective in reducing water use through natural replacement, which makes these questions important.

The Energy Policy Act of 1992 set federal water efficiency standards for toilets at a maximum flush volume of 1.6 gallons per flush (gpf). This federal standard took effect in 1994 for residential toilets and in 1997 for commercial toilets. States received points for Question 2 if a state statute or regulation required the maximum flush volume for toilets to be less than 1.6 gpf. Most of these state laws are limitations on what products can be sold, but an extra credit point was awarded under questions 2-6 if the fixture or appliance was subject to a law that mandates replacement of those items with more efficient ones.

Toilet technology has advanced a great deal since the Energy Policy Act of 1992 and high-efficiency toilets are becoming more commonplace. As of the time this report was developed, the U.S. EPA WaterSense® program had labeled over 2,162 high-efficiency toilet models that flush at a volume of 1.28 gpf or less and perform well.[3] Toilets (as well as showerheads and faucets) with the WaterSense label are 20 percent more water efficient than their non-WaterSense counterparts, and they have undergone rigorous third-party testing to ensure equal or better performance.[4] These statistics are important because they demonstrate that the marketplace has a sufficient stock of well performing high-efficiency toilets that can meet more stringent efficiency standards.

3. Does the state have a water use regulation for showerheads?

WaterSense created a specification for showerheads in 2010 and has labeled more than 3,600 models at a flow rate of 2.0 gallons per minute (gpm). This is 0.5 gpm more efficient than the federal standard of 2.5 gpm set forth in the Energy Policy Act of 1992. Moreover, WaterSense has labeled more than 2,300 models that have a flow rate of 1.9 gpm or less. The WaterSense labeling of showerheads indicates that there are just under 6,000 well-performing showerheads in the marketplace that are more efficient than the national standard requires.[5] States received points for Question 3 if a state statute or regulation required the maximum flow rate for showerheads to be less than 2.5 gpm.

4. Does the state have a water use regulation for urinals?

The standard for urinals in the United States is 1.0 gpf as per the Energy Policy Act of 1992. WaterSense began labeling high-efficiency urinals in 2009, with a maximum flush volume of 0.5 gpf.[6] At present there are 493 urinal models with the WaterSense label.[7] If states choose to go beyond the federal standard for urinals, there are many options that meet water efficiency and performance criteria. States received points for Question 4 if a state statute or regulation required the maximum flush volume for showerheads to be less than 1.0 gpf.

3 WaterSense Product Search, https://www.epa.gov/watersense/product-search.

4 Safe Plumbing, *Look for the WaterSense Label* (Nov. 17, 2017), https://www.safeplumbing.org/water-efficiency/watersense.

5 WaterSense Labeled Showerhead List, http://www.epa.gov/WaterSense/product_search.html?Category=3.

6 WaterSense Specification for Flushing Urinals, http://www.epa.gov/WaterSense/docs/urinal_finalspec508.pdf.

7 WaterSense Labeled Urinal List, http://www.epa.gov/WaterSense/product_search.html?Category=3.

5. Does the state have a water use regulation for clothes washers?

Currently the federal standard for residential and commercial family-sized clothes washers requires a water factor (WF) of 9.5 or less based on the Energy Independence and Security Act of 2007 and the Energy Policy Act of 2005. The water factor is a value used to determine the water efficiency of a clothes washer, and represents the number of gallons used to wash one cubic foot of laundry.[8] The lower the water factor, the higher the efficiency. On May 31, 2012 the U.S. Department of Energy issued new standards for residential clothes washers that took effect in 2015 and change again in 2018. The new standards use an integrated water consumption factor (IWF) and are presented in **Table 2** below. **Table 2** and **Table 3** below show the standards as they existed at the time states were surveyed for this report, as well as the standards effective as of the date this report was published. States were scored based on the standards existing at the time the survey process occurred.

Table 2: New U.S. Department of Energy Clothes Washer Standards

AMENDED RESIDENTIAL CLOTHES WASHER STANDARDS	INTEGRATED WATER FACTOR (IWF)*	
Product Type	**Effective 3/7/2015**	**Effective 1/1/2018**
Top-loading, Compact (less than 1.6 ft^3 capacity)	14.4	12.0
Top-loading, Standard	8.4	6.5
Front-loading, Compact (less than 1.6 ft^3 capacity)	8.3	8.3
Front-loading, Standard	4.7	4.7

**"IWF (integrated water consumption factor) is calculated as the sum, expressed in gallons per cycle, of the total weighted per-cycle water consumption."*[9]

Energy Star labeled clothes washers currently must have an integrated water factor of 4.5 or less depending on the type of washer as shown in **Table 3** below. As of this writing, Energy Star has labeled 294 clothes washers,[10] which means that consumers have a large variety of clothes washers to choose from in a scenario where the state adopted Energy Star standards.

Table 3: ENERGY STAR® Clothes Washer Standards

RESIDENTIAL CLOTHES WASHER STANDARDS*	INTEGRATED WATER FACTOR (IWF)	
Product Type	**Effective 5/7/2015**	**Effective 2/5/2018**
Residential Clothes Washers, Front-loading (> 2.5 cu-ft)	3.7	3.2
Residential Clothes Washers, Top-loading (> 2.5 cu-ft)	4.3	4.3
Residential Clothes Washers (≤ 2.5 cu-ft)	4.2	4.2
Family Sized Commercial Clothes Washers	4.5	4.0

**Only front and top-loading clothes washers with capacities greater than 1.6 ft3 and less than 6.0 ft3; and are not defined as Combination All-In One Washer-Dryers or Residential Clothes Washers with an Optional Dry Cycle are eligible for ENERGY STAR Certification.*

It is important to note that in order for a state to establish a water consumption requirement for clothes washers that is more stringent than the national standard, it would have to obtain a waiver for federal preemption. Preemption, in this case, means that the federal standard preempts any state or local standard for clothes washers. Federal preemption was waived for faucets, showerheads, toilets, and urinals in 2010.[11] No further waivers have been issued for water-using fixtures or appliances since then, and thus no state has a standard more stringent than the federal standard.

8 Alliance for Water Efficiency Residential Clothes Washer Introduction, http://www.allianceforwaterefficiency.org/Residential_Clothes_Washer_Introduction.aspx-?terms=water+factor.

9 2012-05-31 Energy Conservation Program: Energy Conservation Standards for Residential Clothes Washers; Direct final rule, http://www.regulations.gov/#!documentDetail;D=EERE-2008-BT-STD-0019-0041.

10 Residential and Commercial Clothes Washers Qualified Product Lists, https://www.energystar.gov/productfinder/product/certified-clothes-washers/results.

11 Federal Register /Vol. 75, No. 245 /Wednesday, December 22, 2010/Rules and Regulations, http://www.allianceforwaterefficiency.org/uploadedFiles/Federal-Register75.pdf.

Code of Federal Regulations

Title 10: Energy

§ 431.408 Preemption of State regulations for covered equipment other than electric motors and commercial heating, ventilating, air-conditioning and water heating products.

This section concerns State regulations providing for any energy conservation standard, or water conservation standard (in the case of commercial prerinse spray valves or commercial clothes washers), or other requirement with respect to the energy efficiency, energy use, or water use (in the case of commercial prerinse spray valves or commercial clothes washers), for any covered equipment other than an electric motor or commercial HVAC and WH product. Any such regulation that contains a standard or requirement that is not identical to a Federal standard in effect under this subpart is preempted by that standard, except as provided for in sections 327(b) and (c) and 345(e), (f) and (g) of the Act.1.[12]

6. Does the state have a water use regulation for pre-rinse spray valves?

Pre-rinse spray valves commonly are used in restaurants and other commercial food operations to remove food residue and remnants from dishware with a high-pressured spray of water before loading them into a dishwasher. The Energy Policy Act of 2005 created a standard of 1.6 gpm; however, the WaterSense program requires a standard of 1.28 gpm or less for labeling. As is the case with clothes washers, a state requirement for pre-rinse spray valves that is more stringent than the federal standard would require a waiver of preemption; no such waivers have been issued, and thus no state has a standard more stringent than the federal standard.

7. Does the state have mandatory building or plumbing codes requiring water efficient products?

Building and plumbing codes can require the installation of water-efficient products in the course of construction. These codes may include efficiency standards for the fixtures and appliances addressed in questions 2 through 6 as well as other fixtures and fittings. States received points for Question 7 if the state plumbing or building code requires the water efficiency of any fixture or appliance to be more stringent than the standard set by the federal government.

8. Does a state statute(s)/regulation(s) limit water loss in a utility distribution system?

According to the AWE Resource Library,

> *Losses in water utility operations occur in two distinctly different manners. Apparent losses occur due to customer meter inaccuracies, billing system data errors and unauthorized consumption. These losses cost utilities revenue and distort data on customer consumption patterns. Losses also occur as real losses or water that escapes the water distribution system, including leakage and storage overflows. These losses inflate the water utility's production costs and stress water resources since they represent water that is extracted and treated, yet never reaches beneficial use.*[13]

Real losses may very well represent the most inefficient consumptive fate of treated water. This question, enhanced from the 2012 report, includes several sub-questions. They pose specific inquiries as to the water loss control work utilities are required to do. The questions are specifically looking at what measures are required, and whether there are ties between receiving state funding and instituting water loss control measures. One of the sub-questions also addresses whether there is a numeric limit on leakage or a formula for calculating acceptable levels of leakage, such as allowable gallons lost per connection per day or per mile of main.

States could receive up to two extra credit points for leveraging state funding for M36 compliant technical assistance, and up to one point for requiring that audits be conducted using the AWWA Free Water Audit Software.

9. Does a state statute(s)/regulation(s) require water suppliers to plan and/or implement conservation measures as a condition of a water right permit?

Conditions attached to the water withdrawal permitting process, or the permits themselves, can help ensure that water is not being wasted or used inefficiently. This question, enhanced from the 2012 report, is intended to identify whether a state imposes such conditions and what those conditions are. This question also includes several sub-questions. The sub-questions are designed to identify whether preparing a water conservation plan is a prerequisite to obtaining a water right permit, and the processes and information required for such a plan. Two sub-questions were adopted from questions 12 and 14 of the 2012 report. States could receive up to two extra credit points under this question for having an especially detailed set of criteria.

12 Electronic Code of Federal Regulations- Title 10: §431.408, http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=5ee7839b2d086bfb07257f6318ca-fa72&rgn=div8&view=text&node=10:3.0.1.4.19.22.82.8&idno=10.

13 *Water Loss Control – What Can Be Done?*, http://www.allianceforwaterefficiency.org/Water_Loss_Control_-_What_Can_Be_Done.aspx.

10. Does a state statute(s)/regulation(s) require utilities, municipalities, regional water authorities, or other water suppliers to develop a drought preparedness plan?

The distinction between drought plans and conservation plans is that drought plans are comprised of short-term actions performed in response to an immediate drought-induced supply challenge, whereas conservation plans contain actions taken across longer time lines, and that are intended to have long-term effects on water demand regardless of drought conditions. Since drought plans are needed to deal with significant and urgent supply challenges, it is important that they be in place in advance of the water shortage. States could receive up to one point of extra credit for having an adaptive management approach, and up to another point for having an exceptionally robust framework of drought plan contents and update requirements.

The goal of this question is to determine whether a state requires water suppliers to prepare such plans. This question is an extended version of question 10 presented in the 2012 report. The 2017 version includes several sub-questions that explore the content and procedural requirements for drought plans, and whether drought plans are a prerequisite to permitting.

11. Independent of a water right permitting process and drought plans, does a state statute(s)/regulation(s) require utilities, municipalities, regional water authorities, or other water suppliers to develop plans for water conservation and/or efficiency?

Question 11 asks if water conservation plans are required separately from drought plans and the water right permitting process. This question is a modification of question 11 in the 2012 report, with numerous sub-questions having been added. A number of the sub-questions were adopted from questions 12-15 in the 2012 report. As with questions 9 and 10, the sub-questions here focus on content and procedural requirements for conservation plans, and also whether there are any implementation requirements in light of the fact that the plan is not tied to permitting. States could receive up to one point of extra credit for an exceptionally robust framework of plan contents.

12. Does the state offer financial assistance other than Drinking Water State Revolving Funds (e.g., another revolving loan fund, grants, bonds, appropriations) to utilities, cities, or counties for urban water conservation programs?

This question is a modified version of question 16 from the 2012 report. Technically, all states can capitalize water conservation programs via the Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) programs. A September 2000 EPA memorandum titled, "Policy on Using the CWSRF on Water Efficiency/ Conservation Measures," details eligible projects, which include conservation programs. A similar EPA memo regarding the DWSRF programs indicates that fund can be used for water conservation programs.[14] In addition to these memoranda, the EPA factsheet, "Funding Water Efficiency through the State Revolving Fund Programs," confirms that both the CWSRF and DWSRF can be used for: "financial assistance to help states and systems initiate a variety of efficiency measures and programs." However, the goal of this question is to identify states with dedicated funding mechanisms independent of either state revolving fund, and which are supported with state funds and target conservation and efficiency work.

13. Does the state offer technical assistance for urban water conservation programs?

This question is a modified version of question 17 from the 2012 report. It is intended to identify not only which states offer technical assistance for urban water conservation and efficiency, but also what types of assistance are offered. States could receive one point for online resources, one point for direct technical assistance, and up to one point of extra credit for offering other types of assistance.

14. Does a statute(s)/regulation(s) require water connections that are part of a public supply to be metered?

This question is a significant update to question 19 of the 2012 report. The original question asked *what percentage or number of publicly supplied water connections (residential and non-residential) are metered in your state?* Ultimately, this question was not scored in the 2012 report because not all of the answers could be verified. Because connection metering underlies a supplier's ability to use volumetric billing, it was still important to try to explore this issue in the 2017 report. The 2017 approach is broader, asking whether there is a metering law for public suppliers in the first place. Notably, because of the 2012 results, the question was not included in the original survey to state agency officials. However, the project advisory committee ultimately decided that it was an important enough topic that the project team reached back out to state agency officials and performed some independent research to locate answers to this question.

14 EPA DWSRF Memorandum (July 25, 2003) *Use of Drinking Water State Revolving Fund (DWSRF) Program Funds for Water Efficiency Measures.*

15. Does a statute(s)/regulation(s) require water suppliers to implement volumetric billing?

This question is a modified version of question 18 from the 2012 report. Volumetric billing is a critical tool for encouraging water efficiency and conservation since customers billed for the amount of water consumed are less likely to waste water[15] Volumetric billing also makes it possible to implement water rate structures that encourage conservation.

16. Does a statute(s)/regulation(s) require rate structures explicitly designed to encourage water conservation?

This question is new to the survey. Water rates that are designed to communicate the value of water are structured to send price signals that discourage customer water waste and reflect the full cost of sustainable water services, while also contributing to the long-term financial stability of the water provider. Because water rates are a critical component to supplier stability and sustainable water resources, the project team and advisory committee felt it was important to add this question.

Resiliency

The 2012 report came just a few years after the signing of the Great Lakes-St. Lawrence River Basin Water Resources Compact, an interstate compact that outlines in some detail how the Great Lakes states are to manage water from the Great Lakes Basin. Since the Compact was relatively new, the report distinguished those states from the rest, giving them more focused attention and noting the ways in which the Compact would improve water conservation and efficiency in the Great Lakes States. In the 2017 report, climate change resiliency was selected as a critical area of water management in need of special focus. As weather patterns become less predictable and weather events of all kinds more intense and changing in duration, it is important that states give serious consideration to mitigating the challenges produced by these scenarios through the use of a formal plan. Because the water efficiency and conservation questions were expanded, the resiliency questions were kept fairly short.

1. Does the state have a climate action, adaptation, or resiliency plan?

States may target resiliency as part of a drought or water conservation plan, or may have independent stand-alone plans to address climatic and weather challenges. A stand-alone plan may be referred to by a number of names or phrases such as climate action, climate adaptation, climate resiliency, or climate preparedness. For purposes of information gathering, the project team and advisory committee elected to disregard the formal title of a plan, and instead identify steps where efforts to promote resiliency work are being achieved.

The question was developed with sub-questions depending on whether the answer to question 1 was "yes" or "no." These sub-questions help frame a state's approach to planning for the effects of climate change. If respondents answer "yes," they were also asked to answer sub-questions about focus areas within the plan, goals and implementation, and legal authority. States that responded "yes" could receive up to one point in extra credit for having well-aligned plans among state agencies or critical stakeholders.

If states answered "no," they were asked to answer the same questions excluding plan implementation. States could also receive up to two points for having an especially robust combination of enforcement provisions and requirements whether they responded "yes" or "no."

2. Does the state require any climate change-related actions of the water and/or wastewater industries in resiliency plans and/or statutes/regulations?

This question was included since any efficiency or conservation goals set out at the state level will ultimately impact suppliers at the local level. This question simply aims to identify whether water suppliers are part of the state's resiliency planning, and specifically whether they are directly obligated to perform any actions or non-actions under a plan or a state law. As states advance climate adaptation plans, it will be increasingly important to expressly consider the impact to suppliers and communities.

3. Does the state have specific benchmarks against which it measures progress toward increased water resource resiliency?

This final question identifies whether and how states are evaluating progress toward goals set out in plans or law. Recognizing that states may employ other methods of measuring progress, states that responded "no" were also asked in a sub-question how the state measures progress toward resiliency goals. Overall, the purpose of this question is to identify those states that are proactively engaged in tracking progress and evaluating work done to advance climate change preparedness, while also encouraging other states to implement benchmarking or another form of progress measurement as part of their approach to preparing for climate change.

15 Alliance for Water Efficiency Metering Introduction, http://www.allianceforwaterefficiency.org/metering.aspx.

D. Data Collection and Scoring Methodology

The water efficiency and conservation questions and the resiliency questions were evaluated and scored independently of each other, producing two separate grades. However, both sets of questions went through parallel collection and scoring processes.

Once all of the questions were fully vetted and finalized, the project team began collecting data. The data collection effort, which included a thorough review of the results, ran from mid-April through September of 2017. Contact with state-level agency staff was initiated first by mailing introductory letters and copies of the 2012 report, then later by phone calls and emails. Data collection was primarily done by requesting agency staff to complete and return the survey, helping to ensure that citations were available for all responses. However, the process also included a combination of phone and in-person interviews, as well as project team research, in order to ensure the scoring was based on the most complete and comprehensive information possible.

There were a few instances when the project team repeatedly attempted to connect with state personnel and received little or no assistance, and just one case in which the project team was unable to connect with state personnel at all. In these cases, the team conducted extensive research to find information for unanswered survey questions.

As completed surveys were collected, the project team began reviewing responses for accuracy. The 2017 questions were designed to be more pointed, but there remained a few questions that generated complex answers and illustrated significant variance across states. Additionally, even with the help of state employees, the survey results required extensive research and cite checking to verify answers since all questions answered in the affirmative required a citation in order to receive points. Many responses were edited in the course of the verification process and additional information often was added to support answers.

Following AWE's preliminary efforts to verify responses, AWE shared the augmented survey responses with a team of attorneys at the Environmental Law Institute (ELI) for a more comprehensive legal review. ELI restricted its analysis to the survey questions that involved legal matters: water efficiency and conservation questions 2-11, and 14-16, and resiliency questions 1 and 2. Through review of state climate adaptation plans as well as state laws, ELI determined whether the laws and plans cited by the respondents were sufficient to support the respondents' answers. ELI disregarded non-binding guidance documents, evidence of future or historical policies, and statements regarding administrative practice as immaterial to its analysis. When necessary and appropriate, the ELI attorneys exercised their professional judgment to interpret and evaluate the statutory or regulatory language.

In the course of their analysis, ELI attorneys changed answers where, in their professional judgment, respondents' answers were incorrect or the cited authority failed to support the proffered answer. Where the information provided by the state was insufficient for ELI to evaluate the answer as either correct or incorrect, ELI flagged the answer for AWE as requiring further attention. In many instances, AWE was able to obtain the necessary additional information from the state and forward the answer to ELI for analysis. To support its conclusions, ELI cataloged direct quotations of all on-point statutory and regulatory provisions.

Using a point system to compare the relative strength of water efficiency and conservation laws and climate adaptation plans between the 50 states allowed ELI to stratify the states into tiers. These tiers are directly reflected in the scoring rubric.

AWE, with the assistance of ELI and the project advisory committee, developed the scoring rubrics for both the water conservation and climate resiliency questions. In addition, Cavanaugh helped develop the scoring rubric for the water loss questions. The scoring tiers for the conservation questions were drawn from the 2012 scoring rubric and modified in light of technological and legal developments since then.

A total of 75 possible base points could be earned from the conservation survey questions, with an additional 14 points available in the form of extra credit. The point values for the 2017 report are a significant departure from the 2012 report, for which a total of 40 possible base points and 3 additional extra credit points were available. The increase in potential points is due to the numerous sub-questions asked in the 2017 survey, as well as increased points available for questions without multiple parts so as to keep the relative "value" of different accomplishments roughly equal to what it was in the 2012 report. The point values for the resiliency portion are 28 possible base points and a maximum of 3 extra credit points.

The scoring rubric was developed with the expectation that there would be a broad diversity in the quality of answers to the questions.

Based on its legal analysis, and in consultation with AWE, ELI scored each answer according to the scoring rubrics presented in **Table 4** and **Table 6**. The project team encountered some challenges in the scoring process; there are addressed in a later section. Following scoring, ELI and AWE identified laws believed to be the strongest examples of water efficiency and conservation law under each question. A few of these examples are repeated from the 2012 report, but ELI and AWE tried to showcase new and different examples, particularly in light of the expanded questions. Separately, notable climate adaptation plans and laws were selected as highlights for each of those questions. These model examples are presented in the corresponding exemplary laws section.

Table 4: Scoring Guidelines for the Water Efficiency and Conservation Questions

SCORING GUIDELINES FOR THE WATER EFFICIENCY AND CONSERVATION QUESTIONS		
1.	What state agency or agencies are in charge of drinking water conservation/ efficiency?	States received 2 points for answering.
2.	Does the state have a water use regulation for toilets?	0 = No or it is equal to or less stringent than the federal standard
		1 = Yes and it is more stringent than the federal standard, but it is limited in its application (e.g., geographically or only applies to new construction)
		2 = Yes and it is more stringent than the federal standard, and it is not limited in its application
	Extra Credit #1	1 = Yes and the fixture is subject to a replacement mandate in law
3.	Does the state have a water use regulation for showerheads?	0 = No or it is equal to or less stringent than the federal standard
		1 = Yes and it is more stringent than the federal standard, but it is limited in its application (e.g., geographically or only applies to new construction)
		2 = Yes and it is more stringent than the federal standard, and it is not limited in its application
	Extra Credit #2	1 = Yes and the fixture is subject to a replacement mandate in law
4.	Does the state have a water use regulation for urinals?	0 = No or it is equal to or less stringent than the federal standard
		1 = Yes and it is more stringent than the federal standard, but it is limited in its application (e.g., geographically or only applies to new construction)
		2 = Yes and it is more stringent than the federal standard, and it is not limited in its application
	Extra Credit #3	1 = Yes and the fixture is subject to a replacement mandate in law
5.	Does the state have a water use regulation for clothes washers?	0 = No or it is equal to or less stringent than the federal standard
		1 = Yes and it is more stringent than the federal standard, but it is limited in its application (e.g., geographically or only applies to new construction)
		2 = Yes and it is more stringent than the federal standard, and it is not limited in its application
	Extra Credit #4	1 = Yes and the fixture is subject to a replacement mandate in law
6.	Does the state have a water use regulation for pre-rinse spray valves?	0 = No or it is equal to or less stringent than the federal standard
		1 = Yes and it is more stringent than the federal standard, but it is limited in its application (e.g., geographically or only applies to new construction)
		2 = Yes and it is more stringent than the federal standard, and it is not limited in its application
	Extra Credit #5	1 = Yes and the fixture is subject to a replacement mandate in law
7.	Do state building codes or plumbing codes require use of water efficient products?	0 = No
		.5 = Yes, but the code only applies to a specific subset of buildings or conditions
		1.5 = Yes and the code applies to most buildings or conditions
		3 = Yes, with broad application
8.a.	Does a state statute(s)/regulation(s) limit water loss in utility distribution systems?	0 = No
		1 = Yes, but it is geographically limited or it applies only in order to receive state funding or a supply permit
		2 = Yes and it is a conditionless requirement
		State is leveraging state-funding for M36-compliant technical assistance to water systems in support of an existing or potential mandate:
	Extra Credit #6	1 = On a pilot scale only 2 = On a statewide scale (whether or not on a pilot scale too)
8.b.	To what suppliers do the laws apply?	0 = No relevant law
		1 = Public suppliers
		2 = Public and private suppliers

8.c.	**If there is a numeric limit on leakage or a formula for calculating acceptable levels of leakage, what is it?**	0 = No limit or a percentage limit
		1 = Statutory or regulatory requirement prompting development of non-universal numeric limits
		2 = Non-universal numeric limits
8.d.	**Is submitting audit information required?**	0 = No
		1 = Yes
	Extra Credit #7	1 = Audits are required to be conducted using the AWWA Free Water Audit Software
8.d.i.	**If yes, at what frequency must it be submitted?**	0 = One-time requirement
		1 = Every 2-5 years
		2 = Annually
8.d.ii.	**If yes, is audit data validation required?**	0 = No
		1 = Yes
8.e.	**Is leak detection required?**	0 = No
		1 = Yes
8.f.	**Is leak correction required?**	0 = No
		1= Yes
9.	**Does a a state statute(s)/regulation(s) require water suppliers to plan and/or implement conservation measures as a condition of a water right/water permit/ water authority?**	0 = No
		1 = Little more than a plan is required, or a strong law with limited geographic, water source, or water user application
		1.5 = Water rights can be expressly conditioned (or rejected based) on water conservation efforts.
		2.5 = Robust application or approval requirements (compliance with conservation plans, required conservation conditions, etc.)
9.a.	**If yes, to what water suppliers to the laws apply?**	0 = No relevant law
		1 = Public suppliers
		2 = public and private suppliers
9.b.	**Is preparing a water conservation plan a prerequisite to obtaining a water right permit?**	0 = No
		1 = Yes
9.c.	**Does a state statute(s)/regulation(s) identify required contents of that plan?**	0 = No
		1 = Yes
9.d.	**Does a state statute(s)/regulation(s) require the supplier to incorporate stakeholder input in the plan development process?**	0 = No
		1= Yes
9.e.	**Does a state statute(s) or regulation(s) require the state to evaluate the sufficiency of that plan in determining whether to issue a water right permit?**	0 = No
		1 = Yes
9.f.	**Does a state statute(s)/regulation(s) identify criteria for evaluating the sufficiency of that plan?**	0 = No
		1 = Yes
	Extra Credit #8	2 = For an especially detailed or pointed set of criteria
9.g.	**Does a state statute(s)/regulation(s) require that plan to be incorporated into the permit as an enforceable condition?**	0 = No
		2 = Yes
9.h.	**Does a state statute(s)/regulation(s) condition approval of municipal water permits/licenses on adoption and/or implementation of water conservation measures?**	0 = No
		2 = Yes

10.a. Does a state statute(s)/regulation(s) require utilities, municipalities, regional water authorities, or other water suppliers to develop a drought preparedness plan?	0 = No
	1 = Yes, as part of a general water management plan or general emergency plan
	1.5 = Yes, as part of the permitting process
	2.5 = Yes, as a stand-alone plan
10.b. Does a state statute(s) or regulation(s) identify required content regarding drought in such a plan?	0 = No
	1 = Yes
10.c. Does a state statute(s)/regulation(s) require the water supplier to incorporate stakeholders into plan development?	0 = No
	1 = Yes
10.d. Does a state statute(s) or regulation(s) require the state to evaluate the sufficiency of the drought plan?	0 = No
	1 = Yes
10.e. Does a state statute(s)/regulation(s) identify criteria for evaluating the sufficiency of that plan?	0 = No
	1 = Yes
10.f. How often must a drought preparedness plan be updated?	0 = No requirement
	1 = 7-10 years
	2 = 1-6 years
Extra Credit #9	1= For adaptive mangement
Extra Credit #10	1 = For an exceptionally robust framework of what a drought plan must contain and frequent update requirements
11. Independent of a water right permitting process and drought plans, does a state statute(s)/regulation(s) require utilities, municipalities, regional water authorities, or other water suppliers to develop plans for water conservation and/or efficiency?	0 = No
	1 = Yes
11.a. If yes, to what water suppliers does this requirement apply?	0 = No relevant law
	1 = Public suppliers
	1.5 = Public and private suppliers
11.b. Does a state statute(s)/regulation(s) identify required contents of those plans?	0 = No
	1= Yes
Extra Credit #11	1 = For an exceptionally robust framework of what a plan must contain
11.d. Does a statute(s)/regulation(s) require a state agency to draft guidelines to assist water suppliers in preparing those plans?	0 = No
	1 = Yes
11.e. Does a state statute(s)/regulation(s) require the water supplier to incorporate stakeholders in the plan development process?	0 = No
	1 = Yes
11.f. Does a state statute(s)/regulation(s) require the state to evaluate the sufficiency of those plans?	0 = No
	1 = Yes
11.g. Does a state statute(s)/regulation(s) identify criteria for evaluating the sufficiency of those plans?	0 = No
	1 = Yes
11.h. How often must those plans be updated?	0 = No requirement
	1 = 7-10 years
	2 = 1-6 years
11.i. Does a state statute(s)/regulation(s) explicitly require implementation of those plans or other water conservation measures?	0 = No
	1 = Yes

11.j.	Does a state statute(s)/regulation(s) require water suppliers to prepare any of the following: (cumulative points possible)	0 = None
		.5 = Implementation schedules for the plan
		.5 = Identification of the financial resources and/or legal authorities necessary to implement the plan
		.5 = Reports to submit to the state regarding plan implementation progress
11.k.	Does a state statute(s)/regulation(s) allow the state to penalize, fine, revoke permits from, or withhold privileges from a water supplier for not implementing those plans?	0 = No
		1 = Yes
12.	Does the state offer financial assistance other than Drinking Water State Revolving Funds (e.g., another revolving loan fund, grants, bonds, appropriations) to utilities, cities, or counties for M&I? (cumulative points possible)	0 = No
		1 = Yes, Clean Water State Revolving Funds
		4 = Yes, through means other than Clean Water State Revolving Funds
13.	Does the state offer technical assistance for urban water conservation programs? If Yes, Please Describe. (cumulative points possible)	0 = No
		1 = Online resources
		1 = Direct technical assistance
	Extra Credit #12	Up to 1 = Other. If other, please describe.
14.	Does a statute(s)/regulation(s) require water connections that are part of a public supply to be metered?	0= No
		1 = Yes, but limited in its application
		2 = Yes and not limited in its application
15.	Does a statute(s)/regulation(s) require water suppliers to implement volumetric billing?	0 = No or declining block rate structure is counted as volumetric billing under the law
		1 = Yes, but limited in its application
		2 = Yes and not limited in its application
16.	Does a statute(s)/regulation(s) require rate structures explicitly designed to encourage water conservation?	0 = No
		1 = Yes, but limited in its application
		2 = Yes and not limited in its application

A total of 75 possible points could be earned from the water efficiency and conservation questions. Another 14 points in extra credit could be earned for having particular additional requirements under certain questions. After each question was scored, the total was summed and states were assigned a grade based on the scale presented in **Table 5**. If a state was a half of a point away from the next grade on the scale, the score was rounded up (e.g., 39.5 points would equal a "B+" instead of a "B grade).

The water efficiency scorecards are notably different from a school report card. There are no "F" grades, for example, and the grading scale is much more forgiving than the typical percentage-based scoring utilized by educational institutions. The grades are intended to serve as a guide, and the project team made every effort to create a grading scale that demonstrated the level of effort states are making toward water efficiency and conservation via state-level laws.

Table 5: Efficiency and Conservation Grading Scale

GRADING SCALE	
67 to 75	A+
58 to 66	A
49 to 57	A-
40 to 48	B+
31 to 39	B
26 to 30	B-
21 to 25	C+
16 to 20	C
11 to 15	C-
6 to 10	D+
1 to 5	D
Round up for .5's	

Table 6: Scoring Guidelines for the Climate Resiliency Questions

SCORING GUIDELINES FOR INDIVIDUAL QUESTIONS	
1. Does the state have a climate action, adaptation, or resiliency plan?	0 = No Up to 5 points = Yes
If yes:	
1.b. What water resource management goals does it include, if any? (cumulative points possible)	1 = Water availability 1 = Water quality 1 = Flood management 1 = Watershed protection 1 = Other
1d. On what water supply-related impacts, if any, of climate change or changing weather patterns does the plan focus? (cumulative points possible)	1 = Drier Conditions 1 = More frequent or longer droughts 1 = Changes in timing of snowmelt and/or precipitation 1 = Other
1.e. What agencies, organizations, or stakeholders are responsible for implementing the water resources strategies in the plan?	0= None 1 = An agency is designated
Extra credit #1	1 = Well aligned strategies or plans among agencies, between agency plans and state plans, and/or between stakeholders
1.f. How often is the plan updated?	.5 = 25+ years 1 = 11-24 years (or split among two planning processes) 1.5 = 7-10 years 2 = 1-6 years
Extra credit #2	Up to 2 points = An especially robust combination of enforcement provisions and requirements
If no:	
1.a. What state statute(s)/regulation(s), if any, provide legal authority or requirements regarding climate action or resiliency?	0 = None 1= An agency is designated
1.b. What water resource management goals do any statute(s)/regulation(s) include, if any? (cumulative points possible)	1 = Water availability 1 = Water quality 1 = Flood management 1 = Watershed protection 1 = Other
1.c. On what water supply-related impacts, if any, of climate change or changing weather patterns does the plan focus?	1 = Drier Conditions 1 = More frequent or longer droughts 1 = Changes in timing of snowmelt and/or precipitation 1 = Other
Extra credit #3	Up to 2 points = An especially robust combination of enforcement provisions and requirements
2. Does the state require any climate change-related actions of the water and/or wastewater industries in: 2.a. Resiliency Plans 2.b. Statutes/Regulations	0 = No 2.5 = Yes 0 = No 2.5 = Yes
3. Does the state have specific benchmarks against which it measures progress toward increased water resource resiliency?	0 = No 3 = Yes

Table 7 – Climate Resiliency Grading Scale

GRADING SCALE	
23 to 25	A+
20 to 22	A
18 to 19	A-
15 to 17	B+
13 to 14	B
11 to 12	B-
8 to 10	C+
5 to 7	C
3 to 4	C-
1 to 2	D+
0	D
Round up for .5's	

A total of 25 possible points could be earned from the resiliency questions. Another 3 points in extra credit could be earned for having particular additional requirements under certain questions. **Table 7** presents the guidelines used for assigning grades based on the maximum points available.

As with the grading scale for the water efficiency and conservation questions, scores were rounded up in cases where a state was a half-of-a-point away from the next grade on the scale (e.g., 14.5 points would equal a "B+" instead of a "B" grade). Also, there are again no "F" grades, and the grading scale is much more forgiving than the typical percentage-based scoring utilized by educational institutions. The grades are intended to serve as a guide, and the project team made every effort to create a grading scale that demonstrated the level of effort states are making toward climate resiliency with regard to water via state-level plans and laws.

IV: State Scorecards

Alabama

Alabama Water Efficiency Scorecard — **Grade: C-**

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	6.5
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	1
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

TOTAL **10.5**

Alabama

Alabama Climate Resiliency Scorecard — **Grade: C**

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	5
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

TOTAL **5**

Alaska — Alaska Water Efficiency Scorecard — Grade: D

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	2

Alaska — Climate Resiliency Scorecard — Grade: B-

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	5.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	10.5

Arizona — Water Efficiency Scorecard — Grade: B+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	9
9.	Water conservation is a condition of a water right permit?	6
10.	Water suppliers must develop a drought preparedness plan?	6.5
11.	Water suppliers must develop water conservation/efficiency plans?	8
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	3
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	41.5

Arizona — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Arkansas — Water Efficiency Scorecard — Grade: C-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	6
10.	Water suppliers must develop a drought preparedness plan?	1.5
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	12.5

Arkansas — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

California — Water Efficiency Scorecard — Grade: A-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	3
3.	Water consumption law* for showerheads?	3
4.	Water consumption law* for urinals?	3
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	1.5
8.	Limitation on water loss in utility distribution systems?	8
9.	Water conservation is a condition of a water right permit?	5.5
10.	Water suppliers must develop a drought preparedness plan?	6.5
11.	Water suppliers must develop water conservation/efficiency plans?	10
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	52.5

California — Climate Resiliency Scorecard — A-

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	13
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	1

	TOTAL	19

Colorado — Water Efficiency Scorecard — B

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	2
3.	Water consumption law* for showerheads?	2
4.	Water consumption law* for urinals?	2
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	5
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	10.5
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	32.5

Colorado — Climate Resiliency Scorecard — B

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	8
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	13

Connecticut — Water Efficiency Scorecard — Grade: B-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	3
9.	Water conservation is a condition of a water right permit?	7
10.	Water suppliers must develop a drought preparedness plan?	5
11.	Water suppliers must develop water conservation/efficiency plans?	8
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	26

Connecticut — Climate Resiliency Scorecard — Grade: B

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	7.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	12.5

Delaware — Water Efficiency Scorecard — Grade: C

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	6
9.	Water conservation is a condition of a water right permit?	7.5
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	16.5

Delaware — Climate Resiliency Scorecard — Grade: B-

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	6
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0
	TOTAL	11

Florida — Water Efficiency Scorecard — Grade: C+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	6
9.	Water conservation is a condition of a water right permit?	8.5
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	3
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	24.5

Florida — Climate Resiliency Scorecard — Grade: B

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	8.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	13.5

Georgia — Water Efficiency Scorecard — Grade: B+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	2
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	2
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	3
8.	Limitation on water loss in utility distribution systems?	14
9.	Water conservation is a condition of a water right permit?	6
10.	Water suppliers must develop a drought preparedness plan?	3.5
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	1
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	40.5

Georgia — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Hawaii — Water Efficiency Scorecard — Grade: C

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	7
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	16

Hawaii — Climate Resiliency Scorecard — Grade: B-

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	1
	If *Yes*, who implements it, what does it address, and how often is it updated?	7.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	3

	TOTAL	11.5

Idaho — Water Efficiency Scorecard — Grade: D+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	7

Idaho — Climate Resiliency Scorecard — Grade: C+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	1
	If *Yes*, who implements it, what does it address, and how often is it updated?	8
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	9

Illinois — Water Efficiency Scorecard — Grade: C

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	1
3.	Water consumption law* for showerheads?	1
4.	Water consumption law* for urinals?	1
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	6
9.	Water conservation is a condition of a water right permit?	5
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	18

Illinois — Climate Resiliency Scorecard — Grade: C-

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	1
	If *Yes*, who implements it, what does it address, and how often is it updated?	1.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	2.5

Indiana — Water Efficiency Scorecard — Grade: C-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	8
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	13

Indiana — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Iowa — Water Efficiency Scorecard — Grade: D+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	6.5
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	8.5

Iowa — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Kansas — Water Efficiency Scorecard — Grade: C-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	5.5
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	10.5

Kansas — Climate Resiliency Scorecard — Grade: C+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	1
	If *Yes*, who implements it, what does it address, and how often is it updated?	7.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	8.5

Kentucky — Water Efficiency Scorecard — Grade: B-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	8
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	8
11.	Water suppliers must develop water conservation/efficiency plans?	9.5
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	1.5
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	30

Kentucky — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Louisiana — Water Efficiency Scorecard — Grade: D+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	5
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	9

Louisiana — Climate Resiliency Scorecard — Grade: D+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0.5
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0.5

Maine — Water Efficiency Scorecard — Grade: D

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	1
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	4

Maine — Climate Resiliency Scorecard — Grade: B-

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	3
	If *Yes*, who implements it, what does it address, and how often is it updated?	8.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	11.5

Maryland — Water Efficiency Scorecard — Grade: C-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	7
9.	Water conservation is a condition of a water right permit?	5
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	14

Maryland — Climate Resiliency Scorecard — Grade: B+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	11
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	16

Massachusetts — Water Efficiency Scorecard — Grade: B-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	8
9.	Water conservation is a condition of a water right permit?	7.5
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	28.5

Massachusetts — Climate Resiliency Scorecard — Grade: B

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	8
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	13

Michigan — Water Efficiency Scorecard — Grade: D

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	3

Michigan — Climate Resiliency Scorecard — Grade: C+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	1
	If *Yes*, who implements it, what does it address, and how often is it updated?	8
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	9

Minnesota — Water Efficiency Scorecard — Grade: B

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	4
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	5.5
11.	Water suppliers must develop water conservation/efficiency plans?	9.5
12.	State offers financial assistance for urban water conservation?**	4
13.	State offers technical assistance for urban water conservation?	3
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	2

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	34

Minnesota — Climate Resiliency Scorecard — Grade: B+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	11
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	16

Mississippi — Water Efficiency Scorecard — Grade: D

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	4

Mississippi — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Missouri — Water Efficiency Scorecard — Grade: D

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	3

Missouri — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Montana — Water Efficiency Scorecard — Grade: D+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	4
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	1
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	8

Montana — Climate Resiliency Scorecard — Grade: B-

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	2.5
	If *Yes*, who implements it, what does it address, and how often is it updated?	9
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	11.5

Nebraska — Water Efficiency Scorecard — Grade: D+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	4
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	1
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	7

Nebraska — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Nevada — Water Efficiency Scorecard — Grade: B

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	6
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	6
11.	Water suppliers must develop water conservation/efficiency plans?	11.5
12.	State offers financial assistance for urban water conservation?**	4
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	2

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	37.5

Nevada — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

New Hampshire — Water Efficiency Scorecard — Grade: B

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	8
9.	Water conservation is a condition of a water right permit?	12.5
10.	Water suppliers must develop a drought preparedness plan?	4
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	4
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	1
16.	Rate structures must encourage water conservation?	1

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	35.5

New Hampshire — Climate Resiliency Scorecard — Grade: B-

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	3
	If *Yes*, who implements it, what does it address, and how often is it updated?	7.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	10.5

New Jersey — Water Efficiency Scorecard — Grade: B-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	6
9.	Water conservation is a condition of a water right permit?	9.5
10.	Water suppliers must develop a drought preparedness plan?	4.5
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	2

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	29

New Jersey — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

New Mexico — Water Efficiency Scorecard — Grade: C

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	3.5
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	3.5
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	16

New Mexico — Climate Resiliency Scorecard — Grade: C+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	2.5
	If *Yes*, who implements it, what does it address, and how often is it updated?	6
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	8.5

New York — Water Efficiency Scorecard — Grade: C+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	3
8.	Limitation on water loss in utility distribution systems?	6
9.	Water conservation is a condition of a water right permit?	8.5
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	23.5

New York — Climate Resiliency Scorecard — Grade: C+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	3
	If *Yes*, who implements it, what does it address, and how often is it updated?	5.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	8.5

North Carolina — Water Efficiency Scorecard — Grade: B-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	9
10.	Water suppliers must develop a drought preparedness plan?	7
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	4
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	26

North Carolina — Climate Resiliency Scorecard — Grade: B

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	8
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	13

North Dakota — Water Efficiency Scorecard — Grade: D

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	5

North Dakota — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

2017 State Scorecard

Ohio — Water Efficiency Scorecard — Grade: D+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	5
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	9

Ohio — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Oklahoma — Water Efficiency Scorecard — Grade: D+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	1
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	7

Oklahoma — Climate Resiliency Scorecard — Grade: D+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0.5

	TOTAL	0.5

Oregon — Water Efficiency Scorecard — Grade: B

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	7
9.	Water conservation is a condition of a water right permit?	9
10.	Water suppliers must develop a drought preparedness plan?	6.5
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	3
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	1

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	37.5

Oregon — Climate Resiliency Scorecard — Grade: A

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	13
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	3

	TOTAL	21

Pennsylvania — Water Efficiency Scorecard — Grade: D+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	1
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	6

Pennsylvania — Climate Resiliency Scorecard — Grade: B+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	10
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	1
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	16

Rhode Island — Water Efficiency Scorecard — Grade: B-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	2
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	8
11.	Water suppliers must develop water conservation/efficiency plans?	11.5
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	2

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	29.5

Rhode Island — Climate Resiliency Scorecard — Grade: B+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	10.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	1
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	16.5

South Carolina — Water Efficiency Scorecard — Grade: C-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	5
10.	Water suppliers must develop a drought preparedness plan?	4.5
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	12.5

South Carolina — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

South Dakota — Water Efficiency Scorecard — Grade: D

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	1
14.	Water connections that are part of a public supply must be metered?	1
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	5

South Dakota — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Tennessee — Water Efficiency Scorecard — Grade: C-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	8
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	2
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	13

Tennessee — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Texas — Water Efficiency Scorecard — Grade: A-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	2
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	2
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0.5
8.	Limitation on water loss in utility distribution systems?	8
9.	Water conservation is a condition of a water right permit?	6.5
10.	Water suppliers must develop a drought preparedness plan?	7.5
11.	Water suppliers must develop water conservation/efficiency plans?	10
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	2

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	51.5

Texas — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Utah — Water Efficiency Scorecard — Grade: B-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	1
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	9
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	3
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	2

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	26

Utah — Climate Resiliency Scorecard — Grade: C+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	1
	If *Yes*, who implements it, what does it address, and how often is it updated?	7
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	8

Vermont — Water Efficiency Scorecard — Grade: D+

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	4.5
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	1
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	8.5

Vermont — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

Virginia — Water Efficiency Scorecard — Grade: B

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	4
9.	Water conservation is a condition of a water right permit?	11
10.	Water suppliers must develop a drought preparedness plan?	6
11.	Water suppliers must develop water conservation/efficiency plans?	7.5
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	33.5

Virginia — Climate Resiliency Scorecard — Grade: C+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	3
	If *Yes*, who implements it, what does it address, and how often is it updated?	6.5
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	9.5

Washington — Water Efficiency Scorecard — Grade: B

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	10
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	4
11.	Water suppliers must develop water conservation/efficiency plans?	9
12.	State offers financial assistance for urban water conservation?**	5
13.	State offers technical assistance for urban water conservation?	3
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	35

Washington — Climate Resiliency Scorecard — Grade: B+

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	11
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0.5

	TOTAL	16.5

West Virginia — Water Efficiency Scorecard — Grade: C-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	7
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	12

West Virginia — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	Total	0

Wisconsin — Water Efficiency Scorecard — Grade: B-

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	2
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	10
9.	Water conservation is a condition of a water right permit?	9
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	0
13.	State offers technical assistance for urban water conservation?	2
14.	Water connections that are part of a public supply must be metered?	2
15.	Water suppliers must implement volumetric billing?	2
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	27

Wisconsin — Climate Resiliency Scorecard — Grade: B-

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	5
	If *Yes*, who implements it, what does it address, and how often is it updated?	6
	If *No*, do any state laws concern climate action or resiliency; if so, how?	
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	11

Wyoming — Water Efficiency Scorecard — Grade: D

QUESTION		POINTS
1.	State agency in charge of drinking water conservation/efficiency?	0
2.	Water consumption law* for toilets?	0
3.	Water consumption law* for showerheads?	0
4.	Water consumption law* for urinals?	0
5.	Water consumption law* for clothes washers?	0
6.	Water consumption law* for pre-rinse spray valves?	0
7.	Building/plumbing codes require* water efficient products?	0
8.	Limitation on water loss in utility distribution systems?	0
9.	Water conservation is a condition of a water right permit?	0
10.	Water suppliers must develop a drought preparedness plan?	0
11.	Water suppliers must develop water conservation/efficiency plans?	0
12.	State offers financial assistance for urban water conservation?**	1
13.	State offers technical assistance for urban water conservation?	0
14.	Water connections that are part of a public supply must be metered?	0
15.	Water suppliers must implement volumetric billing?	0
16.	Rate structures must encourage water conservation?	0

** Requirement is more stringent than the federal standard*
*** Beyond Drinking Water State Revolving Funds*

	TOTAL	1

Wyoming — Climate Resiliency Scorecard — Grade: D

QUESTION		POINTS
1.	Does a state climate adaptation/resiliency plan address water resources?	0
	If *Yes*, who implements it, what does it address, and how often is it updated?	
	If *No*, do any state laws concern climate action or resiliency; if so, how?	0
2.	Does the state require water industries to take climate change-related actions?	0
3.	Does the state have benchmarks for tracking water resource resiliency?	0

	TOTAL	0

V. Exemplary Laws in Water Efficiency and Conservation

Strong statutory and regulatory language is the foundation of an effective statewide water conservation and efficiency program. This chapter showcases examples of outstanding state laws for promoting potable water efficiency, conservation, and planning. In some cases, diverse examples were selected in order to demonstrate a variety of effective methods for facilitating water efficiency through legal requirements. This chapter also details why the top-performing states within each question scored so well. The highlighted examples may serve as useful models for states wishing to strengthen their water conservation requirements and improve their future water efficiency score. Answers to questions 1, 12, and 13 were not put through a legal review process, but represent important initiatives and are included in this chapter.

Question 1:

State Agencies

Each state that answered this question was awarded one point. There is no better or best answer to the question, and thus no example to highlight here. States with a high overall score have active agencies, but the structures differ. Some states have several agencies in charge of water efficiency and conservation. This can have advantages, such as putting specialized agencies in charge of specific components of water efficiency and conservation. However, when multiple agencies are involved, a lack of cohesion can result. It is important for agencies to be aware of each other's responsibilities and work together as much as possible.

Questions 2-6

Water Consumption Laws

Questions 2 through 6 are similar: does the state have a water consumption law for toilets, showerheads, urinals, clothes washers, and pre-rinse spray valves? States received credit for each of the five fixtures or appliances for which a state statute or regulation is more stringent than the federal standard. Five states received credit for toilet and urinal efficiency requirements, and three of those states received credit for showerhead efficiency requirements. No state identified laws more stringent than the federal standards for clothes washers or pre-rinse spray valves. Additional credit was awarded for mandatory retrofits of existing buildings.

California, Georgia, and **Texas** specify in their laws concerning fixture efficiency numeric water consumption limits that are more stringent than the federal standards. California and Texas require toilets that are offered for sale to have an average or effective flush volume of no more than 1.28 gallons per flush, and they require urinals that are offered for sale not to exceed an average of 0.5 gallons per flush. California further specifies that wall-mounted urinals that are offered for sale may not to exceed an average of 0.125 gallons per flush. Georgia statutorily mandates the state minimum standard codes to require the installation of high-efficiency plumbing fixtures in all new construction. This requirement includes toilets with an average or effective flush volume of no more than 1.28 gallons per flush and urinals with no more than an average of 0.5 gallons per flush, but the statute also requires toilets to be "listed to the WaterSense Tank-Type High Efficiency Toilet Specification" and urinals to meet "all WaterSense specifications." California also has promulgated a regulation limiting the maximum flow rates of showerheads below the federal standard. Showerheads manufactured on or after July 1, 2016 must have a maximum flow rate of 2.0 gallons per minute at 80 psi, and those manufactured on or after July 1, 2018 must have a maximum flow rate of 1.8 gallons per minute at 80 psi. In addition, California received extra credit for its statutorily mandated replacement of plumbing fixtures in all residential and commercial real property.

Colorado and **Illinois**, by contrast, have simply linked their water efficiency requirements for toilets, urinals, showerheads, and other fixtures to the WaterSense standard. A Colorado statute prohibits the sale of plumbing fixtures that are not WaterSense listed. An Illinois regulation requires the Illinois Department of Natural Resources to condition allocations of water from Lake Michigan on, among other things, evidence that the permittee has adopted ordinances mandating that new and replacement plumbing fixtures be labeled WaterSense products. As of the drafting of this report, the WaterSense standard for toilets is 1.28 gallons per flush, for urinals is 0.5 gallons per flush, and for showerheads is 2.0 gallons per minute at 80 psi.

(h) Plumbing Fittings.

Table H-5:
Standards for Showerheads

APPLIANCE	MAXIMUM FLOW RATE		
	Manufactured on or after January 1, 1994, and prior to July 1, 2016	Manufactured on or after July 1, 2016, and prior to July 1, 2018	Manufactured on or after July 1, 2018
Showerheads	2.5 gpm at 80 psi	2.0 gpm at 80 psi[1,2,3]	1.8 gpm at 80 psi[1,2,3]

[1] The maximum flow rate shall be the highest value obtained through testing at a flowing pressure of 80 ± 1 psi and shall not exceed the maximum flow rate in Table H-5.

[2] **Minimum flow rate.** The minimum flow rate, determined through testing at a flowing pressure of 20 ± 1 psi, shall be not less than 60 percent of the flow rate reported by the manufacturer pursuant to section 1606(a). The minimum flow rate determined through testing at a flowing pressure of 45 and 80 ± 1 psi shall be not less than 75 percent of the flow rate reported by the manufacturer pursuant to section 1606(a).

[3] **Showerheads with multiple nozzles.** The total flow rate of showerheads with multiple nozzles must be less than or equal to the maximum flow rate in Table H-5 when any or all the nozzles are in use at the same time.

. . . .

(i) Plumbing Fixtures.

(1) The water consumption of water closets, and urinals, other than those designed and marketed exclusively for use at prisons or mental health care facilities, shall be no greater than the values shown in Table I-2.

Table I-2
Standards for Plumbing Fixtures

APPLIANCE	MAXIMUM GALLONS PER FLUSH OR DUAL-FLUSH EFFECTIVE FLUSH VOLUME	
	Sold or offered for sale on or after January 1, 2014[1]	Sold or offered for sale on or after January 1, 2016[1]
All water closets	1.28	1.28
Trough-type urinals	Trough length (inches) 16	Trough length (inches) 16
Wall mounted urinals	0.5	0.5
Other Urinals	0.5	0.5

1 For the items identified in Table I-2, noncompliant products may not be sold or offered for sale on or after the designated date, regardless of manufacture date.

(2) Water closets sold or offered for sale or after January 1, 2016, shall pass the Waste Extraction Test (Section 7.10) of ASME A112.19.2.[16]

16 CAL. PUBLIC UTILITIES AND ENERGY CODE § 1605.3.

Colorado

6-7.5-101. Definitions

As used in this article, unless the context otherwise requires:

(1) "Low-efficiency plumbing fixture" means any of the following plumbing fixtures that is not a watersense-listed plumbing fixture:

(a) A lavatory faucet;

(b) A shower head;

(c) A flushing urinal; or

(d) A tank-type toilet or tank-type water closet.

(2) "Watersense-listed plumbing fixture" means a plumbing fixture or plumbing fixture fitting that has been:

(a) Tested by an accredited third-party certifying body or laboratory in accordance with the federal environmental protection agency's WaterSense program or an analogous successor program;

(b) Certified by the body or laboratory as meeting the performance and efficiency requirements of the program; and

(c) Authorized by the program to use its label.

6-7.5-102. Low-efficiency plumbing fixtures

(1) Effective September 1, 2016, a person shall not sell a new low-efficiency plumbing fixture in Colorado.

(2) This section does not preempt any action of a city, county, or city and county that prescribes additional or more restrictive water conservation requirements affecting the sale, installation, or use of plumbing fixtures if the requirements comply with the standard specified in subsection (1) of this section.[17]

Question 7

Building and Plumbing Codes

Question 7 asks whether the state building or plumbing codes require water efficient products. States received credit if the water consumption requirements of at least some products are more stringent than the federal standard. The amount of credit received depended on how widely the water efficiency code provisions apply, whether to a specific subset of construction or to all construction.

Georgia and **New York** have supplemented their respective state plumbing/building codes with water efficiency requirements for toilets, urinals, and lavatory faucets that are more stringent than the national standards. New York also established a more stringent showerhead standard, and Georgia established a more stringent sink faucet standard. **California** has adopted a green building standards code (CALGreen), and **Texas** has water conservation design standards for state buildings and institutions of higher education facilities.

17 Colo. Rev. Stat. § 6-7.5.-101, -102.

Georgia

SECTION 604
DESIGN OF BUILDING WATER DISTRIBUTION SYSTEM

*Revise Table 604.4 'Maximum Flow Rates and Consumption For Plumbing Fixtures and Fittings' to read as follows:

TABLE 604.4
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

PLUMBING FIXTURE OF FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY[b]
Lavatory, private	1.5 gpm at 60 psi[f]
Lavatory, public (metering)	0.25 gallons per metering cycle
Lavatory, public (other than metering)	0.5 gpm at 60 psi
Shower head[a]	2.5 gpm at 60 psi[f]
Sink faucet	2.0 gpm at 60 psi[f]
Urinal	0.5 gallons per flushing cycle[f]
Water Closet	1.28 gallons per flushing cycle

For SI: 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 pound per square inches = 6.895 kPa.

a. A hand-held shower spray is a shower head.
b. Consumption tolerances shall be determined from referenced standards.
c. For flushometer valves and flushometer tanks, the average flush volume shall not exceed 1.28 gallons.
d. For single flush water closets, including gravity, pressure assisted and electro-hydraulic tank types, the average flush volume shall not exceed 1.28 gallons.
e. For dual flush water closets, the average flush volume of two reduced flushes and one full flush shall not exceed 1.28 gallons.
f. See 2014 GA Amendment to Section 301.1.1 'Waiver from requirements of high efficiency plumbing fixtures.'[18]

18 GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS, GEORGIA STATE AMENDMENTS TO THE INTERNATIONAL PLUMBING CODE 15 (2014).

New York

4.3. 2015 IPC TABLE 604.4 (MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS)

Table 604.4 of the 2015 IPC shall be deemed to be amended to read as follows:

TABLE 604.4
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS[a]

PLUMBING FIXTURE OF FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY[b]
Lavatory, private	1.5 gpm at 60 psi
Lavatory, public (metering)	0.25 gallons per metering cycle
Lavatory, public (other than metering)	0.5 gpm at 60 psi
Shower head	2.0 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Urinal	0.5 gallons per flushing cycle
Water Closet	1.3 gallons per flushing cycle[b]

For SI: 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 pound per square inches = 6.895 kPa.

a. Consumption tolerances shall be determined from referenced standards.

a. The flush volume for a dual-flush water closet is defined as the composite, average flush volume of two reduced flushes and one full flush.[19]

Question 8

Utility Distribution Water Loss

Question 8 asks whether the state has statutes or regulations that limit water loss in water utility distribution systems. The answer for roughly half of the states is yes, but information-gathering, reporting, and response requirements, as well as which utilities must comply, vary. Ideally, state law requires public and private water suppliers to comply with non-universal numeric limits on water loss, submit annual audits with independent data validation, as well as detect and correct leaks. Partial credit was given for state water loss requirements that apply to a limited geographic area or only in the course of permitting or funding processes. Extra credit was given to states requiring the use of AWWA Free Water Audit Software and to those states leveraging state-funding for M36-compliant technical assistance to water systems in support of an existing or potential mandate.

Georgia received a nearly perfect score for this question, and **California** had one of the higher scores, both states having many notable requirements. California requires each water supplier that directly provides potable municipal water to more than 3,000 users or that annually supplies more than 3,000 acre-feet of potable water for municipal purposes at retail price to submit a completed and validated water loss audit report for the previous calendar year on or before October 1 each year. Georgia requires each provider of piped water that regularly serves at least 3,300 individuals to annually submit water loss audits, including a certification statement by a Qualified Water Loss Auditor, by March 1. Both states require that the audits use the AWWA Free Water Audit Software. California also has a unique statutory provision, requiring the State Water Resources Control Board to adopt rules obligating the aforementioned water suppliers to meet performance standards for the volume of water losses. Georgia requires the aforementioned water suppliers to develop and conduct a water loss control program to investigate, assess, and implement water supply efficiency improvements, and the first potential component of such a program listed in the regulation is leakage management, including water leakage detection and repairs.

19 NEW YORK STATE DEPARTMENT OF STATE, 2017 UNIFORM CODE SUPPLEMENT 117 (2017).

(a) (1) On or before January 1, 2017, the department shall adopt rules for all of the following:

(A) The conduct of standardized water loss audits by urban retail water suppliers in accordance with the method adopted by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0.

(B) The process for validating a water loss audit report prior to submitting the report to the department. For the purposes of this section, "validating" is a process whereby an urban retail water supplier uses a technical expert to confirm the basis of all data entries in the urban retail water supplier's water loss audit report and to appropriately characterize the quality of the reported data. The validation process shall follow the principles and terminology laid out by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0. A validated water loss audit report shall include the name and technical qualifications of the person engaged for validation.

(C) The technical qualifications required of a person to engage in validation, as described in subparagraph (B).

(D) The certification requirements for a person selected by an urban retail water supplier to provide validation of its own water loss audit report.

(E) The method of submitting a water loss audit report to the department.

(2) The department shall update rules adopted pursuant to paragraph (1) no later than six months after the release of subsequent editions of the American Water Works Association's Water Audits and Loss Control Programs, Manual M36. Except as provided by the department, until the department adopts updated rules pursuant to this paragraph, an urban retail water supplier may rely upon a subsequent edition of the American Water Works Association's Water Audits and Loss Control Programs, Manual M36 or the Free Water Audit Software.

(b) On or before October 1, 2017, and on or before October 1 of each year thereafter, each urban retail water supplier shall submit a completed and validated water loss audit report for the previous calendar year or the previous fiscal year as prescribed by the department pursuant to subdivision (a). Water loss audit reports submitted on or before October 1, 2017, may be completed and validated with assistance as described in subdivision (c).

(c) Using funds available for the 2016–17 fiscal year, the board shall contribute up to four hundred thousand dollars ($400,000) towards procuring water loss audit report validation assistance for urban retail water suppliers.

(d) Each water loss audit report submitted to the department shall be accompanied by information, in a form specified by the department, identifying steps taken in the preceding year to increase the validity of data entered into the final audit, reduce the volume of apparent losses, and reduce the volume of real losses.

(e) At least one of the following employees of an urban retail water supplier shall attest to each water loss audit report submitted to the department:

(1) The chief financial officer.

(2) The chief engineer.

(3) The general manager.

(f) The department shall deem incomplete and return to the urban retail water supplier any final water loss audit report found by the department to be incomplete, not validated, unattested, or incongruent with known characteristics of water system operations. A water supplier shall resubmit a completed water loss audit report within 90 days of an audit being returned by the department.

(g) The department shall post all validated water loss audit reports on its Internet Web site in a manner that allows for comparisons across water suppliers. The department shall make the validated water loss audit reports available for public viewing in a timely manner after their receipt.

(h) Using available funds, the department shall provide technical assistance to guide urban retail water suppliers' water loss detection programs, including, but not limited to, metering techniques, pressure management techniques, condition-based assessment techniques for transmission and distribution pipelines, and utilization of portable and permanent water loss detection devices.

(i) No earlier than January 1, 2019, and no later than July 1, 2020, the board shall adopt rules requiring urban retail water suppliers to meet performance standards for the volume of water losses. In adopting these rules, the board shall employ full life-cycle cost accounting to evaluate the costs of meeting the performance standards. The board may consider establishing a minimum allowable water loss threshold that, if reached and maintained by an urban water supplier, would exempt the urban water supplier from further water loss reduction requirements.[20]

20 CAL. WATER CODE § 10608.34.

Georgia

391-3-33.04 Water Loss Audits

(1) Water Loss Audits. Public water systems shall conduct an annual water loss audit in accordance with the International Water Association (IWA) and American Water Works Association (AWWA) methodology for water loss auditing as provided by the Division in the most current versions of the Georgia Water System Audits and Water Loss Control Manual and AWWA Water Audit Software.

(2) Reporting. By March 1 of each calendar year, annual water loss audit results for the previous calendar year shall be submitted to the Division in a form and manner prescribed by the Division and shall include documentation of the basis of the audit in the comments section of the Reporting Worksheet. A certification statement shall be included with each annual water loss audit reporting that a Qualified Water Loss Auditor has examined the annual water loss audit results and the results meet the requirements in the Georgia Water System Audits and Water Loss Control Manual and the American Water Works Association methodology for water loss auditing.

(3) Review by the Division. Public water systems shall cooperate with the Division during Division review of the submitted water loss audits, including providing responses to follow up questions by the Division and the submittal of additional supporting information for the audits. If the Division determines that an audit is of poor quality, the Division may require the Public water system to have their audit reviewed and resubmitted by a third party Qualified Water Loss Auditor.

(2) Individualized Goals. Each public water system shall establish individual goals to set measures of water supply efficiency and to improve water supply efficiency. These measures may include, but are not limited to:

(a) Infrastructure Leakage Index;

(b) Water Audit Data Validity Score;

(c) Operational Basic Apparent Losses;

(d) Operational Basic Real Losses; and

(e) Economic Level of Leakage

(3) Demonstration of Progress.

(a) Public water systems shall make progress toward improving water supply efficiency. Progress may be demonstrated through process and performance measures:

1. Improvement in data validity score to the extent practicable for a specific utility as a process measure of data reliability;

2. The development and implementation of the water loss control program;

3. Improvement in performance measures once a reliable level of validity score has been achieved:

* Operational Basic Real Losses;

* Operational Basic Apparent Losses; and

4. Economic Level of Leakage has been achieved and maintained...[21]

Question 9

Conservation and Water Permitting

Question 9 asks whether the state requires water suppliers to plan and/or implement water conservation measures as part of the water permitting process. The answer for roughly half of the states is yes, but the amount and quality of information required, whether and how stakeholders must be part of the process, the review required by the permitting agency, and the authority of the permitting agency to condition a permit vary. Ideally, a state will require all municipal water permittees to plan for and adopt specific water conservation measures, and condition the permit on implementation of those measures and others that may be necessary in the future. States requiring nothing more than the development of a water conservation plan received limited credit. States with robust requirements but limited applicability, such as a specific watershed, water sources, or water users, received partial credit. States received credit for specifying, in statute or regulation, required elements of the plan, making the development of the plan a prerequisite to obtaining a permit, requiring stakeholder involvement in the planning process, requiring the state to review the plan in the course of the permitting process, specifying the criteria for evaluating the sufficiency of the plan, requiring that the plan be incorporated into the permit as an enforceable condition, and conditioning approval of the permit on implementation of the water conservation measures.

21 GA. COMP. R. & REGS. 391-3-33.04, -.05.

New Hampshire and **Oregon** had two of the highest scores for this question. The relevant administrative rules for both of these states provide extensive detail as to the content required for water conservation plans. So much detail, in fact, that the excerpts below only could accommodate the categories of information and actions required. New Hampshire received full credit for how widely the permitting requirement applies and for the rule explicitly requiring the state to include conditions in its permit approval that ensure the water conservation plan is implemented. Both states' rules require the state to evaluate the sufficiency of the water conservation plan, and they explicitly identify the factors to be considered in that evaluation. Oregon was the only state to receive extra credit for particularly detailed evaluation criteria.

New Hampshire

Env-Wq 2101.02 Applicability.

(a) As specified in RSA 485:61, II, these rules shall apply to "all new permit applicants and applications for water withdrawals subject to the provisions of RSA 485:3, RSA 485:48, RSA 485-C:21 and section 401 of the Clean Water Act."

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Env-Wq 2101.06 Water Meters.

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Env-Wq 2101.07 Leak Detection and Repair.

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Env-Wq 2101.08 Water Balance.

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Env-Wq 2101.09 Development and Implementation of Response Plans.

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Env-Wq 2101.11 Rate Structure and Billing Practices to Promote Water Conservation.

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Env-Wq 2101.12 Educational Outreach Program.

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Env-Wq 2101.16 Minimization of Water Loss and Water Waste for Specified Systems.

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Env-Wq 2101.24 Water Conservation Plan Required.

(a) The applicant for approval of a source that would be a conservation source shall submit a water conservation plan that demonstrates compliance with the applicable provisions of Env-Wq 2101.05 through Env-Wq 2101.22…

(b) The water conservation plan shall be signed by the owner, certifying that the owner has read the water conservation plan, understands the responsibilities as referenced in the plan, and that all information provided is complete, accurate, and not misleading.

(c) If an application is filed pursuant to (a)(1) or (2), above, for an existing community water system that currently bills for water service based on metered consumption, the water conservation plan shall include a water audit prepared using protocols and procedures described in the 2009 AWWA M36 Manual, available as described in Appendix A, for the most recent calendar year.

(d) The department shall contact the applicant within 30 days of receiving the water conservation plan in order to:

(1) Review the water conservation plan with the applicant; and

(2) Assess the accuracy and adequacy of the water conservation plan.

Env-Wq 2101.25 Public Notification.

(a) The department shall send the applicant a summary of the requirements of Env-Wq 2101.

(b) Within 10 working days of receiving the summary from the department, the applicant shall provide a copy of the water conservation plan and summary via certified mail, return receipt requested, to:

(1) The governing board of:

a. The municipality in which a proposed conservation source is located;

b. All municipalities that receive water from the water system; and

c. All wholesale customers of the water system; and

(2) The regional planning commission established in accordance RSA 36:46 for the location of a proposed new source.

Continues on next page

(c) The applicant shall request the governing boards described in (a)(1), above, to amend the body's site planning requirements to:

(1) Reflect the requirements of Env-Wq 2101 when applicable; and

(2) Promote water conservation landscaping for new projects.

(d) The applicant shall send copies of the returned receipts to the department prior to receiving approval for the water conservation plan.

Env-Wq 2101.26 Approval.

(a) The department shall issue a written decision on the water conservation plan within 45 days of receipt of the plan.

(b) The department shall approve the water conservation plan if the department determines that:

(1) The water conservation plan is complete and correct;

(2) The water conservation plan demonstrates that the applicable water conservation measures required by Env-Wq 2101.05 through Env-Wq 2101.22 are being or will be implemented in accordance with the specified timeframes; and

(3) The applicant has sent the notice as required by Env-Wq 2101.25.

(c) The department shall include in its approval such conditions as are required to ensure the water conservation plan is implemented as required.

. . . .

(e) The department shall not approve the water conservation plan if the criteria specified in (b), above, are not met.

(f) If the department does not approve the water conservation plan, the department shall specify the reason(s) in the notice sent pursuant to (b), above.

Env-Wq 2101.27 On-Going Compliance Reports.

(a) The owner of a conservation system shall provide the following information on a form supplied by the department once every 3 years from the date of approval of the water conservation plan, to demonstrate on-going compliance with the plan:

(1) The owner's name, mailing address, and daytime telephone number;

(2) The name, mailing address, and daytime telephone number and, if available, fax number and e-mail address of the individual responsible for maintaining compliance with Env-Wq 2101 on behalf of the owner; and

(3) Details and documentation of how compliance with each of the applicable requirements of these rules is being achieved.

(b) The owner shall sign and date the on-going compliance report. Such signature shall constitute certification that:

(1) The owner has personally examined and is familiar with the information submitted in or with the on-going compliance form;

(2) Based on the owner's inquiry of those individuals immediately responsible for obtaining the information provided on or with the on-going compliance report, the owner believes that the submitted information is true, accurate and complete; and

(3) The owner understands that he or she is subject to the penalties specified in RSA 641:3 for making unsworn false statements.

(c) If the conservation system is not in compliance with one or more requirement(s), the on-going compliance report shall identify the non-compliance and include an explanation of how the non-compliance has been, is being, or will be addressed.[22]

22 N.H. Code Admin. R. Ann. Env-Wq 2101, et. seq.

Oregon

690-086-0125 – Municipal Water Supplier Plan Elements

A water management and conservation plan submitted by a municipal water supplier shall include:

(1) A municipal water supplier description as described under OAR 690-086-0140;

(2) A municipal water conservation element as described under OAR 690-086-0150;

(3) A municipal water curtailment element as described under OAR 690-086-0160;

(4) A municipal water supply element as described under OAR 690-086-0170;

(5) A list of the affected local governments to whom the draft plan was made available pursuant to OAR 690-086-0120(6) and a copy of any comments on the plan provided by the local governments;

(6) A proposed date for submittal of an updated plan within no more than 10 years based on the proposed schedule for implementation of conservation measures, any relevant schedules for other community planning activities, and the rate of growth or other changes expected by the water supplier; or an explanation of why submittal of an updated plan is unnecessary and should not be required by the Department; and

(7) If the municipal water supplier is requesting additional time to implement metering as required under OAR 690-086-0150(4)(b) or a benchmark established in a previously approved plan, documentation showing additional time is necessary to avoid unreasonable and excessive costs.

690-086-0130 – Criteria for Approval of a Plan Submitted by a Municipal Water Supplier

In order to approve a plan by a municipal water supplier under OAR 690-086-0915, the Department must find that:

(1) The plan includes each of the required elements under OAR 690-086-0125;

(2) The projections of future water need in the water management and conservation plan are reasonable and consistent with available land use plans and the municipal water supplier has demonstrated a need for the quantity of water to be diverted during the next 20 years under each permit held by the supplier;

(3) For each of the water conservation measures required under OAR 690-086-0150(4) and, as applicable, 690-086-0150(5), the plan includes a reasonable and appropriate schedule with five year benchmarks for implementation of conservation activities;

(4) If applicable, for each of the water conservation measures required under OAR 690-086-0150(6), the plan includes:

(a) A reasonable and appropriate schedule with five year benchmarks for implementation of conservation activities; or

(b) Documentation to demonstrate that implementation of the measure is neither feasible nor appropriate to ensure efficient use of water and the prevention of waste and the supplier has used a suitable methodology in evaluating the measure;

(5) The identification of resource issues under OAR 690-086-0140(5)(i) is accurate and complete;

(6) The water curtailment element required under OAR 690-086-0160 satisfactorily promotes water curtailment practices and the coordination of usage regulation, taking into account state water law and local conditions, or is substantially the same as a curtailment plan prepared pursuant to ORS 536.780 and OAR 690-019-0090 and approved by the Department within the previous five years;

(7) If during the next 20 years the maximum rate of water diverted under an extended permit will be greater than the maximum rate authorized for diversion under the extension or previously approved water management and conservation plan;

(a)The plan includes a schedule for development of any conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources, unless the supplier has provided sufficient justification for the factors used in selecting other sources for development or the supplier serves a population of less than 1,000;

(b) Increased use from the source is the most feasible and appropriate water supply alternative available to the supplier; and

(c) If mitigation is legally required to address limitations or restrictions on the development of permits for which resource issues are identified under OAR 690-086-0140(5)(i), the plan contains documentation that the supplier is complying with the mitigation requirements. The Department may consult with federal and state agencies in making this determination; and

(8) After January 1, 2042, for review of water management and conservation plans that propose to increase the maximum rate of water diverted under an extended permit that the additional diversion of water will not impair or be detrimental to the public interest.[23]

23 OR. ADMIN. R. 690-086-0125, -0130.

Question 10

Drought Plans

Question 10 asks whether the state requires water utilities, municipalities, regional water authorities, or other water suppliers to develop a drought preparedness plan. Ideally, the state law will identify in detail the content to be included in a drought plan, require stakeholder involvement in the planning process, mandate state review of drought plans, specify the criteria for approving those plans, and require regular updates to the plans. An independent drought planning process usually is superior to the inclusion of drought planning in a water right permitting or general emergency or water planning process for two reasons: 1) the focus of public participation and state review is solely on the drought plan, not multiple other factors; and 2) the timing of updates is based on what is best for drought analysis, not other emergencies or the state's permit renewal schedule.

States received limited credit for requiring drought planning as part of water right permitting, general emergency planning, or general water planning processes. Several states require water suppliers to prepare an emergency plan but do not explicitly include drought or water shortages among the "emergencies" to be addressed by a plan. In such instances, the state received no credit since most strategies for handling terrorism, mechanical failures, storm events, and other public infrastructure emergencies are different from methods of addressing drought.

Kentucky, **North Carolina**, and **Texas** received some of the highest scores for this question, each requiring water suppliers to develop drought plans, submit the plans to the state for review, and update the plans every five years. Texas' requirement stands alone, while North Carolina's is connected to local water supply plans and Kentucky's is part of county-level long range water supply plans, which water suppliers are required to help prepare. Each states' administrative rules on the topic identify required content of the plans and incorporate stakeholders in the planning process in some fashion. Kentucky has detailed plan review procedures and approval criteria, but for the entire long range water supply plan, of which the water shortage

Kentucky

Section 2. Scope and Applicability. Each county, its municipalities and water suppliers, shall prepare a water supply plan. Representatives of each county, its municipalities and water suppliers shall decide whether to form a multicounty planning unit and shall form a planning council to oversee the planning process. Under the oversight of the planning council, a planning representative shall assess the need to provide increased or alternative water supplies for the water supplier systems within each county, formulate recommendations to protect water supplies, and prepare a water supply contamination response plan. If increased or alternative water supplies are needed, the planning representative shall develop water shortage response plans and evaluate water supply alternatives. The planning council shall select water supply alternatives…

Section 6. Responsibilities of the Planning Representative.

. . . .

(13) Emergency plans. The planning representative shall prepare water shortage response and supply contamination plans, which shall be documented in section XIII of the plan formulation document and summarized in section XII of the final plan document.

(a) Water shortage response plans. If the water supply availability inventory indicates that water availability for any supplier will be less than adequate during drought conditions, the planning representative shall outline contingency plans for managing water demands and accessing alternate sources of water.

1. Water shortage response plans shall be based on the water shortage response plan available from the cabinet, and shall include: identification of various levels of response; triggers that shall initiate these responses; actions and responses applicable to local government and the public for each response level; and penalties as necessary to ensure that the required actions are implemented.

2. Water shortage response plans shall describe the methods to be used by any affected water supplier to notify the public of the emergency and to provide the public with the information needed to understand the seriousness of the situation and to know what shall be done to properly respond to the situation.

3. Water shortage response plans shall identify sources of water for use during water supply emergencies and shall describe plans for receiving prior approvals, achieving access to the water, and adequately treating and distributing the water.

Continues on next page

4. Water shortage response plans shall include a description of provisions made for activities to be performed by the Department for Military Affairs or the cabinet, if the emergency plan calls for any actions on the part of either agency. The discussion of such provisions shall include the types of activities to be performed by the Department of Military Affairs or the cabinet, at what level of water shortage these actions are to take place, approximately what it will cost the local community to reimburse the Department of Military Affairs' or the cabinet's expense, and documentation of agreement and approval from the appropriate agency.

5. Water shortage response plans shall describe any legal arrangements that are recommended or would be required to implement or enforce the emergency plans, including at least Public Service Commission approval when applicable.

6. Water shortage response plans shall identify who within the local government shall enforce the emergency provisions in the plan. The plan shall demonstrate that the local government has the authority to enforce these provisions.

. . . .

(14) Implementation plan. The planning representative shall determine the steps necessary to implement the water supply plan and describe these in section XIII of the final plan document.

(a) Plans for implementation shall include methods for updating and amending the plan document and addressing current or future potential conflicts.

(b) Implementation plans shall contain a timetable for initiation and completion of tasks and shall identify parties responsible for completing tasks.

(c) The planning representative shall create a chart showing the anticipated costs of implementation and describe proposed methods of financing, including reasonable estimates of the interest rates on loans and the per capita cost to water users.

(d) The planning representative shall recommend procedures to coordinate actions of local government, and other agencies that impact development decisions within the planning unit, with the water supply plan.

(e) The implementation plan shall describe existing authority to implement the plan and identify any legal changes or agreements that are necessary to implement the plan. If the planning council makes any written agreement towards the implementation of the plan or a portion of the plan, section XIII of the final plan document shall describe the nature of the agreement, the parties involved, and when the implementation will happen. Copies of any written agreement or resolution, including agreements to expand treatment facilities or use new water sources, shall be included in section XIV of the plan formulation document.

Section 7. Grant Provisions and Plan Approval.

. . . .

(4) Plan approval. The planning council shall submit one (1) copy of the plan formulation document and three (3) copies of the final plan document to the cabinet.

(a) No plan shall be approved by the cabinet unless it meets all the provisions of this administrative regulation and is consistent with state laws and administrative regulations.

(b) The cabinet shall examine the plan for consistency with other water supply plans that have been approved by the cabinet pursuant to this administrative regulation. The cabinet shall notify planning councils of inconsistencies between water supply plans. If any portion of any county in a planning unit is located within the watershed of the Kentucky River, the cabinet shall examine the plan for consistency with administrative regulations promulgated by the Kentucky River Authority and with the Kentucky River Authority's water resource plan and notify the planning council and the Kentucky River Authority of inconsistencies.

(c) The cabinet shall notify the planning council within ninety (90) days if any portion of the plan document is not consistent with statutes or administrative regulations and shall identify any portion of the plan document requiring revision. The planning council shall subsequently submit a revision within 120 days after receiving notice of disapproval. The cabinet may extend the time period allowed to revise a plan document if a planning council submits written justification to postpone the deadline.

(d) Payments. No payments shall be made to a grant recipient for work that does not conform to the approved plan. As part of the grant contractual agreement, the cabinet may specify a schedule for payment based on submittal and approval of work elements. No more than eighty (80) percent of any total grant allotment shall be paid until grant conditions have been met and work completed under the planning grant has been approved by the cabinet. (17 Ky.R. 3054; Am. 3457; 18 Ky.R. 22; 6-26-1991; TAm eff. 11-25-2008; TAm eff. 7-8-2016.).[24]

24 401 KY. ADMIN. REGS. 4:220.

North Carolina

(a) Publicly and privately owned water systems that are required to prepare a Local Water Supply Plan under G.S. 143-355(l) shall include the following information in their local Water Shortage Response Plans for review by the Division of Water Resources:

(1) The designation of a staff position or organizational unit responsible for the implementation of their Water Shortage Response Plan;

(2) Notification procedures that will be used to inform employees and water users about the implementation of the plan and required water conservation response measures;

(3) Tiered levels of response actions to be taken to reduce water use based on the severity of water shortage conditions;

(4) Specific measurements of available water supply, water demand and system conditions that will be used to determine the severity of water shortage conditions and to initiate water use reduction measures and the movement between various levels;

(5) Procedures that will be used to regulate compliance with the provisions of the plan;

(6) Procedures for affected parties to review and comment on the plan prior to final adoption;

(7) Procedures to receive and review applications for variances from specific requirements of the plan and the criteria that will be considered in the determination to issue a variance;

(8) An evaluation method to determine the actual water savings accomplished and the effectiveness of the Water Shortage Response Plan when implemented; and

(9) Procedures for revising and updating Water Shortage Response Plans to improve plan effectiveness and adapt to new circumstances.

(b) Publicly and privately owned water systems that are required to prepare a Local Water Supply Plan shall submit a copy of their Water Shortage Response Plan and any subsequent revisions of the plan to the Division of Water Resources for review every five years with the full Local Water Supply Plan, as required by G.S. 143-355(l).

(c) Publicly and privately owned water systems not required to prepare a Local Water Supply Plan shall:

(1) Assess their vulnerability to drought and water shortage emergencies; and

(2) Prepare a written plan for responding to water shortage emergencies and drought using the provisions of Paragraph (a) of this Rule.

(d) Publicly and privately owned water systems that depend on the water storage in a private or public impoundment that they do not own and operate under a contract for the withdrawal of water issued by the owner of an impoundment shall prepare a written plan for responding to water shortages that is consistent with the provisions of the contract and shall comply with all Water Shortage Response Plan provisions established by the owner of the impoundment.

(e) Water Shortage Response Plans shall provide for water users who have made improvements to maximize water use efficiency in their daily operations and may face disproportionate hardships when making further water use reductions. Water Shortage Response Plans shall avoid restricting efficient water users in ways that would undermine incentives for water users to seek continued improvements in water use efficiency and shall honor locally approved certification programs that recognize efficient water users who meet industry standards for water use efficiency and water conservation.

(f) When the NCDMAC issues a drought advisory designating an area of the state as currently suffering from drought, publicly and privately owned water systems that depend on water from the designated area shall for the duration of the designation:

(1) Implement the provisions of their Water Shortage Response Plan, as determined by the specific indicators established in the plan for initiating response measures;

(2) Monitor and document water supply conditions;

(3) Educate customers and employees on the need to conserve water and how to prepare for potential drought conditions;

(4) Inspect water delivery system components and ensure that existing equipment is operating as efficiently as possible;

(5) Stay informed on drought and water shortage emergency conditions and participate in regional coordination for the management of water resources; and

(6) Evaluate the feasibility of reclaiming and recycling water to meet water needs.[25]

25 N.C. ADMIN. CODE tit. 15A, r. 02E .0607.

Texas

Section 288.30 – Required Submittals

…(5) Drought contingency plans for retail public water suppliers. Retail public water suppliers shall submit a drought contingency plan meeting [applicable] requirements...to the executive director after adoption by its governing body. The retail public water system shall provide a copy of the plan to the regional water planning group for each region within which the water system operates.[26]

Section 288.20 – Drought Contingency Plans for Municipal Uses by Public Water Suppliers

(a) A drought contingency plan for a retail public water supplier, where applicable, must include the following minimum elements.

(1) Minimum requirements. Drought contingency plans must include the following minimum elements.

(A) Preparation of the plan shall include provisions to actively inform the public and affirmatively provide opportunity for public input. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting.

(B) Provisions shall be made for a program of continuing public education and information regarding the drought contingency plan.

(C) The drought contingency plan must document coordination with the regional water planning groups for the service area of the retail public water supplier to ensure consistency with the appropriate approved regional water plans.

(D) The drought contingency plan must include a description of the information to be monitored by the water supplier, and specific criteria for the initiation and termination of drought response stages, accompanied by an explanation of the rationale or basis for such triggering criteria.

(E) The drought contingency plan must include drought or emergency response stages providing for the implementation of measures in response to at least the following situations:

(i) reduction in available water supply up to a repeat of the drought of record;

(ii) water production or distribution system limitations;

(iii) supply source contamination; or

(iv) system outage due to the failure or damage of major water system components (e.g., pumps).

(F) The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this subparagraph are not enforceable.

(G) The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following:

(i) curtailment of non-essential water uses; and

(ii) utilization of alternative water sources and/or alternative delivery mechanisms with the prior approval of the executive director as appropriate (e.g., interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.).

(H) The drought contingency plan must include the procedures to be followed for the initiation or termination of each drought response stage, including procedures for notification of the public.

(I) The drought contingency plan must include procedures for granting variances to the plan.

(J) The drought contingency plan must include procedures for the enforcement of mandatory water use restrictions, including specification of penalties (e.g., fines, water rate surcharges, discontinuation of service) for violations of such restrictions.

(2) Privately-owned water utilities. Privately-owned water utilities shall prepare a drought contingency plan in accordance with this section and incorporate such plan into their tariff.

(3) Wholesale water customers. Any water supplier that receives all or a portion of its water supply from another water supplier shall consult with that supplier and shall include in the drought contingency plan appropriate provisions for responding to reductions in that water supply.

(b) A wholesale or retail water supplier shall notify the executive director within five business days of the implementation of any mandatory provisions of the drought contingency plan.

(c) The retail public water supplier shall review and update, as appropriate, the drought contingency plan, at least every five years, based on new or updated information, such as the adoption or revision of the regional water plan.[27]

26 30 TEX. ADMIN. CODE § 288.30.

27 30 TEX. ADMIN. CODE § 288.20.

Question 11

Water Conservation Plans

Question 11 asks whether the state requires water utilities and/or municipalities to prepare water conservation plans. Unlike drought emergency plans, which only apply during drought emergency events, water conservation plans outline measures that are broadly applicable at all times of operation to promote efficient water use. Water conservation plans required primarily or entirely as part of a water right permitting process were scored under question 9 and not here.

Fourteen states received credit for this question, but their scores varied significantly depending on the application and detail of the law. More credit was given for requiring water conservation plans from both private and public water suppliers and for update requirements with shorter timeframes. A state's score for the question also depended on whether specified contents of plans are required; whether the state must draft guidelines to aid in plan preparation; whether stakeholders must be involved in the planning process; whether the water supplier must prepare implementation schedules, identify financial resources or legal authorities needed to implement the plan, or submit progress reports; whether the state must evaluate the plans and if criteria for that evaluation are explicitly referenced; whether plan implementation is mandated; and whether the state penalizes the water supplier for not implementing the plan.

Colorado and **Nevada** received the highest scores for this question. Their respective statutes apply to both public and private water suppliers, include detailed lists of minimum plan contents, and identify how public review and opportunity for comment must be made available. In both Colorado and Nevada, state approval of the plan is required, and while Nevada law references the basic criteria for review, the Colorado Water Conservation Board is obligated to adopt guidelines for plan submittal and the method of review. Plans must be updated at least every five years in Nevada and at least every seven years in Colorado. Also, the Colorado statute explicitly requires implementation of the plan, whereas the Nevada statute requires the appropriate local government to adopt ordinances, identify fines, and hire staff necessary to facilitate plan implementation.

Connecticut received extra credit for the extensive, thoughtful plan contents identified in and required by state regulation, including analyzing strategies for implementing plumbing retrofit programs and the feasibility of a no-demand-increase policy for new service connections.[28]

28 Conn. Agencies Regs. § 25-32d-3.

Colorado

(1) As used in this section and section 37-60-126.5, unless the context otherwise requires:

. . . .

(b) "Covered entity" means each municipality, agency, utility, including any privately owned utility, or other publicly owned entity with a legal obligation to supply, distribute, or otherwise provide water at retail to domestic, commercial, industrial, or public facility customers, and that has a total demand for such customers of two thousand acre-feet or more.

. . . .

(2) (a) Each covered entity shall, subject to section 37-60-127, develop, adopt, make publicly available, and implement a plan pursuant to which such covered entity shall encourage its domestic, commercial, industrial, and public facility customers to use water more efficiently. Any state or local governmental entity that is not a covered entity may develop, adopt, make publicly available, and implement such a plan.

(b) The office shall review previously submitted conservation plans to evaluate their consistency with the provisions of this section and the guidelines established pursuant to paragraph (a) of subsection (7) of this section.

(c) On and after July 1, 2006, a covered entity that seeks financial assistance from either the board or the Colorado water resources and power development authority shall submit to the board a new or revised plan to meet water conservation goals adopted by the covered entity, in accordance with this section, for the board's approval prior to the release of new loan proceeds.

(3) The manner in which the covered entity develops, adopts, makes publicly available, and implements a plan established pursuant to subsection (2) of this section shall be determined by the covered entity in accordance with this section. The plan shall be accompanied by a schedule for its implementation. The plans and schedules shall be provided to the office within ninety days after their adoption. For those entities seeking financial assistance, the office shall then notify the covered entity and the appropriate financing authority that the plan has been reviewed and whether the plan has been approved in accordance with this section.

(4) A plan developed by a covered entity pursuant to subsection (2) of this section must, at a minimum, include a full evaluation of the following plan elements:

(a) The water-saving measures and programs to be used by the covered entity for water conservation. In developing these measures and programs, each covered entity shall, at a minimum, consider the following:

(I) Water-efficient fixtures and appliances, including toilets, urinals, clothes washers, showerheads, and faucet aerators;

(II) Low water use landscapes, drought-resistant vegetation, removal of phreatophytes, and efficient irrigation;

(III) Water-efficient industrial and commercial water-using processes;

(IV) Water reuse systems;

(V) Distribution system leak identification and repair;

(VI) Dissemination of information regarding water use efficiency measures, including by public education, customer water use audits, and water-saving demonstrations;

(VII) (A) Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner.

(B) The department of local affairs may provide technical assistance to covered entities that are local governments to implement water billing systems that show customer water usage and that implement tiered billing systems.

(VIII) Regulatory measures designed to encourage water conservation;

(IX) Incentives to implement water conservation techniques, including rebates to customers to encourage the installation of water conservation measures;

(b) A section stating the covered entity's best judgment of the role of water conservation plans in the covered entity's water supply planning;

(c) The steps the covered entity used to develop, and will use to implement, monitor, review, and revise, its water conservation plan;

(d) The time period, not to exceed seven years, after which the covered entity will review and update its adopted plan;

Continues on next page

Colorado, *Continued*

(e) Either as a percentage or in acre-foot increments, an estimate of the amount of water that has been saved through a previously implemented conservation plan and an estimate of the amount of water that will be saved through conservation when the plan is implemented; and

(f) (I) Best management practices for water demand management, water efficiency, and water conservation that may be implemented through land use planning efforts.

. . . .

(5) Each covered entity and other state or local governmental entity that adopts a plan shall follow the entity's rules, codes, or ordinances to make the draft plan available for public review and comment. If there are no rules, codes, or ordinances governing the entity's public planning process, then each entity shall publish a draft plan, give public notice of the plan, make such plan publicly available, and solicit comments from the public for a period of not less than sixty days after the date on which the draft plan is made publicly available. Reference shall be made in the public notice to the elements of a plan that have already been implemented.

. . . .

(7) (a) The board shall adopt guidelines for the office to review water conservation plans submitted by covered entities and other state or local governmental entities. The guidelines shall define the method for submitting plans to the office, the methods for office review and approval of the plans, and the interest rate surcharge provided for in paragraph (a) of subsection (9) of this section.

. . . .

(9) (a) Neither the board nor the Colorado water resources and power development authority shall release grant or loan proceeds to a covered entity unless the covered entity provides a copy of the water conservation plan adopted pursuant to this section...[29]

Nevada

NRS 540.121 - "Supplier of water" defined.

As used in NRS 540.121 to 540.151, inclusive, "supplier of water" includes, but is not limited to:

1. Any county, city, town, local improvement district, general improvement district and water conservancy district;

2. Any water district, water system, water project or water planning and advisory board created by a special act of the Legislature; and

3. Any other public or private entity,

that supplies water for municipal, industrial or domestic purposes. The term does not include a public utility required to adopt a plan of water conservation pursuant to NRS 704.662.

NRS 540.131 - Plan of water conservation: Procedure for adoption and updating of plan; review of plan by Section; joint plans permitted by certain suppliers; duties of local governing body.

1. Except as otherwise provided in subsection 5, each supplier of water which supplies water for municipal, industrial or domestic purposes shall, on or before July 1, 1992, adopt a plan of water conservation based on the climate and the living conditions of its service area in accordance with the provisions of NRS 540.141, and shall update the plan pursuant to paragraph (c) of subsection 4. The provisions of the plan must apply only to the supplier's property and its customers. The supplier of water shall submit the plan to the Section for review by the Section pursuant to subsection 3.

2. As part of the procedure of adopting a plan, the supplier of water shall provide an opportunity for any interested person, including, but not limited to, any private or public entity that supplies water for municipal, industrial or domestic purposes, to submit written views and recommendations on the plan.

3. The plan must be reviewed by the Section within 30 days after its submission and approved for compliance with this section and NRS 540.141 before it is adopted by the supplier of water.

Continues on next page

29 COLO. REV. STAT. § 37-60-126.

4. The plan:

(a) Must be available for inspection by members of the public during office hours at the offices of the supplier of water;

(b) May be revised from time to time to reflect the changing needs and conditions of the service area. Each such revision must be made available for inspection by members of the public; and

(c) Must be updated every 5 years and comply with the requirements of this section and NRS 540.141.

. . . .

6. The board of county commissioners of a county, the governing body of a city and the town board or board of county commissioners having jurisdiction of the affairs of a town shall:

(a) Adopt any ordinances necessary to carry out a plan of conservation adopted pursuant to this section which applies to property within its jurisdiction;

(b) Establish a schedule of fines for the violation of any ordinances adopted pursuant to this subsection; and

(c) Hire such employees as it deems necessary to enforce the provisions of any ordinances it adopts pursuant to this subsection.

NRS 540.141 - Required provisions of plan or joint plan of water conservation; review by Section; posting of plans and joint plans on Internet website.

1. A plan or joint plan of water conservation submitted to the Section for review must include provisions relating to:

(a) Methods of public education to:

(1) Increase public awareness of the limited supply of water in this State and the need to conserve water.

(2) Encourage reduction in the size of lawns and encourage the use of plants that are adapted to arid and semiarid climates.

(b) Specific conservation measures required to meet the needs of the service area, including, but not limited to, any conservation measures required by law.

(c) The management of water to:

(1) Identify and reduce leakage in water supplies, inaccuracies in water meters and high pressure in water supplies; and

(2) Where applicable, increase the reuse of effluent.

(d) A contingency plan for drought conditions that ensures a supply of potable water.

(e) A schedule for carrying out the plan or joint plan.

(f) Measures to evaluate the effectiveness of the plan or joint plan.

(g) For each conservation measure specified in the plan or joint plan, an estimate of the amount of water that will be conserved each year as a result of the adoption of the plan or joint plan, stated in terms of gallons of water per person per day.

2. A plan or joint plan submitted for review must be accompanied by an analysis of:

(a) The feasibility of charging variable rates for the use of water to encourage the conservation of water.

(b) How the rates that are proposed to be charged for the use of water in the plan or joint plan will maximize water conservation, including, without limitation, an estimate of the manner in which the rates will affect consumption of water.

3. The Section shall review any plan or joint plan submitted to it within 30 days after its submission and approve the plan if it is based on the climate and living conditions of the service area and complies with the requirements of this section...[30]

30 NEV. REV. STAT. 540.121-.141.

Question 12

Funding

Question 12 asks whether the state offers financial assistance, aside from Drinking Water State Revolving Funds, to utilities, cities, or counties for urban water conservation programs. Roughly three-quarters of the states received at least some credit for this question. States using the Clean Water State Revolving Fund to support urban water conservation programs received a point, and states making available any other funding sources received four points. There are several strong examples of other funding sources. The **Colorado** Water Conservation Board's Water Efficiency Grant Program annually makes available $550,000 for planning and implementation of water efficiency, drought measures, and public education and outreach regarding water efficiency, and Colorado's $1 million Water Plan Grant fund supports progress on the critical actions identified in the state's water plan. Similarly, the State Water Implementation Fund for **Texas** supports projects in the state water plan, through low-interest loans, extended repayment terms, deferral of loan repayments, and incremental repurchase terms. In addition, the **Massachusetts** Department of Environmental Protection's Water Management Act Grants deserve special note for being tied to the M36 principles.

Question 13

Technical Assistance

Question 13 asks whether the state offers technical assistance for urban water conservation programs. Thirty states received at least some credit for this question. States offering online resources received a point; states offering direct technical assistance received a point; and extra credit was available for other means of assistance. **Arizona**, **Florida**, **Minnesota**, **Oregon**, **Utah**, and **Washington** scored the highest, each receiving three points. Examples of direct technical assistance include: the **North Carolina** Department of Environmental Quality's help to local governments and large community water systems in developing local water supply plans; the **Oklahoma** Department of Environmental Quality's free water audits for small systems serving fewer than 10,000 people; and the **Utah** Division of Water Resources' trainings on how to create a water conservation plan.

Question 14

Metering Requirements

Question 14 asks whether the state requires water connections that are part of a public supply to be metered. Most states encourage metered service connections and even have laws governing their use and customers' rights regarding their use, but robust requirements are less common and sometimes apply only to new construction.

Washington has a straightforward, comprehensive law regarding the metering of connections to systems providing water for human consumption. All new direct service connections must be metered when activated, and all existing direct service connections and clustered entities must be metered within ten years of the effective date of the rule. That ten year mark occurred on January 22, 2017. **Georgia** is the only state with a law requiring, not simply encouraging, sub-metering of new multiunit residential, retail, and light industrial buildings.

Georgia

(c) All new multiunit residential buildings permitted on or after July 1, 2012, shall be constructed in a manner which will permit the measurement by a county, municipal, or other public water system or by the owner or operator of water use by each unit. This subsection shall not apply to any building constructed or permitted prior to July 1, 2012, which is thereafter: (1) renovated; or (2) following a casualty or condemnation, renovated or rebuilt.

(d) All new multiunit retail and light industrial buildings permitted or with a pending permit application on or after July 1, 2012, shall be constructed in a manner which will permit the measurement by the owner or operator of water use by each unit. This subsection shall not apply to any building constructed or permitted prior to July 1, 2012, which is thereafter: (1) renovated; or (2) following a casualty or condemnation, renovated or rebuilt. This subsection is not intended to apply to newly constructed multiunit office buildings or office components of mixed use developments. Multiunit office buildings and the office component of mixed use developments may seek reimbursement from office tenants for water and waste-water use through an economic allocation which approximates the water use of each tenant based on square footage. The retail component of a mixed use development shall be constructed in a manner which will permit the measurement by the owner or operator of water use by each retail unit.

(e) (1) A county, municipal, or other public water system, if applicable, or the owner or operator of a building which is subject to subsection (c) or (d) of this Code section shall seek reimbursement for water and waste-water usage by the units through an economic allocation methodology which is based on the measured quantity of water used by each unit.

(2) The owner or operator of such a building which includes common areas for the benefit of the units may also seek reimbursement for common area water and waste-water use through an economic allocation which approximates the portion of the common area water and waste-water services allocable to each unit.

(3) The total amount of charges to the units under paragraphs (1) and (2) of this subsection shall not exceed the total charges paid by the owner or operator for water and waste-water service for the building, plus a reasonable fee for establishing, servicing, and billing water and waste-water consumption.

(4) The director shall be empowered to issue a temporary waiver of this subsection upon a showing by an owner or operator of a building subject to this subsection that compliance with this subsection has temporarily become impracticable due to circumstances beyond the control of the owner or operator. Such waiver shall be limited in duration to the period during which such circumstances remain in effect and beyond the control of the owner or operator to change.

(5) The owner or operator who seeks reimbursement for water and waste-water usage as required by this chapter shall be relieved of liability for actions or inactions that occur as a result of billing or meter-reading errors by an unaffiliated third-party billing or meter-reading company.[31]

31 GA. CODE ANN. § 12-5-180.1(c)-(d).

Washington

(2) Consumption:

(a) The requirements of this section apply to public water systems that supply water for municipal water supply purposes.

(b) Except as provided in (g) of this subsection, the volume of water delivered to consumers must be measured by meters installed on all direct service connections.

(c) Meters must be installed on all existing direct service connections and clustered entities as provided in (g) of this subsection within ten years of the effective date of this rule.

(d) Meters must be installed on all new direct service connections when the service connection is activated.

(e) Meters must be installed on all interties used as permanent or seasonal sources within ten years of the effective date of this rule.

(f) If a system is not fully metered, the municipal water supplier shall complete the following:

(i) Develop a meter installation schedule consistent with this section.

(A) For systems serving one thousand or more total connections, submit the schedule to the department by July 1, 2008.

(B) For systems serving less than one thousand total connections, submit the schedule to the department by July 1, 2009.

(C) The schedule must include milestones demonstrating steady and continuous progress toward compliance with the requirements of this section.

(ii) Implement activities to ensure distribution system leakage is minimized (e.g., periodic leak detection and repair) until the system is fully metered.

(iii) Report the status of meter installation and all actions taken to minimize leakage in annual performance reports developed under WAC 246-290-840 and water use efficiency programs developed under WAC 246-290-810.

(g) The volume of water may be measured through a single meter for the following clustered entities:

(i) A campground;

(ii) A recreational vehicle park;

(iii) A designated mobile home park;

(iv) A building with multiple units; and

(v) A complex with multiple buildings served as a single connection.[32]

Question 15

Volumetric Billing

Question 15 asks whether the state requires water suppliers to implement volumetric billing. While several states have laws that encourage volumetric billing, few states actually require it. This is a step beyond metering requirements, although volumetric billing laws often are accompanied by explicit metering requirements.

California and **Wisconsin** both have laws that clearly specify a requirement to bill for water based on the volume used. Wisconsin's rule is very succinct and applies to all water sold by a utility, unless otherwise authorized by the commission or used for a purpose for which volumetric billing is not practicable. California has three statutory provisions on the matter, one for urban water suppliers that receive water from the Central Valley Project, one for all other urban water suppliers, and one for water purveyors that become urban water suppliers. While the deadlines for implementation differ between the three provisions, the objectives—installing water meters on all service connections and charging customers for water based on the actual volume of deliveries, as measured by a water meter—are the same.

32 WASH. ADMIN. CODE § 246-290-496(2).

California

§ 526

(a) Notwithstanding any other provision of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract executed pursuant to Section 485h(c) of Title 43 of the United States Code with the Bureau of Reclamation of the United States Department of the Interior shall do both of the following:

(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, located within its service area.

(2) On and after March 1, 2013, or according to the terms of the Central Valley Project water contract in operation, charge customers for water based on the actual volume of deliveries, as measured by a water meter.

(b) An urban water supplier that receives water from the federal Central Valley Project under a water service contract or subcontract described in subdivision (a) may recover the cost of providing services related to the purchase, installation, and operation and maintenance of water meters from rates, fees, or charges.

§ 527

(a) An urban water supplier that is not subject to Section 526 shall do both of the following:

(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.

(2) (A) Charge each customer that has a service connection for which a water meter has been installed based on the actual volume of deliveries as measured by the water meter, beginning on or before January 1, 2010.

(B) Notwithstanding subparagraph (A), in order to provide customers with experience in volume-based water service charges, an urban water supplier that is subject to this subdivision may delay, for one annual seasonal cycle of water use, the use of meter-based charges for service connections that are being converted from nonvolume-based billing to volume-based billing.

(b) A water purveyor, including an urban water supplier, may recover the cost of providing services related to the purchase, installation, and operation of a water meter from rates, fees, or charges.

§ 528

Notwithstanding Sections 526 and 527, any water purveyor that becomes an urban water supplier on or after January 1, 2005, shall do both the following:

(a)Install water meters on all municipal and industrial service connections located within its service area within 10 years of meeting the definition of urban water supplier.

(b)(1) Charge each customer for which a water meter has been installed, based on the actual volume of water delivered, as measured by the water meter, within five years of meeting the definition of urban water supplier.

(2) Notwithstanding paragraph (1), in order to provide customers with experience in volume-based water service charges, an urban water supplier that is subject to this subdivision may delay, for one annual seasonal cycle of water use, the use of meter-based charges for service connections that are being converted from nonvolume-based billing to volume-based billing.

(c) For the purposes of this article, an "urban water supplier" has the same meaning as that set forth in Section 10617.[33]

Wisconsin

(1) Except where otherwise authorized by the commission, all water sold by a utility shall be on the basis of meter measurement except that the volume of water used for fire protection, street or sewer flushing, construction, or similar purposes where metering is not practicable may be estimated.[34]

33 CAL. WATER CODE §§ 526-528.

34 WIS. ADMIN. CODE PSC § 185.31(1).

Question 16

Rate Structures that Encourage Water Conservation

Question 16 asks whether the state requires rate structures explicitly designed to encourage water conservation. While many states encourage conservation-promoting rate structures, and several of them even document this encouragement in law or formalize it as a consideration in planning processes, few states have broad statutory or regulatory requirements for adopting such rate structures. Only these few states received credit for this question.

Minnesota, **New Jersey**, and **Rhode Island** each have succinct laws on this subject. New Jersey requires all public community water systems to file water rate structures that provide incentives for water conservation. Minnesota requires all public water suppliers serving more than 1,000 people to implement demand reduction measures, including a conservation rate structure or a uniform rate structure with a conservation program that achieves demand reduction. Pursuant to state statutes, the Rhode Island Water Resources Board requires major public water suppliers to establish rate structures that encourage the efficient use of water and are equitable, sensitive to economic impacts, and adequate to pay for all costs associated with water supply.

Minnesota

> (a) For the purposes of this section, "demand reduction measures" means measures that reduce water demand, water losses, peak water demands, and nonessential water uses. Demand reduction measures must include a conservation rate structure, or a uniform rate structure with a conservation program that achieves demand reduction. A "conservation rate structure" means a rate structure that encourages conservation and may include increasing block rates, seasonal rates, time of use rates, individualized goal rates, or excess use rates. If a conservation rate is applied to multifamily dwellings, the rate structure must consider each residential unit as an individual user.
>
> (b) To encourage conservation, a public water supplier serving more than 1,000 people must implement demand reduction measures by January 1, 2015.[35]

New Jersey

> (a) Unless more stringent water conservation measures are required by the Department, all public community water systems shall:
>
> . . . .
>
> 4. File water rate structures which provide incentives for water conservation with the Department and the Board of Public Utilities, as appropriate; and
>
> 5. Require installation of water meters for all service connections. This shall not apply to fire emergency uses. Water systems with fewer than 500 service connections or systems where it is demonstrated to the satisfaction of the Department that metering is not practical may be exempted from metering if it is shown that the annual average daily water use by the system does not exceed 75 gallons per person per day.[36]

35 MINN. STAT. § 103G.291(4).

36 N.J. ADMIN. CODE tit. 7, § 19-6.5(a).

Rhode Island

3.0 Water Efficiency and Demand Management Targets for Major Public Water Suppliers

The following targets, pursuant to R.I. General Laws §46-15.3-5.1 (c) and §46-15.8-5, are established by the Board:

. . . .

3.6 Accurate metering and billing to account for all water supplied

4.0 Methods for Achieving Targets for Major Public Water Suppliers+

4.1 Required Methods for Achieving Targets

4.1.1 Initiate a program to accomplish 100% metering of all water delivered by December 31, 2012, as specified in R.I. General Laws §46-15.3-22(b). The metering requirement is not applicable to fire suppression systems, such as fire hydrants and fire sprinkler systems since the high flows of such systems makes metering impractical.

. . . .

4.1.4 Record metered usage and bill quarterly or more frequently by December 31, 2013, as specified in R.I. General Laws §46-15.3-22(c).

. . . .

4.1.6 Rate structures that are adequate to pay for all costs associated with water supply, are equitable, sensitive to economic impacts, and encourage the efficient use of water, per R.I. General Laws §39-15.1-3 or §45-39.1.5 as applicable.[37]

37 STATE OF RHODE ISLAND WATER RESOURCES BOARD, RULES AND PROCEDURES GOVERNING THE WATER USE AND EFFICIENCY ACT FOR MAJOR PUBLIC WATER SUPPLIERS §§ 3-4.

VI. Exemplary Laws in Climate Resiliency

Effective planning is key to a state's ability to address the impacts of climate change on critical water resources. Predicted effects vary by geographical region and encompass prolonged droughts, heavier and more frequent precipitation, and more extreme weather events. Scientists project that climate change will result in reduced surface and groundwater in arid regions, more frequent and severe flooding, and reduced drinking water quality due to increased pollution loadings and concentration.[38] Many state governments are taking steps to mitigate these effects in order to ensure a future water supply that is safe and reliable for drinking, sufficient to support the industrial and agricultural sectors, and capable of ensuring watershed health.

State climate action plans provide a comprehensive strategy for responding to the causes of climate change and its impacts on critical resources and infrastructure, and most importantly, in creating resiliency in a state's ability to handle climate related challenges. Many states have developed both climate *mitigation* plans, which aim to reduce greenhouse gas emissions, and climate *adaptation* plans, which focus on tactics to respond to those impacts deemed unavoidable. This section analyzes the robustness of state adaptation plans, specifically focusing on how effectively these plans address projected impacts to the water sector.

Key Takeaways

State climate adaptation plans serve as guidance documents. Presently, no state has created a legally enforceable obligation to implement a plan's recommended strategies. State agency authority to carry out the strategies may originate in state police powers; in existing jurisdiction over water supply and infrastructure; or, rarely, via an explicit legislative grant of power to address climate change impacts.

Plan strategies vary significantly from vague recommendations to specific objectives. Strategies may fall under one of the following action categories: assessment (e.g., monitoring and modeling); planning (e.g., updating design requirements for future infrastructure and land use); outreach and education (e.g., providing technical assistance and informing water systems and the public about climate change and best practices); operations (e.g., improving water use efficiency, demand management, and/or training); and infrastructure (e.g., capital projects, including new construction, repairs/retrofits, and upgrades; adopting new technology and green infrastructure; and diversification of water supply sources).

Most completed and near-term projects fall under the first three categories, with an initial focus on implementing low-cost projects. Few states offer detailed strategies to proactively invest in substantive capital projects or to enact statutory or regulatory changes, such as mandating consideration of climate change impacts in capital projects and siting decisions or implementing substantive new conservation measures or water management solutions. Many plan recommendations are limited to "no regrets" strategies. These strategies mirror water supply management practices that generally are considered advisable even in the absence of the threat of climate change.

Question 1

State Climate Action, Adaptation, or Resiliency Plan

This question was the focal point of the resiliency portion of the survey and, accordingly, offered the majority of points for a state's total resiliency score.

The question begins with a threshold inquiry: has the state adopted a climate adaptation plan? Each state with a climate adaptation plan in place could earn up to five points, depending on the overall robustness of the plan. The rest of the question consists of four sub-parts, with up to 12 points awarded based on how extensively the plan anticipates and addresses climate impacts to state water resources. The sub-parts include overall water resource management goals (five points), evaluation of water supply impacts (four points), clear accountability for implementing the plan (one point), and the frequency with which the plan must be revised (two points). Three extra-credit points were available: one point for well-aligned strategies or plans among agencies, between agency plans and state plans, and/or between stakeholders; and up to two points for plans with a particularly robust combination of enforcement provisions and/or requirements.

States lacking a climate plan were graded on how effectively their statutes and regulations address climate change impacts to the water sector, with the potential to earn as many as 12 points.

38 IPCC. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change 69 (R.K. Pachauri and L.A. Meyer, eds., 2014).

Threshold inquiry: existence of a comprehensive state plan

Fifteen states have adopted comprehensive climate adaptation plans substantively addressing water resources, earning the five points available.[39] **California** and **Rhode Island** stood out—California for its climate plan's overall comprehensiveness and Rhode Island for explicitly empowering its agencies to address climate change impacts in fulfilling their duties. Both states received two extra credit points for having an especially robust combination of enforcement provisions and requirements.

California, in its most recent implementation action plan, goes several steps beyond other states' efforts to address the water supply impacts of climate change.[40] The document's Water Sector Plan is remarkably extensive, dedicating over 30 pages to the topic. This section addresses water supply vulnerabilities specific to each major geographic region and its major industries, and details current actions to prepare for both climate change and other challenges to a reliable water supply. The plan describes next steps and future actions, including a detailed implementation schedule via a Gantt chart. California further distinguishes itself through a sub-section addressing water-related impacts of climate change on vulnerable and disadvantaged populations and cultural resources. This sub-section discusses the need to ensure an equitable distribution of the benefits of the state's efforts in mitigating climate change impacts, as well as to prevent certain populations from being disproportionately impacted by climate change in terms of a reliable and sanitary supply of water.

California

A. TIMELINE FOR IMPLEMENTATION OF EXPANDED AND NEW INITIATIVES[41]

Figure #WC-4 Water Sector Implementation Schedule for Next Steps and Future Actions

		2015	2016				2017			
ID	Task Name	QTR 4	QTR 1	QTR 2	QTR 3	QTR 4	QTR 1	QTR 2	QTR 3	QTR 4
1	Improvements to Statewide Flood Management									
2	Improvements to Economic Analysis									
3	Improved Reporting or Hydroclimate Conditions									
4	DWR Vulnerability Assessment and Adaptation Plan									
5	Reoperations Studies									
6	Improved Quantitative Vulnerability Assessments of State Infrastructure									
7	Development of an Urban Water System Resilience Model									
8	Integration of Climate Change in State nad Regional Water Board Regulations, Policies, Permits and Funding Actions									
9	Increase Work with Academic and Other Institutions Related to Water Energy Technology Development									

39 Hawaii is currently awarded one point, because its current plan represents an initial framework rather than a comprehensive plan. However, the state in 2014 enacted a law establishing a planning agency, whose duties include publishing a climate adaptation plan by December 31, 2017. As of this Scorecard's publication, it remains to be determined whether this plan will incorporate a discussion of water resources.

40 California Natural Resource Agency, Safeguarding California: Implementation Action Plans (2016).

41 Recreated from Id. at 222.

Rhode Island

Powers and duties of state agencies – Exercise of existing authority.

> Consideration of the impacts of climate change shall be deemed to be within the powers and duties of all state departments, agencies, commissions, councils, and instrumentalities, including quasi-public agencies, and each shall be deemed to have and to exercise among its purposes in the exercise of its existing authority, the purposes set forth in this chapter pertaining to climate change mitigation, adaption, and resilience in so far as climate change affects the mission, duties, responsibilities, projects, or programs of the entity.[42]

Water resource management goals

Priority goals for water management in the face of climate change include water availability, water quality, flood management, and watershed protection. Most states adopting climate adaption plans addressed at least two of these goals. Sixteen states addressed all four goals, and four of these states earned a fifth point by mentioning an additional goal. **Minnesota** identified groundwater sustainability as an important measure of adaptability, given the state's concern that drought will contribute to groundwater depletion.[43] The state's Water Report notes a potentially unsustainable trend toward greater reliance on groundwater.[44] The goals of **Washington's** plan extend beyond public and ecological health and safety to the role that sufficient water supply and quality play in supporting hydropower, navigation, recreation, and tourism.[45]

Montana does not have a comprehensive adaptation plan, but its State Water Plan does address improving water supply reliability on a general basis through managing water supply and demand, increasing flexibility through enhancing existing storage and developing new storage infrastructure, improving water use administration and information, and sustaining ecological health.[46] "Climate variability" is noted as a large-scale force and is treated as a driver of adapting water management strategies. The State Water Plan also focuses on increasing water conservation and efficiency. One of the plan's Drought Preparedness recommendations is to conduct a climate risk assessment pilot study in each of the four planning basins.[47]

Water supply-related impacts of climate change

Climate change and associated shifts in weather patterns can affect the quality and quantity of water supplies, such as through drier conditions, more frequent or longer droughts, and new variations in the timing of snowmelt and/or precipitation. Seven states earned four points for addressing each of these three impacts and at least one other anticipated risk. **Oregon**, for example, notes the vulnerability of groundwater to drought and a potential loss of groundwater recharging wetlands.[48]

Alternatively, **Montana's** State Water Plan provides information regarding how climate variability will impact the state's water resources and proffers recommendations for management strategies to meet demand over the next several decades.[49] These impacts include warmer temperatures and modest precipitation increases and shifts in streamflow timing due to earlier snowmelt and an increase in rain as a fraction of precipitation.

A number of coastal states recognize the risk of saltwater intrusion into groundwater, due in part to sea level rise. Yet, credit was not given for this important consideration in order to maintain a level playing field between coastal and non-coastal states, where this issue does not present a vital concern.

42 R.I. GEN. LAWS. § 42-6.2-8.

43 Interagency Climate Adaptation Team, Adapting to Climate Change in Minnesota: 2013 Report of the Interagency Climate Adaptation Team 13, 22 (2013).

44 Minnesota Environmental Quality Board, Beyond the Status Quo: 2015 EQB Water Policy Report 6-7 (2015).

45 State of Washington Dept. of Ecology, Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy 102 (2012).

46 Montana Dept. of Natural Resources and Conservation, Montana State Water Plan (2015).

47 *Id.* at 70.

48 State of Oregon, Oregon Climate Change Adaptation Framework 62-64 (2010); Oregon Climate Change Research Institute, The Third Oregon Climate Assessment Report 20 (2017). Earlier discussion noted that Montana also considers groundwater sustainability as a goal.

49 Montana Dept. of Natural Resources and Conservation, Montana State Water Plan (2015).

Authority and accountability

Implementing a climate adaptation plan requires a state entity to be granted sufficient authority and capacity to carry out the recommended strategies. Fourteen states earned the one point available for clearly identifying which specific agency, organization, or stakeholder is responsible for implementing the plan's water resources strategies. In most cases, this is simply the agency or agencies with jurisdiction over water supply matters. With one exception, no state has legislatively authorized an agency to address climate change-related matters. **Rhode Island**, as discussed above, earned extra credit for explicitly authorizing state agencies, including those charged with managing water resources, to address climate change impacts as part of their duties.

Oregon also earned extra credit for developing well-aligned strategies among agencies and establishing a nexus between the state and agency plans.[50] Several agencies either have jurisdiction over water resources or otherwise are charged with duties affected by water quality and supply. Many of these agencies developed and adopted their own plans, addressing drought resiliency in particular. This includes the Water Resources Department's Integrated Water Resources Strategy,[51] required under statute to address climate change impacts; the Oregon Climate and Health Resilience Plan,[52] addressing the potential effects of compromised water quality and drought on other industries, and ultimately on public health and safety; and the Oregon Parks and Recreation Department's *Climate Change Response: Preparedness and Action Plan* (2010), which addresses watershed health and the effects of climate change-driven reduction of water supplies and water quality on natural habitat, species, and recreational activities.[53]

Oregon

(3) (a) The Water Resources Department shall develop an integrated state water resources strategy to implement the state water resources policy specified in subsection (2) of this section. The department shall design the strategy to meet Oregon's in-stream and out-of-stream water needs.

. . . .

(d) The integrated state water resources strategy shall describe the following:

. . . .

(D) Plans related to the challenges presented by climate change.

. . . .

(I) Recommendations of the Water Resources Department regarding the continuous monitoring of climate change effects on Oregon's water supply and regarding water user actions that are necessary to address climate change.

(e) (A) The Water Resources Commission shall give the Environmental Quality Commission, the State Department of Agriculture and the State Department of Fish and Wildlife notice of the integrated state water resources strategy prior to adoption of the strategy. The strategy shall take effect upon adoption by the Water Resources Commission.

(B) The Water Resources Commission shall review and update the integrated state water resources strategy every five years. The Water Resources Commission shall give notice to the Environmental Quality Commission, the State Department of Agriculture and the State Department of Fish and Wildlife prior to adopting any revisions of the strategy. Revisions of the strategy shall take effect upon the Water Resources Commission's adoption of the revised strategy by reference in rule.[54]

50 State of Oregon, Oregon Climate Change Adaptation Framework 20-25 (2010).

51 Oregon Water Resources Dept., Oregon's 2017 Integrated Water Resources Strategy: Public Review Draft (2017). Chapter 3 discusses predicted critical pressures on the state's water supply and demand; Climate Change and Extreme Events are both addressed extensively.

52 Oregon Health Authority, Public Health Division, Climate and Health Program, Oregon Climate and Health Resilience Plan (2016).

53 Oregon Parks and Recreation Dept., Climate Change Response: Preparedness and Action Plan (2010).

54 OR. REV. STAT. § 536.220(3).

Updates and revisions

State adaptation plans remain relevant only if they are regularly reviewed and updated to reflect the evolving understanding of climate change and its impacts on water supplies. States were awarded up to two points based on how frequently plans are revised. Seven states have a record of updating their plans every one-to-six years, earning the full two points. The other 13 states with a full or partial climate adaptation plan either are not committed to regular revisions or consider the existing plan to constitute a stand-alone event.

Two states explicitly mandate plan revisions. A **California** statute requires that the state's plan be updated every three years. The original Climate Adaptation Strategy was issued in 2009 and updated in 2014; another update is underway for 2017. The state, in 2016, issued the implementation action plan for the 2014 update. **Pennsylvania's** Climate Change Act requires the state's Department of Environmental Protection and the Climate Change Advisory Committee to produce a Climate Change Action Plan and update it every three years. The first plan was submitted to the governor in 2009; the Impacts Assessment report was last updated in May 2015; and the Action Plan Update was last published in August 2016.

California

(a) By July 1, 2017, and every three years thereafter, the agency shall update the state's climate adaptation strategy, known as the plan. As part of the update, the agency shall coordinate with other state agencies to identify a lead agency or group of agencies to lead adaptation efforts in each sector. The updates to the plan shall include all of the following:

(1) Vulnerabilities to climate change by sector, as identified by the lead agency or group of agencies, and regions, including, at a minimum, the following sectors:

(A) Water.[55]

Pennsylvania

(a) Report required.--The department shall prepare and publish a report on the potential impact of climate change in this Commonwealth…

. . . .

(c) Deadline.--This report shall be completed, published and distributed to the General Assembly and made available to the public in printed form and on the department's Internet website within nine months of the effective date of this act and shall be revised every three years thereafter.[56]

55 CAL. PUB. RES. CODE § 71153(a).

56 71 PA. CONST. STAT. § 1361.3.

Question 2

Water/Wastewater Industry Mandates

Question 2 ascertains whether the state requires any climate change-related actions of the water and/or wastewater industries in adaptation plans or in statute or regulation. No state includes in an adaptation plan climate change-related requirements of water or wastewater industries. The same is largely true for statutory or regulatory requirements, but **Pennsylvania** and **Rhode Island** each received partial credit. Pennsylvania's Department of Environmental Protection recently proposed a regulation mandating that public drinking water systems provide sufficient back-up power and develop effective plans to maintain operations and provide adequate quantities of safe and potable water during extreme weather events.[57] Since the rule has not yet been promulgated, the state received only one point. Rhode Island issued guidance, recommending that existing and new municipal wastewater systems and certain private systems incorporate elements of resiliency in the planning and design of all expansions or upgrades.[58] Since these expectations take the form of guidance, are recommended rather than required, the state received only one point.

Question 3

Benchmarks and Measuring Progress

Question 3 asks whether the state has specific benchmarks against which it measures progress toward increased water resource resiliency. While no state has developed benchmarks specifically linked to water resource resiliency targets in its climate adaptation plan, two states received credit for tracking overall water resource resiliency in a manner which provides a benchmark for measuring progress in adapting to climate change. Hawaii maintains a website which tracks the state's freshwater targets, including total daily usage, per capita use, conservation, recharge, and reuse.[59] **Oregon's** legislature established Key Performance Measures (KPMs) for an annual progress report of state water efficiency.[60] These KPMs include: Promote Efficiency in Water Management and Conservation Reviews; Promote Efficiency in Water Right Application Processing; and Increase Water Use Reporting.

57 Proposed Rulemaking to be codified at 25 Pa. Const. Stat. § 109.708. Safe Drinking Water: General Update and Fees. Promulgated August 26, 2017 and expected to be effective in 2018.

58 Rhode Island Dept. of Environmental Management, Office of Water Resources, Guidance for the Consideration of Climate Change Impacts in the Planning and Design of Municipal Wastewater Collection and Treatment Infrastructure (2017). This guidance is based on the "TR-16" Guide for the Design of Waste Treatment Works issued by the New England Interstate Water Pollution Control Commission.

59 State of Hawaii, Natural Resource Management (last visited Nov. 3, 2017) available at https://dashboard.hawaii.gov/en/stat/goals/5xhf-begg/4s33-f5iv/n7ta-6ctz/view.

60 Water Resources Dept.: Annual Performance Progress Report, Reporting Year 2016 (2016).

VII. Project Challenges

In developing the 2017 report, the project team followed several of the recommendations in the 2012 report's project challenges section. For example: a few of the survey questions were removed; the survey questions were much more specific; ELI staff were again part of the process; and an advisory committee comprised of geographically diverse state agency officials were significant contributors to this work again. Incorporation of these suggestions improved the survey, vetting, and scoring processes, but the project still had challenges. They are discussed here in the hopes of improving the clarity of the questions, efficiency of the process, and usefulness of the report in the future.

Designing the survey instrument was a complex task that required stakeholder involvement and approval, in addition to thoughtful reflection and consideration of the survey and surveying experience in 2012. It was a challenge to elaborate on the specific details sought in some of the questions while keeping the survey to a reasonable length. By creating sub-questions for the more complex and nuanced topic areas, the project team was required to do more follow-up with the state contacts and more independent research than was necessary for the 2012 report. In most cases, the respondents answered all of the questions rather thoroughly, but a few states required significant follow-up, and one state did not respond to the survey at all.

Several complications arose in the course of reviewing the survey responses and allocating credit. The most notable of these instances were:

- Differentiating credit due for questions 2-6 and question 7 was difficult in a few instances because of the potential for overlap in the survey responses. The key distinction between the two questions is the location of the requirements: statute or regulation for questions 2-6 and building or plumbing code for question 7. This is not a practical distinction in some states and confuses a more important issue: whether the sale of inefficient fixtures or appliances is prohibited (a requirement established through statute or regulation) or construction activities must use efficient products (a requirement that could be established through building or plumbing codes or by statute or regulation). These questions should be rephrased or combined next time. With regard to rephrasing, it is worth noting that questions 2-7 did not clarify that credit would be given only for efficiency requirements that are more stringent than federal standards. This change from the survey associated with the 2012 report occurred to simplify the question for the respondent, but it also meant many positive responses that did not receive credit, as the state standard was equal to or less stringent than the federal standard. The questions could be better clarified by explicitly referencing the numeric federal standards and asking whether the state's standards are more stringent.
- Question 9 asks whether preparation of a conservation plan is required as part of the water right permitting process, while Question 11 asks whether a conservation plan is required independent of water right permitting requirements. The distinction was not always clear to respondents, resulting in some answers being given for the wrong question and requiring another layer of review, as well as follow-up, by the project team. It is worth keeping these questions separate as some states require conservation plans only in the permitting process (e.g., Massachusetts), while others require conservation plans independent of any permitting processes (e.g., Colorado), and still others require plans under both scenarios (e.g., California), but the questions should be clearer next time.
- Question 14 was a particular challenge because it was not included in the survey. It stems from a question in the 2012 report that was cut from the 2017 survey because of the difficulty in verifying the responses: *What percentage or number of publicly supplied water connections (residential and nonresidential) are metered in your state?* However, the project advisory committee later felt that a modified version of the question needed to be included in the report, so the question was added, and the project team followed up with respondents and conducted independent research in order to provide answers in the report.
- The climate resiliency questions also posed challenges even though they were fairly broad in scope and few in number. The biggest challenge in locating answers to these questions was that they were found in very different places across states and that not every state acknowledged climate change in the same way or with the same terminology, if at all. Additionally, those that did acknowledge it responded with varying types of plans such as a mitigation or adaptation plan, or by including climate resiliency elements within a state water plan. To overcome this, the project team decided to award points for climate resiliency regardless of where plans were located. As a result, some states were awarded points for content appearing in their state water plans while others received points for content located in a formal climate planning document. Additionally, the project team did not differentiate

those states that used the word "climate" from those states that did not, instead opting to award points to states that had laws in place to address the impacts of climate change, such as prolonged drought, extreme and less predictable weather events, and rising temperatures. This approach created more work for the project team, but it ultimately led to a more accurate representation of what states are doing, as well as a more fair assignment of grades.

A project like this is inherently challenging due to the large amount of information that must be gathered from 50 different states. In expanding the water conservation survey with sub-questions, the 18-item questionnaire actually asked for 70 pieces of information. Applied to 50 states, the project team was working through a possible maximum of 3,500 text-based data points. The climate resiliency survey had three questions, one of which contained sub-questions. The multi-part questions asked in all 50 states created up to an additional 800 text-based data points. Collecting and verifying data required assistance from state personnel, with whom communication often was difficult. Moreover, making contact with the correct people did not guarantee they had the time or the inclination to provide assistance. Additionally, while some state staff were incredibly helpful, not all staff were knowledgeable about all of the topics covered by the survey, requiring contacts with multiple people, at least some of whom worked in different agencies.

The review of collected data necessitated retrieval and analysis of statutes, regulations, building and plumbing codes, climate adaptation plans, and other state documents, which was a very time-intensive process. The added detail in the survey actually simplified the review and vetting of responses, since the key aspects for scoring in 2012 were explicitly requested, as were citations for proof. The scoring in 2017 added some new elements, which should be incorporated into future survey questions, so as to further simplify the review and provide greater transparency as to credit. A thorough review of answers is critical to the methodology, enabling the project team to verify the survey responses and allocate credit as accurately and objectively as possible, thereby creating credibility for the final report.

This project did not consider implementation because of a lack of funding to do so. The sheer volume of programs across 50 states and over 50,000 utilities makes this an impossible task. As a result, states with strong laws, climate adaptation plans, etc. that are not being fully implemented or enforced may receive more credit than practice would suggest. Conversely, states that are improving water conservation and adaptation without the support of strong laws, plans, etc. may not receive the credit that practice would suggest. While not perfect, this reliance on firm documentation is critical to efficient and equitable comparisons of state actions, and the more engrained requirements are into law, the greater the likelihood that they will persist into the future.

Developing a scoring rubric that fairly weighted the value of different questions and categories of questions was a challenge. The project team and the advisory committee worked hard to create such a rubric, and to be consistent in applying it to the survey responses. In addition, the 2017 report rubric came with extra challenges resulting from all of the sub-questions, nearly doubling the maximum available points as were available in 2012. With so many more points available, the project team also had to be mindful of the grading scale that was used to assign grades to each of the states.

As with the 2012 report, funding was also a challenge. The Turner Foundation provided partial funding for this project, for which AWE is grateful. When finished, the project will have required a substantial amount of money beyond what was grant-funded. The difference was made up with in-kind resources from AWE.

Recommendations for future updates:

1. Involve a project advisory committee comprised of state representatives for guidance. They are very helpful and provide a tremendous insight and perspective.
2. Involve a team of legal experts such as the Environmental Law Institute, who provide invaluable contributions in the form of research skills and legal knowledge.
3. Continue to refine the survey so that it poses specific questions directly relevant to the scoring rubric. This should be done in part by addressing the issues presented in the above-mentioned questions. Additionally, the request for legal citations (or appropriate references when it is not a legal question) made the review process significantly more efficient.
4. Refine the scoring methodology to make it even more systematic, and to give consideration to the value of laws in terms of the level of effectiveness they have in reducing water consumption (if feasible) as well as their legal strength.
5. Strive to more accurately estimate the time and budget needed for a project of this scale. This will help ensure comprehensiveness and avoid potential compromise.
6. If financially feasible, future updates could overlay the results with other state information such as state water consumption values (total and per capita), and water supply conditions.

VIII. Conclusion

While water efficiency and conservation efforts can be initiated by the federal government, regional entities, water providers, and even by customers, state-level initiatives are critical to the sustainable management of our nation's fresh water resources. States are in a special position to require water suppliers to limit water loss, plan for drought, devise a strategy for improving water conservation, and bill customers in ways that promote water-use efficiency. States also are uniquely situated to build upon federal water efficiency requirements for some fixtures and appliances. In addition, state actions can spur developments in federal law and policy, moving the entire nation toward greater water use efficiency and conservation as well as more comprehensive climate adaptation planning.

This research effort identified water conservation laws and climate adaptation plans across the 50 states via a 16-question survey. Specifically, the survey posed questions about plumbing fixture and appliance standards, water conservation planning requirements, water loss control requirements, drought planning requirements, funding sources for water efficiency and conservation programs, technical assistance, metering requirements, volumetric billing, and conservation-oriented rate structures. Additional survey questions focusing on climate resiliency were structured to assess adaptation plans and laws, planning priorities, the implications and obligations of those plans and laws for water and wastewater utilities, and whether the state establishes any benchmarks or metrics to gauge progress.

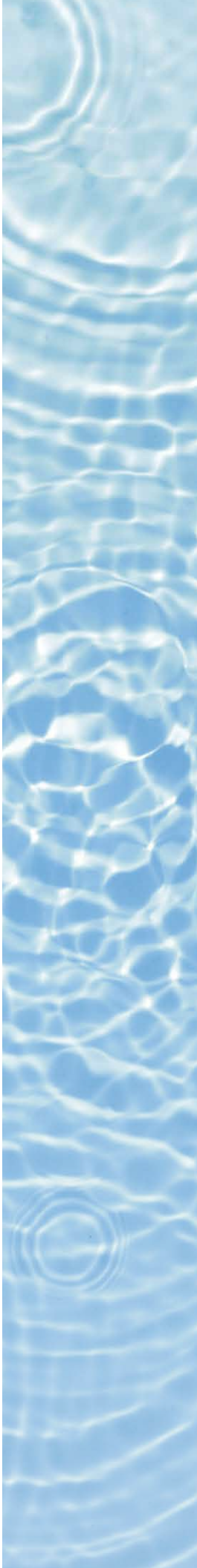
The project began with the creation of the survey questions and a scoring rubric under the guidance of a project advisory committee. The project team then sought to gather answers to the questions through the assistance of state agency staff, coupled with significant independent research. After the data were gathered, the answers were thoroughly reviewed and amended, as necessitated by the findings of the review. Each question for each state was then scored, and states were assigned a report card-style grade based on its point total.

This report presents the information, scores, and grades. It demonstrates areas of both deficiency and strength, and it provides examples of exemplary laws that could be used as models for other states.

Concerning the water efficiency and conservation grades, only 2 states scored an "A," 16 states scored a "B" grade, 14 states scored a "C," and 18 states were assigned a "D." By comparison, 2 states scored an "A," 11 states scored a "B" grade, 18 states scored a "C," and 19 states scored a "D" in the 2012 report. On the whole, states are making progress. The most noticeable strides are among states that had taken some steps by 2012, but added to those efforts in the five years since. Yet, that should not overshadow early developments in states with low scores or the progress that continues to be made by the top-scoring states. The grades are a helpful guide but still general; they do not tell the whole story.

The climate resiliency questions, while new, are indicative of the baseline efforts made by states to plan for climate related impacts to their water supplies. States with "A" grades are certainly leaders. "B" states are making considerable effort and often have some valuable examples of strong plans. "C" states also may provide a good example in a specific instance, but the overall approach is not as comprehensive as it could be. "D" states have a lot of opportunity for growth.

All states can improve their laws regarding water efficiency, conservation, and climate resiliency. States that scored A's and B's should not consider their work finished. Their continued advancements will raise the bar for other states. States that scored C's and D's should recognize their opportunities for improvement. No matter the grade, the strong examples contained in the exemplary laws sections can be foundational for planners, policy makers, and water professionals who want to improve their state's approach to managing fresh water resources. It is hoped that this report will be used to guide all states forward on these critical issues.



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