

State Primacy Agency Survey Efforts to Increase Public Water System Sustainability

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INTRODUCTION

In an era of ever-tightening federal and state budgets, increased regulations regarding water treatment and quality, a shrinking and aging workforce, and increased responsibilities being placed on the governing boards of public water systems, state drinking water administrators must continually adopt new ideas and methods to provide the residents of their states with a safe and affordable drinking water supply. This study proposes to identify strategies being used by various states concerning these four broad areas: board member education, system capacity building, waterworks operator training, and operator recruitment. The goal is to identify strategies that are currently being used and to generate new ideas that can be used in achieving safe and affordable drinking water.

To accomplish this, Mississippi State University Extension Service faculty developed a survey instrument that was distributed to state drinking water primacy agencies in all US states and territories in the summer of 2012. This instrument sought responses regarding individual states' current and planned activities concerning board member education, system capacity building, waterworks operator training, and operator recruitment. The instrument was distributed using a list of state drinking water administrator e-mail addresses provided by the Association of State Drinking Water Administrators (ASDWA).

Drafts of the instrument were reviewed by various industry professionals, including the ASDWA executive director

and the director and associate director of the Mississippi State Department of Health–Bureau of Public Water Supply (Mississippi's primacy agency for drinking water). The survey instrument was introduced to the state administrators through a message from the ASDWA executive director that included an introductory e-mail explaining that the instrument would be forthcoming and its purpose. The project's principal investigator sent the administrators an e-mail discussing the purpose of the survey with a link to the online instrument. A copy of the survey instrument was also attached to enable the administrators to prepare their answers (some respondents chose to complete the attachment to the e-mail while others used the online link).

The instrument consists of three parts. The *Board Management Training* section focuses on the availability, topics, and venues of management training for the governing boards of public water systems. The *Capacity and Development* section examines the methods of capacity assessment used by individual states, technical assistance programs, and training offered to water operators. The *New Operator Recruitment* section assesses specific and innovative partnership methods being used to recruit new operators into the industry.

Although all fifty states responded to the survey, none of the US territories or possessions participated. For purposes of comparison, state responses were divided into Environmental Protection Agency (EPA) regions, as seen in **Figure 1**.

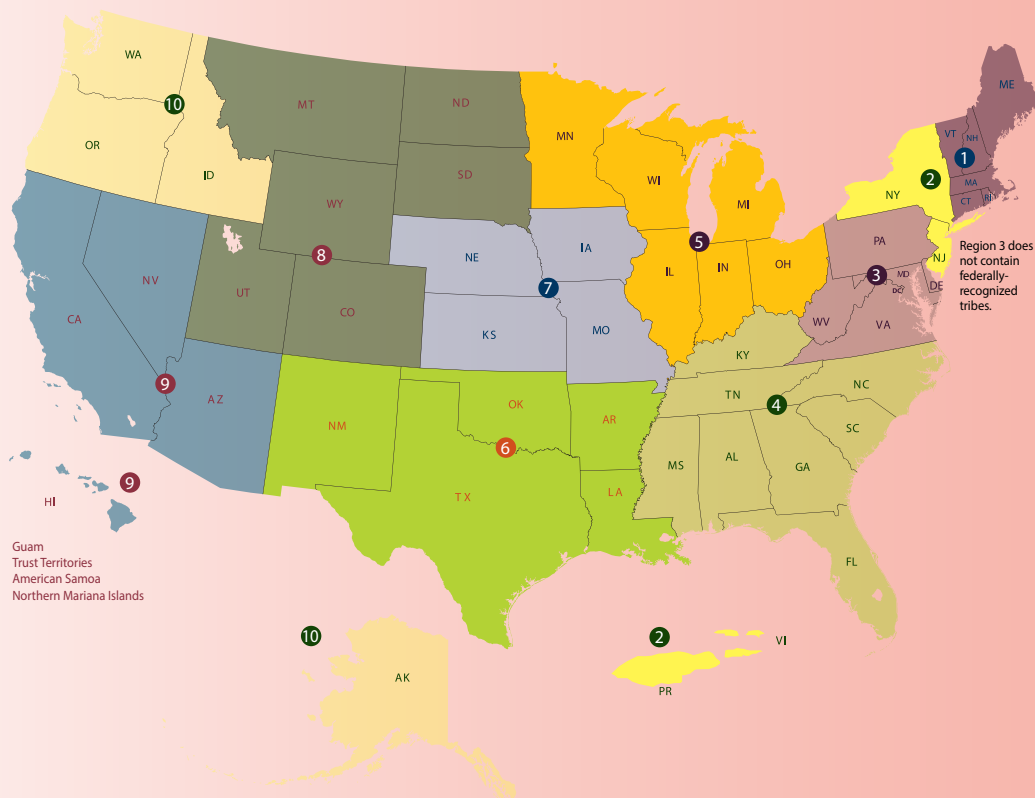


Figure 1. US Environmental Protection Agency regions.

BOARD MANAGEMENT TRAINING

This section focuses on the availability of state-sponsored/sanctioned management education programs for the governing bodies of public water systems. The terms used for these types of programs vary among the states, but they represent a similar objective of understanding desired management roles for public water system governing board members. Nineteen states (38 percent) currently have some type of board management education program in place, and four of these (8 percent) are mandated through either legislation or state primacy agency regulations. Of the states with mandatory programs, three are located in EPA Region 6, and one state is in Region 4. The regions with the highest proportion of states currently offering this type of educational program (either mandatory or voluntary) are EPA Region 6 with 80 percent, Region 7 with 75 percent, and Region 1 with 50 percent of the states. EPA Regions 2 and 3 currently have no states offering this type of training.

Figure 2 shows the status of board management training programs by EPA regions. Of the thirty-one states that do not currently offer board management training, ten are exploring the possibility of implementing this type of program. Of these, EPA Regions 4 and 8 each have two states considering this type of program. States exploring management training are in various phases of the process. For example, Arkansas reported

that the possibility is being explored. South Carolina reported that a board management program has been developed in association with the South Carolina Rural Water Association but has yet to be implemented. Kentucky has formed a partnership with the Kentucky Public Service Commission to administer a management training program for those water systems that fall under the purview of the public service commission.

The board management training programs currently being offered vary in both content and delivery. Five states (26 percent) reported that the training material currently used only covers basic board management topics, while fourteen states (74 percent) reported that these materials cover both basic and advanced board management topics. All of the board management training programs cover financial management. Eighteen programs (95 percent) cover the organization and function of a waterworks system board, setting water rates, and long-term financial management. Seventeen programs (89 percent) cover operations and management of a waterworks system, and fourteen programs (74 percent) cover the topic of laws and regulations. Finally, thirteen programs (68 percent) cover customer service, and ten programs (53 percent) cover emergency preparedness. In addition to these topics, Washington covers energy conservation, managing water resources, and asset management. Florida covers board member separation of duties topics such as ethical behavior and conflict of interest management.

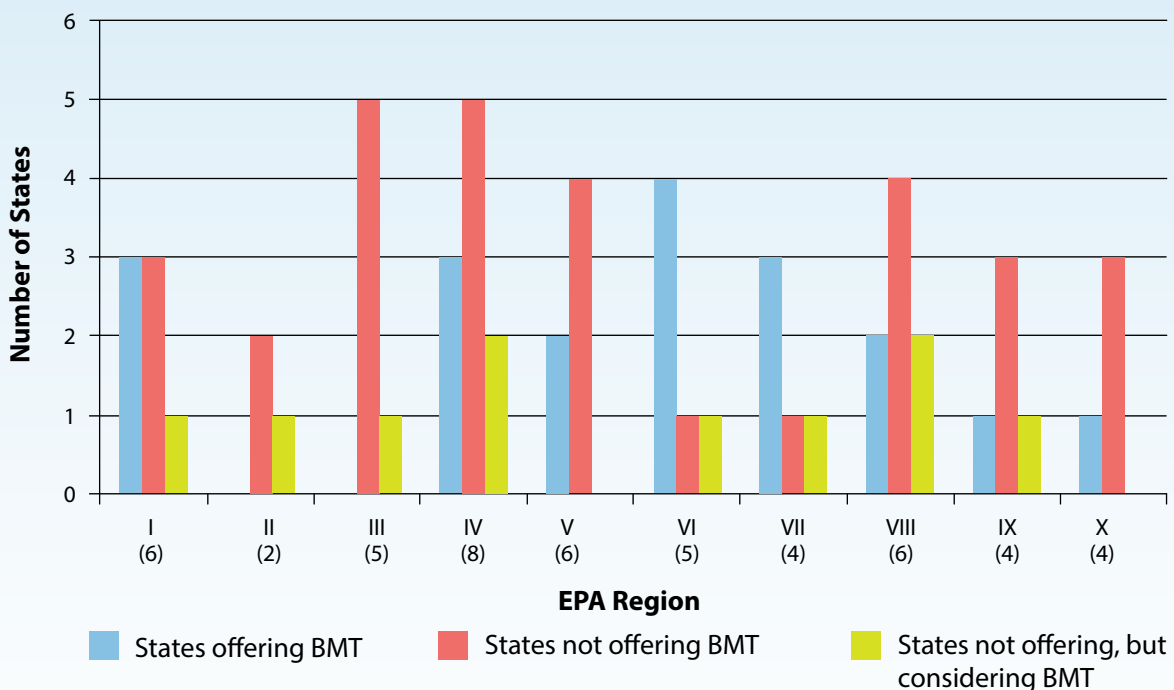


Figure 2. Board management training program options by EPA region.



nient for them. Four states charge registration fees for participation in training sessions. The number of sessions held each calendar year varies among states. Some states hold one board management training session per year, while others hold as many as fifty.

CAPACITY ASSESSMENT AND DEVELOPMENT

Capacity assessment and development concerns the regulatory actions of primacy agencies, information availability, capacity improvement efforts, and the understanding of these by the water system. Three states (6 percent) inspect water systems annually, and twenty-one states (42 percent) inspect systems once every three years. Several states inspect community systems every three years and all other systems every five years in accordance with EPA's Ground Water Rule. Other states inspect systems at varying times depending on the type of system. Several states inspect community systems every year and all other systems every three years, while other states vary the frequency of non-community system inspections from four times per year to once every five years. Forty of the fifty states (80 percent) responding to the survey indicated that their inspection forms are publicly available.

Thirteen states (26 percent) use a "peer review" type program to assist in improving the overall capacity of water systems. The number of states with a peer review program based on EPA regions can be seen in **Figure 3**. These programs use operators and managers from high-performing systems to

Three states (16 percent) with a board management education program present the training themselves, while ten primacy agencies (53 percent) use only contractors to provide the training. The remaining six states (32 percent) use a mixture of contractors and primacy agency professionals.

Of the nineteen states that provide board management education programs, thirteen states (68 percent) have an established curriculum for the training. In some states, the primacy agency is responsible for maintaining and updating the training curricula, while in others the contractor holds this responsibility. Yet in other states, the state rural water association is responsible for the curricula updates, while other states' curricula are maintained by a local organization such as the Midwest Assistance Program in Montana. All nineteen states offer board management training in a face-to-face format. Three states also offer an online, on-demand training format where participants can complete the program at times conve-

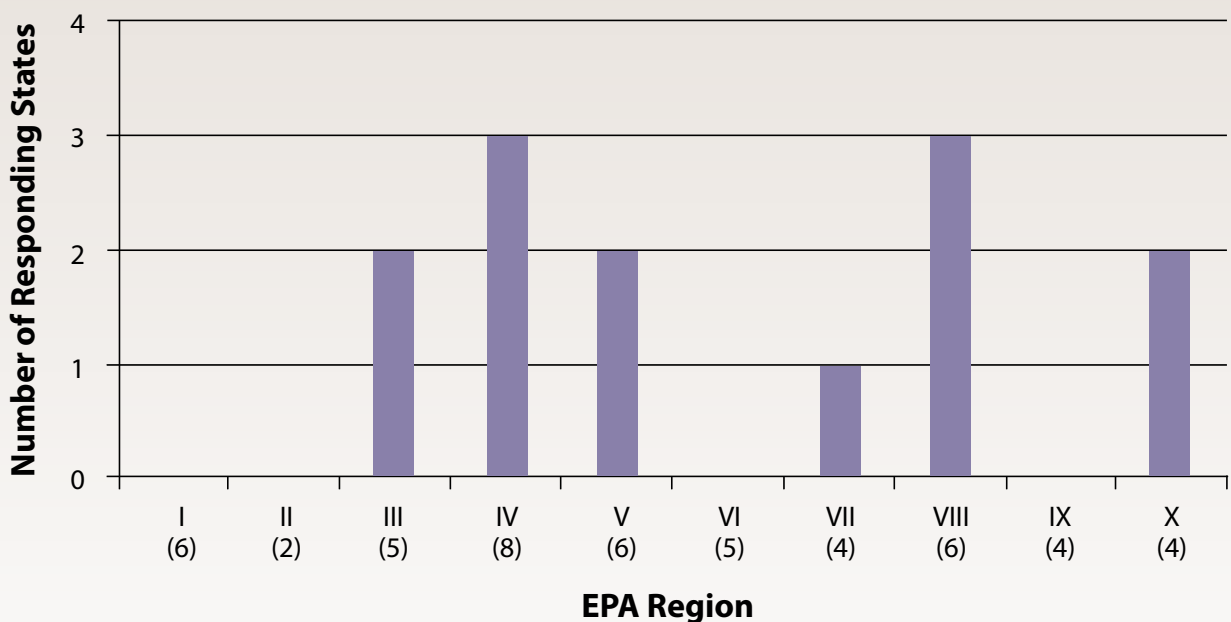


Figure 3. Number of states with a peer review program by EPA region.

help their counterparts in lower-performing systems develop strategies to increase and improve capacity. All of these programs are voluntary, and many are coordinated by a combined effort among each state’s rural water association, state department of health, and other local organizations. Other programs are coordinated strictly by area-specific agencies such as the Utah Water Quality Alliance (a group of Utah water suppliers that work to optimize the performance of surface water treatment). One program compensates reviewers for their time. Preliminary analysis from Mississippi indicates that systems participating in the peer review program have a 20 percent better chance of achieving a successful capacity assessment score (defined as being greater than 3.0 on a scale of 0.0 to 5.0) if they had a low score (3.0 or below) in the inspection immediately before the review.



WATERWORKS OPERATOR TRAINING

As with board management training, other agencies or organizations may partner with the primacy agency to provide education, training, or technical assistance to the operators of public drinking water systems. In all fifty states, the primacy agencies have partnered with state rural water associations to provide this assistance. Thirty states (60 percent) have partnerships with state waterworks operators associations, and thirty-one states (62 percent) have partnerships with a community resource group/rural community assistance program (CRG/RCAP).

Institutions of higher education also play an important role in providing training to waterworks operators. Thirty-three states (66 percent) partner with a local college or university. Nine of these states (27 percent) partner with a regional college or university, twenty states (61 percent) partner with state or land-grant universities, and twenty-four states (73 percent) partner with community colleges.

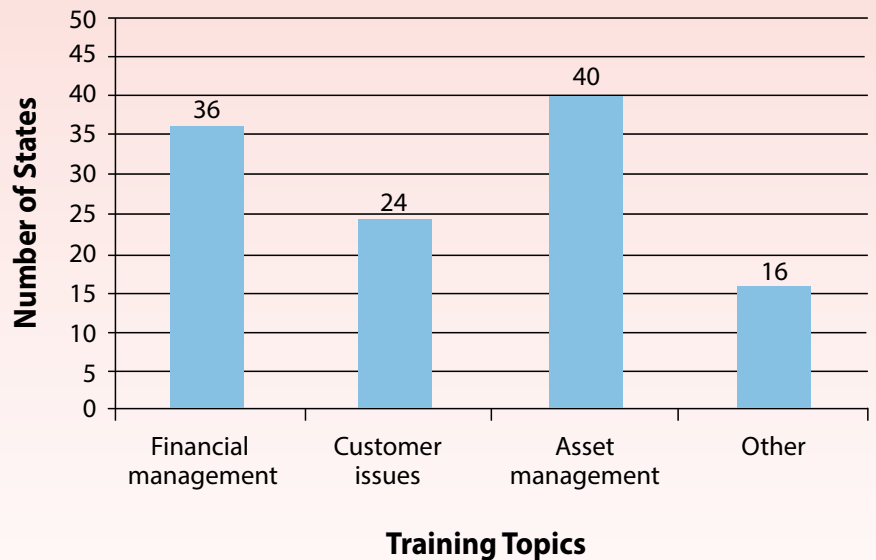
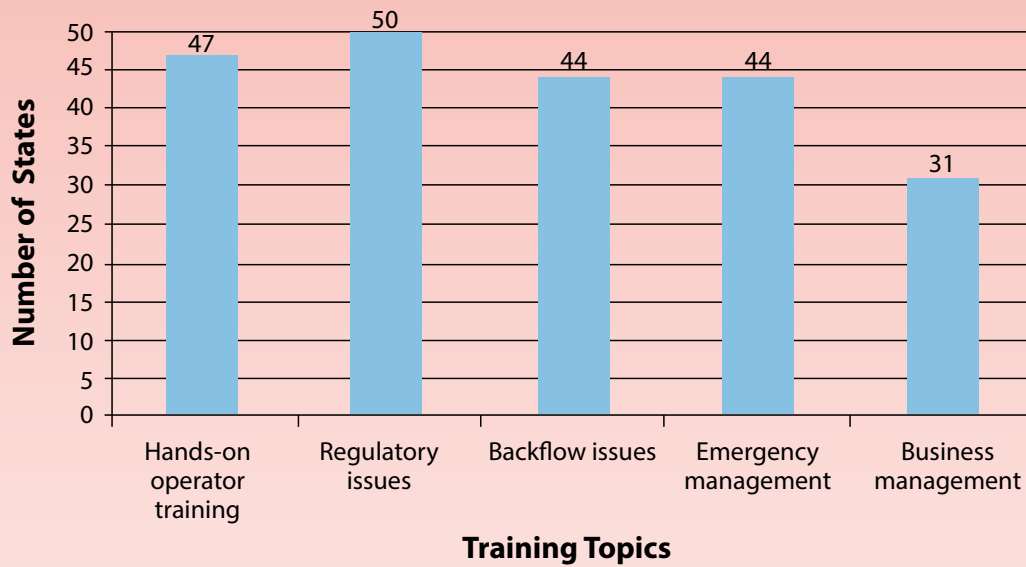
Twenty-six states (52 percent) have training partnerships with other associations or nonprofits, and fourteen states (28 percent) partner with waterworks equipment and supply businesses. Primacy agencies also reported that partnerships have been formed with other agencies such as environmental finance centers, for-profit training organizations, laboratories/research facilities, and municipal associations to provide operator training opportunities.

Table 1. Partners for operator training by EPA region.

EPA region	Number of states in region	Number of states								
		Rural water assoc	Operator assoc	CRG/RCAP	Other assoc/nonprofit	Equipment supply business	Community college	Regional college/university	State/land-grant university	Other type of partner
1	6	6	3	2	4	4	2	0	0	2
2	2	2	2	1	1	1	1	1	2	2
3	5	5	3	3	3	1	4	2	3	2
4	8	8	5	4	4	1	0	0	3	4
5	6	6	4	5	3	2	5	2	2	2
6	5	5	3	4	1	2	3	2	3	2
7	4	4	4	1	3	2	4	1	3	2
8	6	6	3	5	3	0	3	1	2	2
9	4	4	1	4	2	1	1	0	0	1
10	4	4	2	2	2	0	1	0	2	3

Primacy agencies and their partners offer operator education in a wide variety of topics as shown in **Figure 4**. All fifty states offer training on regulatory issues such as sampling and treatment. Forty-seven states (94 percent) have hands-on skills training as part of their overall effort. Forty-four states (88 percent) cover both backflow prevention and emergency and disaster management. Forty states (80 percent) offer education in asset management, while thirty-six states (72 percent) offer other types of financial management training. System business management training is offered by thirty-one states (62 percent).

Operator training programs are offered in a face-to-face format by all fifty states. Sixteen states (32 percent) offer operator training in a structured online format where the training is offered at specific times and facilitated by an instructor. Twenty-three states (46 percent) offer operator training in an online, on-demand format where students can participate at any time that is convenient. The number of operator trainings varies greatly from state to state. Some states hold as few as twelve sessions, while other states report hundreds and even thousands of training sessions each year. Most states average about 350 trainings per year.



All fifty states offer training on regulatory issues such as sampling and treatment.

Figure 4. Number of states offering specific operator training topics.

In addition to the online training options, many states use and promote additional online resources from a number of providers (Table 2). Twenty-five states (50 percent) use American Water Works Association (awwa.org) resources, while nineteen states (38 percent) use materials from the National Rural Water Association (nrwa.org). Twenty-four states (48 percent) use the Environmental Protection Agency (epa.gov). Nineteen states (38 percent) also use other types of environmental and water training programs such as the Maryland Center for Environmental Training and Montana Water Center. Thirteen states (26 percent) use the Rural Community

Assistance Program (rcap.org), while eleven states (22 percent) use the Association of State Drinking Water Administrators (asdwa.org). Seven states (14 percent) promote resources from the Environmental Finance Centers. Some states use resources from the Federal Emergency Management Agency (FEMA) and various Extension Service offices. Twenty-one states (42 percent) use their own online resources or use resources from other state primacy agencies. Twelve states (24 percent) do not use or promote any online resources. The number of resources used by EPA region can be seen in Table 2.

Table 2. Online training sources by EPA region.

EPA region	Number of states in region	Number of states								
		No online training offered	EPA	AWWA	NRWA	CRG/RCAP	State primacy agency	Environmental finance center	Other environmental centers	Other providers, inc ASDWA
1	6	1	5	4	1	1	1	1	4	3
2	2	0	2	2	2	1	1	1	1	1
3	5	2	2	0	1	0	2	0	4	3
4	8	3	2	3	3	1	1	0	0	6
5	6	1	4	5	4	4	4	1	2	2
6	5	0	3	3	3	3	3	1	3	1
7	4	1	2	2	0	0	1	1	2	2
8	6	3	1	2	2	1	3	1	1	1
9	4	1	2	2	3	2	1	0	1	2
10	4	0	1	2	0	0	4	1	1	2

OPERATOR RECRUITMENT

Many state primacy agencies have formed partnerships with various organizations in an effort to recruit new waterworks system operators into the industry. According to survey results, twenty-one states (42 percent) work with state professional associations such as state rural water or operators associations in this effort. Twenty states (40 percent) work with community college workforce training programs, while seven states (14 percent) use high school vocational/technical programs. Four states (8 percent) use workforce investment areas, and four states (8 percent) also work with correctional facilities to recruit new operators. Three states (6 percent) work with their state economic development agencies, and two states (4 percent) work with their state employment security agencies. Two states (4 percent) use “welfare to work” type programs to recruit new operators.

Several other innovative partnerships have been developed by states in an effort to recruit new operators. For example, three states work with a job corps program in cooperation with EPA to recruit new operators. Other states have also begun to work with veterans’ programs in order to recruit military veterans into the waterworks industry. Michigan uses an approved community college water/wastewater technology degree program. The Florida Operator Certification Program has worked with the Florida Department of Education to develop a curriculum to be taught to high school students seeking to enter the waterworks industry. Connecticut has developed a similar program in which, after a 72-hour curriculum, high school seniors may sit for the operator certification test. New Jersey has applied for a grant to fund an operator internship program to educate recruits through curriculum as well as experience before certification.

The need for water and wastewater system operators is expected to increase through the foreseeable future. Economic Modeling Systems Incorporated (a private economic forecasting firm) predicts that the demand for water and wastewater operators will increase by more than 7 percent from 2013 to 2020 (from just over 108,000 to almost 116,000) compared to an 8.8 percent predicted increase in the demand for all occupations in the United States. **Table 3** shows the expected increase

in demand and the hourly wage for water and wastewater operators by EPA region.

Wages for water and wastewater operators compare favorably, as well. The median hourly wage by state for this occupation ranges from a low of \$13.21 to a high of \$29.89. The median hourly wage for water and wastewater operators in the United States is \$20.09, just slightly above a US hourly median wage of \$19.98 for all occupations.

Table 3. Expected job growth for water and wastewater operators (2013–2020).

EPA region	2013 jobs	2020 jobs	% change in jobs	2013 median hourly wage
I	5,098	5,234	2.7%	\$22.92
II	6,881	7,046	2.4%	\$22.60
III	11,302	11,838	4.7%	\$19.17
IV	20,859	22,498	7.9%	\$18.51
V	18,927	19,503	3.0%	\$21.17
VI	15,832	17,946	13.4%	\$15.02
VII	6,067	6,438	6.1%	\$17.82
VIII	5,598	6,210	10.9%	\$20.47
IX	12,623	13,723	8.7%	\$28.50
X	4,921	5,389	9.5%	\$23.63



CONCLUSION

In times of increased pressure on state and federal finances and an ever-increasing push toward public water system sustainability, many state primacy agencies are offering or promoting a variety of strategies designed to strengthen their public water systems. From board management training to various methods of operator education to innovative ways of attracting new employees to the sector's workforce, the responses to this survey demonstrate that primacy agencies are at the forefront in helping public water systems provide a safe and affordable supply of drinking water to their customers.

The need for water and wastewater system operators is expected to increase through the foreseeable future.

APPENDIX

State Drinking Water Primacy Agency Survey



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Contact: Alan Barefield, PhD
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Mississippi State, MS 39762
alanb@ext.msstate.edu
662.325.7995

State or territory: _____ Agency name: _____

I agree that specific answers that I provide may be reported on a singular basis as evidence of innovative programs that my state is undertaking. Agree Do not release my individual responses

Board Management Training

Does the state primacy agency sponsor, either directly or through contract assistance, Board Management Training to members of the governing boards of waterworks systems? Yes No

If no,

Are the possibilities of offering this type of training being explored?

- Basic board management training only is being considered.
- Advanced board management training only is being considered.
- Both** basic and advanced board management training are being considered.
- Neither type of board management training is being considered at this time.

If yes,

Is the sponsored training focused on the basics of serving on a waterworks system board or on advanced topics?

- Basics of serving on a waterworks system board
- Advanced board management topics
- Both

Is the training presented by the state primacy agency or by contractor(s)?

- State primacy agency
- Contractor(s)
- Both

Is this training mandated by the state's legislature or by the state primacy agency?

- Yes
- No

Is a registration fee charged to the participants for the training?

- Yes
- No

Is there an established curriculum (curricula) for the training?

- Yes
- No

What entities are responsible for maintaining and updating the training curricula? _____

If the sponsored training is focused on the basics of serving on a waterworks system board, what topics are included in the training?

(Please select all that apply.)

- Laws and regulations (including SDWA, the Surface and Ground Water Rules, etc.)
- Organization and function of a waterworks system board
- Customer service
- Financial management
- Setting water rates
- Long-term financial planning
- Emergency and disaster preparedness
- Operations and management of a waterworks system

- Other (please identify) _____
- Other (please identify) _____
- Other (please identify) _____

Through what venue is the board management training offered? *(Please choose all that apply.)*

- Face-to-face sessions only
- Structured online training (training is only offered at specific times through sessions facilitated by an instructor)
- On-demand online sessions where the participant can participate in the program anytime that is convenient

Capacity Assessment and Development

How often are water systems inspected by the state primacy agency?

- Annually
- Every three years in accordance with the Ground Water or Surface Water Rules
- Every five years in accordance with other rules
- Other (please explain)

Is the inspection form available to the public? Yes No

If yes, please provide information on how this form could be obtained for comparison purposes.

Does your state utilize a peer review type program (operators from high-performing systems providing advice to the operator and management of low-performing systems to assist in developing the capacity of public drinking water systems)? Yes No

If yes, is this a voluntary program on the part of the lower-performing systems? Yes No

What entity coordinates this program? _____

Are the reviewers compensated for their time? Yes No

What entities have partnerships with the state primacy agency to provide education, training, or technical assistance to operators of public drinking water systems?

- State rural water association
- State waterworks operator association
- Community Resource Group (RCAP)
- College or university
- Community college
- Regional college or university
- State or land-grant university
- Other associations/nonprofit entities (please identify)

- Waterworks equipment/supply businesses
- Other types of partnerships (please identify)

What types of education/training programs are offered either by the primacy agency or partners/contractors?

- Hands-on operator skills training
- Regulatory issues (sampling, treatment, GWR/SWR implementation, etc.)
- Backflow prevention
- Emergency/disaster management
- System business management
- Financial management

- Marketing/customer service
 - Asset management
 - Other types of education/training programs (please identify)
-
-

Through what venue is operator training being offered? *(Please choose all that apply.)*

- Face-to-face sessions only
- Structured online training (training is only offered at specific times through sessions facilitated by an instructor)
- On-demand online sessions (the participant can participate in the program at any convenient time)

Please indicate any online resources that are actively used/promoted in education/training opportunities for either waterworks operators or system boards:

- No online resources are being utilized at this time
 - Association of State Drinking Water Administrators (asdwa.org)
 - Environmental Protection Agency (epa.gov)
 - American Water Works Association (awwa.org)
 - National Rural Water Association (nrwa.org)
 - Rural Community Assistance Program (rcap.org)
 - Your own or other state primacy agencies (i.e., Colorado TMF Trainer)
 - Environmental Finance Center Network (EPA-designated centers at selected universities, including University of Southern Maine, Syracuse University, University of Maryland, University of North Carolina at Chapel Hill, University of Louisville, Cleveland State University, New Mexico Institute of Mining & Technology, Wichita State University, Dominican University of California, and Boise State University)
 - Other types of environmental and water training programs (i.e., Maryland Center for Environmental Training, Missouri Public Drinking Water Site, Montana Water Center, etc.)
 - Other sources of online education/training programs and tools (please identify)
-
-

How many “agency-sanctioned” operator-oriented training events (of all lengths) are typically offered in a calendar year? _____

How many “agency-sanctioned” system board management training events are typically offered in a calendar year? _____

New Operator Recruitment

Please indicate any partnerships that your state primacy agency is utilizing to recruit new waterworks system operators into the industry.

- Workforce investment areas
- Community college workforce training programs
- State economic development agencies
- State employment security agencies
- High school vocational/technical programs
- Welfare to work programs
- State professional associations (state rural water or operators association, etc.)
- Correctional facilities (prisons and jails)
- Other (please identify) _____
- Other (please identify) _____
- Other (please identify) _____

Please describe any types of innovative methods (recruitment, training, or certification) that your state is using to recruit new waterworks system operators into the industry.



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