

Revisiting the 2012 Source Water Protection Vision and Roadmap for U.S. Drinking Water Utilities (Water Research Foundation Project #4176)

Chi Ho Sham, Ph.D. (he/him/his)
VP & Chief Scientist, Eastern Research Group, Inc.
President (2021-2022), American Water Works Association

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Source Water Contamination in the News

- The Elk River spill on Jan. 9, 2014 in WV
- Microcystin contamination of Toledo, OH drinking water Aug. 2, 2014 (Ohio River, 2015; Salem, OR, 2018; West Palm Beach, FL; 2021)
- Massive mine tailings spill Aug. 4, 2014 in central BC, Canada
- PFCs (perfluorooctane sulfonate [PFOS] and perfluorooctanoic acid [PFOA]) in Hoosick Falls, NY, Manchester, NH, Cape Cod, MA in 2015 and 2016 (tip of the iceberg)

Source Water Protection

- A key component of a sustainable water utility
 - Reduce uncertainties relating to water quality and treatment in the future
 - Reduce chemical and energy use
 - Enhance public trust
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- Difficult to quantify immediate benefits because of long time horizon
 - Difficult to prove the absence

Purposes of this talk

- To revisit the Water Research Foundation Project 4176 (published in 2012)
- To identify progress made against recommended actions under each of the roadmap themes
- To assess additional efforts to advance source water protection in the U.S.

Water Research Foundation Project #4176's Goal (published in 2012)

To identify critical elements of a unified source water protection roadmap and define steps that should be taken to set this roadmap in motion

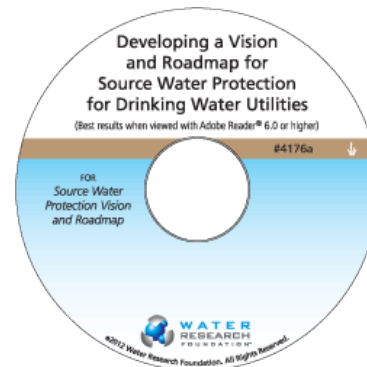


Participating Utilities

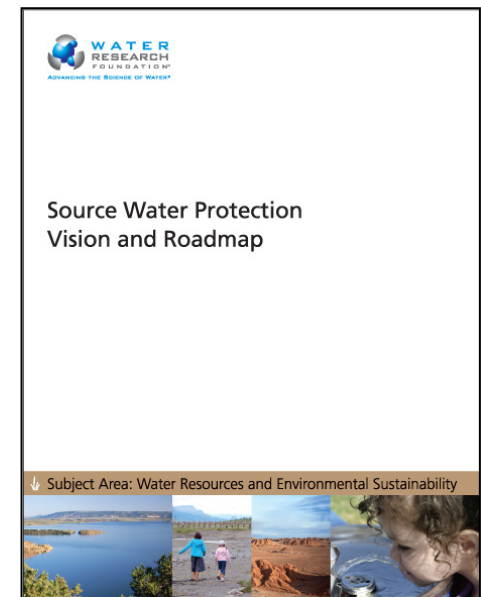
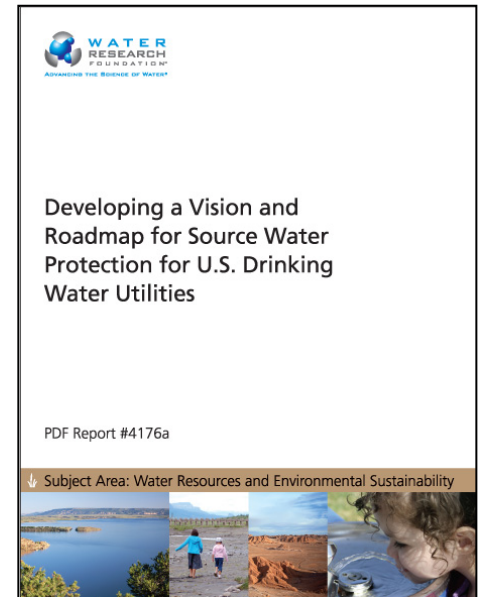


Project 4176 Elements

- Literature/background review
- Water utility interviews
- Utility case studies
- Workshop



4176a Full Report (Electronic copy only)
4176b Shorter Version with Roadmap



Water Utility Interviews

- 60 community water systems interviewed (30 surface water, 30 ground water)
- Broad spectrum of sizes and locations across U.S.
- All interviews used same form

Utility Case Studies

Utility	City, State	Source of Supply	Population Served
Beaver Water District	Lowell, AR	Surface – lake	250,000
Central Arkansas Water	Little Rock, AR	Surface – lakes	398,000
Greater Cincinnati Water Works	Cincinnati, OH	Ground water and surface (river)	314,000
Columbus Division of Power and Water	Columbus, OH	Surface – river, reservoirs	1,083,100
East Bay Municipal Utility District (EBMUD)	Oakland, CA	Surface – reservoirs	1,200,000
East Greenville Borough Water District	East Greenville, PA	Surface – creek/river	3,200
Massachusetts Water Resources Authority (MWRA) and the Massachusetts Department of Conservation	Boston, MA	Surface – reservoirs	2,200,000
Meredith Water Department	Meredith, NH	Surface - reservoir	1,367
New York City Department of Environmental Protection	New York, NY	Surface – reservoirs	8,000,000
Regional Water Authority	New Haven, CT	Primarily surface water	400,000
Salt Lake City Department of Public Utilities	Salt Lake City, UT	Surface (rivers) and groundwater	400,000
San Antonio Water System	San Antonio, TX	Groundwater	1,000,000
Washington Aqueduct	Washington, DC	Surface – river	1,000,000

Products of Workshop

- Articulate a SWP vision for U.S. water utilities
- Define goals for attaining vision
- Identify benchmarks reflecting attainment of goals
- Develop strategies for achieving benchmarks
- Organize into a SWP roadmap for U.S. utilities

Source Water Protection Vision:

“Source water protection is essential for providing a reliable supply of high-quality drinking water. By 2025, every public community water supply will be protected by an active source water protection program.”



Roadmap Themes

- Raise Awareness
- Enhance Coordination
- Provide Support
- Increase Recognition



Raise Awareness

Need to ***raise awareness*** of importance and value of source water protection. Greater awareness is needed

- ***By utilities***, of the role SWP plays in the multi-barrier approach to providing reliable, high quality water at reasonable rates
- ***By utilities and their management***, of the value of SWP
- ***By consumers***, of the benefits and value of SWP
- ***By stakeholders***, of the importance of protecting drinking water sources and priority that should be given to drinking water

Enhance Coordination

Programs, efforts, and regulations affecting SWP can be conflicting, redundant, or lacking in focus. Need to ***enhance coordination***

- ***Overall (across all relevant operational and stakeholder groups)***, so that SWP efforts and programs are better integrated and work together synergistically
- ***Among CWA and SDWA regulators, both at the state and federal levels***, for more effective implementation of existing CWA regulations so that drinking water interests are more immediately and completely addressed

Provide Support

There is a need for greater ***support***. Specifically, water utilities would benefit most from support provided by

- ***Experienced water industry peers***, for fellow drinking water professionals trying to plan and implement SWP programs
- ***State and federal funding agencies***, so SWP needs are sufficiently addressed (for high quality water sources as well as impaired water bodies)
- ***Municipal officials***, who can influence public support of regulatory and financial measures to implement SWP
- ***Customers***, through water rates

Increase Recognition

Issues and efforts related to SWP should be acknowledged more publicly. Successful efforts should be praised more frequently. Regulatory inconsistencies hampering SWP should also be addressed. In these ways, there should be ***increased recognition***

- ***By the public and the drinking water community,*** of successful SWP efforts made by water utilities
- ***By state and federal regulators,*** of inconsistencies and shortcomings of existing regulations that should more effectively ensure the protection of drinking water sources

Roadmap Themes

- Raise Awareness

Obstacle:

- *Among water utilities, there is often a lack of awareness of the need for action regarding SWP.*
- *There is a broad lack of awareness of the importance of SWP among stakeholders outside of the water utilities.*
- *It is difficult to ascribe a value to SWP*



Raise Awareness

Recommended Action:

Increase the use of regional and statewide organizations for increasing awareness of SWP for water utilities

- Formation of state and regional SWP collaboratives – Salmon Falls (NH and ME), Connecticut, Idaho, Iowa, Potomac DWSP, and more. Need to spread the words and expand effort – bottom-up/grassroot.

Perform knowledge gap analyses for individual water utilities and stakeholder groups

- WRF Workshop 4595 identified a few research gaps in forest management. WRF 4651 also identify future research for the Potomac DWSP. WRF 4702 quantified benefits of land conservation on water supply. AWWA-USFS-USEFC quantified land use and treatment costs. Positive value for land use management to protect source water; use of CBA and challenges of local factors.

Raise Awareness

Recommended Action:

Develop a system for raising awareness, providing outreach, and promoting education to key decision-makers regarding the importance and benefits of SWP.

- Some progress through a number of NGOs (including SWC) but still a lot to do. AWWA Communication using Consumer Confidence Reports. 2021 AWWA Source Water Protection Week. **Need more audience-specific and user-friendly materials.**

Work with local schools on educational programs.

- **Limited deployment across education communities. Need to work with Education Department on curricula (similar to conservation program).**

Raise Awareness

Recommended Action:

Take a more proactive approach with the media

- Some success but in general relationship with media is still reactive in nature. Need to improve quickly.

Recognize and educate utility management on quantification of SWP

- WRF & Water Services Association of Australia (WSAA) project (WRF 4570) “Catchment Management Investment Standard” attempted to provide standard quantification for source water investment. Economic feasibility analysis for Beaver Water District, AR. AWWA Justification Toolkit, and Performance Metrics Tool. Need to invest more resources to make business case and introduce concept such as triple bottom line.

Raise Awareness

Recommended Action:

Re-package available information on the “true value of water.”

- A number of attempts by AWWA, U.S. Water Alliance, and other organizations were made, but fragmented. **Need consistent message developed across stakeholders.**

Roadmap Themes

- Enhance Coordination

Obstacle:

- *Ineffective existing regulatory framework to protect water supplies.*
- *No one to coordinate or lead the charge on SWP.*



Enhance Coordination

Recommended Action:

Fix gaps to improve integration of CWA regulation and SWP.

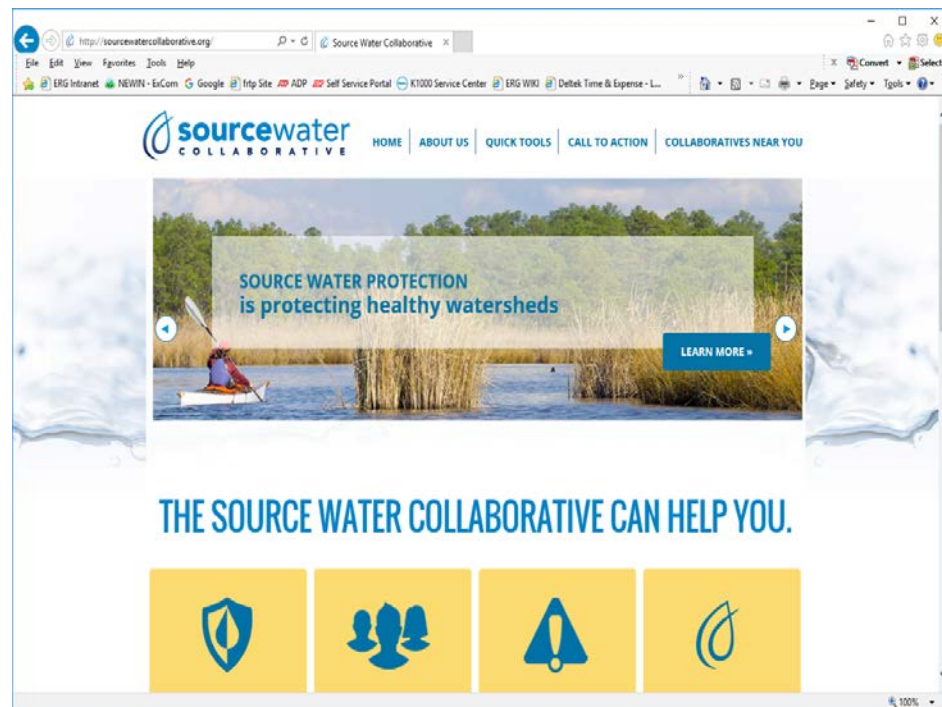
- SWC has initiated a workgroup of EPA and state programs to identify opportunities to integrate CWA and SDWA provisions. Need to update authorities to break up barriers among programs (e.g., to deal with issues such as stormwater).
- States (with support from EPA) have held workshops with SDWA and CWA staff to improve alignment of WQ standards and impairment definitions for designated drinking water supplies. Need to continue to carry out additional workshops, identify follow-up support.
- A number of organizations including EPA and ASDWA have used “innovation challenge” to link water quality standards and SWP. Limited efforts have been made because of resource limitations and “siloed” tradition.

Enhance Coordination

Recommended Action:

Identify ways the CWA can do a better job at protecting high quality drinking water sources.

- Deployment of Healthy Watershed program (under CWA), was managed by the U.S. Endowment for Forestry and Communities. Progress is encouraging but slow because of limited available resources.



Enhance Coordination

Recommended Action:

Identify ways the CWA can do a better job at protecting high quality drinking water sources. (continues)

- Some assessments of federal and state anti-degradation and other regulations under CWA to protect high quality drinking water sources (by OR, OH, WI, MN). **Still limited progress.**
- Use of CWA funding (e.g., Section 319) to support protection of high quality watersheds. **Some progress on the use of CWA funding – need better collaboration.**

Enhance Coordination

Recommended Action:

Leverage CWA and other state and federal regulations and programs more effectively to improve protection of drinking water sources.

- Some efforts are being made to use Clean Water and Drinking Water State Revolving Fund dollars for SWP. Availability of USDA-NRCS funds for SWP in the 2018 Farm Bill. Need to provide education and support funding to plan and implement programs in addition to funding to local entities and producers.

Enhance Coordination

Recommended Action:

Build upon Source Water Assessments completed in the early 2000's and move from assessments to protection.

- Some progress has been made and tools have been developed by EPA – DWMAPS and WRF – Project 4581 to map and catalog chemical storage tanks. Additional efforts can be helpful. Challenges associated with emerging contaminants.

Enhance Coordination

Recommended Action:

Create a SWP coordinator position.

- A coordinator position was established by the U.S. Endowment for Forestry and Communities to work with water utilities that can benefit from forest protection. Limited progress and success because of difficulties to quantify benefits and reluctance of water utilities to participate. Need to be coupled with other aspects of roadmap themes, along with additional resources and demonstrated results.

Roadmap Themes

- Provide Support



Obstacle:

- *There is no organized mechanism for water utilities to teach and support one another.*
- *Utility personnel do not sufficiently understand the impact of certain contaminants on source water quality.*

Provide Support

Recommended Action:

Create education and training program for utilities with (1) monitoring, (2) research programs, and (3) training/audit.

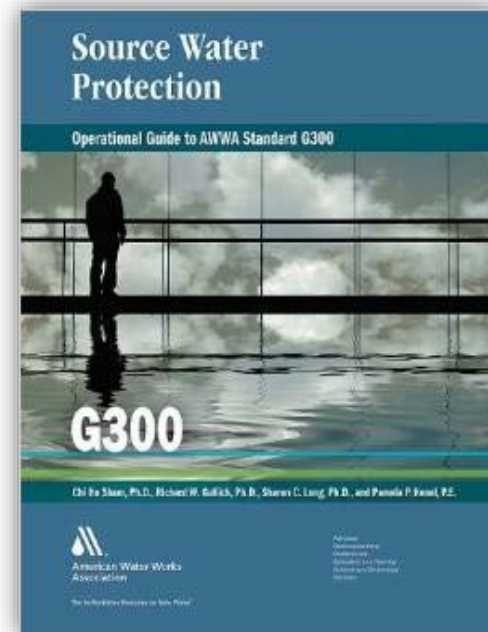
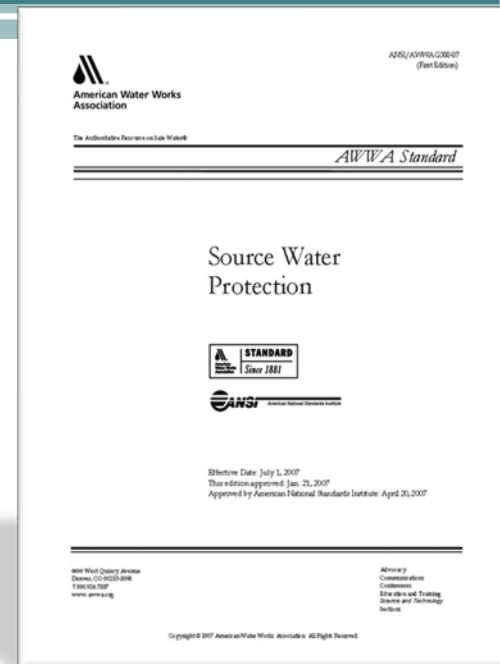
- Training program development efforts are fragmented. **Need consistent messages and certification/ accreditation through organized efforts across organizations (scalable and customizable).**
- Conduct research to address the impact of new contaminants on source water and treated water quality (e.g., PFAS and Cyanotoxins). **Need coordination among researchers and funding entities.**

Provide Support

Recommended Action:

Create education and training program for utilities with (1) monitoring, (2) research programs, and (3) training/audit.

- Develop a simple to use framework for SWP. The use of AWWA G300 standard via coordination across AWWA, NRWA, RCAP, ASDWA, GWPC, and certification programs. Need agreements across these organizations and leadership. AWWA is working on a Partnership for Safe Water module on source water protection.



Provide Support

Recommended Action:

National organizations shall provide guidance on emerging issues.

- Information provided at the national level continues to be reactive rather than proactive. A comprehensive guidance can be developed by AWWA, NRWA, RCAP, ASDWA, GWPC, NRCS, CDC, and other relevant organizations on PPCPs, microbes, DBPs, spills, terrorism, and climate change. Some good progress on forestry and land use issues. More coordination across agencies is needed to accelerate this process (using Farm Bill and AWIA).

Roadmap Themes

- Increase Recognition



Obstacle:

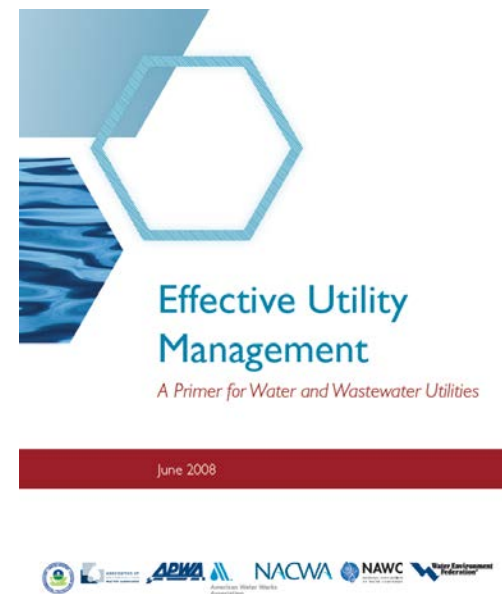
- *There is insufficient acknowledgment and recognition of SWP efforts.*
- *There is no consistent recognition of SWP at the regional or local planning and land use management levels.*

Increase Recognition

Recommended Action:

Develop an award program to recognize successful, high-quality SWP programs.

- Provide well publicized recognition of successful SWP programs. **Coordination across appropriate organizations and cross reference with Effective Utility Management (EUM) program would be helpful.**
- Expand current AWWA Exemplary SWP award to other organizations such as NRWA, RCAP, ASDWA, and GWPC. **AWWA G300 standard can be used as the basis of the award criteria. Need buy in.**



Increase Recognition

Recommended Action:

Promote recognition at national organizations, watershed/aquifer councils, interstate commissions, and local/state legislative bodies.

- Work with land use planning partners to stress the importance of land and water relationship. Work at watershed, aquifer, and interstate levels to gain recognition. Educate legislatures on the importance of SWP. WRF have complimentary research projects related to improved coordination between water resource managers and land use planners. **Limited successes have been gained by working with APA and state/local land planners. Progress has been made in a small number of states such as NH/ME, VT, IA, CT, and CA.**

Summary:

- Raise Awareness
 - Provide good news regarding efforts by water professionals to protect drinking water from source to tap [enhance Source Water Protection week]
- Enhance Coordination
 - Develop source water protection summit to maximize what we can do across different programs (public, private, citizens)

Summary:

- Provide Support
 - Leverage funding and coordinate efforts to prioritize programs at the local, regional, and national levels through creative and innovative approaches
- Increase Recognition
 - Celebrate good works done by water utilities and collaborators on protecting source water and public health in sustainable and resilient manners

Questions?

Chi Ho Sham, Ph.D.

Vice President and Chief Scientist

Eastern Research Group, Inc.

110 Hartwell Ave., Lexington, MA 02421

Office: 781-674-7358; WFH: 617-347-3639

E-mail: ChiHo.Sham@erg.com

**“An ounce of prevention is
worth a pound of cure”**

- Ben Franklin

