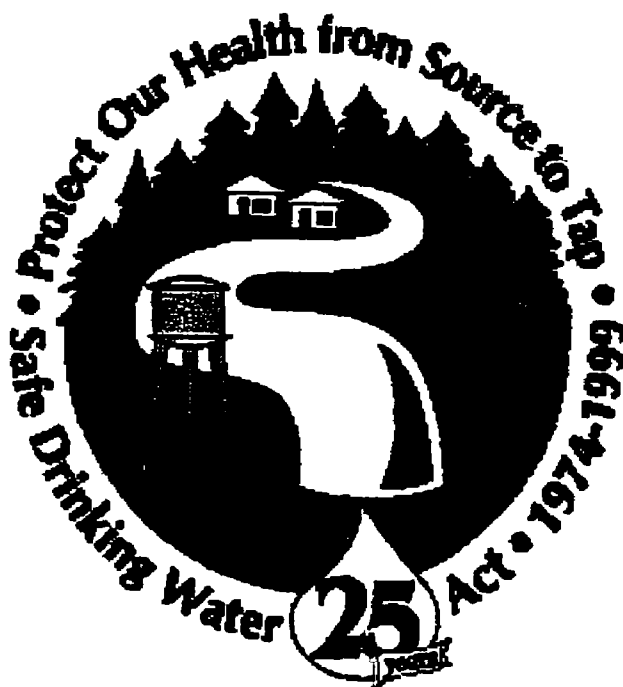


# Drinking Water Futures Forum

EPA Summaries of Discussion



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# The Drinking Water Futures Forum

## EPA Summary of Major Points of Discussions

December 16, 1999 marks the 25<sup>th</sup> anniversary of the signing of the Safe Drinking Water Act (SDWA), the principal federal law ensuring the quality of Americans' drinking water. The Act recognizes that providing safe water is a comprehensive and integrated endeavor, involving water protection and treatment from drinking water source to consumer's tap.

In pursuit of these objectives, EPA and a number of partners launched a Drinking Water Futures Forum to evaluate the challenges facing the nation in ensuring a safe supply of drinking water for the next 25 years. The overall question for the Futures Forum is: "How can we ensure safe drinking water in 2025?,"

This overall question was divided into 7 sub-questions: innovative drinking water treatment technologies, source water quality and quantity, the needs of vulnerable subpopulations, the cost of drinking water, the needs of small systems, how to help populations not served by community water systems, and drinking water research. Nearly 20 meetings have been held by EPA and the partners to discuss these questions and other cross-cutting issues, such as education and outreach, that have arisen from the initial discussion topics.

The following summaries are an attempt to capture some of the key points of the discussions. These are EPA's summary only. These are not consensus documents, and may not reflect the views of all participants in the futures forum discussions, and any recommendations recorded are not consensus recommendations. They are only intended to be a brief record of some of the major points of discussion.

The discussion summaries are:

- Treatment Technologies
- Source Water Quality and Quantity
- Vulnerable Subpopulations
- Cost
- Small Systems
- Unserved Populations
- Research
- Outreach

# Treatment Technologies

## Discussion Summary



Are there emerging or available drinking water technologies that might enable us to “leap frog” the fragmented, individual contaminant-by contaminant regulatory approach to more expeditiously and efficiently bring us closer to our common goal of safe drinking water for everyone?

### Background:

New regulations focusing on specific contaminants can require water utilities to add new individual treatment technologies which can come at high cost. Also, the length of time it takes to regulate a new contaminant leads us to look for treatments that can remove classes of contaminants. Many discussions centered around newly emerging technologies that remove multiple contaminants, or incentives that could enable systems to install better overall technologies rather than just replace existing ones.

### Key Concepts and Challenges:

- The best approach to ensuring high-quality water at the tap is to develop an integrated water quality plan coupling source water protection, flexible water treatment, and distribution system management.

### Source water

- Source water assessment and watershed control would also play an important role to minimize treatment requirements
- Linkages between SDWA and the Clean Water Act can reduce the discharge of contaminants into the source water

### Treatment

- We should look at newly emerging technologies that remove multiple contaminants, or incentives that could enable systems to install better technologies rather than just replace existing ones. “Supertreatment” would most likely include integrated membranes, advanced oxidation, and use of chloramines
- Drawbacks and limitations of “supertreatment” include “one-size-does-not-fit-2!!,” cost, retrofitting difficulties, possible “side-effects” of treatment (the need for discharge permits, unintended byproduct formulation, etc)

- To help identify emerging technologies, we should hold an international forum on drinking water treatment technologies and incentives. In this forum, experts from this country and around the world would meet to explore new technologies and potential incentives to use them.

#### Distribution systems

- Deteriorating distribution systems are thought to be one of the biggest problems in the next 20 years. Costs of overall infrastructure rehabilitation are estimated at \$138 - \$325 billion.
- Water quality can be subject to deterioration in the distribution system, especially if the pipes are in need of replacement. Because of this, some believe we should look for more decentralized treatment.

#### Operator Training

- New and emerging technologies will be successful only if properly operated and maintained. This will require operator training and education and adequate financial resources.

#### Public Education

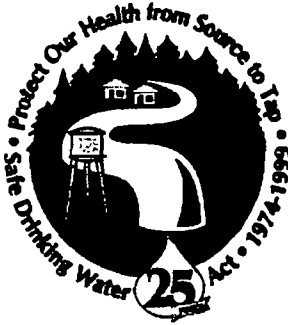
- Consumer perception can drive regulatory actions on treatment. This perception can be based on taste and odor issues as well as general water quality fears or watershed activities. We must educate the public on the safety of their water, and relative risks.

#### Voluntary Efforts

- Any changes to the regulatory structure should promote voluntary efforts above baseline public health protection (e.g., Partnership for Safe Water)

# Source Water Quality and Quantity

## Discussion Summary



Given the national trends of increasing population, urbanization and development, how can the drinking water program help ensure the availability and good quality of drinking water; what are the barriers and some solutions to source water protection; and how can we better focus each level of government and the private sector on better coordination in planning for the future of a safe and reliable drinking water supply?

### Background:

Upstream activities have an impact on drinking water quality. If contaminants are kept out of the source water, the risk to human health is lessened and the removal costs can be reduced. The multiple barrier approach to drinking water protection -- source water protection, treatment, distribution system maintenance, monitoring, consumer education -- makes prevention of contamination the first line of defense in providing safe drinking water. EPA has a Government Performance and Results Act (GPRA) goal which states that by 2005, 50% of the population on community water systems will be served by water systems with source water protection

Economic development and expanding population can affect both surface and ground water quantity and water quality if not properly managed. If our goal is to continue to ensure safe drinking water, then source water protection must be the first step.

### Key Concepts and Challenges:

- Source water protection can play a major role in protecting drinking water, and should be a part of every drinking water protection program.

### Source water assessments

- The foundation of effective source water protection is a high quality source water assessment. The assessment delineates the source of the public drinking water; identifies potential sources of contamination; determines the drinking water source's susceptibility or vulnerability to contamination; and makes the information available to the public and local decision makers. The assessments must be as comprehensive as possible.

### Public Education

- Source water protection will require the support of the community, as protection measures may involve voluntary actions, best management practices, or local

zoning issues. To educate the community, the results of the assessments need to be publicized, including through the consumer confidence reports.

### Linkages

- Link source water protection with source control programs: SDWA mandates source water assessments but not source water protection, with the exception of the Underground Injection Control (UIC) program. Therefore, effective protection measures must involve the Clean Water Act (CWA) and other laws with source control mandates, such as the Resources Conservation and Recovery Act (RCRA).
- Integrate water-related programs by institutionalizing links between source control and drinking water programs, including UIC, as well as with other Federal Programs, at the federal, state, Tribal, and local level. Create incentives at local level for these linkages. These include:
  - (state level) linking TMDL action plans and source water assessments;
  - (local level) promoting area-wide planning councils, comprehensive water supply planning, and local land-use decisions to ensure drinking water sources are protected;
  - (Federal level) developing unified Federal lands policy that incorporates drinking water priorities and delivers Federal data to other local assessment areas
- We must link drinking water protection actions with watershed protection actions. Historically, water programs were developed to protect separate parts of the ecosystem or separate uses of its resources; however, this fragmented approach can be a barrier to public health protection. Rivers, streams, and ground water that are drinking water sources also have ecological value, and their functions cannot be separated. Therefore, we have to make sure that our institutional programs work together.

### Local flexibility

- Local flexibility: Because communities needs are different, it is important that source water protection is instituted at the local level. Through voluntary actions at home and in the community, individuals can make important contributions to preventing pollution of source of drinking water, both ground water and surface water. Communities need access to education approaches and tools that involve and motivate individuals to act.

### Quality and Quantity

- Increasing development and population growth can also have a significant effect on water quantity. Effective long term management of the drinking water resources requires consideration of not only upstream or up-gradient activities

that might affect the quality and quantity of the drinking water source, but also recognition of the downstream water users and demands on the aquifer. Obstacles include conflicts over water use, especially in arid parts of the country, and the cost of implementing/managing a source water protection program

- **Balancing economic growth and development with source water protection-** Source water protection requires strong links between land use planning and source water quality and quantity protection.



# Vulnerable Subpopulations

## Discussion Summary



In a country where the population has increasing rates of aging and cancer survival, how do we ensure that vulnerable subpopulations (also including children and immunocompromised), receive safe water?

### Background:

Most people agree that the goal of the drinking water community should be to ensure that everyone has access to safe and affordable drinking water. Questions exist, however, on what level of safety is needed, the delivery of that water (at the tap or by other means), and who is responsible for ensuring that persons receive water that meets their specific health needs.

### Key Concepts and Challenges:

- Options for providing "safer" drinking water to vulnerable subpopulations include improving water quality for all persons, installing a separate distribution system dedicated solely to providing drinking water for all persons, providing bottled water for vulnerable subpopulations, and/or using point of use/point of entry devices.

### More information needed

- Obstacles to meeting the needs of vulnerable subpopulations include identifying the vulnerable subpopulations; identifying what is "safe" for them (different populations have different susceptibilities); explaining to the public why some people get "safer" water; and delivering and paying the costs of this "safer" water.
- It is unclear what percentage of the population is especially susceptible to contaminants from drinking water. It may not be possible to identify everyone who is vulnerable; some people may not know themselves (e.g. HIV positive persons, women in early stages of pregnancy). In addition, many persons cycle in and out of being "vulnerable," depending on their age, stage, or whether they are undergoing a particular medical treatment (e.g. chemotherapy or prescription steroids which can render them immunocompromised).

We need to conduct research to determine who is vulnerable, what they are vulnerable to, and at what levels. Data gathering should include identifying those who are highly exposed, as well as those who are highly susceptible.

- Questions exist on the effect of the distribution system on water quality. Aging distribution systems will make it more difficult to provide "safe" water at the tap for all persons. For the long term, some recommended performing a thorough analysis of the costs of providing water that meets the health needs of all persons via improved or replaced infrastructure, as compared to establishing an alternate delivery system

In the short term, some recommended developing further proposals for providing safe water to vulnerable populations.

#### Health care and public outreach

- Health care providers and the general public need more education on drinking water and health issues. We should develop an education program to provide information to health care providers and consumers about drinking water and health

## Cost

### Discussion Summary



Are we paying the real cost of providing a safe supply of drinking water? What are the cost issues facing the nation's water systems (including infrastructure repair, replacement, and expansion, new treatment technologies, and new program administration activities?) How can these needs be paid for, and made affordable for the economically disadvantaged? How can resources be more efficiently allocated among local, state, and federal governments and the private sector? What are the opportunities to improve current infrastructure, including the distribution system?

#### **Background:**

The costs of providing a safe, sufficient and reliable supply of drinking water can be high. Cost are high due to issues such as aging infrastructure, high replacement costs, direct and indirect costs of compliance with SDWA, and the increased need for source water protection. For smaller systems, cost issues are even more important.

#### **Key Concepts and Challenges:**

##### Water is artificially inexpensive

- The price of drinking water often does not reflect the actual, full costs of providing water. The current costs generally only cover current service, not future needs, such as infrastructure replacement.
- Water is generally cheap in the United States, much cheaper than in many other countries. The average price of water in the US in 1999 is 51 cents per cubic meter, versus 115 cents per cubic meter in the United Kingdom and 182 cents per cubic meter in Germany. In the US the average cost of water actually dropped between 1998 and 1999.

##### Costs are high

- The costs of infrastructure replacement and removal of pollutants that increasingly enter source waters due to increasing population and development are high
- The drinking water community should convene a forum on costs of infrastructure and costs of providing safe water, and develop options for promoting sustainable pricing

- The drinking water community needs to look at assistance options for areas with low income customers or exceptionally high costs. Options include: 1) Phased-in rate increases, 2) lifeline or special rates for low income customers, 3) customer assistance programs coordinated with community-based organizations, 4) funds for low income customers such as dollar check-offs on water bills, 5) monthly rather than quarterly billing, and 6) provision of low consumption plumbing fixtures and consumer education about the need to fix leaks.

#### Small system needs

- Small systems may not have adequate financial resources to continue to provide safe drinking water. We need to address the question of who cannot afford increased rates, and come up with ways to assist them. (See Small Systems summary)
- To improve technical, managerial, and financial capacity for water systems, regionalization or other forms of consolidation should be considered.

#### Public education

- Increased efforts are needed to educate the public on the costs of providing safe drinking water.

## Small Systems Discussion Summary



What should the structure of the drinking water provision system be in the future? Can consolidation and restructuring take more advantage of economies of scale? Are there additional activities to help alleviate tribal and small system compliance problems? What can/will be the drivers affecting the structure of the industry? Are there innovative or alternative institutional structures for the provision of drinking water to small populations?

### Background:

Small drinking water systems constitute over 90% of all public water systems. These systems are increasingly challenged to provide clean and safe water because of the increasing demand on their technical, financial and managerial capabilities. The small systems component of the drinking water industry services, and is owned and managed by, large and diverse groups of people.

In reauthorizing the SDWA in 1996, Congress found, among other things, that: "More effective protection of public health requires: prevention of drinking water contamination through well-trained system operators, water systems with adequate managerial, technical, and financial capacity, and enhanced protection of source waters of Public Water Systems"

Congress also found that "Compliance with the requirements of the SDWA continues to be a concern at public water systems experiencing technical and financial limitations, and Federal, State and local governments need more resources and more effective authority to attain the objectives of the SDWA". The statute recognized these challenges and provided tools for capacity development and upgrade of systems.

### Key Concepts and Challenges:

- The 1996 Amendments to SDWA provide significant new authorities and resources designed to address small system challenges. While these new tools offer much promise, the challenges facing small systems continue to grow.
- Water systems of all sizes and ownership types can provide safe and affordable drinking water under certain circumstances. No one institutional structure is inherently superior in all cases.

### Challenges for small systems

- Source water quality may affect a small system's ability to comply with drinking water standards

- Drinking water is an industry whose costs are rising, placing more strain on small systems
- Even with government incentives, existing public, private, and not-for-profit entities will not be able to provide solutions for all troubled systems. A few systems serve such a high percentage of low-income customers, are so isolated, have source water of such poor quality and/or limited quantity, or are otherwise hampered, that existing entities cannot provide solutions.
- Economic forces such as the move toward privatization have the potential of changing the structure of the drinking water industry. There is significant potential for the administrative consolidation of physically non-connected systems.
- Water utilities will need enhanced and expanded knowledge and skills in order to be successful over the next twenty five years and beyond.
- Over the next 25 years, the water industry as a whole will move closer to the ideal of financially self-sufficient and self-sustaining utilities.

#### Potential assistance

- Long-term, area-wide planning is essential if economically efficient institutions and least-cost service options are to be identified.
- To assist small systems, EPA should create a panel to explore incentives to help small systems be successful in meeting SDWA requirements.
- The drinking water community should explore the possibility of a partner-based "Environmental Extension Service" for training for small water systems. Some of the options discussed include mentoring from large water systems, building on the Agriculture Department's Cooperative Extension Service to put an environmental extension representative in every county or other geographic area, and modeling programs on the Partnership for Safe Water.

# Unserved Populations

## Discussion Summary



What are our responsibilities to help provide safe drinking water to those not served by public water systems? How could we meet such responsibilities (e.g., education?)

### Background:

To fulfill the Safe Drinking Water Act's (SDWA) mandate to provide clean and safe water to the nation, EPA has set a goal that "By 2005, the population served by community water systems providing drinking water that meets all 1994 health standards will increase to 95% from baseline of 83% in 1994." However, since SDWA regulates public water systems, and because those who receive their water from public water systems receive the health benefits from the regulations, a fundamental issue for the drinking water community is whether better protection for those not served by public water systems can and should be provided through SDWA or through other mechanisms.

Private well owners are responsible for the safety of their own water, including testing, and there is not a SDWA mandate protecting drinking water from private wells.

### Key Concepts and Challenges:

#### Challenges to unserved populations

- There can be serious barriers to ensuring clean, safe water for Americans not served by public water systems, including access to or the lack thereof of technology, infrastructure, and money. Additional barriers can include geography, income and education.

#### Information still needed

- More information is needed to better classify the "unserved" and thereby provide a clearer picture of the need to reduce the potential risk this problem might pose. Many participants felt that the definition of "unserved populations" was too narrow and did not take into account individuals who may be receiving water from systems that may be inadequate or contaminated. Some wanted the definition to be broader and include individuals that were "underserved," and some thought that the definition was too broad and individuals who were served by modern individual wells should not be included.

- Research is needed so that accurate information may be obtained on the unserved population with which to make better decisions.
- To better understand who the unserved are, their location, and current and future risks, the drinking water partners should establish a working group to collect statistical information and data on unserved populations.

#### Coordination of assistance activities

- The drinking water community must find ways of working with other groups both in and out of government to help leverage support to help address some of the economic and social problems that might pose a barrier to safe and affordable drinking water. Community outreach and education are important tools in this equation.
- The organizations involved in unserved populations issues -- including EPA, the Department of Housing and Urban Development, The Rural Utilities Service, the Rural Community Assistance Program, and the states -- should coordinate their activities.
- Regionalization and consolidation could help to provide service to additional people

#### Public outreach

- EPA should create an education program targeted at unserved populations



## Research

### Discussion Summary



What science research and data are necessary to achieve public health objectives, satisfy SDWA standards for sound science, and meet near and long term statutory requirements in the areas of health effects, treatment technology and distribution systems, analytical methods, and special issues (i.e., sensitive subpopulations, mixtures). What level of research investment is adequate to address these needs? What is the most efficient, effective and timely combination of public and private efforts to undertake the necessary drinking water research and data collection? If there is a gap between programmatic research needs and available resources, what is the best way for EPA and interested stakeholders to decide on priorities?

#### **Background:**

Research is key to understanding contaminants, how they affect public health, and how to combat them. Sound research, data and assessments are the backbone of an effective and progressive drinking water risk-management program. Research is critical to assuring the safety of drinking water and increasing the public's confidence in the value of its drinking water investments.

A key element of the 1996 SDWA Amendments was the Congressional recognition of the importance of science as the foundation for a protective and credible drinking water public health program. The Amendments strengthened the science provisions of the law including requiring the use of "the best available, peer reviewed science and supporting studies conducted in accordance with sound and objective scientific practices..." SDWA Section 1412 (b)(3)(A). In support of this initiative, Congress and the Administration in 1996-1997 directed an increase in the drinking water research budget to address the most urgent needs.

#### **Key Concepts and Challenges:**

##### Comprehensive approach to research

- Develop a drinking water research program that comprehensively addresses both near-term and future research needs, and that allows regulators and water systems to address future health needs and develop regulations that are supported by strong science and data.
- A coordinated, comprehensive and targeted approach is needed that will allow for the development of a drinking water strategic research plan which will include near and long term needs.

- Develop coordinated research plans for specific, high-priority research areas that include governmental and private research programs. Some of these areas include distribution systems; vulnerable subpopulations; source water quality; quantity, assessment, and protection; treatment technologies; and multiple exposure pathways.

#### Coordinate research among EPA, other federal agencies, and private sector

- While EPA and other groups have done a good job coordinating research efforts and developing research plans for specific contaminants, these efforts need to be broadened to other rule areas in light of the number and complexity of regulations on the horizon. Therefore, EPA and stakeholders will need to coordinate extensive research efforts that will address complex issues such as identifying priority needs, developing comprehensive research plans, reviewing the adequacy of resources and looking at options.
- Decision makers and stakeholders need to make sure that current research answers high priority, near-term questions, such as (M/DBP cluster, Arsenic), the Contaminant Candidate List (CCL) and the 6-year revision of existing standards. Other priority needs include emerging contaminants, sensitive sub-populations, distribution systems and others.

#### Funding

- Without adequate funding for research, the best planning efforts of EPA and the drinking water community could be ineffective, with resulting negative impacts on health or costs. Many involved in the futures forum felt that the current public and private research investments are inadequate to fully meet the SDWA 96 public health requirements and deadlines. This could translate into delayed public health standards, relying on conservative uncertainty assumptions instead of real data, and decreased quality in regulatory and risk management decision making. Therefore, the drinking water community must come together to determine the best way to close this resource gap.
- We need to invest an adequate amount in EPA, other Federal agency, and industry research to address current research priorities.

#### Ongoing FACA Committee

- To improve openness and coordinate, EPA should form an ongoing FACA Group/ National Drinking Water Advisory Working Group on Research to ensure that planning needs are addressed

## Public Outreach and Education

### Discussion Summary



Question: (Not an original question, but emerged from all other discussions) What public education and outreach components need to be included in an effective, sustainable drinking water protection program of the future? What are the next steps that we, as the drinking water community, need to be working on now and in the next few years to put us on course to make this vision a reality?

#### **Background:**

All futures forum discussions emphasized the importance of public outreach and education to effective drinking water protection. An informed and involved public is the key to the success of future drinking water protection activities, including improved treatment and source water protection. The 1996 amendments to SDWA emphasized program accountability through public right to know. New public information provisions; including consumer confidence reports, source water assessments, and revised public notification, and new EPA databases make available unprecedented amounts of information.

#### **Key Concepts and Challenges:**

- The Consumer Confidence Reports are changing people's perceptions. Citizens are becoming public water suppliers' allies rather than "victims" of safety concerns or increased costs—and we are only just beginning. Communities are beginning to understand that their drinking water needs to be protected from source to tap.
- Our next step is to build on consumer confidence reports and improved use of the Internet to enable each person to find information about his or her local drinking water and how he/she can help protect the source water, make individual health decisions, engage in the rulemaking process, and support continued high quality treatment.
- The public gets most of its information about drinking water from the media, and this tends to be negative (i.e., outbreaks). The drinking water community needs to work together to assure that timely, accurate information is available through many credible sources. Be proactive rather than reactive.

#### **Groups to target**

- Engage constituencies who have not traditionally been involved in drinking water, but who should care, such as the elderly, people with HIV/AIDS, children's

advocates and parents, land owners (including agriculture), Environmental Justice offices and organizations, churches (provide social services; also own land and hospitals), education organizations, and teachers.

- Include information to targeted audiences such as health care providers, persons on private wells not regulated by the Safe Drinking Water Act, vulnerable subpopulations with special health needs, and local communities concerned about their specific drinking water quality.
- Get drinking water information into the education system (curriculum/projects/tours) from the bottom up. Begin at earliest grade levels and increase quantity of information at all levels.

#### Outreach themes

- Remember that "all drinking water is local." Effective outreach has to bring issues to the local level. Tell consumers where they can find information and what they can do with it.
- Any campaign should emphasize prevention and conservation from the outset.
- Start talking about drinking water quantity as well as quality. Overall expense and resource allocation includes providing, protecting, treating, and delivering tap water. Significant use of water for landscaping and other purposes increases demand and costs overall. Engage public in quantity issues as well as quality – it's not only the responsibility of the water system to assure that there is enough water.
- We must do a better job of communicating the economic benefits of safe, affordable, and available drinking water, which is the base needed for successful economic development. Quantify the benefits of prevention. Aggressively market these benefits to utilities, local leaders, and consumers.
- EPA should increase amount and distribution of information about water issues beyond public drinking water (e.g. private wells, septic systems). NOTE: People in the group recognize that EPA does not have statutory authority over these areas, but still feel that these issues are important and that these consumers need information.
- Include public education as a part of comprehensive planning. Instead of always responding to crises, practice crisis prevention.
- Foster and strengthen non-traditional partnerships. Water suppliers and public interest groups need to work together at all levels and should jointly convene meetings at all levels to inform public and share information. Partner with non-profit organizations, hospitals, and community leaders to increase credibility.

- Use the Internet as much as possible.

#### Promote actions

- Use the new drinking water information to promote civic participation in drinking water. Outreach should be understandable to consumers, and should give people actions that they can take. Cross local jurisdictions and get people involved in watershed planning.
- Promote tax laws and regulations which encourage stewardship, protection, and conservation. Water suppliers and others should include land owners as partners in discussions about drinking water programs and community planning.
- Recognize, support, and reward good actors (e.g. protection, stewardship) as a way to encourage others.

#### Recommendation

- Conduct a vigorous public education and outreach effort to enable each person to find information about his or her local drinking water and how he/she can help protect the source water, make individual health decisions, engage in the rulemaking process, and enable continued high quality treatment. This includes information to health care providers and for persons on private wells not regulated by the Safe Drinking Water Act, and for vulnerable subpopulations with special health needs.