Watershed Planning from Start to Finish
In 2007, the National Environmental Services Center (NESC) published a four-part series in On Tap magazine about watershed approaches to water quality problems. The series covered (1) how to start a watershed group to tackle water quality problems, (2) methods for measuring and assessing watershed conditions, (3) how turn this data into a strategic plan, and (4) techniques for putting the plan into action. Each article in the series also includes a case study of the Friends of Deckers Creek, a West Virginia watershed group, showing how that group addressed the topics in the article. The four installations in the series—available individually on NESC’s Web site www.nesc.wvu.edu/subpages/watershed.cfm—are presented here as a single product that may help small communities address water quality issues.
Many experts see watershed planning and management as being the most effective way to deal with water and wastewater issues. NESC presents a four-part series about watersheds that will provide an overview about how to start a watershed initiative, how to assess problems, how to develop a workable plan, and how to implement these watershed efforts.
Maybe the local creek is fouled by wastewater from straight pipes. Or maybe acid mine drainage has killed all the wildlife in the watershed. Perhaps runoff from agricultural fertilizers and pesticides is to blame. Whatever the case, many communities around the country are looking to a watershed approach as a way to address ongoing pollution problems in their rivers, lakes, and streams. It’s a strategy that makes a lot of sense, given the nature of water pollution in the decades after the Clean Water and Safe Drinking Water Acts were first passed.

According to the U.S. Environmental Protection Agency (EPA), “Thirty years ago, most water quality problems were linked to discharges from factories and wastewater treatment plants. Today, however, 40 percent of our nation’s waters do not meet their water quality goals from streets, farms, mines, yards, parking lots, and other nonpoint sources of pollution. Solving these problems requires the commitment and participation of stakeholders throughout our communities.”

Although the specifics of the water quality situation will vary from place to place, one feature that nearly all successful watershed efforts have in common is a core group of individuals with a commitment to achieving a solution.

**Getting Started**

Evan Hansen has worked with water quality and watershed projects in Massachusetts, California, and West Virginia. As a consultant with Downstream Strategies and president of the Friends of Deckers Creek watershed group in Morgantown, West Virginia, Hansen understands that most watershed efforts begin with a problem. (See the article on page 9 for more information about the Friends of Deckers Creek.)

“Watershed groups usually start because a situation, such as pollution, has developed to the point that it can no longer be ignored,” he says. “Beyond recognizing that there’s a problem, though, is the realization that something can be done. The real work begins when a group makes the decision to pull together to find a solution.” Ideally, a wide cross-section of the community will want to be involved. But Hansen observes that these projects often fall on a “superstar volunteer” who is willing to devote a great deal of time to the cause.

Some organizations refer to the leader of this sort of project as a “sparkplug,” because he or she provides the motivation to get things moving. “The ‘sparkplug’ is the indispensable ingredient for a community project,” says Christopher Conway with Small Towns Environment Program and one of the authors of The Self-Help Handbook for Small Town Water and Wastewater Projects. “This is the person or persons—sometimes there are two or three, but rarely more than that—who takes responsibility for galvanizing support for the project and defining it in terms of local volunteers and other resources that will get the job done.

“This does not mean that the sparkplug has to do everything him or herself,” Conway continues. “Rather, the sparkplug energizes and organizes other residents who bring their time and talents to the endeavor.” Because a project like watershed restoration can be a long-term endeavor, this person should also have a strong commitment to the effort and the tenacity to see it through.

Once a problem has been identified, the core team faces several tasks. (See the sidebar on page six for a to-do list.) Basically, the group must answer a series of questions. How will the group be organized? What are the initial goals of the project? What is the geographic scope? What are the community’s concerns and how will they be addressed? Who are some likely partners? When and how will the larger group of stakeholders be involved? What information about the watershed already exists? Of course many things will change over the duration of the project. At this stage, however, the group should have a clear sense of who it is, what it hopes to accomplish, and how it can involve others to achieve its goals.

According to the User’s Guide to Watershed Planning in Maryland, “The first step in the watershed planning process analyzes watershed conditions to develop clear consensus among stakeholders on the goals, objectives, and indicators that will guide watershed planning. The process starts by examining the existing regulatory, programmatic, and scientific information that will influence the planning process. The core team should also consider its local capacity, existing data, and stakeholder concerns when setting goals.”

Hansen recommends getting as much information as possible as early as possible. Usually, a wealth of information can be found in federal, state, and local government studies, as well as sources in the community such as newspapers and environmental groups. “Don’t waste time and resources reinventing the wheel.”
The more resources you have available to the project, and the more buy-in you have from people and groups in the community, the greater your chance for success.

EPA strongly encourages participation from the community in the broadest sense. In the guide Engaging and Involving Stakeholders in Your Watershed, the agency presents a compelling argument: “The move toward integrated, holistic watershed management has meant that more attention must be paid to factors beyond the water body itself—how land is used, what type of vegetation or other cover it has, and how it is managed,” EPA notes. “Such an approach requires the involvement of landowners, developers, farmers, urban government, homeowners, recreational groups, and other constituents in the watershed if real progress is desired.”

Related to stakeholder involvement is getting help through partnerships with other organizations. The basic idea is to get a variety of people from different groups working on the project. When crafted correctly, partnerships can:

- further increase participation and buy-in;
- supply more information for the project; and
- provide more resources to the project, in terms of volunteers and potential release time for employees with similar duties (e.g., state workers).

Hansen reports that state agencies will, occasionally, devote staff time to help watershed projects once they are up and running. “This kind of assistance can be extremely helpful,” he says.

Partners that might be involved in a watershed project include: state agencies (e.g., department of environmental protection, community development offices); nonprofit services providers (e.g., the National Environmental Services Center, the Rural Community Assistance Partnership); environmental groups (e.g., Sierra Club, Trout Unlimited); extension service (the university-based USDA program with offices in every county in the U.S.); and local businesses (e.g., banks, outdoor recreation).

Hansen says, “Use available data to better understand the issues and to set realistic goals.”

The More the Merrier

The prevailing wisdom is that watershed groups should involve stakeholders (e.g., interested citizens, community groups, government agencies) from the beginning. Keep in mind, however, that unless you have some idea of what you’re doing and how you intend to do it, meetings will lack focus and potential supporters can become disillusioned. As outlined above, the core group should perform certain tasks before opening up the process.

“Once you’ve determined why you’re undertaking a watershed planning or management initiative, it is important to examine your organization’s internal goals and objectives regarding the project,” the Center for Watershed Protection notes in A User’s Guide to Watershed Planning in Maryland. “Addressing this issue before involving stakeholders will help you determine which stakeholders need to be involved based on your goals and objectives.”

Nevertheless, stakeholders should be involved as early as is logical and feasible. “A larger group of people will have a larger set of ideas and more approaches, which can lead to better solutions,” Hansen says.

“Once you’ve determined why you’re undertaking a watershed planning or management initiative, it is important to examine your organization’s internal goals and objectives regarding the project,” the Center for Watershed Protection notes in A User’s Guide to Watershed Planning in Maryland. “Addressing this issue before involving stakeholders will help you determine which stakeholders need to be involved based on your goals and objectives.”

Nevertheless, stakeholders should be involved as early as is logical and feasible. “A larger group of people will have a larger set of ideas and more approaches, which can lead to better solutions,” Hansen says.
Getting the Word Out

We live in the “Information Age,” but many worthy projects flounder because participants don’t adequately address communications efforts. The savvy watershed group will create a communications plan and consider ways to publicize their efforts in the community.

According to Model Institutions for Excellence’s *Communications Cookbook*, a good communications plan should include:

- **Goals**—Define clearly what the watershed group wants and plans to accomplish.
- **Audience**—Who is the group trying to inform?
- **Messages**—What does the group want the audience to know? Carefully think through what the content of messages will be.
- **Implementation**—How will the group convey messages to their audiences? What is the best way to achieve these goals?
- **Materials**—Develop materials that will clearly state the message and capture the audience’s attention.
- **Outcomes**—Inform the public about what the expected outcomes are of plans implemented by the group.

Once you feel comfortable with your communications plan, it’s time to let people know what you’re doing. Getting the word out can be accomplished in a number of different ways:

- **Newsletters**—If there’s enough interest in a project, a newsletter can be invaluable. These range from multi-page, commercially printed productions to two-sided photocopies (remember to leave room for the mailing address).
- **Web site**—More and more, communities are turning to the Internet to post information. Setting up a Web site has never been easier. Once it’s up and running, updates can be made and there are no printing or mailing costs.

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**WHY WATERSHED PLANS FAIL**

The Center for Watershed Protection has identified six primary reasons that watershed plans fail:

1. Planning activities were conducted at too great a scale.
2. The plan was a one-time study rather than a long-term management process.
3. Stakeholder involvement and local ownership were lacking.
4. The plan skirted land-use/management issues in the watershed.
5. The document was too long or complex.
6. Recommendations were too general.

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Source: The Center for Watershed Protection
Most watershed projects develop as a way to address a problem. But it doesn’t have to be that way. “The most compelling reason to create watershed plans is because small communities often have an excellent opportunity to protect their water resources prior to development rather than trying to restore them after degradation of water quality has occurred,” observes Chris Swann, watershed planner with the Center for Watershed Protection. “A local watershed management plan is arguably the best and most comprehensive tool to protect streams, lakes, and estuaries from the cumulative impact of land development.”

If your community is blessed with excellent water quality, a watershed organization might provide a good mechanism for keeping it that way.

Closing Thoughts

By the end of this stage of the project, the fledgling watershed group should have a core group of committed volunteers, a vision for what needs to be done, a list of desirable stakeholders and partners, a communications plan, and willingness to do the work that lies ahead. A flexible strategy and tactics will, therefore, come in handy.

Unfortunately, there is no blueprint for designing and implementing watershed plans. As A User’s Guide to Watershed Planning in Maryland notes, “Each local watershed is unique, with a different combination of impacts, planning objectives, development pressures, stakeholders, and local protection capacity. Consequently, watershed planning is always somewhat improvisational: a unique sequence of planning methods is applied to arrive at the desired outcome.”

Many things will change and new challenges will emerge as the project develops. In reality, the best people to understand what will work in a community are the people who live in that community.

What must drive these efforts, though, is an unwavering commitment to do what it takes to save the watershed. When you encounter difficulties, as you inevitably will, keep in mind the words of the anthropologist Margaret Mead: “Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.”

For More Information


References


Local legend has it that Deckers Creek was one of the finest trout streams in the East during the 18th and early 19th centuries. By the end of the 20th century, though, the creek, which runs through two counties in northern West Virginia, was a stinky, orange mess. Fouled by acid mine drainage, industrial waste, and raw sewage, Deckers was categorized “severely impaired” by the state Department of Environmental Protection and, for most of its length, nearly devoid of life.

In 1995, a group of kayakers, rock climbers, and other environmentalists formed the Friends of Deckers Creek (FODC) to address the pollution problems. Initial activities included an Adopt-a-Highway program and trash clean-ups that removed literally tons of waste from the watershed. Early on, the FODC launched CarpFest, an annual community picnic and fundraiser that continues to this day.

By the late 1990s, group members had conducted various water quality studies and the state of West Virginia had kicked in a grant of $5,000 to help these efforts. By the group’s 10th anniversary, they had secured a $200,000 U.S. Environmental Protection Agency grant and commitments from the state and the U.S. Natural Resources Conservation Service for $10 million to address acid mine drainage cleanup.

Along the way, the FODC forged key partnerships with state government, nonprofit environmental groups, and West Virginia University’s National Mine Land Reclamation Center. In 2000, FODC was incorporated as 501c(3) organization and held its first membership drive.

For residents of the area, the group’s efforts have made a noticeable difference. People now enjoy biking along a rail/trail that parallels the creek and other outdoor enthusiasts are visiting the area. As FODC President Evan Hansen likes to say of the creek, “Ten years ago we were picking up trash. Ten years from now we’ll be fishing in it.”

To learn more about the Friends of Deckers Creek, visit their Web site at www.deckerscreek.org
Many experts see watershed planning and management as an effective way to deal with water and wastewater issues. NESC presents a four-part series about watersheds that will provide an overview about how to start a watershed initiative, how to assess problems, how to develop a workable plan, and how to implement these watershed efforts.
nce your fledgling watershed group has formed and come up with some ideas about what it wants to accomplish, it’s time to get a better understanding of the actual conditions in the watershed. Although the particulars will vary from project to project, most groups will need to know more about water quality and the sources of pollution in the water, and then go on to delineate the scale of the project and begin documenting the issues at hand.

In this article, we’ll take a look at ways of assessing the health of a watershed so that planning and restoration can proceed in a logical fashion. First, though, we need to understand some basic watershed concepts and terminology.

The Geography of Watersheds

“A watershed is the area of land where all of the water that is under it or drains off of it goes to the same place,” says Dale Kemery, press officer, U.S. Environmental Protection Agency (EPA). Sounds simple enough but those who work in watershed planning have specific terms and concepts that they employ.

Typically, the largest watershed management unit is a basin, which drains to a large river, estuary, or lake. Basin drainage areas—such as the Ohio or Mississippi Rivers—often encompass thousands of square miles.

Basins are then made up of sub-basins, which can be several hundred square miles. Sub-basins consist of groups of watersheds, which in turn comprise subwatersheds. Watersheds typically range from 20 to 100 square miles, while subwatersheds are most often 10 square miles or less.

Within subwatersheds, neighborhoods are geographic areas that share similar land uses and other characteristics. The project site is the smallest watershed management scale and is the location where a single restoration project is implemented. A watershed project often has dozens of these sites. (See Figure 1 and the Friends of Deckers Creek overview on page 17.)

While wanting to improve the entire Mississippi River is a noble goal, it wouldn’t be a practical pursuit for a volunteer watershed group. Better to start small. As the User’s Guide to Watershed Planning in Maryland notes, “Watersheds and subwatersheds are the most practical units for preparing local plans. Each watershed is composed of many individual subwatersheds that can have their own unique water resources objectives.”

This isn’t to say that smaller projects shouldn’t lose sight of larger objectives. “A watershed plan is a comprehensive framework for applying management tools within each subwatershed in a manner that also achieves the water resource goals for the watershed as a whole,” the User’s Guide states.
Once you’ve identified a watershed or subwatershed with a manageable scale, it’s time to start collecting data. Fortunately, a wealth of information is usually available to get started, often through local, state, and federal government sources. Watershed experts sometimes call the process of finding and compiling this information a desktop assessment.

"Desktop assessments fall into the ‘don’t-reinvent-the-wheel category,’” observes Craig Mains, a training specialist at the National Environmental Services Center and a leader in several watershed assessment efforts. “Watershed groups will want to piece together enough data to get a good picture of the overall health of their stream. It only makes sense to gather as much data as possible from all sources. It may take some research on the part of the watershed group to find not just what data exists, but also who knows about different sources of data, and where the data can be found.”

There are many potential sources of information but not all will be applicable to the situation at hand, so watershed groups will have to be flexible in their searches. A good place to start is with the state agency that has oversight for surface water quality in your state.

As part of complying with the federal Clean Water Act, state water quality agencies have to file a biennial list of streams that do not meet water quality standards (impaired waters) with EPA. The list is known as the 303(d) list. These agencies also have to file a biennial report on the quality of the state’s streams known as the 305(b) report. In the past, these reports were typically published separately, but they are increasingly being integrated into one report. These reports don’t typically include much raw data, but those data should be readily available from the state agency that compiled the report.

Other possible sources of information at the state level include source water assessment plans, total maximum daily load plans, national pollutant discharge elimination system reports, and special reports generated for specific watersheds. At the local level, land use plans, flood management plans, and water and sewer facility plans usually have applicable information.

“Water quality data have both a spatial and a temporal dimension,” Mains adds. “Existing data are especially valuable because they can provide historical information that might allow the watershed group to determine if there are trends in the quality of the stream over time.”

Dirty Hands, Wet Feet

Most watershed groups, after reviewing the information available to them, discover that they need more specific data to help address the unique problems they are trying to solve. “While mining existing data is a good place to start, there is no substitute for developing an on-the-ground, in-the-stream knowledge of your watershed,” says Mains. “Usually some additional assessments will be needed to get a clear picture of what is going on in the watershed.”

“Some information will likely be available,” he continues, “but it is unlikely that this data will provide all the information that a watershed group might want. State agencies, for example, will have a body of data, but because they have such a wide geographic area to cover, their data
on a particular watershed is likely to have some gaps either in terms of the number of sampling locations, the frequency of sampling, or the parameters measured. Assessments by the watershed group can fill in any gaps."

Field tests can be divided into three general categories:

1. **Chemical**, which includes measurements such as pH, conductivity, dissolved oxygen, biochemical oxygen demand, and nutrients such as phosphorous and nitrogen.

2. **Biological**, which measures some aspect of aquatic life, including tests for bacteria, benthic macroinvertebrates (e.g., insects, snails, crustaceans, worms), algae, rooted aquatic plants, and fish.

3. **Physical**, which includes measurements of some characteristic of the structure of the stream bed and banks such as the relative composition of stream bed materials according to particle size (silt, sand, pebbles, cobbles, boulders, etc), the extent that larger particles are embedded by fine sediment, the extent to which the stream bed and banks have been altered by human activity, and the overall condition of stream banks, including measuring the extent of eroded or unstable banks. Measurement of stream flow is also a physical indicator and involves measuring stream width and depth to develop a cross sectional profile and measuring stream current velocity. Other physical indicators include water clarity, water color, and temperature. Stream temperature is critical because it affects the metabolic rate of aquatic organisms and also limits the saturation concentration of oxygen in water.

Information gathered about a specific watershed or subwatershed can have utility beyond just measuring water quality. Mains says that this information is also useful in public awareness efforts.

"Well-designed assessments can provide an antidote to misconceptions that might exist about a

**FIELD TESTING FOR WATER QUALITY**

Methods for assessing water quality are typically grouped into three categories:

1. **Chemical**—measures the pH of the water and pollutants and other chemicals found in it.

2. **Biological**—gauges the extent of microbial plant, insect, and animal life in water.

3. **Physical**—examines the characteristics of the watershed, including streambed materials and banks.

Testing will vary depending on the problems inherent in the watershed and the goals of the restoration effort, as well as the resources available to the watershed group.
particular stream,” he says. “Local residents sometimes feel they know everything about a stream, which is not always the case. They may believe that the entire stream is impaired, when the impairment may be localized. Or, they may believe that a historically high quality stream is in pristine condition, while some gradual degradation may have actually occurred without much notice. Actual stream data can end such misconceptions.”

Ongoing Assessment Efforts
Assessing water quality is not a one-time activity. Watershed groups should develop a multi-year strategy to gather information about watershed conditions. “What tests or measures a group decides to conduct would depend on the mission or goals of the group, how much money they have to spend on equipment and/or lab analyses, and the capability of the group,” Mains says.

“Ideally,” EPA notes in their Watershed Approach Framework, a strategy “should recognize that responsibilities can be shared by many stakeholders and that monitoring must be done to fulfill distinct purposes: characterizing the watershed, identifying and locating specific problems, and determining if actions are effective and goals are met. A strong monitoring program should include:

- an inventory of key existing information on resources, including priority groundwater, sources of drinking water, habitat, wetlands and riparian acreage, function and/or restoration sites;
- a monitoring design that confirms or updates existing information or fills gaps and can report trends;
- reference conditions for biological monitoring programs to provide baseline data for water quality assessments and development of biological and nutrient criteria;
- data collected using comparable methods to allow aggregation of data at various scales and stored so as to be readily accessible to others (e.g., in EPA’s database STORET);
- geographic references so that monitored waters can be mapped using a geographical information system (GIS), allowing information to be aggregated on a watershed basis;
- key information on condition of waters (e.g., impaired, in need of special protection, endangered species present, threatened sources of drinking water) and causes of impairment are reported in the national water quality inventory (305(b) report); and
- collaborative efforts on existing and planned monitoring activities with other public and private institutions to share information when goals are similar.”

Invariably, watershed groups augment written plans with various maps showing water quality data. In recent years, this means using GIS. The hardware and software needed is expensive but often available at local engineering firms or colleges and universities. The
ability to update geographic information and to examine different scenarios makes this technology very appealing.

**Watershed Health Is Holistic**

Water quality is, of course, hugely important for watershed planning and restoration. But, it represents only part of the picture. In reality, numerous activities impact the watershed, some obvious and some not so obvious.

“Formerly, when most people thought about surface water quality, they focused on the network of river and streams and the discharges of contaminants into those waterbodies,” Mains says. “The watershed approach recognizes that what happens on the land surface can, directly or indirectly, affect water quality. Focusing on the stream network has been compared to analyzing the veins on a leaf, while focusing on the watershed would involve analysis of the entire leaf. Stream quality is a reflection of everything that is happening on the watershed.”

**For More Information**

The National Environmental Services Center has a section of its Web site devoted to watershed issues. Go to [www.nesc.wvu.edu/subpages/watershed.cfm](http://www.nesc.wvu.edu/subpages/watershed.cfm) for a listing of watershed resources and articles. NESC Training Specialist Craig Mains may be reached at (800) 624-8301 ext. 5583 to discuss watershed planning and restoration efforts.


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**Benthic Macroinvertebrates**

Organisms with no backbones that live on the stream, river, or lake bottom, and are large enough to be seen without magnification. They can be sampled to assess stream quality based on their numbers, diversity, and sensitivity/tolerance to pollution.

**Biochemical Oxygen Demand (BOD)**

The amount of oxygen consumed during the microbial decomposition of organic matter and the chemical oxidation of some inorganic compounds. It is measured under laboratory conditions by incubating a water sample under prescribed conditions and measuring the dissolved oxygen concentration before and after incubation.

**Conductivity**

The ability of water to carry an electrical charge. The conductivity of surface waters is largely determined by geology, so an abrupt change in conductivity may indicate a source of pollution.

**Dissolved Oxygen (DO)**

A measurement of the concentration of gaseous oxygen (O2) in water. Adequate dissolved oxygen is crucial for the maintenance of aquatic life. Oxygen is dissolved into water through diffusion from the atmosphere, by aeration, and as a product of photosynthesis. Oxygen is removed from water through the respiration of organisms and the decomposition of organic materials. As oxygen levels decrease, the types of aquatic organisms the stream can support may shift to less desirable species.

**National Pollutant Discharge Elimination System (NPDES)**

A program created as part of the Clean Water Act that works to control water pollution by regulating the discharge of point-source pollutants into U.S. surface waters. Facilities that discharge effluents directly into surface water must obtain an NPDES permit, which specifies what types and concentrations of waste may be discharged.

**Nutrients**

Typically refer to certain forms of phosphorus and nitrogen, which are essential nutrients for aquatic plants and animals. Under certain conditions, nutrients can stimulate plant and algal growth, which can potentially affect dissolved oxygen levels in the water and change the composition of aquatic life. Sources of nutrients may be from wastewater treatment plants, runoff from agricultural operations, runoff from urban and suburban areas, and failing septic systems.

**pH**

A measure of the intensity of the acid or base content of a water. pH is expressed as the negative logarithm of the concentration of hydrogen ions and is measured on a scale of 0 to 14. A pH of 7 is neutral, with lower numbers representing increasingly more acidic solutions and higher numbers more alkaline. Most aquatic life prefers pHs in the range of 6 to 9, with long-term deviations outside that range resulting in stress on aquatic life that may affect survival.

**Total Maximum Daily Load (TMDL)**

Calculates the maximum amount of the pollutant a water body can receive and still meet water quality standards. It identifies and quantifies the sources of the pollutant, both point and non-point source, and, using computer modeling, determines how the inputs must be reduced from the various sources in order for the water body to meet water quality standards. A water body may have multiple TMDL studies for different pollutants.
The Maryland Department of Natural Resources developed *A User’s Guide to Watershed Planning in Maryland*, which may be downloaded from [http://dnr.maryland.gov/watersheds/pubs/planninguserguide/UserGuideCover-Ack.pdf](http://dnr.maryland.gov/watersheds/pubs/planninguserguide/UserGuideCover-Ack.pdf). Although tailored to watershed efforts in Maryland, the guide is useful to groups in other parts of the country. A section of the site features tools and worksheets that can help document assessment efforts.

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West Virginia Department of Environmental Protection. Date Unknown. *Guidelines for Preparing Monitoring Study Design Plans*. Charleston, WV: WV DEP.

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**Finance**

- **DWBKFN30** Catalog of Federal Funding Sources for Watershed Protection

**General Information**

- **SFQUNL28** Making an Impact: The Watershed Approach
- **DPBLGN02** Demonstration of Innovative Onsite Wastewater Systems in the Green Hill Pond Watershed of Rhode Island
- **DPBLGN03** Innovative Technology and Management District Demonstration in an Impaired Watershed in Southern Pennsylvania
- **GNBLGN03** Watershed Protection Approach: An Overview
- **GNBKGN12** Community-Based Environmental Protection: A Resource Book for Protecting Ecosystems and Communities (CD-ROM)
- **GNBLGN13** Environmental Indicators of Water Quality in the United States
- **GNBKGN14** Watershed Protection: A Statewide Approach
- **FMBLGN14** Watershed Approach Framework
- **GNBKGN16** Quality of Our Nation’s Waters: Nutrients and Pesticides
- **WWPKGN86** Nonpoint Pointers: Understanding and Managing Nonpoint Source Pollution in Your Community
- **WWBKGN96** Compendium of Tools for Watershed Assessment and TMDL Development
- **WWCDGN265** Watershed-Based National Pollutant Discharge Elimination System (NPDES) Permitting Implementation Guidance

*See page 22 for additional listings.*
A Modest Beginning
Friends of Deckers Creek Measures Water Quality

Editor’s Note: In each segment of the four-part series about watershed groups, we’ll show how the Friends of Deckers Creek, a successful watershed organization in West Virginia, has implemented the ideas presented in this article in their restoration efforts.

Founded in 1995, the Friends of Deckers Creek (FODC) watershed group has worked diligently to restore an impaired waterway in northern West Virginia.

The Deckers Creek watershed, although relatively small, has several factors that influence water quality. Primarily, there is a legacy of acid mine drainage from abandoned coal mines that adds acidic water and iron to the stream resulting in stretches with very sparse aquatic life. However, a sizeable limestone quarry and runoff from the stockpiles of crushed rock has a neutralizing effect on the acid water. (See the map at right.)

To get an initial idea of what was going on in the water, the group conducted a benthic macroinvertebrate survey of the watershed. “We chose this type of survey because we wanted an overall assessment of the health of the watershed,” recalls Craig Mains, a training specialist with the National Environmental Services Center and a founder of the FODC. “Because the benthic organisms have extended life spans in the aquatic environment they are exposed to the entire range of water quality conditions and because different organisms range from pollution tolerant to pollution sensitive they are excellent indicators of stream health. Also, because they don’t require much investment in terms of collection equipment, this type of study made sense for a group that had more time than money.”

Mains and other volunteers collected samples at 40 sites in the watershed, once in the spring and once in early fall. They also measured pH, conductivity, and temperature, but the focus was on the benthic macroinvertebrates. After analyzing the samples for diversity, pollution tolerance/sensitivity, and overall numbers, the group assigned a stream quality rating for individual stream segments and created a color-coded stream map that graphically showed stream quality for the watershed in a way that the general public could understand.

“The general public impression of the creek was that, while some of the tributaries were in fairly good shape, the main stem of the stream was polluted from beginning to end to the extent that it supported almost no life,” Mains says. “We knew that the upper section of the main stem was acidic and that there was some recovery in pH levels below the limestone quarry, but that the pH readings dropped once again further downstream below where additional acid mine drainage entered. The benthic survey, however, showed that, far from being lifeless, aquatic life had recovered considerably downstream of the quarry. This led us to believe that if the primary source of acid mine drainage in the lower watershed was treated the lower section would become fishable.”

Since 2002, FODC has conducted quarterly chemical monitoring and semi-annual biological monitoring for benthic macroinvertebrates and fish at fixed sites across the watershed. By publishing these data in annual State of the Creek reports, the group has educated the local community and agencies about the true conditions of the creek. FODC data has also been valuable in securing funding to mitigate several acid mine drainage sites in the watershed.

To learn more about the Friends of Deckers Creek, visit their Web site at www.deckerscreek.org.
Many experts see watershed planning and management as being an effective way to deal with water and wastewater issues. NESC presents a four-part series about watersheds that will provide an overview about how to start a watershed initiative, how to assess problems, how to develop a workable plan, and how to implement these watershed efforts.
The previous article in this series examined different ways to evaluate the health of a watershed. Whether through existing studies or field assessments or, more likely, a combination of the two, your group should have a pretty clear understanding of the problems you face and which merit the most attention.

If, for example, you live in an area with many farms, you may have to deal with excess nutrients such as nitrogen and phosphorous in the water. In other regions, failing septic systems are the number one issue. Elsewhere, the legacy of industrial pollution may be causing most of the problems.

Whatever the challenges your watershed faces, the next task is to describe the overarching issue that is to be rectified and develop a list of projects that will directly benefit the effort. Most groups cannot tackle an entire watershed and its multiple problems all at once. Rather, they start with the most pressing concerns or those that can be quickly and easily resolved, and then move on to the next project on the list.

Involve Stakeholders

The core group of dedicated individuals has already performed much important work delineating the scope of the project and assessing the challenges ahead. Now, it’s time to involve a larger group, usually referred to as stakeholders. Ideally, these stakeholders have both a vested interest in the health of the watershed and the resources to help implement solutions.

“Before building your stakeholder group, spend some time researching the key interest groups in your community,” the U.S. Environmental Protection Agency (EPA) advises in the publication *Getting in Step: Engaging and Involving Stakeholders in Your Watershed.* “If the community will be responsible for implementing the management strategies developed, it is vital that a cross-section of the community participate in the process.”

Identifying stakeholders can be tricky and other groups or individuals may have started similar work. “A way to spearhead this effort is to talk with local government or agency officials who are already working in the field or on streams with landowners, or with other community groups,” says Adam Webster, conservation director with the West Virginia Rivers Coalition. “These folks can usually recommend a contact, or may be interested in the project themselves.

“Community or informational meetings about the project or effort—advertised in local papers, grocery stores, post offices, and other outlets—are useful ways to get people’s attention, as well as a way to get more people involved,” he says. “Initial outreach efforts
can be limited simply by time or by lack of knowing how many people in the community may be interested in a watershed issue.

“It’s often a good idea to step outside of your own boundaries and comfort levels to solidify a diverse group,” Webster continues. “If you know someone who is affected by something you are doing, that automatically makes him or her a stakeholder. Not too many folks are opposed to the idea of a watershed group. But, there will certainly be differing opinions about projects and other group-related efforts. If you feel a group or individual may have an opposing position to your group’s interests, it doesn’t hurt to invite them to the table. From a community perspective, it is only fair to at least allow them to express their concerns at an informational meeting.”

**Hold Public Meetings**

EPA’s guide *Getting In Step* advises, “Once you’ve developed a list of stakeholders, invite them to participate in writing. If someone in the community recommended them, be sure to include that person’s name in the letter. To increase the chances of participation, tailor each letter with the reasons why they need to be involved in the project. For example, if you’re trying to get representation from the building community, you might want to highlight the fact that no one from the building community is involved with the watershed community is involved with the watershed planning process.”

“Follow up your letter with a personal phone call to answer any questions and confirm their participation,” EPA’s guide continues. “Be prepared for resistance. If the potential stakeholders say they can’t participate in the kickoff meeting, make sure you send them any information that comes out of the meeting and ask if there is someone from their organization who could attend in their place.”

Webster notes three common pitfalls that watershed groups often encounter as they work to involve the community: (1) not doing enough outreach, (2) being too complicated, and (3) being naive about how issues are understood in the community. “Not putting enough initial effort toward reaching out to various stakeholders can nip at your heels down the road,” he says. “Make an effort—through flyers, or even a local news story—if you want to educate the community about your project, the odds are reduced.”

Similarly, presenting too much information or complicating the issue can alienate people. “Don’t feed people too much information at once,” Webster suggests. “Give them time to digest what information is provided. Define your goals and explain your interest in having them as a stakeholder. Make progress one step at a time.”

It may be useful to think of information about your watershed in layers. You should have general...
information that can be presented to the media or in public forums. A second layer provides more detail that may be useful to individuals who want to become involved in the effort or for more specialized publications. A third layer is the all-the-details, scientific data that may only appeal to specialists.

Keeping it simple doesn’t mean that your information should be dumb. After all, Albert Einstein maintained that you should be able to explain your ideas to a six-year old. By knowing your audiences, you can present information that is easily understood. (See the sidebar on 20.) The simpler the message, the harder it is to misconstrue.

“At times, watershed efforts can get framed as an attack on a particular group or individual who is polluting a watershed,” Webster says. “Whatever the case, don’t point fingers in any one direction when initially seeking stakeholders. Remain open: the person or entity polluting the watershed may actually want and/or need help to stop their violations. If the rest of the community perceives that your watershed efforts somehow pose a risk to jobs or businesses, you may receive negative feedback from the start. Control your message and be sensitive to community issues.”

Strategic Planning

Once you’ve held public meetings and gotten initial stakeholder involvement, it’s time to turn ideas into action. Strategic plans provide a way to not only identify the issues but to map a way to get to an agreed-upon solution. Four questions are common to most planning endeavors:

1. Where are we now?
2. Where do we want to be?
3. How do we get there?
4. How will we measure our progress?

To answer these questions, the strategic plan should determine community needs, create projects to fulfill those needs, determine what the projects will cost, and figure out a way to pay for them.

“Good watershed plans do not need to be long or complex,” notes the Users Guide to Watershed

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STAKEHOLDER EXPECTATIONS

According to researchers at the Social and Environmental Research Institute in Massachusetts, participants in public involvement efforts want:

- Access to the process,
- The ability to influence the plan and its outcomes,
- Access to information,
- A structure that promotes constructive interaction,
- Adequate analyses, and
- The option for future processes.

Source: Social and Environmental Research Institute.
Planning in Maryland. “Instead, they should be written with the punch of a newspaper article, and clearly specify the ‘what,’ ‘why,’ ‘when,’ ‘where,’ ‘how much,’ and ‘by whom’ of the recommended projects. The main body of a good watershed plan should be no more than 20 to 40 pages long, with a table of key recommendations and a watershed map showing specific project locations.”

Looking Ahead

As you build your watershed group and begin implementing plans, you may feel like you’re making stuff up as you go along. You are not alone.

According to the Users Guide, “Much of the watershed planning field is so new that each plan is basically its own watershed experiment. As a result, it is important to institute tracking and monitoring systems. These systems include the internal tracking of the delivery of restoration projects, monitoring of stream indicators at sentinel monitoring stations, or performance monitoring of individual restoration projects. Information gathered from tracking systems is then used to revise the plan over a five- to seven-year cycle.”

“Stakeholders can contribute to strategic planning by helping to seek grounded solutions that protect the interests of various parts of a community,” Webster says. “Stakeholder groups provide an opportunity for various interest groups to voice their concerns and gain perspectives. They are an invaluable way to spread ideas and share resources. And, individual stakeholder group members can also serve a delegate role. A farmer, for example, can carry messages about a watershed effort back to other farmers, a business owner can carry information to other business owners, and similarly for the other members of the group.”

For More Information

Founded in 1995, the Friends of Deckers Creek (FODC) watershed group has worked diligently to restore an impaired waterway in northern West Virginia. Originally formed by a group of kayakers, rock climbers, and other environmentalists, the FODC now has a board of directors representing a cross-section of the community, including a fisheries professor, professional writer, high school teacher, lawyer, environmental consultant, and small business owner.

How did the FODC get the public involved in their effort? “We have involved different community members in different ways,” says Martin Christ, executive director of the FODC. “One of the most important methods has just been asking people we know to join us and help. [Nearby] West Virginia University has been a huge help as well. Many faculty who share our commitment to cleaning up Deckers Creek have invited us to tell our story to their classes, or have helped us recruit volunteers.” The group keeps people involved through a quarterly newsletter that currently has more than 1,200 subscribers.

The FODC also hosts regular public gatherings. The group sponsors an annual festival (CarpFest), fundraisers with live music at a local brewpub, and numerous appearances at public forums. According to Christ, these events have also been important for drawing in new people.

“We have also visited local government bodies and county commissions,” Christ says. “They let us know that they stand with us in the mission.”

To learn more about the Friends of Decker’s Creek, visit their Web site at www.deckerscreek.org.
Many experts see watershed planning and management as being an effective way to deal with water and wastewater issues. NESC presents a four-part series about watersheds that provides an overview about how to start a watershed initiative, how to assess problems, how to develop a workable plan, and how to implement these watershed efforts.
Almost any time a person starts a new endeavor, there's a palpable sense of enthusiasm and energy. However, we all know that the initial excitement tends to fade and it's usually harder to keep the ball rolling than it is to get the ball rolling in the first place. Watershed groups are no exception to this fact of life.

If you've followed the watershed plan we've laid out in the previous three installments of this series, you have a core group of people who are committed to the project or projects in the watershed, you have compiled some information about water quality, you've involved community stakeholders in your project, and you've developed a plan about how to tackle the problems that confront you. How, then, can you sustain the level of interest necessary to see that vision becomes reality?

Many watershed groups have found that they can maintain momentum through a combination of (1) regular communication, (2) more organizational structure, and (3) securing funding. This article examines these three components, as well as ways to measure progress toward the goals defined in the group's plan.

Publicize Your Group's Activities

Even the best project will have trouble if people don't know about it. Getting the word out about your project can be accomplished in a number of different ways:

- **Newsletters**—If there's enough interest in a watershed project, a newsletter can be invaluable. These range from multi-page, commercially printed productions to two-sided photocopies (remember to leave room for the mailing address).
- **Web site**—More and more, communities are turning to the Internet to post information. Setting up a Web site has never been easier. Once it's up and running, updates can be made and there are no printing or mailing costs.
- **Cable**—Most cable television companies have a channel devoted to community events. This is typically a free service and a great way to publicize things like public meetings.
- **TV and Radio**—Radio and television stations make public service announcements about public events.
- **Local Media**—Local talk shows are often willing to host a show about the project being suggested. Similarly, the local newspaper will be interested in running a story about the project.
- **Mailings**—You may wish to reach stakeholders via direct mail. Watershed groups should develop their own mailing lists and can sometimes use kindred groups for outreach of this kind.
tanks with fish caught from Deckers Creek, and booths from local nonprofits and agencies.” (See the sidebar on page 29 for more information about the Friends of Deckers Creek.)

**Becoming More Structured**

It’s okay for a group to start out without much structure. In fact, most watershed groups start with hardly any structure at all. Once things get rolling, though, the need for a more defined structure becomes apparent. For many groups, this means becoming a registered non-profit organization, often referred to as a “501(c)(3) group” because of the Internal Revenue Service designation for such organizations.

“You’ll want to get 501(c)(3) status if you begin to apply for grants, because most grants can only go to nonprofits,” Hansen says. “An alternative is to use an existing nonprofit as your fiscal agent. If your organization is raising and spending any significant amount of funds, you should strongly consider incorporating and having a board of directors.”

“A corporation, whether for-profit or nonprofit, is required to have a governing board of directors,” says Carter McNamara who teaches at St. Thomas University and helped found the Management Assistance Program for Nonprofits in Minnesota. “A corporation can operate as a separate legal entity, much like a person in that it can own bank accounts, enter into contracts, and so forth. However, the laws governing corporations require that a corporation ultimately is accountable to its owners (stockholders in the case of for-profits and the public with nonprofits). That accountability is accomplished by requiring that each corporation have a board of directors that represents the stockholders or the public.”

“Celebration should play an important part of building support. After all, undertaking a community project doesn’t have to be all drudgery. The Friends of Deckers Creek realized this early on and started an annual party called CarpFest, named for that hardy fish that can survive even the most polluted water.

“We use CarpFest to celebrate the creek and as an educational tool,” Hansen says. “Some people are interested in water issues because they like to have fun and to learn and celebrate with like-minded people in the community. At CarpFest we always have music and kids’ activities but we also have educational activities like a stream walk to find bugs, One of the keys to effective communication is to get the message out in as many formats as possible and to repeat the message as often as possible. You never know where or when someone will hear what you’re saying.

According to Evan Hansen, president of the Friends of Deckers Creek watershed group, a good technique is to “publicize each successful step along the way, using the local media, your newsletter, e-mail lists, or public meetings. It’s especially important to get coverage when, for example, you receive a grant, design a remediation project, or start a construction.”
In 2008, NESC, in partnership with the Rural Community Assistance Partnership (RCAP), launched *SMART About Water*, a project designed to assist small communities in their efforts to protect drinking water quality. Funded by the U.S. Environmental Protection Agency, the project provides training and technical assistance about source water and wellhead protection, with a special focus on untreated wastewater from failing septic and sewer systems, the largest contributor to water quality degradation.

To learn more about this project, call NESC at (800) 624-8301 or visit the *SMART About Water* Web site at [www.nesc.wvu.edu/SMART/](http://www.nesc.wvu.edu/SMART/).
range of personalities. Some examples include:

- working boards (where board members might be fixing the fax one day and strategic planning the next),
- collective boards (where board members and others in the organization usually do the same types of work and it’s often difficult to discern who the board members actually are),
- policy (where board members attend mostly to top-level policies), and
- policy governance (where there are very clear lines between the board and the CEO).

“Boards play a very important role in overseeing the organization, fund raising, and for most organizations, also providing volunteer labor,” Hansen observes.

While adopting more and more structure, remember that boards, like people, usually change over time. According to McNamara, “Some people believe in life stages of boards, including that they start out as working boards, where members focus on day-to-day matters in addition to strategic matters, evolve to policy boards, where members focus mostly on strategic matters, and eventually become large, institutionalized boards with small executive committees and a larger group of directors, some of whom are ‘big names’ to gain credibility with funders or investors."

Working With Volunteers

Regardless of the particular structure your group adopts, people donating their time and talent form an integral part of every watershed group. But having volunteers also means work for the group’s leaders. Without direction and purpose, people will lose their focus and gravitate away from the project.

“You should be clear about what you expect from each of your volunteers,” McNamara says. “Volunteers deserve to know what you expect from them, as well. To recruit volunteers for a specific role or job, you will need a clear job description from which to develop the advertisements and to show to any potential candidates.”

Volunteers are often found through the networks of the people who started the watershed group. More volunteers will appear when news of the project hits the media and through word of mouth. If you have an especially large task or are undertaking a new project, you may wish to advertise for volunteers in the local newspaper and online.

After 10 years, the Friends of Deckers Creek had grown to the point that they were able to hire a director. More volunteers will appear when news of the project hits the media and through word of mouth. If you have an especially large task or are undertaking a new project, you may wish to advertise for volunteers in the local newspaper and online.

“People believe in life stages of boards, including that they start out as working boards, where members focus on day-to-day matters in addition to strategic matters, evolve to policy boards, where members focus mostly on strategic matters, and eventually become large, institutionalized boards with small executive committees and a larger group of directors, some of whom are ‘big names’ to gain credibility with funders or investors.”

Finding Money and Measuring Success

Once a watershed group has identified the work that needs to be done and has recruited a cadre of volunteers, the question of funding usually comes up. There’s only so much work that can be done on a budget of zero.

At the same time, it’s important to remember that funding for environmental projects is extremely tight at the moment. Investigating local, state, and federal sources of money can be worthwhile. Another good idea is to seek support in the community. Banks, local companies, and community foundations often participate in these sorts of activities.

Hansen suggests researching the conventional wisdom about funding nonprofit organizations. “It’s important to diversify your funding between your membership, special events, and grants,” he says. “These feed on each other too. For example, if you have a strong membership, your grant applications will be taken more seriously. If you have grants for remediation projects and are reducing pollution, it’s easier to ask for membership contributions from the local community.”

If you get money, whether it’s from a local business or a government grant, you’ll need to report how the funds were spent and what the outcomes were. Even if you aren’t required to do this, a regular assessment of your work is a worthwhile activity.

“Program evaluation is carefully collecting information about a program or some aspect of a program in order to make necessary decisions about the program,” McNamara says. “The type of evaluation you undertake to improve your programs depends on what you want to learn about the program. Don’t worry about what type of evaluation you need or are doing—worry about what you need to know to make the program decisions you need to make, and worry about how you can accurately collect and understand that information.”

Only the Beginning

Undertaking a watershed project can be overwhelming. There are so many things to consider and numerous tasks that must be performed for the work to proceed. The items discussed in this article—good communication and funding in particular—are essential for your project to move forward.

While the path will be difficult at times, it will not be without satisfaction. Celebrate your victories, no matter how small, and learn from your mistakes, no matter how big they may be. Your diligence and hard work will be rewarded, in no small part, with the knowledge that you’ve helped make your community a better place.
Founded in 1995, the Friends of Deckers Creek (FODC) watershed group has worked diligently to restore an impaired waterway in northern West Virginia. Originally formed by a group of kayakers, rock climbers, and other environmentalists, the FODC now has a board of directors representing a cross-section of the community, including a fisheries professor, professional writer, high school teacher, lawyer, environmental consultant, and small business owner.

The FODC has grown steadily over the past decade. Among the milestones are: obtaining 501(c)(3) status, receiving state and federal funding for stream restoration, undertaking a substantial membership drive, and hiring their first staff member.

“There is probably no right way to grow a watershed organization,” says Martin Christ, FODC executive director and the first paid staff member hired by the group. “But there are many crucial things to keep in mind:

- Gather as much information as you can. State workers often know quite a bit about individual watersheds. Make sure you know all that they know, and then start learning more.
- Find a way to pay people. By paying people, you can hold them accountable for what needs to get done.
- Look for easy successes. They may be reports, events or ad campaigns rather than remediation projects, but a track record of small successes can often lead to larger projects.
- Get a diverse board of directors to represent many different parts of the community.
- Spend time being a good organization, including keeping good, clear accounting and meeting minutes.”

This summer, the FODC started a three-week camp for area teens. Dubbed the “All Hands on Deckers Creek Camp,” the new program involved different community groups and featured both work in the creek and more light-hearted activities such as sculptures made from discarded materials found in the waterway and tie-dyed shirts. On the final day of camp, the participants made a presentation to Morgantown City Council.

To learn more about the Friends of Deckers Creek, visit their Web site at www.deckerscreek.org.
There are numerous Internet sites devoted to watershed issues. Here are several that have information about field assessment techniques, monitoring, and stream restoration.

National Watershed Coalition
www.watershedcoalition.org

The National Watershed Coalition is a membership organization made up of national, regional, state, and local organizations, associations, and individuals, that advocate dealing with natural resource problems and issues using watersheds as the planning and implementation unit. Their Web site provides information about watersheds, legislation affecting watersheds, and various brochures and reports.

The Chesapeake Bay Program
www.chesapeakebay.net

This program is a regional partnership of various state, federal, academic, and local watershed organizations that builds and adopts policies supporting restoration of the Chesapeake Bay. Their Web site features an information clearinghouse, publications, maps, and data.

The Watershed Management Council
www.watershed.org

The Watershed Management Council has a mission of “advancing the art and science of watershed management.” Included on this site are various issues of their newsletter, each containing multiple topics related to watershed management.

Izaak Walton League
www.iwla.org

For more than 30 years, the Izaak Walton League has been involved in watersheds through their Save Our Streams program. This part of their site has different tools for effective watershed improvement projects, including a stream monitoring and restoration database.

The River Network
www.rivernetwork.org

River Network is a national nonprofit organization working for clean and healthy waters. The Portland, Oregon-based organization supports grassroots groups working for watershed protection. Their Web site includes a resource library, networking opportunities, and information about the Network’s services such as training and consultation.

Water Footprint
www.waterfootprint.org

The water footprint of an individual, business, or nation is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual, business, or nation. This site provides information for national water footprints and a calculator for learning how much water an individual uses.

U.S. Geological Survey
http://water.usgs.gov/nawqa/

The U.S. Geological Survey has a wealth of information about water issues. The National Water Quality Assessment Program monitors various rivers and streams around the country, including pollutant levels for pesticides, nutrients, and volatile organic compounds.

Center for Watershed Protection
www.cwp.org

The Center for Watershed Protection is a nonprofit organization that provides local governments, activists, and watershed organizations around the country with the technical tools for protecting streams, rivers, and lakes. The center has created and distributed a multidisciplinary strategy for watershed protection that encompasses planning, restoration, research, site design, education, outreach, and training. The site includes a calendar of events, publications, listing of watershed projects, technical tools for assessing and protecting watersheds, and a watershed quiz.

Global Rivers Environmental Education Network
www.earthforce.org/section/programs/green

The Global Rivers Environmental Education Network site shows ways to educate a community about the benefits of healthy watersheds. Numerous publications about watershed improvement programs are available.

Water Quality Information Center
www.nal.usda.gov/wqic

The U.S. Department of Agriculture’s Agricultural Research Service maintains a Web site with information about water and agriculture. The Water Quality Information Center site includes searchable databases, bibliographies, discussions lists, and news.

From aquatic and wetland plants to water conservation, information is available on numerous water-related topics. The site features a section titled “Funding” that provides a comprehensive list of federal money available for water projects. This section may be accessed at www.nal.usda.gov/wqic/funding.shtml.
The Natural Resources Conservation Service (NRCS), formerly called the Soil Conservation Service, provides information for those involved in watershed planning and source water protection.

According to the NRCS Web site, “communities and local governments work with NRCS state offices and local USDA [U.S. Department of Agriculture] Service Centers to help them protect their natural resources. NRCS also provides information on climate change, water management, watershed planning, and flood control. A coalition of state conservation agencies, The National Association of State Conservation Agencies, provides guidance and operates state environmental, sediment control, and soil erosion prevention programs. The Resource Conservation and Development program focuses on improvement of quality of life achieved through natural resources conservation and community development. NRCS can provide grants for land conservation, water management, community development, and environmental needs in designated areas.”

The site features information on community planning, water quality, water management, water supply, watershed protection, and flood prevention. Watershed planners will want to download the National Watershed Manual (www.nrcs.usda.gov/programs/watershed/NWSM.html). Those involved with source water protection should visit the National Water Management Center (wmc.ar.nrcs.usda.gov).

Low Impact Living
www.lowimpactliving.com

A Los Angeles-based Web site was recently launched to help Americans make their homes more environmentally sensitive. The site Low Impact Living notes that our homes are responsible for two to three times the environmental damage as our cars are, although the latter receives much more attention with respect to pollution.

The site allows users to calculate their environmental impact and provides recommendations about how users can foster sustainability. Topics include water and energy use, trash and sewage production, carbon emissions, and more.

As the Web site states, “At Low Impact Living, we want to help you lower the environmental impact of your home and your daily life. To do that, we help you find the best green products, practices and service providers to help you achieve your environmental goals. And we will also help you understand the environmental benefits and economic trade-offs of your choices. Our primary goal is to make the path from inspiration to implementation as short and as smooth as possible. Only by taking action will we collectively reduce the damage to our planet and ecosystems.”

The Biodiversity Project
www.biodiversityproject.org

The Biodiversity Project Web site has environmental outreach information, including fact sheets for creating effective messages, developing grants, and using public opinion research firms.

Science Daily
www.sciencedaily.com

Each of the last three years, Science Daily has been the winner of Popular Science magazine’s “Top 50 Web Sites.” This free, advertising-supported service brings you breaking news about the latest discoveries and hottest research projects in everything from astrophysics to zoology. The Earth and Climate section is of particular interest for people dealing the water and wastewater issues.

The site’s articles are selected from news releases submitted by leading universities and other research organizations around the world. Each news release is posted in its original form, with a link to the organization’s home page, to help those interested in finding up-to-date and relevant background information about a topic.

Management Help Available
www.mapfornonprofits.org

Running a nonprofit organization like a business is easier said than done. The Management Assistance Program for Nonprofits (MAP) provides management and board development services for nonprofit organizations and governmental agencies, such as water utilities.

From financial management and accounting to strategic planning, MAP will conduct an assessment of your needs at no charge and with no obligation. They will then give you a cost estimate for services. Call MAP at (651) 647-1216 or visit their Web site for more information.

Located in St. Paul, MAP provides services in Minnesota. Their Web site provides links to similar training in other areas, although not all states are represented.

The MAP Web site also provides a link to the Free Management Library (www.managementhelp.org). With more than 675 topics arranged in 75 categories, this site provides comprehensive coverage of management issues. Whether it’s problem solving or public relations, customer service or computer skills, risk management or research methods, you’ll find the information you need for your system presented in an easy-to-comprehend style.

The National Environmental Services Center
www.nesc.wvu.edu

The National Environmental Services Center (NESC)—home to both the National Drinking Water Clearinghouse and the National Small Flows Clearinghouse—has devoted a section of its Web site to watershed issues. Included are articles about watersheds (including the first two installments of the four-part series currently running in On Tap magazine), information about source water protection and onsite wastewater management, and links to other sites devoted to watershed issues. NESC water and wastewater engineers are also available to answer questions. Call toll-free (800) 624-8301 and select option 3 to speak to one of our technical staff.

See the back cover of this publication for additional US EPA watershed-related web resources
Water Quality Report
www.epa.gov/305b
Includes National Water Quality Inventory reports to Congress, fact sheets, and a brochure.

State Source Water Assessment and Protection Programs
http://cfpub.epa.gov/safewater/sourcewater/
Provides information about each state’s source water assessment program, including background about the program and contacts in each state.

STORRET
www.epa.gov/storet/
Has raw water quality data, including where and when samples were taken, sampling methods used, and the laboratory that performed the analysis.

Total Maximum Daily Load Program
www.epa.gov/owow/tmdl
Provides general and state-specific information about the maximum amount of pollutants that a waterbody can receive and still meet water quality standards.

Adopt Your Watershed
www.epa.gov/adopt
Information about watersheds, as well as ways to add your watershed group to their database.

Surf Your Watershed
www.epa.gov/surf
Provides the ability to locate and check on the health of watersheds, find restoration efforts, and obtain real-time water quality data for participating states.

EPA’s Watershed Home
www.epa.gov/owow/watershed/
Provides an overview of watershed-related topics.

- Newsletter
  www.epa.gov/watershed/winnews/

- Funding
  www.epa.gov/owow/funding.html

- Tools
  www.epa.gov/owow/watershed/tools/

- Training
  www.epa.gov/owow/watershed/wacademy/

- Section 319 Nonpoint Source Program Grants
  www.epa.gov/owow/nps/cwact.html

- Targeted Watersheds Grants Program
  www.epa.gov/owow/watershed/initiative

- Watershed Approach Framework
  www.epa.gov/OWOW/watershed/framework.html