# WATERSHED SCIENCE BULLETIN

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*A program of the Center for Watershed Protection, Inc.*
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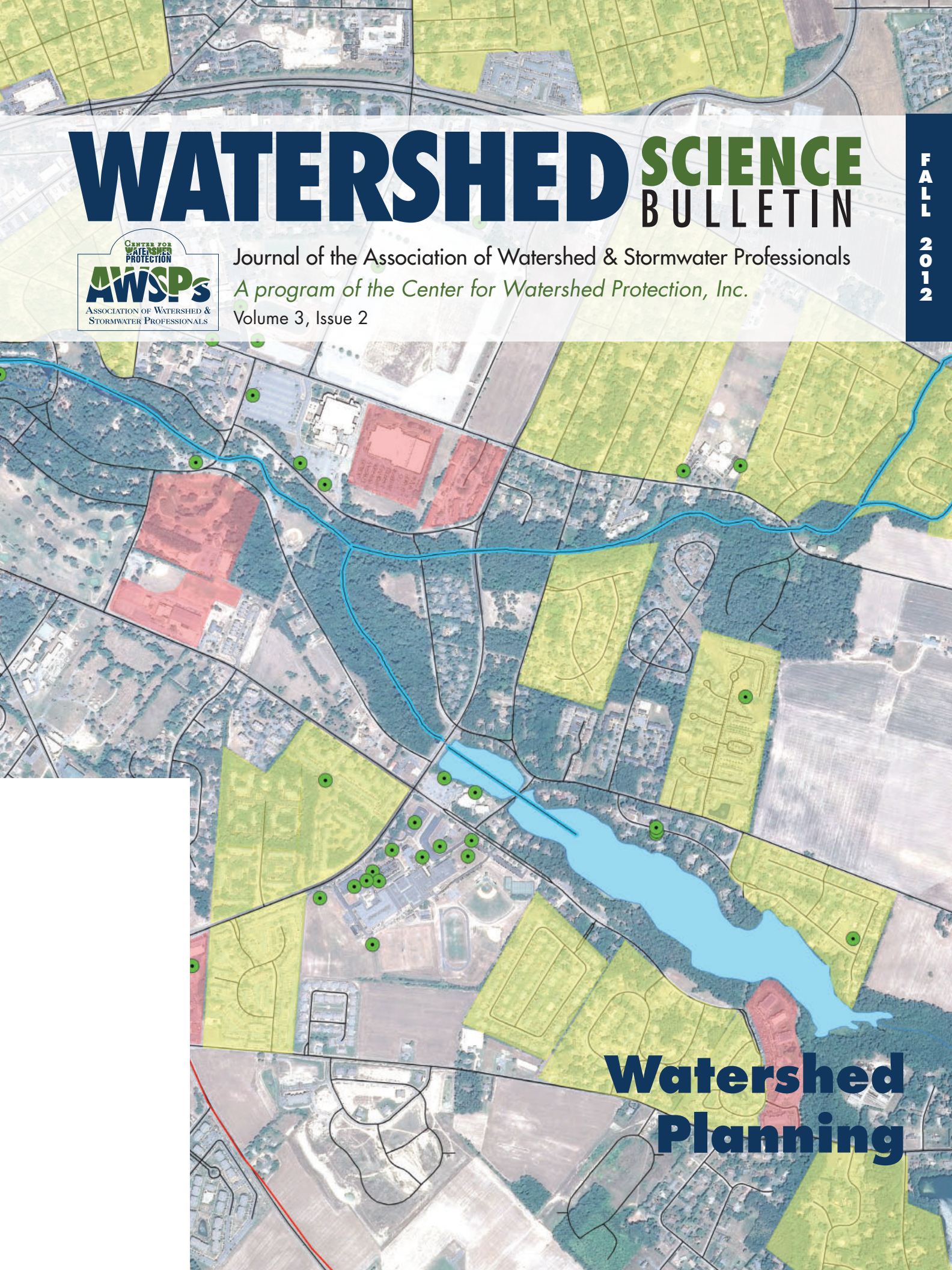

## Watershed Planning

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**Cover photo courtesy of the Center for Watershed Protection**
showing Wicomico River watershed field assessment locations in Salisbury, Maryland.



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## BULLETIN DEPARTMENTS

**HAVE A QUESTION YOU'D LIKE US TO ASK OUR EXPERTS?** *The upcoming Spring 2013 issue will focus on green infrastructure and will support national and local efforts to help fill gaps in our knowledge about the performance and cost-effectiveness of green infrastructure in site- and landscape-scale applications, approaches taken to implement green infrastructure within a community, and how green infrastructure, in its many forms, fits into programs to protect and restore watersheds. AWSPs members and Bulletin subscribers may email their questions to bulletin@awsps.org. The Bulletin features interviews with experts in the watershed and stormwater professions to discuss the topic of each issue. In this issue, four professionals provide insight into the origins of watershed planning and how it has evolved and adapted to fit local program needs for both urban and agricultural watersheds. Here is what our experts had to say…*

## Dov Weitman

*Chief, US Environmental Protection Agency, Nonpoint Source Control Program (Retired)*

Dov Weitman received a BA in mathematics from Yeshiva University in 1973 and a JD from Harvard Law School in 1976. After two years in private legal practice, Dov joined the US Environmental Protection Agency (USEPA) in 1978 and worked as a lawyer for 11 years. In that capacity, Dov focused on developing regulations for USEPA's water quality and hazardous waste programs and defending those regulations in federal courts. Beginning in 1989 and continuing until his retirement on January 1, 2012, Dov served as chief of USEPA's Nonpoint Source Control Program, managing a highly diverse management program that encompassed agriculture, urban runoff, hydrologic and habitat modification, forestry, grazing, stream restoration activities, and the protection of healthy watersheds. For more information about some these programs, please see the Resources list.

**Q: How have you been involved in watershed planning?**

**A:** I worked at USEPA for 33 years beginning in 1978. At first, I used my background in law for rulemaking and litigation in point source programs, wetlands, and hazardous waste. Beginning in 1989, I served as chief of the Nonpoint Source Control Program for 22 years until my retirement in 2011. In this capacity, I led USEPA's national efforts to promote watershed planning at the state and local levels.

Watershed planning is an essential part of the Nonpoint Source Control Program. In fact, the Clean Water Act (CWA) of 1987, which created the Nonpoint Source Control Program, explicitly directed states to implement their nonpoint source control programs, "to the maximum extent practicable . . . on a watershed basis." In the program's initial years, states were not provided enough money to work holistically at the watershed scale. In its first ten years, USEPA received modest funds, ranging from $40 to $100 million in appropriated funds, and distributed it to states for pilot projects that focused on demonstrating remediation technologies and approaches; but planning was, in most cases, minimal and only project-related. In 1999, Congress increased funding to $200 million and beginning in 2002, USEPA required states to develop watershed-based plans prior to implementing projects. USEPA defined nine elements ("a– i criteria" ) for watershed plans to address before implementation.

**Q: Can you tell us more about the "a–i criteria"?**

**A:** The "a–i criteria" came about as a way to combine better watershed planning with a water quality improvement outcome that supported the total maximum daily loads (TMDLs) that states developed for their nonpoint source–impaired waters. The idea was that TMDLs defined estimates of load reductions to achieve water quality standards, while watershed planning provided the steps to identify and quantify actions to achieve those load reductions. I credit my boss, Chuck Sutfin, the division director who managed both the TMDL and Nonpoint Source Control Programs, with establishing the basic framework for the watershed planning "a–i criteria" as a means to achieve water quality standards. The first three criteria are to understand the pollutant problems in a watershed and identify their sources, estimate the load reductions from

management practices, and describe the best management practices that could reduce pollutants. Using a quantitative modeling approach, you determine what nonpoint source pollutant reductions you need to meet the TMDL. The next six components are aimed at how to implement the overall watershed project, including the identification of available resources, a plan for public outreach, and an indication of how progress will be monitored over time. USEPA initially released guidelines for this approach in 2002 and 2003; then in 2004, the agency rewrote the entire Nonpoint Source Control Program guidelines with a watershed planning approach as the central feature. However, USEPA is currently in the process of revising the guidelines again.

A fair complaint when these requirements were established was that most states did not have adequate tools to implement this approach. USEPA recognized the need for training and has created guidance documents and provided live training and web-based resources to help states develop their technical capacity to do the analytical work; USEPA also trains people on the ground to work with community members and find solutions. Funding is always an obstacle, and states need to supplement 319 funds with their own funds, cost sharing by fund recipients, and other funding sources, such as the US Department of Agriculture's (USDA) Environmental Quality Incentives Program (EQIP).

**Q: Ideally, the watershed approach addresses multiple stressors (e.g., wastewater, agriculture, and atmospheric pollutants) and integrates multiple programs (e.g., wetlands, land use planning, and stormwater). Is this approach used? Why or why not? How can we improve the watershed approach?**

A: Acknowledging all stressors in a watershed is a first step in planning but, because of resource constraints, states typically focus their implementation of watershed plans on their highest-priority pollutants and stressors and their sources. For example, a state might first focus on animal waste in a watershed where that is the dominant source of pollutants, while deferring projects addressing streambank erosion until funds become available to address that source as well.

We can improve the watershed approach by increasing technical capacity through collaboration. For example, partnering with universities, local governments, and/or consulting firms often results in stronger watershed plans. It is also important for project planners to spend time in the field to better inform the models used to develop watershed plans.

**Q: How can watershed planning be used to inform the decision-making process (policy and regulatory)? For example, how can watershed plans be integrated into city, county, state, or federal budgets? How can watershed plans help shape regulations?**

A: First, develop a watershed plan that provides a real feel for what it will take to meet water quality goals and the implementation issues or barriers. During this process, staff leading the watershed planning effort should meet with the people who will do the implementation.

Public willingness to help or not help has a big impact on success. Through the watershed planning process, you may learn, for example, that you need more funds to involve the stakeholders in the process. Or you may learn that you need to use a regulatory approach to implement the plan. State policy direction can be informed by learning whether well-designed watershed plans are adequate to achieve implementation targets that can solve the water quality problem or whether other steps need to be taken to promote implementation. In addition, a watershed plan estimates the funds needed to solve a watershed problem. This information can be disseminated to the public and political decision makers to increase the likelihood that the project will have adequate financial support as well as other needed human and capital resources.

Overall, watershed planning should provide a factual basis on which to make intelligent decisions about how to spend federal, state, or local funds to make progress toward water quality goals. Leveraging federal and state funds with local resources is important and is needed.

**Q: What do you think are the best opportunities for funding watershed planning and implementation?**

A: In addition to CWA Section 319 funding, an agricultural watershed can use funds from USDA programs—such as EQIP, the Conservation Reserve Program, or the Conservation Reserve Enhancement Program that provide cost sharing, allow valuable land to be set aside for conservation, and/or protect riparian areas. However, if urban runoff pollution is the

watershed's main source of impairment, then different funds, such as state or municipal funds, can supplement Section 319 funding. Urban areas often have regulations to address new development, and local governments can raise funds through programs such as state revolving funds or locally developed stormwater fees.

**Q: What innovations in technology or funding for watershed protection and restoration have you seen or do you see on the horizon?**

**A:** In urban areas, the last decade has seen the emergence of low impact development (LID) and stormwater retrofits that use land in both developed and developing areas to capture, store, treat, and filter the stormwater runoff. I think LID is the wave of the future and will, over time, achieve great success in helping to protect and restore urban water quality. On a broader geographic scale, green infrastructure will be used in conjunction with LID to protect and restore watersheds. Green infrastructure is broad-based and includes constructed wetlands, the protection and restoration of green space, and so forth to improve stormwater management and to achieve a myriad of broader societal goals. Looking at the long term, I have a lot of confidence and enthusiasm for where we are headed in urban areas.

In rural areas, the work is more complicated and can be more difficult. We should continue to push the envelope in nutrient management planning and soil conservation planning, and we need to have mechanisms in place to ensure that these plans are implemented. We may find that regulatory or strong incentive-based approaches are needed to ensure the development and implementation of these plans.

Finally, riparian protection and restoration in urban and rural areas is beginning to occur and will show progress in the future.

**Q: Based on your experience with watershed plans and watershed planning, what research, innovations, or other work (e.g., coordination of programs) is still needed for effective watershed planning?**

**A:** Watershed planning needs to be easier. In other words, we need user-friendly modeling platforms and databases that are easy to access, understand, and use for widespread watershed planning at every level. It is critical that we continue to pursue the use of high-quality data in our watershed planning. For example, new technologies—such as geographic information systems (GIS), remote sensing, and modeling—should be incorporated into the process. USEPA has done extensive training and resource development, but more is needed to reach local governments and communities and to support them in determining their watershed impairments, possible pollution causes, and what to do to begin fixing the impairments.

**Q: Anything else you want to tell us?**

**A:** The money available is not adequate to do the job. States will need to use available resources for watershed planning and increase the use of the regulatory component to drive consistent long-term improvements. Otherwise, experience to date (including many billions of dollars expended by USDA, USEPA, states, local communities, and the private sector) indicates that it is unlikely that significant reductions in overall water quality impairments nationwide will be achieved unless significant funding increases or regulatory approaches are made available.

## Resources

Handbook for Developing Watershed Plans To Restore and Protect Our Waters
http://water.epa.gov/polwaste/nps/handbook_index.cfm

Healthy Watersheds
http://water.epa.gov/polwaste/nps/watershed/index.cfm

Low Impact Development (LID)
http://www.epa.gov/nps/lid

Polluted Runoff (Nonpoint Source Pollution)
http://www.epa.gov/owow_keep/NPS/index.html

Section 319 Nonpoint Source Success Stories
http://water.epa.gov/polwaste/nps/success319/

USEPA Management Measures for Nonpoint Source Pollution
http://www.epa.gov/owow/NPS/MMGI/index.html

Watershed Central
http://www.epa.gov/watershedcentral

## Stephen Stanley

*Aquatic Ecologist, Washington State Department of Ecology*

Stephen Stanley earned a BS in aquatic biology and BA in environmental studies from the University of California, Santa Barbara, and has more than 30 years of experience in wetland and watershed assessment, management, and regulation. In his work as a consultant, educator, and regulator in the state of Washington, Stephen has conducted and reviewed wetland delineations and assessments and has developed wetland enhancement and restoration plans, including a watershed-based restoration plan for the Snohomish Estuary. At the Washington State Department of Ecology (WDOE), Stephen manages the Puget Sound Characterization Project. He developed guidance for characterizing and analyzing watershed processes in western Washington and assisted in the development of wetland assessment models for the Columbia basin. Also, for the past ten years, he has co-taught the fall quarter of the wetland certificate program at the University of Washington.

**Q: How have you been involved in watershed planning?**

**A:** I work with local governments and state and federal agencies that manage and regulate development in freshwater and nearshore watersheds. This includes planning under the state's Growth Management and Shoreline Management acts. Currently, WDOE is developing a watershed-based approach to help guide local planning decisions on the best locations for new development and priority areas for protection and restoration. This approach is being used in a Puget Sound pilot project for freshwater watersheds in Washington known as the Puget Sound Characterization Project.

**Q: Ideally, the watershed approach addresses multiple stressors (e.g., wastewater, agriculture, and atmospheric pollutants) and integrates multiple programs (e.g., wetlands, land use planning, and stormwater). Is this approach used? Why or why not? How can we improve the watershed approach?**

**A:** We address the multiple stressors in a watershed using coarse-scale models and local-level data collection efforts to help inform planning decisions. For example, the Puget Sound Characterization Project consists of three distinct assessments: water flow, water quality, and habitat. For the water flow assessment, our watershed approach is based on the assumption that broader-scale processes drive the formation and maintenance of habitat structure, which subsequently supports habitat functions. An assessment of these watershed processes is essential to developing a planning approach that comprehensively protects and restores watershed ecosystems by understanding the root causes of watershed problems. Generally, the watershed unit assessments are rated using an importance model that includes physical indicators for water delivery, movement, or loss. The watershed unit is also assessed by a degradation or stressor model. The combination of the results from these two models helps in the development of land use guidance for the best locations on the landscape to protect, restore, conserve, and develop land.

Our approach is designed to integrate abiotic and biotic data from multiple models, programs (the Shorelines and Environmental Assistance Program and Water Quality Program at WDOE), and agencies (the Washington Department of Fish and Wildlife and the Washington State Department of Natural Resources). These broad-scale assessments use relatively basic data and information in comparison to site- or reach-scale assessments that require much more detailed data and analysis to understand processes and functions at the finer scale. This approach identifies the best locations for future development and restoration or protection actions at a watershed scale, instead of mitigating for impacts on an individual project basis. If it works, it may help inform similar approaches at the national level. Our next task is to use this pilot to develop a web-based decision support tool for local implementation.

**Q: What are the key factor(s) in a watershed plan that make it more likely to be used and implemented instead of sitting on a shelf gathering dust? Are there general standards or rules of thumb that you believe watershed plans should follow (e.g., USEPA's "a–i criteria," recommended watershed scale)?**

**A:** I have seen watershed planning come full circle from being in favor during the 1970s, to not being used, and now reconsidered because research has demonstrated its importance. The key factors to ensuring its implementation are to (1) work closely with local government planners when

putting together the methods and the guidance for interpreting and applying assessment results and (2) implement pilot projects at the local level to address issues uncovered during the watershed's characterization assessment. We are attempting to do this by forming a technical team of watershed experts to work with local governments on watershed issues and by developing subarea plans (Birch Bay and Gorst watersheds) in conjunction with local governments. Another key aspect is that stakeholders will not support the plan if they do not understand why they need to undertake the actions identified, so training, education, and outreach are essential to making this happen.

**Q: Could you provide an example of a watershed plan you were involved with that you consider a "success story"? What made it a success?**

**A:** One success story is Birch Bay in Whatcom County in northeastern Puget Sound. We conducted the watershed assessment and provided the information to the local government. The local government staff interpreted the information and developed a management plan with minimal involvement from us; in other words, we did not dictate the outcome. This allowed the local government to find the best way to work with landowners and to apply the watershed assessment results in the most effective manner. This was also a success because the local government had the technical expertise (e.g., GIS and modeling) and the willingness to do the work and implement the plan. The Birch Bay watershed-based subarea plan is the basis for the following two credit systems: (1) a point-based permit application system and (2) a buffer reduction in-lieu fee. Under the permit point system, an applicant receives points for approved LID practices. An expedited permit is issued when enough permit points are credited. The in-lieu fee system allows buffer reductions in degraded watershed units. A fee is paid for the buffer reduction, and the funds are used for buffer restoration in watershed units of higher ecological value.

**Q: What do you think are the best opportunities for funding watershed planning and implementation?**

**A:** USEPA's National Estuary Protection (NEP) Program has been a key source of Puget Sound funding for efforts such as the Puget Sound Characterization Program; the NEP has also funded watershed technical teams and the development of a watershed-based grant program for pilot program implementation. The best opportunities for using this or similar funds is when we have all jurisdictions, cities and counties, participate in the development of a comprehensive and coordinated watershed plan.

**Q: What innovations in technology or funding for watershed protection and restoration have you seen or do you see on the horizon?**

**A:** The development of ecosystem services markets applied to local watersheds has great promise. If we can identify ways to provide incentives to residents within a watershed to undertake actions that protect, restore, and sustain processes and functions in that watershed, we can reduce the reliance on state and federal funding sources. These funding sources are not long-term and typically, when the funding expires, so does the program. Then, we start the work all over again a decade later. Because the ecosystem services market is so new, it will require considerable time and effort to understand how it can be successfully incorporated into the existing planning and permitting system.

We have several grantees looking at ecosystem services economics to establish reasonable values for natural areas and propose a feasible market mechanism. These market mechanisms will then be tested in several pilot projects in Puget Sound.

**Q: Overall, how well is the watershed-based approach working to protect/restore water resources?**

**A:** It is too early to say how well the watershed-based approach is working in our state. We are just developing the guidance and web support for implementing the characterization results. It will take time for local governments to apply the watershed framework we developed. Also, it will take time to gather data showing whether we improved watershed conditions (e.g., whether we solved the key watershed problem[s]) through the implementation of these watershed-based plans.

**Q: Based on your experience with watershed plans and watershed planning, what research, innovations, or other work (e.g., coordination of programs) is still needed for effective watershed planning?**

**A:** Currently, the approach to watershed planning is a patchwork quilt of policies, assessments, recommendations, and land use actions that are reach- or site-specific and are not coordinated with watershed stakeholders.

I believe that the key to success is, first, to set up a framework to assess and solve watershed issues at multiple scales

appropriate for local government and resource agency use. Second, we need a comprehensive monitoring program to evaluate whether key environmental indicators, such as flow regimes, are within or returning to the normal range of variation. This feedback loop to test how the watershed's environmental indicators change over time using monitoring data is essential to correct and modify the models, assessments, and land use measures used in the watershed framework.

## Resources

Puget Sound Watershed Characterization Project
http://www.ecy.wa.gov/services/gis/data/puget-sound/characterization.htm

Washington State Department of Ecology "Mitigation That Works" Landscape Planning
http://www.ecy.wa.gov/mitigation/landscapeplan.html

## Patrick J. Sutter

*County Conservationist, Dane County, Wisconsin, Land and Water Resources Department, Land Conservation Division*

Pat Sutter graduated from the University of Wisconsin, Madison, in 1982 with a BS in agricultural education. He has been a soil and water conservationist for Dane County, Wisconsin, Land and Water Resources Department since 1984, serving the Conservation Division. Since his promotion in 2006 to the position of county conservationist, Pat has managed both agricultural and urban staff serving all of Dane County. He managed the Black Earth Creek and Dunlap Creek priority watershed projects from 1987 to 2004. Over the years, he has worked on various local, state, and federal conservation initiatives to implement conservation practices. Most recently, Pat has supervised the implementation of the Lake Mendota Priority Watershed Project (located north of Madison). One of the main goals of all three watershed projects was the management of sediment and nutrient runoff into the county's lakes and streams. A key to the success of these projects was the development of close working relationships with landowners, nonprofits, municipalities, and partner agencies. As a result of these efforts, tons of sediment and nutrients have been prevented from entering the county's water resources.

**Q: How have you been involved in watershed planning?**

**A:** I work in watersheds throughout Dane County, Wisconsin. Our work is focused in watersheds that vary in their scope, size, priority pollutant(s), available funding, geography, stakeholders, collaborators, etc. Most watershed plans focus on sediment, phosphorus, and/or nitrogen and are tailored to prioritized needs for the different areas in the county. For example, trout waters on the 303(d) list are the focus in the western part of the county, whereas in other areas, agricultural runoff is the focus, and in Madison, the lakes are our primary focus. One thing we know is that getting partners identified up front is essential. Difficulties arise when partners in the watershed planning process come into the process late. We work with a wide variety of groups and stakeholders for each watershed project. Our watershed planning focuses on both rural and urban water quality issues but also considers the "whole-farm planning" approach, which includes all other resources, such as wildlife, woodland, pastures, wetlands, streams, etc.

**Q: Ideally, the watershed approach addresses multiple stressors (e.g., wastewater, agriculture, and atmospheric pollutants) and integrates multiple programs (e.g., wetlands, land use planning, and stormwater). Is this approach used? Why or why not? How can we improve the watershed approach?**

**A:** The watershed approach allows us to make measurable progress and clean up our water resources. Using this approach, we can understand the different types of pollution impacting the watershed and where they are coming from, and we can plan to reduce the pollution using several different methods.

In the past, we tended to focus primarily on cropland, but we have learned, over time, that we may have missed the other big producers of sediment or phosphorus coming off the pastures where manure has built nutrient levels to an extreme. We improved our watershed approach to identify these areas and now work with stakeholders, especially the farmers, in the beginning of the planning process. For us, getting the involvement up front of farmers or other stakeholders—such as local leaders and townships—is essential. Input from these experts into the initial watershed planning

project is a major element of our work. We also know that we are not experts on everything, so we bring others to the table to help support the watershed plan.

To improve our planning process, we are using improved science and tools, such as SNAP-Plus, that help us identify the fields that are likely to contribute the most pollution. We have learned, through improved science and technology, that small fields can be big pollution sources for sediment, nitrogen, and/or phosphorus. We need models that are field-tested and proven to work. We get support from partner agencies such as the University of Wisconsin, Madison, for the improved technology and resources.

**Q: What are the key factor(s) in a watershed plan that make it more likely to be used and implemented instead of sitting on a shelf gathering dust? Are there general standards or rules of thumb that you believe watershed plans should follow (e.g., USEPA's "a–i criteria," recommended watershed scale)?**

A: I think we first need to be confident, ourselves, that the watershed plan will do what it was designed for, and that is to improve water quality in that specific region. If we have confidence in the plan, it is much more likely to be used and not shelved. I think another key factor is to work with landowners and farm producers to change their management tendencies. We need to encourage them to think "outside of the box" when it comes to conservation planning. Through increased education and outreach, we have seen positive changes in management and have built our credibility with our landowners and farmers. We need experienced staff that are skilled and can convince people to contribute to the watershed plan and its implementation.

Another key factor is to not promise too much in your watershed plan and to stick with what you can deliver. This builds credibility with landowners. We want the farmers and other landowners to feel like this is their plan, and we ask for their input to ensure that the plan has actions that they can, and will, complete. Once we have built a credible program and have trained staff, we have people knocking on our door to work with us. If you have a plan that was built with stakeholders who see you as credible, then the plan will not sit on the shelf. Finally, policymakers or decision makers should be confident in the plan's content and confident that, if implemented, it will be a success.

**Q: Could you provide an example of a watershed plan you were involved with that you consider a "success story"? What made it a success?**

A: When I worked "in the field" I managed the Black Earth Creek Watershed Project where we got all but two of the targeted farmers in the 100-square-mile watershed to participate in the watershed project and conservation planning effort. This project worked because I was directed to spend the majority of my time in the watershed. We began working with a few farmers who we felt confident would work with us and show other farmers some successful projects. Then, I got call after call from people who needed and wanted our help. I was able to spend the time needed in the watershed to make the project successful. A local group of stakeholders formed during this project, called the Black Earth Creek Watershed Association, and it is still functioning after 25 years. To me, that is one sign of a successful plan.

**Q: How can watershed planning be used to inform the decision-making process (policy and regulatory)? For example, how can watershed plans be integrated into city, county, state, or federal budgets? How can watershed plans help shape regulations?**

A: Look back at watershed plans that were successful and those that were not as successful to determine what works and what does not work. Then, share this information with policymakers so they have that documentation to form or change the policy. In a recent example, the Pleasant Valley Watershed Project, we used SNAP-Plus to inventory 85% of the cropland/pastureland in the 22-square-mile watershed. This information helped us target those farms producing the highest nutrient loads. We found out that 20% of the land produced 50% of the nutrient load in that watershed. By focusing our resources on that 20%, we saved staff time and used our incentive monies in the most efficient way. When the project is over, we will use these results to support our arguments to policymakers for the need for water quality improvements.

**Q: Tell us about how your organization works with farmers and also is part of the regulatory agency for the farmers?**

A: We have developed a good working relationship with farmers by keeping our agriculture planners on the conservation side of the job. We have separate urban planners who address enforcement. This helps to alleviate concerns about the regulatory nature of my organization. We use step enforcement, where we try to fix the situation with the farmer's cooperation. In my 28 years on the job, only one farmer has ever seen a judge.

**Q: Overall, how well is the watershed-based approach working to protect/restore water resources?**

**A:** If done right, the watershed-based approach works well. For example, in Black Earth Creek, the US Geological Survey documented water quality improvements due to conservation practices in a ten-year study.

You have to implement the plan. If you only implement half the plan it is only half of a success. Also, I think if you have enough time to get the planning right, do the research, work with the community, bring in experts, and manage expectations, there is more chance for success. Finally, in watershed planning, the inputs are always changing. For example, in the Lake Mendota watershed, we are not seeing the phosphorus levels in the lake drop as we would like, but you need to recognize how nutrient inputs have changed. For example, the herd size in the watershed has nearly doubled over the last 20 years, the area experiences more intense storms, and the crops planted have changed.

**Q: Based on your experience with watershed plans and watershed planning, what research, innovations, or other work (e.g., coordination of programs) is still needed for effective watershed planning?**

**A:** We need current research and modeling available so that we can "show the facts" to farmers, stakeholders, policymakers, and others who are involved in the watershed plan. We need to defensibly show that we were objective in the management options suggested and that there will be improvements if we follow the recommendations.

In our area, we need research that quantifies the winter manure application in order to determine if an ordinance would impact water quality. Currently, the research load findings are mixed. We know that the state has a phosphorus index of six but we need a couple more years of research to determine if that is a high number or if it should vary among watersheds. We also need to know how to verify that nutrient management plans are implemented correctly. For example, perhaps a soil test could be part of the nutrient management plan to track the change over time on a farm-by-farm basis.

**Q: Anything else you want to tell us?**

**A:** We are fortunate to have a staff that enables us to do a variety of work. Across the board, better statewide watershed planning needs to have consistent resources available. It is extremely important to have "boots on the ground" for conservation practices to be consistently successful. We have Land Conservation Committees that prioritize activities based on what we need to do, how much funding we need, and what regulations we need to meet our goals. Policymakers and county board supervisors support this type of effort.

## Resources

Dane County Land and Water Resources Department
http://www.countyofdane.com/lwrd/

Dane County Land and Water Resources Department, Land Conservation Division
http://www.countyofdane.com/lwrd/landconservation/

SNAP-Plus Nutrient Management Software
http://www.snapplus.net/

## AWSPs Photolog Contest

The Association of Watershed and Stormwater Professionals (AWSPs) is accepting photo entries for our next photolog contest. The winning photo will be featured on the AWSPs website and in the Spring 2013 issue of the *Bulletin*.

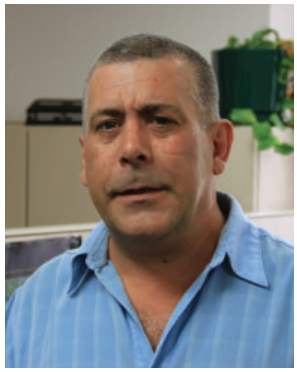
The photolog contest features the watersheds in which we work, live, and play. The photos can feature any number of subjects, including:

- streams, forests, or other natural features;
- stormwater best management practices;
- restoration projects; or
- anything that captures the essence of a watershed.

To submit your photolog, provide one original digital photograph with a 250-word description to photocontest@awsps.org. All photologs must be submitted by **Friday, November 2nd, 2012,** by 5 p.m. For complete contest rules, see http://www.awsps.org/photolog.html.

## Tom R. Schueler

*Executive Director, Chesapeake Stormwater Network*



Tom Schueler has more than 30 years of experience in practical aspects of stormwater practices for the protection and restoration of urban watersheds. The founder of the Center for Watershed Protection (the Center), Tom currently directs the Chesapeake Stormwater Network, a nonprofit organization devoted to the implementation of more sustainable stormwater practices across the Chesapeake Bay watershed. As director of the Chesapeake Bay Stormwater Training Partnership, he oversees the development and dissemination of webcasts, workshops, and online training modules that train engineers in the implementation of new practices. He also serves as the stormwater technical coordinator for USEPA's Chesapeake Bay Program. In all of his work, Tom actively promotes better stormwater regulations and permits in communities across the Bay.

**Q: How have you been involved in watershed planning?**

**A:** In my career, I have worked at three different scales of watershed planning. At the scale of large urban watersheds, I worked for the Metropolitan Washington Council of Governments Department of Environmental Programs on the Anacostia River watershed plan. This was the first urban watershed restoration effort in the country. It involved multiple jurisdictions, and the result was a comprehensive watershed plan that is still being implemented today. Second, at the Center, I advocated for strong planning efforts geared toward small (~10-square-mile) watersheds, incorporating GIS mapping, desktop assessment, and field assessments. Now, as the Chesapeake Stormwater Network's executive director and the USEPA Chesapeake Bay Program's stormwater coordinator, I work on a watershed that is 64,000 square miles, spans seven states, has multiple stakeholders, and must meet cutting-edge regulatory thresholds, such as watershed implementation plans and the Chesapeake Bay TMDL.

**Q: Ideally, the watershed approach addresses multiple stressors (e.g., wastewater, agriculture, and atmospheric pollutants) and integrates multiple programs (e.g., wetlands, land use planning, and stormwater). Is this approach used? Why or why not? How can we improve the watershed approach?**

**A:** At the Center, we spearheaded the notion that watershed restoration and protection plans should include many different stressors and sectors. There is always the challenge of having too many objectives, so a smaller watershed scale with fewer objectives is ideal. For small urban watersheds, tools like the Impervious Cover Model (ICM) are useful for watershed practitioners because they can aggregate multiple stressors in a single planning tool. With larger watersheds, the ICM breaks down and more comprehensive tools are needed. The Chesapeake Bay watershed is large and has numerical TMDLs that have a large impact on watershed planning with good and bad impacts. The good impacts include a more quantitative and accountable watershed implementation approach, but the bad impacts include a narrow planning focus with few objectives (e.g., nutrients and bacteria) that leave out other worthwhile objectives, such as wetland protection or green space

**Q: What are the key factor(s) in a watershed plan that make it more likely to be used and implemented instead of sitting on a shelf gathering dust? Are there general standards or rules of thumb that you believe watershed plans should follow (e.g., USEPA's "a–i criteria," recommended watershed scale)?**

**A:** A few rules of thumb for watershed planning are found in *Methods to Develop Restoration Plans for Small Urban Watersheds*, which is part of the Urban Subwatershed Restoration Manual Series that I oversaw when I was at the Center. This type of watershed planning is most practical for small urban watersheds. However, watershed protection plans are not as successful as they could be due to the difficulty of changing land use patterns to protect sensitive aquatic resources. There is never the political will to make hard land use decisions that hold up over time.

Also, check out "Eleven Reasons Why Watershed Plans End Up on the Shelf" (in the Schueler [2000] document listed below), which explores common watershed plan pitfalls such as "the document was too long or complex" and "the plan had no regulatory meaning." I still frequently see plans that have these common pitfalls.

**Q: Could you provide an example of a watershed plan you were involved with that you consider a "success story"? What made it a success?**

**A:** A series of watershed plans that the Center developed with James City County, Virginia, were good examples. This was the first time that a lot of field work was used with Center methods such as the unified stream assessment, unified subwatershed and site reconnaissance, urban stormwater retrofit practices (retrofit reconnaissance investigation), and forested wetlands assessment. There was also the now-famous watershed camp where we compiled information in an informal setting at the end of the day. A few plan accomplishments included: (1) the identification of specific conservation areas for protection, (2) the discovery of endangered plants and birds during the field work, (3) the conservation of a 300-foot buffer for the Powhatan Creek mainstem, and (4) strong stakeholder involvement that influenced the county council to pass the controversial plan by a narrow vote. The county continues to implement the plan's recommendations today.

**Q: How can watershed planning be used to inform the decision-making process (policy and regulatory)? For example, how can watershed plans be integrated into city, county, state, or federal budgets? How can watershed plans help shape regulations?**

**A:** Watershed plans can create a dialogue about changes needed in local development codes, stormwater ordinances, and land conservation policies, but this rarely happens. Watershed plans are just the beginning of the recommendations, and more work is needed to get the recommendations implemented. For example, one way to use policy to improve plan implementation is to incorporate the watershed plans in the municipal separate storm sewer system permits. This can provide a long-term way to stay on top of the plan (i.e., to implement the plan).

**Q: What innovations in technology or funding for watershed protection and restoration have you seen or do you see on the horizon?**

**A:** As we shift towards watershed plan implementation, real innovation is needed to improve the local watershed delivery capacity (i.e., innovations in local management capability and/or capacity). We have most, if not all, of the tools needed to solve the problems, but we lack the internal capabilities to cost-effectively deliver these tools through public and/or private partnerships.

**Q: Based on your experience with watershed plans and watershed planning, what research, innovations, or other work (e.g., coordination of programs) is still needed for effective watershed planning?**

**A:** While an enormous amount of good work has been done in watershed planning, we need to collectively get together to learn from each other, network, and share results. Watershed planners also need to play a more prominent role in the legislative and political world. Watershed planning is a bit of an orphan in several disciplines, such as hydrology, water quality, forestry, wetlands, GIS, and many others.

**Q: Anything else you want to tell us?**

**A:** Historically, watershed planning has cycled up and down in popularity. We seem to be in a waning cycle now. I think this is partly due to the recent decline in local and state resources for environmental planning, but it also may be attributable to the fact that watershed planning has not always delivered on its grand promises. We need to continually evolve our planning methods to ensure that we can truly achieve tangible watershed results.

## Resources

Schueler, T. R. 2000. Crafting better watershed protection plans. Watershed Protection Techniques 2(2): 162–170. Available online at: http://www.cwp.org/.