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*Christmas isn't a season; it's a feeling. ....Edna Ferber*

### President's Message

With the Christmas season comes a new year, 2004. As we come to the end of 2003, we give thanks for all the support and recognition that has come our way. Without the support of members, organizations and local governments we could not continue our work to protect the waters of the Shenandoah.

The efforts which we continue to receive from our river basin partners and the many dedicated monitors has enabled our staff to analyze some 3000 water samples in the laboratory at Shenandoah University. This and future data will be useful in carrying out the Shenandoah Tributary Strategy to reduce the sediment and nutrients entering the Chesapeake Bay.

The articles in this edition will give you a picture of the scope of our involvement.

The FOSR Board and Staff wish all of you a very happy holiday season.

*Merry Christmas.*

Milton Boyce  
Bud Nagelvoort  
Steve Sagar

Fran Endicott  
John Simpser  
Karen Andersen

Meryl Christiansen  
Charles Vandervoort  
Dave Gunnells

Don Orr  
Charles Newton  
George L. Ohrstrom, II  
Glen Hickerson

### **WHY MONITOR???** *by Meryl Christiansen*

Much of the energy of the Friends of the Shenandoah River is expended on monitoring waters of the river system. Fundraising, recruitment of monitors, collecting and analysis of samples, documenting and distributing of data all take an enormous amount of work. And to what end use of the data produced?

In actuality it is difficult to determine the many users of the data. We are well aware that Dr. Tom Benzing and his graduate students at James Madison University have used the data to interrelate with information on the impact of land use on water quality via the Geographic Information System (GIS) and that the Friends of the Rivers of Virginia determined that the Shenandoah River System is the most impaired system in the State by combining our data with that of the Commonwealth. Also the Department of Environmental Quality included our data in their biannual report of surface water quality to EPA and Congress. The U. S. Geologic Survey is using FOSR data for the Minimum Instream Flow Study. But where else is it utilized? Most certainly the Soil and Water Conservation Districts are perusing the data to identify the tributary stream watersheds that are high in nutrients and sediment and in need of Agricultural Best Management Practices to reduce problems, or warn the District or local county building inspectors that storm run-off from building sites is uncontrolled. In final analysis our data also provides a measure of the efficiency of efforts to prevent pollution of surface and ground water. The bottom line is that monitoring of water quality is essential to not only identify pollution problems but also to measure the efficacy of efforts to cure the problems.

But why does the Commonwealth not provide necessary monitoring to identify surface water pollution? One problem is the 65000 miles of streams that require attention....and the major budget problems that prevails in Virginia. Even in plush financial times only a few sites are measured on a monthly or yearly basis. It is necessary to frequently monitor surface waters to record seasonal variations or to determine rainfall impact on sedimentation or nutrient spikes.

*So the bottom line is that the FOSR's monitoring program is essential to the present and future of the Shenandoah River. Sincere thanks to all who contribute their valuable time and their money to the river-dipping program!*

## [River Monitoring Data Now Visible Through the “Shenandoah Water Window”](#) by Thomas R. Benzing

I dip water twice a month. I share this ritual with an army of other volunteers across the Shenandoah Valley who collectively send their samples to the Friends of the Shenandoah River's laboratory for analysis.

I'm not quite sure why I do it. Maybe I believe that collecting my samples creates new knowledge about the health of our rivers. But, then, maybe it's just that this semimonthly ritual is another way to stay connected to my environment. I have become intimately familiar with my sampling stations in all seasons of the year. I like to think that I'm the first one in autumn to notice when the air temperature drops below the river's. I notice other changes at my stations, too - the decreased clarity or increased flow that result from that rainstorm we had two days ago. Or, the big changes we've seen from recent floods!

Another reason is because I teach about water quality in the Integrated Science and Technology department at James Madison University. I try to practice what I preach. My collection ritual keeps me stocked with real-world data to discuss with my students. It has also led me into one of the most interesting projects of my professional career.

Two years ago, Kai Degner and I put together an ambitious proposal to create a geographic information system (GIS) and website that could deliver the water quality data from this volunteer army to the fingertips of anyone who is comfortable using a keyboard and the internet. Our goal was to create a GIS that allowed one to answer some basic questions about water quality in the Valley:

- How does it change at each sampling station with time?
- How does land cover upstream of each sampling station relate to water quality?
- How does water quality change as you follow the rivers downstream?

Through a summer internship at the Canaan Valley Institute (CVI) and thanks to funding from several other sources (visit the Partners link on the Water Window), Kai and I became immersed in the details of GIS technology and emerged with the foundation for what we are now calling the Shenandoah Water Window. Getting to the current look and layout of the Water Window took another year of collaboration and technical assistance. Once again, we relied on CVI and, for some of the final programming, contracted Terralogic, a GIS shop in Staunton with expertise in designing customized applications.

The Shenandoah Water Window can be found at [www.purewaterforum.org/waterwindow](http://www.purewaterforum.org/waterwindow). What you will see when you first arrive at this website is a page with links to lots of useful information including instructions on using the Water Window, lists of partner organizations, and background information. Don't get too caught up in that. Instead, click on the window image in the middle of the screen and you'll find yourself with a map of the entire Shenandoah Basin. Use the Map Controls (below the map) to navigate your way around. Or, if you're a volunteer monitor like me, type your site ID in the Quick Search box, click "Find the Site" and let the GIS do the work! *Continued on next page.....*

The screenshot displays the Shenandoah Water Quality Online GIS Interface. The main map shows the Shenandoah Basin with various rivers and towns labeled. The interface includes a 'Quick Search' box with 'GA01' entered and 'Find the Site' button. Below that is a 'Land Cover Information Viewer' showing a pie chart for 'GA01 on South River' with categories: Agriculture 30.9%, Forest 62.8%, Urban 5.2%, and Other 1.2%. Further down is a 'Water Quality Viewer' showing a scatter plot of 'Turbidity: 1/6/1996 to 3/9/2003' with a y-axis from 0 to 50 and an x-axis from 1/1/1997 to 1/1/2003. At the bottom, there are 'Map Controls' and 'Map Layers' sections with various options like 'Sampling Sites', 'Rivers', 'Roads', etc.

...“Shenandoah Water Window” Continued from previous page

Once you’ve selected a site, the edges of the map will become filled with information about the land cover in the watershed for that site and graphs of the water quality data. You can select what you’d like to see by clicking on the boxes under the graph – ammonia, nitrate, pH, temperature, what days or years, take your pick! Click “Graph It!” and see the data displayed on the screen. If you don’t know how to interpret what you’re looking at, try the “Learn More” button. I wrote the “Learn More” text in layman’s terms to give background on dissolved oxygen, nitrate, phosphate, and the other water quality variables that are measured in the lab. If you don’t find an answer to your questions under the links provided, send me an e-mail to [waterwindow@purewaterforum.org](mailto:waterwindow@purewaterforum.org) and I’ll get you one. (By the way, this is also the e-mail address to send a description of problems you encounter while using Water Window or to give us suggestions for improvement.)

There are many options available once you get comfortable with the basic layout of the Water Window. Try selecting different combinations of layers (roads, streams, hill-shaded elevation) for your map using the options in the Map Layers section. Once you’ve created a map you’re happy with, hit the “Print” button to make a copy to share with your neighbors.

Upon hearing me talk about the possible designs for the Water Window last year, a fellow monitor in Augusta County, Emerson Fike, told me to “keep it simple stupid”. I hope we’ve honored Emerson’s request. I also hope that we’ve provided another reason for all of us volunteer monitors to keep dipping. Let me know how you like it. In the meantime, I’ll be watching for the first sign of spring when air temperatures once again rise above the river water.



### **South River Science Team Update** *by Bob Luce*

For the past three years, the South River Science Team (SRST) has been meeting bimonthly at the Virginia Department of Environmental Quality (DEQ) office in Harrisonburg to plan, carry out, and assess studies on the amount and effects of mercury contamination in the South River and downstream waterways. Scientists and engineers from DEQ, DuPont, the Department of Game and Inland Fisheries, the Department of Health, and representatives from several Virginia universities conduct the studies and regularly attend the meetings.

The end of the year meeting for 2003 was held on October 21 – 23 at which time Team investigators summarized a dozen current projects to an audience that included not only Team members, but also the Team’s mercury expert panel and representatives of U.S. EPA Region III. The projects include clam studies (uptake of mercury at points in the South River by *Corbicula*, a freshwater clam), fish diet studies, a vegetable crop study, a bird survey, DEQ’s intensive water sampling, a South River water budget, a plant site storm water study, development of TMDL for mercury in the South River, floodplain soil sampling, and core sampling of the South River sediments for mercury analyses and age-dating purposes.

The SRST projects are scientifically rigorous and are well presented at the meetings. There are plans for publications of results. The SRST initiates and modifies projects in a consensual process, much to its credit. On the last half day of the October meeting, Ralph Stahl of DuPont led the group in a critical discussion of what is known about mercury contamination in the South River. There was general agreement that mercury concentrations are highest within three miles of the DuPont plant, that concentrations are not attenuating with time and that they vary with season, flood events and stretch of the river. Highly toxic methylmercury bioaccumulates in fish; concentrations vary according to species and fish size. Methylmercury also is found at high levels in aquatic earthworms and terrestrial insects. A high proportion of mercury bound to suspended particles is in the form of methylmercury.

The data collected thus far indicate the likelihood of a continuing source of mercury contamination in the South River. But was there an essentially one-time release from one location or were there several early disposal sites? Do isolated pockets of mercury exist in the sediments or in the bedrock that can slowly bleed off soluble mercury to the river? Or do such potential sources contribute to the river’s contamination mainly during flood and erosion events? Past working hypotheses were reviewed and new ones proposed that could be tested to determine the location and nature of the current source or sources.

To date the Team has focused on monitoring mercury concentrations in the South River and investigating the effects that mercury (and methylmercury) have on various environmental receptors. Data of recent years show that mercury concentrations in the South River and in the South Fork of the Shenandoah River have not been decreasing. This observer hopes that a shift of focus to investigation of possible source areas will lead to efficient measures to isolate or reduce the contamination.



## Northern Shenandoah Valley Regional Water Resources Policy Committee by John Staelin

In 1999 a group of regional elected officials met in Warren County to discuss the impact of the ongoing drought. Although no firm agreements were made at the meeting it was obvious that everyone believed the problem was regional in scope and should be addressed by a regional response.

As a result, the Northern Shenandoah Valley Regional Commission (NSVRC), the authorized planning agency for the northern part of the Shenandoah Valley, formed a committee of elected officials to study the best way to tackle the problem. Several organizational structures were considered from Water Authorities to State Commissions but in the end it was decided that the best way to move ahead was the simplest way, the formation of a regional water committee manned by locally elected officials.

The Committee began operation in October of 2002 and called itself the Regional Water Resources Policy Committee. Initially it only included local elected officials from the localities represented by the NSVRC but the Committee quickly expanded to include communities both upstream and downstream from our local area. Currently it has members from counties, cities and towns in two states. The Virginia group includes Augusta, Clarke, Frederick, Page, Rockingham, Shenandoah and Warren counties, the cities of Winchester and Staunton and the town of Front Royal. The West Virginia group includes Berkeley and Jefferson counties.

The first act of the Committee was to create a Mission Statement. It reads as follows:

As a Committee of local elected officials, the Mission of the Regional Water Resources Policy Committee shall be to develop an action oriented Comprehensive Plan that establishes a regionally coordinated policy framework for long term protection and use of the surface and groundwater resources in the Shenandoah Valley.

- The objective of this plan is to preserve ecological quality and foster resource stewardship for the environmental and economic health of the Valley.
- This objective will be supported by promoting communication, coordination and education, and by suggesting appropriate solutions to identified problems.
- The Committee shall provide oversight for the Regional Commission's water resource technical committees in developing a Comprehensive Plan of the watersheds in the Shenandoah Valley, ensuring stakeholder inclusion and coordination with other government agencies.

It is important to note that the mission statement gives equal attention to both surface and ground water. This was done because the Committee recognized early on that our region's surface and ground water systems are linked and little can be done to protect or use one without affecting the other.

The Committee recognizes that there is a long term need in our region for expanding our water producing and storage infrastructure. However, the Committee feels that a lot of learning and planning has to be accomplished before any major projects are undertaken. In fact, the unofficial slogan of the Committee has become "planning before plumbing". To that end the Committee has begun the process of creating a Regional Water Resources Comprehensive Plan.

The Regional Water Resources Comprehensive Plan will take some time to complete but once it is done it is hoped that it will serve as the blueprint for future action by all the jurisdictions in our area. Ideally its goals and suggested actions will be incorporated into the Comprehensive Plans of every city, county and town in our region and will lead to cooperation between us all.

To date, two steps have been taken towards the completion of the Regional Water Resources Comprehensive Plan. The first step was the adoption of a tentative set of water resource goals and the second was the creation of a methodology for documenting all the information that is currently known about our region's water resources. To accomplish this second step the Committee applied for and received a grant to pay for the services of AMEC, a national organization that specializes in water resources planning. By July it is hoped that AMEC will have created a complete database describing all the information that is currently known about the quantity and quality of both our ground and surface water in our area.

Once the database is complete the Committee hopes to refine and prioritize its goals, examine the existing data and write the first draft of its Water Resources Comprehensive Plan. No deadline has been set but it is hoped the Committee can have a rough draft in a year or so. That draft can then be sent to all the local jurisdictions in our region for comment and approval. Only after that is done can implementation begin. Hopefully Mother Nature will give us the time we will need to complete the process and better prepare for the future before she returns with her next long drought.

**The Friends of the Shenandoah River and Its Board Members are Recognized:**

<b>The Garden Club of Virginia Conservation Forum</b>	<b>Trout Unlimited Wins Award</b>	<b>Soil and Water Conservation Awards</b>
<p>On October 27 and 28, 2003, The Garden Club of Virginia held its 45<sup>th</sup> Annual Conservation Forum in Norfolk, Virginia. At the Forum, Mary Bruce Glaize, Chairman of the Conservation and Beautification Committee of The Garden Club of Virginia, presented the Elizabeth Cabell Dugdale Award for Conservation. This award is given for outstanding accomplishment in conservation to an industry, an organization or an individual not a member of The Garden Club of Virginia. This year the winner was The Friends of the Shenandoah River, Front Royal, Virginia. The FOSR was nominated by the Garden Club of Warren County, for its efforts in preserving and protecting the Shenandoah River watershed and its tributaries and for providing educational programs concerning the river and water quality for the watershed.</p>	<p>The Winchester Chapter of Trout Unlimited received the <i>Best Project Award</i> for its stream restoration efforts at the Annual Awards meeting of the Virginia Council of Trout Unlimited. Chapel Run and Redbud Run were beneficiaries of the chapter's work, which was spearheaded by Bud Naglevoort, chapter secretary.</p> <p>Additionally, Naglevoort was honored with the council's <i>Award for Excellence</i> for his leadership role over a number of years in improving the habitat of both local streams.</p> <p>Trout Unlimited is incorporated as a national, non-profit educational and charitable organization dedicated to protecting cold-water fisheries and their watersheds.</p>	<p>Meryl Christiansen received the <i>Watershed Connections Award</i> for the Shenandoah River Watershed at the Virginia Association of Soil and Water Conservation Districts 65th Annual Meeting held on December 9th.</p> <p>This is the sixth year of the award giving recognition to a director/associate director of SWCD in each of the major watersheds in Virginia for the many hours of volunteer time and leadership in promoting soil and water conservation work on a watershed basis.</p> <p>At the local Lord Fairfax Soil and Water Conservation District Annual Banquet on October 16, Meryl Christiansen was awarded the <i>Outstanding Director of the Year</i> and Milton Boyce was awarded the <i>Outstanding Associate Director of the Year</i>.</p>

**Willow Brook-Crooked Run Watershed Initiative** by Lyle Schertz

The Lord Fairfax Soil and Water Conservation District and the Friends of the Shenandoah River are giving special attention to the Willow Brook-Crooked Run Watershed. It lies north of Front Royal on both sides of Route 522.

This initiative is made possible by a grant from the National Fish and Wildlife Foundation, the commitment of volunteers of the two organizations, the assistance of the US Department of Agriculture's Natural Resources Conservation Service, the cooperation of Frederick and Warren County, and additional support of the Canaan Valley Institute and the Virginia Department of Forestry.

The Willow Brook-Crooked Run watershed is located in Warren, Frederick, and Clarke Counties in northwestern Virginia. It is a center of recreation, farming, transportation, industrialization, commercialization, residential development, and a major source of rural drinking water.

Significant changes with lasting effects have occurred in the Willow Brook-Crooked Run watershed. These changes include: construction of divided lane interstate highways, zoning of a significant portion of the watershed for industrial and commercial development, construction of an inland port, the presence of large distribution and chemical processing centers, low returns to agricultural enterprises relative to what can be realized in other occupations, increased demands for recreation, and substantial appreciation of land values for residential, recreational, commercial, and industrial uses. Further, a number of water analyses performed by the Friends of the Shenandoah River indicate high levels of pollutants, including fecal coliform.

The Willow Brook-Crooked Run watershed is part of the Chesapeake Bay watershed. Both the brook and the run flow into the Shenandoah River. Crooked Run is located in the western part of the watershed where the underlying rock is shale. Willow Brook, on the other hand, is located in the eastern part of the watershed, which has karst geological formation. Due to the karst geology, Willow Brook, at times, flows directly into the groundwater supply. Therefore, polluted surface water contributes to the continued degradation of the Shenandoah River and the Chesapeake Bay, but it also pollutes local drinking water. The challenge is to preserve the watershed's natural resources and heritage while supporting economic growth.

To Learn More and To Become Part of the Initiative, please contact Milton Boyce, President FOSR at 540 869-3108 or Lyle Schertz, Chair of the LFSWCD at 540 636-8919.

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WE ALL LIVE DOWNSTREAM



*Dear Monitors;  
The years have gone by there has been many moments of Joy & Praise to all;  
Thank you for all your efforts and time in all kinds of weather –hot and cold,  
wet and dry.  
Sincerely,  
Don Orr*

**2004 MONITORING SCHEDULE**

January	10 & 24	February	7 & 21	March	6 & 20
April	3 & 17	May	8 & 22	June	5 & 19
July	10 & 24	August	7 & 21	September	11 & 25
October	9 & 23	November	6 & 20	December	11

