



## **Message from the President**

There is a lot going on in the Chesapeake Bay Watershed these days. Since President Obama signed the "Executive Order" last year calling the bay a "National Treasure," it has become a major focus of not only watershed protection groups, but also agencies and legislators at both the state and federal levels.

The United States Environmental Protection Agency has begun work on a Chesapeake Bay TMDL—the Total Maximum Daily Load of pollution that a water body can accept and still meet water quality standards. In the past most of these TMDL studies and implementation plans have been managed by state agencies, not federal ones. The EPA's involvement makes a huge difference. Usually in a TMDL process, a state agency lists a certain watershed or segment of a watershed as impaired. Water bodies can have impairments that are bacteriological, benthic, pH, nutrient, or sediment based, but once an agency has listed a water body as impaired; a TMDL study is required to define the extent of the impairment and develop an implementation plan. These plans define alternative clean-up measures and best management practices that reduce enough pollution sources to allow the water body to be removed from the "dirty waters" list. The final part of the TMDL process is monitoring the water body to verify that it will continue to meet water quality standards after it is cleaned up.

Until now the clean-up of the Chesapeake Bay Watershed has been a cooperative effort between the several states in the watershed with the EPA setting voluntary goals 10 to 15 years into the future. When the states reached their last agreement 10 years ago, the EPA told them that if their results did not remove the Chesapeake Bay Watershed's impairments by 2010, the agency would develop its own TMDL to reduce the impairments.

Well, 2010 is here and the Chesapeake Bay is nowhere near reaching the reductions set in that last agreement. The EPA has already done the calculations to determine the total pollution reductions needed. They have divided up those reductions of nitrogen, phosphorus, and sediments, and assigned a fair share to each of the 5 states in the 64,000-square-mile Chesapeake Bay Watershed—Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia—as well as the District of Columbia. Virginia has received its pollution "diet" allocation and must now decide how much each river basin and jurisdiction must reduce its own pollution in order for the state to meet the EPA requirements.

Now that the EPA is involved with the bay, the resulting clean-up will have some regulatory teeth to make sure each jurisdiction involved finishes the job. The states and the District of Columbia will be required to establish aggressive but reasonable goals for two-year performance periods. All of these jurisdictions will be required to report every two years on their actual accomplishments toward meeting these goals that they established for themselves.

I believe this TMDL program will be very different from earlier ones because the EPA has described a range of possible sanctions for jurisdictions not meeting their goals. These could include requiring tougher point source permit requirements or withholding federal grant funding—some speculate that federal highway funds could be withheld. Each state may decide how much of the pollution reduction will be realized in the areas of storm-water, agriculture, or wastewater treatment; and, furthermore, the state can trade pollution reductions from any of these sources to meet their goals. However, if the total reductions aren't reached, the federal government will act.

This is a very different scenario from the past efforts of the Chesapeake Bay Clean-up, which has been a voluntary program without sanctions at any level. Implementation of the Chesapeake Bay TMDL will require pollution reduction in our local streams that will benefit the local environment that we live in.....Stay Tuned.....

The draft TMDL is expected to be available for public comment during the late summer of this year.

The US EPA is providing lots of info about the Chesapeake Bay TMDL and many opportunities for public comment on their Website: <http://www.epa.gov/chesapeakebaytmdl/newsitems.html>

## To the membership of the FOSR:

My name is John Simpers, and I am currently the Secretary of the Friends of the Shenandoah River. It has been my privilege to serve this organization during the past nine years – first as a volunteer in our laboratory at Shenandoah University, and later as an active member of the FOSR Board of Directors.

Although our board is entrusted with making the decisions that direct and focus the work of our organization, nothing can truly take place without the valuable input of our membership. As members, you have already displayed a profound interest in the health and prosperity of the Shenandoah River and its communities. Your thoughts and feelings about what the FOSR is doing today, and where it could offer the most benefit in the months and years ahead, can greatly influence the work we do and the impact we have.

On behalf of the Board of Directors, I would like to invite you all to share your ideas and concerns with us. Most especially, I would ask you to come and attend a board meeting and learn firsthand how you could take a more active role in the ongoing efforts of the FOSR. We want to hear new voices and fresh ideas as we move forward with our monitoring work, our outreach activities, and our educational programs, all with the goal of improving and sustaining the health of the Shenandoah River.

Please contact us – by phone, e-mail, or post – and let us know that you would like your voice to be heard. From the entire Board, thank you once again for your continued support of the FOSR, and we hope to hear from you in the very near future.

Sincerely,

**John Simpers**

Secretary of the Friends of the Shenandoah River

### South River Science Team Meeting, Spring 2010, by Bob Luce

The Spring meeting was held on April 23 at William & Mary College in conjunction with a four day International Mercury EXPO at the college. Faculty and students from a variety of disciplines held workshops and discussions on science and history regarding mercury. Film, art, and theater presentations that took years in the making were presented. It was a wonderful exposition that truly rounded out the usual concerns of the South River Science Team (SRST).

The SRST talks primarily took stock of the major research efforts, although two new projects were described. Robert Brent of JMU outlined his upcoming “in the river” manipulative experiments on periphyton growth and its mercury uptakes; Wayne Landis of Western Washington University proposed a Bayesian Network Model for Ecological Risk Assessment of mercury in the South River environs.

In general, investigative projects underway will be completed but future emphasis will be on devising and testing remedial options for cleaning up, isolating, or minimizing the effects of mercury in the water, soil, and biota.

The timeline of major regulatory actions was given at the meeting:

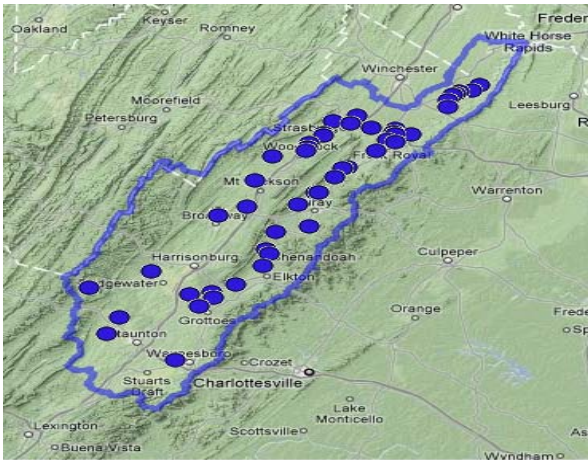
- Resource Conservation & Recovery Act (RCRA) investigation began in 1998; ongoing
- SRST organized in 2000; ongoing
- TMDL study began in 2002; ended in 2008
- Natural Resources Damage Assessment study began in 2004; expected to end in 2012
- Natural Resources Defense Council ecological study began in 2005; expected to end in 2012

## Recent updates to the FOSR's

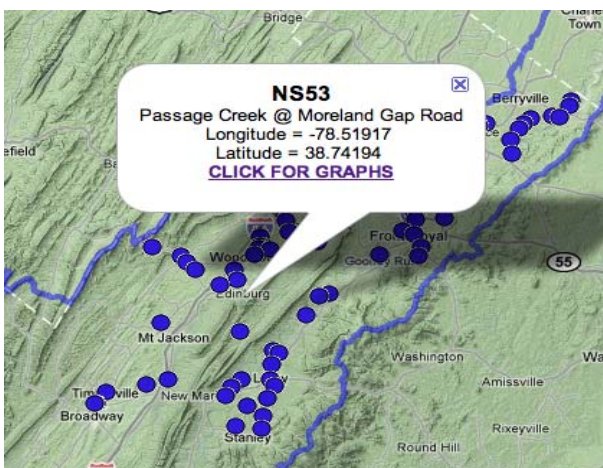
### "WATER WINDOW II"

by Gary Lauben, FOSR's Webmaster

FOSR is pleased to announce a new interactive map of the Shenandoah Watershed. The "Water Window II" now includes clickable markers for all samplings sites, U.S. Geological Survey stream gages, river mile-markers for both the North Fork and South Fork, Virginia DEQ impaired streams, an outline of the entire watershed, and over thirty sub-watersheds.



Clicking a sampling site will bring up the data query page with the site pre-selected for graphing or tabular data. Clicking on a USGS stream gage marker brings up a link to a USGS web page with real-time data. Clicking on an impaired stream segment brings up details about the impairment, and clicking on a sub-watershed shows the drainage area (in square miles) for each.



# UPCOMING EVENTS

## Harpers Ferry Outdoor Festival and Tim Gavin Down River Race



**Saturday, June 19, 2010**

The Harpers Ferry Outdoor Festival is a yearly event held to raise money for river and environmental conservation and to raise environmental awareness. The Festival is used to bring together participants, activists, and enthusiasts of the many outdoor activities in our area including kayakers & canoeists, rafters, hikers, bikers, campers, anglers, climbers, bird watchers and anyone else who shares our love and concern for our natural environment. We are here to promote the healthy and peaceful enjoyment of everything which our unique area has to offer.

Admission to the festival is only \$10 and is free to overnight guests of the KOA & anyone participating in the Tim Gavin Race or the Amateur Raft Race. Don't miss the Whitewater Film Extravaganza!

For more information visit the festival website @:  
<http://harpersferryoutdoorfestival.org>



## ON THE RIVER '10 FESTIVAL

**August 21, 2010**

8AM – 4PM

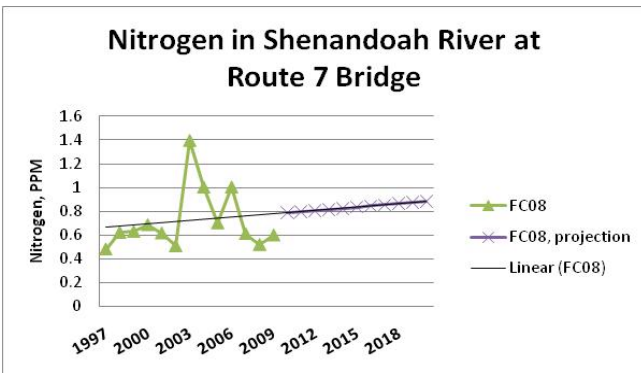
Held next to the beautiful Shenandoah River at the VFW Event Grounds in Front Royal Virginia

- FREE Canoe Trips provided by [Front Royal Canoe](#) & [Downriver Canoe Company](#) with passenger shuttles from VFW to Front Royal Landing. Demand for the free canoe trips is expected to be very high! So please arrive early to help ensure that you register for a free trip down the river.
- Local music, great food, demonstrations, fun activities for the kids, and more!
- Environmental education opportunities will be provided by the Friends of the Shenandoah.
- Local vendors and Virginia products.
- PRIZES!

## STATE OF THE RIVER, *by Charles Vandervoort*

This section of the newsletter focuses on the extent and trend of nitrate-nitrite (nitrogen) and turbidity pollution measured at the 79 sampling sites – called the baseline set – in the FOSR database that were regularly sampled (twice a month, weather permitting) since January 1, 1997. Not included are sites that, for short-term research purposes, were sampled for only a few months during the 1997 – 2010 time period.

**Nitrogen:** The graph below shows the average concentration for nitrogen measured in the main stem of the Shenandoah River at the Route 7 bridge. This site is our furthest downstream monitoring sites and is close to the confluence with the



Potomac River. It is therefore important because it combines the totality of all the waters in the Shenandoah River Basin.

Eventually that water going under the route 7 bridge ends up in the Chesapeake Bay, and contributes about 10% of its water. (The Shenandoah River provides approximately one-third of the volume of the Potomac River; the latter in turn provides about one-third of the volume of water in the Chesapeake Bay.)

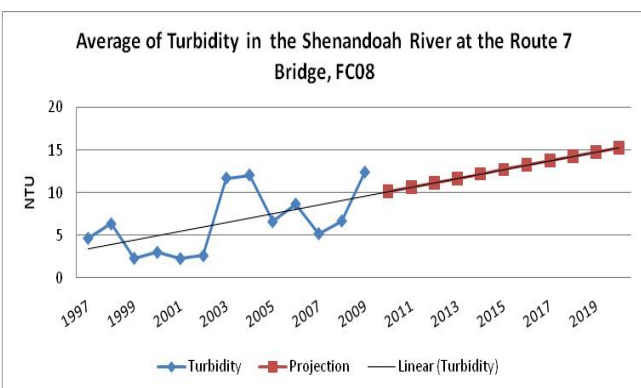
The nitrogen concentration starts off in 1997 at 0.5 PPM. This is well below the impaired level of 0.75 PPM, and as the trend line shows, the concentration increases gradually over time. A linear projection suggests that by 2020, a short ten years from now and if nothing is done, the nitrogen concentration will be above the impaired level of 0.75 PPM. The graph shows a great amount of

variability in the nitrogen concentrations. This variability is caused by the combination of the multitude of factors that contribute to nitrogen pollution, along with the impact of measures to reduce nitrogen concentrations such as improvements in best management practices, better regulation, and better enforcement of regulations.

High concentrations of nitrogen can cause harmful algae blooms and eutrophication in both the Shenandoah River and downstream waters such as the Potomac River and Chesapeake Bay. EPA has not yet developed quantitative criteria for nitrogen with regard to its impact on aquatic health and eutrophication in fresh water. Research by the FOSR on criteria developed by other States, academia, and environmental organizations however suggests that, in fresh water, nitrogen concentrations above 0.75 start harming aquatic life and start contributing to eutrophication.

Looking at all river monitoring sites, only four of the 26 sites reported average nitrogen concentrations for 2009 that were not impaired (below the level of 0.75 PPM.). 18 sites were at the impaired level (above 0.75 but below 1.5 PPM), and four were severely impaired (above above 1.5 PPM).

**Turbidity:** Turbidity measures the level of sedimentation in the water. Although the EPA has not yet developed definitive criteria for turbidity in streams, research by the FOSR suggests that a concentration above 20 NTU (nephelometric turbidity units) can be considered harmful to aquatic life. At such concentrations the high sedimentation, among other things,



blocks sunlight and suffocates small bottom dwelling organism. A high average annual turbidity level is therefore of great concern.

As shown in the figure below, turbidity in the Shenandoah River at the Route 7 bridge starts off at a relatively low concentration, but increases rapidly and is projected to be higher than 15 NTU by the year 2010. This is a level believed to be very harmful to aquatic life. Both turbidity and nitrogen concentrations are affected by similar factors, such as runoff from agricultural land. In addition, however, turbidity is much influenced by the growth of urban development. The building of new houses, urban roads, parking lots and other infrastructure, unless done carefully, can

create runoff of water from impermeable surfaces. Such runoff can carry with it considerable amounts of sediment to the rivers and tributaries.

The average concentrations of turbidity for 2009 for all the river sites were unimpaired (below 4 NTU) for only one site. Four sites were impaired (between 4 and 7 NTU), and the vast majority of 21 river sites were severely impaired (more than 7 NTU).

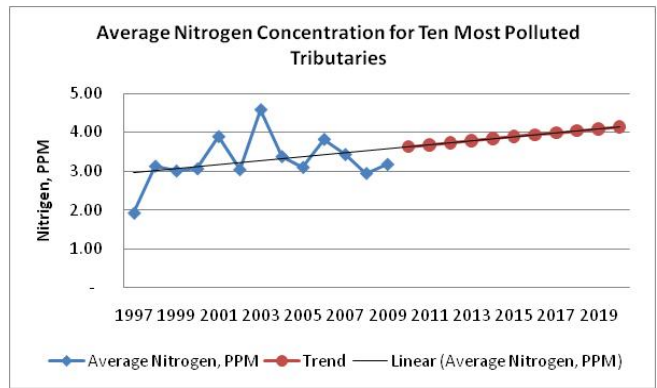
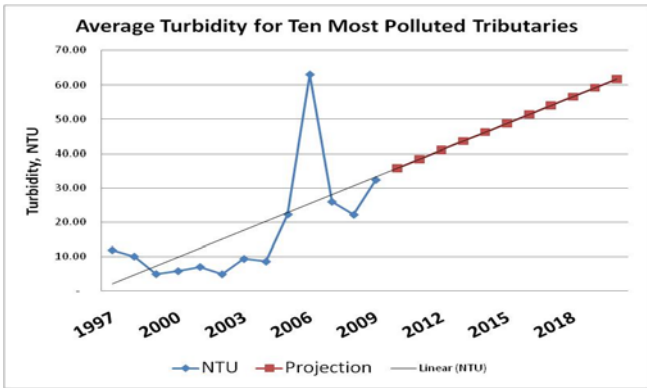
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**Hot Spots:** The Fall 2009 newsletter dwelled on tributaries where levels on nitrogen and turbidity were the highest. Not much has changed since that letter. The seven monitoring sites where the highest nitrogen concentrations were recorded still include Pleasant run, Muddy Creek, and Cooks Run in Rockingham, Mill Creek in Page County, and Dog Run, Spout Run, and Lewis Run in Clarke County.

In this newsletter we take a slightly different approach by focusing on the trend of concentrations of nitrogen and turbidity in the tributaries.

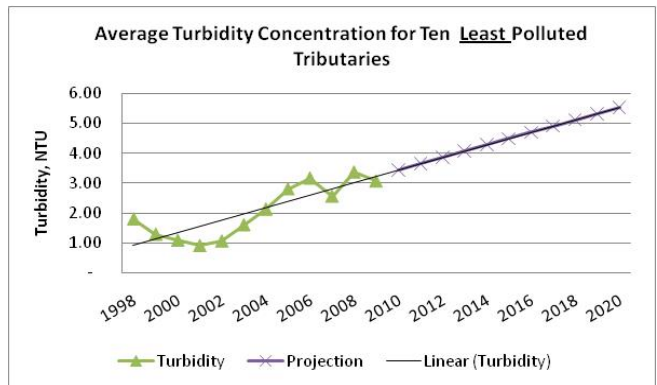
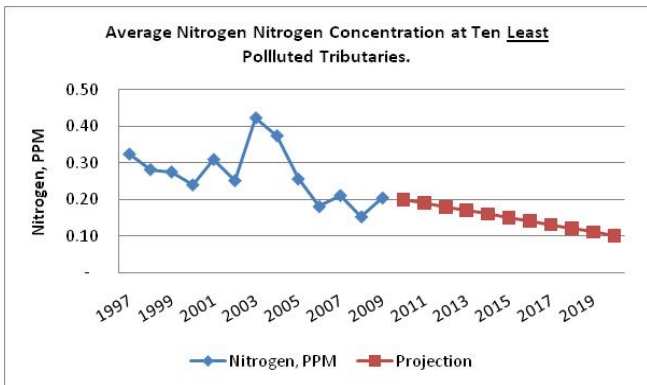
Nitrogen and Turbidity in the Worst Tributaries..

The two charts below show the level and trend for nitrogen and turbidity in ten most polluted tributaries. It is clear that the levels for both nitrogen and turbidity are very high. By the year 2020, and if nothing is done to mitigate the pollution, nitrogen will exceed 4.0 PPM – this is well above the severely impaired level. For turbidity, the concentration will be about 60 NTU. This is seriously above the severely impaired level.



Nitrogen and turbidity in the ten best tributaries..

The graph below shows a marked decrease in the concentration of nitrogen in the ten best tributaries. These are located in Warren, Shenandoah, Page and Augusta counties. The trend is down sharply, and by the year 2020 will fall well below the impaired level. The picture for turbidity shows only a moderate increase in trend. By the year 2020, turbidity concentration will be below the impaired level of 7 NTU. These good sites suggest by how far concentration levels could possibly be reduced by accelerating measures such as Best Management Practices.



**Summary:** Average levels of concentration for nitrogen and turbidity in the rivers and tributaries of the Shenandoah River Basin are high, although there is evidence that the concentration for nitrogen in many tributaries may be slowly declining.

More detailed analysis based on larger samples and inclusion of more parameters is presented in the comprehensive FOSR report available on the FOSR website ([www.fosr.org](http://www.fosr.org)). This report analyzes in considerably more depth the extent of water quality deterioration in the Shenandoah River Watershed, the efforts and effectiveness of the various groups that are implementing possible solutions to halt and reverse the deterioration, and prospects for the future.



