FOSR Office
1460 University Drive
Winchester, VA 22601
(540) 665-1286
www.fosr.org

Issue I 2011

FRIENDS OF THE SHENANDOAH RIVER
We All Live Downstream

FOSR Laboratory
1460 University Drive
Gregory Hall 152
Winchester, VA 22601

http://www.fosr.org/data/

Message from the President,

Earlier this year the Board of Directors of FOSR engaged in a strategic planning exercise to help us assess exactly where the organization is at the present time. We felt that while our monitoring program is doing very well; we were all concerned about our long-term financial health. We engaged a first class facilitator, Mr. Milton Herd, to help us work through some of the issues involved.

We had three meetings through the winter and spring months, and we had great attendance from the Board, and a few monitors came to some of the sessions. They were long, sometimes tense meetings, but we all felt that they were very worthwhile and helpful.

It became clear to us that while FOSR has substantial recognition by the state agencies and other organizations that use our data, not very many people outside of our own group really knew much about us. It also came out that our data was not really utilized by many people. Our database is a priceless asset, but other than posting it on our website, we don't really use it either. One of the most important ideas that came out of our meetings was that we ourselves need someone to help us find and publish the nuggets of information that our data set often suggests. We should be giving out timely packets of information to each of the counties we monitor in, and we need to let county officials and concerned citizens know about disturbing trends, or off-the-chart nutrient concentrations. We should also be publishing occasional papers about water quality topics.

The Board was also concerned about our financial sustainability. With our two staff people busy with our existing monitoring work, and the distinct possibility of lots of monitoring jobs to do for other organizations, we need to raise a large amount of money to help us find another person to help us implement ways to make our data more relevant. We are going to be launching a major fund raising campaign to make the organization more sustainable in every way.

I would say that the whole process has been exceedingly helpful to all of us, and while we aren't finished with the process, we are committed to continuing it to make "The Friends" a better, stronger, and more relevant organization.

George L. Ohrstorm, II

2010 FOSR Financial Report and 2011 Update,

by Bernard C. Nagelvoort, Treasurer

The year 2010 was a successful financial year for the Friends of the Shenandoah River. Operating on a cash basis, our cash position at the beginning of the year was $65,747.38 and we ended the year with $117,068.97, an increase of $51,321.59.

Our operating income amounted to $162,673.95 in 2010 versus $132,826.78 in 2009. However, included in 2010 is $74,615 net related to the sale of 10 acres of property in Frederick County donated to the Friends in 2009. Excluding this special item, operating income declined by $44,767.83. That amount is represented almost entirely by a reduction of $39,810 in receipts from the Virginia Tech's National Fish and Wildlife Foundation Opequon Targeted Watershed Project grant funds for contracted water quality monitoring performed by the Friends lab in 2009. Virginia Tech's grant-related research program with the FOSR concluded in December 2009.

Cash expenses in 2010 were $110,058.64 versus $113,472.68 in 2009, a reduction of $3414.04. Staff salaries and related expenses amounted to $83,815.22 in 2010, 76% of operating expenses versus 73% in 2009. Managing and operating the Friends state-accredited laboratory at Shenandoah University by our very capable two person staff is our major expense as expected.

Detailed financial statements for calendar 2010 are available at our website at www.fosr.org.

Beginning in late 2010 and continuing through the first six months of 2011 our Board has been involved in the development of a long range plan for the organization which is described in the President's report. Related to the plan will be the development of long term funding to carry us through what will likely be a substantial increase in our lab operations.

At the same time, we developed what I consider to be an interim budget for calendar 2011. While it included a substantial budgeted deficit of $47,000 for the year, at the time of its development we were not ready to include income which was being considered, but not formalized. As of July 17, 2011, all but $17,000 of this budgeted loss has been made up by donations in excess of budget with income of $74,881 and expenses of $63,228 with the expenses being $1400 above budget and income $27,500 above budget.

$$$$$$$$$$

Saturday August 13, 2011, 10AM – 3PM,

VFW Post 1860, 1847 N. Royal Ave, Front Royal, VA

Free family event designed to connect and reacquaint our community with the Shenandoah River. This year's Riverfest will feature canoe rides along the South Fork of the Shenandoah River, live music, great food, fun activities for the kids, fly fishing demonstrations and wild animal displays. Also featured will be environmental and educational displays.

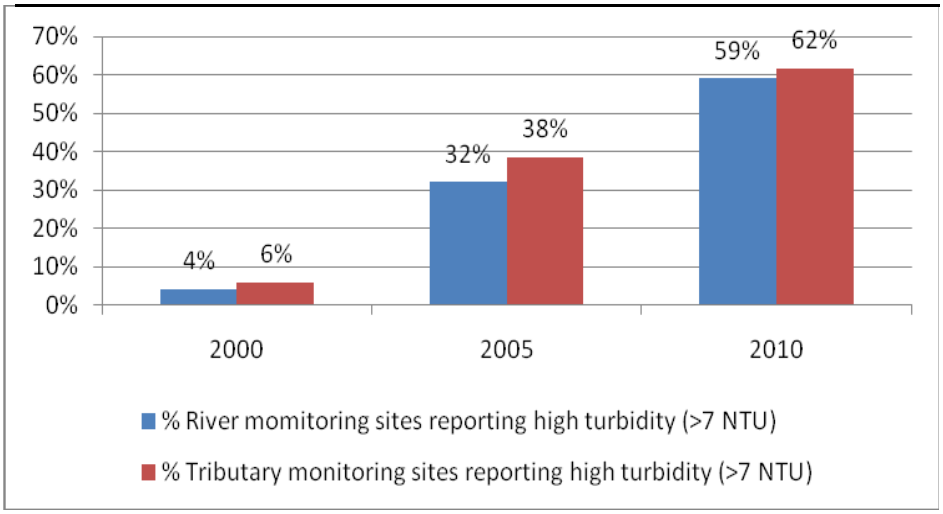
STATE OF THE RIVER REPORT: July 2011, *by Charles Vandervoort*

Overall Status: Over the past ten years the number of monitoring sites reporting high turbidity and nitrogen (nitrate-nitrite) has substantially increased (See Tables 1 and 2 below). This suggests that water quality in the Shenandoah River Watershed is getting worse.

Turbidity: Table 1 shows that in the year 2000 only a few (4% to 6%) monitoring sites reported high concentrations of turbidity in the rivers and tributaries of the Shenandoah River basin. By 2005, however, between 32% and 38% of the sites reported high turbidity, and by 2010 more than half the monitoring sites reported high concentrations of turbidity. As remarked in earlier FOSR newsletters and reports, this deteriorating trend of turbidity is of great concern.

The criteria used for "high" turbidity is a concentration exceeding 7 NTU (nephelometric turbidity units indicating the "clarity" of water). Generally, water starts to turn muddy above that level. Although Virginia does not yet have criteria for critical levels for turbidity concentration, we were able to adopt useful criteria developed by a number of competent organizations [1].

Table 1: Growth of the percentage of FOSR monitoring sites reporting high concentrations of turbidity in rivers and tributaries of the Shenandoah River Watershed.



Nitrogen (Nitrate-Nitrite): The picture emerging for nitrogen is similar but somewhat more subdued than that for turbidity. In the year 2000 27% of the FOSR monitoring sites located on tributaries and 10% of the monitoring sites located on rivers reported nitrogen levels above 1.5 PPM, a level considered impaired in "The Status Of Water Quality in the Rivers And Tributaries of the Shenandoah River Watershed, August 2007." Virginia has not yet developed criteria for critical concentrations for nitrogen [2]. By 2010 the percentage of river sites reporting high concentrations of nitrogen had doubled to 21% and the percentage of tributary sites had risen to 42%.

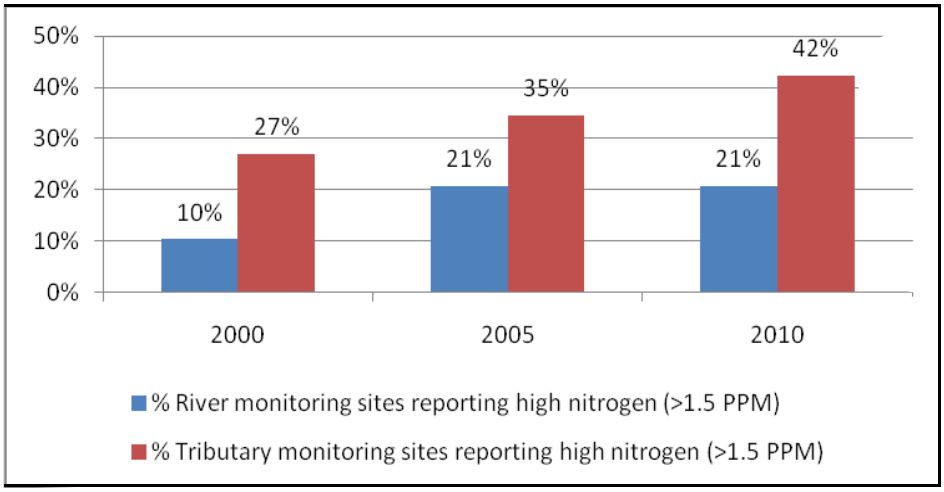
[1]. Page 54 of "The Status Of Water Quality in the Rivers And Tributaries of The Shenandoah River Watershed, August 2007" provides useful references and citations justifying 7 NTU as the concentration at which fresh water becomes impaired. This report is available on www.fosr.org.

[2]. Page 51 of the "The Status Of Water Quality in the Rivers And Tributaries of The Shenandoah River Watershed, August 2007: presents useful references and citations justifying the use of 1.5 PPM as the concentration at which fresh water becomes impaired.

(Continued on page 4)

(Continued from page 3)

Table 2: Percentage of FOSR monitoring sites reporting high concentrations of nitrogen in rivers and tributaries.



The data in Tables 1 and 2 show that as time goes on, an increasing percentage of FOSR monitoring sites on the rives and tributaries in the Shenandoah River Watershed are reporting high levels of nitrogen and turbidity concentrations. This strongly suggests that pollution in our watershed is on the increase.

Hot Spots: The preceding section showed that nitrogen and turbidity pollution are on the increase. This section analyzes where the problem areas (hot spots) are.

Table 3 below show the ten sites in the Shenandoah river basin with the highest concentrations of nitrogen in 2010. Except for one river, these "hot spots" are all tributaries. Although the water flow in the tributaries is small, there are 52 tributaries that discharge into the rivers, and the pollution from these small streams adds up.

Table 3: Avg. Nitrogen Concentration in 1997-1999 and 2008-2010 at Ten Worst Sites

Site ID	Avg. Nitrogen PPM 1997-1999	Avg. Nitrogen PPM 2008 - 2010	Site Name	Type
JR01	5.74	4.76	Muddy Creek-North River	Tributary
JR10	4.00	4.93	Pleasant Run-North River	Tributary
JR07	3.79	4.48	Cooks Creek-North River	Tributary
FP13	2.72	3.33	Mill Creek	Tributary
JR06	2.25	2.46	Long Glade Creek-N. River	Tributary
FC06	1.83	2.67	Dog Run	Tributary
NS13	1.68	2.20	Toms Brook above STP	Tributary
JA01	1.67	1.98	Naked Creek-North River	Tributary
JR13	1.60	1.73	Cub Run-North River	Tributary
JR09	1.53	1.88	North River above HRRSA	River

The table compares the average nitrogen concentration of the ten hot spots for the 1997 – 1999 years with the average for the 2008-2010 years. We used the average of three years rather than using the concentration for a single year because of the high volatility of nitrogen concentration. Much of the volatility from year to year is caused by infrequent severe weather events, such as the triple blizzard of 2010.

(Continued on page 5)

(Continued from page 4)

The Table 3 shows that the recent hot spots were already "hot" ten years ago. The table also shows that there has been very little change in the concentrations of nitrogen at the hot spots recorded from 1997-1999 (average 2.7 PPM) to 2008-2010 (average 3.0 PPM). In other words, the hot spots were already showing high pollution ten years ago, and this level of pollution continued until the present time.

The fact that nitrogen pollution levels measured at the hot spots stayed on a high plateau over the ten years is a bit of a mystery. It seems odd considering that earlier in this paper we showed that the total of all 52 tributary monitoring sites, of course including the hot spots, reported a very significant rise over time in the number of sites recording high nitrogen concentrations, i.e. exceeding 1.5 PPM. The increase was from 27% of the sites in 2000 to 42% in 2010.

One explanation could be that, although there was an increase in the number of sites reporting higher nitrogen concentrations over the past ten years, the concentrations at the hot spots started at levels that were already close to a physical maximum. Could it be that specific tributaries have a maximum concentration level for nitrogen that cannot be exceeded? For example, consider a specific creek where ten years ago all the forest land had already been converted to urbanized and agricultural land, and all the damage done by polluting industries such as poultry had reached its peak. In that case the nitrogen concentration could have already reached its maximum. Ten years later the nitrogen concentration would still be at this maximum; i.e. things could not get any worse.

Another explanation is that the hot spots may have received much more attention for remedial actions than other tributaries, such as riverine buffer zones and cattle fences, and that these measures kept nitrogen concentrations down. This, however, conflicts with the trend for turbidity at the hot spots as shown in Table 4 below. The table shows turbidity concentrations at the hot spots were already high at 7.5 NTU ten years ago. Over the next ten years the turbidity concentration increased even more to 24.5 NTU. This could only happen if remedial actions to alleviate nitrogen pollution were ineffective for turbidity pollutions, and this is very unlikely. Could it be that, unlike hypothesized for nitrogen, there is no "maximum" level for turbidity? Time will tell.

Table 4: Avg. Turbidity Concentration 1997-1999 and 2008-2010 at Ten Worst Sites

Site ID	Avg. Turbidity. NTU 1997-1999	Avg. Turbidity. NTU 2008 - 2010	Site Name	Type
JR07	13.66	35.53	Cooks Creek-North River	Tributary
JR06	12.85	36.97	Long Glade Creek-N. River	Tributary
JA01	11.47	34.57	Naked Creek-North River	Tributary
JR10	9.55	48.23	Pleasant Run-North River	Tributary
JR13	6.25	23.94	Cub Run-North River	Tributary
JR09	5.95	7.99	North River above HRRSA	River
JR01	4.77	15.21	Muddy Creek-North River	Tributary
FC06	4.57	15.99	Dog Run	Tributary
FP13	4.20	15.01	Mill Creek	Tributary
NS13	1.99	11.94	Toms Brook above STP	Tributary

Friends of the Shenandoah River
1460 University Drive
Winchester, VA 22601

Non-Profit Org.
U.S. Postage
PAID
Winchester, VA
Permit No. 99

JOIN THE FRIENDS OF THE SHENANDOAH RIVER IN THEIR MISSION

"To protect and restore the aquatic environment of the Shenandoah River and its tributaries"

Yes, I would like to be a member of The Friends of the Shenandoah River (FOSR)

___ $20 Supporter

___ $35 Friends & Family

___ $50 Patron

___ $75 Guardian

___ $100 Steward

___ Other/Donation

NAME_____

ADDRESS_____

_____

Telephone_____

E-mail:_____

Please make checks payable to: ***Friends of the Shenandoah River***
and mail to:

1460 University Drive
Winchester, VA 22601

*If you do not wish for the FOSR to exchange your info with other environmental groups, please check box ☐