

**South River Science Team**

**June 24, 2003  
Harrisonburg, VA**

**AGENDA**

<b>Time</b>	<b>Issue</b>	<b>Responsible</b>
9:00	Welcome	Don Kain
9:15	Floodplain soils	Annette Guiseppi- Elie
9:45	Forestry Center Crop Studies	Bill Berti
10:30	Break	
10:45	DEQ Intensive Water Survey and Follow-up Sediment Options	Ted Turner
11:00	Statistical analysis of 2002 fish tissue data	John Green
12:00	LUNCH	
12:45	seasonal and sexual mercury data in smallmouth bass	Greg Murphy
1:30	Communications - Newsletter Outreach	Mike Liberati Rick Straitman
2:00	Bird Studies	Ralph Stahl
2:15	Manuscript	Ralph
2:30	Brainstorming	Ralph
3:00	October Expert Panel Meeting	Ralph / Don
3:15	Wrap-up / Action Items / Next Mtg	Ralph / Don

## Meeting Summary

**Welcome.** Don Kain welcomed all attendees and reviewed housekeeping. Self-introductions were made by all. A list of attendees is included as Attachment 1, page 5.

**Floodplain soils.** Dick Jensen presented plans for a continuation of the floodplain survey begun last year. The initial work consisted of land-based (generally from within a vehicle) observations and documentation of floodplain features and structures. The focus of this work has been to identify “at risk” areas within the South River floodplain, such as gardens, buildings, feedlots, public access, etc. that may be subject to mercury contamination from sediment deposition during high water events. The survey will be expanded this summer to include observations from the river, and will be accomplished by floating the full length of the river from Waynesboro to Port Republic and noting features not readily apparent from the earlier roadside survey, including erosional areas, cultivated areas, property boundaries, etc. The data collected will also be used to help determine locations for a floodplain soil sampling effort. The field survey is scheduled for mid-July.

Dick also announced a meeting / conference call on July 15 to discuss a statistical approach to designing a floodplain sampling program. The meeting will be in Waynesboro. Contact Dick if interested in participating in the river survey or the meeting.

**Forestry Center Crop Studies.** Bill Berti provided an update on the crop uptake study (see Presentations folder). DuPont will plant several types of vegetables at the Augusta Forestry Center in Crimora to determine if mercury is being taken up by the vegetables and posing a risk to consumers. The treatment garden plot will be in a portion of the floodplain near the river where earlier soil samples indicated mercury levels in the range of about 20-50 ppm. A control site in an upland portion of the Forestry Center will be planted with the same crops. Planting will take place this summer and efforts will be made to maintain the garden plots in a manner similar to home gardens.

**DEQ Intensive Water Survey and Follow-up Sediment Options.** Ted Turner outlined plans for DEQ to perform a follow-up survey to the South River intensive water column survey of July 2002. The follow-up survey would target two areas:

- A site several hundred yards downstream of Hopeman Parkway, which had elevated levels of total mercury in the water column in the 2002 survey, and
- The 1-mile reach of South River beginning at the Wayne Avenue bridge (upstream of DuPont) and ending downstream of Jones Hollow (below DuPont).

Details, including specific sample locations, parameters, and methods are included in the Presentations folder. Sampling will occur this summer.

Ted also outlined a proposed methodology for sediment sampling that would allow for consistent sampling at all sites. DEQ is considering using a device similar to the McNeil

sampler, and will do some field tests during the coming months. Objectives are to collect similar material at all sites for comparative purposes and to evaluate mercury concentrations within different particle sizes at individual sites.

**Statistical analysis of 2002 fish tissue data.** John Green (via phone) provided a statistical review of mercury levels in fish samples collected by DEQ during 2002. This evaluation focused on smallmouth and largemouth bass and sunfish. General Findings: Mercury levels in 2002 were consistently lower than those from 1996, but remain higher than the baseline from the 1970s and early 1980s. Mercury levels increase in South River as one moves downstream from DuPont, past 2<sup>nd</sup> Street and Hopeman Parkway and peak in the reach from Dooms to Grottoes. Levels in the South Fork Shenandoah River decrease with distance downstream.

**Seasonal and sexual mercury data in smallmouth bass.** Greg Murphy provided results of data from fish samples collected during the past year (see Presentations folder). Mercury concentrations were highly variable, but typically increased with size and age. Mercury levels in smallmouth bass were higher for males and females in the spring. Females had higher mercury levels than males in all seasons. It was unclear which factors influence mercury levels by season, although feeding behaviors and rates, along with reproductive condition, are likely to be important. Greg recommended that managers standardize fish sampling periods for more meaningful comparisons of sites and time periods. He also recommended that sex of each fish be determined and recorded. Greg's abstract of this project can be viewed below in Attachment 2, page 6).

**Communications – Newsletter.** Mike Liberati informed attendees that the next newsletter is in press and should be mailed within the next week or so. He asked for ideas for the fall issue (October target).

**Outreach.** Rick Straitman led a discussion on the topic of outreach. A primary objective of the Science Team is to ensure that we are effectively communicating (particularly risk issues) with appropriate stakeholders. Examples of recent outreach activities include the Shenandoah River Sojourn and the Shenandoah River Roundtable, sponsored by JMU and Pure Water 2000 (Science Team Display). Paul Bugas volunteered to set up the Science Team Display at the upcoming Riverfest in Waynesboro. Others in the group were also encouraged to carry the display (stored at DEQ) to appropriate venues. The group was asked to be thinking about the makeup of the Science Team and to make recommendations for representation from other groups or individuals, either as key contributors or as stakeholders. Based on past interest shown by the Chesapeake Bay Foundation, Don volunteered to contact Jeff Corbin, senior scientist with CBF, and extend an invitation to participate in Science team activities. The concept of an annual report was mentioned. Don, Ralph, and Rick will explore this further.

**Bird Studies.** Ralph Stahl shared concerns over the lack of information on mercury levels in birds in the Shenandoah River system. Many bird species consume fish and other aquatic organisms, which are known to contain mercury, yet we have no local data on waterfowl. Ralph referenced a controlled study of mallards fed a diet containing 10 ppm mercury in which the eggs and embryo were impacted. While local, natural food items are not known to have mercury levels of this magnitude, it remains unclear how much risk may exist. Ralph suggested that we explore ways to address that data

gap, including compiling lists of local waterfowl species and developing data on fish species not addressed in our past collections. Paul Bugas will try and get a bird inventory list, and we will review Greg Murphy's fish prey mercury data as a starting point. Mike Newman mentioned a study on blue herons and mercury and said he will locate and share that information.

**Manuscript.** Ralph reminded the group of the continuing work by Science Team members to develop a manuscript for publication. Additional volunteers are welcome. An outline has been developed and assignments made for the sections of the manuscript. Work is continuing on schedule for submittal to a journal later this year.

**Brainstorming (see Attachment 3, below).** Ralph led a discussion identifying efforts by the Science Team, including ongoing or completed studies and data gathering exercises, proposed work, and other plans for information exchange. The priorities of items in Attachment 3 were confirmed by the group, and all were reminded of the need to continue to pursue projects which are not currently active.

**October Expert Panel Meeting.** The meeting has been set for October 21-23, beginning on the afternoon of the 21<sup>st</sup> and ending at noon on the 23<sup>rd</sup>. Science Team members will be asked to provide summaries of work completed during the last year. We will develop lists of unanswered questions and issues that need further exploring and ask the panel members for recommendations for continued or new work. Details of the agenda will be discussed at the next meeting.

On a related subject, a suggestion was made to have Dr. Dave Krabbenhoft provide a seminar on mercury and fish communities. DuPont staff will explore this further.

**Wrap-up / Action Items / Next Mtg.** The next meeting was set for August 19 (later moved to September 9). Potential agenda items were discussed.

## Attachment 1. Attendees

### SOUTH RIVER SCIENCE TEAM MEETING – June 24, 2003

Name	Organization	Phone No.	E-Mail Address
Lydia Cubbage	DEQ	(540) 574-7888	lcubbage@deg.state.va.us
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Greg Murphy	VaTech	540-250-1314	gmurphy@vt.edu
David Greber Newfeld	EMU	540-432-4401	newfeldd@emu.edu
WILL BERTI	DuPont	302-306-6766	WILLIAM.R.BERTI@USA.DUPONT.COM
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Rick Straitman	DuPont	302-992-5829	richard.a.straitman@usa.dupont.com
Mike Liberati	DuPont	302 892 7421	michael.r.liberati@usa.dupont.com
Mike Sherrier	DuPont / URS	302 892-1168	Michael.p.sherrier@usa.dupont.com
DIK JENSEN	DuPont	302-541-6286	JENSEN@DELAWARE.NET
TED TURNER	DEQ	(540) 574-7858	tturner@deg.state.va.us
DON KAIN	DEQ	540-574-7815	DGKAIN@DEQ.STATE.VA.US

**Attachment 2. Abstract of sexual and seasonal variations of mercury in smallmouth bass (*micropterus dolomieu*) from the South Fork of the Shenandoah River, Virginia by Greg Murphy**

Gregory W. Murphy, Tammy J. Newcomb & Donald J. Orth, Department of Fisheries & Wildlife Sciences, Virginia Polytechnic Institute & State University, Blacksburg VA 24061. Smallmouth bass were collected from the South Fork Shenandoah River, Virginia during three sampling periods in 2002: spring (April 11); summer (July 17); and fall (October 1). Total mercury concentrations ranged from 0.38 to 1.38 ppm. Mean mercury concentrations adjusted for total length were significantly different between males and females ( $P = 0.0158$ ) and between seasons ( $P = 0.0516$ ). Female smallmouth bass consistently had higher mean mercury concentrations adjusted for total length than males. In addition, mean mercury concentrations adjusted for total length were highest in the spring for both male and female smallmouth bass. These results suggest that natural resource managers that oversee mercury monitoring programs may want to assess mercury concentrations in smallmouth bass during standardized sampling periods and record sex of fish so that data can be more accurately compared among water bodies and tracked over time.

## Attachment 3. "Brainstorming" Ralph Stahl

### Filling Data Gaps

#### *Ongoing or Completed*

- **Sediment Sampling and Coring**
- **Corbicula Studies (& intensive around plant site)**
- **Fish Diet Studies**
- **DuPont Site Stormwater Investigation**
- **Investigate Floodplain (& for purposes of CSM) / Vegetation / Biota**
- **Publications (need some common definitions)**
- **Water Column Sampling (ions, etc.)**
- **Atmospheric Deposition Studies (spring 04 results)**

#### *Planned or Proposed*

- **Investigate 2<sup>nd</sup> St. Landfill**
- **Initial estimate of bird exposure and hazards**
- Sampling Periphyton / Aquatic Vegetation (Bill make presentation)
- **Sediment Sampling & Analysis**
- Non Trust-fund Fish Sampling
- **Develop Basic Mass Balance, etc.**
- **Develop set of bioindicators (including fish)**
- **Modeling Help**
- **Hg Speciation**

#### **Related Activities**

Seminars and presentations by experts - USGS