



Keeping you up to date on South River Science Team activities

First Half 2013

At A Glance: DuPont Preparing Remediation Proposal

DuPont, with input from the Remedial Options Program Task Team of the South River Science Team, is preparing a Remediation Proposal for the South River and South Fork Shenandoah River. The proposal will address select eroding river banks that have been identified as the major potential continuing source of mercury to the rivers. The development of this proposal represents the final requirement of an agreement between DuPont and the Natural Resources Defense Council (NRDC) and the Sierra Club (Virginia Chapter).

The proposal will build upon the findings from Science Team

members and a six-year Ecological Study. As highlighted on page 2, the data collected over the years indicate that mercury primarily enters the South River through the erosion of mercury-contaminated river banks. As a result, a range of river bank remediation alternatives will be evaluated in the proposal.

In September 2013, the final Remediation Proposal will be submitted to the NRDC, Virginia Department of Environmental Quality (DEQ), U.S. Environmental Protection Agency (EPA), and U.S. Fish and Wildlife Service. The final proposal will form the basis for more detailed



The DEQ and the EPA will provide regulatory oversight for any work performed once the proposal is finalized and approved.

work plans associated with the design, construction, and monitoring of remedial actions, as well as stakeholder outreach.

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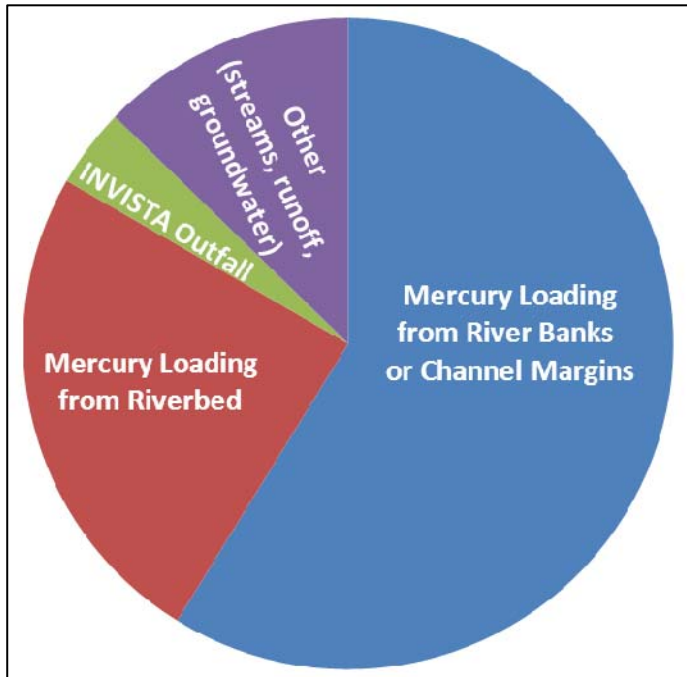
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About this Newsletter...

In the Fall 2000, the South River Science Team was formed to serve as a focal point for technical issues concerning mercury in the South River and downstream waterways. The Science Team is a cooperative effort between the Virginia Department of Environmental Quality, Department of Health and the Department of Game and Inland Fisheries and representatives from academia, citizens groups, the Environmental Protection Agency and DuPont. The Science Team provides technical direction for the mercury monitoring program and ensures that there is effective communication provided to the users of the river. The Science Team's goal is to understand why mercury in South River fish has not decreased over time and to identify potential solutions to improve the situation.

TechCorner: Identifying and Prioritizing Bank Management Areas

The Remediation Proposal (see article on page 1) focuses on reducing river bank erosion and the associated amount of mercury entering the South River (i.e., mercury loading) system. As shown in the pie chart below, the mercury associated with



Study results show that the primary mechanism for the continued loading of mercury to the South River is the slow (but chronic) erosion of mercury-contaminated soil in river banks.

river bank erosion is the largest contributor of mercury to the river. The first phase of the Remediation Proposal addresses eroding river bank areas immediately adjacent to and downstream of the INVISTA facility. These river banks were evaluated for bank stability, average mercury concentration, and estimates of mercury loading. Based on this information, preliminary bank management areas were identified, prioritized, and included in the Remediation Proposal. Pending confirmation and approval by stakeholders, these areas may be remediated to reduce the transport of mercury-contaminated soil to the river and improve the water quality and river bank habitat.

As highlighted in past issues of *UPDATE*, the erosion rates for some of the banks in the first two miles downstream of the INVISTA facility were estimated previously. For the remaining river banks in this area, bank stability was evaluated using observations and field measurements, including the bank angle, root depth-to-bank height ratio, and weighted root density. Relative bank angles were

measured from the base of the river bank to the top of the bank. As a point of reference, banks that are undercut by the river have bank angles greater than 90° . With that in mind, river banks with a relative bank angle greater than 80° were categorized as having a low stability. If the relative bank angle was less than 45° , the bank was considered highly stable. The root depth-to-bank height ratio was calculated based on the depth of tree and plant roots and the height of the river bank. A ratio of 1 indicated that the bank was highly stable; banks with a ratio of less than 0.75 were classified as having a low stability. Tree root densities were estimated and combined with the root depth-to bank height data to establish weighted root densities. Based on these measurements and calculations, the overall stability of the river bank was determined.

Then, soil samples were collected along the river bank to characterize the distribution and



River bank stability metrics were assessed as a first step in identifying preliminary bank management areas.

concentration of mercury, which allows scientists to estimate the amount of mercury entering the river at a particular location. Average mercury concentrations for each bank were calculated, and these results were combined with the results of the bank stability evaluation.

Using this information, a weight-of-evidence approach was taken and preliminary bank management areas were selected based upon bank stability, mercury concentration, and mercury loading.

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TechCorner: Bank Management Areas
(continued from page 2)

Once the Remediation Proposal is finalized and accepted by appropriate stakeholders, these preliminary bank management areas will be evaluated further. For example, estimates of mercury loading will be refined by measuring bank erosion using simple erosion pins or more sophisticated laser techniques to estimate bank erosion more accurately. As this work progresses, additional areas downstream may be identified and prioritized in a similar manner as described above. Using the adaptive management approach described in the last issue of *UPDATE*, changes to the process may be made as additional data become available.

After remedial actions are implemented, data will be collected and analyzed to assess the effectiveness of the remedial action in the area. In the long term, these data will be used to reduce the uncertainty associated with the fate, transport, and uptake of mercury in the natural system. In the short term,



An erosion pin like the one shown in this photograph is a common way to measure active soil loss on a river bank. The metal rod is set into the bank with a portion sticking up above the surface. The length of the pin above the surface is measured and monitored over time.

scientists will use this information to make adjustments to the remedial action technology.

For more information about bank management areas, contact Nancy Grosso (DuPont) at (302) 999-3114 or nancy.r.grosso@dupont.com.

From the Team...

Science Team Shares Office Space

Since its inception, the South River Science Team has been composed of members from various organizations who work together to achieve a common mission. This same spirit of cooperation and collaboration is now visible in the Science Team office on Main Street in downtown Waynesboro. The office space is being re-designed and shared with the Virginia Museum of Natural History and



This footprint from a three-toed dinosaur called *Kayentapus minor* is part of the Museum of Natural History's display at the office.

the Center for Coldwater Restoration to further environmental education and connect the revitalization of downtown Waynesboro with restoration work on the South River.

To further environmental education in the area, the Virginia Museum of Natural History has established an exhibit in the Science Team office as part of its two-year plan called "A Museum without Walls." Museum Executive Director Joe Keiper says the new branch provides "a real opportunity to expand our mission" and to be more visible statewide. The portable exhibit features insects, a dinosaur footprint, and rocks that reveal the area's geology.

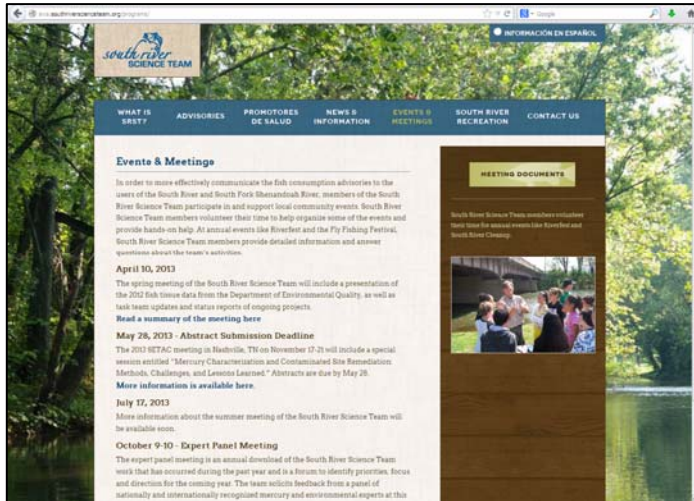
In an effort to connect the revitalization of the city with river restoration, the Center for Coldwater Restoration is installing a demonstration fish hatchery and information center. (The organization is a subcommittee of Waynesboro Downtown Development Inc.) When completed, the hatchery and information center will help develop the community's potential as an outdoor recreation and tourism destination.

For more information, contact Scott Gregory (URS) at (540) 949-5361 or scott.gregory@urs.com.

Did You Know? Extreme Makeover: Website Edition!

The South River Science Team website (www.southernriverscienceteam.org) received a makeover that was unveiled during the Science

While newsletters and fact sheets continue to be posted on the website, new features allow users to access all sorts of information.



A screenshot of the Science Team website (www.southernriverscienceteam.org) shows off the new design.

Team meeting in April. With a new design and different features, the website provides information for Science Team members and the larger community of river users.

- An interactive map allows users to select an area; zoom in; and locate boat ramps, float trip points, and local parks.
- Fish consumption advisories for the area’s rivers are shown on the interactive map.
- Advisory information and information about the Promotores Program is available in Spanish via a button on the home page.
- A “Meeting Documents” button allows users to access presentation files from previous Science Team meetings.
- Details about upcoming conferences and Science Team meetings are listed on the “Events & Meetings” page.

If you have an event or conference notice you would like highlighted on the website, contact Kathy Adams at kathleen.o.adams@dupont.com.

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To be added or deleted from our distribution list or to receive the newsletter electronically, contact Kathy Adams at (302) 999-3856.

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