

At A Glance: Benefits Apparent After Dam Removals

Last fall, the Rife-Loth Dam (also known as the Ram Works Dam) and the DuPont dam, both located in Waynesboro, were removed to eliminate potential safety hazards; allow for canoe, kayak, and fish passage; and improve South River water quality. Already the benefits of the dam removals are apparent. Trout will enjoy the cooler water temperature in the summer and have been spotted in the bedrock channels upstream of the former dam locations. A few days after the dam removals, people were taking advantage of the uninterrupted canoeing and kayaking route from Lyndhurst to Dooms.



An excavator begins the process of removing Rife-Loth Dam on October 31, 2011. (Photo courtesy Mark Miller – www.markmillerphotography.com).

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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: Studying Potential Links to Mercury Methylation

The South River Science Team conducted two studies to determine the potential link of submerged aquatic vegetation (SAV) and different sediment types to areas of high mercury methylation and exposure. The studies were conducted along the South River from the Invista footbridge to the Augusta County Forestry Center—a total of almost 12 miles of river. Understanding how mercury is transformed into methylmercury, which is the form that large fish and other aquatic life accumulate in their tissues, is one area of mercury science that is not well understood. By performing these studies, the Science Team is trying to better understand the process of mercury methylation in the South River so that potential remediation options can be targeted to improve the mercury situation.

The first study was conducted to determine if areas containing SAV or fine-grained sediment are linked to areas in the river with high mercury methylation rates. In Phase I, the Science Team evaluated existing data to identify areas containing fine-grained sediment. In Phase II, the Science Team went out on the river to confirm that the areas identified in Phase I actually contained fine-grained sediment. While on the river, the team identified the different types of sediment, fine-grained sediment beds, and SAV present and placed the locations of

these features on a map. With all of the information collected and integrated, the team noticed a pattern—riverbeds containing SAV also seemed to accumulate fine-grained sediment deposits.

To study this pattern and determine the potential role of SAV in mercury methylation, the Science Team collected samples of plant and aquatic insect tissue, surface water, sediment, and pore water in these areas. SAV beds are an important habitat for aquatic animals in the South River, so these samples were collected to determine if the environment in these areas is related to an increase in these animals' methylmercury concentrations. As a means for comparison, samples were collected in areas with and without SAV, and concentrations of total mercury and methylmercury were measured and compared.

The Science Team is evaluating the sampling results from both studies to determine if a relationship exists between fine-grained sediment, riverbeds containing SAV, and mercury methylation. The results will help determine the distribution and importance of these environments in methylmercury production in the South River. Based on the results from the studies, the Science Team may investigate potential remedial options in these environments or modify the conceptual system model to reflect what was learned.

For more information about this study, contact Mike Liberati at (302) 999-2891 or Michael.R.Liberati@dupont.com.



The Science Team studied submerged aquatic vegetation like the water stargrass shown in the photograph above.



The Science Team collected pore water samples as part of the study. Pore water is the water that fills the spaces in between grains of sediment.

From the Team...

Promotores Graduate and Continue Outreach

Eighteen lay health providers (i.e., Promotores) graduated September 3, 2011 from a 40-hour training course designed to increase awareness among Spanish-speaking individuals about the

brochures, wallet cards, and other information. Now, through its partnership with the BRAHEC, the Science Team is taking a more innovative approach to communicate the fish consumption advisory with the growing Spanish-speaking population in the area.



The Promotores gathered after graduation with the program's coordinator Joanna Jensen (center).

mercury fish consumption advisories along the South River and South Fork Shenandoah River. As highlighted in the Second Half 2010 newsletter, the South River Science Team is partnering with the Blue Ridge Area Health Education Center (BRAHEC) at James Madison University, which coordinated and held the training. The graduates are now certified as community health and mercury educators and will continue their work in disseminating information and educating Spanish-speaking communities about the details of the advisories and the potential physical and environmental effects of mercury.

The graduating Promotores live in Luray, Harrisonburg, McGaheysville, Shenandoah, and Linville and represent five Latin American countries. They are proof of the growing Hispanic population in the Shenandoah Valley; according to the U.S. Census, the total population of Hispanics in Harrisonburg alone almost doubled in recent years (8.8% in 2000 to 15.7% in 2010). Since its inception, the Science Team has provided Spanish translations of fish consumption advisory signs,

They poured over maps of the rivers and fishing spots to get a better sense of the river and their location to it and the areas in which people might fish. Then, they went about their lives—going to church, talking to neighbors, and watching their children play soccer. During these activities, the Promotores told the various people in their circle about what they

The Science Team created fish bookmarks, like this one of a rainbow trout, with the advisory on the back in both English and Spanish.



were learning. Fish bookmarks with the advisories on the back proved to be a favorite handout to support the information that the Promotores provided.

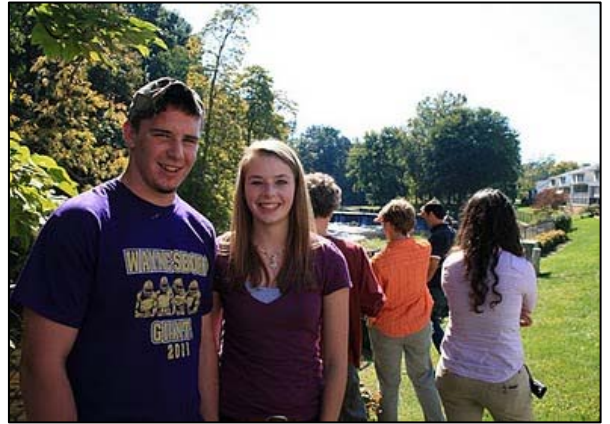
Using this approach, the Promotores are able to deliver scientifically accurate information in a culturally appropriate way. Trust is established, and the Promotores are viewed as leaders within the community in which they live.

For more information about the Promotores de Salud program, contact Joanna Jensen at (540) 568-5284 or jensenjb@jmu.edu.


Did You Know?

JMU Professors Offer Guidance to High School Students

For over eight years, professors at James Madison University (JMU) in Harrisonburg have been volunteering in high schools to offer academic guidance and encouragement to students who have historically been underserved. Currently, the program serves seven Virginia high schools with diverse student populations. Dr. Tom Benzing, South River Science Team member and JMU Professor of Integrated Science & Technology, recently joined the program and is currently working with Waynesboro High School students. As part of the Professor-In-Residence Program, participating professors visit their assigned school about once a week and help students prepare for college aptitude tests, compose college essays, and complete financial aid applications. The program also provides students an opportunity to learn about effective college studying skills, note taking, and time management. Take-a-Look Day, which is sponsored by JMU's Admissions Office, gives the students the chance to visit the university for a day and sit and learn about JMU's academic programs and extracurricular activities. In Spring 2012, Dr. Benzing is hosting two Saturday programs called "Science on South River" to help Waynesboro students learn more about the river that runs through their community. More details about the Professor-In-Residence Program are available at < <http://www.jmu.edu/pir/>>.



Dr. Benzing invited Waynesboro High School students Kole Showalter (left) and Logan Graves (right) to the Pure Water Forum Annual Meeting in October 2011. As part of the meeting, the students visited the Rife-Loth Dam before its removal.

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