

South River Science Team

A Collaborative, Multi-stakeholder Approach to
Addressing Mercury Contamination in the South River
and South Fork Shenandoah River



Massanutten
Mountains

Front Royal -
River mile 125

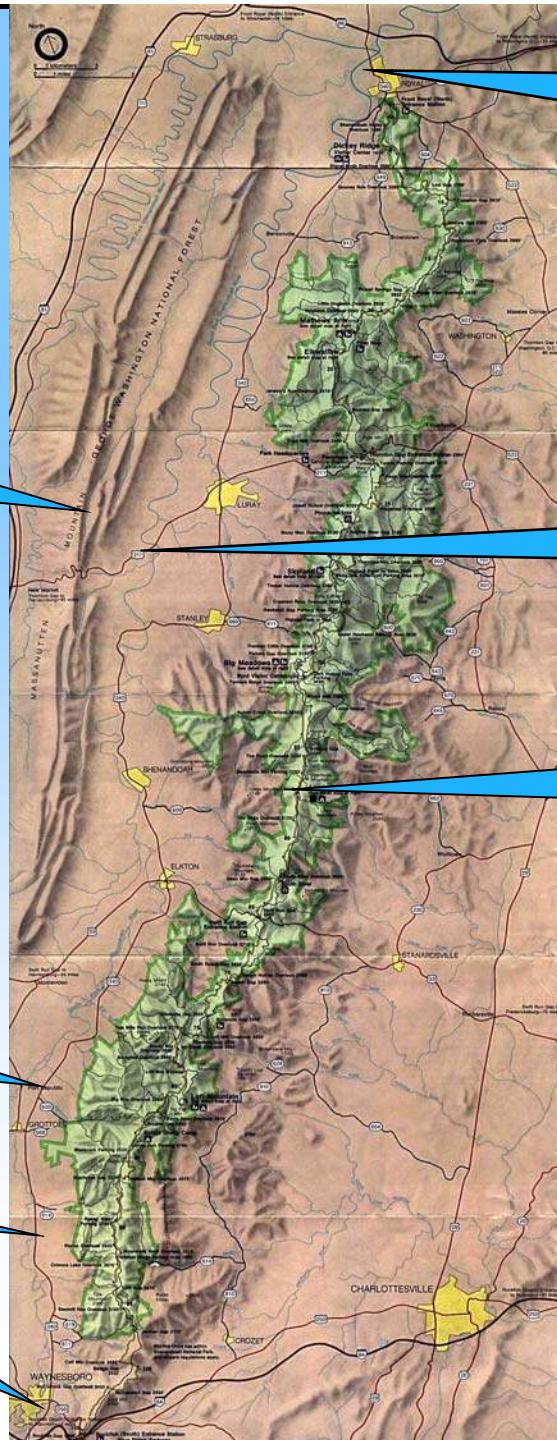
South Fork
Shenandoah River

Shenandoah
National Park

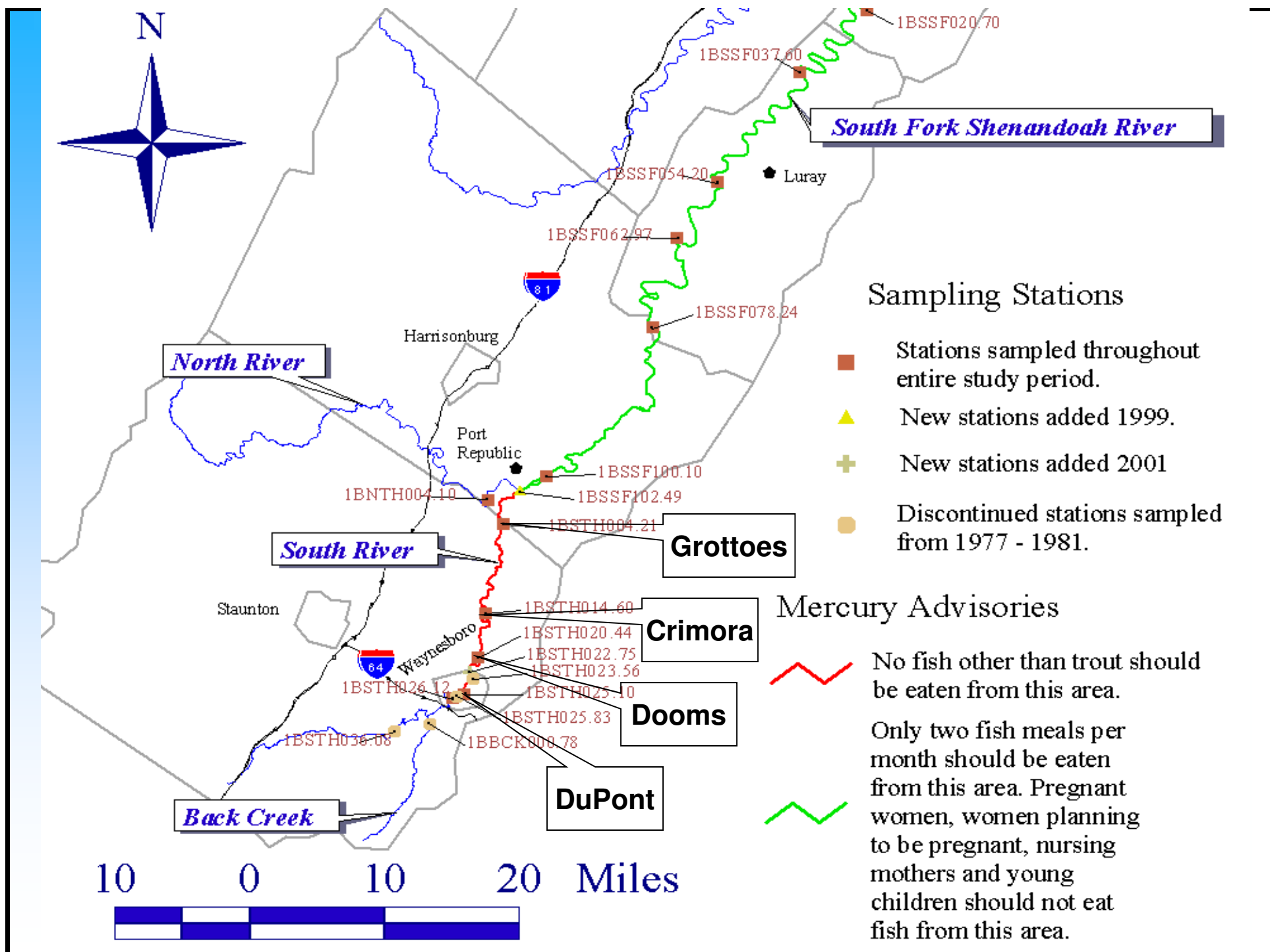
Port Republic -
River mile 25

South River

Waynesboro -
River mile 0







Vision for the Future.

Mercury levels decline in the South River and South Fork Shenandoah River so that the fish consumption advisories are eliminated or reduced.

Ultimately - the public and other stakeholders are satisfied.

Strategy for the South River

- ◆ **To achieve our vision, we will be**
 - **Proactive.**
 - **Collaborative.**
 - **Credible.**
 - **Communicative.**

Why A Science Team ?

◆ The Problem

- A 1982 study predicted that by now mercury levels in fish would be decreasing; in fact, they seem to be the same or slightly increasing.
- Perhaps:
 - » the original prediction was incorrect
 - » its too early to conclude there's a trend
 - » there is an ongoing release of mercury... somewhere.

◆ More efficient to work collaboratively... no one group has all the answers or resources.

Fundamental Questions We Are Addressing.

- ◆ **Why hasn't mercury in fish gone down as predicted?**
- ◆ **How is the mercury getting to the overall river ecosystem?**
- ◆ **How are the fish and other aquatic animals getting the mercury?**
- ◆ **What might be done to reduce the mercury level in the fish?**

Science Team Member Organizations

◆ VA Dept of Environmental Quality	}	State
◆ VA Dept of Game and Inland Fisheries		
◆ VA Dept of Health		
◆ US EPA	}	Federal
◆ US Fish & Wildlife Service		
◆ Friends of the Shenandoah	}	NGO
◆ Issak Walton League		
◆ Chesapeake Bay Foundation		
◆ College of William and Mary	}	Academia
◆ James Madison University		
◆ Virginia Tech		
◆ Expert Panelists		
◆ DuPont		

Science Team Outreach Activities

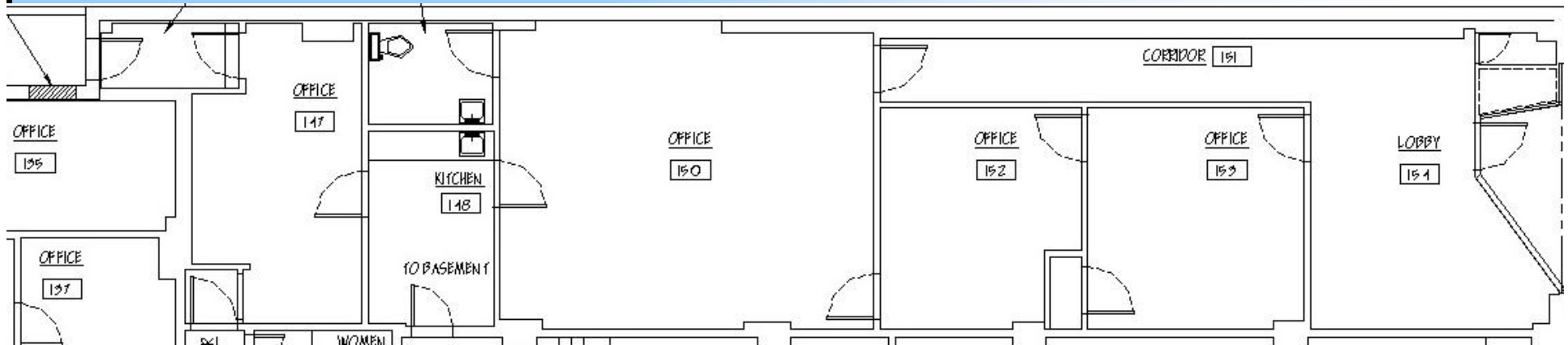
- ◆ Benchmarking with other Hg sites
 - Alcoa, Olin, Honeywell
- ◆ Bi-Annual Newsletter - 2,500 distribution
- ◆ Health advisory brochures to physicians, health centers
- ◆ Spanish advisory signs posted
- ◆ River-User Survey
- ◆ Educational Outreach
- ◆ Routine media coverage
- ◆ Augusta County Comprehensive Plan
- ◆ Waynesboro Greenway Committee
- ◆ Flyfishing Festival Exhibit
- ◆ Riverfest Forum
- ◆ SRST Office and Public Displays







Pre-Renovation Layout



Design Objectives

- ◆ Create a field office space for all SRST members to use, provide an area for equipment storage, and sample sorting, packing, and storage
- ◆ Create an exhibit area where the public can learn about the mercury situation and activities of the SRST
- ◆ Provide the public access to information about the fish consumption advisory, and brochures from SRST member organizations

SRST Office Design

- ◆ JMU interior design students developed the concept for the public space
- ◆ JMU graphic design students developed all print formats
- ◆ Small, local engineering firm completed drawings
- ◆ JMU students constructed and installed displays
- ◆ SRST members developed display text

Grand Opeining Ap 28

- ◆ **Media Event**
- ◆ **Open House**

**OPEN HOUSE
TODAY 2-6 PM**















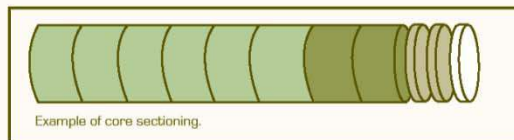


South River Science Team Sediment Core Investigation

Vertical cores of sediment deposits contain a backward look into the history

of the South River. The upper portion of the core is the most recently deposited sediment, and the lower portion of the core is sediment that was deposited many years ago. Mercury is typically attached to fine particles in the sediment, so looking at the pattern of mercury concentrations versus the depth in the core will help develop an understanding of when mercury entered the river.

The sediment cores are cut into thin “pancake” slices, and each slice is analyzed for mercury and marker elements like cesium 137 (^{137}Cs) or lead 210 (^{210}Pb). The team used the depth of ^{137}Cs and the amount and known decay rate of ^{210}Pb to date the core slices. The results verified that mercury inputs to the river began around 1929 and decreased greatly after 1952. The



“...sediment cores are cut into thin “pancake” slices and each slice is analyzed for mercury...”

most recently deposited sediments contain much lower concentrations of mercury than deeper sediments, but surface sediments are still elevated above background levels for this part of Virginia. Given that manufacturing inputs of mercury to the river ceased over 50 years ago, the South River Science Team is examining where the mercury in more recently deposited surface sediments may be originating.

List of Participants

Erin Mack *DuPont*

Rich Landis *DuPont*

Dick Jensen *Unique Environmental Services*

Mike Sherrier *DuPont*

Andy Davis *URS*

Jim Pizzuto *University of Delaware*

Katie Skalak *University of Delaware*



Katie Skalak places a coring device in position.



University of Delaware personnel take a sample of core slice.









South River Science Team

the discovery of mercury contamination in the South River

In the mid-1990s, the Virginia Department of Environmental Quality (VDEQ), State and Federal Fishery (USFWS), and South River Task Force (SRTF) were created. The SRTF was established to coordinate the efforts of the South River and the South River Watershed Task Force. The South River Task Force was created in 1996 to serve as a first point of contact for issues concerning mercury in the South River and its watershed. The team is a cooperative effort between local, state, and federal agencies, organizations, and academic institutions.

The team is dedicated to providing technical assistance to the member agencies, conducting research, and monitoring the river. The team's focus includes conducting river studies to better understand mercury distribution and behavior.

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List of Organizations

US Dept. of Environmental Quality
US Dept. of Fishery and Wildlife
US Dept. of Health
Virginia Department of Environmental Quality
US Fish and Wildlife Service
US Geological Survey
US National Park Service
US National Oceanic and Atmospheric Administration
US National Science Foundation
US National Aeronautics and Space Administration
US National Institute of Environmental Health Sciences
US National Institute of Standards and Technology
US National Institute of Standards and Technology
US National Institute of Standards and Technology
US National Institute of Standards and Technology



STATE AGENCIES

- Virginia Department of Environmental Quality
- Virginia Department of Health
- Virginia Department of Transportation

INDUSTRY

- General Electric
- General Motors
- General Motors

FEDERAL AGENCIES

- U.S. Department of the Interior
- U.S. Department of Justice
- U.S. Department of Education
- U.S. Department of Health and Human Services
- U.S. Department of Agriculture
- U.S. Department of Energy
- U.S. Department of Commerce
- U.S. Department of Defense
- U.S. Department of State

ACADEMICS

- University of Virginia
- University of Maryland
- University of North Carolina
- University of South Carolina
- University of Tennessee
- University of Wisconsin
- University of Michigan
- University of California
- University of Texas
- University of Arizona
- University of Colorado
- University of Florida
- University of Georgia
- University of Illinois
- University of Indiana
- University of Iowa
- University of Kansas
- University of Kentucky
- University of Louisiana
- University of Maine
- University of Massachusetts
- University of Minnesota
- University of Missouri
- University of Montana
- University of Nebraska
- University of Nevada
- University of New Hampshire
- University of New Jersey
- University of New Mexico
- University of New York
- University of North Dakota
- University of Ohio
- University of Oklahoma
- University of Oregon
- University of Pennsylvania
- University of Rhode Island
- University of South Dakota
- University of South Florida
- University of South Carolina
- University of Tennessee
- University of Texas
- University of Utah
- University of Vermont
- University of Virginia
- University of Washington
- University of Wisconsin
- University of Wyoming

CITY/STATE GROUPS

- City of Washington
- State of Maryland
- State of North Carolina
- State of South Carolina
- State of Tennessee
- State of Virginia
- State of West Virginia

History of Waynesboro

Waynesboro, Virginia, is a town in Stafford County, Virginia, United States. It is the county seat of Stafford County. The town was founded in 1752 and was named in honor of General Braxton Lee, a prominent figure in the American Revolutionary War. The town is located on the Rappahannock River, which is a major waterway in the region. The town has a rich history and is known for its scenic views and historic architecture. The town is home to several historic landmarks, including the Braxton Lee House, which was built in 1752 and is now a museum. The town is also home to the Rappahannock River, which is a popular destination for fishing and boating. The town is a beautiful and historic place to visit.





