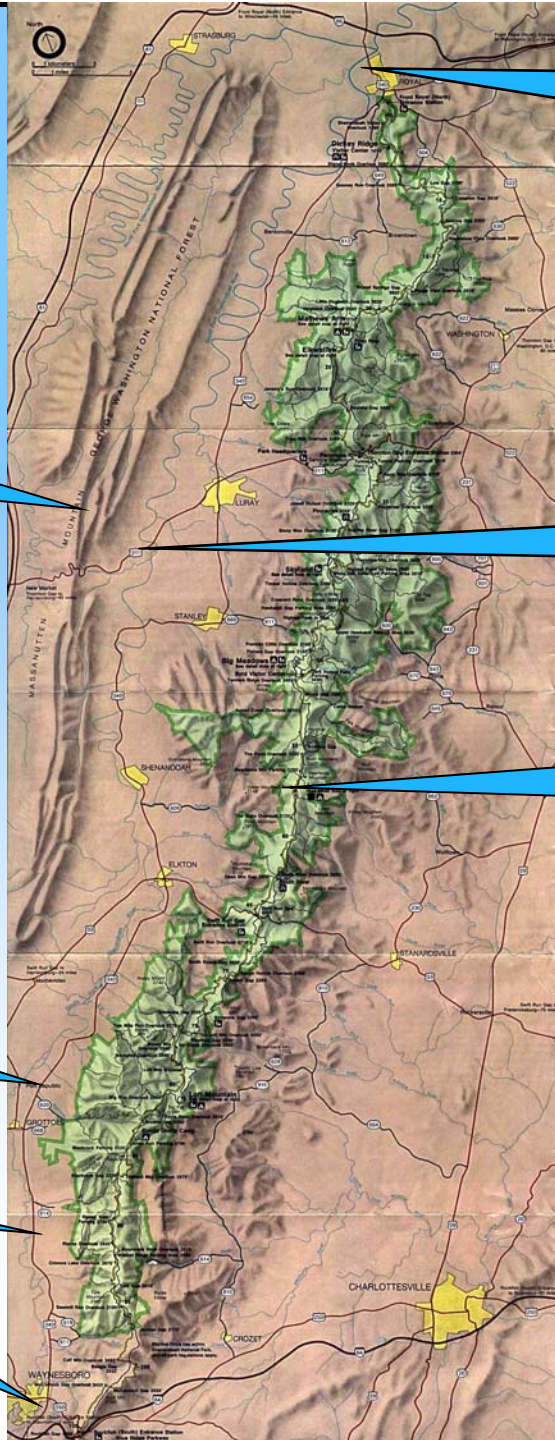


South River Science Team

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

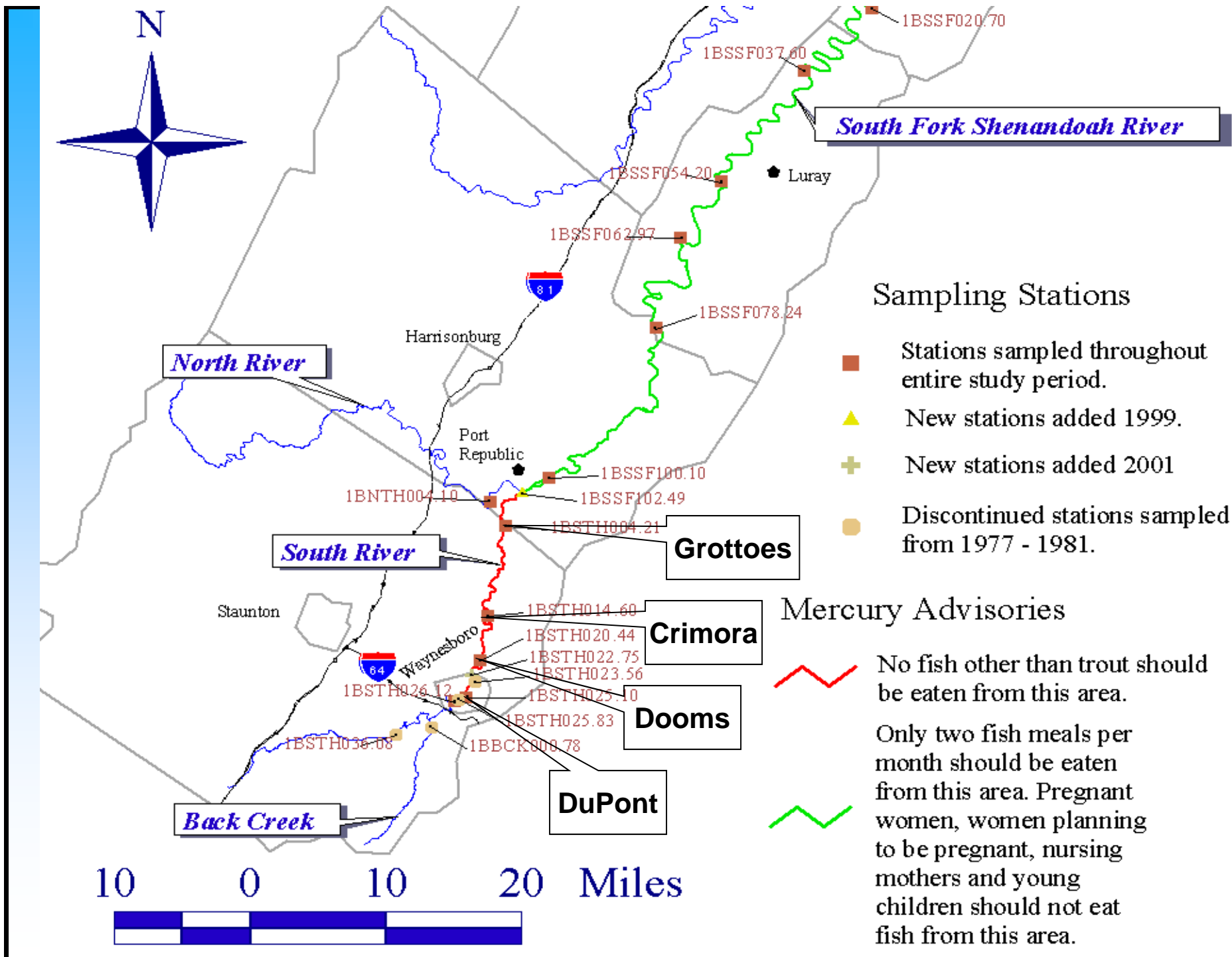
Shenandoah
National Park

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

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**





American Red Cross

Valley City & Hobbs

FOR LEASE

TOYOTA

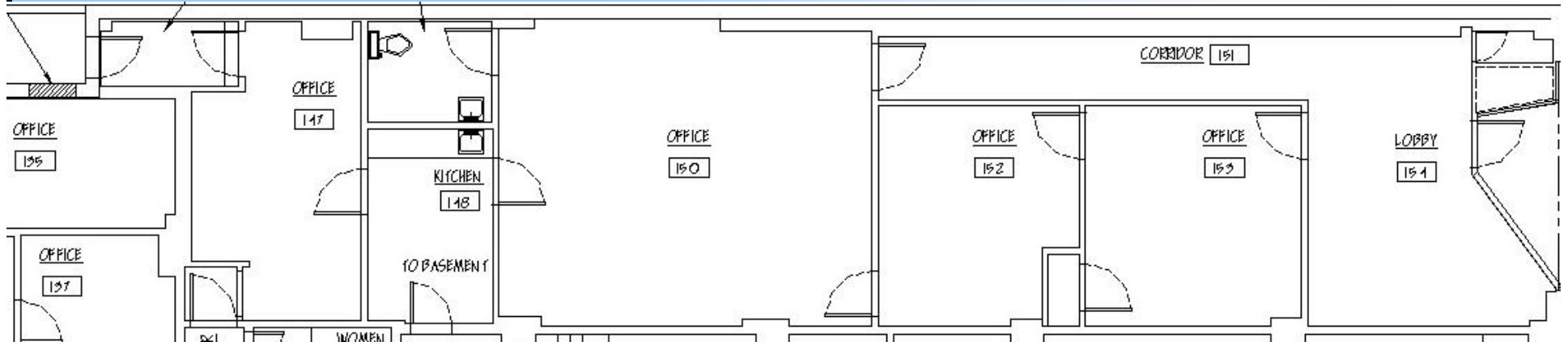


American Red Cross

FOR LEASE
COLDWELL BANKER
BARGER REAL ESTATE
943-1200



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

SCIENCE TEAM

Show the history of mercury contamination in the South River.

In the mid-1970s, the highest concentration of mercury ever found in any natural source was found in the South River. This has caused the river and its tributaries to be listed as impaired on the National Sanitation River Quality List. This is because of the high mercury levels found in the river and the fish that live in it.

Mercury is a poisonous metal that is found in the water and in the fish that live in the river. It is found in the water because it is a byproduct of many industrial processes, including coal burning and gold mining. It is also found in the air because of the burning of fossil fuels. Mercury is highly toxic and can cause serious health problems, especially in children.

44 The team's focus includes conducting river studies to better understand mercury distribution and behavior. 45

List of Organizations

- US Dept of Environmental Quality
- US Dept of Commerce Fisheries
- US Dept of Health
- US Fish and Wildlife Service
- Wildlife Conservation Society
- Wildlife Society
- Wildlife Society
- Wildlife Society
- Wildlife Society
- Wildlife Society
- Wildlife Society
- Wildlife Society



STATE AGENCIES

- US DEPARTMENT OF ENVIRONMENTAL QUALITY
- US DEPARTMENT OF COMMERCE AND FISHERIES
- US DEPARTMENT OF HEALTH

INDUSTRY

- BAFFIN COMPANY

FEDERAL AGENCIES

- US GEOLOGICAL SURVEY
- ENVIRONMENTAL PROTECTION AGENCY
- US FISH AND WILDLIFE SERVICE

ACADEMICS

- UNIVERSITY OF WISCONSIN
- WISCONSIN MADISON UNIVERSITY
- UNIVERSITY OF DELAWARE
- UNIVERSITY OF TEXAS

CITIZENS GROUPS

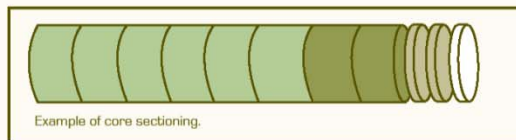
- ASSOCIATION OF ENVIRONMENTAL SCIENTISTS
- WATER QUALITY LEAGUE
- CONSUMERS BEST FOUNDATION

Southern 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 (¹³⁷Cs) or lead 210 (²¹⁰Pb). The team used the depth of ¹³⁷Cs and the amount and known decay rate of ²¹⁰Pb 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-1970s, the Virginia Department of Environmental Quality (DEQ), State and Federal Fisheries (SDFP), and Health (VHHS) first recognized fish, birds, and wildlife throughout the eastern distribution of the continent. Since 1976, a full investigation address due to mercury has been in effect for the South River and the South Side Mountain River. The South River Science Team was formed in 2000 to serve as a focal point for inter-agency research concerning mercury in the South River and associated tributaries. The team is a cooperative effort between local, state, and federal agencies, representatives from academic, citizen groups, and

business. In addition to providing technical assistance for the mercury monitoring conducted by the South River Science Team, the team includes monitoring, data analysis, public education, outreach, and policy. The team is also responsible for the development of a mercury action plan for the South River and associated tributaries. The team is a cooperative effort between local, state, and federal agencies, representatives from academic, citizen groups, and

64 The team's focus includes conducting river studies to better understand mercury distribution and behavior. 55

List of Organizations

- VA Dept of Environmental Quality
- VA Dept of Game and Inland Fisheries
- VA Dept of Health
- Southwest Virginia Conservation Council
- VA Geological Survey
- DEQ Region 20
- VA Fish & Wildlife Services
- Virginia Tech
- Western Piedmont Conservancy
- James Mountain Conservancy
- College of William and Mary
- University of Pittsburgh
- Smithsonian Environmental Research Center
- Rocky Mountain College
- Chenoweth Bay Foundation



STATE AGENCIES

- Virginia Department of Environmental Quality
- Virginia Department of Game and Inland Fisheries
- Virginia Department of Health

INDUSTRY

- Southwest Virginia Conservation Council

FEDERAL AGENCIES

- U.S. Environmental Protection Agency
- U.S. Geological Survey
- U.S. Fish & Wildlife Service

ACADEMICS

- College of William and Mary
- University of Pittsburgh
- Smithsonian Environmental Research Center
- Rocky Mountain College
- Chenoweth Bay Foundation

CITIZEN GROUPS

- James Mountain Conservancy
- Western Piedmont Conservancy

History of Waynesboro

Waynesboro, Virginia, is a town in Stafford County, Virginia, United States. It is the county seat of Stafford County and is located on the South River, a tributary of the Rappahannock River. The town was founded in 1753 and is one of the oldest towns in the Shenandoah Valley. It is known for its historic architecture, including the Waynesboro Courthouse, and its proximity to the Shenandoah National Park. The town has a rich history and is a popular destination for tourists and residents alike.

South River Science Team

South River Science Team





Science Team

Options to address the growing concern over the mercury remaining in the South River, the team's focus includes conducting river water to better understand mercury distribution and behavior, increasing river water quality, and ensuring that there is effective communication provided to the users of the river. Advances in the understanding of mercury behavior in the environment, coupled with continued river monitoring, will provide the tools necessary to make informed decisions about managing river resources in the future.

conducting river
and mercury



- STATE AGENCIES**
 - MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
 - MISSISSIPPI DEPARTMENT OF GAME AND WILDLIFE FISH
 - MISSISSIPPI DEPARTMENT OF HEALTH
- INDUSTRY**
 - SEMPER CORP'S REMEDIATION GROUP
- FEDERAL AGENCIES**
 - US GEOLOGICAL SURVEY
 - ENVIRONMENTAL PROTECTING AGENCY REGION 6
 - US FISH AND WILDLIFE SERVICE
- ACADEMICS**
 - UNIVERSITY OF MISSISSIPPI
 - MISSISSIPPI STATE UNIVERSITY
 - UNIVERSITY OF MISSISSIPPI
 - MISSISSIPPI STATE
- CITIZEN GROUPS**
 - MEMBERS OF THE MISSISSIPPI RIVER
 - STATE WILDLIFE FEDERATION
 - MISSISSIPPI RIVER FOUNDATION

