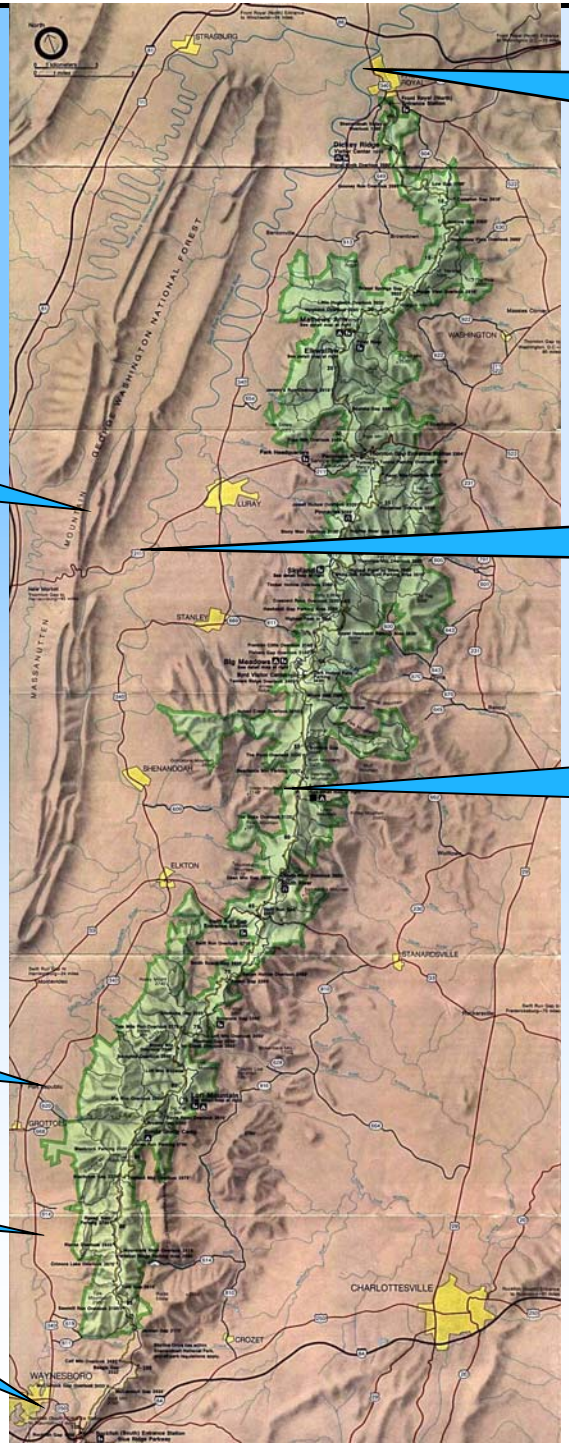
South River Science Team

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


Front Royal - River mile 125
Massanutten Mountains
South Fork Shenandoah River
Shenandoah National Park
Port Republic - River mile 25
South River
Waynesboro - River mile 0
STRASBURG
WASHINGTON
LURAY
STANLEY
SHENANDOAH
ELKTON
STANARDSVILLE
GROTTOES
CHARLOTTESVILLE
CROZET
WAYNESBORO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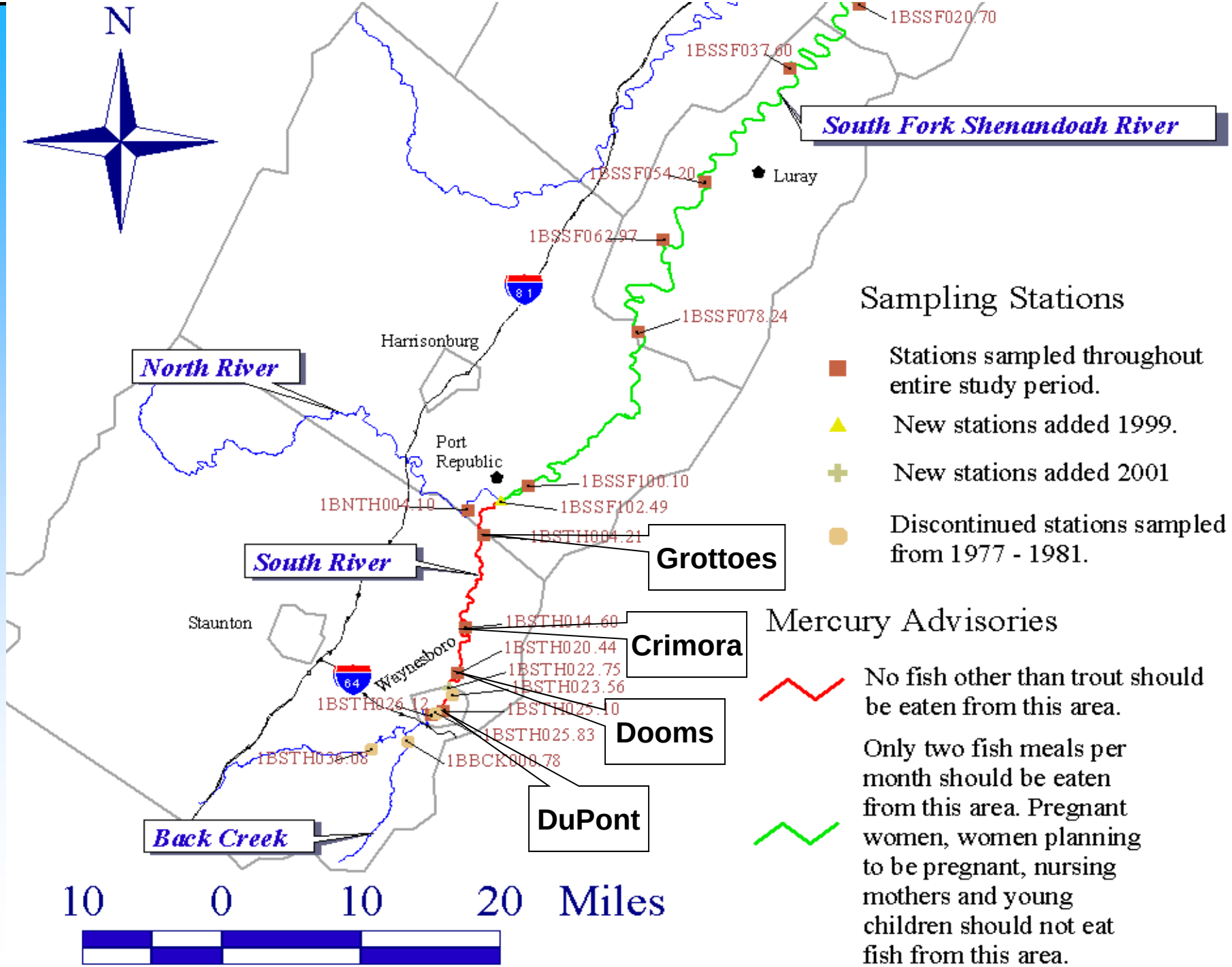

N
1BSSF020.70
1BSSF037.60
South Fork Shenandoah River
Luray
1BSSF054.20
1BSSF062.97
81
1BSSF078.24
Harrisonburg
North River
Port
Republic
1BSSF100.10
1BNTH004.19
1BSSF102.49
1BSTH004.21
Grottoes
South River
Staunton
1BSTH014.60
Crimora
1BSTH020.44
1BSTH022.75
1BSTH023.56
64
Waynesboro
1BSTH026.12
1BSTH025.10
Dooms
1BSTH025.83
1BSTH036.08
1BBCK000.78
DuPont
Back Creek
10 0 10 20 Miles
Sampling Stations
Stations sampled throughout entire study period.
New stations added 1999.
New stations added 2001
Discontinued stations sampled from 1977 - 1981.
Mercury Advisories
No fish other than trout should be eaten from this area.
Only two fish meals per month should be eaten from this area. Pregnant women, women planning to be pregnant, nursing mothers and young children should not eat fish from this area.

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

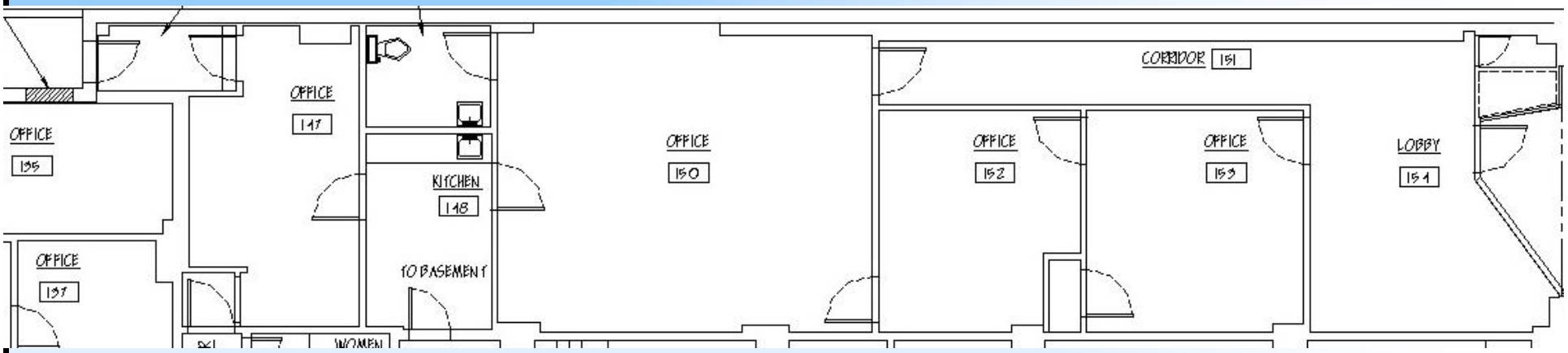
- Benchmarking with other Hg sites
  - Alcoa, Olin, Honeywell
- Bi-Annual Newsletter - 2,500 distribution
- Health advisory brochures to physicians, health centers
- Spanish advisory signs posted
- River-User Survey
- Educational Outreach
- Routine media coverage
- Augusta County Comprehensive Plan
-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


Former DuPont Plant Site Studies
Mercury Source Investigation
Monitoring the South River
South River Science Team
Work on research for Mercury
Tom's Fly-Fish
south river
SCIENCE TEAM
540-949-5361


American Red Cross
TOYOTA


American Red Cross
FOR LEASE
COLDWELL BANKER
BARGER
REAL ESTATE
TOYOTA

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


OPEN HOUSE
TODAY 2-6 PM


"A Touch of Love"
PAWN
TEESVILLE EMPORIUM


South River Science Team
SCIENCE TEAM
STATE AGENCIES
INDUSTRY
FEDERAL AGENCIES
ACADEMICS
CITIZENS' GROUPS

Sediment *Core* Investigation

SEDIMENT

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

Example of core sectioning.

> **"...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.


Investigation
South River Science Team
SCIENCE TEAM


Chamber
Survey


2000
1984
'88
'81
'81–'85
DEQ
Monitoring the South River
Survey


1800
1900
Studies
Chamber


th River Science Team
the discovery of mercury contamination
South River
The team's focus includes conducting river studies to better understand mercury distribution and behavior.
List of Organizations
south river SCIENCE TEAM
STATE AGENCIES
INDUSTRY
FEDERAL AGENCIES
ACADEMICS
CITIZENS' GROUPS
History of Waynesboro


Geomorphology Studies
Jordan Flue Chamber


nce Team
conducting river
nd mercury
STATE AGENCIES
INDUSTRY
FEDERAL AGENCIES
ACADEMICS
CITIZENS' GROUPS


VDH