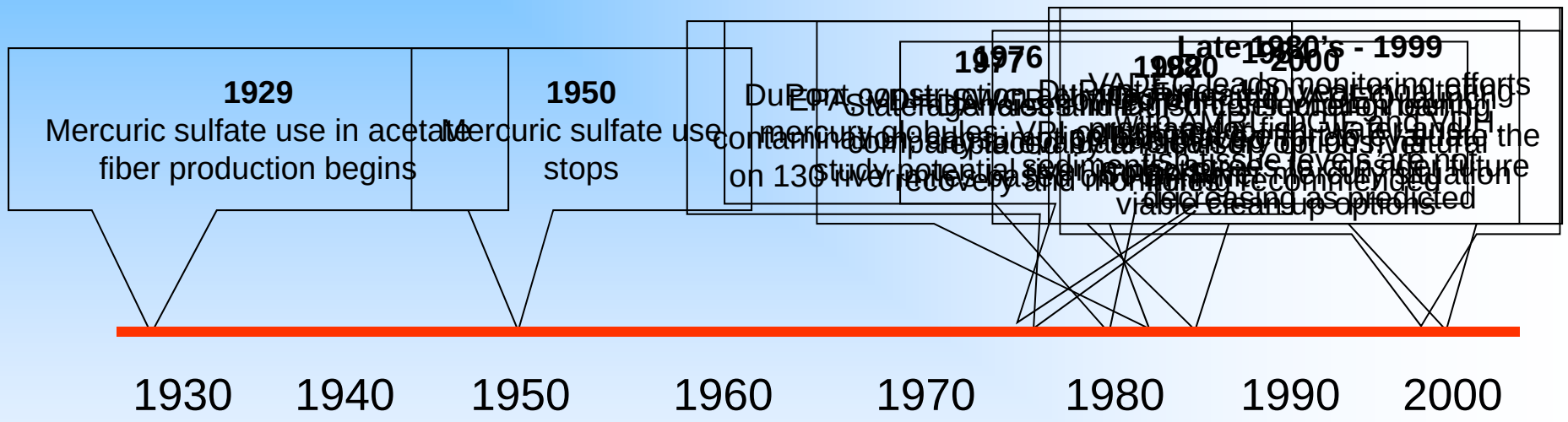
South River Science Team

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

The South River Mercury Story



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?

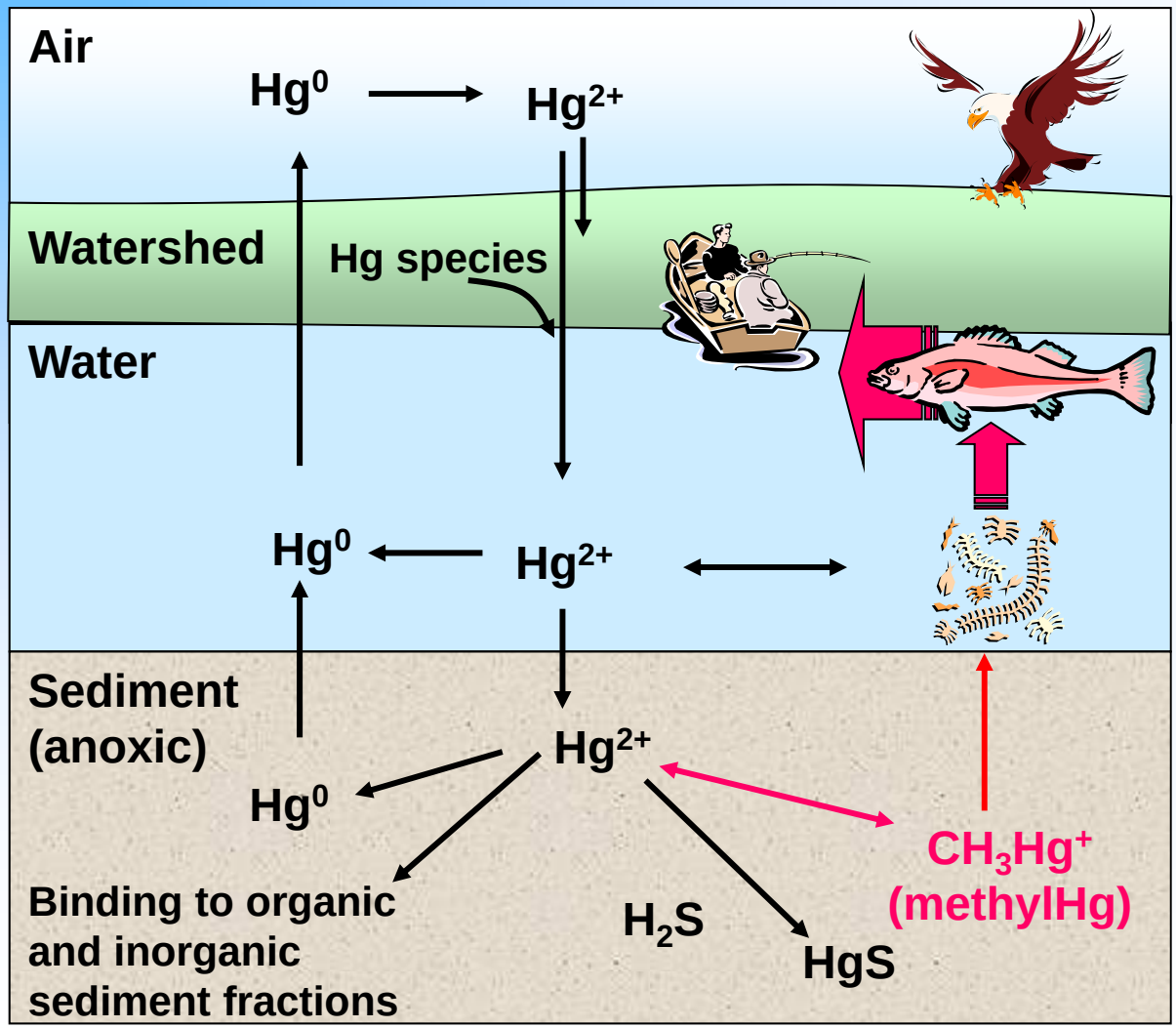
Organization of the Science Team

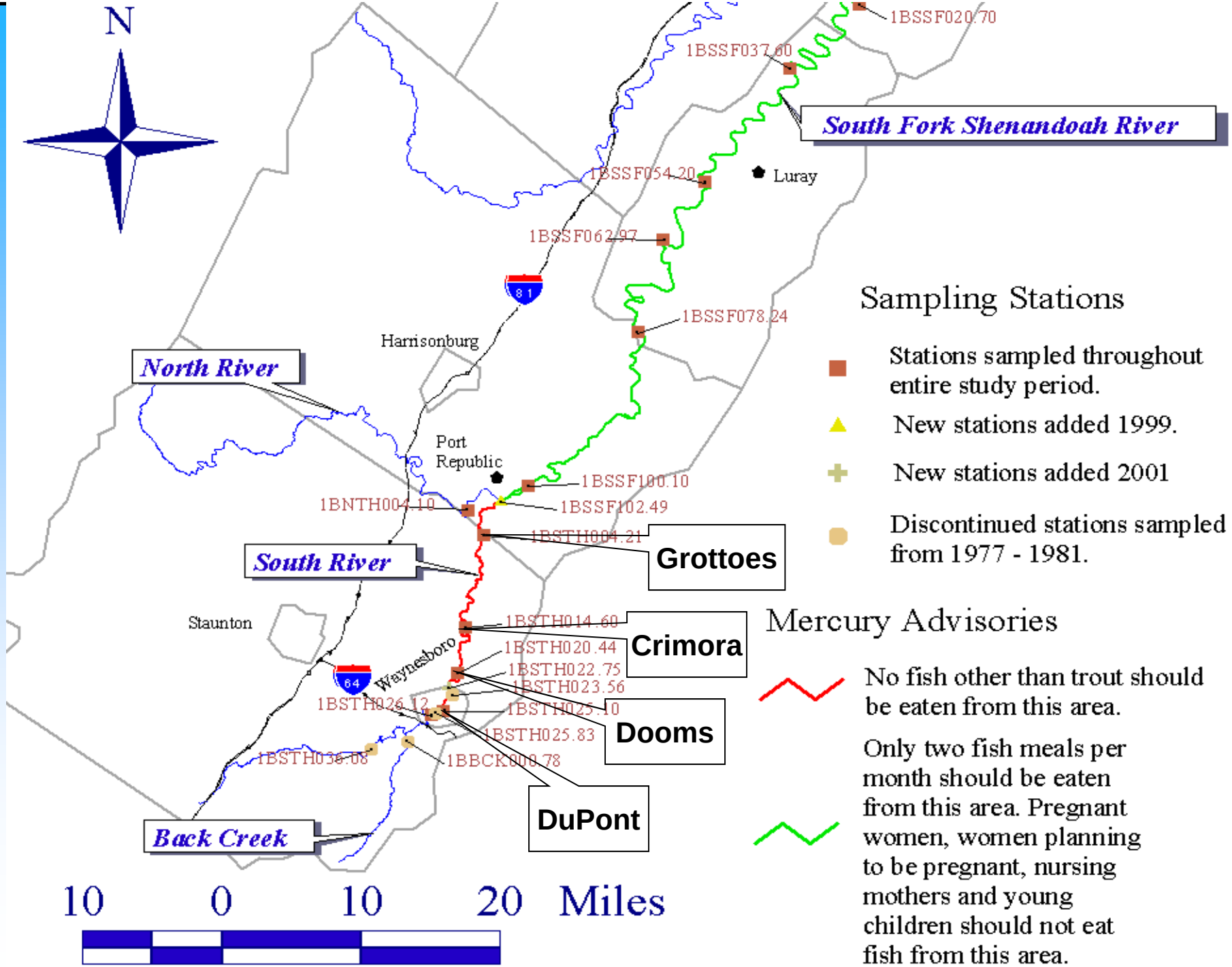
- Virginia Dept of Environmental Quality
- Virginia Dept of Game and Inland Fisheries
- Virginia Dept of Health
- US EPA
- Friends of the Shenandoah
- Izaak Walton League
- College of William and Mary (VIMS)
- James Madison Univ.
- Virginia Tech
- Expert Panelists
- DuPont

What Have We Been Doing ?

- **Focus Areas 2000 – 2002**
  - **Collecting information and analyzing it**
  - **Building a picture of the river – pieces of the puzzle**
  - **Having outside experts give us advice and check our work**
  - **Talking to other groups facing similar problems**
  - **Informing the local communities of what we're doing**
  - **Exploring the potential for exposure of people and animals**
  - **Looking at technologies for managing the mercury.**

How Mercury Moves in the Environment

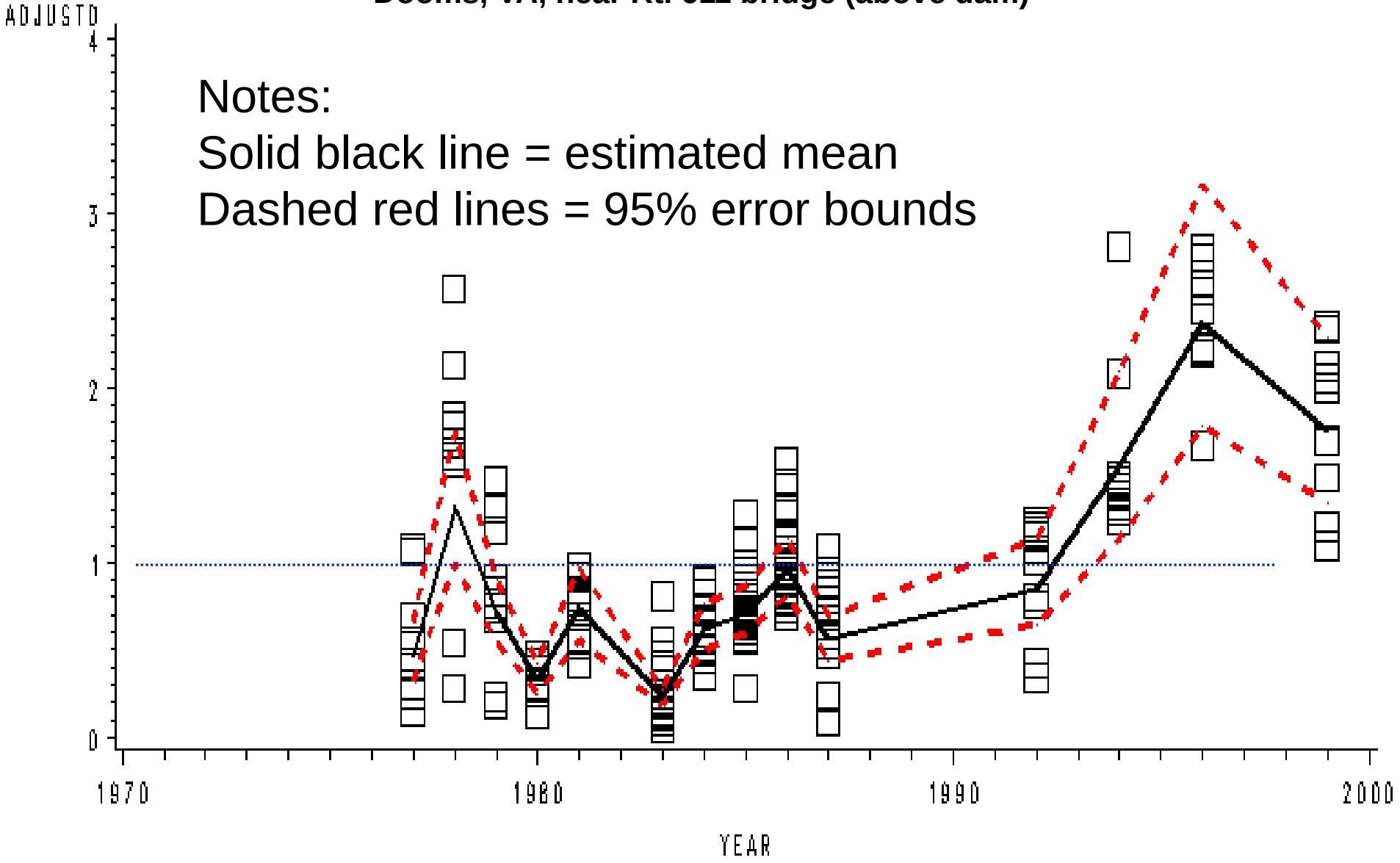



N
1BSSF020.70
1BSSF037.60
South Fork Shenandoah River
Luray
1BSSF054.20
1BSSF062.97
81
1BSSF078.24
Harrisonburg
North River
Port
Republic
1BSSF100.10
1BNTH004.19
1BSSF102.49
1BSTH004.21
Grottoes
South River
Staunton
1BSTH014.60
Crimora
1BSTH020.44
1BSTH022.75
1BSTH023.56
64
Waynesboro
1BSTH026.12
1BSTH025.10
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.

Adjusted and Predicted Total Hg in SUNFISH

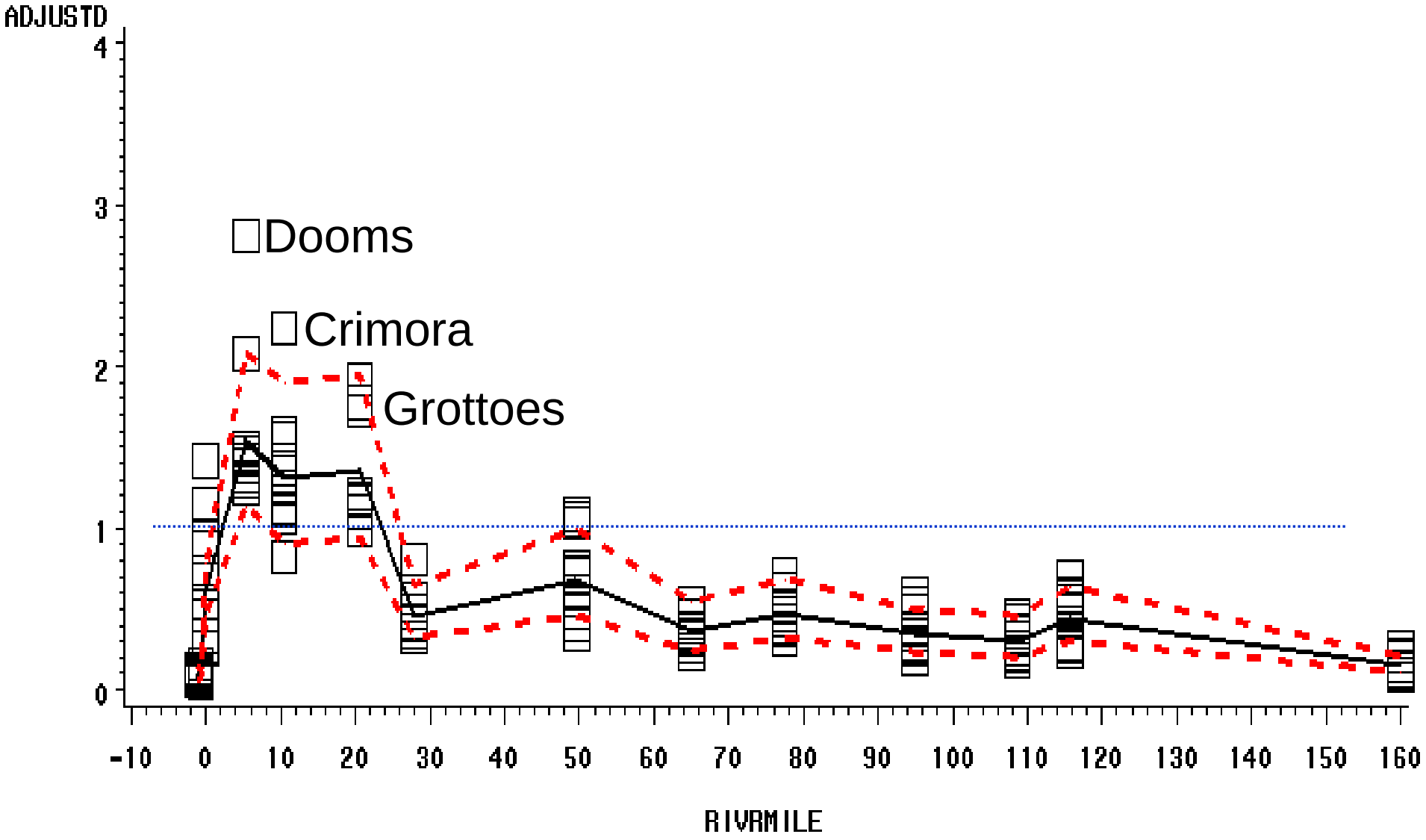
MODEL: LOGTHG=STATION|YEAR LOGLEN STATION*LOGLEN YEAR*LOGLEN
FULL DATA SET
STATION=5 STAT_ID=1BSTH020.44

Dooms, VA, near Rt. 611 bridge (above dam)



Adjusted and Predicted Total Hg in SUNFISH

MODEL: LOGTHG=STATION|YEAR LOGLEN STATION*LOGLEN YEAR*LOGLEN
FULL DATA SET
YEAR=1994



Fish Statistical Summary

- **Based on data from 1980's – 1999, there does not appear to be a downward mercury trend in fish at Dooms, Crimora, and Grottoes**
  - **Dooms, VA, near Rt. 611 bridge (above dam)**
  - **Crimora, VA, near Rt. 612 bridge**
  - **Grottoes, VA, near Grand Caverns bridge**

Accomplishments 2000-2002

- **Developed multiple, practical theories to guide research and investigations;**
- **Identified locations on the South River where mercury and sediments may accumulate;**
- **Studied land use in the South River floodplain;**
- **Conducting research to better understand how mercury accumulates at various depths in river sediments;**
- **Conducting research to determine if mercury is entering the river from any source, including the DuPont plant site.**

Accomplishments 2000-2002

- **Made spring and fall 2002 Newsletters accessible to an audience of thousands in surrounding communities;**
- **Funded a senior's honors project at James Madison University that the Asiatic clam can be an additional indicator of mercury uptake from river water.**
- **Funding a Master's student at Virginia Tech to study how mercury gets into fish.**

Plans for 2003

- Study whether plants absorb mercury from the soil.
- Continue Virginia Tech fish study.
- Explore use of the Asiatic clam for mercury monitoring in the river.
- Sample South River sediment to determine whether mercury adheres to other sediment components.
- Conduct further study of other potential sources of mercury to the river.
- Publish findings in a scientific journal.