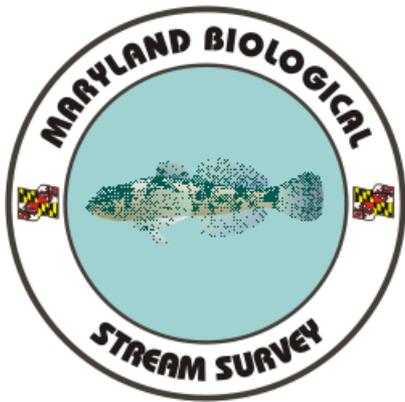


Welcome to 2014 MBSS Spring Training



February 20, 2014



Origin of the MBSS



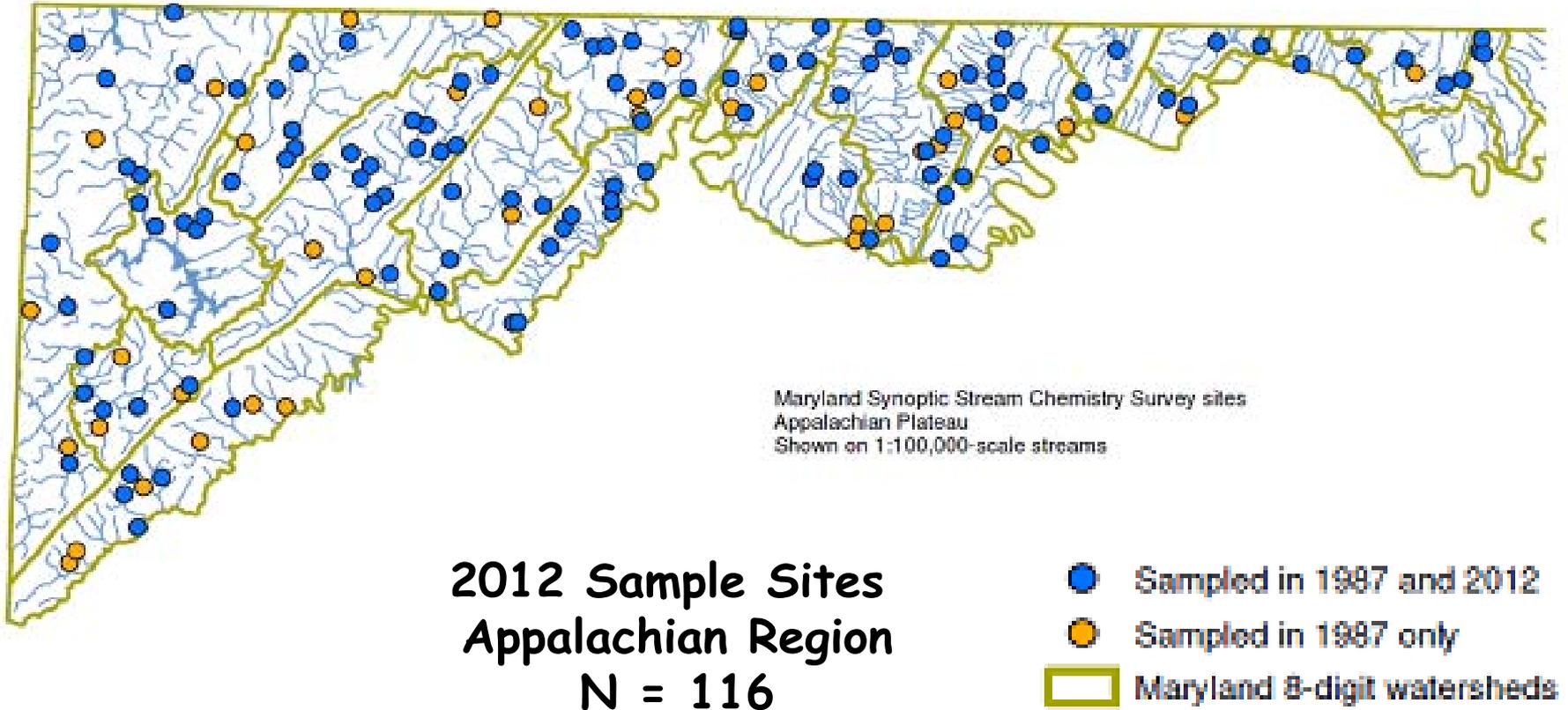
1987 Maryland Synoptic Stream Chemistry Survey (MSSCS)

What paid for the MSSCS?

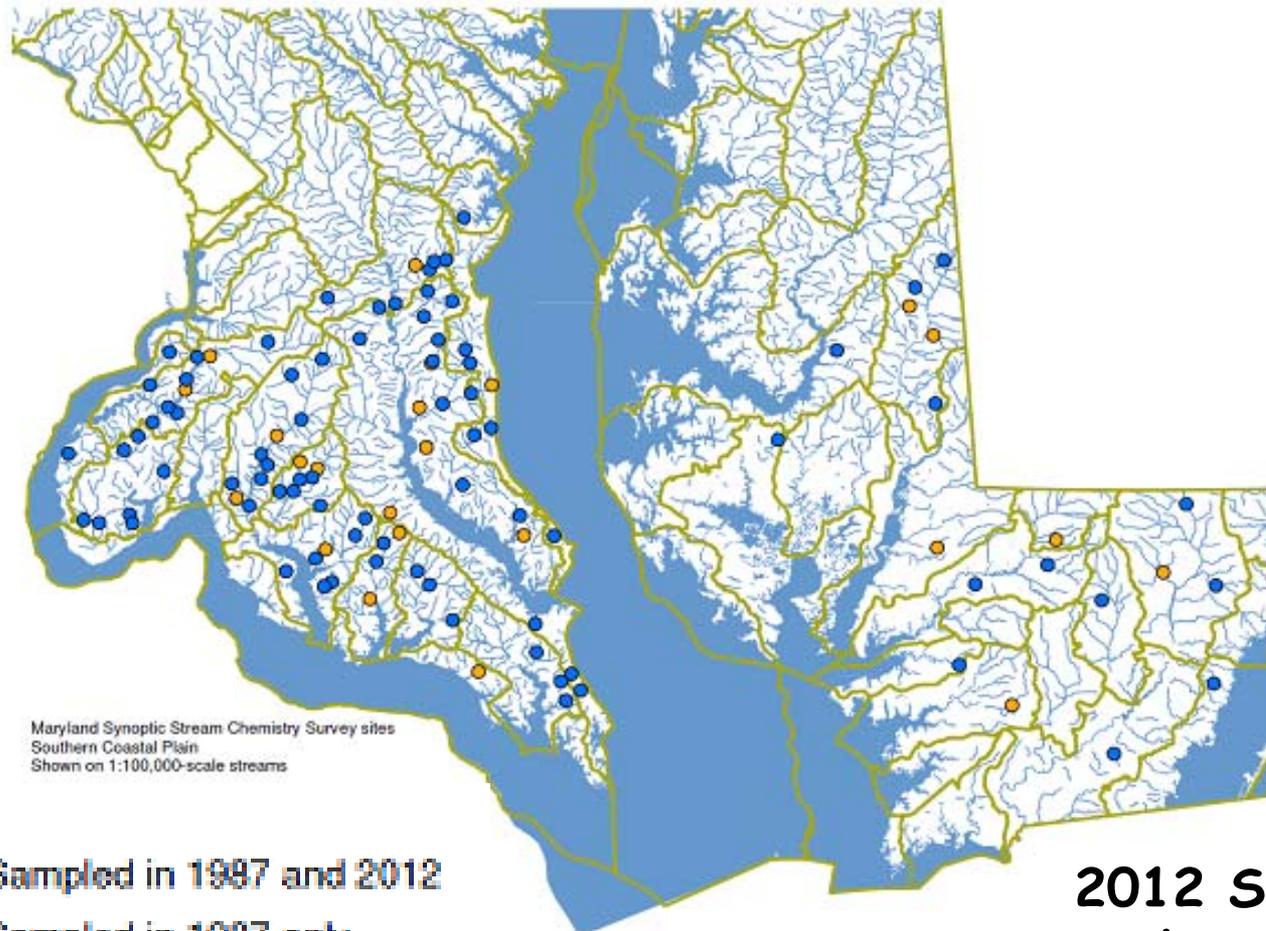


- Environmental Surcharge on monthly electric bills
- ETF provides some support for the MBSS

2012 MSSCS (Repeat Study 25 Years Later)



2012 MSSCS (Repeat Study 25 Years Later)



- Sampled in 1987 and 2012
- Sampled in 1987 only
- Maryland 8-digit watersheds

2012 Sample Sites
Southern Coastal Plain
N = 81

2012 MSSCS

What did we measure?

Parameter	1987	2012
Acid Neutralizing Capacity (ANC)	X	X ^a
pH	X	X ^a
Conductivity	X	X ^a
Dissolved Organic Carbon (DOC)	X	X ^a
Dissolved Inorganic Carbon (DIC)	X	X
Color	X	X
Chloride (Cl)		X ^a
Nitrate-Nitrogen (NO ₃ -N)		X ^a
Sulfate (SO ₄)		X ^a
Total Nitrogen (TN)		X ^a
Total Phosphorus (TP)		X ^a

^a Also MBSS Parameter

2012 MSSCS

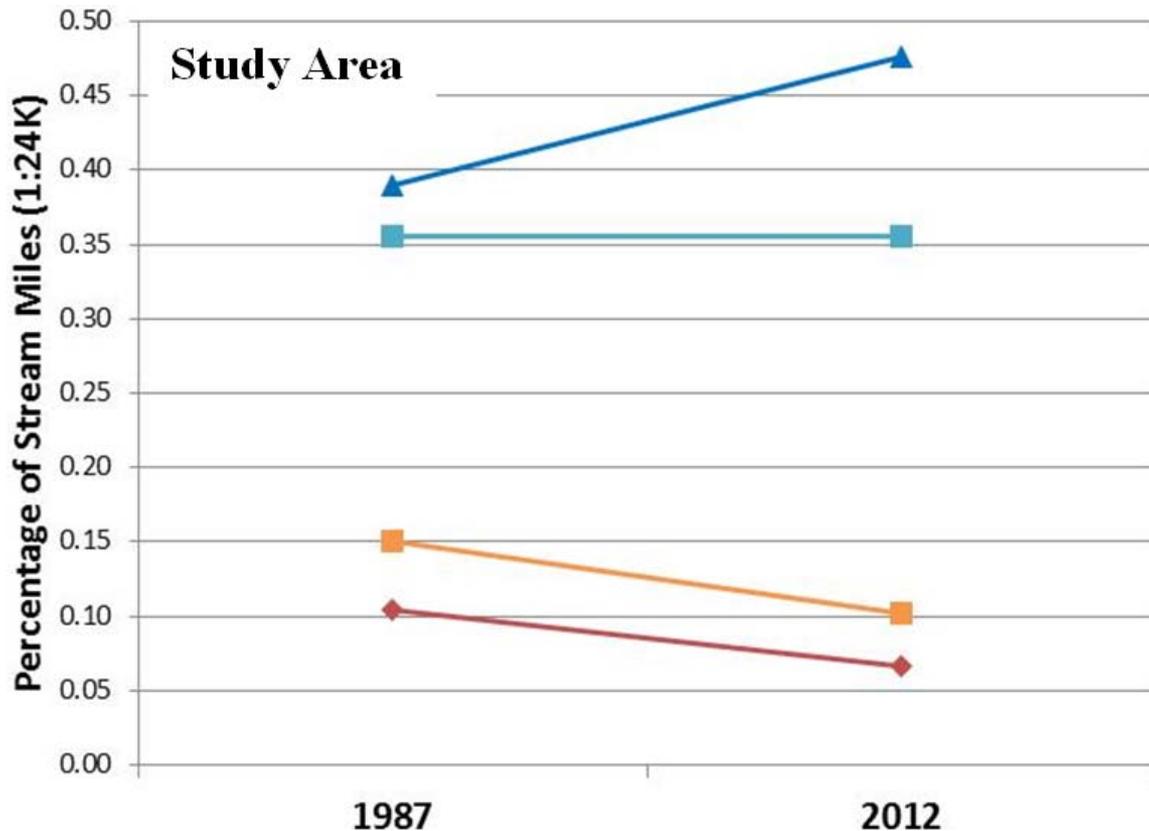
Acid Neutralizing Capacity (ANC) is a Key Parameter

ANC ($\mu\text{eq/L}$)	ANC Category ^a
≤ 0	Acidic
>0 to ≥ 50	Highly Sensitive
>50 to ≥ 200	Sensitive
>200	Not Sensitive

^a Inherent ability to buffer acid inputs

2012 MSSCS ANC Results

Percentage of Stream Miles 1987 vs. 2012



◆ Acidic ■ Highly Sensitive ■ Sensitive ▲ Not Sensitive

- Fewer acidic and highly sensitive streams in 2012
- More not sensitive streams in 2012
- Miles of sensitive streams did not change

Where is the MBSS in 2014?



We have three in the hopper and we're going for more!

The MBSS in 2014

"By the Numbers"

2,529
Random MBSS
Sites

>200 MBSS
participants

1,819
Targeted
MBSS
Sites

7,462
Targeted
Stream Waders
Sites
(>1,400 Trainees)

342 Actual Miles of Streams Samples (MBSS and SW)
Or 3.7% of Total Stream Miles

29 Sentinel Sites

- 14 Years of Sentinel Site Data
- 14 years of Stream Waders Data

The MBSS in 2014

"By The Numbers"

10,122
Landowners Contacted
For permission

- 61 Published Papers Using MBSS Data
- 3 Maryland Streams Symposia
- 107 MBSS Certifications Awarded
- 235 Tier II (High Quality) Waters
- 70 Impaired Watersheds
- 159 Stronghold Watersheds
- 3 Statewide Surveys and Assessments

So What's new with the MBSS in 2014?

1. Begin Round 4
 - 2014 - 2018
 - Repeat random
 - Targeted
2. Look for Change
 - 20 year interval (R4 vs. R1)
 - 14 year interval (R4 vs. R2)
3. Add New Geomorphology Measurements
 - Cross section survey (summer)
 - Pebble count (summer)
 - Facies mapping (spring)
4. Expand Salamander Protocols
 - Increase sampling effort for stream salamanders
 - Implement salamander IBI

For details on R4, see the Round Four Sampling Manual

MBSS Goal and Objectives

Goal:

Provide the best possible information for ensuring the protection and restoration of Maryland's stream ecological resources

Objectives:

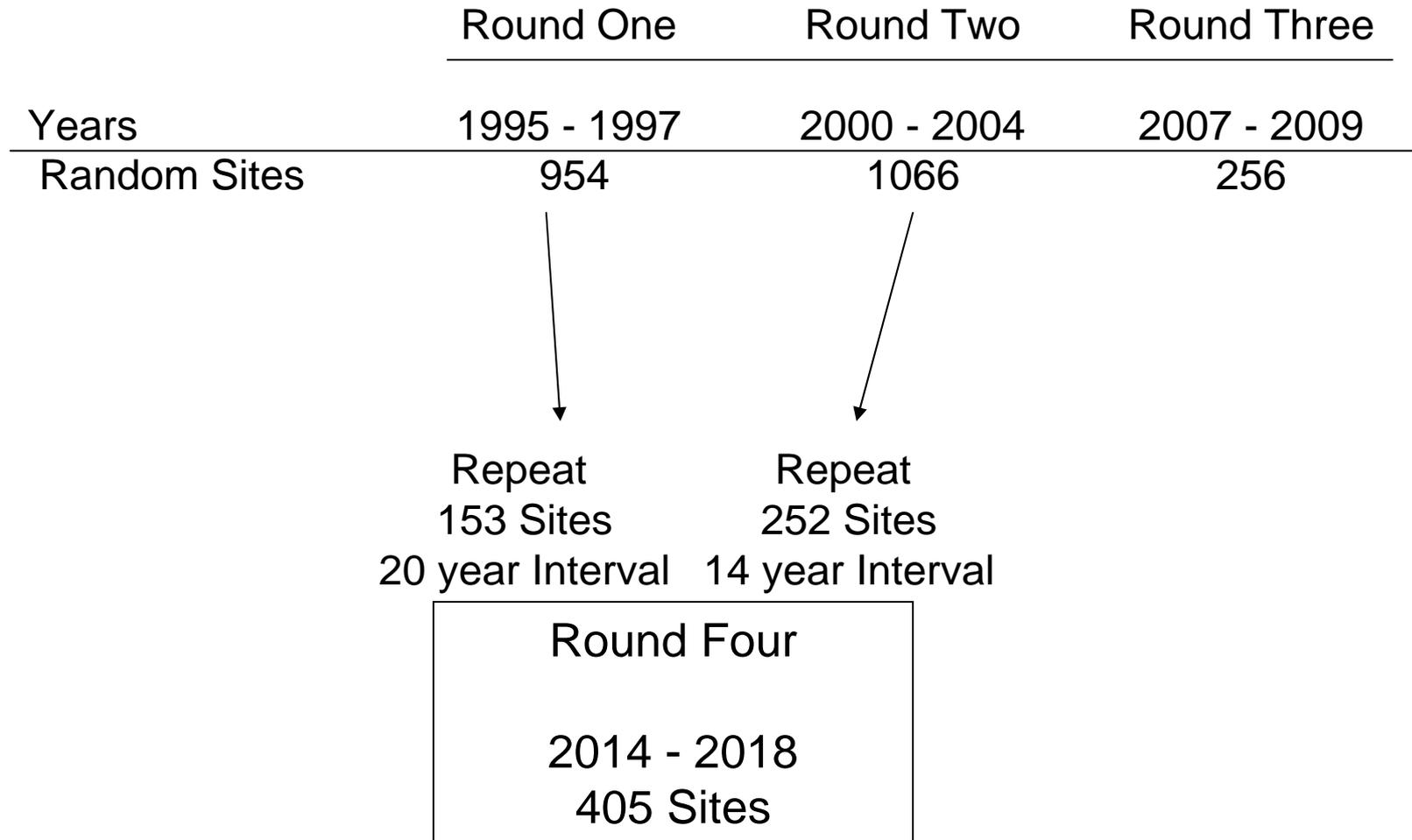
- **Assess, with known confidence, the current condition of ecological resources in Maryland's streams and rivers**
- **Identify causes of adverse effects (stressors) to ecological resources**
- **Provide an inventory of biodiversity in Maryland's streams**
- **Document changes (improvements and degradation) over time in Maryland's stream ecological conditions and biodiversity status**
- **Communicate findings to scientists, local governments, decision makers, and the public to ensure the use and application of results**

Round Four Goal

Document changes (improvements and degradation), with known confidence, in Maryland's stream ecological conditions and biodiversity status over 20 and 14 year intervals.



Round Four = Resample Random Sites (Same Location) Sampled Previously



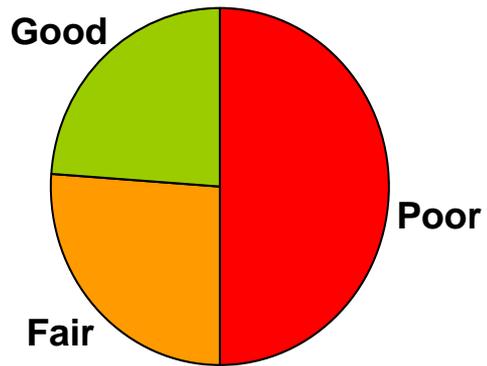
Have stream conditions changed?



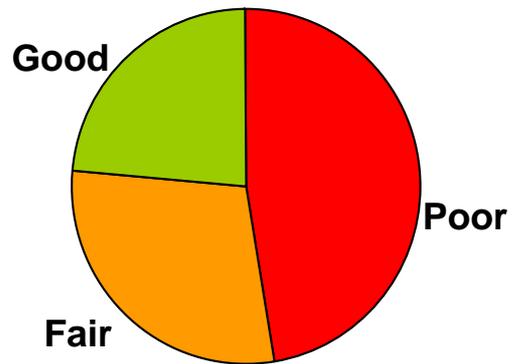
MBSS will also continue to focus on targeted sampling too –

- Special Study Watersheds (Mattawoman and Deep Creek)
- Patapsco River Dam Removal
- Restoration Effectiveness
- Large Rivers and Wadeable Streams (EPA)
- Rare Aquatic Species Inventories
- Nutrient and Sediment Reduction
- Sentinel Sites
- Freshwater Mussel Relocation
- Marcellus Shale Mining Impacts
- Impact Assessment
- Regional Monitoring Network (EPA)

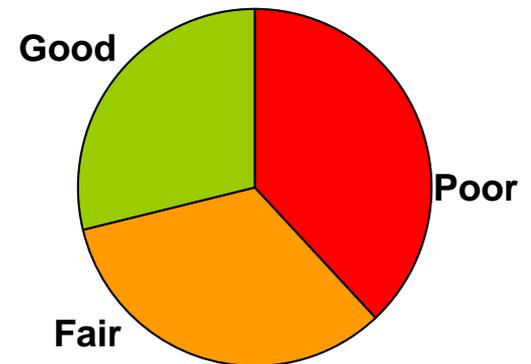
Have stream conditions changed?



R1



R2



R3

**MARYLAND BIOLOGICAL
STREAM SURVEY
2000-2004**

Volume XII



Changes in Condition

