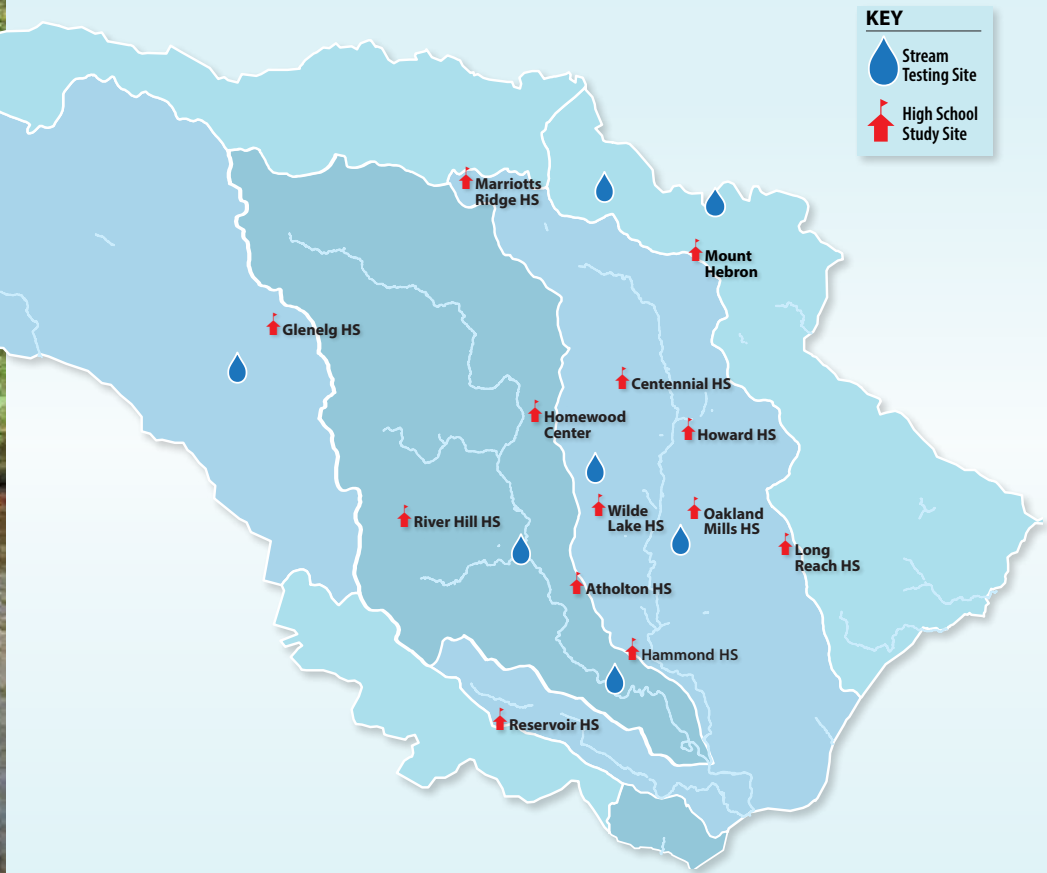




# Student Scientists in Action



2023  
STREAM GRADE: **B**

STUDENT SCIENTISTS  
COLLECT DATA ON THE  
FOLLOWING:

## STREAMS

- Severe stream bank erosion found in many streams
- Sensitive macroinvertebrates found across the county
- High nitrate levels found in several streams

## SCHOOLYARDS

- Litter found consistently across schoolyards
- Several low mow zones populate schoolyards
- Some tree canopy present



## ABOUT THE PROGRAM

The Watershed Report Card program was designed to provide a systemic opportunity for Howard County Public School 9th grade students to participate in a Meaningful Watershed Educational Experience (MWEE). This year, more than 5,000 Earth Space Science students and GT Biology students participated in this project. This experience provides an opportunity for students to engage in an authentic and meaningful exploration of their local watershed.

Students have been collecting data at these stream sites for several years. Student scientists can access historical data on the Chesapeake Commons Water Reporter map.

# OVERALL SCHOOLYARD DATA

Students collected data on erosion, downspouts, storm drains, parking lots, dumpsters, turf management, water chemistry, permeable surfaces, tree canopy, and existing environmental features to determine their schoolyard's overall score. The main focus this year was about taking a hard look at how the flow of rainwater can be slowed down in the schoolyard.

## SCHOOLYARD FEEDBACK

### Atholton High School

- + Stenciled storm drains
- + Pervious pavers in courtyard
- Lack of tree canopy

### Centennial High School

- + Good water quality in pond and stenciled storm drains
- + Existing low mow zones
- Many impervious surfaces and lots of erosion sites

### Glenelg High School

- + Several low mow zones
- Juice leaking from dumpster
- Erosion spots in schoolyard

### Hammond High School

- + Bike racks in place
- Lack of tree cover

### Homewood Center

- + Native plant garden near Monarch Waystation
- Erosion present in high foot traffic areas

### Howard High School

- + Small native plant garden plus low mow zone
- Excessive litter near stadium

### Long Reach High School

- + Stenciled storm drains
- Bare and compacted soil

### Marriotts Ridge High School

- + Outdoor recycling bins
- Large amounts of impervious surfaces

### Mt. Hebron High School

- + Native plant gardens
- Lack of forest cover in schoolyard

### Oakland Mills High School

- + Updated stenciled storm drains
- + Two well-maintained native plant gardens

### Reservoir High School

- + Recycling bins present outdoors
- + Native plants and stenciled storm drains
- Too much litter

### River Hill High School

- + Rain garden present
- + Compost bins
- Litter present throughout schoolyard

### Wilde Lake High School

- + Outdoor recycling bins available
- Erosion in high foot traffic areas

## SCHOOLYARD ACTION RECOMMENDATIONS

Students across the county have recognized three main areas that need improvement on our schoolyards – reduce the amount of litter that is prevalent on schoolyards, add native plants and trees to solve erosion issues and increase biodiversity, and reduce run-off and erosion to slow the flow of rainwater.

### Protect & Encourage Biodiversity

12/13 Schools



- Plant more native trees and shrubs
- Protect habitats
- Remove invasive plants

### Reduce Schoolyard Litter

10/13 Schools



- Sponsor schoolyard campus clean ups
- More recycling bins outdoors
- Find new ways to reduce schoolyard litter

### Increase Pervious Surfaces

9/13 Schools



- Remediate erosion areas
- Add and maintain rain gardens
- Add low mow zones
- Replace impervious surfaces





# STREAM QUALITY OBSERVATIONS

**South Branch Patapsco** at Mt. Pleasant **MODERATE**  
**Patapsco River** at Daniels **MODERATE**  
**Little Patuxent** at Faulkner Ridge **POOR**  
**Little Patuxent** at Macomber Lane **POOR**

**Middle Patuxent** at Shady Lane **MODERATE**  
**Middle Patuxent** at Southwind Trail **MODERATE**  
**Middle Patuxent** at Sweet Hours Way **MODERATE**

## SENSITIVE MACROINVERTEBRATE CHART

	Casemaker Caddisfly	Mayfly	Stonefly	Water Penny	Hellgrammite
<b>South Branch Patapsco</b> at Mt. Pleasant		●		●	
<b>Patapsco River</b> at Daniels		●	●	●	●
<b>Little Patuxent</b> at Faulkner Ridge					
<b>Little Patuxent</b> at Macomber Lane	●				
<b>Middle Patuxent</b> at Shady Lane	●	●		●	●
<b>Middle Patuxent</b> at Southwind Trail	●	●		●	●
<b>Middle Patuxent</b> at Sweet Hours Way	●	●	●	●	●

Macroinvertebrates are often used in studies to determine water quality due to their known pollution tolerances, limited mobility and dependence on the land environment around the stream. The sensitive macroinvertebrates are of particular importance because they do not tolerate high levels of pollution. At each stream site, students searched in riffles, runs, pools, under cobbles and leaf matter, and through root wads using D-Nets to find a variety of macroinvertebrates.



## STREAM FEEDBACK

### South Branch Patapsco at Mt. Pleasant

*Homewood Center and Marriotts Ridge High School*

- + Stream meanders helps to slow the flow
- High levels of sedimentation
- Low biodiversity scoring

### Patapsco River at Daniels

*Howard High School, Long Reach High School, and Mt. Hebron High School*

- + Diverse macroinvertebrate count
- Stream bank erosion
- Elevated conductivity values

### Little Patuxent at Faulkner Ridge

*Wilde Lake High School*

- + New tree plantings in riparian zone
- Very high conductivity values reported
- Mostly tolerant macroinvertebrate species found

### Little Patuxent at Macomber Lane

*Oakland Mills High School*

- + Clear transparency
- High nitrate levels measured
- Poor macroinvertebrate count found

### Middle Patuxent at Shady Lane

*Glenelg High School*

- + Abundant biodiversity with many sensitive macroinvertebrates
- + Salamanders were observed at this site
- High nitrites

### Middle Patuxent at Southwind Trail

*Reservoir High School and River Hill High School*

- + Lots of vegetation surrounding the stream
- + High scores for corridor assessment
- Trash in stream

### Middle Patuxent at Sweet Hours Way

*Atholton High School, Hammond High School and Reservoir High School*

- + Highest macroinvertebrate scores
- Stream bank erosion, lots of silt deposition
- High nitrate values





## STREAM RECOMMENDATIONS

South Branch Patapsco  
at Mt. Pleasant .....



Patapsco River  
at Daniels .....



Little Patuxent  
at Faulkner Ridge .....



Little Patuxent  
at Macomber Lane .....



Middle Patuxent  
at Shady Lane .....



Middle Patuxent  
at Southwind Trail .....



Middle Patuxent  
at Sweet Hours Way .....



## THANK YOU

to the following for your  
continued dedication  
and support

HCPSS Earth Space Systems  
Science and Biology Gifted  
& Talented Teachers

Howard County Conservancy  
Volunteer Naturalists

HCPSS Secondary Science Office

## THANK YOU

to our Partners

