

# Score Four: Exploring with Maps

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Interstate Commission on the Potomac River Basin



# Goal: Explore Links Between Land Uses & Water Quality in the Local Watershed

Maps Help Students:

- Formulate Questions
- Determine Answers

Sources:

- Maryland Department of Natural Resources (DNR)
- Maryland Department of Planning



# Maryland DNR Stream Health Map

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RE: FYI -- Festival del Rio A... x Shared with me - Google D... x Stream Health Home page x +

dnr.maryland.gov/streams/Pages/streamhealth/default.asp Search

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DEPARTMENT OF NATURAL RESOURCES

Enter search term

**Rivers & Streams**

- › Rivers and Streams Home
- › Maryland Biological Stream Survey
- › Stream Waders Volunteers
- › Maryland Water Monitoring Council
- › Maryland Stream Health
- › Marcellus Shale Stream Monitoring
- › Publications
- › MBSS Trainings and Certifications
- › Videos
- › Noon Seminars
- › Data Request
- › Maryland Invasive

**Stream Health**

**Help Restore Your Stream**

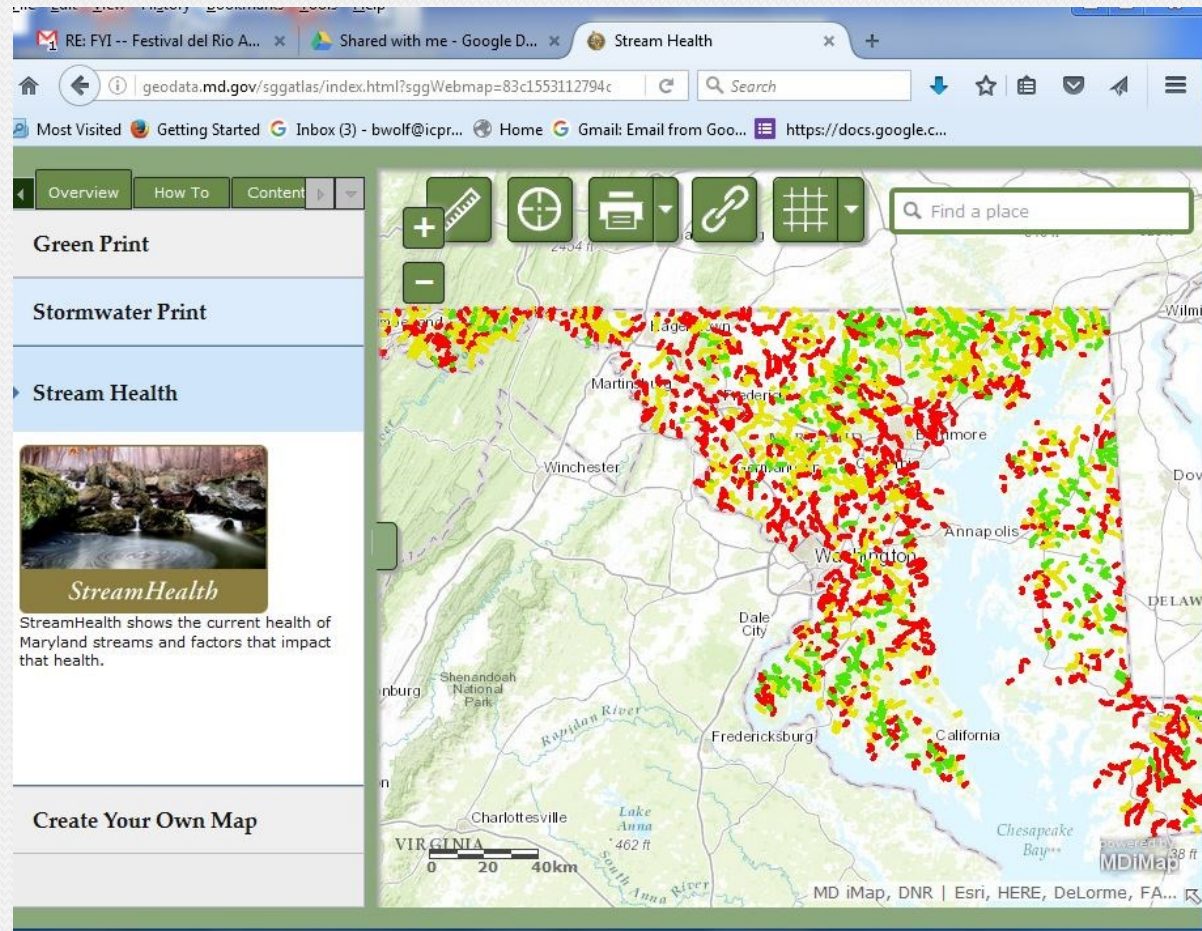
Maryland has over 10,000 miles of rivers and streams that reach through every corner of our State – from the Appalachians to the Eastern Shore.

[Click here for the Interactive Maryland StreamHealth Map](#)

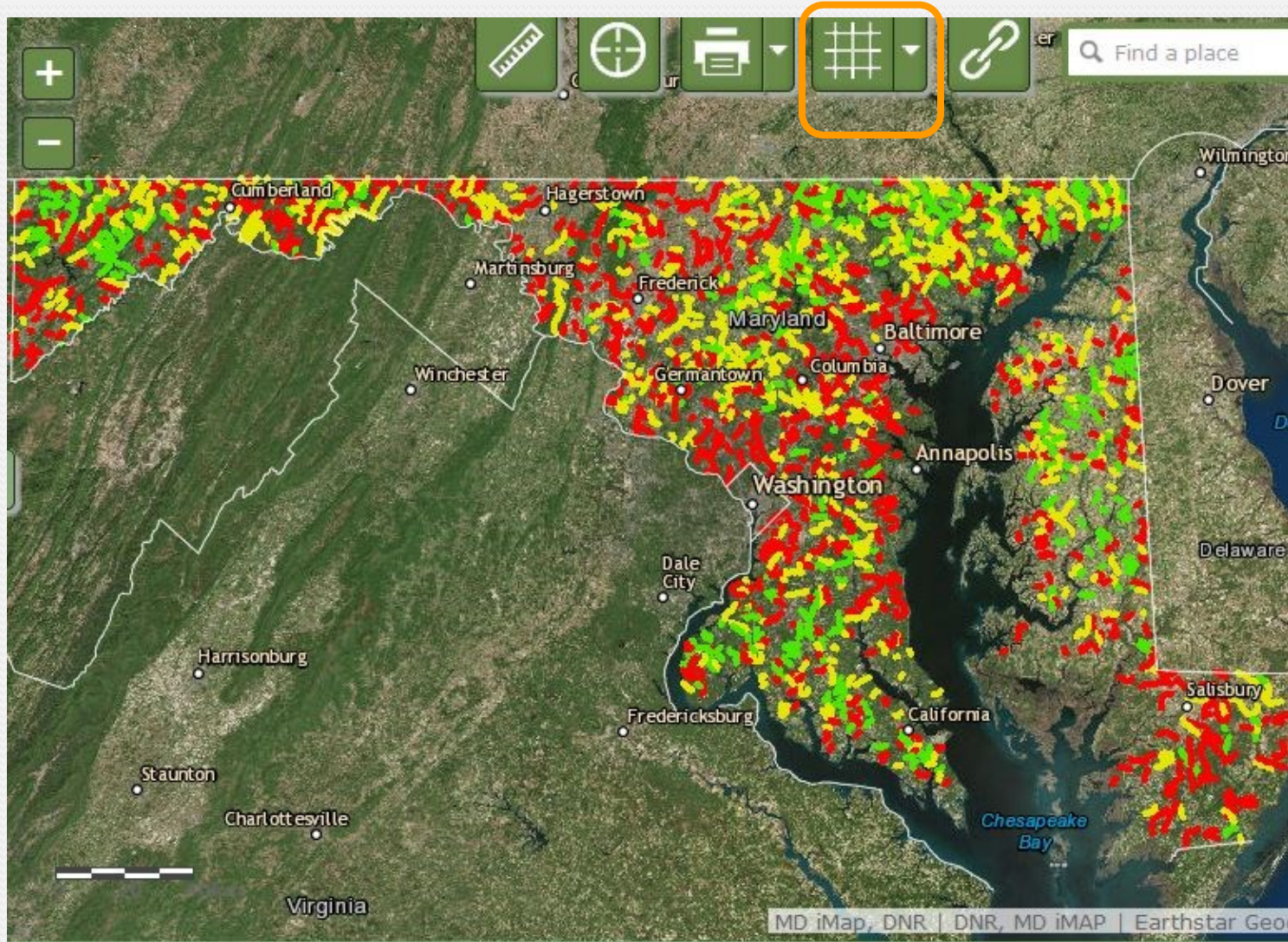
They range from the mighty Potomac to small, unnamed creeks in our backyards. Our streams serve as the capillaries and arteries carrying water, life, and pollutants to the Chesapeake Bay. They provide recreational opportunities such as canoeing and fishing, help grow our crops, feed our reservoirs, serve as critical habitat for valuable and endangered species, and provide essential natural services to our environment. Every Maryland citizen lives within at least 15 minutes of a stream or river. What we do on our land directly influences the health of these valuable parts of Maryland's landscape. This website is provided as a resource on the health of Maryland's streams, factors that impact that health, and to direct you to ways that you can become actively involved in



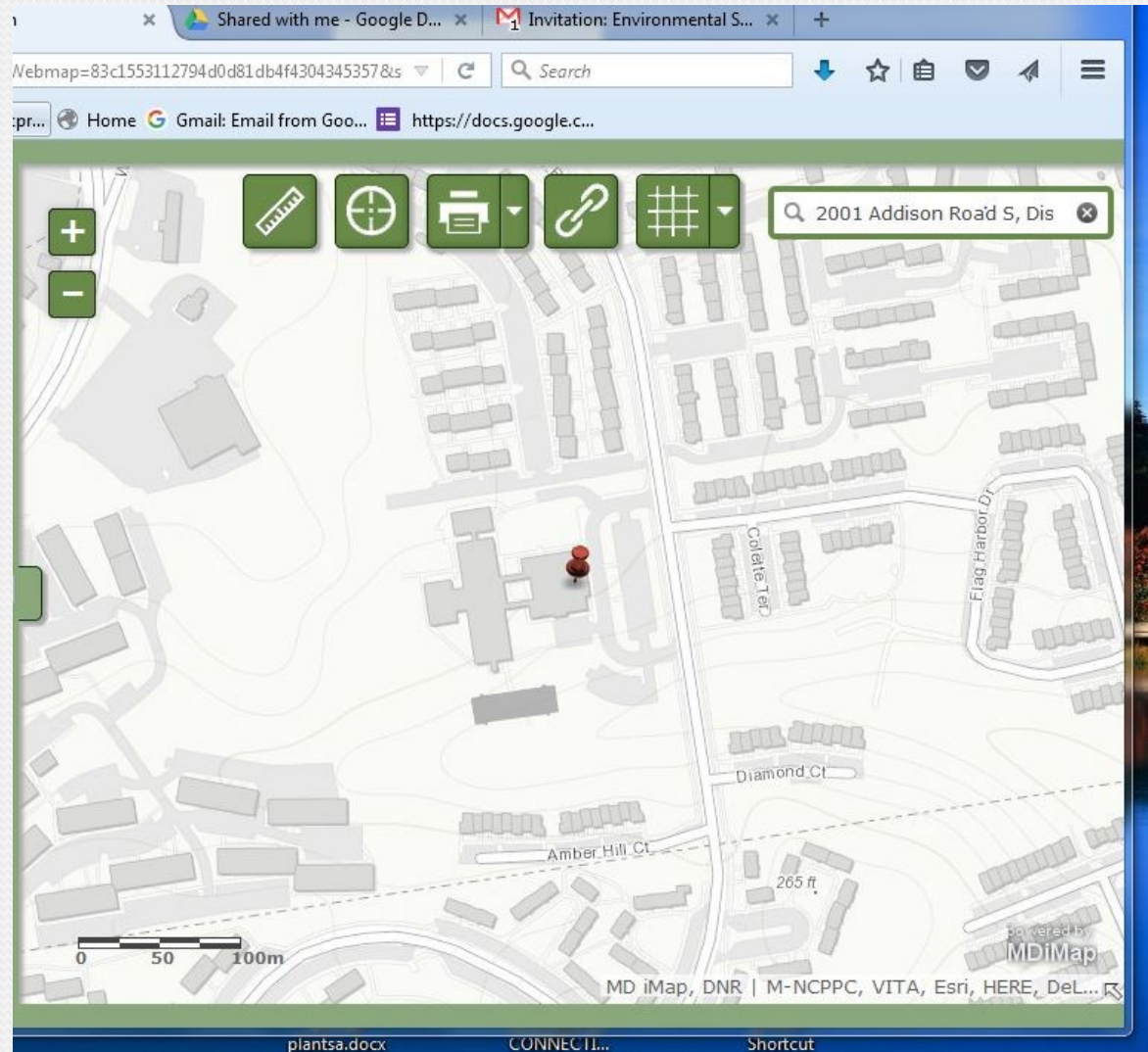
# What Are Your First Impressions?



# Easy to Switch to A Land-Cover Base Map



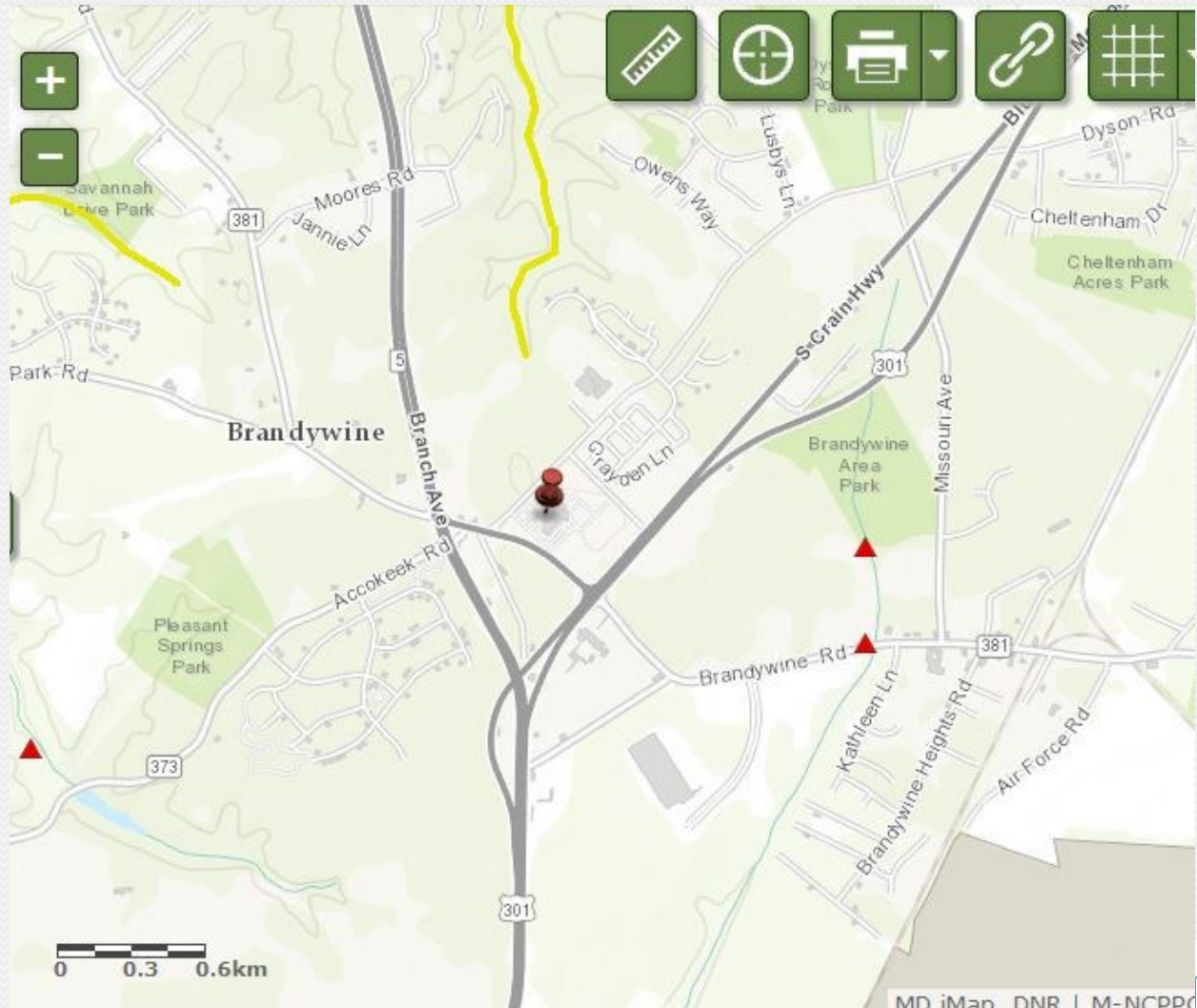
# Search for Your Local School



# Zoom In To See Survey Results

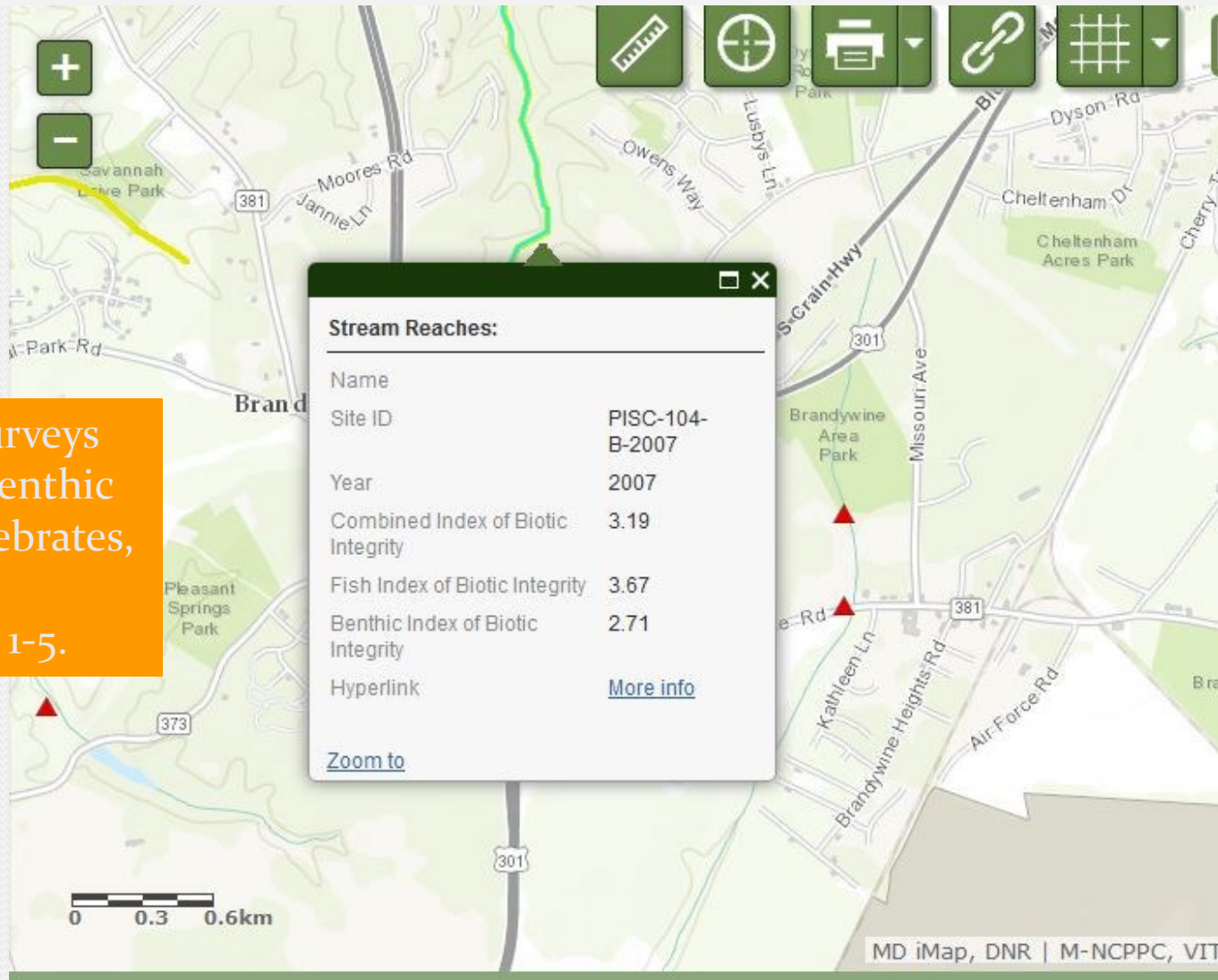
Symbols represent stream surveys.

Click on them to learn the who, what, where's, etc.



# Details...

Biological Surveys  
of fish and Benthic  
Macroinvertebrates,  
Results from 1-5.



# And More Details



[New Search](#)

[Search Tips](#)

[About the MBSS](#)

[Fish Distributions](#)



[Your Feedback](#)

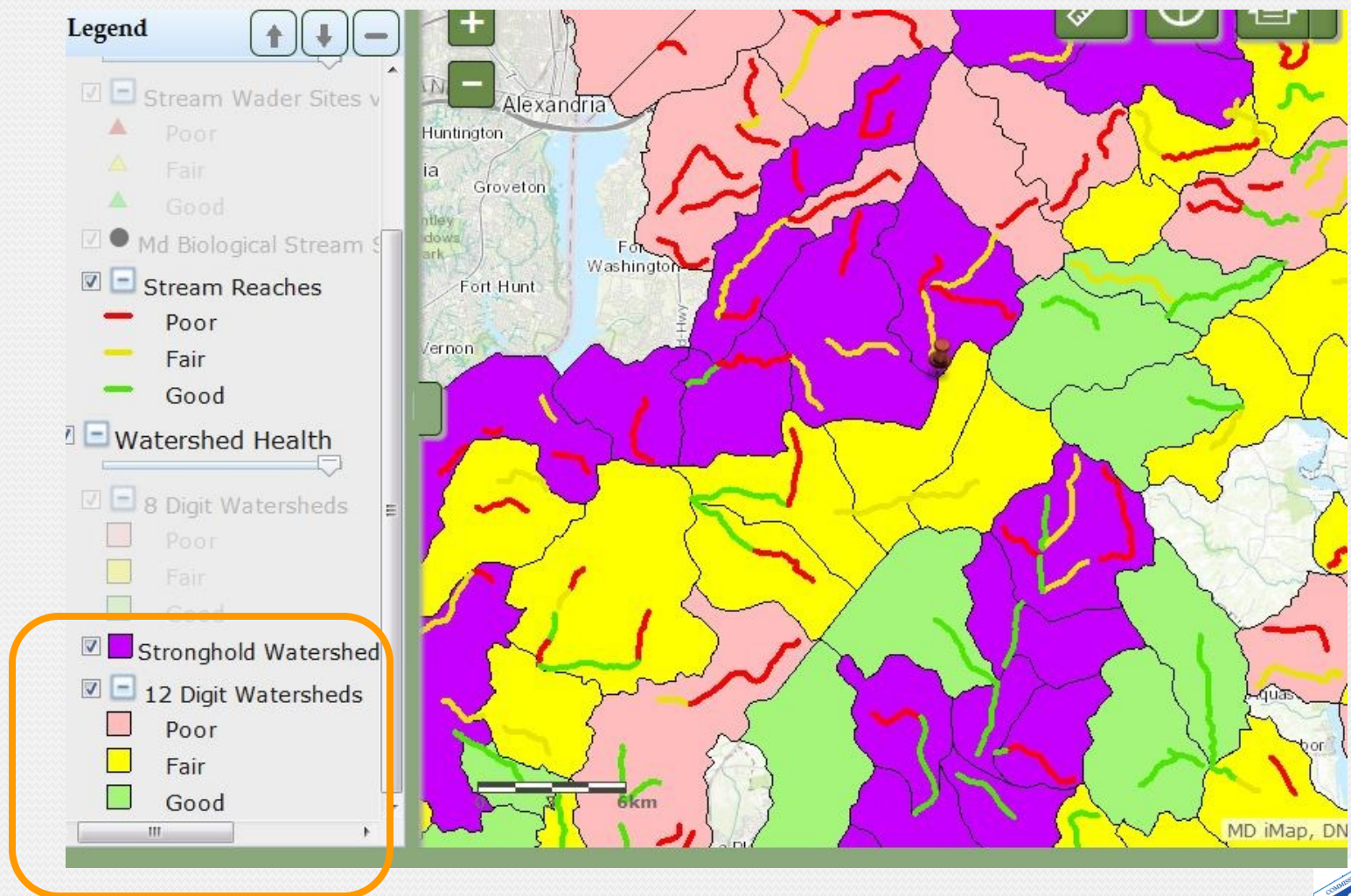
PISC-104-B-2007 is located on **piscataway creek ut5** in the Piscataway Creek watershed, 8-digit code: (02140203). This stream was visited in the spring on 4-3-2007 and again in the summer on 7-11-2007.

<a href="#">Fish IBI</a>	3.67	<b>Fair</b>
Benthic IBI	2.71	<b>Poor</b>

Catchment area	850 acres	<a href="#">Instream Habitat</a>	16 (Optimal)
<a href="#">Urban</a>	17.5 %	<a href="#">Epifaunal Substrate</a>	10 (Marginal)
<a href="#">Agricultural</a>	20.1 %	<a href="#">Velocity/Depth Diversity</a>	13 (Suboptimal)
<a href="#">Forest</a>	61.2 %	<a href="#">Pool Quality</a> Pool Extent = 60 of 75 meters	17 (Optimal)
<b>Amphibians and Reptiles</b>		<a href="#">Riffle Quality</a> Riffle Extent = 18 of 75 meters	12 (Suboptimal)
AMERICAN BULLFROG		<a href="#">Shading</a>	85 %
GRAY TREEFROG		<a href="#">Embeddedness</a>	50
NORTHERN GREEN FROG			



# Extending Results to Watersheds



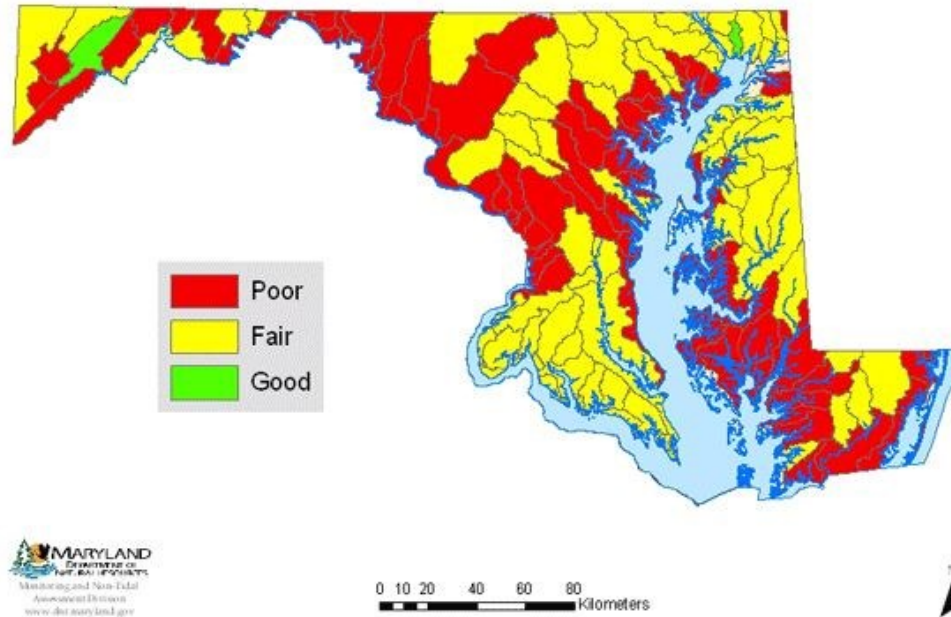
# For State Overview & Other Info

- ✓ Publications
- MBSS Trainings and Certifications
- Videos
- Noon Seminars
- Data Request
- Maryland Invasive Species
- Species Spotlight Archives

## Stream Health

- Home
- Interactive Map
- Current Stream Health Overview
- Maryland's Stronghold Watersheds
- Forested Stream Buffers
- How Impervious Surface Impacts Stream Health
-  The Effects of Hurricanes and Tropical Storms on Stormwater Runoff and Maryland's Streams
- Help Restore Your Stream
- Funding Opportunities
- Teacher Resources
- Help Survey Streams

## Maryland's Watershed Health



After all the sites in the watershed have been sampled, the results are then compiled to assign an overall rating of "good", "fair", or "poor" for streams in the watershed. It is important to note that stream health can vary considerably from location to location within a watershed based on activity on the adjacent land. As a result, there may be several "good" sites in an overall "poor" watershed and visa versa.

# Maryland Department of Planning

Focus:  
Land Use  
and Land  
Cover

The screenshot shows the Maryland Department of Planning website. The browser address bar displays [www.mdp.state.md.us/OurProducts/iMaps.shtml](http://www.mdp.state.md.us/OurProducts/iMaps.shtml). The website header includes the Maryland state logo, the text "DEPARTMENT OF PLANNING", a search bar, and social media icons for Facebook, Twitter, YouTube, and Pinterest. A navigation menu at the top lists: HOME, OUR WORK, OUR PRODUCTS (highlighted), YOUR PART, REDISTRICTING, HISTORICAL TRUST, and DATA CENTER. The main content area is titled "Interactive Maps" and is highlighted with an orange border. To the left of this section, under "Mapping Tools", are links for Congressional & Legislative Districts, Priority Funding Areas Mapping, Land Use Mapping, Census Mapping, Zip Codes Mapping, and Downloadable GIS Files. Below that, under "Related Sites", is a link for the MDiMAP portal. The "Interactive Maps" section contains a paragraph explaining the value of maps, a small map of Maryland with a cursor, and text stating that MDP has used GIS for 40 years. It also mentions that Adobe Flash version 10 or higher is required for interactive mapping applications. At the bottom of the page, there is a "Recently Added" section.

www.mdp.state.md.us/OurProducts/iMaps.shtml

stronghold watershed md DNR

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**Mapping Tools**

- > Congressional & Legislative Districts
- > Priority Funding Areas Mapping
- > Land Use Mapping
- > Census Mapping
- > Zip Codes Mapping
- > Downloadable GIS Files

**Related Sites**

- > MDiMAP portal  
Online mapping applications for the State

**Interactive Maps**

If it is true that "a picture tells a thousand words", then a map tells volumes. Maps are a universal medium for communication. People have been using maps for as long as they have wondered, "What's over there?" A map is a scaled, graphic representation of the real world and a means for conveying a lot of information geographically.

MDP has been using geographic information systems (GIS) to answer questions and formulate scenarios for close to 40 years. A GIS is simply a map. When you go to an Internet roadmap for directions, you are using a GIS. MDP is pleased to make some of our most valuable data available to the public as interactive GIS maps. Just like the online roadmap, you can search and address and learn about the surrounding area. The maps convey information such as population change (Census 2010), how much residential development has occurred (residential growth) and the area where you vote (legislative districts), to name a few.

We hope you find these maps useful and welcome your suggestions on other applications.

Adobe Flash version 10 or higher is required to view the interactive mapping applications. Additional online mapping applications for the State are also available at the [MDiMAP portal](#).

**Recently Added**



# Students Explore Land Use/Land Cover Changes

Ancient  
history to  
some of our  
students.

## Land Use/ Land Cover Map

MDP is a comprehensive source for maps of current Land Use/Land Cover for every jurisdiction in Maryland. The Land Use/Land Cover Interactive Map allows you to view, zoom and pan our digital map "layers." These include:

1. 1973 Land Use/Land Cover
2. 2010 Land Use/Land Cover
3. 1973 - 2010 Change
4. 2002 - 2010 Change (based on modified 2002 release)\*

\* Enhancements to the 2010 Land Use/Land Cover release impacted the ability to perform comparative analysis with original 2002 release data. MDP resolved this by creating a modified 2002 Land Use/Land Cover product.

To read more about this process, please refer to [Mapping Process and Methodology](#).

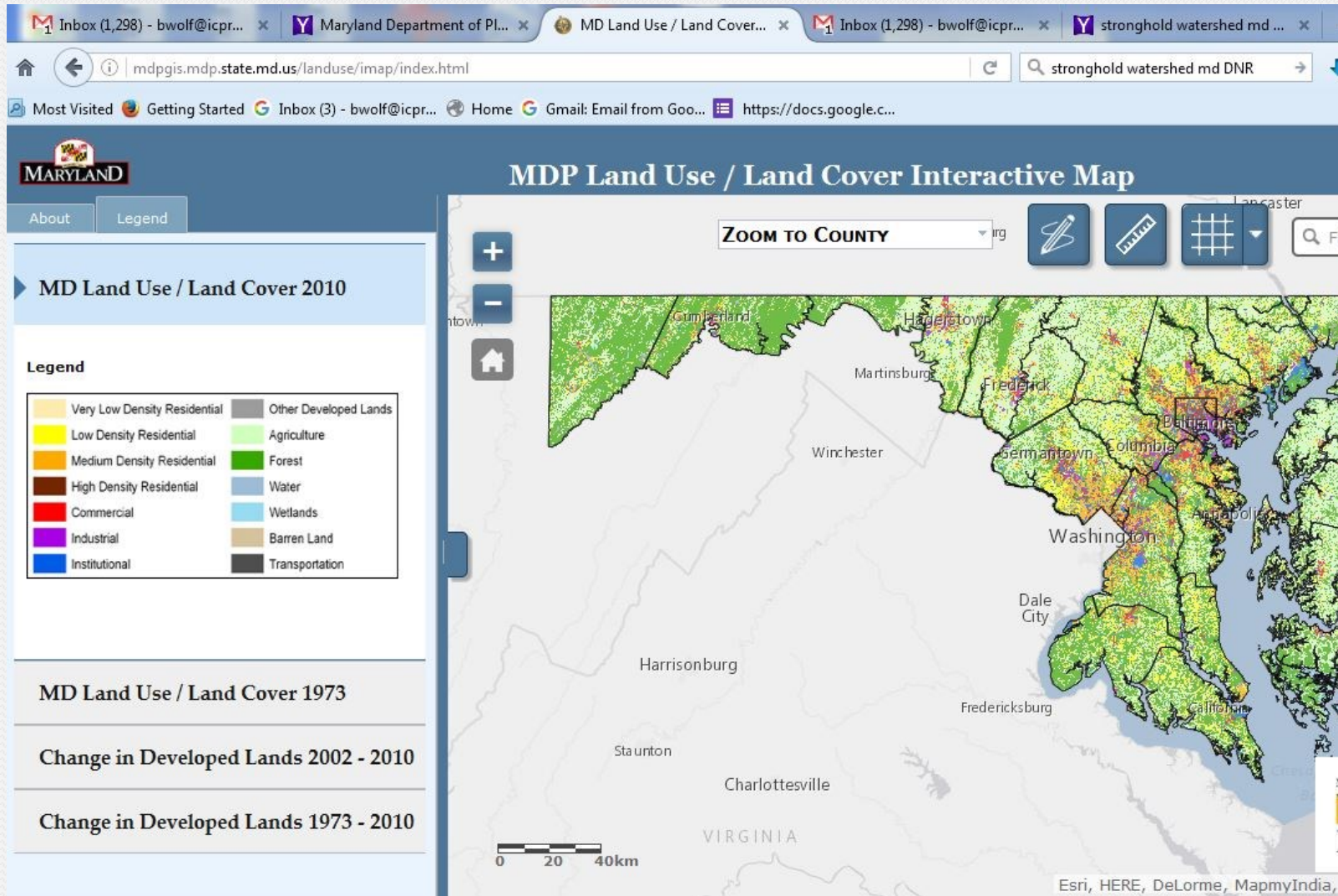
Click on the picture of the map below to begin using MDP's Interactive Land Use/Land Cover Map. To familiarize yourself with the 2010 Land Use/Land Cover release, please refer to these materials:

- [Mapping Process and Methodology](#)
- [Land Use/Land Cover Classification Definitions](#)
- [Metadata](#)



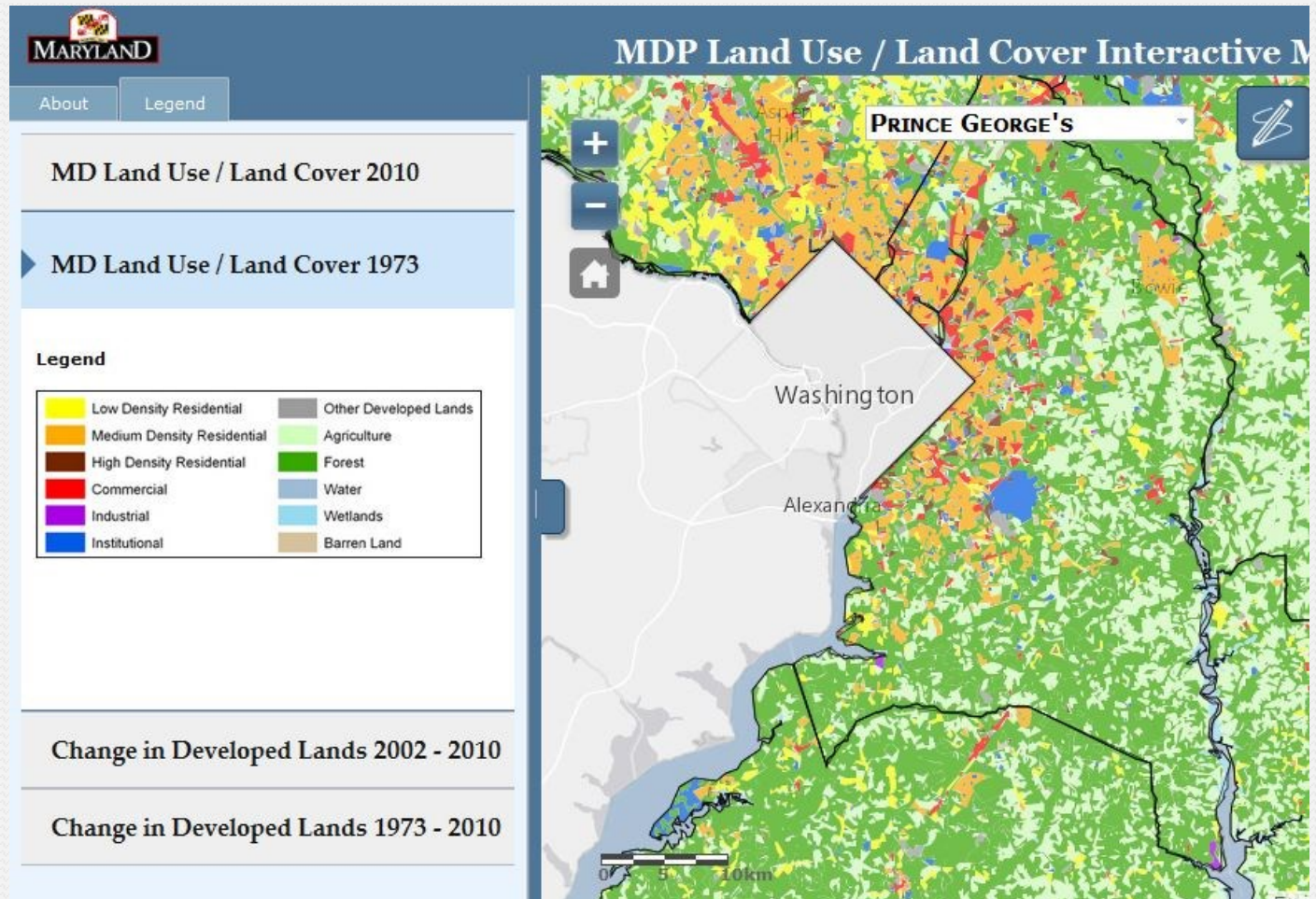
[Click to access the interactive map](#)

# Look At Maryland or Look Locally

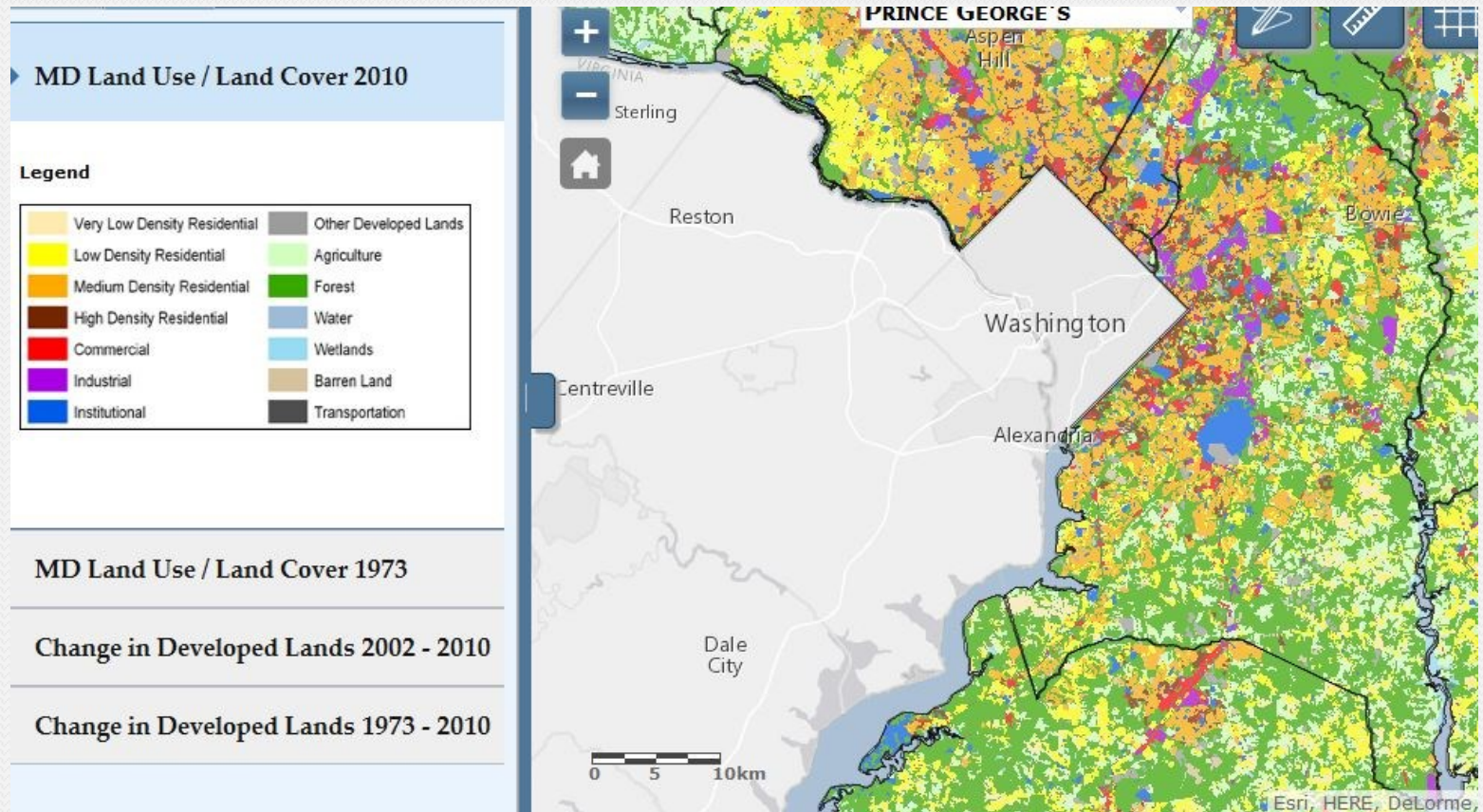


# Prince George's County 1973

What do you notice about the land use?



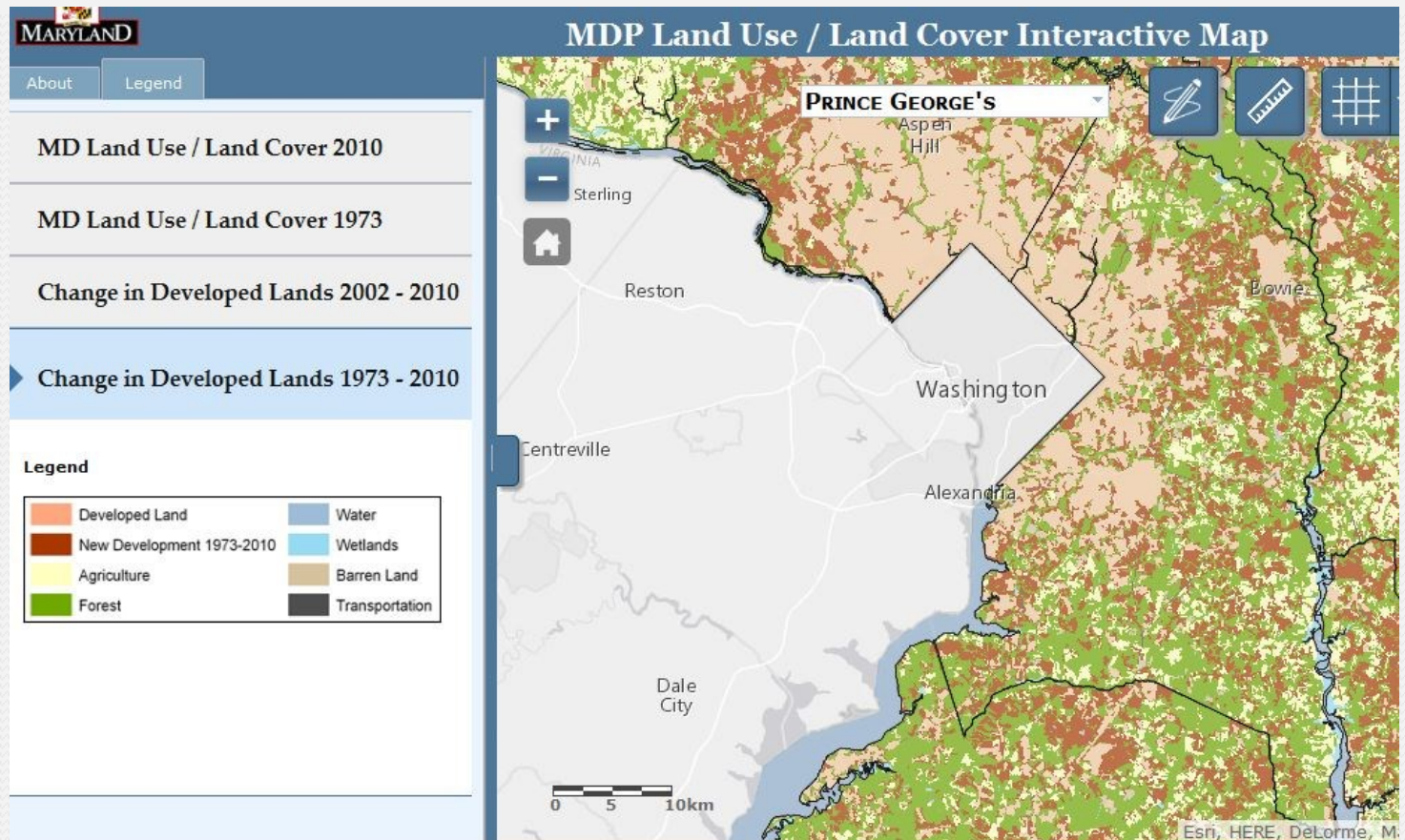
# Prince George's County 2010



What changes do you notice?  
What questions does this map raise?

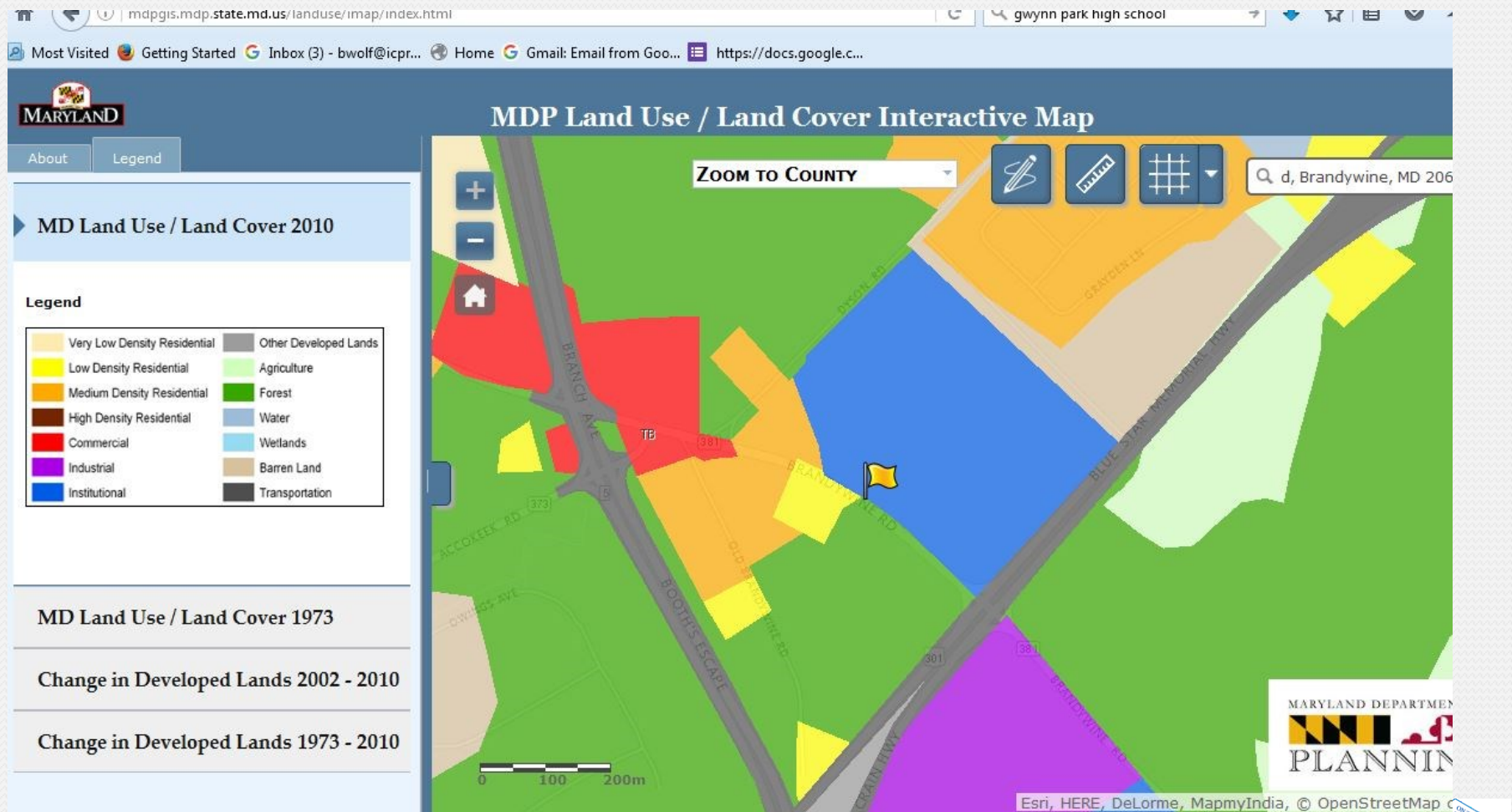


# Prince George's County Changes

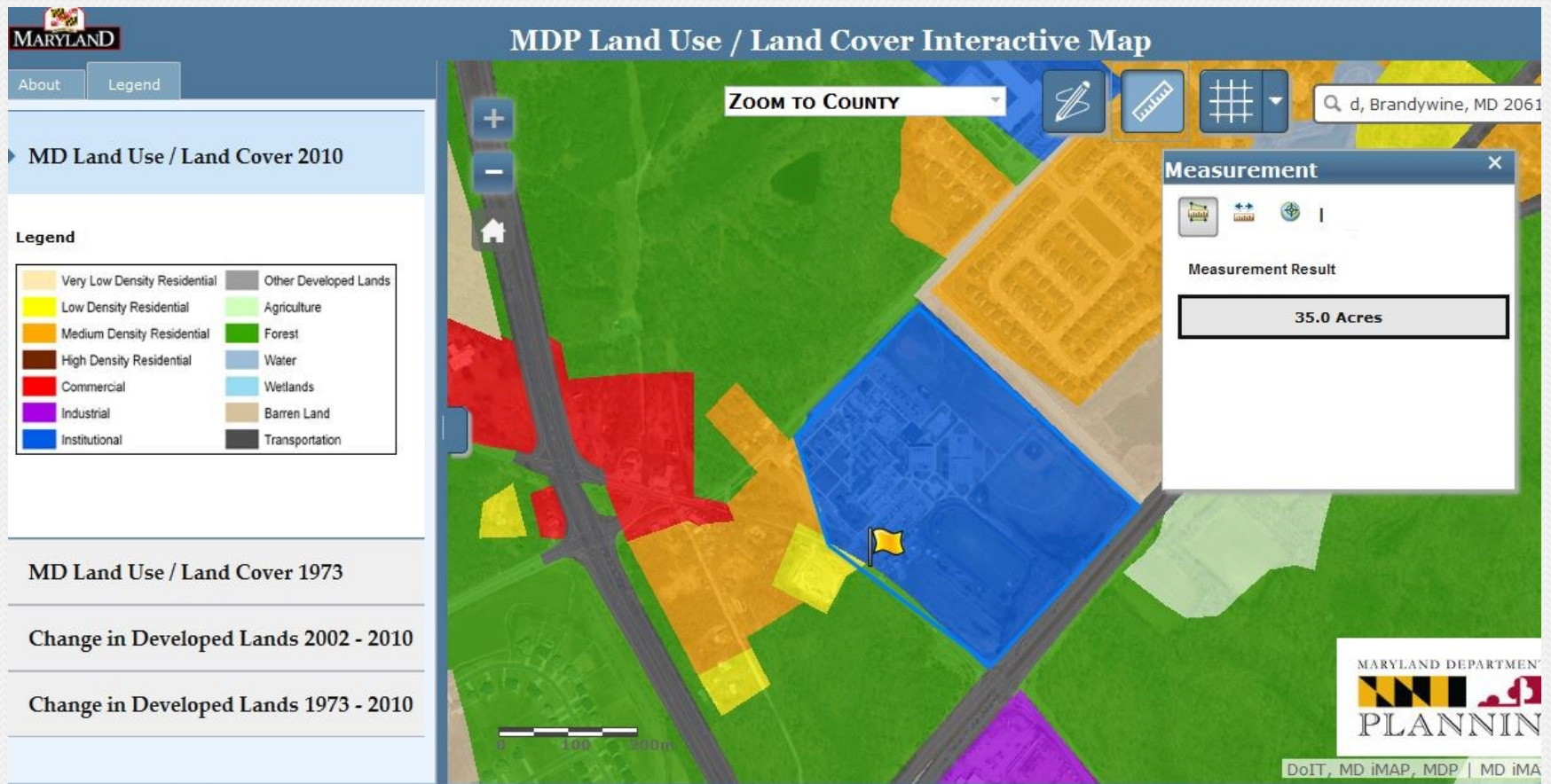


- What patterns do you notice?
- How could these changes affect waterways?

# Close-up Inspection: Gwynn Park HS



# Bringing in Math & Science ...



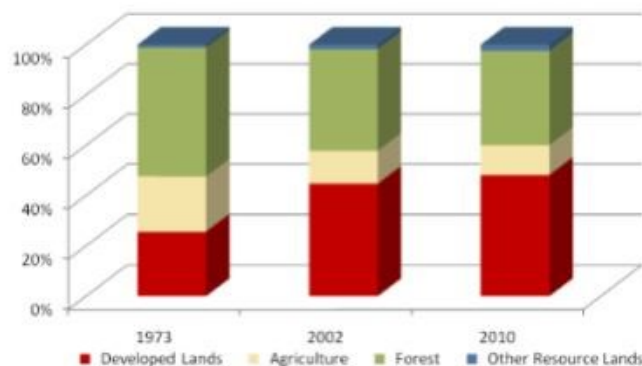
# One last thing: Graphs and Charts

## Prince George's County

	Land Use in Acres		Land Use Change	
	2002 <sup>3</sup>	2010 <sup>2</sup>	2002-2010	
	Acres	Acres	Acres	Percent
Very Low Density Residential <sup>1</sup>	9,450	10,659	1,209	12.8%
Low Density Residential	23,558	26,389	2,830	12.0%
Medium Density Residential	49,869	53,298	3,429	6.9%
High Density Residential	12,990	13,765	774	6.0%
Commercial	8,946	9,670	724	8.1%
Industrial	7,776	8,438	662	8.5%
Other Developed Lands/ Institutional/Transportation <sup>1</sup>	25,705	26,784	1,079	4.2%
<b>Total Developed Lands<sup>3</sup></b>	<b>138,294</b>	<b>149,002</b>	<b>10,709</b>	<b>7.7%</b>
Agriculture	40,531	36,829	-3,702	-9.1%
Forest	125,095	115,990	-9,104	-7.3%
Extractive/Barren/Bare	2,357	4,456	2,099	89.1%
Wetland	2,998	2,997	-1	0.0%
<b>Total Resource Lands<sup>3</sup></b>	<b>170,981</b>	<b>160,273</b>	<b>-10,708</b>	<b>-6.3%</b>
<b>Total Land</b>	<b>309,275</b>	<b>309,275</b>		
<b>Water</b>	<b>9,515</b>	<b>9,515</b>		

	Land Use in Acres			Land Use Change
	1973 <sup>4</sup>	2002 <sup>3</sup>	2010 <sup>1,2</sup>	1973-2010
	Acres			
All Residential	52,533	95,867	104,110	51,578
All Non-Residential	27,284	42,426	44,892	17,609
<b>Total Developed Lands<sup>3</sup></b>	<b>79,816</b>	<b>138,294</b>	<b>149,002</b>	<b>69,186</b>
<b>Total Resource Lands<sup>3</sup></b>	<b>230,833</b>	<b>170,981</b>	<b>160,273</b>	<b>-70,560</b>
<b>Total Land</b>	<b>310,649</b>	<b>309,275</b>	<b>309,275</b>	
<b>Water</b>	<b>8,722</b>	<b>9,515</b>	<b>9,515</b>	

Land Use Change 1973 - 2010



1. Two new categories have been added to the 2010 Land Use/Land Cover layer update; very low density residential development (VLD) and transportation (T).

2. Updates/modifications to the 2002 land use/land cover layer used the 2007 NAIP aerial imagery and parcel information from Maryland Property View 2008.

3. The original 2002 data were mapped using georectified LANDSAT satellite imagery and 2002 NAIP Property View. In 2010 two new land use categories were added; transportation and very low density residential making it necessary to modify the 2002 land use/land cover layer to incorporate these categories for comparative purposes. Additionally, better imagery and property data information were used to make further modifications. The enhanced 2002 dataset is available upon request.

4. Very low density residential was not mapped in 1973, so there is no data associated with changes. Transportation was not mapped in 1973.

5. As noted above, new land use categories were added in 2010 and associated adjustments were made to 2002 data. Similar adjustments were not made to 1973 data, making it impossible to know how much change from 1973 is due to new development since then, versus misclassified land uses at that time. For these reasons, we suggest reliance only on change statistics for the aggregate land use categories, Total Developed and Total Resource Lands.