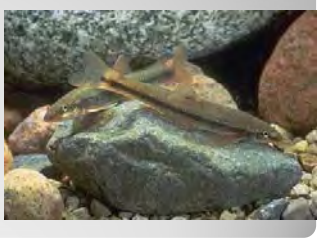
Montgomery County, MD

Monitoring Our Local Streams: Meeting Regulatory and Programmatic Goals





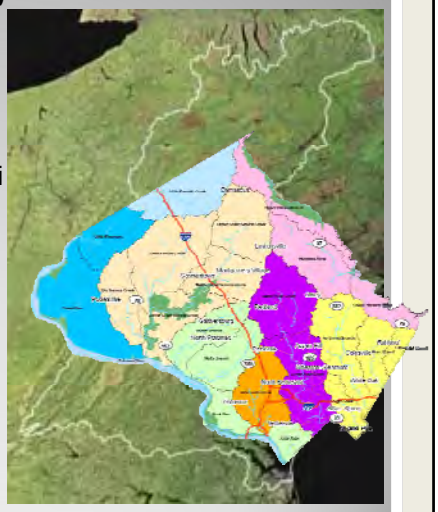
Meosotis Curtis, Manager Stormwater Permit Coordination Watershed Management Division

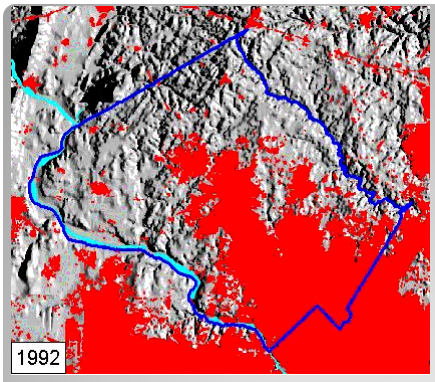
Presentation Outline

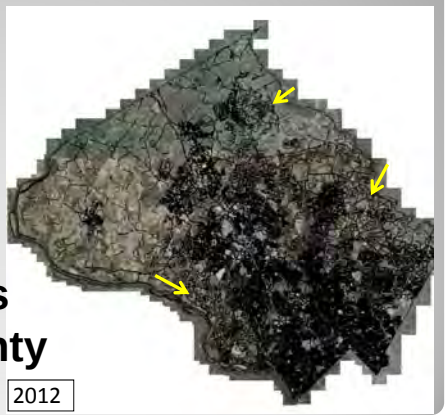
- Background
- Municipal Separate Storm Sewer System (MS4) Permit
- Stream Resource Condition Monitoring
- Comparison with State program

Montgomery County, MD

- 500 sq. miles; 1,000,000 people
- About 12% impervious overall
  - Equal to Area of Washington, DC
- Second only to Baltimore City within Maryland in average people per sq mi
- > 95% of land zoned for development is developed
- Two major basins: *Potomac and Patuxent*
- Eight major watersheds
- At least 184 languages spoken, top 5 non-English are:
  - Spanish, Chinese (Mandarin), Korean, Vietnamese, Amharic (Ethiopia)







Land Cover Changes in Montgomery County

Major Impacts to County Streams

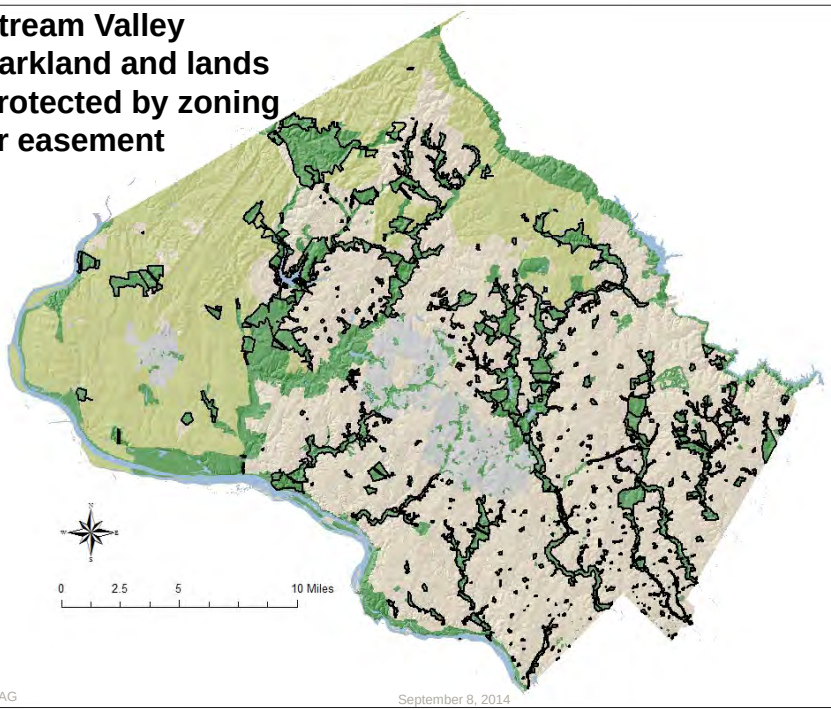
Increased flooding

Much lower baseflows

Erosion of stream banks and channel

- Altered flows and stream shape
  - increased storm flow
  - accelerated bank and channel erosion
  - reduced baseflow
  - less groundwater replenishment of streams
- Loss of instream habitat

Stream Valley Parkland and lands protected by zoning or easement



Summary of Significant MS4 Permit Requirements

- ***Watershed Restoration:*** Implement restoration projects to add runoff management to developed areas
  - Best Management Practices (BMPs): Stormwater Retrofits and Stream Restoration
  - Non-Structural Projects and Programs
- ***Water Quality:*** Implement projects to make progress toward achieving wasteload allocations for TMDLs, including Trash Reduction
- ***Implementation Strategy:*** Develop coordinated implementation plans within one year to meet requirements, including public outreach and stewardship plan
- ***Accountability:*** Track progress toward meeting Permit requirements

MS4 Permit- Section III. F. Watershed Assessment

1. The County shall conduct a systematic assessment of water quality within all of its watersheds. These watershed assessments shall include detailed water quality analyses, the identification of water quality improvement opportunities, and the development and implementation of plans to control stormwater discharges to the MEP.

   i. Determine water quality conditions
   ii. Identify and rank water quality problems

Monitoring is also required for the Breewood Tributary Restoration and to evaluate the effectiveness of the stream channel protection requirements in the State Design Manual .

Countywide Water Monitoring Program

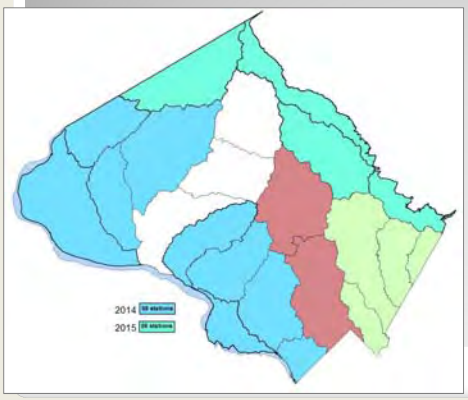
- Began in early 1970's
- Water Chemistry only
  - DO, temperature, pH
- Limited stations but were countywide
- Few problems were found
- Ended in 1980

Stream Resource Condition Monitoring

- First County to have biology and stream geomorphology monitoring in its NPDES MS4 permit (1996).
  - Used to identify cumulative impacts and track changes associated with restoration efforts
- Goal is to provide cost-effective, useful information on stream resource conditions.
  - Non-technical audiences (elected officials and general public) understand and accept results
  - Apply data for trends in particular watersheds as well as countywide
- Change over time to track management needs and new science.
  - More focus on smaller drainage areas to show trends in shorter timeframe

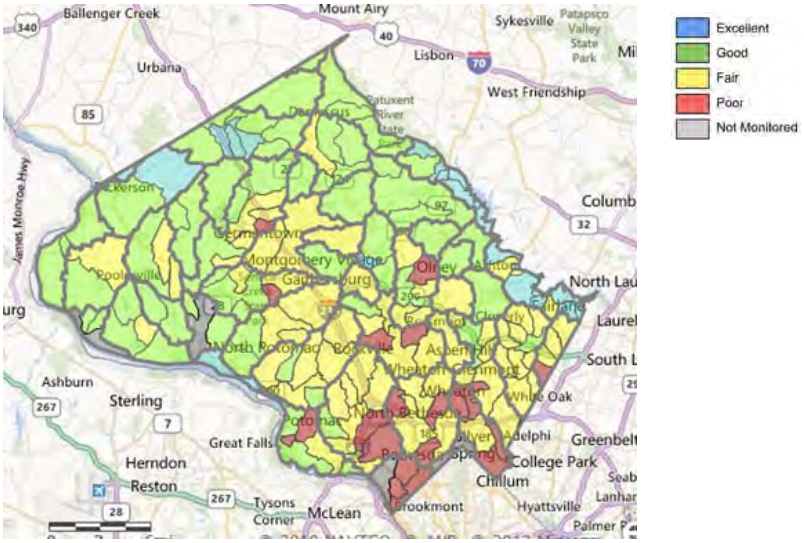
Stream Resource Condition Monitoring

- **Stream Biology and Habitat**
  - Entire County on a 5 year cycle, over 250 stations, coordinated with MBSS schedule to the extent possible
  - Every year at about 50 SPA stations in Clarksburg, Piney Branch, Upper Paint Branch, and Upper Rock Creek



- Data used to develop fish and benthic organism Index of Biologic Integrity (IBI's).
- *Calculated numbers used to define narrative categories: "excellent" "good" "fair" "poor"*
- Habitat data also used to develop narrative categories
- IBIs are compared across monitoring cycles

Latest Stream Conditions via Internet

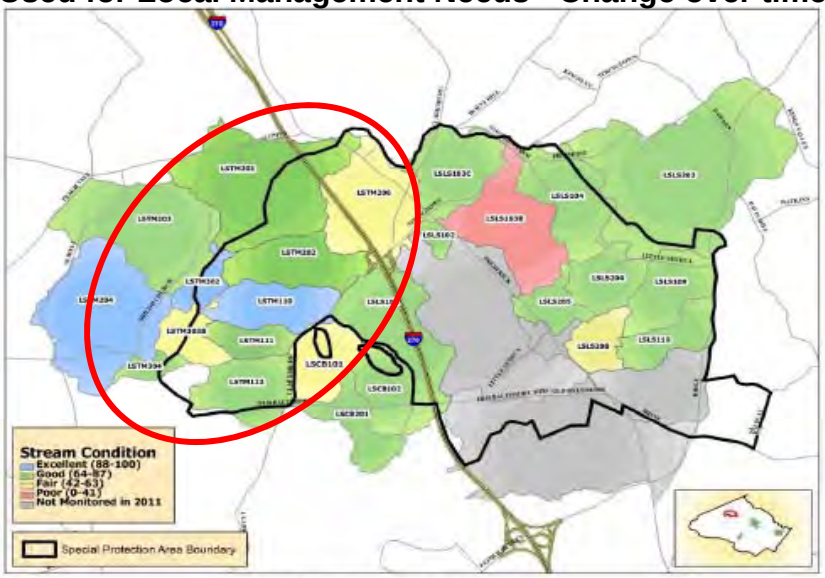


http://www6.montgomerycountymd.gov/dectmpl.asp?url=/Content/dep/maps/introwqm.asp

Used for Local Management Needs—Clarksburg SPA

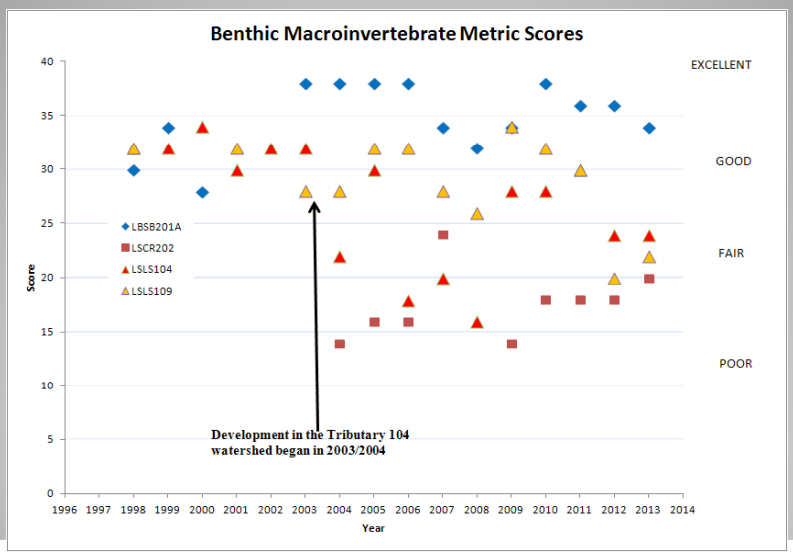
1994-1998 (*prior* to initiation of development)

Used for Local Management Needs - Change over time

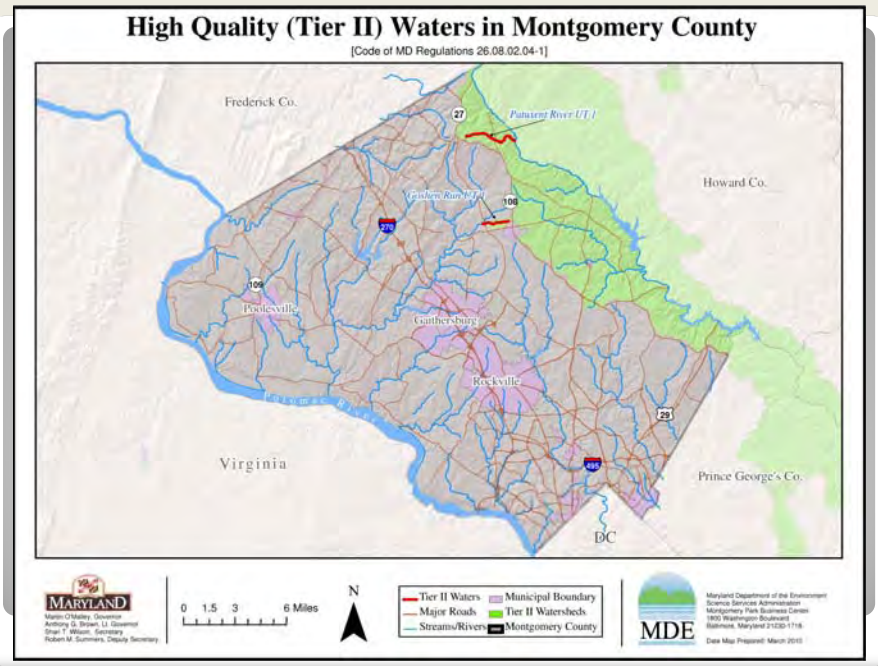


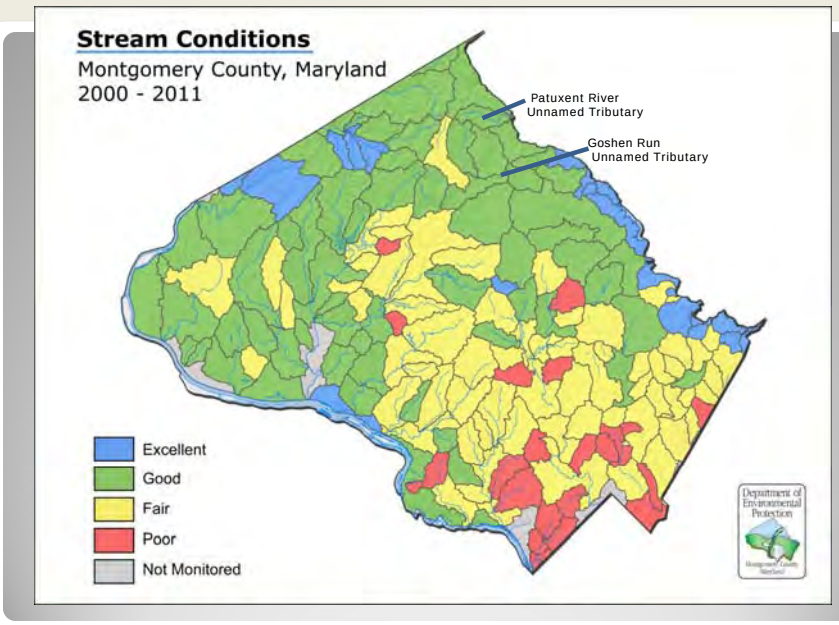
2011 (*after* initiation of development)

Used for Local Management Needs - Change over time



Is County Monitoring Data Used for State Programs?





Why the difference?

Why the Difference?

- Year(s) of monitoring
  - precipitation and rainfall
- Definition of Reference Condition
  - 'highest quality' streams
- Sample Site Selection
  - scale used to decide on station location
- Subsampling Protocols
  - size of subsample trays
  - number of grid units
- Taxonomy Protocols
  - level used for most specific identification

Definition of Reference Condition

- Montgomery County uses a reference condition largely defined by the best streams in Montgomery County, which are generally found in the West, North, and Northeast portions of the County. Since these represent the best streams in the County, within certain soil types, they are ***not completely coincident with the best streams in Maryland's Piedmont.***
- Some reference sites were used from neighboring counties such as Frederick, Carroll, and Howard but a ***disproportionate number*** were from Montgomery County.

Sample Site Selection

- Montgomery County has a variety of purposes for which they sample stream biology. As a result, their sampling sites may be chosen through a completely random process, a random process within a certain geographic scope (e.g. watershed, stream segment, etc), or completely targeted to a certain location. **For the purposes of Maryland's Integrated Report, MDE will only use sites chosen randomly within a 12-digit watershed or larger so as to be consistent with the Biological Assessment Methodology** (http://www.mde.maryland.gov/programs/water/tmdl/integrated303dreports/pages/programs/waterprograms/tmdl/maryland%20303%20dlist/ir_listing_methodologies.aspx)

Subsampling Protocols

- Montgomery County uses a 36 cm by 30 cm gridded tray with 20 tiles/cells for their benthic subsampling work. The state protocols call for a 100 cell tray of approximately 100 cm by 25 cm in size. Both Montgomery County and the MBSS specify that once the 120th organism is found, staff should completely pick that last cell containing the 120th organism. By having less cells within the subsampling tray (20) this could skew the subsample toward having a greater number of organisms picked since each cell will theoretically contain 5% of the sample (20 cell tray) as opposed to 1% (100 cell tray) of the total sample.

Taxonomy Protocols

- Montgomery County DEP does not identify chironomidae beyond the tribe level for reasons of cost savings and classification (ability to distinguish an impaired site from a healthy site) efficiency. However, the MBSS chose to continue IDing chironomids to genus. The MBSS Benthic Piedmont metrics, Percent Clingers and Percent Intolerant Urban, both depend on having this level of taxonomic specificity. It is also possible that the MBSS Benthic Highlands metrics, Percent Scrapers and Percent Swimmers, depend on identifying chironomids to genus

State use of Montgomery County data Identifying cold-water streams

COMAR Description	Current Use	New Use	COMAR Limits	Latitude	Longitude	To Latitude	To Longitude	Coldwater Obligate Found
Bennett Creek and all tributaries	I-P	III-P	From a point, 700 yards to the east of the intersection of Moxley and Clarksburg Road, upstream	39.3109616	-77.2313935			*Sweltsa*
Unnamed Tributary to Bennett Creek	I-P	III-P	Near intersection of Prices Distillery	39.3037582	-77.2868977			*Tallaperla*
			Road and Haines Road					
Unnamed Tributary to the C & O Canal	I-P	III-P	750 yards east of Blockhouse Point in Blockhouse Point Park	39.0596015	-77.3085830			*Sweltsa*
Unnamed Tributary to Muddy Branch	I-P	III-P	North of River Road in Blockhouse Point Park	39.0658343	-77.2975954			*Sweltsa*

Priority: Restore Our Streams

Blacknose Dace

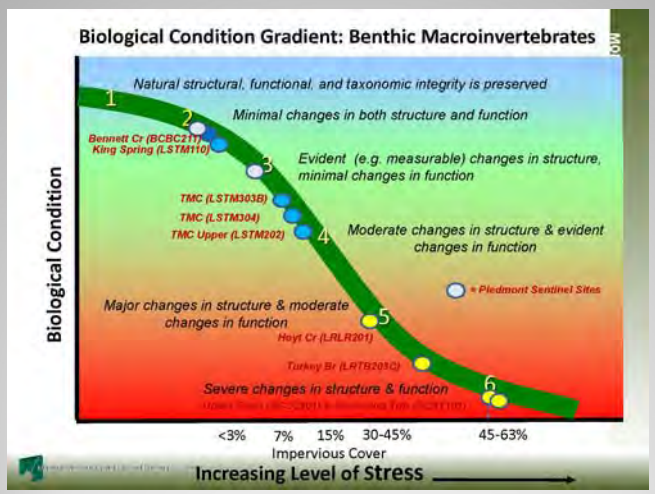
Only organisms tolerant of poor conditions will survive

Black Fly and Chironomid Larvae

Changing our protocols?

- Will the effort match the needs for our local program goals?
- How will we compare with data collected previously?
  - Subwatershed scale for setting stations
  - Subsampling differences
  - Taxonomy differences
  - *Data not available for prior samples*

Other analysis techniques?



Goal: Streams in Good Condition

Sculpin

Stonefly

References

- Montgomery County Annual Reports for the MS4 Permit
  - *www.montgomerycountymd.gov/DEP/water/ms4.html*
- SPA Annual Reports
  - *www.montgomerycountymd.gov/DEP/water/special-protection-areas.html*
- *meosotis.curtis@montgomerycountymd.gov or 240-777-7711*