Maryland
Department of
the Environment

Agricultural Improvement Act 2018: Source Water Protection and Prioritization

Rebecca-Ann Warns
MDE Water Supply
November 13, 2019

Outline

- Agricultural Improvement Act 2018 Background
- Prioritization Methods and Results
- Lessons Learned and Future Considerations

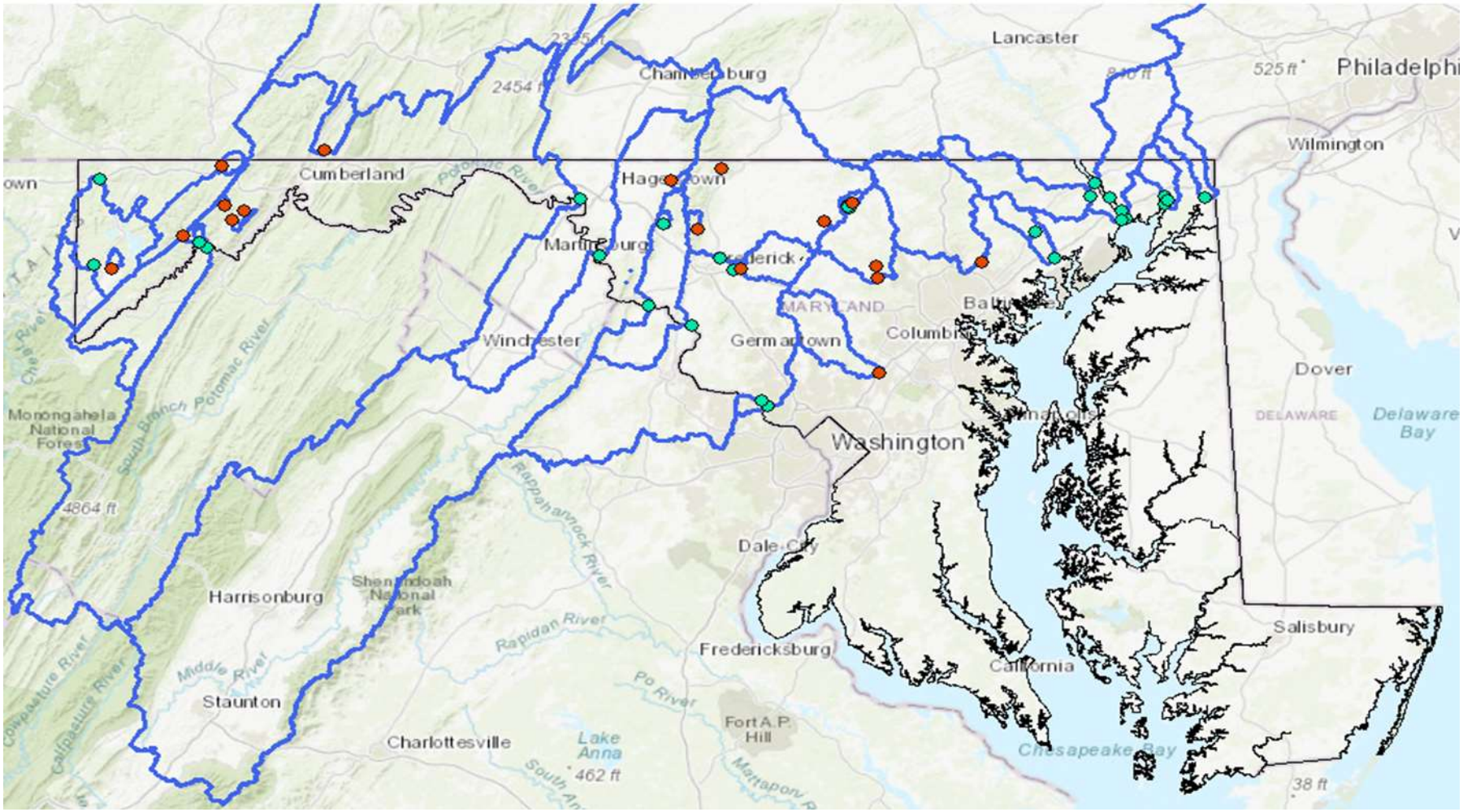
Agricultural Improvement Act Background

- Also known as the "Farm Bill"
- Reoccurring bill
  - Most recent iteration passed on December 20,2018
  - Remains in effect through FY 2023
- Contains twelve different titles
  - Our efforts concentrated on the conservation title and its provisions
- <u>New with this bill:</u>
  - 10% of conservation funding (or $4 billion over 10 years) to be spent on source water protection

Key Players in this Project

- Maryland Department of the Environment- Water Supply Program (MDE-WSP)
  - Provide recommendations for which protection areas to receive funding
- Natural Resources Conservation Services (NRCS)
  - Farm Bill specialists; Send final selections to area wide planning branch
- Environmental Protection Agency (EPA) and Maryland Department of Agriculture (MDA)
  - Organizers and provided insight to methods

Maryland Community Water Systems: Surface Water Sources



Legend

0 25 50 100 Miles

CWS Surface Water Source Type

- Free Flowing Sources
- Reservoir Sources
- CWS Surface Water Protection Areas
- MD State Boundary

Prioritization Methods Overview

- Efforts focused on MD's Community Water Systems that use Surface Water as main water source
  - 31 systems total
- Developed a list of criteria to examine for each of these systems
- Derived a ranking system based off of criteria examined and group discussion
- Presented our approach and findings to members of NRCS, MDA, and EPA, reassessing as needed.

Surface Intake Prioritization Criteria Classifications

- Agricultural Importance
- Water Quality Parameters

Agricultural Importance

- Percent Crop Cover
  - Data Sources: Chesapeake Assessment Scenario Tool, MD & Department of Planning Land Use Data (2010)
- Percent Pasture Cover
  - Data Sources: Chesapeake Assessment Scenario Tool, MD & Department of Planning Land Use Data (2010)
- Animal Density
  - Data Sources: NRCS Database

Water Quality Parameters

- Sensitivity to Pathogens
  - Data Source: Long Term 2 Enhanced Surface Water Treatment Rule
    - Geometric Average [E. Coli]
    - Percent Samples over EPA Trigger Levels
- Sensitivity to Disinfection Byproducts
  - Data Source: MDE Database
    - Average [Total Organic Carbon]
- Sensitivity to Nutrients
  - Data Source: MDE TMDL Program
    - If source is an impoundment
    - If source is impaired or has a TMDL
    - If source has a history of algal blooms

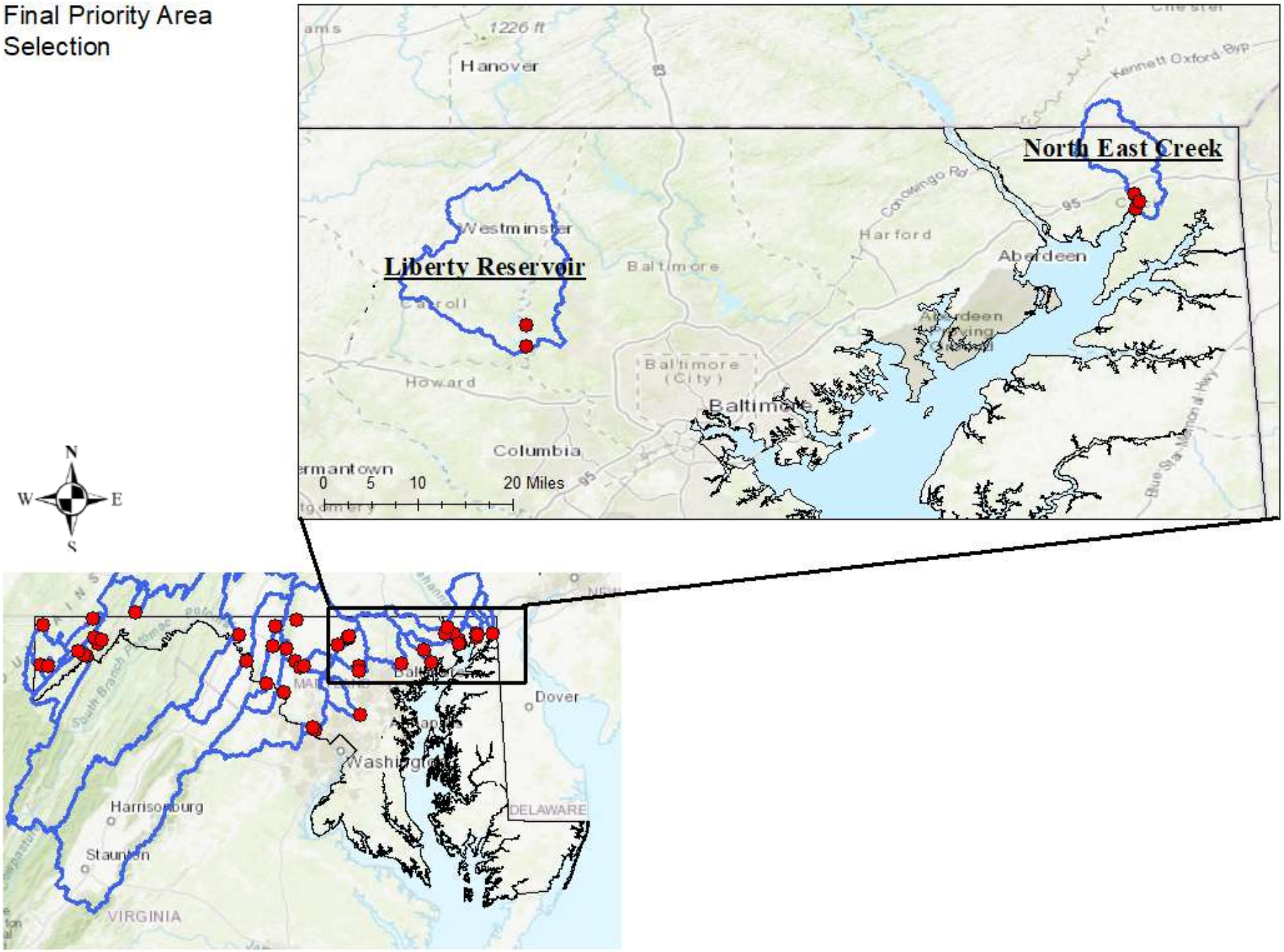
	Criteria	Possible Points Earned
Agricultural Importance	Percent Crop Cover	4
	Percent Pasture Cover	4
	Animal Density	4
Water Quality Parameters	Average [E. coli]	4
	Percent E. coli Samples over EPA Trigger Level	
	Average [Total Organic Carbon]	4
	If source is an Impoundment	1
	If source is impaired or has TMDL	1
	History of Algal Blooms (HABs vs. Other Blooms)	2

MDE Priority Level Description

MDE Priority Level	Description
Highest	MDE Total Rank between 16-23
Mid-High	MDE Total Rank between 13-15
Middle	MDE Total Rank between 11-12.5
Lower	MDE Total Rank between 7-10.5
Lowest	Excluded from geospatial and numerical analysis for variety of reasons

System Name	Water Source	MDE Total Rank
Oakland (Broadford Reservoir)	Broadford Reservoir	23
Westminster	Cranberry Run	20
City of Frederick (Monocacy)	Monocacy River	19
Baltimore City - Big Inch	Sus.River- Conow. Pool	19
Ft. Detrick	Monocacy River	18.5
City of Frederick (Linganore Creek)	Linganore Creek	18.5
Oakland (Little Youghiogheny River)	Little Youghiogheny River	17
North East	North East Creek	16
Carroll County (Liberty Reservoir)	Liberty Reservoir	16
Frostburg	Piney Reservoir	15
Perry Point	Susquehanna River Basin*	14
WSSC Potomac	Potomac River	13.5
Port Deposit	Susquehanna River Basin*	13.5
Baltimore City (Loch Raven Reservoir)	Loch Raven Reservoir	13.5
WSSC Patuxent	Duckett Reservoir	13.5
New Design - Fred.Co.	Potomac River	13
Perryville	Susquehanna River Basin*	13
Baltimore City (Liberty Reservoir)	Liberty Reservoir	13
Harford County DPW	Susquehanna River Basin*	12.5
Rockville	Potomac River	12.5
Brunswick	Potomac River	12
Havre de Grace	Susquehanna River Basin*	12
MD-American	Winters Run	12
Elkton	Big Elk Creek	11
Myersville	Little Catoctin Creek	11
Sharpsburg	Potomac River	10.5
Friendsville	Youghiogheny River	9.5
Midland-Lonaconing (Charles Reservoir)	Charles Reservoir	9
Midland-Lonaconing (Midland Gilmore)	Midland-Gilmore	8.5
Hagerstown	Potomac River	8
Midland-Lonaconing (Koontz Run)	Koontz Run	7

Final Priority Area Selection



Lessons Learned and Future Considerations

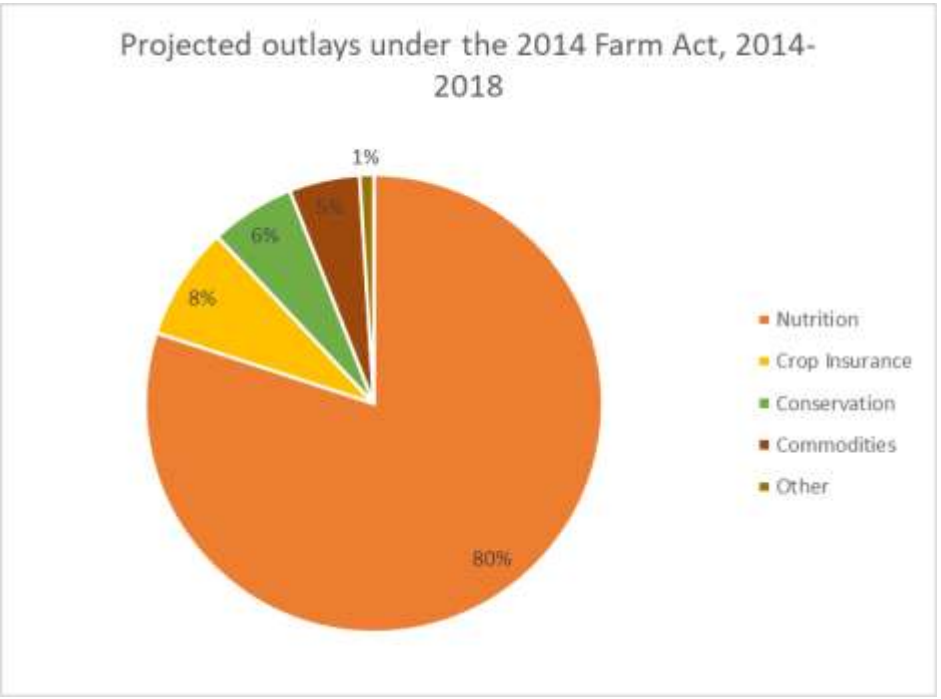
- Establish relationship early with NRCS and other important players
  - Process takes time!
- Check-in often for progress updates and remain responsive to feedback
- Future Considerations:
  - Integrating population served into ranking criteria
  - Looking at total watershed land cover data, not just what falls in Maryland
  - Consider using only animal density or percent pasture cover to more accurately model animal inputs

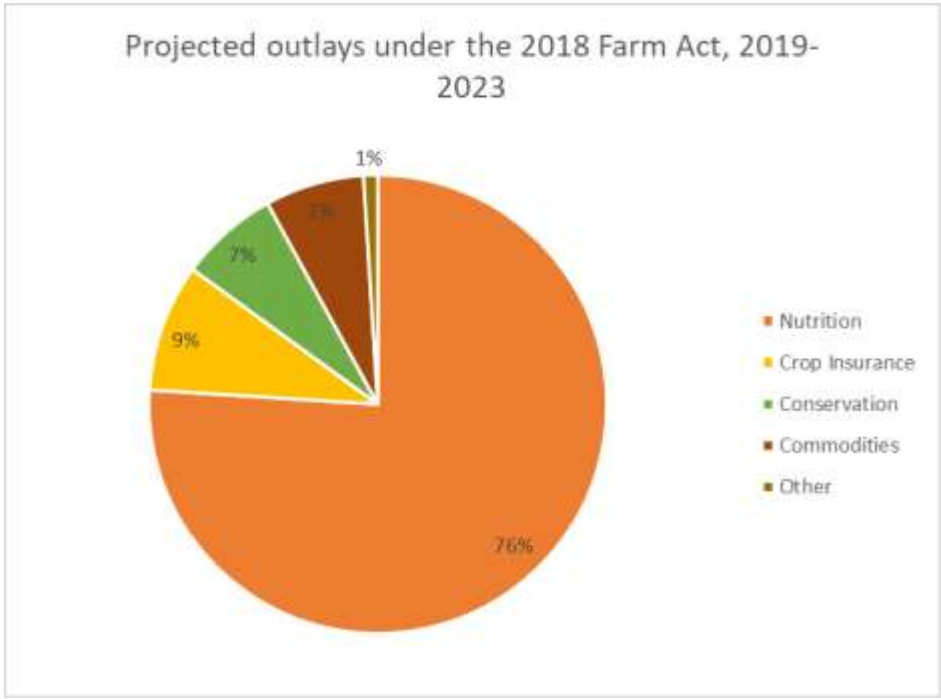
Questions?

Agricultural Improvement Act 2018 Background

- "Farm Bill"
- Signed on December 20, 2018
- Remains in effect through 2023
- Titles include:
  - I. Commodities
  - II. Conservation
  - III. Trade
  - IV. Nutrition
  - V. Credit
  - VI. Rural Development
  - VII. Research, Extension and Related Matters
  - VIII. Forestry
  - IX. Energy
  - X. Horticulture
  - XI. Crop Insurance
  - XII. Miscellaneous

Agricultural Improvement Act 2018 Background

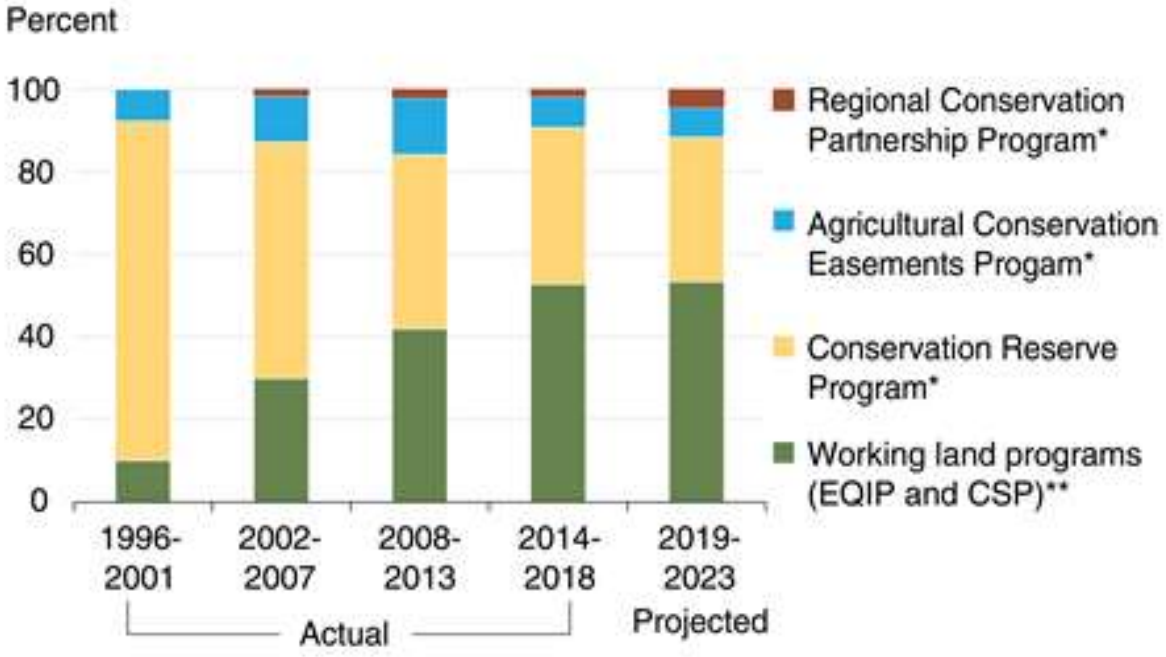




Sources:
USDA Economic Research Service using data from Congressional Budget Office, Cost Estimates for the Agricultural Act of 2014, Jan 2014
USDA, Economic Research Service calculations based on Congressional Budget Office estimates

Farm Bill Conservation Efforts and Programs

Share of conservation spending by major programs and predecessors in the 2018 and previous farm acts



*Includes predecessor programs

**Includes the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program (CSP) and predecessor programs. The programs are shown together because they are combined in the CBO estimates.

Sources: ERS analysis of Office of Budget and Policy Analysis data for 1996-2017 and Congressional Budget Office Estimates for 2018-2023.

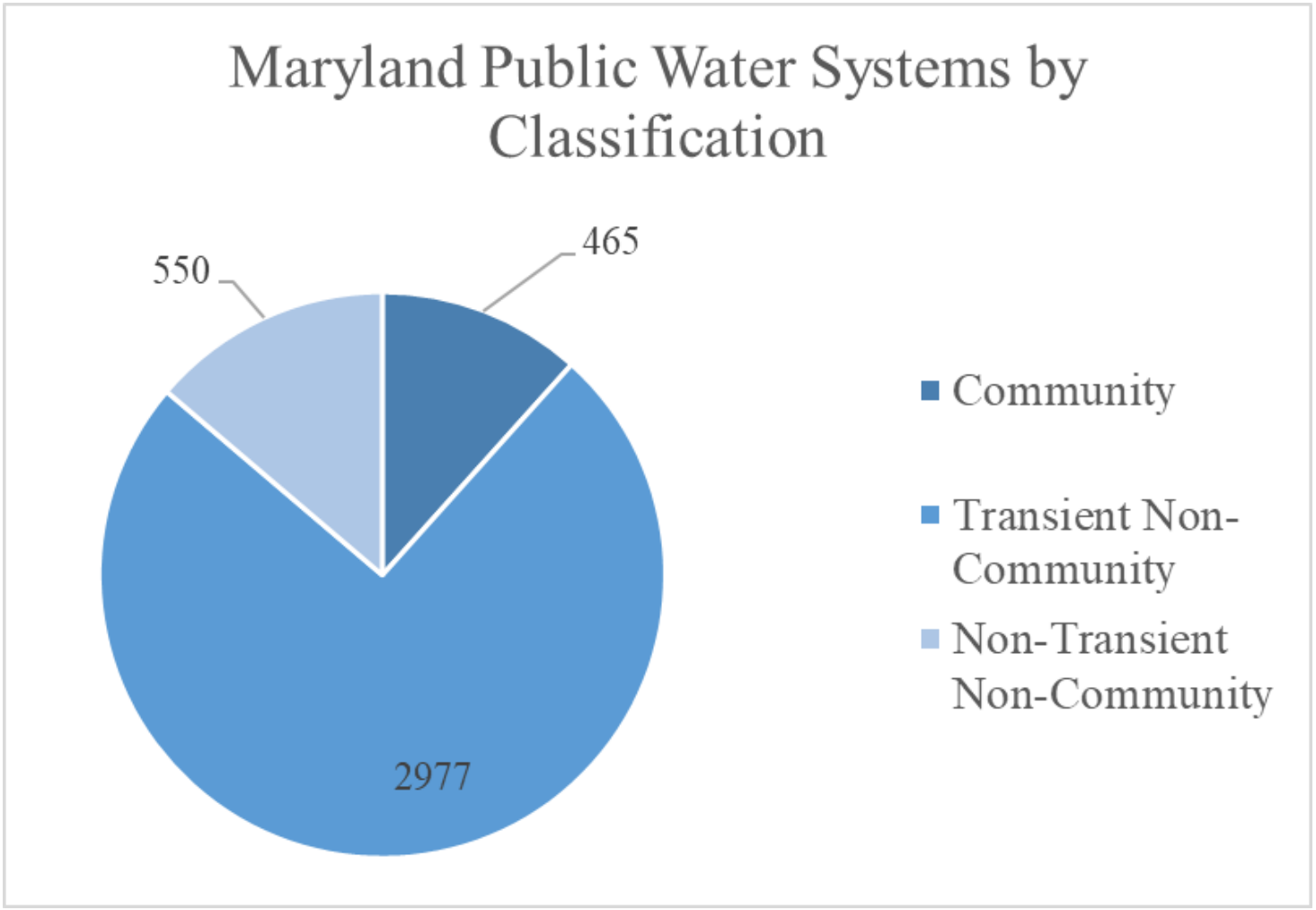
Environmental Quality Incentives Program (EQIP)

- Voluntary Conservation Program
- Financial and Technical Assistance Provided
- Funding Opportunities:
  - Local Work Groups
  - State Fund Pools
  - National Initiative Funding Pools

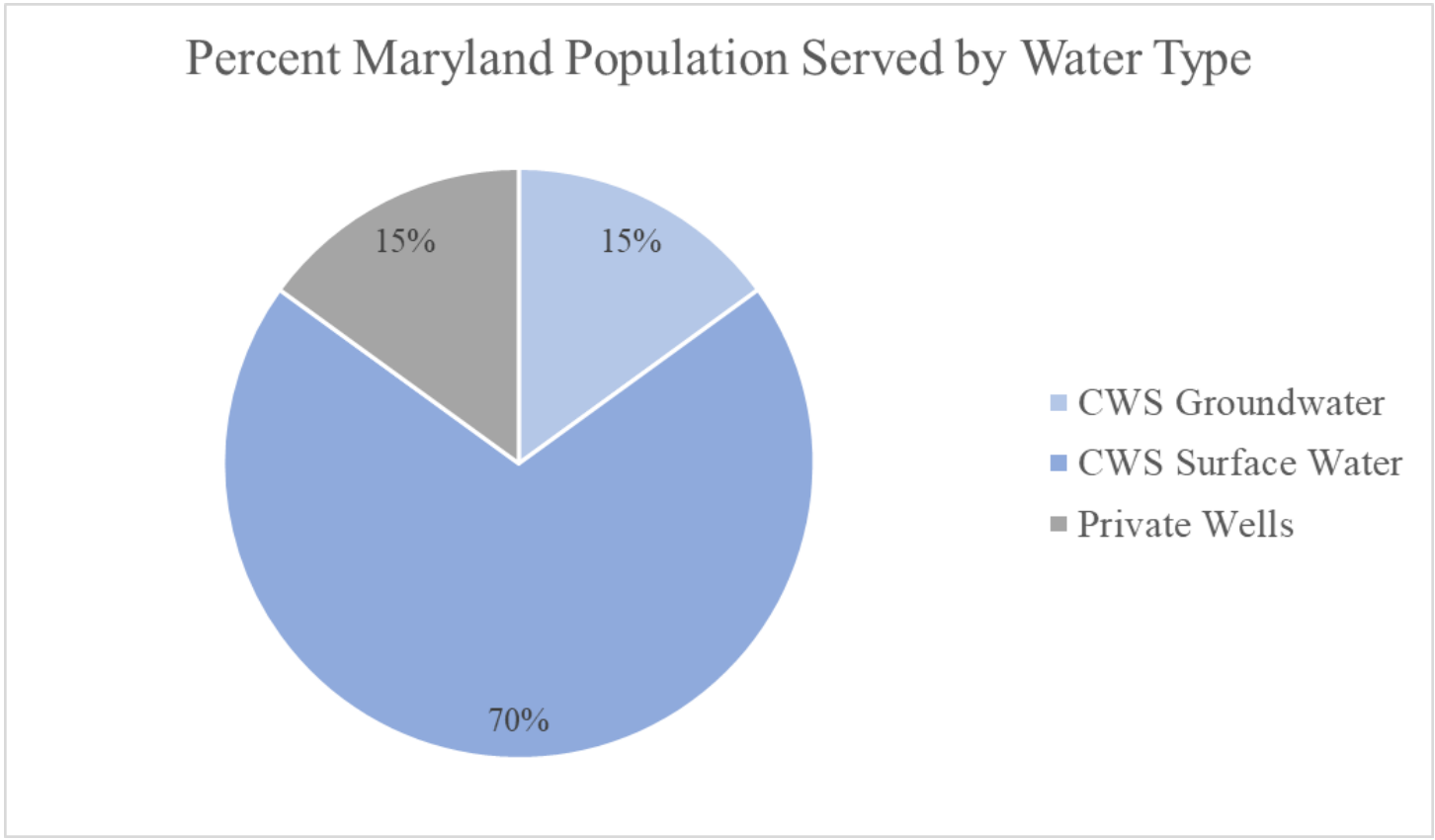
Maryland Public Water Systems

- Community Water Systems (CWS):
  - serves at least 25 people at their primary residences or at least 15 service connections
- Transient Non-Community Water Systems (TNC):
  - 25 or more people for at least 60 days/year, but not to the same people and not on a regular basis
- Non-transient non-community (NTNC):
  - regularly supply water to at least 25 of the same people at least six month per year, but not year-round

Maryland Public Water Systems



Maryland Community Water Systems



Maryland Community Water Systems By Category

Category	Number of Systems
Surface Water	31
Groundwater	387
Purchased Water • Surface Water • Groundwater	33 • 26 • 7
GWUDI Sources	14
Total	**465**

Maryland CWS: Groundwater Sources

Confined Aquifer:

- aquifers overlain with an impermeable dirt/rock layer, preventing water from seeping into the aquifer from the ground surface located directly above; recharged by rain or stream water infiltration from a large distance

Unconfined Aquifers:

- aquifers whose upper water surface (water table) is at atmospheric pressure, and has the ability to rise and fall. Water-table aquifers are usually closer to the Earth's surface than confined aquifers; recharged directly from infiltration through the overlying soils

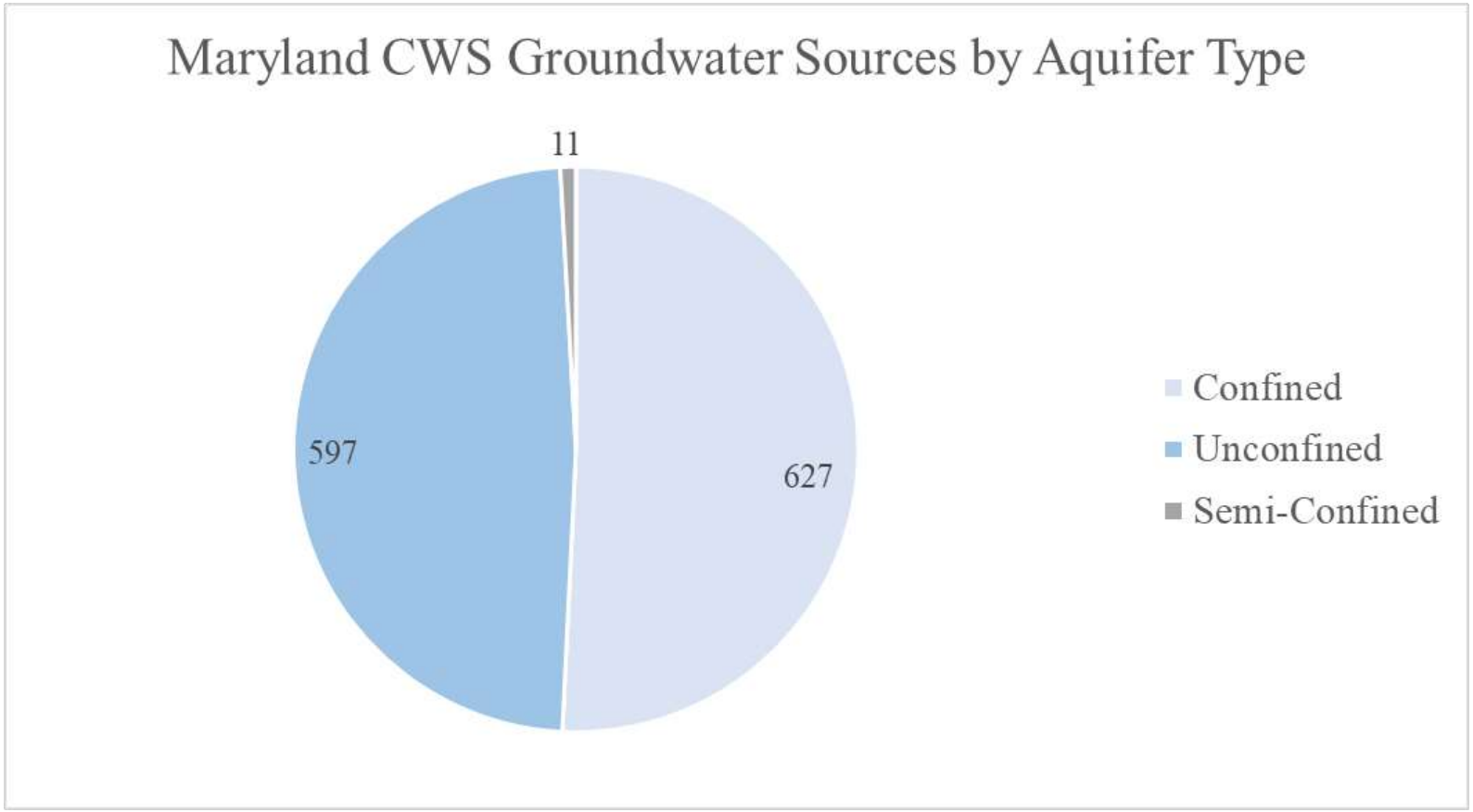
Semi-Confined Aquifers:

- aquifer partially overlain by a rock formation with low permeability, through which water can pass only slowly to recharge the aquifer; lose or gain water through adjacent less permeable layers

Groundwater Under the Direct Influence of Surface Water (GWUDI):

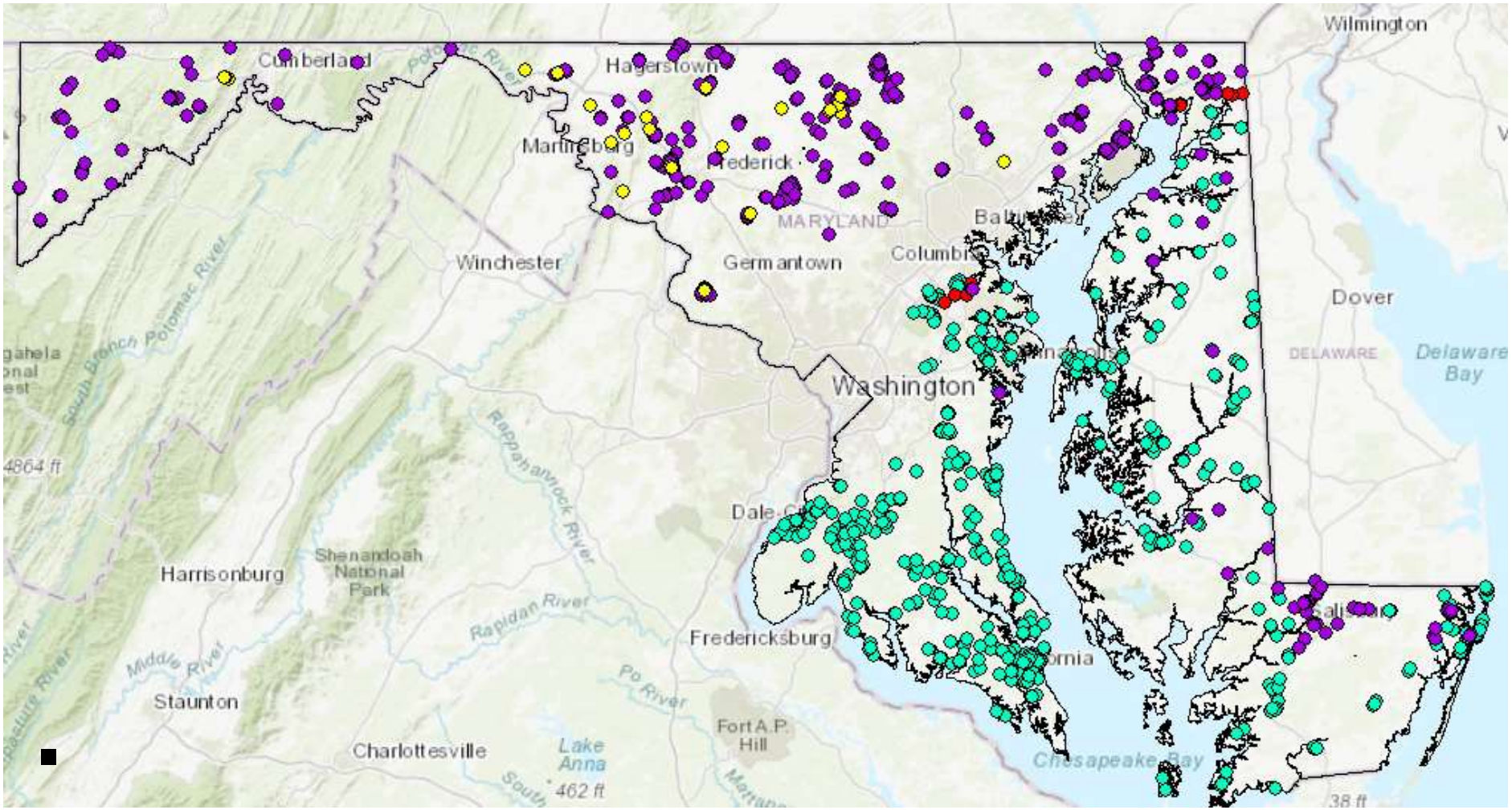
- Any water under the surface of the ground with significant occurrences of macroorganisms, algae, pathogens, or other relatively significant and rapid shifts in water characteristics (i.e. turbidity, temperature, conductivity, or pH) which correlate to climate and surface water conditions

Maryland CWS Groundwater Sources



* 38 GWUDI Sources, all unconfined

Maryland Community Water Systems: Groundwater Sources

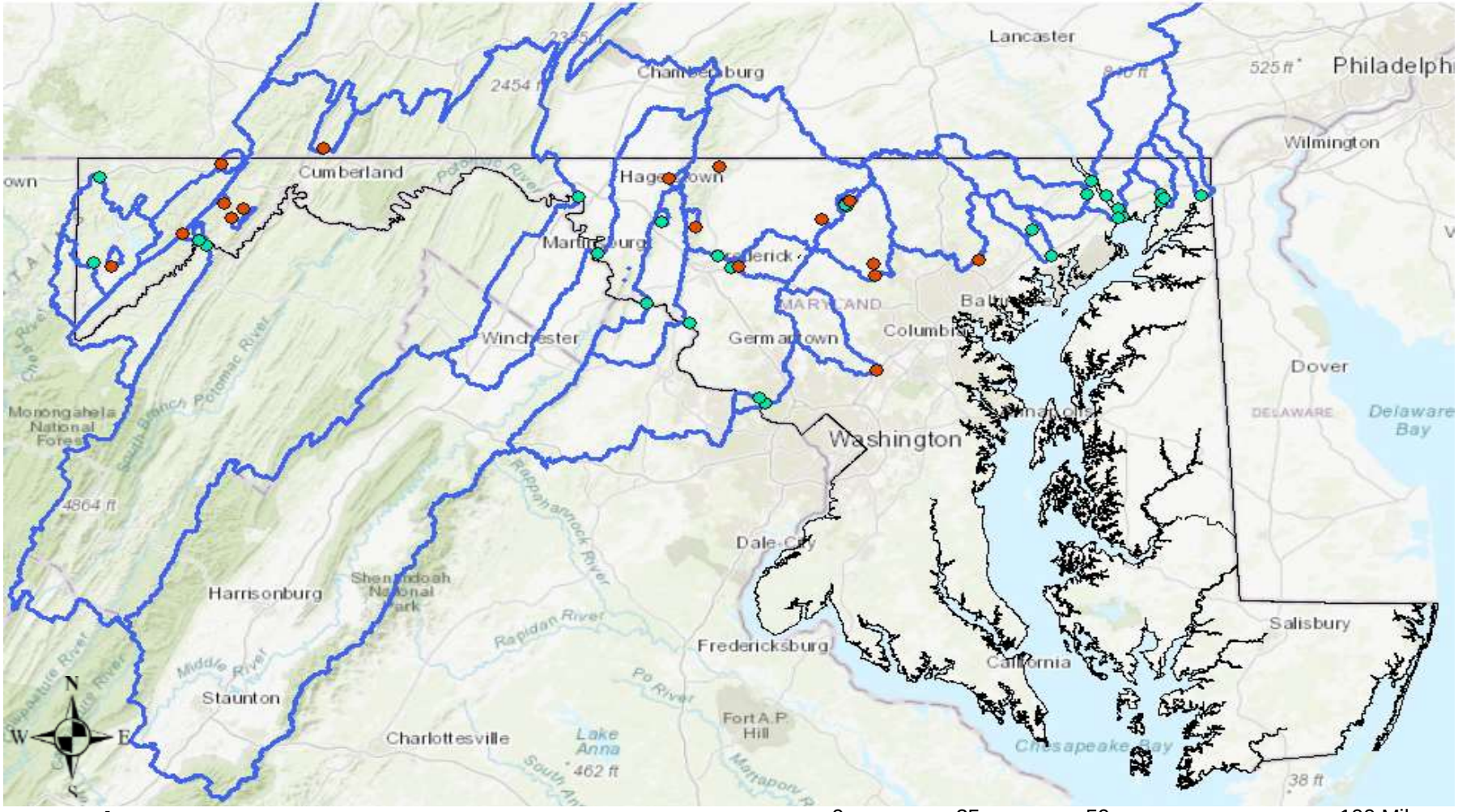


Legend

0 25 50 100 Miles

- GWUDI Sources
- Unconfined Aquifers
- Semi-Confined Aquifers
- Confined Aquifers
- MD State Boundary

Maryland Community Water Systems: Surface Water Sources



Legend

0 25 50 100 Miles

CWS Surface Water Source Type

- Free Flowing Sources
- Reservoir Sources
- CWS Surface Water Protection Areas
- MD State Boundary

Impacts of Agricultural Land Use on Water Quality

Contributions to:

- Pesticide, herbicide, and manure runoff
- Pathogen Contamination
- Increased Erosion, Sedimentation, and Siltation
- Increased Nutrient Levels (Nitrogen, Potassium, Phosphorus)
- Algal Bloom Development
  - Hypoxic Zone Creation
- Increased Levels of Metals and Salts
- Disruption of Hydrologic Cycle

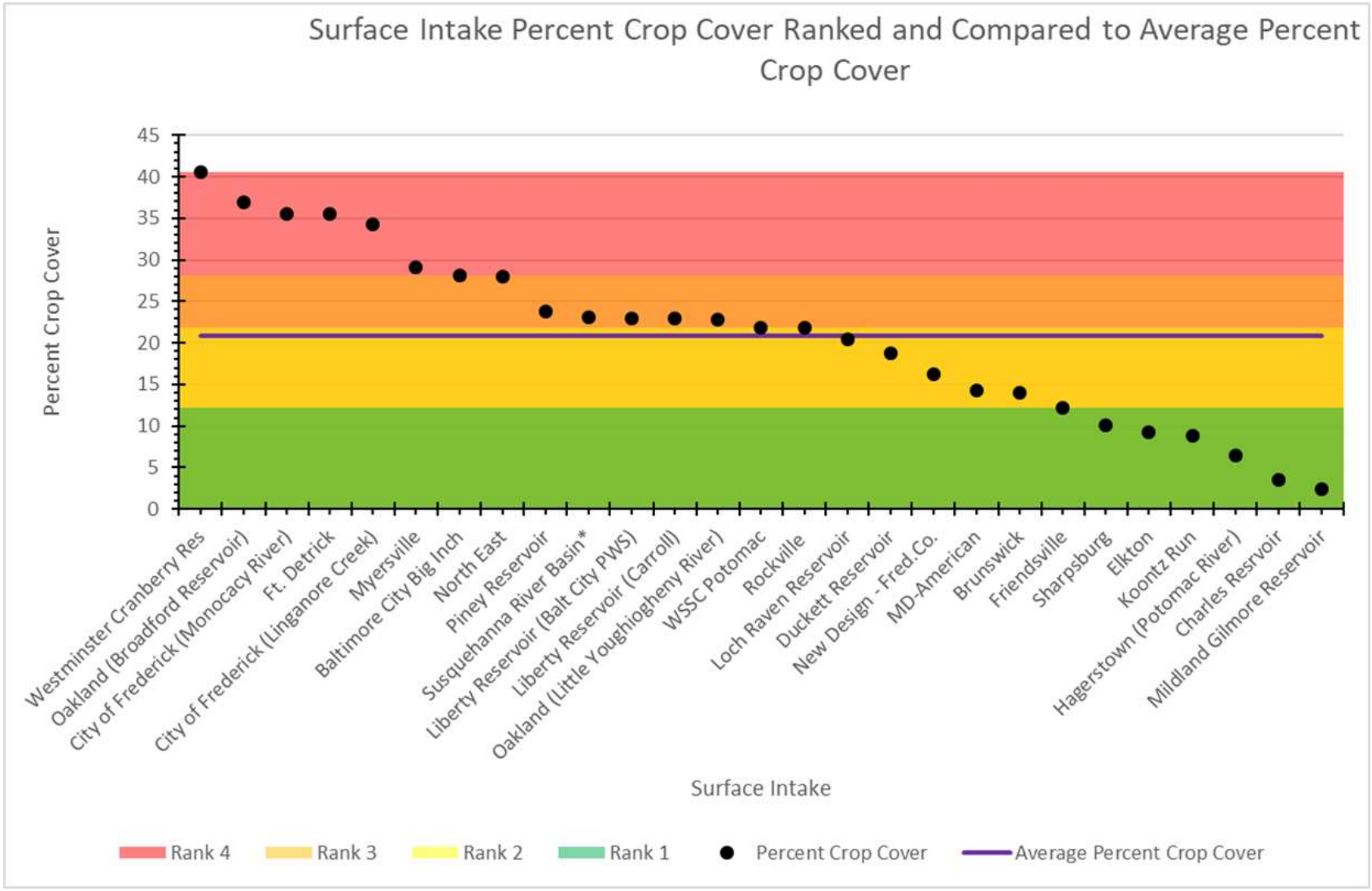
Community Water Systems using Surface Water Sources

Community Water System Name	Surface Water Sources
Aberdeen Proving Grounds (Chapel Hill)	Deer Creek
Aberdeen Proving Grounds Edgewood	Winters Run
Bloomington	Savage River
City of Baltimore	Loch Raven Reservoir, Liberty Reservoir, Conowingo Pool, Prettyboy Reservoir
City of Brunswick	Potomac River
City of Cumberland	Lake Gordon
City of Frederick	Fishing Creek Reservoir, Linganore Creek, Monocacy River
City of Frostburg	Piney Reservoir
City of Hagerstown	Potomac River, Edgemont Reservoir
City of Rockville	Potomac River
City of Westminster	Cranberry Branch (Intake/ Reservoir), W. Branch Patapsco (Grabian/Coffer Dam), Medford Quarry,
Fort Detrick	Monocacy River
Freedom District	Liberty Reservoir
Harford County DPW	Susquehanna River, Loch Raven Reservoir, Conowingo Pool
Havre de Grace	Susquehanna River
Maryland American Water Company	Winters Run
Midland-Lonaconing	Charles Reservoir, Koontz Run, Midland Gilmore
New Design - Frederick County	Potomac River, Lake Linganore
Perry Point V.A. Medical Center	Susquehanna River
Port Deposit	Susquehanna River
Town of Elkton	Big Elk Creek
Town of Emmitsburg	Rainbow Lake
Town of Friendsville	Youghiogheny River
Town of Luke. Verso Corp. Mill	Potomac River
Town of Myersville	Little Catoctin Creek
Town of North East	North East Creek
Town of Oakland	Broadford Reservoir, Little Youghiogheny River
Town of Perryville	Susquehanna River
Town of Sharpsburg	Potomac River
Town of Westernport	Savage River Reservoir
Washington Suburban Sanitary Commission	Potomac River, Duckett Reservoir, Seneca Reservoir, Tridelphia Reservoir

Community Water Systems using GWUDI Sources

PWSID	System	County of Source	Sources
MD0010016	LaVale Sanitary Commission	Allegany	Laber Springs, Wells 1,2,3,4,6
MD0030208	Glen Meadows Retirement Community	Baltimore	Wells 1, 2
MD0060013	Town of Union Bridge	Carroll	Town Hall, Whyte St. Well
MD0060015	City of Westminster	Carroll	Kriders Church Well (5), Carfaro Well (7), Gessell Well
MD 0060017	Wakefield Valley	Carroll	Wells 1&2
MD0100013	Fountaindale South	Frederick	Well A, B, 5
MD000020	Town of Myersville	Frederick	Springs Collection Box
MD0100023	Town of Thurmont	Frederick	Well 3
MD0100025	Town of Walkersville	Frederick	Wells 1,2,3
MD0100041	Knolls of Windsor	Frederick	Well 8 (K)
MD0150002	Town of Poolesville	Montgomery	Well 2
MD0100005	City of Brunswick	Washington	Yourtree Spring
MD0210005	Town of Clear Spring	Washington	Wells A, B, C
MD0210020	Cedar Ridge Children's Home	Washington	Well 1,3
MD0210020	Saint James School	Washington	St. James Spring, Well WA942739
MD0210213	Fahrney-Keedy Senior Living	Washington	Well 3
MD0210002	Boonsboro-Keedysville	Washington	Warrenfeltz and Keedysville Springs

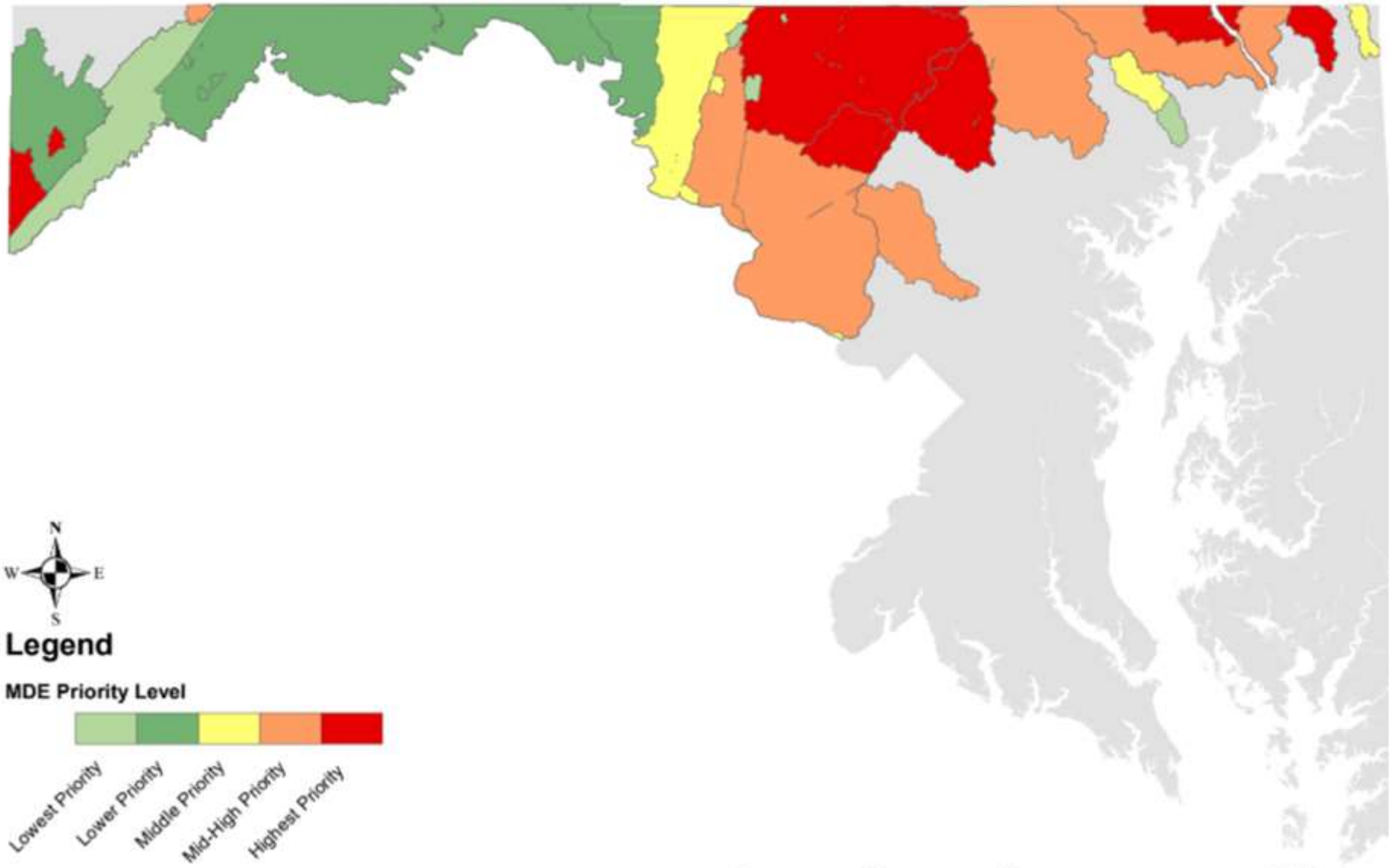
Example of Prioritization Method



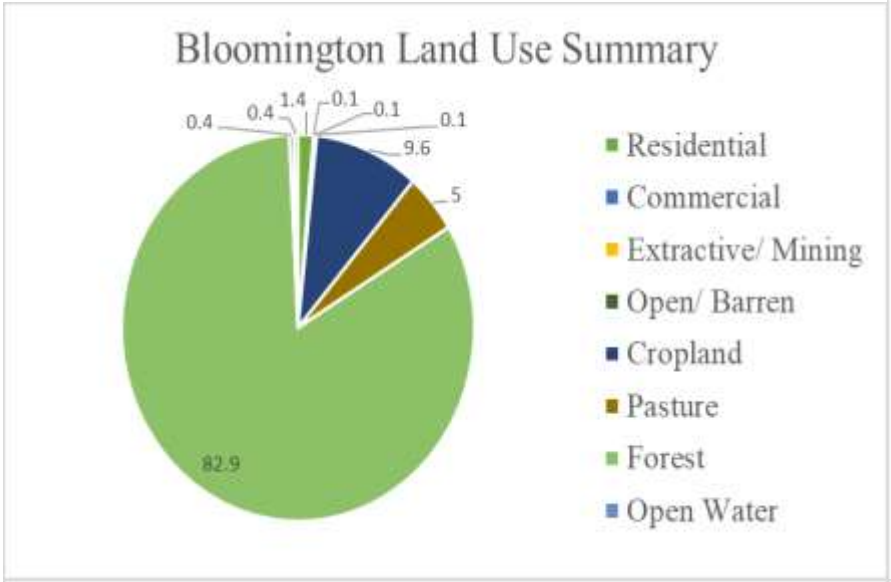
Areas of Lowest Priority

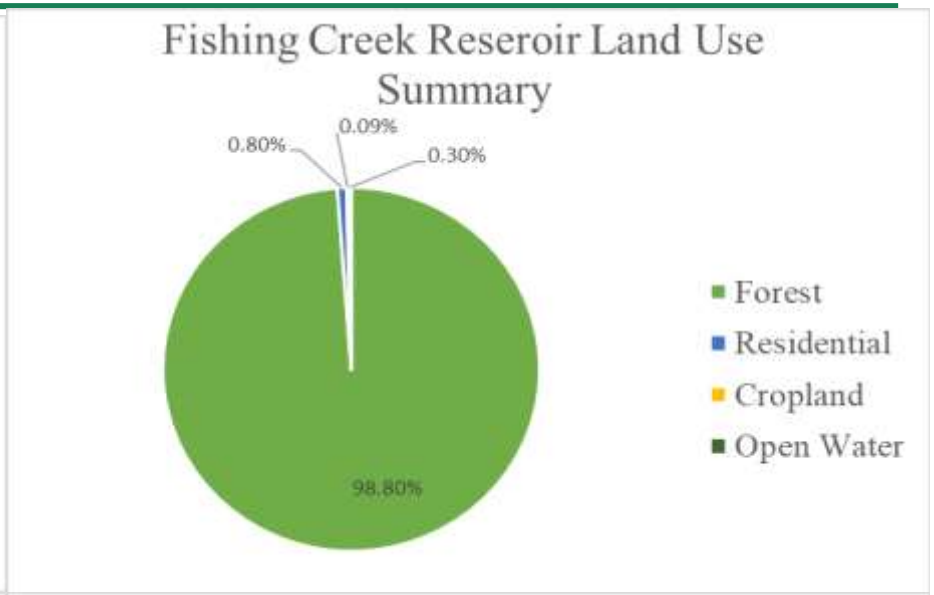
System Name	Water Source	Reason
APG Chapel Hill	Deer Creek	Anticipate to be offline or backup supply by 2020
APG Edgewood	Winters Run	Anticipate to be offline or backup supply by 2021
Bloomington	Savage River	Highly Forested Area
City of Frederick (Fishing Creek Reservoir)	Fishing Creek Reservoir	Highly Forested Area
Cumberland	Lake Gordon	Source is out of state
Emmitsburg	Rainbow Lake	Highly Forested Area
Hagerstown (Edgemont Reservoir)	Edgemont Reservoir	Source is now offline, City deciding if will bring back
Lake Liganore	Lake Linganore	Source is a backup supply only
Luke - Westvaco (Verso)	Potomac River	Uncertain future, paper mill is closed, water plant only to operate until 2020
Westernport	Savage River Reservoir	Highly Forested Area

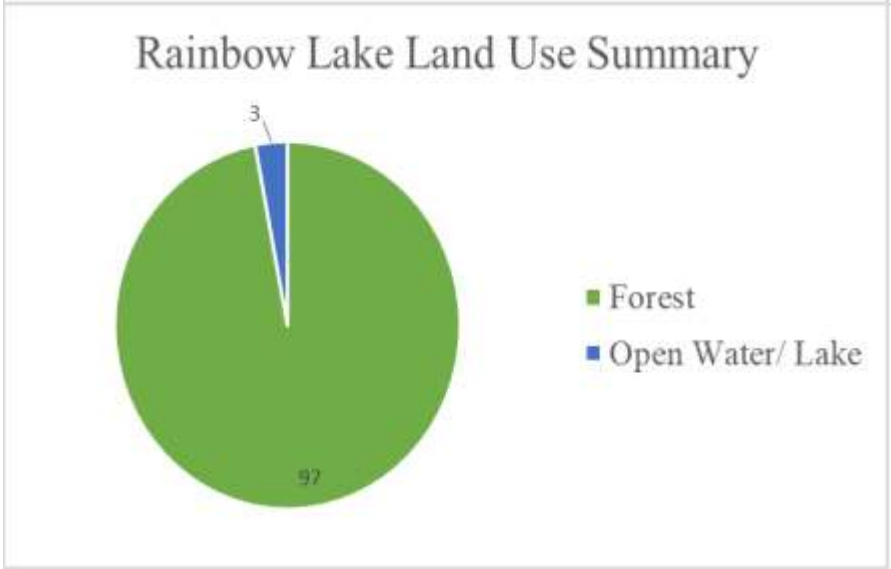
Maryland Surface Intake Prioritization
August 12, 2019

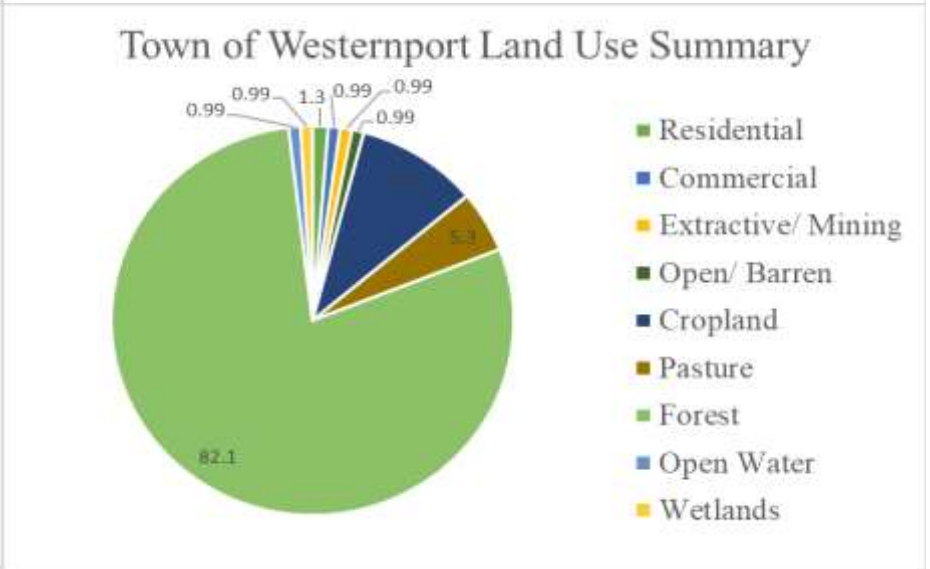


Areas of Lower Priority with High Forested Land Use

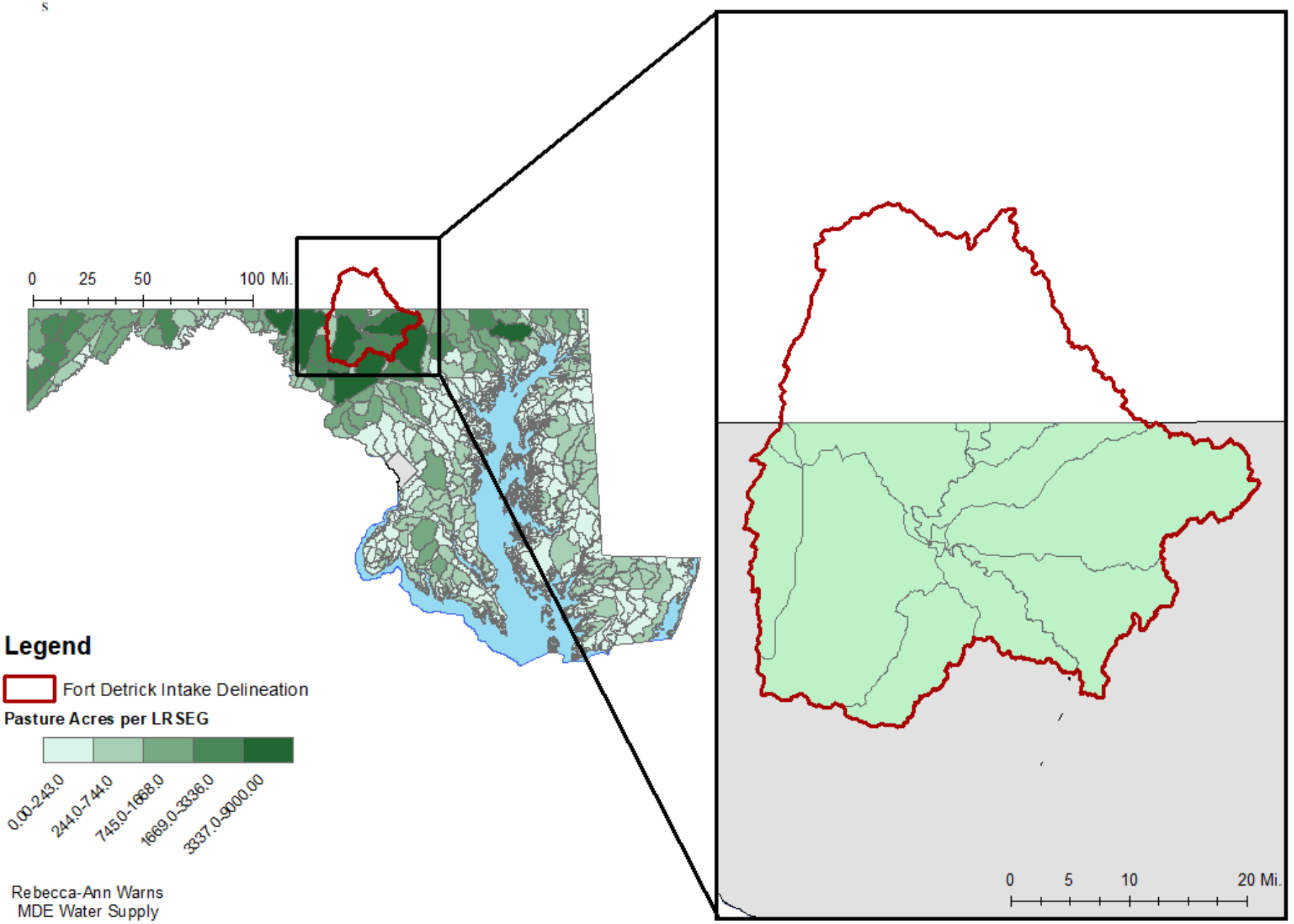








Example: Percent Pasture Cover



Rebecca-Ann Warns
MDE Water Supply

System Name	Comments (NRCS): Availability of staff, MD Portions of Larger Watersheds, Landowner Cooperation, etc.
Town of Oakland	Low work capacity for Garrett County office; more information and interest needed before committing money to the area; Two landowners (one on board other is not)
City of Westminster	Yes, focus on Liberty Reservoir; could start work in this watershed
City of Frederick (Monocacy River)	Frederick County already receives large amounts of money, already ranks high, already a priority area. Active DCs
City of Baltimore	Susquehanna River is biggest influence, need PA cooperation
Fort Detrick	Same reasons as City of Frederick Monocacy
City of Frederick (Linganore Creek)	Same reasons as City of Frederick Monocacy
Town of Oakland	Staffing concerns in Garrett County, prefer to focus on Broadford Reservoir
Town of North East	Yes, staff support, streambank work underway, small and measurable outcomes, only small amount in PA
Freedom District	Yes, focus over Westminster
City of Frostburg	Staffing concerns in Garrett County office, want to build capacity, may need PA cooperation
Perry Point V.A. Medical Center	Susquehanna River is biggest influence, need PA cooperation
WSSC (Potomac)	Focus on other funding opportunities (MLU, RCPP, NWQI) and establishing a partnership with WSSC and ICPRB at large
Port Deposit	Susquehanna River is biggest influence, need PA cooperation
City of Baltimore	Yes, NWQI work already in Prettyboy that feeds into Loch Raven, a lot of ag land not in Pretty Boy, well staffed, portion will benefit Carroll County
WSSC (Patuxent)	Howard and Montgomery County offices able to keep up with workload, no backlog of work, new DC (once caught up to speed new projects)
New Design - Frederick County	Reservations because of unsuccessful history; A lot of times looking for technical work… we are looking for financial assistance opportunities
Town of Perryville	Susquehanna River is biggest influence, need PA cooperation
City of Baltimore	Yes, recommended over Loch Raven