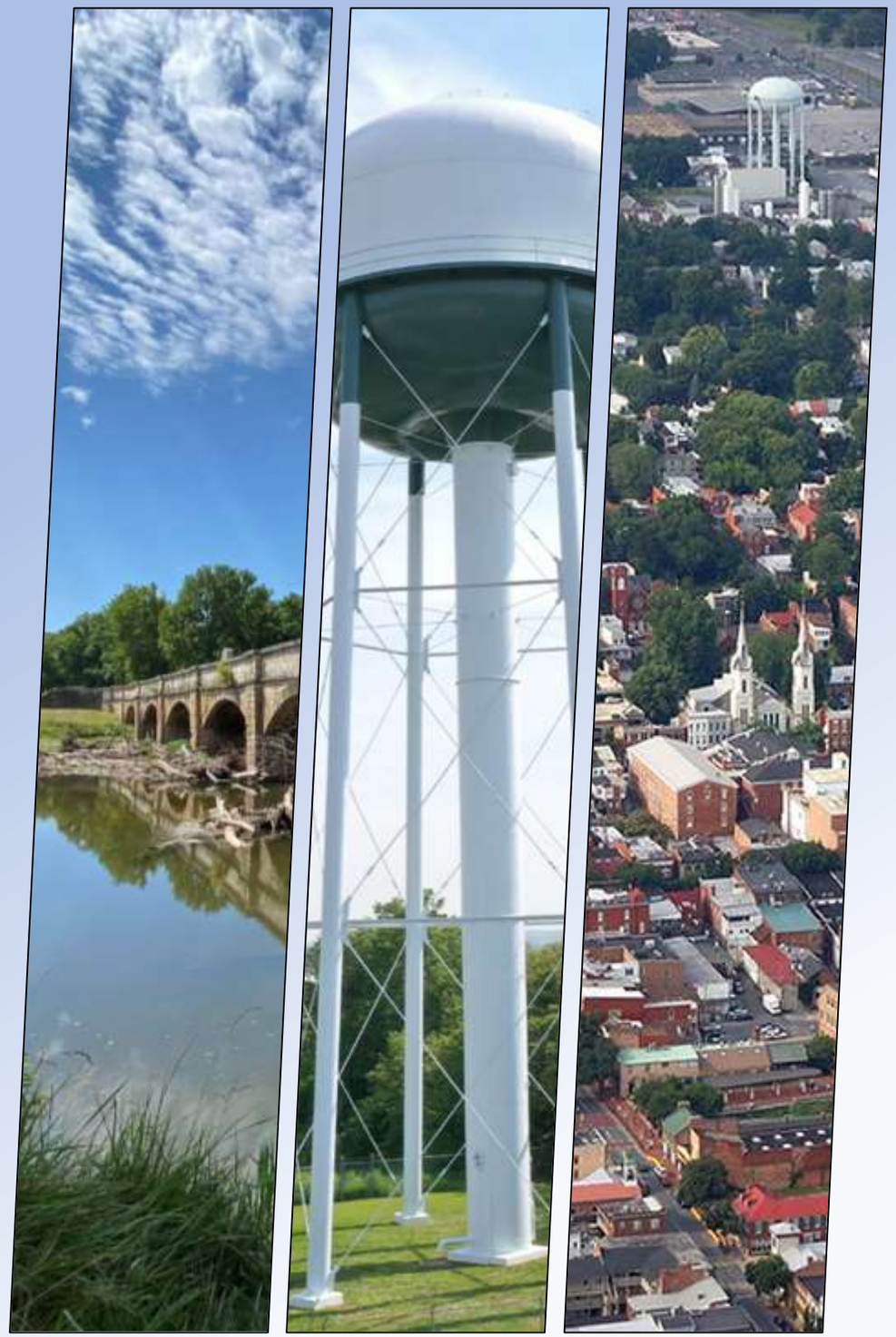

Frederick County Water Resources Element

Frederick County Planning Commission

December 20, 2023

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Drinking Water

Wastewater

Stormwater

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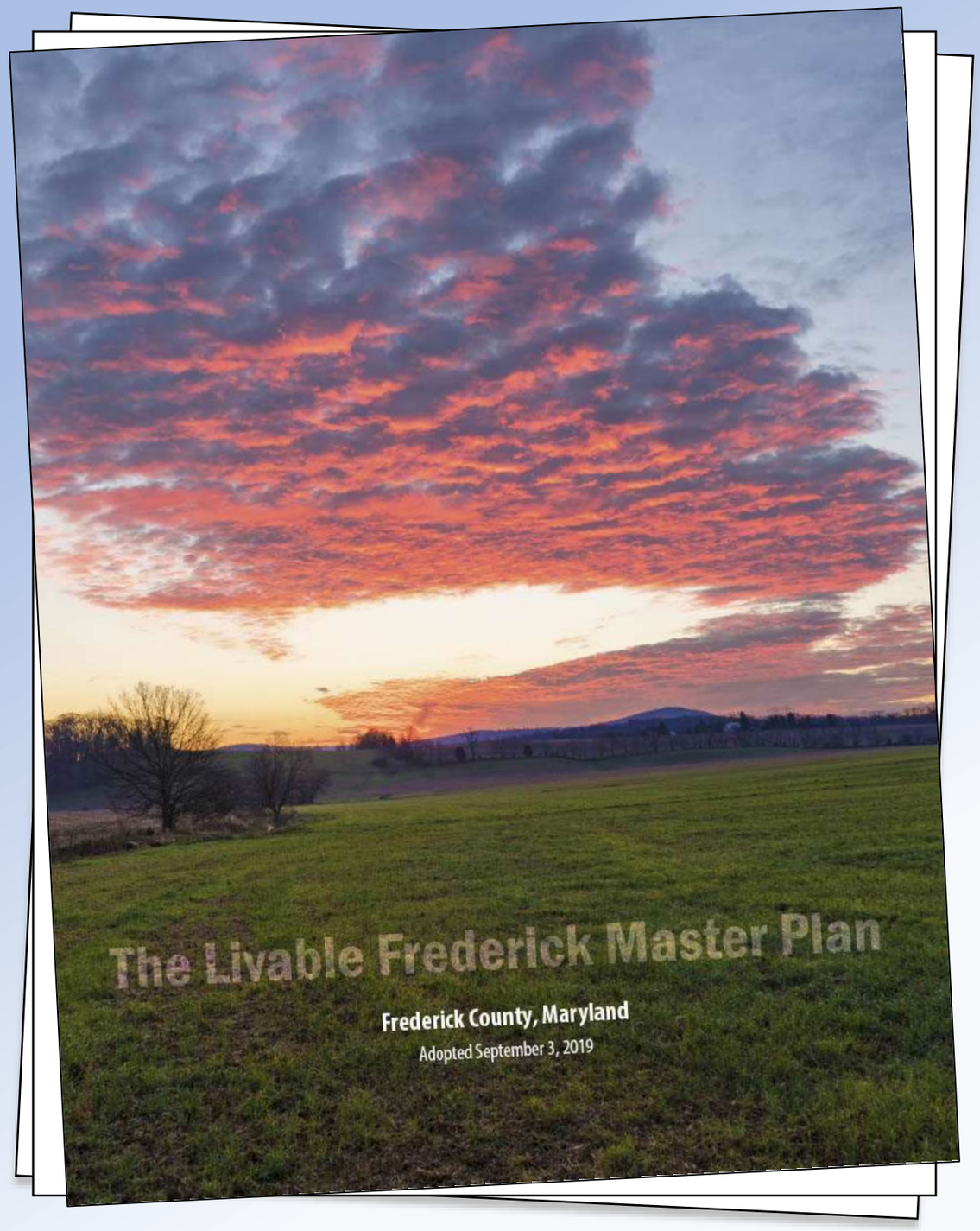

LFMP Goals & Initiatives

Goal 4.2.1 (Water) Quality

Goal 4.2.2 Supply and Treatment Infrastructure

Initiative 4.2.2.1 Water and Sewer Adequacy

Supporting Initiative 4.2.2.1.2

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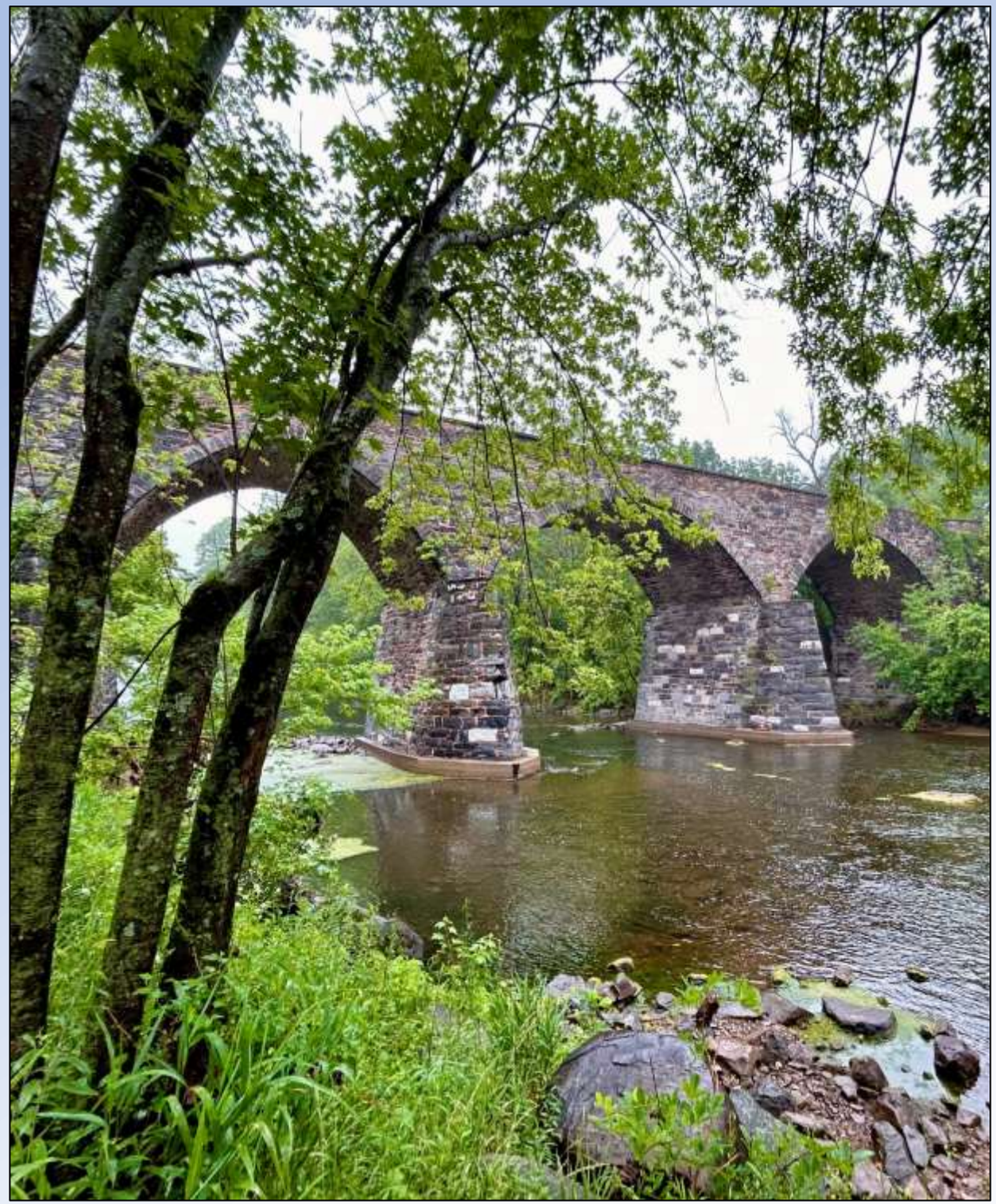

Impacts to Source Waters

- Drinking water is secured from surface waters or subsurface aquifers
- Withdrawal limits are set by MDE Water Management Administration (Water Appropriation or Use Permit, a.k.a. WAUP)
- Water Balance Methodology or 7-day-10-year low flow (7Q10)

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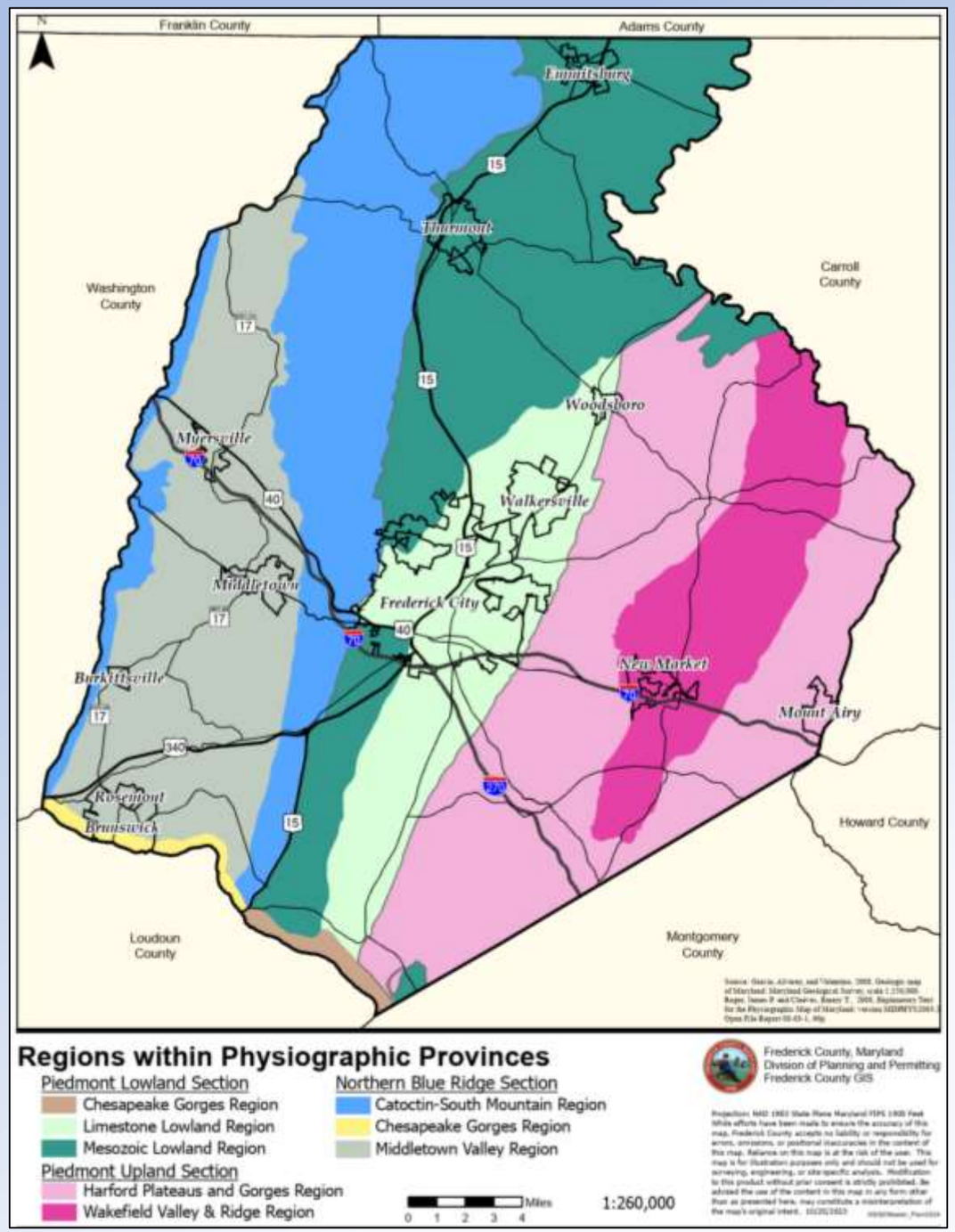

Subsurface Water Sources

- Aquifers cross political boundaries and are characterized by USGS, MGS, MDE based on hydrogeomorphic conditions
- DWSU holds and maintains WAUPs from MDE/WMA for groundwater withdrawals.
- Several county and municipal systems rely entirely on groundwater withdrawals

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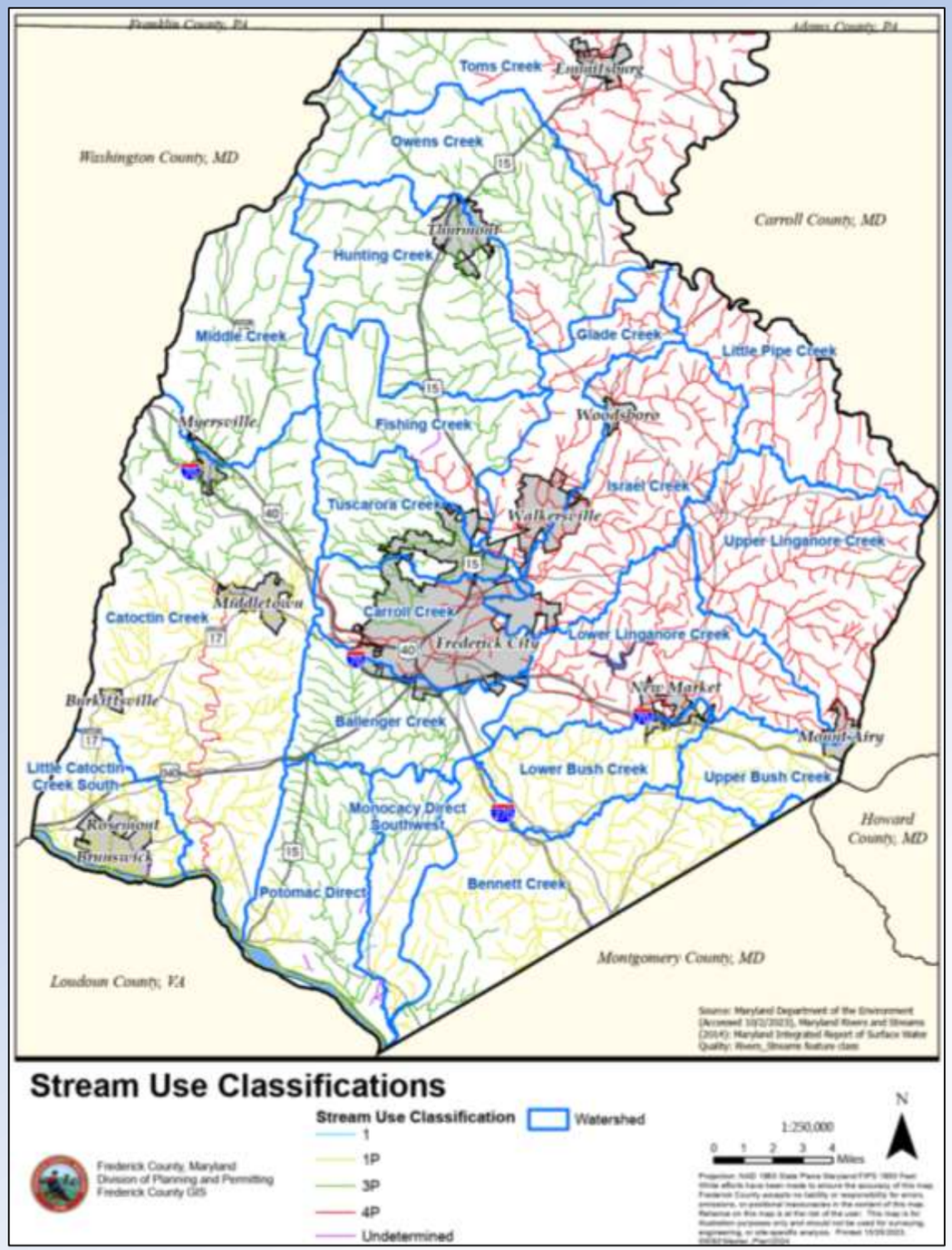

Surface Drinking Water Sources

- Surface water sources include the Potomac River, Monocacy River, Catoctin Creek, Linganore Creek, and Fishing Creek
- May be supplemented by reservoir storage (Linganore Creek, Turkey Creek, Fishing Creek)
- DWSU holds and maintains WAUPs from MDE/WMA for surface water withdrawals

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Drinking Water Systems

- 16 regional, publicly owned Community Water Systems or CWS (7 county systems, 9 municipal system) +4 sub-regional county systems
- Fort Detrick & Mount St. Mary's University operate separate systems along with some other small, privately owned systems
- Overlap exists between County and Municipal Boundaries/Systems

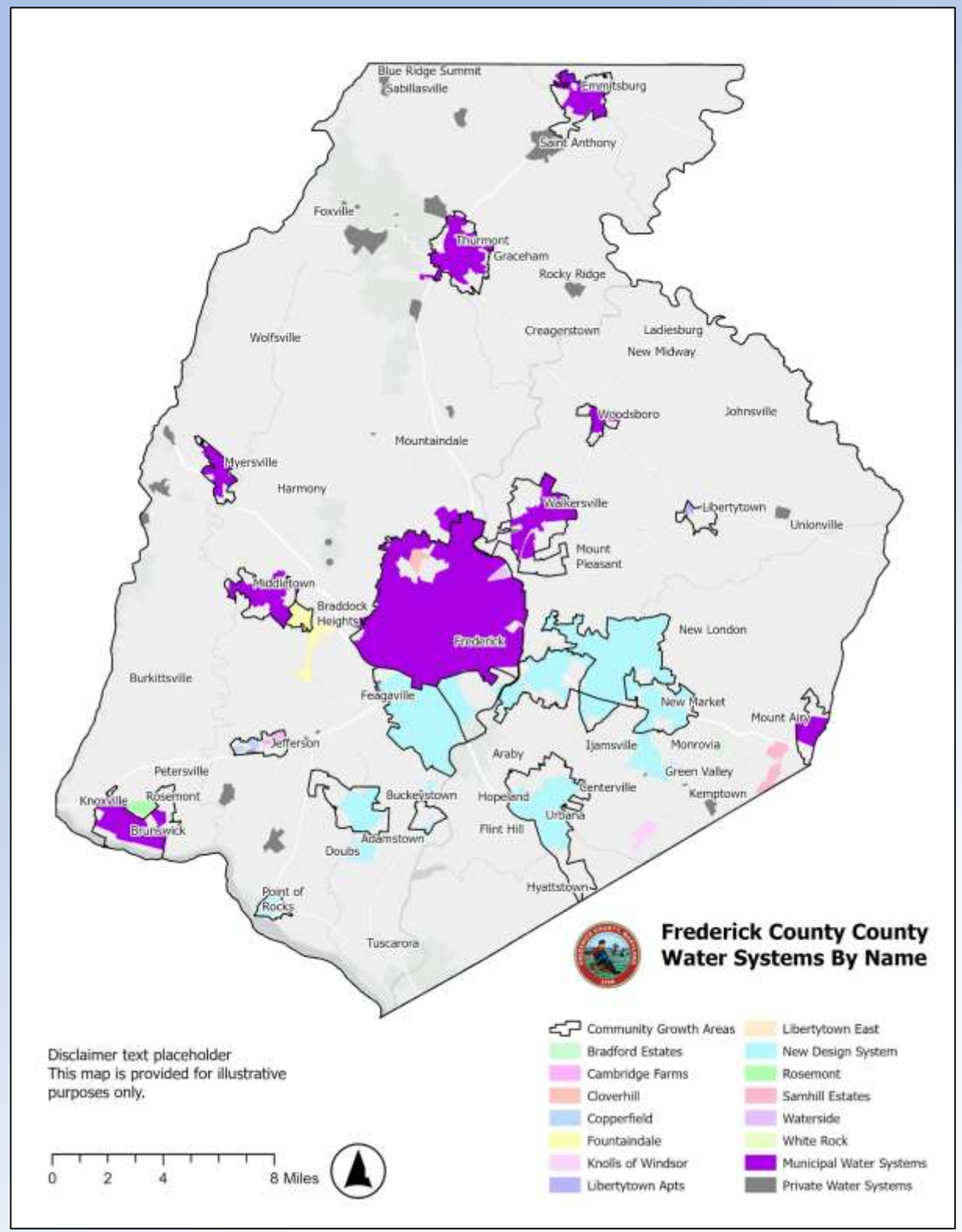

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Table 2.01

Water Supply and Demand by Service Area							
Service Area	**Permitted Withdrawal (avg. MGD) [1]**	**Permitted Withdrawal (max. MGD) [1]**	**Existing Treatment Capacity (MGD) [1]**	**Existing Demand (MGD) [2]**	**Maximum Demand Monthly Average (MGD) [3]**	**Projected Demand 2035 (MGD)**	**Projected Demand 2050 (MGD)**
Rosemont [4]	1.350	2.000	2.000	0.010	0.019		
Copperfield	0.029	0.047	0.029	0.040	0.056		
Cambridge Farms	0.062	0.100	0.062	0.042	0.048		
Fountaindale South	0.280	0.420	0.280	0.181	0.263		
White Rock	0.030	0.045	0.030	0.022	0.036		
Samhill Estates	0.156	0.260	0.155	0.086	0.115		
Bradford	0.017	0.028	0.017	0.013	0.017		
Knolls of Windsor	0.107	0.177	0.107	0.067	0.085		
Libertytown Apartments	0.008	0.012	0.009	0.003	0.006		
Libertytown East	0.016	0.024	0.016	0.007	0.010		
Waterside [5]	-	-	-	0.076	0.099		
Cloverhill [5]	0.084	0.125	0.083	0.100	0.179		
New Design	16.000	26.000	25.000	6.281	11.784		
TOTALS	**18.139**	**29.238**	**27.788**	**6.927**	**12.719**	**0.000**	**0.000**

(1) Information obtained from Frederick County Water & Sewerage Plan - Approved - February 2, 2021 (as amended December 28, 2022) - Table 3.04

(2) Average of 2020 - 2022 WTP flow data provided by Frederick County

(3) The max demand monthly average is the maximum average daily flow for a single calendar month from the 2020 - 2022 WTP flow data provided by Frederick County

(4) Rosemont water is supplied by the City of Brunswick, permitted withdrawal and treatment capacity data corresponds to Brunswick data

(5) Water is supplied and treated by the City of Frederick, DWSU operates the distribution

Stem-Haines-Saylor Farm in Union Bridge, MD by Frederick County Historic Preservation Staff

Individual Well Use

- Approximately 30,000 wells
- Declining as a percentage of overall service as more new development utilizes public water facilities
- Up to 80% of withdrawals returned through septic systems

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Commercial & Agricultural Use

- Withdrawals associated with these uses typically meet the 5,000 gpd threshold for WAUPs

- Agricultural irrigation, recreation facilities (golf courses), camps and churches, dewatering operations (quarries), etc.

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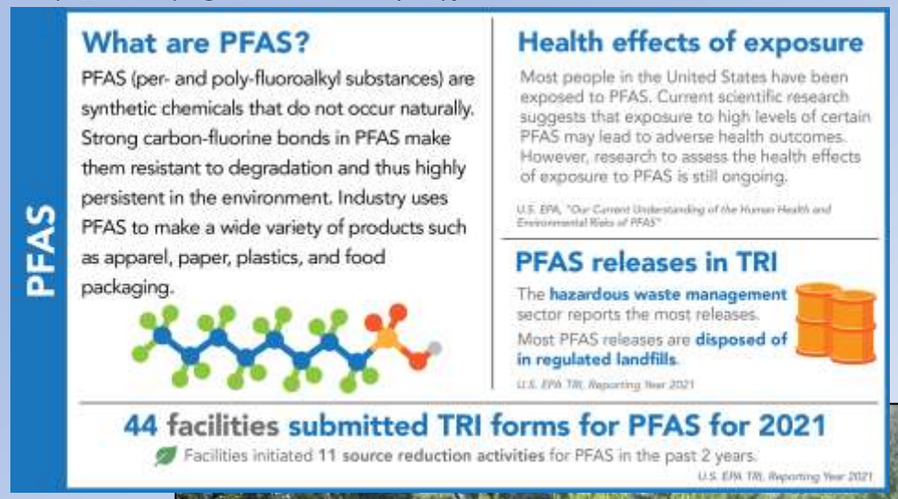
Toxics Release Inventory, United States Environmental Protection Agency, March, 2023.
https://www.epa.gov/trinationalanalysis/pfas



Natural Hazards Mission Area, USGS, 2023.
https://www.usgs.gov/media/images/sinkhole-frederick-maryland

Drinking Water Issues

- Water Conservation
- Per- and Polyfluoroalkyl substances (PFAS)
- Karst topography and GWUDI

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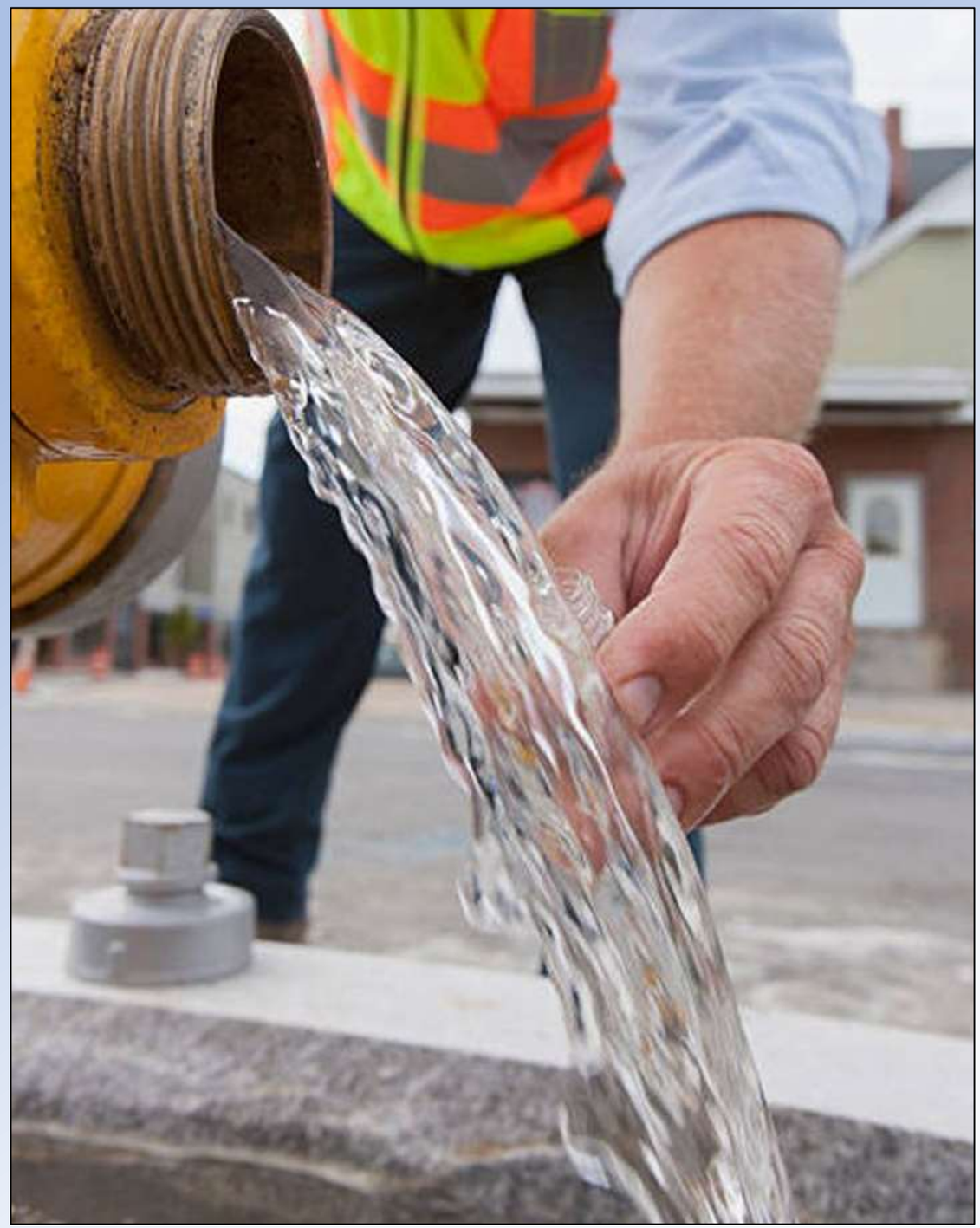

Drinking Water and Equity

- Susceptibility of groundwater sources and associated expenses
- Areas served by adjacent municipalities

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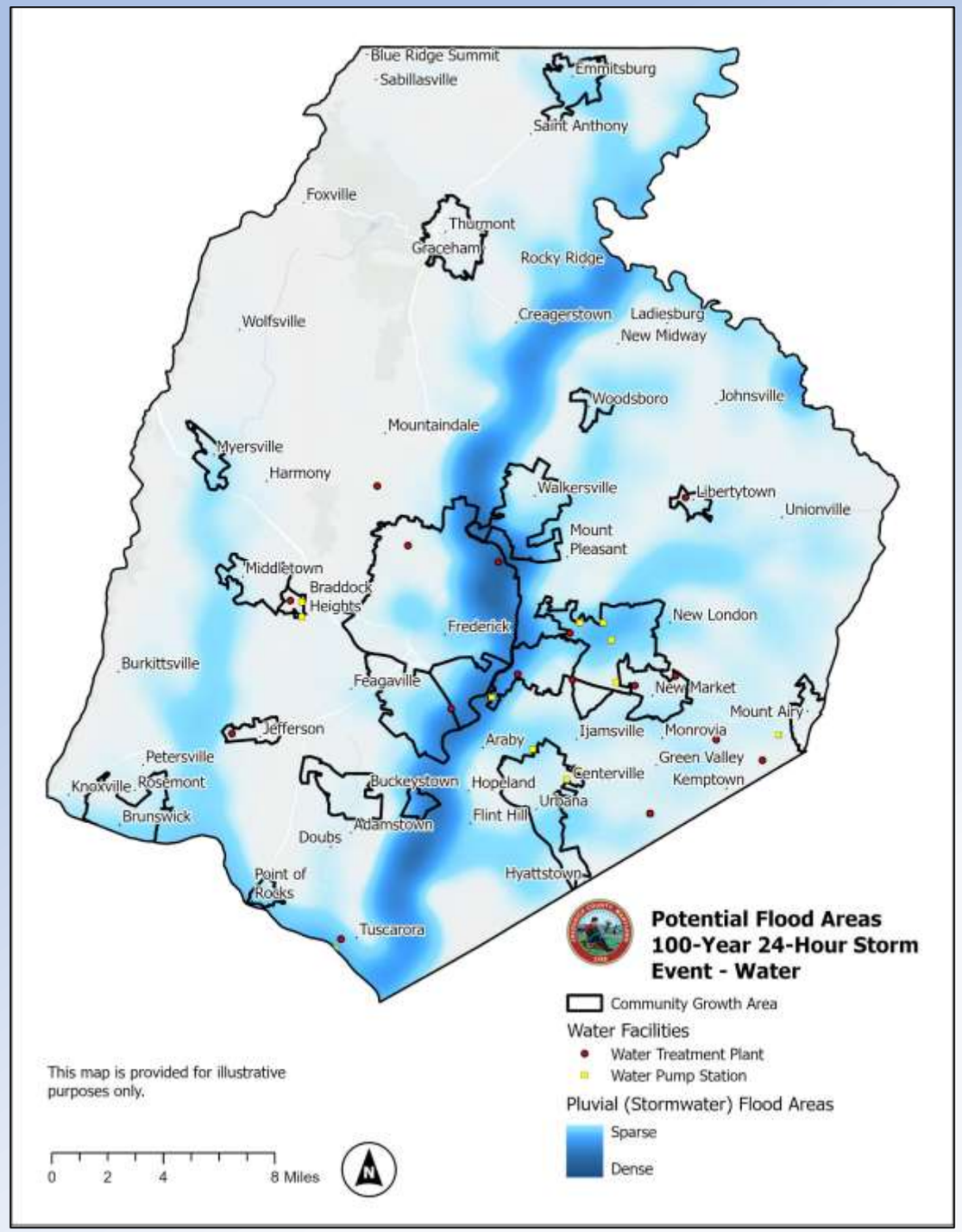

… and a Changing Climate

- Drinking water facilities located in or near existing floodplains
- Impacts of drought on the ability of waterways to maintain the 7Q10 flow-by requirements while meeting withdrawal and supply needs

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Drinking Water

Wastewater

Stormwater

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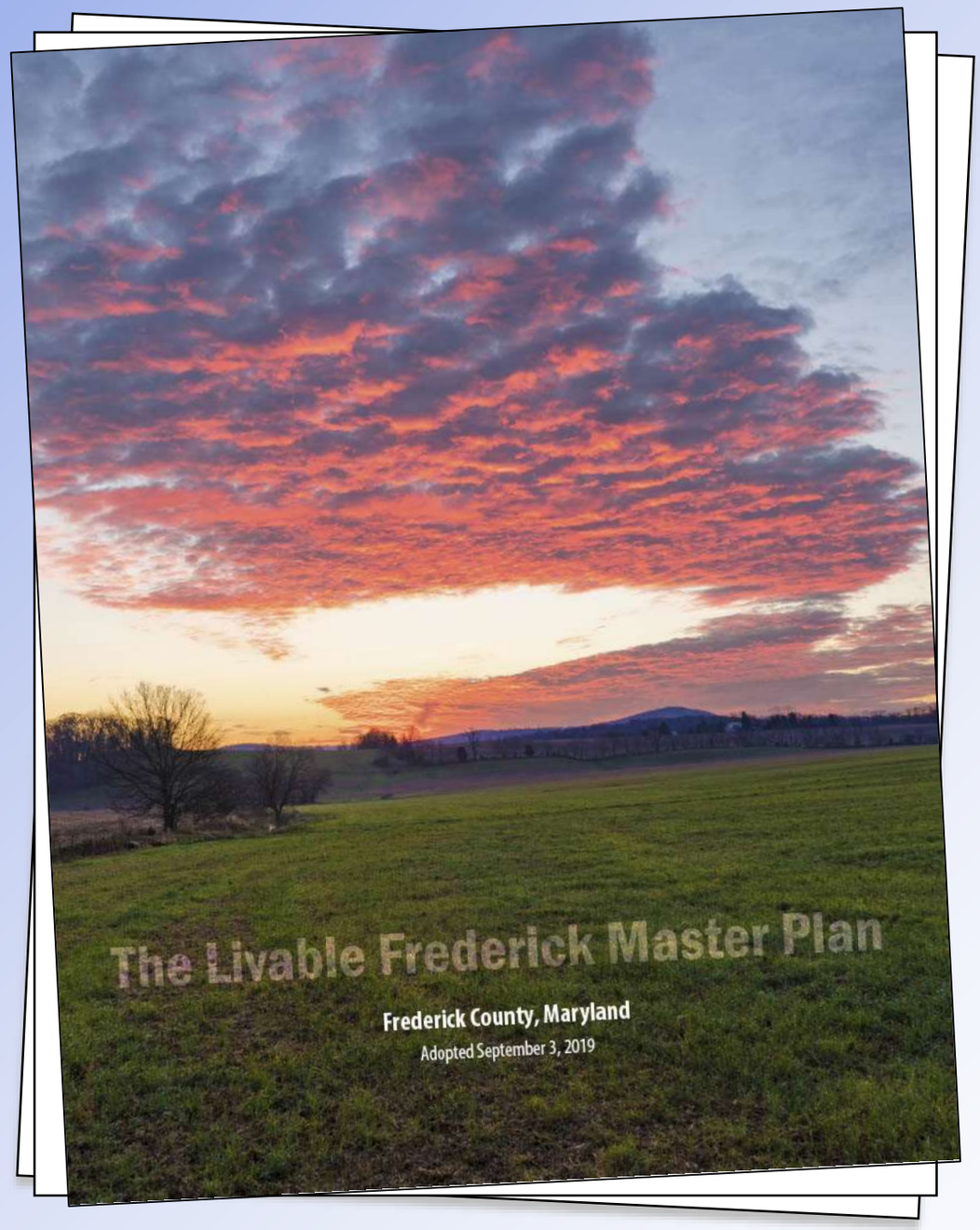

LFMP Goals & Initiatives

Goal 4.4.1 Climate Resiliency

Initiative 4.4.1.3 Stormwater Impacts

Supporting Initiative 4.4.1.3.1 and 4.4.1.3.2

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Stormwater: Where It **Flows,** Everything **Goes**

When it rains, snows, or sleets, water hits hard surfaces and takes anything on that surface with it, through drains, pipes, and ditches to local rivers, lakes, and streams.

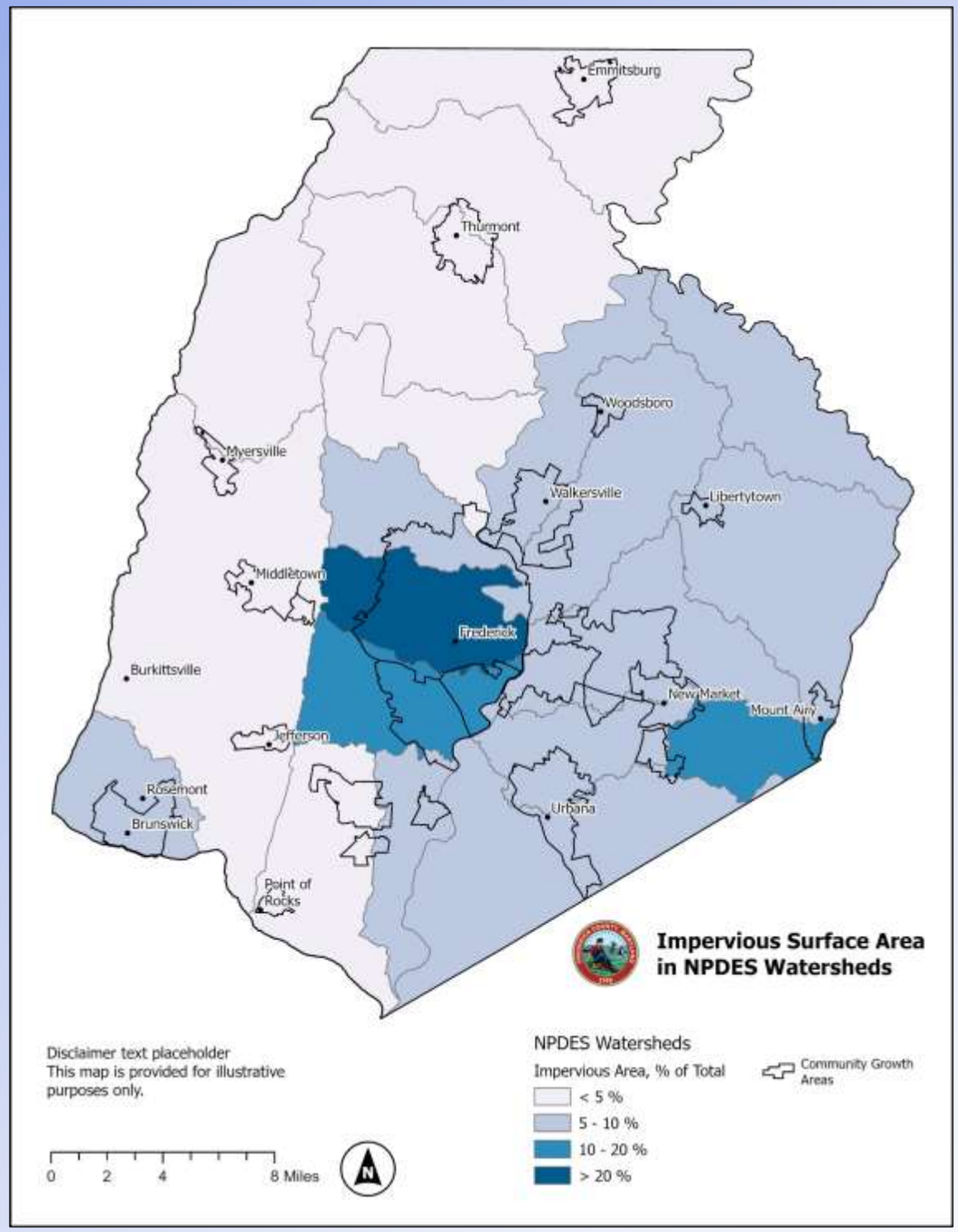
Where Stormwater Flows, Everything Goes

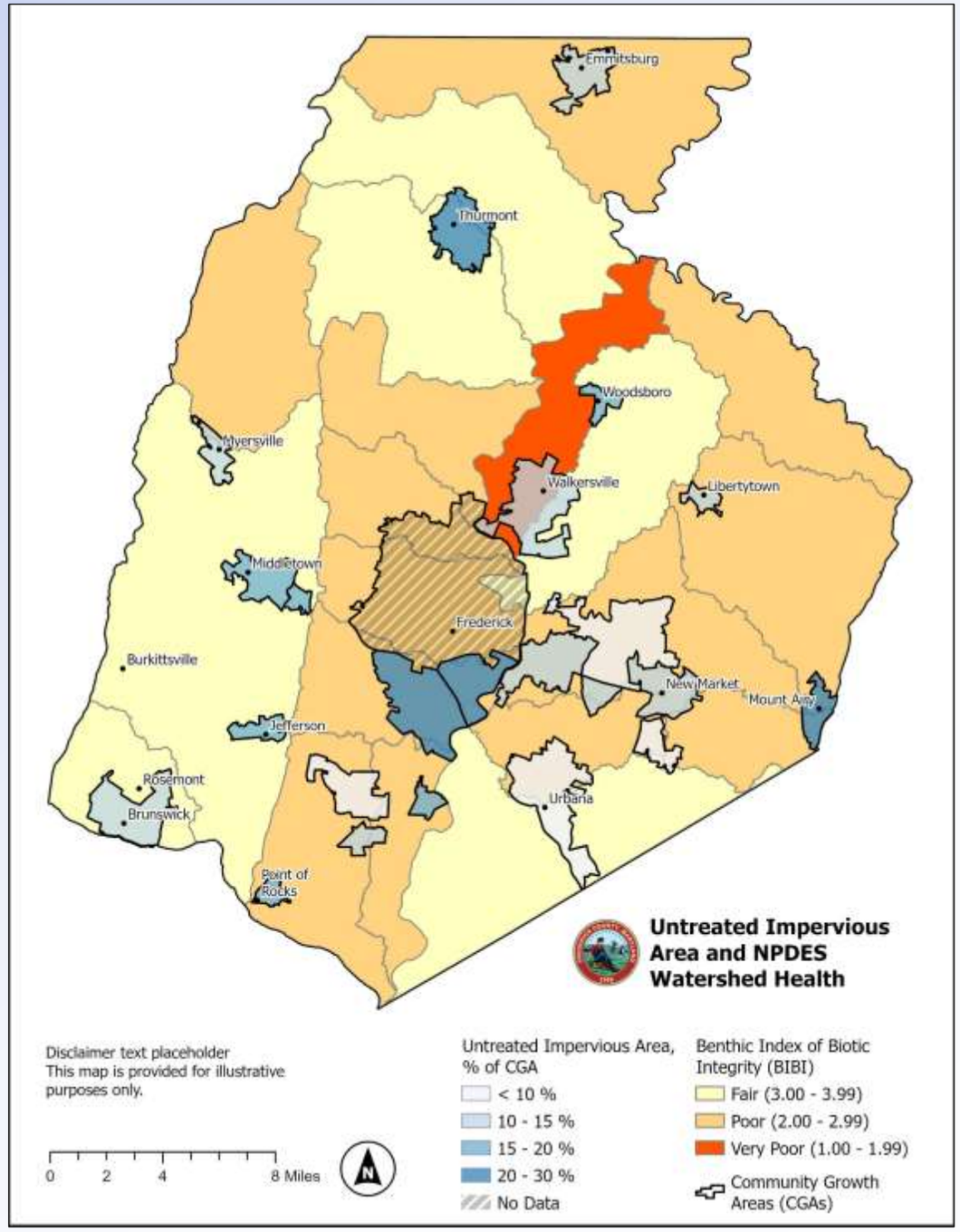
Credit: https://www.epa.gov/npdes/stormwater-smart-outreach-tools

EPA

Some Stormwater Management Practices

https://frederickcountymd.gov/DocumentCenter/View/300401/oes_bmpbro_maintenance_81723?bidId=
https://frederickcountymd.gov/DocumentCenter/View/319045/pondmgmtguide
https://www.montgomerycountymd.gov/DEP/contact/sediment-erosion.html
https://www.visitfrederick.org/blog/stories/post/the-bridges-and-fountains-of-carroll-creek-park/


Emmitsburg
Thurmont
Woodsboro
Myersville
Walkersville
Libertytown
Middletown
Frederick
Burkittsville
New Market
Mount Airy
Jefferson
Rosemont
Brunswick
Urbana
Point of Rocks
Impervious Surface Area in NPDES Watersheds
Disclaimer text placeholder
This map is provided for illustrative purposes only.
0 2 4 8 Miles
N
NPDES Watersheds
Impervious Area, % of Total
< 5 %
5 - 10 %
10 - 20 %
> 20 %
Community Growth Areas


Emmitsburg
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Woodsboro
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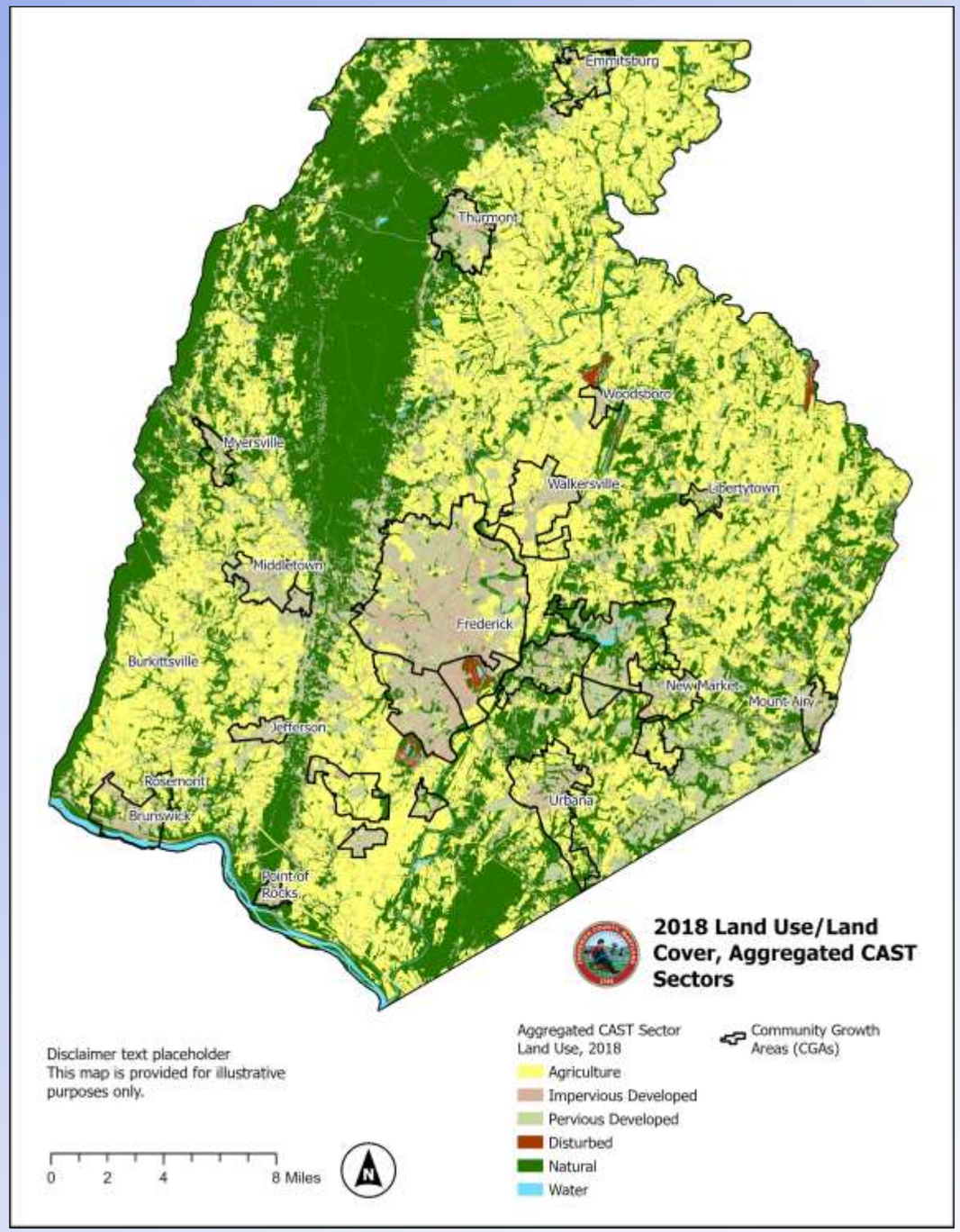
New Market
Mount Airy
Jefferson
Rosemont
Brunswick
Urbana
Point of Rocks
Untreated Impervious Area and NPDES Watershed Health
Disclaimer text placeholder
This map is provided for illustrative purposes only.
0 2 4 8 Miles
N
Untreated Impervious Area, % of CGA
< 10 %
10 - 15 %
15 - 20 %
20 - 30 %
No Data
Benthic Index of Biotic Integrity (BIBI)
Fair (3.00 - 3.99)
Poor (2.00 - 2.99)
Very Poor (1.00 - 1.99)
Community Growth Areas (CGAs)



Land Use / Land Cover

- Pollutants come from more than urban stormwater runoff
- Land Use / Land Cover analysis can be used to estimate *nonpoint* pollution
- Can also be used to estimate impacts of future land use change

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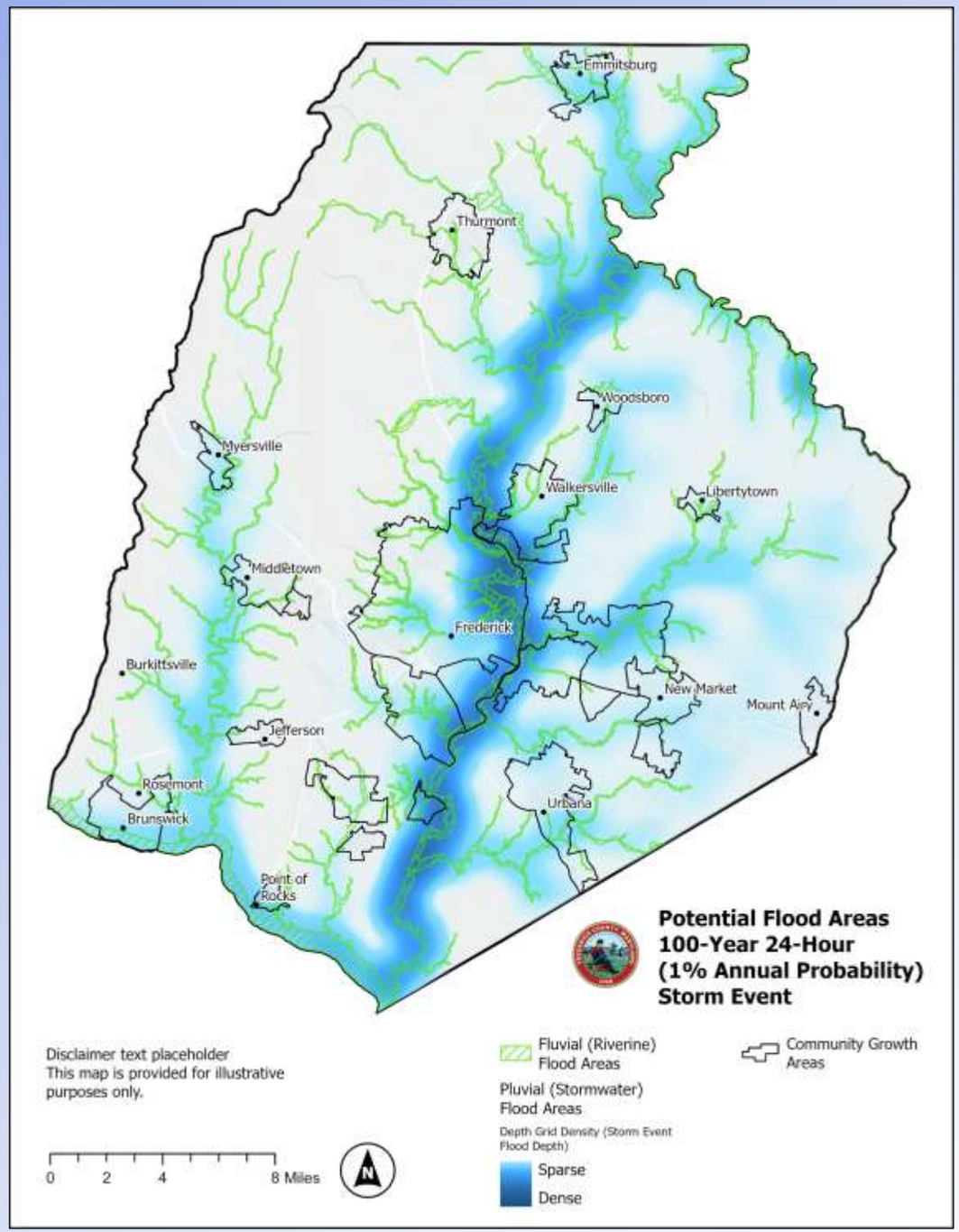

Potential Flood Areas

- FEMA floodplains only represent one specific type of flood risk (riverine/fluvial).
- Pluvial/stormwater model prepared for Frederick County's 2022 Hazard Mitigation Plan provides enhanced picture of flood risk.

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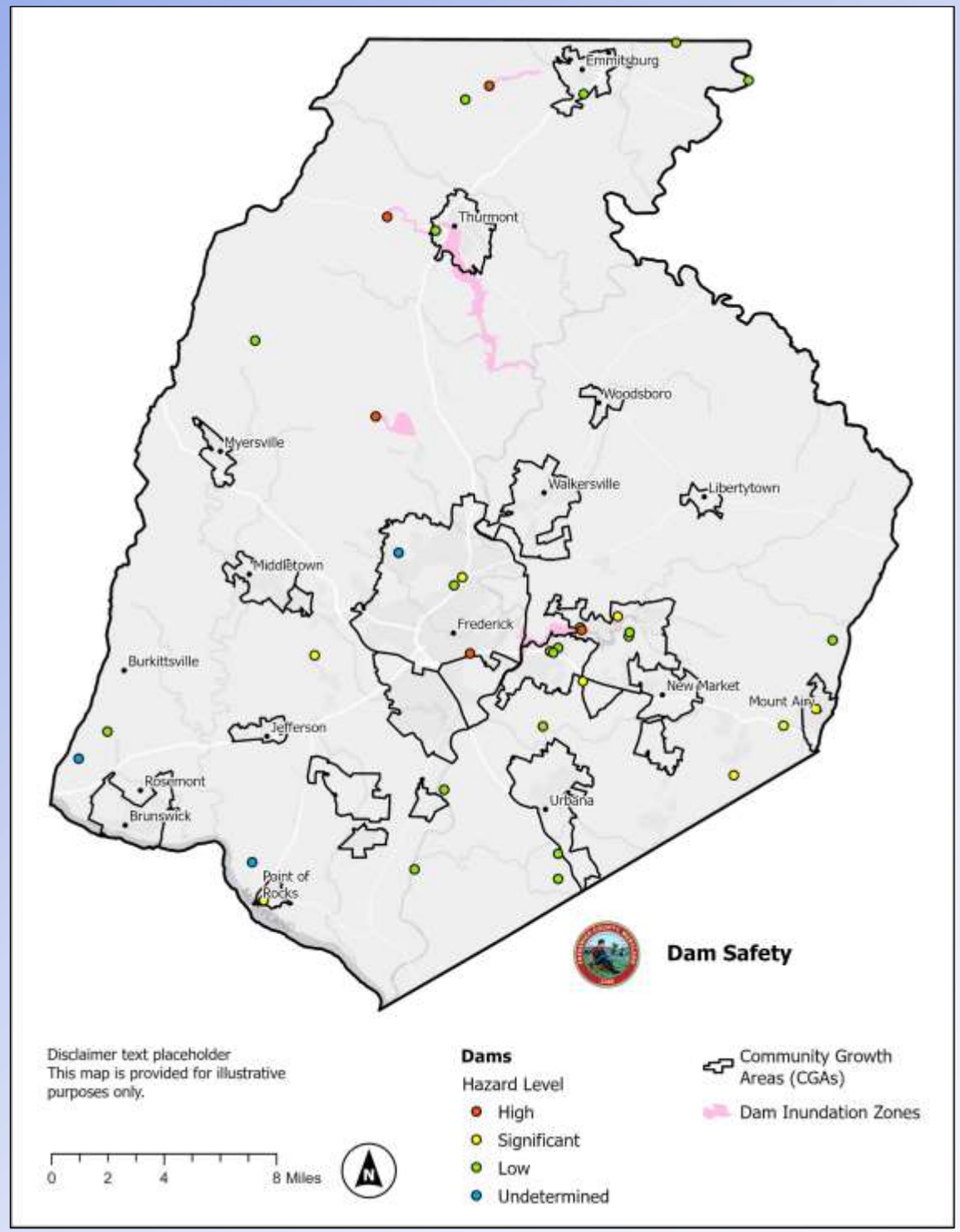

Dam Safety

- Dam Safety hazard categories are based on damage that may occur if the dam fails, not structural integrity of the dam

- Dam failures can affect State assets, critical facilities (necessary before, during, and after disasters), and homes and businesses

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https://www.stacylevy.com/projects/missing-waters

Stormwater and Equity

- Flooding or flood risk
- Age and/or failure rate of stormwater facilities
- Infrastructure investments

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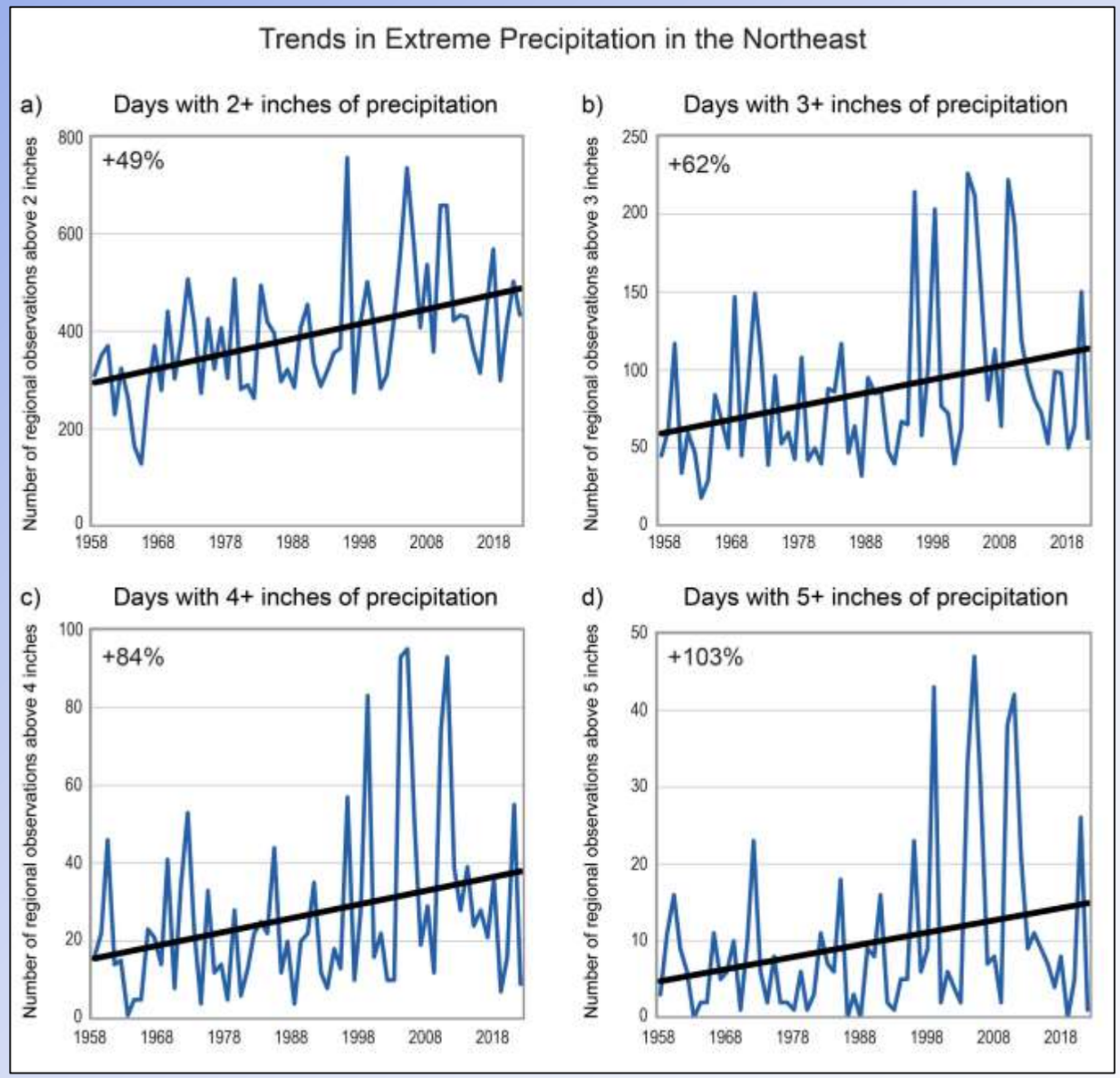

https://nca2023.globalchange.gov/chapter/21/

… and a Changing Climate

- Increasing frequency and intensity of storms
- Drought can impact TMDL goals and can worsen flooding when precipitation returns
- Increased stream temperature
- More areas can be anticipated to be in FEMA floodplains

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