Potomac River Watershed Plan

Team 1

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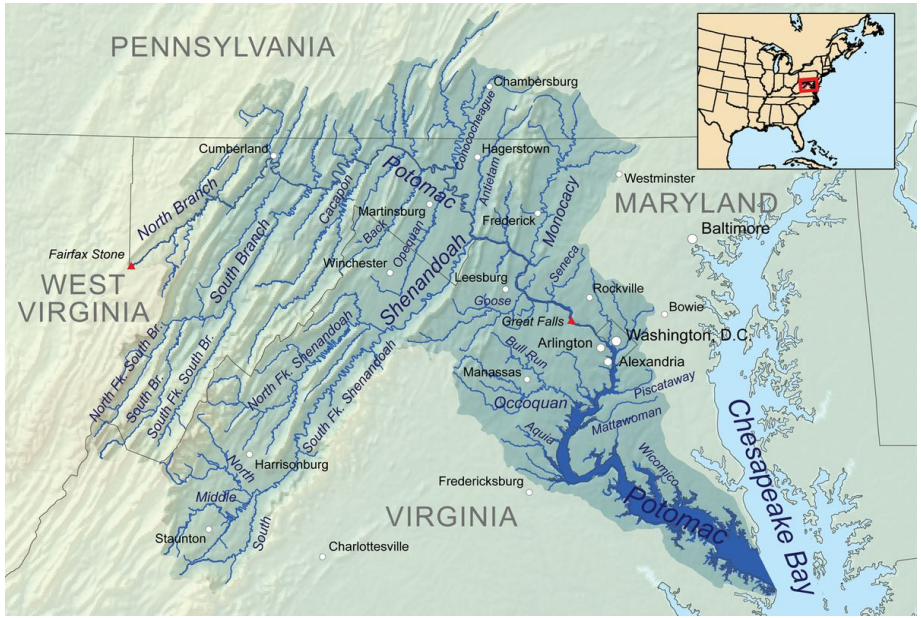
Background on Watershed Planning

- Early stages:
  - Erosion control & flood management
- Clean Water Act of 1972
  - Provided a framework for addressing pollution and water quality
- Modern watershed planning emphasizes:
  - Adaptive management
  - Data-driven solutions
  - Climate resilience
  - Stakeholder engagement
  - Public education

The POTOMAC Foundation



- **P**rotecting **O**ur **T**erritory, **O**ptimizing **M**anagement, **A**dvancing **C**onservation
- Mission Statement:
  - POTOMAC's focus is to safeguard the health and resilience of the Potomac River Watershed and surrounding areas, specifically the Washington D.C. region, through analyzing results of climate change and other environmental issues, such as pollution, flooding and droughts, as well as the diminishing habitat of the region, and provide recommendations and inspire change and influence governmental policy by 2040.

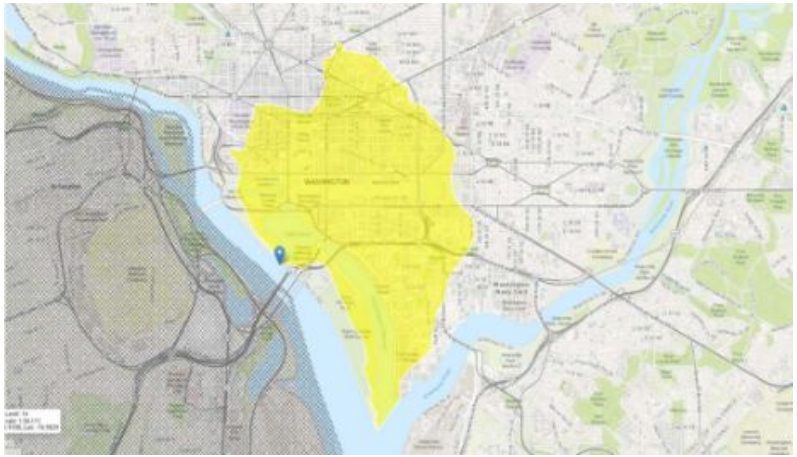
History of Potomac River Watershed

- **Pre-1600's: Indigenous Peoples**
  - Piscataway, Powhatan, and Susquehannock relied on the river for sustenance, transportation, and trade networks
- **1600's: European Settlement**
  - English, Scottish, and Dutch established trading posts and settlements along the river
  - Captain John Smith mapped river
- **1700's: Colonial Era**
  - Erection of port towns (Alexandria, Virginia) for shipping and commerce
  - Vital corridor, linking inland settlements to Chesapeake Bay and Atlantic Ocean
- **1800's: Industrial Revolution & Development**
  - Chesapeake and Ohio Canal facilitated transportation of coal, lumber, etc.
- **1900's-2000's: Conservation & Environmental Protection**
  - Creation of George Washington Memorial Parkway provided scenic opportunities along Potomac River
  - Clean Water Act

Current Conditions

Physical Characteristics

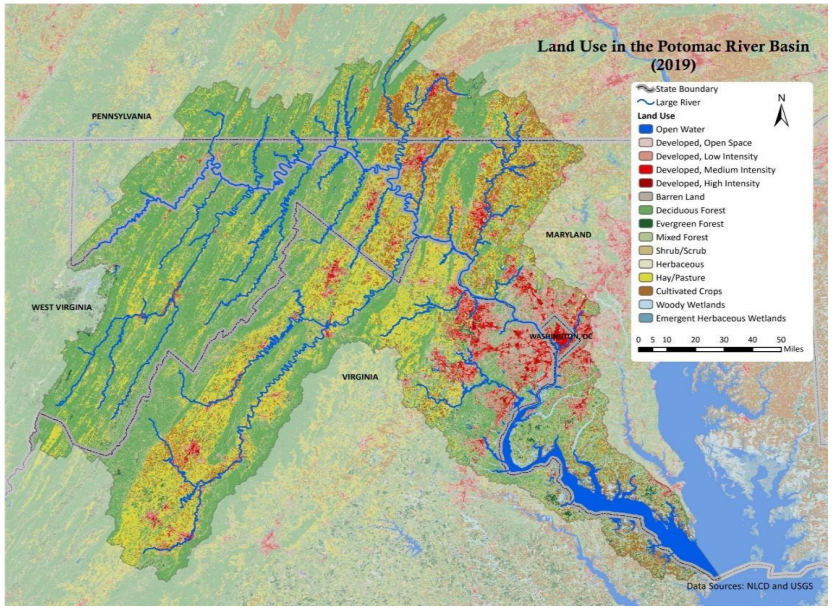
Watershed Delineation



Potomac River Watershed Total Drainage Area: 14,679 sq. miles
Potomac River Watershed Total Length: 383 miles
Washington D.C. Drainage Area:
Washington D.C. Length:

Topography

Land Use



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.74	square miles
FOREST	Percentage of area covered by forest	0.14	percent
FOREST_MD	Percent forest from Maryland 2010 land-use data	0	percent
IMPERV	Percentage of impervious area	60.1	percent
LIME	Percentage of area of limestone geology	0	percent
PRECIP	Mean Annual Precipitation	42.4	inches
SOILCorD	Percentage of area of Hydrologic Soil Type C or D from SSURGO	84.1	percent
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	0	percent
STATSGOA	Percentage of area of Hydrologic Soil Type A from STATSGO	0	percent
STATSGOD	Percentage of area of Hydrologic Soil Type D from STATSGO	5.77	percent

Soil Types

Arlington County, Virginia (VA013)
District of Columbia (DC001)

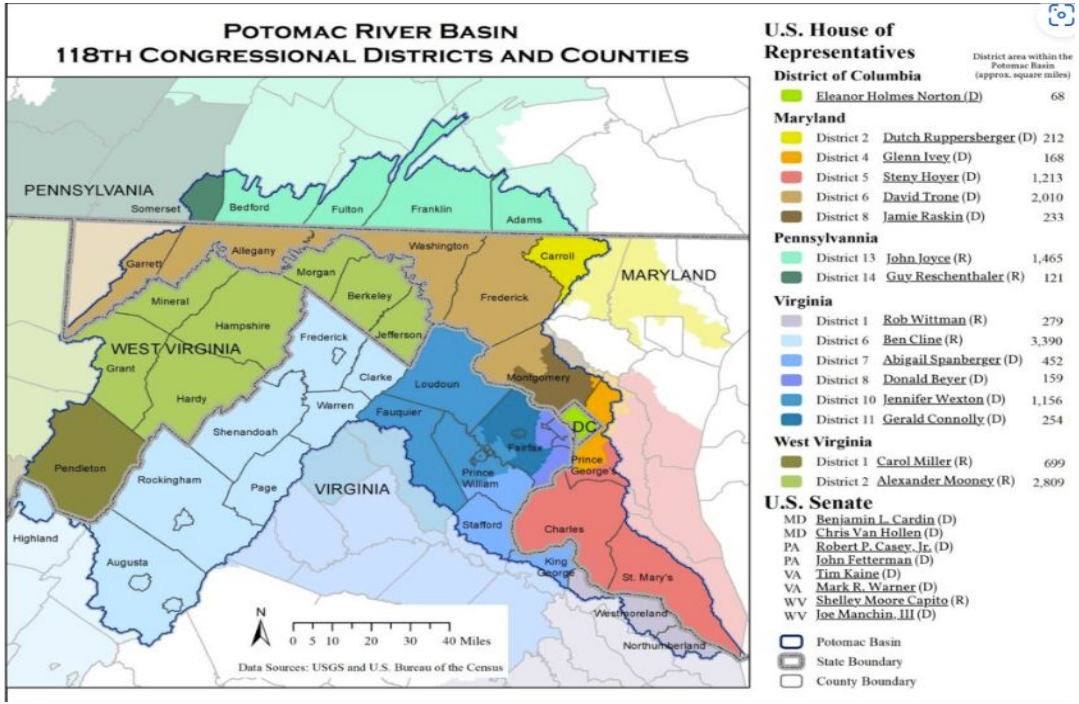
Arlington County, Virginia (VA013)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12	Urban land-Udorthents complex, 2 to 15 percent slopes	232.5	2.1%
W	Water	28.2	0.3%
Subtotals for Soil Survey Area		**260.7**	**2.4%**

Economic Conditions

- Economic Drivers
  - Agriculture & Food Production
  - Tourism, Hospitality
    - National Mall, Lincoln Memorial, Jefferson Memorial
  - Government Services
  - Real Estate & Development
- Economic Challenges
  - Infrastructure Needs
  - Equity & Access

Governmental Influence



No senators

Governmental Policies

- **Clean Water Act (CWA)**
  - Federal water quality standard that regulates pollution in waterways. Protects biological, chemical, and physical stability of flowing water
- **National Environmental Policy Act (NEPA)**
  - Federal agencies assess environmental impact
- **Chesapeake Bay Program**
  - Regional partnership committed to restoring and protecting the Chesapeake Bay and its tributaries
- **Climate Solutions Now Act**
  - Addressing climate change in Maryland, calls for 60% reduction in climate-warming carbon emissions by 2031
- **Total Maximum Daily Load (TMDL) for Chesapeake Bay**
  - EPA set limits on amount of nitrogen, phosphorus, and sediment that can be discharged into the bay and its tributaries
- **Land Use and Zoning Regulations**
  - Local government have implemented planning and zoning regulations to restrict development and protect wetlands and other critical habitats
- **Stormwater Management Regulations**
  - Local jurisdictions have implemented regulations that reduce the impacts of urban and suburban runoff on water quality through use of BMPs

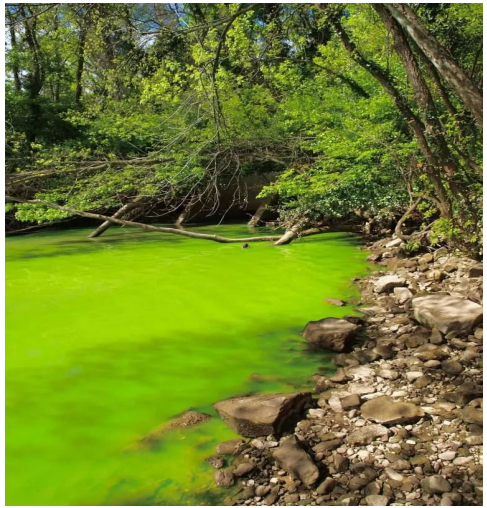
Environmental Problems

Pollution

- Poor stormwater infrastructure has led to excessive runoff
- 525 million gallons of polluted runoff is produced from a 1.2 inch rainstorm in Washington D.C. (Kliefoth)
- Carries pollutants such as:
  - Agricultural
  - Heavy metals from industrial sources
- Runoff leads to bank erosion, exposing sewage leaks in some cases

Source: Bay Journal

Habitat Degradation



Source: WikiMedia. 2012 photo of algal bloom on the Potomac River near Washington, D.C.

- Degrading habitat due to urban expansion and agricultural needs
- 62% of surrounding land is for agriculture or has impervious cover
- Deforestation also weakens defense to runoff
- Current dissolved oxygen levels are regularly below 3 mg/L
- Susceptible to algal blooms upstream, further degrading the watershed ecology

Flooding & Droughts

- Climate change has led to global glacial melt, increasing sea levels
- 1,300 acres in Washington, D.C. sit below the projected high tide line for 2030
- Creates increased flood risk for the Potomac and its tributaries
- Also suffers consequences of drought
- The potomac has experienced periods of low precipitation and high evaporation

Source: Alx Now

Goals & Recommendations

Pollution

Goal:

- By 2040, through collaborative efforts:
  - Reduce nutrient and sediment levels,
  - Increase dissolved oxygen concentrations
  - Decrease pollutant loads entering source water bodies

Recommendations:

- Promote sustainable land use practices
- Promote green infrastructure
- Enhance monitoring & enforcement
- Enhance agriculture best management practices
- Enhance stormwater management practices
- Upgrade wastewater treatment facilities
- Educate and engage the community
- Foster Collaboration and partnerships

Habitat Degradation

Goal:

- By 2040, through collaborative efforts:
  - Increase habitat connectivity
  - Increase species diversity
  - Improve ecosystem functions

Recommendations:

- Conduct habitat assessments
- Implement reforestation projects
- Restore wetland and riparian areas
- Manage invasive species
- Protect and expand green spaces
- Enhance habitat connectivity
- Promote sustainable land management practices
- Engage and educate the community

Flooding & Droughts

Goal:

- By 2040, through collaborative efforts:
  - Enhance floodplain and land use management
  - Implement green and climate resilient infrastructure projects
  - Strengthen coastal and riverine resilience

Recommendations:

- Implement green infrastructure projects
- Enhance floodplain management
- Improve water conservation practices
- Implement sustainable land use planning
- Strengthen coastal and riverine resilience
- Increase climate resilience of infrastructure

Current Watershed Conservation Efforts

- Reducing pollution in source water
  - Upgraded WWTP in Maryland, saw significant reduction in nitrogen and phosphorous
  - Stormwater retrofits decreased nitrogen pollutants
  - Drinking Water Source Protection Program (DWSPP)
- Combating habitat degradation
  - Alice Ferguson Foundation Annual Potomac River Watershed Cleanup
  - Incentives for land use that protects water quality
    - Over 55,000 acres have been preserved by Maryland conservation programs
- Reducing effects of climate change
  - Cover crops planted to reduce carbon emissions
    - Over 80,750 acres of cover crops planted by Maryland Department of Natural Resources
- Other foundations helping the Potomac River Watershed
  - Interstate Commission on the Potomac River Basin (ICPRB) (1940)
  - The Potomac (1967)

Financing

Funding Strategies

- Annual Cost: $500,000 - $2 million
- Total Cost by 2040: $10 - 30 million
- Financed by:
  - Government policy & funds
    - Clean Water State Revolving Fund (CWSRF)
  - Capacity Building grants
  - Matching Funds
  - Private Donations

Conclusion

Protecting **O**ur **T**erritory, **O**ptimizing **M**anagement, **A**dvancing **C**onservation

- Hopefully will play pivotal role in safeguarding Potomac River watershed for future generations
- Promotes:
  - Resilience
  - Biodiversity
  - Inclusion
- Plan is nothing without:
  - Collective action
  - Innovation
  - Commitment from community

Any Questions?

Thank You

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