PROTECT DC

Potomac **R**iver **O**ptimization for **T**otal **E**nvironmental **C**onservation & **T**reatment

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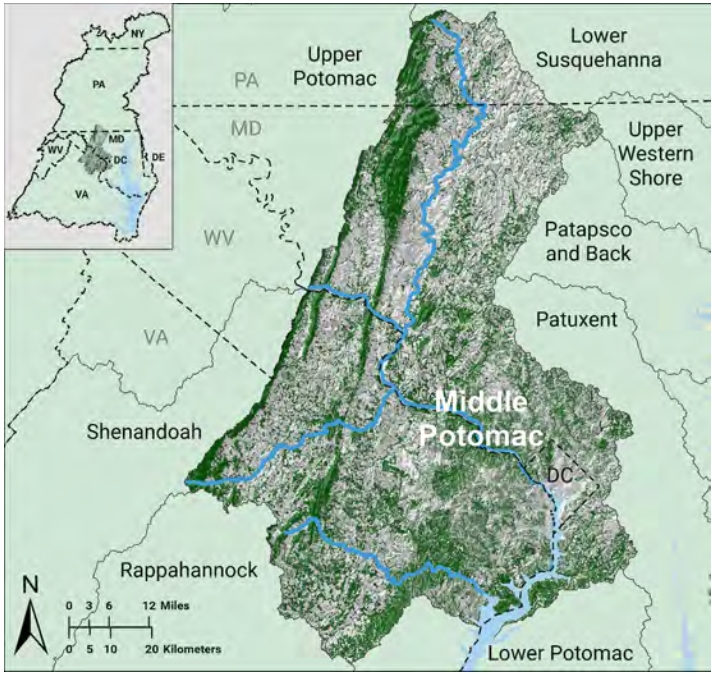
Mission Statement

The overall mission of **PROTECT** is to improve the quality of the **Middle Potomac River Watershed** where it has been impacted by urbanization in the District of Columbia (D.C.) and Virginia. By addressing runoff, legacy pollution, and ecosystem health, we hope to make the United States's Capital's **drinking water source safe for all by the year 2050.**



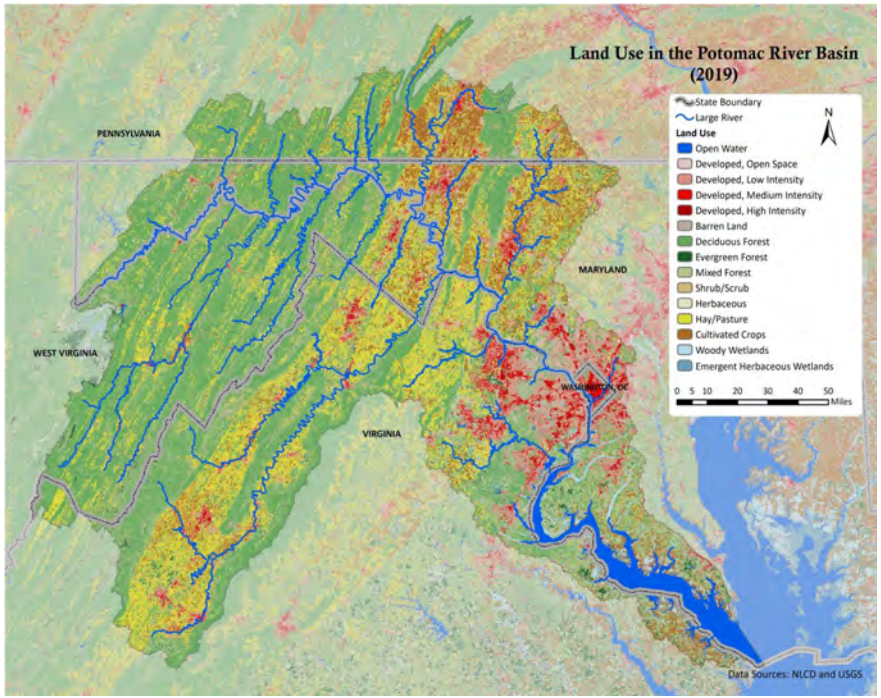
Background & History

Geography
- ~ 3,450 mi^2 (~175 river miles)
- Flows through Piedmont region
  - MD, PA, VA, DC
- Tributary of Chesapeake Bay, meeting at Point Lookout, MD

Land Use
- Urban (49%)
- Agriculture (24%)
- Forest (13%)

Importance
- Native American Heritage - “Patowmeck”
- Transportation route and drinking water source since mid 1800s
- Diverse ecosystem

Challenges
- Water quality (industrial runoff, urban runoff, agricultural fertilizers)
- Climate change
- Cumulative impacts of surface and groundwater withdrawals



Policies and Mandates

Maryland

- **The Clean Water Justice Act:** This makes it easier for private citizens to sue to stop illegal pollution or compel a state agency to act.
- **The Whole Watershed Act:** The act is meant to improve and restore severely degraded ecosystems through coordinated, comprehensive investments and conservation efforts.

Virginia

- **Great Outdoors Act:** This is a $200 million request that prioritizes investments in outdoor recreation.
- **Wetlands Protection Strategy Work Group Legislation:** This funds an important study of Virginia's wetland protection policies and practices. It examines ways to make them more effective.

Problem 1: Runoff

Issue:

- The area surrounding the Potomac River consists of mainly impervious surfaces
- Runoff carries pollutants into the river affecting water quality

Pollutants:

- Sediments and Nutrients: Nitrogen and phosphorus cause harmful algal blooms that deplete oxygen and harm aquatic life
- Salt: De-icing the roads increases the chlorine and sodium levels

Consequences of Runoff:

- Poor water quality
- Harms aquatic life

Solution 1: Runoff

Goal: Reduce pollutants entering the Potomac

- Stormwater Management: Implement strategies to control runoff.
- Green Infrastructure: Use natural solutions to filter pollutants before they reach the river.

Actions:

- Rain Gardens & Bioretention Area: Absorb rainwater and filter out pollutants.
- Permeable Pavement: Allows water to seep through and reduces runoff.
- Community Engagement:
  - Education: Teach residents and businesses about reducing fertilizer, and pesticide use.
  - Promote Alternatives: Encourage less harmful de-icing products and better management practice.
- Monitoring: Track pollutant levels along the river to measure progress.

Problem 2: Legacy Pollution

Issue:

- The surrounding area of the Potomac used to be an industry hub for making a variety of goods
- Past chemicals used in manufacturing these goods are still present in the Potomac River

Pollutants:

- PCBs- Used to make electronics, paints, plastics
- PFAs- Used to make water, heat, and oil resistant materials

Consequence:

- These chemicals are linked to increased cancer rates, birth defects, and liver impacts in both the marine ecosystem and humans
- These chemicals are known as “forever chemicals” taking thousands of years to break down naturally

Solution 2: Legacy Pollution

Goal: Reduce the amount of legacy pollution affecting human and marine life

- Implement policies that continue to limit the use of these chemicals
- Practice sediment covering

Actions:

- Push for legislation that would completely ban or restrict the use of these chemicals and how they are used
  - While PCBs have been banned since 1979, PFAs are still used in some products
  - Create an Education Campaign to inform the public about these materials and how it is affecting their community
- Practice Sediment Covering
  - This is the strategy of dumping sediment into heavily polluted areas of the river and covering the exposed chemicals
  - This would bury the chemicals under many layers of sediment, decreasing their exposure to marine life

Problem 3: Ecosystem Health

Issue:

- Habitat loss in the Potomac River as as a result of declining submerged aquatic vegetation

Pollutants:

- Sediments and Nutrients: Nitrogen and phosphorus
- Dissolved Oxygen: decline with fewer submerged aquatic plants

Consequences:

- Deterioration of ecosystem health
- Decline in ecosystem resilience
- Water quality issues

Solution 3: Ecosystem Health

Goal: Increase population of underwater grasses in the Potomac River

- Habitat Restoration
- Continued Monitoring

Actions:

- Seeding and Planting
  - Identify shallow and nutrient-rich areas ideal for new vegetation.
  - Host community events to help with the planting on a larger scale.
- Remote Sensing
  - Monitor aquatic vegetation growth through remote sensing and/or on-site assessments.
  - Implement these findings into further habitat restoration in other areas of the Potomac.
- Political and Educational Awareness
  - This project would require both funding and government support, allowing for the continued growth of these restoration efforts and improved Potomac ecosystem health

Conclusions

- The proximity of this watershed to the US Capital (Washington DC) highlights the importance of making sure water quality is safe for humans and ecosystems
- The three problems and solutions in this program are just a stepping stone into future Potomac Conservation as the Middle Potomac is part of a much larger system
- The solutions and goals presented will need collaboration between local and federal governments as well as residents
- Through PROTECT, cleaning the Potomac is possible!

Questions?

Sources:

- https://www.fairfaxcounty.gov/publicworks/stormwater/middle-potomac-watersheds
- https://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/PotomacWQassessmenthandout.pdf
- https://ecoreportcard.org/report-cards/chesapeake-bay/watershed-regions/middle-potomac/
- https://potomac.org/101maps