

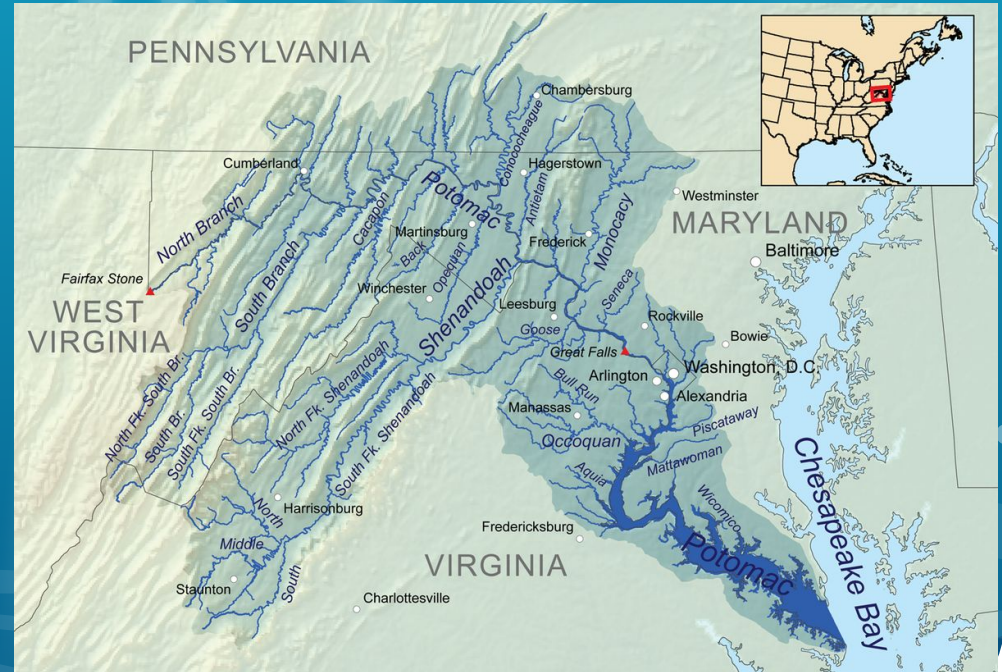
PRIME

Potomac River Intervention, Management, and Evaluation

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Map of the Potomac River Watershed



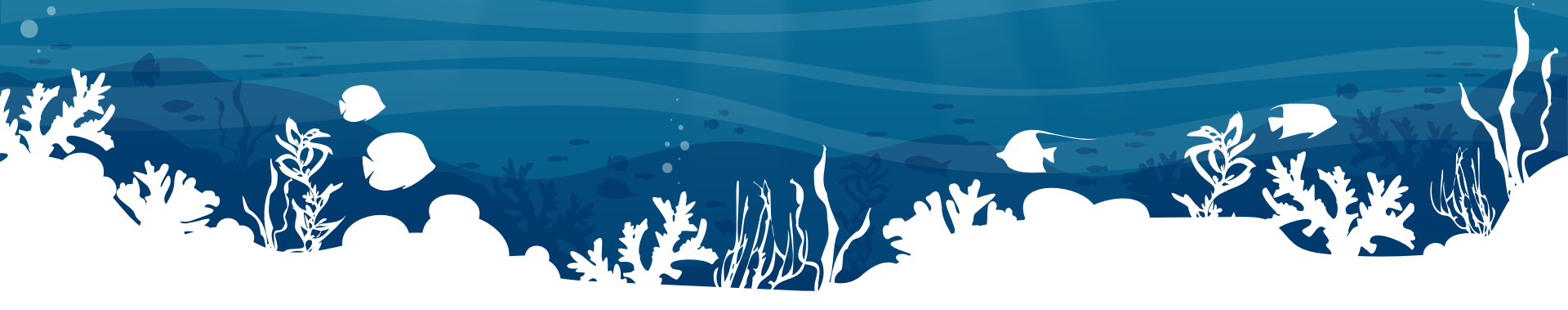
Source: https://commons.wikimedia.org/wiki/File:Potomac_river_watershedmap.png

Outline

-  Mission Statement
-  Background + History
-  Policies and Mandates
-  Problem and Goal One
-  Problem and Goal Two
-  Problem and Goal Three
-  Recommendations + Conclusion


Mission Statement

PRIME's mission is to analyze the Potomac River Watershed and provide adequate recommendations to increase the water quality and fish populations by 30% while decreasing flood risks by 25% by the year 2035.



Background + History

The Potomac River Watershed spans Pennsylvania, Maryland, Virginia, West Virginia, and the District of Columbia. Roughly seven million residents reside in this watershed, with an average of 486 million gallons of water withdrawn daily. The Potomac houses many tributaries and bodies of water, including Savage Ridge Reservoir, Jennings Randolph Lake, and Little Seneca Lake.

The background of the slide features a light blue gradient with sunbeams at the top. The bottom portion is decorated with a dark blue silhouette of an underwater scene, including various fish, coral, and seaweed.

Relevant Policies and Mandates



Clean Water Act (CWA)



The Chesapeake Bay Preservation Act (Bay Act)



National Pollutant Discharge Elimination System (NPDES)



Safe Drinking Water Act (SDWA)



Climate Solutions Now Act of 2022



Mandated as a 'public water supply' in MD

Problem 1: Flooding

Increased flooding events are caused by climate change. Glaciers melting off of the coast of Greenland and Antarctica are causing sea levels to rise, as well as coastal rivers. Additionally, larger quantity storm events are occurring more frequently. This is not only changing ecosystems, but poses a threat to large metropolitan areas, such as Washington, DC. Finally, the river has risen 11” in the past century.

Causes of Flooding

- Upstream events, such as heavy rains, rapid snowmelt, remnants of a hurricane
- Shape of land creating a chokepoint
- Riverine, coastal, and interior floods



Source: google earth

Goal 1: Improve Stormwater Management Systems to Handle 100+ Year Storm Events



Significantly reduce flooding by implementing best management practices (BMPs), reducing impervious cover use, and upgrading stormwater management facilities (SWMs)



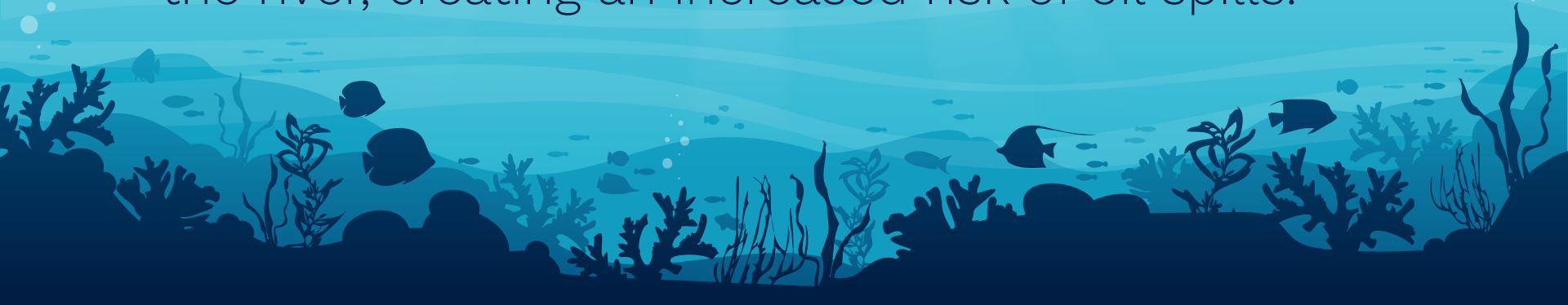
These efforts will increase infiltration of water into the ground and redirect unwanted water to be used as drinking water






Reduce natural disaster consequences

Problem 2: Decrease in Fish Population

The fish population has been gradually decreasing. Within the past decade, the health grade for the river has declined from a grade B to a B-. This increase in pollution and decrease in oxygen levels has led to a decrease in the fish population. Additionally, there are 5 oil/gas pipelines that cross the river, creating an increased risk of oil spills.



Causes of the Decrease in Fish Population

-  Hundreds of thousands of pounds of acid have been dumped in the river from old coal mines
-  Increase in human population causing an increase in sewage
-  Sediment transport from an increase in impervious cover



Goal 2: Increase Fish Population



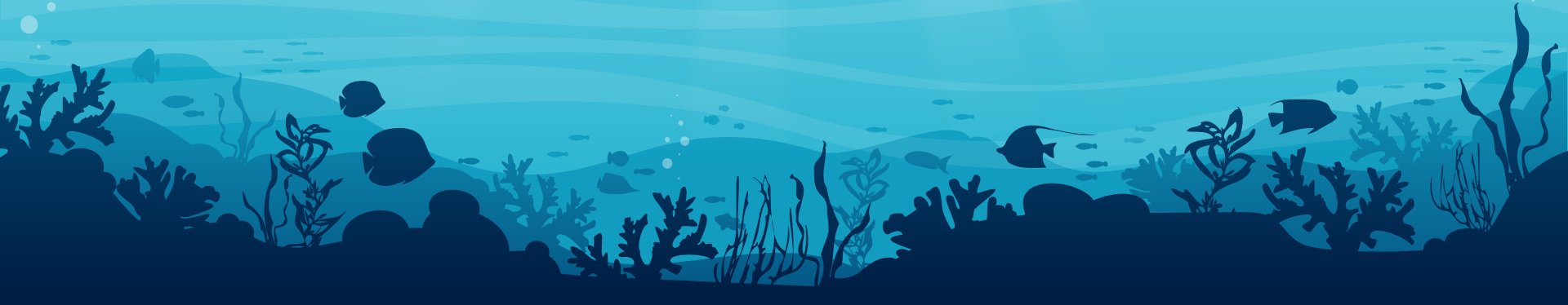
Reduction of water nitrogen levels via water treatment



Policies mandating proper disposal of local discharge sources to ensure minimal wastewater flow into the Potomac.

Problem 3: Bacteria and Pathogens

The Potomac River is largely unswimmable with significant sewage overflow and stormwater runoff contributing to the increasing numbers of pathogens in the water.








Causes

- Higher temperatures allow for bacteria to proliferate, and colder temperatures increase oxygen levels
- Sewers overflow from pipe breaks/leaks
- Combined sewer/swm systems overflow during rain events
- Stormwater running off of streets, buildings, and impervious surfaces, increasing the temperature of the water






Source: <https://water-purifiers.com/waterborne-diseases-caused-contaminated-water/>

Goal 3: Decrease Pollution from Bacteria and Pathogens

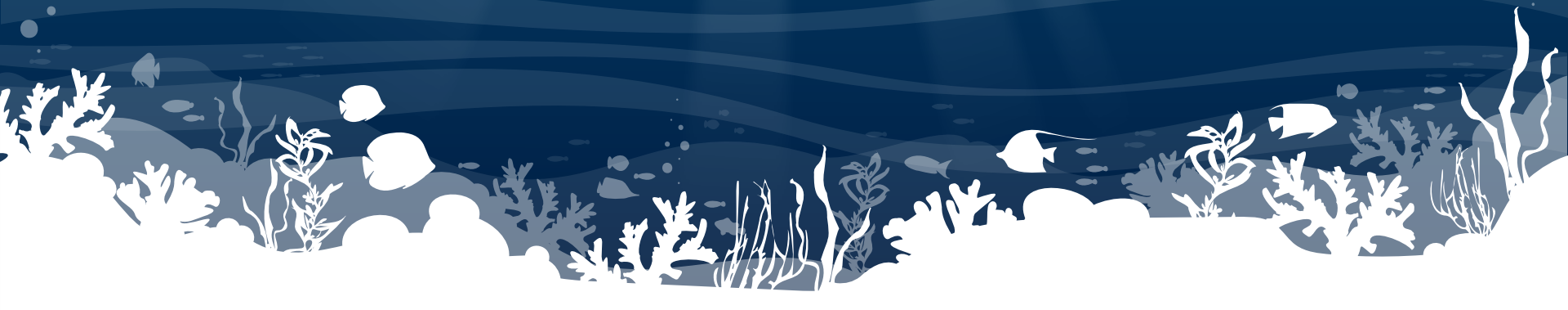
-  Decrease polluted runoff into the Potomac
-  Decrease sewage overflow by eradicating combined sewer systems in the watershed
-  Public notification systems for unsafe drinking water
-  Implementation of Rapid Response Teams to address sewage overflow
 -  sample, test, and document water quality immediately after sewage spill

Recommendations

-  To mitigate flooding: Improve SWM, reduce impervious coverage, increase preparedness.
-  To increase fish population: Decrease wastewater, nitrogen treatment plan, discharge policies.
-  To decrease pollution from bacteria/pathogens: Treat polluted runoff, public notifications, rapid response team.

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QUIZ TIME!



Conclusions

Overall, the main goals of PRIME are to:

- 🐟 Improve water quality by implementing better BMPs to decrease the amount of flooding
- 🐟 Decreasing nitrogen content by introducing a nitrogen treatment plan to improve water quality
- 🐟 Reduce the amount of overall pollutants by treating polluted runoff

This will all be done while prioritizing the safety of all ecosystems and wildlife that live within the PRB.

References

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