

Potomac River Revival Plan (PRRP)



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Mission Statement:

PRRP's mission is to restore the Potomac River and surrounding regions of southeast Maryland to both swimmable and fishable waters by the year 2030.

Background:

The Potomac river has 6.11 million people within its watershed and covers almost 15,000 square miles. It reaches into West Virginia, Virginia, Maryland, Pennsylvania and the District of Columbia.

The river drains an area of approximately 14,500 sq mi (37,600 sq km).

The Potomac River stretches for 383 miles, of which 117 mi are tidal, from its starting point in West Virginia to where it meets the Chesapeake Bay at Point Lookout, Maryland.

Many major tributaries flow to the Potomac River: the Anacostia River, Antietam Creek, the Cacapon River, Catoctin Creek, Conococheague Creek, the Monocacy River, the North Branch, the South Branch, the Occoquan River, the Savage River, Seneca Creek, and the Shenandoah River. When you add up all of these major tributaries, the entire Potomac River system is 12,878 miles long.

The Potomac River crosses several geologic regions on its journey from its headwaters to the Bay: the Appalachian Plateau, Ridge & Valley, Blue Ridge, Piedmont Plateau, and Coastal Plain.

Nearly 90% of the Washington, D.C. metro area gets its drinking water from the Potomac River.

The river is navigable to Washington, D.C., above which it descends from the Piedmont in a series of rapids and falls, including Great Falls, a cataract about 35 ft (11 m) high.

History:

Mount Vernon, home of George Washington, is on its banks below Washington, D.C. The river's name derives from "Patawomeck," as it was recorded by the colonist John Smith in 1608; its origin and meaning are unknown.

In the 1600s, Cecilius Calvert and Thomas Colepeper both received land grants for what would later become the states of Maryland and Virginia. Both used the Potomac River as a boundary, but did so in a way that meant their territories overlapped, leading to disputes between the two areas. Then, in the first half of the 1700s, attempts were made to find the source of the Potomac River. Surveyors determined that the source began with the headwaters from the North Branch and placed a marker there that became known as the Fairfax Stone.

During the American Civil War (1861–1865), the Potomac traced the border between the Union and the Confederacy.

The river itself is at least 3.5 million years old,[9] likely extending back ten to twenty million years before present when the Atlantic Ocean lowered and exposed coastal sediments along the fall line.



Policies and Mandates in Place:

- Chesapeake Bay Preservation Act (Bay Act) was enacted in 1988 and has since seen amendments in 1991, 2001, and 2012 as the backbone of the protection of the Chesapeake Bay grows
- Put in place to balance water quality with continual development and specifically dealt with nonpoint source pollution
- Assist local bay governments financially as well as upholding regulations and water quality requirements within the bay zone
- Largely work with land use and zoning to ensure that the nonpoint source pollution can be properly managed before entering the bay

- Bay Act established and protects Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) that are zoned and controlled accordingly based on their risk factor
- In 2009, Executive Order 13508 established a federal leadership committee and designated the Chesapeake as a national treasure in need of protection
- Chaired by a rep from the EPA with members in the departments of Agriculture, Commerce, Homeland Security, Interior, and transportation
- Many goals including increased stormwater management in the bay, assess impacts of climate change, and increase research efforts

Problems:

Though the region is plagued with multiple problems, the problems we will choose to focus on include chemical contaminations, invasive species, and oysters.

<https://www.chesapeakebay.net/issues>

Problem	Description	Causes
Problem 1: Chemical contaminants	Small, bottom-dwelling organisms take up contaminants through skin contact or while feeding. Also, larger fish eat contaminated organisms and accumulate toxins in their tissues. Going off of that, birds, mammals and other wildlife eat contaminated fish that bioaccumulates to the apex predators of the food web.	Insecticides that are put on farm fields to the cleaners we use to disinfect our homes. Contaminants can enter the Bay and its tributaries and harm the health of both humans and wildlife. Air pollution emitted by factories, power plants, cars, trucks, gas-powered lawn tools and other sources, Agricultural runoff, Stormwater runoff, and Wastewater discharged from industrial facilities and wastewater treatment plants into rivers and streams.
Problem 2: Invasive species	Invasive species can cause harm when they establish themselves at the expense of native plants and animals, encroaching on their food or habitat. Indeed, after habitat loss, invasive species are one of the top threats to native plants and animals.	Invasive species' new environments often lack the natural controls—like predators or disease—that might otherwise keep them in check. Once an invasive species is established, it can be impossible to eradicate

Problem 3: Oyster population	Over-harvesting, disease and habitat loss have led to a severe drop in oyster populations within the bay.	In 1949, over-harvesting, disease, and habitat loss led to a severe drop in oyster populations. In the 1850s, more than 1.5 million bushels of oysters were harvested from the Bay each year; three decades later, this number jumped to 20 million.
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Problem 1: Chemical Contaminants

The first problem we encounter is the increased concentrations of chemical contaminants that have continued to rise in recent years. As a result of the industrial and medical meccas such as Baltimore that line the bay and use it as a form of clean water and transport, there have been an unusual amount of chemical contaminants that have found their way into the ecosystem. These contaminants find their way into the smaller organisms which slowly bioaccumulate up the food chain until they become pervasive issues in the apex predators of the Chesapeake bay.

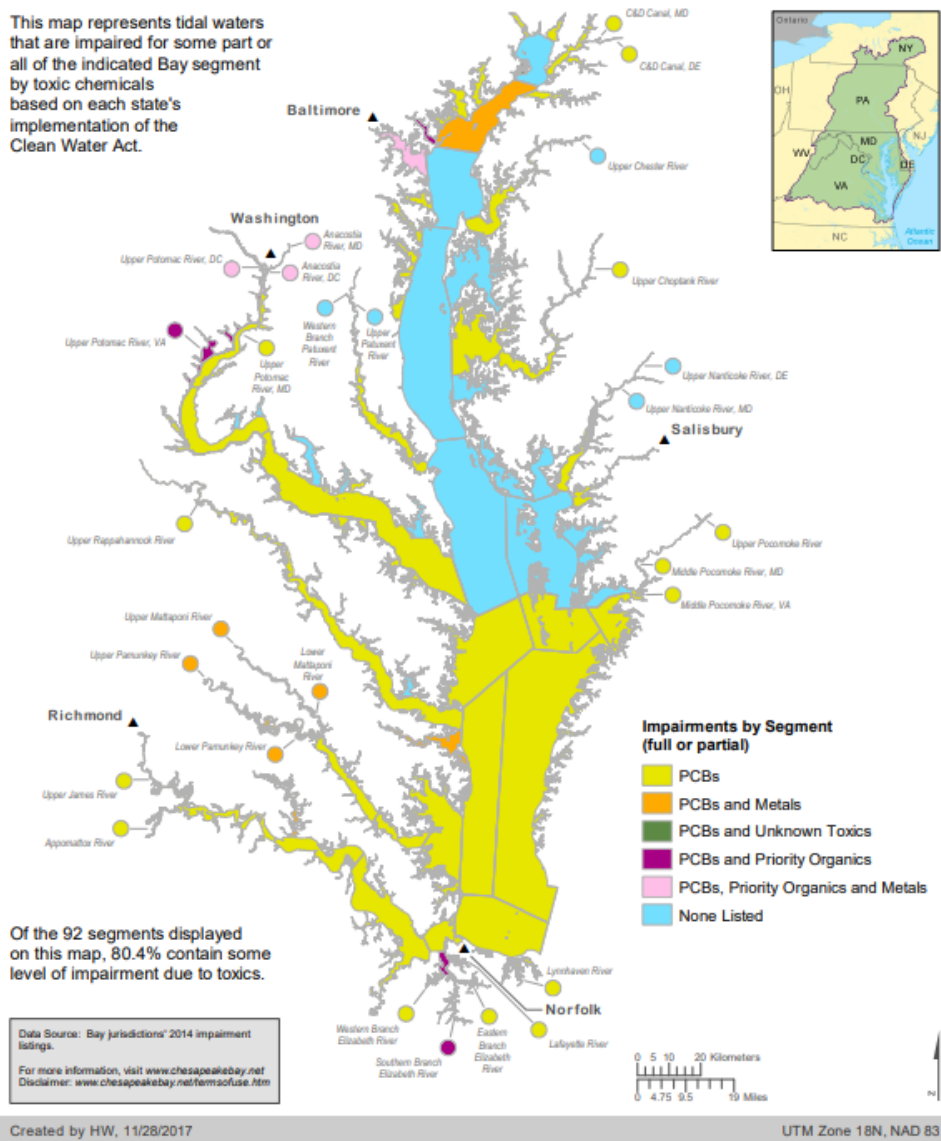


Chemical Contaminants (2014)

Impairments Illustrated Using the Chesapeake Bay Segmentation Scheme



This map represents tidal waters that are impaired for some part or all of the indicated Bay segment by toxic chemicals based on each state's implementation of the Clean Water Act.



The above map is our first GIS-derived map that shows the distribution of chemical contaminants that permeate and plague the Chesapeake Bay. These contaminants range from PCBs and metals used in manufacturing to unwanted organics that are a derivative of agriculture in the surrounding areas. As seen above, PCBs are the most abundant contaminant in the Potomac and will require the most immediate response along with slight levels of metals that need remediation.

Goal 1:

To lower chemical contaminants in the Bay watershed, consider using non-toxic pesticides or chemical-free cleaning and personal-care products. You can also follow safe and legal disposal methods for paint, motor oil and other household chemicals, and keep pharmaceuticals out of our waterways by returning

unused medicine to a consumer drug return location or fouling it with coffee grounds or cat litter before putting it in the trash.

Problem 2: Invasive Species

Another problem we found is the presence of invasive species in the Chesapeake Bay region. There are more than 200 possible species including: Mute swans, Nutria, and Water chestnut. As they begin to take over the food and habitat of the native plants and animals, they are considered a big threat to them. It is found that invasive species have put more than 40 percent of already threatened or endangered species at risk of further decline.



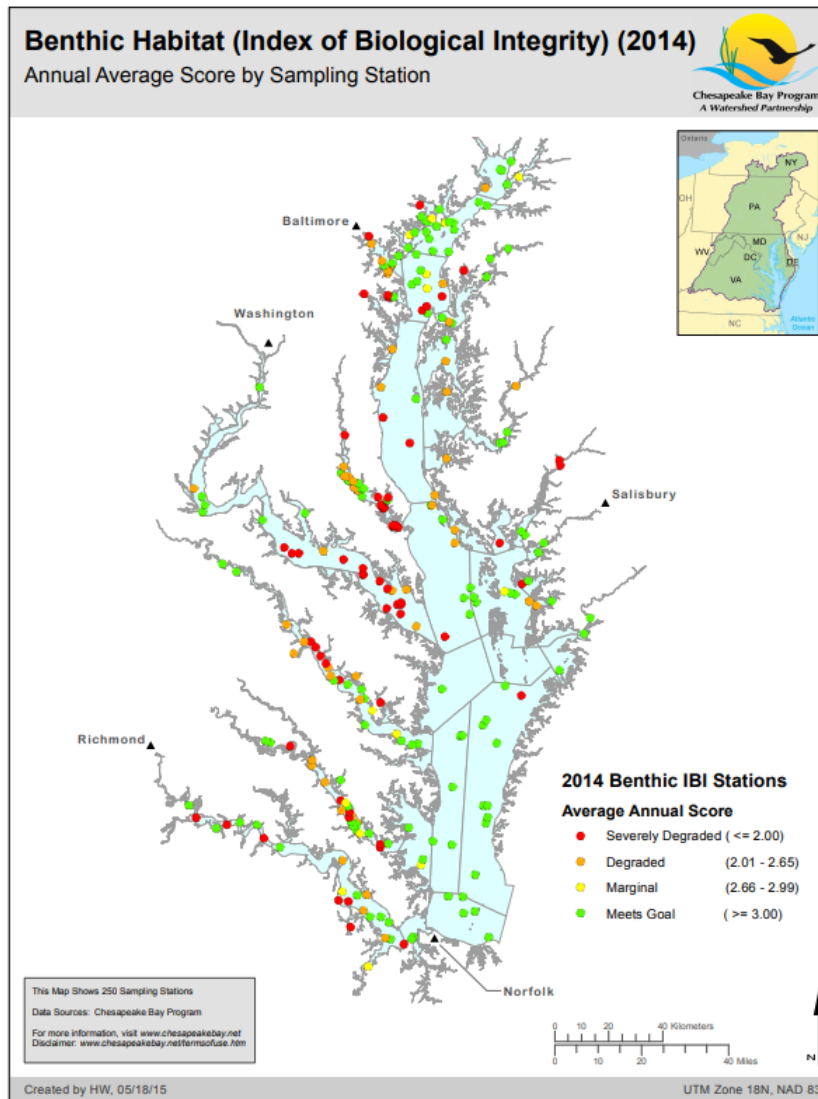
Goal 2:

The best way to fight invasive species is to prevent them from occurring in the first place. To prevent the spread of invasive species, consider planting native flowers, shrubs and trees in your garden. You can also protect waters from aquatic hitchhikers by cleaning your boat hull before moving it to another body of water and by keeping bait or aquarium species out of storm drains and waterways. Do not release any sort of aquarium fish and plants, live bait or other exotic animals into the wild. If you plan to own an exotic pet, make sure to research and plan ahead to make sure you can commit to looking after it.

Problem 3: Oyster Population

Within the Chesapeake Bay region, the eastern oyster is one of its most iconic species. Oysters act as natural filters, as they feed by pumping water through their gills and trapping harmful contaminants. By doing so, oysters are important as they help keep the water clean. They also contribute to the region's economy through catching and selling oysters. Over-harvesting, disease, and habitat loss are contributing to the decline of the native oyster population. This decline is so severe that today's oyster population can only filter a volume of water equal to that of the entire Bay in a year, in comparison to the population in the late nineteenth century being able to within three to four days.





The above GIS-derived map shows average Benthic scores for the entirety of the Chesapeake Bay. This is a measure of the biological integrity of the Bay and as seen above, there is a distinct level of degradation in the Potomac river as it reaches this bay. This is due to the decrease in oysters, a keystone benthic species, and also a reason for their lack of repopulation. This map is a good indicator of the health of some of the most important filtering and cleansing species that need revival in the Potomac.

Goal 3:

To restore oysters in the Bay watershed, consider recycling oyster shells so they can be used to build new reefs. Through the careful management of oyster harvests, the establishment of oyster sanctuaries and the restoration of oyster reefs, experts are working to support healthy, sustainable populations of the bivalve.

PRRP Summary of Goals:

PRRP is focused on aiding and ultimately resolving the problems addressed in this report. In order to complete the mission of our report, the following goals must be met:

G1: Reduce Chemical Contaminants

Significantly reduce the chemical contaminants entering the river.

G2: Prevent Spread of Invasive Species

Combat the spread of invasive species within the watershed by maintaining the landscape surrounding.

G3: Restore Oysters in the Bay Watershed

Promote and maintain oyster sanctuaries to restore their population in the watershed.

References:

“Four Facts About the Potomac.” *ICPRB*, 29 July 2016,
www.potomacriver.org/news/four-facts-potomac/.

Potomac River Fisheries Commission - COMMISSION ORDERS AND POLICIES,
prfc.us/Commission_Orders_and_Policies.html.

“Travel Back in Time at These Six Historical Potomac River Sites.” *Chesapeake Bay Program*,
www.chesapeakebay.net/news/blog/travel_back_in_time_at_these_six_Historical_potomac_river_sites.

Thebault, Reis. “From Smelly to Sparkling: A \$2.7 Billion Cleanup of Anacostia, Potomac Rivers.” *The Washington Post*, WP Company, 21 July 2018

Wongsrichanalai, Kanisorn. *Potomac River during the Civil War*,
www.encyclopediavirginia.org/Potomac_River_During_the_Civil_War.