Basin Profile: Chesapeake Bay Watershed
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Water Status

- In the past 200 years, the Bay has come under pressure from overharvesting of fish and shellfish species, pollution from agriculture, contaminated runoff from ever-growing urban areas, air pollution from both automobiles and power plants, and competition from invasive species.
- The water resource challenges in the CBW are largely the result of water quality issues.
- There has been a dramatic decrease in the number of fish landings, vital to the area's economy. Estimates of the loss of fishery revenue are in the billions of dollars.

Basin Overview
East Coast of United States - New York to Virginia
Area: 165,759 square kilometers
Climate: Temperate
Basin population: 17,000,000

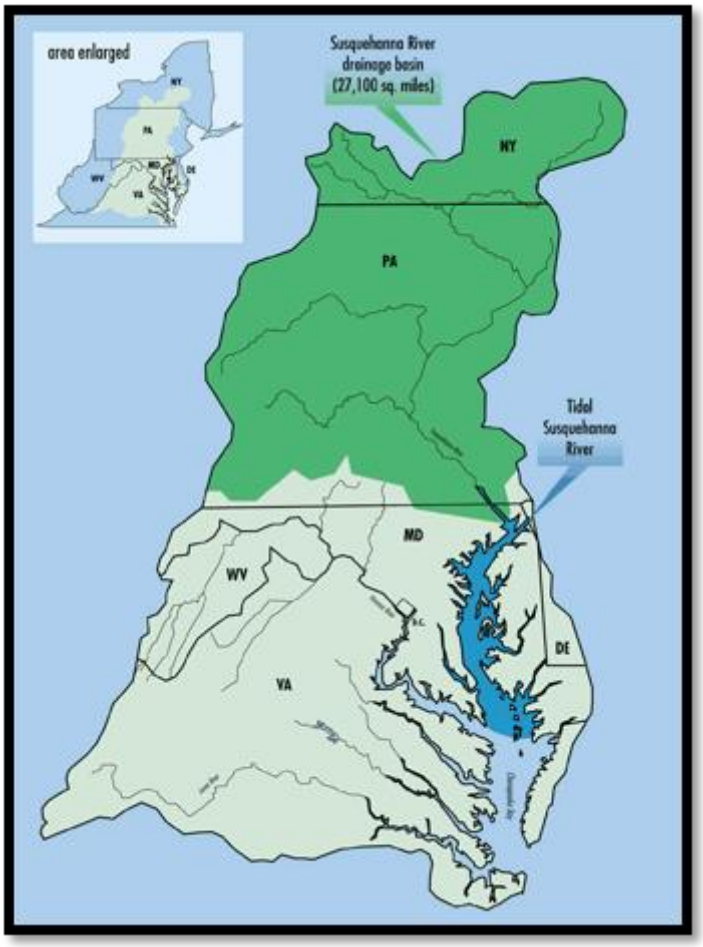

Figure 1. Map of Chesapeake Bay watershed (CBP)

The Chesapeake Bay is the largest estuary in the United States and the third largest in the world. The Bay's watershed encompasses about 64,000 square miles (166,000 square kilometers) and is home to more than 17 million people in New York, Pennsylvania, Maryland, Delaware, Virginia, West Virginia, and the District of Columbia. The Chesapeake Bay watershed (CBW) stretches roughly 500 miles (805 kilometers) from the headwaters near Cooperstown, New York down to Suffolk, Virginia, and the Bay itself extends 200 miles (320 kilometers) from Havre de Grace, Maryland to Virginia Beach, Virginia.

Approximately half of the Bay's 15 trillion gallons of water volume comes from the Atlantic Ocean while the rest is freshwater that enters from 150 rivers and streams that empty into the basin (the Bay watershed encompasses over 100,000 streams, creeks, and rivers in total). The Susquehanna, Potomac, and James rivers are the three largest and supply over 80 percent of the runoff to the Bay. The Chesapeake ecosystem is also altered by multiple series of dams along the river tributaries. The Conowingo Dam on the Susquehanna River currently blocks millions of tons of sediment. An estimated 40% of phosphorus and two-thirds of the sediment that reached the reservoir settled behind the dam over the past few decades. This is a problem because the dam will eventually reach its "pollution maximum", meaning it won't be able to block future incoming pollutants from entering the Chesapeake. As the dam approaches its pollution maximum, an intense rainfall event can cause more and more polluted sediment and cause it to enter the Chesapeake.

Seventeen million people call the Chesapeake Bay home, and an estimated 157,000 people move into the basin every year. Newcomers are attracted by the region's strong economy, diverse cities, and the historical and natural attractions of the area. By 2030, the population is expected to reach almost 20 million residents. The Chesapeake Bay Program (CBP) estimates that about 100 acres of forest are lost each day to development, with 750,000 acres developed since the early 1980s. The Bay region is also very productive for agricultural operations. About 6.5 million acres, or 25 percent of the Bay land cover, is allocated for farmland across more than 87,000 operations.

The multiple jurisdictions that impact the Chesapeake make management a complicated ordeal to say the least. The Chesapeake is currently being protected by the federal government under the Clean Water Act (CWA). The Bay was assigned a Clean Water Blueprint by the Environmental Protection Agency (EPA). A Total Maximum Daily Load (TMDL), or a pollution diet for the Chesapeake, was determined by the EPA. Each of the six states and the District is given its TMDL; the states and the District then individually decide how it plans to meet its limit.

There is a diverse economic activity in the CBW including agriculture, seafood, manufacturing, shipping, tourism, information technology, telecommunications, aerospace, defense, and service industries such as finance and real estate. According to the National Atmospheric and Oceanic Administration's 2009 Fisheries Economics of the U.S. report, the commercial seafood industry in Virginia and Maryland alone created $3.39 billion in sales in 2009, contributing nearly 34,000 jobs. Commercial fishing landings are dominated by sea scallop and blue crab, but other key commercial species in the mid-Atlantic region are the American lobster, eastern oyster, menhaden, quahog clam, squid, striped bass, and summer flounder. Menhaden and blue crab harvests accounted for 68 percent of the total seafood landings in the mid-Atlantic region in 2009. The blue crab average harvest from the Bay accounts for one third of the national yield However, the majority of fisheries are under poor management and have suffered significant declines.

Water Impacts

Environmental Impacts

Approximately 300 million pounds of nitrogen in total enters the Bay each year, a six-fold increase from the load in the 1600s. Nitrogen inputs to the Bay come primarily from agriculture, point sources, and atmospheric deposition. High nitrogen and phosphorous levels fuel large algae blooms in rivers and lakes, creating dead zones of low oxygen that are detrimental to organisms. At the same time that nutrient and sediment inputs have been increasing, the natural ability of the Bay to filter and absorb these nutrients has been diminished. In total, the Bay has lost 98 percent of its oysters, which at one time could filter the entire water volume of the Bay within a day or two. Only about 20 percent of submerged grasses and 50 percent of forest buffers remain from historical levels to filter out nutrients. Fewer than 40 percent of historic wetlands still exist due to development in the surrounding area.

There are over 200 known or suspected alien invasive species in the CBW, of which 46 have been identified as nuisance species and six as grave threats. Mute swans are a non-native species that destroy submerged grass beds year-round (unlike native migratory species) and displace native wildlife by aggressively defending their territory. Nutria, a South American aquatic rodent, destroys wetlands by digging up the roots of marsh grasses. Over 7,000 acres of marsh on the Eastern Shore of Maryland have been eroded and converted to open water by nutria. Zebra mussels, native to Europe, are extremely efficient filter feeders that out-compete native species. They also damage

power plant infrastructure by clogging intake pipes. A particularly sensational invasive species story is that of the northern snakehead, an Asian native, which first appeared in Maryland in 2002 and spread in the Potomac River. Invasive plants crowd out native species and do not provide quality habitat and food for native wildlife. Invasive plant species in the CBW include phragmites, purple loosestrife, and water chestnut.

Economic and Social Impacts

The seafood industry in the Chesapeake Bay is not what it once was. There has been a dramatic decrease in the blue crab population since the early 1990s, due largely to overharvesting. The economic impact to Maryland and Virginia of the decline of the blue crab population between 1998 and 2006 is estimated at $640 million when considering the effects on harvesters, processors, wholesalers, and restaurants The oyster industry has a similar history of depletion by overharvesting, and the Bay oyster population is now only 1 percent of levels in the 1800s. The U.S. Army Corps of Engineers estimates that Maryland and Virginia have lost more than $4 billion in the last 30 years from the decline of the Bay oyster population. Fishermen are rapidly losing their way of life

The degradation of the health of the Bay also has an effect on the sense of connection that Bay residents feel to the land and the watershed. The Bay is a central feature of the region's history and culture and helps to define a sense of place for people living in the CBW. Other social metrics influence water quality and quantity issues in the Bay. For instance, the Anacostia River, one of the most polluted in the CBW, flows through economically beleaguered neighborhoods in Washington, DC. The Anacostia Riverkeeper organization compares the huge trash problem in the Anacostia to a "psychological toxin" like a "broken window that drives people away from a building" (Anacostia Riverkeeper, 2012).

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