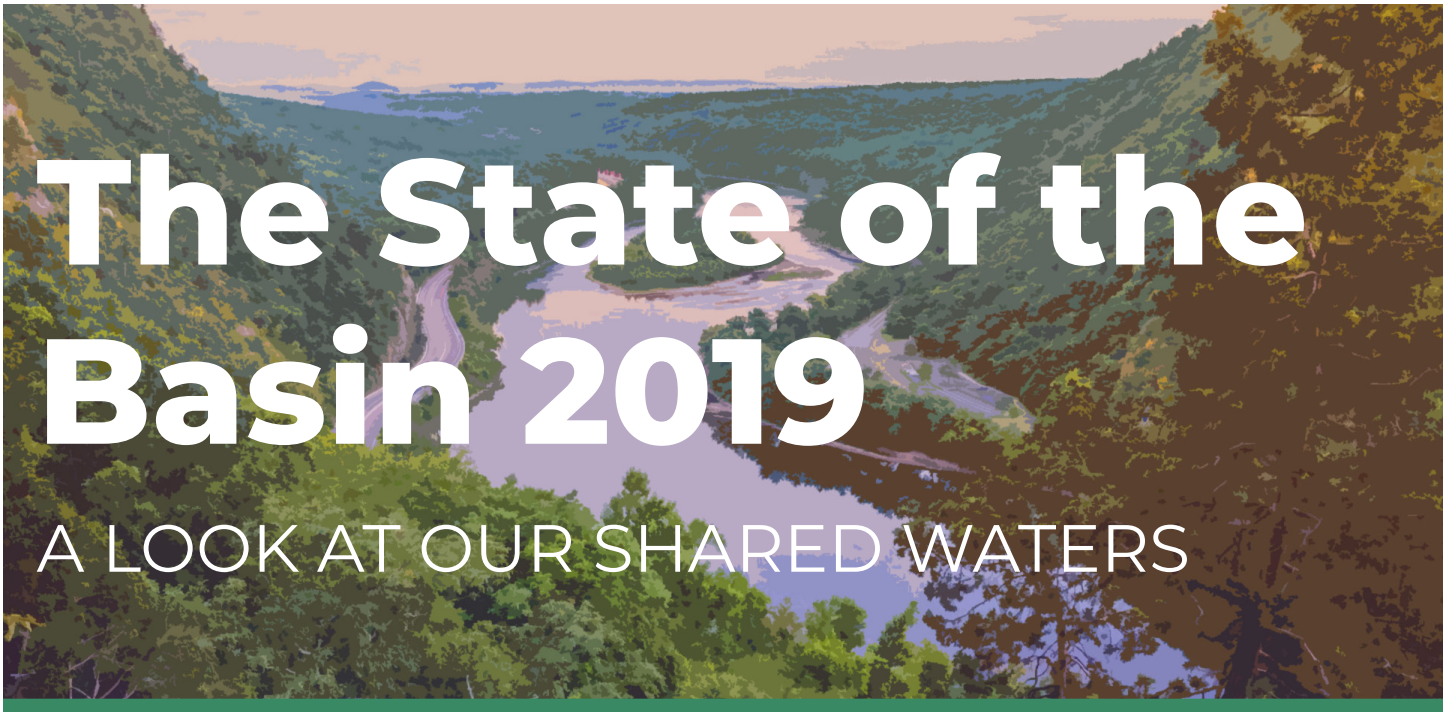


The State of the Basin 2019

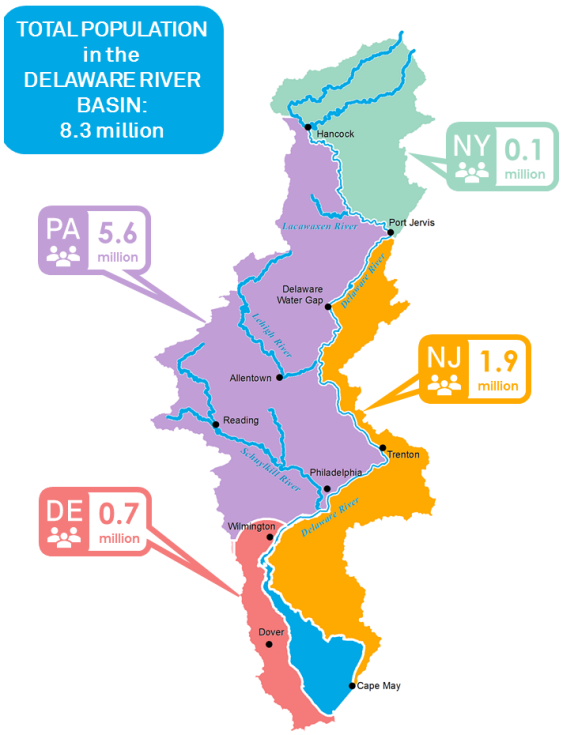
A LOOK AT OUR SHARED WATERS

What defines a "shared water"? Watersheds are the lands that drain to rivers, streams and creeks. A river basin is a combined regional group of watersheds that all drain and flow to a major river. **The availability of water and the protection of water quality are shared responsibilities, since activities and impacts in any portion of a river basin can affect downstream waters and water users.**

The Delaware River Basin covers 13,530 square miles in parts of Delaware, New Jersey, New York and Pennsylvania. The Delaware River is 330miles long. It begins in New York State and flows to the Atlantic Ocean. From about Trenton, NJ downstream to where it opens to the Atlantic Ocean, the river is influenced each day by the movement of the tide. The Delaware River is fed by 216 smaller rivers, canals, creeks and streams that we know of as our local waterways. About 8.3 million people live within the Basin watershed shared by the four states,[1] and an even greater number, **13.3 million people, rely on the Delaware River Basin for their drinking water.**

Beyond providing a source for drinking water and public water supply, **the Delaware River Basin is a vital and valuable ecological, recreational and economic resource.** The Basin is home to aquatic, animal and plant life balanced within a delicate ecosystem that is vulnerable to even small changes in water quality. Millions of people both local and from afar visit the Basin each year to fish, hunt, paddle, recreate and enjoy nature in many ways. The health of our Delaware River Basin waters plays a central role in the quality of life that all Basin residents are able to enjoy.

Every five years, the Delaware River Basin Commission (DRBC), supported by numerous stakeholders and partners, develops a report analyzing the "State of the Basin." This report is a look at the health of the Delaware River and the species within it that examines such key factors as: water availability, water quality, climate change, and land cover. The Delaware River is much cleaner than it has been in past decades, and DRBC with many others is invested in sustaining the improvements we have achieved. **But there is still work to be done if this critical resource is to be restored and preserved for future generations.**



1 U.S. Census ACS data for 2016

Factors Impacting Health of the Basin

The primary factors which impact water quality, water supply and aquatic life within the Basin are:

(1) Pollution, primarily from two classes of sources: "Point source" pollution originates from any single identifiable outfall, such as an industrial or sewage treatment plant outfall, or in the case of older systems, a combined sewer outfall. "Nonpoint source" pollution generally refers to stormwater runoff from farms and developed areas

When thinking of pollution, many people visualize plastic trash floating in the river. However, water quality is impacted as much or more seriously by unseen chemical pollutants. Many of these, like ammonia, are found in the discharge from point sources like municipal wastewater treatment plants. Additionally, legacy contaminants such as polychlorinated biphenyls (PCBs), though diminished through intensive efforts over the past several years, still present potential health risks to people and fish. Nonpoint sources of pollution in the Delaware River Basin vary from excess fertilizers, pesticides, and herbicides used in agricultural and residential areas, to bacteria and nutrients from livestock, pet wastes and faulty septic systems. All of these invisible contaminants can change the delicate balance of dissolved oxygen in the water that aquatic species need to live and thrive.

Pollution discharged to Basin waterways can be extremely harmful to fish, wildlife, and plants, and can also contaminate the food we eat when the water is used by farms to irrigate crops.

"Contaminants" are specific elements and compounds with varying degrees of toxicity to aquatic life and human health. The narrative standard applicable to waters of the Basin requires that: "the waters shall be substantially free from … substances in concentrations or combinations which are toxic or harmful to human, animal, plant, or aquatic life."

(2) Rising sea levels flooding, and droughts associated with climate change

Climate change has the potential to impact water availability in the Basin. Predicted increases in precipitation and temperature, as well as shifts in seasonality, may affect the water cycle and thus the amount of groundwater, streamflow, and snowpack. Warmer temperatures in the winter will mean less water stored as snow. Although more precipitation is predicted for the region, increases in temperature may offset that due to increases in evaporation rates.

Although temperatures in the Basin appear to be increasing, the overall trend in precipitation remains

unclear. Increased temperatures and precipitation as a result of climate change may lead to changes in the seasonality of streamflow and thus the timing of availability of water for different uses. Sea level rise will also impact flow and drought management in the Basin. Extreme weather events may result in more shorter duration floods and dry periods.

(3) Population growth and development

Among the four states comprising portions of the Basin, Pennsylvania accounts for the highest population (67% of Basin residents), followed by New Jersey (23% of Basin residents). These two states also account for the largest land area in the Basin—PA 49.2% and NJ 23.2%. Understanding the changes in population and land cover over time is essential for planning for water resource needs. From 2000 to 2016, the Basin's population increased by more than 93,500 people, or 7%. The population is expected to grow from 8.3 million people today to almost 9 million by 2030. The highest areas of expected growth are the counties in and around Philadelphia, as well as the central and Bay regions.

With the Basin's population continually growing, development of the built environment is accelerating the loss of forested and agricultural lands. Many of these forests protect critical water resources and aquatic habitat in the Basin. Impervious surfaces, such as roads, parking lots, and rooftops, prevent rainfall from infiltrating and recharging groundwater resources. Instead, more water flows across impervious areas, carrying pollutants to streams and rivers and contributing to local flooding. Research has shown that when impervious cover reaches 10%, the health of streams and aquatic life is adversely affected, and that more than 25% impervious cover is potentially "non-supporting" of stream habitat. Areas with more development typically have higher percentages of impervious cover.

The smart management of growth and development will be essential to mitigate the otherwise negative impacts it may have on source waters, water quality, and aquatic life within the Basin.

A look at the health of living species within the Delaware River Basin

The waters of the Delaware River Basin are home to an abundance of fish and aquatic species, which in turn support an array of wildlife. Factors affecting the health of native fish and other aquatic life in the Delaware River Basin include pollution, water temperature, pH, salinity and the spread of invasive species – animals, plants and other organisms that are intentionally or accidentally introduced into habitats outside their natural environment that displace or put a strain on native species.

The health and abundance of fish and other aquatic animals, including some of those pictured below, are monitored by DRBC and partners for the State of the Basin report.

In order to fully protect these species, efforts are needed to further reduce the levels of toxic chemicals and other pollutants in our waters that accumulate in fish tissue. Cooperative efforts among state and federal agencies and other partners to reduce these "bioaccumulative" pollutants should continue and be expanded to address all persistent toxic pollutants.

Efforts by public and private entities to are needed to conserve areas, restore lands that have been contaminated by legacy pollutants and ensure future development is undertaken in a way that protects water resources from adverse impacts. Other actions in the form of catch and release programs, minimum catch size requirements and increased monitoring may be necessary to support the sustainability of various species.


American Eel
Photo credit: Evan Kwityn, DRBC


White Perch
Photo credit: Evan Kwityn, DRBC


Brook Trout


Osprey


Horseshoe Crab
Photo credit: Partnership for the Delaware Estuary Staff


Shad
Photo credit: Evan Kwityn, DRBC


Weakfish
Photo credit: Evan Kwityn, DRBC


Blue Crab
Photo credit: Evan Kwityn, DRBC


Macroinvertebrates
Photo credit: Dave Huth, Flickr


Striped Bass
Photo credit: Partnership for the Delaware Estuary Staff


Eastern Oyster


Freshwater Mussels

Our Role in the Health of the Delaware River Basin

We all have a role to play in the protection, improvement and sustainability of the Delaware River Basin. **Everyone can do something to support this vital resource.**

Members of the public can take measures at home to conserve water and **use fewer chemicals** in their households and on their lawns and properties. You can **volunteer for cleanups** of waterways and recreational spaces within the Basin to ensure the resource can be enjoyed by others and that fish and wildlife are protected from pollution.

Elected officials from the Basin states play an important part in allocating funds for the conservation and monitoring work done by DRBC and stakeholder groups. Members of the public can **contact their elected officials** at any time to urge their support for efforts that support conservation in the Basin.

Delaware River Basin Commission
DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
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To read the full State of the Basin Report, visit www.drbc.gov.