

# 2016 New Jersey Integrated Water Quality Report

## Fact Sheet

### Purpose

New Jersey's biennial Integrated Report assesses the health of the state's waters as required under sections 303(d) and 305(b) of the federal Clean Water Act, the NJ Water Quality Planning Act, and the NJ Water Pollution Control Act.

This report provides information on:

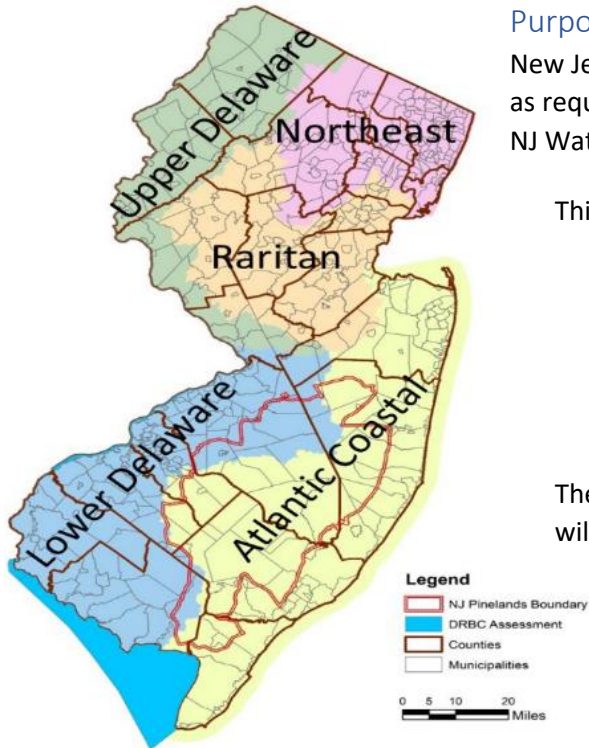
- Current water quality conditions
- Water quality trends
- Causes of water quality impairment
- Restoration and protection efforts
- NJDEP Water Programs

The EPA and New Jersey state government will use this information to:

- Determine regulatory, preventative, and restoration priorities
- Identify funding for protecting, restoring, and maintaining waters of the state

New Jersey's waterbodies provide environmental, public health, recreational, and economic benefits to our citizens.

It is important to regularly analyze whether these benefits are being supported currently and to ensure their protection for decades to come.



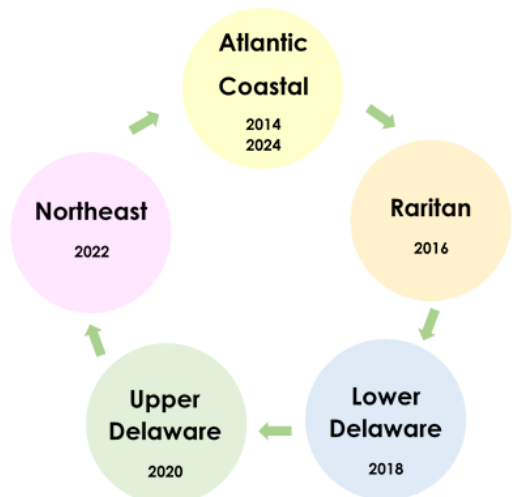
The 2016 Integrated Report summarizes results of both short-term and long-term water quality analysis. The water quality data generated during a five-year period (2010-2015) provides a "snapshot" of regional water quality conditions over a relatively short period of time along with an overview of statewide water quality conditions.

Long-term trends, including ambient chemical data, macroinvertebrate data, and fish population studies, provide a better indication of changes in water quality over time.

Since 2014, NJDEP has employed the rotating regional approach to integrated water quality assessments. In addition to the statewide assessment, this approach includes a comprehensive assessment of one of New Jersey's five water regions each cycle. The current report focuses on the **Raritan Water Region**.

This rotating regional approach will result in a comprehensive assessment of the entire State every ten years.

### Rotating Basin Approach



**The Integrated Report covers 958 Assessment Units (AUs):** over 18,000 miles of rivers and streams, 50,000 acres of lakes, ponds, and reservoirs, 950,000 acres of wetlands, 260 square miles of estuaries, 127 miles of coastline, and 450 square miles of ocean.

**The 303(d) List of Impaired Waters** identifies pollutant causes of water quality impairments. The top five causes of impairment include *E. coli*, biological (cause unknown), arsenic, total phosphorus, and PCB in fish tissue.

## STATEWIDE Key Facts and Findings

- **Statewide Long-Term Trends** over a 30-year period (1980-2011) show total phosphorus and total nitrogen improving; however, nitrate, total dissolved solids, and chloride show increasing concentrations.

### Why?

Since the 1980's, wastewater dischargers have been regionalized and upgraded to secondary treatment, New Jersey's Pollution Discharge Elimination System (NJPDES) permits have reduced nutrient discharge levels, NJDEP nonpoint source pollution programs have been implemented, along with local stewardship activities aimed to reduce nonpoint source pollution.

Ammonia reduction measures implemented at wastewater treatment plants oxidize ammonia to form nitrate, inadvertently resulting in increased nitrate concentrations. Ammonia is much more detrimental to the environment than nitrate because of its uptake of oxygen and its toxicity to aquatic life.

Runoff from urban and agricultural areas, including runoff of road salt used to control ice on roadways, are the likely cause of increased TDS and chloride concentrations over time.

- **Ocean waters** are **100%** swimmable and shellfish-harvestable.
- **Biological impairments** based on benthic macroinvertebrates and fish communities are the primary cause of General Aquatic Life Use impairment. A new listing methodology for biological assessments resulted in 228 new biological impairments on the 303(d) Impaired Waters List that previously were not listed\*.

\* The new method lists all biological impairments whereas the previous listing methodology did not list biological impairments if there were aquatic-life based water quality impairments in the same AU.

**A significant increase in data over the last decade:**

- Increase from 300,000 data samples used in the 2006 assessment to 5 million data samples used in the 2016 assessment.
- Number of AUs with at least one designated use assessed rose to 97%.
- Unassessed designated uses declined from 45% to 23% of AUs with insufficient data\*.
- Number of AUs where all designated uses are assessed rose from 30% to 55%\*.

\* Does not include fish consumption



### New Jersey Water Quality Trends



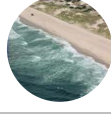



Trends	Statewide	Raritan Water Region
Total Phosphorus	↓	▬
Total Nitrogen	↓	↓
Nitrate	↑	▬
Total Dissolved Solids and Chloride	↑	↑
Biology	NA	▬
Metals and Unionized Ammonia	↓	↓

↓ Decreasing Concentration Trend   
 ↑ Increasing Concentration Trend   
  Stable

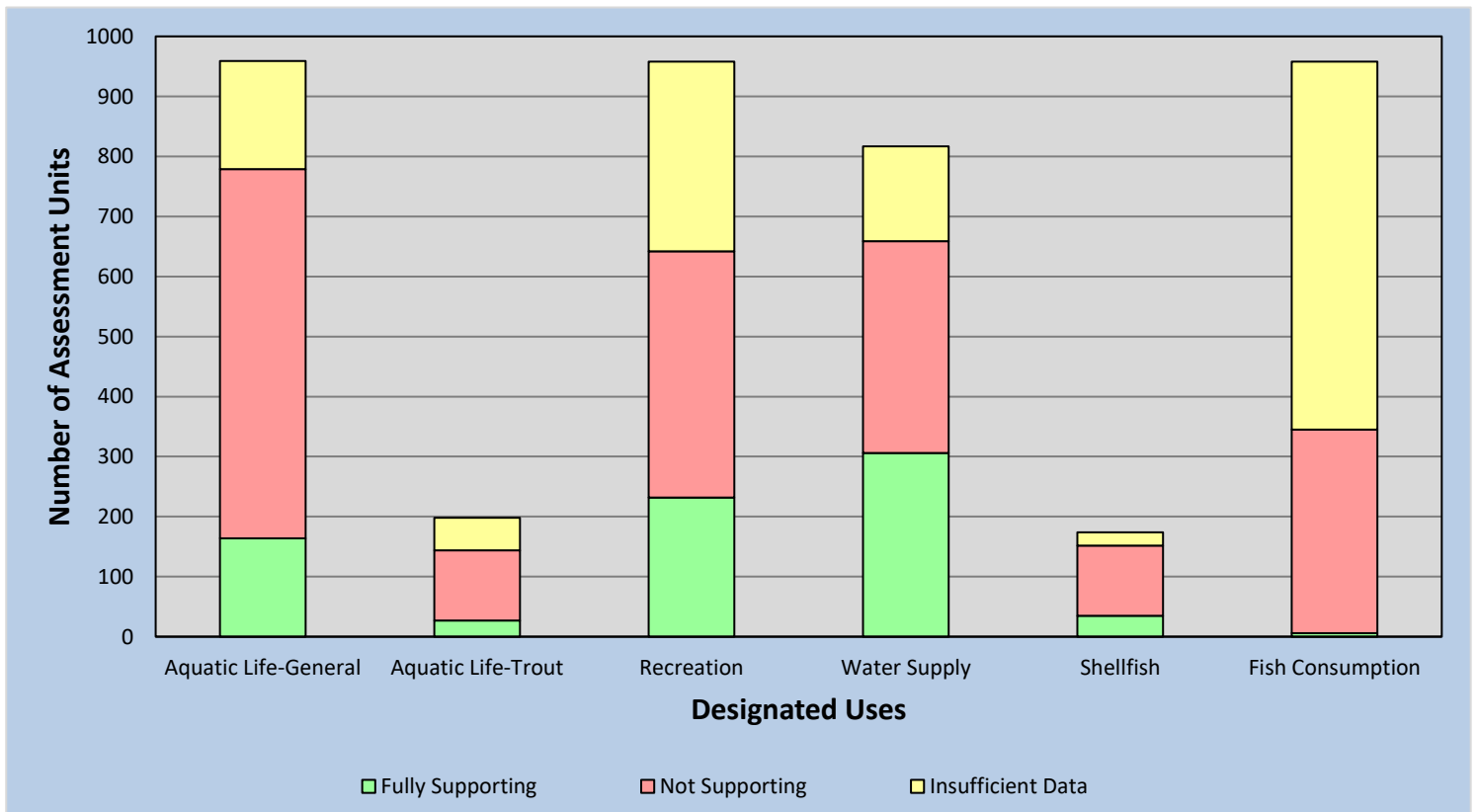
NJDEP administers numerous programs to restore, maintain, and enhance water quality. These programs include regulatory and non-regulatory water pollution control programs, along with pollution prevention through education, outreach, and stewardship programs for volunteer and community groups. The progress exhibited by NJDEP's water quality management programs is supported by the results of the water quality trends analysis, which shows improving and stabilizing conditions for key parameters over time.

## Overview of Designated Uses

Through the Integrated Report, NJDEP analyzes whether waterbodies are meeting water quality standards by determining if they support a **designated use**. Designated use descriptions and examples of implemented actions are described below:

Designated Use	Description	Actions
 Aquatic Life (General)	Can these waters support a healthy ecosystem? Monitoring focuses on determining excessive nutrients and impaired biological communities which are the primary causes of designated use impairment.	Water Quality Restoration Grants for Nonpoint Source Pollution are made available annually to help improve water quality due to excessive nutrients.
 Aquatic Life (Trout)	Can species of trout survive and reproduce in these waters? These waterbodies are monitored for meeting dissolved oxygen and cold-water temperature ranges capable of supporting trout species.	Trout Production waters are eligible for Category One Designation and thus protected from any measurable change in water quality.
 Recreation	Can we swim, boat, and do other activities in these waters? Three criteria that are monitored and tested to determine recreational use are fecal coliform, E. coli, and Enterococcus.	TMDLs to identify and reduce pollutant loads to meet surface water quality standards have been established for 73% of impaired waters.
 Water Supply	Can we use these waters as sources for drinking water? Ambient water quality is monitored in rivers and lakes for chemical pollutants, metals, and toxins before undergoing treatment to be used as a water supply.	Water supplies are protected by the NJ Safe Drinking Water Act and NJ Water Supply Plan by establishing standards, conducting monitoring, completing inspections, and resolving violations.
 Shellfish Harvest	Can we eat clams, oysters or mussels from these waters? NJDEP monitors fecal coliform levels and the bacterial species <i>Vibrio parahaemolyticus</i> to ensure safe harvests of shellfish.	The Nonpoint Source Tracking Program targets degraded areas by identifying pollutant sources and collaborating with the community to fix the problem.
 Fish Consumption	Can we eat fish from these waters? Fish tissue in different species are currently monitored for metals including "legacy" pollutants such as PCB, DDT, and chlordane which are no longer manufactured, but are still found in fish tissue.	NJDEP issues Fish Consumption Advisories and Guides to advise on which fish are safe to eat. An approved Mercury TMDL addresses air emissions to decrease concentrations in fish tissue.

## 2016 Statewide Designated Use Assessment Results



## RARITAN REGION

### Key Facts and Findings

The **Raritan Protection Plan** was approved in 2018 as the first recognized protection plan by EPA in the country. This plan addresses Total Phosphorus and Total Suspended Solids in 66 Assessment Units (AUs) in the water region.

The **Raritan TMDL** was approved by EPA in May 2016. The TMDL addresses 33 AUs for Total Phosphorus, 15 AUs for Total Suspended Solids, 3 AUs for pH, and 1 AU for Dissolved Oxygen. Its regulatory actions require nutrient reductions impacting 45 wastewater treatment plants.

**Raritan Nonpoint Source Restoration** efforts include seven Watershed Plans approved and \$7.6 million funding for restoration projects since 2015.

The Raritan Water Region underwent a comprehensive analysis to determine water quality.

#### Regional Trends Observed:

- Total Nitrogen show decreasing concentrations
- Total Phosphorus show stable concentrations
- Nitrate has mixed results
- Biological community conditions remain stable

#### Metals and Ammonia:

In 1998, there were 191 impaired listings for metals including unionized ammonia. In 2016, only nine metal listings remain on the 303(d) List, showing a reduction of 95% due to factors such as:

- Issuing discharge limits for point source dischargers (both water and air)
- Remediation of contaminated sites
- Manufacturers closing or moving out of the region

Through the Rutgers Sustainable Raritan River Initiative, NJDEP collaborated with stakeholders to finalize assessment decisions and help refine restoration and protection priorities.

## RARITAN REGION

### Biological Trends

Biological trends analysis, which involved fish indexes of biotic integrity (FIBI) and macroinvertebrate assessments from 1999 to 2015, point to stable conditions with the majority of sites showing no changes over the 15-year period. The trends also show a correlation between biological impairment and anthropogenic factors such as agricultural land use, urban land use, increases in impervious surface, and decreases in forests and wetlands in a stream's watershed.

National studies have shown that impervious surface is the most predictive and reliable land use indicator for biological integrity, with degradation occurring where impervious surface exceeds 10% of watershed land use. In the Raritan Water Region, biological communities exhibit high sensitivity to land use changes within the riparian buffer. Where impervious surface exceeds 10% in the riparian buffer, the biological communities display extensive degradation with 90% of the biological communities impaired. Without a buffer to reduce the effects of stressors within the watershed, the biological communities are inundated and unable to recover. Development in the riparian buffer degrades the benefits from a healthy ecosystem by destabilizing streambanks, increasing levels of sedimentation and other nonpoint pollutants, increasing water temperatures, damaging stream habitat, and increasing the frequency and intensity of flooding and low stream flows. NJDEP's water quality protection programs guard against further degradation of waters in part through protection of riparian buffers such as providing 300-foot riparian zones along waters designated as Category 1 to protect and maintain their exceptional water quality.

The full 2016 Integrated Report is available on NJDEP's website at <http://www.state.nj.us/dep/wms/bears/assessment.htm> along with other related documents.



### Biological Condition Trends: 1999 to 2015

