

# Delaware River Basin Commission

## Plenary Session

*New Jersey Water Environment  
Association*

*Steve Tambini, Executive Director,  
DRBC*

*May 8, 2019*



Photo: <http://pariveroftheyear.org/wp-content/uploads/2014/01/cody20102.jpg>



Photo courtesy of U.S. Army Corps of Engineers





**Delaware River Basin Commission**

DELAWARE • NEW JERSEY  
PENNSYLVANIA • NEW YORK  
UNITED STATES OF AMERICA

# Today's Agenda

- Who we are (and who we “are not”).
- What we do.
- One case study.
- Regulatory collaboration.



*Photo: Keith Balderston*

# Who are we?



Delaware River  
Joint Toll Bridge  
Commission



Delaware River and Bay Authority



Delaware Watershed  
Research Fund



DELAWARE RIVER  
PORT AUTHORITY  
*of Pennsylvania & New Jersey*<sup>®</sup>

# Delaware River Basin Commissioners



New Jersey Governor, Phil Murphy,  
DRBC Chair



New York Governor, Andrew Cuomo,  
DRBC Vice Chair



Pennsylvania Governor, Tom Wolf



Delaware Governor, John Carney



Major General, Jeffrey Milhorn,  
US Army Corps of Engineers



# Delaware River Basin Commission

## ■ Five Equal Members:

■ Delaware



■ New Jersey



■ Pennsylvania



■ New York



■ Federal Government

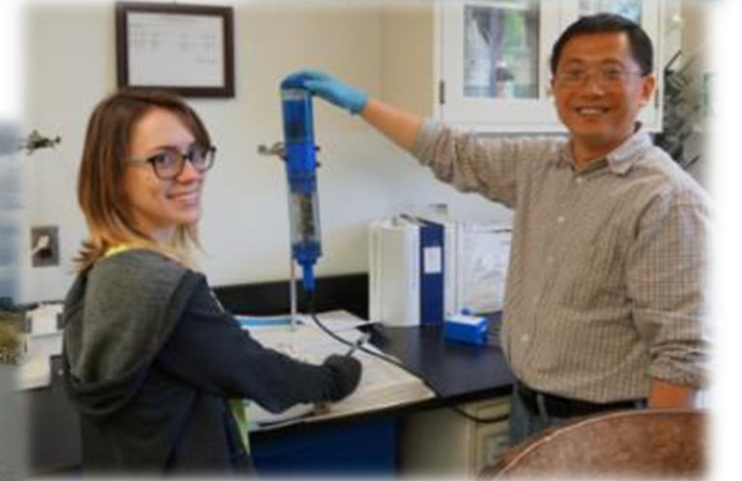


- Four Governors are the Commissioners
- Commissioner may select alternates
- Federal Commissioner is Commanding General, USACE, NAD
- Majority rules in most voting
- Meets quarterly

Note: New York City and Philadelphia are “advisors” and not members

# DRBC Staff and Budget

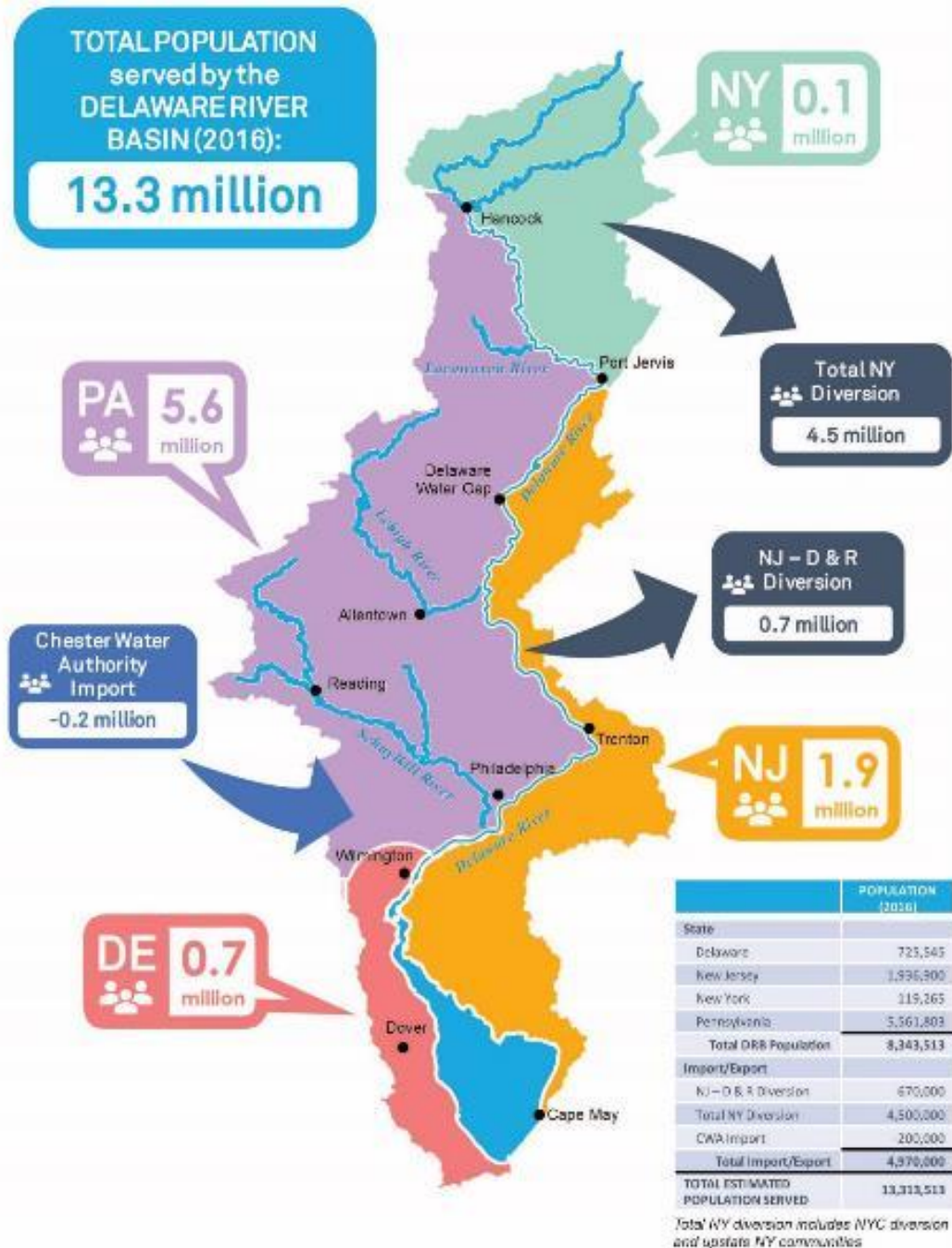
- Professional Planners, Engineers and Scientists
- 39 Budgeted Staff (12% Vacancy Rate)
- FY2019 Budget = \$6.3 million
- Funding from “Signatory Members” = \$1.7 M (27%)
- Located in West Trenton, NJ since 1974



# The Delaware River

- 330 miles long
- Interstate boundary its entire length
- Longest, un-dammed U.S. river east of the Mississippi (dams are located on tributaries, not the main stem Delaware)
- Tidal to Trenton, NJ





# The Delaware River Basin

- ~13 million people (about 5% of the U.S. population) rely on its waters
- Provides half the drinking water to NYC
- Drains 13,539 square miles of watershed in 4 states
- 6.4 billion gallons are withdrawn every day
- Contributes over \$21B in economic value



# The Delaware River “Today”



Photo: Delaware River Sojourn



Photo: Nicholas A. Tonelli



Photo: Keith Balderston



Photo: <https://camdenwd.weebly.com/>



Photo: Delaware River Sojourn

# It Used to Look Like...








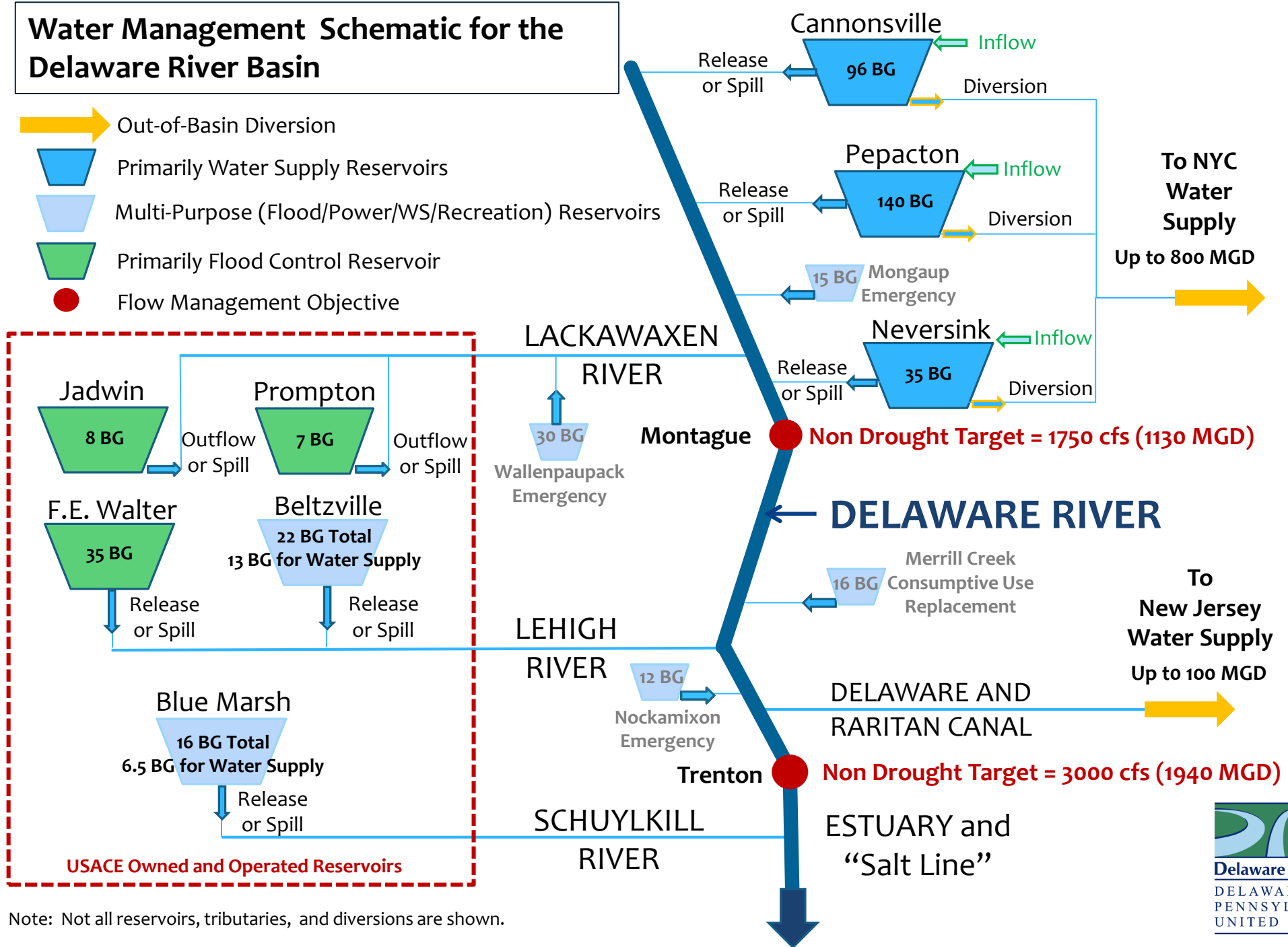
*Slaughterhouses discharging in 1928  
(PWD Historic Collection)*



*Fish kill on the Delaware from oil spill in 1929  
(Temple Archives)*

# Water Management Schematic for the Delaware River Basin

-  Out-of-Basin Diversion
-  Primarily Water Supply Reservoirs
-  Multi-Purpose (Flood/Power/WS/Recreation) Reservoirs
-  Primarily Flood Control Reservoirs
-  Flow Management Objective



Note: Not all reservoirs, tributaries, and diversions are shown.



# And Sometimes It Looked Like...



*Delaware River at Washington Crossing in April 2005*



*Delaware River at Trenton in 1965*

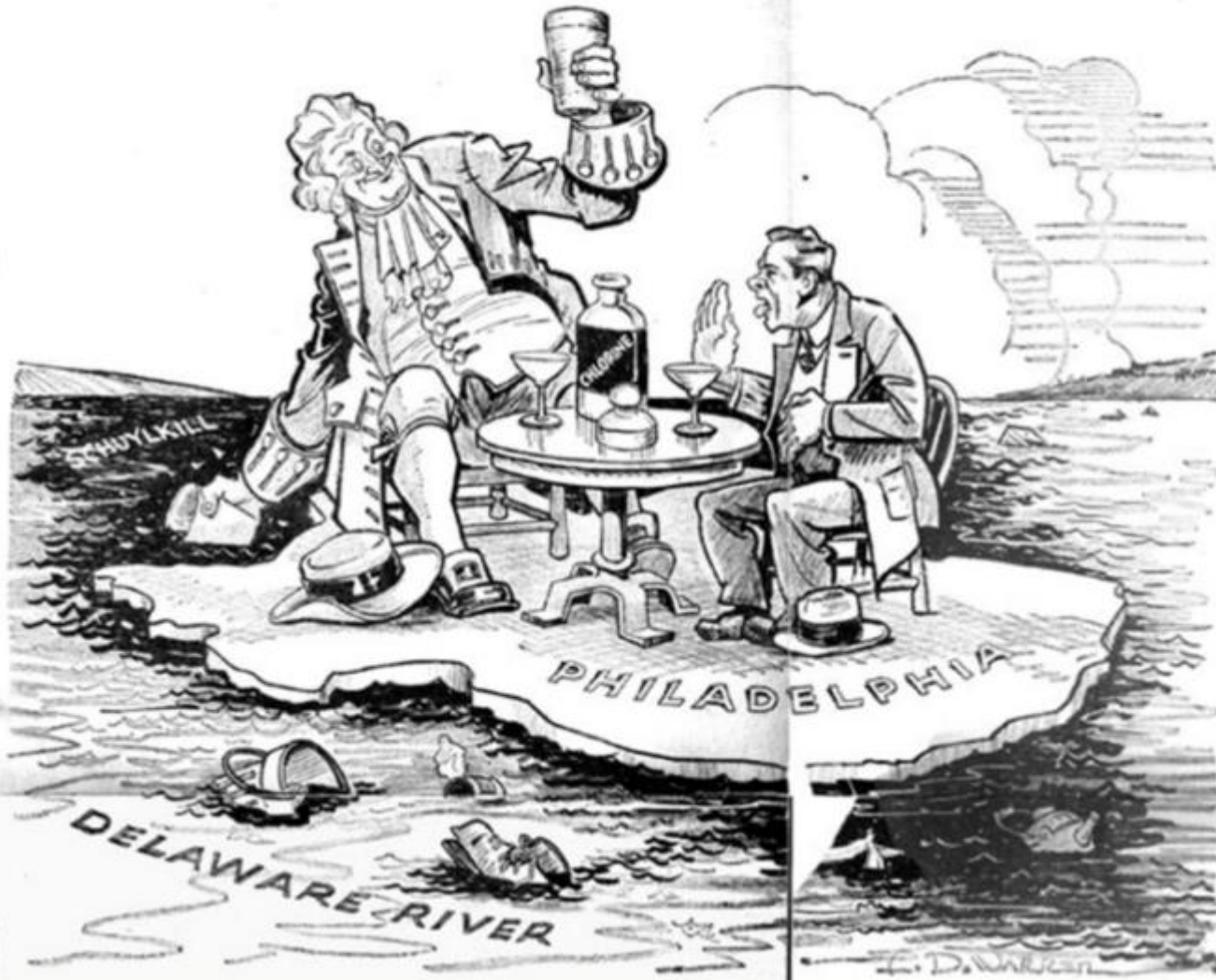
EDITORIAL PAGE  
**PHILADELPHIA RECORD**

The War in Outline :: America Speaks :: Travel

SUNDAY, MARCH 14, 1937

Sports :: Stage :: Music :: Art :: Radio :: Puzzles

**WATER, WATER EVERYWHERE, BUT NOT A DROP FIT TO DRINK.**



# The Problems

- Water supply shortages and disputes over the apportionment of the basin's waters
- Severe pollution in the Delaware River and its major tributaries
- Serious flooding

# The Challenge

- 4 States
- 42 Counties
- 838 Municipalities
- NY City



# The Solution: The Delaware River Basin Commission

- 1961 – President Kennedy and the four Basin State Governors sign the Delaware River Basin Compact, the federal/state law that formed the Delaware Basin Commission (DRBC)



# Delaware River Basin Compact

- Recognizes DRB as a regional asset with local, state and national interests
- Management and control of water resources under a **Comprehensive Plan** will bring benefits and is in the public welfare
- The Commission shall develop and effectuate **plans, policies and projects** relating to the water resources of the Basin





# DRB Compact Basic “Charges” From the Preamble

A Comprehensive **Plan** administered by a basin wide agency will provide:

- abatement and control of stream pollution;
- conservation and development of ground and surface water supply...;
- development of recreational facilities;
- propagation of fish and game;
- promotion of related...watershed projects;
- protection to fisheries...;
- development of hydroelectric power;
- control of movement salt water;
- flood damage reduction;
- and **regulation** towards the attainment of these goals.

# DRBC Core Responsibilities

- **FLOW** - An adequate and sustainable supply of water.
- **QUALITY** - Clean and healthy water resources.



*View from Bowman Hill Tower by Linda Park*

# The Quality of Basin Waters Shall Be Maintained For:

- Public drinking water (after reasonable treatment)
- Recreation
- Wildlife, fish and other aquatic life
- Regulated waste assimilation



*Delaware River at Point Mountain by David B. Soete*

# In the News

**WHYY** News Radio & Podcasts TV Arts Events Education

SCIENCE ENVIRONMENT

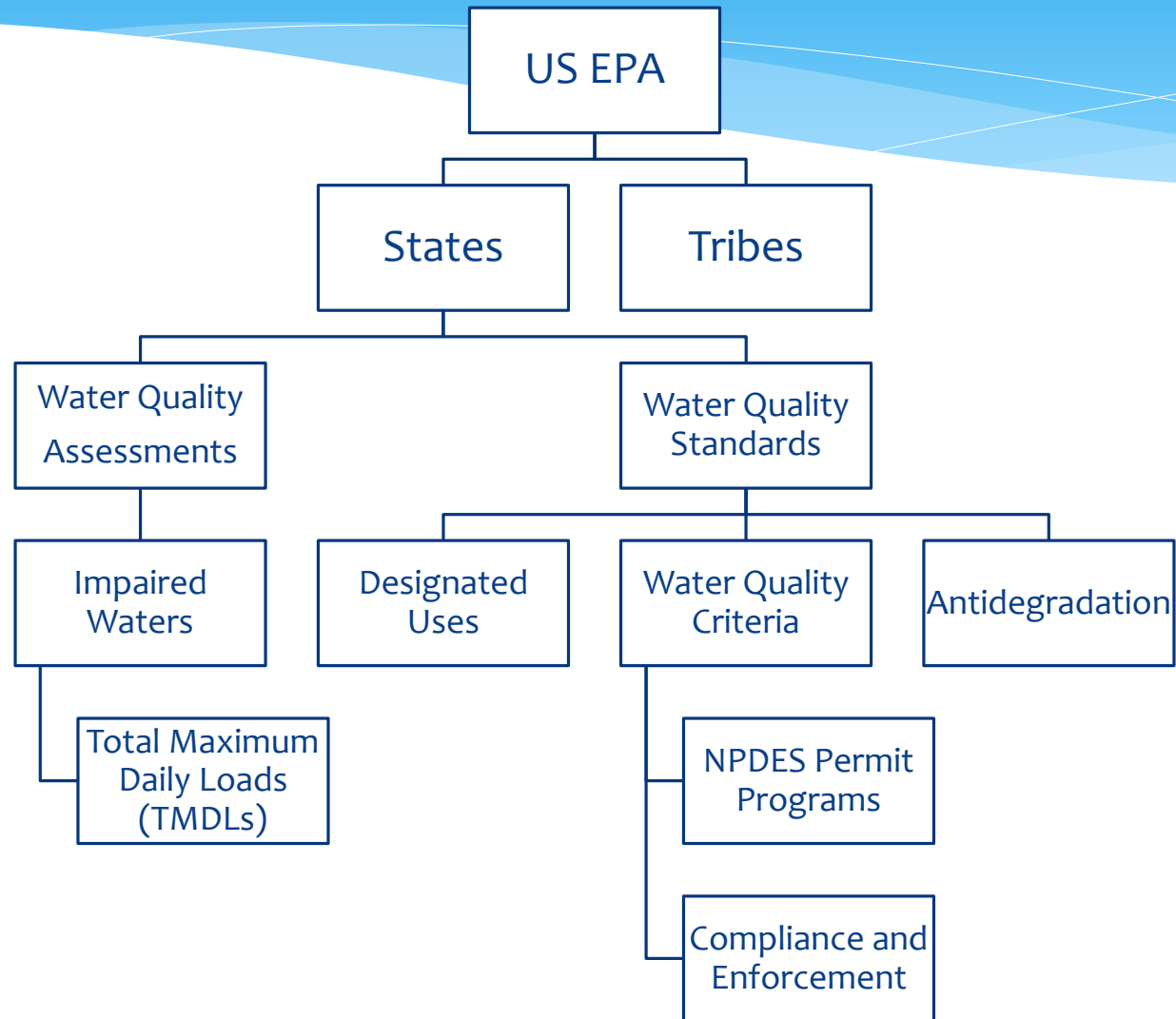
REVIVING THE RIVER

## How the Clean Water Act fixed the Delaware River's pollution problem

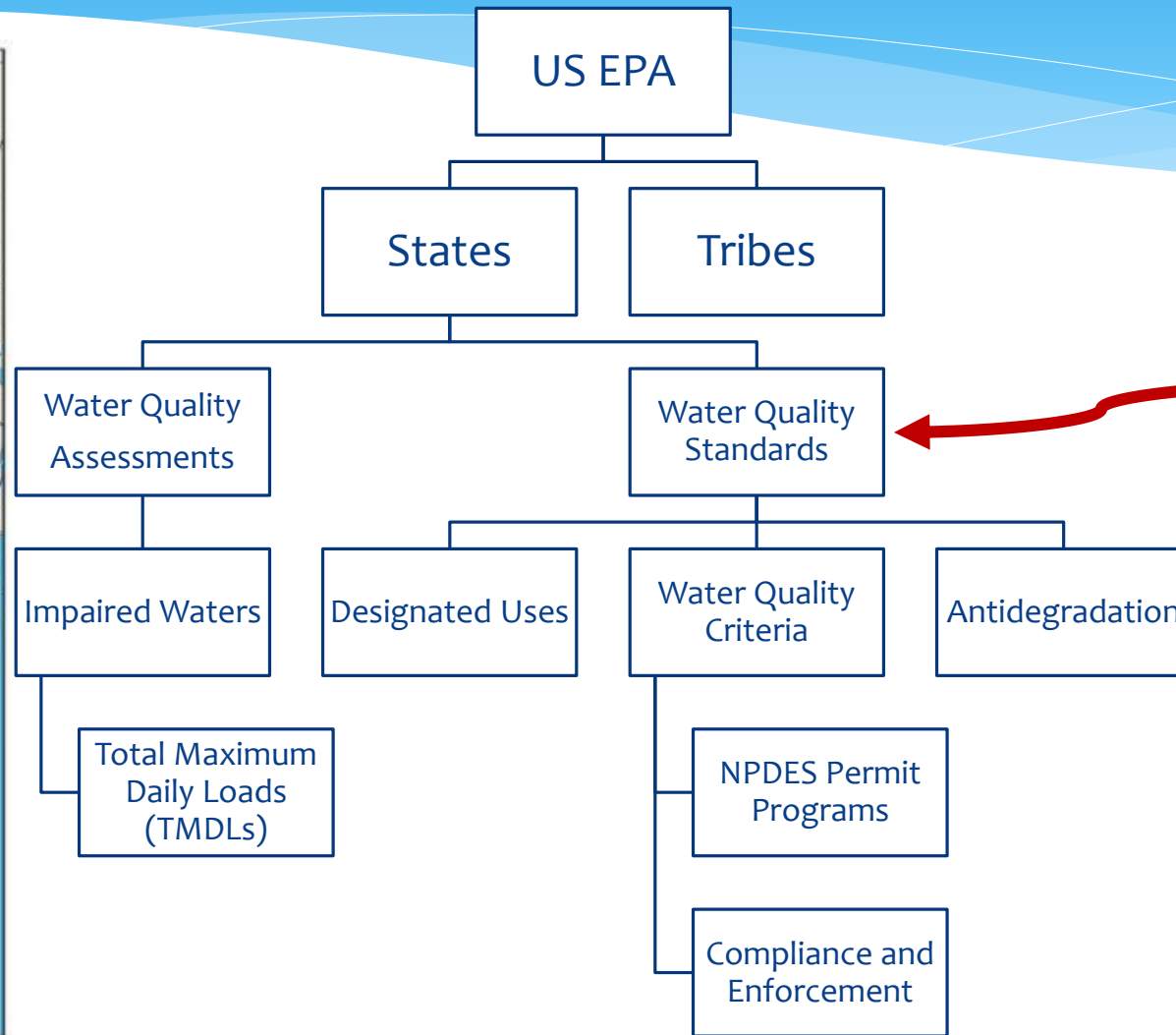
By [Susan Phillips](#) · January 15, 2019

<https://why.org/articles/how-the-clean-water-act-fixed-the-delaware-rivers-pollution-problem/>

# Clean Water Act Responsibilities



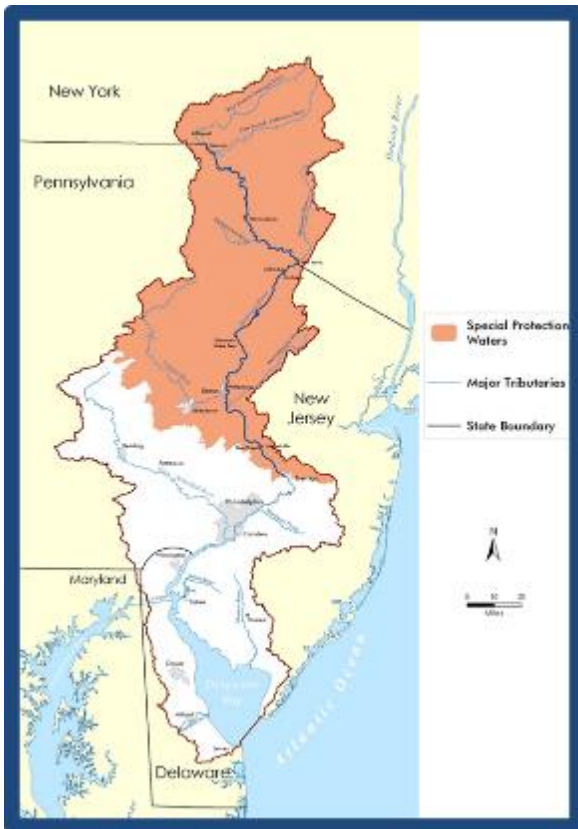
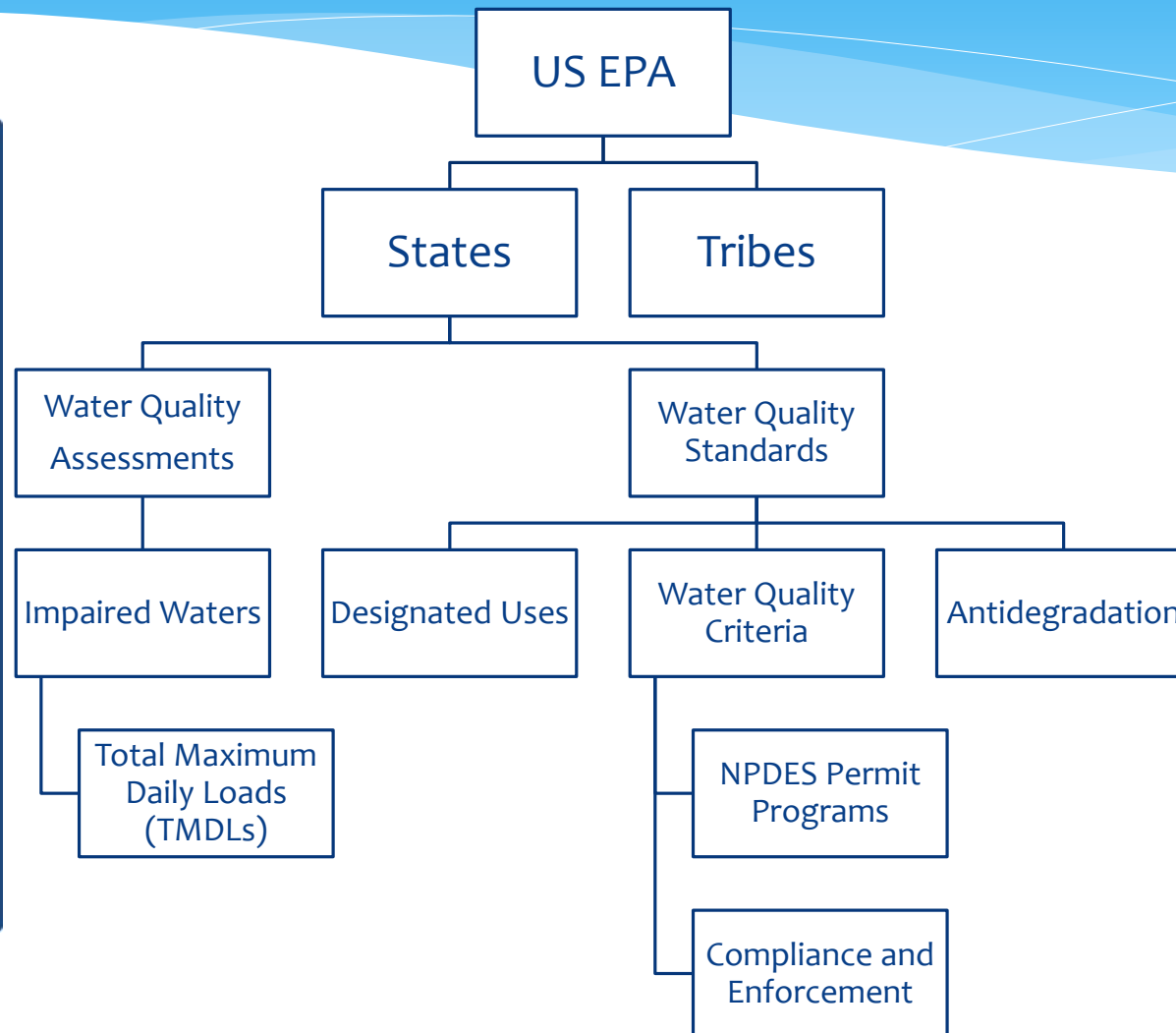
# Clean Water Act Responsibilities



***For Main Stem Delaware River Interstate Waters:***

- DRBC establishes or revises WQ Standards, WQ Criteria and Designated Uses.
- State WQ Regulations refer to or defer to DRBC WQ Standards.

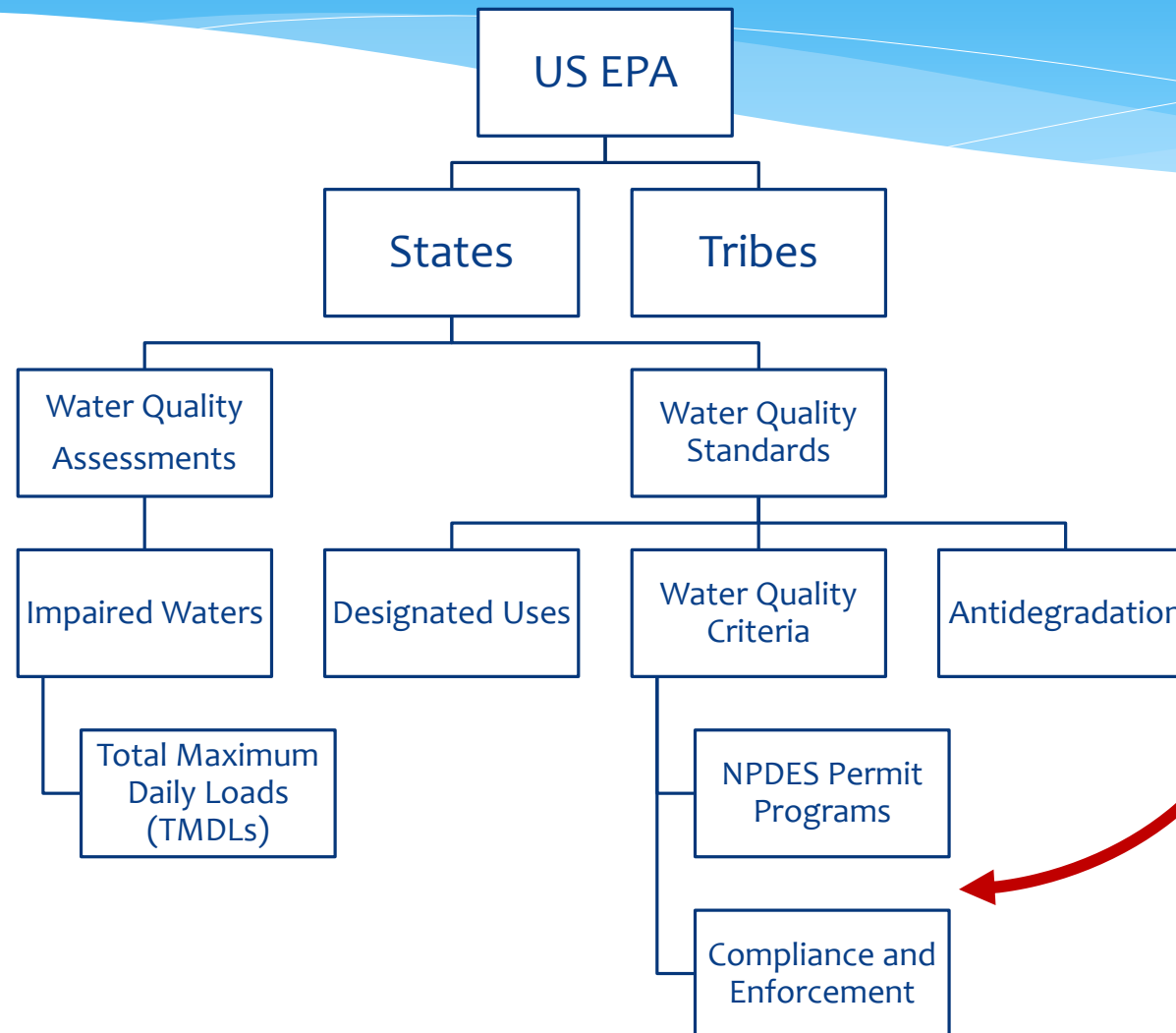
# Clean Water Act Responsibilities



***For Main Stem Delaware River Interstate Waters:***

- DRBC established Special Protection Waters for the entire main stem upstream from Trenton.

# Clean Water Act Responsibilities

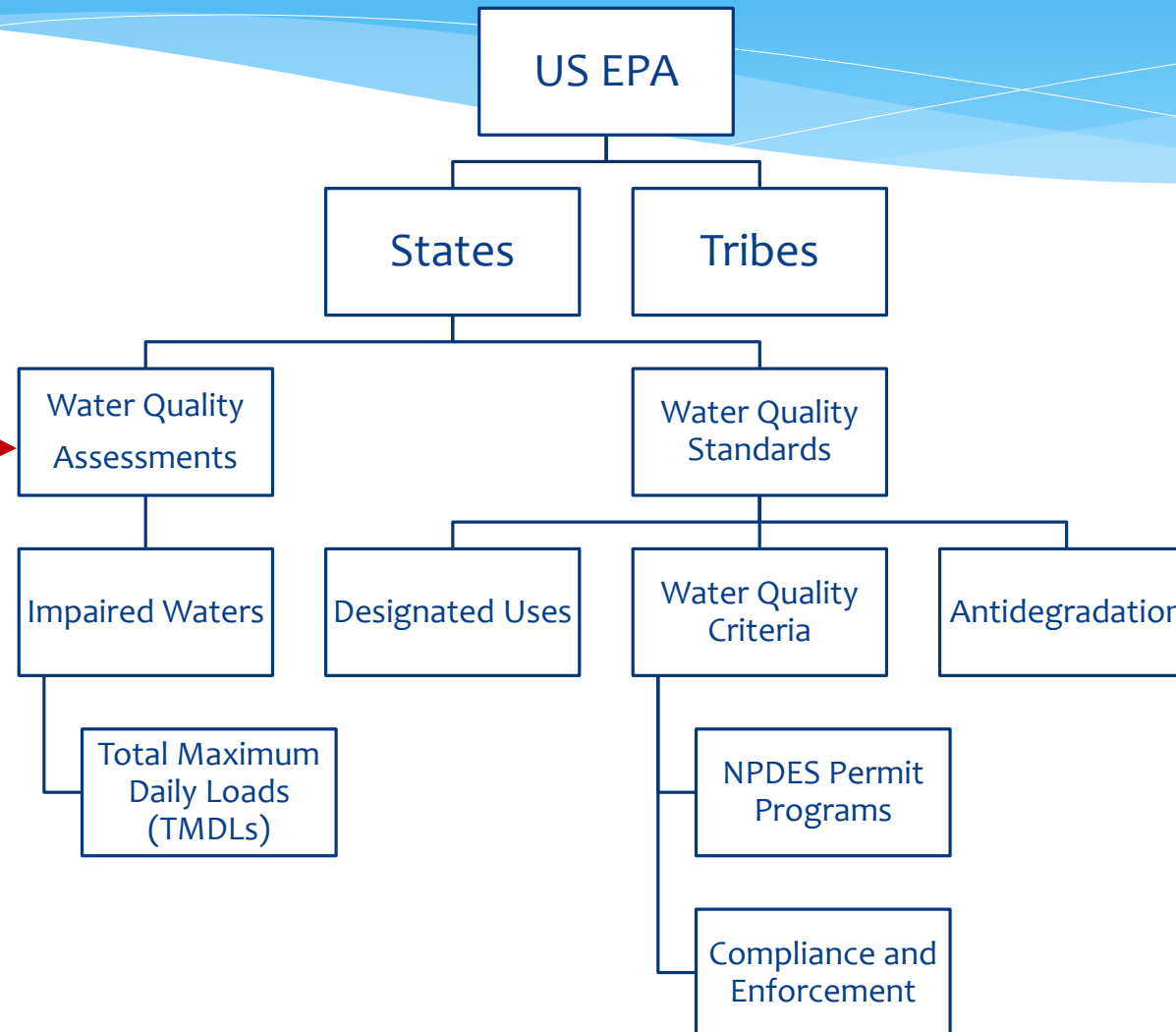


## ***For Main Stem Delaware River Interstate Waters:***

- DRBC uses docket approvals or administrative agreements to implement and enforce water quality criteria.
- Both are added to the DRBC Comprehensive Plan.



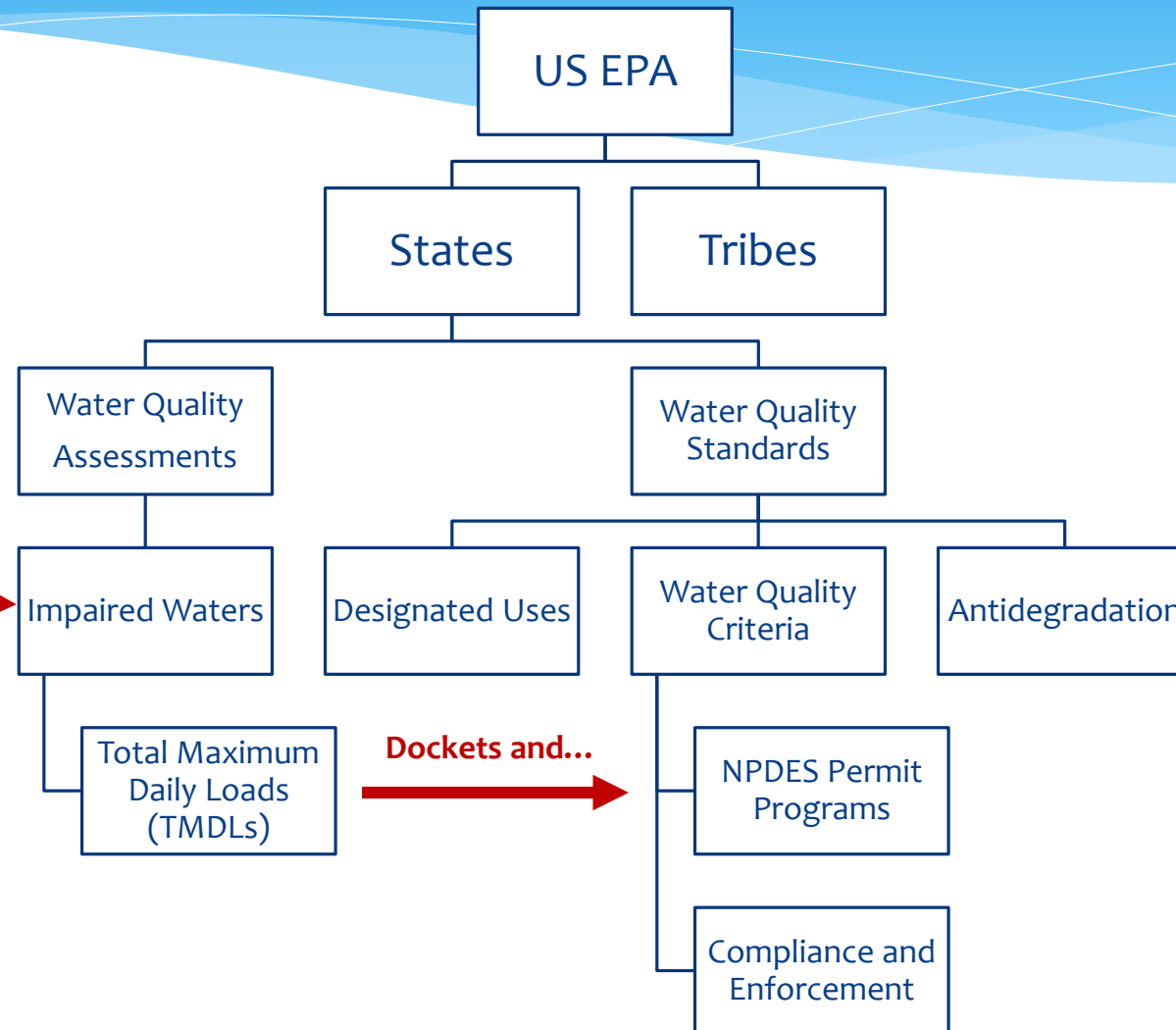
# Clean Water Act Responsibilities



## ***For Main Stem Delaware River Interstate Waters:***

- DRBC Conducts Monitoring and Assessments.
- States use the DRBC main stem assessment as part of their reports to US EPA.

# Clean Water Act Responsibilities



## ***For Main Stem Delaware River Interstate Waters:***

- DRBC leads impaired waters recovery.
- Models improvement plans
- Establishes “pollution budgets” or waste allocations.
- Sets interim and long term standards, goals and plans.

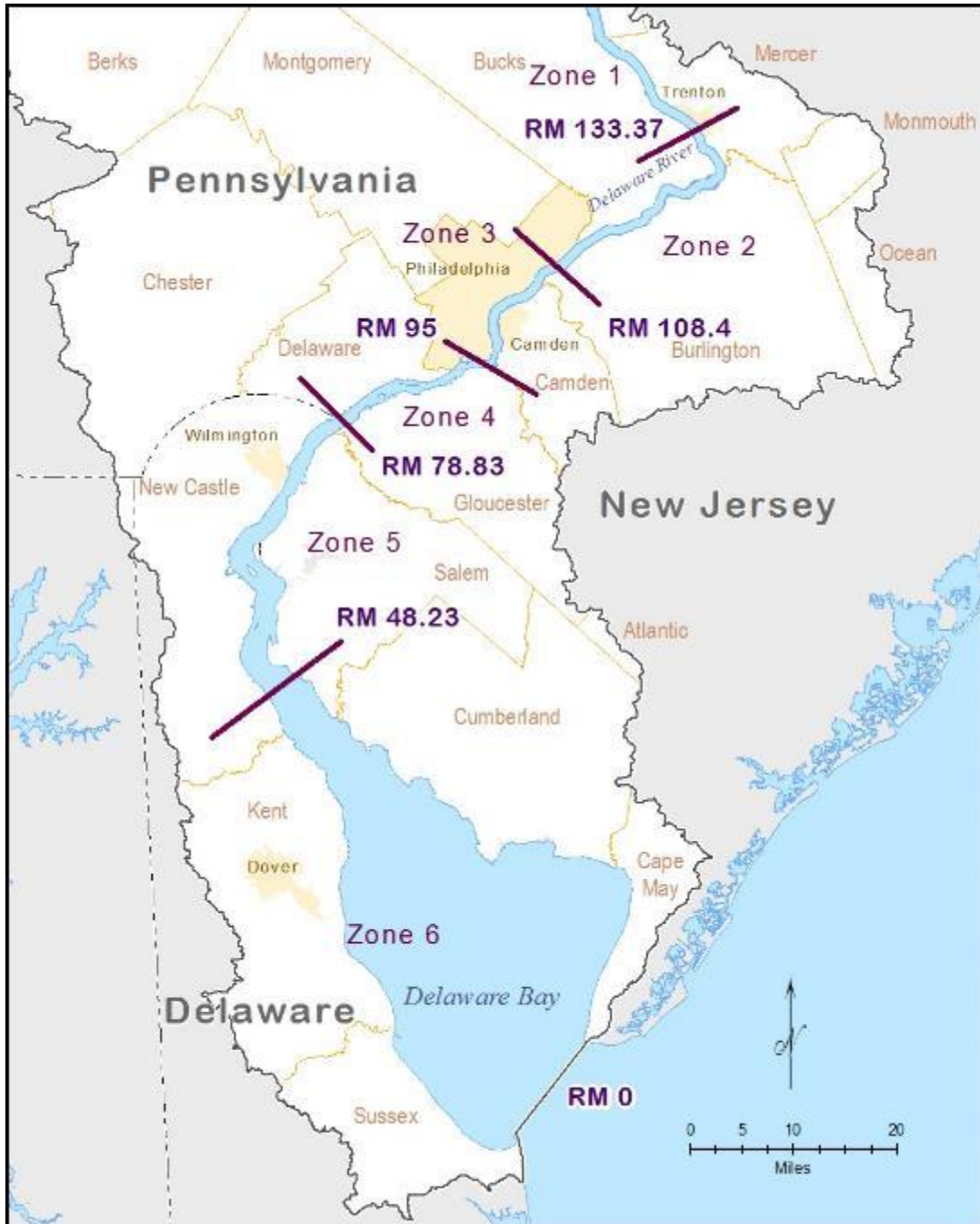
# The Next Chapter

The screenshot shows the Delaware River Basin Commission (DRBC) website. At the top left is the DRBC logo with the text 'Delaware River Basin Commission' and 'DELAWARE • NEW JERSEY PENNSYLVANIA • NEW YORK UNITED STATES OF AMERICA'. To the right is a search bar with 'Index A-Z | Search' and a 'Submit' button. Below the logo is a navigation menu with 'Home', 'About DRBC', 'Basin Information', 'Hydrological Information', 'Water Quality Information', 'Programs', 'Meetings', and 'Contact DRBC'. Social media icons for RSS, Twitter, Facebook, YouTube, Instagram, and LinkedIn are also present. A secondary navigation bar includes 'Conventional Pollutants', 'Toxic Pollutants', 'Reports/Assessments', 'Data', 'Alert Tools', and 'Other Links'. The main content area shows a breadcrumb trail: 'Home > Water Quality Information > Conventional Pollutants > Dissolved Oxygen > DRBC's Designated Use Study'. The article title is 'DRBC's Designated Use Study' and the sub-header is 'The Next Chapter in Delaware Estuary Water Quality Improvements'. The text describes a resolution approved in September 2017 regarding water quality improvements in the Delaware River Estuary. A sidebar on the right lists categories: Bacteria, Chlorides, Dissolved Oxygen, and Nutrients. At the bottom right is a photograph of a bridge over a river.

[www.drbc.gov](http://www.drbc.gov)

<https://www.state.nj.us/drbc/quality/conventional/designated-use.html>

# Delaware River Estuary



## River Miles:

RM 0.0 = Atlantic Ocean

RM 100 = Ben Franklin Bridge, Philadelphia / Camden

RM 133 = “Head of Tide”, Trenton, NJ

## WQ Assessment Units:

Zone 1: Non-tidal (Upstream from Trenton)

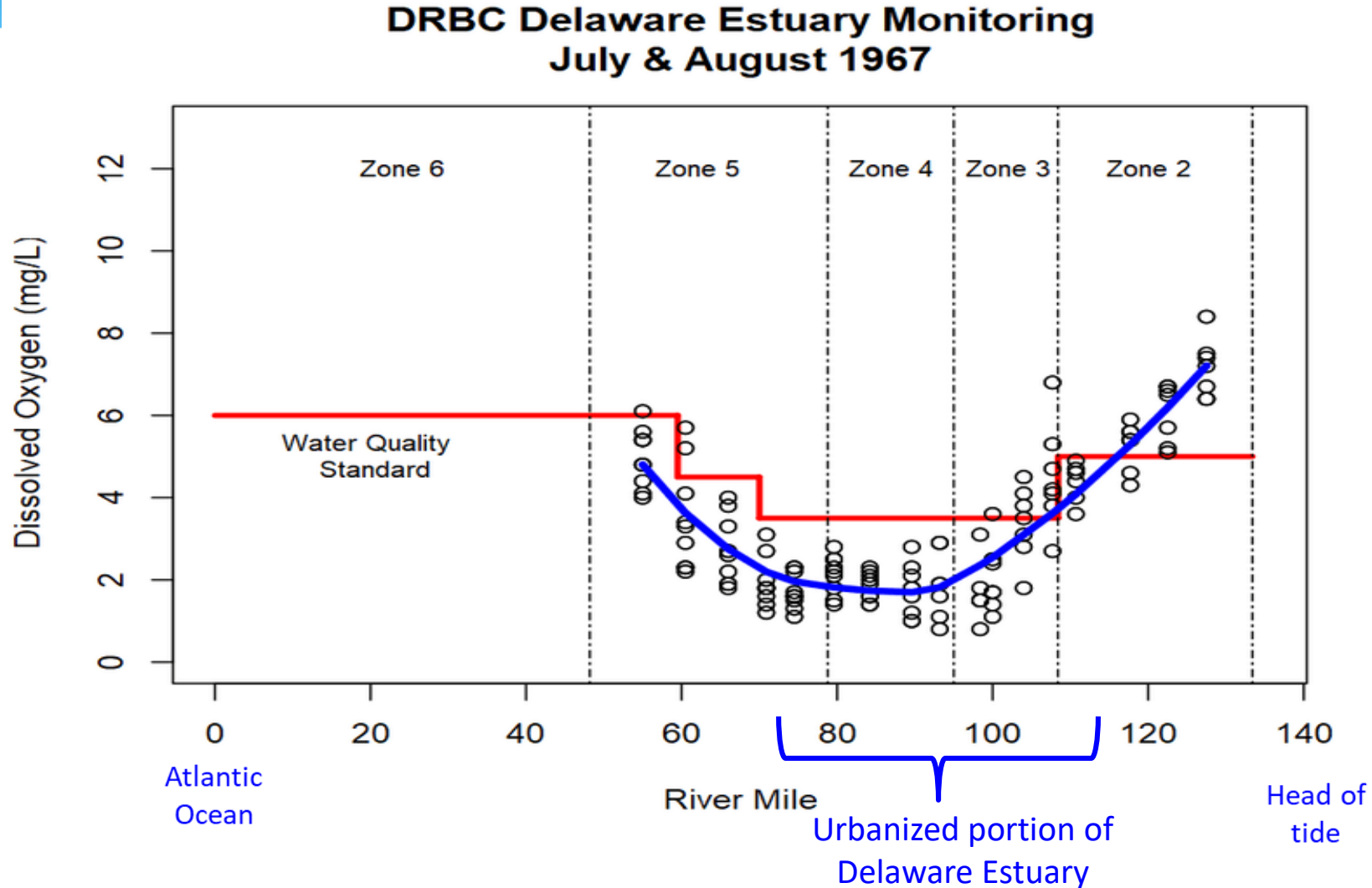
**Zone 3: Philadelphia / Camden**

Zone 6: Delaware Bay

# Aquatic Life Designated Uses in Current DRBC Regulations since 1967

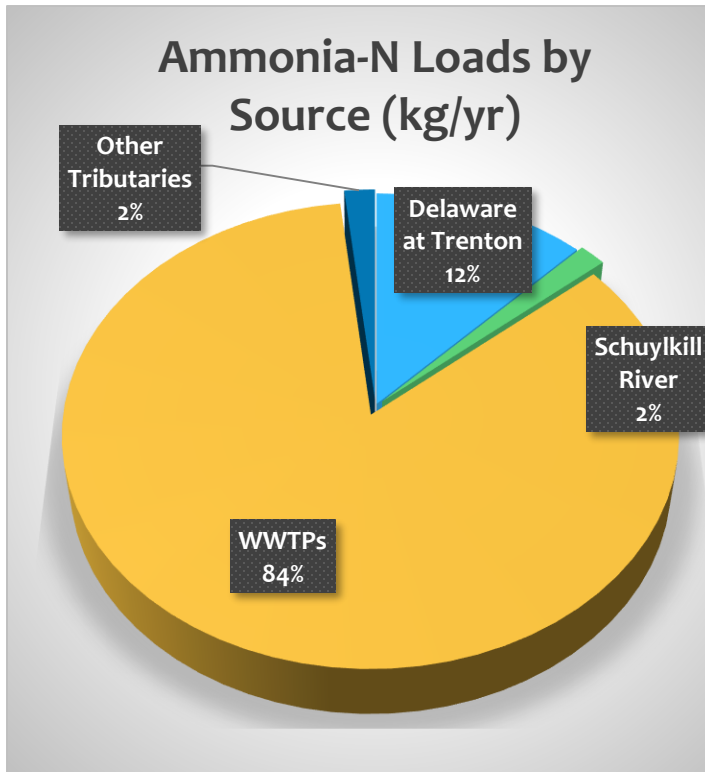
Zone	River Mile	Aquatic Life Use	Migratory Fishes	24-hour average D.O. Criteria
Urbanized portion of Delaware Estuary	2	<b>maintenance</b> and <b>propagation</b> of resident fish and other aquatic life	<b>passage</b> of anadromous fish	5.0 mg/l
	3	<b>maintenance</b> of resident fish and other aquatic life	<b>passage</b> of anadromous fish	3.5 mg/l
	4	<b>maintenance</b> of resident fish and other aquatic life	<b>passage</b> of anadromous fish	3.5 mg/l
	5	<b>maintenance</b> of resident fish and other aquatic life	<b>passage</b> of anadromous fish	3.5 mg/l
	5	<b>maintenance</b> and <b>propagation</b> of resident fish and other aquatic life	<b>passage</b> of anadromous fish	4.5 – 6.0 mg/l
The Delaware Bay	6	<b>maintenance</b> and <b>propagation</b> of resident fish and other aquatic life	<b>passage</b> of anadromous fish	6.0 mg/l
		<b>maintenance</b> and <b>propagation</b> of shellfish		

# Delaware Estuary DO "Sag"

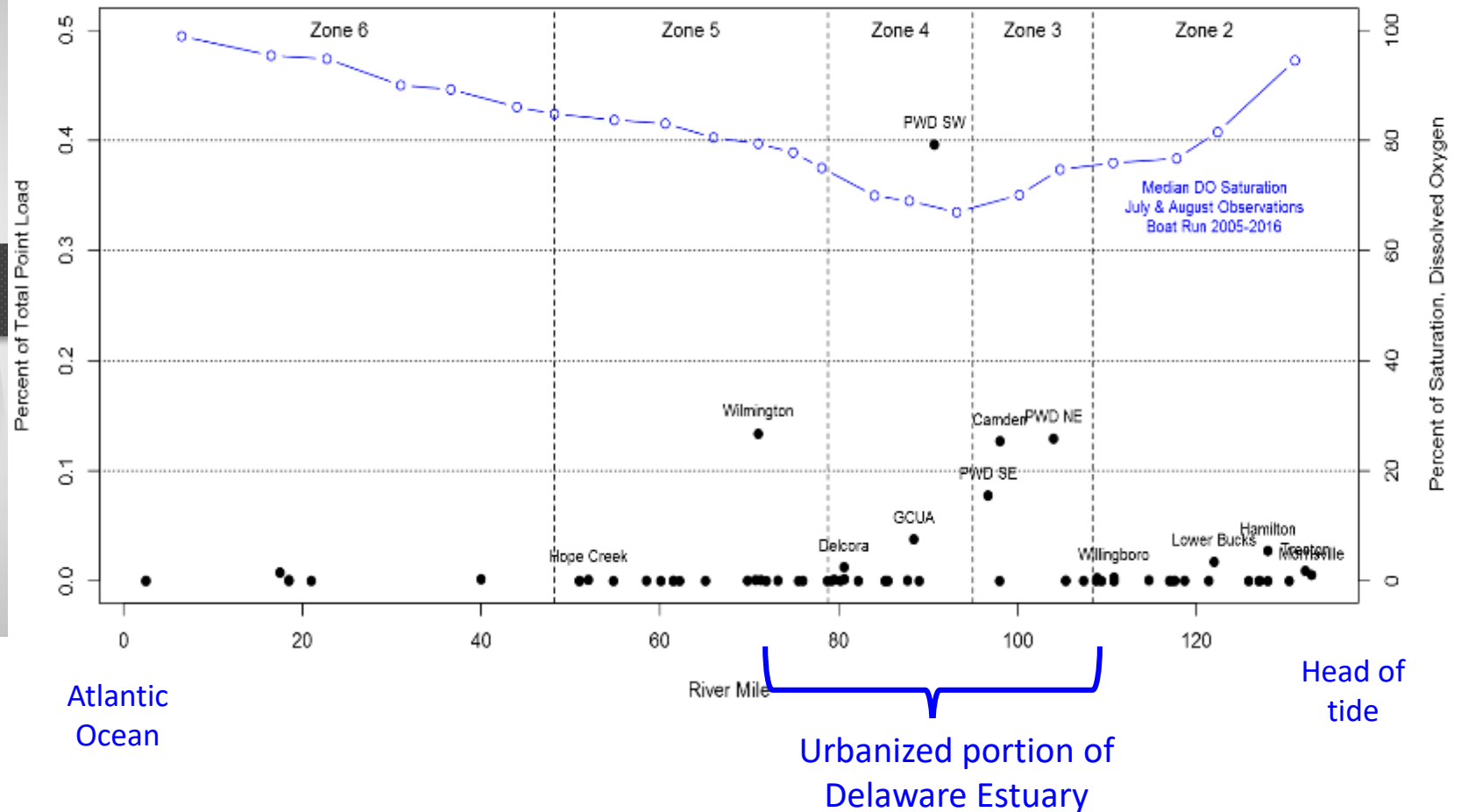


The Dissolved Oxygen "sag" in the Estuary is primary influenced by point source discharges

# Ammonia-Nitrogen



Relative Point Discharge Load by Delaware Estuary River Mile  
NH3 - Ammonia, whole water Loading



# A “Dead” River Zone Restored

## Dissolved Oxygen (DO)

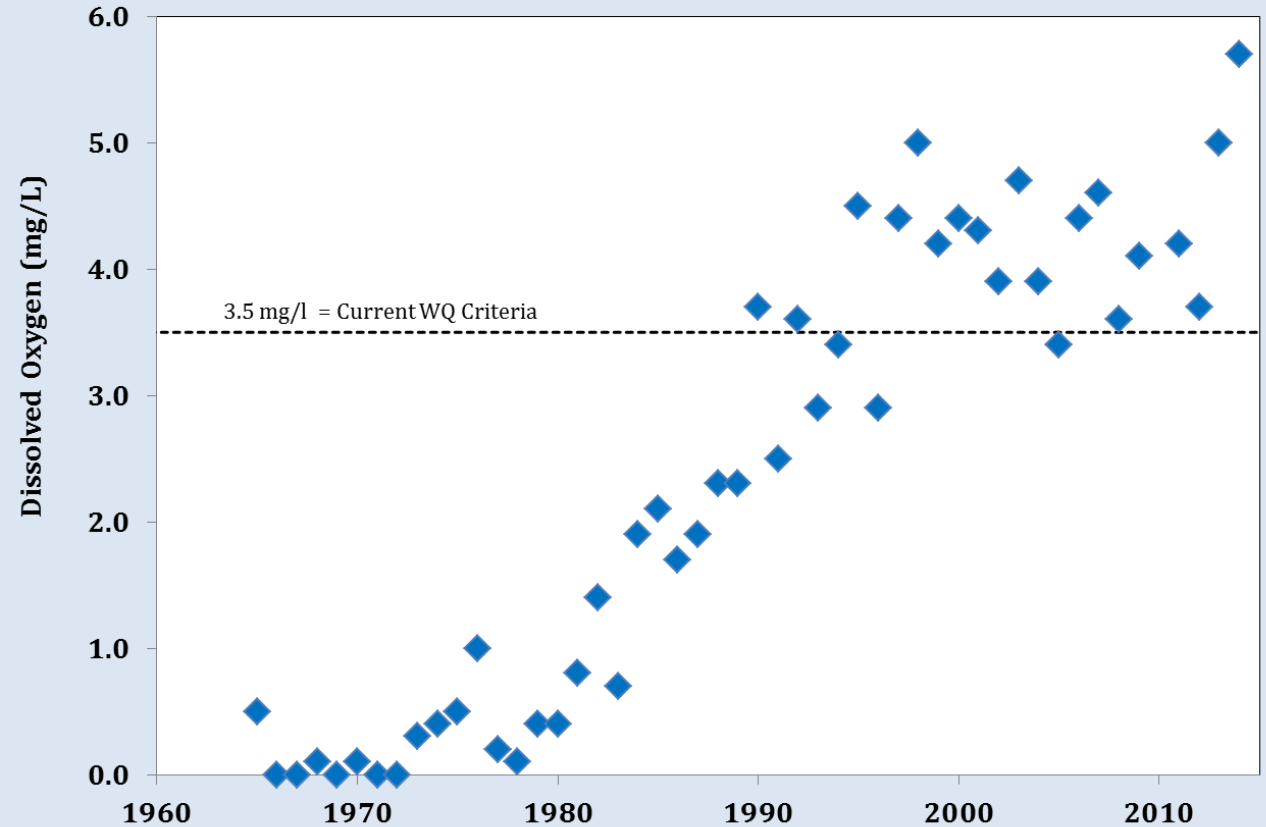
- 30 mile “Dead Zone”
- Particularly bad in Summer
- Anadromous fish migration stopped



Images: NOAA  
[fisheries.noaa.gov](http://fisheries.noaa.gov)



Delaware River Dissolved Oxygen  
@ River Mile 100/ Ben Franklin Bridge  
Minimum of all July Averages





# Evaluation of Existing Aquatic Life Use

- ❑ Some **strong** evidence for successful reproduction for:
  - White Perch (Zones 3 & 4), Striped Bass (Zone 5)
- ❑ Some **moderate** evidence for successful reproduction for:
  - American Shad (Zone 3), Alewife (Zones 3 & 4), Bay Anchovy (Zones 4 & 5)
- ❑ Evidence for **weak** reproductive success in each Zone:
  - Atlantic Sturgeon (Zone 4), American Shad (Zone 4), Blueback Herring (Zones 3 & 4)

## Existing Use Evaluation for Zones 3, 4, & 5 of the Delaware Estuary Based on Spawning and Rearing of Resident and Anadromous Fishes

September 30, 2015



[https://www.nj.gov/drbc/library/documents/ExistingUseRpt\\_zones3-5\\_sept2015.pdf](https://www.nj.gov/drbc/library/documents/ExistingUseRpt_zones3-5_sept2015.pdf)

- ✓ **Update to DRBC Water Quality Regulations needs to be considered**



# Science Based Approach

Review DO requirements for key sensitive species in the Estuary.



Enhanced Estuary monitoring.



Develop a linked hydrodynamic and water quality model for the Estuary.



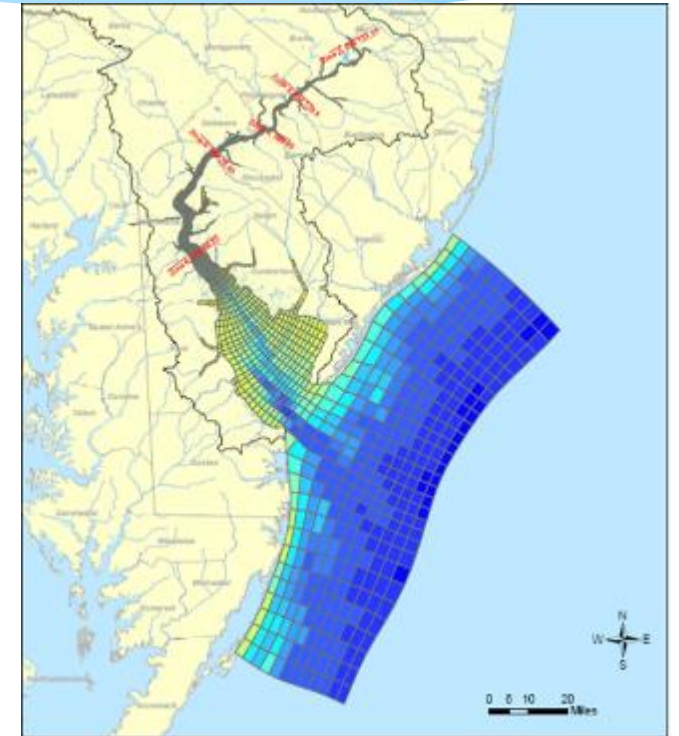
Determine higher level of DO to protect the designated use.



Develop waste load allocations to achieve new DO criteria.



Review treatment costs, cost impacts and attainability.





# Stakeholder and Expert Input

## Water Quality Advisory Committee

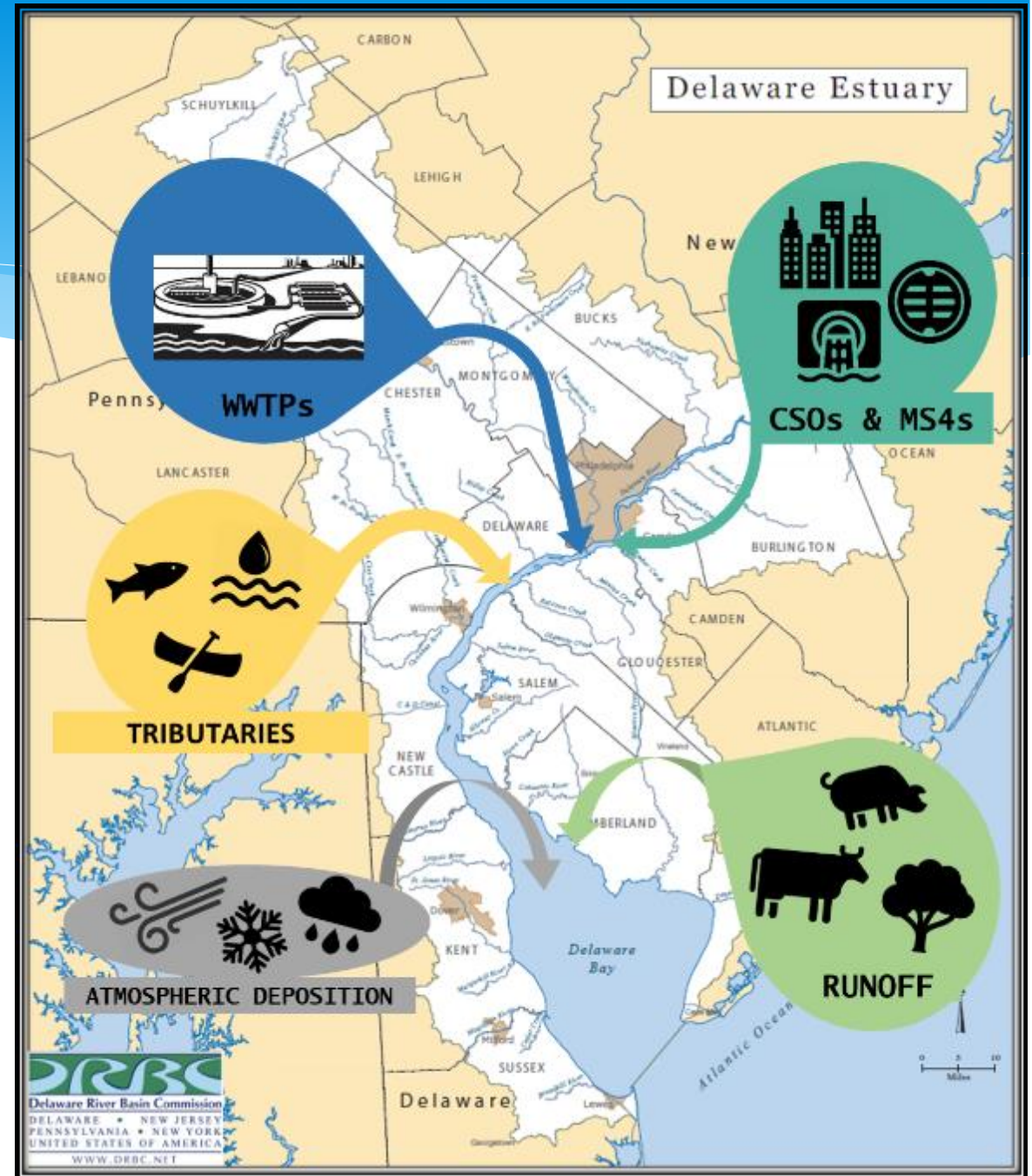
<b>Academia / Science</b>	Stroud Water Research Center
<b>Delaware</b>	DNREC
<b>Environmental Group</b>	Delaware Riverkeeper Network
<b>Watershed Organization</b>	Wildlands Conservancy
<b>National Parks Programs</b>	National Park Service
<b>New Jersey</b>	NJDEP
<b>New York</b>	NYDEC
<b>Pennsylvania</b>	PADEP
<b>Industry</b>	Chemours and Exelon
<b>Municipal</b>	Philadelphia Water and City of Wilmington
<b>US EPA</b>	US EPA

## Expert Panel for Estuary Model Development

<b>U.S. Army Corps of Engineers</b>	Dr. Carl Cerco (Retired)
<b>Rutgers University</b>	Dr. Bob Chant
<b>Tufts University</b>	Dr. Steve Chapra
<b>U.S. EPA Region 4</b>	Tim Wool
<b>LimnoTech</b>	Dr. Vic Bierman

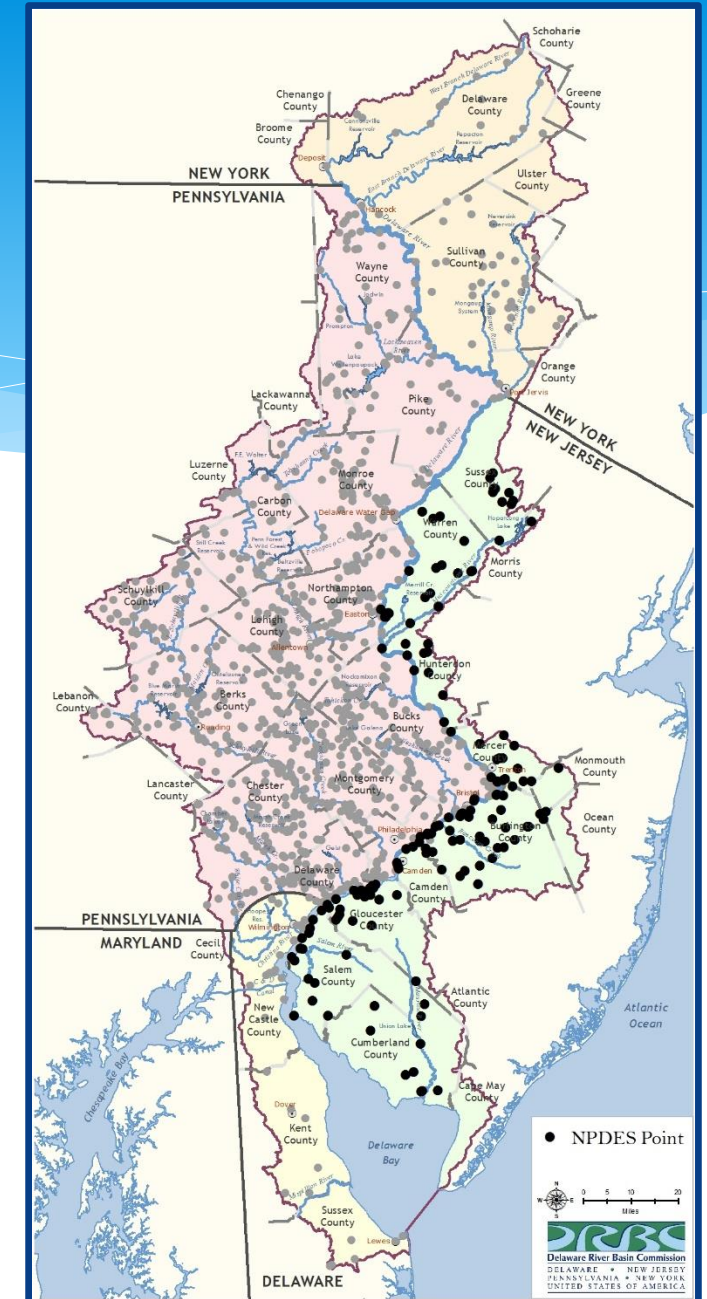
# Development of linked hydrodynamic and water quality model

- \* Tributary Loads
  - \* Delaware River at Trenton (Zone 1)
  - \* Schuylkill River
  - \* ~ 29 other tributaries
- \* Tidal Boundaries
  - \* Ocean at mouth of Delaware Bay
  - \* C&D Canal
- \* Direct Basin Loads
  - \* Wasteloads: **WWTPs**, CSOs, MS4
  - \* Nonpoint Source (runoff outside MS4)
  - \* Wet/Dry deposition onto water surface



# One Process / One Permit

- DRBC Compact and Rules allow for and encourage the use of administrative agreements with states and state agencies to:
  - ✓ Promote inter-agency collaboration and cooperation on shared mission objectives.
  - ✓ Promote regulatory program efficiencies.
  - ✓ Avoid unnecessary duplication of effort.
- Recognizes the Authority, standards, rules of each agency

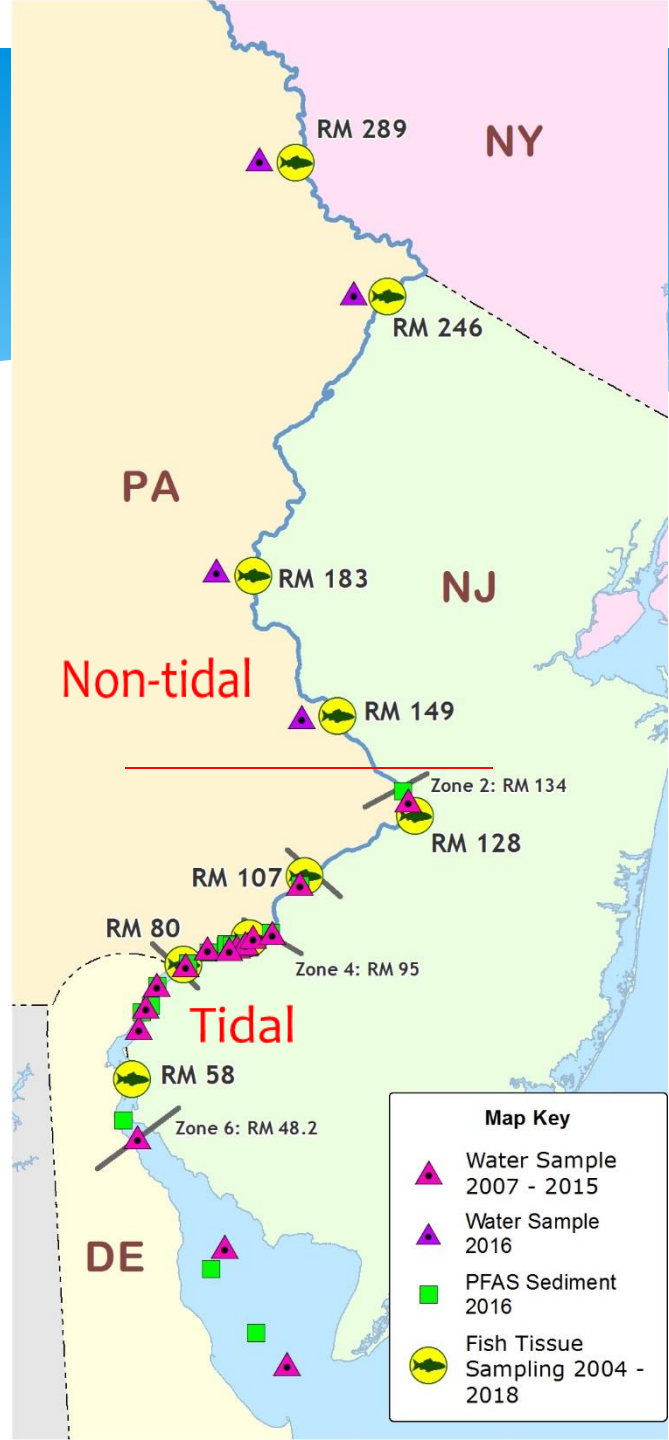




# DRBC Water Resource Management Programs

Planning	Operations	Regulation	Science
Sustainable Water Availability	Flow / reservoir management	Water withdrawals	Water quality Assessments
Future water use	Drought management	Wastewater discharges	Water quality Monitoring
Consumptive water use	Salinity control	Special protection waters	Emerging contaminants
Water efficiency	Decree parties	Groundwater special protection	Toxic pollutants
Water audits	Hydrologic models	Water quality standards - Interstate Waters	Fish consumption
Climate Change	Water charges	Flood protection	Reduction of legacy pollutants - PCBs

# PFAS Sample Sites Main Stem Delaware River



## Surface water:

- Six tidal sites in 2007, 2008, 2009
- Fifteen tidal sites in 2015
- Four non-tidal sites in 2016

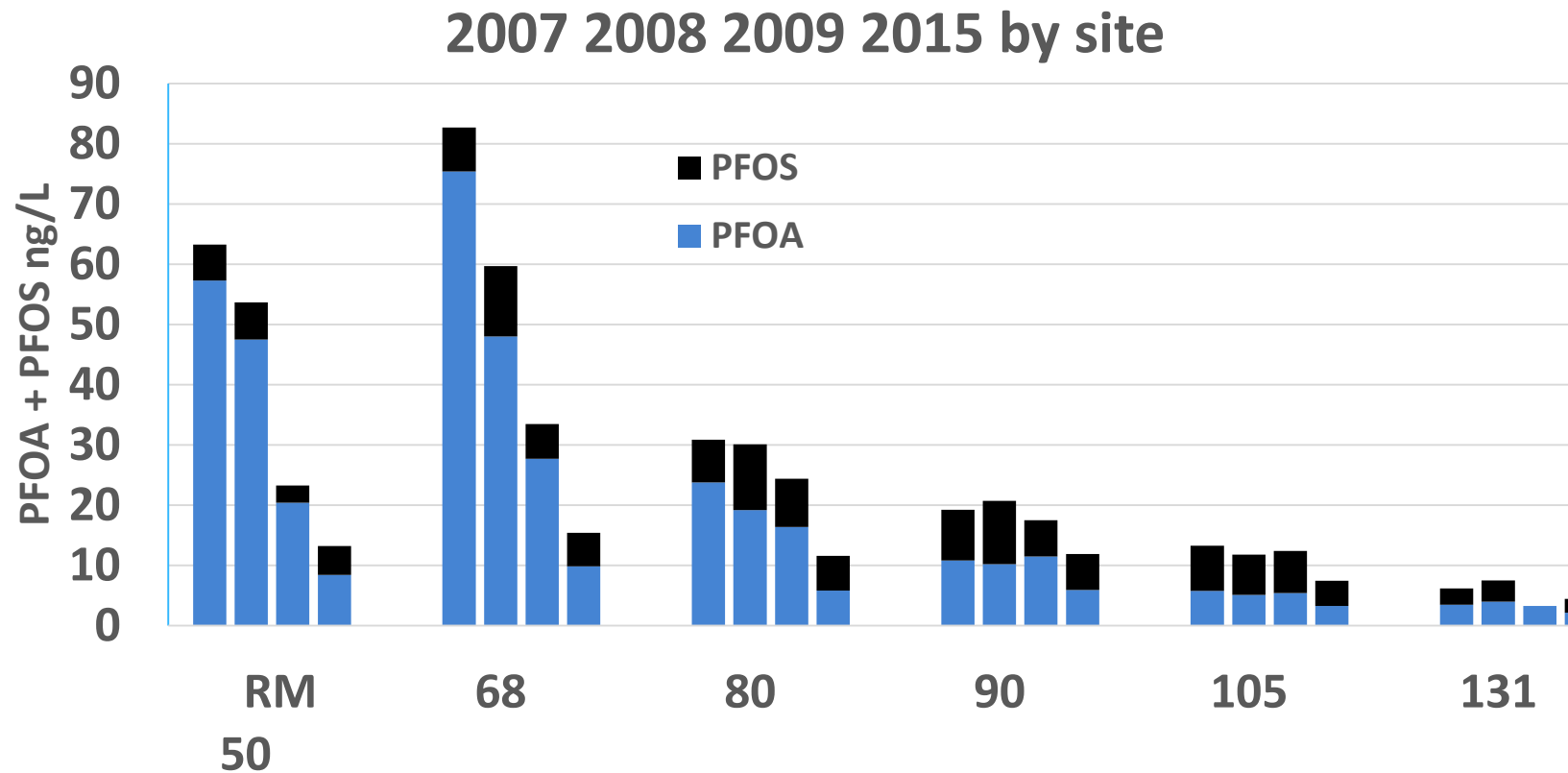
## Fish:

- Four non-tidal and five tidal sites in 2004, 2005, 2006, 2007, 2010, 2012, 2015 and 2018

## Sediment:

- Fifteen tidal sites in 2016

# Surface Water Estuary (tidal) PFAS







# Delaware River Basin Commission

Managing our shared Basin water resources.

Built on a shared and foundational commitment in the ***Delaware River Basin Compact*** to:

- Manage complex interstate water resource systems and needs.
- Collaborate with members on shared waters management issues – from headwaters to the Ocean.
- Adapt to achieve mission results.
- Balance progress and protection.
- Partner to achieve for the Basin, what individual<sup>41</sup> members cannot achieve alone.





# Shad making a big comeback in Delaware River

[https://www.pressofatlanticcity.com/news/shad-make-a-big-comeback-in-delaware-river/article\\_bd20f7b6-9888-54ec-8930-8c476eec7013.html](https://www.pressofatlanticcity.com/news/shad-make-a-big-comeback-in-delaware-river/article_bd20f7b6-9888-54ec-8930-8c476eec7013.html)

## There's good news for one of N.J.'s most endangered fish

[https://www.nj.com/news/2017/10/atlantic\\_sturgeon\\_still\\_depleted\\_but\\_slowly\\_recove.html](https://www.nj.com/news/2017/10/atlantic_sturgeon_still_depleted_but_slowly_recove.html)

Updated Oct 28, 2017; Posted Oct 28, 2017

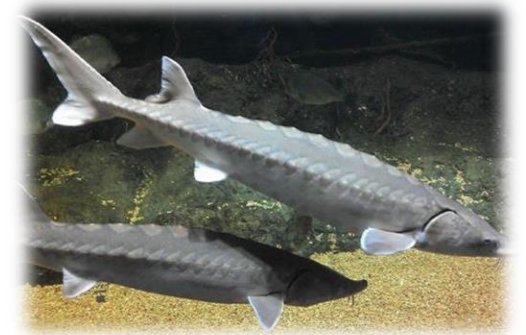


Photo: Fisheries.noaa.gov

### NEW JERSEY, DELAWARE EASE ADVISORIES ON CERTAIN FISH

TOM JOHNSON | FEBRUARY 21, 2018

<https://www.njspotlight.com/stories/18/02/20/new-jersey-delaware-ease-advisories-on-certain-fish/>



### Mapping the Delaware River Waterfront's building boom

*Big changes are coming to the waterfront*

By **Melissa Romero** and **Anna Merriman** | Updated Sep 26, 2018, 5:30pm EDT

<https://philly.curbed.com/maps/delaware-river-philadelphia-development-projects>

# Steve Tambini, Executive Director

*Steve.Tambini@drbc.gov*

*www.drbc.gov*



**Delaware River Basin Commission**

DELAWARE • NEW JERSEY  
PENNSYLVANIA • NEW YORK  
UNITED STATES OF AMERICA

***Managing, Protecting and  
Improving the Basin's Water  
Resources since 1961***