

Delaware River Basin Commission

Legislative Staff Briefing

March 26, 2019

Independence Seaport Museum



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



Photo courtesy of U.S. Army Corps of Engineers

Today's Agenda

- Who we are (and who we “are not”).
- What we do.
- Why it matters.



Tow path at Lumberville, PA by Keith Balderston

Who are we?



Delaware River
Joint Toll Bridge
Commission

DELAWARE
RIVER BASIN
SOURCE WATER COLLABORATIVE



Delaware River and Bay Authority



Delaware Watershed
Research Fund



DELAWARE RIVER
PORT AUTHORITY
of Pennsylvania & New Jersey[®]

Delaware River Basin Commission



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

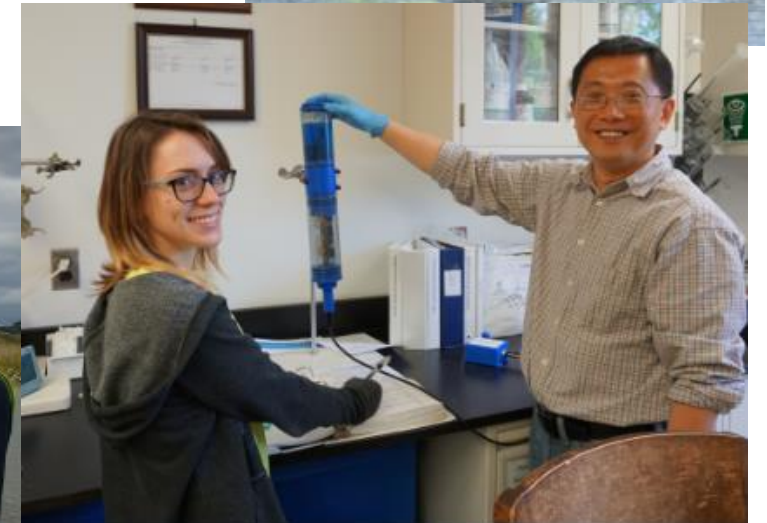


- Four Governors are the Commissioners
- Commissioner may select alternates
- Federal Commissioner is Commanding General, USACE, NAD
- Majority rules in most voting
- Meets quarterly

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

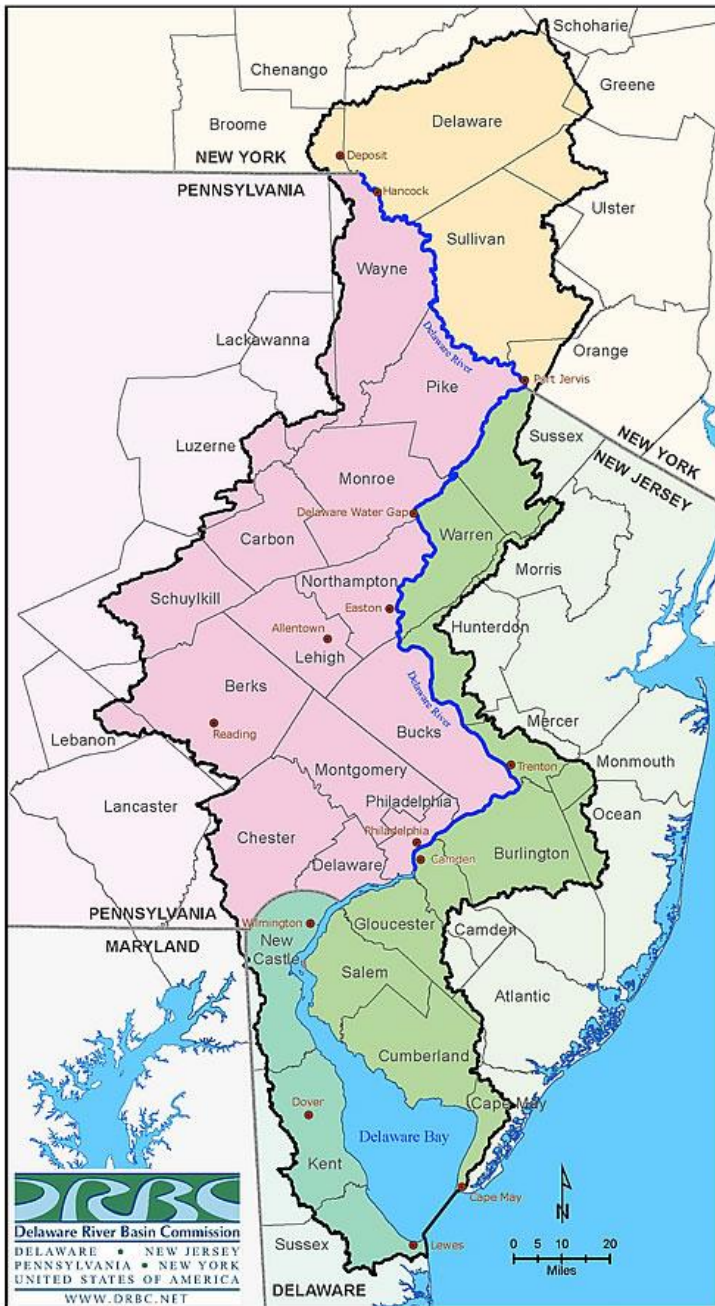
DRBC Staff and Budget

- 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



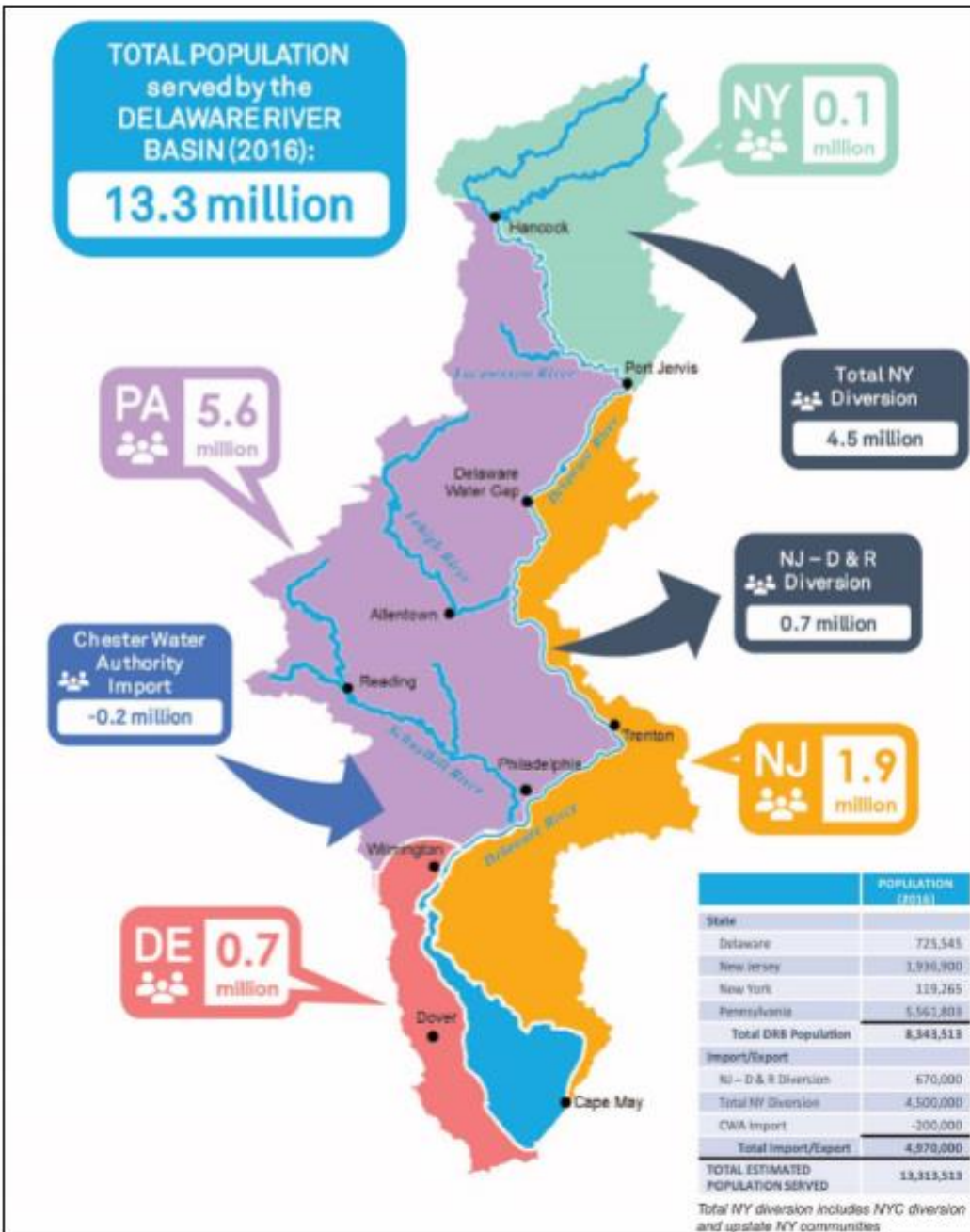
The Delaware River

- 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: Nicholas A. Tonelli



It Used to Look Like...



*Slaughterhouses discharging in 1928
(Phila. Water Dept. Historic Collection)*



*Bridgeport Canal up from Schuylkill River in 1928.
(Phila. Water Dept. Historic Collection)*

And Sometimes It Looked Like...



*Delaware River at Washington Crossing in
April 2005*



Delaware River at Trenton in 1965

EDITORIAL PAGE
PHILADELPHIA RECORD

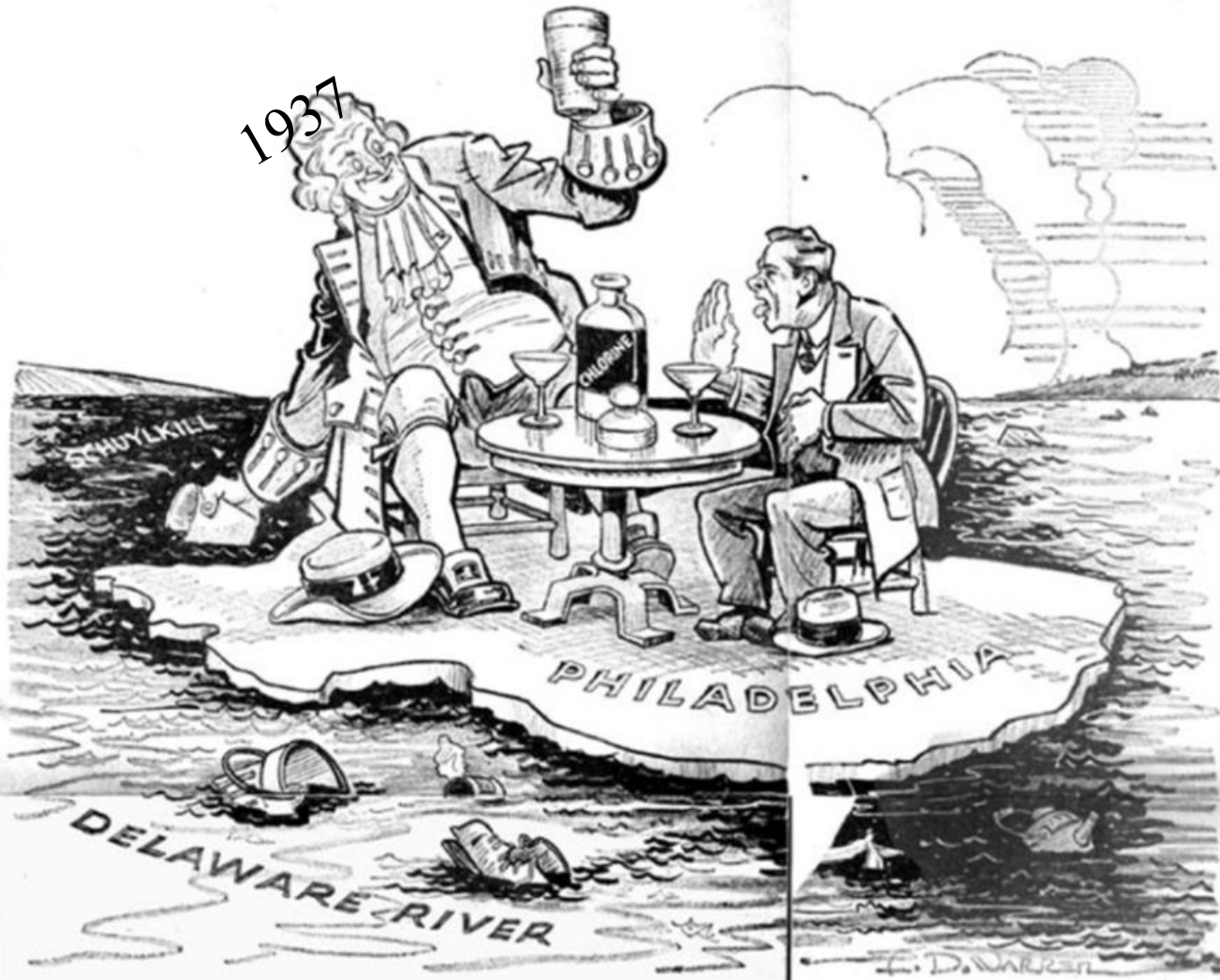
The War in Outline :: America Speaks :: Travel

SUNDAY, MARCH 14, 1937

Screen :: Stage :: Music :: Art :: Radio :: Puzzles

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

1937



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 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:

- **flood damage** reduction;
- 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**;
- **abatement and control of stream pollution**;
- **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

Flow

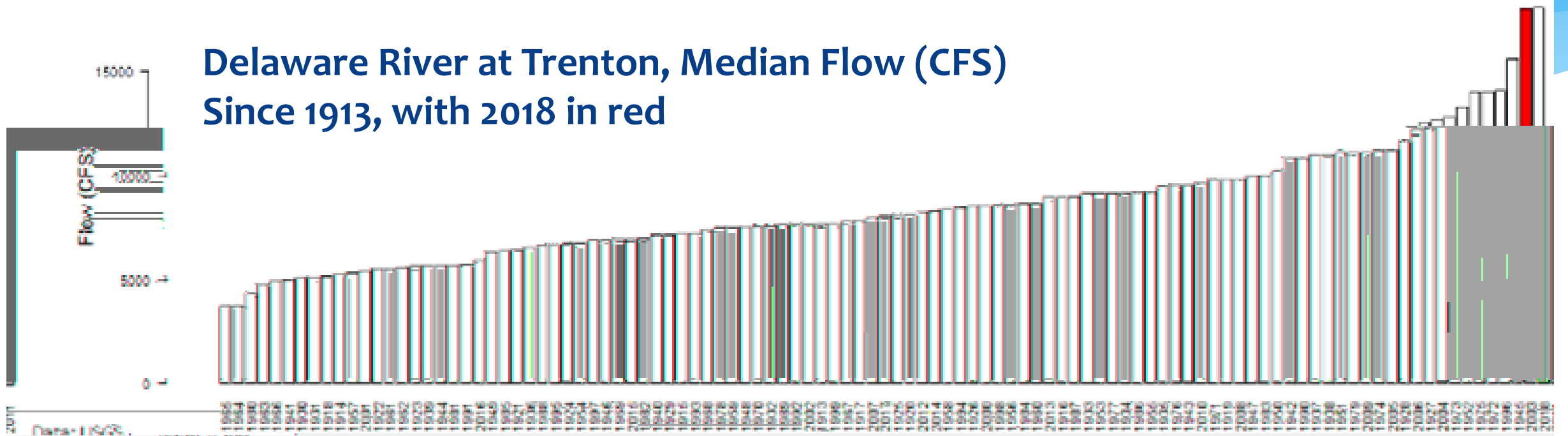
“It has to be wet before it can be clean.”



Dawn at Ten Mile River by Martha Tully

How Wet Has It Been?

Delaware River at Trenton, Median Flow (CFS)
Since 1913, with 2018 in red



NOTE: Highest year was 2011, which included flows resulting from Hurricane Irene and Tropical Storm Lee.






How Dry Has It Been?

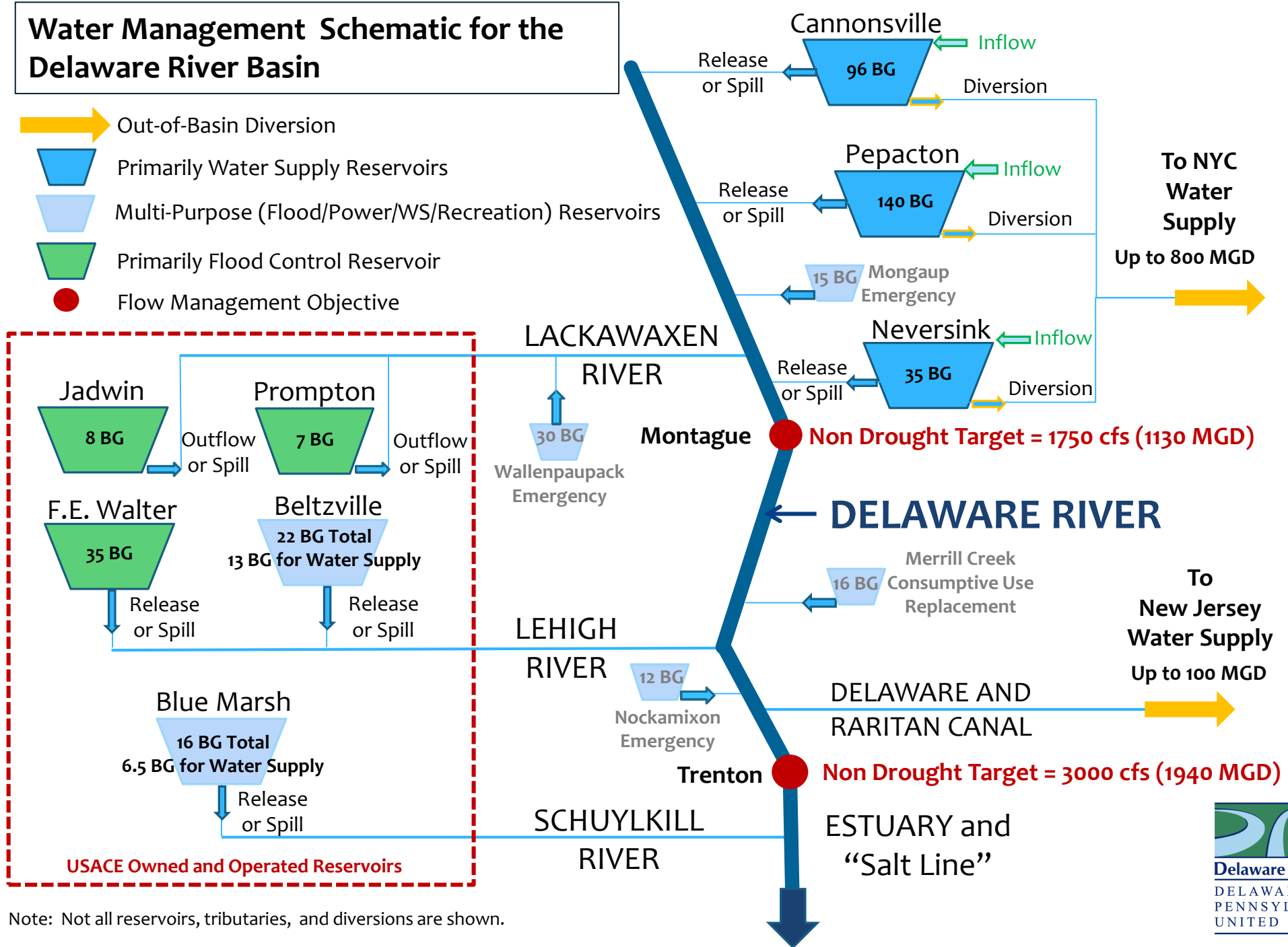
<u>Decades</u>	1950s	1960s	1970s	1980s	1990s	2000s	2010s
Reservoir Completed	A B C	D E F	G H	I			
<u>Drought Years:</u>							
Drought Watch or Warning							
Drought Emergency							

A=Neversink, B=Pepacton, C=Nockamixon, D=Promtpon and Jadwin, E=FE Walter; F=Cannonsville, G=Belzville, H=Blue Marsh, I=Merrill Creek.

Lake Wallenpaupack and the Mongaup System were constructed in the 1920s]; Dates are approximate.

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 Reservoir
-  Flow Management Objective

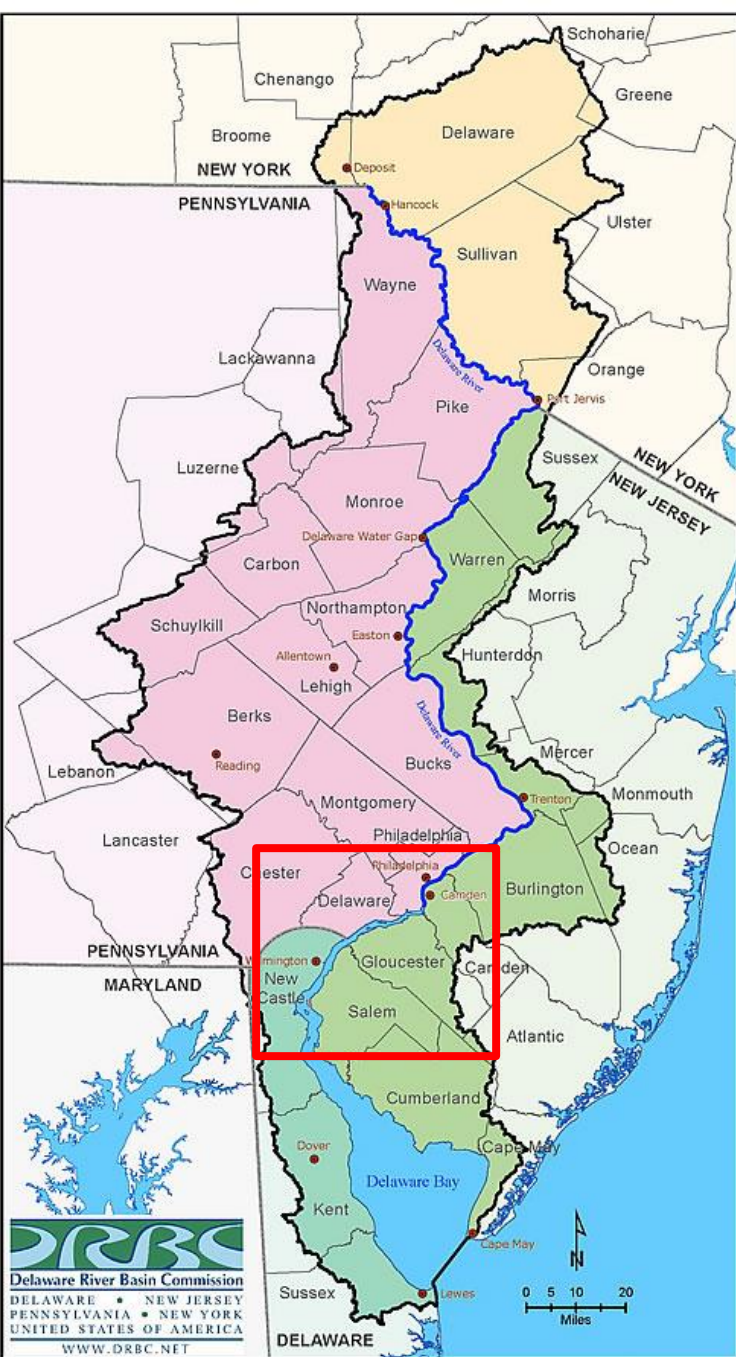


Note: Not all reservoirs, tributaries, and diversions are shown.



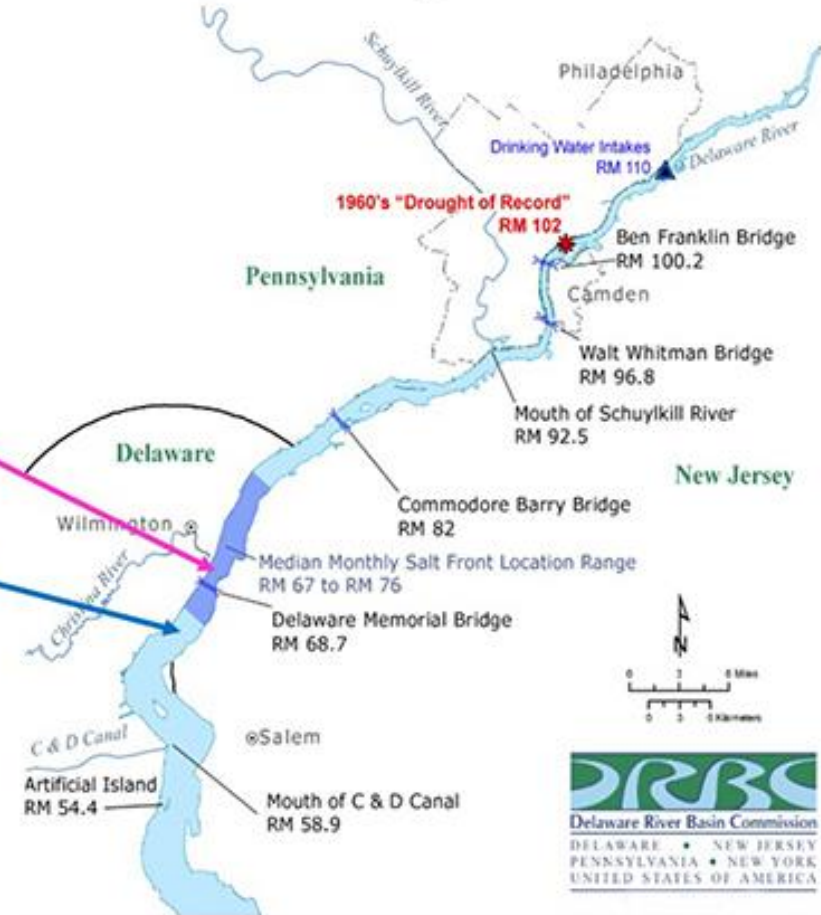
The Salt Front

Salt Line Location: March 18, 2019



Normal March
Location:
RM 70

3/18/2019
Location:
RM 66



Trenton Flow Objective

Pushing Back the Salt Front

Concept:

- Based on drought status
 - Basinwide – NYC Storage
 - Lower Basin – Beltzville and Blue Marsh Storage
- Varies Seasonally
- Varies with location of the “salt front” (drought emergency)

Goals:

- Salinity Repulsion
 - Drinking Water
 - Industry
 - Power
- Freshwater Inflows to Estuary

Water Quality



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



Plastic Pollution

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

Federal Clean Water Act Basics



Clean water starts with you
and ends with us.

Water Quality
Standards

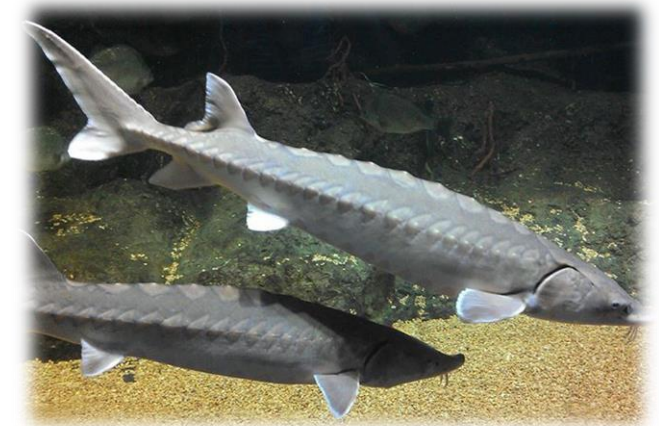
Designated Uses

Water Quality
Criteria

Antidegradation

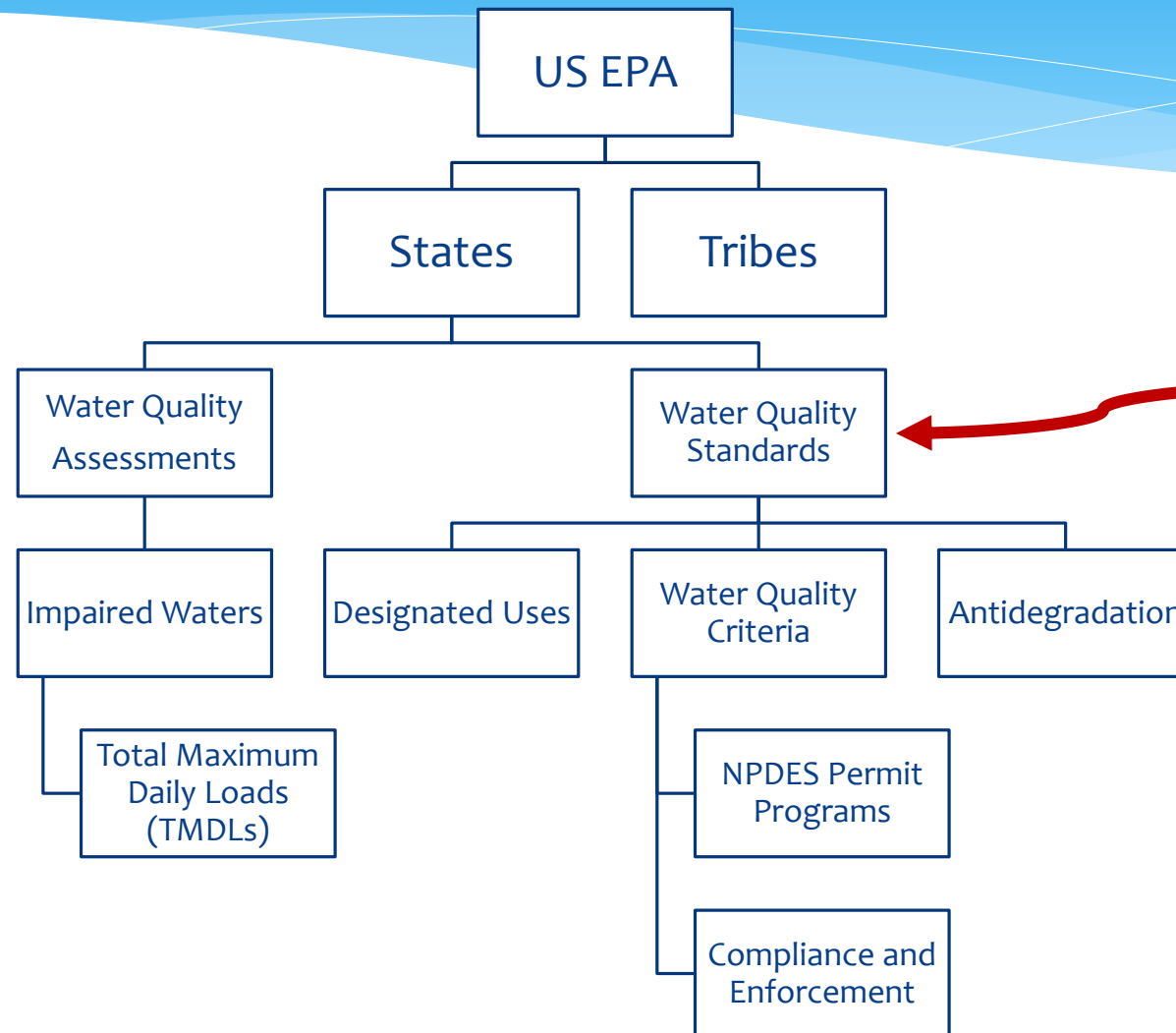
Designated Uses

- “What do we want to use this water body for?”
- CWA “Fishable / Swimmable” goals.
- Examples:
 - Public water supply (drinking water)
 - Aquatic Life
 - Water based recreation
 - Fishing / fish consumption
 - Industrial water supply
 - Agriculture water supply



Fisheries.noaa.gov

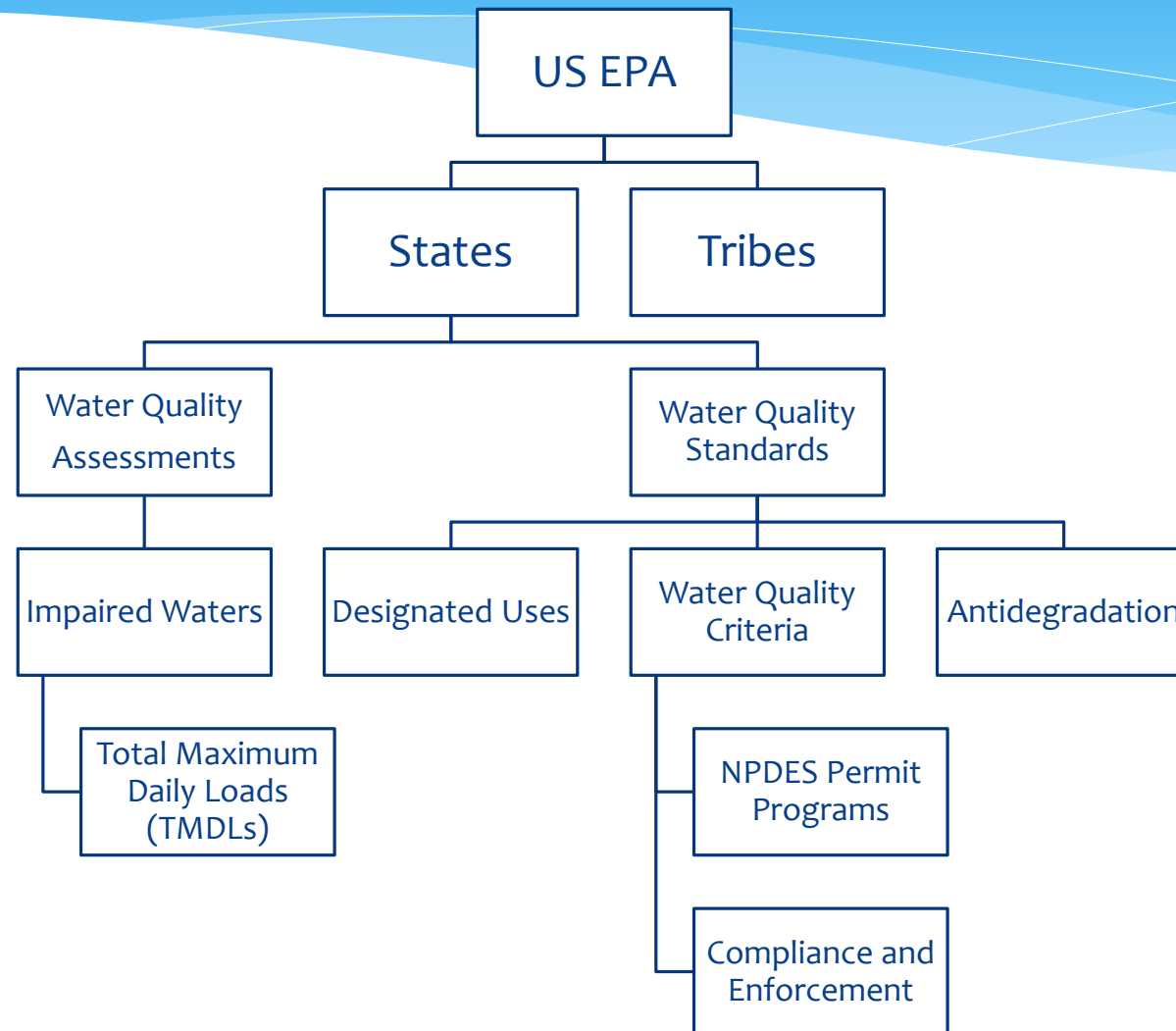
Clean Water Act Responsibilities



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.

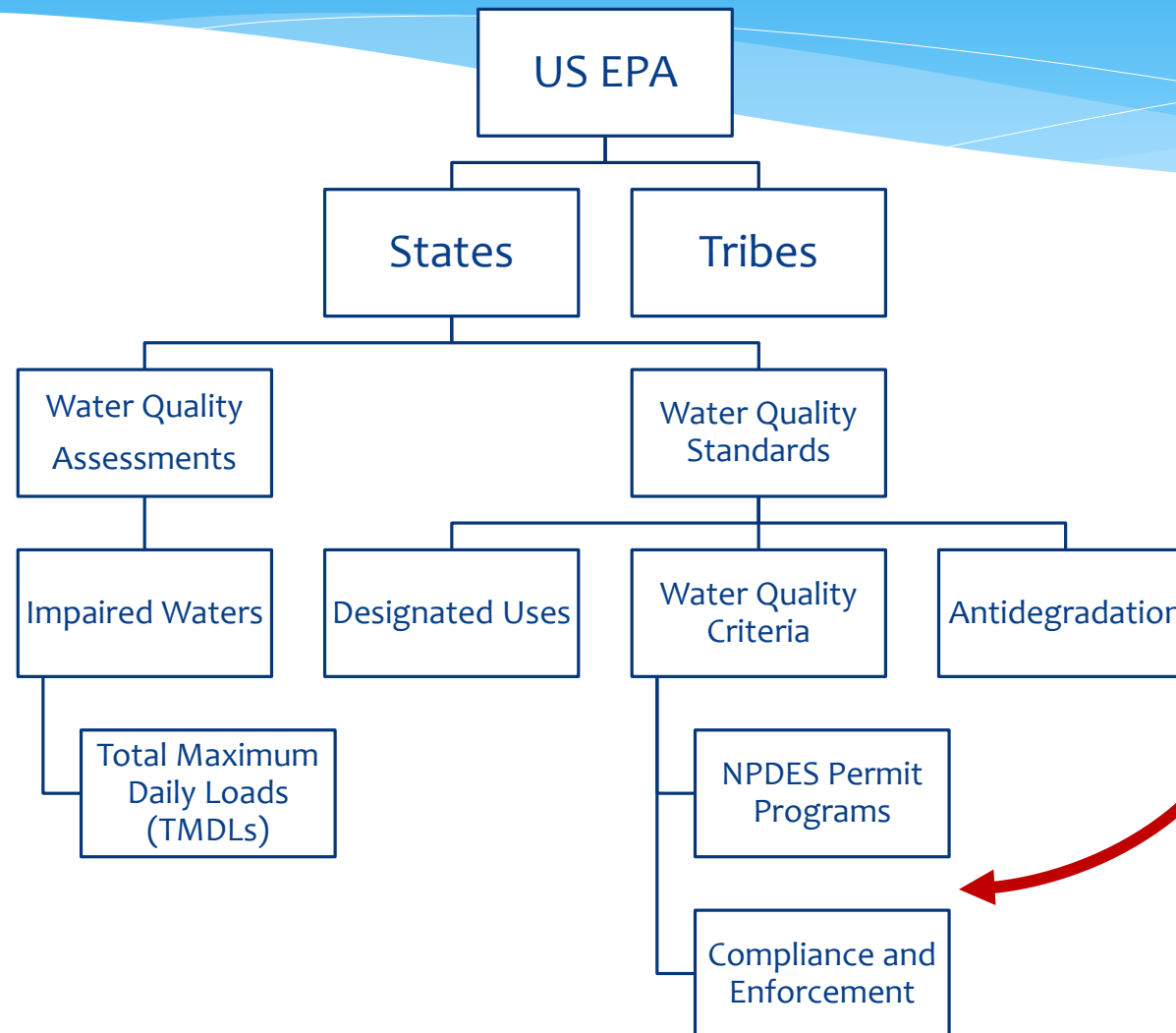
Clean Water Act Responsibilities



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

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

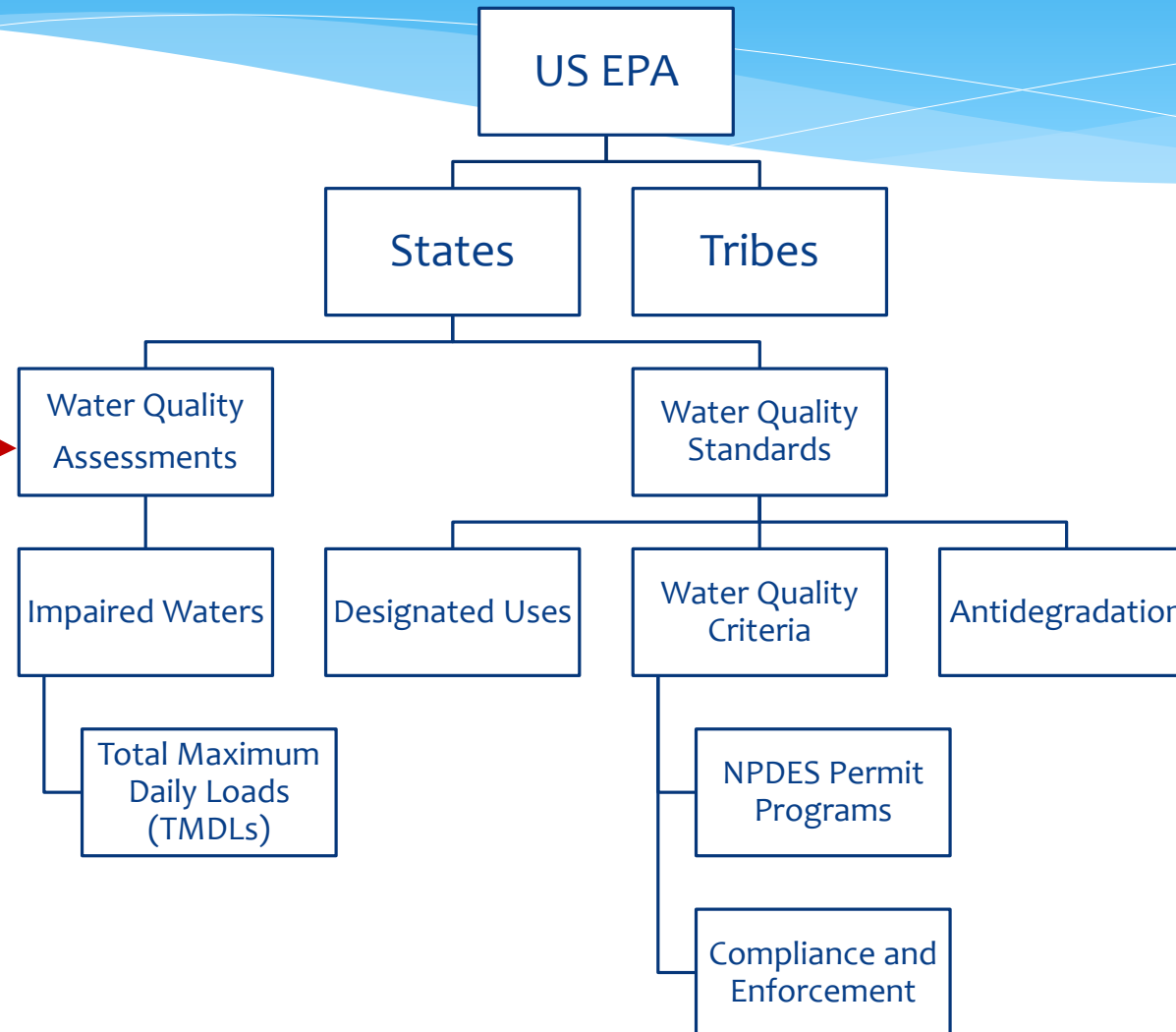
Clean Water Act Responsibilities



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.

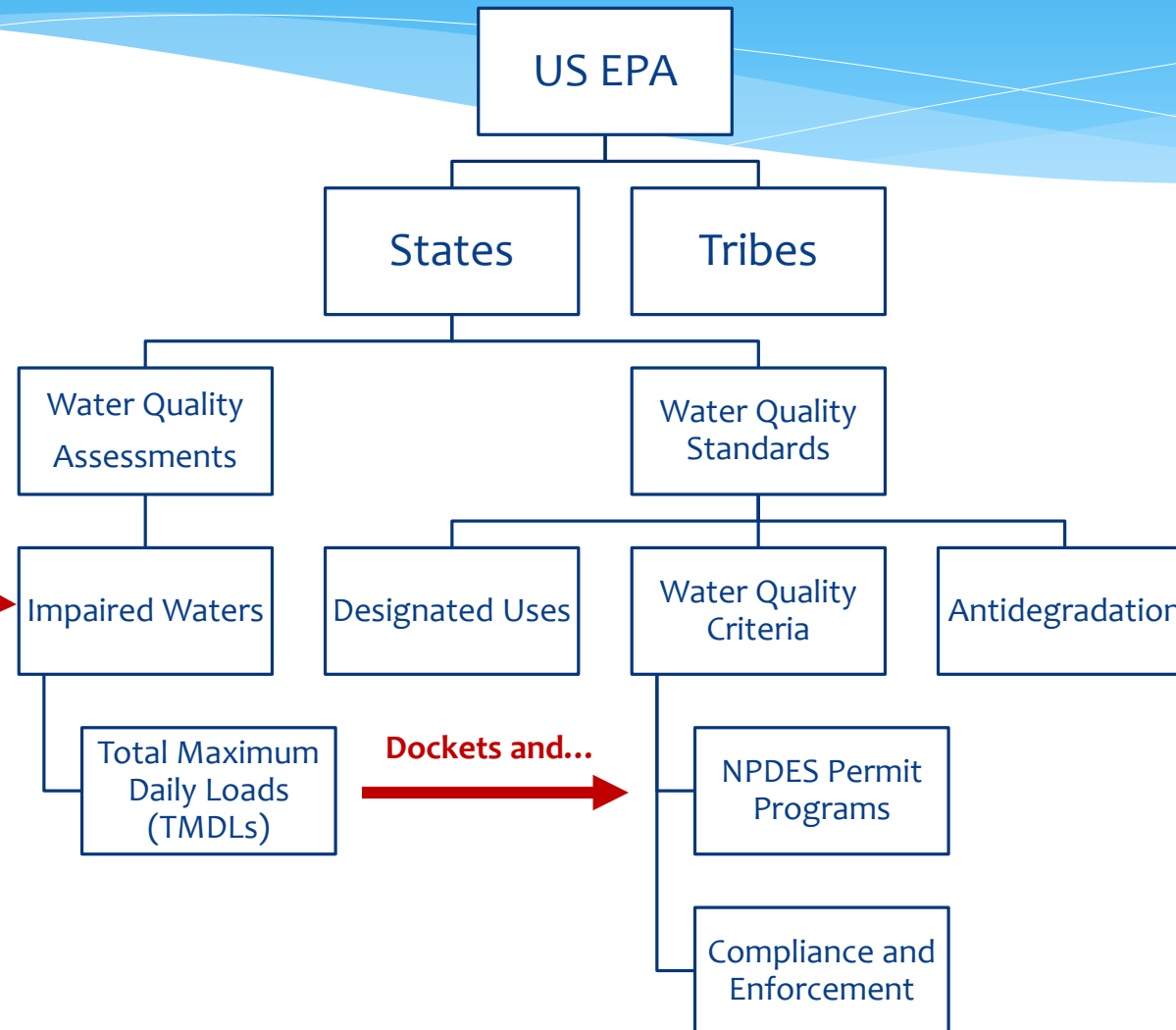
Clean Water Act Responsibilities



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.

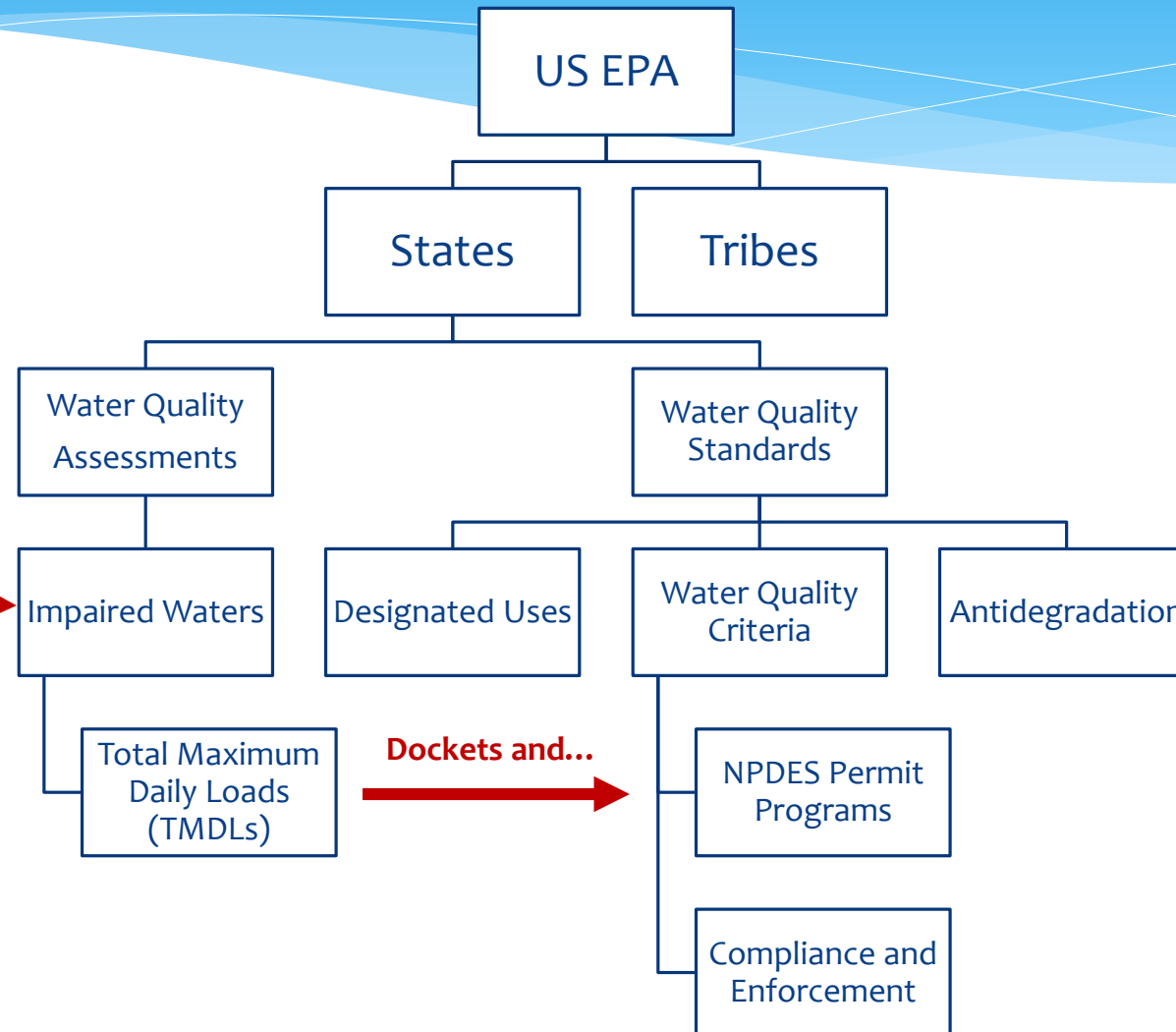
Clean Water Act Responsibilities



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.

Clean Water Act Responsibilities



For Main Stem Delaware River Interstate Waters:

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A "Dead" River Zone Restored

Dissolved Oxygen (DO)

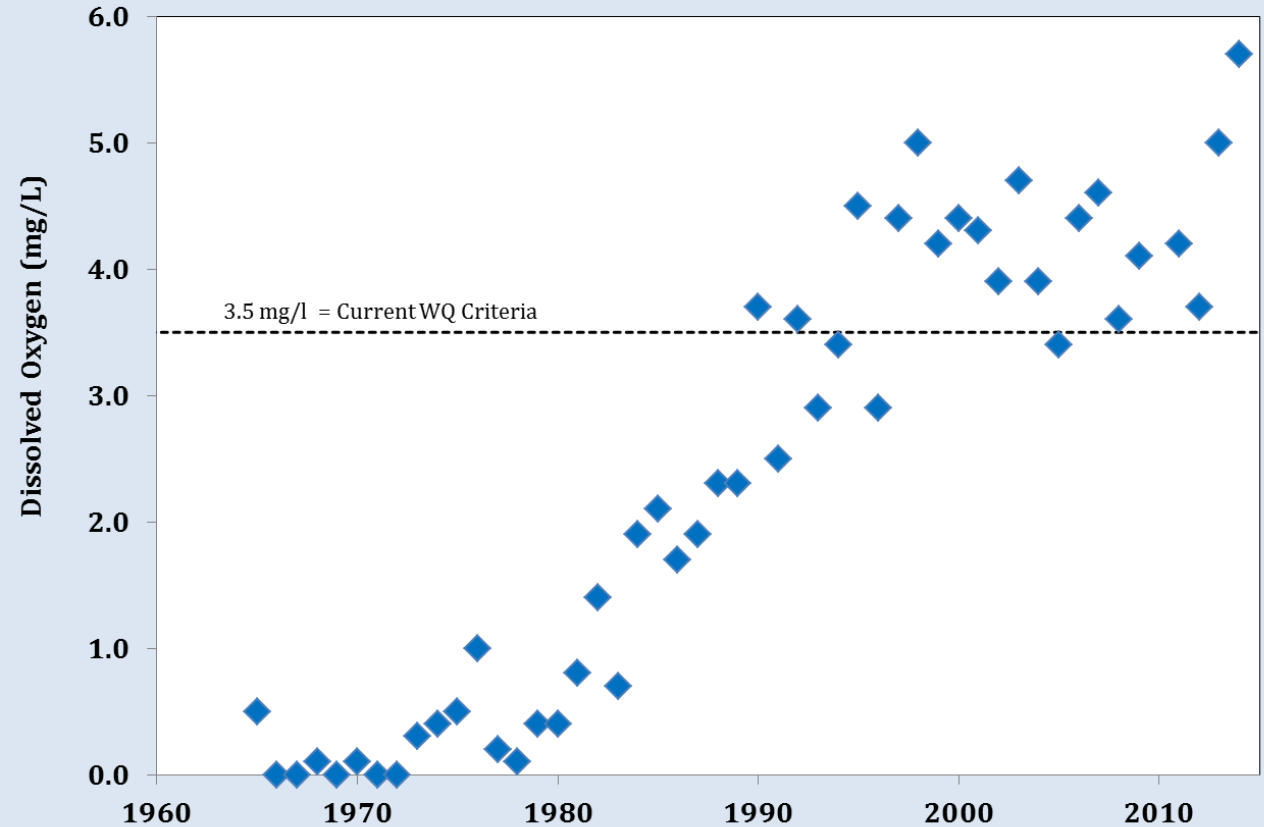
- 30 mile "Dead Zone"
- Particularly bad in Summer
- Anadromous fish migration stopped



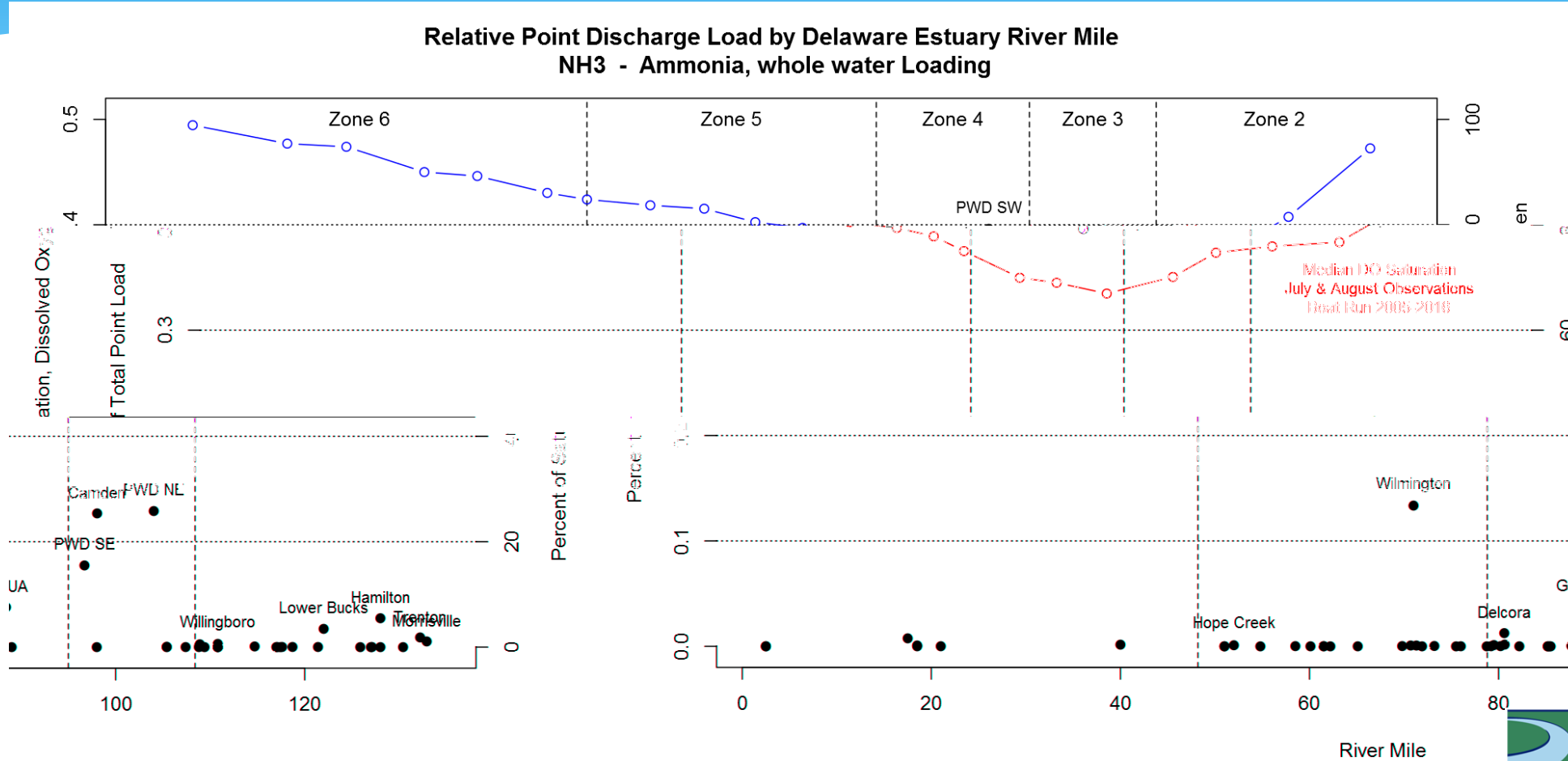
Images: NOAA
fisheries.noaa.gov



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



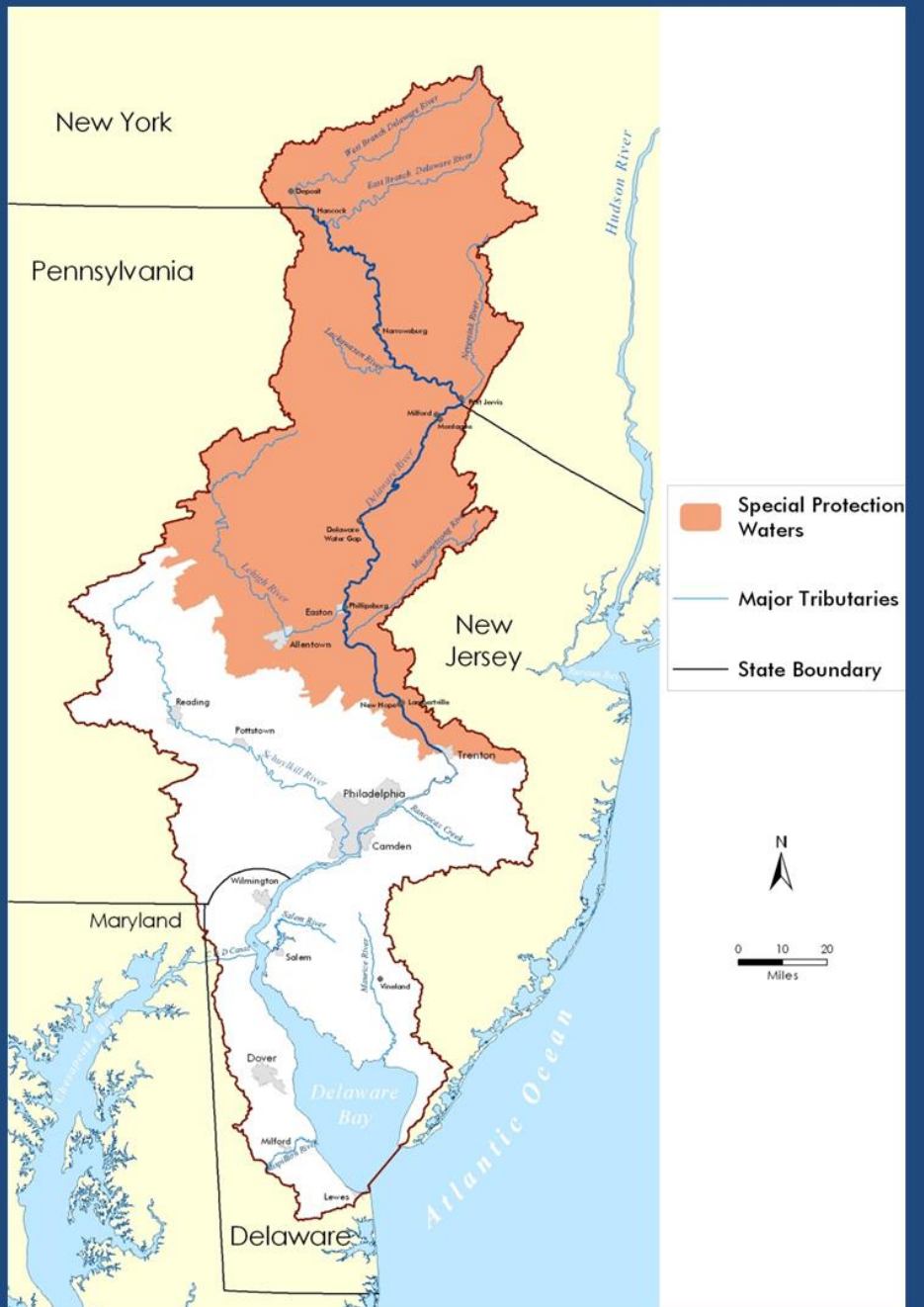
Delaware Estuary DO "Sag"



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

Special Protection Waters

Keeping Clean Waters Clean



- Entire basin upstream from Trenton
- Believed to be the longest anti-degradation reach in the US.
- It's more beneficial to “keep the clean waters clean” than to allow them to become degraded and attempt to restore them later.

Other Challenges

What's in our waters?

- PFAS
- Microplastics
- PCBs
- Other Contaminants of Emerging Concern

Climate

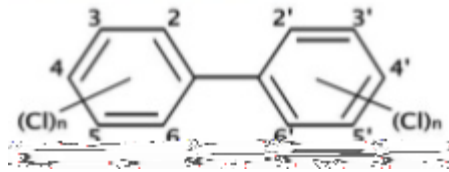
- Precipitation
- Temperature
- Sea Level Rise

Can we Swim in it?



Frozen Stemware on the Flat Brook by Evan Kwityn

Polychlorinated Biphenyls (PCBs)



- Man-made organic chemicals
- Industrial and commercial applications
 - Electrical insulating
 - Flame retardant
- Banned in 1979
- Possible human carcinogen
- Not water soluble



Photo: Wikipedia



Photo: U.S. EPA



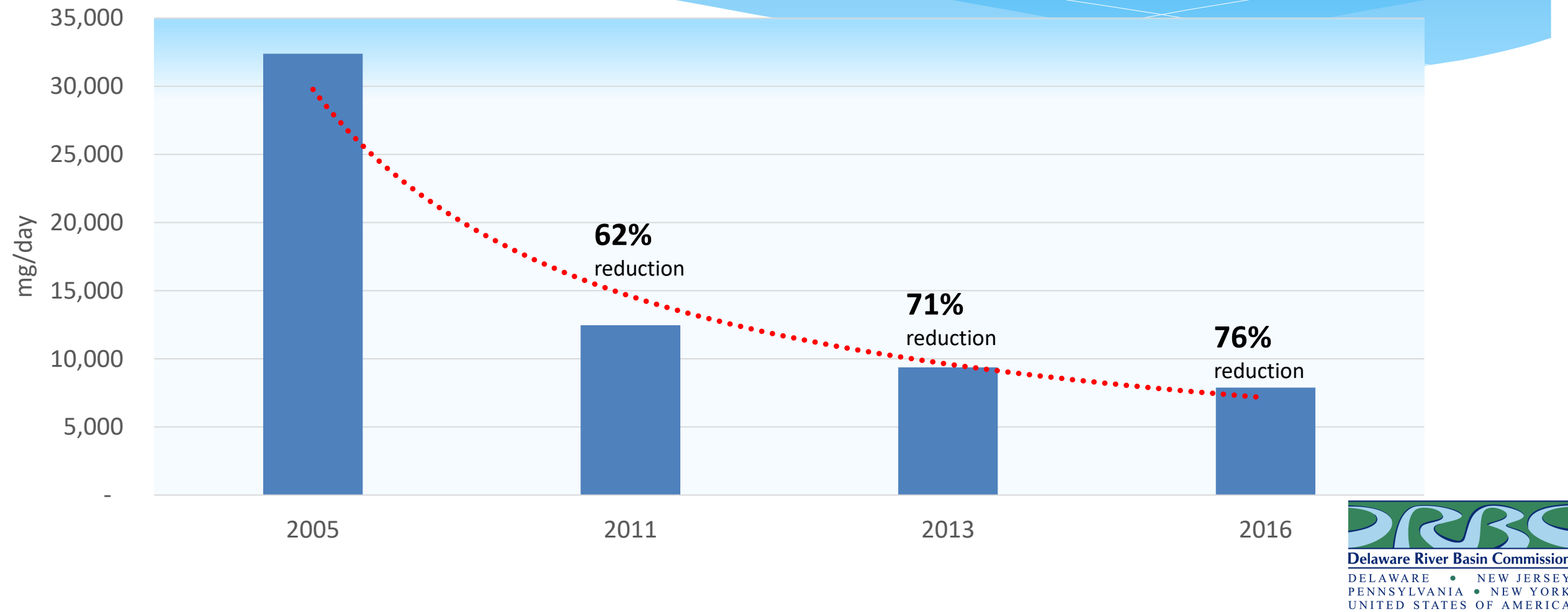
Photo: Wikipedia



Photo: U.S. EPA

PCB Loadings

Top Ten Point Source Dischargers mg/day



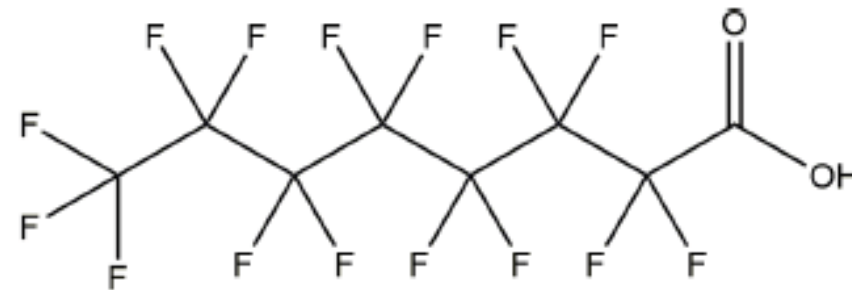
Per- and Polyfluoroalkyl Substances (PFAS)

Human Toxicity

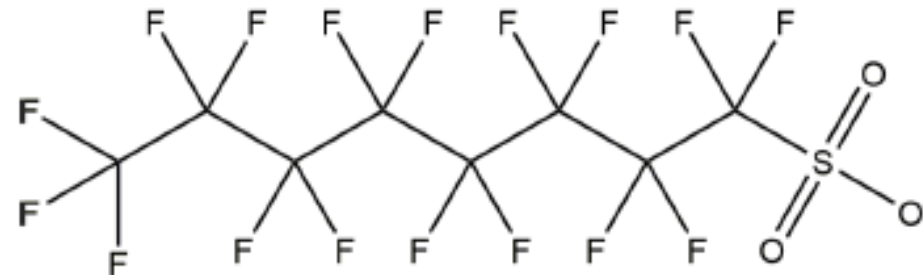
- Associated with liver damage, increased cholesterol, thyroid disease, decreased response to vaccines, asthma, decreased fertility and birth weight, pregnancy-induced hypertension/preclampsia.
- Scientific understanding is evolving.

DRBC Monitoring

- Water Samples
- Fish Tissue Samples



Perfluorooctanoic acid (PFOA)

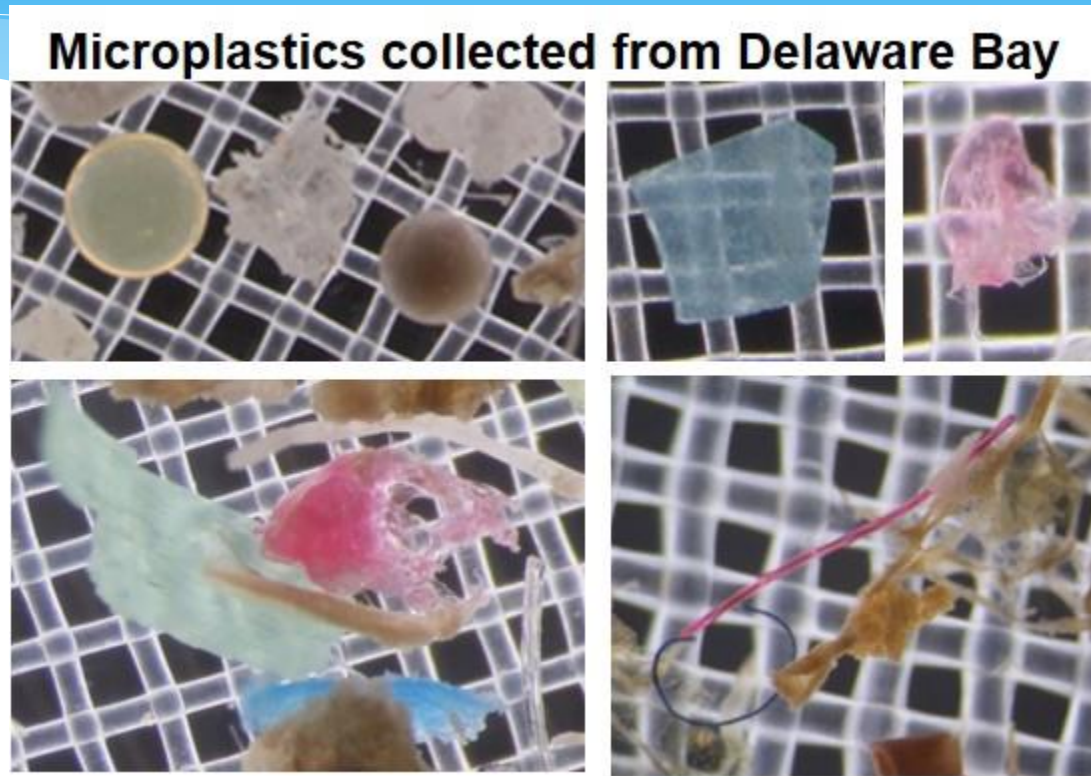


Perfluorooctane sulfonate (PFOS)

Microplastics

Small plastic pieces less than five millimeters long which can be harmful to our ocean and aquatic life.

- Primary microplastics include microbeads which were commonly found in health care products like face washes and toothpastes.
- Secondary microplastics occur when larger pieces of plastic like bottles and fishing line break down through photodegradation.



University of Delaware

Climate Change



- More warm extremes and fewer cold extremes
- Heavy rains become more intense
- More frequent dry spells
- Rising sea level with increased frequency and intensity of coastal flooding

*From RCI Co-Director **Tony Broccoli** featured at September 27, 2017 statewide conference *Climate Change Policy in New Jersey: Advancing Opportunities to make New Jersey Safer, Greener, Healthier and More Prosperous* , sponsored by the *New Jersey Climate Adaptation Alliance*.*



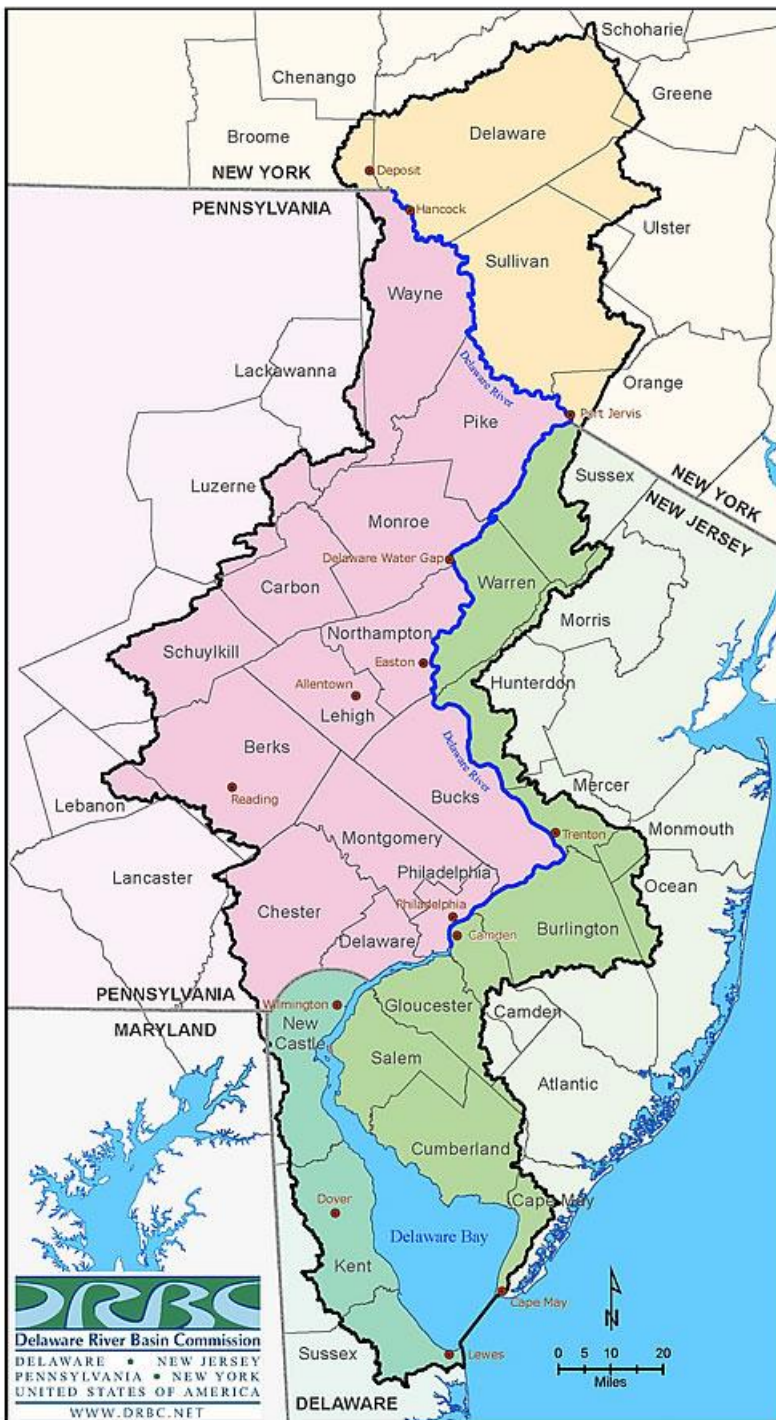
Complex Considerations

Freshwater Hydrologic Climate Considerations:

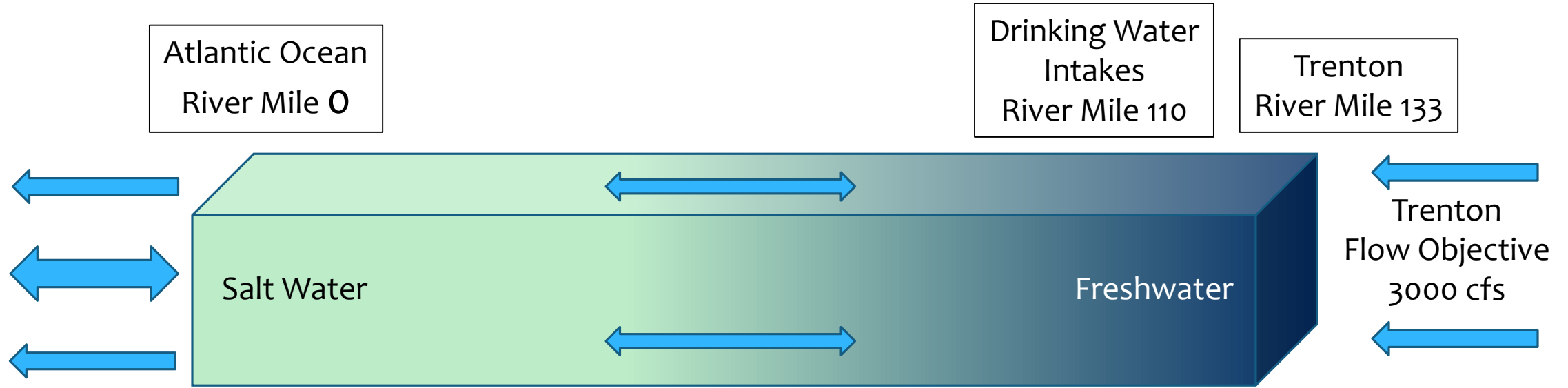
- Precipitation
 - Flow
- Temperature
 - Evapotranspiration
 - Snowpack

Salt Water Climate Considerations:

- Sea Level Rise

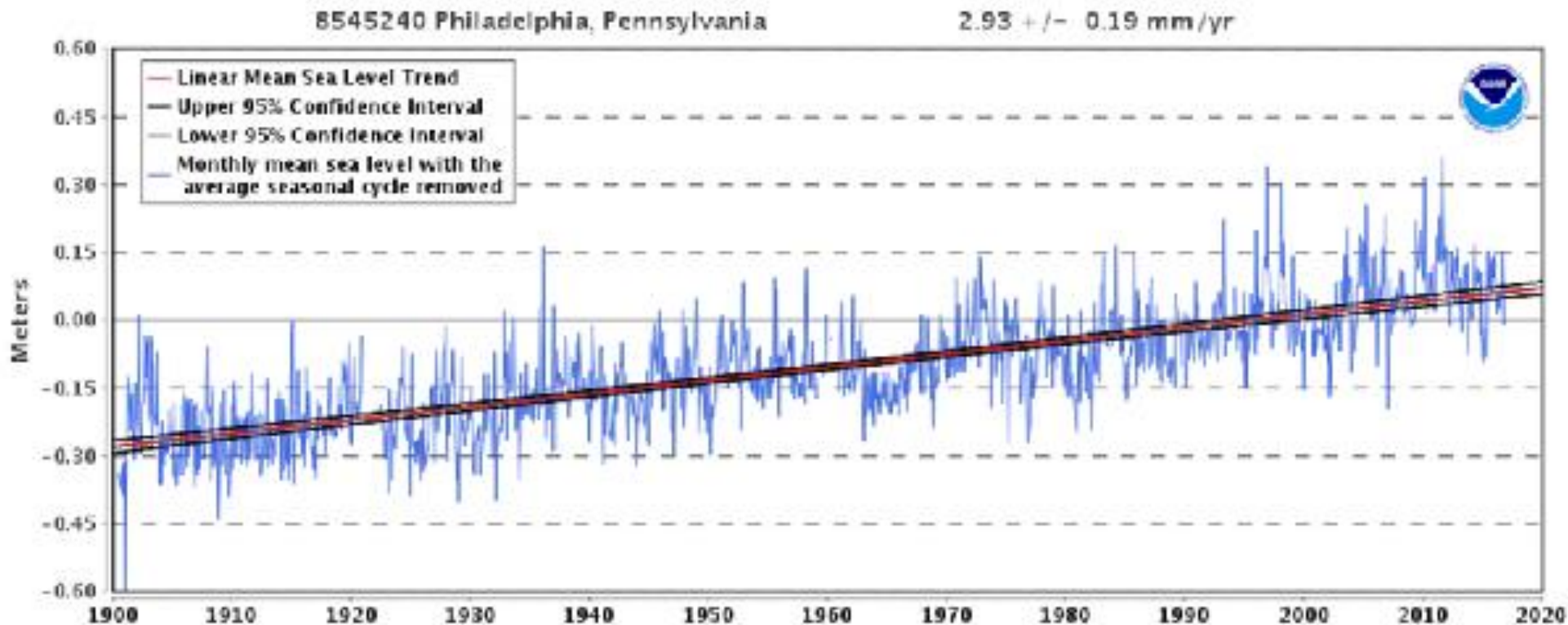


The Delaware Estuary “Tidal to Trenton”



Sea Level Rise

“Regional Sea Level Change Projections: It is very likely that in the 21st century and beyond, **sea level change will have a strong regional pattern**, with some places experiencing significant deviations of local and regional sea level change from the global mean change.” -IPCC 2013

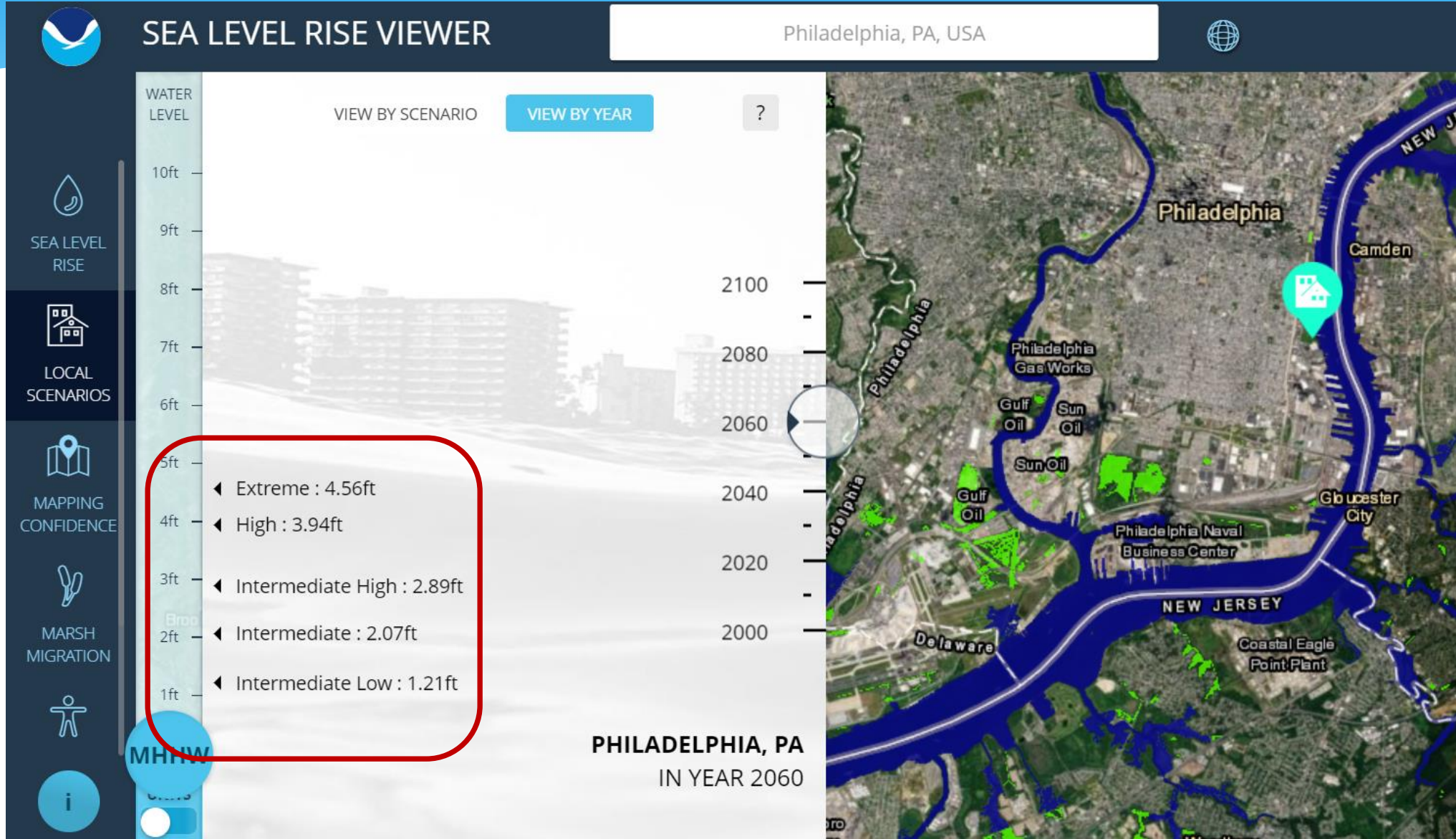


NOAA - Mean Sea Level Trend, Philadelphia:

- 2.93 mm/year (1/10 inch/year)
- 11.5 inches/century

NOAA Sea Level Rise Viewer

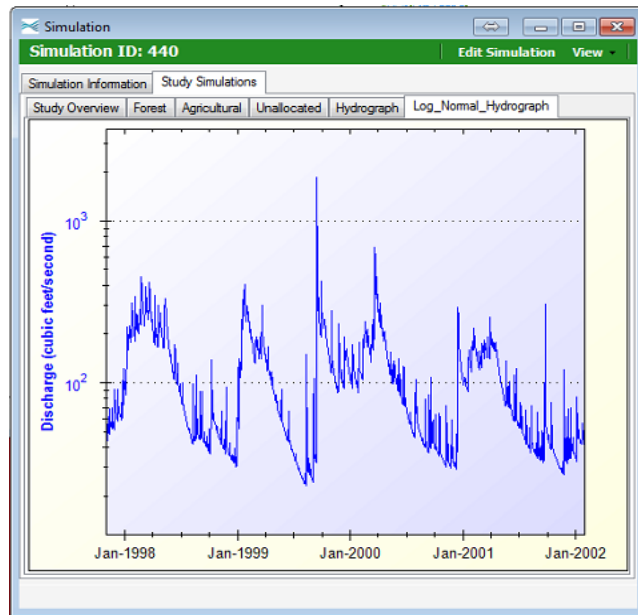
Philadelphia, PA @ 2060



Models

DRBC Model

Inflows



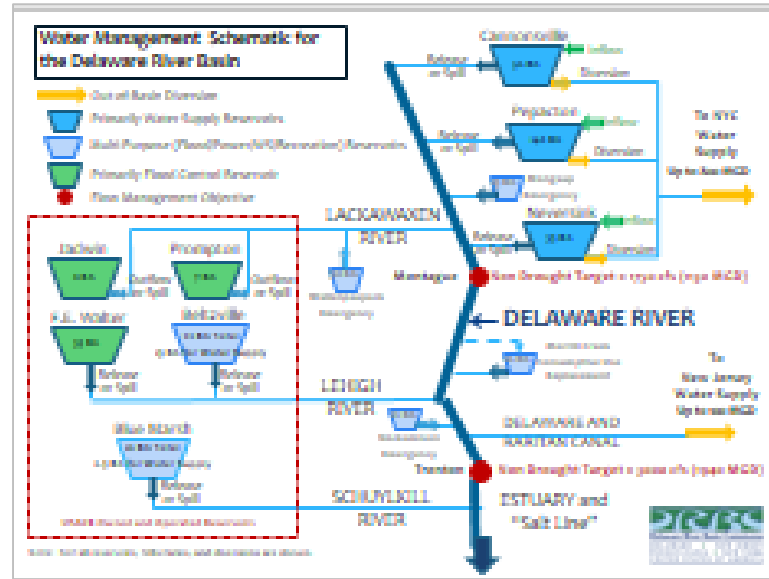
USGS WATER

Water Use Data

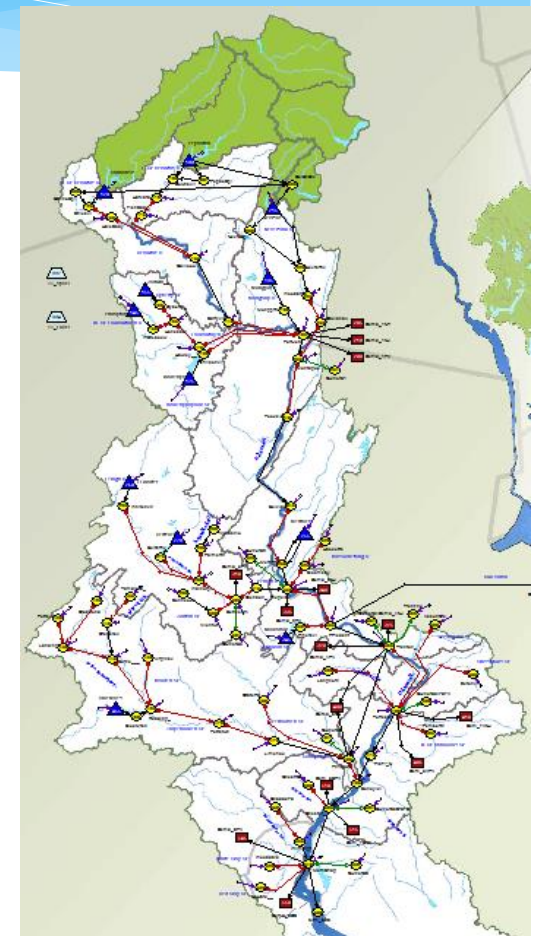


DRBC, States

Flow Management Rules

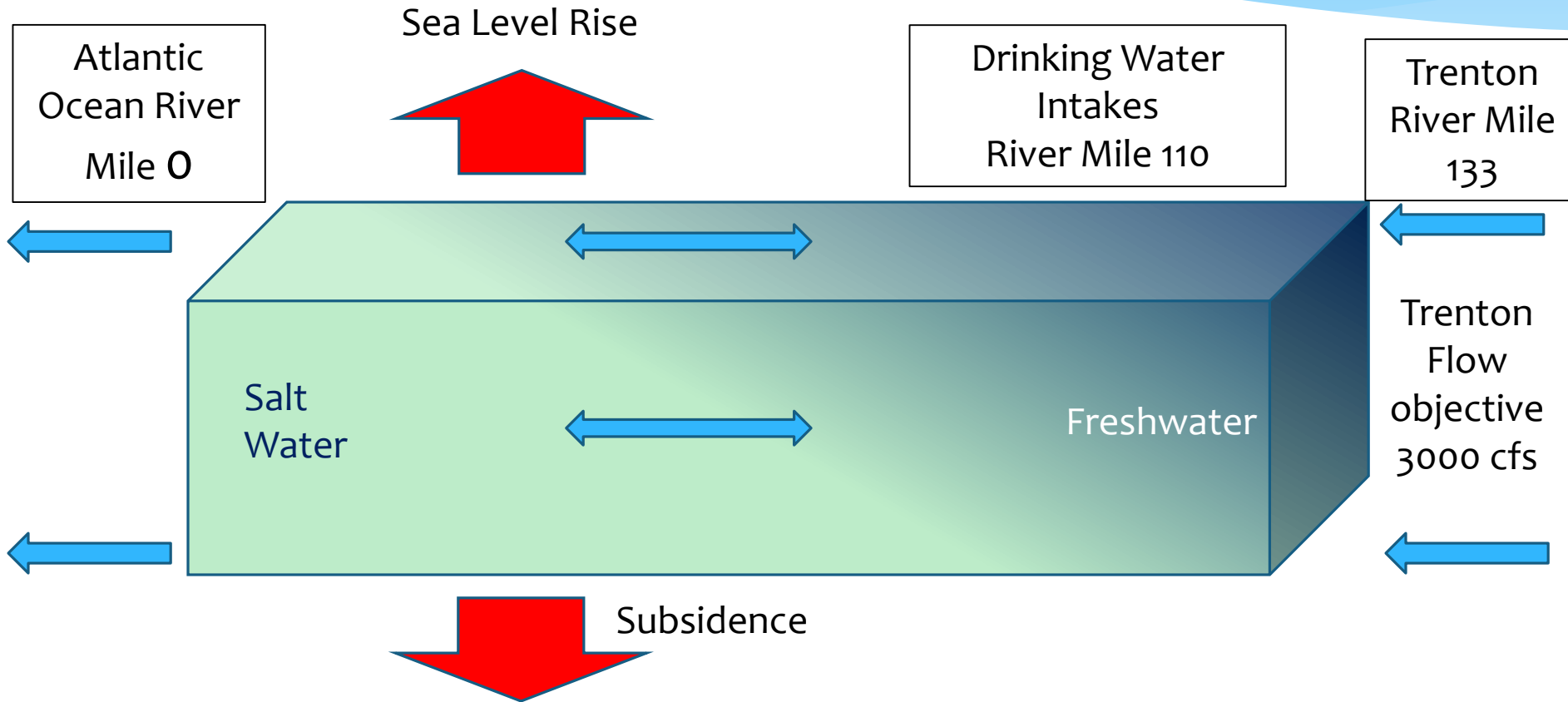


Water Code, FFMP, Dockets



Sea Level Rise and Salinity

? Future Ocean and River Salinities ?





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 members cannot achieve alone.



Steve Tambini, Executive Director

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www.drbc.gov



Delaware River Basin Commission

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

*Managing, Improving and
Protecting Our Shared Water
Resources since 1961*