Sea Level Rise and the Delaware River Basin

Public Webinar
January 27, 2026

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Welcome to the webinar!

Today's Agenda

- **Introduction & Logistics**
- Sea Level Rise Report Highlights
  - Key Findings
  - Modeling Overview
  - Next Steps
- DRBC's Climate Portfolio
- Public Involvement
- Questions & Discussion

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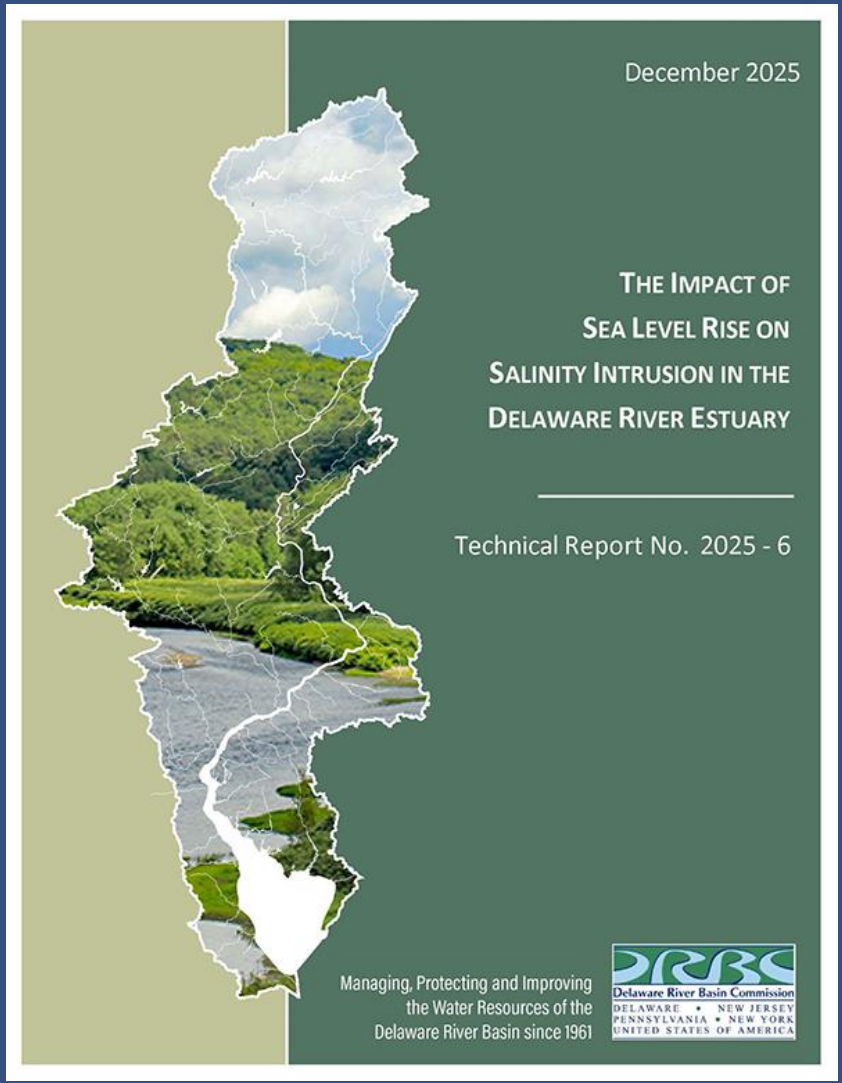
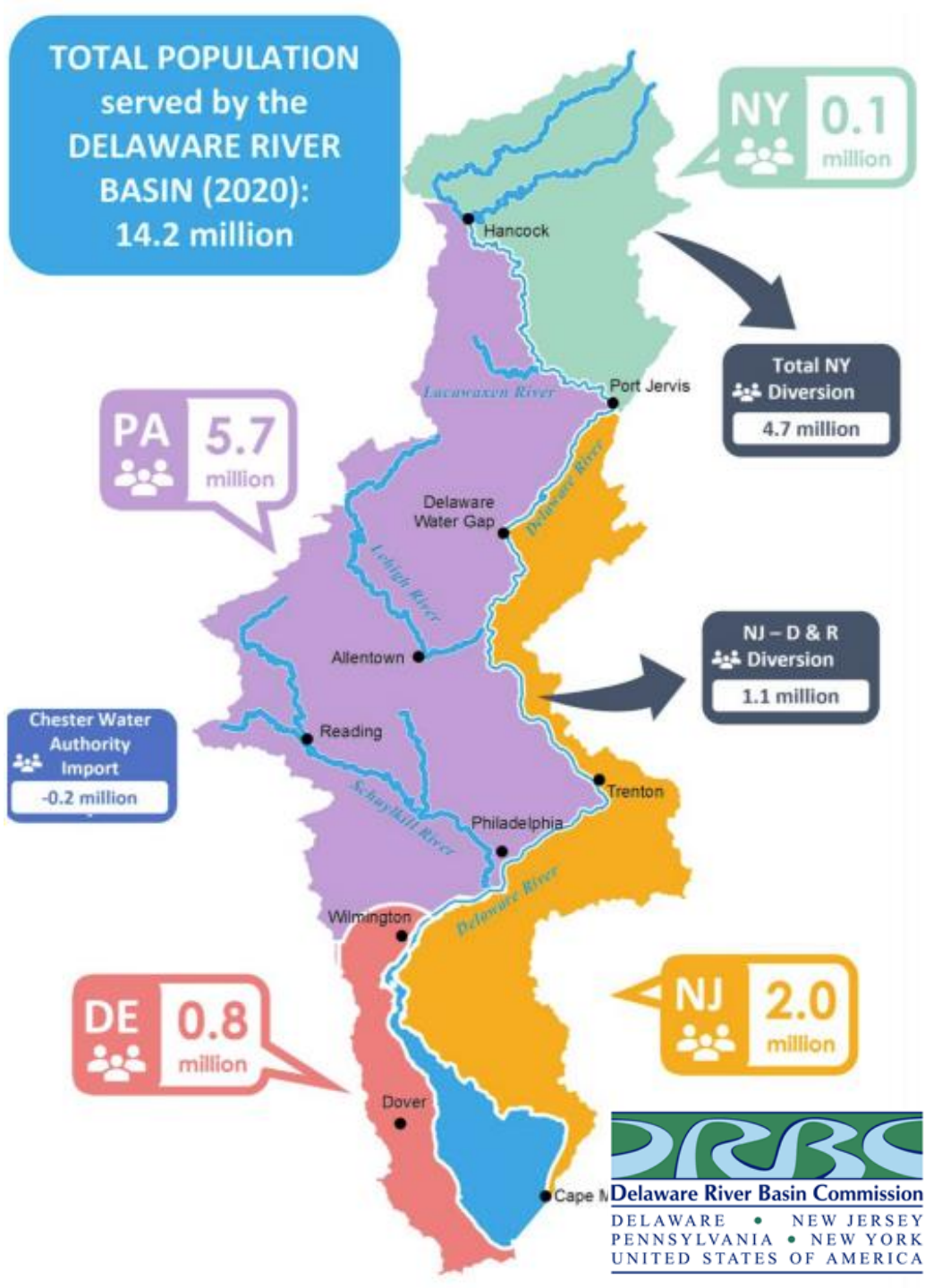
Today's Topic:
Sea Level Rise and the Delaware River Basin



The Delaware River Basin is **highly managed** to meet competing needs

- 14+ million people in four states
- $21+ billion in economic value
- 330-mile river
- Free-flowing mainstem
- Unique habitats & communities
- Interstate boundary



The Delaware River Basin Commission is a federal-interstate government agency

Our Mission

Manage, protect, and improve the water resources of the Delaware River Basin.

Our Vision

Provide trusted, effective, and coordinated management of the Basin's shared water resources.

Webinar Logistics

- Submitted questions
- Q&A at end
- Additional resources
- DRBC introduction

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How will sea level rise affect the basin?

- Storm Surge
- Tidal flooding
- Increased salinity intrusion (higher concentrations of salt upstream)
  - Habitat
  - Water Use

The tides push salty water upstream.

Tides are evident by the change in water surface elevation at Washington Avenue in Philadelphia

Photo credit (time lapse): John Yagecic, September 2020.

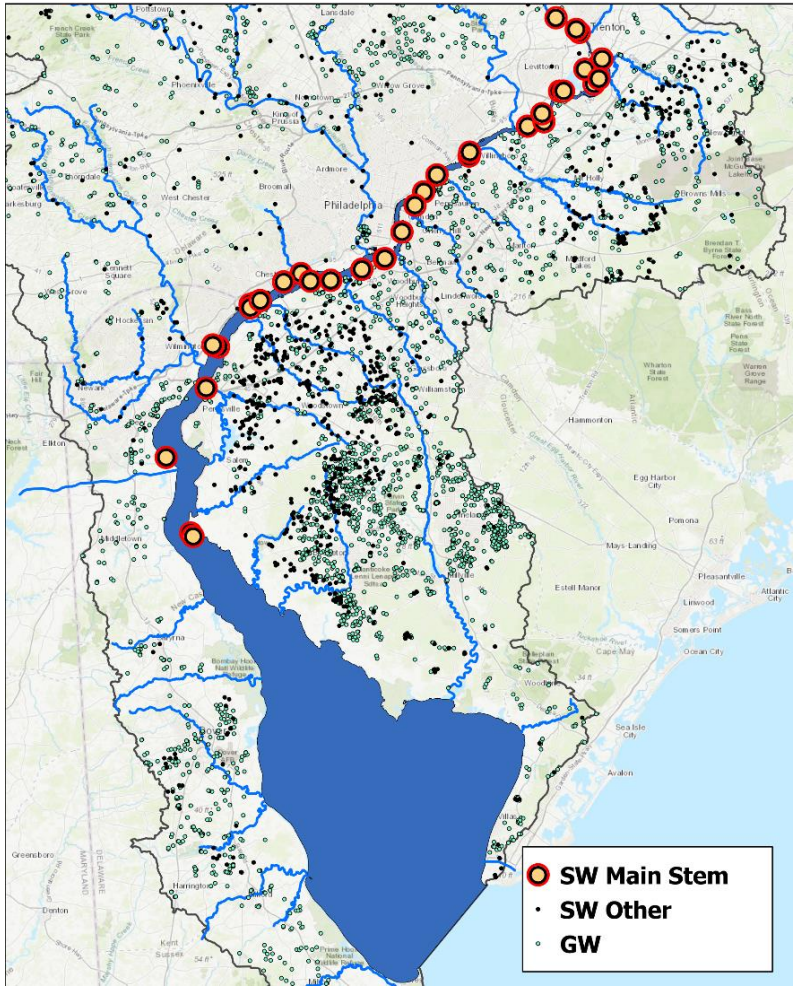
Salinity is a concern for surface water users below Trenton.

Phila.gov

N. Suk

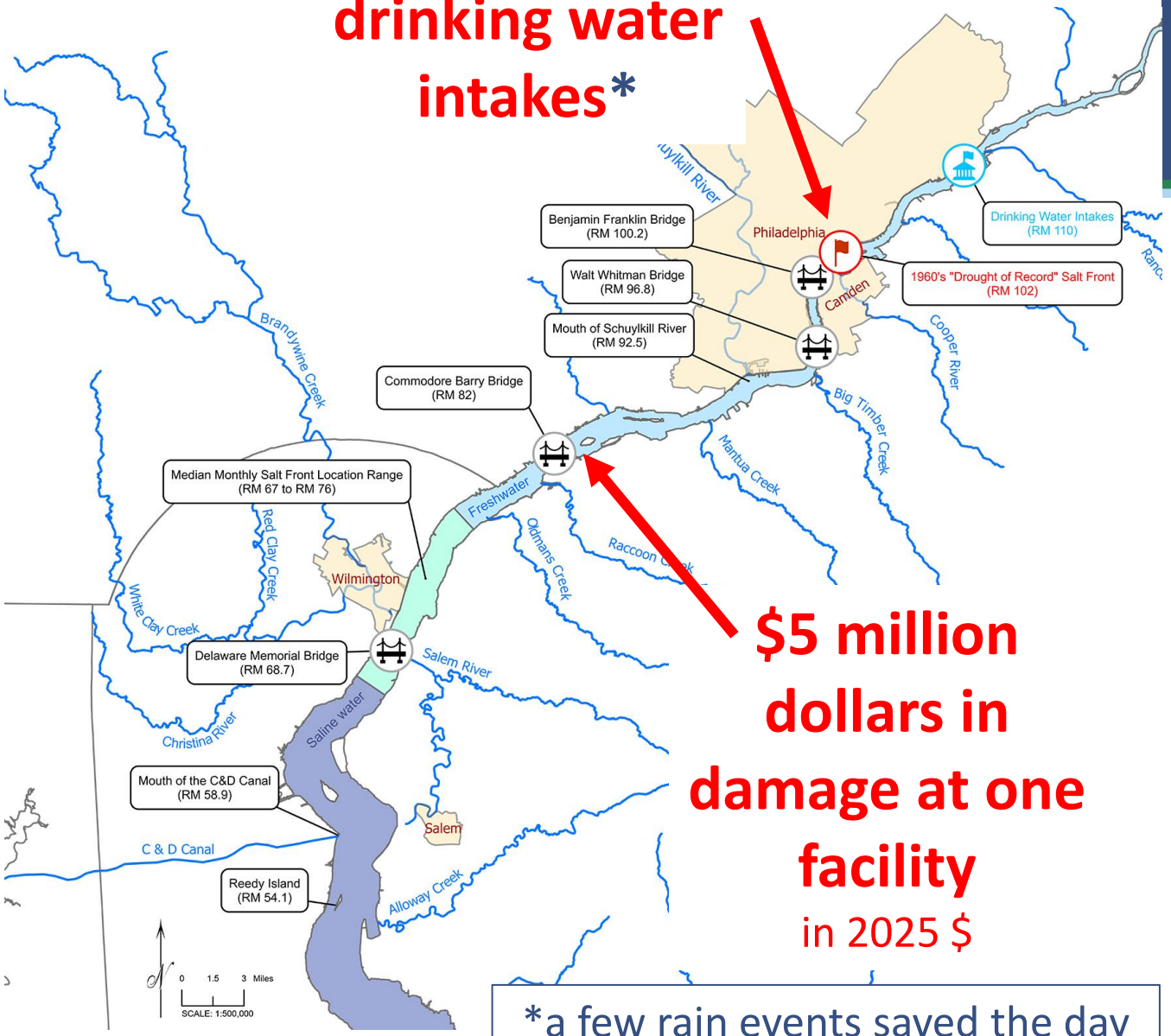
wikimapia.org/photo/1905408

Peretz Partensky



The Estuary can be used for drinking water, manufacturing, power generation and provides habitat.

Managing salinity is DRBC's responsibility.



- Impactful salinity intrusion events in 1957 and 1963-1967
- DRBC established the **Trenton Flow Objective.**
- Reservoir releases dilute the saltwater moving upstream
- Use the salt front to monitor

*a few rain events saved the day

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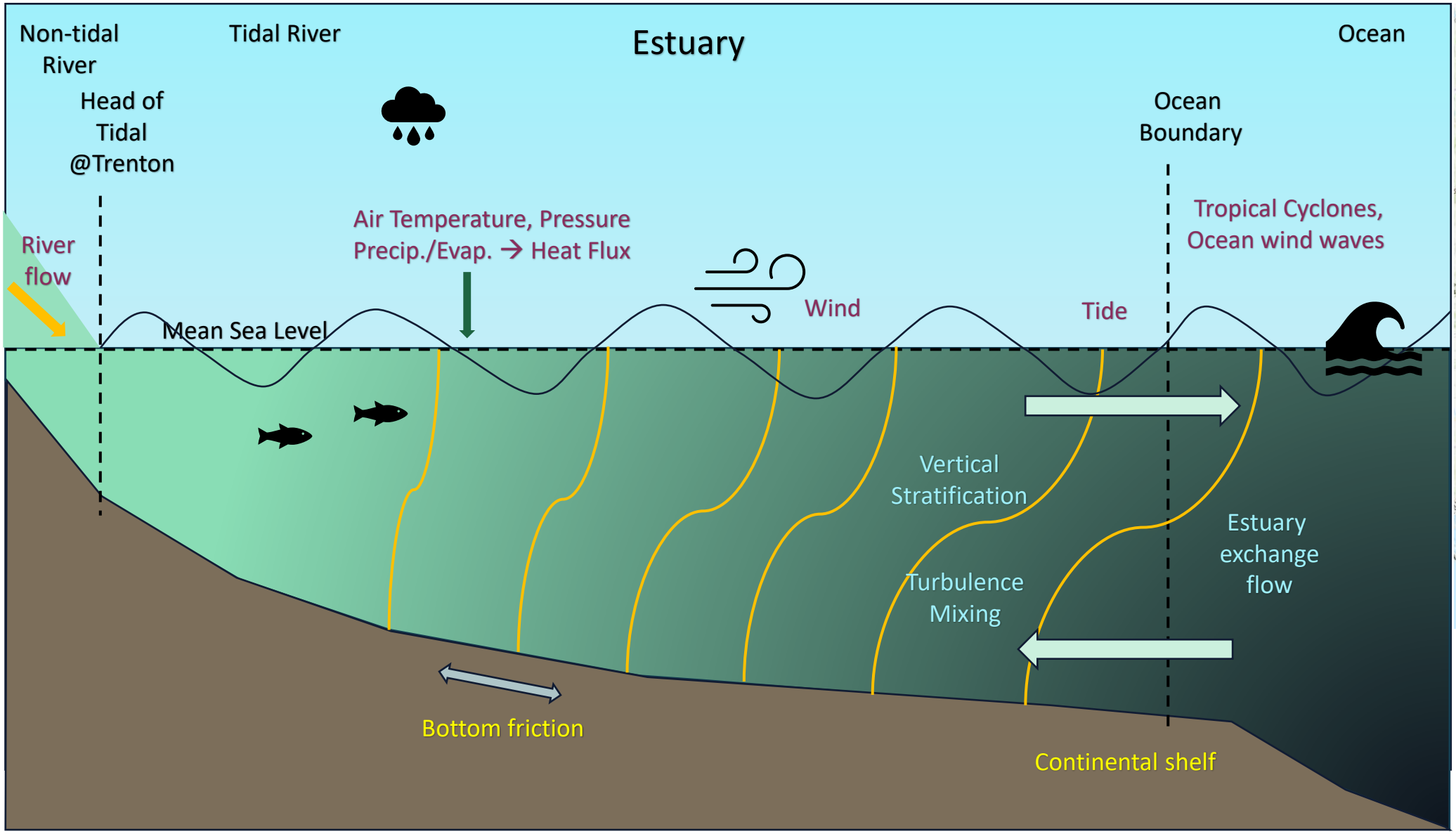
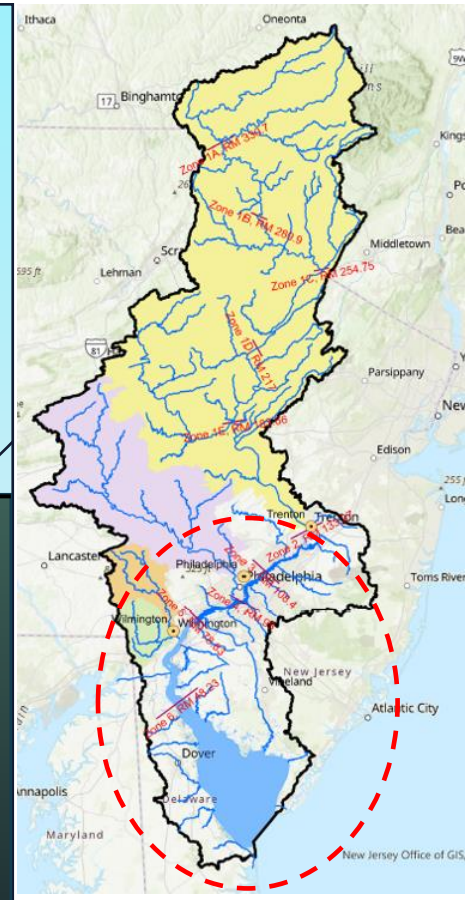
The hydrodynamic model tells us how salt moves upstream.





Delaware River Estuary

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A significant amount of observed information is needed to develop the model.

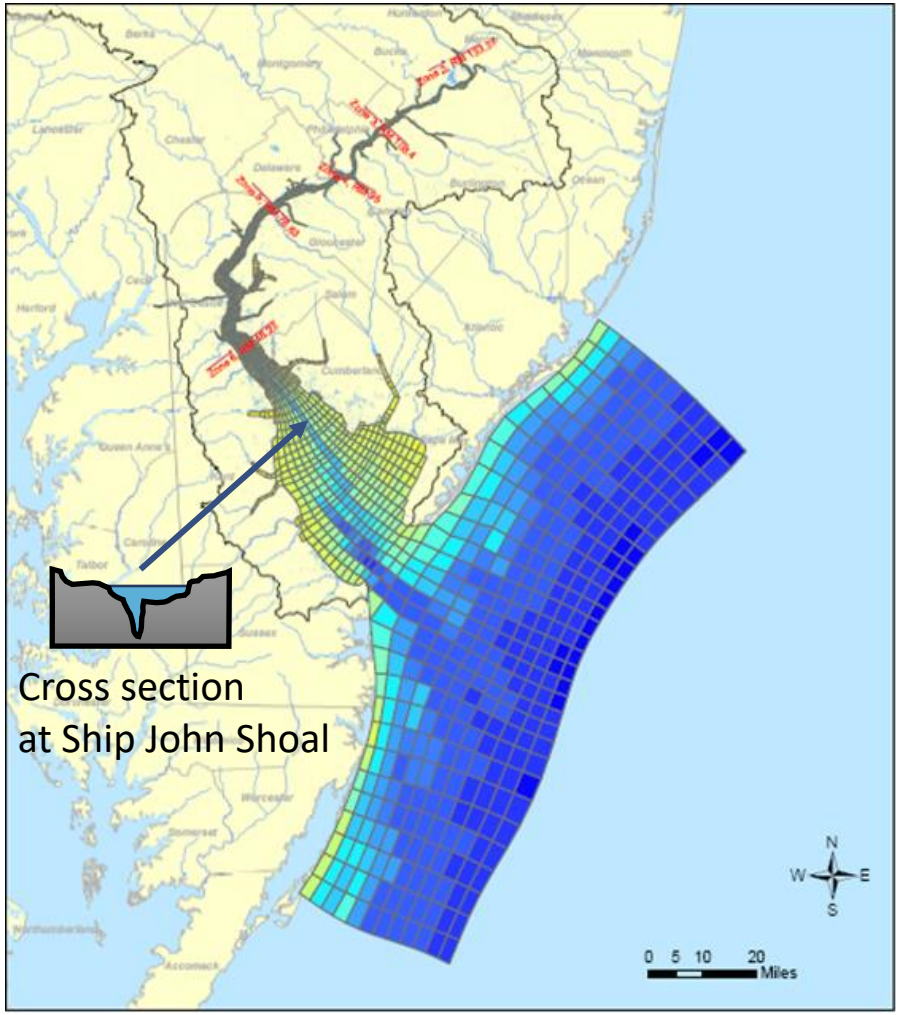
Model Inputs

Bathymetry and shape
Bottom characteristics
Physical coefficients

Flows (*tributaries, point sources*)
Tides
Current velocity
Salinity (*river, ocean*)
Water temperature
Weather: air temp/pressure, wind

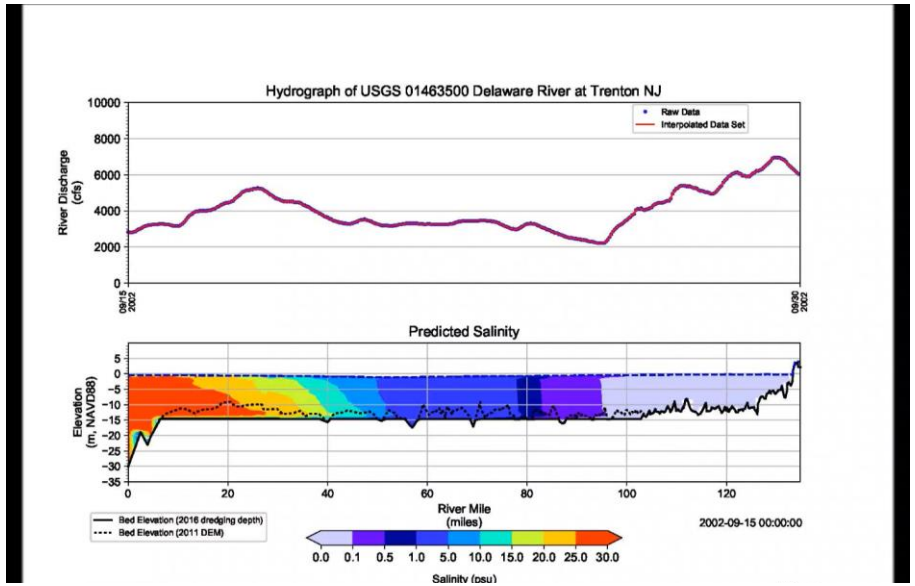
The salinity model **(SM3D)** is developed with Environmental Fluid Dynamics Code (**EFDC**), which is supported by EPA. *Hamrick (1992) and Tetra Tech Inc. (2002)*.

Domain and Model Grid



What model simulates?

Spatial and time-variable WSE, Current Velocity, Water Temperature, Salinity and Salinity intrusion (salt front location)



Model Application

Evaluate impact from SLR on salinity intrusion

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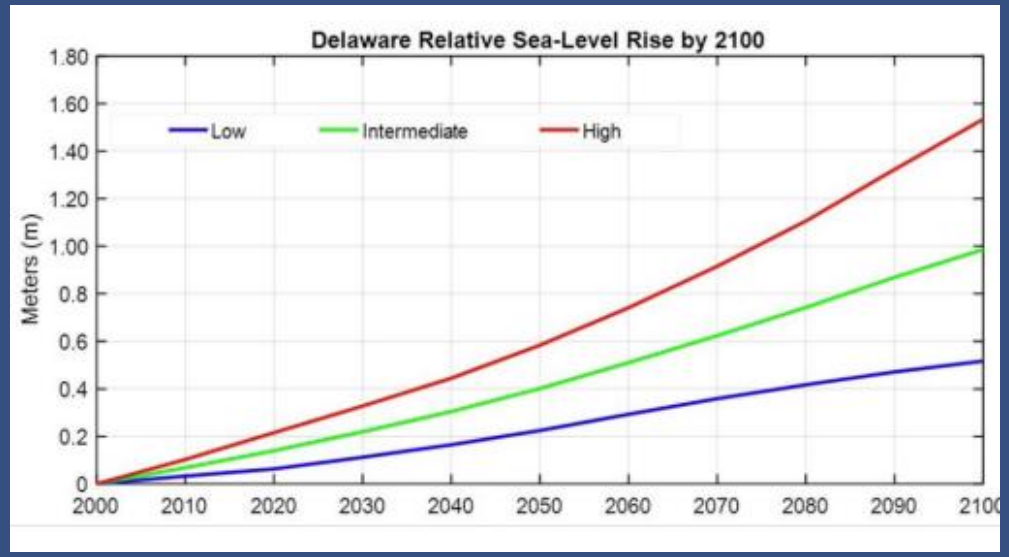
What did we study?

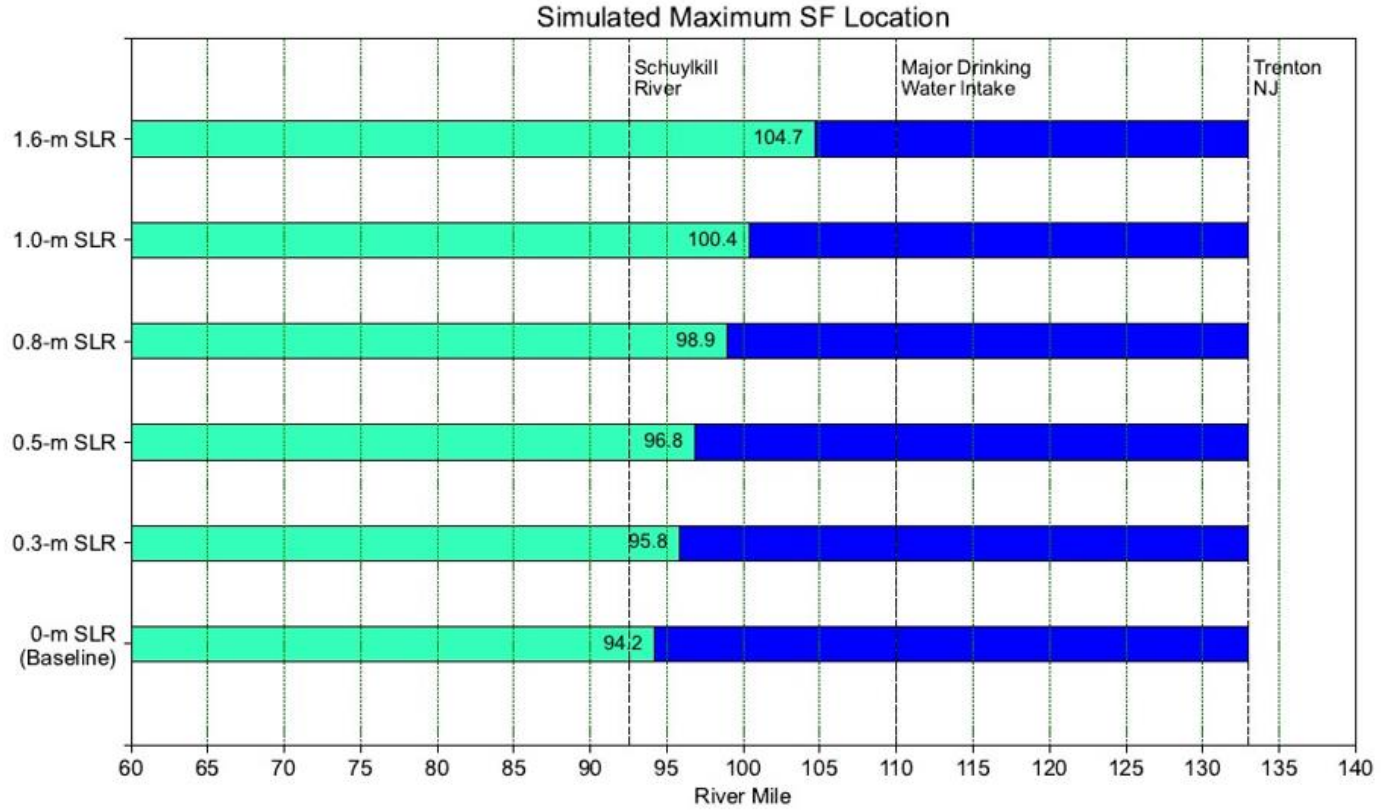


SLR compared to the MSL in 2000

- Range of sea levels
- Extreme conditions
- Range of flows
- Characteristics of the Estuary that may change
- Management options
- Assumptions

The salt front will move farther upstream with sea level rise

EXTREME: Repeat of 1965 conditions with management using flow objective.

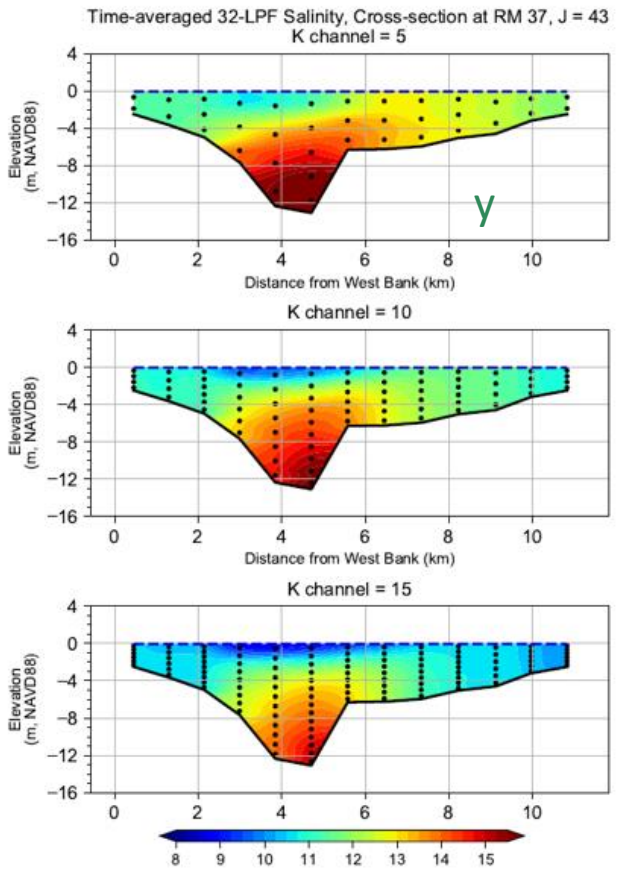


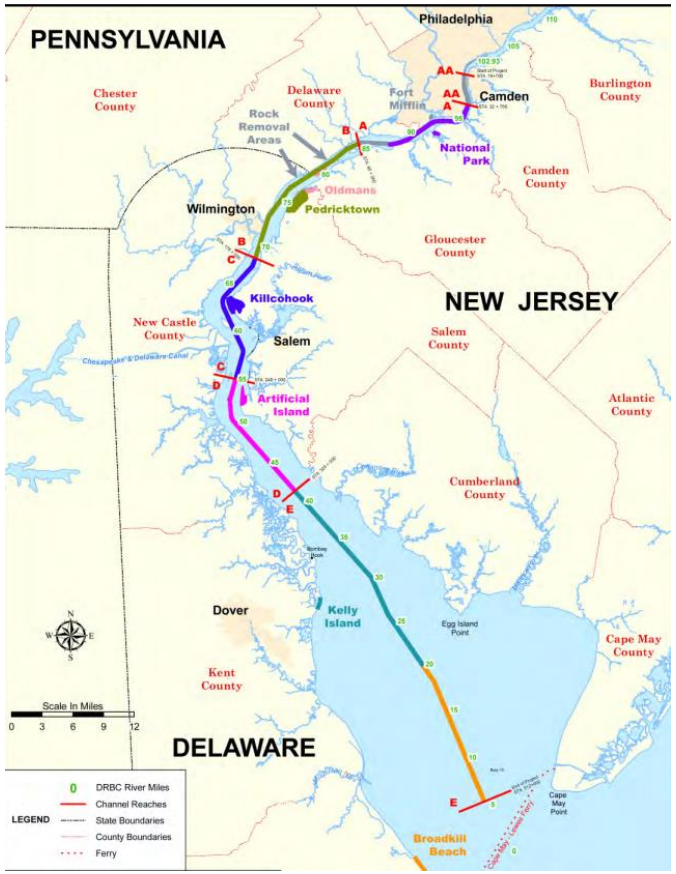
SLR (m)	Max Salt Front
0	94.2
0.3	95.8
0.5	96.8
0.8	98.9
1.0	100.4
1.6	104.7

If the flows of 1965 occurred today, the salt front would likely be upstream of RM 92.5.

Recent dredging will bring the salt front 2-miles upstream, but SLR has a larger effect

Other factors besides sea level rise will affect salinity intrusion in the future

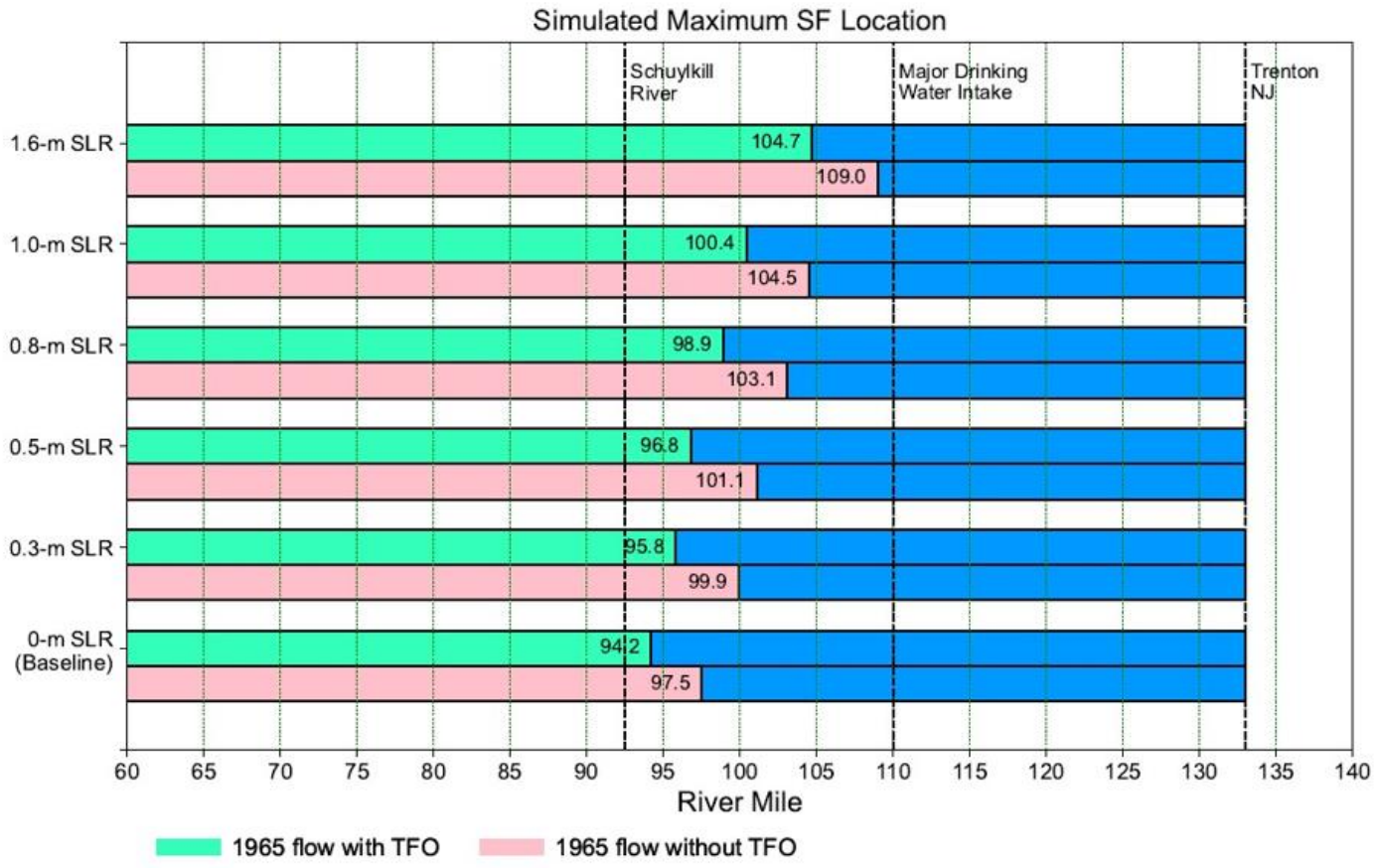




- The channel is 5 feet deeper than the 1960s drought
- From 40 ft to 45 ft
- Dredged from 2012-2017
- Width unchanged

*For a **moderately dry** condition. The additional upstream distance is in addition to SLR

The flow objective is effective but not enough with SLR



Tested the effectiveness of a flow objective.

With and without the flow objective

SLR 0 m: 94.2 → 97.5

SLR 0.5 m: 96.8 → 101.1

SLR 1.0m: 100.4 → 104.5

Even with the flow objective, at 1.0 m the salt front is farther upstream than in the 1960s drought.

The report contains additional analyses related to salinity intrusion.

- Channel representation
  - Effects of marshes
  - Marsh vegetation (friction)
  - Bank Erosion
- Increased background salinity
- Ocean temp and salinity
- Other management options

Future work with the model is planned

- Update as more information becomes available
- Evaluate other management options
  - Flow
  - Structural
  - Other
- Use in other DRBC Studies such as the water resources resilience plan

This model and study were developed to provide information about how salinity and the salt front will be affected by sea level rise and should not be used for other purposes unless adapted to do so.

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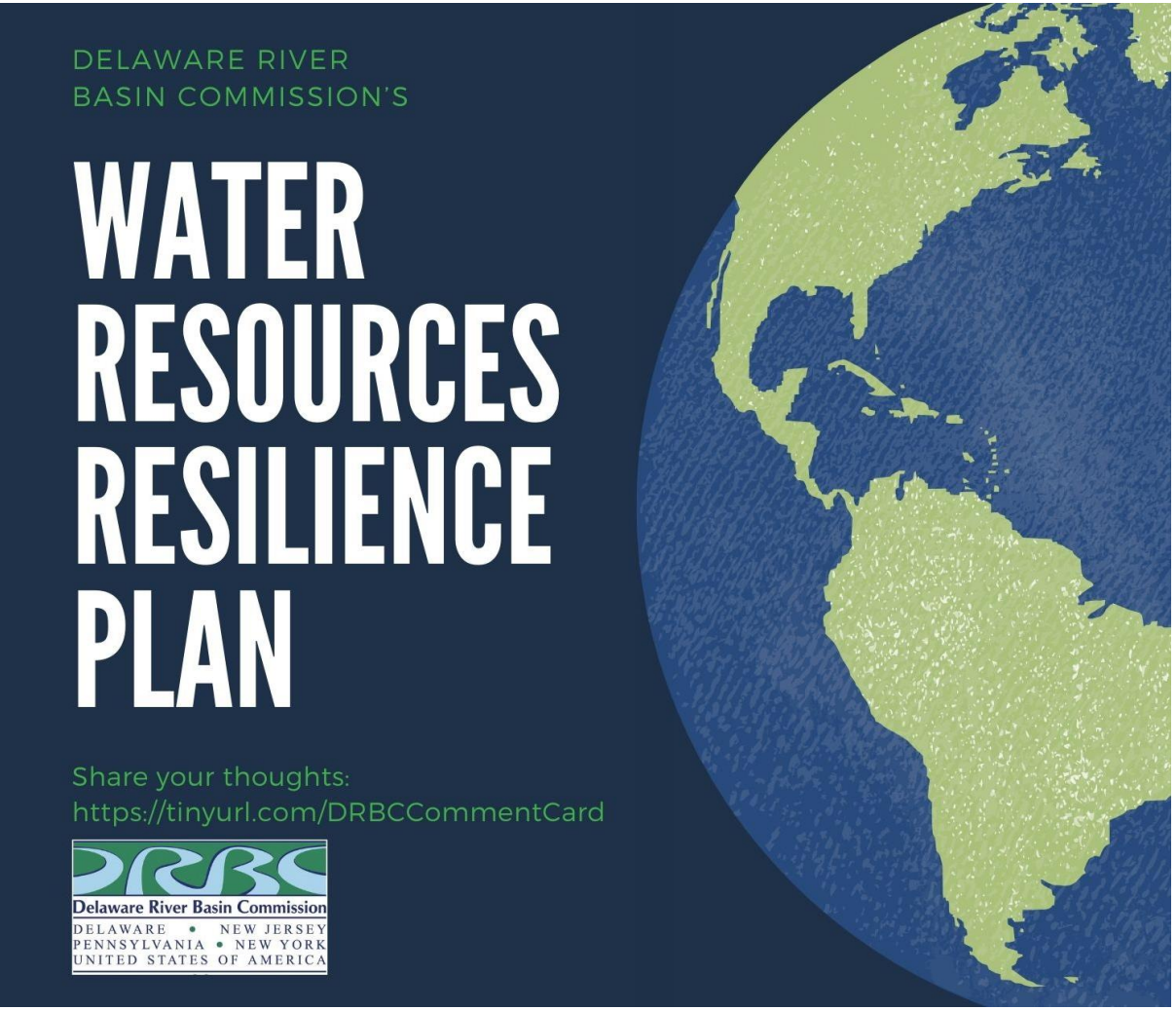
DRBC has been intentionally considering climate change effects on water resources for decades.

- Hydrology
  historical vs. future global climate models
- Estuary water quality
  ocean temperature & meteorological conditions
- Extreme precipitation
  online intensity-duration-frequency (IDF) tool
- Convenings
  Climate Forums, Practitioners Workshop, webinars
- Advisory Committee on Climate Change (ACCC)

June 2006
Easton, PA and Phillipsburg, NJ Express-Times File Photo

DRBC is planning for water resources resilience.



The challenge

- Climate change and extreme weather impacting Basin
- Commissioners direct plan
- Actions within authority

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Water Resources Resilience Plan

Next Steps

- Finalizing Phase 1
- Initiating Phase 2
- Work continues in parallel
- Flood loss, water quality, more
- Additional public input

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Stay Engaged with DRBC's Resilience Work

- **Attend an Advisory Committee on Climate Change (ACCC) meeting**
  - Next meeting: **February 17, 2026** – Register at https://www.nj.gov/drbc/meetings/advisory/index.html
- **Apply to serve on a DRBC advisory committee**
  - Committee openings: https://www.nj.gov/drbc/about/advisory/committee-openings.html
- **Share DRBC's Sea Level Rise Report social media toolkit**
  - Toolkit will be sent via email to webinar attendees
- **Sign up for the Water Resources Resilience Plan (WRRP) listserv**
  - https://www.nj.gov/drbc/contact/interest/ (select "DRBC Water Resources Resilience Plan")
- **Join the *Our Shared Waters* partner network**
  - Contact Avery.Lentini@DRBC.gov

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The Delaware River Basin Commission ensures an adequate supply of high-quality water for varied uses, for over 14 million people in 4 states.

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Credits:
Slide 4: Getty Images
Slide 6: Keith Balderston
Slide 21: Express-Times