Delaware River Basin Commission

Salinity and the Delaware River Estuary

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Regulated Flow Advisory Committee
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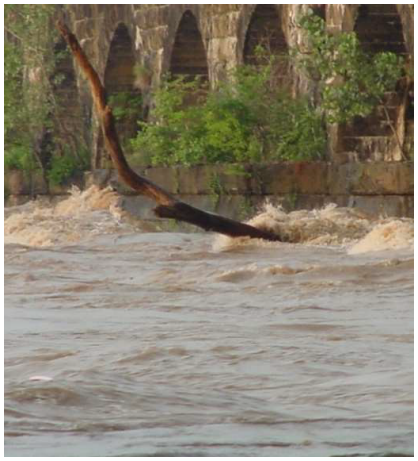

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Delaware River and Basin

- Main stem (Hancock NY => Ocean) is 330 miles long – No Dams
- The River forms interstate boundaries over its entire length
- Watershed drains 13,539 square miles in 4 states
- Drinking water for 13.3 million people (approximately 5 % of the U.S. population)
- Water withdrawals exceed 6.4 billion gallons/day
- Significant Exports to NYC (up to 800 MGD) and NJ (up to 100 MGD)
- Contributes over $21B in economic value

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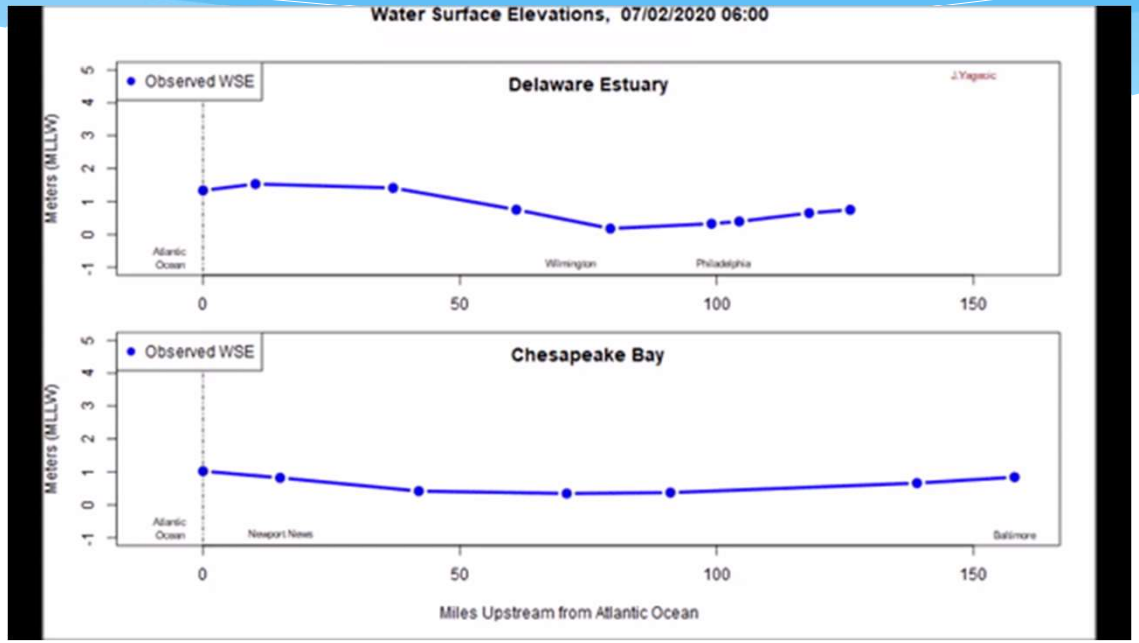
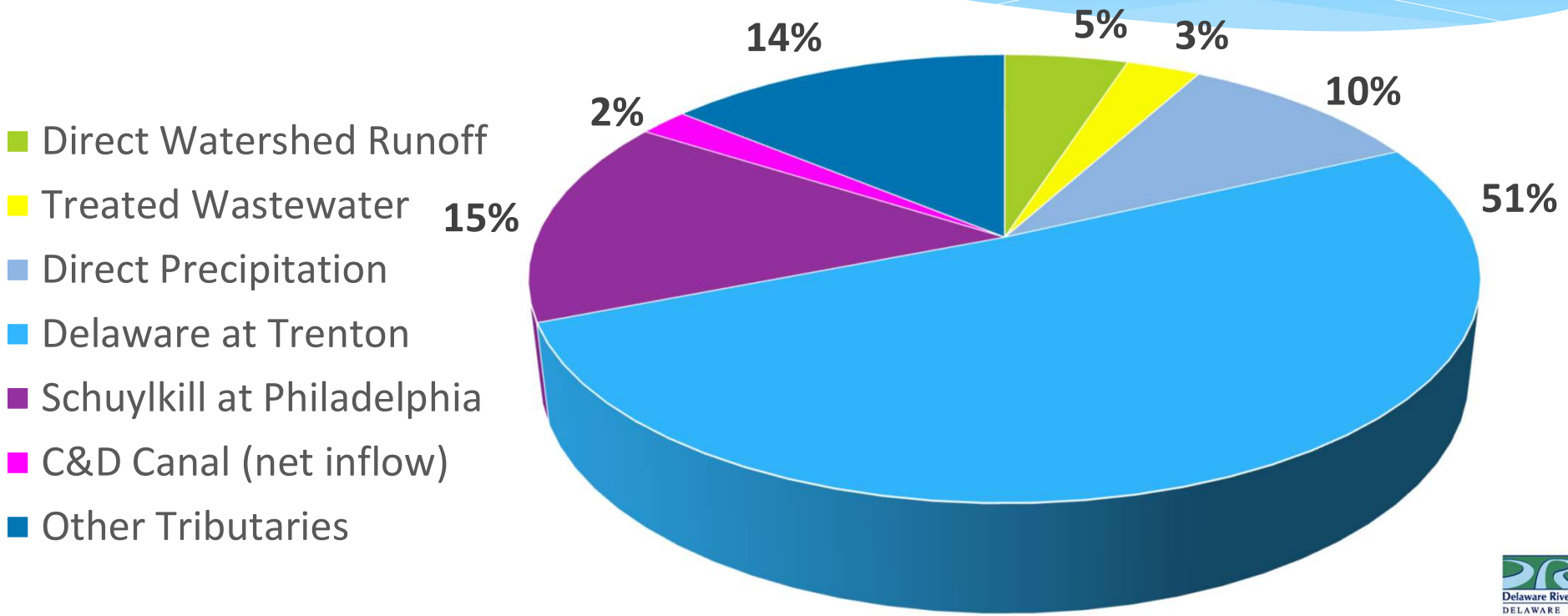
Chesapeake v. Delaware Bay/Estuary



Moving upstream, the DRB shoreline converges more quickly and the head of tide is like a wall which reflects the wave energy back downstream, unlike the Chesapeake bay and other estuaries.

Map: Google. Annimation: J. Yagecic.

Estuary Inflow Composition



Source: DRBC

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Water Users

Phila.gov

N. Suk

http://wikimapia.org/21274124/Kimberly-Clark-Inc-Chester-Papermill#/photo/1905408

Photo: Peretz Partensky, https://www.flickr.com/photos/ifl/7238282472/in/album-72157629823114004/; unedited

* Drinking Water Providers
* Manufacturing
* Refining
* Energy Production

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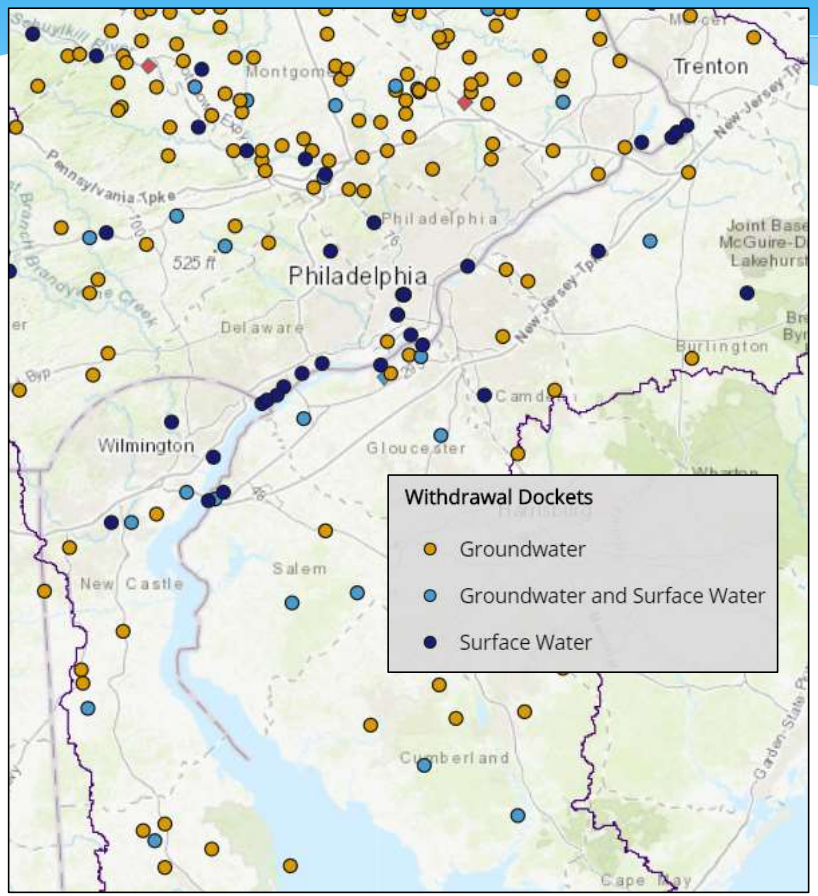
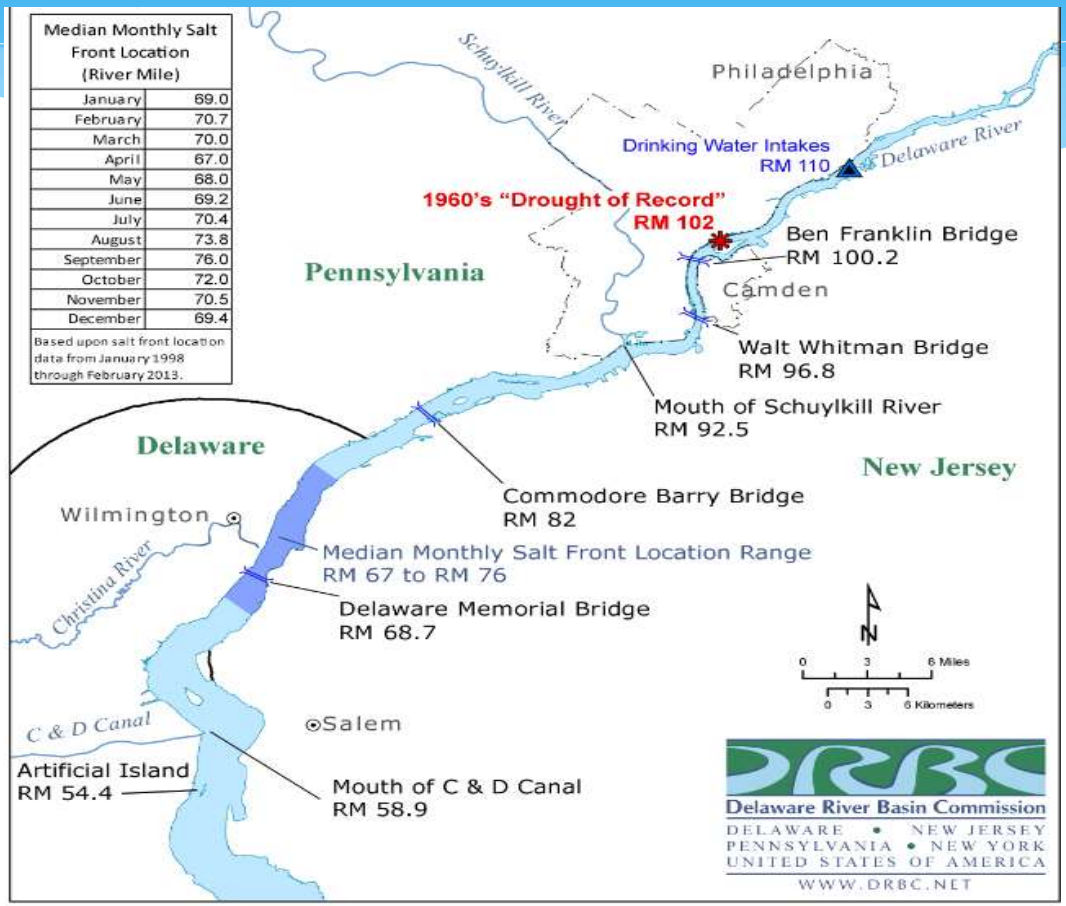
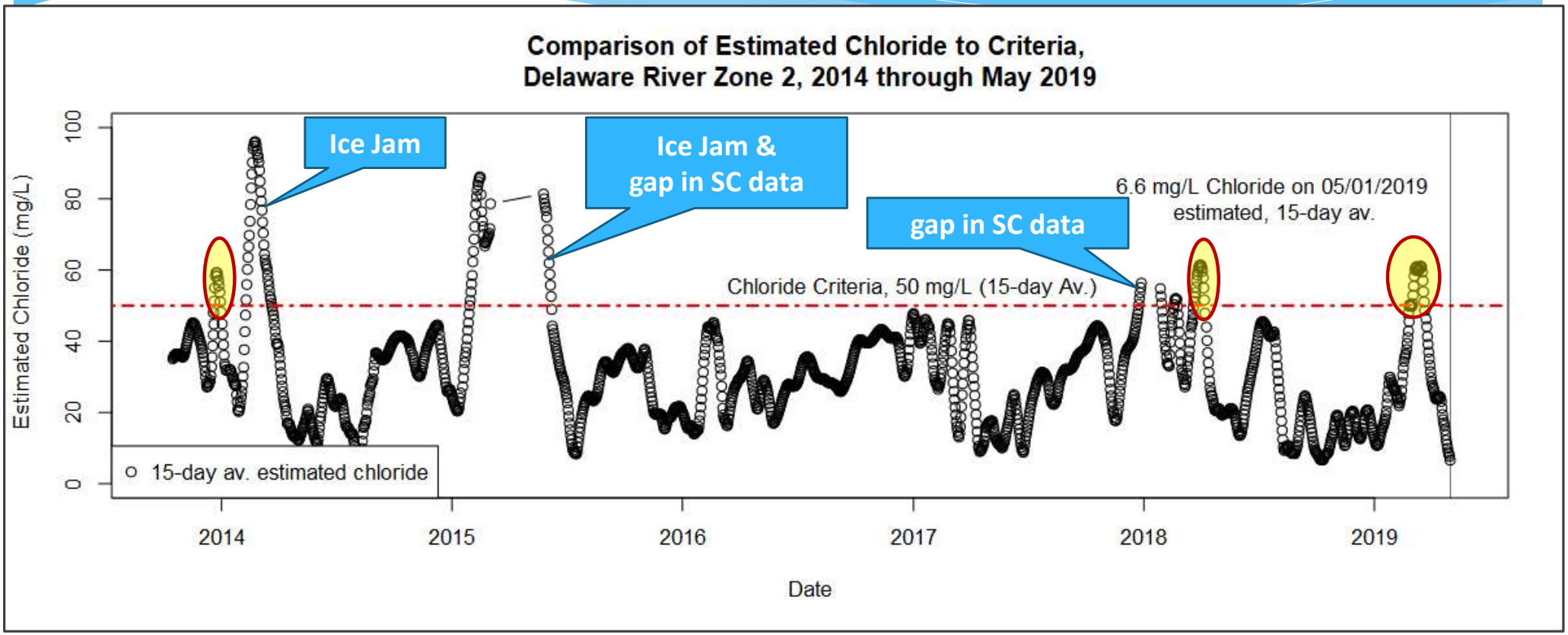
Drought Management and the Salt Front





Apparent Violations of Chloride Criteria, Zone 2



Sea Level Rise and Salinity

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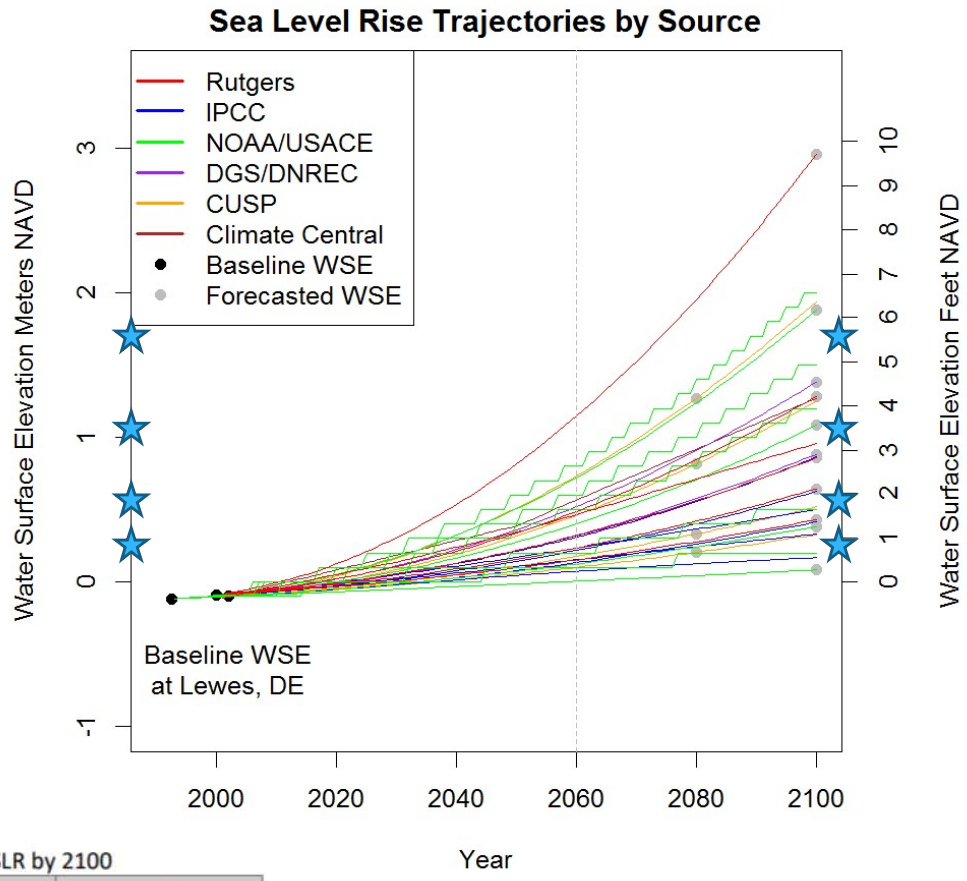

SLR Planning Scenario	SLR by 2100	
Low Scenario (5%)	**0.52 m**	**1.71 ft**
Intermediate Scenario (50%)	**0.99 m**	**3.25 ft**
High Scenario (95%)	**1.53 m**	**5.02 ft**

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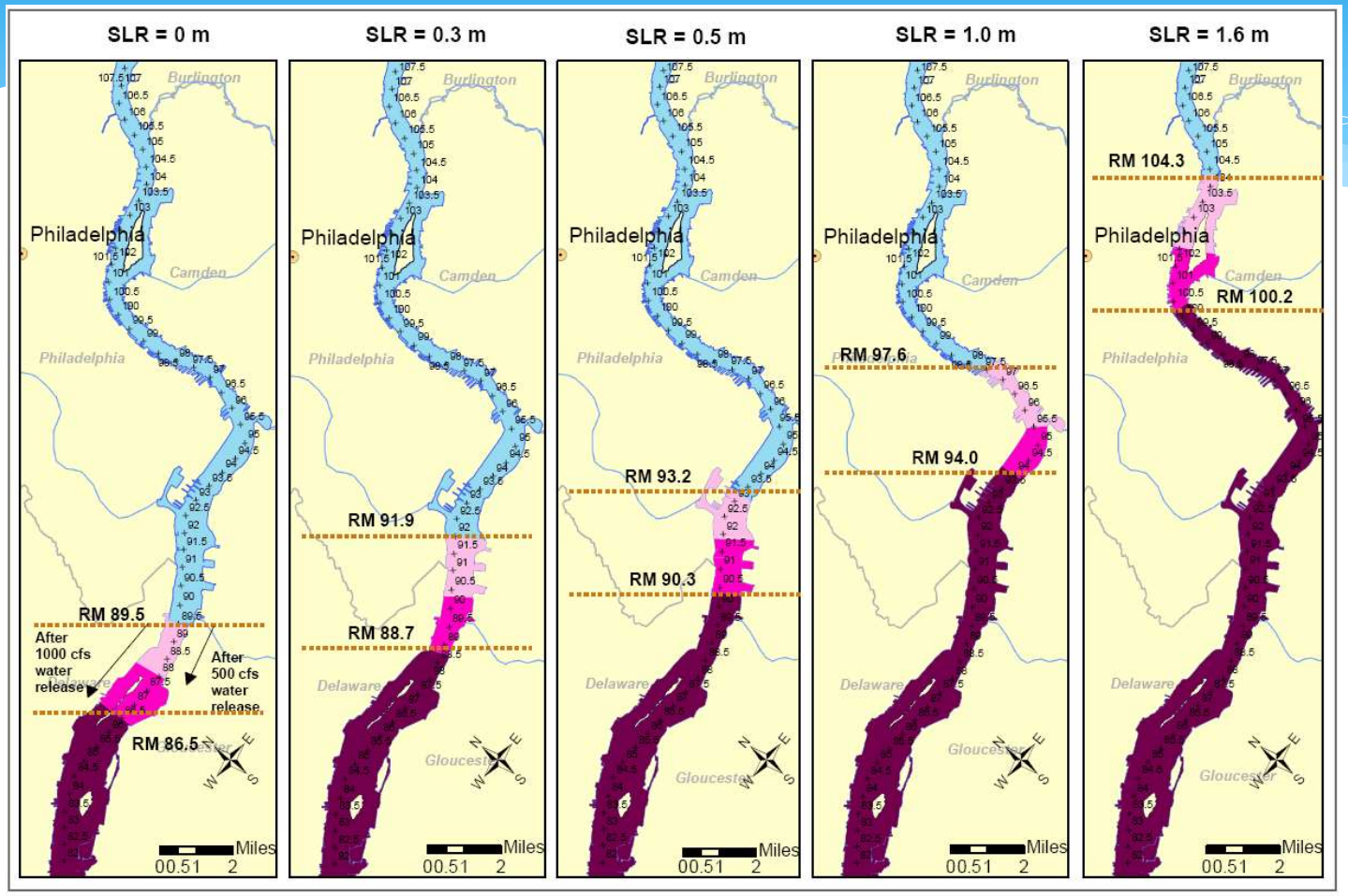
DRBC: Sea Level Trajectories by Source (2016). Delaware Geological Survey: SLR Planning Scenarios Table (2017). NJ: Rutgers STAP 2019, not shown.

Range of Salt Front Movement

with dry conditions and different flow augmentation



Legend

Simulated SF Range (SLR = 1.6 m)

- No additional flow added
- 500 cfs for 2 months
- 1,000 cfs added for 2 months

Simulations of July-October 2002 conditions with additional water released in August and September. A significant amount of water may be needed to keep the salt front below RM 92.5.

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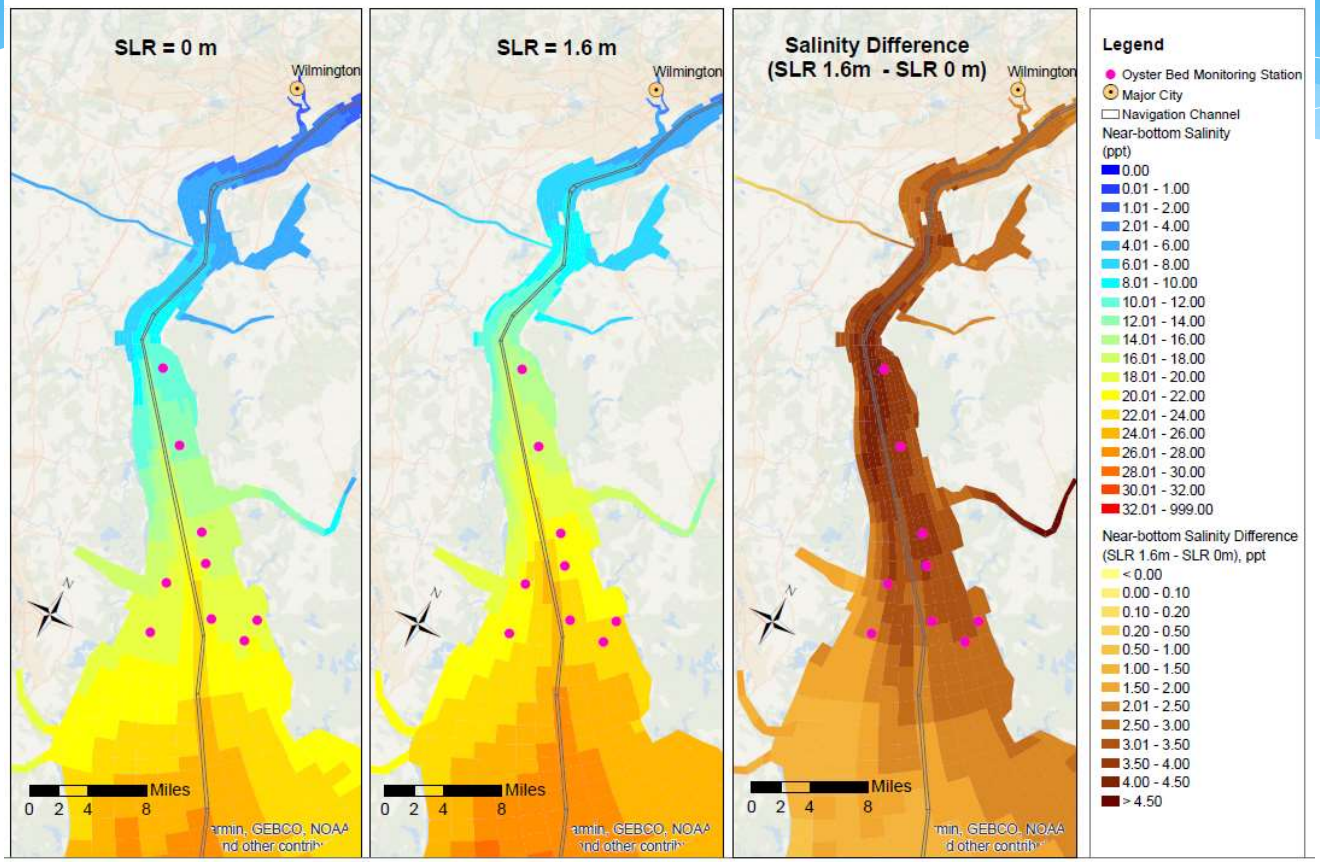
Impacts to Oysters

Preliminary



DRBC. EFDC Model - Preliminary Results

Simulated Average Salinity with July-October 2002 flows (a dry period)

- Oysters thrive with salinity of 14-28 psu; survive in 5-35 psu
- Parasites prefer and are more prevalent in higher salinity water
- Higher salinity water affects taste (mineral taste)

14.01 - 16.00
16.01 - 18.00
18.01 - 20.00
20.01 - 22.00
22.01 - 24.00
24.01 - 26.00
26.01 - 28.00

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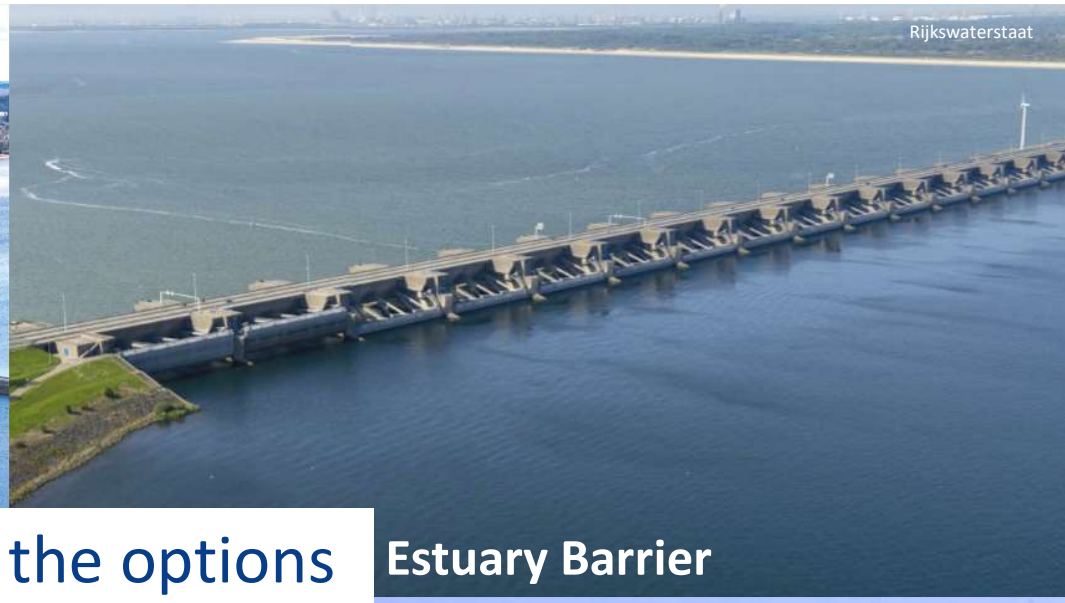
Relocation



Estuary Barrier

What are the options to reduce the risk?

Reservoir Releases

Desalinization

Summary

* On average, 66 percent of flow in the river is from the watersheds above Trenton and Philadelphia
* The estuary supports a variety of water users
* Sea Level Rise and Chlorides present the greatest challenges to use of water from the estuary
* Work is underway to understand those challenges and develop or modify strategies to manage issues

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