

Delaware River Basin Commission

Navigating Water Law in the Eastern U.S.

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DRBC Asst. General Counsel

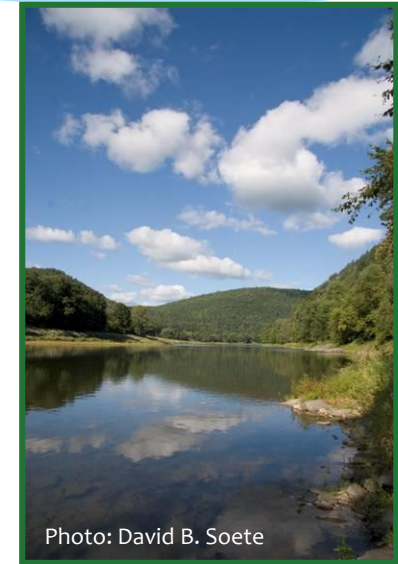


Photo: David B. Soete



AWRA, Baltimore, MD

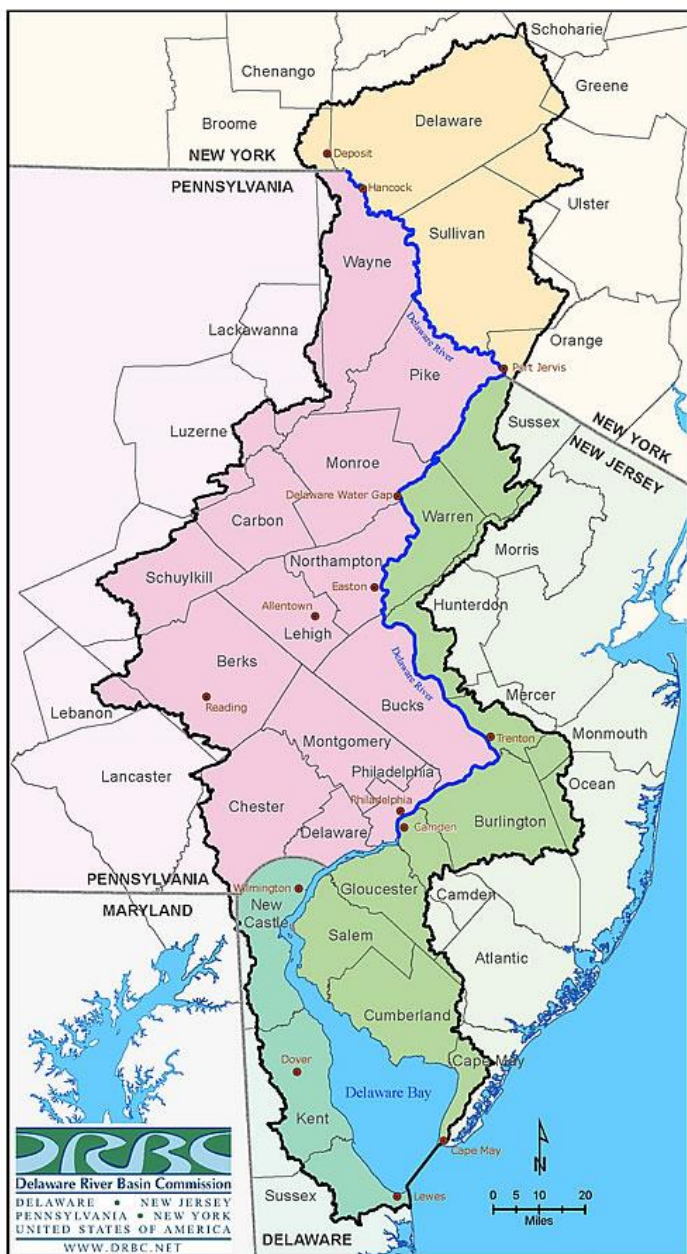
November 7, 2018

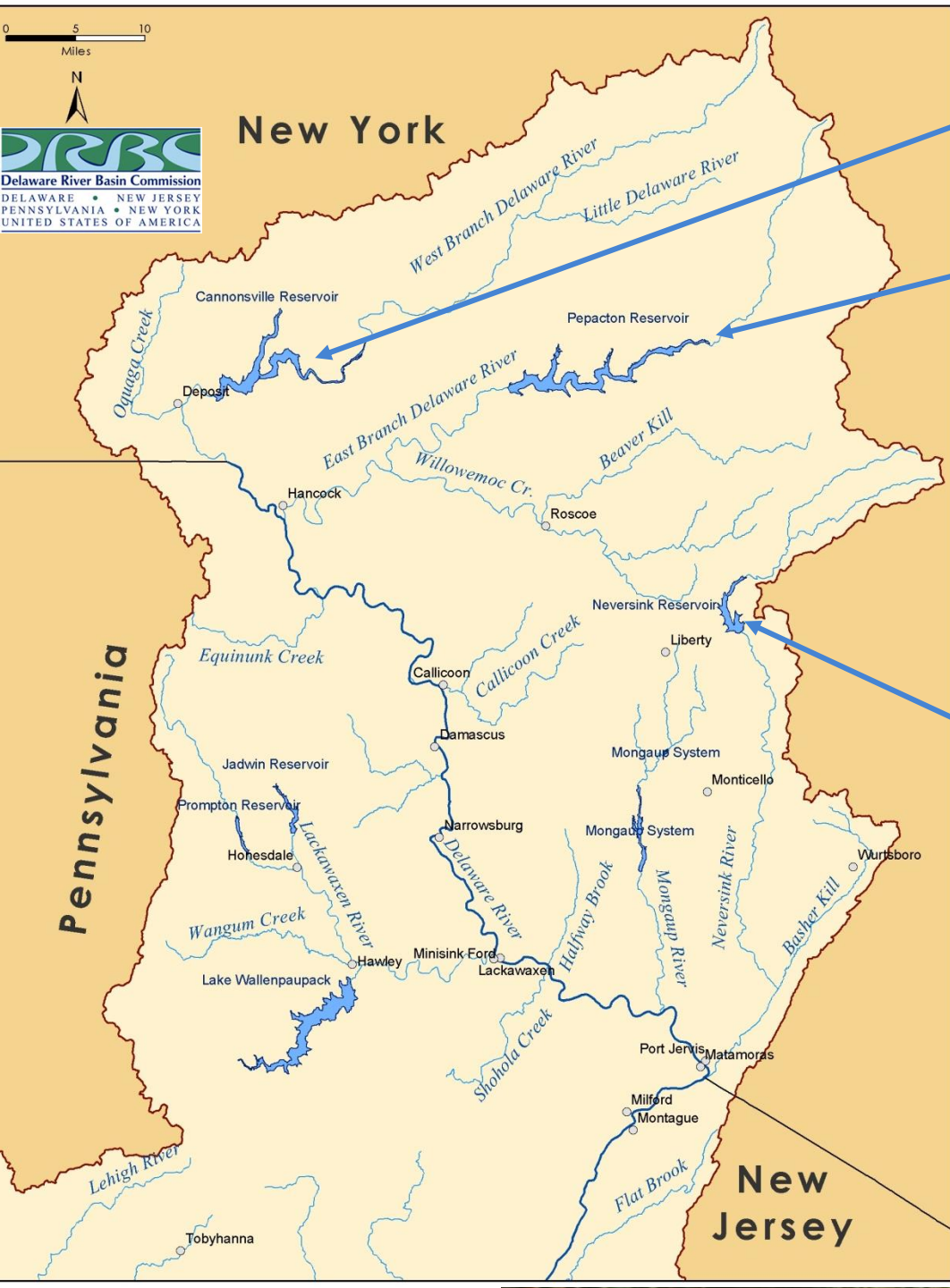


“A river is more than an amenity, it is a treasure”
- U.S. Supreme Court Justice Oliver Wendell Holmes

Fast Facts:

- Delaware River Main stem river is **330 miles long**
- Forms an interstate boundary over its entire length
- **~15 million people** (about 5% of the U.S. population) rely on the Basin's waters
- **Drains 13,539 square miles** of watershed in 4 states.
- Water withdrawal = **6.6 billion gallons a day**
- **Significant Exports: NYC (up to 800 MGD) and NJ (up to 100 MGD)**
- Longest un-dammed U.S. river east of the Mississippi
- **Contributes over \$21B in economic value** to the Region.





Cannonsville – 55 BG

Pepacton – 98 BG

Neversink – 32 BG



Photo Courtesy NYC DEP



MAERSK LINE



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Delaware Bay

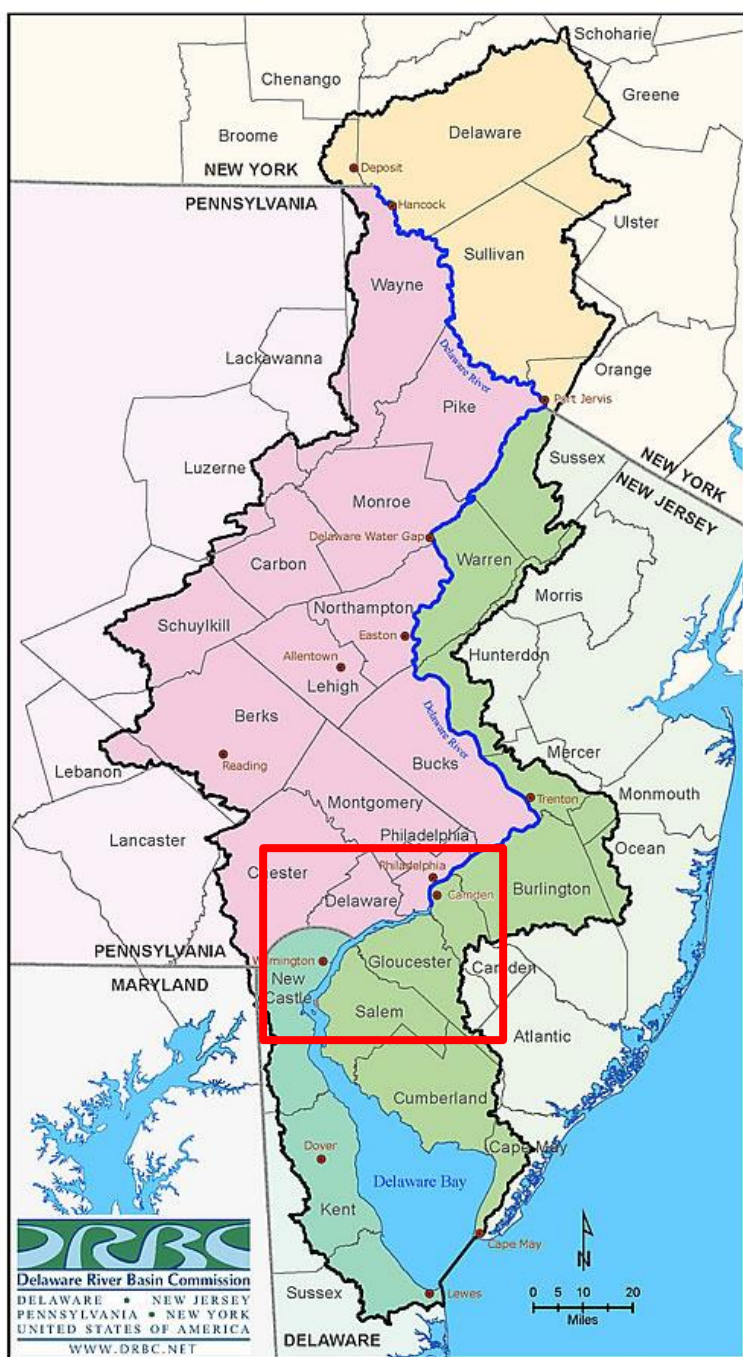
Salem Nuclear Plant



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

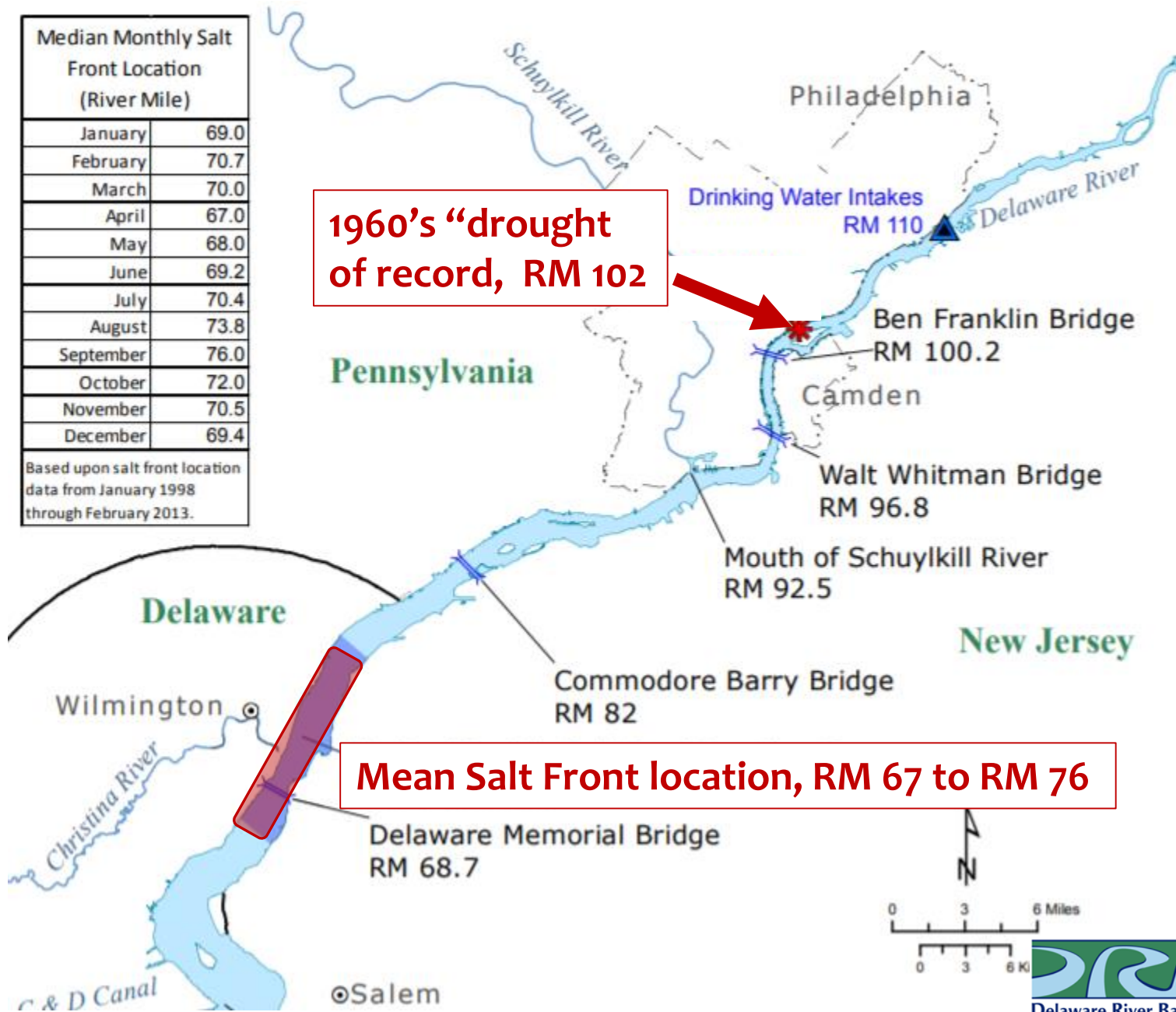
Red Knots and Horseshoe Crabs





Median Monthly Salt Front Location (River Mile)	
January	69.0
February	70.7
March	70.0
April	67.0
May	68.0
June	69.2
July	70.4
August	73.8
September	76.0
October	72.0
November	70.5
December	69.4

Based upon salt front location data from January 1998 through February 2013.



1960's "drought of record, RM 102"

Mean Salt Front location, RM 67 to RM 76

New York

Pennsylvania

New Jersey

Maryland








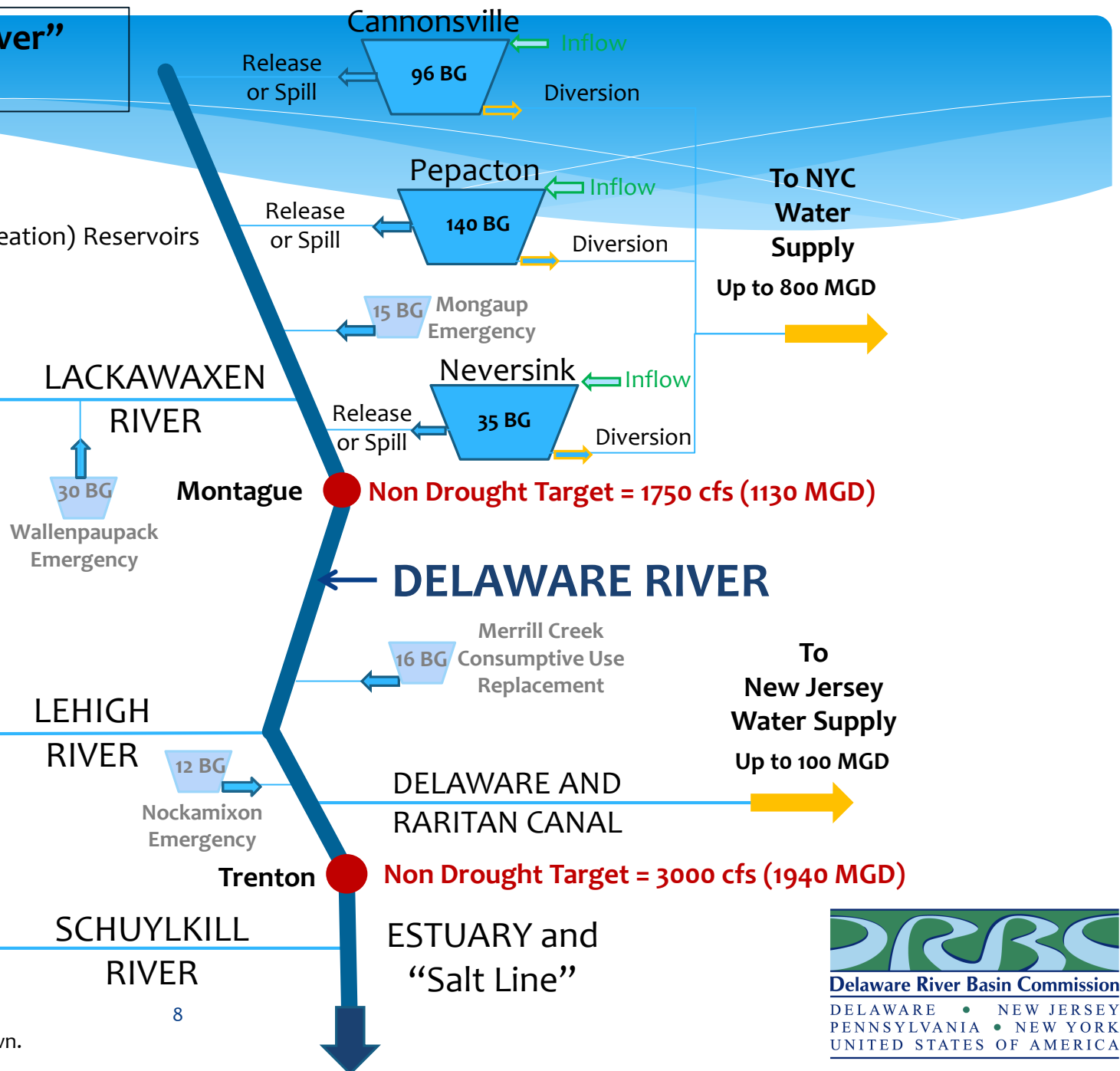
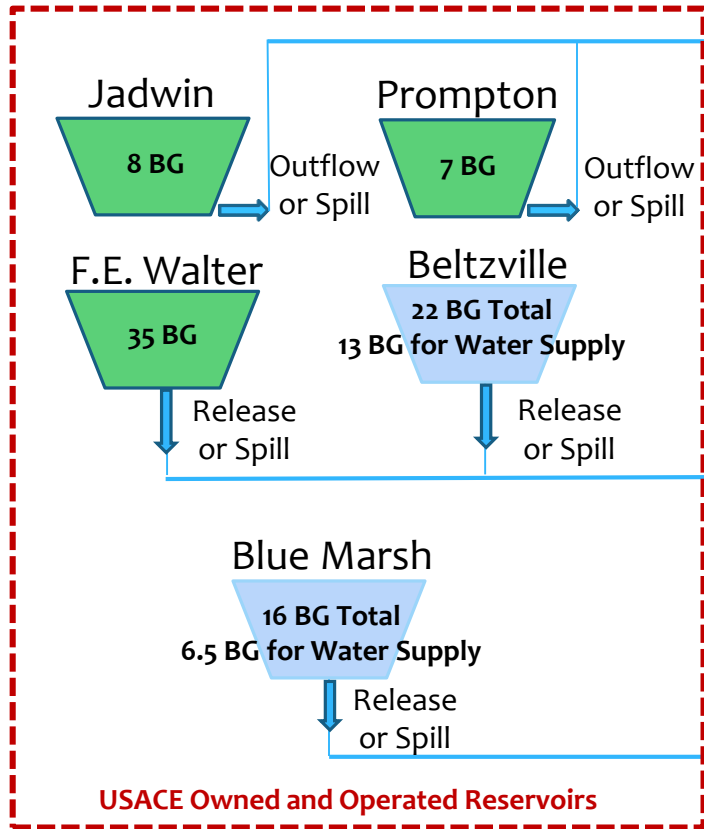
Flow Augmentation Sources

- * ERQ (bank est. by Decree)
- * DRBC Storage in USACE Reservoirs
- * Emergency
- * Consumptive Use Replacement Water (Power Generators)



The Delaware – an “Undammed River” but a Managed System

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



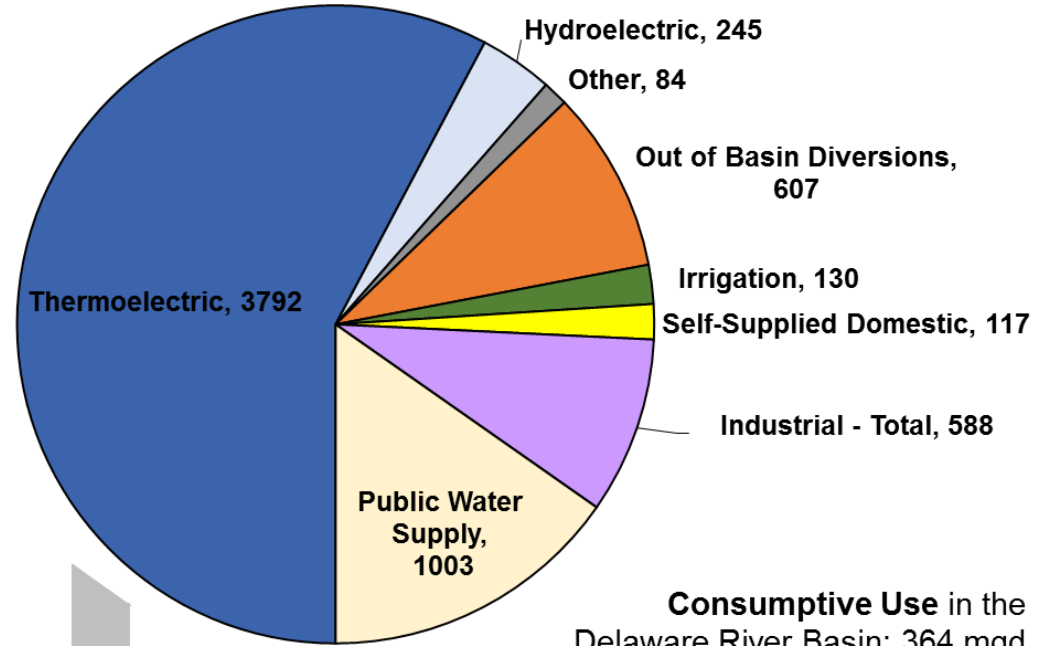
Note: Not all reservoirs, tributaries, and diversions are shown.



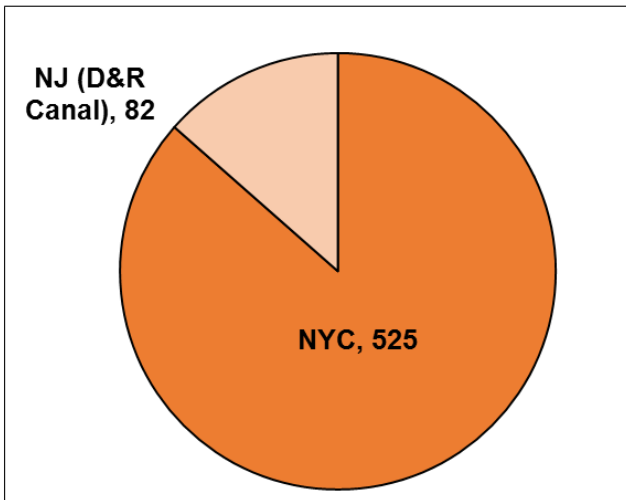
DRB Current Water Use and Trends

Total Water Withdrawals (ground and surface) from the Delaware River Basin, **2016: 6,565 mgd**

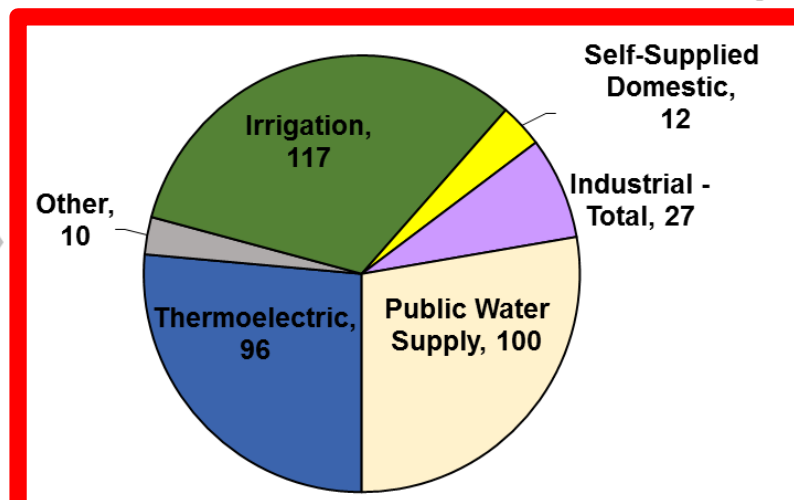
- Thermoelectric
- Hydroelectric
- Other
- Out of Basin Diversions
- Irrigation
- Self-Supplied Domestic
- Industrial - Total
- Public Water Supply



Major Exports from the Delaware River Basin: 607 mgd



Consumptive Use in the Delaware River Basin: 364 mgd





Delaware River Basin Commission



Compact signed 1961

Equal Members:

- Delaware
- New Jersey
- Pennsylvania
- New York
- Federal Government

“the conservation, utilization, development, management, and control of the water and related resources of the Delaware River Basin under a comprehensive multipurpose plan will bring the greatest benefits and produce the most efficient service in the public welfare;”

Broad Authorities

- * Water Supply
- * Drought Management
- * Flood Loss Reduction
- * Water Quality (Pollution Control)
 - Establish Water Quality Standards
 - Monitoring & Assessment
 - Load Reductions
- * Watershed Management
- * Regulatory Review (Permitting)
- * Outreach/Education
- * Recreation

Compact Preserves the Supreme Court Decree of 1954

New Jersey v. New York, 347 U.S. 995 (1954)

DRBC Members

- Delaware
- New Jersey
- Pennsylvania
- New York State
- Federal Government



Decree Parties

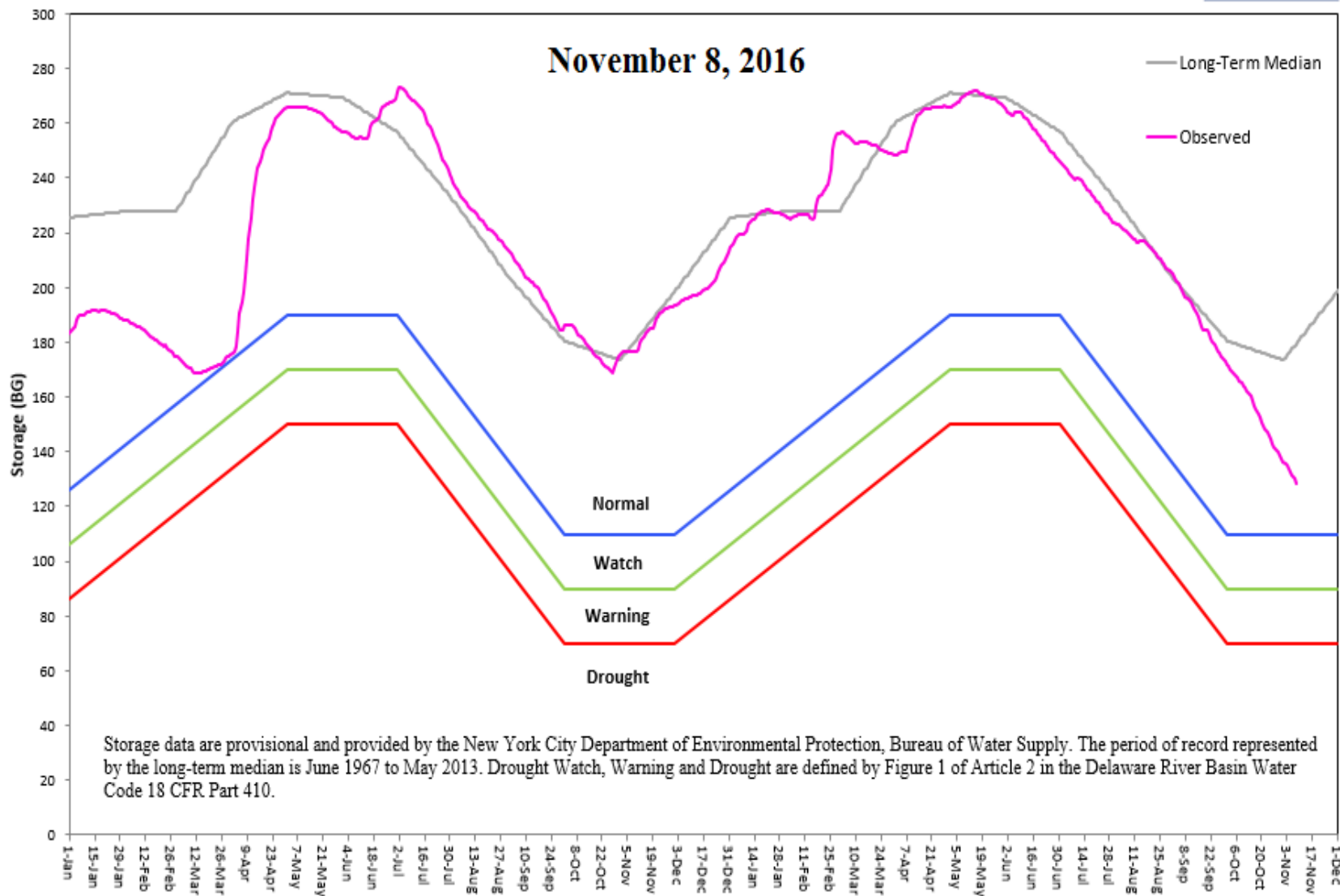
New York City



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New York City Delaware River Basin Storage



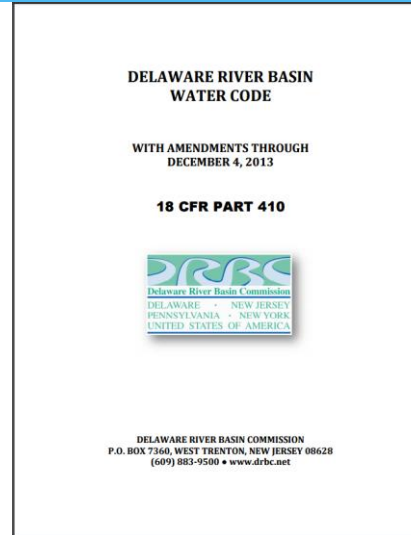
Useable Storage				2015-16				
	Cannonsville	Pepacton	Neversink	Total	BG Above Drought Watch =	19	BG Below Daily Storage Median =	51
BG	25.0	81.2	22.5	128.7	BG Above Drought Warning =	39	BG Below One Year Ago =	48
%	26.1%	57.9%	64.5%	47.5%	BG Above Drought =	59		

Drought Operating Plans and Actions

Water Code 18 CFR Part 410

* Basinwide

- * Reduced conservation releases
- * Reduced flow objectives
- * Reduced out-of-basin diversions
- * Consumptive Use Replacement
- * Use of additional reservoirs



* Lower Basin (below Montague Gage)

- * Similar to basinwide, except Montague, NYC Diversion and Releases
- * Reduced Trenton Flow Objective
- * Choice of six operating plans

- ❖ Address the **essential conservation of regional reservoir storage** for purposes of water supply and flow augmentation for the Delaware River
- ❖ Control salinity in the Delaware Estuary.

DRBC Strengths



- Technical capability – modeling, data collection and analysis; partnerships with USGS, USACE, NOAA and state agencies
- Watershed approach – not silo'd; headwaters to ocean; ex. modeling storage needs; consumptive use make-up req's; calculating TMDLs. Watershed = valid scientific unit
- Ability to establish uniform policies and stds. in shared waterways, incl., e.g., water quality standards, anti-deg., drought/low flow operations
- Convening power – advisory committees (WQAC, MACC, TAC, FAC, WMAC, RFAC, SEF)
- Transparency – all actions at public meetings
- Members can accomplish together what none can accomplish alone.

Institutional Challenges

- Funding – no federal share since 1997; state shortfalls in recent years
- State agencies also understaffed and underfunded; competing for scarce \$\$; limited time
- Polarized politics around role and cost of govt. generally; and attacks on environmental regulation as drag on economy
- Land-based water management issues – i.e., development, forest loss, localized flooding

Water Supply Planning

- Issues driving DRBC planning needs:
 - Climate change.
 - 1954 Supreme Court Decree (exports to NJ and NYC) and flow management.
 - Water quality improvements.
- DRBC funding challenges have limited the discretionary resources needed for planning.

Basin Challenges – 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](#).*

Have we seen the Drought of Record?

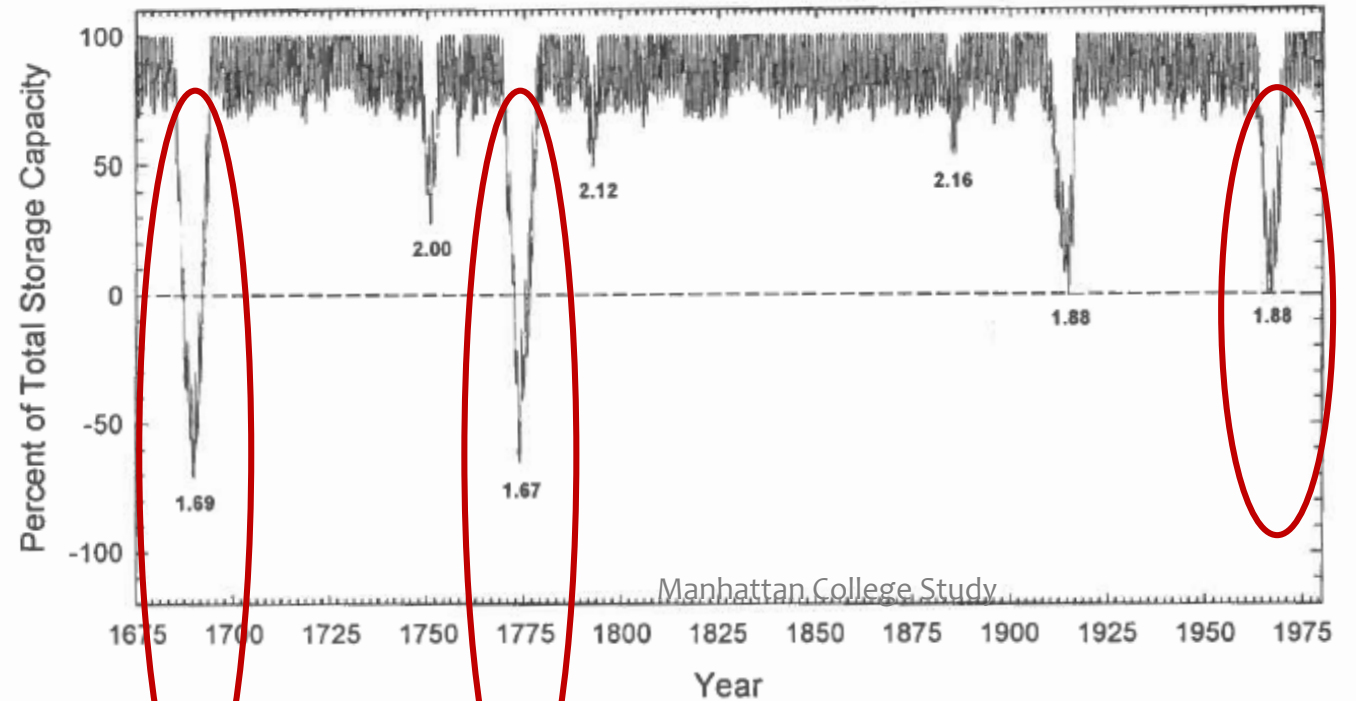
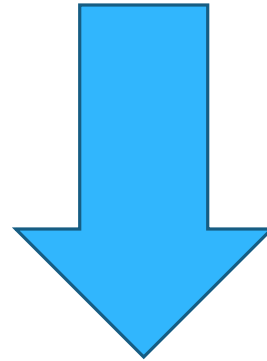
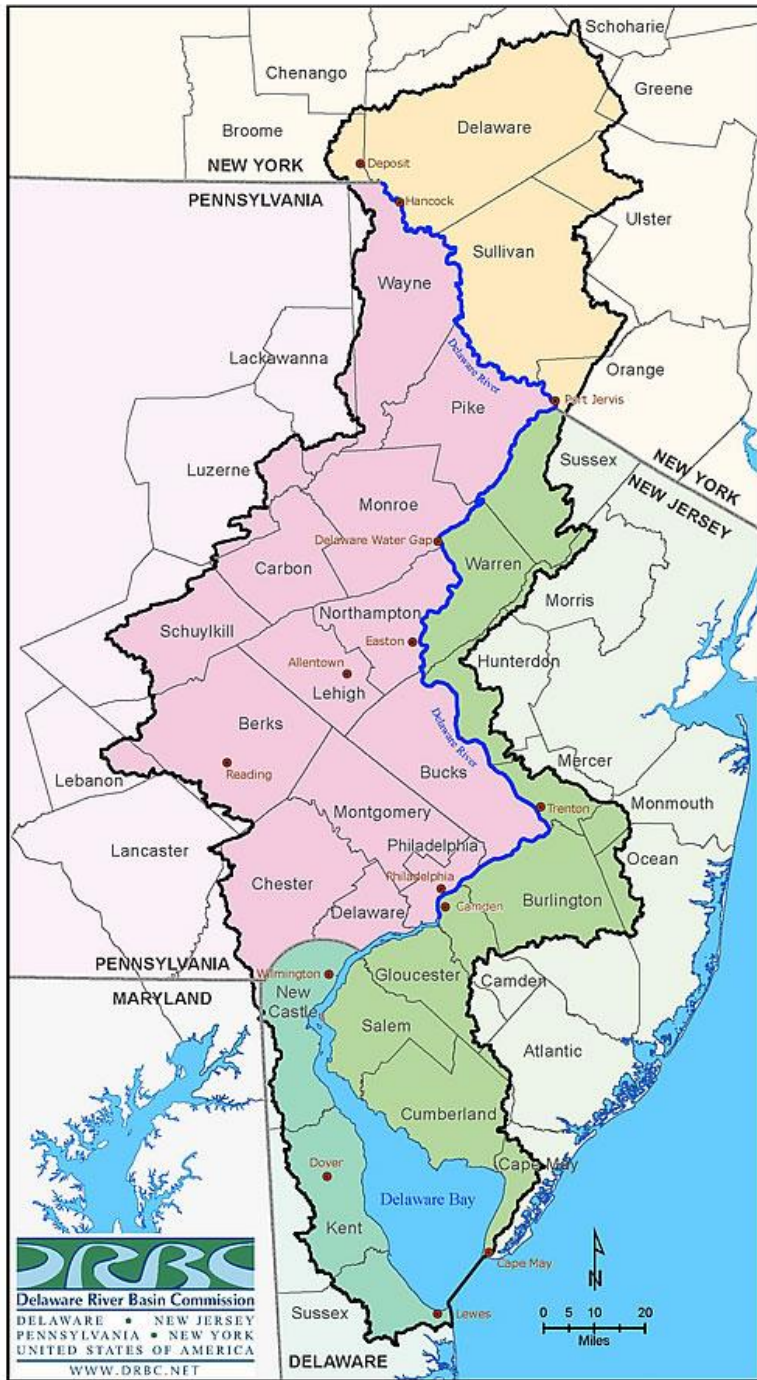


Figure S 4. Monthly Inflow Model – Tree-Ring Reconstructed Monthly Inflow Data Obtained by Disaggregation (1675 – 1980). The total storage capacity of the system is 547.5 BG. The bold numbers represent the total system yields associated with the selected droughts. The outflow from the system is set to that corresponding to the total system yield for the 1960s drought (1.88 BGD). Therefore, any droughts with a lower total system yield than 1.88 BGD will result in negative storage capacities.

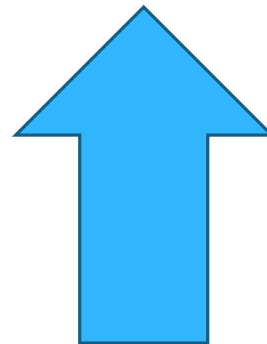
Photo: Henri D. Grissino-Mayer
Department of Geography,
The University of Tennessee

Department of Environmental Engineering, Manhattan College, Kaitlin J. Bars, Kevin R. Ellenwood, Joseph J. Nemesh, Kevin J. Rader. Tree Ring Analysis as a predictor of pre-1927 reservoir inflows, April 26, 2004



Freshwater Hydrologic Climate Considerations:

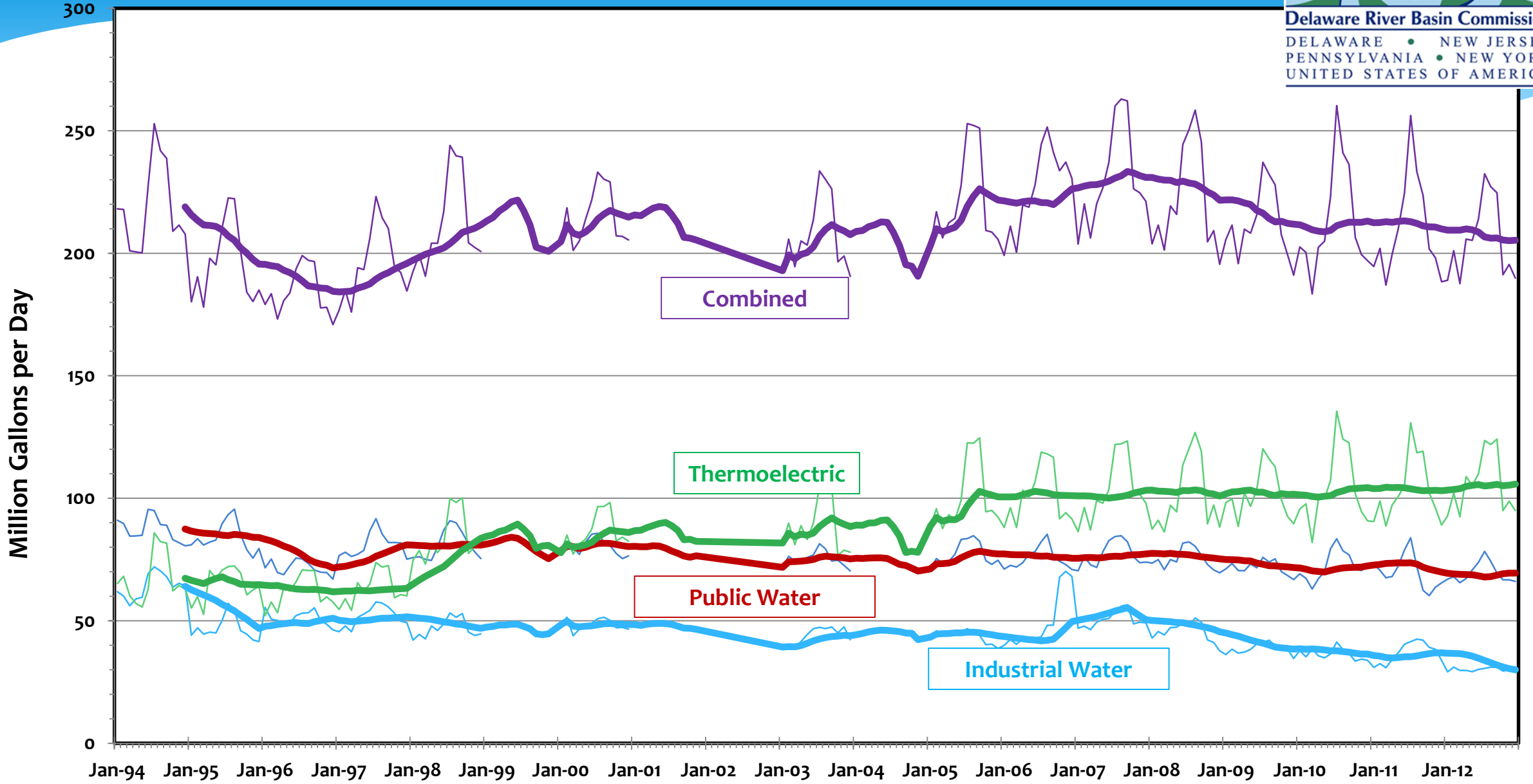
- Precipitation
 - Flow
- Temperature
 - Evapotranspiration
 - Snowpack



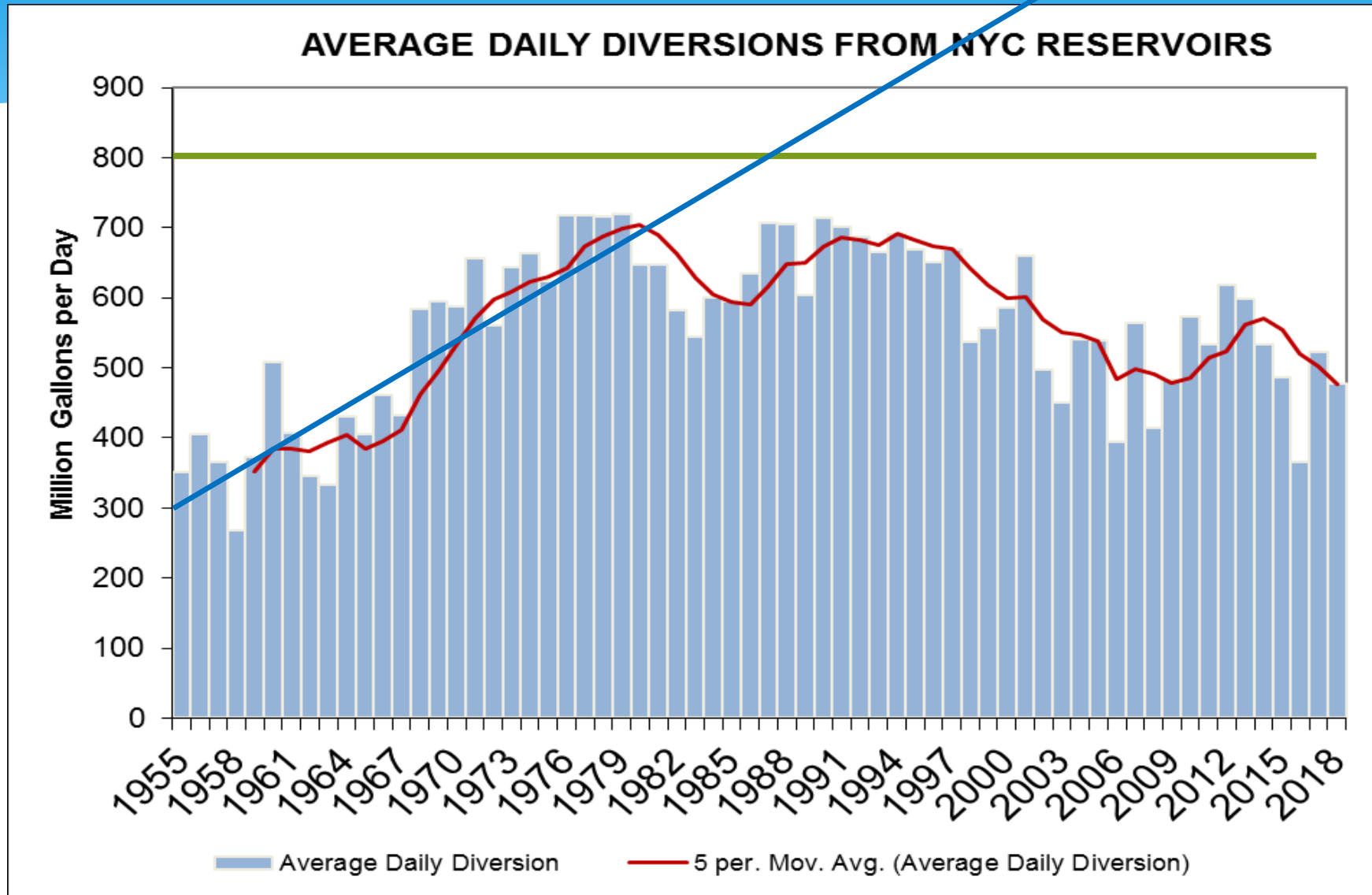
Salt Water Climate Considerations:

- Sea Level Rise
- **There is no dam
on the Delaware
River**

Consumptive Use Trends 1994 - 2012



Water Exported to New York City from Delaware River Basin 1955 - 2018 (Annual Data)



What do the trends tell us?



- **Overall:** Relatively flat demand w/localized demand pressures
- **Power Generation:**
 - Trend is away from Once Through Cooling to Evaporative Cooling, which results in much less total water use but increases in consumptive use
 - Replacement policies compensate for consumptive use in drought conditions
- **Industry:**
 - Decreased water use over time, sensitive to loss of large facilities
- **PWS:**
 - Conservation efforts *are working* to offset population growth
 - Implementation of Water Loss Accounting could continue this trend

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www.drbc.gov



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*Managing Our Shared Water
Resources since 1961*