

# Delaware River Basin Commission

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## Drought Management

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October 27, 2016



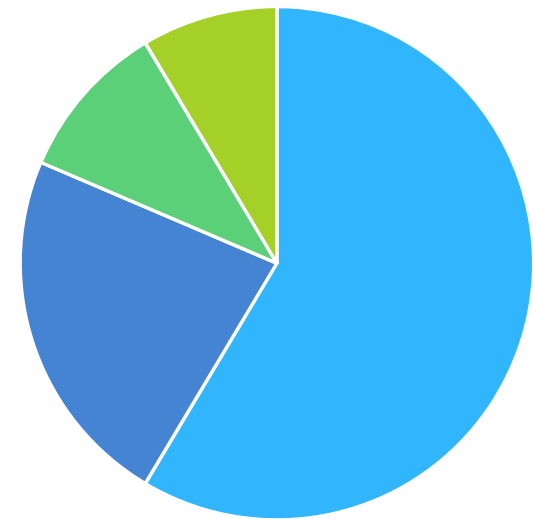
# Basinwide Droughts

	Enter Drought Watch	Enter Drought Warning	End Drought Watch/Warning	Enter Drought	Declare Drought Emergency	End Drought Emergency
<b>1960s</b>					7/7/65	3/2/67
<b>1980s</b>	10/17/80	12/1/80		1/15/81	1/15/81	4/27/82
	11/13/82	12/8/82	3/27/83			
	11/09/83	--	12/20/83			
	1/23/85	2/7/85		5/13/85	5/13/85	12/18/85
	1/16/89	2/5/89		--	3/21/89 Conditional	5/12/89
<b>1990s</b>	9/13/91	11/7/91	4/25/92			
	9/21/93	--	12/6/93			
	9/15/95	10/13/95	11/12/95			
	10/27/97	--	1/13/98			
	12/14/98	12/23/98		--	8/18/99 <sup>(8)</sup>	9/30/99
<b>2000s</b>	10/29/01	11/4/01		12/1/01	12/18/01	11/25/02

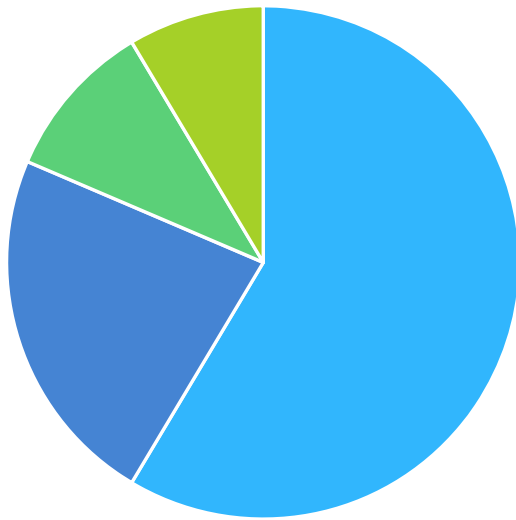


# Commission Roles and Authorities

- \* Emergency Declarations (but states have primacy for water conservation) – Compact 3.3(a) and 10.4
- \* **Drought Operations for Major Reservoirs**
- \* Emergency Storage
- \* Consumptive Use Replacement
- \* Drought Management and Contingency Plans
- \* Voluntary Conservation



# Pre-emptive in Drought Management



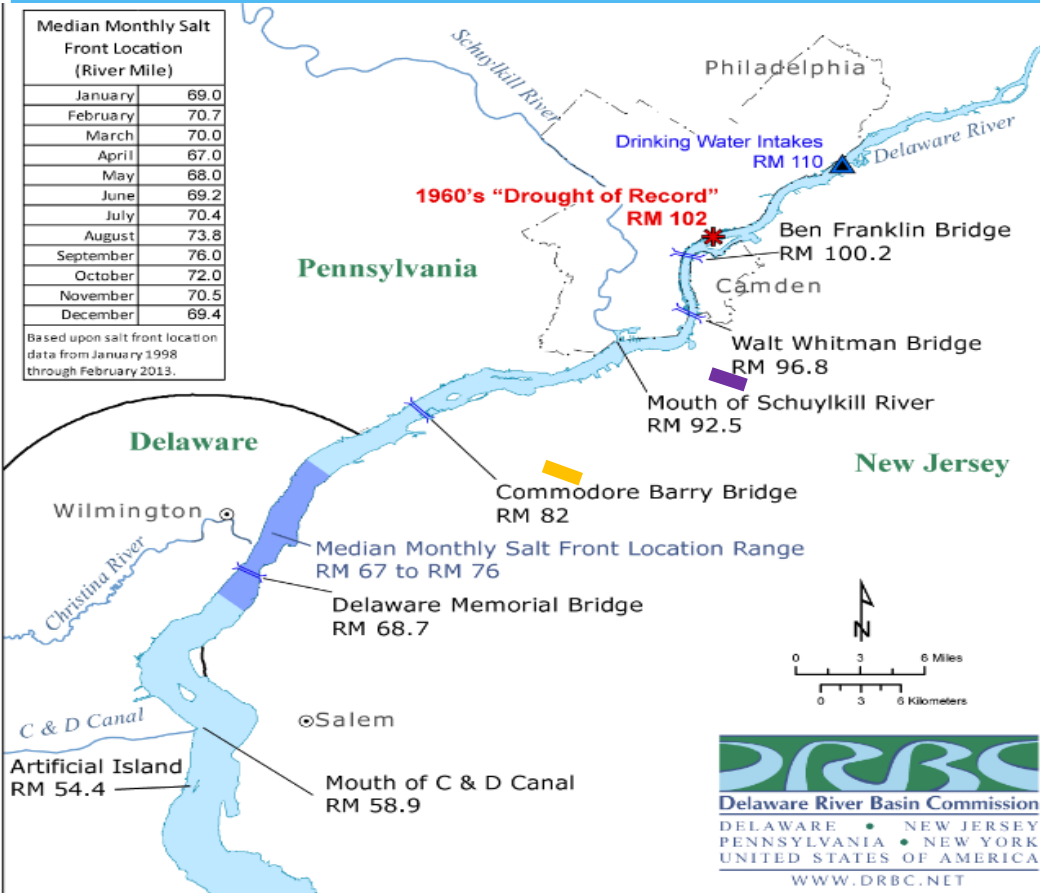
- \* **Drought Operations Plans**
- \* **Plan/Project Review**
- \* **Water Conservation**
- \* **Water Audits**
- \* **SE PA Groundwater Protected Area**

## Commission's Role

The Commission's drought **planning and response** actions complement the states' drought actions by addressing the **essential conservation of regional reservoir storage** for purposes of water supply and flow augmentation for the Delaware River and salinity control in the Delaware Estuary.



# Salt Front



## Chlorides

7-Day Avg. RM Location of 250 mg/l

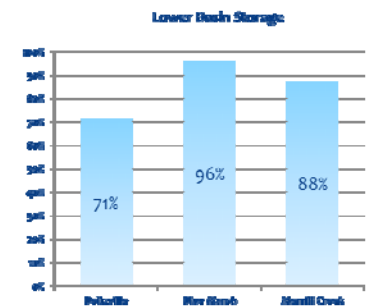
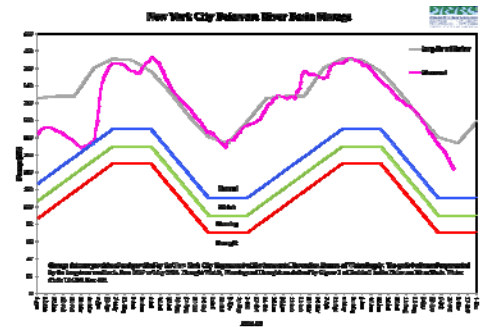
**Current R.M. 86**

**Normal R.M. 72**

The Flow Objective at Trenton was designed to repel salinity for the protection of drinking water treatment facilities and industrial intakes.

# Two Drought Operating Plans

- \* Basinwide – triggered by combined storage in NYC Reservoirs
  - \* Cannonsville
  - \* Pepacton
  - \* Neversink
- \* Lower Basin – triggered by DRBC-owned lower basin storage
  - \* Beltzville - Lehigh
  - \* Blue Marsh - Schuylkill





# Low Flow Augmentation

- \* Two flow objectives: Montague and Trenton
- \* Montague - to ensure the lower basin states receive water
- \* Trenton – to ensure freshwater flows into the estuary for:
  - \* Protection of drinking water and industrial intakes
  - \* Limitation of chloride intrusion into the PRM aquifer
  - \* Protection of wildlife (fish, oysters)

# Consumptive Use Replacement

- \* 1960s Commission Study - Power Utilities
  - \* largest water users
  - \* largest water use sector
- \* Requirements for replacement of consumptive use in dockets
- \* Construction of Merrill Creek Reservoir by power companies
- \* Use of other sources



# What Happens?

## \* Basinwide

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

## \* Lower Basin

- \* Similar to basinwide, except Montague, NYC Diversion and Releases
- \* Reduced Trenton Flow Objective – base on salt front location
- \* Choice of six operating plans

DELAWARE RIVER BASIN  
WATER CODE

WITH AMENDMENTS THROUGH  
DECEMBER 4, 2013

**18 CFR PART 410**








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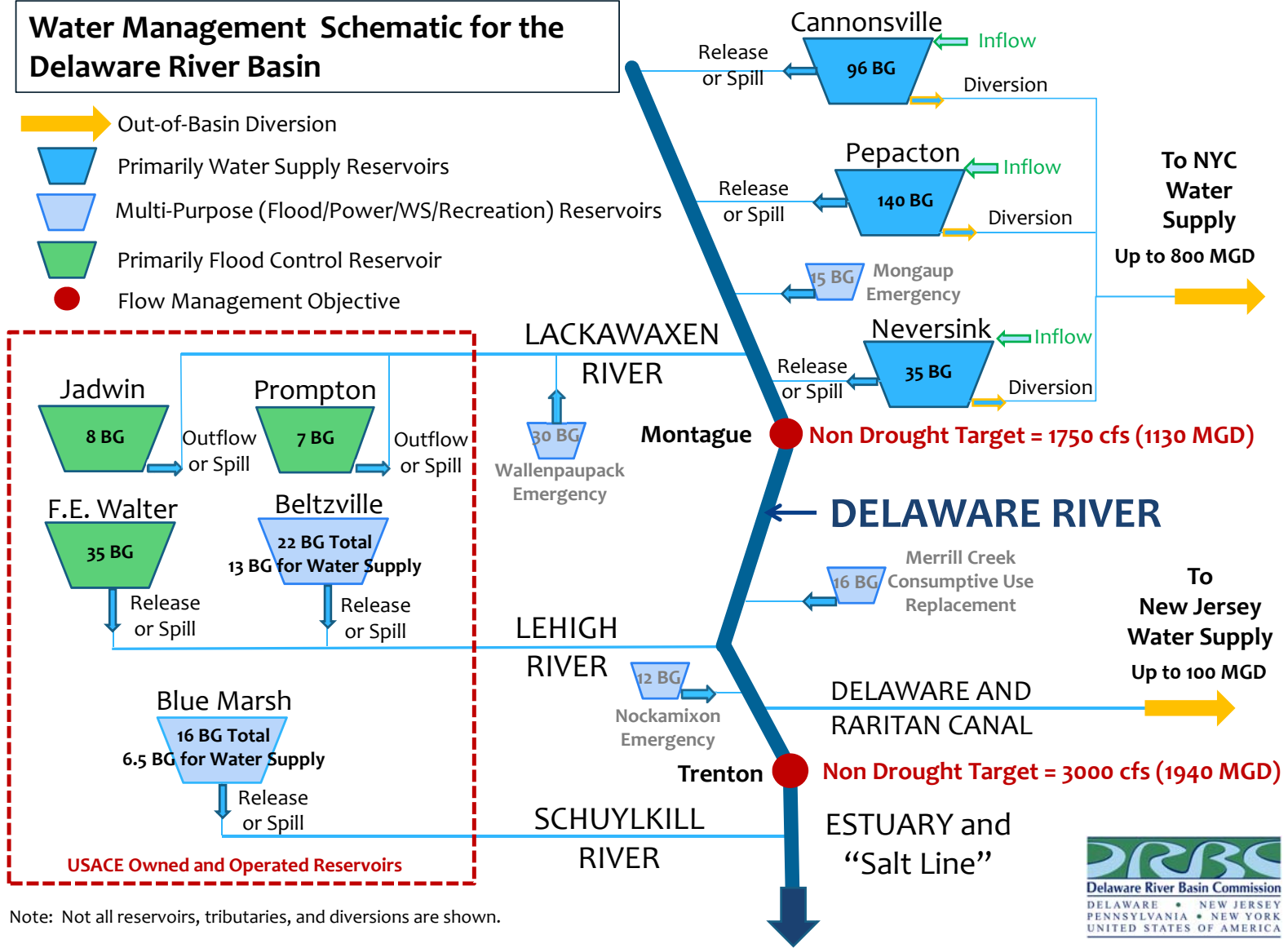
# Sources of Water

- \* Excess Release Quantity (specified in Decree)
- \* DRBC Storage in USACE Reservoirs
- \* Emergency
- \* Consumptive Use Make-Up



# 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.



# Summary

- \* The Commission's drought actions **complement the states**
- \* DRBC's primary role is the **conservation of regional reservoir storage** for purposes of flow augmentation and salinity control in the Delaware Estuary.
- \* Plans identify **phased reductions** in flow objectives, out-of-basin diversions and conservation releases, and **additional storage** for Commission use in meeting Trenton
- \* Plans are **automatically implemented** based on reservoir storage conditions.
- \* Major power users must implement **consumptive use replacement**.

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