Delaware River Basin Commission

FFMP Implementation Performance

Release Year 2022
June 1, 2022 – May 31, 2023

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RFAC meeting
August 16, 2023





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All data used in the analysis are Provisional

Final/approved data are available from:

NYC Department of Environment Protection (NYCDEP)

Office of the Delaware River Master (ODRM)

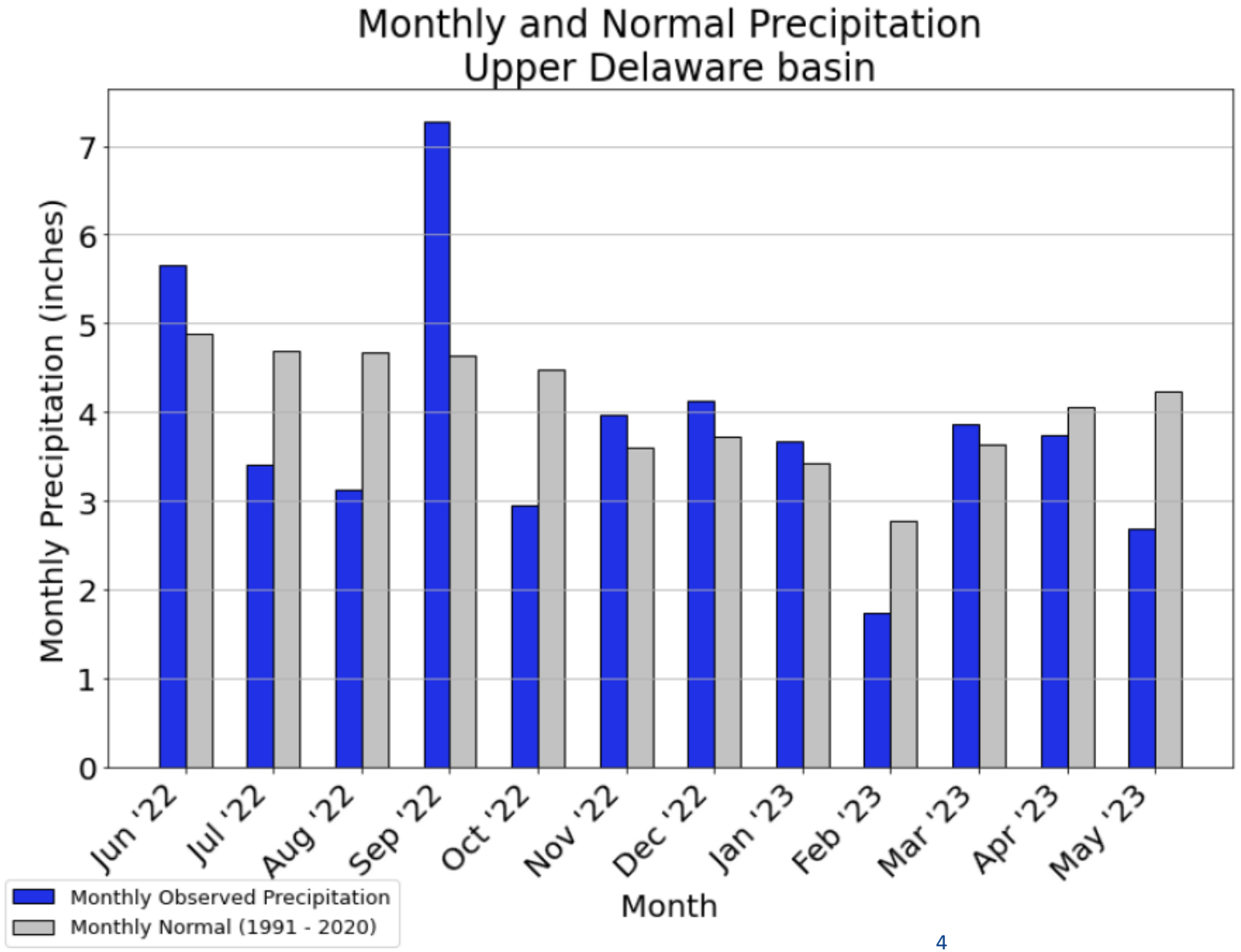
United Sates Geological Survey (USGS)

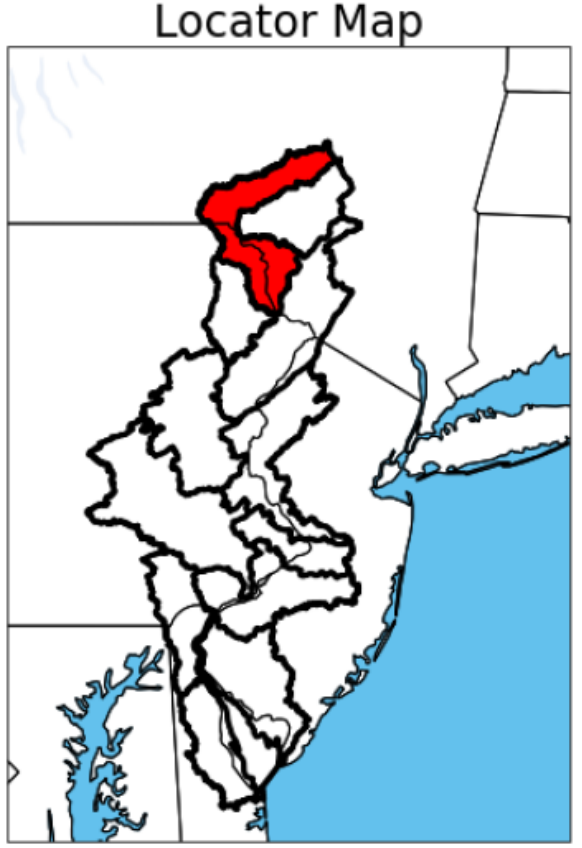
FFMP Performance Goals

* Manage Droughts
* Maintain Flow Objectives
* Provide enhanced conservation releases
* Maintain desirable tailwater temperatures
* Minimize spills using the Conditional Seasonal Storage Objective (CSSO)

USGS Delaware River Master https://webapps.usgs.gov/odrm/ffmp/flexible-flow-management-program

Precipitation – Upper Basin





Source: ACIS, USGS HUC: 02040101
Monthly Normal is based of 4 stations in the Upper Delaware basin

Data Source: ACIS

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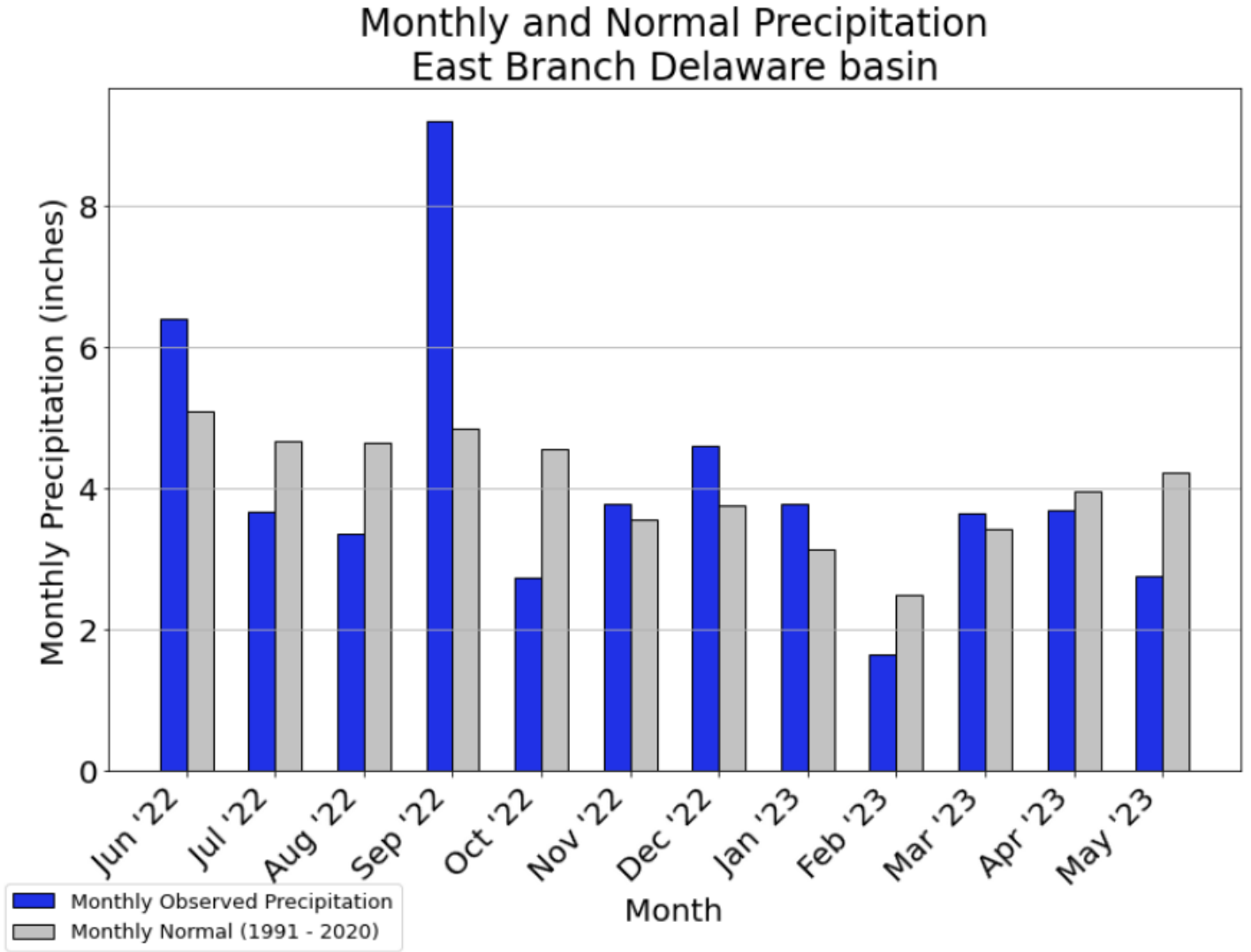
Precipitation – Upper Basin



Source: ACIS, USGS HUC: 02040102
Monthly Normal is based of 1 stations in the East Branch Delaware basin

Data Source: ACIS

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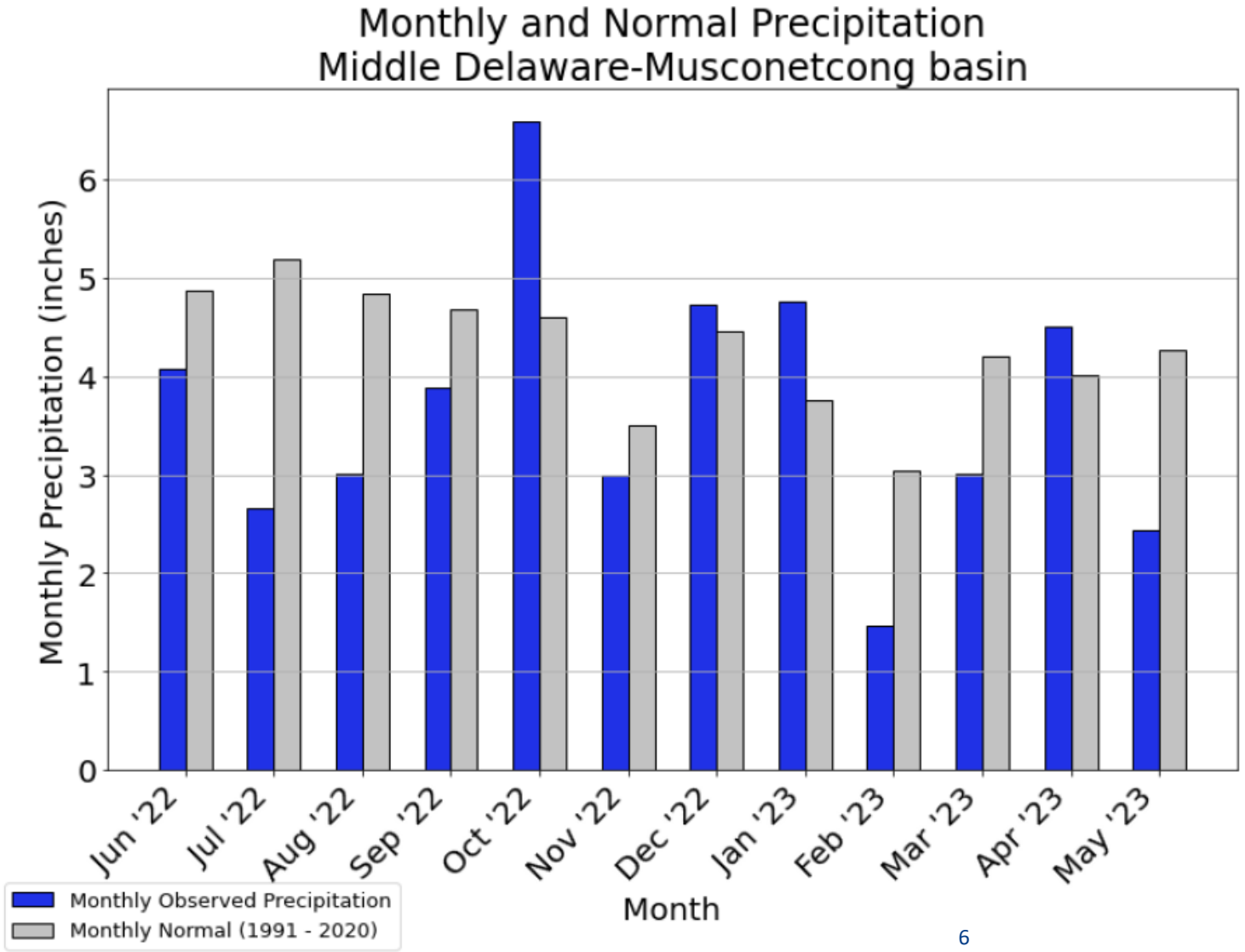
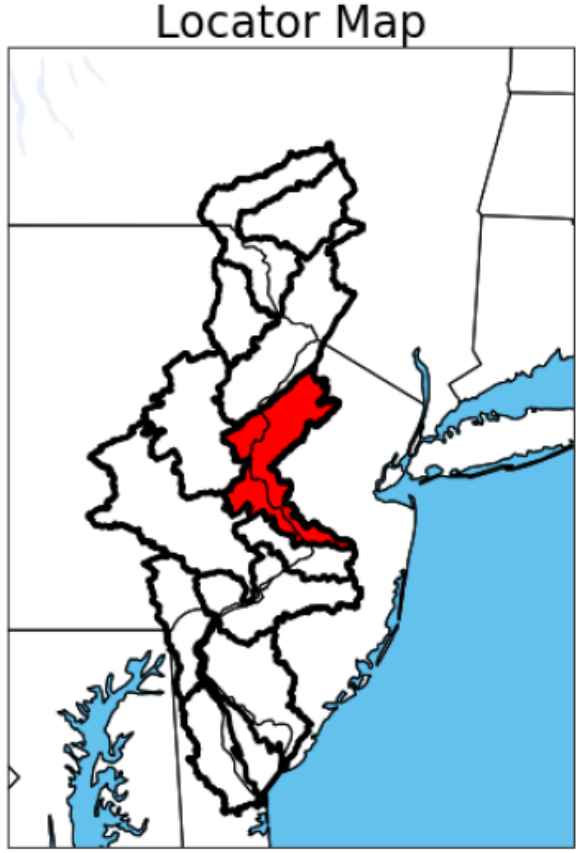
Precipitation – Lower Basin

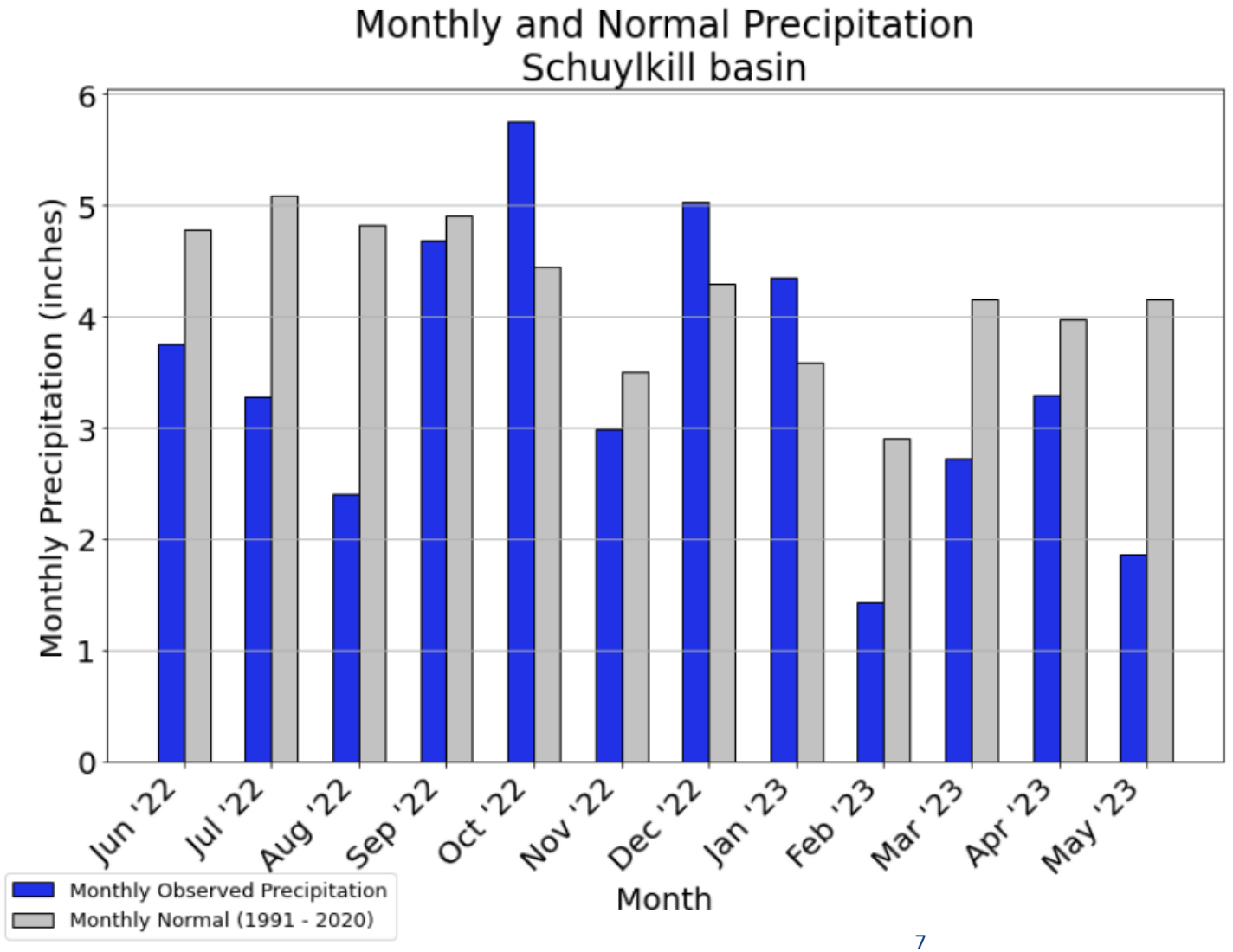


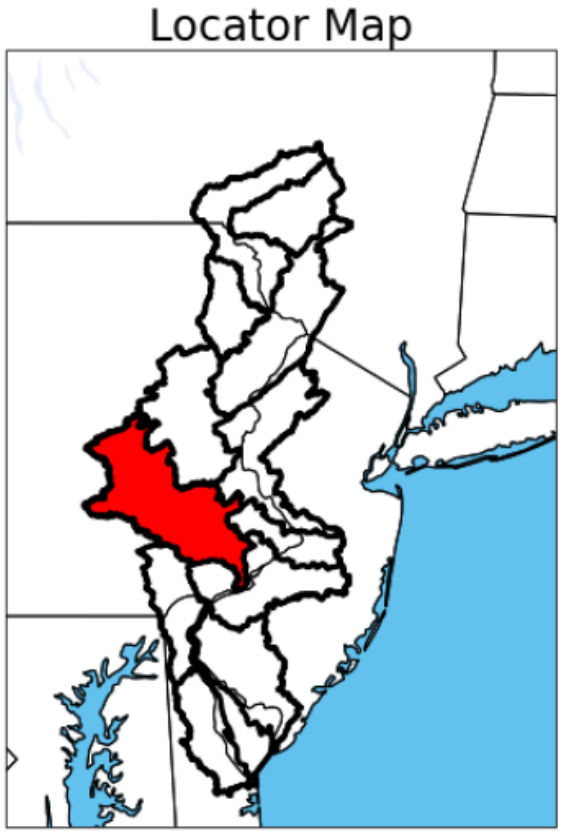


Source: ACIS, USGS HUC: 02040105
Monthly Normal is based of 8 stations in the Middle Delaware-Musconetcong basin

Data Source: ACIS

Precipitation – Lower Basin





Source: ACIS, USGS HUC: 02040203
Monthly Normal is based of 19 stations in the Schuylkill basin

Data Source: ACIS

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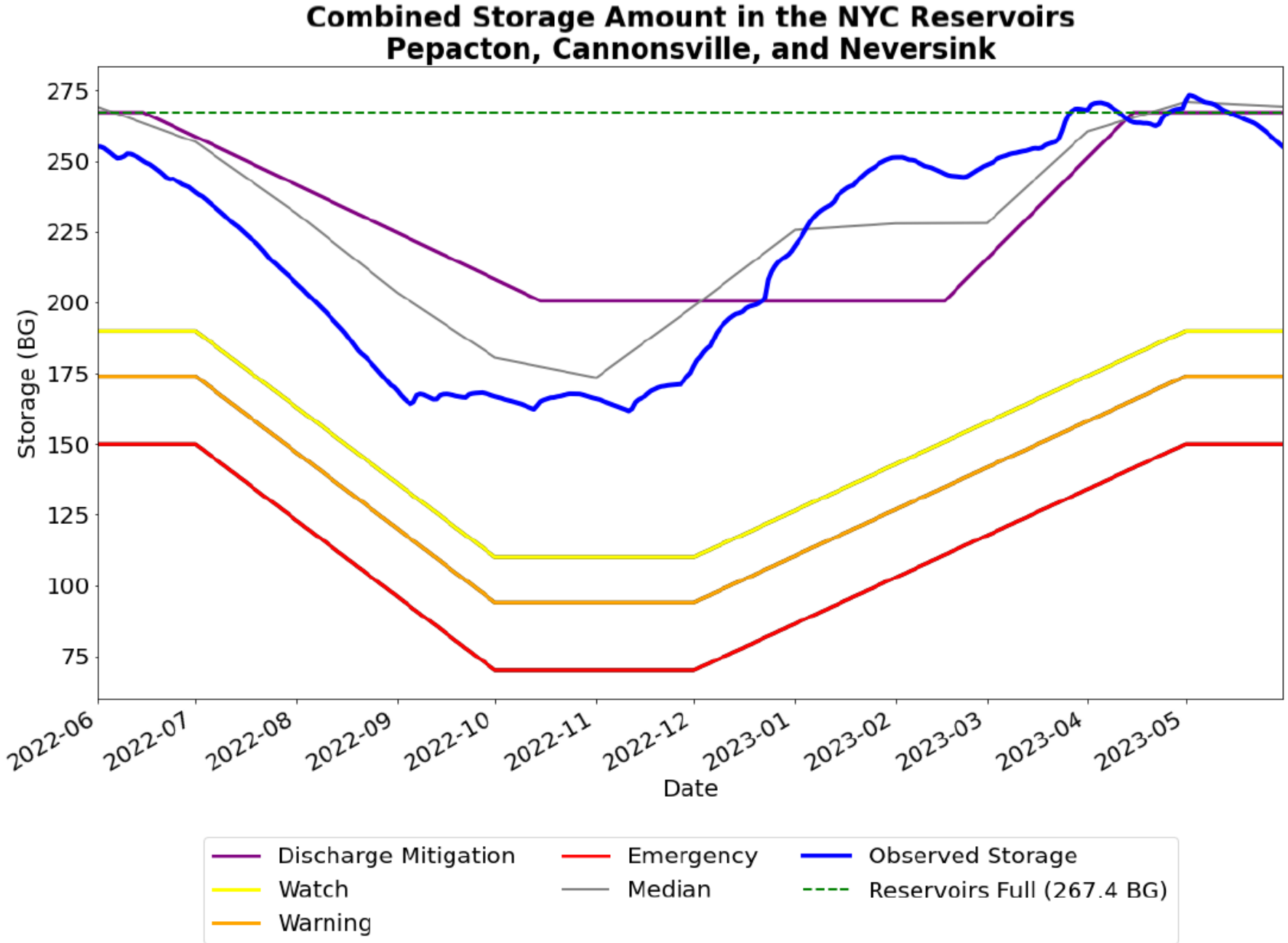

Data Source: NYCDEP

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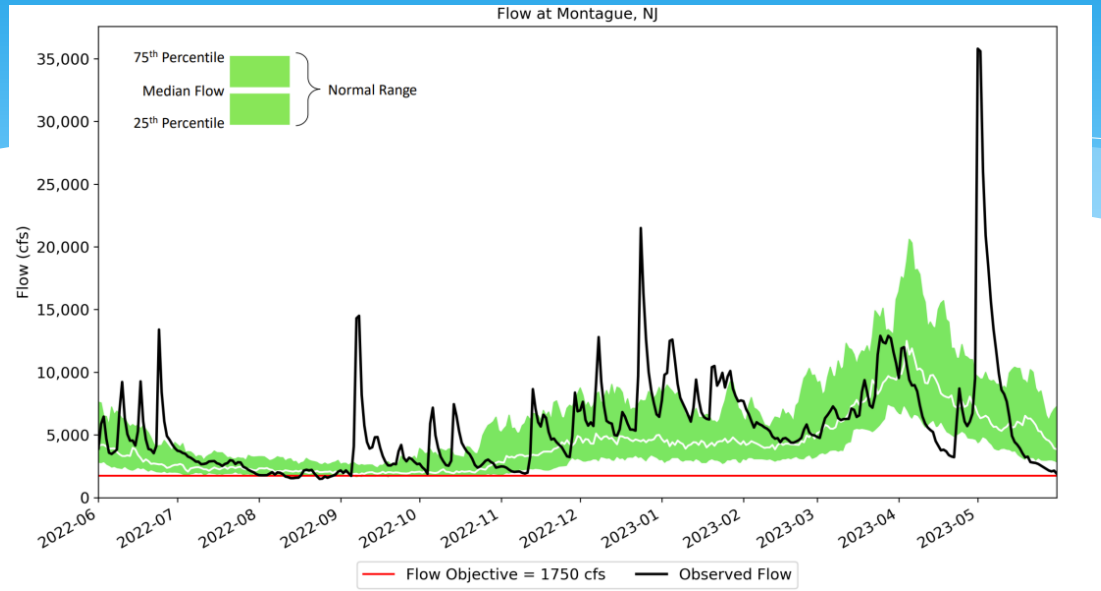
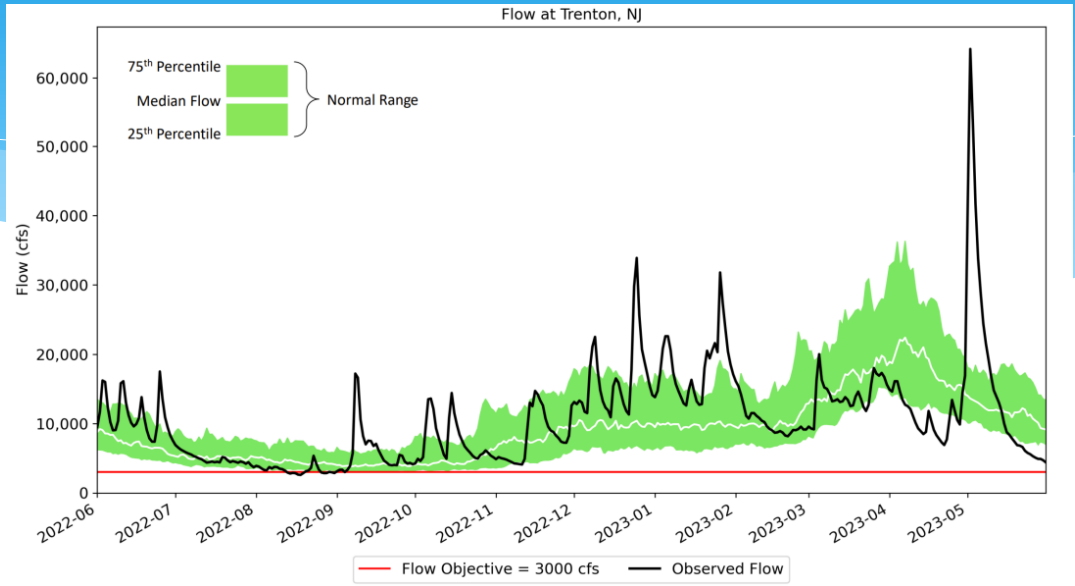
Flow Objectives

Montague



Trenton



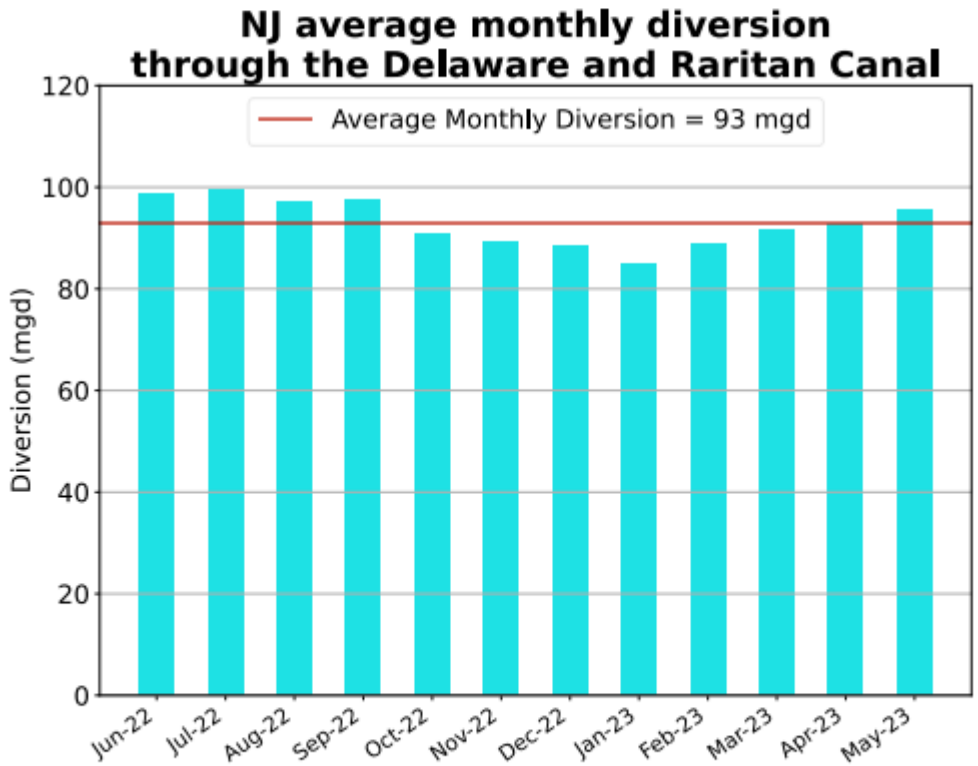
Water Released from NYC to Meet Flow Objectives (MG)	
Montague	21,448*
Trenton	550
Total	21,968

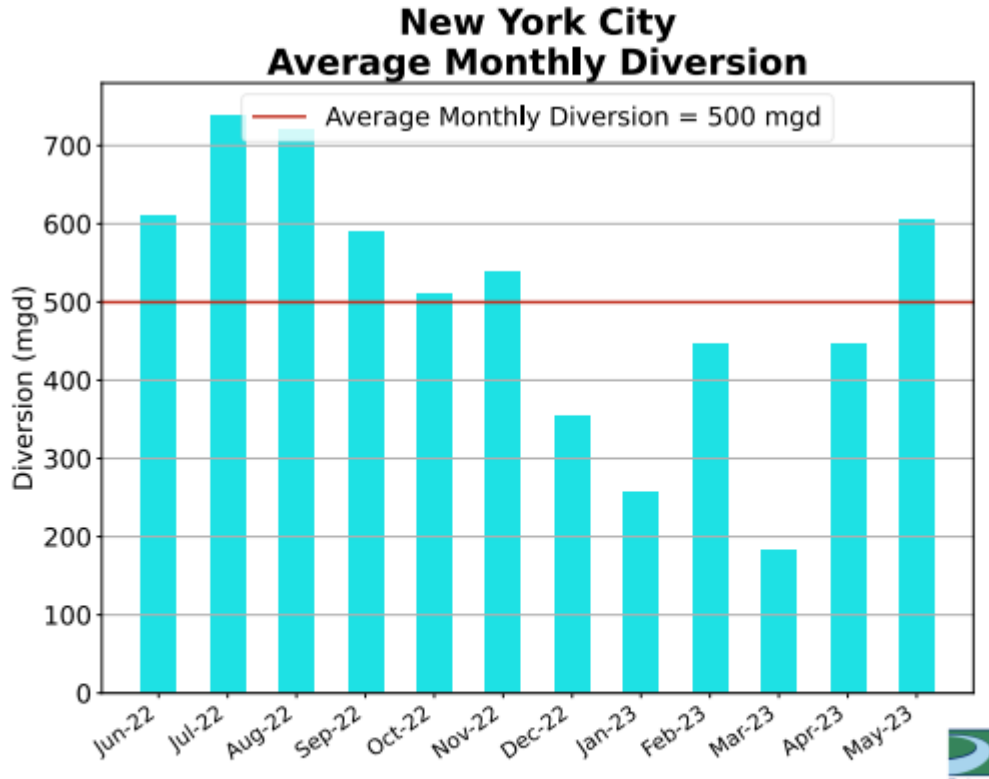
Water Released from Lower Basin to Meet Trenton Flow Objectives (MG)	
Beltzville	990
Blue Marsh	550
Total	1,540

*Includes the portion of the conservation releases needed to meet Montague, but not the amount of the conservation release that exceeds what is needed to meet Montague.

Diversions

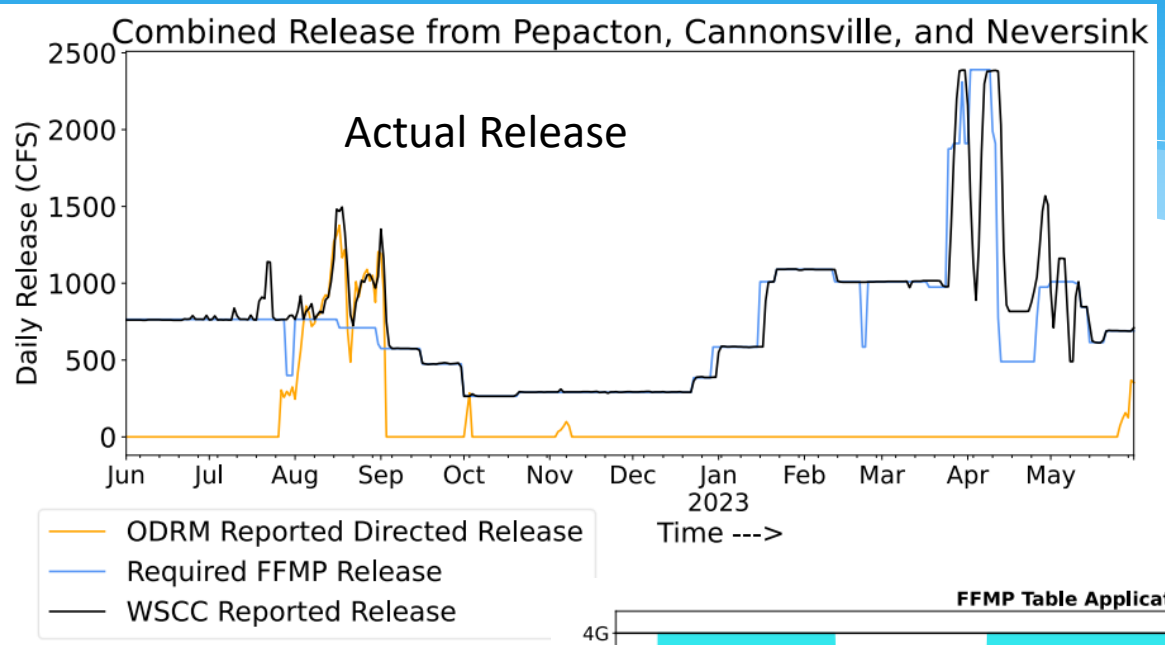
Monthly Average Daily Diversion (June 1, 2022 – May 31, 2023)	
New Jersey	New York
93 mgd	500 mgd





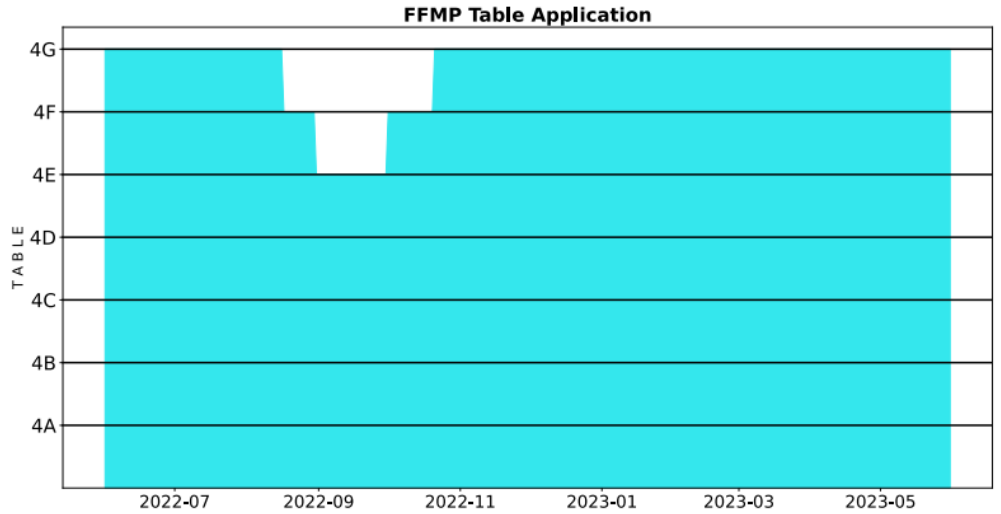
Data Source: USGS, NYCDEP

Conservation Releases



Volume of Conservation Releases (MG)			
	FFMP 2017 Tables Based on Storage (6/1/22 - 5/31/23)	**REV1**	**Multiple of Revision 1**
Cannonsville	104,190	20,665	5.0
Pepacton	43,476	14,562	3.0
Neversink	23,482	8,664	2.7

Values are the conservation releases required by the FFMP Tables Only. All or a portion of the release may have been used to meet the Montague Flow Objective. Additional release volume may have been required for bank use.



FFMP TABLE	Number of Days	Percent (%)
4G	300	82.2
4F	34	9.3
4E	31	8.5
4D	0	0
4C	0	0
4B	0	0
4A	0	0

Data Source: NYCDEP, ODRM, USGS

Bank Use

FFMP 2017 Bank	Used	Size
NJ Diversion Amelioration Bank	0	of 2,545 cfs-days
Rapid Flow Change Mitigation Bank	14	of 1,000 cfs-days
Thermal Mitigation Bank	1,754	of 2,500 cfs-days
Trenton Equivalent Flow Objective Bank	850	of 9,423 cfs-days
NJ Diversion Offset Bank*	0	cfs-days

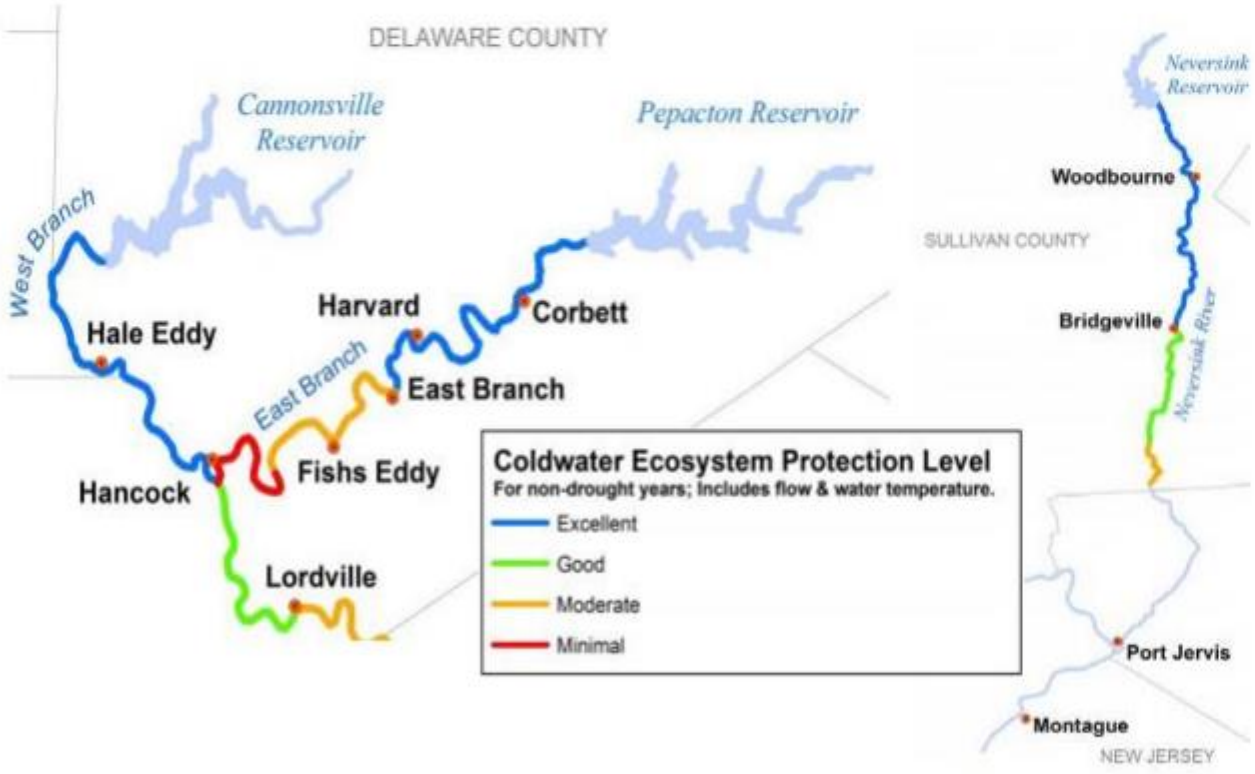
Thermal Releases were made on 26 days for 9 events in June 2022, July 2022, and August 2022. A rapid flow change mitigation release was needed on August 20, 2022.

*The NJ Diversion Offset Bank accumulated 2,075 cfs-days

Data Source: ODRM

Habitat Protection

(Temperature)



Goals for Excellent Habitat:

* Summer Temperature typical less than 20 ^{0}C
* Rare Exceedances of > 24 ^{0}C

Temperature

Goals for Excellent Habitat:

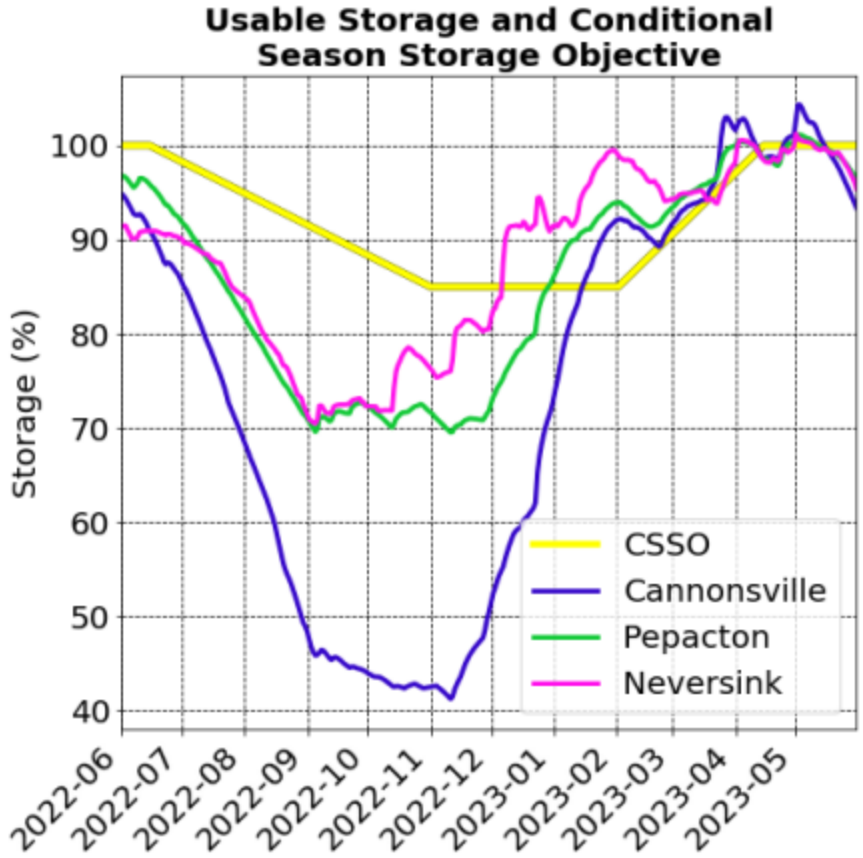
* Summer Temperature typical less than 20 ^{0}C
* Rare Exceedances of > 24 ^{0}C

Location	Exceedances of 24 ^{0}C		Exceedances of 20 ^{0}C	
	Days the Maximum Temperature was above 24 ^{0}C	Days the Average Temperature was above 24 ^{0}C	Days the Maximum Temperature was above 20 ^{0}C	Days the Average Temperature was above 20 ^{0}C
Hale Eddy	0	0	0	0
Harvard	0	0	15	0
Hancock	0	0	0	0
Lordville	2	0	67	37
Bridgeville	3	0	70	11

Thermal Releases were made on 26 days for 9 events in June 2022, July 2022, and August 2022. Approximately 1.1 BG was used from the bank.

Data Source: USGS

Discharge Spill Mitigation

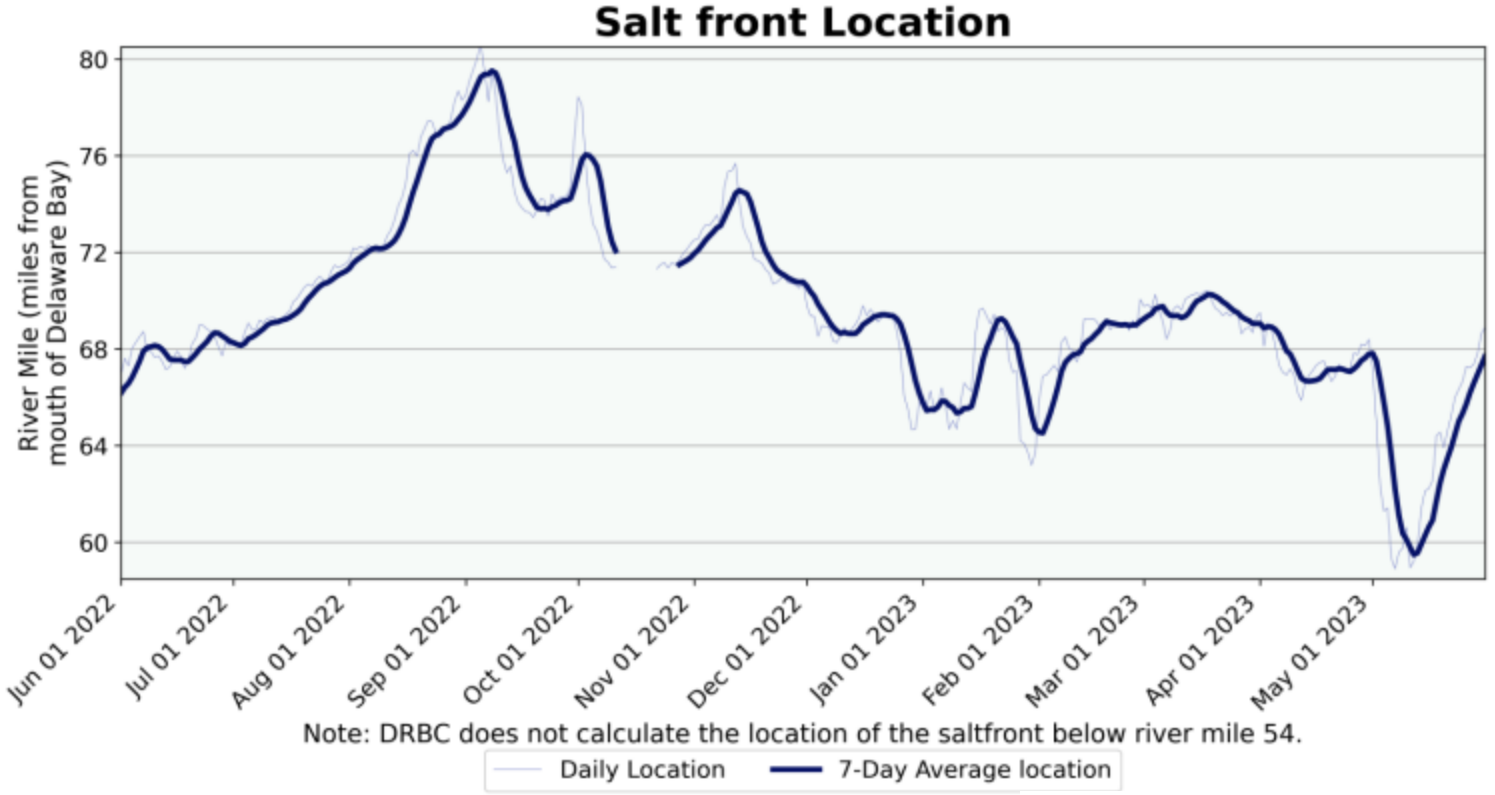


	Spill Volume (MG)	Days
Cannonsville	27,770	40
Pepacton	10,652	25
Neversink	3,611	19

	All L1 Discharge Mitigation Releases (MG)	Number of days above CSSO (L1-a, L1-b)
Cannonsville	48100	104
Pepacton	28844	118
Neversink	11866	110

Data Source: NYCDEP

Salinity Management (Water Code)



* DRBC is responsible for making releases to manage the salt front
* Under the FFMP 2017 agreement, NYC makes additional releases **during drought emergency** to provide additional flow from upstream based on the location of the salt front.
* Note: No drought emergency occurred in the past FFMP release year.

Data Source: USGS

Summary FFMP 2022-2023

* Warm water temperatures during June, July, and August of 2022 required used of the **thermal mitigation bank** on twenty-six separate days. Approximately 1.13 BG was used from the bank.
* The maximum water temperature exceeded 24℃ on 2 days at Lordville and 3 days at Bridgeville.
* Dry conditions during July and August required release of approximately 20.4 BG to meeting **Montague Flow Objective.**
* Additional releases were made during November 2022, February 2023 and May 2023 bring the total; directed releases for Montague to approximately 21.5 BG.
* Releases of approximately 1.5 BG were made for lower basin reservoirs Beltzville and Blue Marsh to meet the **Trenton Equivalent Flow Objective**.

* The **conservation releases** were based on Table 4G for 82.2% of the year
* The three NYC reservoirs were below the CSSO for most of the time between June 2002 and November 2002. From November 2022 until May 2023:
  - Neversink was above the CSSO except at the end of May
  - Pepacton was above the CSSO except during December and at the end of May
  - Cannonsville was above the CSSO except during the second part of December and at the end of May

Presentation Available On DRBC's Website

http://www.nj.gov/drbc/programs/flow/FFMP_PerformanceRpts.html