Delaware River Basin Commission
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Kristen Bowman Kavanagh, P.E.
Executive Director

MEMORANDUM

Flexible Flow Management Program: Performance Report June 1, 2024 – May 31, 2025

The goals of the Flexible Flow Management Program (FFMP)[1] are to protect water supplies, manage drought conditions, and maintain flow objectives during periods of low flow. In addition, conservation releases are enhanced to maintain tailwater temperatures, and to minimize spilling of reservoirs through use of the Conditional Seasonal Storage Objective (CSSO). The following is a summary of the performance of the FFMP during the release year 2024– 2025 (June 1, 2024, through May 31, 2025).

In the upper basin, above Montague, precipitation trends were generally mixed. Both August 2024 and May 2025 were well above normal, while September, October, and January were well below normal.[2] In the middle basin, above Trenton, precipitation tended to be below normal throughout the year, except for December 2024 and April 2025, which recorded normal rainfall. In August 2024 and May 2025, significantly above normal precipitation was observed in the middle basin. In the lower basin, precipitation had a similar pattern, and most of the year experienced much below normal precipitation. Rainfall in October was nearly absent across the lower basin gauges. The lack of rainfall in the fall months led to state-declared drought conditions throughout the Basin. Drought conditions were more severe in the lower basin. **(Slide 4-8)**.

The combined storage in the New York City reservoirs is used to define drought levels for the basinwide drought management plan, adopted in the Delaware River Basin Water Code (18 CFR 410 Part 410) and incorporated in the FFMP. During the release year, the combined storage was not less than the drought watch line, and the drought management plan was not implemented. At the beginning of the release year, storage in the three New York City (NYC) reservoirs (Pepacton, Cannonsville, and Neversink) was below the median value. Storage increased to above the median value in mid-August after a heavy rain event before falling below the median again in late September. Storage remained below the long-term median for the next 7 months due to persistent dry conditions and very little precipitation. In addition, in preparation for the repair of the Delaware Aqueduct[3], NYC followed its Water Supply Sustainability Operation (WSSO) protocol, which did not affect provisions of the Water Code or FFMP. The intent was to divert and releases water from the Delaware River Basin Reservoirs from June 1 to September 30 to preserve storage in the remainder of the NYC system. The reservoirs would refill, while the aqueduct was closed. However, due to dry conditions, concerns about drought, and unforeseen complications, the aqueduct project was postponed. Diversions from the reservoirs resumed in late November until March, when a series of precipitation events provided enough water to refill the reservoirs, and they

[1] https://webapps.usgs.gov/odrm/documents/ffmp/Appendix_A_FFMP-20180716-Final.pdf
[2] Data Source: Applied Climate Information System - https://www.rcc-acis.org/
[3] Delaware aqueduct shutdown - https://www.nj.gov/drbc/library/documents/2024Hydrologic-Conditions-Rpt.pdf; https://www.nj.gov/drbc/library/documents/NYCDEP_DelawareAqueductRepair_fact-sheet.pdf

spilled in mid-May after a coastal storm passed through the region. As of the end of this year's reporting period, the combined storage of the NYC reservoirs was 100 percent. Information about hydrologic events is available in the Annual Hydrologic Conditions Report for the Delaware River Basin, published on the Delaware River Basin Commission (DRBC) website[4]. **(Slide 9)**.

The FFMP established four banks of water provided by the NYC reservoirs for specific purposes. These banks include the Interim Excess Release Quantity (IERQ) of 10 BG (15,472 cfs-days), which addresses ecological concerns and augment flows in the lower basin. The Thermal Mitigation bank provides 1.62 BG (2,500 cfs-days) to reduce water temperatures to levels protective of fish. The Rapid Flow Change Mitigation Bank is 0.65 BG (1,000 cfs-days) and is used to reduce large fluctuations due to changes in releases for Montague. The Trenton Equivalent Flow Objective Bank (6.09 BG or 9,423 cfs-days) provides water that can be used to meet the Trenton Flow Objective. The New Jersey Diversion Amelioration Bank (1.65 BG or 2,553 cfs-days) is available during drought conditions only and is used to offset differences between New Jersey's diversion allowances under the FFMP and the Water Code. Another bank of water, called the New Jersey Diversion Offset Bank is used in the same manner, but accumulated during the summer season. During the release year, the bank accrued to a volume of 1.49 BG (2,305 cfs-days) but was not needed. During the release year 2024-2025, releases of 1,590 cfs-days were made from the thermal mitigation bank (described below), 219 cfs-days were used from the Rapid Flow Change Mitigation Bank, and 2,900 cfs-days were used from the Trenton Equivalent Flow Objective Bank. The New Jersey Diversion Amelioration and Offset banks were not used. **(Slide 21)**.

The flows at Montague[5] and Trenton[6] were below normal in June. Beginning in August, flows were above normal[7] for the next 30 days due to a high-volume precipitation event and then returned to below normal October through December until another high-volume event allowed the flow to recover to normal levels. Beginning in 2025, fluctuated between below-normal and above-normal due to dry periods followed by precipitation events. In May, a coastal storm passed through the basin, which allowed for the streamflow at both locations to significantly recover and remain above normal through the end of the release year. During the periods of low flow, releases were made to meet the flow objectives at both Montague and Trenton. In 2024-2025, a total of 52.4 BG was released from the NYC reservoirs to meet the flow objectives: 50.5 BG for Montague and 1.88 BG from the TEFO bank for Trenton. The Delaware River Basin Commission (DRBC) is responsible for meeting the Trenton Flow Objective. To do so, DRBC jointly funds the construction of and pays a portion of the O&M for two federal reservoirs, Beltzville Reservoir in the Lehigh Valley, and Blue Marsh reservoir in the Schuylkill Valley. In each, DRBC has a pool of water to release for the Trenton Flow Objective. In addition to water from the TEFO bank, releases of 3.03 BG were made from Beltzville Reservoir, to meet the flow objective at Trenton. **(Slide 10)**.

As defined in the FFMP, the diversion from NYC is limited to 800 million gallons per day (mgd) based on a running average beginning on June 1 until May 31 of the previous year. The running average did not exceed 800 mgd during the release year 2024-2025. The average diversion from the NYC reservoirs

[4] https://www.nj.gov/drbc/programs/flow/annual-hydro-reports.html
[5] USGS 01438500 - https://waterdata.usgs.gov/usa/nwis/uv?01438500
[6] USGS 01463500 - https://waterdata.usgs.gov/usa/nwis/uv?01463500
[7] Normal is defined as the 25th to 75th percentile of flow on a given day

during the release year 2024-2025 was 424 mgd. In New Jersey, the diversion is limited to 100 mgd as a monthly average. The average diversion for the release year 2024-2025 was 92 mgd. **(Slide 15)**.

Conservation releases are designed to protect the ecology of the stream reaches below the NYC reservoirs. In release year 2024-2025, the required conservation releases based on the FFMP tables were as follows: Cannonsville – 69,063 MG, Pepacton – 25,826 MG, and Neversink – 18,436 MG. All or a portion of the releases on a given day may have been used to meet the Montague Flow Objective. For 80 percent of the year, Table 4G was used. The percentage of time in the other tables, in decreasing order, was 4E for 9 percent, 4A for 5 percent, 4F for 3 percent, and 4C for 3 percent. **(Slides 16-20)**.

The thermal releases are designed to protect stream reaches below the NYC reservoirs from high water temperatures. The goal for excellent habitat below the reservoirs (at Hale Eddy, Harvard, and Bridgeville) is for summer water temperatures to be less than 20 degrees C with only rare instances of maximum daily temperatures above 24 degrees C (FFMP). In release year 2024-2025, the water temperatures at Bridgeville and Lordville exceeded 24 degrees C for one day and five days, respectively[8]. Water temperatures were above 20 degrees C for 61 days at Lordville, 48 days at Bridgeville, 13 days at Harvard, and one day at Hancock. Releases from the thermal bank were made on seven days for one event in June 2024, seven days for two events in July 2024, and two days for one event in August 2024. Thermal releases were made for a total of 16 days, and 1,589 cfs-days (1.03 BG) were used from the thermal mitigation bank. For context, the summer of 2024 (June – August) was the 7th warmest summer on record for the Upper Basin and 9th warmest in the Lower Basin based on average temperature.[9] **(Slides 22-29)**.

To enhance flood mitigation, water is released from the NYC reservoirs based on a Conditional Seasonal Storage Objective (CSSO). Discharge mitigation releases are made from a reservoir when the combined storage is in the L1 zone, and the individual reservoir elevation/storage is above the CSSO. Releases to achieve the CSSO create a high probability of maintaining fifteen percent void spaces in individual reservoirs between November 1 and February 1, and at least ten percent void space in individual reservoirs between approximately September 15 and March 1. Discharge mitigation releases for this release year were 6,272 MG from Cannonsville, 3,062 MG from Pepacton, and 1,397 MG from Neversink. The reservoir elevations were above the CSSO for 17, 15, and 21 days, respectively. Cannonsville reservoir spilled 6,272 MG over 17 days, Pepacton reservoir spilled 3,062 MG over 15 days. Neversink reservoir spilled 1,397 MG over 21 days. A provision of the FFMP requires reductions in release rates in the water levels at gages below the reservoirs that are predicted to reach action stage or higher. The Hale Eddy gage (USGS 01426500), below Cannonsville, was above action stage (9 ft) for two separate days (May 6-7, 2025, and August 9, 2024). The Harvard gage (USGS 01417500), below Pepacton, was above action stage (7 ft) for three non-sequential days (August 9-10, December 11-12, 2024, and May 9-12, 2025). It should be noted that locations below the reservoirs can reach NWS Action Flood Stage in the absence of, or prior to, significant spills. **(Slide 29)**.

As established in the Delaware River Basin Water Code[10], DRBC is responsible for managing salinity intrusion in the Delaware River by maintaining the flow objective at Trenton, N.J. The purpose of the flow objective at Trenton is to increase flows into the Estuary so the salt front, an indicator of salinity

[8] Data Source: USGS Gages (01426500, 01417500, 01427000, 01436690, 01427207)
[9] NCEI NCDC - https://www.ncdc.noaa.gov/cag/national/rankings
[10] https://www.nj.gov/drbc/library/documents/watercode.pdf

intrusion, remains below the confluence of the Delaware and Schuylkill Rivers. The salt front is a calculated indicator based on the 7-day average location of the 250 mg/L isochlor in the river[11]. The goal of salinity management is the protection of major drinking water intakes near RM 110 for two water treatment facilities, one serving Philadelphia, PA and the other providing water to parts of central and southwestern New Jersey.

The salt front was in or near the normal range from June through mid-October. It then began to move upstream due to the low flow resulting from the lack of precipitation. On November 21, the salt front reached its most upstream location of RM 90 near Philadelphia International Airport. As flows began to increase later in November and remain higher due to several rain events, the salt front moved downstream and was below RM 70 by the end of the year. Between January and April 2025, the salt front fluctuated between RM 65 and RM 75, its normal range, until May, when two large precipitation events increased the flow and moved the salt front below RM 54[12]. At the end of the release year, the salt front was near RM 65, slightly below normal for the month of May. **(Slide 30).**

Summary: In the 2024-2025 release year, precipitation was mixed throughout the basin. During October 2024, no precipitation was recorded at stations in the lower basin. NYC reservoir storage was below its long-term median for most of the year, except for a short period from mid-August to mid-September. During this time, higher diversions and releases were made in preparation for the Delaware Aqueduct project. Flows were generally below normal for much of the release year and experienced temporary recoveries during large precipitation events. In 2025, streamflows continued to fluctuate but ended the release year above normal. The NYC Diversion and NJ Diversion did not exceed their respective limits as set forth in the Water Code and FFMP. The conservation releases were mixed and included releases from tables 4A, 4C, 4E, 4F and 4G. Warm summer air temperature led to increased water temperatures and thermal mitigation releases were made intermittently in June, July, and August of 2024. The salt front was above its normal range (RM 67-76) from late September until the beginning of December. Its most upstream location was RM 90 on November 21, 2024, near the Philadelphia International Airport. The salt front was briefly below its normal range for the first few weeks in May but otherwise in the normal range.

For non-provisional, approved data, contact the Delaware River Basin Commission (salt front), the NYC Department of Environmental Protection (NYCDEP), the Office of the Delaware River Master (ODRM), or the United States Geological Survey (USGS)[13]. This report is available online at: https://www.nj.gov/drbc/programs/flow/FFMP_PerformanceRpts.html

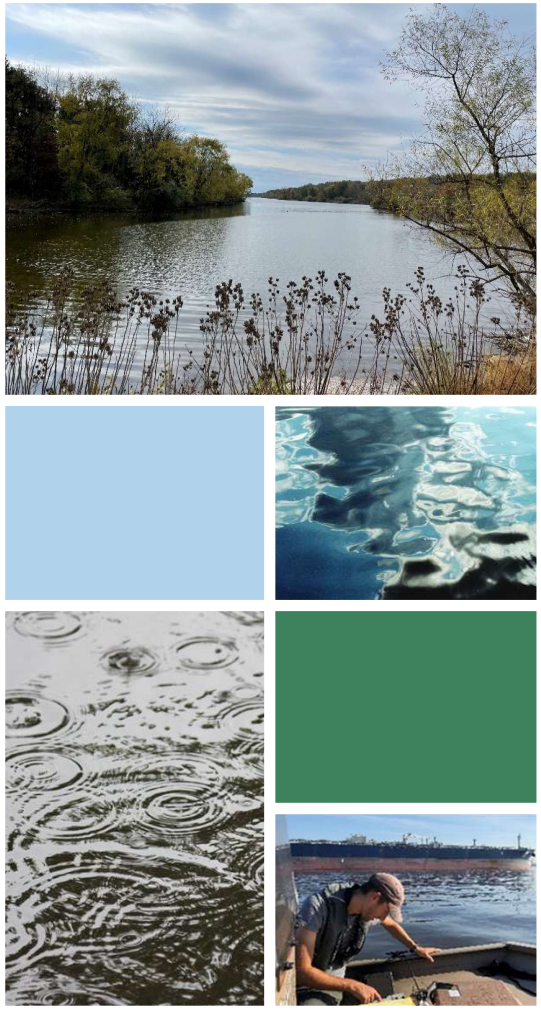
ACKNOWLEDGEMENTS

This report was prepared by the Delaware River Basin Commission staff. Ms. Sara Sayed and Ms. Amy Shallcross, P.E., Manager of Water Resource Operations, authored this report. Ms. Sayed is a Water Resource Scientist and Ms. Shallcross is the Manager of Water Resource Operations.

[11] https://www.nj.gov/drbc/programs/flow/salt-front.html
[12] The location of the salt front below river mile 54 is unavailable due to the lack of data for the calculation.
[13] USGS - https://www.usgs.gov/

SUGGESTED CITATION

DRBC. 2025. FFMP Performance Report 2024-2025. Delaware River Basin Commission. West Trenton, NJ. URL: https://www.nj.gov/drbc/programs/flow/FFMP_PerformanceRpts.html



FFMP Implementation Performance

Release Year 2024-2025
June 1, 2024- May 31, 2025

Sara Sayed
Water Resource Scientist
Amy Shallcross, PE
Manager, Water Resource Operations

Delaware River Basin Commission
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June 2025

Data Sources

All data used in the analysis are provisional.

Final/approved data are available from:

NYC Department of Environmental Protection (NYCDEP)

Office of the Delaware River Master (ODRM)

United States Geological Survey (USGS)

Methodology for calculations is included for reference on the last slide.

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FFMP Performance Goals

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

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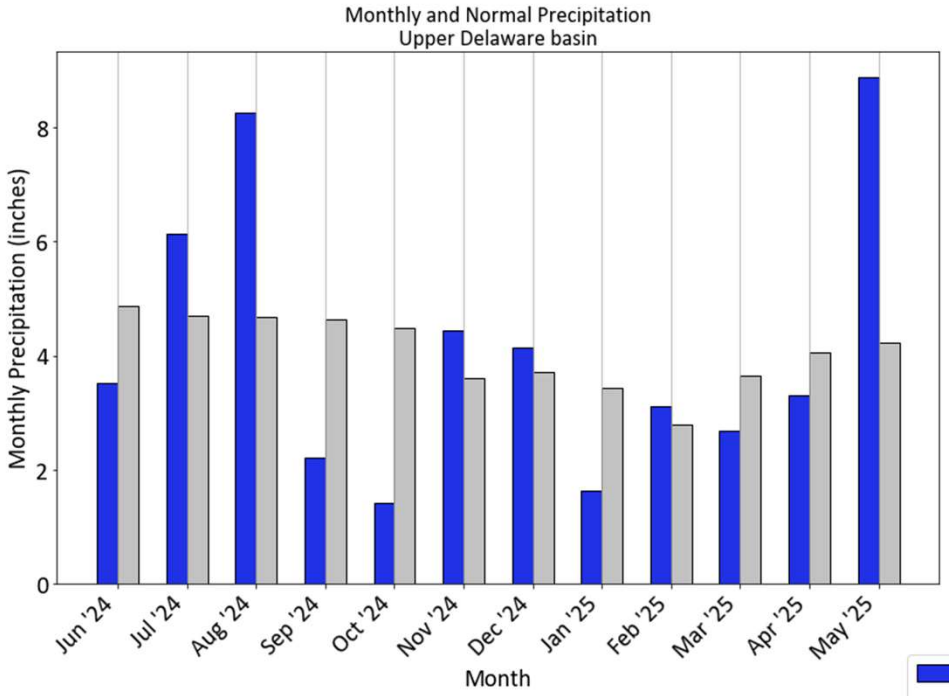
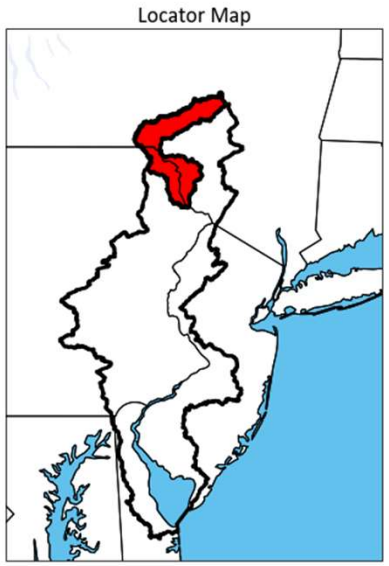
Precipitation – Upper Basin





Source: ACIS, USGS HUC: 02040101
Monthly Normal is based on 29 stations in the Upper Delaware basin

Monthly Observed Precipitation
Monthly Normal (1991 - 2020)

Data Source: ACIS

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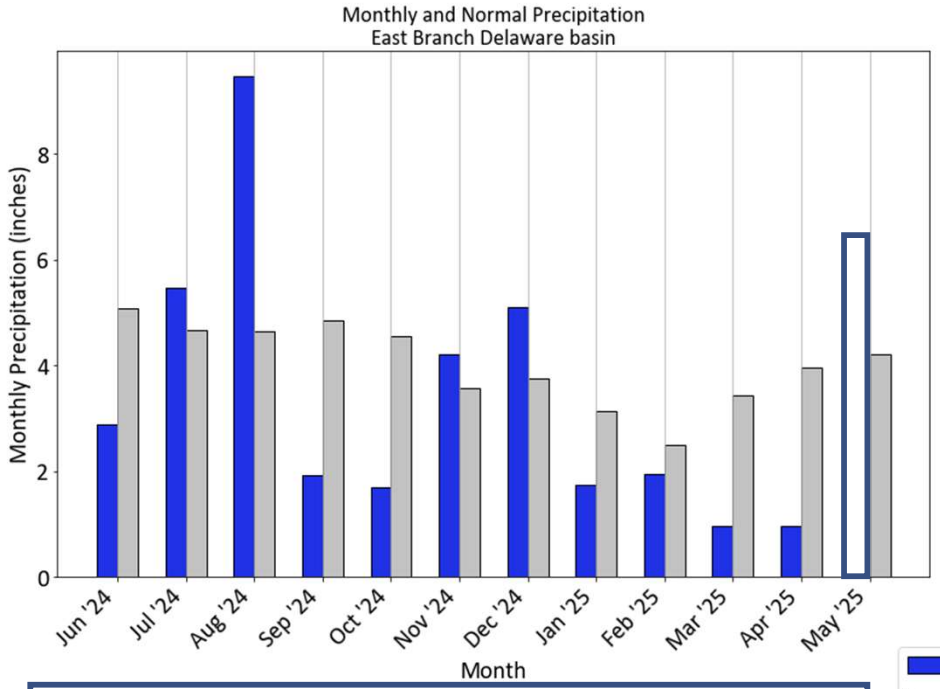
Precipitation – Upper Basin



* Note: Due to gauge reporting issues, data is missing for May 2025. Data from Pepacton reservoir in the watershed shows 6.65 inches of precipitation for the month of May.

Data Source: ACIS

Source: ACIS, USGS HUC: 02040102
Monthly Normal is based on 10 stations in the East Branch Delaware basin

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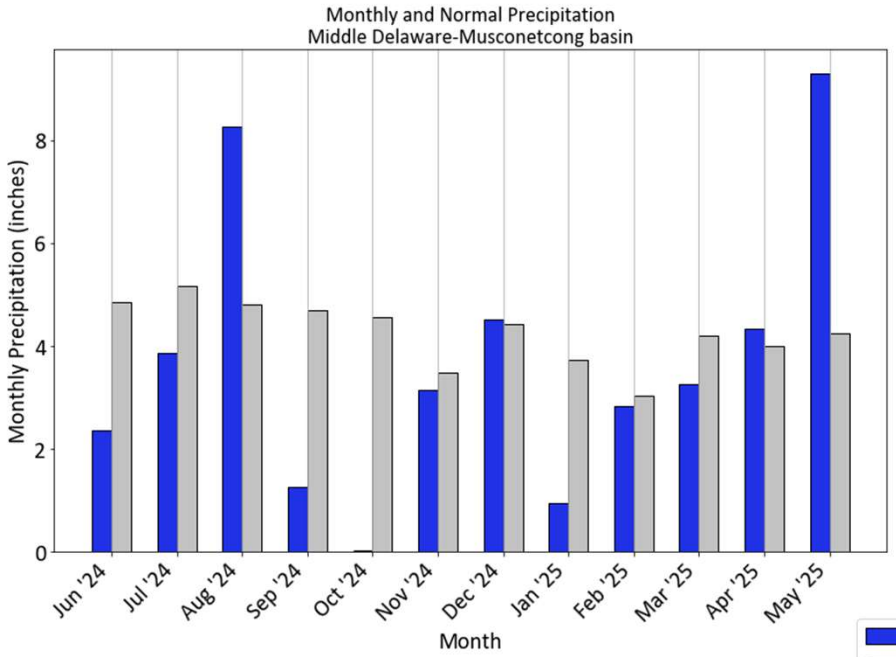
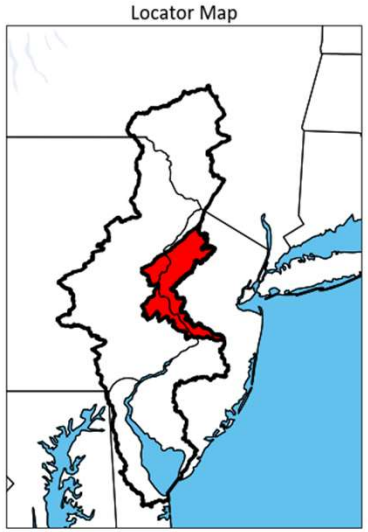
Precipitation – Middle Basin





Source: ACIS, USGS HUC: 02040105
Monthly Normal is based on 91 stations in the Middle Delaware-Musconetcong basin

Monthly Observed Precipitation
Monthly Normal (1991 - 2020)

Data Source: ACIS

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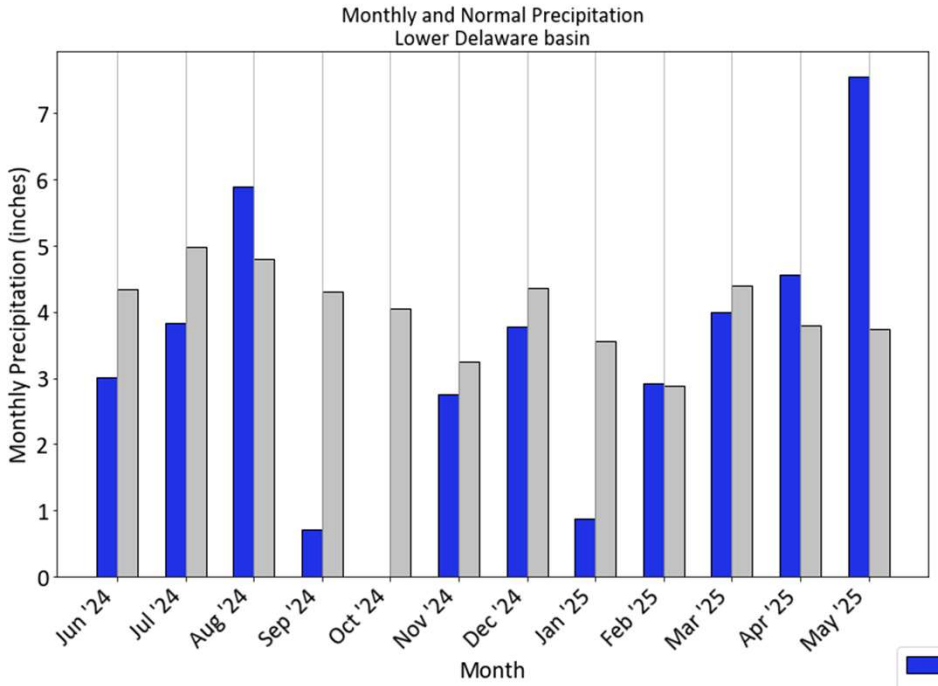
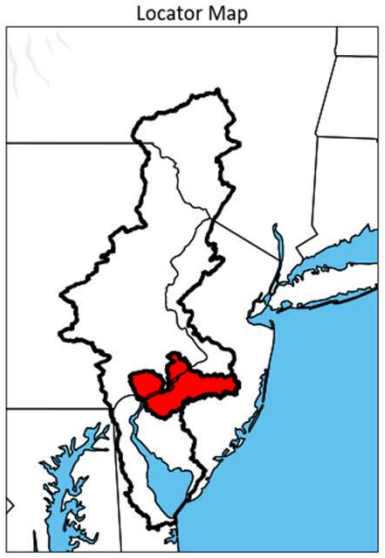
Precipitation – Lower Basin





Source: ACIS, USGS HUC: 02040202
Monthly Normal is based on 106 stations in the Lower Delaware basin

Monthly Observed Precipitation
Monthly Normal (1991 - 2020)

Data Source: ACIS

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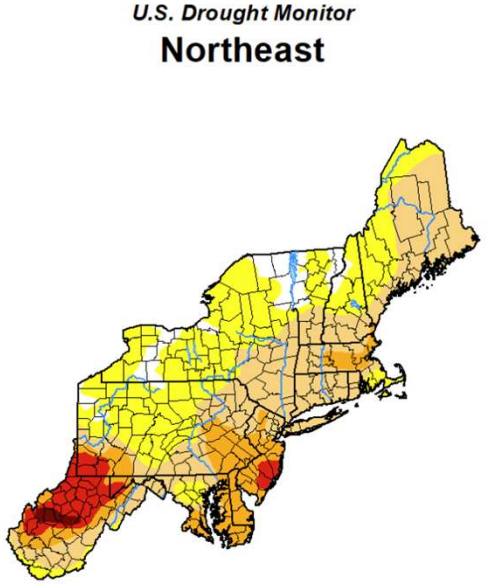
Drought Conditions



November 5, 2024
(Released Thursday, Nov. 7, 2024)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6.35	93.65	56.56	19.87	6.64	0.67
Last Week 10-29-2024	21.01	78.99	38.28	15.23	4.82	0.67
3 Months Ago 08-06-2024	62.42	37.58	20.32	9.18	2.70	0.00
Start of Calendar Year 01-02-2024	87.20	12.80	2.50	0.67	0.00	0.00
Start of Water Year 10-01-2024	45.94	54.06	19.29	9.92	4.95	0.67
One Year Ago 11-07-2023	79.11	20.89	3.44	0.27	0.00	0.00

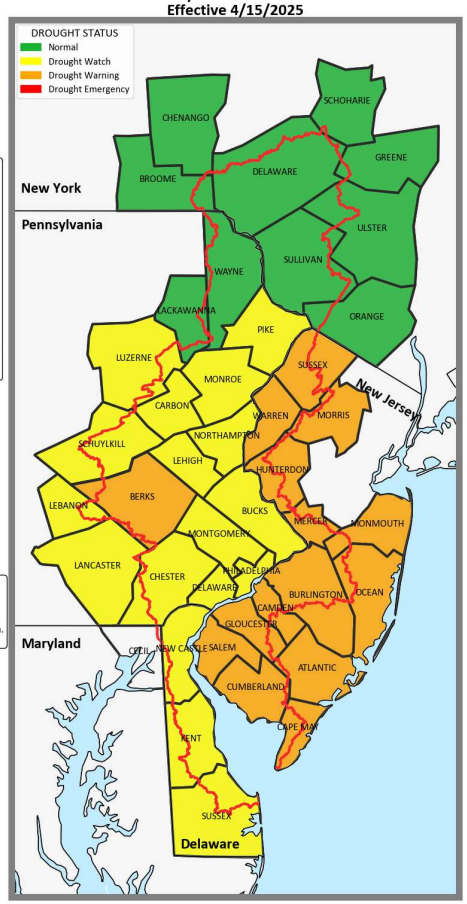
Intensity:
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
Brian Fuchs
National Drought Mitigation Center

droughtmonitor.unl.edu

Drought Status In the Delaware River Basin
As Declared by the Individual Basin States
Effective 4/15/2025



Pennsylvania

On 11/1/2024, PA declared a drought watch for 33 counties, incl. 13 in the DRB, and declared a drought warning for 2 counties, both in DRB. On 4/5/2025 PA changed Schuylkill County from drought warning to drought watch. Drought warning remains for Berks County

Delaware

On 10/25/2024, DE declared a Statewide Drought Watch.

New York

On 11/2/2024, NY declared a drought watch for Regions II& IIA, incl. 6 counties in DRB. On 11/18/2024, NY upgraded Regions II & IIA to drought warning & placed the rest of NYS in drought watch. On 12/16/2024, the entire NY state was downgraded to drought watch. On 1/3/2025, NYSDEC announced the statewide upgrade from Drought Watch to Normal.

New Jersey

On 10/17/2024, NJ declared a Statewide Drought Watch. This was updated to a Statewide Drought Warning on 11/13/24.

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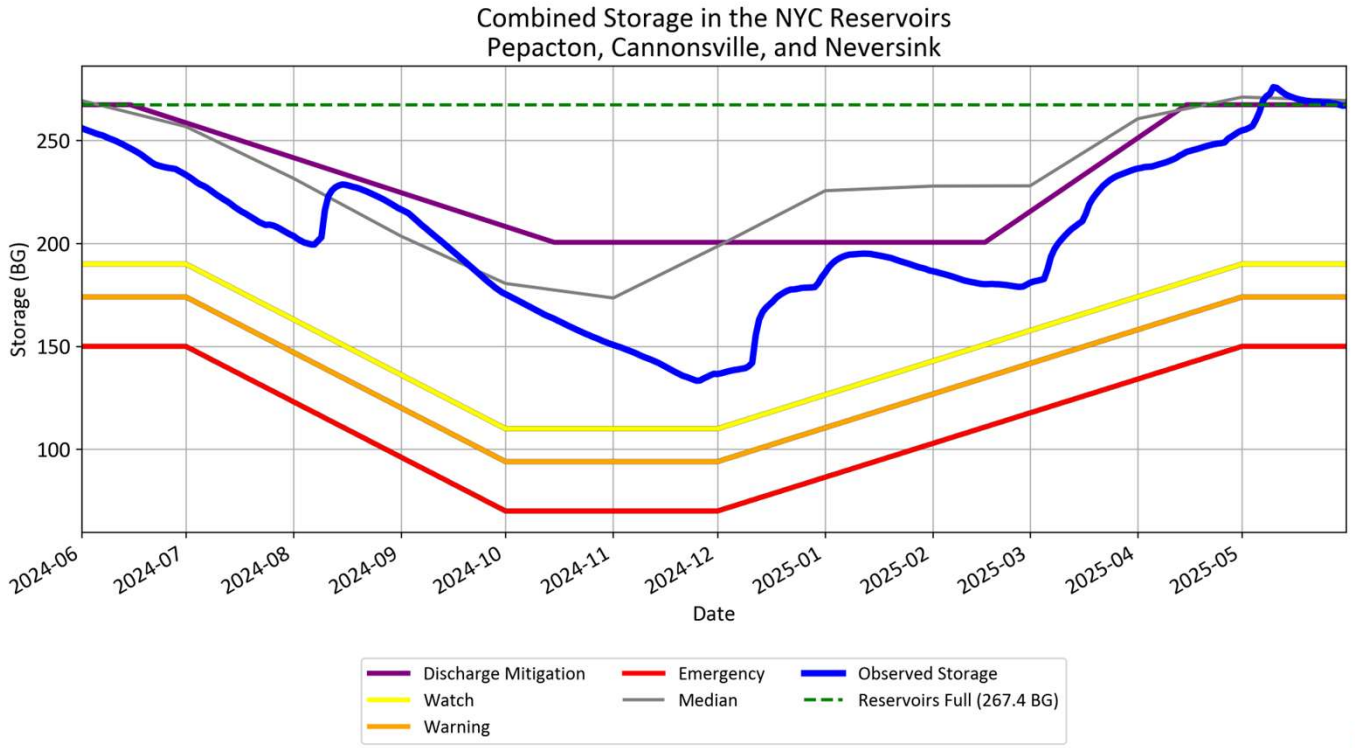
Data Source: ACIS

New York City Reservoir Storage



Data Source: NYCDEP

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Flow Objectives

Water Released from NYC to Meet Flow Objectives (MG)	
Montague*	50,527
Trenton **	1,875
Total	52,401

Water Released from Lower Basin to Meet Trenton Flow Objectives (MG) ***	
Beltzville	3,028
Blue Marsh	0
Total	3,028

*Releases made to meet the Montague Flow Objective, called directed releases, include the conservation release for the days when water is needed. Dates: 6/15, 6/20-6/23, 7/9-7/10,7/14,7/22-7/23, 8/31, 9/5-9/26, 9/28-11/21, 1/26, 2/4, 2/10-2/16 .

**Releases made to meet the Trenton Flow Objective are from a bank established by the FFMP (TEFO Bank) and are in addition to the directed release. Dates: 11/8-11/10, and 11/14-11/19.

*** Releases made from lower basin reservoirs for the Trenton Flow Objective exclude the conservation release.

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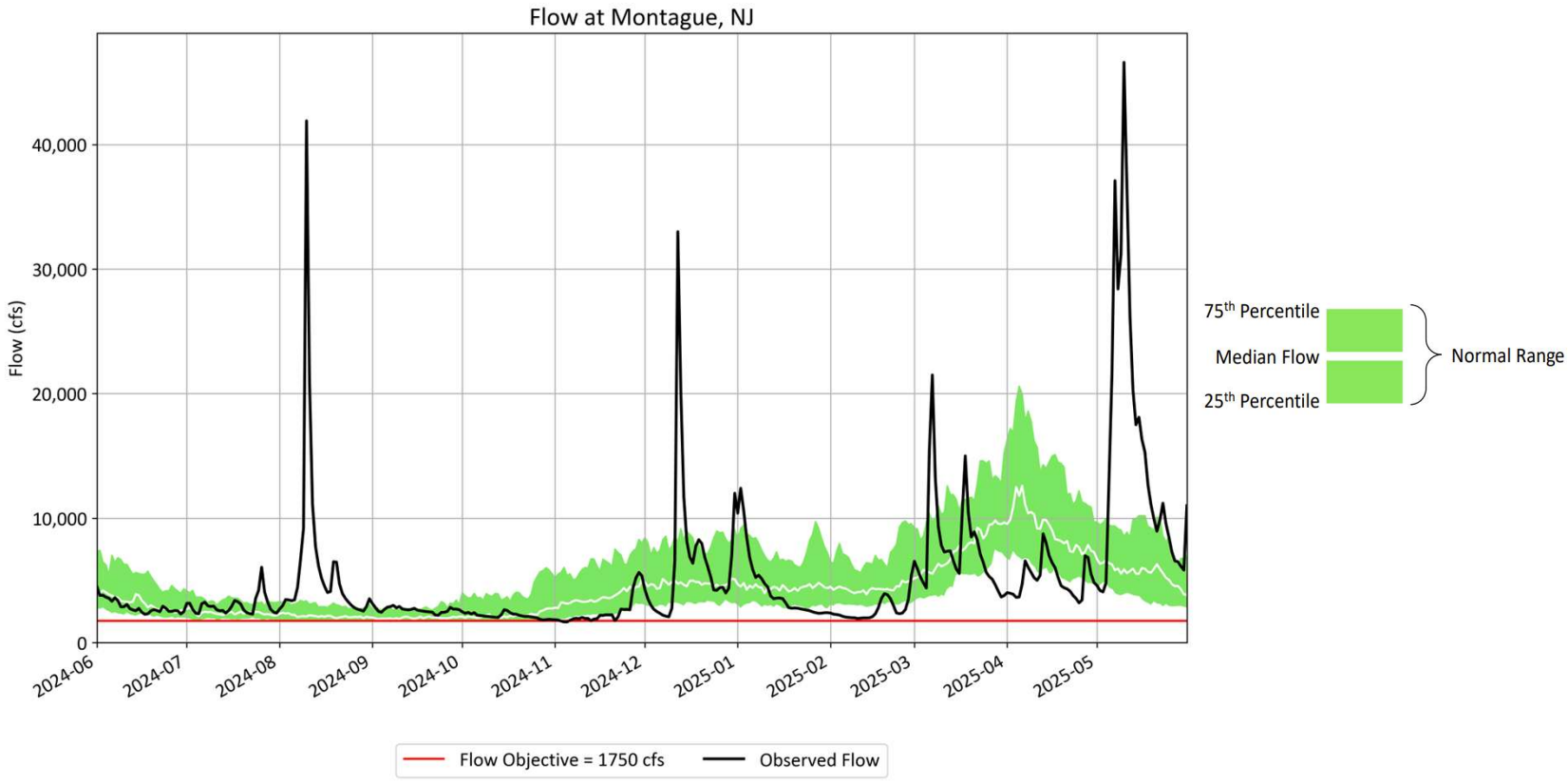
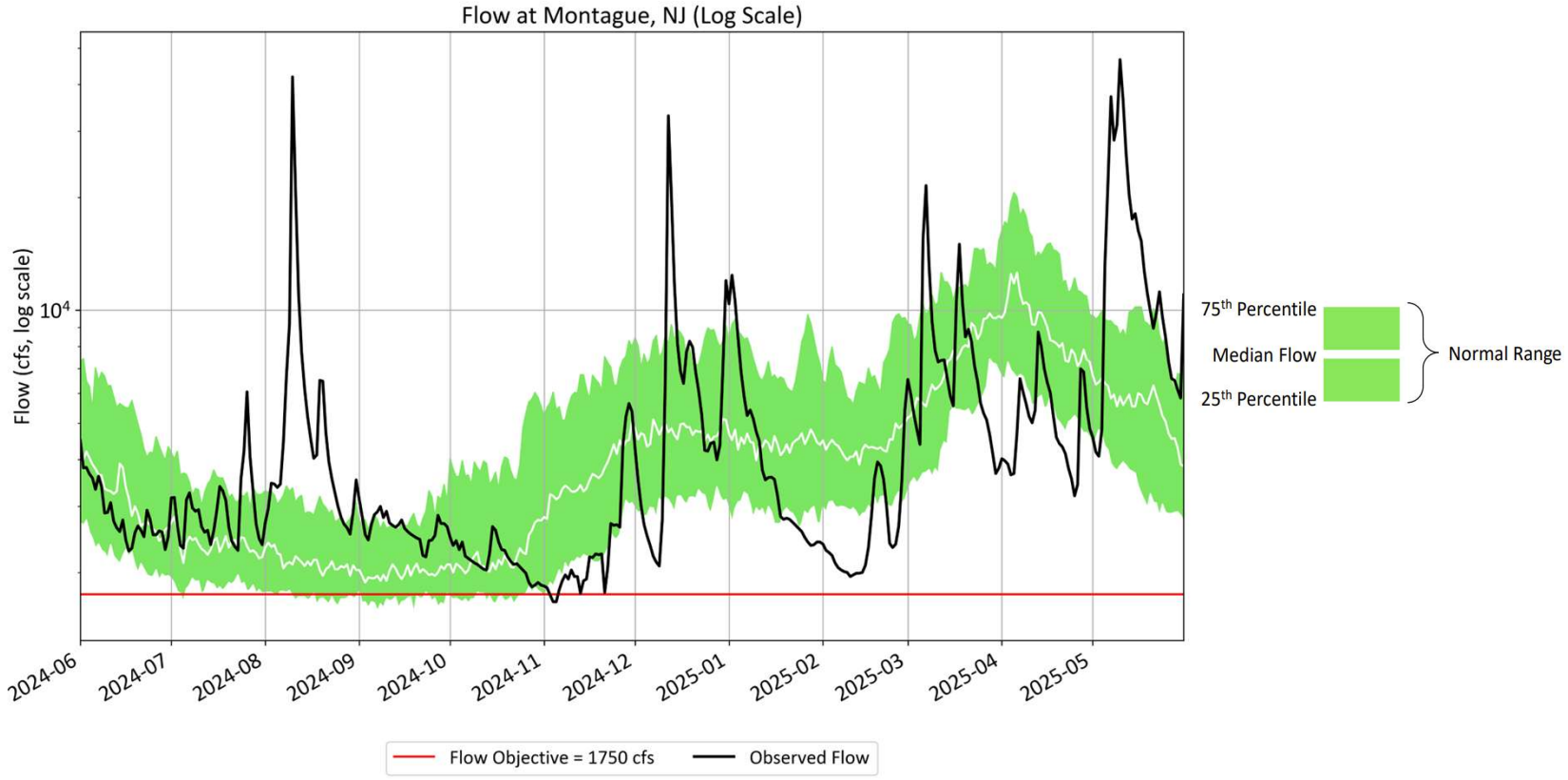
Flow at Montague



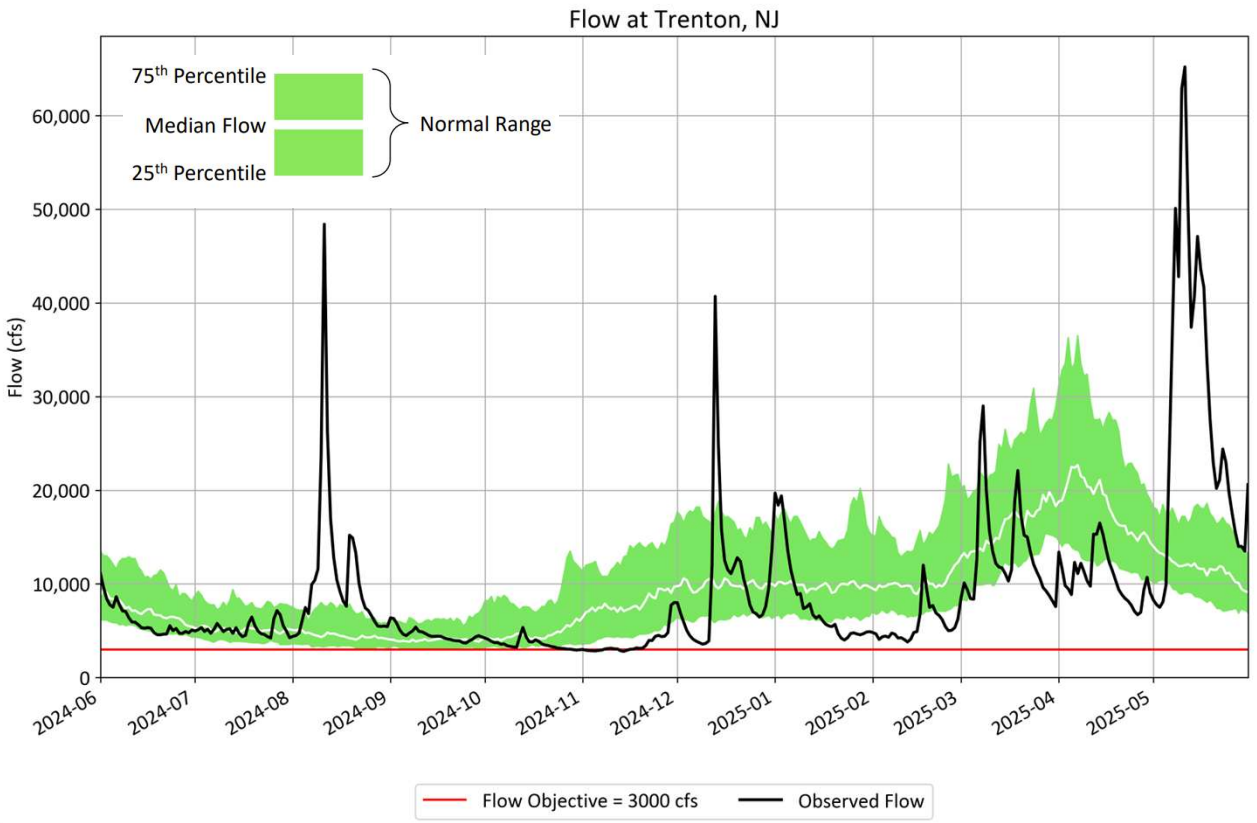
Data Source: USGS

Flow at Montague (log scale)



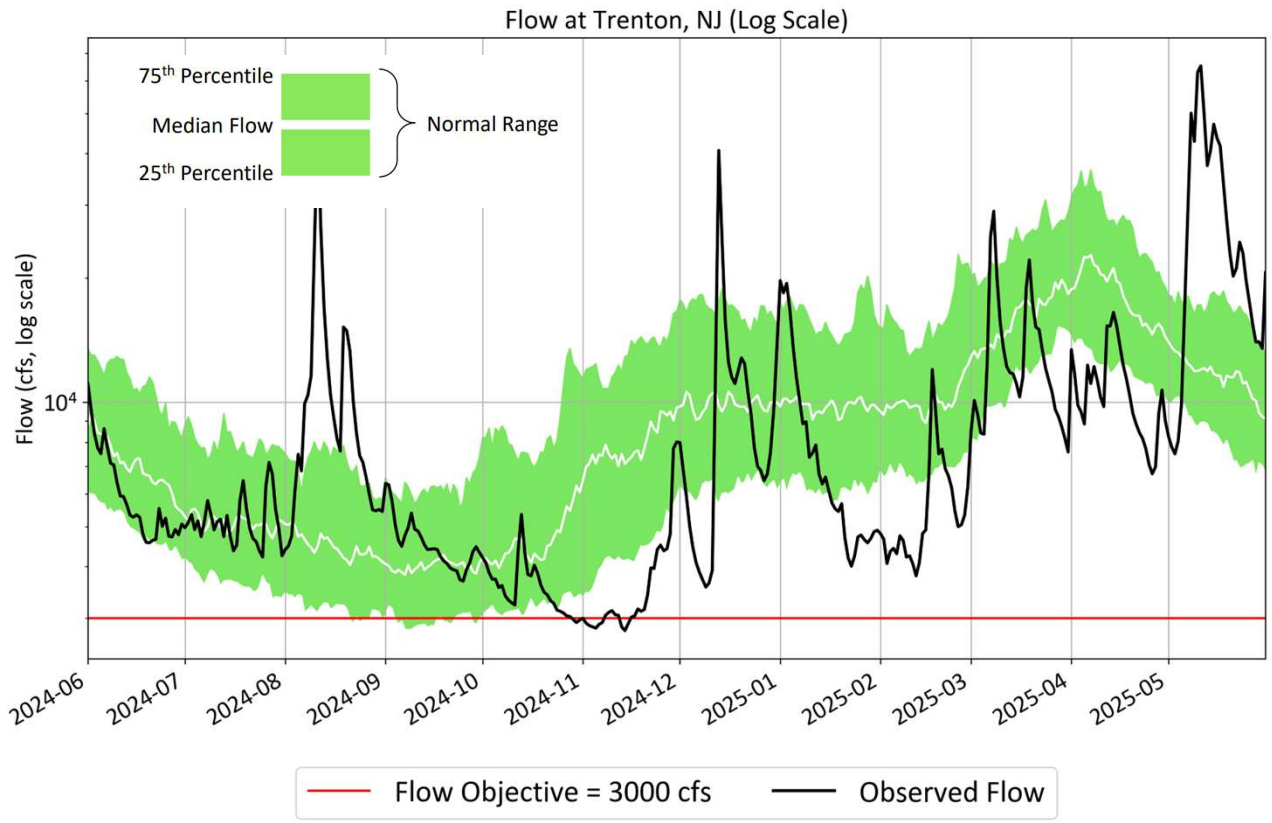
Data Source: USGS

Flow at Trenton



Data Source: USGS

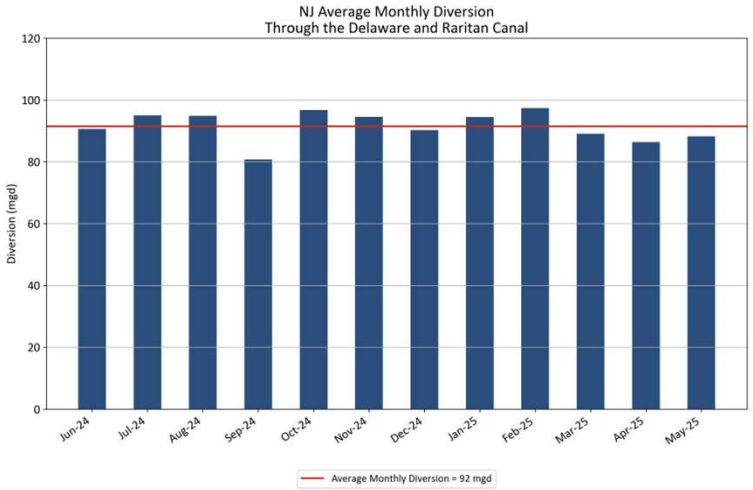
Flow at Trenton (log scale)

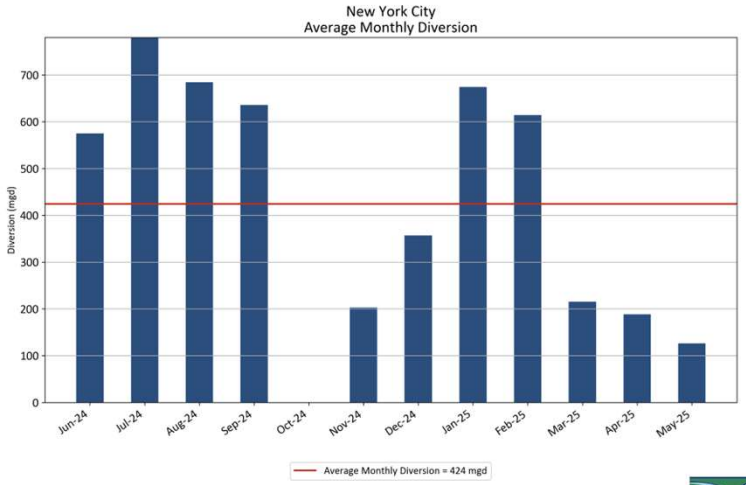


Data Source: USGS

Diversions

Monthly Average Daily Diversion (June 1, 2024 – May 31, 2025)	
New Jersey	New York
87 mgd	410 mgd





No diversions were made by NYC in October in preparation for the Aqueduct Repair, which was postponed in November.

Data Source: USGS, NYCDEP

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Conservation Releases

Total Volume of Conservation Releases (MG)			
	FFMP 2017 Tables Based on Storage (6/1/24 - 5/31/25)	**REV1**	**Multiple of Revision 1**
Cannonsville	69,063	20,686	8.4
Pepacton	25,826	14,593	5.8
Neversink	18,436	8,680	3.9
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.			

Percent of time in FFMP Table release rates used 6/2024-5/2025:
80% Table 4G, 9% Table 4E, 5% Table 4A, 3% for Table 4F and 3% Table 4C.

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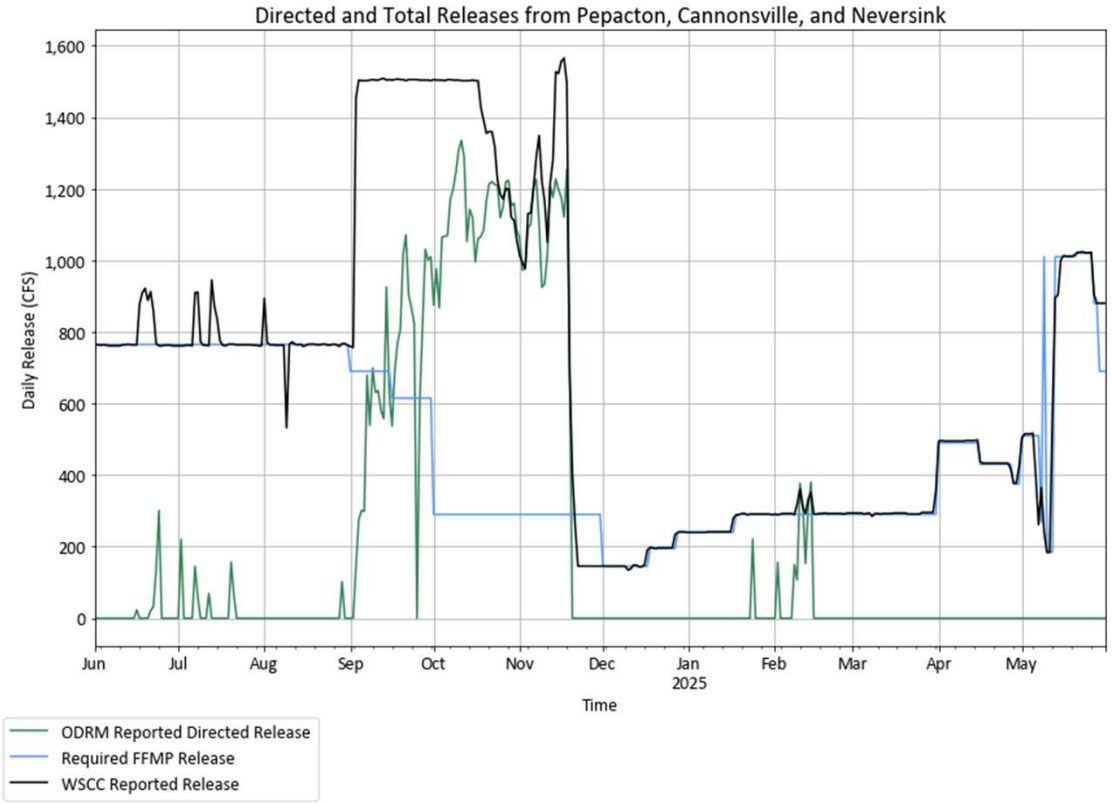
Combined Release History



Data Source: NYCDEP, ODRM, USGS

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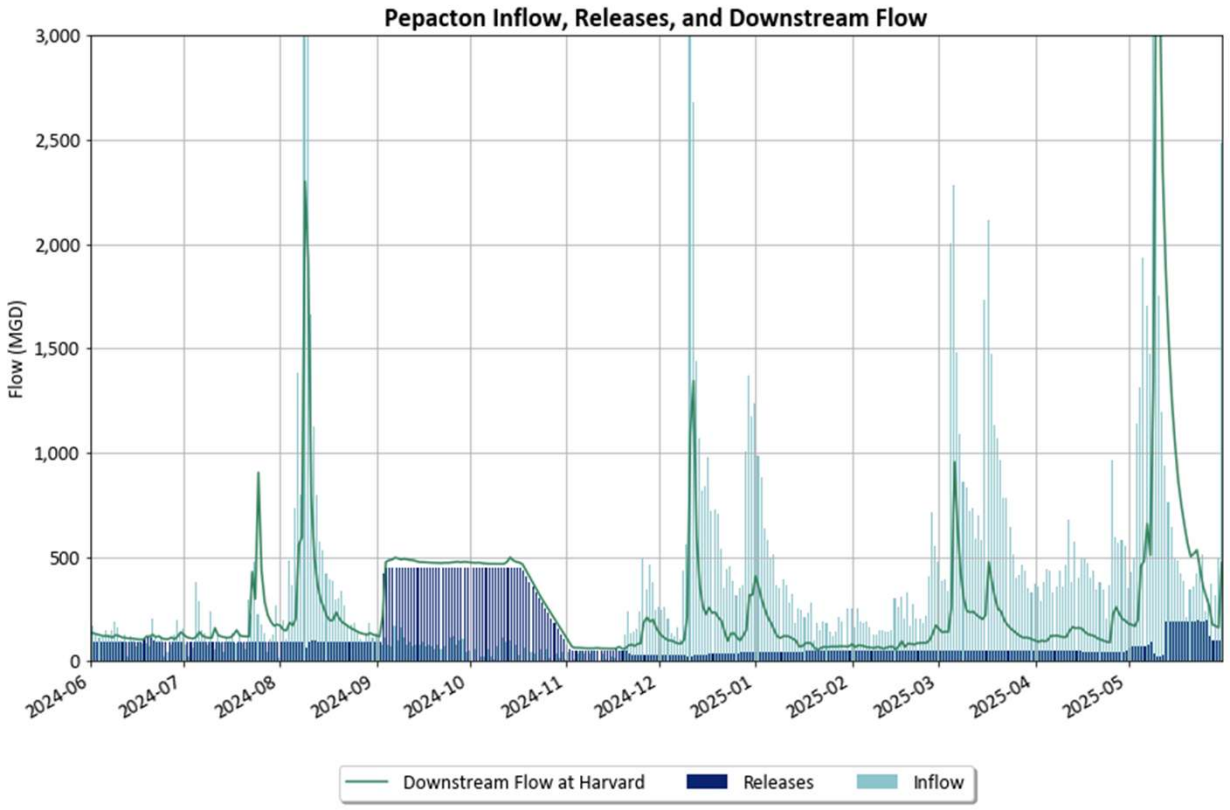
Pepacton: Inflow, Releases and Downstream Flow



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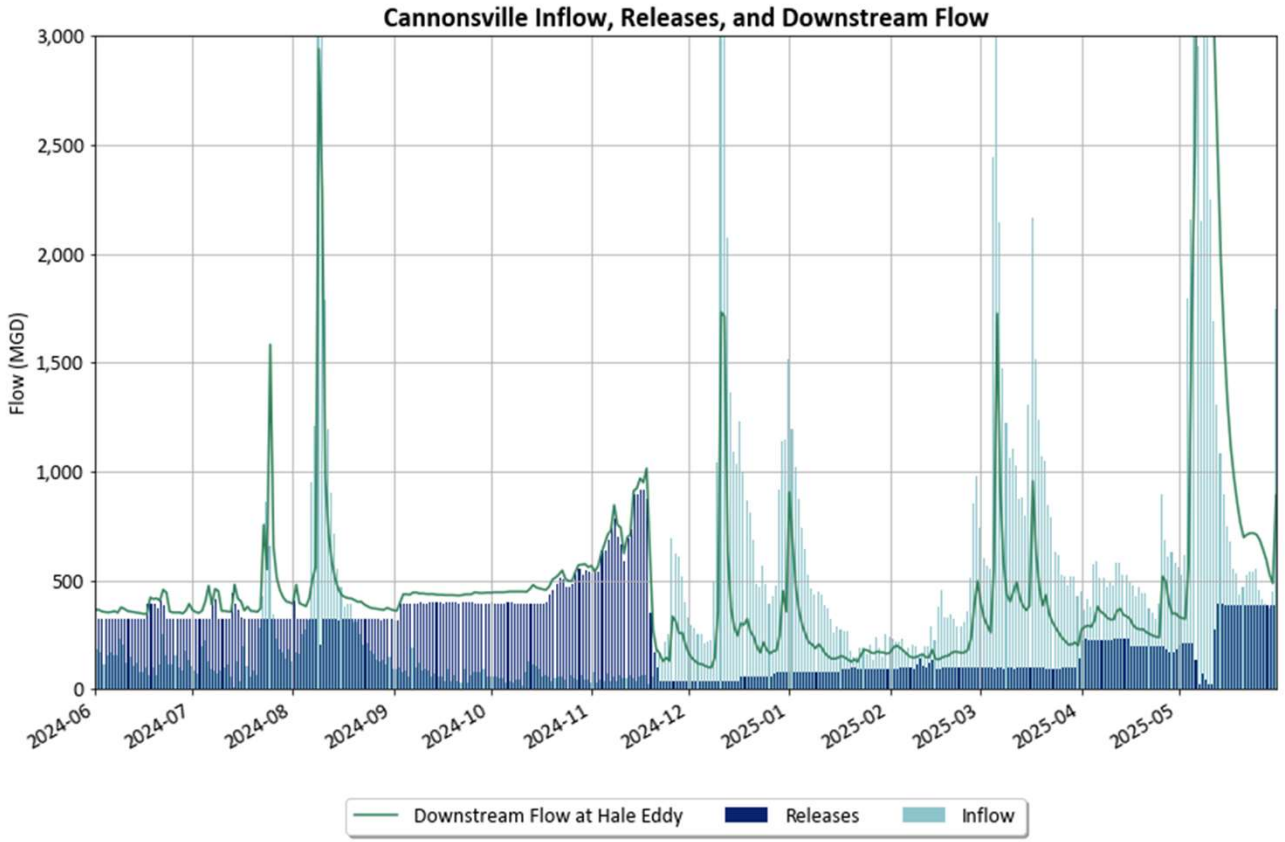
Cannonsville: Inflow, Releases and Downstream Flow



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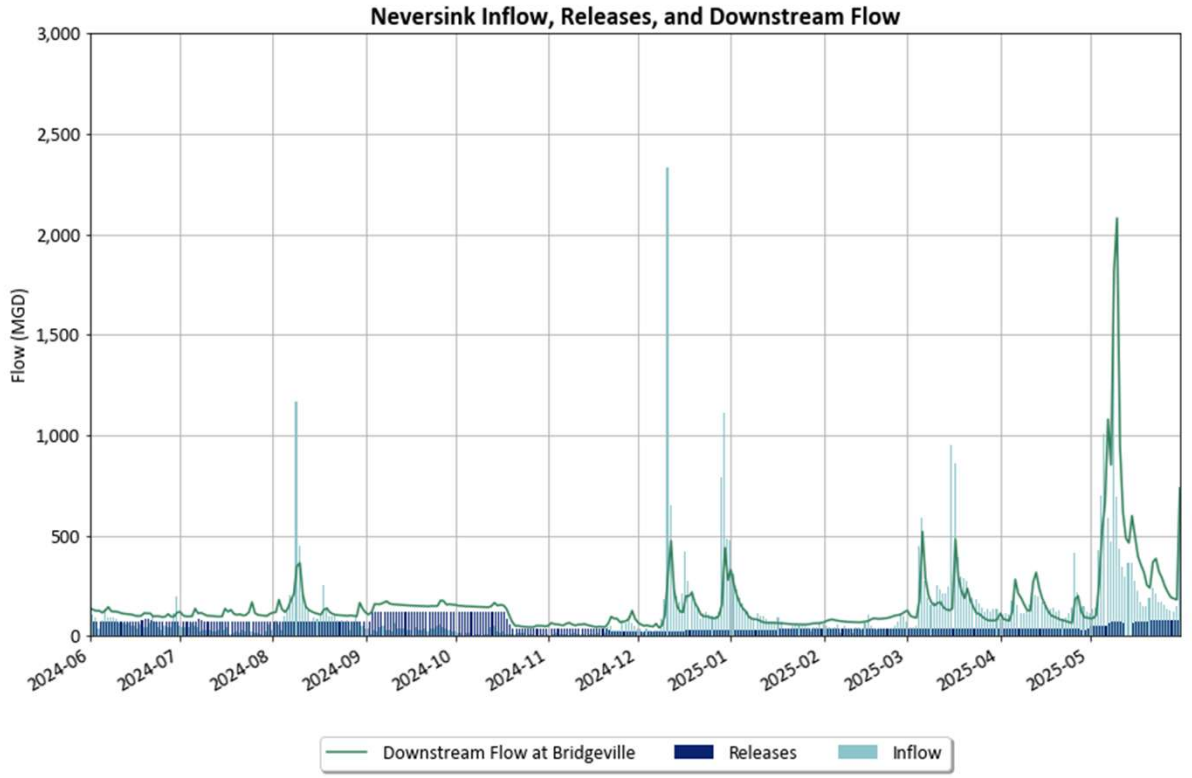
Neversink: Inflow, Releases and Downstream Flow



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FFMP Bank Use

Available during normal only	Used	Size
Rapid Flow Change Mitigation Bank	219	of 1,000 cfs-days
Thermal Mitigation Bank	1,590	of 2,500 cfs-days
Trenton Equivalent Flow Objective Bank	2,900	of 9,423 cfs-days

Available during drought	Used	Size
NJ Diversion Amelioration Bank	0	of 2,545 cfs-days
NJ Diversion Offset Bank	0	of 2,300 cfs-days

Thermal Releases were made on 7 days for 1 event in June 2024, 7 days for 2 events in July 2024 and 2 days for 1 event in August 2024. A total of 1,590 cfs-days were used.

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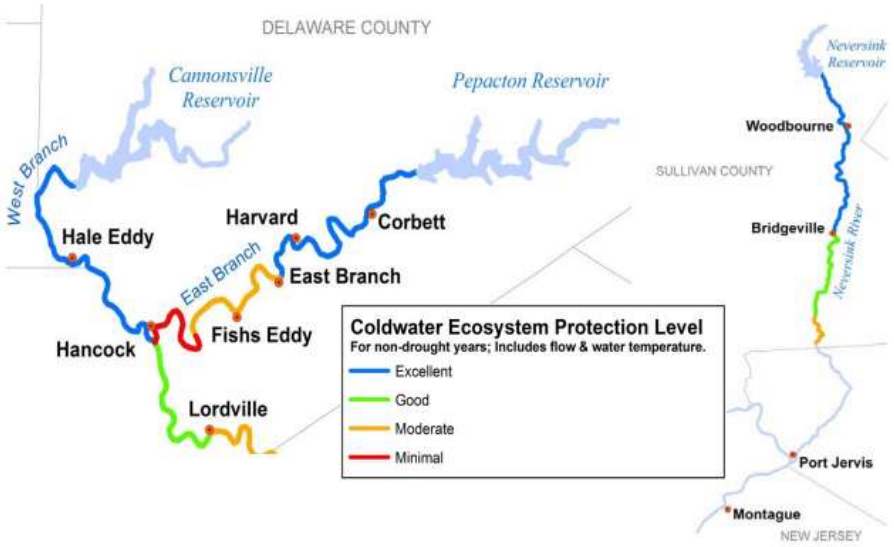
Habitat Protection
(Temperature)



- Goals for Excellent Habitat:
  - Summer Temperature typical less than 20 ^{0}C
  - Rare Exceedances of 24 ^{0}C

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Water Temperature

Location	Exceedances of 24 ^{0}C		Exceedances of 20 ^{0}C	
	Days Maximum Temperature above 24 ^{0}C	Days Average Temperature above 24 ^{0}C	Days Maximum Temperature above 20 ^{0}C	Days Average Temperature above 20 ^{0}C
Hale Eddy	0	0	0	0
Harvard	0	0	13	0
Hancock	0	0	1	0
Lordville	5	0	61	41
Bridgeville	1	0	48	5

Goals for Excellent Habitat: Summer Temperature typical less than 20 ^{0}C, Rare Exceedances of 24 ^{0}C

For June- Aug 2024, the Upper Basin air temperature was ranked the 7^h warmest and Lower Basin air temperature ranked 10th warmest

Thermal Releases were made on 7 days for 1 event in June 2024, 7 days for 2 events in July 2024 and 2 days for 1 event in August 2024. A total of 1,590 cfs-days were used.

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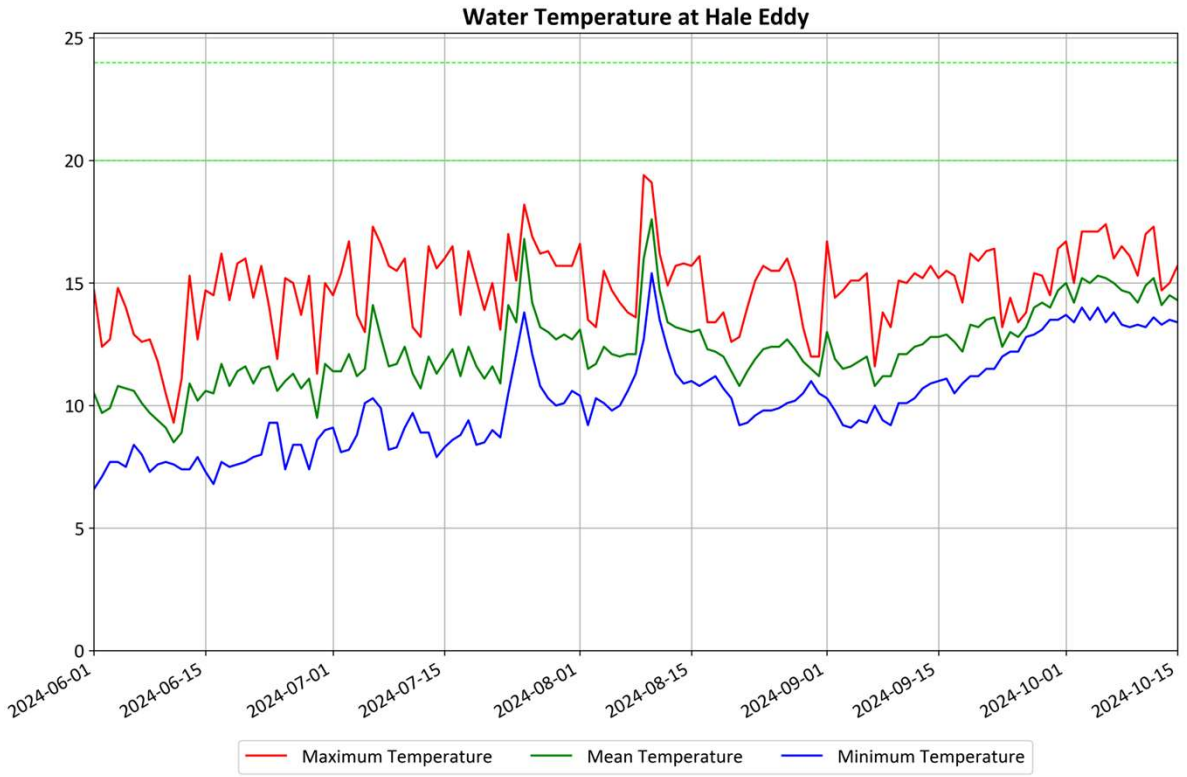
Water Temperature at Hale Eddy



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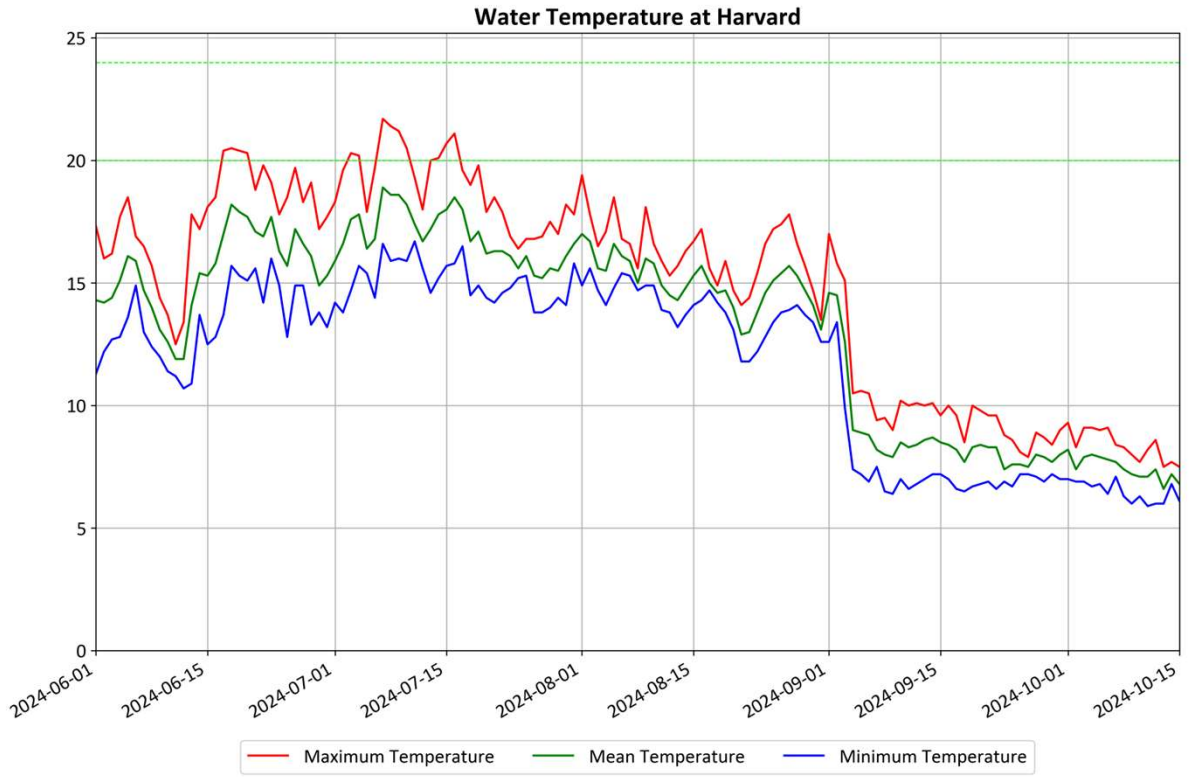
Water Temperature at Harvard



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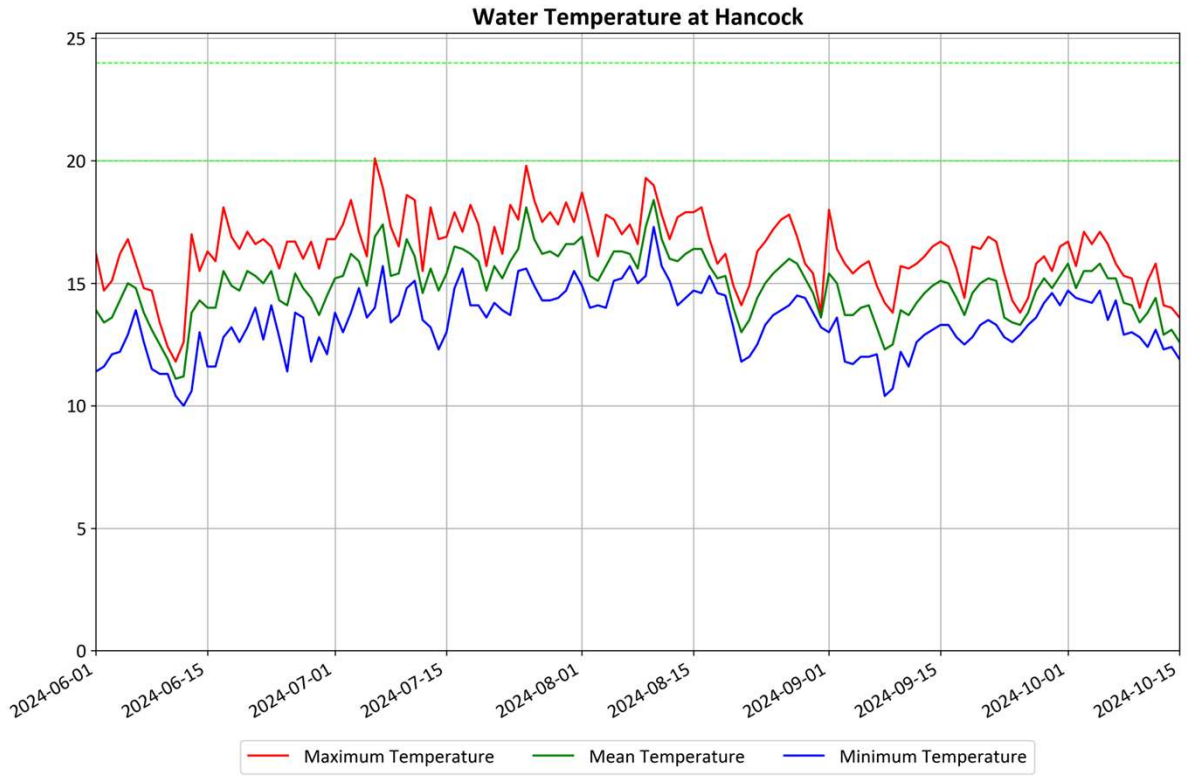
Water Temperature at Hancock



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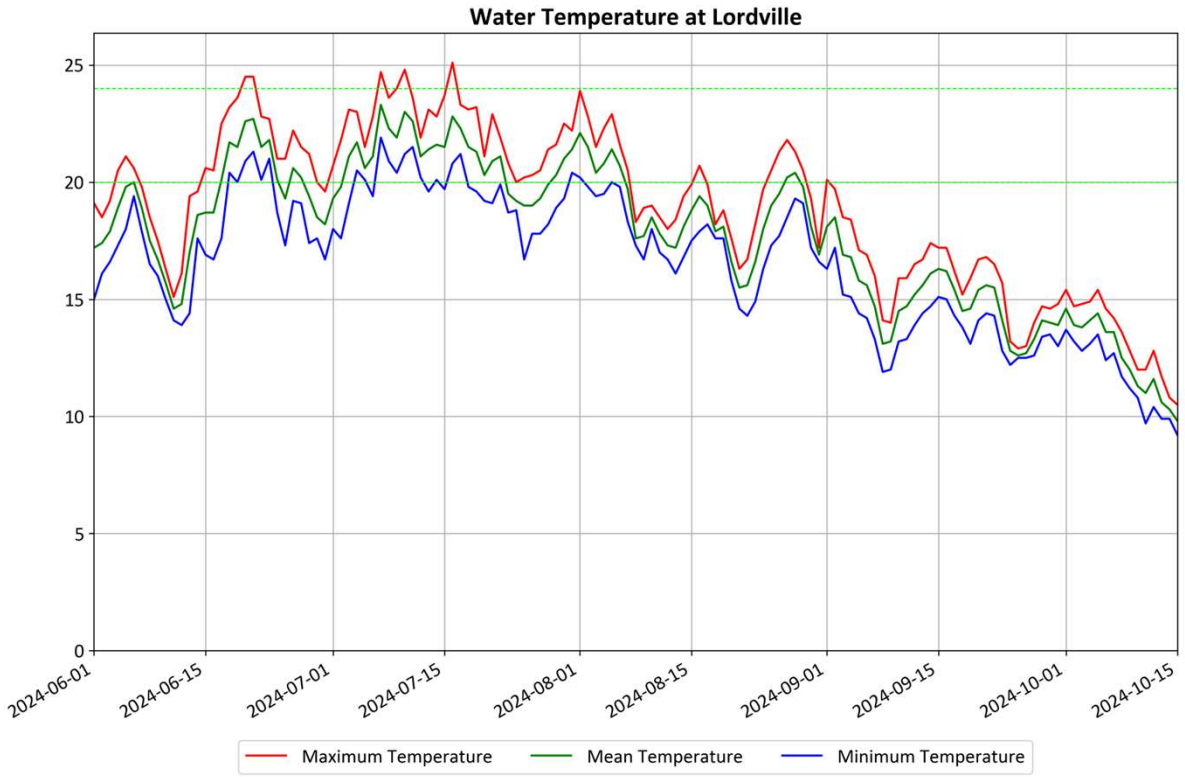
Water Temperature at Lordville



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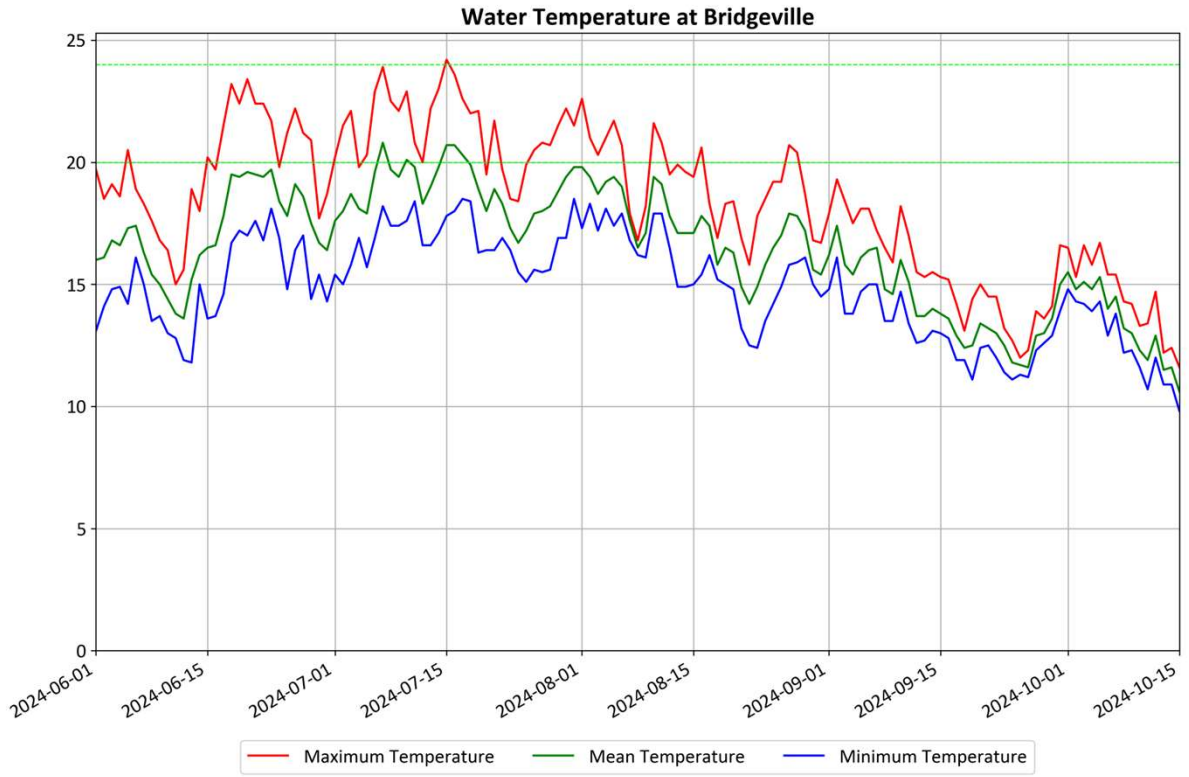
Water Temperature at Bridgeville



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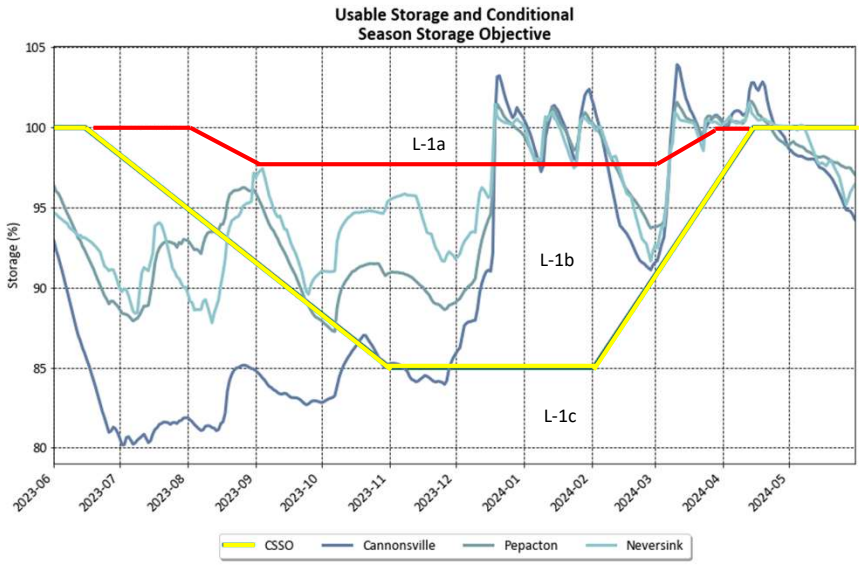
Discharge Spill Mitigation



	Spill Volume (MG)	Days
Cannonsville	6,272	17
Pepacton	3,062	15
Neversink	1,397	21

	All L1 Discharge Mitigation Releases (MG)*	Number of days Above the CSSO
Cannonsville	6,272	17
Pepacton	3,062	15
Neversink	1,397	21

*The CSSO is the yellow line, per FFMP Figure 2.

- Locations below the reservoirs can reach NWS Action Flood Stage in the absence of, or prior to, significant spills.
- Hale Eddy gage was above action stage for 2 non-sequential days.
- Harvard gage was above action stage for 7 non-sequential days.

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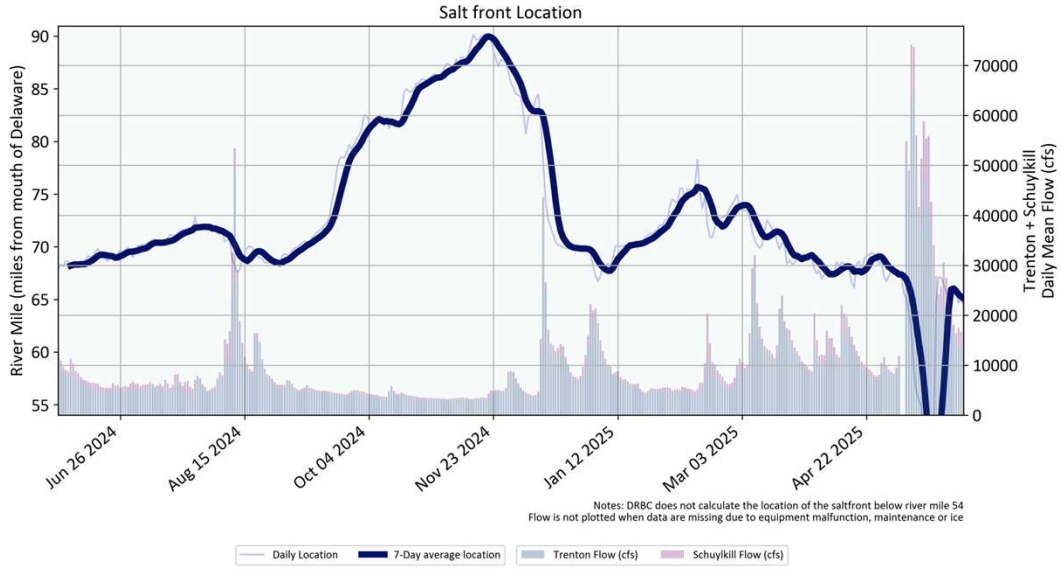
Salinity Management (DRB Water Code)



- DRBC is responsible for making releases to manage the salt front
- The Montague Flow Objective is based on the location of the salt front **only during a drought emergency**.
- No drought emergency occurred during this FFMP release year.

Delaware River Basin Water Code: The Delaware River Basin Commission directs reservoir releases from Basin Reservoirs to meet the Trenton Flow Objective under normal and drought conditions.

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Summary

- Normal operations were in effect for the release year.
- Montague and Trenton flow objectives were met within operational constraints (weather forecasts, power generation)
- Conservation releases were mixed. 80% Table 4G, 9% Table 4E, 5% Table 4A, 3% for Table 4F and 3% Table 4C.
- Thermal Releases were made for 16 days in summer 2024.
- Discharge mitigation releases (L1-a, L1-b, L1c) were required at all three reservoirs due to the above average rainfall and inflow.

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Methodology

- **Flow Objectives**: Amount of water released for flow objectives is calculated by summing the NYC WSCC spreadsheet directed release column for each reservoir. FFMP Bank releases (e.g., thermal releases) are excluded from the releases for Montague.
- **Diversions:**
  - NJ Diversion is calculated using the daily discharge observations from the USGS Port Mercer gage, 01460440. The averages are of the daily discharge for each month and the average of the daily discharge for the entire year (release year 6/1-5/31).
  - NYC diversion is determined from the WSCC data spreadsheet (column E, daily total). The averages are of the daily discharge for each month and the average of the daily discharge for the entire year (release year 6/1-5/31).
- **Conservation release volume:** the sum of the conservation released based on the zone (L1, L1-a, L1-b, L1-c, L2) and FFMP Table (4E, 4F, 4G). It should be noted that more water may have been released for Montague. For example, if no releases were required for Montague, this is the amount of water that would have been released with minor differences related to transitions among tables and zones. REV1 amounts refer to the first revision of D-77-20 CP and are the total amount over the release year that would have been released based on this release program.
- **Bank Use:** was obtained from the accumulated Daily River Master Data, dated June 1, 2024.
- **Discharge Mitigation Releases (CSSO)** – volume of water released when a reservoir is in L1. Number of days above CSSO: days when reservoir is in L1-a or L1-b.

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