

# Delaware River Basin Commission

## FFMP Implementation Performance

Release Year 2018

June 1, 2018 – May 31, 2019

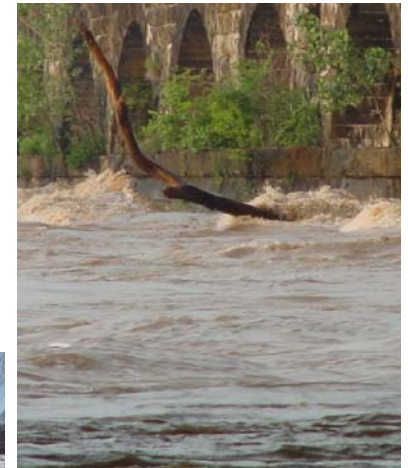
**Anthony Preucil**

Water Resource Scientist

**Amy L. Shallcross, PE**

Manager, Water Resource Operations

September 2019



# NOTE

## All Data are Provisional!

Final/approved data are available from:

NYC Department of Environmental Protection (NYCDEP)

Office of the Delaware River Master (ODRM)

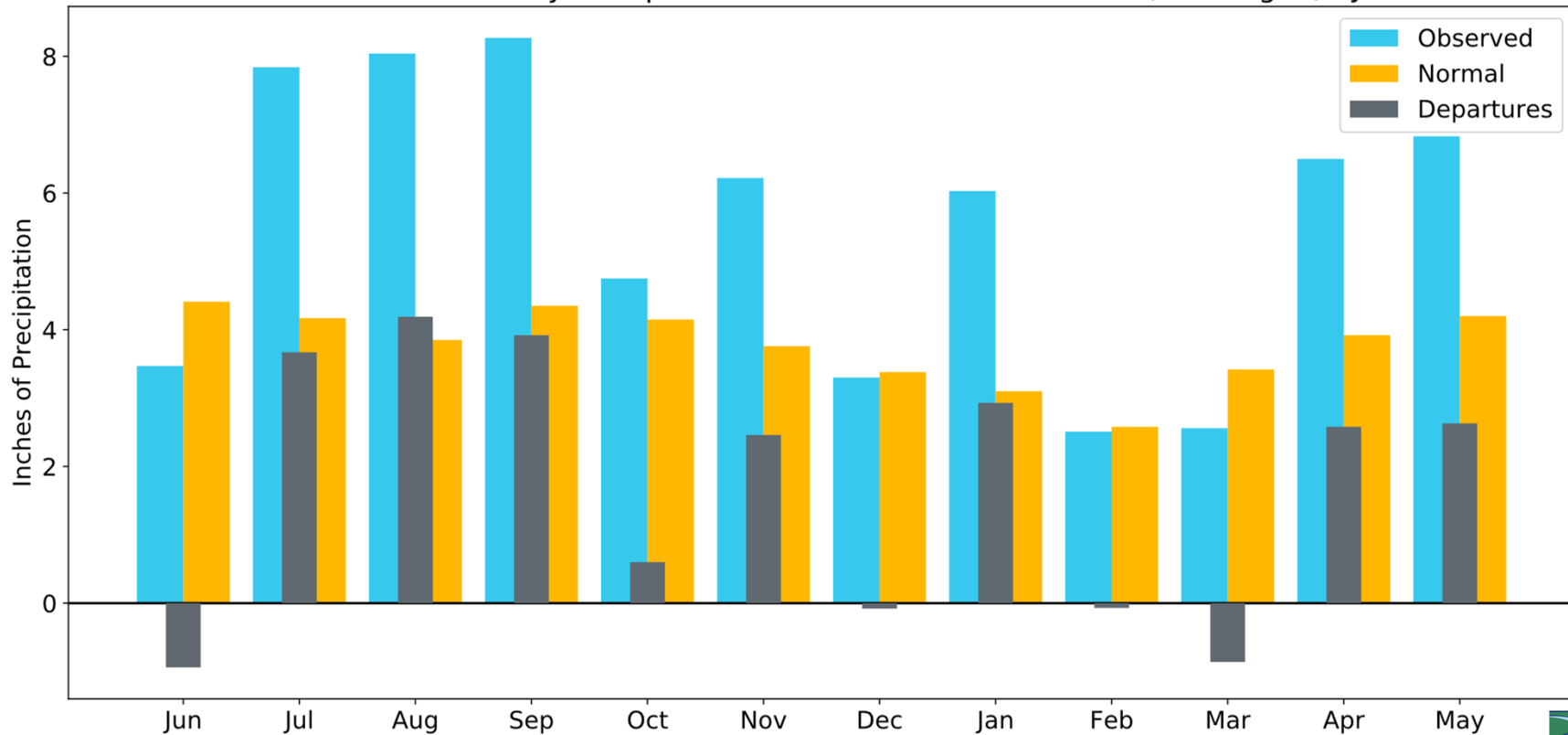
United States Geological Survey (USGS)

# 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)

# Precipitation -- Montague

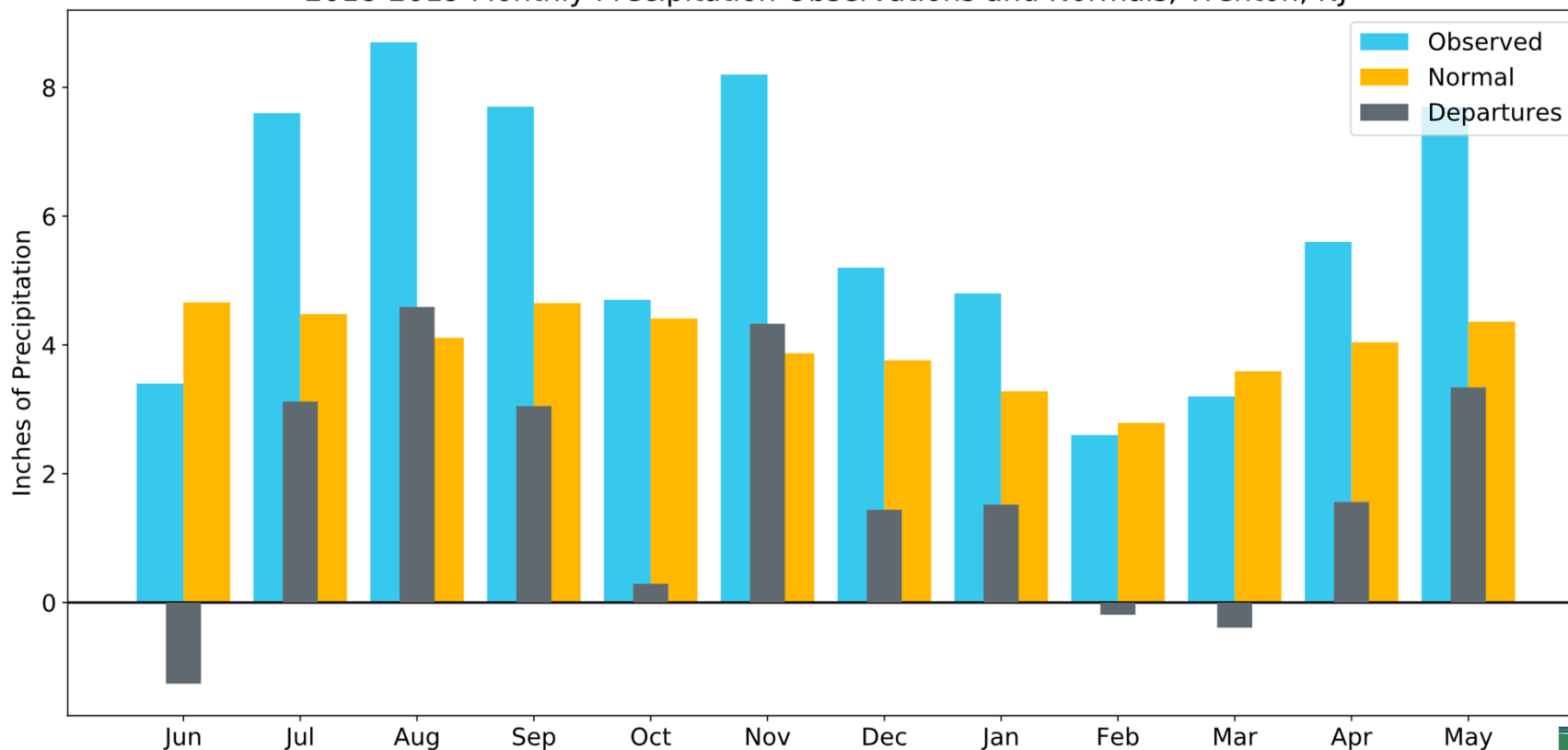
2018-2019 Monthly Precipitation Observations and Normals, Montague, NJ



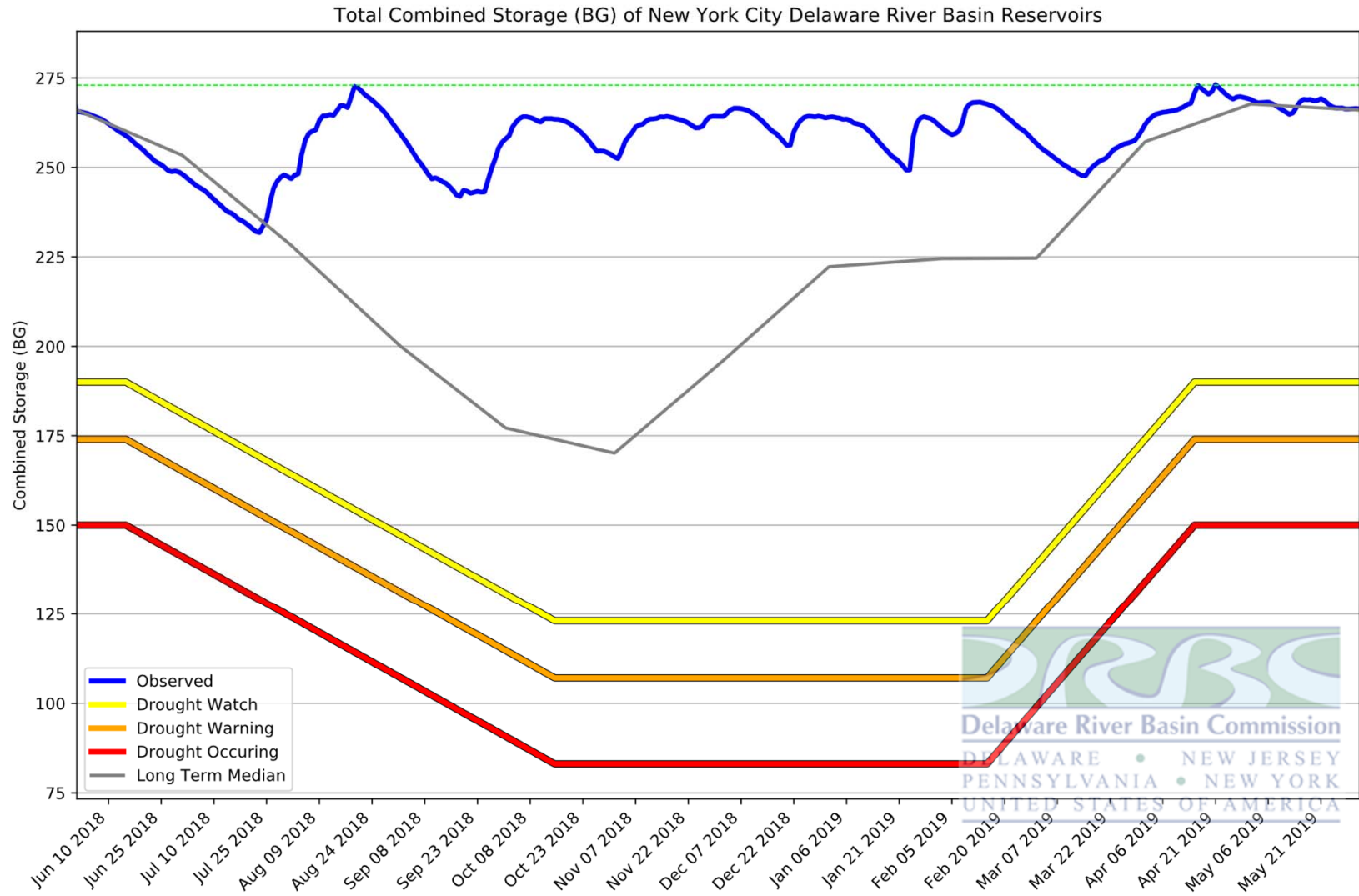
\* Data sources: Office of the Delaware River Master, Middle Atlantic River Forecast Center

# Precipitation - Trenton

2018-2019 Monthly Precipitation Observations and Normals, Trenton, NJ



\* Data source: Middle Atlantic River Forecast Center



\* Data source: New York City Department of Environmental Protection

# Flow Objectives

## Water Released from NYC Reservoirs to meet Montague Flow Objective (MG)

Montague	Trenton
3945	0

## Water Released From Lower Basin Reservoirs to Meet Trenton Flow Objective (MG)

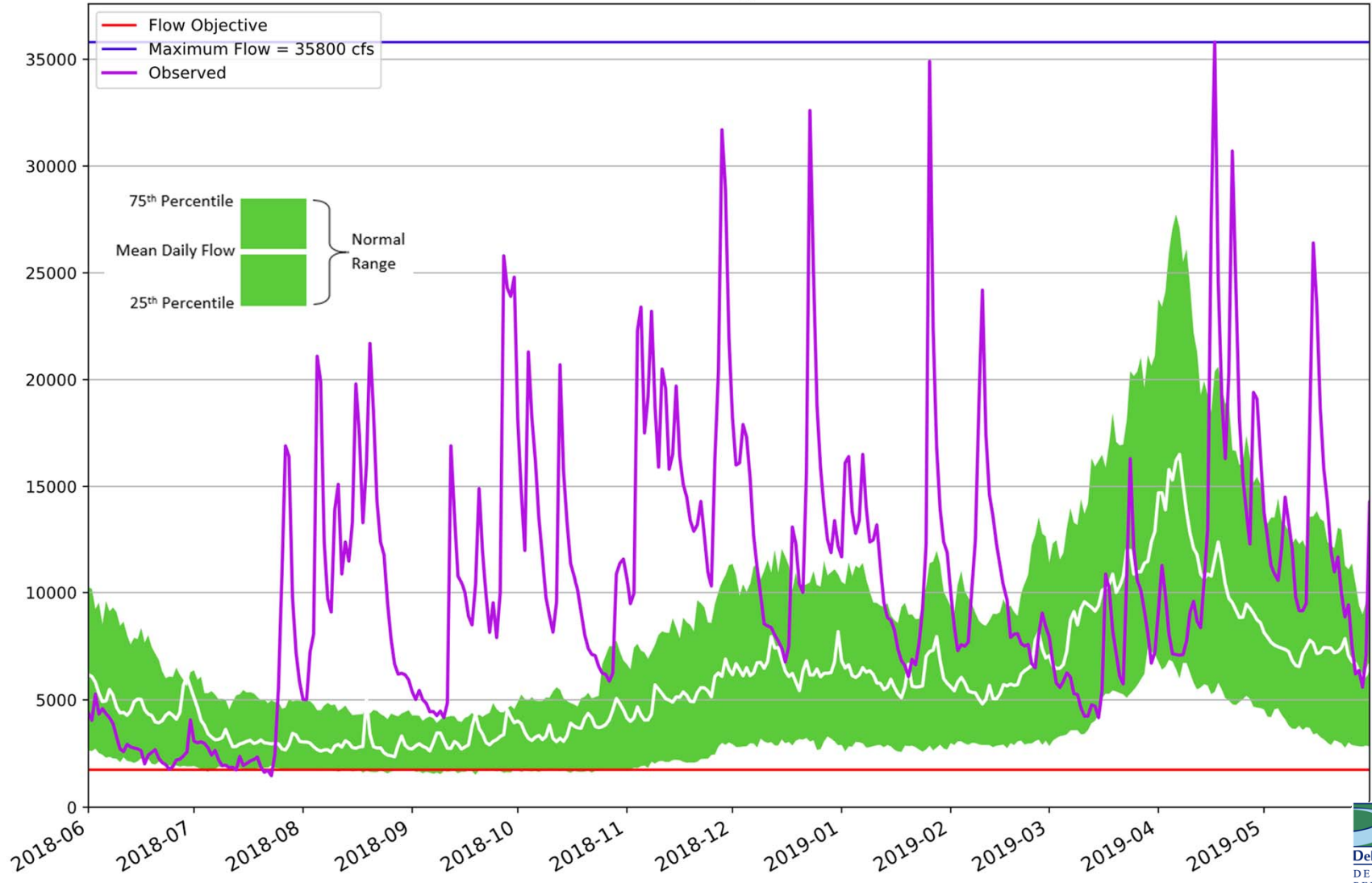
Beltzville	Blue Marsh
0	0

Due to the high flows, there was little water required to meet the Montague flow Objective. Additional releases were made for Thermal Mitigation.

No water was released from the lower basin reservoirs to meet the Trenton Effective Flow Objective.

\*Data sources: DRBC, NYC, ODRM

# Montague

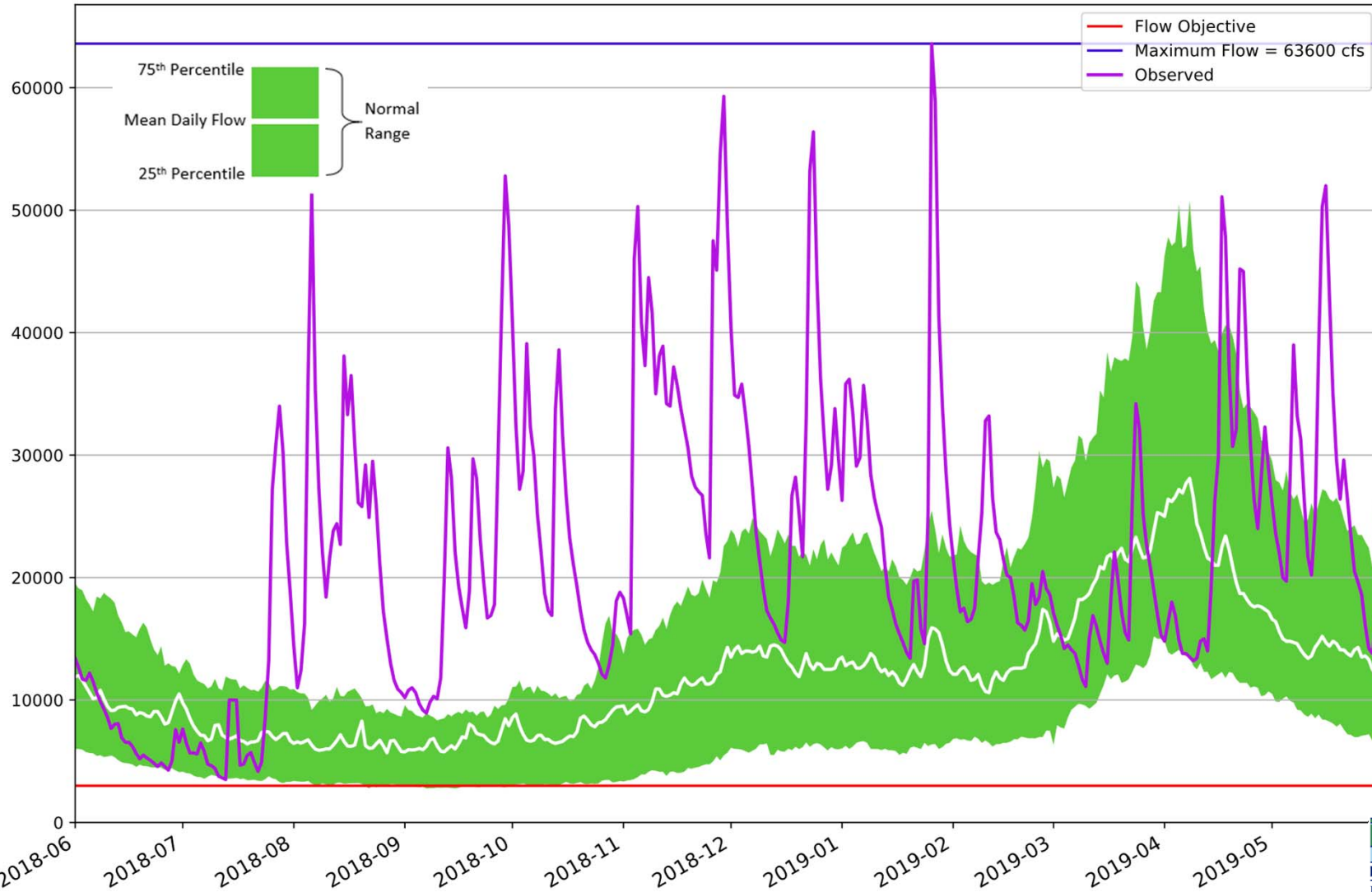


\*Data source: USGS





# Trenton



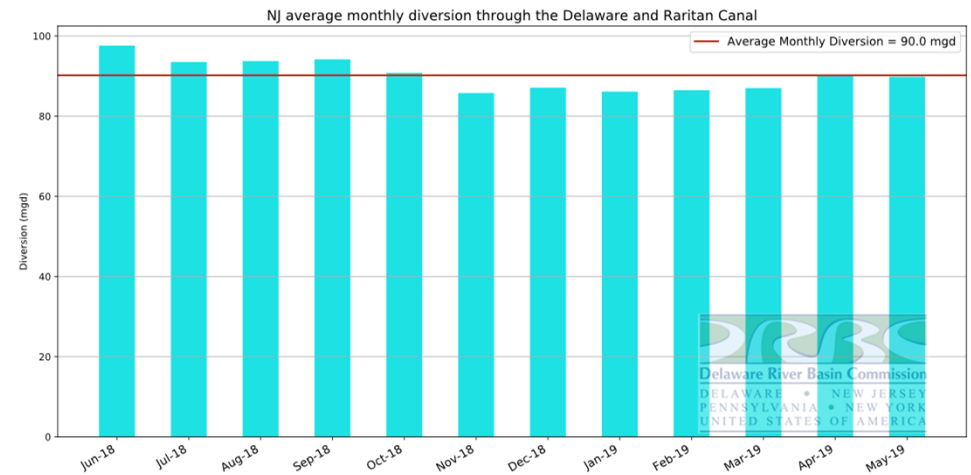
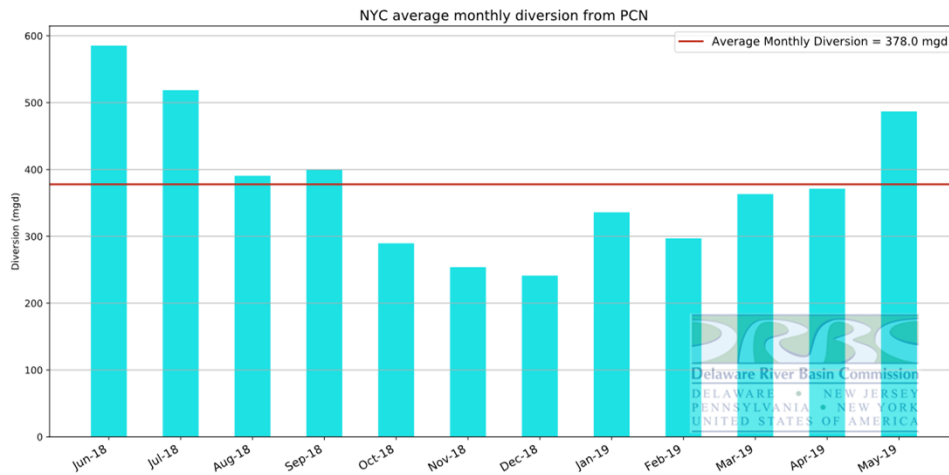
\*Data source: USGS

# Diversions

## Monthly Average Daily Diversion (June 1, 2018 - May 31, 2018)

**New York**  
378.0 mgd

**New Jersey**  
90.0 mgd



\*Data sources: USGS, NYDEP

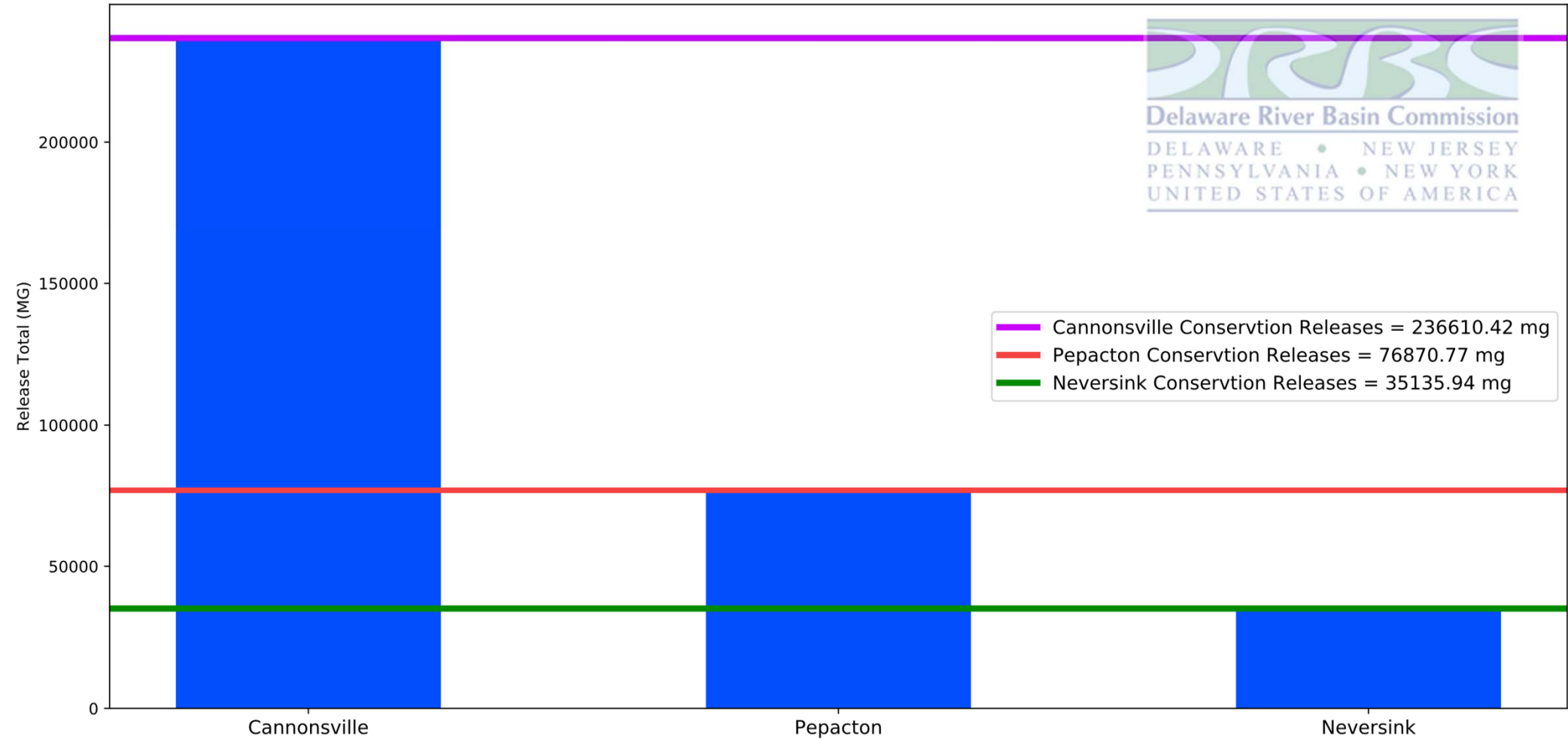
# Conservation Releases

<b>Volume of Conservation Releases (MG)</b>			
	<b>FFMP 2017 Tables</b> Based on Storage (6/1/18 - 5/31/19)	<b>REV1</b>	<b>Multiple of Revision 1</b>
<b>Cannonsville</b>	236,610	20,665	11.4
<b>Pepacton</b>	76,871	14,562	5.2
<b>Neversink</b>	35,136	8,664	4.1
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.			

Conservation Releases for NYC Delaware River Basin Reservoirs, FFMP 2017-2018



Cannonsville Conservation Releases = 236610.42 mg  
Pepacton Conservation Releases = 76870.77 mg  
Neversink Conservation Releases = 35135.94 mg

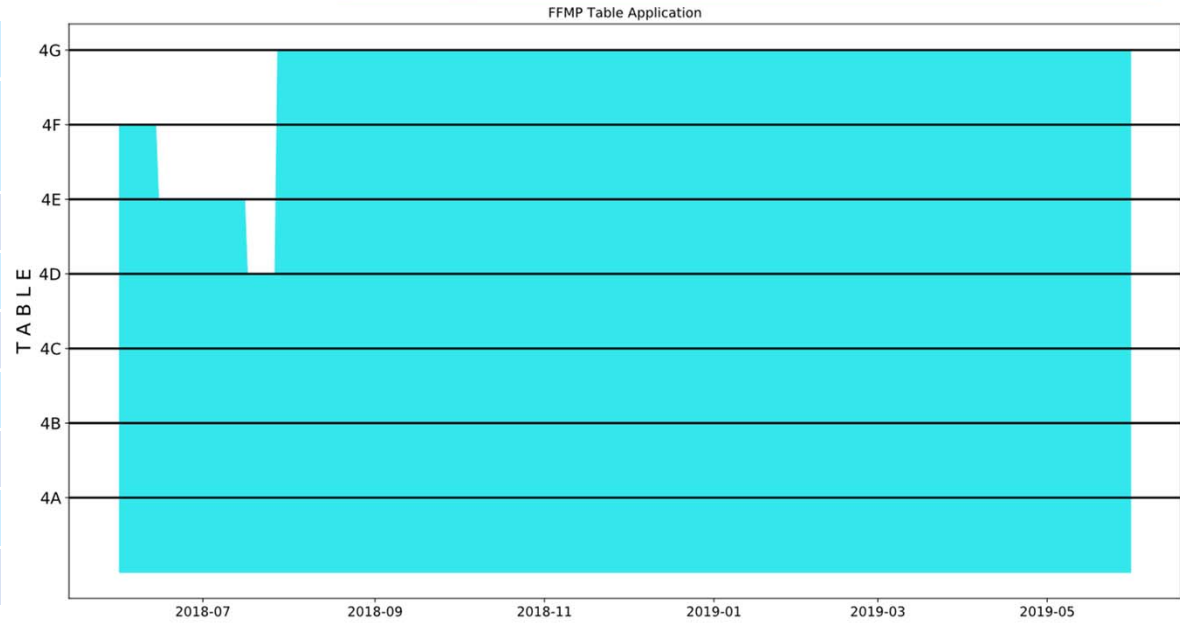


\*Data source: NYDEP

# Release Tables

## Release Tables

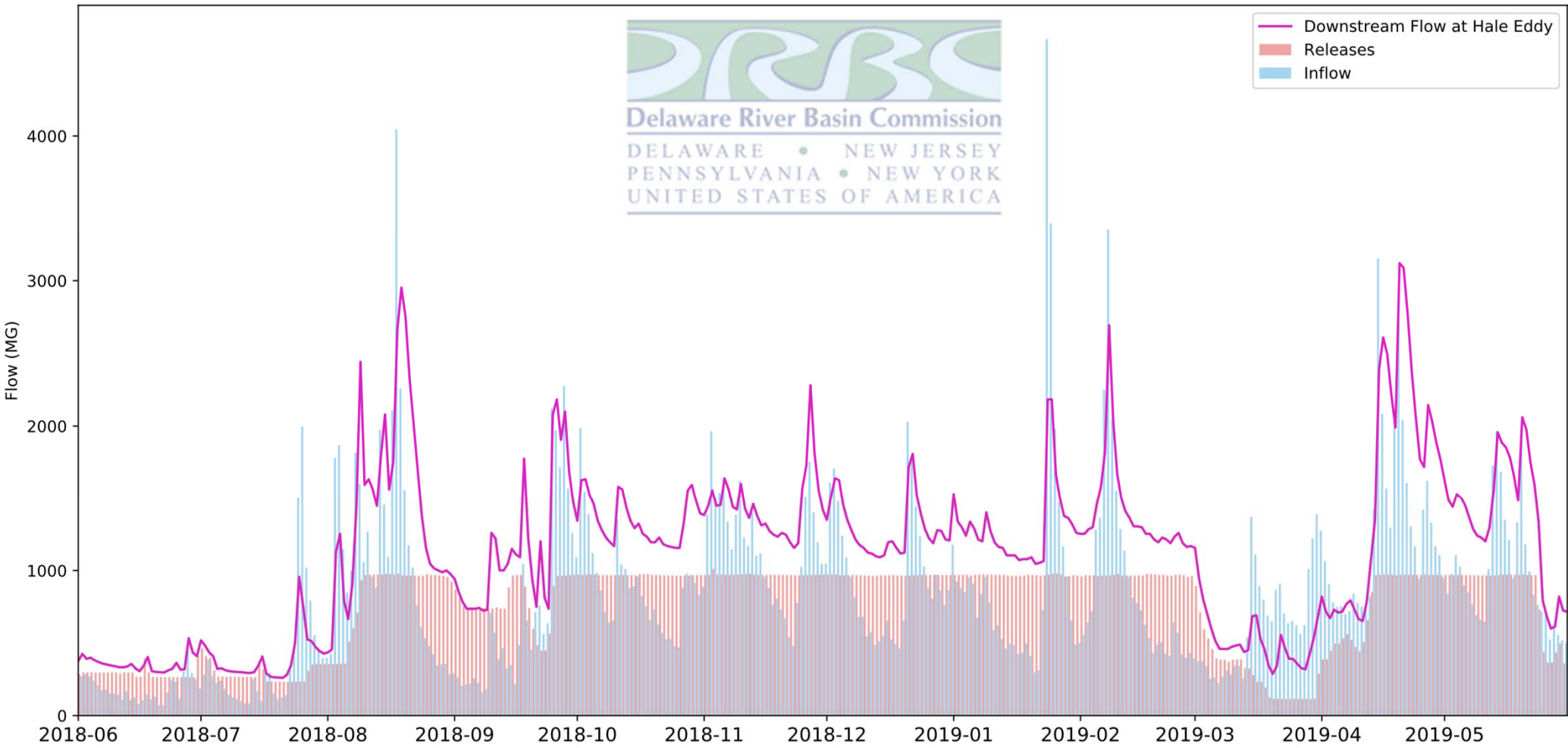
FFMP Table	Number of Days	Percent
G	308	84
F	14	4
E	32	9
D	11	3
C	0	0
B	0	0
A	0	0



Cannonsville Inflow, Releases, and Downstream Flow

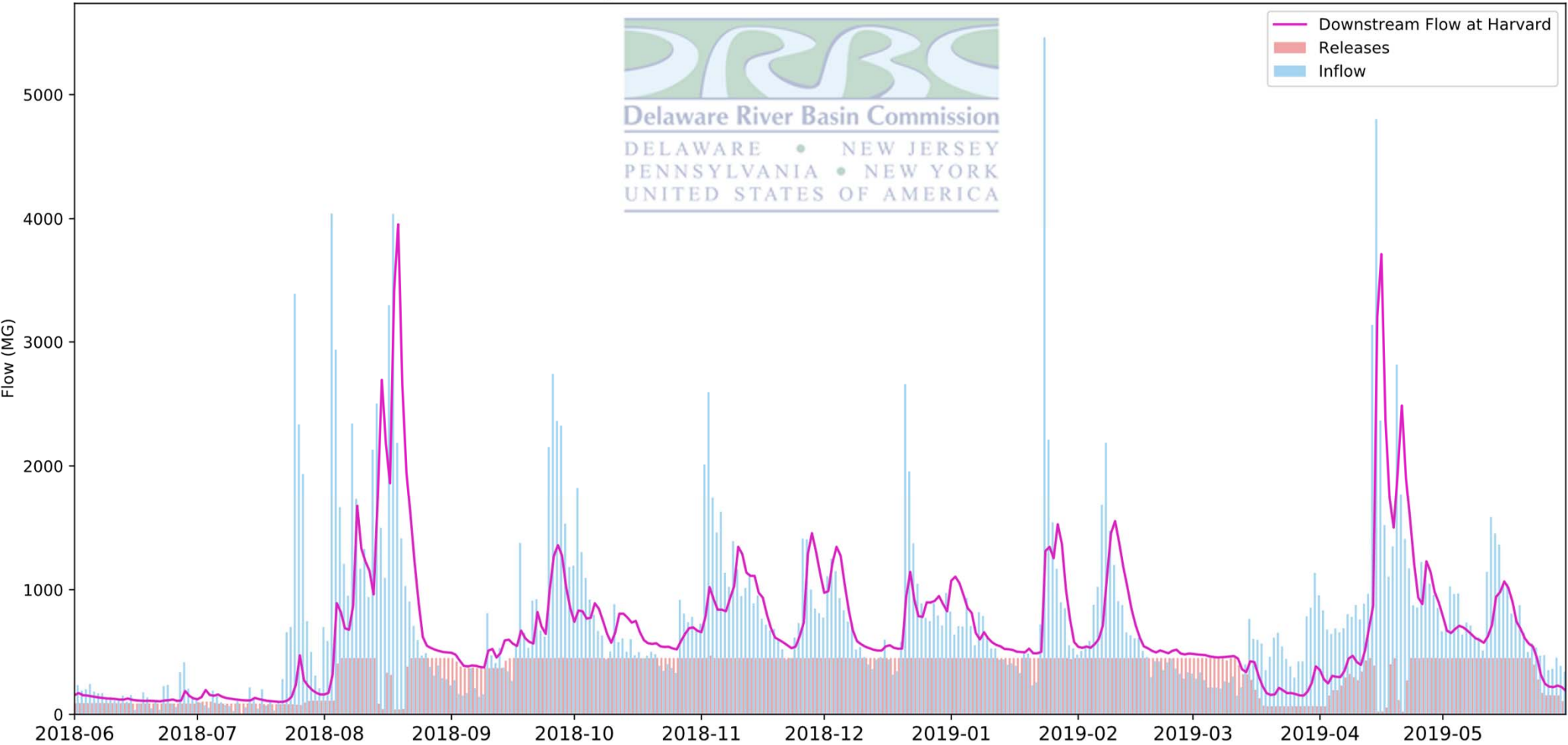


- Downstream Flow at Hale Eddy
- Releases
- Inflow



\*Data source: USGS

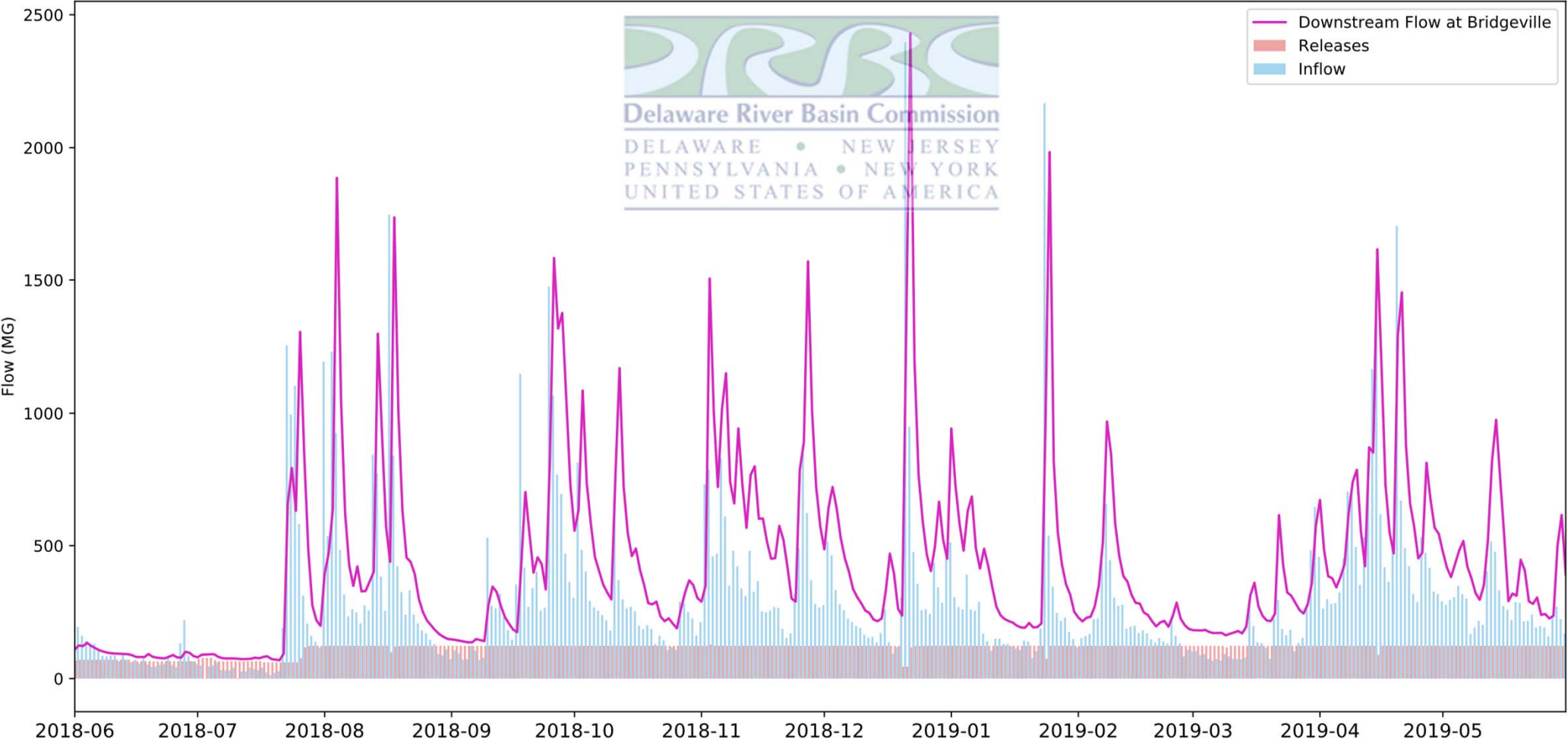
Pepacton Inflow, Releases, and Downstream Flow



- Downstream Flow at Harvard
- Releases
- Inflow

\*Data source: USGS

### Neversink Inflow, Releases, and Downstream Flow

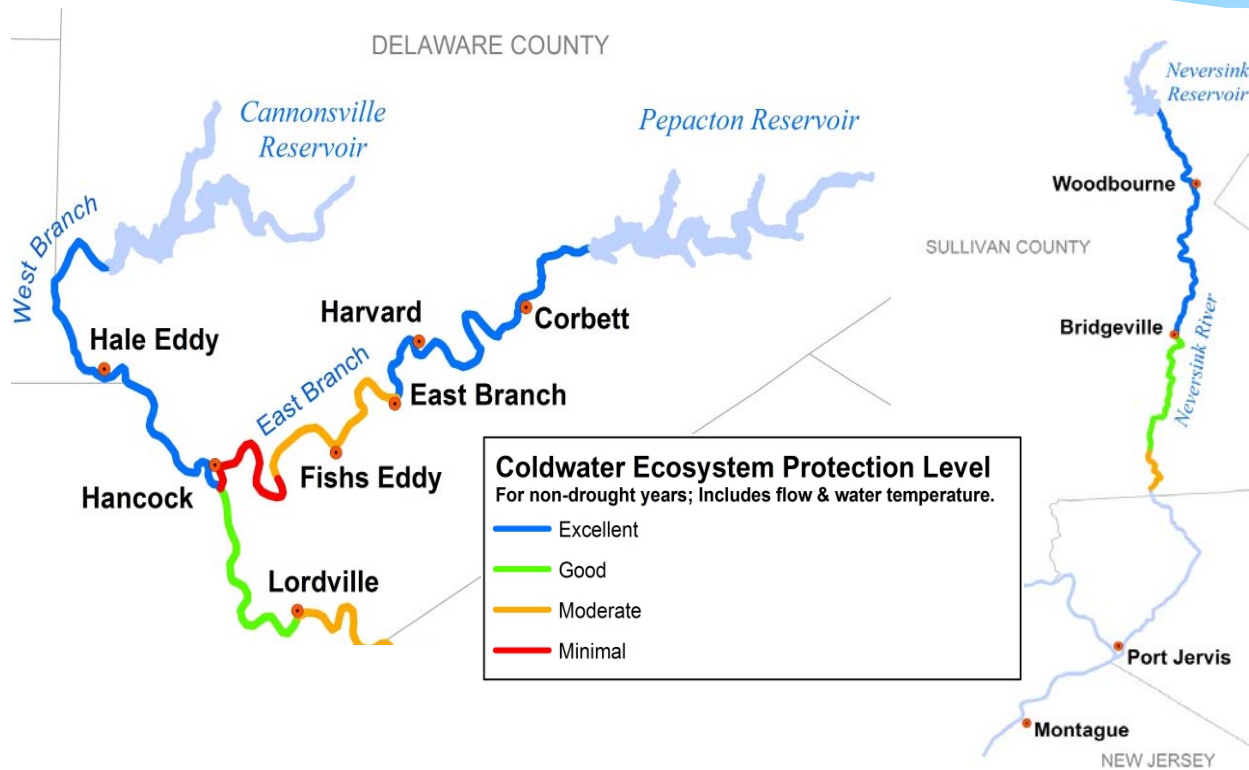


- Downstream Flow at Bridgeville
- Releases
- Inflow

\*Data source: USGS



# Habitat Protection (Temperature)



## Goals for Excellent Habitat:

- \* Summer temperatures typically less than 20 °C
- \* Rare Exceedances of >24 °C

# Temperature



## GOALS for Excellent Habitat:

Summer temperatures typically less than 20C

Rare exceedances of > 24C

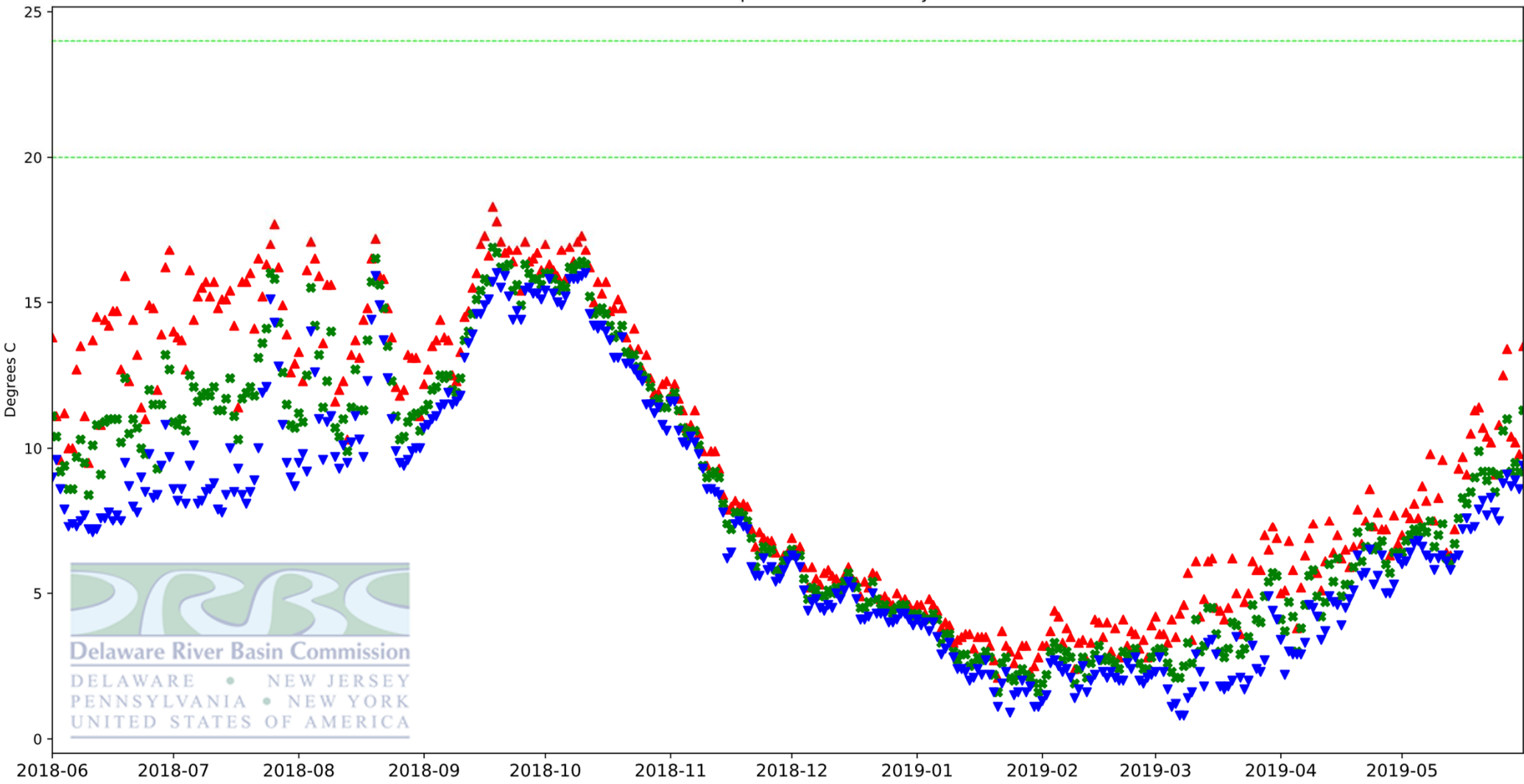
Locations	Exceedances of 24C		Exceedances of 20C	
	Days the Maximum Temperature was above 24C	Days the Average Temperature was above 24C	Days the Maximum Temperature was above 20C	Days the Average Temperature was above 20C
Hale Eddy	0	0	0	0
Harvard	0	0	27	6
Hancock	0	0	4	0
Lordville	5	0	43	31
Bridgeville	0	0	55	22

Thermal mitigations releases were made on 11 days and 1.06 BG (1,642 cfs-days) of the bank were used.



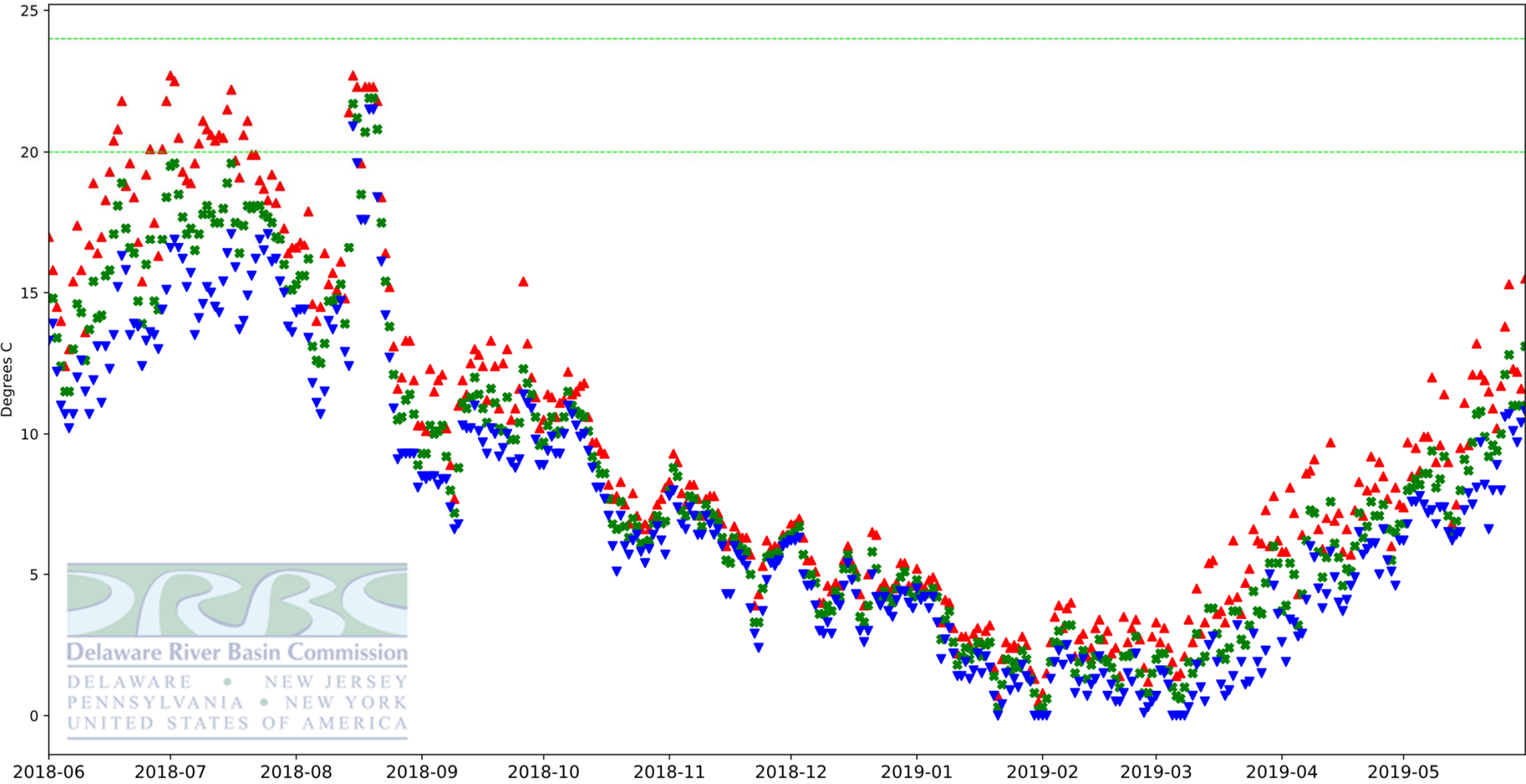
\*Data source: USGS

# Water Temperature at Hale Eddy



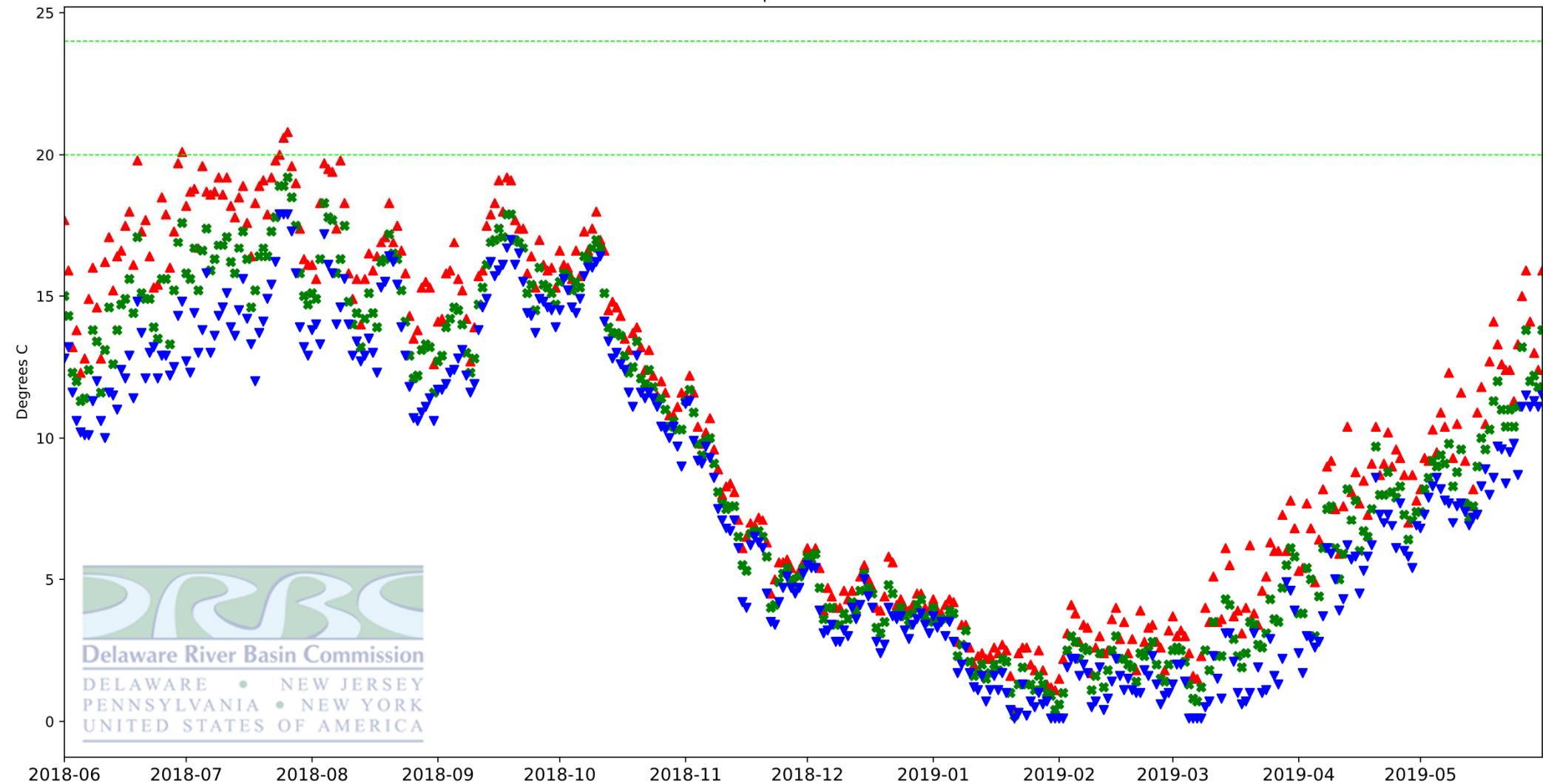
\*Data source: USGS

# Water Temperature at Harvard



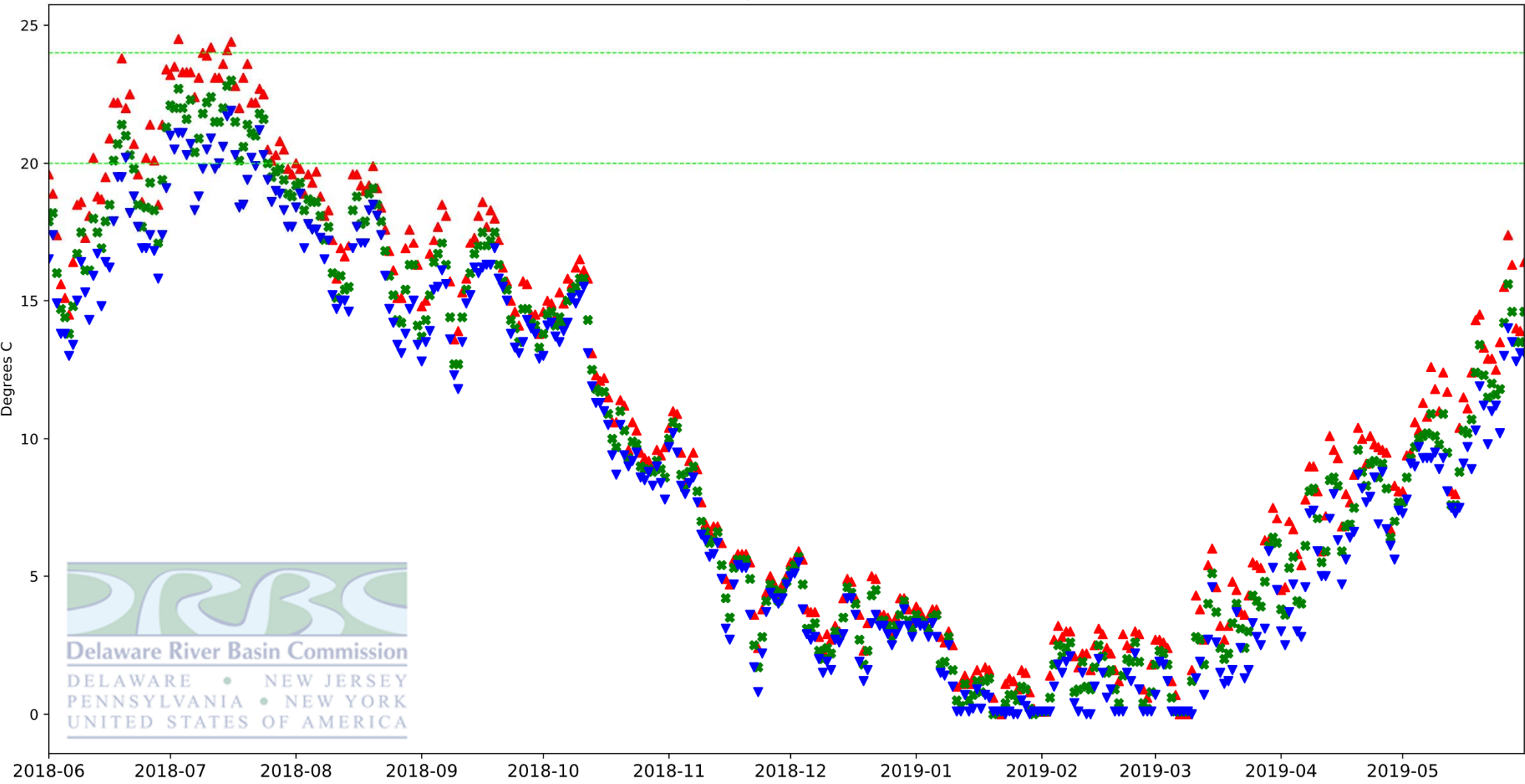
\*Data source: USGS

# Water Temperature at Hancock



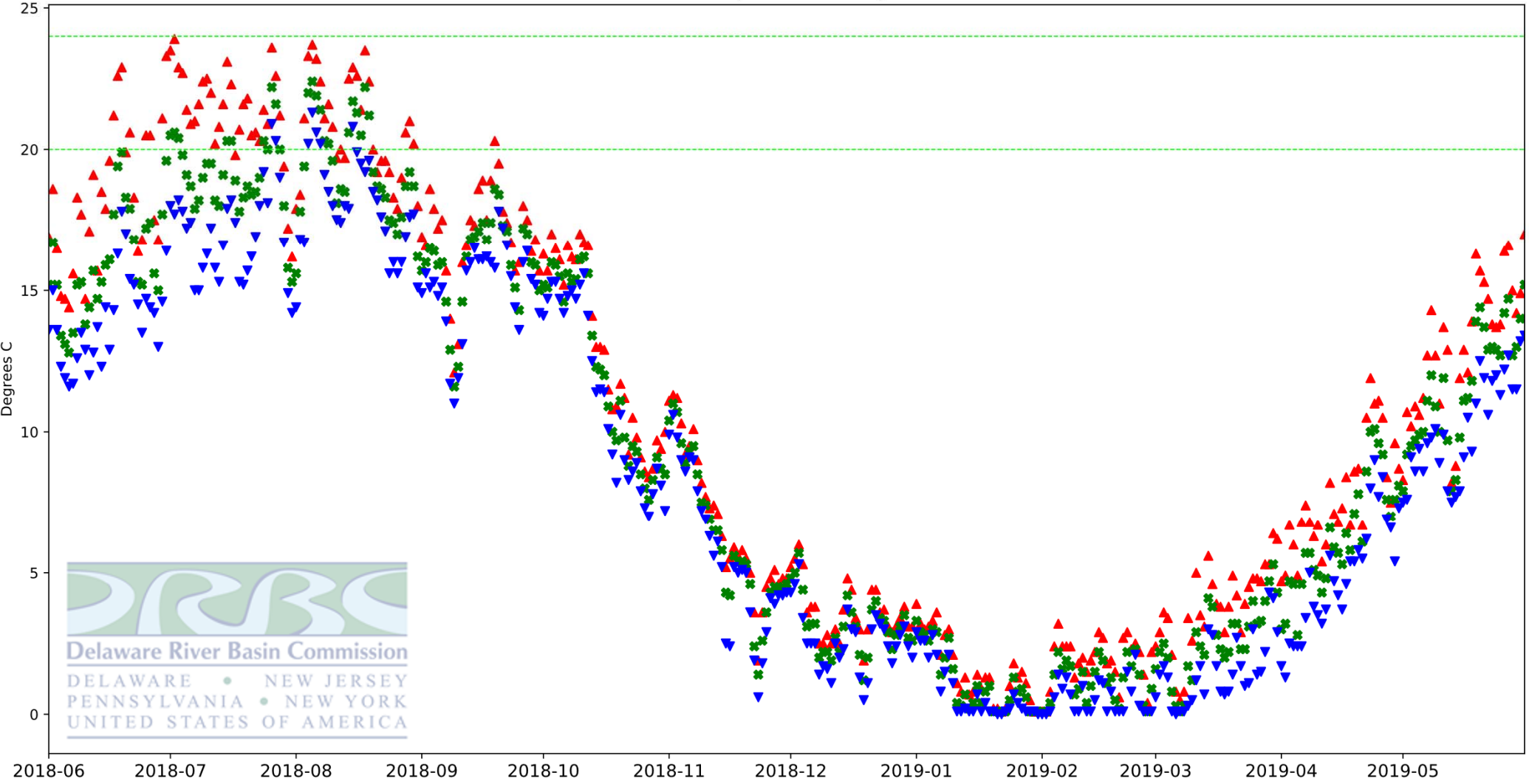
\*Data source: USGS

Water Temperature at Lordville



\*Data source: USGS

# Water Temperature at Bridgeville



\*Data source: USGS

# Temperature Rankings

## May-August

### 2018 – Last Release Season

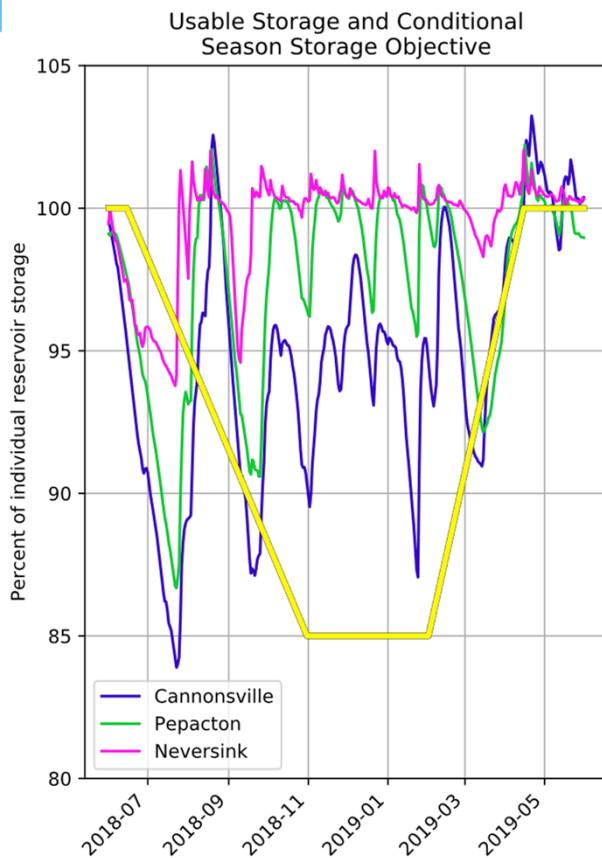
PERIOD	VALUE	1901-2000 MEAN	ANOMALY	RANK (1895-2019)	WARMEST/COOLEST SINCE	RECORD
May-Aug 2018 4-Month	66.2°F (19.0°C)	63.0°F (17.2°C)	3.2°F (1.8°C)	124th Coolest	Coolest since: 2017	1927
				2nd Warmest	Warmest since: 2012	1955
<i>Ties: 1949, 2012</i>						

### 2019 – This Release Season

May-Aug 2019 4-Month	71.4°F (21.9°C)	68.3°F (20.2°C)	3.1°F (1.7°C)	119th Coolest	Coolest since: 2017	1907, 1927
				7th Warmest	Warmest since: 2018	2010



# Discharge/Spill Mitigation



	<b>Spill Volume (MG)</b>	<b>Days</b>
Cannonsville	17,187	51
Pepacton	50,551	119
Neversink	61,615	251

	<b>L1 Discharge Mitigation Releases (MG)</b>	<b>Number of Days Above Conditional Seasonal Storage Objective</b>
Cannonsville	243,695	259
Pepacton	115,076	262
Neversink	35,648	312

Total releases from the reservoirs when in L1

\*Data source: NYDEP

# Summary

- \* Little water was needed from the NYC reservoirs to meet the Montague Flow Objective due to wet conditions and above average flows.
- \* No water was required to meet the Trenton Effective Flow Objective.
- \* For 84 percent of the year, the conservation releases were based on Table 4G.
- \* The maximum water temperature did not exceed 24 degrees C, except for 5 days at Lordville.
- \* The maximum temperature exceeded 20C at all locations except Hale Eddy (Harvard 4, Hancock 27, Lordville 43, Bridgeville 55)
- \* For much of the year, all three NYC reservoirs were above the CSSO with exceptions occurring in June through August during a drier period.

FFMP June 2018 – May 2019

# Presentation Available On DRBC's Website

[http://www.nj.gov/drbc/programs/flow/FFMP\\_PerformanceRpts.html](http://www.nj.gov/drbc/programs/flow/FFMP_PerformanceRpts.html)