

## **October 2019**

### **Summary of Precipitation Departures and Other Hydrologic Indicators in the Delaware River Basin**

Below is a summary of precipitation departures and other hydrologic indicators for the Delaware River Basin (DRB).

October was a month of recovery for the basin. After an abnormally dry September, the first half of October was a continuation of the same pattern. NYC reservoir combined storage decreased by over 1 BG per day, and the Climate Prediction Center's Drought Monitor had some of the basin reaching into severe drought levels. October 15 – 16, the basin had a cold front pass through the region which dropped 1-2 inches of rain total. This began the recovery of many of the stream flows as well as the reservoirs. The next big event arrived the following week, when two days of onshore flow followed by the remnants of Tropical Storm Olga contributed to another 1-3 inches of rain on average. The month was ended with a strong storm system that brought even a few tornadoes throughout the basin, and helped to boost up monthly precipitation totals by another 0.5 -1.5 inches.

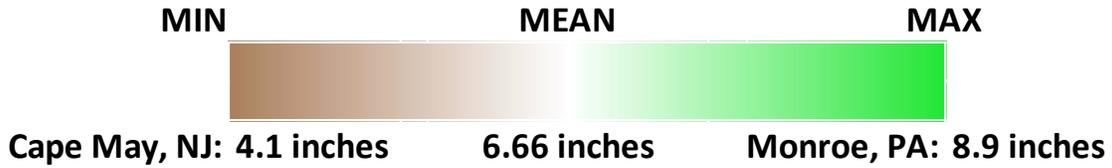
By the numbers, there were no counties that ended the month with below average precipitation, and some counties further north were close to 5 inches above normal for the month. 90-day departures are still recovering a bit, but are significantly improved from the 90-day period July – September when 86% of counties were below average. Currently, about 3 out of 5 counties are below average for 90-day departures, but the numbers are trending towards improvement. The 180-day departures have also improved, coming in with only 8% of the basin below average for precipitation.

The precipitation events can clearly be seen in the sudden increases on the reservoir storage plot, with the current levels now above the median storage level for this time of year. With the combined storage at 74%, 70 BG above drought watch levels, the risk of a drought has been quelled for now. The increased precipitation can also be seen in the improvement of ground water and surface water levels, coming in at normal or above normal for all stations in the Delaware River Basin.

The salt front continued to move steadily upstream through the first half of the month, and 7-day average location reached a maximum of river mile 84.6 (near the mouth of Crum Creek in Pennsylvania) before the rain and runoff began to push it back down. The Average location for October is river mile 72, which the salt front was above for the entire month until the very end. As we transition to November, the average location of the salt front goes down to river mile 70.

**Precipitation**  
**October 2019**

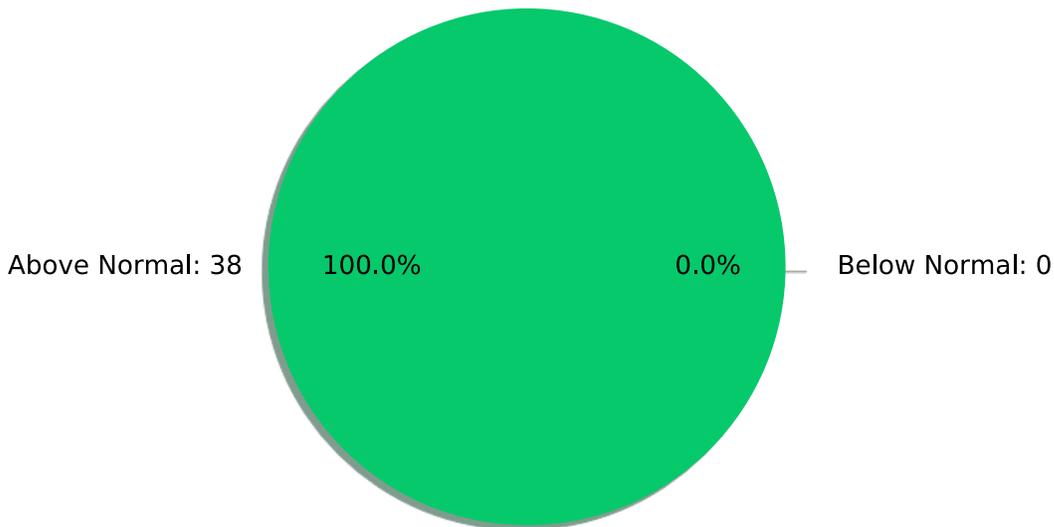
**Range of Monthly Precipitation Totals for Delaware River Basin Counties**



**Top 5 Surpluses for Delaware River Basin Counties this month:**

| County, State   | Inches From Normal | % From normal |
|-----------------|--------------------|---------------|
| Chenango, NY    | 4.8                | 127           |
| Warren, NJ      | 4.4                | 99            |
| Northampton, PA | 4.4                | 103           |
| Lehigh, PA      | 4.2                | 103           |
| Schuykill, PA   | 4                  | 92            |

**Number of counties above  
and below normal**



**90-Day Period Ending November 6, 2019**

**Range of 90-Day Precipitation Totals for Delaware River Basin Counties**

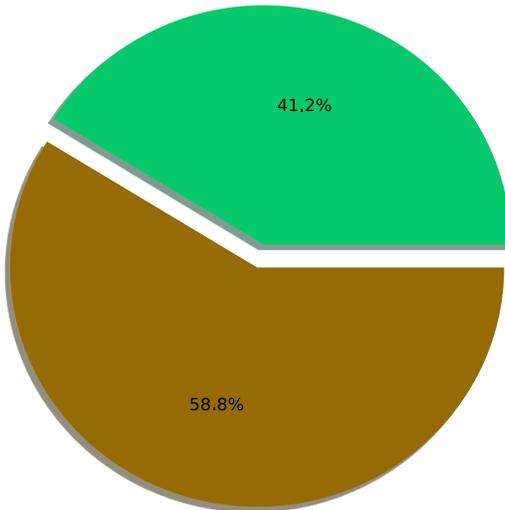
**MIN MEAN MAX**



**Cape May, NJ: 8.3 inches      11.62 inches      Warren, NJ: 15.0 inches**

Number of counties above and below normal

Above Normal: 14



Below Normal: 20

**Top 5 Surpluses in the past 90 days for DRB counties:**

| County, State   | Inches From Normal | % From normal |
|-----------------|--------------------|---------------|
| Chenango, NY    | 3.2                | 28            |
| Broome, NY      | 2.8                | 25            |
| Warren, NJ      | 2                  | 15            |
| Northampton, PA | 1.6                | 12            |
| Lebanon, PA     | 1.2                | 11            |

**180-Day Period Ending November 6, 2019**

**Range of 180-Day precipitation totals for DRB Counties**

**MIN MEAN MAX**

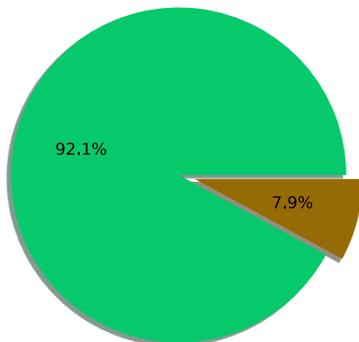


**Cape May, NJ: 20.3 inches      28.22 inches      Berks, PA: 36.2 inches**

Number of counties above and below normal

**Top 5 Surpluses in the past 180 days for DRB counties:**

| County, State   | Inches From Normal | % From normal |
|-----------------|--------------------|---------------|
| Berks, PA       | 11.5               | 46            |
| Warren, NJ      | 9.6                | 37            |
| Lehigh, PA      | 8.5                | 34            |
| Northampton, PA | 8.1                | 32            |
| Lebanon, PA     | 7.9                | 33            |

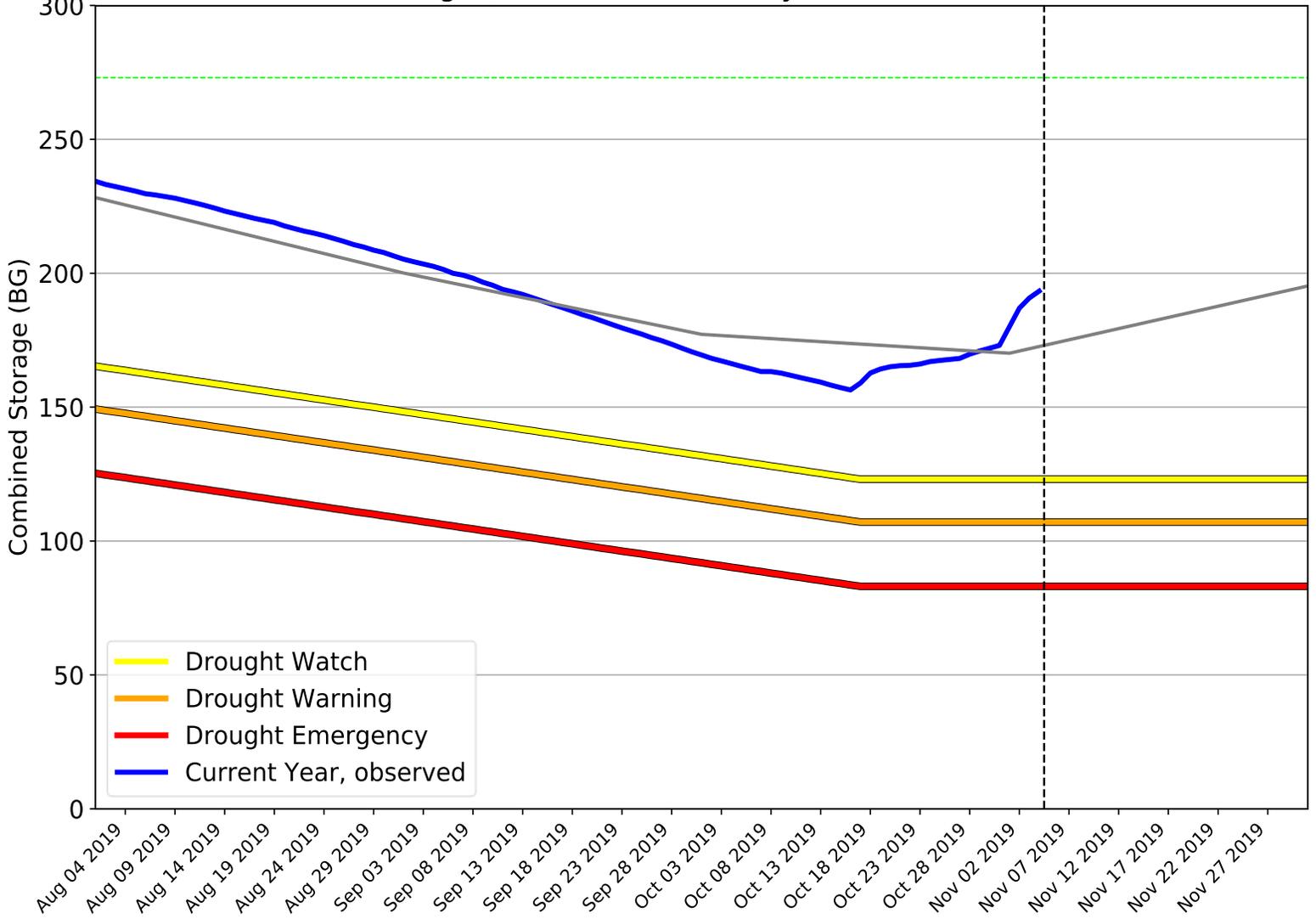


Below Normal: 3

Above Normal: 35

## Storage (NYC and Lower Basin)

Total Combined Storage (BG) of New York City Delaware River Basin Reservoirs



— Drought Watch  
— Drought Warning  
— Drought Emergency  
— Current Year, observed

| Usable Storage | Cannonsville | Pepacton | Neversink | Total  | BG above drought = 110.2        | BG above median = 20.7       |
|----------------|--------------|----------|-----------|--------|---------------------------------|------------------------------|
| BG             | 57.8         | 106.0    | 29.6      | 193.3  | BG above drought watch = 70.2   | BG below one year ago = 65.3 |
| %              | 61.8         | 76.0     | 85.4      | 74.423 | BG above drought warning = 86.2 |                              |

## **Surface Water and Groundwater Conditions**

### **Surface Water**

The table below displays the status (November 6, 2019) of 28-day running average streamflow for the index stations. Water levels within the 25% to 75% range are defined as “normal.”

| <b>PA COUNTY INDEX STATION</b>            | <b>CURRENT STATUS</b> |
|---|-----------------------|
| Dyberry Creek Nr Honesdale                | Normal                |
| Bush Kill at Shoemakers                   | Above Average         |
| Brodhead Creek Nr Analomink               | Normal                |
| Lehigh River at Stoddardsville            | Normal                |
| Pohopoco Creek at Kresgeville             | Normal                |
| Little Lehigh Creek Nr Allentown          | Above Average         |
| Monocacy Creek at Bethlehem               | Above Average         |
| Lehigh River at Bethlehem                 | Above Average         |
| Neshaminy Creek Nr Langhorne              | Not Valid             |
| Pennypack Creek at Lower Rhawn St, Phila. | Above Average         |
| Schuylkill River at Landingville          | Above Average         |
| Schuylkill River at Berne                 | Above Average         |
| Tulpehocken Creek Nr Bernville            | Normal                |
| Schuylkill River at Pottstown             | Above Average         |
| Perkiomen Creek at Graterford             | Above Average         |
| Schuylkill River at Philadelphia          | Above Average         |
| Chester Creek Nr Chester                  | Above Average         |
| Brandywine Creek at Chadds Ford           | Normal                |

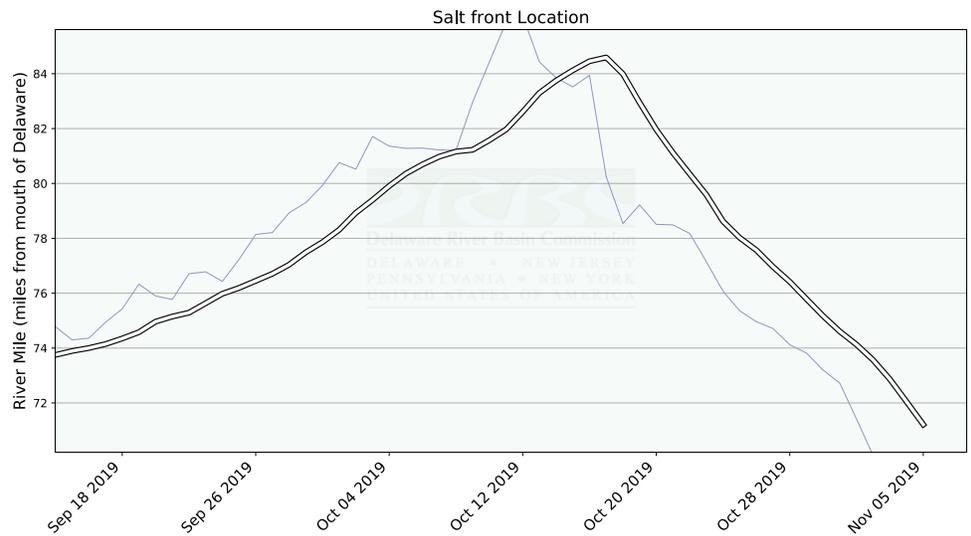
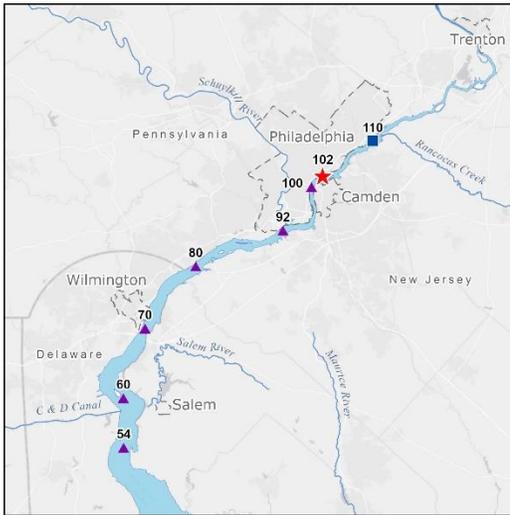
### **Groundwater**

The table below displays the status (November 6, 2019) of groundwater levels for 12 wells in the Delaware River Basin. Water levels within the 25% to 75% range are defined as “normal.”

| <b>COUNTY</b> | <b>STATE</b> | <b>DATA SOURCE</b> | <b>WELL ID</b> | <b>INDICATOR AS OF 2019-10-23</b> |
|---------------|--------------|--------------------|----------------|-----------------------------------|
| Wayne         | PA           | USGS               | WN 64          | Above Normal                      |
| Monroe        | PA           | USGS               | MO 190         | Normal                            |
| Carbon        | PA           | USGS               | CB 104         | Above Normal                      |
| Schuylkill    | PA           | USGS               | SC 296         | Normal                            |
| Lehigh        | PA           | USGS               | LE 372         | Above Normal                      |
| Bucks         | PA           | USGS               | BK 1020        | Above Normal                      |
| Chester       | PA           | USGS               | CH 10          | Above Normal                      |
| Delaware      | PA           | USGS               | DE 723         | Normal                            |
| Lebanon       | PA           | USGS               | LB 372         | Above Normal                      |
| Burlington    | NJ           | USGS               | 050689         | Above Normal                      |
| Cumberland    | NJ           | USGS               | 110042         | Above Normal                      |

## Delaware River Salt Front Location

The salt front is defined as the 250 parts-per-million isochlor. The seven-day average location of the salt front is used by DRBC as an indicator of salinity intrusion in the Delaware Estuary. The salt front's location fluctuates along the main stem Delaware River as streamflow increases or decreases in response to changing inflows, diluting or concentrating chlorides in the river.



Note: DRBC does not calculate the location of the saltfront below river mile 54.

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**Report prepared by DRBC Staff. Acknowledgments: NWS-MARFC; USGS; Delaware Geological Survey (DGS).**

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