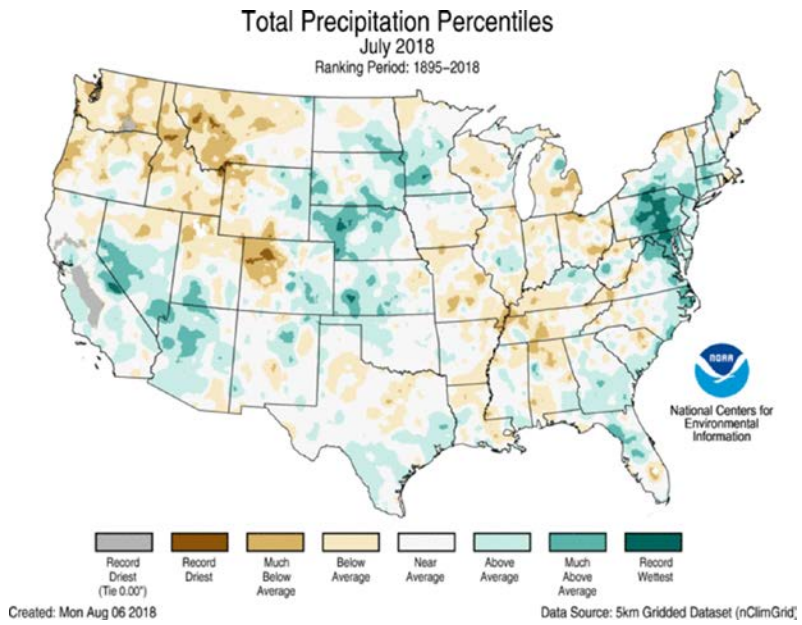
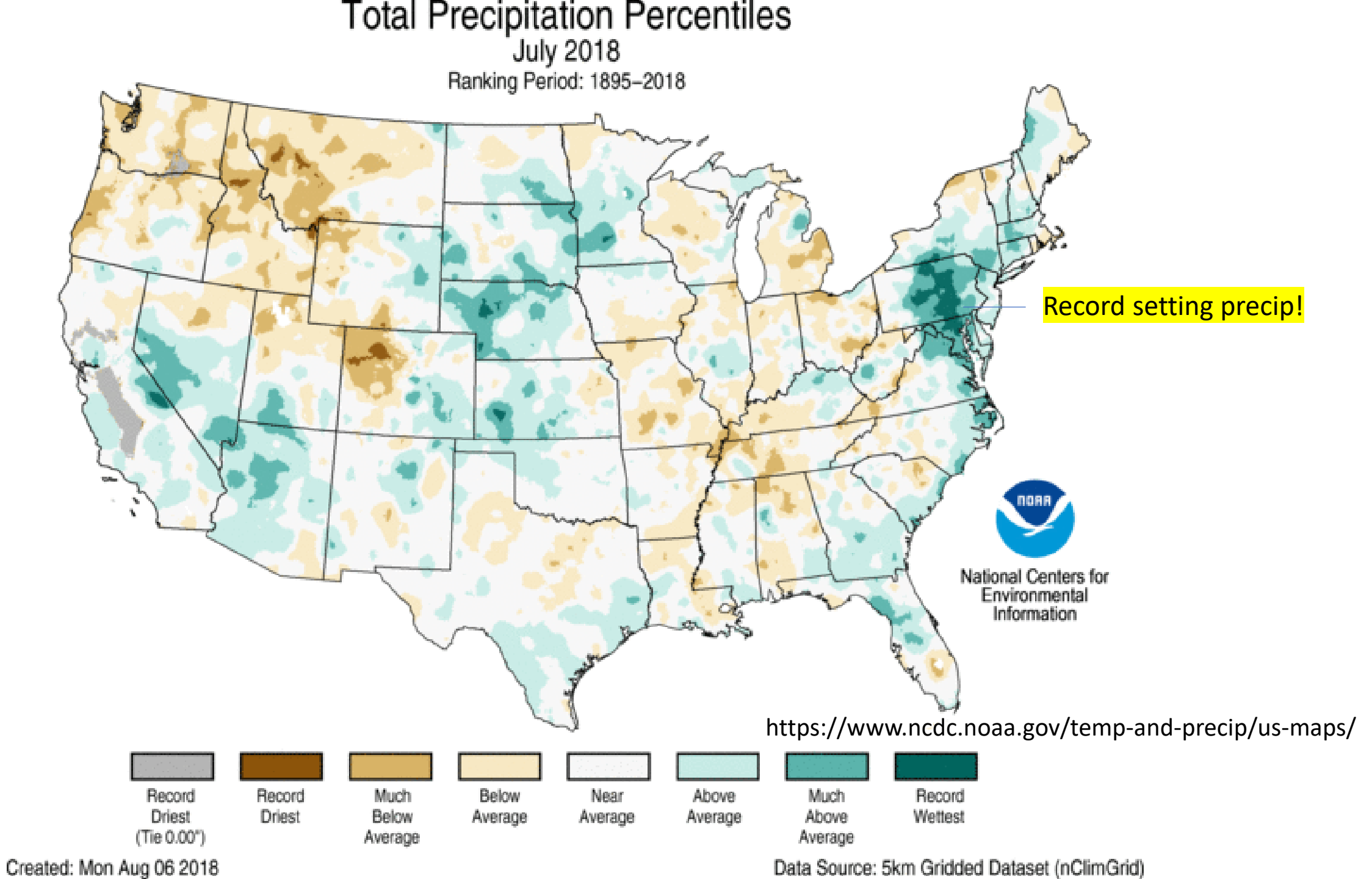
Summer Storms 2018: Chesapeake Bay watershed conditions and early monitoring results

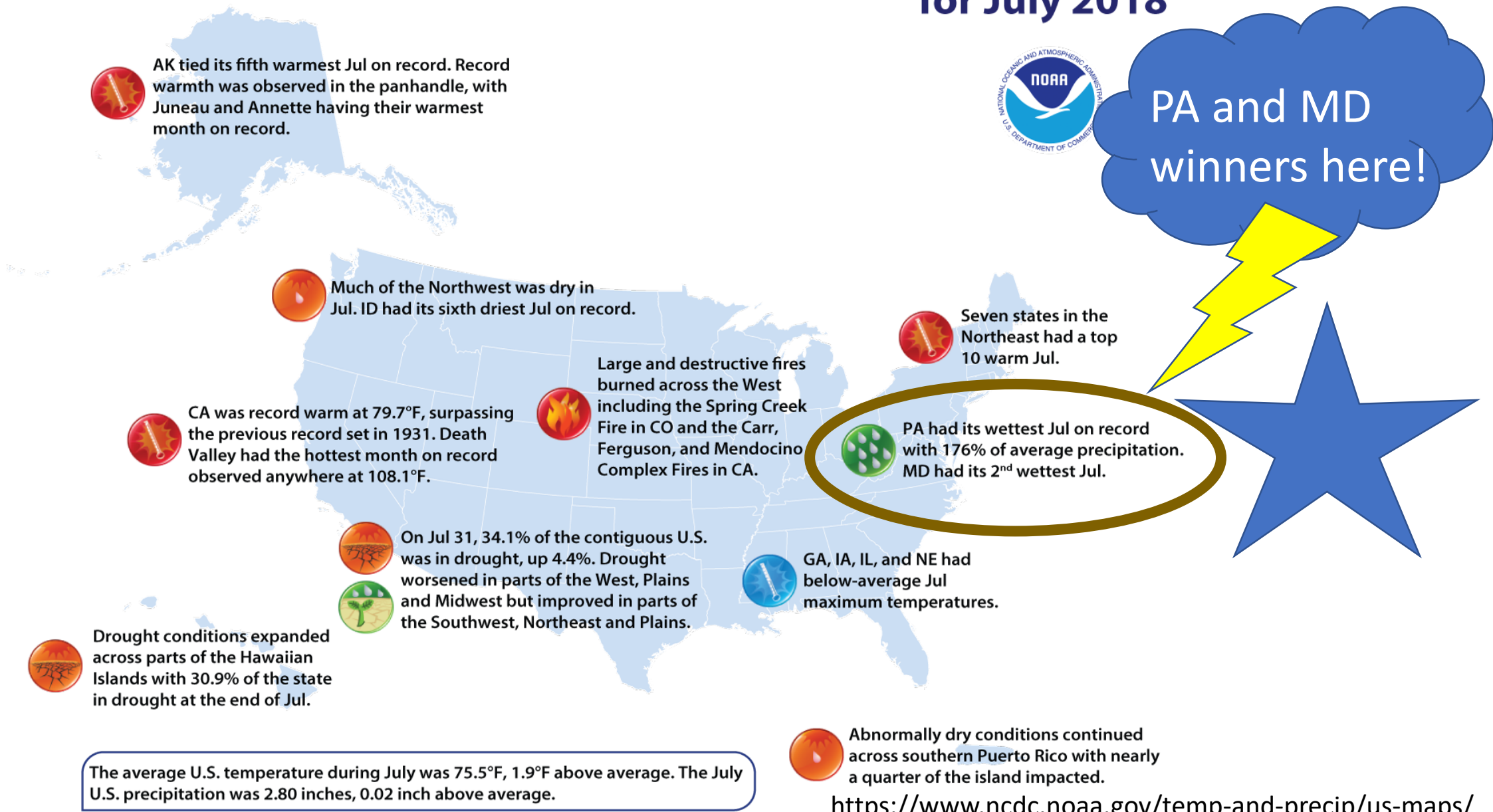


STAR August 2018

CBP Community Collaboration


Total Precipitation Percentiles
July 2018
Ranking Period: 1895–2018
Record setting precip!
National Centers for Environmental Information
https://www.ncdc.noaa.gov/temp-and-precip/us-maps/
Record Driest (Tie 0.00")
Record Driest
Much Below Average
Below Average
Near Average
Above Average
Much Above Average
Record Wettest
Created: Mon Aug 06 2018
Data Source: 5km Gridded Dataset (nClimGrid)

U.S. Selected Significant Climate Anomalies and Events for July 2018



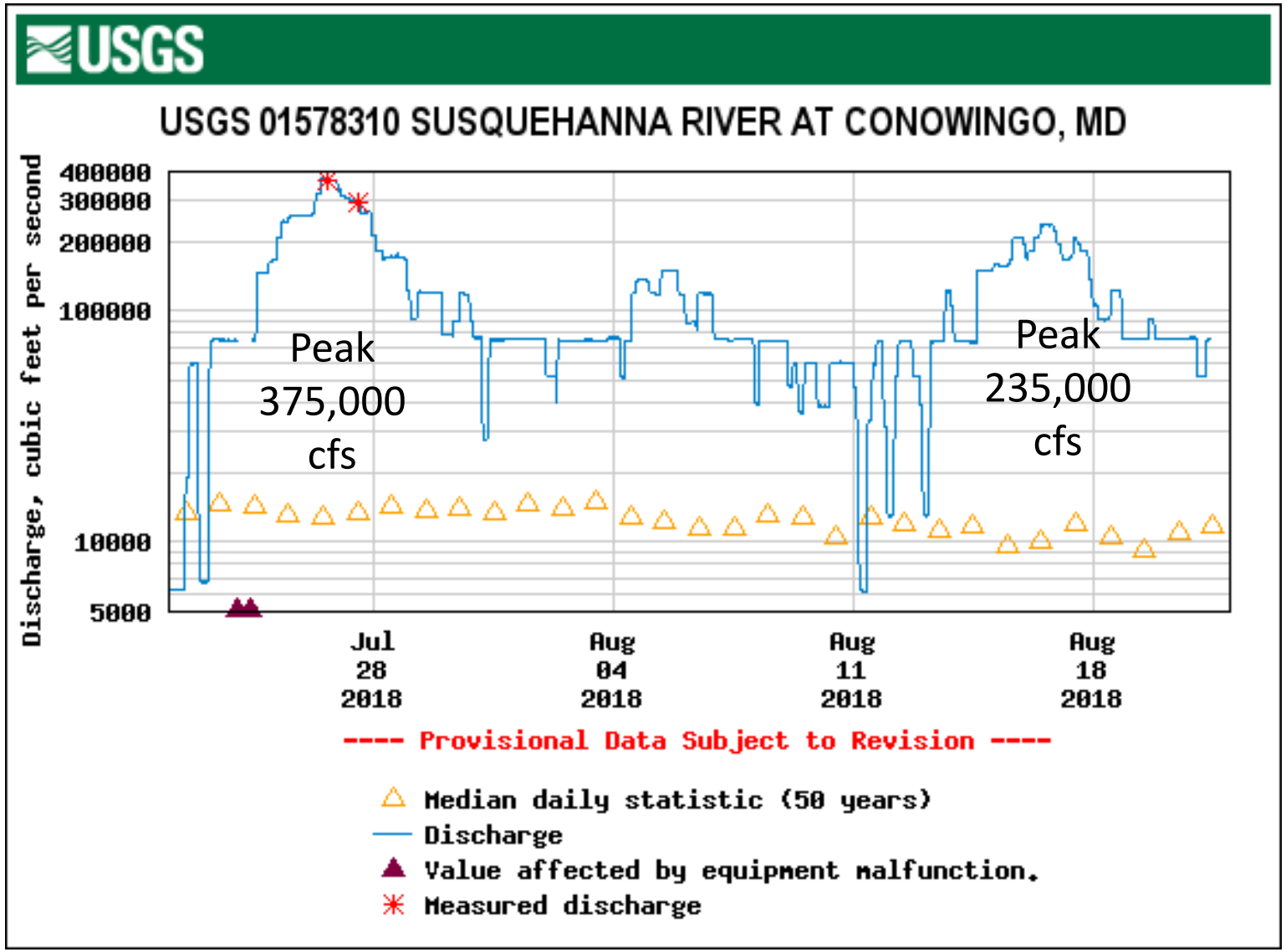
PA and MD winners here!

The average U.S. temperature during July was 75.5°F, 1.9°F above average. The July U.S. precipitation was 2.80 inches, 0.02 inch above average.

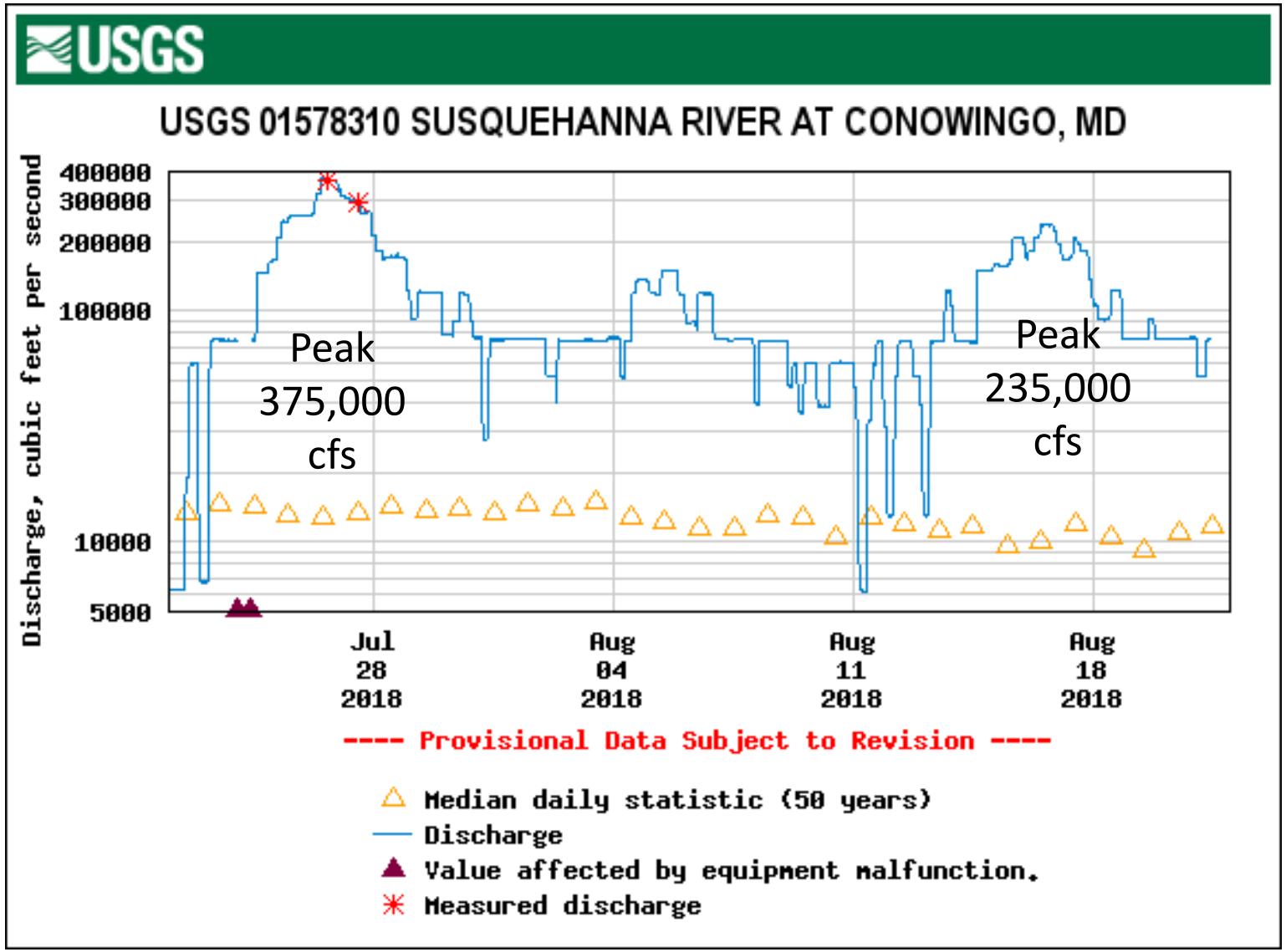
https://www.ncdc.noaa.gov/temp-and-precip/us-maps/

Please Note: Material provided in this map was compiled from NOAA's State of the Climate Reports. For more information please visit: http://www.ncdc.noaa.gov/sotc

Lower Susquehanna River:
High flow conditions reached in July and August 2018 at Conowingo Dam



Lower Susquehanna River:
High flow conditions reached in July and August 2018 at Conowingo Dam



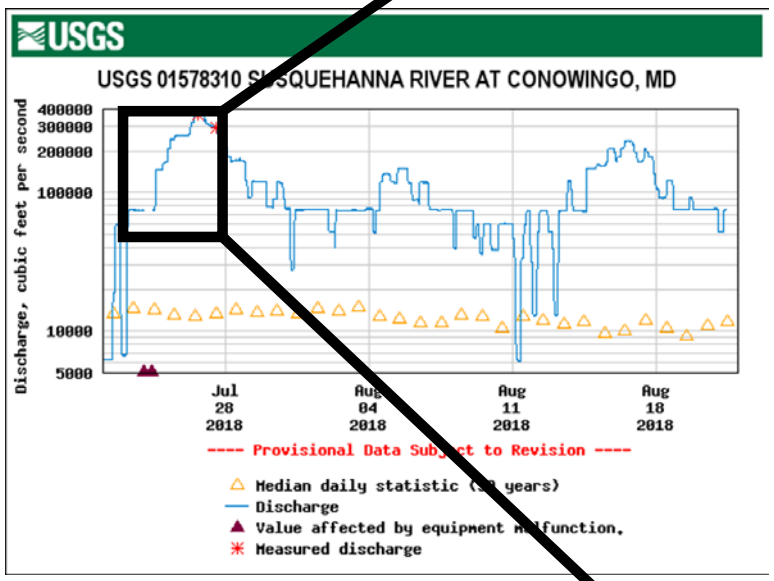
Maximum flows for comparison:

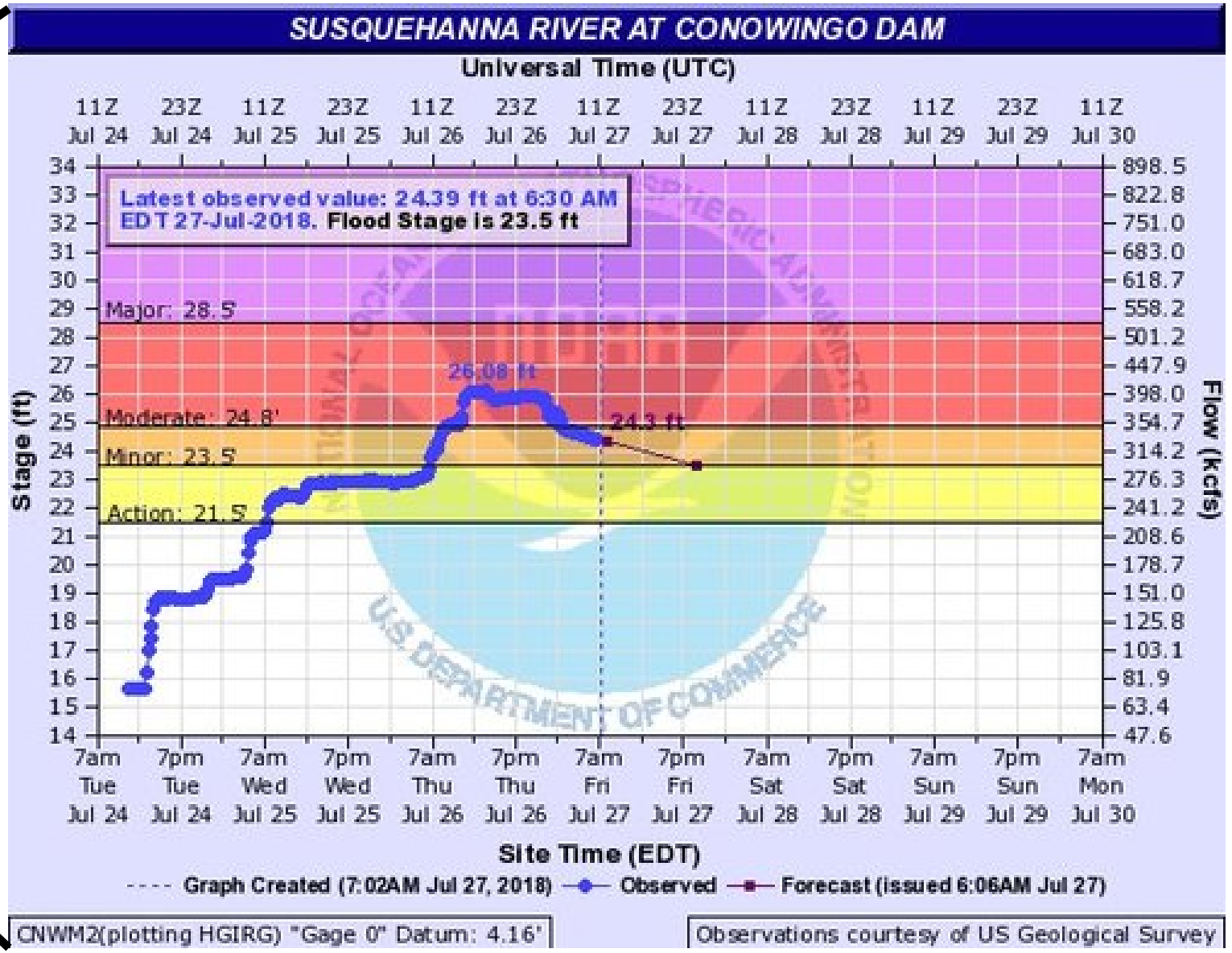
H. Agnes: 1.13M cfs

Jan 1996: ~900,000 cfs

TS Lee 2011: ~775,000 cfs

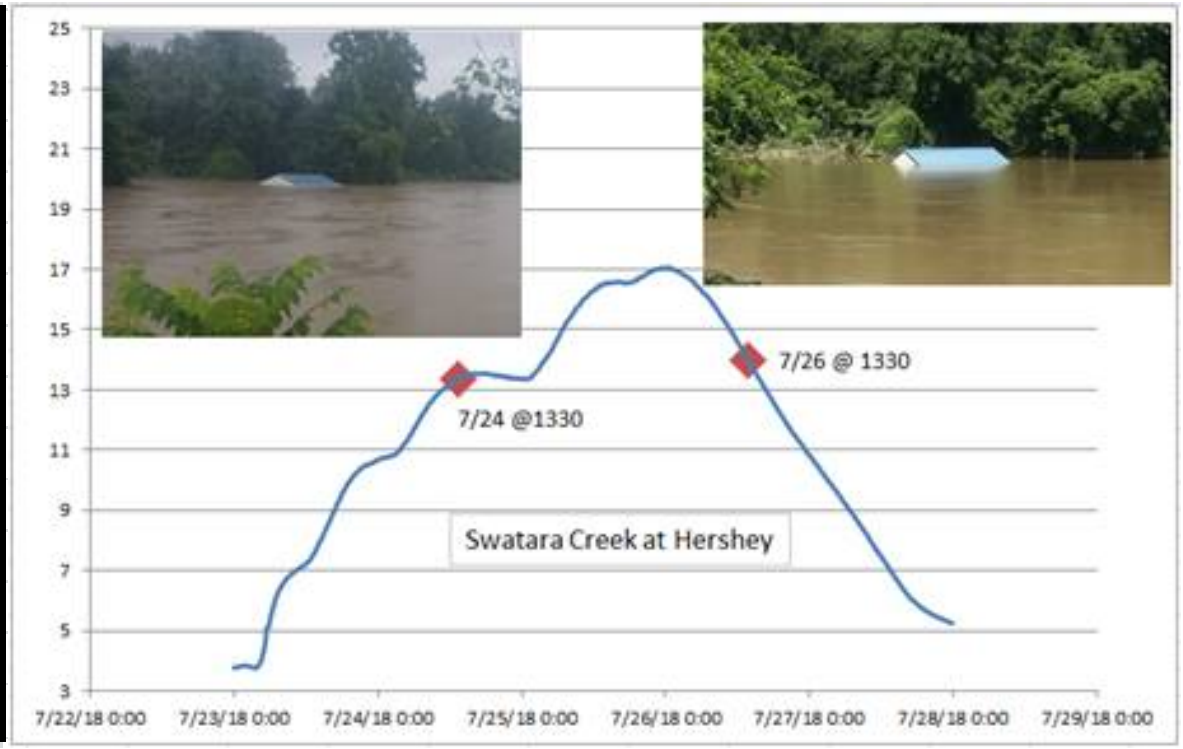
Moderate Flood Stage achieved July 26th, 2018





Storm sampling in the watershed – July 2018

	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Total
Towanda			1	1				2
Wilkes B			1	1				2
Danville			1	1				2
Lewisburg			1	1				2
Penns		1	1					2
Mahantango			1	1				2
Shermans		1	1					2
Conodoguinet		1	1					2
Swatara	1		1					2
West Conewago	1		1					2
Marietta				1			1	2
Newport			1					1
Bald Eagle				1				1



Storm sampling across the Susquehanna River Nontidal Water Quality Monitoring Network

Courtesy of K. McGonigal, SRBC

July 2018.

- **Susquehanna River flows** - It was an unusually wet July in the Susquehanna watershed, with *the greatest July river flows on record for that watershed*.

- **375,000 cfs** - This was *the highest flow at Conowingo Dam since Tropical Storm Lee in 2011*.

- **Total river flow to the bay** - USGS estimates that in 2018, rivers contributed *the second greatest July freshwater flows to Chesapeake Bay on record*. (First place – July 1972 with Hurricane Agnes)

USGS report, photo MD DNR

July 2018. Total river flow to the bay

- Normal July streamflow entering the Bay is between 25,000 and 44,100 cubic feet per second. (These are the 25th and 75th percentiles, respectively, of all July values in the 81 year record).

- Average July streamflow to the bay is 38,800 cfs.

- The estimated monthly mean streamflow entering Chesapeake Bay for July 2018 was 100,000 cubic feet per second (cfs)

Susquehanna Flats, August 2018. Photo D. Nemazie, UMCES

Related issues during the storm flows - sewage.

NY plant released 35M gallons of untreated waste into Susquehanna

August 17, 2018 timesleader Local, News 70

By Ed Lewis - elewis@timesleader.com

- USGS computed that the dilution rate of this release was estimated at 1:156,000. (M. Langland)
- At 100,000 cfs, 35M gallons is about 0.05% of 1 day of flow at Conowingo.
- 35M gallons is about 0.002% of the bay volume.

Related issues during the storm flows - sewage.

NY plant released 35M gallons of untreated waste into Susquehanna

August 17, 2018 timesleader Local, News 70

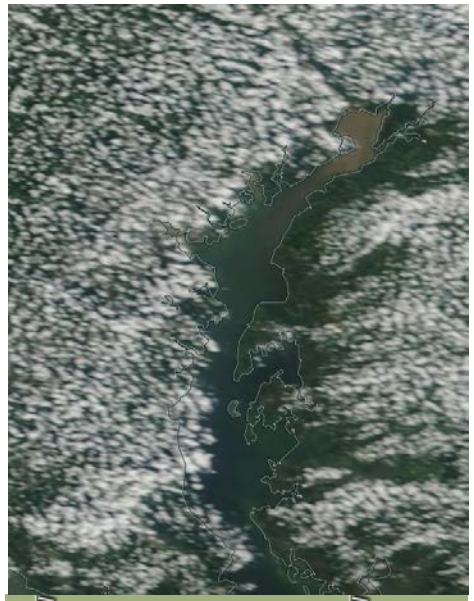
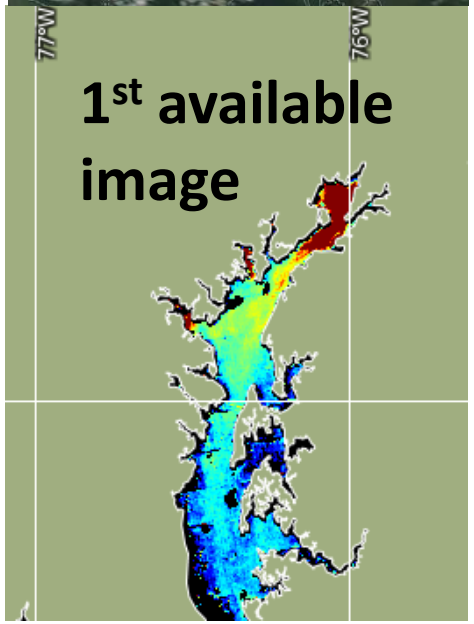
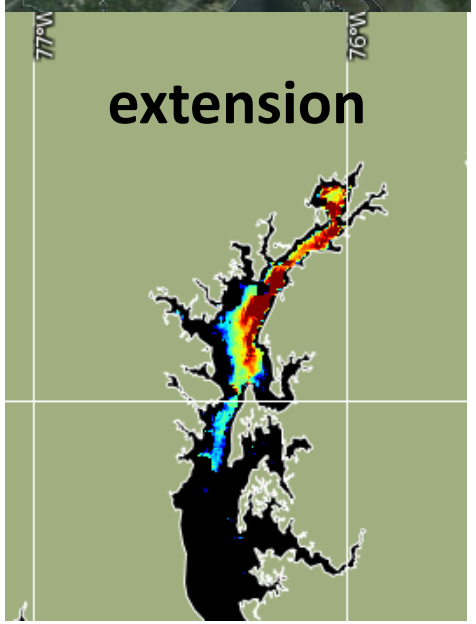
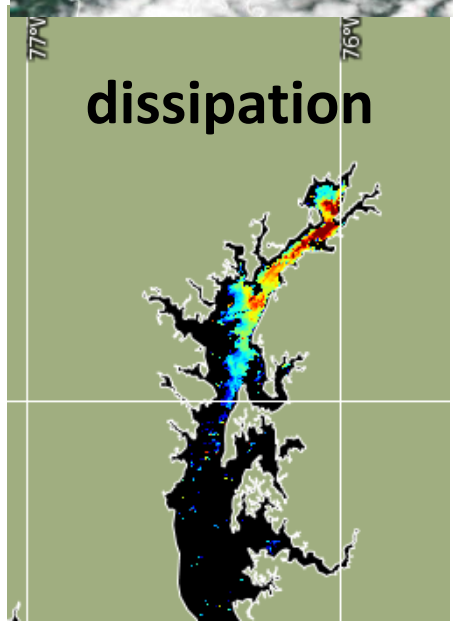
By Ed Lewis - elewis@timesleader.com

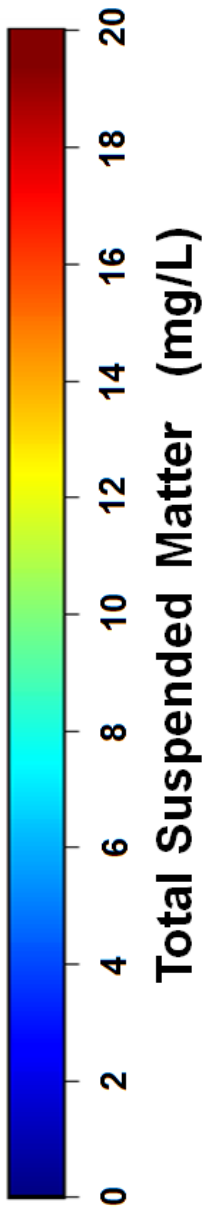
- USGS computed that the dilution rate of this release was estimated at 1:156,000. (M. Langland)
- At 100,000 cfs, 35M gallons is about 0.05% of 1 day of flow at Conowingo.
- 35M gallons is about 0.002% of the bay volume.

Baltimore Harbor – Balt Sun photo

Meanwhile,
down on the bay…

NOAA Satellites Track the Sediment Plume

	July 26, 2018	July 29, 2018	Aug 1, 2018
Satellite image			
Total Suspended Matter Concentration from satellite (mg/L)			



Susquehanna Flats, August 2018. Photo D. Nemazie, UMCES

On the Bay… States continued biweekly WQ monitoring cruises July and August.

- MD DNR adjusted the timing of its 2nd August cruise to the third week of August instead of 4th week to better align with nearterm effects of storm flows on the bay.
- Additional samples were collected for nutrient, sediment and related parameters with support from USEPA.
- UMCES conducted additional survey work on the upper Bay.

Latest news from the upper Bay.

- Brooke Landry (MD DNR) visited the SAV bed on the Susquehanna Flats on Friday, Aug. 10.
    - Interior of the SAV beds look good.
    - Water clarity was excellent.
    - Periphery of the beds showed some impact of the July high flow event, but overall bed integrity was sound and resilient.

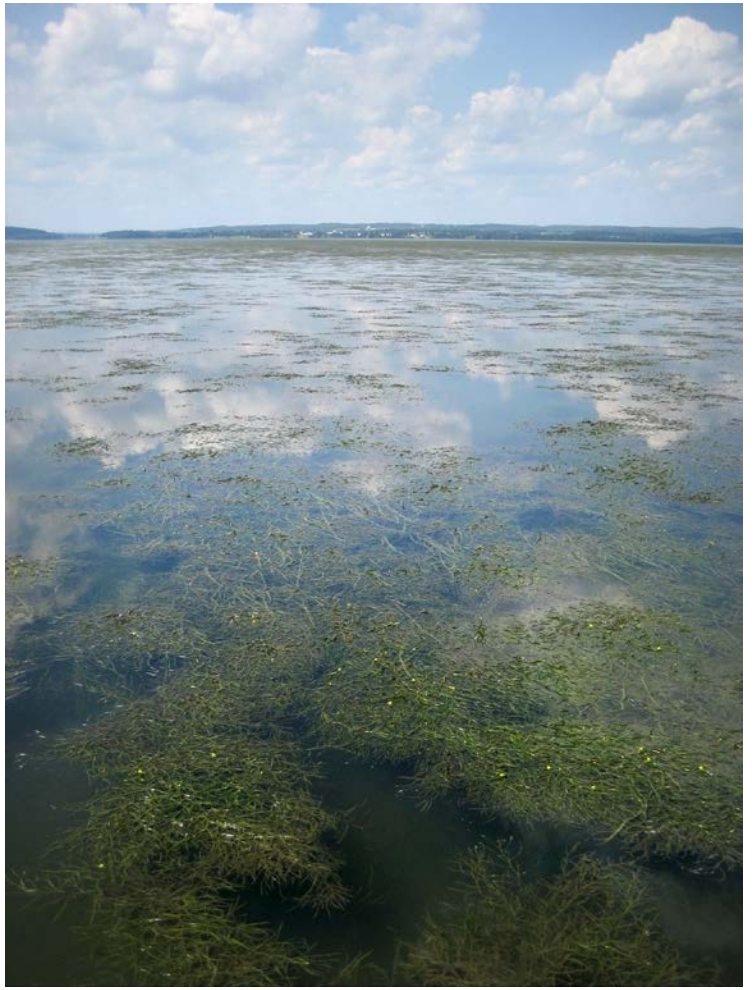


Photo Phys.org – not from this week

Honorable mention – citizen collaboration on launch site use by VADEQ

- Special thanks to Donn Hall

RiverCreek Properties LLC

President - RiverCreek HOA

46 Ironwood Road

Fredericksburg, AA 22405

Located between Muddy Creek and mainstem Rappahannock in VA.

Next steps

- Laboratory processing of samples will take months.
- We will continue updates of the story into the fall and early winter as sample results become available.

- Many thanks to field and lab teams for the long hours and stormflow chasing efforts across the watershed!