

2019 Bonnet Carré Spillway Monitoring Update

July 26, 2019



- The US Army Corps of Engineers began closing bays of the Bonnet Carré Spillway on July 22. Assuming no weather delays or equipment issues, full closure is projected to be completed by Sunday, July 28. As of July 26, a total of 64 bays remain open and the discharge flow rate has decreased to 25,000 cubic feet per second (cfs).
 - The maximum number of bays open for the second spillway opening of 2019 was 168, from May 21 to July 21; during that period, the discharge rate was typically greater than 110,000 cfs and ranged between 84,000 and 161,000 cfs depending on river stage.
 - Additional information on the spillway and its operations is available at <http://www.mvn.usace.army.mil/Missions/Mississippi-River-Flood-Control/Bonnet-Carre-Spillway-Overview/Spillway-Operation-Information/>.
- Once all bays are closed, there will be a relatively low amount of Mississippi River water (presently ~5,000 cfs) released into Lake Pontchartrain as long as the river stage is above the elevation of the spillway weir. This results from leakage of river water between the timbers of the spillway bays (20 timbers per bay) while the river stage remains above its banks and overtops the sill of the spillway.
- As the spillway is closed, the return to typical salinity conditions in the Mississippi Sound may take several days or weeks depending on a number of factors, including wind direction/strength, regional rainfall amounts, coastal water circulation patterns and, to a lesser degree, the duration of leakage of river water through the spillway timbers. Favorable conditions for a rapid return to typical seasonal salinities in the Mississippi Sound would be southeasterly winds (pushing Gulf marine water into the Sound) and low rainfall.
- Expanded sampling was conducted by USM on July 25 to assess water quality conditions throughout the Mississippi Sound; preliminary results from sampling at those 16 stations will be provided in next week's update.
- USM and MDMR will continue to conduct expanded sampling minimally through August to monitor the return to typical seasonal environmental conditions and assess recovery of coastal biota and habitats. Assessments will continue well into the future to determine and, where possible, quantify not only ecological impacts to fishery populations and associated habitat components but also economic impacts to Mississippi's fishing sectors and local economies.
- As noted in the last update, increased salinity levels in the Mississippi Sound were observed for July 10 to 14 as a result of the passage of Hurricane Barry and the influx of marine water from the hurricane's southeasterly wind flow. Salinities have since decreased to generally the pre-hurricane levels (Figure 1), remaining low in the western Sound compared to the prior three years.
- Based on preliminary results of analyses of the percent contribution of Mississippi River water to samples collected by USM in June and early July, the influence of freshwater outflow from the Bonnet Carré spillway has extended south of the Mississippi barrier islands and as far east as the easternmost stations in the Mississippi Sound in July (Figure 2).
- Water contact warnings remain in effect for coastal waters immediately adjacent to Mississippi Gulf Coast beaches (<http://opcgis.deq.state.ms.us/beaches/>) as a result of the presence of freshwater cyanobacteria capable of producing toxins.
 - MDEQ and MDMR continue to sample waters from those areas on a daily basis to test for the presence of the freshwater cyanobacteria; additional toxin analyses are also being obtained, and samples from more offshore waters of the Mississippi Sound are being collected and analyzed by USM and MDMR.
 - With the pending full closure of the spillway, a gradual return to typical (i.e., higher salinity) conditions in the Mississippi Sound is expected to eliminate these freshwater blooms in the area; the die-off and decomposition of the cyanobacteria will be monitored to assess the fate of associated toxins and any possible local effects.
- The MDMR continues to test water and fish samples to ensure seafood safety in Mississippi waters and is advising fishermen to avoid catching seafood in waters where algae is present. As previously reported, water samples tested by MDMR and the National Oceanic and Atmospheric Administration have not shown toxin levels high enough to warrant concern for consumption of local seafood. Recreational and commercial fishing offshore in Mississippi waters remains unaffected by the algal bloom, and those catches are safe for consumption.
- Surface salinity modeling for July 25 projects a continued persistence of lower salinity waters along the central Mississippi coastline (Figure 3); animated imagery available at: http://131.95.1.37/~BCS_share/CircModel/hourly/20190725/ngofs_saltUV_20190725.gif.

Report any unusual observations associated with the Bonnet Carré spillway opening to the USM Hotline at 228-818-8099. Dolphin and turtle strandings should be reported to the IMMS 24-hour hotline at 888-767-3657.



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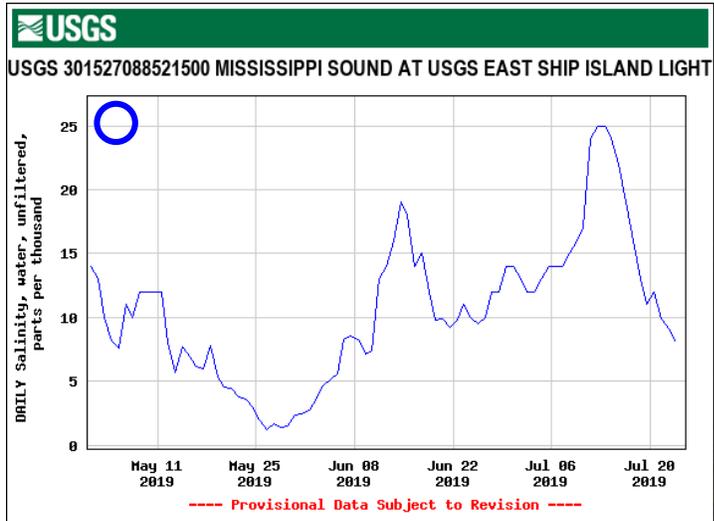
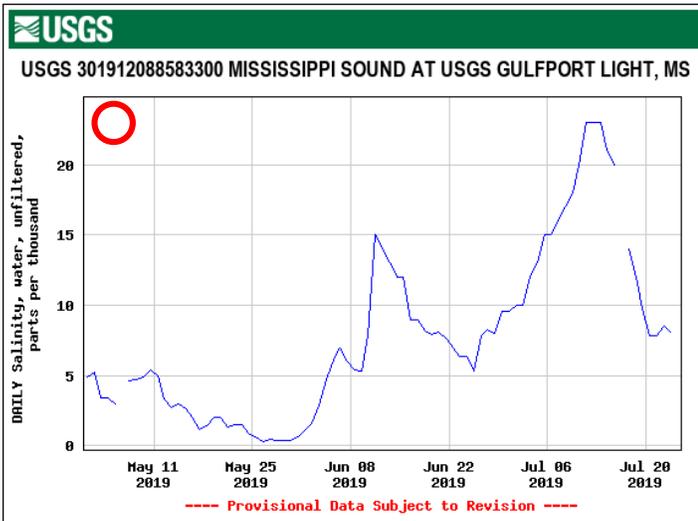
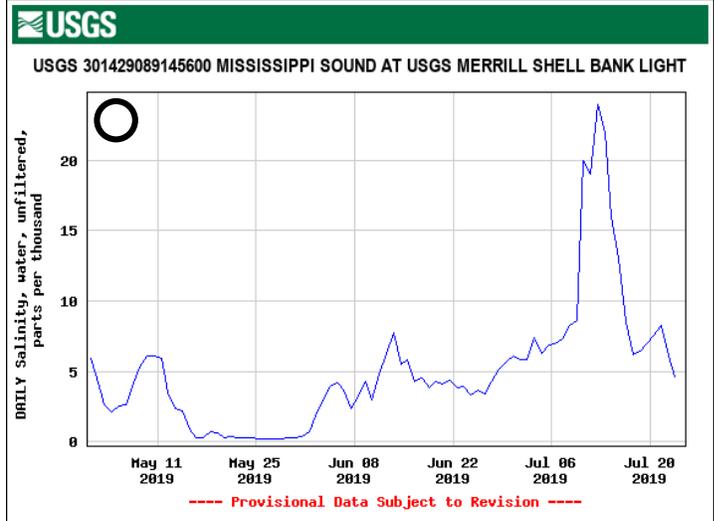
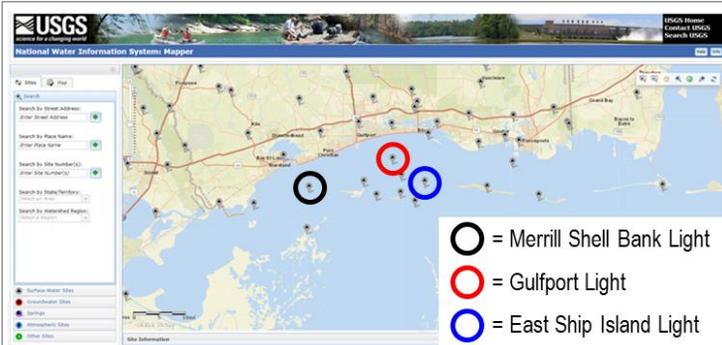


Figure 1. Daily salinity measurements from May 01 to July 24, 2019, at USGS/MDMR gauges in the Mississippi Sound. Increased salinity levels observed for July 10 to 14 were a result of the passage of Hurricane Barry, with salinities subsequently decreasing to generally pre-hurricane levels thereafter. *Source:* USGS/MDMR

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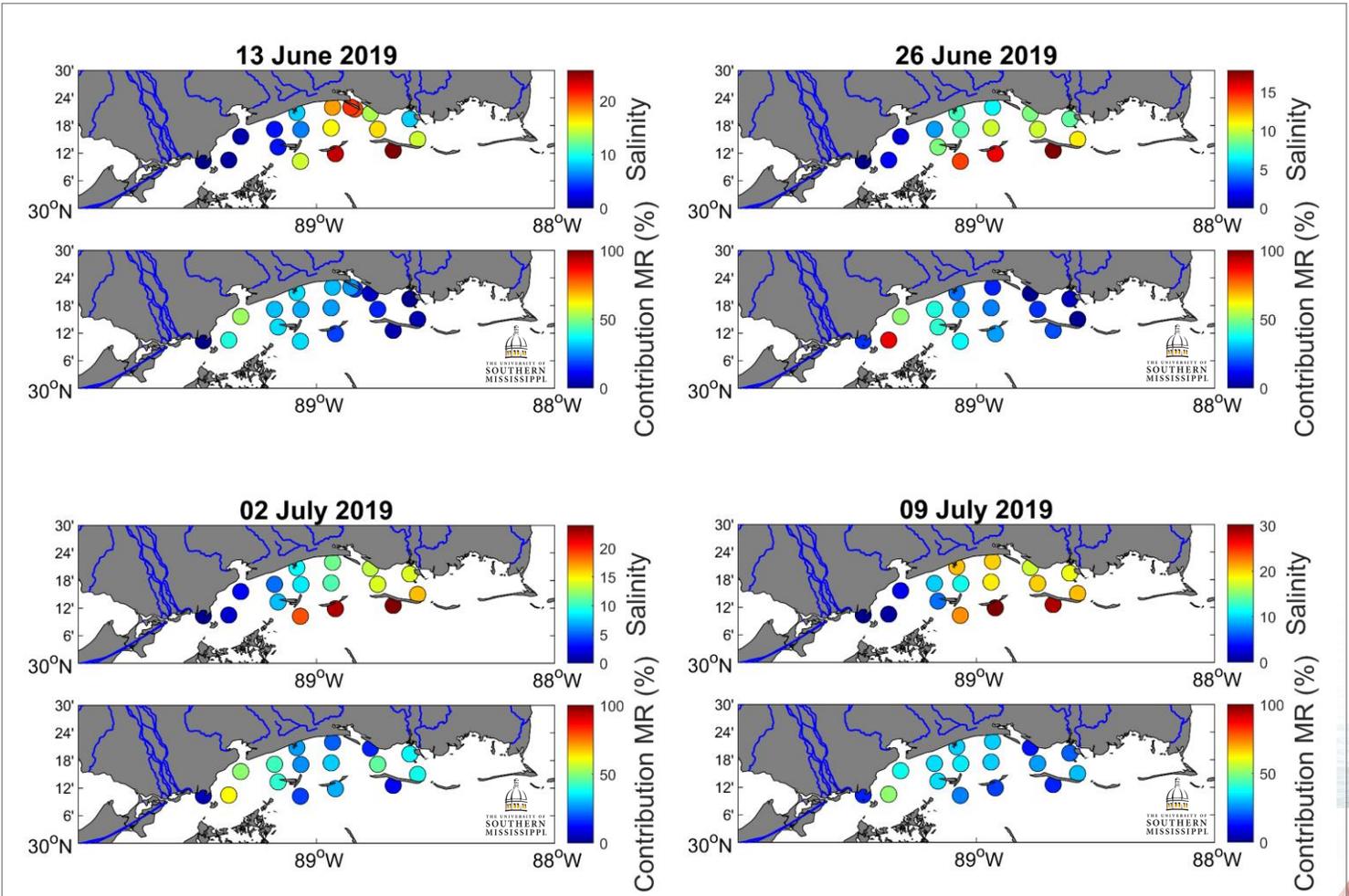


Figure 2. Preliminary results from four sampling events (6/13, 6/26, 7/2 and 7/9) to determine sources of freshwater in the Mississippi Sound. Top panel for each date depicts salinity levels, and bottom panel depicts the percent contribution of Mississippi River outflow to the total freshwater presence in the sample, based on isotopic signatures. Note that the zero-to-low contribution of Mississippi River water at the westernmost site is a result of the influence of Pearl River discharge at that station. *Source:* USM

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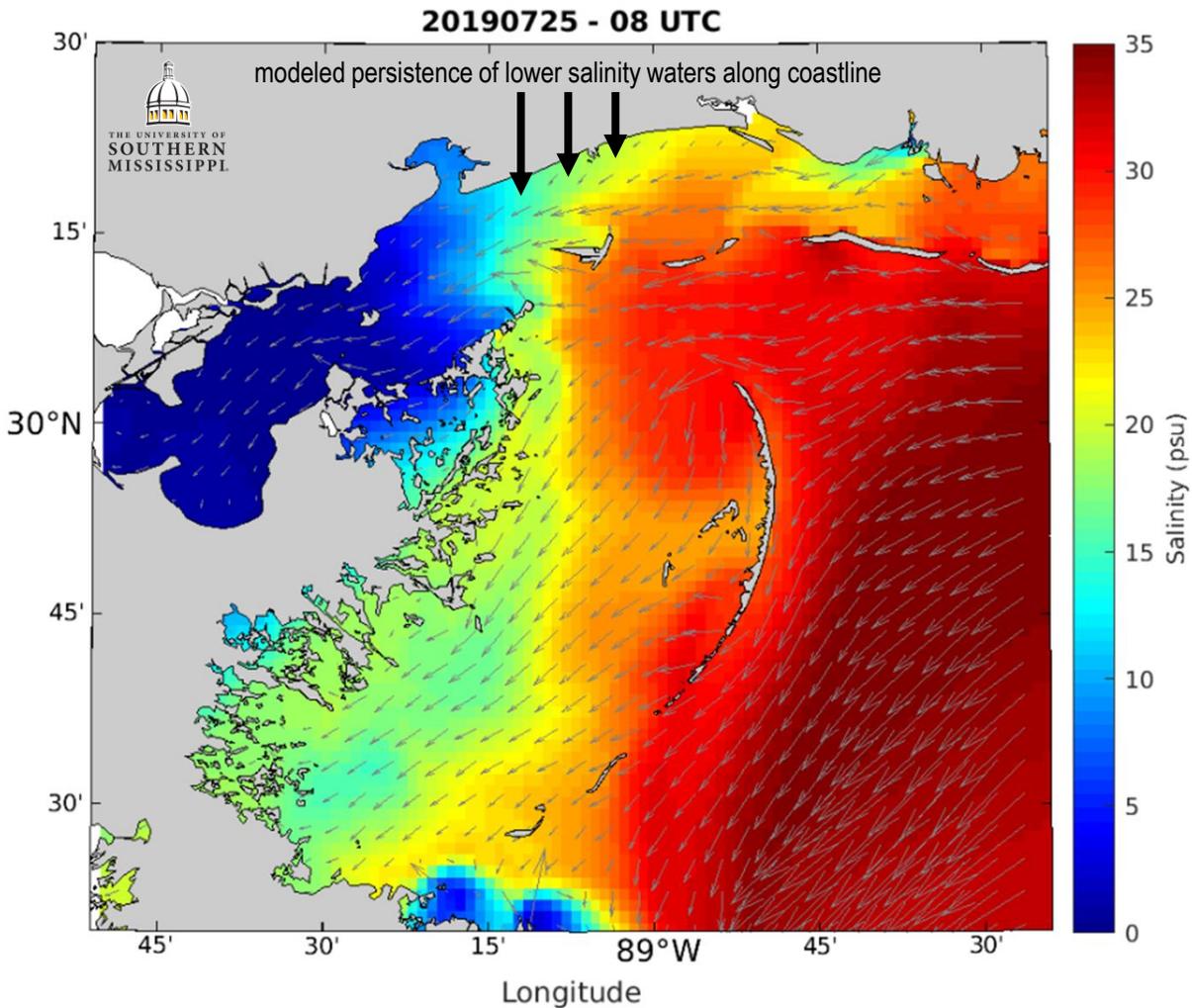


Figure 3. Screen shot of regional surface salinity model animation for July 25; animation of modeled salinity circulation is available at http://131.95.1.37/~BCS_share/CircModel/hourly/20190725/ngofs_saltUV_20190725.gif. Depiction illustrates the interaction of freshwater outflow influenced by the Bonnet Carré spillway and typical coastal circulation patterns influenced by wind, ocean currents and tides. The continued persistence of modeled lower salinity waters along the central Mississippi coastline is indicated with black arrows. Source: USM

General Interpretation: Warmer colors (yellow to red) represent higher salinity waters typically observed in the region, while cooler colors (blue) are representative of lower salinity waters primarily associated with the freshwater influence from the Bonnet Carré spillway discharge in the western Mississippi Sound.