Temporal and Spatial Progression of the Freshwater inflows to Lake Pontchartrain & Mississippi Sound

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USACE Bonnet Carré Spillway: 2019 flood control operationsreleases Mississippi river water into spillway and into Lake Pontchartrain, LA

Fresh-water front of Mississippi River water moving east mixing with Gulf waters near Cat Island, MS.

NASA Modis imagery of: Mississippi River water filling Lakes Pontchartrain & Borgne and Mississippi Sound (March 23, 2019). USGS water and algae data collection:

near St. Joseph Light house in Mississippi Sound, MS



Spillway openings 1937-2019



Erick Swenson, Louisiana State University

Ranking of spillway openings 1937-2019

						Event
					Event total	percent of
		Date		Total days	discharge	total lake
Event	Year	opened	Date closed	open	(cubic feet)	volume
5	1975	04/14/1975	04/26/1975	13	7.46E+10	32
12	2018	03/08/2018	03/29/2018	22	2.04E+11	87
11	2016	01/10/2016	02/01/2016	23	2.45E+11	104
9	2008	04/11/2008	05/09/2008	29	2.64E+11	113
8	1997	03/17/1997	04/18/1997	33	4.12E+11	176
3	1950	02/10/1950	03/19/1950	38	4.72E+11	201
6	1979	04/17/1979	05/31/1979	45	4.92E+11	210
13	2019a	02/27/2019	04/11/2019	44	5.32E+11	227
1	1937	01/28/1937	03/16/1937	48	5.37E+11	229
7	1983	05/20/1983	06/23/1983	35	5.37E+11	229
10	2011	05/09/2011	06/17/2011	40	7.73E+11	330
14	2019b	05/10/2019	07/27/2019	79	8.13E+11	347
4	1973	04/08/1973	06/21/1973	75	8.30E+11	354
2	1945	03/23/1945	05/18/1945	57	1.06E+12	454
13+14	2019	02/27/2019	07/27/2019	151	1.34E+12	574

Erick Swenson, Louisiana State University

Fresh surface water sources: Pontchartrain & Mississippi Sound

Comparison of Bonnet Carré spillway opening discharge (annualized) to annual inflows from Lake Pontchartrain and coastal Mississippi drainages for indicated time periods.

	2019*	2005-17	2011	2012	2016		
	Average annual flow, in cubic feet per second						
Lake Pontchartrain inflows (from local drainages)	4,200	3,800	2,300	3,800	8,600		
Pearl / Pascagoula inflows	33,800	20,100	14,000	19,100	23,600		
Bonne Carre Spillway discharge (annualized)	57,600		24,500	no opening	7,760		

* Averaged January 2019-September 2019













Late May 2019



Early July 2019 (pre-Barry)











MS at St. Joseph Island Light (daily conductance)



MS at Merrill Shell Bank (daily conductance)



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Biloxi Bay at Point Cadet Harbor at Biloxi



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Daily minimum salinity value at continuous stations in the Mississippi Sound

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WATER-QUALITY: Summer hypoxia is common throughout the Mississippi Sound, and follows salinity stratification (ie between Cat and Ship Island)



Preliminary data Subject to revision

δ¹⁸**O** isotopic tracking A. Shiller, USM

Hurricane Barry July 11 – 19, 2019





Preliminary data Subject to revision Composition of Water at Sampling Stations in Lake Pontchartrain and Western MS Sound Waters, July 2019 (Pre-Hurricane Barry)



Composition of Water at Sampling Stations in Lake Pontchartrain and Western MS Sound Waters, August 2019 (Post-Hurricane Barry)



Algae blooms along Mandeville Beach on north shore lake Pontchartrain, LA (June 2019), - Anabeana sp. & Microcystis sp.

Algae Blooms

Cyanobacteria: Anabaena circinalis Lake Pontchartrain

NOAA Chlorophyll-a estimates of algal biomass using Sentinel 2 imagery: showing high chlorophyll-a concentrations above 100 mg/L, red, near Pass Christian, MS (July 2019).

Cyanobacteria bloom on south shore Lake Pontchartrain, LA (August 2019) USGS Merrill Banks Monitoring Station near oyster production in Mississippi Sound, MS



Questions - Comments

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