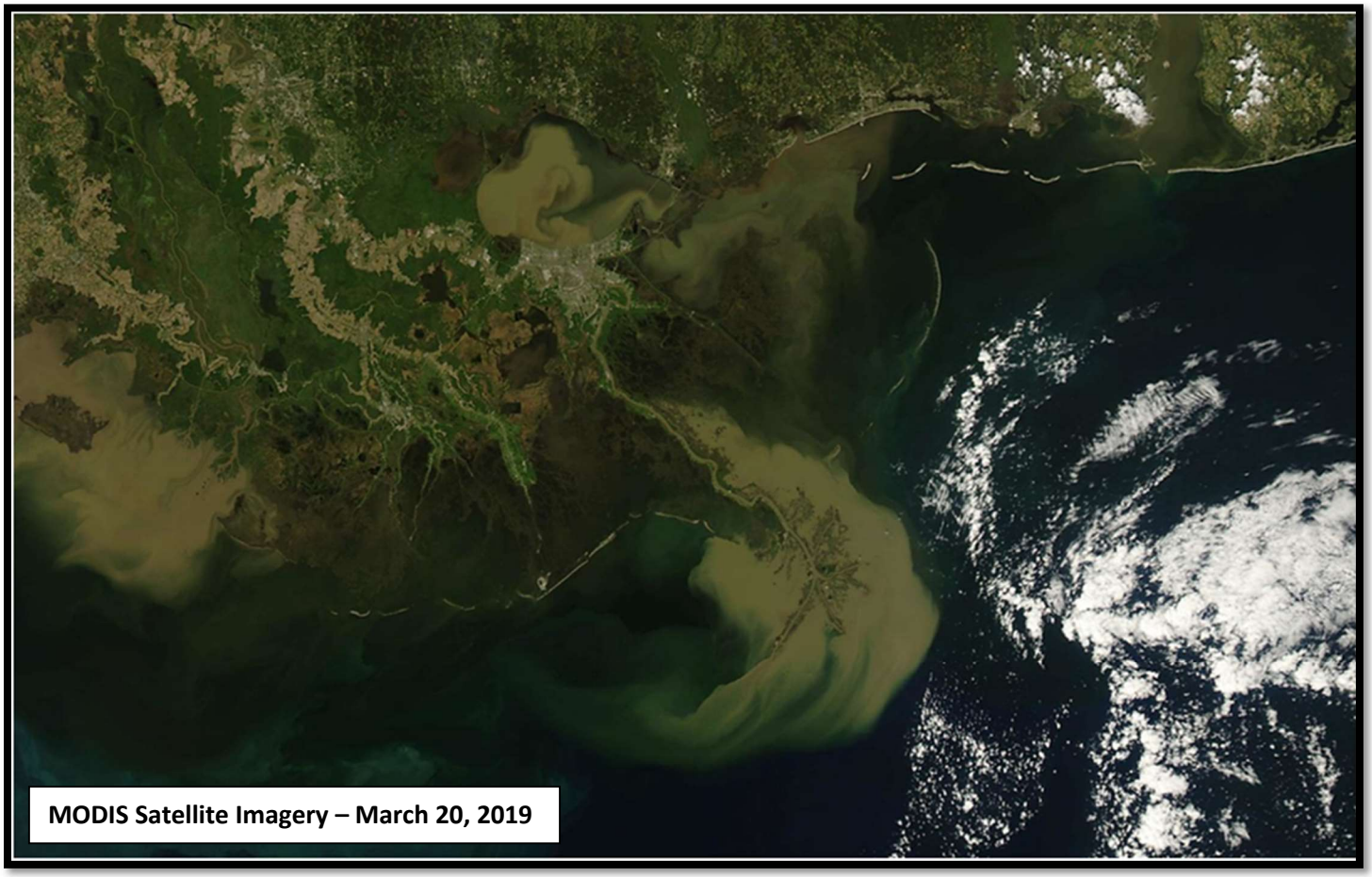
The 2019 Freshwater Impacts to Marine Natural Resources Along the Northern Gulf of Mexico



GULF STATES MARINE FISHERIES COMMISSION
70th Annual Meeting
October 16, 2019
Golden Nugget Biloxi Hotel & Casino
Biloxi, Mississippi

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The 2019 Freshwater Impacts to Marine Natural Resources Along the Northern Gulf of Mexico

70th Annual Meeting
October 16, 2019
Golden Nugget Biloxi Hotel & Casino
Biloxi, Mississippi
1:30 p.m. – 5:00 p.m.

Agenda

1:30 Introduction – *Mr. David Donaldson (GSMFC)*

1:45 Temporal and Spatial Progression of the Freshwater Inflows to Lake Pontchartrain & Mississippi Sound – *Scott Mize (USGS Lower Mississippi Gulf Water Science Center)*

2:15 Impacts to Louisiana's Marine Resources – *Jason Froeba (Louisiana Dept. of Wildlife and Fisheries)*

2:45 Impacts to Mississippi's Marine Resources – *Rick Burris (Mississippi Department of Marine Resources)*

3:15 *Break*

3:30 2019 Bonnet Carré Spillway Event: USM's Monitoring and Assessment – *Read Hendon (USM/Gulf Coast Research Laboratory)*

4:00 Economic Impacts to Alabama as a Result of the Freshwater – *John Mareska (Alabama Department of Conservation and Natural Resources - Marine Resources Division)*

4:30 Bonnet Carré Spillway 2019 Event: Environmental Impacts in Mississippi Bight? – *Brian Dzwonkowski (University of South Alabama - Dauphin Island Sea Lab)*

5:00 Adjourn

Summary

Since its construction in 1931 the Bonnet Carré Spillway has been opened a total of fourteen times. The spillway was opened an average of once every nine and a half years from 1931-2007; however, over the last decade it has been opened six times with three of the openings taking place in the last two years. The increasing frequency of these openings and the amount of freshwater that is discharged is starting to have significant impacts on the natural resources of the Mississippi Sound.

In 2019 the northern Gulf of Mexico experienced a fisheries disaster as a result of all the freshwater that was introduced to the system from the Mississippi River. 2019 marked the first time in history that the Bonnet Carré Spillway was opened in two consecutive years and the first time it was opened twice in one year which resulted in the spillway being open for 151 days in 2019 (twice as many as any other year in history) and a total discharge of 1.34 trillion cubic feet of water, almost six times the volume of Lake Pontchartrain. This record setting amount of freshwater caused salinities to plummet and dissolved oxygen levels to bottom out which had a devastating effect on the marine natural resources of the surrounding coastal environment. This inflow also caused extensive algal blooms across the region that impacted coastal recreational activities.

The Gulf States Marine Fisheries Commission arranged this general session to more completely illustrate this freshwater event and the impacts associated with it. The following presentations will outline the freshwater discharge, the associated environmental monitoring, and the different impacts that were observed across the northern Gulf of Mexico.

A full recording of the 2019 Freshwater Impacts to Marine Natural Resources Along the Northern Gulf of Mexico Session can be found on the GSMFC YouTube Channel (https://www.youtube.com/watch?v=lxhJ3d--Jus).

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

Scott Mize (USGS / Lower Mississippi Gulf Water Science Center)

Scott provided an overview of all the openings of the Bonnet Carré Spillway and compared the amount of freshwater that was released from recent openings to the amount discharged through coastal rivers. He explained that the openings are becoming more frequent due to the amount of freshwater being introduced to the system in the middle of the country. Using satellite imagery, he showed how the freshwater from the two spillway openings in 2019 progressed through Lake Pontchartrain and across the Mississippi sound. He also covered the associated impacts to salinity in coastal waters and the resulting algal blooms.

Impacts to Louisiana's Marine Resources

Jason Froeba (Louisiana Dept. of Wildlife and Fisheries)

Jason reported that Louisiana experienced significant impacts to their marine resources which included nearly 100% oyster mortality on reefs east of the river and resulted in their lowest oyster stock assessment on public grounds in history. Their commercial oyster landings decreased by

35% on private reefs and by 91% on public reefs. Louisiana also had significant impacts to their shrimp, crab, and finfish fisheries as a result of the freshwater event. Their brown shrimp catch per unit effort (CPUE) was 70% below average and white shrimp CPUE was 27% below average. They also had a decrease of 26% in statewide commercial blue crab landings.

Impacts to Mississippi's Marine Resources

Rick Burris (Mississippi Department of Marine Resources)

Rick Burris provide a presentation on the impacts to Mississippi's marine resources which also included nearly 100% mortality of their oysters on their most productive reefs in the west. Mississippi's brown shrimp CPUE was down about 85% across the entire Mississippi coast and the shrimp were growing very slowly. Because of this slow growth, the shrimp never reached the threshold to open the commercial season, so the Mississippi Commission had to use an emergency order to open the 2019 season. Their preliminary brown shrimp landings through August were down about 73% compared to previous years and their blue crab landings were down about 25%. Rick also outlined the very persistent freshwater algal bloom that accrued in the majority of Mississippi coastal waters. This algal bloom resulted in increased water quality sampling and seafood testing as well as extensive beach closures that had an impact on tourism.

2019 Bonnet Carré Spillway Event: USM's Monitoring and Assessment

Read Hendon (USM / Gulf Coast Research Laboratory)

Read Hendon presented on GCRL's monitoring of the waters around the Bonnet Carré Spillway. These efforts focused on water quality sampling, remote sensing and circulation modeling, and oyster spat settlement and were designed to augment the expanded sampling that was being conducted by MDMR. Through their sampling efforts they generated weekly updates of the water quality in the Mississippi Sound for the governor's office. These weekly updates are available online at http://gcrl.usm.edu/news/2019.bonnet.carre.spillway.overview.php. They also conducted source water tracking that showed Mississippi River water impacted the entire Mississippi Sound. Through their circulation modeling work they were able to show a daily pulse of freshwater from the Lake Borgne into the Mississippi Sound and a persistence of the freshwater in the western sound even after the spillway was closed.

Economic Impacts to Alabama as a Result of the Freshwater

John Mareska (Alabama Department of Conservation and Natural Resources / Marine Resources Division)

John Mareska reported that although Alabama did not see significant impacts to their marine natural resources like Louisiana and Mississippi, they did have economic impacts as a result of the freshwater event, with the primary one being a 60-90% reduction in seafood from Louisiana and Mississippi to Alabama processors. John pointed out that even though they didn't have impacts from the Mississippi River discharge they did experience much higher discharges of freshwater from the Mobile River which resulted in freshwater conditions on some of their oyster reefs for over 100 days.

Bonnet Carré Spillway 2019 Event: Environmental Impacts in Mississippi Bight?

Brian Dzwonkowski (University of South Alabama / Dauphin Island Sea Lab)

Brian Dzwonkowski provided a presentation on the University of South Alabama's rapid response to collect data on the impacts of the 2019 freshwater event. He outlined all the freshwater sources that affect the region on an annual basis and how the freshwater from the Bonnet Carré Spillway differed from the normal sources and how it, in conjunction with the natural flooding period of local rivers, impacted the coastal environment. Their CTD and water quality sampling demonstrated extremely low surface and bottom salinities and extended periods of hypoxic conditions over large areas of the continental shelf offshore of Alabama. Brian also explained how wind-driven shelf circulation (downwelling and upwelling) were affecting the hypoxic conditions in Alabama's coastal environment. This research outlines the reoccurring problem of hypoxic conditions that develop over large areas of the mid-shelf environment of the northern Gulf of Mexico and the need to better understand the factors that are leading to these conditions.

Attendees

Jason Adriance
LDWF
Baton Rouge, LA

James Ballard
GSMFC
Ocean Springs, MS

Scott Bannon
ADCNR
Dauphin Island, AL

Jon Bell
NOAA
Pascagoula, MS

Donna Bellais
GSMFC
Ocean Springs, MS

Harry Blanchet
LDWF
Baton Rouge, LA

Gregg Bray
GSMFC
Ocean Springs, MS

Allan Brown
USFWS
Atlanta, GA

Rick Burris
MDMR
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Glenn Constant
USFWS
Baton Rouge, LA

Roy Crabtree
NOAA Fisheries
St. Petersburg, FL

Laura Deighan
Audubon
New Orleans, LA

Dave Donaldson
GSMFC
Ocean Springs, MS

Dan Ellinor
FWC
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Baton Rouge, LA

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TPWD
Rockport, TX

Jerry Mambretti
TPWD
Dickinson, TX

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Trevor Moncrief
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Public
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College Station, TX

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