



Hot and Out of Breath: Heatwaves and Our Coastal Fisheries

(Repost from Lagniappe Blog)

Louisiana is in the midst of an extreme heatwave and drought. As of Oct 6, according to the University of Nebraska's drought monitor, almost 85 percent of our state is in "extreme drought" while 58 percent of our state is in "exceptional drought". To add some perspective to this statement exceptional drought (D5 on a D0 – D5 scale) is the highest category of drought and historically has resulted in compromised fishing, loss of pastures, loss of crops and water shortages. Compounding the ecological strain resulting from the drought, this summer southern Louisiana has experienced extreme heat not observed in 100 years. In the summer of 2023, Baton Rouge had 32 days at or exceeding 100°F, while the next closest case of extreme heat of this magnitude was in 1921 with 21 days at or exceeding 100°F (temperature measured at the Baton Rouge Regional Airport and Southeast Baton Rouge Monitoring Stations). In response to this extreme heat, the Louisiana Department of Wildlife and Fisheries has published a press release (www.wlf.louisiana.gov/news/wildlife-affected-by-extended-heat-wave-drought-in-louisiana) highlighting some of the dire effects that extreme prolonged heat has on wildlife including water birds, deer, turkey and quail. However, as important heatwaves are to our terrestrial wildlife, we should take a minute to discuss how extreme heat can affect the coastal living resources we are also dependent on.

Extreme heat can result in a variety of challenging environmental conditions for coastal fish and invertebrates. While we typically think of these animals as being able to find refuge from high heat in the water, sustained extreme temperatures decreases the opportunities to find shelter or tolerable habitat. Listed here are a just few of the environmental conditions that increase stress on coastal fish and invertebrates in cases of extreme heat:

Low Dissolved Oxygen

One way heat affects aquatic organisms is the reduction of available oxygen in the water. Water with higher temperatures holds less oxygen, which is essential for survival for fish and invertebrates. Water that holds the normal amount of oxygen to sustain living creatures is called "normoxic" and has dissolved oxygen concentrations generally greater than 3mg of oxygen per liter of water. However, when the water gets hot, the concentration of oxygen decreases to below 2–3 mg of oxygen per liter and becomes "hypoxic", where organisms must strain to get the required oxygen they need to survive. In our part of the world we are very familiar with hypoxic water specifically in the summertime, where the "dead zone," a hypoxic layer on the bottom of the ocean, forms near the mouth of the Mississippi and Atchafalaya rivers [1]. However, this "dead zone" is not just a result of increased temperatures, but the consumption of dead organic matter and algae by bacteria who consume oxygen in the water resulting in hypoxia. For coastal fisheries, hypoxia is especially concerning because it can adversely affect fish and invertebrates, even kill them. This is especially true for immovable invertebrates, such as oysters, or larval and juvenile fish that are not especially mobile [2]. Prolonged hot hypoxic water can result in widespread die-offs which can result in poor fisheries production and low fishery yields.

High Metabolisms

Most species of coastal invertebrates and fishes are cold-blooded or "ectothermic", meaning their body temperature and metabolism is directly correlated with the temperature of the surrounding water. For fish and invertebrates that are in high densities, or are young and vulnerable, extreme heat can be especially detrimental through their metabolisms. As young fish and invertebrates grow, they are dependent on their ability to find food to sustain that growth. In areas experiencing extreme heat, it is sometimes the case that young animals are not able to find the food they need to survive or be able to compete with other individuals in their

cohort, resulting in reduced growth or even starvation [3]. However, not only does high temperatures affect juvenile or larval fish and invertebrates. Adult animals can also easily be stressed by extreme high heat resulting in low energy stores or reproductive production [4].

Physiological Stress

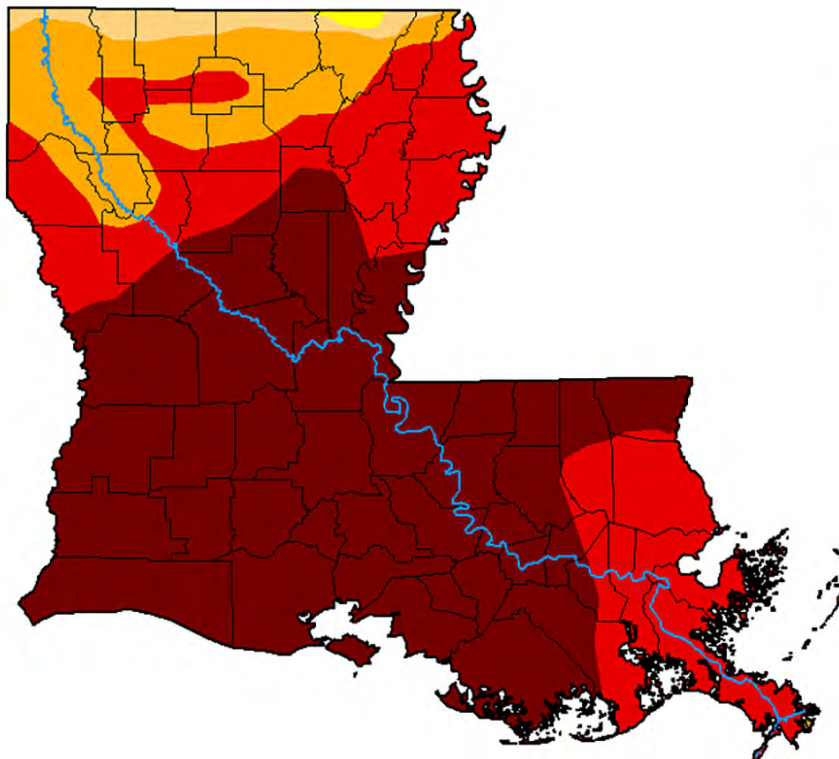
At some point, all living things reach their limit. For ectothermic fish and invertebrates, thermal tolerances ranges from species to species; however, many species of fish and invertebrates start to exhibit physiological stress at temperatures $< 30^{\circ}\text{C}$ (86°F) [5]. Although some species of pupfish (Family: Cyprinodontidae) can live in waters exceeding 40°C (104°F). For many species of coastal fish, the preferential method of avoiding high temperatures is to move to deeper cooler waters. However, for less mobile animals that do not have the ability to move far or fast to find refuge, there are few options to avoiding high temperatures and cool their bodies resulting in mortality from extreme heat. From a study in Texas, 13 percent of fish kills occurring from 1951 to 2006 were the direct result of temperature, although many of these cases were due to the water the fish were living in simply drying up [6]. For many fishers, the question remains: “What can be done?” and the answer is somewhat disappointing: “Not much”. The duration and extremeness of heatwaves like these are projected to increase in the southern United States over the next 50 years, so what we’ve observed this summer in Louisiana may not be an uncommon phenomenon in the future [7]. However, one way we may be able to adapt as resource users is to proactively alter our fishing habits and use conservation-based best practices. If it’s extremely hot, and the animals are stressed, excessive resource use may make things worse. Protecting our living resources by conserving them is one of the best ways to keep Louisiana fishing for generations to come.

Literature Referenced:







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U.S. Drought Monitor Louisiana

October 3, 2023
(Released Thursday, Oct. 5, 2023)
Valid 8 a.m. EDT



Intensity:

	None
	D0 Abnormally Dry
	D1 Moderate Drought
	D2 Severe Drought
	D3 Extreme Drought
	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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Louisiana Wildlife and Fisheries Commission sets 2023-2024 Oyster Season

The following dates were set for the upcoming oyster season:

- The Calcasieu Lake Public Oyster Area will open solely for sacking of market size oysters: the West Cove shall open one-half hour before sunrise on Sunday, Oct. 15, 2023, and East Cove shall open one-half hour before sunrise on Monday, Jan. 1, 2024.
- The Sister Lake Public Oyster Seed Reservations Public Oyster Seed Ground, Vermilion/East and West Cote Blanche Bay/Atchafalaya Bay Public Oyster Seed Grounds will open for bedding purposes only one half-hour before sunrise on Monday, Oct. 9, 2023, and will close one half-hour after sunset that same day.
- The Sister Lake Public Oyster Seed Reservations Public Oyster Seed Ground as described in R.S. 56:434, shall open for sacking of market oysters for direct sale at one-half hour before sunrise on Tuesday, Oct. 10, 2023, and shall close to the harvest of market oysters at one-half hour after sunset on Monday, Oct. 30, 2023.
- Bay Gardene Public Oyster Seed Reservation, Vermilion/East, West Cote Blanche Bay/Atchafalaya Bay Public Oyster Seed Grounds, including all areas east of Mississippi River, Louisiana Department of Health (LDH) Shellfish Harvest Areas 1, 2, 3, 4, 5, 6, 7 will open for sacking of market size oysters only one half-hour before sunrise on Monday, Nov. 13, 2023 and shall close at one-half hour after sunset on Monday, April 1, 2024 (or if biological data indicates that harvest levels have been met).

During the 2023-24 oyster season, the following provisions will be in effect:

- Any vessel from which any person(s) takes or attempts to take oysters from the public oyster seed grounds and reservations described above shall be restricted to a daily limit not to exceed 30 sacks of oysters per vessel, except for Calcasieu Lake. The daily limits for Calcasieu Lake shall not exceed 15 sacks of oysters per vessel per day in aggregate between West Cove and the East Side, with no more than five sacks coming from the East Side per day. The possession limit shall be twice the daily limit for the Public Oyster Seed Grounds and Reservations East of the Mississippi River, as described in Louisiana Administrative Code (LAC) LAC 76:VII.511 and LAC 76:VII.513, Louisiana Department of Health (LDH) Shellfish Harvest Areas 1, 2, 3, 4, 5, 6, 7. The daily and possession limits for Sister Lake Public Oyster Seed Reservations Public Oyster Seed Ground as described in R.S. 56:434, Vermilion/East and West Cote Blanche Bay/Atchafalaya Bay Public Oyster Seed Grounds, shall not exceed 30 sacks of oysters per vessel per day. A sack of oysters for the purposes of this Declaration of Emergency shall be defined as the size described in R.S. 56:440. If sacks smaller than the size described in R.S. 56:440 are used, the daily harvest and possession limit shall be based on the number of sacks used, not the size of the sack or other measures. The daily take and possession limit shall not apply to vessels harvesting seed oysters for bedding purposes. The possession limit shall not apply to vessels operating under a valid Oyster Cargo Vessel Permit, and these vessels shall not harvest oysters.
- All vessels harvesting on the open public oyster seed grounds on Monday, Oct. 9, 2023, shall be harvesting seed oysters for bedding purposes only and shall not have sacks or other containers typically used to hold oysters on board the harvest vessel, except for Calcasieu Lake.
- A vessel is limited to either harvesting market oysters for direct sale (sacking) or harvesting seed oysters for bedding purposes on any one day and is specifically prohibited from doing both.
- If any person on a vessel takes or attempts to take oysters from the public oyster areas, seed grounds or reservations described above, all oysters contained on that vessel will be deemed to have been taken from said seed ground or reservation from the time harvest begins until all oysters are off-loaded dockside.
- The harvest of seed oysters from a public oyster seed ground or reservation is for the purpose of moving the live oyster resource. The removal of more than 15 percent of non-living reef material in bedding loads is prohibited. All vessels must allow on-board inspection and sampling of seed oyster loads by LDWF biologists and/or agents.
- All oysters harvested from public areas, seed grounds or reservations for the purpose of market must be uncontaminated, sealed, and not gaping.
- All oysters harvested from public areas, seed grounds or reservations for the purpose of market sales must measure a minimum of three inches from hinge to bill.
- Market oysters harvested from any public oyster area (including Calcasieu Lake), seed ground or reservation must be sacked, the number of sacks recorded in a logbook, and each sack properly tagged prior to leaving said public oyster area, seed ground or reservation, with the exception of bedding vessels.
- All vessels located in public oyster areas, seed grounds or reservations during those times between one-half hour after sunset and one-half hour before sunrise must have all oyster scrapers unshackled.

- The use of oyster scrapers is prohibited in Calcasieu Lake. Oyster harvesting shall be limited to using hand tongs on vessels harvesting oysters or collected by hand. Oyster tongs shall be made as a grasping device consisting of two pieces joined by a pivot or hinged like scissors used for picking up objects.
- Every vessel harvesting oysters from the Public Oyster Areas for oyster resource shall report harvest information to the LDWF before 9 p.m. each day fished. Vessels shall provide the following information: captain's name, oyster harvester number, vessel number, the total number of sacks harvested that day, total barrels of seed removed and the LDH harvest area fished. Electronic reporting will be done through the e-Reporting application via smart phone. The eReporting app is supported by both iOS and Android. Fishermen will need to download the app from these links at the Apple Store or Google Play Store then create an account using an email. The registration page requires name, commercial fishing license number and type of license to register. Once the account is created, the fisherman will add their vessels. The following link will soon contain instructions for using the eReporting app: www.wlf.louisiana.gov/page/oyster-e-reporting. The call option is still available to submit harvest reports at (800) 442-2511. This reporting does not substitute for trip ticket reporting.

The following areas will remain closed for the entire 2023-24 oyster season:

1. The Hackberry Bay, Lake Mechant and Bay Junop Public Oyster Seed Reservation as described in R.S. 56:434.
2. The 2022 Drum Bay Cultch Plant with the following coordinates:

North Plant

29° 53' 24.837", -89° 17' 08.500"
 29° 53' 50.990", -89° 16' 30.541"
 29° 54' 12.658", -89° 16' 43.889"
 29° 53' 55.360", -89° 17' 30.601"

South Plant

29° 52' 32.400", -89° 19' 18.340"
 29° 52' 36.238", -89° 18' 40.818"
 29° 53' 07.579", -89° 19' 36.541"
 29° 53' 18.409", -89° 19' 07.703"

Drum Bay SOS Enhancement

29° 52' 50.471", -89° 16' 38.502"
 29° 52' 54.871", -89° 16' 25.121"
 29° 52' 49.018", -89° 16' 21.173"
 29° 52' 44.382", -89° 16' 34.559"

3. Lake Tambour, Lake Chien, Lake Felicity, Deep Lake and Barataria Bay Public Oyster Seed Grounds as described in LAC 76:VII:517.
4. The Little Lake Public Oyster Seed Grounds as described in LAC 76:VII:521.
5. The 2023 Calcasieu Lake Cultch Plant with the following coordinates:

2023 Calcasieu Lake Cultch Plant

29° 50' 31.761", -93° 18' 42.243"
 29° 50' 20.951", -93° 18' 44.229"
 29° 50' 29.153", -93° 18' 21.044"
 29° 50' 18.585", -93° 18' 21.352"

6. Oyster harvest on the Sabine Lake Public Oyster Area is prohibited as described in R.S. 56:435.1.
7. The Calcasieu Lake artificial reef with the following coordinates:

29° 53' 16.5", -93° 16' 56.9"
 29° 53' 16.4", -93° 16' 34.8"
 29° 52' 57.2", -93° 16' 34.7"
 29° 52' 57.2", -93° 16' 56.8"

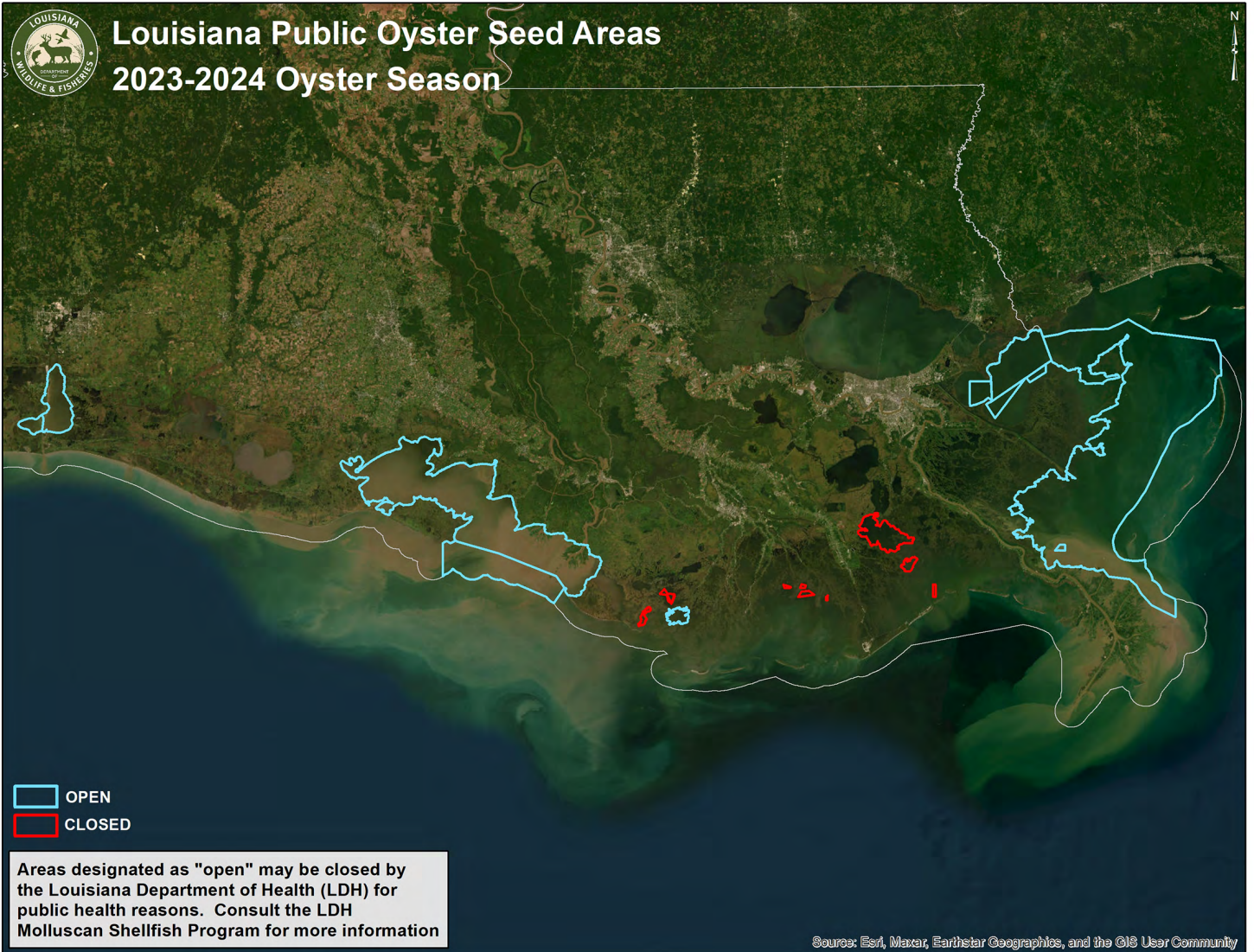
The secretary of the department was authorized by the commission to set closure dates and adjust sack limits and/or sacking-only areas based on biological harvest data or if enforcement issues are encountered. The secretary is also authorized to take emergency action to close or reopen areas previously closed if the threat to the resource has ended and to open public areas if substantial oyster resources are located.

Public notice of any opening, delay or closing of a season will be provided at least 72 hours prior to such action, unless such closure is ordered by the Louisiana Department of Health for public concerns.

Area/Public Ground	Season	Limit
East of MS River, North of MRGO (Sacking Only)	Opens Nov. 13, 2023 (Closes April 1, 2024)	30 sacks/vessel/day *
East of MS River, South of MRGO (Sacking Only)	Opens Nov. 13, 2023 (Closes April 1, 2024)	30 sacks/vessel/day*
Sister Lake, Vermillion/East and West Cote Blanche Bay /Atchafalaya Bay Public Oyster Seed Grounds – Bedding only	Opens Oct. 9, 2023 (One day only)	No more than 15 percent of non-living material allowed in bedding loads.
Sister Lake – Sacking	Opens Oct. 10, 2023 (Closes Oct. 30, 2023)	30 sacks/vessel/day (take and possession)
Vermillion/East and West Cote Blanche Bay / Atchafalaya Bay Public Oyster Seed Grounds - Sacking	Opens Nov. 13, 2023 (Closes April 1, 2024)	30 sacks/vessel/day (take and possession)
Hackberry Bay, Lake Mechant, Bay Junop Public Oyster Seed Reservation, Lake Tambour, Lake Chien, Lake Felicity, Deep Lake, Barataria, Little Lake	Closed No Season	Closed No Season
Calcasieu Lake (West side)	Opens Oct. 15, 2023	15 sacks/vessel/day (take and possession)**
Calcasieu Lake (East side)	Opens Jan. 1, 2024	5 sacks/vessel/day (take and possession)**

* *The possession limit shall be twice the daily limit.*

** *No more than 15 sacks of oysters per vessel per day for the entire Calcasieu Lake.
No scrapers: Tong or hand only*



Gulf Council Hosts a Meeting of its Shrimp Advisory Panel

The Gulf of Mexico Fishery Management Council will convene a one-day, hybrid meeting of its Shrimp Advisory Panel (AP) on Thursday, Oct. 19, 2023, from 8:30 AM to 5:00 PM EDT. The meeting will be held at the council offices located at 4107 W. Spruce St., Suite 200 in Tampa, FL 33607.

The panel will begin by reviewing council actions taken in response to motions from the most recent Shrimp AP meetings. Next, the council will hear a presentation on the National Marine Fisheries Service (NMFS) cellular vessel monitoring system project. The AP will then receive an update on gulf wind energy before hearing a report on the re-initiation of a shrimp biological opinion as it relates to sawfish and giant manta rays, and an update on recent Endangered Species Act listings and Critical Habitat Rules. Finally, the AP will receive an update on SEDAR 87 for brown, white and pink shrimp, and receive an overview of Deepwater Horizon Natural Resource and Damage Assessment Projects.

Public comment will be held before the meeting adjourns.



Two Commercial Fishing Companies Cited for Fishing Violations

Louisiana Department of Wildlife and Fisheries (LDWF) enforcement agents have cited two commercial fishing companies for violations related to harvest of menhaden.

The charges stem from three separate events of spilling or releasing of contents of menhaden purse seines resulting in dead fish found near and on Cameron Parish beaches in September.

Agents cited Omega Protein for two counts of failing to report the release of purse seine gear or menhaden within two hours on Sept. 20 and Westbank Fishing LLC for excessive killing of fish on Oct. 4.

LDWF agents learned about the dead fish on the beach and began an investigation. The investigation is still ongoing and further charges could be pending. In addition to the citations issued, each company will face civil restitution for the value of the fish released or lost in each incident.

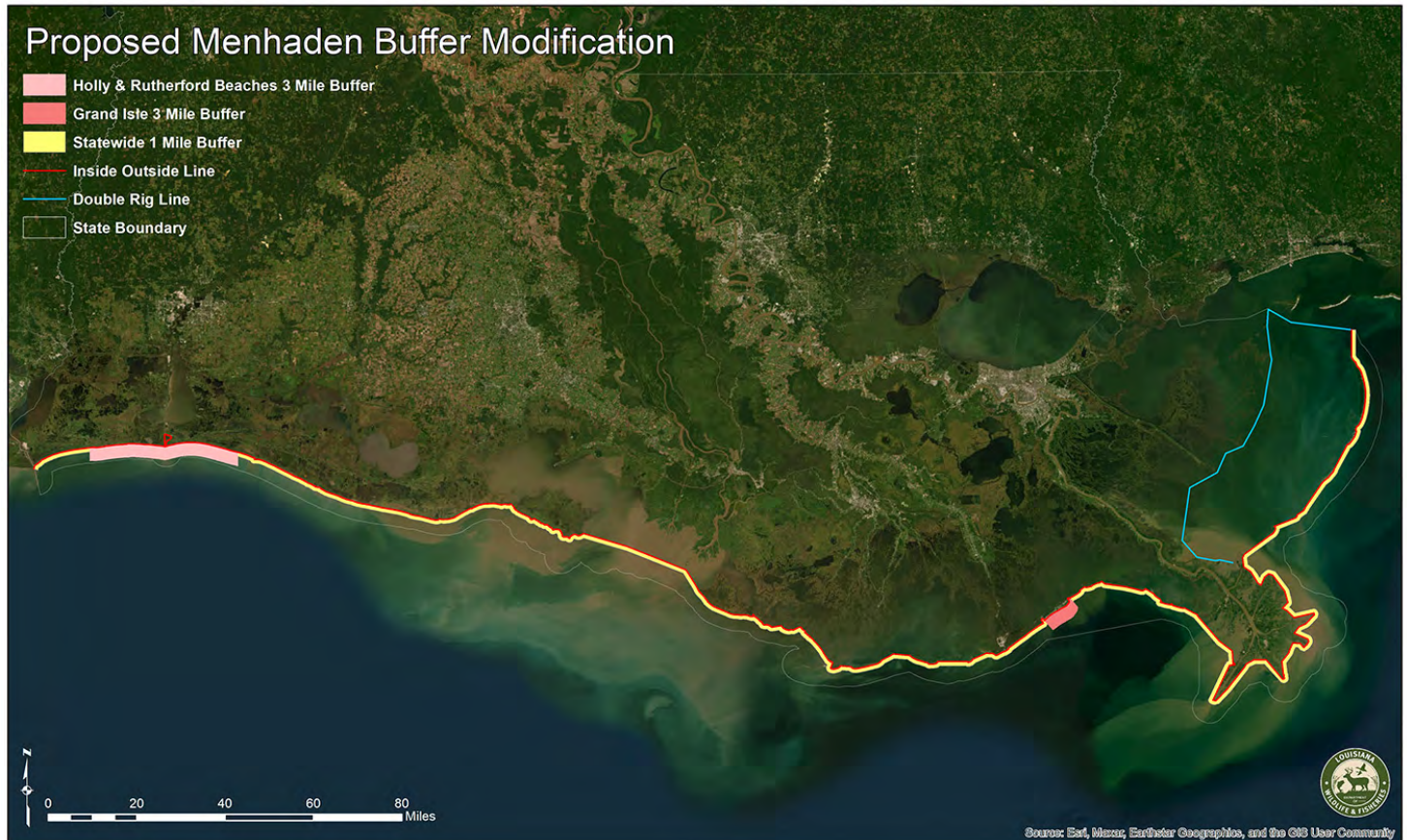


LWFC Passes NOI to Modify Rules for Menhaden Fishery

The Wildlife and Fisheries Commission passed a Notice of Intent (NOI) to amend rules to the menhaden fishery regarding the buffer zone and spill reporting.

Buffer Zone

This portion of the NOI establishes a coastal buffer zone for the commercial harvest of menhaden one-mile off the entire Louisiana coastline and three miles from the area between Holly Beach and Rutherford Beach in western Louisiana. This action will extend the existing ¼-mile buffer and the existing three-mile buffer at Grand Isle will remain in place.



Reporting

The section of the NOI establishes a 48-hour period for retrieving any menhaden or bycatch that is unintentionally or intentionally released into the environment and provides penalties and restitution associated with failure to comply. Additionally, the NOI specifies that reporting must also be made by phone call (in addition to the existing email requirement) within two hours of any release to the Enforcement Division. The proposed rule modification details specific reporting elements that must be included in the notification to the Enforcement Division.

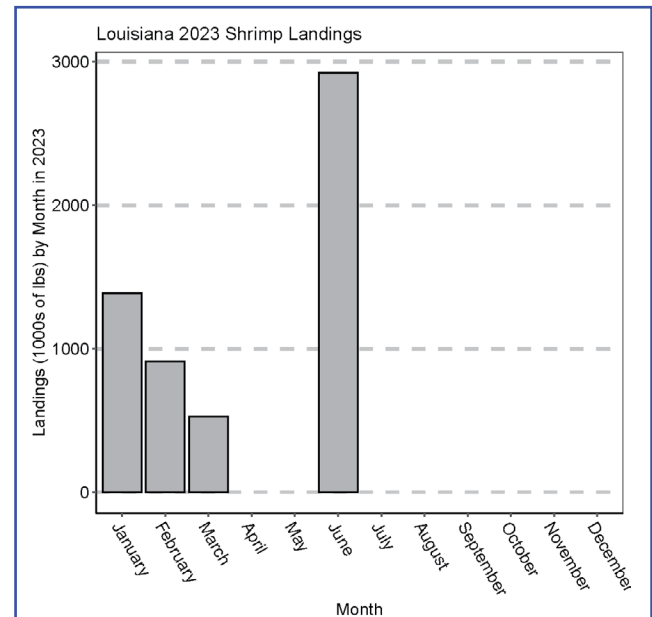
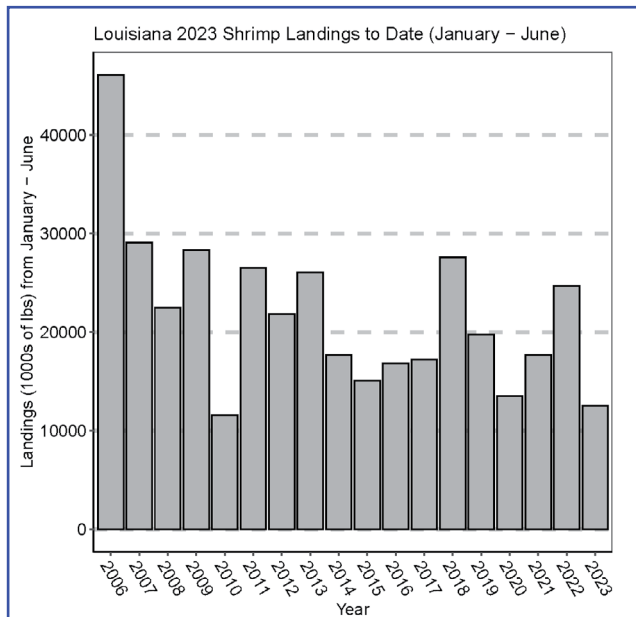
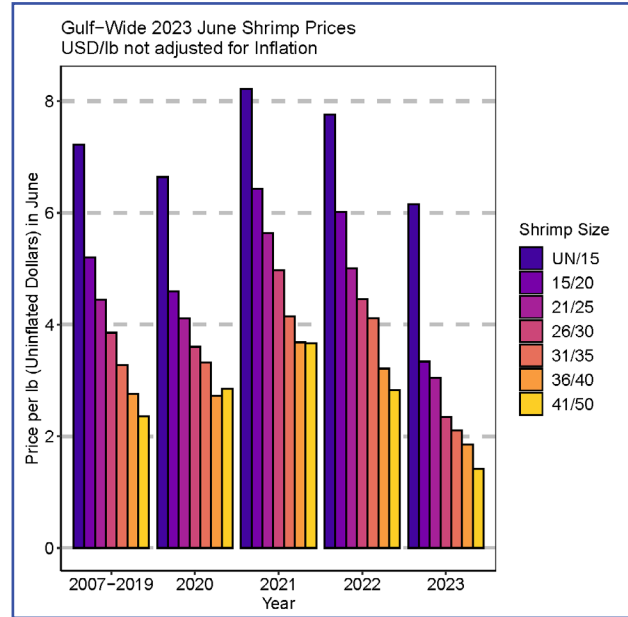
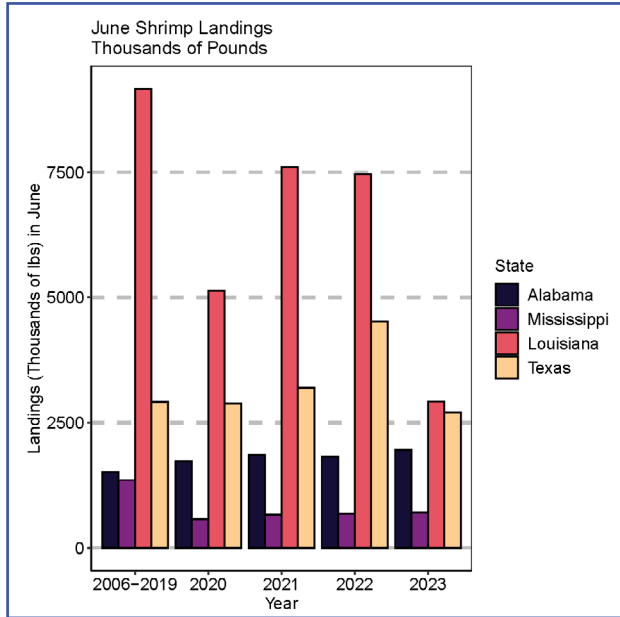
The data that will be required to be reported after a fish release will include:

- Date and time of the release
- Species of fish released
- Disposition of the fish released
- Name of the vessel which released the fish
- Estimation of the number of fish released
- Photo/video evidence of the release
- Coordinates of the release
- Causative factors of the release

Before the rule becomes final, the commission will hear a presentation about the economic impacts of this rule.

Louisiana Shrimp Watch

The Shrimp Watch data is here for the October issue and includes data through June, although data for April and May are still being updated. All landing data is based on trip ticket data provided by Gulf States and no estimations have been made.



THE GUMBO POT

CREAM OF OYSTER SOUP*

Recipe courtesy of Rudy Lombard for *Louisiana Kitchen & Culture*

For more recipes or to subscribe to their magazine or free newsletter, please visit <http://louisiana.kitchenandculture.com/>



Ingredients:

- 1 pint of Louisiana oysters
- 1 stick unsalted butter
- 4 tablespoons flour
- 1 medium onion, finely chopped
- 2 stalks celery, finely chopped
- 2 cups half and half
- 2 teaspoons fresh chopped parsley (1 teaspoon dried)
- salt and pepper
- hot buttered French bread

Method:

- Drain oysters, reserving liquor and oysters separately.
- Melt butter in a 4-quart saucepan over medium heat; add flour and whisk well. Cook, whisking constantly, for 5 minutes or until roux is golden. Add onion and celery; cook 5 minutes, stirring often. Add reserved oyster liquor and half and half. Cover, reduce heat to low and simmer 20 minutes. Add reserved oysters and parsley. Season with salt and pepper; stir well. Simmer 1 minute or until the edges of the oysters begin to curl.
- Remove from heat and serve immediately with hot buttered French bread.

*Serves 4



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We would like to hear from you! Please contact us regarding fishery questions, comments or concerns you would like to see covered in the Lagniappe. Anyone interested in submitting information, such as articles, editorials or photographs pertaining to fishing or fisheries management is encouraged to do so.

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additional news and timely events between issues.
<https://louisianalagniappe.wordpress.com/>

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