

Florida's Biotoxin Management Plan

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Why are molluscan shellfish one of the most regulated commodities in the US?



- Filter Feeders
- Can retain microorganisms, toxins and chemical contaminants
- If water is contaminated = potential health hazard to consumers
- Necessary because public choose to consume shellfish raw or partially cooked
- \$\$\$ Important economically



National Shellfish Sanitation Program

- A federal/state cooperative program collaborating with the Food and Drug Administration (FDA) and the Interstate Shellfish Sanitation Program (ISSC)
- Establish minimum requirements to regulate interstate commerce of shellfish – NSSP Model Ordinance
- Protects public health by ensuring the harvest of shellfish are from properly classified waters and ensuring shellfish are handled properly at all levels from harvest to final sale to the consumer.
- US Food and Drug Administration oversees and ensures compliance of the NSSP by all member states through annual audits



What shellfish are regulated in Florida?

- Molluscan shellfish
 - Oysters
 - Clams
 - Mussels



Florida's Shellfish harvest area biotoxin management plan

- Staff from SHAC program collect water samples to manage for HAB closures
- Water and meat samples are sent to FWRI for analysis
- Frequency depends on time of year and area
- Shellfish meat may be collected for toxin analyses

The image shows four white plastic bottles with labels for water samples. The labels are handwritten and include the following information:

- Bottle 1:** Date: 8/14/18, SEAS: 030, Location: Cape Romano, 25.844 -81.038, LIVE SAMPLE.
- Bottle 2:** Date: 8/14/18, SEAS: 031, Location: Coon Key, 25.8819 -81.632167, LIVE SAMPLE.
- Bottle 3:** Date: 8/14/18, SEAS: 302, Location: Shell Key, 25.891667 -81.608833, LIVE SAMPLE.
- Bottle 4:** Date: 8/14/18, SEAS: 187, Location: Round Key, 25.851667 -81.524967, LIVE SAMPLE.

Below the bottles is the FDACS Field Data Sheet (SHA 66). The form includes fields for County (Collier), Collector(s), Collection Date, Sample Condition (Live, Preserved), Time Zone, Reason Collected (Routine, Event Response, Other (explain)), and a table for sample data.

SHA	SEAS #	Location Latitude/Longitude	Time	Sample Depth (feet)	Bottom Depth (feet)	Temp (C)	Salinity (ppt)	DO (mg/L)	pH	Observations	For FWRI Use: Shore code	HAB Status
66	030	Cape Romano 25.844 -81.038									1	
66	031	Coon Key, S of 25.8819 -81.632167									1	
66	302	Shell Key, S of 25.891667 -81.608833									1	
66	187	Round Key, N of 25.851667 -81.524967									1	
CL1		Round Key, S of 25.838 -81.5287									1	

At the bottom of the form, there are fields for "RI Use: By:" and "Received On (Date & Time):", and a "Program: FDACS" label.



Species of Concern

- *Pseudo-nitzschia spp.* – Amnesic shellfish poisoning (ASP)
- *Pyrodinium bahamense* – Paralytic shellfish poisoning (PSP)
- *Karenia brevis* – Neurological shellfish poisoning (NSP)



Pseudo-nitzschia spp. (ASP)

- **Precautionary Closure:** Cell counts approach or exceed 1,000,000 cells/liter if a meat sample can't be collected within 1-2 days. Subject to toxin levels in water samples.
 - Meat sample has a positive result from Neogen Reveal 2.0 for ASP
- **Closure:** Meat sample results $\geq 2\text{mg}/100$ grams (HPLC-UV)
- **Reopening:** Meat test results $< 2\text{mg}/100$ grams on two consecutive samples 7 days apart (HPLC-UV)

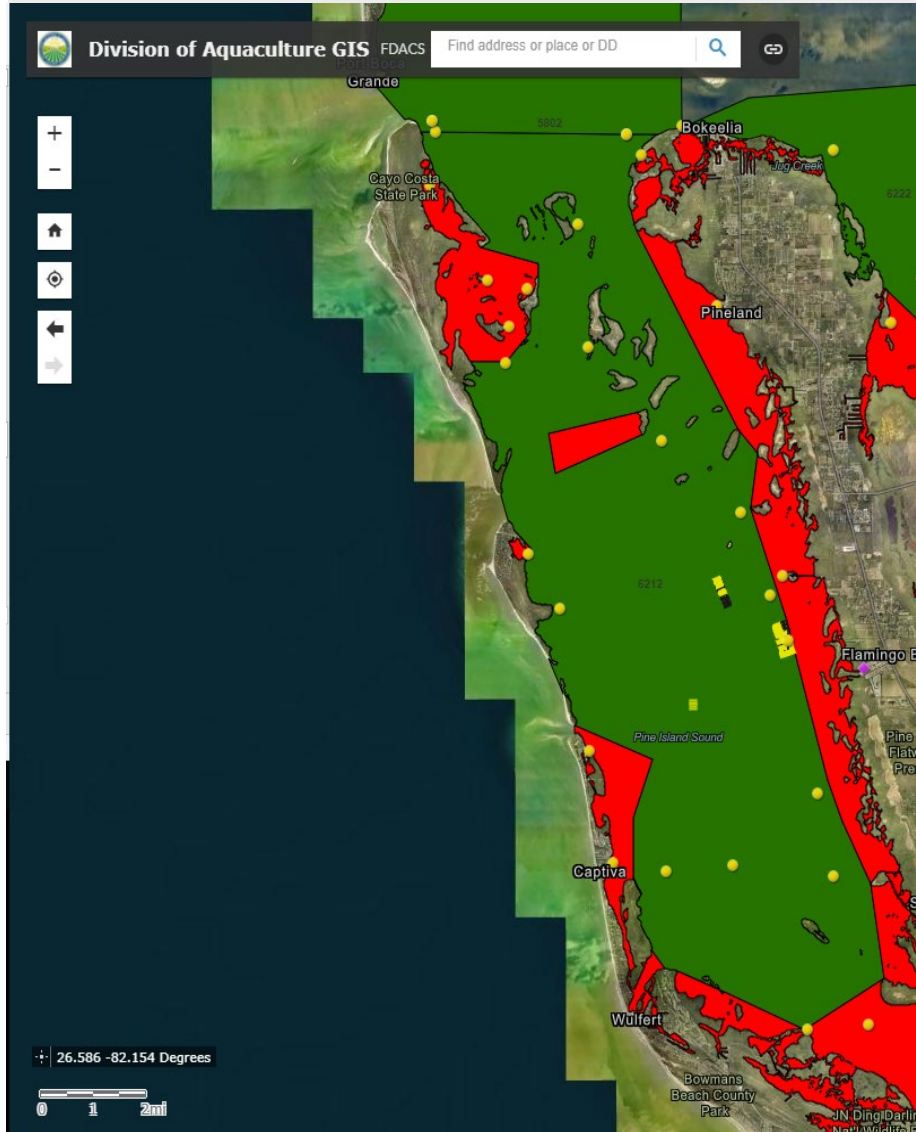


Pyrodinium bahamense (PSP)

- **Precautionary Closure:** Cell counts can cause a trigger if meat samples can not be obtained in 1-2 days.
 - Meat sample has a positive result from Neogen Reveal 2.0 for ASP
- **Closure:** Meat sample results $\geq 80\mu\text{g}/100$ grams subject to status of bloom
- **Reopening:** Meat test results $< 80\mu\text{g}/100$ grams on two consecutive samples 7 days apart (PSP mouse bioassay)

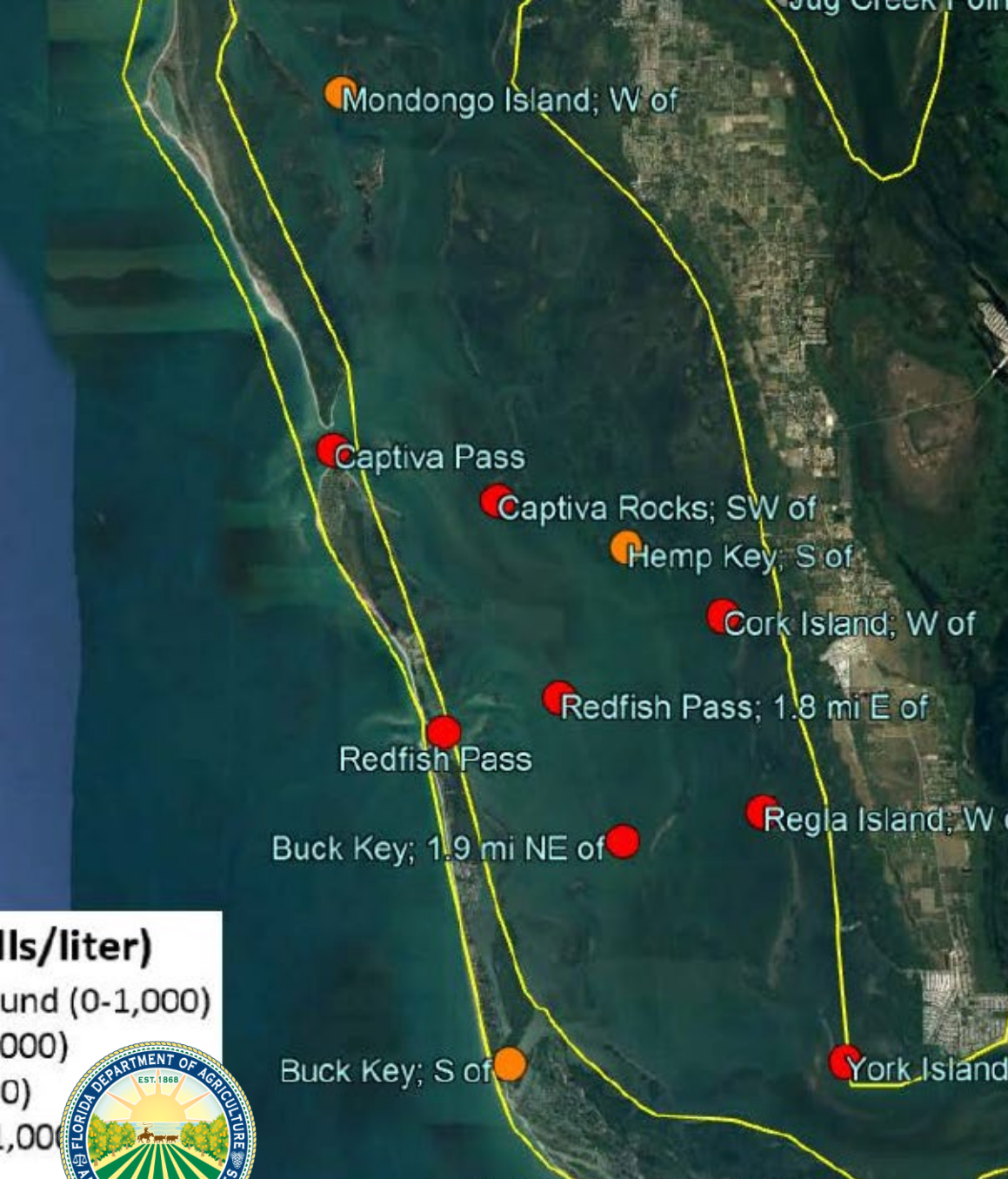


Karenia brevis (NSP)



- **Shellfish Harvest Area Plan**
- **Precautionary Closure:** >50,000 c/L adjacent to SHA, >5,000 c/L in SHA collected by other agency
- **Closure:** >5,000 c/L in SHA collected by FDACS
- **Reopening:** <5,000 c/L and meat results and <20 mouse units/100g (NSP mouse bioassay) or,
 - ≤ 1.6 ppm (Clams, ELISA)
 - ≤ 1.8 ppm (Oysters, ELISA)
- Note: Southwest Florida harvest areas have specific aquaculture lease NSP biotoxin management plans developed late 2020.



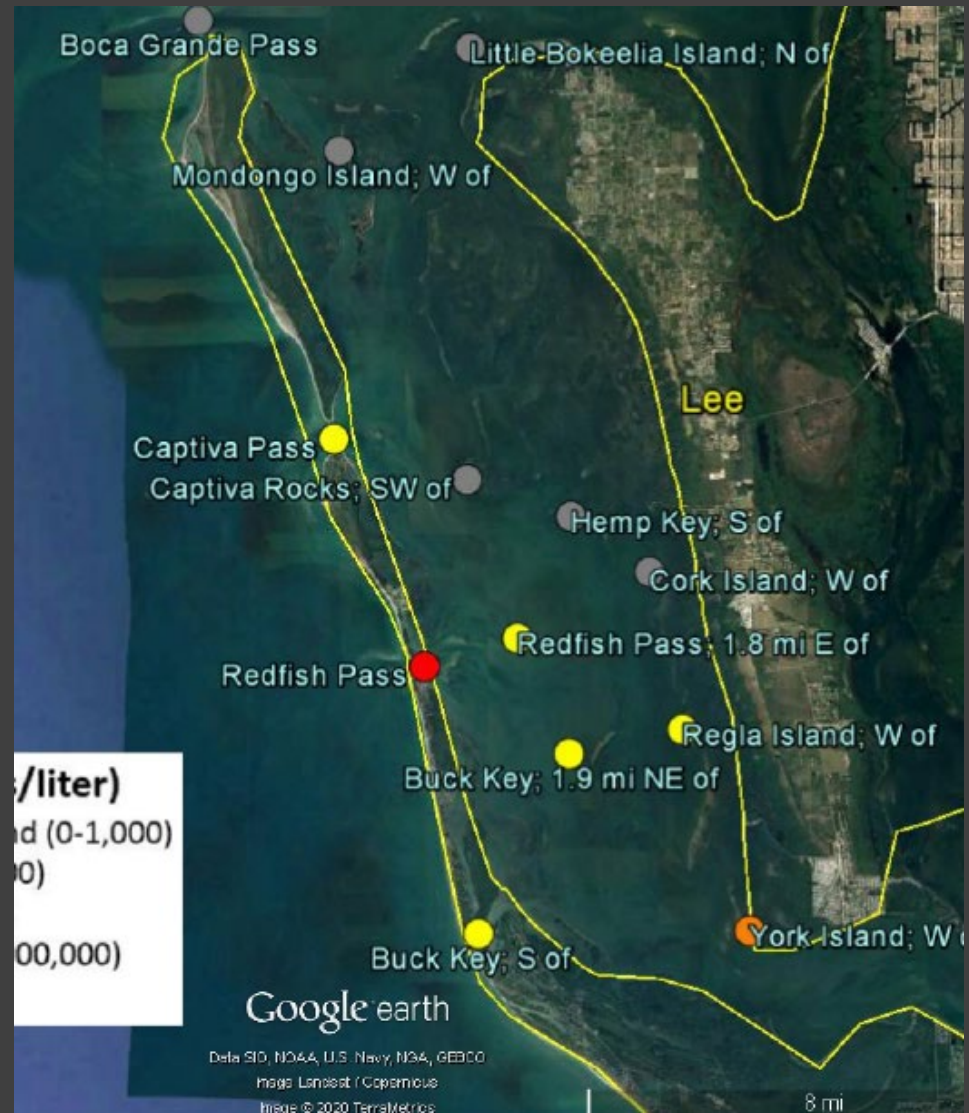


Shellfish Industry effects from red tide

- Shellfish area closures may last for months (2018 bloom lasted for almost 18 months in SW Florida)
- Loss of revenue for industry growers
- Loss of clam/oyster crop (>75% of clams had died over bloom length)
- Consumer safety concerns

Aquaculture Use Zone management

- Implemented in Lower Tampa Bay, Gasparilla and Pine Island Sound
- Allows leases to remain open while the SHA is closed and the bloom is monitored
- Weekly meat sampling on leases is initiated when cell counts exceed 5,000 c/L at any station within the harvest area.
- Specific to NSP



FWRI: 12/14/2020

Aquaculture Use Zone management

