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Commissioner of
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Florida Department of
Agriculture and
Consumer Services

Florida Aquaculture

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Division of Aquaculture

Highlights:

- Farmers and Agencies nail Davis Productivity Award!
- Domoic Acid suspected in marine mortalities.
- Shellfish farming has come a long way in 20 years.

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Innovative Red Tide Program Receives Davis Award

The Davis Productivity Awards program has recognized a multi-farm and agencies partnership that created and has been testing the marketing of Southwest Florida hard clams when red tide is present in the region.



An eight member Hard Clam Aquaculture Biotoxin Monitoring Partnership implemented a quarantine option for harvested clams until meat tests are completed to prove product safety. The pilot program was implemented 15 times. On 10 occasions clams were released to market resulting in an estimated \$250,000 to \$300,000 in sales. Six certified shellfish processors and between 30 and 40 hard clam farmers from Gasparilla and Pine Island Sounds have benefited.

Shellfish harvest area closures in this region have occurred for the last 40 years. Shellfish producers are hurt in the short and long term by lost sales and market opportunities. A red tide closure during 2001 resulted in \$3 million lost in direct sales and a total region wide economic impact of \$4.9 million.

The quarantine option was suggested by Dan Leonard of Bull Bay Clam Farm. Clam meat samples are collected and Dr. Karen Steidinger, Florida Marine Research Institute, and her staff complete biotoxin testing.

The synergy generated by this public-private partnership provided the justification, scientific information and programmatic resources to make this option viable and successful.

The U.S. Food and Drug Administration, during their recent audit of the Division's shellfish programs, suggested minor changes to strengthen management procedures. FDA's constructive response is a remarkable endorsement. Twenty-four coastal states manage shellfish harvest and none have considered or adopted this innovative approach.

The Davis Productivity Awards recognize and reward programs that significantly and measurably increase productivity and promote innovation to improve the delivery of state services and save money for Florida taxpayers and businesses. The program is a major government improvement initiative chaired by Lt. Governor Toni Jennings and sponsored by Florida Tax-Watch, The Florida Council of 100, and the State of Florida.

Florida Shellfish Farmers: A Step Ahead

Florida is famous for shellfish, producing an estimated \$29 million worth of clams each year. Less than 5% of the Florida production is harvested from wild stocks with the remaining cultured or farmed on submerged lands.

The Florida Department of Agriculture and Consumer Services promotes and regulates aquaculture within the State. The Department has statutory authority for 1) regulating shellfish aquaculture, harvesting and

processing, and 2) the classification and status of shellfishing waters (recreational and commercial), pursuant to Chapter 597, Florida Aquaculture Policy Act, Florida Statutes.

The Department regulates the culture and sale of farmed clams through the Aquaculture Certification with Best Management Practices, shellfish processing plant inspection, and the Sovereign Submerged Lands Aquaculture Leasing program. Individuals wishing to engage in clam

culture in State waters must contact the Division to apply for aquaculture certification and to identify waters approved for shellfishing. Clams may be cultured on privately owned submerged bottoms (in approved waters) and on State owned submerged bottoms (clam lease areas) with an authorization from the Board of Trustees in the form of a Sovereign Submerged Lands Aquaculture Lease, pursuant to Chapter 253, Florida Statutes.

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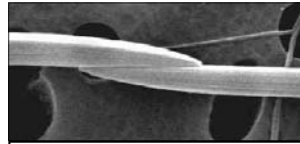
A naturally occurring biotoxin, domoic acid, produced by certain diatoms causes Amnesic Shellfish Poisoning

Unexplained Marine Mortalities Trigger Multi-Agency Response

Red tide organisms, *Karenia brevis* and *Pseudo-nitzschia delicatissima* diatoms, are suspected in the deaths of a variety of vertebrate and invertebrate animals in and around St. Joseph Bay. Between March 10th and 30th over 100 bottlenose dolphins have died and the deaths of jellyfish and horseshoe crabs has been observed. The Division has closed St. Joseph Bay Shellfish Harvesting Area 15 since November 19, 2003 to commercial and recreational harvesting.

A multi-agency team is investigating the deaths. Florida's departments of Health, Agriculture and Consumer Services, and Fish and Wildlife Commission, the National Marine Fisheries Service, and the privately owned Gulf World Marine Park are cooperating in the sampling and testing of water, shellfish and dead dolphins. The Park, located in Panama City Beach, is an entertainment and education facility dedicated to protecting and preserving marine mammals. Analytical work has been carried out at Mote Ma-

rine Laboratory, Florida Marine Research Institute, various laboratories of NOAA's National Ocean Service, Armed Forces Institute of Pathology, and the universities of Florida, Purdue and Miami.



Pseudo-nitzschia pseudo-delicatissima. Chain-forming, toxic diatom that produces domoic acid.

Pseudo-nitzschia spp. produce a toxin, domoic acid, that can be concentrated by plankton feeding species (shellfish, jellyfish, crustaceans, or fish) and can kill these initial consumers or those species that feed upon them (birds, dolphins, fish and crustaceans). Domoic acid, when concentrated in shellfish that are eaten by humans, causes Amnesic Shellfish Poisoning.

Karenia brevis produces a different toxin, brevetoxin, that is also concentrated by plankton feeding shellfish and can trigger Neurotoxic Shellfish Poisoning in humans when consumed.

If the *Pseudo-nitzschia delicatissima* and domoic acid are confirmed as the source and toxin that have killed these species, this will be the first instance for the Gulf of Mexico. Canada and the states of Washington, Oregon and California were the only locales in North America where *Pseudo-nitzschia* spp. and domoic acid have been a human health concern.

For additional information, contact David Heil, 850-488-5471.

Article information courtesy the multi-agency response team. Image courtesy the Florida Marine Research Institute.

Domoic Acid: Frequently Asked Questions

What is domoic acid?

Domoic acid is a naturally occurring toxin produced by diatoms in the genus *Pseudo-nitzschia*. Shellfish and crabs can ingest this marine algae and concentrate domoic acid. Significant amounts of domoic acid can cause Amnesic Shellfish Poisoning (ASP) when contaminated shellfish are consumed by humans.

What are ASP symptoms?

Within 24 hours of ingestion, a consumer can experience vomiting, nausea, diarrhea and abdominal cramps. In severe cases, neurological symptoms develop within 48 hours and

may include headaches, dizziness, confusion, disorientation, loss of short-term memory, motor weakness, coma and possibly death. Short term memory loss is permanent.

How does domoic acid affect humans?

The acid binds to receptor sites in the central nervous system disrupting and damaging neurotransmissions.

Does cooking shellfish make it safe to eat?

No. Domoic acid is not destroyed by cooking or freezing.

What should be done if ASP is suspected?

If symptoms are mild, call your health care provider and local public health agency. If symptoms are severe, call 911 or transport the affected person to the emergency room. There is no ASP antidote.

Information courtesy the Florida Marine Research Institute and Washington State Department of Health.

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The Florida Fish and Wildlife Conservation Commission (FWC) manages and regulates native fish and wildlife resources. The Commission has statutory authority for wild clam collection pursuant to Chapter 68B-17, Florida Administrative Code. The Commission manages the wild clam resource through issuance of saltwater products licenses pursuant to Chapter 370.06 Florida Statutes; and wild clam harvest criteria pursuant to Chapter 68B-17, Florida Administrative Code. In addition to the saltwater products license, commercial wild harvesters in Brevard County must obtain a Brevard County Hard Clam License. Commercial wild harvesters in the Canaveral National Seashore in Volusia County must also obtain a special authorization from the U.S. Department of the Interior.



partment of Agriculture, farmers have the ability to monitor real-time growing and working conditions in lease areas by accessing DACS weather stations online. Farmers also have the ability to exclude predation by use of cover wire over the grow-out bags.

HARVESTING

While working on the water and throughout transport, farmers are not restricted on clam sizes of clams in their possession. However, pursuant to Chapter 68B-17.003, Florida Administrative Code, wild harvesters can not harvest or sell any hard clam measuring less than 1 inch in thickness across the hinge nor can they possess more than one bushel of unsorted hard clams in a vessel while on the water. Farmers also enjoy the added benefit of being able to wash and sort clams onshore (in a cool, spacious location) prior to replanting or delivery to a certified processor.

LOGISTICS Aquaculture Certified clam farmers enjoy many advantages in comparison to wild harvesting. Clam farmers do not need to continually search for productive areas in which to harvest. Farmers utilizing a Sovereign Submerged Lands Aquaculture Lease are ensured that production/grow-out areas are exclusive to other growers or harvesters. Clam culture typically presumes that a determined quantity of seed “planted” will yield an expected quantity of market clams when harvested. Growers also have the ability to monitor and promote growth of their seed by re-bagging thus reducing crowding and stunting. This management technique ensures a consistent size and high quality product. As a service provided by the De-



PUBLIC HEALTH Additionally, processors and wholesale buyers are assured that cultured clams are harvested from approved waters and should not pose any health risks to the consumer.

BUSINESS PRACTICES

Growers can consistently and continuously produce clams by replanting as soon as clams are harvested and bottom space is available. This makes the farmer a dependable supplier of market clams in the eyes of the processor/wholesaler. With a readily accessible supply of clams, producers are better positioned to cope with fluctuating market demands and pricing.

CERTIFICATION Certified clam producers must comply with the Aquaculture Best Management Practices (BMPs) and the terms of the Sovereign Submerged Lands Lease agreement. Certification ensures that clam farmers compliant with BMPs are not responsible for water quality violations or habitat destruction. Conversely, culture areas (SSL aquaculture leases) are protected (by permit application review) from development of onshore and offshore operations or activities which could be deemed harmful to clam culture and/or ultimately public health. As an added benefit, the BMPs create and regulate a uniform “playing field” for all of the commercial producers. Certified clam producers are eligible to purchase crop disaster insurance to protect their investment. Certified clam producers receive tax breaks on equipment and materials used in the farming operation. Aquaculture clam products (seed, nursery and market clams) accompanied by an Aquaculture Certification Registration Number may be sold to certified producers and certified shellfish processors without the need for a Retail Seafood Dealers license or Saltwater Products License from FWC. Certified leaseholders in Brevard and Volusia Counties are free of any additional regulations stipulated for the harvest of the wild clam resource.



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We're on the Web!
www.FloridaAquaculture.com



Macroalgae culture at the University of Miami.

The Division of Aquaculture's responsibilities include certifying all legitimate aquaculturists through an annual registration, implementing on-farm Aquaculture Best Management Practices to meet the State of Florida's environmental goals, managing 1.4 million acres of coastal waters for the harvest or culture of wholesome shellfish, implementing the National Shellfish Sanitation Program through periodic inspection of shellfish processing plants and product, and managing submerged sovereign land leases for aquacultural purposes.



Additional information about Florida aquaculture or Division programs can be obtained from the following offices.

Apalachicola Shellfish Center:	850-653-8317
Bartow Field Office:	863-519-8459
Cedar Key Field Lab:	352-543-5181
Murdock Field Lab:	941-255-7405
Palm Bay Field Lab:	321-984-4890
Panama City Field Lab:	850-747-5252
Tallahassee Office:	850-488-4033 or 488-5471

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Protecting Natural Resources*

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