



THE BIVALVE BULLETIN

Sunray Venus Clams—From seed (left) to table (right)

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What's in store for 2011? Declamations and proclamations

This is the time of year to take stock of what has occurred in the past year and assess what is in store for the new year. Fortunately, the Deepwater Horizon oil spill, which dominated the clam farming industry's attention last year, is over. Lessons learned and responses to the disaster are reviewed in this newsletter. However, indirect impacts and concerns linger. Most concerning is future clam harvests and sales as many growers reduced seed plantings during the threat of oil. Many of the industry's seed suppliers were also affected due to reduced sales. Currently, hatcheries are up and running with seed availability projected in spring. Go to Page 4 in this newsletter for a listing of Florida seed suppliers. Although the record-setting cold weather may make working on the water unpleasant, clam crops should not be affected. Predictions for a drier winter season are holding true, which should minimize risks this spring when planting seed in some growing areas.

A challenge the industry has faced for several years, which may not change this year, is the lingering national recession. The economy has kept clam prices depressed, while operating costs have steadily increased. There is a need for improved production performance and increased efficiencies. Ongoing applied research projects, focusing on selection of hardier clam stocks, species diversification, and advancement of farm practices, are addressing these objectives. Project updates will be provided at an upcoming industry workshop (see Page 3).

The new year also marks a change in our state agriculture agency with a new commissioner, Adam Putnam, and a new director of the Division of Aquaculture, Leslie Palmer. It is an opportune time to work with our lead agency in identifying limits to our industry and addressing them cooperatively through the Statewide Clam Industry Task Force. Finally, here's wishing for a clamorous and exclamatory 2011!

Florida clam farming industry's response to the Deepwater Horizon oil spill: Lessons learned

This past year the Florida clam farming industry was subjected to a threat never imagined as the largest marine oil spill in the history of the petroleum industry occurred in the Gulf of Mexico. On April 22, 2010 the Deepwater Horizon oil rig, an ultra-deepwater, semi-submersible offshore drilling rig located 50 miles southeast of the Mississippi Delta, sank at a depth of about 5,000 feet after an explosion and fire. Oil flowed for three months until it was temporarily capped on July 15 (Day 85). Spill characteristics were estimated at up to 4.2 million gallons per day, as much as 180 million gallons total, and an area of 2,500 to 68,000 square miles. The Governor of Florida declared a state of emergency on April 30 (Day 9), which allowed the Division of Emergency Management to activate a response plan. The clam farming industry also prepared for potential impacts. Weekly conference calls were initiated on May 4 (Day 13) by the statewide clam industry task force. This allowed for timely updates from state agency representatives, discussion of concerns, and an exchange of information on response efforts. The oil well was permanently sealed on September 19 (Day 153). To date oil products have not been found in any of the 39 shellfish harvesting areas throughout the state. Lessons learned during this disaster by the clam culture industry and the agencies that work with the industry are reviewed.

Area Contingency Planning—In response to the *Exxon Valdez* oil spill in Alaska, Congress initiated legislation, the Oil Pollution Act of 1990, to address deficiencies in the response system and structure, specifically the lack of a unified effort between local, state, and federal stakeholders. An Incident Command System (ICS) framework was devised, which provides for standard hierarchy and procedures for managing incidences and outlines the roles and responsibilities of various agencies in a large-scale event. The ICS is responsible for developing and implementing an area contingency plan (ACP), which is an oil and hazardous material spill planning and response tool. Prepared by an Area Committee, the ACP geographically defines regional environmental and socio-economic resources that require priority protection. The Area Committee is made up of emergency management and government officials, resource managers, and stakeholders. This summer, clam farmers and the shellfish extension agent participated in Area Committees and met with Unified Command to develop ACPs. In this incidence, Unified Command was comprised of U.S. Coast Guard sectors, the Florida Department of Environmental Protection, and the responsible party, British Petroleum (BP). As a result, Geographic Response Plans (GRPs), which are composed of a series of maps and

Continued on Page 2

Responses to the Deepwater Horizon oil spill (continued)



site-specific response locations, were developed for Florida's west coast. For each location, resources at risk and specific response strategies were defined. In these plans, shellfish aquaculture lease areas were identified as habitat and shellfish seed were identified as wildlife resources to be protected. Further, a top tier designation (Level A or "triple-diamond") for protection was determined for shellfish aquaculture.

Protection Strategies—Protection in the event of an oil spill typically consists of placing boom materials to either contain or deflect surface oil to a collection point, such as a beach or skimmer. Booms can be effective barriers of inshore coastal waters when placed at inlets or passes. For example, Franklin County's contingency plan identified reflective boom to be placed across the mouth of Alligator Harbor. During this incidence, booms were deployed and several local clam farmers employed in the Vessels of Opportunity program were trained to maintain them. However, booms are not effective in subtidal conditions nor where currents are greater than 0.5 knots or when wave chop exceeds one to two feet. Thus, many lease areas identified in the GRPs would not be protected using traditional booming strategies. In response, the Cedar Key Aquaculture Association called for a special planning meeting with Unified Command on July 13 (Day 83). During which, alternative countermeasures, such as tar ball recovery devices and snares, were identified by the Coast Guard to protect open-water leases.

Public Health Regulations—There are two independent regulatory issues related to the consumption of foods possible contaminated with oil. First, foreign substances are not permitted to be added to food. Oil in food may render it as tainted and is not permissible on the market. The regulatory response is based on human smell and taste by trained individuals. Second, foods must be safe to eat. Although oil will not cause acute illness in humans, some constituents of oil, such as polycyclic aromatic hydrocarbons or PAHs, are potentially carcinogenic. The regulatory response is based on human health risk assessment for PAHs, which are measured by analytical chemical analysis. The Department of Agriculture and Consumer Services (DACS) is Florida's shellfish regulatory authority. The agency manages shellfish harvesting areas based on bacteriological standards and implements risk management plans for *Vibrio vulnificus* and marine biotoxins (red tide blooms). In response to the oil spill, a written plan for hydrocarbons was developed for molluscan shellfish. The closure plan is based on observations of oil products (sheen or tarballs) in an area. Less understood was criteria for re-opening an area as no specific public health standards have been determined for PAHs in shellfish tissues. In conjunction with the Food and Drug Administration, DACS Division of Aquaculture staff conducted a risk assessment of selected PAHs and developed a plan which coupled sensory evaluations with analytical tests of affected shellfish for contaminants. Staff also collected pre-impact shellfish samples for baseline characteristics as no prior data set existed for cultured clams. Visit the Division's website www.FloridaAquaculture.com for more information on these protocols.

Seafood Safety and Marketing—

The industry's biggest challenge through this disaster was ensuring buyers and consumers that shellfish were safe, as misinformation about conditions in Gulf of Mexico waters unnecessarily affected sales. Based on consumer polling data collected by the DACS Division of Marketing, market loss during the oil spill for Florida seafood was estimated between 20-30% with residual losses of annual sales estimated at 5%. In response, a *Florida Gulf Safe* promotional campaign partially funded by BP was conducted by the Bureau of Seafood and Aquaculture Marketing. Activities featured on their website www.fl-seafood.com included a seafood hotline with daily reports, live webcams at seafood processing and retail locations, and audio clips of fishermen (even of a clam farmer). In October, DACS announced that BP will pay \$20 million over the next three years to fund seafood inspections and marketing efforts aimed at restoring consumer confidence in seafood safety.

Summary—Oil spills occur with disturbing regularity in coastal waters throughout the world. Yet, the Florida clam culture industry has never experienced an oil spill prior to the Deepwater Horizon incidence. Industry members are now better aware of the oil spill process and connected with the response system. Collaboration with emergency management officials and the U.S. Coast Guard has been established. There is a common interest to ensure clam growers are part of the response system and prepared for potential risks of future oil or hazardous waste spills. Specifically, Geographic Response Plans have been developed with input from the industry. These plans identify protection for shellfish aquaculture leases and facilities. Further, an emergency regulatory response plan for hydrocarbons is in place for shellfish harvesting waters. This catastrophe also resulted in the Task Force and growers association taking a proactive role to ensure the safety of their industry and strengthen their needs, responses, and loss claims.

Filing claims related to DWH oil spill losses

The Gulf Coast Claims Facility (GCCF) is the official way for individuals and businesses to file claims for costs and damages incurred as a result of the Deepwater Horizon oil spill. The GCCF is administered by Kenneth Feinberg, a neutral fund administrator responsible for all decisions relating to processing claims. For clam industry members, who have suffered hardships or may experience reductions in earnings and sales in the future, interim and final claim submission options and procedures are now available at the GCCF's website, www.GulfCoastClaimsFacility.com. To receive a copy of the claim form by U.S. mail, call (800) 916-4893, or you can visit one of their Claims Offices in Florida. Interim and final claims may be submitted to the GCCF through August 23, 2013. Information to assist clambers in filing has been developed by the DACS Division of Marketing and is posted online at www.fl-seafood.com/clamclaims/.



YOU ARE INVITED TO PARTICIPATE!

Wednesday, February 2, 2011
Community Center (old Lion's Club)
809 6th Street, Cedar Key

1:00–4:30 PM

**Clam Industry Workshop:
Focus on the Potential of Sunray Venus
Culture and Marketability**

Seed production and broodstock development—John Scarpa, HBOI-FAU
Nursery and growout field trial results and production evaluation
at existing commercial lease areas—Leslie Sturmer, UF
Consumer acceptance results and examination of wholesale
market product attributes—Chuck Adams, UF
Sensory, nutritional, and shelf life profiles—Steve Otwell, UF
A discussion of what we know and do not know from seed to table

ALSO Project Updates:

Clam stock improvement through backcrossing F1 hybrids—John Scarpa
Selection for heat tolerance in clams using biomarkers—Shirley Baker, UF
Soil properties on clam leases under varying cultivation efforts and
influence of harvest techniques on soils—Rex Ellis & Todd Osborne, UF
Water quality and temperature variability monitoring—Leslie Sturmer
Growout evaluation of the bay scallop—Curt Hemmel, Bay Shellfish
And more, Industry Feedback Session

4:30–5:30 PM Social Hour

Hosted by the Cedar Key Aquaculture Association
Sunray Venus reared in field trials will be served

For more information, contact Leslie Sturmer, UF/IFAS Shellfish Extension,
at 352-543-5057 or LNST@ufl.edu.



2011 Florida Clam Seed Suppliers

These hatchery and nursery operations are supplying hard clam, *Mercenaria mercenaria*, seed to Florida growers this year.* Contact suppliers for information on seed sizes, price, color variation, and availability.

Bay Shellfish Co. - H, N

Terra Ceia, FL 34250
Contact: Curt Hemmel
(941) 721-3887 or (561) 445-3488 (cell)
bayshellfish@tampabay.rr.com

Blue Acres - N

Palm Bay, FL 32907
Contact: Kevin Reinecke
(321) 733-2704 or 243-2526 (cell)

Blueswater Shellfish - H, N

Melbourne Beach, FL 32951
Contact: Steve Woodford
(321) 726-0523 or 848-4839 (cell)
blueswater@cfl.rr.com

Cedar Creek Shellfish Farm - H, N

New Smyrna Beach, FL 32168
Contact: Mike Sullivan
(386) 426-0113 or 847-3202 (cell)
cedarcreekshellfish@gmail.com

Clamtastic - H, N

Cedar Key, FL 32625
Contact: Chris Topping
(352) 213-5999 or 949-2233
clamtastic2000@yahoo.com

Cole's Nursery - N

Placida, FL 33946
Contact: Buck Cole or Barry Hurt
(941) 697-3181 or (863) 604-1891

Ewan Leighton - H, N

Melbourne Beach, FL 32951
Contact: Ewan Leighton
(321) 288-8201
sleighton1@cfl.rr.com

Linda Lee Seafood - H, N

Port Canaveral, FL 32920
Contact: Rose Cantwell
(352) 543-6346 or 215-6341 (cell)
cantwellrr@bellsouth.net

Orchid Island Shellfish Co. - N

Sebastian, FL 32958
Contact: Ed Mangano
(772) 589-1600 or 589-5080 (Fax)
aquagemfarms@aol.com

Pelican Inlet Aquafarms - H, N

Cape Coral, FL 33914
Contact: Edwin or Michael Connery
(239) 549-8014 or 246-5820 (cell)
highimage@mac.com

Research Aquaculture - H, N

Hutchinson Island, Stuart, FL 34996
Contact: Tom McCrudden
(561) 702-8159
raiclams@bellsouth.net

Southern Cross Seafarms - H, N

Cedar Key, FL 32625
Contact: Shawn Stephenson / Jon Gill
(352) 543-5980 or 543-5982 (Fax)
southerncross@gmail.com

Out-of-State Seed Suppliers**

To obtain a list of shellfish seed suppliers along the East Coast, Contact: Gef Flimlin
Rutgers Cooperative Extension
Toms River, NJ 08755
(732) 348-1152
flimlin@aesop.rutgers.edu
Or go to www.ecsga.org, click on Resources in the left-hand menu.



* This list is provided as a service of the UF/IFAS Shellfish Aquaculture Extension Program. We do not sponsor or endorse any of these suppliers over any others. ** Clam seed obtained from out-of-state suppliers must meet best management practices pertaining to genetic protection and disease prevention. Seed must be accompanied by documentation from a licensed veterinarian certifying stocks do not show clinical signs of any diseases that may pose a threat to natural shellfish populations. For more information, go to www.FloridaAquaculture.com, click on Aquafarm Program, then Best Management Practices, or contact Mark Berrigan, Florida Department of Agriculture and Consumer Services, at (850) 488-4033.

2011 Bag Suppliers

Remember every bag must be tagged
for crop assistance programs!

Island Bags

Cedar Key, FL 32625
Contact: Carla and Ray Ermel
(352) 543-5231 or 949-1869 (cell)
isbags@att.com

M&R Seafood

Cedar Key, FL 32625
Contact: Rick Viele (352) 543-9395 or
215-3121 (cell) rickviele@bellsouth.net

Playing Hooky Enterprises

Crawfordville, FL 32327
Contact: Sharon Scarborough
(850) 508-0981 sharon@clambags.com

Southern Belle Bags

Old Town, FL 32680
Contact: Faith van Orden
(352) 542-2508 or 542-5288 (cell)
ospreyf@bellsouth.net

Chris Vandenberg

Cedar Key, FL 32625
Contact: Chris Vandenberg
(352) 949-0441

For information on **Fabric, Thread, Net Coating and Tag Suppliers**, contact the UF Shellfish Aquaculture Extension Office at (352) 543-5057 or LNST@ufl.edu.

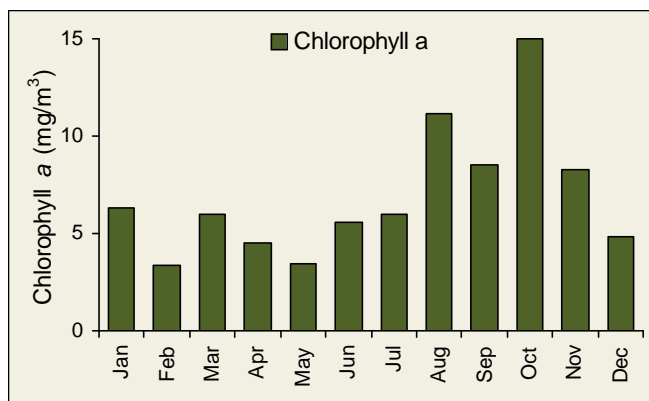
WHAT DO CLAMS EAT? A pictorial guide to food sources for clams

Introduction Hard clams are bivalve mollusks, animals that feed by filtering suspended particles out of the water column. Particulate material in shallow coastal waters is abundant, and the filtering capacity of bivalves often promotes good water quality. Filter feeding is accomplished by capturing food particles that enter the shell through water currents or active pumping by the animal through siphons. Particles are trapped by gill filaments that contain small hair-like protrusions called “cilia.” The cilia move the food to the mouth to be digested by the animal. If a particle is too small (<1 μm) it may pass through the filter, but if it is too big (>100-200 μm) it will be rejected as pseudofeces. Studies have shown that phytoplankton (microscopic algae) are the primary food source of most filter-feeding bivalves. Although most species of phytoplankton are acceptable food items, some produce toxins that can be harmful to hard clams and/or humans that consume them, and some species are inedible or not digestible due to their physical structure. Phytoplankton can also vary in terms of chemical composition, such as lipid content, which can affect their quality as a food item. A pictorial guide was developed to assist farmers in identifying potential food sources for clams, the spatial and seasonal distribution of food, as well as whether the food is good (nutritious) or bad (noxious or harmful) for clams. The guide focuses on two Florida growing areas—Suwannee Sound on the west coast and Indian River Lagoon on the east coast.



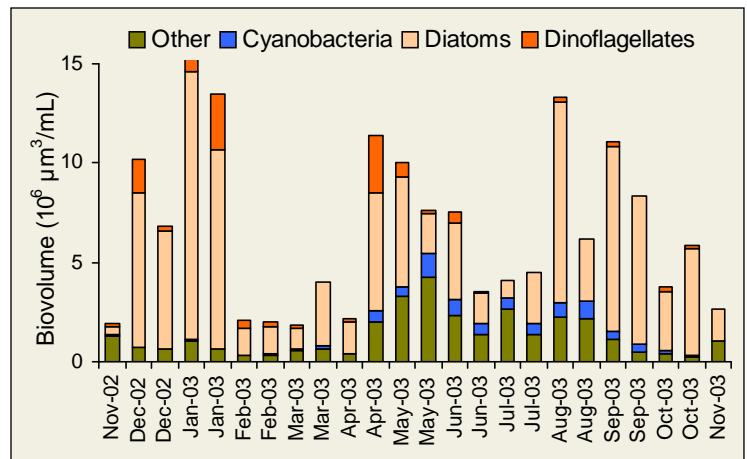
Clam siphons

Photo © Eric Zamora



Measures of Food Quantity Microscopic counts are the ideal way to investigate food availability from phytoplankton, but they are expensive and time-consuming. An indirect method for determining phytoplankton abundance is by estimation of chlorophyll *a* concentration. Chlorophyll *a* is a photosynthetic pigment contained in all algal cells (and plants). This measurement provides a good estimate of how much food is in the water, but does not indicate the quality of the food for clams. Chlorophyll *a* patterns for selected lease areas over several years are available through this guide. The graph on the left depicts average levels from 1997 through 2009 at a sample station located nearby shellfish leases south of the Sebastian Inlet.

Measures of Food Quality Biomass is an excellent measure of food availability and quality in the form of phytoplankton. To determine biomass, a water sample is placed under a microscope, then individual phytoplankton cells are identified and counted. This method allows scientists to determine which species (and how many of each) are present. Size estimates can also be made, which, when totaled, give an estimate of total phytoplankton biomass in the water. This provides not only a measure of just how much food is available, but the potential quality of the food. Graphs, such as the one on the right for the Gulf Jackson High-density Lease Area near Cedar Key, illustrate the seasonal composition of four major phytoplankton groups over a one-year sample period (2002-3).



Marine algal species

Phytoplankton Groups and Species The guide also provides information on major algal groups (dinoflagellates, diatoms, cyanobacteria) as well as example species from each group that were commonly found at sample locations. Biographical sketches of 50 algae further identify what the species looks like, where and how often it was found during sampling, and its potential “good” and “bad” effects on clams. Most species have the potential to harm clams if they form dense blooms; however, these categories refer to the acceptability of individual cells as food items. For example, diatoms are among the most common microscopic marine algae and are the dominant group in Florida’s coastal waters. Diatoms store food in the form of lipids (fats), which makes most of them nutritious food for clams. Yet, some diatoms with long, rigid spines can cause physical harm to gill filaments and may be difficult for clams to filter.

How do I access this guide? Phytoplankton studies conducted by University of Florida/IFAS scientists provided the resource information to initiate this guide, which Ed Phlips and his graduate student Nikki Dix, along with Leslie Sturmer, Shirley Baker, and Kevin Hulen, developed. It can be accessed online at the website <http://shellfish.ifas.ufl> and is also available as a CD-ROM.



CLAMmunications

New Canadian Import Regulations for Molluscs

The Canadian Food Inspection Agency (CFIA) has adopted changes to their import regulations for aquatic animals. The regulated list includes hard clams and American oysters. Once the regulation comes into effect in December 2011, the listed species will require import permits issued by CFIA and health certification by veterinarians from all exporting countries including the U.S. The USDA Animal and Plant Health Inspection Service is collecting voluntary information to assist Canada in the development of specific requirements to facilitate continuous trade of aquatic animals. Contact Dr. Kathleen Hartman at (813) 671-5230, ext. 119 for more info.

ECSGA Publishes Shellfish Culture BMP Manual

The East Coast Shellfish Growers Association recently published a new manual for shellfish growers. The manual provides a framework that will enable growers to write best management practices (BMP) documents for their farms. There are three major sections—a code of conduct, a BMP section with a discussion of issues and suggested statements for specific farm operations, and a template with suggestions for farm-level BMP elements and a sample management plan. Each section also discusses an issue important for growers to address. To create your own farm-specific BMP document using their template, visit www.ECSGA.org.

Evaluation of Pilot Clam Crop Insurance Program

The USDA Risk Management Agency (RMA) has contracted with Promar International to evaluate the pilot insurance program for cultivated clams. The program began in 2000, was revised after an internal RMA review in 2004 and an outside evaluation in 2005, and is currently authorized to operate through 2011. The program is available in selected counties in Florida and other states. The purpose of the evaluation is to determine whether the pilot program should be converted into a permanent program, modified and continued as a pilot, or terminated. Promar staff held listening sessions in Florida this month to get feedback on how the program has worked in recent years and how it can be improved. If you were unable to attend the sessions and would like to provide input, contact Tom Earley at (703) 739-9090, ext. 113.

Online Resource Guide for FL Shellfish Culture

<http://shellfish.ifas.ufl.edu>

A completely updated and redesigned website replaces the Florida Shellfish Aquaculture Extension site. Information is provided about clam farming, research and extension updates, suppliers list, and newsletters. Archived water quality data from monitoring stations at selected lease areas are also posted at this site. Additional resources will be added over time including pertinent ones from the former site.

Make plans to attend the Clam Industry Workshop on February 2nd.

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through the University of Florida

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