

# THE BIVALVE BULLETIN

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## World Wildlife Fund initiates Mollusc Aquaculture Dialogues

As the world's premier conservation organization, the World Wildlife Fund (WWF) strives to protect endangered wildlife, preserve wild lands, and address global threats and challenges. In the early 1990s, WWF began spearheading the creation of certification programs for fisheries (Marine Stewardship Council), forestry (Forestry Stewardship Council), and agriculture (Protected Harvest). All of these programs are: 1) Built on a consensus about the key environmental impacts, 2) Identify and support the adoption of better management practices that significantly reduce or eliminate those impacts, 3) Determine globally acceptable performance levels, and 4) Contribute to global shifts in performance within an industry.

A similar approach is now being used for aquaculture. Dialogues began in 1999 with farmers, buyers, nonprofit organizations, and others to develop credible, voluntary standards geared toward minimizing or eliminating any environmental and social impacts caused by aquaculture. However, WWF's approach to developing standards for molluscs (bivalves) is different than their approach used for other aquaculture species. Rather than conducting meetings on a global scale, WWF is in the process of convening regional dialogues. This

strategy addresses that there are significant differences in the way various molluscs species are produced in various regions of the world. As a result, the environmental and social impacts are different. The strategy also recognizes that most mollusc farming is done on a smaller scale than other types of fish farming. The initial focus will be on North America, before expanding into more regions. WWF expects that standards will be developed by the end of 2008 for clams, oysters, scallops, mussels, and abalone. One to two additional years will be needed to field test and finalize the standards. For more info, visit <http://www.worldwildlife.org/aquadialogues>.

On one hand, molluscan shellfish aquaculture has great potential to be certified as environmentally friendly. Such certification could take a number of forms including an eco-labeled product. Farmers participating in such a program could benefit from preferential treatment from wholesalers, retailers, supermarkets, and restaurants, as well as increased or differentiated market access, and possibly even premium prices. On the other hand, U.S. farm-raised shellfish are already grown under the most stringent regulations in the world, and frequently superior in quality to imports. Some industry observers question whether U.S. aquaculturists—already at a price disadvantage due to many imports—would want to add the expense and hassle of a third party certification or eco-labeling. So what do you think?

The Pacific Shellfish Growers Association hosted a mollusc dialogue the past October and another will be conducted in North Carolina this month. **A dialogue is scheduled in Florida on Monday, February 11<sup>th</sup> from 1:30 to 4:30 PM, during the Aquaculture America '08 Conference that will be held at Walt Disney World's Coronado Resort in Orlando.** The WWF will provide free Trade Show passes to industry members interested in participating. It is crucial that Florida's clam aquaculture industry be represented. If you would like to attend, you will need to sign-up by contacting Leslie Sturmer at (352) 543-5057 or [LNST@ufl.edu](mailto:LNST@ufl.edu).

## Remember to complete the 2007 Census of Agriculture !

Every other year clam farmers along with other aquatic growers in the state are asked to report their sales and production for the Florida Aquaculture Survey. This industry report has provided vital information to local governments, the Florida Legislature, Congress, and federal and state agencies in making informed decisions on critical issues, such as legislation, policy, insurance, disaster payments, and public funding. In the December issue of the FDACS Division of Aquaculture's newsletter, it was announced that the Department was discontinuing the survey because of state budgeting cuts. Instead, the Commission of Agriculture Charles Bronson is urging farmers to participate in the 2007 Census of Agriculture, which is conducted by the USDA every 5 years. The Census is a complete count of the nation's farms and ranches. Every certified clam farmer should have recently received a Census form in the mail. **Completed forms are due by February 4, 2008.** Farmers can return their forms by mail or complete online at [www.agcensus.usda.gov](http://www.agcensus.usda.gov). If you did not receive a report form or it was misplaced, call 1-888-424-7828. Remember this is your opportunity to make a positive impact for your community and for U.S. agriculture and aquaculture.



## A Multi-purpose Project to Support the Florida Shellfish Aquaculture Industry



This past year, funding (\$85,000) was awarded by the U.S. Department of Agriculture (USDA) to the UF Department of Fisheries and Aquatic Sciences (DFAS) and the Shellfish Aquaculture Extension Program (SAEP) to assist in providing research and extension support for the shellfish aquaculture industry. The funding was in part procured through the efforts of the Cedar Key Aquaculture Association, and priority areas supported through this funding were industry-generated. Feedback obtained from industry members during a workshop held in Cedar Key last February and discussions with the Statewide Clam Industry Task Force were used in developing a multi-purpose project. The following is a summary of these project areas with information on how you can get involved.

### Health of Seed Clams in Hatcheries

Low survival has been reported periodically in Florida hatcheries impacting clam seed production. To assist commercial hatcheries in the state, an aquatic animal veterinarian, Dr. Denise Petty, will travel to participating facilities where management related to health of clam seed stocks can be reviewed. Samples of algae, larvae, post-set seed, and broodstock (if requested) will be collected and transported to the DFAS aquatic animal disease diagnostic laboratory for assessment. This will include light microscopic examination, bacterial cultures, and histological examination. The intent is to identify what is normal in the hatchery, so there is a baseline for future reference in the event of production problems (for example, algae crashes, poor larval survival, failure to set, etc.). Low numbers of protozoans and bacteria are commonly present in all aquatic animal facilities, thus having a baseline of what is normally present is a vital tool in determining cause(s) of mortality events. **The hatchery visits are being scheduled during January and February.** Participation is strictly on a voluntary basis. Dr. Petty has worked with the aquaculture industry as an aquatic veterinary professional for 17 years. As a veterinarian, she adheres to a code of medical ethical conduct, which protects the privacy of patient information. All information collected during her visits and results of any diagnostic testing will be confidential and not released to the public.

If you would like to participate, immediately contact:

**Denise Petty, DVM**  
**Phone: (352) 392-9617, ext. 229**  
**Email: [pettyd@ufl.edu](mailto:pettyd@ufl.edu)**

### Clam Health Workshops for Hatchery Operators

Funding will also be used to recruit a nationally recognized shellfish hatchery health management specialist to participate in industry workshops (one on each coast) sometime this spring. Ralph Elston of AquaTechnics, Inc. located in Sequim, Washington has agreed to participate in these workshops. Dr. Elston has over 25 years of experience providing diagnostic services and solving problems in hatchery production of bivalve mollusks around the world. He has pioneered the use of probiotic bacteria to prevent bacterial diseases in shellfish hatcheries.

### Water Temperature Variability at Clam Lease Sites

Water temperature monitoring at lease sites was initiated last summer. See page 5 for an update on this ongoing project.

### Food Availability at Start-up of Land-based Nurseries

During the spring, as water temperatures warm up, over 50 land-based nurseries in the state begin operations. Last year, several nursery operators in Cedar Key reported significant seed mortalities during start-up. Salinities were high but waters were colored a dark orange, indicating a dense bloom of phytoplankton (algae). Samples from raceways were collected and high concentrations of small diatoms (golden brown algae) were noted by DFAS faculty. The samples did not contain *Karenia brevis*, the red tide organism. The algal species identified (*Leptocylindrus minimus*) is very small (1-4 microns in diameter) and can be singular or form chains. Results of histopathic examination of clam seed revealed some edema (increased tissue fluid) in the gills. As water temperatures rise, so does the metabolic rate of clams, meaning filtering and feeding activities increase. Although the diatom that supported the phytoplankton bloom is not toxic, it may not have provided adequate nutrition for clam seed at that time. It is speculated that starvation may have been the cause of clam mortalities observed. Differences in seed losses were related to age and size of the various seed crops, location of the nursery, and water supply system. Further, facilities with increased suspended particles in their water supply source fared worse.

### Supplemental Feeding with Algal Paste

It may be beneficial for nursery operators to supplement the naturally-occurring phytoplankton in the water supply source. Commercially available shellfish algal diets could be used during periods when the ambient phytoplankton composition and abundance may not be adequate for clam growth and survival. These inexpensive products are super-concentrated mixes (typically 2 billion algal cells per milliliter of diet) of marine micro-algae that provide a nutritional profile for shellfish. Call the Shellfish Aquaculture Extension Office at (352) 543-5057 for information on suppliers of algal paste products, feeding calculations and directions.

### Phytoplankton (Algae) Monitoring

It may also be beneficial to the industry to set up a monitoring program to determine if phytoplankton species in the surrounding waters are suitable for the start-up of land-based nurseries. This project will assist in providing the labor and equipment necessary to conduct the monitoring. Interested nursery operators may have incoming waters at their facilities checked for chlorophyll content (an indicator of algae abundance) and turbidity (an indicator of suspended solids) with a field fluorometer. If there is concern about the type of algae present or a bloom exists, samples can be collected and sent to the DFAS phycology laboratory for species identification. If you are interested in participating, contact the Shellfish Extension Office at (352) 543-5057.

**Health of Adult Clams in Summer** Continued on Page 4.

# 2008 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

P.O. Box 289  
Terra Ceia, FL 34250  
Contact: Curt Hemmel  
(941) 721-3887 or 722-1346 (Fax)  
[bayshellfish@tampabay.rr.com](mailto:bayshellfish@tampabay.rr.com)

## Blue Acres - N

221 Granville Street, NE  
Palm Bay, FL 32907  
Contact: Kevin Reinecke  
(321) 243-2526 (cell)

## Blueswater Shellfish Inc. - H, N

8280 S. Highway A1A  
Melbourne Beach, FL 32951  
Contact: Steve Woodford  
(321) 726-0523 or 848-4839 (cell)

## Cedar Creek Shellfish Farms - H, N

701 Downing Street  
New Smyrna Beach, FL 32168  
Contact: Mike Sullivan  
(386) 426-0113 or 847-3202 (cell)

## Clams R' Us - H, N

705 27th Avenue SW, Unit A  
Vero Beach, FL 32968  
Contact: Joe Weissman  
(772) 538-1051  
[Weissm\\_J@bellsouth.net](mailto:Weissm_J@bellsouth.net)

## Cole's Clam Nursery - N

P.O. Box 82  
Placida, FL 33946  
Contact: Dot Cole  
(941) 697-3181

## David Grudin - N

325 E. Hall Road  
Merritt Island, FL 32953  
Contact: David Grudin  
(352) 250-0667  
[dgrud@yahoo.com](mailto:dgrud@yahoo.com)

## Island Fresh Seafood - H, N \*\*

7575 Ethel Post Office Road  
Meggett, SC 29449  
Contact: Bill Cox  
(843) 889-6920 or 696-7439 (cell)  
or) Laura Adams, Cedar Key  
(352) 949-0532 (cell)

## Kibbe & Company - N

P.O. Box 629  
St. James City, FL 33956  
Contact: Roy Kibbe  
(239) 283-1448

## Ewan Leighton - H, N

270 Sea Dunes Drive  
Melbourne Beach, FL 32951  
Contact: Ewan Leighton  
(321) 288-8201  
[sleighton1@cfl.rr.com](mailto:sleighton1@cfl.rr.com)

## Dan Leonard - N

7228 Sunnybrook Boulevard  
Englewood, FL 34224  
Contact: Dan Leonard  
(941) 270-2032 (cell)  
[bullbayclam@verizon.net](mailto:bullbayclam@verizon.net)

## Orchid Island Shellfish Co. - N

633 Old Dixie Highway  
Sebastian, FL 32958  
Contact: Ed Mangano  
(772) 589-1600

## Oyster House LLC - H, N \*\*

P.O. Box 12139  
Charleston, SC 29422  
Contact: Knox Grant  
(843) 514-4232 (cell)  
[knox@knology.net](mailto:knox@knology.net)

## Pelican Inlet Aquafarms - H, N

5787 SW 9th Court  
Cape Coral, FL 33914  
Contact: Edwin or Michael Connery  
(239) 549-8014 or 246-5820 (cell)  
[highimage@aol.com](mailto:highimage@aol.com)

## Research Aquaculture - H, N

3663 SE Old St. Lucie Boulevard  
Stuart, FL 34996  
Contact: Tom McCrudden  
(561) 702-8159  
or) Andy Arnold, Alligator Harbor  
(850) 510-3866

## Sandpiper Clam Hatchery - H, N

6745 Old Dixie Highway  
Ft. Pierce, FL 34946  
Contact: Bill Donovan or Peter  
Woodward (772) 486-3609 (cell)

## Kevin Soderburg - N

116 Venus Court  
Indianatlantic, FL 32903  
Contact: Kevin Soderburg  
(321) 508-6200

## Southern Cross Seafarms - H, N

12170 State Road 24  
Cedar Key, FL 32625  
Contact: Bill Leeming  
(352) 543-5980

\* 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 (BMPs) pertaining to genetic protection and disease prevention. Specifically, seed must be accompanied by documentation from a recognized, licensed veterinarian certifying the stock does not show clinical signs of any disease pathogen that may pose a threat to natural shellfish populations. For more information on BMPs, go to the website, [www.FloridaAquaculture.com](http://www.FloridaAquaculture.com), or contact Mark Berrigan, with the Florida Department of Agriculture and Consumer Services, Division of Aquaculture, at (850) 488-4033.

**H - Hatchery N - Nursery**



# 2008 Bag Suppliers

## The Bag Lady

Bronson, FL 32621  
Contact: Dennis, Karen,  
and Annie Voyles  
(352) 486-3763  
[akvoyles@aol.com](mailto:akvoyles@aol.com)

## Island Bags

Cedar Key, FL 32625  
Contact: Carla & Ray Ermel  
(352) 543-5231 or  
(352) 949-1869 (cell)  
[isbags@svic.net](mailto:isbags@svic.net)

## Playing Hooky Enterprises

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

## Southern Belle Bags

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

## Chris Vandenberg

Cedar Key, FL 32625  
Contact: Chris Vandenberg  
(352) 477-5102 (cell)

For information on  
**Thread, Fabric, and Tag Suppliers**, contact the  
UF Shellfish Aquaculture  
Extension Office, Cedar Key  
(352) 543-5057  
[LNST@ufl.edu](mailto:LNST@ufl.edu)

Remember every bag must be tagged  
for crop assistance programs!

## Crop Disaster Assistance Programs: UPDATE

**Clam Crop Insurance** — The Federal Crop Insurance Corporation made minimal changes to the pilot clam crop insurance policy for the 2008 crop year. The most important change is that Global Position System (GPS) coordinates are required of all insured lease locations. The revised policy can be reviewed by visiting the USDA Risk Management Agency's website, [www.rma.usda.gov](http://www.rma.usda.gov).

**Crop Disaster Program (CDP)** — Clam farmers who suffered losses from natural disasters that occurred in 2005, 2006, and 2007 are eligible for the Crop Disaster Program. CDP provides benefits to farmers who had obtained crop insurance or Noninsured Crop Disaster Assistance Program (NAP) coverage for the year of the qualifying loss. Sign-up has begun. Contact a USDA Farm Service Agency county office to determine if you are eligible. For county information, visit the FSA website, [www.fsa.usda.gov](http://www.fsa.usda.gov).

**Adjusted Gross Revenue-Lite (AGR-L) Crop Policy** — This relatively new crop policy is a whole-farm revenue protection plan of insurance. The plan protects against low revenue due to natural disasters and market fluctuations that affect income during the insurance year. The USDA Risk Management Agency approved expansion of AGR-Lite to Florida with the 2008 insurance year. Aquaculture crops are eligible. AGR-Lite can stand alone or be used with other Federal crop insurance plans. To view additional information, visit the RMA online resources at [www.rma.usda.gov](http://www.rma.usda.gov).

## Shellfish Support Projects (continued)

### Health of Adult Clams during Summer Months

Baseline health monitoring of cultured aquatic stocks is an important management tool. In 2003, DFAS and SAEP faculty conducted a preliminary health assessment of cultured clams by examining samples from three growing areas in the state during the winter and summer (see the February 2006 issue of *The Bivalve Bulletin* for those results). No serious disease-causing agents associated with clams were detected. Yet, there is an increasing concern regarding the health of stocks as growers report losses of market-size clams during the summer months. Pathology may be aggravated by stressors such as high temperatures, poor water quality, or high stocking densities. A more thorough examination of stocks prior, during, and after the problematic summer months is necessary to determine if environmental diseases or disease pathogens are present. This project will support health surveys of cultured clams from commercial leases.

To date, adult clams from growers located at different lease areas in Cedar Key were collected from July through October in 2007. Samples were transported to the DFAS disease diagnostic laboratory. The health assessment consisted of a gross examination, including visual examination of shell, mantle, gills and internal organs, as well as wet mounts of gill tissue to determine presence of parasites or other organisms. Sections of mantle and internal organs were preserved for histologic examination. Results are forthcoming. In 2008, samples will be collected from May through September.

### Cultured Clam Pearls: Florida's Newest Lottery?

Appreciation for gemstone quality pearls has been around for centuries. Most people picture a lustrous white masterpiece from an oyster when the word "pearl" is mentioned. Pearls form when an irritant, often a sand grain or other oceanic particle, enters the animal while the shells are open and becomes embedded between the body and shell. Once this occurs, the response is to cover the particle with layers of calcareous material in an effort to reduce irritation. True pearls with the highest market value are produced by pearl oysters. Shells of these bivalves possess an iridescent nacre, known as mother-of-pearl, which provides a glossy finish.

Hard clams also produce a pearl of sorts, but they usually are small, irregularly shaped, and gray to black in color. As clam shells lack a nacreous layer, they are typically dull. Nonetheless, clam pearls hit center stage this holiday season when a Florida couple found one while dining at a raw bar. The spherical pearl was 6 mm in diameter with a magnificent purple color. The coloring of a pearl is the result of pigments present in the shell mantle during formation. This is a rare find with odds estimated around 1:100,000 and only 1:20 of those being of gem quality. Results of an appraisal are still pending. With all the recent media attention, several other pearls obtained from Florida cultured clams have been reported by clam enthusiasts around the state. Finding one of these rare beauties may become Florida's newest lottery!



## RESEARCH UPDATE: Variability of Water Temperature at Clam Lease Sites



**Background:** Water temperature plays an important role in biology and directly affects the bodily functions of aquatic organisms necessary for growth and survival. It also influences water quality parameters, such as dissolved oxygen and pH. Currently, five water quality monitoring stations (CLAMMRS sondes) are located at lease areas around the state to provide timely information on water temperature and other parameters so clam farmers can make more informed decisions about crop management. These stations measure continuously at a depth of 6 inches above the bottom. The limited number of stations does not provide for an in-depth understanding of water temperatures across the lease areas nor the influence of temperature on clam production.

**Objective:** The intent of this project is to provide both detailed and broad coverage of water temperatures by deploying inexpensive data loggers at multiple leases to adequately describe variability possibly due to water depth, substrate characteristics, currents, and other parameters.

**Methods:** The waterproof data loggers used for this project (pictured at right) are small, about 2" long. Because of their size, they can be placed either inside of or attached to the outside of a clam bag on the lease site. This provides for temperature measurements at the same depth and location of the clams. From July through November of 2007, eight clam farmers placed data loggers on 17 leases in Cedar Key. Although this represents a small percentage of leases in the area, it is anticipated that the spread of leases used will provide useful information on temperature variability. In addition, temperature measurements were collected from the two CLAMMRS stations in the area.

**Results to Date:** Water temperature trends in 2007 appeared to be similar across the lease sites from month to month. Regardless of lease site, there was a rise in temperature through the day followed by a cooling during the night (see figure below). The average difference in temperatures over a 24-hour period did not change from month to month (4.3°F

in August versus 4.1°F in November). What did change was the average temperature recorded from month to month (88.3°F in August versus 68.0°F in November). Based on the data collected, significant differences in temperatures across the leases were observed on a day-to-day basis. This suggests to a grower that when comparing temperatures at different leases, it is more important to look at hourly changes as opposed to monthly trends. One factor influencing water temperature is depth. We are still processing the data to understand how much of a role depth plays in temperature variability across these leases. It is anticipated that information obtained from this monitoring project may be useful in determining planting and harvesting strategies during the summer months.

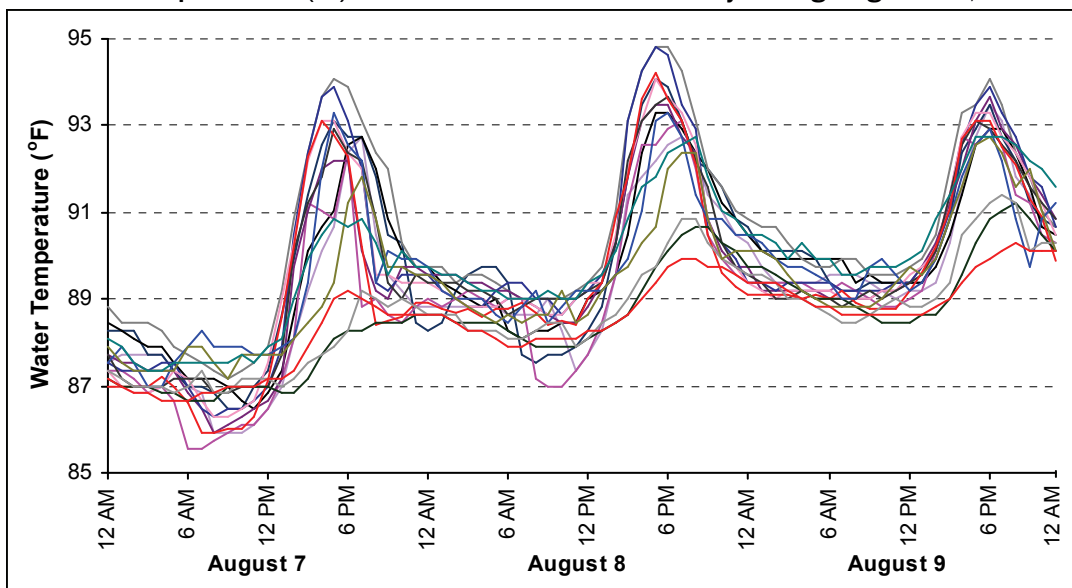
Peak water temperatures were recorded during the month of August, with the hottest temperature (94.8°F) recorded at two of the leases on August 8<sup>th</sup> at 5:00 PM. This peak occurred one hour before a predicted low tide (+0.2'). Temperatures ranged from 89.4°F to 94.1°F on the other 15 leases at that time, representing over a 5°F difference. The CLAMMRS sondes also recorded peak water temperatures at that time (94.2°F). This becomes important as clams cease growth processes around 88°F, and stop filtering at temperatures above 90°F. Looking at water temperatures during the month of August at all leases, there were 26 days on which temperatures reached 88°F, and of those days, temperatures exceeded 90°F on 17 occasions. Also of note is that regardless of lease site, peak temperatures during the day were consistently recorded around 6 PM. This strongly suggests to growers that in order to minimize stress and maximize clam survival and shelf life, farming activities should be conducted in the cooler morning hours when possible. The project provided a lot of useful information this year, and should provide more in the coming years. In 2008, we will begin in

May and run through October.

We are currently seeking more participants so we can increase the number of leases in this project. If you are interested, contact Chuck Mulligan, a new addition to the Shellfish Aquaculture Extension Office in Cedar Key, at (352) 543-5057 or [charles.mulligan@ufl.edu](mailto:charles.mulligan@ufl.edu).

A new publication entitled "The Role of Water Temperature in Hard Clam Aquaculture" (EDIS # FA151) is available online through the UF Electronic Data Information Source at the website, <http://edis.ifas.ufl.edu>.

**Water Temperatures (°F) at 19 Lease Sites in Cedar Key during August 7-9, 2007**



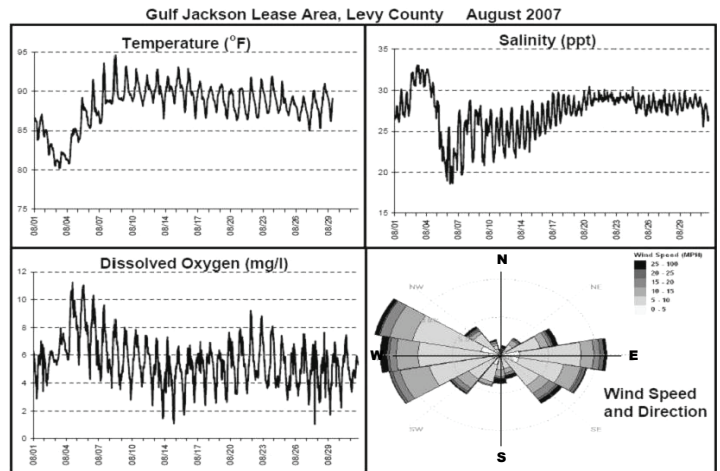
# CLAMmunications

The following are available through the Shellfish Aquaculture Extension Office:

**Clam Reward Signs** These 11" by 17" aluminum signs can be posted on lease poles or at upland facilities, such as wholesale plants and land-based nurseries. They are a "visible" reminder that cultured shellfish are protected by law and a reward is offered by the Department of Agriculture and Consumer Services for information leading to a conviction for theft. An 800 "hot line" telephone number is also displayed. The signs were recently reprinted using state funding for the clam disaster assistance program.



**Monthly Water Quality Graphs** This past summer, water and weather monitoring stations came back online for five lease areas (Alligator Harbor, Dog Island, Gulf Jackson, Horseshoe Beach, and Indian River) located in four counties. "Real-time" information on temperature, salinity, dissolved oxygen, turbidity, wind speed and direction can be viewed at [www.FloridaAquaculture.com](http://www.FloridaAquaculture.com), the DACS Division of Aquaculture's website. Archived monthly data are now available upon request in graphic format. This information may be useful in assessing clam production and verifying crop loss.



**What's in the Clam Bag? CD-ROM** This pictorial guide, which identifies over 150 marine animals and plants that can be found in, on, and around a clam culture bag, is now available as a CD-ROM. It can also be accessed via a website, <http://shellfish.ifas.ufl.edu>.

The World Wildlife Fund's Mollusc Aquaculture Dialogue is set for February 14th in Orlando. Plan to attend! See Page 1 for details.

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For more information, contact Cooperative Extension Service.

through the University of Florida

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