University of Florida Cooperative Extension Service

THE BIVALVE BULLETIN

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INSIDE THIS ISSUE:

2007 Florida Hard Clam Aquaculture Outlook

So what's in store for the new year? Expectations of clam production in 2007 are kept in check by the reality that the industry is still rebounding from the 2004-5 hurricane seasons. Unfortunately, the January forecast update for hurricane activity this year continues to anticipate an active season, with an above-average probability of U.S. major hurricane landfall. To help with hurricane recovery, the 2006 state legislative session funded a financial assistance program for the clam industry. A plan to implement the new program can be found on Page 2 of this newsletter. This issue also provides listings of current seed and bag suppliers (see Pages 3 and 4). After 22 years of producing seed, Harbor Branch Oceanographic Institution is shutting down their hatchery this spring. Regretfully, two other east coast hatchery operations with a long industry history are closing as a result of hurricane impacts. How this will affect seed availability is yet to be seen. This will be discussed, along with other topics, at the upcoming Statewide Clam Aquaculture Task Force meeting on February 8 in Cedar Key. A workshop on that same day will feature updates on a variety of clam research projects. Meeting details are on Page 5.

Regarding market trends, the annual Buyer's Guide of *Seafood Business*, a national trade magazine, compiles information from U.S. buyers and global suppliers to give a focused perspective on what's in store over the next 12 months for important seafood species. The resounding theme in the 2007 Buyer's Guide is higher costs. Wholesale prices are creeping up, which affect everyone in the supply chain, from fishermen and producers to processors and distributors. Their shellfish update states that "the market for littleneck clams has been stable for the past few years," with experts predicting more of the same for the near future. Further, they did not foresee any hard shell clam shortages this year. The *Aquaculture Outlook*, compiled by the USDA Economic Research Service, is a spot assessment of U.S. aquaculture. The latest *Outlook* issue provides a look at national production and pricing trends, a summary of aquaculture imports and their respective impacts on domestic markets, plus a preview of what aquatic producers might expect in 2007. Excerpts which may be helpful to clam producers and shellfish wholesalers are reprinted below. The full report can be found at *http://usda.mannlib.cornell.edu*.

USDA's national aquaculture production outlook for 2007: Slow but steady

The current economic outlook for U.S. aquacultural producers for 2007 is clouded by wide swings in energy prices. Energy prices are falling, but remain above year-earlier levels. The domestic economic forecast is for relatively slow but steady growth in the real Gross Domestic Product. Real per capita disposable income is expected to continue to grow at a relatively strong rate in 2007. Higher disposable income, coupled with lower fuel prices, would have a positive impact on the restaurant and foodservice vector. This is critical to the aquaculture and seafood industries, as they make a larger percentage of sales through these sectors than suppliers of traditional livestock and poultry products. U.S. beef, pork, and poultry industries are all forecast to have increased production in 2007. In the wholesale market, prices for beef and pork are forecast to fall in 2007, but prices for poultry are expected to increase slightly. These projections of increased production and lower prices for these major protein sources mean strong competition for domestic aquaculture products.

Domestic seafood consumption in 2007 is also likely to see a higher percentage of overall consumption from foreign sources, a trend that has been going on for some time. The questions for the U.S. aquaculture industry are how to best compete with growing foreign production and how to determine which market segments are most favorable for domestic producers. Over the past several years, imports of mollusk products have been trending upward as aquaculture production has continued to grow. The value of imported clam products in the first half of 2006 was $2.7 million. Clam imports comprise a number of species, and the various clam products, raw or processed, can vary widely in price. Canada is the largest supplier, followed by China. The value of clam exports during the first 6 months of 2006 rose to $3.3 million, and increased strongly compared to the same period in 2005. Shipments to European Union countries account for over 60% of total exports. Over the last 2 years, exports to the EU have been boosted by the strength of the euro against the dollar.

Statewide Clam Disaster Assistance Program

Report by the Cedar Key Aquaculture Association

In the last state legislative session, funds were appropriated to assist clam farming businesses in Florida increase production and facilitate recovery from the adverse impacts of hurricanes in 2004 and 2005. Funds, about $250,000, for the east coast industry were specifically designated for cleanup of 3,600 acres of submerged lands and shores in the Indian River near Sebastian. Additional funds of $225,000 were allocated for the west coast clam industry, yet no specific plan for implementation was defined.

West Coast Allocation Plan

The Clam Industry Task Force is the principal organization representing clam farmers statewide. As such, the Task Force was charged by the Department of Agriculture and Consumer Services (DACS), Division of Aquaculture to determine how the west coast funds would be spent. At their meetings in Sebastian on August 29 and in Tampa on November 17, the group approved an allocation plan. Further, the Task Force recommended that the Cedar Key Aquaculture Association (CKAA), which is the largest association in the state representing clam farmers, act as project contractor. The CKAA has entered into a contractual agreement with DACS to allocate these funds in the following defined categories.

Category 1	$15,000	Agricultural Law Enforcement
Category 2	$50,000	Water quality monitoring stations
Category 3	$75,000	Direct funding to seed producers
Category 4	$85,000	Direct funding to clam producers

Categories 1 and 2: The Office of Agricultural Law Enforcement will use these funds to purchase a new boat motor and trailer for their Polar Skiff and night vision binoculars. The DACS Division of Aquaculture will purchase necessary equipment and replacement sensors to reestablish water quality and weather monitoring stations.

Category 3 — Seed Producers: Direct payment will be made to in-state clam seed producers to improve their capabilities and increase seed production. Qualified seed producers include those hatcheries that were certified in 2006 and intend to produce seed in 2007. A letter will be sent by CKAA in February to those qualified hatcheries defining the payment method. Basically, it will be cost reimbursement. Out-of-pocket expenses to purchase equipment or supplies for the hatchery facility within a defined time period will be eligible. Proper supporting documentation showing that the item(s) have been paid by the seed producer will be required.

Category 4 — Clam Producers: This funding will be used to assist clam farmers in increasing production and complying with conditions of their leases. Qualified activities include:

- Clam lease cleanup (ie., removal of derelict bags, netting),
- Purchase signage and lease marker replacement,
- Labor to reestablish and replace lease markers and signs,
- Purchase and distribute educational/informational signs,
- Buying clam seed and/or growout bags.

Funds ($85,000) in this category will be allocated in the following manner based on the number of leases and aquaculture certifications in each county. Regional task force members representing west coast counties are responsible for identifying qualified activities and area service providers. At the next Task Force meeting in Cedar Key on February 8, county needs will be discussed.

County	Funds	%	Task Force Representative
Charlotte	$3,400	4	Dan Leonard
Collier	$3,400	4	Dan Leonard, Tony Heeb
Dixie	$15,300	18	Rick Viele
Franklin	$8,500	10	Bill Lartz
Lee	$11,900	14	Tony Heeb
Levy	$42,500	50	Rose Cantwell, Sue Colson, Rick Cooke, Mike Hodges, Billy Leeming, Chris Topping

Levy County Allocation Plan: Clam Bag Removal

Industry representatives of Levy County have agreed to use $30,000 of their allocation to augment a pilot project that has been in the works for a number of months (see the May 2006 issue of this newsletter). These funds, to be administered by the Levy County Soil & Water Conservation District, along with funds provided by the Suwannee River RC&D Council, will be used to remove damaged clam farming equipment ("derelict" bags, clam shell, and live oysters) from leases. Recovered bags will then be used as structural components to construct an oyster reef for a shoreline stabilization project. The pilot project is anticipated to get started by March.

Bag Removal Vendors: Services for removal of these bags and placement at the designated restoration site will be contracted to local vendors. Interested parties may pick up an application form at the Shellfish Extension Office this month. The CKAA will recommend bag removal vendors based on their capabilities to do the job. A fixed price will be set for the removal/replacement of each derelict bag.

Participating Clam Producers: Clam producers with leases in Levy County interested in participating in this pilot program must also pick up an application form at the Shellfish Extension Office. Those producers who expressed interest at the Clam Informational Fair last year do not need to sign up again, unless you need to update your information. This is a cost share program, meaning producers will be requested to provide 25% of the cost to remove clam bags from their leases. Because of limited funds in the pilot program, producers may sign-up for a maximum of 75 bags. If there is more interest than funding, a drawing or lottery will be used to select producers. Participating producers will then be responsible for selecting their bag removal vendor. Verification procedures are being developed by the CKAA to ensure each aspect of this program is completed. For more information, contact one of the CKAA Board of Directors.

2007 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@earthlink.net

Brewer's Clams - H, N
4225 Indian River Drive
Cocoa, FL 32927
Contact: Gray Brewer
(321) 794-3746 (cell)

Cedar Creek Shellfish Farms - H, N
859A Pompano Avenue
New Smyrna Beach, FL 32169
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

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

H - Hatchery
N - Nursery

* This list is provided as a service of the UF/IFAS Shellfish Aquaculture Extension. We do not sponsor or endorse any of these suppliers over any others.

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

Kona Bay Marine - H, N
3465 Waialae Avenue, Suite 240
Honolulu, HI 96816
Contact: Brian Goldstein
(877) 526-2746 / (808)356-0203 (Fax)
sales@konabaymarine.com

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

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

Orchid Island Shellfish Co. - N
633 Old Dixie Highway
Sebastian, FL 32958
Contact: Ed Mangano
(772) 589-1600

Pelican Inlet Aquafarms - H, N
5787 SW 9th Court
Cape Coral, FL 33914
Contact: Edwin Connery
(239) 549-8014
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

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

Southern Cross Seafarms - H, N
12170 State Road 24
Cedar Key, FL 32625
Contact: Bill Leeming
(352) 543-5980

In addition, check the:
East Coast Shellfish Hatchery and Nursery List 2007
Published by Gef Flimlin
Rutgers Cooperative Extension
Toms River, NJ 08755
(732) 349-1152
flimlin@aesop.rutgers.edu
Htpp://www.ecsga.org

Note: Clam seed obtained from out- of -state suppliers must meet best management practices 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. Pathogen testing must take place at the point of origin. If testing is completed after delivery to your farm, it is a BMP violation. Go to *www.FloridaAquaculture.com* or contact Mark Berrigan, DACS Division of Aquaculture, at (850) 488-4033.

2007 Clam Bag Suppliers

The Bag Lady
P.O. Box 1413
Bronson, FL 32621
Contact: Dennis, Karen, Annie Voyles
(352) 486-3763
akvoyles@aol.com

Island Bags
16710 SW 121 Lane / P.O. Box 86
Cedar Key, FL 32625
Contact: Carla and Ray Ermel
(352) 543-5231or 949-1869 (cell)
isbags@svic.net

Playing Hooky Enterprises
1203 Alligator Drive
Alligator Point, FL 32346
Contact: Ed Bradley
(850) 349-2854
capted@clambags.com
www.clambags.com

Southern Belle Clam Bags
423 NE 833rd Street
Old Town, FL 32680
Contact: Faith van Orden
(352) 542-2508 or 542-5288 (cell)
ospreyfr@att.net

Chris Vandenberg
13250 SW 67th Place
Cedar Key, FL 32625
Contact: Chris Vandenberg
(352) 477-5102

Thread Supplier:

Alliance Thread & Sewing Supply
33 Bonair Drive
Warminster, PA 18974
Contact: David Weitz
(215) 441-9300
dwieitz@alliancethread.com

Fabric Suppliers:

Fablok Mills
140 Spring Street
Murray Hill, NJ 07974
Contact: Sylvia, Julie, Joe or Jim
(908) 464-1950 or 464-6520 (fax)
info@fablokmills.com

Jason Mills, Inc.
349 Kinderkamack Road
Westwood, NJ 07675-3601
Contact: Mike or Tom Cosgriff, Sr.
(201) 358-6500 or 358-8915 (fax)
mike@jasonmills.com
www.jasonmills.com

Summit Textiles
118-B Cedar Springs Road
Spartanburg, SC 29302
Contact: Tom Howell
(800) 446-9611

EVERY CLAM BAG MUST BE TAGGED! Suggestions for Identification Tags and Suppliers

To participate in the USDA crop disaster and financial assistance programs, clam growers must tag everyone of their clam bags. A tagging requirement was included in the revisions made to the pilot crop insurance program in crop year 2005. At that time, USDA Risk Management Agency determined that growers in eligible counties must tag their growout bags with the owner's name and aquaculture certification (AQ) number. Now the USDA Farm Service Agency, which administers the Noninsured Crop Disaster Assistance Program, or NAP, is adopting the requirement. The intent is to assist loss adjustors in properly locating the clam grower's crop. This means all growers in all counties must identify both their field nursery and growout bags. Following are a couple of suggestions for identification tags and suppliers. In addition, PVC pipe can be used as tags or the PVC pipe stakes themselves can be marked with a permanent pen.

Horticulture Inventory Tags
Available at: The John Henry Company
Phone: 800-748-0517 Website: www.jhc.com

This blank tag, *Thriftee®,* is made of sturdy polystyrene and is 5/8" wide. It is available in 6 lengths and 8 colors. There are 1,000 tags per box. Prices range from about $46 per box for 6" long tags, all colors (*Product Code:* KN0161-0168) to $60 per box for 8" long tags, colors of white, green, or yellow (*Product Code:* KN0181-0183). The tag is durable and inexpensive, but has no holes. Either a hole punch can be used in order to attach the tag with a cable tie to a bag, or it can just be inserted inside the bag. Another horticulture tag, *Stik-Stake®,* is larger, 1" wide and over 10" long. It is available in white only. A box of 1,000 is about $50 (*Product Code:* BJ9021). This tag allows for more information to be written on it. The supplier recommends using their permanent marking pen, which is water-proof, fade-proof, and dries instantly. More importantly, it provides legible information for the duration the bag is on the lease. Growers have been reusing these tags after a crop period. Marking pens are about $3 each, for 6 pens (*Product Code:* UH0960).

Plastic Truck Seal Tags
Available at: ULINE Shipping Supply
Phone: 800-295-5510 Website: www.uline.com

This plastic tag, 7 1/2" long by 3/8" wide, has a self-locking seal and a breaking strength of 55 lbs. Seals are consecutively numbered, up to 7 digits, and embossed with custom wording, up to 17 characters. A box of 1,000 is about $200 which includes the engraving fee for custom wording. The tag is more expensive but is durable and can be attached to the bag. The consecutive numbering may be advantageous for bag inventory.

UF IFAS

YOU ARE INVITED TO PARTICIPATE!

Thursday, February 8, 2007
Community Center (old Lion's Club)
809 6th Street, Cedar Key

11:00 AM—1:30 PM

Statewide Clam Industry Task Force

Agenda Items:

Hurricane Cleanup Contracts and West Coast Funding
Aquaculture Lease Fees and BMP Updates
Department of Health Regulations for Wells
Status of Hatcheries, Out-of-State Seed BMPs?

2:00—5:00 PM

UF/IFAS Fisheries & Aquatic Sciences Department Workshop

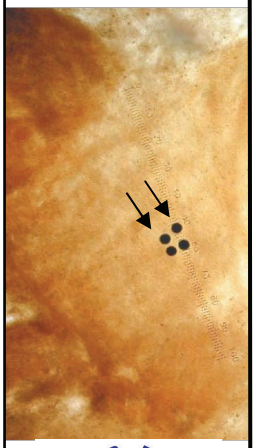
Project Updates:

Genetic Diversity and Clam Stock Performance
Evaluation of Triploidy for Increased Summer Survival
Clam Stock Improvement through Hybridization
Coastal Eutrophication in the Suwannee Sound
and Effects on Shellfish Production
Clam Health Assessment, Sulfides in Lease Sediments
Ark Clam and Sunray Venus Culture Potential
CLAMMRS Project, And More, Industry Feedback Session

5:00—6:00 PM Social Hour

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

University of Florida Department of Fisheries & Aquatic Sciences IFAS



Sea Grant Florida

HARBOR BRANCH OCEANOGRAPHIC INSTITUTION

USDA

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
DIVISION OF AQUACULTURE

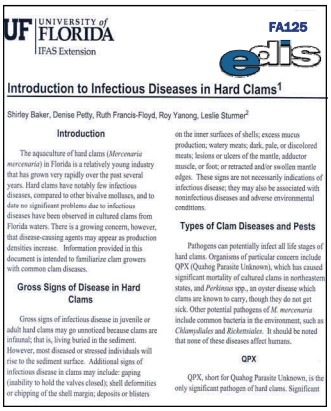
New Clam Publications Available through EDIS, Electronic Data Information Source

EDIS publications are available online at http://edis.ifas.ufl.edu. Click on Topic Areas—Crops—Aquaculture—Clam.

Introduction to Infectious Diseases in Hard Clams

Shirley Baker, Denise Petty, Ruth Francis-Floyd, Roy Yanong, Leslie Sturmer; UF/IFAS Fisheries and Aquatic Sciences Department and Cooperative Extension Service

Hard clams have few infectious diseases, compared to other bivalve molluscs. To date, no significant problems due to infectious diseases have been observed in cultured clams in Florida waters. There is a growing concern, however, that disease-causing agents may appear. Information provided in this document is intended to familiarize clam growers with common clam diseases. Pathogens can potentially infect all life stages of hard clams. Organisms of particular concern are QPX, which has caused significant mortality in clam crops in northeastern states, and Dermo, an oyster disease which clams are known to carry. Other potential clam pathogens, such as intercellular bacteria and parasites, are described. Note that none of these pathogens affect humans. Assistance from aquatic animal health specialists is available and their contact information is provided. EDIS document **FA125** was published in October 2006.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Introduction to Infectious Diseases in Hard Clams[1]

Shirley Baker, Denise Petty, Ruth Francis-Floyd, Roy Yanong, Leslie Sturmer[2]

Introduction

The aquaculture of hard clams (*Mercenaria mercenaria*) in Florida is a relatively young industry that has grown very rapidly over the past several years. Hard clams have notably few infectious diseases, compared to other bivalve molluscs, and to date no significant problems due to infectious diseases have been observed in cultured clams from Florida waters. There is a growing concern, however, that disease-causing agents may appear as production densities increase. Information provided in this document is intended to familiarize clam growers with common clam diseases.

Gross Signs of Disease in Hard Clams

Gross signs of infectious disease in juvenile or adult hard clams may go unnoticed because clams are infaunal; that is, living buried in the sediment. However, most diseased or stressed individuals will rise to the sediment surface. Additional signs of infectious disease in clams may include: gaping (inability to hold the valves closed); shell deformities or chipping of the shell margin; deposits or blisters on the inner surfaces of shells; excess mucus production; watery meats; dark, pale, or discolored meats; lesions or ulcers of the mantle, adductor muscle, or foot; or retracted and/or swollen mantle edges. These signs are not necessarily indications of infectious disease; they may also be associated with noninfectious diseases and adverse environmental conditions.

Types of Clam Diseases and Pests

Pathogens can potentially infect all life stages of hard clams. Organisms of particular concern include QPX (Quahog Parasite Unknown), which has caused significant mortality of cultured clams in northeastern states, and *Perkinsus* spp., an oyster disease which clams are known to carry, though they do not get sick. Other potential pathogens of *M. mercenaria* include common bacteria in the environment, such as *Cytophagales* and *Rickettsiales*. It should be noted that none of these diseases affect humans.

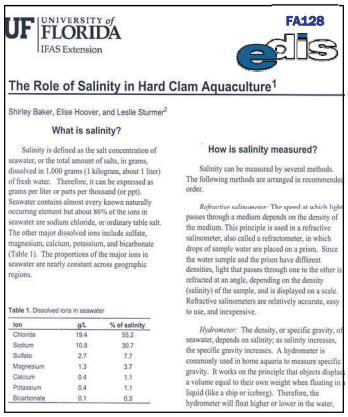
QPX

QPX, short for Quahog Parasite Unknown, is the only significant pathogen of hard clams. Significant

The Role of Salinity in Hard Clam Aquaculture

Shirley Baker, Elise Hoover, Leslie Sturmer; UF/IFAS Fisheries and Aquatic Sciences Department and Cooperative Extension

Salinity in clam leases is an environmental factor that strongly affects clam survival and growth. The following topics in this publication are addressed: what is salinity, how is it measured, why salinity is variable, how salinity affects the physiology of hard clams, what are the gross signs of salinity stress, and how does salinity affect hard clam production. Lastly, information is provided to clam growers on how they can manage their crop in response to salinity. Since growers cannot control salinity on their leases, they must develop management strategies that adapt to it. The essential first step is salinity monitoring; with this information a clam grower can evaluate lease quality, determine optimal seed nursery areas and planting times, and react to extreme salinity events. Salinity can be adjusted temporarily in a land-based nursery, if the clam grower is prepared. EDIS document **FA128** was published in January 2007.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The Role of Salinity in Hard Clam Aquaculture[1]

Shirley Baker, Elise Hoover, and Leslie Sturmer[2]

What is salinity?

Salinity is defined as the salt concentration of seawater, or the total amount of salts, in grams, dissolved in 1,000 grams (1 kilogram, about 1 liter) of fresh water. Therefore, it can be expressed as grams per liter or parts per thousand (or ppt). Seawater contains almost every known naturally occurring element but about 86% of the ions in seawater are sodium chloride, or ordinary table salt. The other major dissolved ions include sulfate, magnesium, calcium, potassium, and bicarbonate (Table 1). The proportions of the major ions in seawater are nearly constant across geographic regions.

Table 1. Dissolved ions in seawater

Ion	g/L	% of salinity
Chloride	19.4	55.2
Sodium	10.8	30.7
Sulfate	2.7	7.7
Magnesium	1.3	3.7
Calcium	0.4	1.1
Potassium	0.4	1.1
Bicarbonate	0.1	0.3

How is salinity measured?

Salinity can be measured by several methods. The following methods are arranged in recommended order.

Refractive salinometer: The speed at which light passes through a medium depends on the density of the medium. This principle is used in a refractive salinometer, also called a refractometer, in which drops of sample water are placed on a prism. Since the water sample and the prism have different densities, light that passes through one to the other is refracted at an angle, depending on the density (salinity) of the sample, and is displayed on a scale. Refractive salinometers are relatively accurate, easy to use, and inexpensive.

Hydrometer: The density, or specific gravity, of seawater, depends on salinity; as salinity increases, the specific gravity increases. A hydrometer is commonly used in home aquaria to measure specific gravity. It works on the principle that objects displace a volume equal to their own weight when floating in a liquid (like a ship or iceberg). Therefore, the hydrometer will float higher or lower in the water.

Statewide Clam Industry Task Force meeting and UF/IFAS Clam Workshop are set for February 8th in Cedar Key. Plan to attend! See Page 5 for details.

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February 2007
This newsletter is published through the University of Florida Cooperative Extension Service.
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