



UNIVERSITY OF
MARYLAND
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Aquaculture Resource Guide



**“Economy,
Employment,
Environment”**

Cover: tumbling equipment for cleaning and grading oysters in operation at the Hollywood Oyster Company, St. Mary's County MD

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"Building Our Industry Together"



Aquaculture Resource Guide

Compiled by
Don Webster and Victoria Corcoran
University of Maryland Extension



*With funding provided by the
National Oceanic and Atmospheric Administration
and the
Maryland Department of Natural Resources*

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Aquaculture Resource Guide

*Don Webster and Victoria Corcoran
University of Maryland Extension*

This guide provides Maryland shellfish growers with information about obtaining seed, supplies, equipment, assistance, financing and other items for developing a successful aquaculture business. Modern shellfish farming has advanced rapidly in many areas of the world, bringing with it a need for quality larvae, seed, and culture equipment. We have brought together many sources for quick reference in this guide. It is updated as additional sources are identified and more businesses begin to supply the growing shellfish aquaculture industry. Please feel free to contact the authors about your experiences using this guide as well as to add other sources that may not currently be included.

Information is divided into several sections:

- *Hatcheries and Nurseries*
- *Equipment and Supplies*
- *Agencies, Institutions and Organizations*
- *Definitions*



HATCHERIES AND NURSERIES

Building a commercial shellfish industry through aquaculture has become possible with the development of hatchery technology, selected lines of animals, and processes such as *remote setting*. This method of seed production has allowed hatcheries to concentrate on production of larvae, which can be shipped overnight to distant locations for setting. The breeding of “*superlines*” of oysters has led to traits such as enhanced resistance to disease and superior meat quality. *Triploidy* provides oysters that do not spawn, producing high quality meats throughout summer when native oysters have become poor after reproducing.

Nurseries provide both spat on shell and *cultchless* seed for growers. While some growers operate their own nursery systems prior to planting, others purchase seed at a size which can be immediately deployed for growout. Another option for spat on shell production is to set your own seed and plant it immediately after set.

Dealing with hatcheries or nurseries

If you are considering obtaining larvae or seed from a hatchery, it is always a good idea to visit the operation prior to purchase. You should tour the business, meet the owner or operator and establish a business relationship. Ask for the names of prior customers and check out their experiences with the business. Word of mouth provides an excellent source of information. Most hatcheries and nurseries **require a non-refundable deposit** for your order to ensure that you pick up your seed on time. This keeps their business operating smoothly as well as yours. If you decide to deal with more than one hatchery or nursery, we recommend that you keep subsamples of the products separated so that you can carry out growth comparisons to see which perform best for your location.

Larvae and seed shipped within the Chesapeake Bay region will usually have no problem with permits since the same diseases are prevalent in both states. However, it should be recognized that these procedures are in place to safeguard all oyster resources in the state. Growers should adhere to the permit requirements since they are important for the health of shellfish in our waters.

A Shellfish Import Permit is required to bring larvae or seed from out of state and must be applied for at least 30 days prior to movement

This list of hatcheries and nurseries is part of an annual report from Rutgers Cooperative Extension of Ocean County (NJ) and from personal communication with the businesses.

These listings are provided for **information purposes only**. The University of Maryland does not endorse or recommend any person or company. Users of this guide should be prudent in their business practices and exercise diligence before committing funds for any purchase.

Maryland state law requires that you obtain a Shellfish Import Permit to allow transporting oyster or clam larvae, seed, spat and/or shell across state lines. Import permit applications are available at: <http://www.dnr.state.md.us/fisheries/oysters/industry/aquaculture> or by calling the DNR Aquaculture Division, Becky Thur at 410-260-8252. **Applications must be submitted at least 30 days prior to when you wish to import these items.**



PRODUCT CODES

HC = Hard Clam

OY = Eastern Oyster

N = Nursery

BS = Bay Scallop

PH = Private Hatchery

Maryland

38° North LLC OY, N

Contact: J.D. Blackwell

Post Office Box 2

Scotland MD 20687

301-872-5051

JD@38northoysters.com

<http://www.38northoysters.com/>



38° North LLC oyster nursery on the Potomac River

Gordon's Shellfish LLC HC, OY, N, PH

Contact: Steve Gordon
4248 Bayside Road
Snow Hill MD 21863
410-726-1202
steve@seaclam.com

Hooper's Island Oyster Company OY, N

Contact: Johnny Shockley
2500 Old House Point Road
Fishing Creek MD 21634
443-521-1635
Johnny@cgoysters.com
<http://www.cgoysters.com>

Johnny Oysterseed Co. OY, N

Contact: John Farrington
5223 Williams Wharf Road
St. Leonard MD 20685
410-610-1508
johnnyoysterseed@gmail.com
<http://johnnyoysterseed.com>

Oyster Recovery Partnership OY

Contact: Jillian Parisi
UMCES Horn Point Lab
PO Box 775
Cambridge MD 21313
410-260-8328
jparisi@oysterrecovery.org

Piney Point Aquaculture Center OY, N

Contact: Stan Tomaszewski
17996 Piney Point Road
PO Box 150
Piney Point MD 20674
301-994-0241 ext2
stomaszewski@dnr.state.md.us

University of Maryland Horn Point Hatchery OY, N

Contact: Stephanie Alexander
UMCES Horn Point Lab
PO Box 775
Cambridge MD 21613
410-221-8310
tobash@umces.edu
<http://www.hpl.umces.edu/hatchery/>



Johnny Shockley of Hooper's Island Oyster Company cleans seed in one of the shoreside upwellers his company operates

Shore Thing Shellfish, LLC. OY, N
Contact Kevin Boyle
P.O. Box 74
Tall Timbers, MD 20690
240-338-3841
shorethingshellfish@gmail.com

Virginia

Bagwell Enterprises HC
Contact: Yvonne Bagwell
Smith Beach Road
P.O. Box 508
Eastville, VA 23347
757-678-5806
757-678-7329 (fax)
clammom@gmail.com



Silo boxes fit in a floating upweller (FLUPSY)
to hold seed while it grows

Bay Watch Oyster Seeds, LLC OY, N
Contact: Keith Rodgers
P.O. Box 535
271 Bay Watch Lane
Reedville, VA 22539
804-453-4367
baywatchoysterseeds@nnwifi.com
www.baywatchoysterseeds.com

Broadwater Salts HC, OY
Contact Jimmy Kelly
P. O. Box 322
Nassawadox, VA 23413
757-710-0353
broadwaterseafood@yahoo.com

Cherrystone Aquafarms HC, OY, PH
Contact: Tim Rapine
P.O. Box 347
Cheriton, VA 23316
757-331-1208
timr@littleneck.com
<http://www.clamandoyster.com>

Chincoteague Shellfish Farms HC
Contact: Mike McGee
P.O. Box 576
Chincoteague, VA 23336
757-336-1985
757-336-6900 (fax)
chincoteagueshellfishfarms@verizon.net

JC Walker Brothers HC, OY, BS, PH
Contact: Tom & Wade Walker/Ann Gallivan
P.O. Box 10
Willis Wharf, VA 23486
757-442-6000
757-442-7059 (fax)
seasideclams@gmail.com
www.jcwalkerbroscclams.com

KCB Oyster Holdings, LLC OY, PH
Contact: A.J. Erskine/Liz Walker
755 Lake Landing Drive
Lottsburg, VA 22511
804-529-6654
804-529-7374 (fax)
ajerskine@bevansoyster.com

Oyster Seed Holdings, LLC OY, PH
Contact: Michael Congrove
PO Box 397
Grimstead, VA 23064
804-725-3046
804-725-3047 (fax)
msc@oysterseedholdings.com
www.oysterseedholdings.com

Shooting Point Oyster Company OY, N
Contact: Tom Gallivan
5456 Bayford Road
Franktown, VA 23354
757-693-1303 (boat)
757-414-0295 (fax)
tom@ShootingPointOysters.com
www.shootingpointoysters.com



Oysters are graded and packed for distribution to buyers



Downweller with microcultch provides production for "cultchless" oyster seed for single oysters

Tarkill Aquaculture Ventures, LLC OY,
Contact: Bob Boardman
PO Box 94
Onancock, VA 23417
757-894-2009
www.tarkillaquacultureventures.com

Toms Cove Aquafarms HC, OY
Contact: Tommy Clark
PO Box 355, Chincoteague Island, VA
757-336-1945
<http://www.tomscove.net>

Ward Oyster Company OY, PH
Contact: John Vigliotta
6578 Jarvis Road
Gloucester, VA 23061
804-693-7597
804-693-0581 (fax)
Clamman47@hotmail.com

EQUIPMENT AND SUPPLIES

There are many methods of raising shellfish. Traditional production in Maryland was by bottom culture on submerged land leases but new ideas have developed to include various types of containment gear to protect single shellfish from predation. Aquaculture uses many of the same supplies as commercial fishing while relying on a variety of other gear to raise shellfish. These include downweller and upweller nursery equipment, bottom cages, surface floats, containers for containing cultch for setting and nets for protecting seed. A number of companies have begun to produce gear for the Chesapeake region.

Maryland

Atlantic Pressure Washers

Contact: Jeff Paulding
1708 Whitehead Road
Baltimore, MD 21207
410-944-5566
admin@atlanticpressurewashers.com
<http://www.atlanticpressurewashers.com/home.php>
Products: pressure washers; cleaning fluids

Captain Bruce's Crabbing Supplies

Contact: Captain Bruce
22 Theresa Lane
North East, MD 21901
410-287-6315
Captainbruce53@aol.com
<http://www.stackablecrabtraps.com/>
Products: commercial fishing supplies

D.O. Baker

Contact: D.O. Baker
Broomes Island, MD 20615
410-591-0361
Products: oyster cages, long line spat cages



Bottom cages hold shellfish to provide protection and come in a variety of sizes.

Eddie Heath's Crab Pots & Supply Co., Inc.

Contact: Eddie Heath
724 West Main Street
Crisfield MD 21817
410-968-1292
Products: commercial fishing and crabbing supplies and equipment; wire mesh, tools and equipment; fabrication of products made from wire mesh; consultation on specialized needs

First State Packaging

Contact: Tim Campbell
P.O. Box 3037
511 Naylor Mill Road
Salisbury, MD 21801
410-546-1008
<http://www.firststatepackaging.com/index.shtml>
Products: boxes; packaging products; trucking; warehousing

Harrington Graphics and Screen

116 Broad Street
Berlin, MD 21811
410-641-1986
chris@hgands.com
<http://hgands.com/hgands.html>
Products: promotional materials; screen printed shirts



Hooper's Island Oyster Company specialized aquaculture vessel fabrication services

Hooper's Island Oyster Company

Contact: Johnny Shockley
2500 Old House Point Road
Fishing Creek, MD 21634
443-521-1635

Johnny@cgoysters.com

<http://www.cgoysters.com>

Products: oyster cages; tools; cage materials; fabrication of upwellers and downwellers, oyster grader & sorters; custom building/modification of fiberglass boats for shellfish farming. Growing systems and consulting services are available.

Johnny Oyster Seed Co.

Contact: Jon Farrington
5223 Williams Wharf Road
St. Leonard, MD 20685
410-610-1508

johnnyoysterseed@gmail.com

<http://johnnyoysterseed.com>

Products: "Revolution" self-maintaining Buoyant Oyster Cultivation System (BOCS); oyster cages; barge service; consulting

Tenax Corporation

4800 East Monument Street
Baltimore, Maryland 21205
410-222-7000
800-356-8495
410-522-7015 (fax)

www.tenaxus.com

Products: plastic netting products; packaging; tubular nets; geotextiles; filtration material

Victory Packaging

Contact: Cheryl Schwabline
7605 B Dorsey Run Road
Jessup, MD 20794
800-790-8457

<http://www.victorypackaging.com>

Products: packaging and shipping supplies

Virginia

Chesapeake Bay Oyster Company

Contact: Jon Quigley

P.O. Box 96

Wake, VA, 23176

804-338-6530

804-776-0703 (fax)

sales@bayoyster.com

<http://www.bayoyster.com/>

Products: wire, oyster cages, oyster bags, floats; tools; grader/sorter; conveyors, upwellers



Plastic mesh oyster bags come in a variety of sizes. Oysters are transferred to larger sizes as they grow.

Other States

Pentair Aquatic Eco-systems Inc.

2395 Apopka Blvd.

Apopka, FL 32703

877-347-4788

<http://www.aquaticesco.com>

Products: company offers a wide range of aquaculture supplies and equipment

Coastal Aquaculture Supply

Contact: Brian Bowes

100 Glen Road, PO Box 8066

Cranston, RI 02920

401-467-9370

bbowes@plasticpipesupply.com

[www://coastalquacultural.com](http://www.coastalquacultural.com)

Products: aquaculture growout equipment and supplies; pipe & accessories



Floats can be used to culture oysters on the surface with the shellfish placed in bags in the flotation collars.

Flexabar Corporation

Contact: Andy Guglielmo

1969 Rutgers University Boulevard

Lakewood, NJ 08701

Andy@flexabar.com

<http://www.flexabar-corporation.com/>

732-901-6500

732-901-6504 (fax)

Products: specialty marine coatings; water based antifouling

Hamilton Marine

155 East Main Street
Searsport ME 04974
207-548-6302
207-548-0481 (fax)
800-639-2715 (order line)

<http://www.hamiltonmarine.com/>

Products: wide range of commercial fishing supplies; personal protective equipment

Ketcham Traps

Contact: Myron Horzesky
111 Myrtle Street
New Bedford, MA 02740
(508) 997-4787

www.Lobstering.com

Products: trap fabrication; construction materials

Memphis Net and Twine

P.O. Box 80331
2481 Matthews Avenue
Memphis, TN 38108
888-674-7638

fishinfo@memphisnet.net

<http://www.memphisnet.net/>

Products: commercial fishing supplies;
aquaculture supplies; tools; knives; personal
protection gear

New Bedford Ship Supply Co., Inc.

108 Front Street
New Bedford MA 02740
508-994-2961

Products: commercial fishing supplies; personal
protection gear; knives

New River Nets

140 Charles Creek Road
Sneads Ferry, NC 28460
910-327-1231
910-327-3136 (fax)

sales@newrivernets.com

<http://www.newrivernets.com/>

Products: commercial fishing supplies; personal protection gear; knives



Vinyl coated wire cages have been developed as an alternative to shell bags.

Netminder Aquatic Coatings

Contact: Steven Fisher, President and CEO

1155 Youngsford Road

Gladwyne, PA 19035

Phone: 267-709-1397

Fax: 484-412-8322

sfisher@netminder.us

Products: non-toxic antifouling coatings for aquaculture and commercial fishing applications



Plastic mesh shell bags provide one means of containing shell for setting

Nylon Net Company

PO Box 592

1340 Farmville Road

Memphis, TN 38122

800-238-7529

901-526-6538 (fax)

nylonnet@nylonnet.com

<http://www.nylonnet.com/>

Products: commercial fishing supplies; aquaculture supplies; tools; knives; personal protection gear

Sea Gear Marine Supply

Contact: Charles Barto

Route 109 and 4th Ave

Cape May, NJ 08204

609-884-2711

609-884-8467 (fax)

425-3511 (cell)

info@seagearmarine.com

<http://www.seagearmarine.com>

Products: commercial fishing supplies; personal protection gear



Remote setting systems for seed production require pumps and aeration for proper operation.

Southern Aquaculture Supplies

PO Box 326

931 St. Mary's Street

Lake Village AR 71653

870-265-3584

800-850-7274

870-265-4146 (fax)

sales@southernaquaculturesupply.com

<http://southernaquaculturesupply.com>

Products: water test equipment; aeration & diffusers; scales

The Rope Locker

Contact: Jim Torbert

PO Box 1

Felton, DE 19943

302-284-4587

jamestorbert@hotmail.com

<http://theropelocker.com>

Products: rope and cordage; Gripmoor® fasteners; splicing services

AGENCIES, INSTITUTIONS AND ORGANIZATIONS

Many state and federal agencies and organizations can assist you with your shellfish aquaculture business. Some are involved in permitting while others provide various types of assistance for industry development. We list them in this section by alphabetical headings with a statement of what they do and contact information by the following groupings:

- Advisory Groups
- Business Assistance
- Education and Training
- Federal Agencies
- Financing
- Grants, Research and Development
- Industry Associations
- Non-Governmental Organizations
- Permitting
- Protection and Enforcement
- Regulatory



Advisory Groups

Aquaculture Review Board

The Aquaculture Review Board (ARB) is comprised of state and federal agency representatives who are charged with responsibility for aquaculture permitting and compliance. The ARB meets monthly to review and track applications to assure that they progress and that the applicant is informed during the process (*Code Natural Resources Article, sec. 4-11A-03.1*).

An important feature of the ARB is the **pre-application hearing**. Individuals may schedule a presentation with the ARB to present concepts and ideas about aquaculture plans they are developing and discuss these with Board members. Potential conflicts or problems can be identified and rectified prior to the application being submitted. The goal is to provide the applicant with an easy path through the permitting process.

The ARB is chaired by the Department of Natural Resources Aquaculture Division Director and includes one representative each from the Department of Agriculture, Department of the Environment and Department of Health and Mental Hygiene. The National Marine Fisheries Service and the US Army Corps of Engineers have invited representatives on the Board. For matters involving navigation (*i.e.* lease marking, etc.) the US Coast Guard is also represented. Current members of the ARB include:

- *Department of Natural Resources:* Karl Roscher, *Chairman*
- *Department of Agriculture:* vacancy
- *Department of the Environment:* Kathy L. Brohawn
- *Department of Health & Mental Hygiene:* Erin Butler
- *National Marine Fisheries Service:* Christopher Boelke
- *U.S. Army Corps of Engineers Baltimore District:* Woody Francis
- *U.S. Coast Guard, Norfolk District:* Albert Grimes

Information: Karl Roscher, DNR; phone: 410-260-8313; email: KRoscher@dnr.state.md.us

Aquaculture Coordinating Council

The Council (ACC) was created in 2005 by the General Assembly to provide guidance and leadership for advancing all types and species of Maryland aquaculture (Annotated Code of Maryland 4-11A-03.2). Specific responsibilities include fee structures, policy initiatives, market tests, pilot projects and Best Management Practices. The Council was consulted on changes to the state leasing program during its revision in 2009 and is charged with periodically reviewing and recommending changes to laws and regulations affecting aquaculture. The Council often uses workgroups to investigate and report on issues. These incorporate the expertise of members and outside experts. The ACC produces an annual report for the Governor and legislature on recommendations for industry improvement.

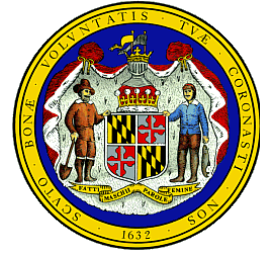
The Council meets bi-monthly (January, March, May, July, September and November) on the second Thursday at 6:30 pm at the Department of Natural Resources in Annapolis. Guests are encouraged to attend and time is allotted for public input.

Among the responsibilities of the Aquaculture Coordinating Council are:

- Make annual proposals to the Governor and General Assembly to advance Maryland aquaculture;
- Conduct applied studies to expand the aquaculture industry in the State;
- Conduct market tests to determine acceptability and demand for new products;
- Implement pilot projects and demonstrations to resolve quality or production issues and educate industry, regulators, and other partners;
- Support the industry in implementing innovation and to comply with regulations;
- Enhance awareness of innovative products and programs among buyers and public;
- Develop best management practices for freshwater and marine aquaculture;
- Regularly review State regulations affecting aquaculture and make recommendations to the Aquaculture Review Board regarding necessary or advisable regulatory changes.

Membership of the Council is designated by law. Current members are:

- *University of Maryland Extension*, Donald Webster, *Chair*
- *Tidal Fish License*, Andrew Buck, *Vice-chairman*
- *Tidal Fish License*, Johnny Shockley
- *Tidal Fish License*, Ben Parks
- *Aquaculture Industry*, Don Flax
- *Aquaculture Industry*, Jon Farrington
- *Aquaculture Industry*, Terry Witt
- *Maryland Senate*: Katherine Klausmeier
- *Maryland House of Delegates*: Anthony O'Donnell
- *Department of Agriculture*: Joanna Kille
- *Department of Business & Economic Development*: Stacy Kubofcik
- *Department of the Environment*: Kathy Brohawn
- *Department of Health & Mental Hygiene*: Erin Butler
- *Natural Resources Police*: Capt. Chris Sherman
- *Department of Natural Resources*: Karl Roscher, *Coordinator*
- *University of Maryland, College Park*: Reginal Harrell, Ph.D.
- *University of Maryland Center for Environmental Science*: Andrew Lazur, Ph.D.



Information on Council activities including upcoming meetings and summaries of prior meetings (after approval at the following meeting) may be obtained at:

<http://www.dnr.state.md.us/fisheries/management/?com=acc>

Information: Karl Roscher: phone: 410-260-8313; email: kroscher@dnr.state.md.us



Aquaculture Coordinating Council members, (L to R) Don Webster, *Chairman*, Karl Roscher, Sen. Kathy Klausmeier, Del. Tony O'Donnell, Jon Farrington, Don Flax, Andy Lazur, Erin Butler, Craig Mask, Kathy Brohawn, Johnny Shockley, Andy Buck, *Vice-chairman*, Mindie Burgoyne (replaced by Staci Kubofcik), Joanna Kille, Terry Witt (not shown Chris Sherman, Reggie Harrell)

Oyster Advisory Commission

The Oyster Advisory Commission was authorized by 2007 legislation to advise the Department of Natural Resources on matters related to oysters in the Chesapeake and coastal bays. It comments on strategies for rebuilding and managing oyster populations under the Chesapeake Bay Oyster Management Plan including rebuilding and managing oyster populations. One of the first tasks of the Commission was to review findings of the Environmental Impact Statement on native and non-native oysters as alternatives in restoration. Commissioners first appointed by the DNR Secretary in September 2007 included scientists, businesspersons, anglers, commercial harvesters, economists, environmental advocates and elected officials. (ACM Natural Resources Articles 1-102, 1-105, 1-104)

The Commission meets three times annually (generally in February, June and October) at a variety of locations. All meetings are open with times provided for public comment.

Current members of the OAC include:

- Tony Chatwin, *National Fish and Wildlife Foundation, Chairman*
- Don Boesch, *University of Maryland Center for Environmental Science*
- Mark Bryer, *The Nature Conservancy*
- Kelton Clark, *Morgan State University Estuarine Research Center*
- Honorable Richard Colburn, *Maryland Senate*
- Kelley Cox, *Phillips Wharf Environmental Center*
- Bill Goldsborough, *Chesapeake Bay Foundation*
- Douglas Legum, *Real Estate Developer*
- Ken Lewis, *Coastal Conservation Association Maryland*
- Doug Lipton, *NOAA National Marine Fisheries Service*
- Donald Meritt, *UM Center for Environmental Science, HPL*
- Honorable Tony O'Donnell, *Maryland House of Delegates*
- Claire O'Neill, *U.S. Army Corps of Engineers (ret.)*
- Ben Parks, *Maryland Watermen's Association*
- Peyton Robertson, *National Oceanic and Atmospheric Administration*
- Honorable Shane Robinson, *Maryland House of Delegates*
- Eric Schott, *UM Center for Environmental Science, IMET*
- Evan Thalenberg, *Chesapeake Bay Savers*
- Donald Webster, *University of Maryland Extension*
- Bill Windley, *Maryland Saltwater Sportfishermen's Association*
- Walter (Robbie) Witt, *Commercial Waterman*
- Len Zuza, *Southern Maryland Oyster Cultivation Society*



Commission information including agenda for the upcoming meeting and summaries of past meetings may be obtained at:

<http://www.dnr.state.md.us/fisheries/management/?com=oac>

Information: Eric Weissberger: phone: 410-260-8344; email: eweissberger@dnr.state.md.us

Business Assistance

Maryland Department of Business and Economic Development (DBED)

DBED provides a variety of support services for new and existing businesses. DBED Staff are available for individual consultation and DBED's website includes easy-to-navigate modules for writing business plans, obtaining assistance from the Small Business Development Centers, developing legal structures for a business, selecting a name and providing access to capital for financing.



Information listed under *Business Resources* includes product development assistance, access to capital, tax credit programs, site selection and recruitment & training. Links are provided to funding agencies including state and federal agencies providing Agricultural loans are included through the *Start a Business* link and aquaculture is considered to be farming by the US Department of Agriculture.

Small Business Development Centers (SBDC) offer counseling and training to solve organizational, financial, marketing, technical and regulatory problems. They are located at:

- SBDC Headquarters, *University of Maryland*
301-403-8300 or 877-787-7232
- Capital Region SBDC, *University of Maryland*
301-403-0501 or 877-787-7232
Serving Prince George's and Montgomery counties
- Central Maryland SBDC, *University of Baltimore*
410-837-4928 or 877-421-0830
Serving Baltimore City/County, Anne Arundel and Howard counties
- Eastern Region SBDC, *Salisbury State University*
410-548-4419 or 800-999-7232
Serving the Eastern Shore from Kent to Worcester counties
- Northern Region SBDC, *Harford Community College*
443-412-2237 or 866-836-6288
Serving Harford, Carroll and Cecil counties
- Southern Maryland SBDC
301-934-7583
Serving St. Mary's, Calvert and Charles counties
- Western Maryland SBDC
301-687-1080
Serving Garrett, Allegany, Washington and Frederick counties



Shellfish aquaculture businesses build economic growth in our rural communities

Regional offices are available throughout the state with staff who can meet with you one-on-one to help your business grow.

Website available: <http://www.choosemaryland.org/>

Education

University of Maryland Extension (UME)

Extension provides technical training and outreach services to those in aquaculture through off-campus, non-credit, continuing education programs. UME currently provides training through the Oyster Aquaculture Education & Training Program funded by NOAA and the Maryland DNR. The project provides regional workshops, gear demonstrations, individual assistance and statewide conferences to build an aquaculture industry. Print and electronic information supporting our educational mission is available on the UME website. For assistance or program information contact:



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Solutions in your community

Faculty:

- Don Webster, Wye Research and Education Center, Queenstown; general aquaculture information; educational and training program development; 410-827-8056 (office); 410-310-7191 (cell); email: dwebster@umd.edu



Don Meritt teaches remote setting techniques to growers at a workshop at the UM Horn Point Lab

- Don Meritt, Horn Point Oyster Hatchery, Cambridge; hatchery, nursery and growout operations; remote setting system design and management; 410-221-8475 (office); email: dmeritt@umces.edu

- Matt Parker, Prince George's County Extension Office, Clinton; business development and management; finance assistance; 301-868-8780 ext. 428 (office); email: mparke11@umd.edu

- Shannon Dill, Talbot County Extension Office, Easton; business development and management; finance assistance; marketing; 410-822-1244 (office); email: sdill@umd.edu

Publications that are available on our website:

- *Production Systems*: culture gear and systems used for growing oysters
- *Remote Setting Systems*: design and operation for production of seed oysters
- *Setting System Economic Analysis*: determining cost in seed production
- *Bottom Culture Cost and Return*: calculating profit and loss for submerged land leases
- *Stabilizing Oyster Ground*: assessing bottom and calculating cultch requirements
- *Purchasing Seed Oysters*: considerations for purchasing seed for planting
- *Best Management Practices*: a manual for maintaining safe and productive leases
- *Aquaculture Systems for the Northeast*: culture systems for shellfish production
- *Marine Species for the Northeast*: animals cultured in the region
- *Planning for Success in your Aquaculture Business*: profitable shellfish farming

Website: <http://extension.umd.edu/aquaculture>

UMCES Horn Point Lab (HPL)

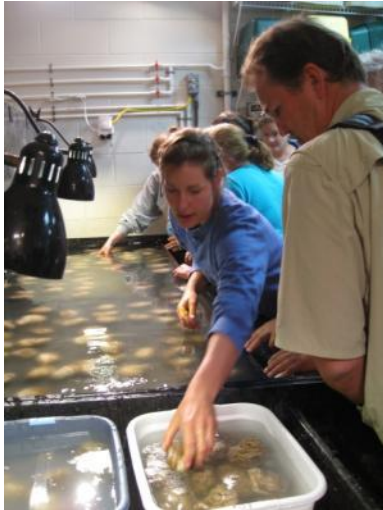
The Horn Point Lab, located near Cambridge on the Eastern Shore, is the site of the largest oyster hatchery on the East Coast. The staff is engaged in large-scale restoration projects and support for developing shellfish aquaculture. Many educational programs aimed at



rebuilding the oyster resource and industry are organized and conducted jointly between HPL, UME and other agencies and organizations including the Oyster Recovery Partnership (ORP) and the Maryland Department of Natural Resources. In recent years the HPL Hatchery has provided training facilities for an annual Oyster Hatchery Short Course, as well as workshops on Remote Setting and lease management. The facilities make it ideal for such programs.

The hatchery produces billions of oyster larvae and creates *spat on shell* for planting natural reefs, sanctuaries and commercial production areas. It offers products for commercial aquaculture including larvae, cultchless seed and spat on shell. These may be purchased as native oysters, selected lines or triploids, depending upon need. The ORP operates a field station at HPL that conducts the large-scale cultch handling required for production. HPL includes the hatchery as well as many setting tanks used in the operation.

The HPL Hatchery has an excellent website with information about the life cycle of the oyster, hatchery facilities and operations, production figures, and many photos. Tours are available



Spawning oysters in the hatchery during an industry short course

during the spawning season, which runs from March through September where groups can see oysters spawn, larvae set, and view the working of this production facility. Tours are open to all ages and usually last 30-60 minutes. In addition to regular HPL lab tours offered twice weekly during summer, groups may be scheduled by advance appointment by contacting hatchery staff.

The Remote Setting Training (RST) program is conducted as a joint project with ORP. Setting tanks are located in many areas around the bay and are available to leaseholders in two-week periods from June until the end of August. Growers are responsible for obtaining clean, aged and containerized shell and providing labor to move it and clean the system at the end of the setting period. Larvae and technical assistance are provided free as part of the RST program, with follow-up visits by staff to determine setting success.

Tour contact: Stephanie Alexander, tobash@hpl.umces.edu; phone 410-221-8310

Remote Setting information and scheduling contact: remotesetting@umces.edu; Steven Weschler, 301-704-0737 (cell); sweschler@umces.edu or Alan Roache, 410-713-2517 (cell); aroache@umces.edu

Website: <http://www.hpl.umces.edu/hatchery/>

Federal Agencies

National Oceanic and Atmospheric Administration (NOAA)

This federal agency provides a wide range of services including weather, fisheries management, coastal management and marine commerce. Two NOAA offices provide services to support the development of aquaculture in the Chesapeake and coastal bays.

NOAA Aquaculture Office

This office fosters marine aquaculture that creates employment and business development in coastal communities leading to safe and sustainable seafood. The group recognizes that aquaculture is one of a range of technologies needed to meet increasing global demand for seafood to support commercial and recreational fisheries, and restore species and marine habitat.



The NOAA Aquaculture Office helps with permitting issues, especially through complicated layers of federal regulations and complex application, review and approval processes. The goal is to develop aquaculture while conserving living marine resources. The Office also oversees aquaculture grant programs are announced periodically.

The principal NOAA Aquaculture Office is located at NOAA headquarters in Silver Spring, MD with a staff of nine. The Regional Coordinator is located at the Northeast Regional Office in Gloucester, MA. His contact information is:

Contact: Dave Alves, 978-281-9210 (office); email: David.Alves@noaa.gov

Website information is available at: <http://www.nero.noaa.gov/ob/aquaculture/>

NOAA Chesapeake Bay Office

The NOAA Chesapeake Bay Office (NCBO) is located in Annapolis and works to protect and restore coastal and marine habitat. The staff has been involved with habitat restoration and commercial aquaculture for many years. The office has funded several projects leading to expansion of commercial shellfish aquaculture including partnering with state agencies and institutions to restore tributaries with self-sustaining oysters and rebuild the oyster industry in Maryland and Virginia. A recent project is the development of an Oyster Data Tool that can aid in providing locations to develop leases for shellfish production.

The NCBO has recently been charged with broad new goals to advance programs that will protect and restore the Bay. They will be focusing on four key areas: *Fisheries; Habitats; Observations; and Education*. The CBO is organized in three primary programs: *Ecosystem Science, Coastal and Living Marine Resources, and Environmental Literacy*.

Contact: Bruce Vogt, 410-267-5655; email: Bruce.Vogt@noaa.gov

Website is available at: <http://chesapeakebay.noaa.gov/>

Financing

Maryland Agriculture and Resource Based Industries Development Corporation

MARBIDCO is an agricultural lending agency that administers funds specifically dedicated to developing shellfish aquaculture. They have partnered with the Maryland Department of Natural Resources to provide affordable financing to watermen and others starting or expanding shellfish aquaculture businesses. University of Maryland Extension contributes to the programs by providing training and individual assistance in developing applications. The following loan programs operated by MARBIDCO are available to growers, although some require the applicant to hold a Tidal Fish License (TFL) due to the nature of the funds.

Maryland Shellfish Aquaculture Loan Program

Eligible Expenses: Items including substrate (e.g., shell), seed (or larvae) and capital equipment (equipment with a 15-year life expectancy). On-bottom and water column (i.e., cages or floats) projects are eligible for funding. Purchase of motor vehicles, including boats and trucks, are **not eligible** under this program.

Minimum/Maximum Loan Amounts: \$5,000 to \$100,000

Loan Terms: In the first 1-3 years, quarterly interest-only payments of 3% APR are required; afterwards, regular amortizing payments are due with 25% of principal forgiven for first-time borrowers in good standing for making required interest payments. *Borrowers not in good standing are required to repay the entire amount of the loan.*



MARBIDCO
growing rural ventures™

Loan Interest Rate: 5% APR maximum

Equity: At least 10% of loan amount (ownership of a commercial workboat may apply).

Credit history: Credit bureau score of at least 620; no bankruptcy within past seven years.

Requirements: 1) applicants must hold a current shellfish aquaculture lease or have applied for one; 2) have a production and business plan; and 3) must demonstrate that production will begin within one year.

Maryland Remote Setting Shellfish Aquaculture Loan Program

Eligible Expenses: Items related to commercial remote setting projects, with approved business plans, to raise oysters or clams in Maryland including larvae, shell (cultch), tanks, pumps, blowers, heaters and plumbing.

Minimum/Maximum Loan Amounts: \$5,000 to \$30,000

Loan Terms: \$5,000 - \$15,000 (5 years); and \$15,001 - \$30,000 (6 years) - first year interest-only (*Note: the final year of loan payments may be forgiven with good performance*)

Loan Interest Rate: 5% APR

Loan Application Fee: None

Security: Cash Collateral of 15% is needed (and can be financed)

Requirements: At least one of the applicants must hold a TFL.

Contact: Steve McHenry; 410-267-6807 (office); email: smchenry@marbidco.org

Website is available at: <http://www.marbidco.org/home.html>

USDA Natural Resources Conservation Service

NRCS operates the **Oyster Bed Restoration and Management** program through the Environmental Quality Improvement Program (EQIP). They provide financial and technical assistance to applicants to restore oyster beds in approved lease sites in the Maryland Chesapeake Bay watershed. The program supports four conservation practice options for oyster habitat and NRCS works with you to determine which best suits your objectives.



U.S. Department of Agriculture
Natural Resources Conservation Service

For all options NRCS requires establishing an oyster or clam shell base (bed) of at least 2 inches thickness.

Option 1: Dredge existing shell to reclaim shell and seeding with spat on cultch (or allowing natural spat set in some areas, including parts of the St. Mary's River, Honga River, Fishing Bay, Manokin River and the area between South Marsh and Smith Islands.

Option 2: Dredge 1 inch of shell base and purchase an additional 1 inch to establish a minimum 2 inch thick bed which will then be seeded with spat on shell which may be purchased or produced by remote setting. This option provides flexibility where available shell available is limited. Clam shell may be substituted.

Option 3: On hard bottom 2 inches of shell can be placed to establish a bed. The shell bed is seeded with spat on cultch which may be purchased or produced by remote setting. Clam shell may be used for bottom placement.

Participants can perform their own dredging on leases or select a dredge operator from the Oyster Recovery Partnership list of qualified operators. The program seeks to rebuild habitat for the benefit of coastal waters. For information, contact the NRCS office in your county.

US Small Business Administration

SBA was founded in 1953 to provide service to small businesses. It provides a range of assistance to those seeking to go into business. While there are a few loan programs, SBA provides guarantees to local banks. They offer a wide range of assistance including help developing business plans and managing operations. Offices offer accessible service at the local and regional level.



The Service Corps of Retired Executives (SCORE) provides experienced business professionals who offer their services to those seeking to manage their business better. SCORE has offices in many local areas which can be accessed from the SBA website.

Contact: Stephen D. Umberger, District Director, Baltimore District Office, City Crescent Building, 6th Floor 10 South, Baltimore MD 21201; phone: 410-962-6195

Website information: <http://www.sba.gov/>

USDA Rural Development

US Department of Agriculture Rural Development improves the economy and quality of life in rural America through programs supporting loans through banks, credit unions and community-managed lending pools. They offer technical assistance and information to agricultural producers and cooperatives to start and improve operational effectiveness.



Committed to the future of rural communities.

USDA Rural Development administers loans, loan guarantees and grants through their programs by helping rural individuals, communities and businesses get the financial and technical assistance needed to address rural needs. Since most shellfish aquaculture

businesses are located in areas considered by USDA to be rural, this agency may provide the way to get assistance to build new processing plants and other capacity needed to provide economic growth and expand employment in these areas.

Some programs operated by Rural Development include:

- Business Loans and Grants – partnering with private lenders and community-based organizations for financial assistance
- Cooperative Grants and Other Programs – for use of cooperatives in ag marketing and distributing ag products
- Community and Economic Development Programs – initiatives that promote self-sustaining, long-term economic and regional development in rural areas

Contact: Bill McGowan, State Director (Delaware/Maryland), 1221 College Park Drive, Suite 200, Dover, DE 19904; phone: 302-857-3580

Website information at: www.rurdev.usda.gov/md

Grants, Research and Development

Maryland Industrial Partnerships (MIPS)

This program accelerates commercialization of technology by jointly funding Research and Development projects between companies and University System of Maryland faculty. MIPS funds are matched by participating companies for university-based research projects to develop new products. MIPS projects help companies find solutions to technical challenges, and develop products, processes or training materials. MIPS projects are conducted by university faculty and graduate students in conjunction with company researchers.



MIPS has a long history of involvement in aquaculture and some of our leading producers have benefitted from work carried out through these projects. These included development of nursery systems and processes for value-added production practices of high quality oysters. MIPS projects are attractive because of the two-round funding cycle available during the year.

The maximum award for MIPS single projects is \$100,000 per year for large and small companies and \$90,000 for start-up firms.

Staff members suggest that you contact them for a meeting before developing your proposal so that they can become familiar with your company and the needs of the project. They will be able to advise you on how to plan and write your proposal as well as assist you in submitting the application and identify high quality researchers to carry out the project.



MIPS helped Gordon's Shellfish LLC develop a shellfish nursery

Staff:

- Joseph Naft, Director; phone: 301-405-3892; email: jnaft@umd.edu
- Ronnie Gist, Manager; phone: 301-405-3890; email: rgist@umd.edu

General contact: Maryland Industrial Partnerships (MIPS), 2100 Potomac Building, University of Maryland, College Park MD 20742; phone: 301-405-3891; fax: 301-314-2658

Website information is at: <http://www.mtech.umd.edu/mips/index.php>

Northeastern Regional Aquaculture Center (NRAC)

The Regional Aquaculture Center (RAC) program was established by Congress and is administered by the US Department of Agriculture. The Northeast RAC is located at the within the College of Agriculture and Natural Resources at the University of Maryland and represents one of the five USDA centers supported through the program. The Center carries out research and outreach education to enhance the region's aquaculture industry. Research priorities are developed from advice by Technical and Industry Advisory Committees with representatives from the twelve Northeast states and District of Columbia. Along with the Board of Directors, they guide the overall pathway for multi-state research and outreach through the Center activities for advancement of the industry.



NRAC has carried out many projects dealing with shellfish industry in the region and provides a range of technical publications on its website. These include information on many types of shellfish as well as annual reports and research documents.

Contact: Dr. Reginal Harrell; phone: 301-405-6511; email rharrell@umd.edu or Sharon Adams; phone: 301-405-6917; email ssadams@umd.edu

Website information is at: <https://agresearch.umd.edu/nrac>

Industry Associations

East Coast Shellfish Growers Association (ECSGA)

The ECSGA represents over 1,000 shellfish farmers from Maine to Florida. The Association informs policy makers and regulators about the needs of the shellfish community to protect businesses for this environmentally helpful industry. The group provides input to federal issues affecting shellfish farmers and organizes an annual “Walk on the Hill” to visit congressional offices in cooperation with regional shellfish associations on the Pacific and Gulf coasts.



There are many useful links on the ECSGA website that provide information on subjects of interest to those growing and marketing shellfish. The Association provides an informative newsletter to members and a useful listserv for timely information. They completed a publication on Best Management Practices for East Coast Shellfish Farmers through NRAC funding that has been adopted as the official BMPs for Maryland growers. This project included meetings with growers along the coast and a thorough review prior to publication. Industry dues are based on gross annual sales with other member classifications that are non-voting. The Board of Directors represents all states on the East Coast.

Contacts: Bob Rheault, Executive Director, phone: 401-783-3360; email: Bob@ecsga.org
Johnny Shockley, Maryland Director, phone: 443-521-1635; email: johnny@cgoysters.com

Maryland Farm Bureau

The Farm Bureau is a national organization promoting agriculture and rural life. County associations make up the state bureau which, in turn, forms the national group. Members present issues that are debated and voted on at state and national conventions. The Farm Bureau is effective at lobbying and provides members with information on issues affecting them. MFB offers benefits such as discounts on equipment, insurance, product and services.

National advisory groups provide the organization with the best possible input from those in the industry. Maryland has been represented on Farm Bureau advisory boards by shellfish growers and the Bureau has supported aquaculture as another component of the agriculture industry. Member applications are provided through the state website.

Website: <http://mdfarmbureau.com>

Southern Maryland Oyster Growers Association (SMOGA)

A recent organization representing oyster growers in the Southern Maryland area, from Anne Arundel through Charles counties, has become active in supporting industry growth. The group meets to discuss issues pertaining to shellfish culture including leases, permitting, protection and marketing. The Association regularly provides recommendations for outreach programs and statewide conferences.

Contact: Brian Russell, Chairman; phone: 240-538-1336; email: btr1286@verizon.net

Non-Governmental Organizations

Oyster Recovery Partnership (ORP)

ORP is a leading nonprofit organization dedicated to restoring oysters in Chesapeake Bay. Public and private sources fund projects for restoration and commercial production. ORP is a partner in the Remote Setting Training (RST) project with a field station at Horn Point Lab that carries out cultch processing and handling of hatchery seed for projects. Funding agencies include NOAA, the US Army Corps of Engineers and Maryland Department of Natural Resources.



**OYSTER RECOVERY
PARTNERSHIP**
— ORP —

ORP coordinates shell and seed sales. Larvae can be picked up at the hatchery or shipped via FedEx. There is a minimum order of \$500 by cash, check or credit card (3% service fee for card purchases). Orders should be made prior to when they are needed and a 50% deposit is required for quantities exceeding 50,000 seed/spat or 5 million larvae. If the order is cancelled, the deposit may be forfeited. Disease resistant lines and/or triploids are available with prior planning. Advance orders are necessary to ensure fulfillment.

2014 ORP prices:

Eyed larvae (per million)	Diploid Wild	Diploid (DR*)	Triploid (DR*)
	\$210	\$260	\$295
Cultchless Oyster Seed (per thousand)			
<5 mm	\$ 9.00	\$ 9.60	\$11.25
5-10 mm	\$12.00	\$12.85	\$15.60
11-15 mm	\$16.00	\$17.05	\$20.75
>15 mm	\$18.50	\$19.70	\$24.45
Spat on Shell (per thousand)**			
<5 mm	\$ 8.50	\$ 9.10	\$10.75
5-10 mm	\$11.50	\$12.35	\$15.10
11-15 mm	\$15.50	\$16.55	\$20.25
>15 mm	\$17.50	\$18.70	\$23.45

Cost per Million (1M) <5mm \$3,635

Cost per Boat Load (10M) <5mm \$36,500 (includes planting fee)

DR = Disease Resistant lines; call for availability; sold under license*

Triploid = sold under license

***Vessel delivery fees may apply to deliveries of spat on shell. Call for pricing to your lease.*

Shell/Cultch

1 bushel unwashed shell (DNR stockpiles only #)	\$ 2.50
1 bushel of cleaned shell	\$ 3.25
1 shell bag (approx. ½ bushel of shell)	\$ 2.85
Shell exchange (1 bu. green shell exchanged for 1 bu. cleaned)	\$ 1.40
1 cu. yd, oyster fines (shell fragments, small pieces, etc.)	\$65.00

NOTES:

Limit 2,000 bushels or 4,000 shell bags per leaseholder

Contact DNR directly to place an order for unwashed shell

ORP Labor and Rates

Load & unload one tank at HPL Hatchery (equipment rental/labor)	\$ 400
Shell exchange (160 bu. for one tank w/cages)	\$ 225
One tank (w/shell exchange, cleaning, loading/unloading)	\$ 625
One tank (aged, cleaned shell, loading/unloading)	\$ 920

Complete information on ORP larvae, seed and shell sales available at:

<http://www.oysterrecovery.org/wp-content/uploads/2012/10/View-Our-2014-Prices.pdf>

ORP Purchase contact: Jillian Parisi; phone 410-221-8328; email: jparisi@oysterrecovery.org

Remote Setting Training program contact: remotesetting@umces.edu

Permitting

Maryland Department of Natural Resources

Tawes State Office Building
580 Taylor Avenue
Annapolis MD 21401



Aquaculture Division

DNR is responsible for aquaculture permitting through the Aquaculture Division. The Division processes commercial shellfish aquaculture lease applications jointly with the US Army Corps of Engineers (ACOE). They also are in charge of:

- Shellfish Import Permits
- Shellfish Aquaculture Harvester Permits
- Shellfish Nursery Permits
- Processing Lease Transfers
- Collecting monthly harvest reports
- Compiling annual lease reports
- Chairing the Aquaculture Review Board
- Administration of the Coordinating Council

Shellfish aquaculture information and application forms are available on-line at:

<http://www.dnr.state.md.us/fisheires/oysters/industry/aquaculture>

On the right side of the screen are links to download lease applications and instructions for completion. There are links provided for Lease Transfers, Shellfish Import Permits, Shellfish Nursery Permits, Monthly Aquaculture Harvest Reports, and Shellfish Aquaculture Harvesters Permits. Other links provide information on financial assistance programs and the US Army Corps of Engineers Baltimore District aquaculture page. Additional links lead to a variety of web resources, such as committees engaged with shellfish aquaculture and news from the Department relating to the industry.

A Shellfish Aquaculture Siting Tool has been developed to provide prospective growers with a way to assess potential lease sites. This has been designed with multiple layers of information to show where a lease cannot be located. Considerations include:

- Public Shellfish Fishing Areas are reserved for public harvest (but can be petitioned for regulatory change if few shellfish exist or no harvest has occurred within 3 years)
- Submerged Aquatic Vegetation areas
- Near marinas and other areas where water quality would affect shellfish safety
- Within 150 feet of a federal navigation channel
- Locations with existing leases

Siting tool website: <http://dnrweb.dnr.state.md.us/fisheries/aquatool/aquatool.asp>

Aquaculture Division Contacts:

Karl Roscher, *Division Director*

410-260-8313

kroscher@dnr.state.md.us

Katie Busch, *Deputy Division Director*

410-260-8342

kbusch@dnr.state.md.us

Rebecca Thur, *Leasing/Permitting Coordinator*

410-260-8252

rthur@dnr.state.md.us

Steve Schneider, *Field Operations*

410-260-8329

sschneider@dnr.state.md.us

Chris Judy, *Marylanders Grow Oysters; Field Operations*

410-260-8279

cjudy@dnr.state.md.us

Alyssa Cranska, *Leasing/Permitting Reviewer*

410-260-2405

acranska@dnr.state.md.us

Stephanie Richards, *Administrative/Program Management*

410-260-8648

srichards@dnr.state.md.us



DNR Aquaculture Division Director Karl Roscher (left) visits Tal Petty (center) at his Hollywood Oyster Company in St. Mary's County



Oyster growth from 1-2 months through the first year and to the year 6

U.S. Army Corps of Engineers, Baltimore District (ACOE)

The Corps is responsible for activities in tidal waters and adjacent land areas. Authority for their regulation is from the River and Harbor Act of 1899 and Section 404 of the Clean Water Act involving a discharge of dredged or fill material into waters of the US. Corps authorization is required for the placement of structures or other work in navigable waters.



**US Army Corps
of Engineers®**

Aquaculture leases are now handled through a joint permit process with the State of Maryland. When submitting an application you should only submit it through DNR (see prior listing). Some shellfish activities are included in the Corps' Nationwide Permit #48 which covers the entire United States. During 2011, the ACOE issued a Regional General Permit (RGP-1) to the State of Maryland designed to streamline the federal review process for leases within certain size ranges. RGP-1 is effective for:

- Submerged Land Leases of 50 acres or less
- Water Column Leases using bottom cages of 5 acres or less
- Water Column Leases using surface floats of 3 acres or less

Contact: Woody Francis; phone (410) 962-5689; email: woody.francis@usace.army.mil

Website: <http://www.nab.usace.army.mil/Missions/Regulatory/Aquaculture.aspx>

Protection and Enforcement

MD Natural Resources Police (NRP)

The NRP was created in the 1800s to control illegal harvesting of oysters in the Chesapeake Bay. Today's modern force patrols the state with missions ranging from natural resource protection to homeland security. **If you find someone illegally harvesting your lease, damaging lease markers, tampering with gear or otherwise interfering with your rights as a leaseholder you should contact the NRP immediately.** It is also suggested that you get to know the officers who patrol your area and familiarize them with your lease and operation as well as those who will be regularly managing and harvesting your grounds.



**24 Hour Communications and Dispatch 410-260-8888
Report Suspicious Activity 800-628-9944 or VHF Channel 16**

**General Information: 410-260-8880
Emergencies: 410-268-8888
Catch-A-Poacher: 1-800-635-6124**

Website information: <http://www.dnr.state.md.us/nrp/>

Regulatory

Shellfish Sanitation

Maryland Department of the Environment

Seafood depends on consumers' confidence products are of the highest quality. MDE monitors the quality of shellfish harvesting waters to certify that these are safe for human consumption. Humans in a watershed increase the potential for adverse effects on shellfish water quality. These include sewage treatment facility discharges and bypasses from sewage pumping stations, failing septic systems and increased runoff from development and farming. Where sewage outfalls exist, closed safety zones surrounding these outfalls are mandated and necessary to protect human health.



MDE monitors 900 stations in state waters for potential contaminants and bacteria. They post information on their website in the form of:

- Fish and Shellfish Consumption Advisories
- Shellfish Harvesting Area Classifications
- Fish Kills

Contact: Kathy Brohawn; phone 410-537-3608; email: kbrohawn@mde.state.md.us

Shellfish Shippers / Plant Inspection

Maryland Department of Health & Mental Hygiene (DHMH)

Growers interested in selling their product direct to the consumer, rather than to a broker, are required to possess a Shellfish Shipper license and undergo training to obtain the necessary skills to assure delivery of a healthy and quality product. DHMH, in cooperation with University of Maryland Extension, holds periodic training in developing Hazard Analysis Critical Control Point (HACCP) plans so that the shipper understands the regulations and requirements of handling safe seafood.



STATE OF MARYLAND
DHMH

If you wish to process shellfish either by shucking or other removal techniques, the facility where you process the product must be inspected and permitted by the DHMH. To operate as a new food processing plant, a written plan is required. When it has been approved, an inspection will be conducted. Upon approval, you will receive and complete a license application. Existing food processing facilities must comply with Maryland health regulations.



Aquaculture growers produce high quality shellfish

Contact: Erin Butler, Office of Feed Protection and Consumer Health; phone 410-767-8404; mobile: 443-690-3079; email: erin.butler@maryland.gov

Definitions

Cultch - Shell or other material that oyster larvae attach to during metamorphosis. Aged, clean oyster shell is deemed to be best for most setting although many other substances have been tried.

Cultchless oysters - Seed attached to finely ground oyster shell or *microcultch* intended for raising in protected containers. They are not actually 'cultchless' due to the fact that they set on small pieces but the cultch is usually not visible and allows the animals to grow as single oysters.

Diploid – Oysters having two sets of chromosomes as found naturally and that are capable of reproducing.

Downweller – A device that holds shellfish on a screen while water circulates down through the animals and is carried away. Frequently used with fine mesh for setting *cultchless* seed.

FLUPSY – Acronym for **F**loating **U**pweller **S**ystem; an upweller that is designed as a raft to float at water level with a pumping device (propeller, paddlewheel, etc.) that displaces water from it. By displacing existing water, inflow of new water occurs, circulating food to the animals and carrying away waste products.

Import Permit – A Maryland permit required for bringing shell, larvae or seed across state lines to assure that only healthy animals are translocated. The permit must be applied for at least 30 days prior to transportation.

Metamorphosis – The process by which a larva transforms from a motile organism to a sedentary, or benthic, one. In oysters, the change is from free-swimming larvae to spat.

Microcultch – finely ground shell (e.g. 300 microns) for setting “cultchless” seed to be raised principally for the raw bar or half-shell market.

Nursery - a facility that cares for juvenile shellfish until they are large enough for planting to growout grounds. Nurseries can provide various shellfish depending upon the salinity they are operating in. They can often provide either spat on shell or cultchless oyster seed.

Pre-application hearing – A meeting held between a prospective lease applicant and the Aquaculture Review Board to discuss plans and determine any problems that may exist prior to application.

Remote Setting – The process of attaching larvae to cultch at a site away (i.e., “remote) from the actual hatchery.

Shellfish hatchery - a facility which conditions and spawns broodstock shellfish and cares for the resulting larvae until *metamorphosis* is imminent. Hatcheries may sell larvae or seed.

Shellfish seed – small shellfish ready for planting.

Spat - A juvenile oyster after undergoing metamorphosis.

Spat on shell - oysters that have attached to aged and clean oyster shell for traditional bottom planting and growout.

Superlines – Oysters that have been genetically selected through breeding programs to exhibit more tolerance of diseases found in the Chesapeake region.

Triploid – Oyster crosses between diploid (i.e., two sets of chromosomes) and tetraploid (i.e. four sets of chromosomes). These are normally sexually sterile and do not reproduce thereby providing a high quality meat yield throughout the year.

Upweller – A device that holds juvenile shellfish on a screen or mesh with water circulated up through the silo or cone, providing food to the animals and carrying away their waste.

Maryland Aquaculture



Notes
