

AQUACULTURE COORDINATING COUNCIL

FY 24

Natural Resources Article § 4-11 A-03.2(c)(1)(i)

Prepared by the Maryland Aquaculture Coordinating Council

January 2026

2024



Maryland Aquaculture Coordinating Council

Annual Report 2024

**Report on Council activities with recommendations
for advancing Maryland aquaculture**

Presented to the:

- ♦ Governor of Maryland
- ♦ Chair of the Senate Education, Health, and Environmental Affairs Committee
- ♦ Chair of the House Environment and Transportation Committee



Cover: USDA funded a five-year project to develop robotics and advanced technology for modern oyster aquaculture. Photo shows the remote-controlled craft being developed by UMD engineers for surveying leases to assess oyster population, growth and health. This will increase production and provide benefits to the Economy, Employment and Environment.



Tawes State Office Building
580 Taylor Avenue, B-2
Annapolis, Maryland 21401

TO: The Honorable Wes Moore, *Governor*
The Honorable Brian J. Feldman, *Chair, Senate Education, Health, and Environmental Affairs Committee*
The Honorable Mark A. Korman, *Chair, House Environment and Transportation Committee*

FROM: Kathy Brohawn, Chair, Maryland Aquaculture Coordinating Council

DATE: July 1, 2024

SUBJECT: REPORT OF THE AQUACULTURE COORDINATING COUNCIL

I am pleased to present the 2024 report of the Maryland Aquaculture Coordinating Council. The Council provides leadership to develop our aquaculture industry which has already brought national attention and recognition to Maryland. The dedicated members of the Council identify issues and develop solutions to expand our industry. We believe aquaculture provides strong benefits for economic growth and expanded employment for our residents, while benefitting the environment and providing our state and nation with quality products.

The Coordinating Council has carried out many of the tasks assigned to it by the General Assembly since its creation in 2005. We research issues and recommend changes to laws, policies and regulations to help our industry advance, creating opportunities to increase and expand business. The Council's specified and broad-based membership includes representatives from industry, state agencies, the General Assembly, the University System of Maryland and support organizations which provides a strong model for progress by working together.

We see opportunities to establish and grow new businesses and continue to encourage others to transition to aquaculture. Many already in the seafood industry are well suited for aquaculture production and have transitioned to the industry to date. We look forward to further expansion of production to provide economic growth for communities while improving water quality for a healthy Chesapeake and coastal bays.

Challenges remain for aquaculture to reach its full potential in Maryland. Therefore, we submit our latest recommendations for your consideration and look forward to continuing our strong collaboration with elected leaders to help us move ahead. The Council will be pleased to provide briefings to you, your staff or members, to provide additional information to develop the recommendations presented in this report. On behalf of the Council, thank you for the support you have provided to the aquaculture industry, as well for your foresight and confidence in creating and supporting the Maryland Aquaculture Coordinating Council.

Executive Summary

The Aquaculture Coordinating Council (ACC) was created by the Maryland General Assembly in 2005 and charged with assisting the development of all types of commercial aquafarming by studying and making recommendations for changes required to attract investment and promote economic and employment growth in the industry. The Council provides a forum for state agencies, institutions, non-governmental organizations, political leaders and business leaders to discuss issues while providing strong and diverse expertise through its designated categories of membership to meet its legislative mandate to “advance Maryland aquaculture”.

Support for development of shellfish aquaculture has resulted in 7,600 acres being placed in active production. Watermen and entrepreneurs have brought advances in production methods and equipment, business development and marketing to create new companies and brands, expand sales and build support industries. These businesses include equipment fabrication, hatcheries, vessel construction and provision of supplies. Aquafarms have expanded and invested in planting, raising and harvesting millions of shellfish.

While shellfish aquaculture remains a principal area of growth for the state, recent interest has been shown by international companies to invest in Recirculating Aquaculture Systems (RAS) for producing high quality salmon. This will increase availability of this popular seafood and minimize the carbon footprint created when air shipping fish.

Maryland has other aquaculture businesses that produce a range of products. These include aquatic plants for water gardens, pond management and shoreline stabilization. Finfish producers raise tilapia, largemouth bass, catfish, hybrid striped bass, shrimp, koi, bluegill and ornamental species as well as marine corals. Species of turtles are raised as well as crawfish. Permits for businesses producing these species span the state, from Allegany to Worcester counties.

Council members have broad and diverse experience in aquaculture that aids in creating solutions for identified needs. The following issues have been identified as current impediments and must be addressed for continued growth and opportunity for aquaculture in our state. We respectfully submit the following for consideration:

Summary of 2024 Recommendations

I. Water Quality Monitoring: Maryland Department of the Environment (MDE) is responsible for carrying out federal (Title 21 CFR Part 123) and state (Natural Resources Article 4-742 Maryland Annotated Code) laws mandating bacteriological monitoring and investigation into pollution sources to ensure that shellfish are harvested from unpolluted waters. In addition, MDE conducts intensive shoreline surveys to identify and mitigate pollution sources that may impact shellfish harvesting waters. Continued expansion of the oyster aquaculture industry has resulted in a year-round oyster harvest that can increase the number of monitoring stations needed to ensure adequate spatial coverage to protect public health. This has led to increased hours for

personnel to conduct shoreline surveys, and increased operational costs for equipment and resources needed to support their monitoring and data collection.

II. Protection of Property: The Natural Resources Police (NRP) provides a strong presence to protect our marine resources. However, their ranks have been reduced and their responsibilities have increased during the past two decades, leading to concern for their ability to protect natural shellfish stocks and assist private growers in keeping crops secure. When NRP was merged with the Park Rangers in 2005, a total of 353 NRP and law enforcement park rangers were in the unit. Immediately after the merger, 35 PINS were abolished or transferred to other agencies. Currently, NRP has an authorized strength of 260 with 26 vacancies and more to come. Only 188 positions are sergeants and below assigned to uniformed field patrol. These are the officers that are actually in the field on a daily basis. NRP must be able to respond quickly and effectively to problems and theft has repeatedly been identified as a principal one in aquaculture industry surveys. Support for NRP assets is required for Maryland to meet the challenge of attracting private capital to invest and expand aquaculture crops to meet the growing demand for seafood. The Council has urged political leaders to provide enhanced funds for law enforcement for a strong and visible force and urges that new assets be provided to this vital unit.

III. Aquaculture and Commercial Fishery Development Grants: Legislation creating the Aquaculture Coordinating Council provided a series of charges for it. Item II directed the Council to *“Establish and monitor a grant program for the implementation of appropriate projects that support the economic health of the State aquaculture industry”*. To date, this important charge has not been implemented because funds have not been provided. With the growth of shellfish aquaculture, new equipment and methods must be introduced to produce quality products. However, those in business are often unable to allocate funds to develop innovative ideas for applied research that could result in more efficient gear, higher production, lower input costs and identification and establishment of new markets. Providing funds for these purposes will keep Maryland producers at the forefront of the industry nationally. Additionally, watermen often have ideas for innovation that could aid them in their businesses. We request that funds be provided for the Council to develop an Aquaculture and Commercial Fisheries Development Grant Program. This would be organized and operated similar to one that has been effectively used in Virginia for several decades for aquaculture and fisheries projects. It would be managed by a committee of institutional and industry representatives. Project grant funds would not be allowed for salaries, purchases of vehicles or vessels and the results would be required to be documented and made publicly available for others to apply to their businesses.



Phytoplankton lab, Ferry Cove Oyster Hatchery

Aquaculture Coordinating Council Membership

Senate

Senator Katherine Klausmeier

House of Delegates

Delegate Dana Jones

State Agencies

Kathy Brohawn, *Department of the Environment*; **Chair**

Kim Coulbourne, *Department of Health*; **Vice Chair**

Matthew Scales, *Department of Agriculture*

Dr. Brian Callam, *Department of Natural Resources*

Act. Maj. Melissa Scarborough, *Natural Resources Police*

VACANT, *Department of Commerce*

MD Farm Bureau

Tyler Hough

Oyster Recovery Partnership

Ward Slacum

University of Maryland

Dr. Jeffrey Cornwell, *UM Center for Environmental Science*

Dr. Reggie Harrell, *UMD - College Park*

Donald Webster, *UMD Extension*

Aquaculture Industry

John T. Barnette

Dan Worrell

VACANT

TFL Licensed

F. William (*Bill*) Kilinski

Walter R. Witt, Jr.

Victoria Brown

Maryland Aquaculture Coordinating Council

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Aquaculture Coordinating Council - Legislative Background

The Aquaculture Coordinating Council was created in 2005, the result of a recommendation by a legislatively mandated Task Force on Seafood and Aquaculture. It has a designated membership that includes Maryland agencies involved in permitting, regulating, policing and advancing the industry. It includes representatives of the University System of Maryland, appointed members of aquaculture and commercial fishing industries and non-governmental organizations. The Council is charged by the General Assembly with designated tasks to develop all segments of the industry including finfish, shellfish and aquatic plants. Tasks assigned to the Council included:

- *Develop Best Management Practices for aquaculture on or before December 31, 2006;*
- *Investigate and, to extent feasible, enhance the area of State waters available to private lease for aquaculture and the seafood industries;*
- *Support the aquaculture industry in its efforts to implement innovative procedures and to comply with associated regulations;*
- *Provide for the establishment of Aquaculture Enterprise Zones in the Chesapeake and coastal bays;*
- *Formulate and make proposals to the Governor and Senate and House committees responsible for the Environment, for advancing Maryland aquaculture, including recommendations for a fee structure to reduce State expenditures on aquaculture programs;*
- *Establish and monitor a grant program for the implementation of appropriate projects that support the economic health of the State aquaculture industry;*
- *Conduct applied studies of projects and products that will expand the aquaculture industry in the State;*
- *Conduct market tests to determine acceptability and potential demand for new aquaculture products;*
- *Implement pilot projects and small commercial demonstrations to resolve outstanding quality of production issues and to educate industry representatives, regulators, and other partners;*
- *Enhance the awareness of innovative aquaculture products and programs among commercial buyers and the general public; and*
- *Regularly review State regulations impacting aquaculture and make recommendations to the Aquaculture Review Board regarding any necessary or advisable regulatory changes.*

(Ref: Annotated Code of Maryland 4-11A-03.2)

Engaging our Citizens

The Aquaculture Coordinating Council meets bi-monthly with workgroups addressing specific topics that arise in the interim. All meetings are open to the public through broadly advertised notices. Time is provided for public input at all meetings to assure non-Council member input. This outreach has aided growth in attendance, which has increased representation from growers and other stakeholders.

The Council uses contact with citizens to identify potential new members who may be interested in serving. Maryland law requires three Aquaculture Industry representatives and three Tidal Fish License (TFL) holders to be appointed to the Council. These members serve staggered three-year terms and may be appointed for two consecutive ones before being required to take at least one year off before becoming eligible for appointment again. Two members (one in each category) rotate from the Council annually. Since its formation, the Council has been fortunate to have had superior representation from those in the appointed categories, with many being elected to leadership. Building a strong aquaculture community created opportunity to identify new growers for Council appointments. Members help identify problems and areas of concern and work to strengthen Maryland aquaculture to create economic growth and employment for our citizens while aiding the environment.

Government Support

State and federal agencies support development and advancement of Maryland aquaculture through dedicated programs and activities. Research institutions provide investigation into methods to solve identified problems with results transferred to industry through extension education programs and support material. Non-governmental organizations are heavily engaged in supporting aquaculture due to positive environmental benefits that accrue from production.

MD Department of Natural Resources

Aquaculture permit consolidation occurred in 2012 when DNR was designated by the Maryland Legislature as the lead state agency for managing aquaculture and aquaculture products through creation of the Aquaculture and Industry Enhancement Division within DNR's Fishing and Boating Services Unit. DNR provides a range of services including: coordination with the U.S. Army Corps of Engineers- Baltimore District, for required federal permits; coordination of the State Aquaculture Review Board; verification of lease operation to ensure active use requirements are met; verification of oyster harvest for nutrient credit trading; field visits and habitat surveys to ensure compliance with application requirements, permit conditions and environmental regulations; annual billing for lease rent; annual issuance of harvester cards; facilitation of lease transfers, renewals and amendments;



permitting for importation of shell, larvae, and seed from out-of-state sources; permitting for shellfish nursery facilities; permitting for non-shellfish aquaculture facilities; coordination of legal issues for lease application protests with the Office of the Attorney General; administrative support to the Aquaculture Coordinating Council; and, coordination with Maryland Department of the Environment and Maryland Department of Health, to ensure compliance with the National Shellfish Sanitation Program, a federal/state cooperative program recognized by the U.S. Food and Drug Administration and Interstate Shellfish Sanitation Conference for the sanitary control of farm-raised and wild-harvested shellfish produced and sold for human consumption.

Development of the oyster industry in particular has been bolstered in recent years by the construction and permitting of new privately-operated oyster hatcheries and shellfish nursery facilities in Maryland. Commercial shellfish hatcheries in Maryland complement other private hatcheries in the Chesapeake region, as well as the output from DNR-run Piney Point Aquaculture Center at Piney Point in St. Mary's County and the University of Maryland Center for Environmental Science, Horn Point Oyster Hatchery in Cambridge. Nurseries are permitted by the Department and may consist of land-based units (*e.g.*, pier or wharf) and/or in-water structures (*e.g.*, remote setting tanks, upweller/downweller units, or floating cages) to cultivate shellfish seed to a maximum size of 1-inch from hinge to bill.

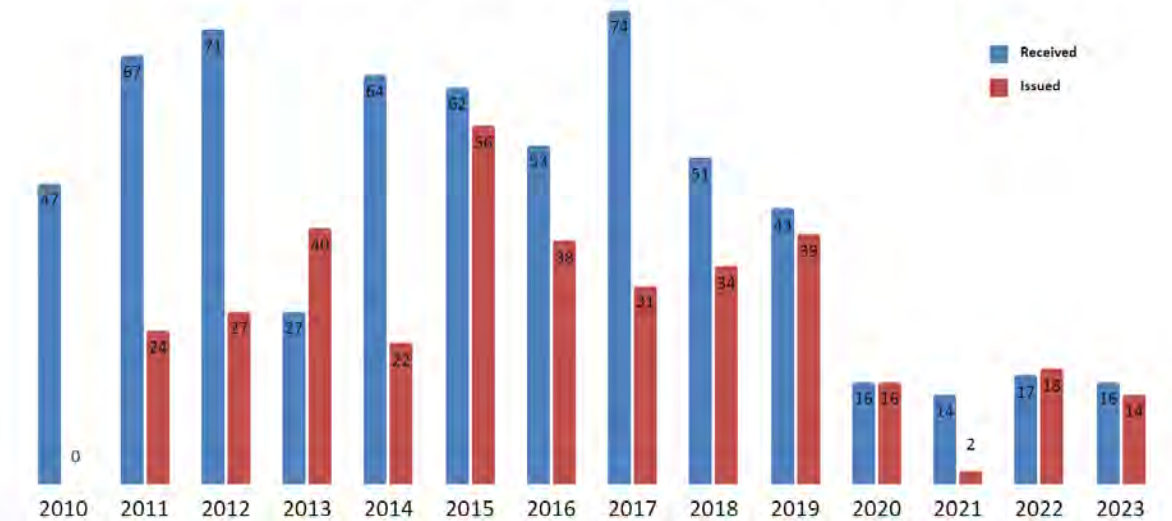


Upweller units for producing single oyster seed

Aquaculture loan and grant programs available to growers through the Maryland Agricultural & Resource Based Industry Development Corporation (MARBIDCO) have played an important role in the continued growth and support of the industry. Additionally, DNR helped facilitate purchase of aquaculture oysters used in restoration projects through The Nature Conservancy Supporting Aquaculture and Restoration (SOAR) program.

There has been strong interest in shellfish aquaculture leasing from September 7, 2010, when the new leasing program was implemented, through to the present. Over that period, the Department received an average of 47 shellfish lease applications and issued an average of 29 new leases per calendar year:

Commercial Shellfish Lease Applications Received and Issued by State of Maryland by Calendar Year (Sept. 2010 - June 2024)



Shellfish Lease Activity Sept 2010 – June 2024	Total Lease Sites	Total Acreage
All shellfish lease applications submitted	628	12,095
Submerged Land Leases executed	235	6,289
Water Column Leases executed	122	669
All new shellfish leases executed	365	7,003
Applications processed as Lease Amendments	13	64
Shellfish Lease Applications in process	93	2,129

Two types of commercial shellfish leases are offered in Maryland: Submerged Land Leases (SLL) and Water Column (WC) Leases. SLL used for oyster cultivation typically operate using traditional spat-on-shell bottom culture methods, with the vast majority of these using hatchery-produced larvae to set on oyster or clam shells for planting. In certain water bodies, a reliable natural oyster spat set often contributes to submerged land lease production when growers maintain suitable cultch on bottom. Currently, SLLs are being used only for oyster production, though clams have been cultured on SLLs in the past. WC leases use intensive gear such as cages, floats, or other gear to raise single shellfish principally for restaurants and raw bars. Juvenile shellfish (i.e., seed) used to plant water column leases are sourced from in and out-of-state shellfish nursery facilities, following shellfish import regulations when necessary.

As of June 2024, there were a total of 739 persons who were issued a Shellfish Aquaculture Harvester Permittee Card for the year, which is representative of the number of leaseholders who are managing or co-managing lease operations. A total of 1,827 persons had been issued a Shellfish Aquaculture Harvester Registration Card as well, which is a proxy for the number of individuals acting as field employees for lease operations. There are also further uncounted industry employees who provide direct support to lease operations, such as administrative staff, packers, truck/delivery drivers, sales or marketing staff, etc., who may not hold a harvester card.

SHELLFISH AQUACULTURE LEASE SUMMARY *(through June 2024)*

County	SLL - Number	SLL – Acres	WC - Number	WC – Acres
Anne Arundel	21	279	2	8
Calvert	12	159	7	38
Charles	5	89	1	8
Dorchester	86	2,673	25	180
Kent	1	45	1	5
Queen Anne’s	2	20	3	8
St. Mary’s	88	864	31	157
Somerset	35	1,011	4	15
Talbot	70	741	12	44
Wicomico	48	1,158	0	0
Worcester	2	15	13	53
Total	370	7,052	99	514

Shellfish Aquaculture Harvest

The annual harvest from shellfish leases increased significantly during the years after 2012, when the first products regulated under the modern leasing program began to be harvested. Annual increases of thirty to fifty percent were seen, with an average during the period of approximately thirty-five percent. However, severe freshets in 2018 and 2019 drastically slowed product growth and negatively impacted survivability, as well as coast-wide larvae and seed shortages in 2019, likely resulted in depressed annual harvest totals in those years. In early 2020, the onset of the COVID-19 pandemic caused national shutdowns of restaurants with impacts

throughout the food chain. Harvests during that period dropped due to constriction of consumer demand and shrinking processing. Many growers showed innovation by developing methods of direct marketing to consumers through shipment or sales at farmers markets. While overall harvests were constricted, ecological growing conditions were more favorable in 2020 and 2021, and growers continued to plant their leases. Farm-raised oyster harvest totals continued to rebound through 2023, to a new high of 94,285 bushels. A growing farm-raised bay scallop harvest was also reported (169 bushels), from water column leases located in the Coastal Bays. In 2023, a farm-raised clam harvest was reported from a shellfish lease for the first time since 2017.

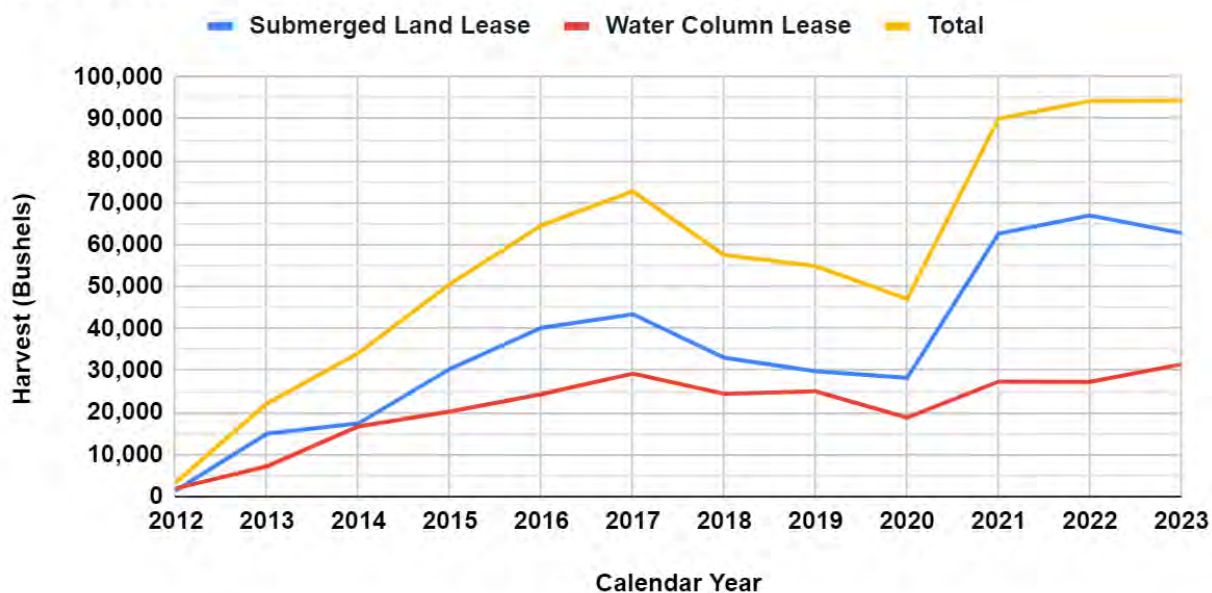
**Annual Maryland Farm-Raised Shellfish Harvest in Bushels
by Species and Lease Type**

(Submerged Land Lease – SLL and Water Column Lease – WC)

Year	Species	SLL	WC	Total
2012	Clams	44.2	0	44.2
2012	Oysters	1,417.2	1,917.4	3,334.6
2013	Clams	58.0	0	58.0
2013	Oysters	14,965.2	7,232.0	22,197.1
2014	Clams	205.0	0	205.0
2014	Oysters	17,430.5	16,724.4	34,154.9
2015	Oysters	30,407.5	20,229.0	50,636.5
2016	Oysters	40,195.3	24,414.2	64,609.5
2017	Clams	64.1	0	64.1
2017	Oysters	43,424.8	29,295.9	72,720.7
2018	Oysters	33,067.4	24,475.5	57,542.9
2019	Oysters	29,849.5	25,054.0	54,903.5
2020	Oysters	28,276.8	18,804.1	47,080.8
2021	Oysters	62,655.5	27,373.1	90,028.6
2021	Scallops	0	83.4	83.4
2022	Oysters	66,946.0	27,311.4	94,257.3
2022	Scallops	0	116.7	116.7
2023	Oysters	62,794.2	31,491.5	94,285.7
2023	Clams	0.6	0	0.6
2023	Scallops	0	169.2	169.2

Annual Farm-Raised Oyster Harvest in Maryland

2012*-2023



Non-Commercial Leasing Programs

In addition to commercial shellfish aquaculture leases, Maryland statute provides for a Demonstration Lease program, which is meant to provide an opportunity for education, research and not-for-profit based institutions and companies to obtain a lease in state waters. Demonstration leases are limited in size to five acres, and must be used for research, education, and/or to expand knowledge related to the ecological benefits of growing shellfish. The Department established regulations for demonstration leasing in 2015. In October 2021, a new lease type called an Enterprise Lease became effective in statute to provide an opportunity for prospective aquaculturists to research and/or test the feasibility of certain types of gear and native or naturalized aquatic plant species for commercial purposes that cannot be authorized through a commercial shellfish or demonstration lease. An Enterprise lease is limited to two acres in size and may not exceed a term of five years. The state has not yet adopted regulations to implement this program.

Non-Shellfish Aquaculture

The Division also issues standard Aquaculture permits for non-shellfish operations for the culture of various fish and aquatic plant species. Currently there are 20 active permits held for re-circulating tank and/or pond systems for commercial and hobby operations as well as research projects. The permitted facilities are located throughout the State in Allegany, Anne Arundel, Baltimore, Caroline, Carroll, Cecil, Charles, Frederick, Harford, Kent, Montgomery, Prince

George's, Talbot, Washington, Wicomico and Worcester Counties and Baltimore City. The species produced at the facilities have included various native fish, hybrid striped bass, channel catfish, tilapia, shrimp, turtles, koi, marine corals, ornamental fish and aquatic plants. Reported production is detailed in the table below:

Species	Amount	Unit
Bog plants	750	Individual
Tilapia	1,500	Individual
Largemouth Bass	6,000	Individual
Red-bellied Turtle	15,000	Individual
Yellow-bellied Turtle	3,500	Individual
Red-eared Sliders	3,700	Individual
Widgeon grass	NA	Individual
Misc. corals	9,000	Individual

MD Department of Agriculture

Maryland Department of Agriculture operates the Seafood Marketing unit that creates demand for our quality products. One of their programs is the “Oyster Pledge” that includes an innovative logo to help boost sales. Restaurateurs sign the pledge to become listed on the MDA website as a



participant and the website notes the significant environmental benefits that come from consuming oysters. An innovative Maryland map can be accessed by the public that shows restaurants and growers with their location, owner and contact information.

MD Department of the Environment

Maryland Department of the Environment bears the responsibility of meticulously regulating shellfish harvesting waters. This mandate entails the identification and eradication of pollution sources, the comprehensive collection of water samples spanning wide geographical regions for bacteriological scrutiny by the Maryland Department of Health Laboratory Administration, and the gathering of shellstock samples for meticulous analysis, probing for potential bacteriological contamination and chemical toxicants.



Maryland
Department of
the Environment

Sanitary surveys serve as a cornerstone in the department's efforts, ensuring that waters designated for shellfish cultivation are accurately classified and subjected to rigorous regulation. Field crews maintain an unwavering vigilance, continuously monitoring water quality and making observations to ensure the proper classification of all water bodies. These findings are compiled

and made accessible to the public through the Shellfish Harvesting and Closure Area Maps prominently featured on the department's website.

Moreover, field crews undertake targeted monitoring of specific waters, particularly those in proximity to shorelines or susceptible to avian or mammalian interference. This monitoring is especially initiated in response to shellfish lease applications and annual inspections are conducted to determine if birds or mammals pose a human health risk on floating gear.

Furthermore, employees of MDE actively engage with their counterparts nationwide through the National Shellfish Sanitation Program. This national collaboration is aimed at developing regulations to safeguard consumers by ensuring that only products of the utmost safety reach the market. Maryland continues to have a stellar reputation for safe, wholesome, shellfish.

MD Department of Health

Maryland Department of Health, Office of Food Protection (MDH OFP), is delegated the authority for inspecting food handling and processing facilities. They are an integral part of the National Shellfish Sanitation Program recognized by the US Food and Drug Administration and the



Interstate Shellfish Sanitation Conference for ensuring the sanitary control of shellfish produced and sold for human consumption. All shellfish dealers must be trained in safe food handling procedures including Hazard Analysis Critical Control

Point (HACCP) methods and the required recordkeeping to receive certification for inclusion on the Interstate Certified Shellfish Shipper List (ICSSL) as an approved source for shellfish. Training for this is usually offered at least annually in partnership with University of Maryland Extension specialists. MDH staff also provide one-on-one education to dealers while conducting pre-operational and routine inspections of processing facilities to assure only safe shellfish are distributed from Maryland shellfish dealers.

MD Department of Health – Laboratories Administration

The Division of Environmental Sciences of the Maryland Department of Health Laboratories Administration supports the National Shellfish Sanitation Program (NSSP) by testing shellfish waters and shellstock samples for microbial pathogens. This long-standing program has been active continuously for >40 years. Maryland's NSSP testing is performed at the Eastern Shore Regional Laboratory, which is strategically located in the coastal community it serves, and the Central Laboratory, which tests >10,000 shellfish water samples each year. Both laboratories rigorously maintain certification under the NSSP program, and are supported, in part, by annual equipment grants competitively secured from the Association of Food and Drug Officials with funds provided by FDA.

MD Agricultural and Resource-Based Industry Development Corporation

Since the creation of the Maryland Shellfish Aquaculture Financing Fund in 2011, MARBIDCO has approved 88 loans to 52 borrowers totaling \$5,606,571 for projects located in 10 tidewater counties. Projects include 31 Submerged Land Leases, 48 Water Column (cage or float) Leases, and nine that were bottom and water column projects. Seventy-four (74) loans were made to commercial watermen (TFL holders) and 85 loans are fully drawn. Borrowers in good standing have an opportunity for forgiveness of 40% (up to a maximum of \$100,000) or 25% (\$100,000 to \$300,000) of the loan principal balance amount.



In 2012, a special finance program was established for commercial watermen to develop remote setting systems for the production of seed oysters. MARBIDCO has approved and funded six loans in this program totaling \$179,984. Growers who have taken advantage of this program have not only used the systems to produce seed oysters for their leased grounds but have sold spat on shell to the state for placement on public harvest grounds to keep that important part of the oyster industry viable.

USDA, Natural Resources Conservation Service

The Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to agricultural producers to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, increased soil health, reduced soil erosion and sedimentation, improved or new wildlife habitat, mitigation against drought and increasing weather volatility. In Maryland, this program has been applied to shellfish farms providing financial and technical assistance to aquafarmers to implement structural and management practices to optimize the environmental benefits of aquaculture production.



The EQIP program has operated for many years providing grants to oyster farmers using bottom culture methods to develop beneficial underwater habitat. Program grant funds are used to renovate substrate or emplace new foundation material that is then planted with hatchery produced spat on shell to emulate a natural oyster reef. This provides benefits from biofiltering while the enhanced habitat attracts other beneficial species. The program has been highly effective in Maryland and has resulted in a significant number of acres of submerged land leases being developed with approved beneficial practices leading to important environmental improvement of our waters.

Oyster Recovery Partnership

The Oyster Recovery Partnership (ORP) supports the growth and development of Maryland's oyster aquaculture industry, emphasizing the benefits of restorative aquaculture and advancing technologies to enhance sustainable fisheries best practices. ORP focuses on improving production, business efficiency, and marketing.

During FY 2023, ORP continued support for existing and new leaseholders by providing access to statewide setting tank infrastructure, oyster shell, and training opportunities through the *Remote Setting and Training* Program. ORP also contracted Maryland aquaculture companies with independent setting systems to produce spat, with a goal to expand oyster bars included in Maryland's public fishery. With ORP's support, those companies produced and planted more than 450 million spat-on-shell, more than double the amount of spat produced in any other year. As a member of the Aquaculture Coordinating Committee, ORP continued to chair and manage a workgroup to evaluate alternate materials for Maryland spat production. Recommendations from the ORP workgroup were approved by ACC in 2023 and passed to DNR for implementation, leading to the publication of a list of approved substrates and the creation of an *Oyster Shell and Substrate Task Force*. ORP continued to provide technical support to the USDA Natural Resource Conservation Service (NRCS) to support the development of leaseholder *Best Management Practices* guidelines through lease holder oyster habitat assessments. These surveys aimed to provide producers and NRCS with information about the best locations for planting and shell replenishment activities.



ORP managed other oyster restoration (sanctuary) programs this past year, including *Supporting Oyster Aquaculture and Restoration (SOAR)*, and community-supported programs like *Marylanders Grow Oysters* and *Build-A-Reef*. These popular, community-based programs engage thousands of Maryland citizens with direct, hands-on exposure to oyster production and restoration. ORP has developed a new aquaculture farm management tool for Maryland's aquaculture industry, focused on digitizing the reporting and with potential business tool features included. Beginning in the summer of 2024, ORP will begin implementing and testing these new technologies in collaboration with oyster producers, DNR and the software developers.

Lastly, ORP works with the Maryland Department of Agriculture's Office of Seafood Marketing to promote Maryland's aquaculture industry and its products. Using traditional and social media, public events, and restaurant-based activities, ORP works closely with state officials, food service industry representatives, chefs, and seafood wholesalers and distributors to market Maryland-based aquaculture products locally, regionally, and internationally. This ORP partnership with the Department of Agriculture actively engages restaurant managers and staff with producers to showcase Maryland seafood and support the farm-to-table ethos of modern-day food service.

The Nature Conservancy – Shellfish Oyster Aquaculture Recovery (SOAR)

During the COVID pandemic, the aquaculture industry was significantly impacted by reduced market demand for oysters. Aquaculture farmers faced complications related to buyer confidence, food safety concerns, human contact restrictions, restaurants closures, and altered business operations. The aquaculture industry and Maryland shellfish farmers were left with an abundance of live oysters and limited options to move their product. During the fall of 2020, The Nature Conservancy and Pew Charitable Trusts offered funds to purchase oysters from growers for transfer to sanctuaries. The SOAR program supported working water waterfronts by providing payments to farmers to use oysters for their ecosystem service and restoration benefits by increasing spawning stock populations, providing critical habitat for other species, improving nutrient cycling and water quality in the Chesapeake Bay.



The Maryland SOAR program was developed by TNC in cooperation with DNR and the UMD Extension program to provide information to the industry, engage interested growers, and provide collaborative market opportunities. The initial program had two rounds of purchases with Maryland being one of seven states in the northeast included in the program. In Round One, 857,851 oysters were purchased, and 399,993 oysters were purchased in Round Two, for a total of 1,257,844 oysters. These were placed on 17 acres of sanctuaries in St. Mary's River, the Eastern Bay and the Nanticoke River. Several growers stated that these funds allowed them to keep their employees paid during that time, while traditional markets were depressed.

TNC continues to work with DNR, UMD Extension, and aquaculture growers to create innovative market opportunities through the purchase and deployment of mature oysters in sanctuaries. In 2023, 67,000 additional oysters were purchased for a total deployment of 1,324,844 oysters. The TNC SOAR program continues to address market and environmental conditions as we develop opportunities in support both business and restoration objectives in Maryland with additional SOAR purchases planned for 2024 and 2025.

University of Maryland

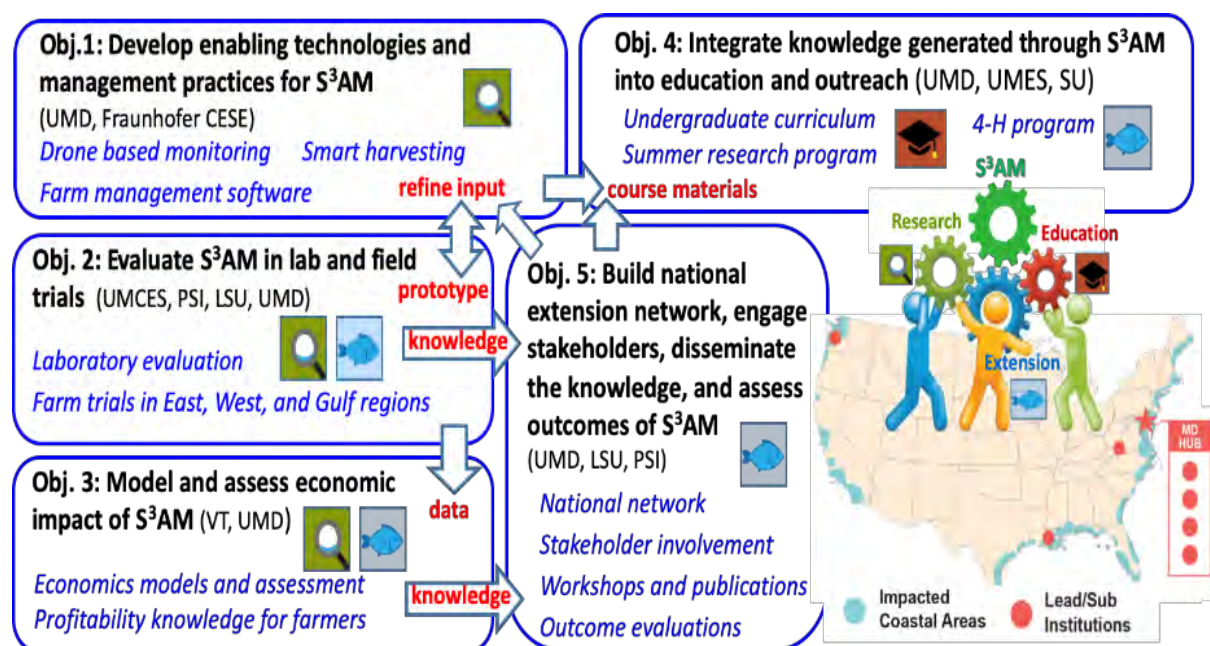
University of Maryland Extension (UME) in the College of Agriculture and Natural Resources is a key component of the Land Grant System providing education for agriculture and rural life. Profitable success in aquaculture requires development of skills in production methods as well as business management. UME has decades of experience training industry through programs that include workshops, demonstrations, short courses and conferences. Program notification is provided to leaseholders through mail, email and Facebook. Support materials include technical manuals, fact sheets, videos and spreadsheets.



The UMCES Horn Point Oyster Hatchery produces larvae and seed to support industry expansion with facilities used to conduct training. Students learn hatchery operations as well as setting and nursery techniques. Single oysters are produced in downwellers and raised in upwellers for growers. HPL has setting tanks to produce spat-on-shell for bottom leases and they produce large quantities for sanctuaries and public grounds.

S3AM - Research for the Future

University of Maryland's College of Engineering received funding for a five-year, \$10 million project from the US Department of Agriculture in 2020 to develop advanced technology and robotics for bottom culture of oysters. The project, known as "Smart, Sustainable Shellfish Aquaculture Management" (S3AM) develops equipment to assess leases with underwater drones monitoring crops to assess size, condition and health of shellfish. Future plans will create efficient planting and harvest gear to avoid negative effects of towed dredges. S3AM includes undergraduate education at the University of Maryland Eastern Shore and Salisbury University along with a 4-H component to complement the award-winning robotics work of Extension. This USDA project is national in scope with an Advisory Board of research and extension faculty and growers from all US coasts to guide the research. Faculty test implementation in all coastal environments to create technology to move oyster aquaculture to the twenty-first century paralleling modern land-based agriculture. Long-term goals will create better planting methods, implement mechanized processing and develop added-value products to expand production to national markets through large-scale distribution while making Maryland a center for applied, high caliber aquaculture research.



Issues and Recommendations

The Aquaculture Coordinating Council has identified key issues affecting the advancement of Maryland aquaculture and provides recommendations developed through their meetings. For 2024, the Council respectfully submits the following for consideration:

I. Water Quality Monitoring

Issue: Maryland Department of the Environment (MDE) is responsible for carrying out federal (Title 21 CFR Part 123) and state (Natural Resources Article 4-742 Maryland Annotated Code) laws mandating bacteriological monitoring and investigation into pollution sources to ensure that shellfish are harvested from unpolluted waters. In addition, MDE conducts intensive shoreline surveys to identify and mitigate pollution sources that may impact shellfish harvesting waters. Continued expansion of the oyster aquaculture industry has resulted in a year-round oyster harvest that can increase the number of monitoring stations needed to ensure adequate spatial coverage to protect public health. This has led to increased hours for personnel to conduct shoreline surveys, and increased operational costs for equipment and resources needed to support their monitoring and data collection.

MDE's Compliance Division tracks the hours devoted to aquaculture. These have risen in recent years due to the addition of new monitoring stations specifically for aquaculture. Currently, \$320k has been awarded to replace two aging vessels that are at the end of their serviceable life where making needed repairs is no longer cost-effective relative to replacement. This is critical for the safety of our field crews using a boat that is waterlogged and dangerous to operate. Although this money has been awarded, we could potentially lose these funds if the money is not encumbered by June 30, 2024.

In addition, our aging fleet of tow vehicles has put a strain on the budget at MDE. Many vehicles are towing 4,000-pound boats with vehicles that have over 130,000 miles. It is necessary to continue to replace two to three of these vehicles over each fiscal year.

MDE needs to fill a vacancy within MDE's shellfish program that was and will be conducting the bacterial monitoring of aquaculture sites and performing shoreline surveys at these sites. With the vacant position, this has resulted in a monitoring reduction of 20% at aquaculture stations and stations in the vicinity of natural oyster bars.

Recommendation: Secure \$150,00 in additional state funds for MDE shellfish programs, particularly for replacing aging vehicles in this fiscal year, and continue to track federal funding to ensure fiscal gaps are addressed. In addition, fill the vacant position to ensure that monitoring and shoreline survey does not fall short of mandated goals. These programs have been effective in assuring that Maryland's shellfish industry remains competitive nationally while maintaining its excellent reputation for safe and wholesome products. It is critical for Maryland's economic

and public health needs to support MDE shellfish monitoring programs.

II. Protection of Property

Issue: The Natural Resources Police (NRP) provides a strong presence to protect our marine resources. However, their ranks have been reduced and their responsibilities have increased during the past two decades, leading to concern for their ability to protect natural shellfish stocks and assist private growers in keeping crops secure. When NRP was merged with the Park Rangers in 2005, a total of 353 NRP and law enforcement park rangers were in the unit. Immediately after the merger, 35 PINS were abolished or transferred to other agencies. Currently, NRP has an authorized strength of 260 with 26 vacancies and more to come. Only 188 positions are sergeants and below assigned to uniformed field patrol. These are the officers that are actually in the field on a daily basis. NRP must be able to respond quickly and effectively to problems and theft has repeatedly been identified as a principal one in aquaculture industry surveys. Support for NRP assets is required for Maryland to meet the challenge of attracting private capital to invest and expand aquaculture crops to meet the growing demand for seafood. The Council has urged political leaders to provide enhanced funds for law enforcement for a strong and visible force and urges that new assets be provided to this vital unit.



Natural Resources Police enhancement has been requested as a high priority need to protect private property of Maryland shellfish growers

Recommendation: Increase support for Natural Resources Police to deter theft of public and private shellfish by providing the force with expanded personnel and funds to enhance technological equipment that can multiply efforts of duty personnel for enforcement activities. NRP developed a Strategic Plan for FY2015-FY2019 that specifically addresses staffing needs. Funds should be allocated to support staffing recommendations as detailed in that document.

III. Aquaculture and Commercial Fishery Development Grants

Issue: Legislation creating the Aquaculture Coordinating Council provided a series of charges for it. Item II directed the Council to “Establish and monitor a grant program for the implementation of appropriate projects that support the economic health of the State aquaculture industry”. To date, this important charge has not been implemented because funds have not been provided. With the growth of shellfish aquaculture, new equipment and methods must be

introduced to produce quality products. However, those in business are often unable to allocate funds to develop innovative ideas for applied research that could result in more efficient gear, higher production, lower input costs and identification and establishment of new markets. Providing funds for these purposes will keep Maryland producers at the forefront of the industry nationally. Additionally, watermen often have ideas for innovation that could aid them in their businesses. We request that funds be provided for the Council to develop an Aquaculture and Commercial Fisheries Development Grant Program. This would be organized and operated similar to one that has been effectively used in Virginia for several decades for aquaculture and fisheries projects. It would be managed by a committee of institutional and industry representatives. Project grant funds would not be allowed for salaries, purchases of vehicles or vessels and the results would be required to be documented and made publicly available for others to apply to their businesses.

Recommendation: The Council's vision is for an Aquaculture and Fisheries Innovation Fund to be established at \$100,000 annually and overseen by an Advisory Board comprised of seven individuals representing state agencies, University of Maryland faculty and industry. Applicants would be required to be actively engaged in Maryland wild harvest or aquaculture industries. Proposals would be submitted to the Board at specified times with broad distribution of the announcement of availability for applications. Funds would not be allowed for the purchase of vessels, vehicles or payment of salaries. The intent of the program is for those in production to create improvements in their operations without incurring personal cost and risk during that development. The program would fund supplies, improve equipment and provide support for developing innovative products or methods to be used for all forms aquaculture and commercial fishing operations.

Proposals would be reviewed by the Advisory Board with external reviews requested if required for additional input. At the conclusion of a project, a report would be required from the recipient which would be in the public domain for availability by other users. Participants would be encouraged to provide information on their projects through UMD Extension programs.

To create the Aquaculture and Fisheries Resource Grant Program, the Governor and legislature are requested to provide \$100,000 to initiate it. The Council envisions being able to form an Advisory Board and have the program active within six months of the allocation being provided.

The members of the Maryland Aquaculture Coordinating Council formally request that the Governor and legislative leaders consider the recommendations in this report when formulating their budgets and we urge support for them. The Council looks forward to continuing its work in the development of Maryland aquaculture for the **ECONOMIC GROWTH, INCREASED EMPLOYMENT** and **ENVIRONMENTAL BENEFITS** that derive from a healthy and thriving aquatic farming industry.

Partners for Aquaculture Development

Maryland Agencies

- ♦ Department of Health
- ♦ Department of Commerce
- ♦ Department of Agriculture
- ♦ Department of the Environment
- ♦ Department of Natural Resources
- ♦ Natural Resources Police
- ♦ MD Agriculture & Resource-Based Industries Development Corporation

University System of Maryland

- ♦ University of Maryland
- ♦ University of Maryland Extension
- ♦ University of Maryland Center for Environmental Science

Federal Agencies

- ♦ USDA Natural Resource Conservation Service
- ♦ US Army Corps of Engineers, Baltimore District
- ♦ National Oceanic & Atmospheric Administration

Non-Governmental Organizations

- ♦ Maryland Farm Bureau
- ♦ Oyster Recovery Partnership
- ♦ Chesapeake Bay Foundation
- ♦ Coastal Conservation Association - Maryland



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