

AQUACULTURE COORDINATING COUNCIL

FY 25

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

Prepared by the Maryland Aquaculture Coordinating Council

January 2026

2025



Maryland Aquaculture Coordinating Council

Annual Report 2025

**Report on Council activities with recommendations
for the advancement of 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

20
years

Aquaculture Coordinating Council Membership

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Senator John D. *(Jack)* Bailey

House of Delegates

Delegate Dana C. Jones

State Agencies

Matthew Scales, **Vice Chairperson**

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Department of Commerce

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Department of the Environment

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Oyster Recovery Partnership

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UMD - College Park

Donald Webster

UMD Extension

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Walter R. *(Robby)* Witt, Jr.



Maryland
Aquaculture Coordinating Council

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TO: The Honorable Wes Moore, Governor
The Honorable Brian J. Feldman, Chair
Senate Education, Energy, and the Environment Committee
The Honorable Marc A. Korman, Chair
House Environment and Transportation Committee

FROM: Daniel Worrell, Chair
Maryland Aquaculture Coordinating Council

DATE: October 9, 2025

SUBJECT: Annual Report from the Maryland Aquaculture Coordinating Council

I am pleased to present the 2025 report from the Maryland Aquaculture Coordinating Council (ACC). Under the ACC's leadership Maryland's aquaculture industry has gained national attention and recognition. The ACC is dedicated to developing solutions to issues that keep our industry from growing.

Aquaculture presents Maryland with an immense opportunity. Single-grown oysters bring strong prices while bottom-grown products serve processing plants to support substantial economic activity in rural areas. With national momentum toward expanded domestic seafood production, Maryland is well-positioned to serve as a model of resilience, innovation, and sustainable growth in aquaculture.

However, Maryland's oyster production has recently shown signs of strain. If we are not proactive, potential downturns could jeopardize livelihoods, affect rural coastal communities and the natural resources we all steward.

To ensure sustainable growth, we have identified these key areas that need attention: 1) expand and invest in market opportunities beyond state borders; 2) streamline the permitting and lease processes; 3) diversify aquaculture production; and 4) unify Maryland's aquaculture industry.

On behalf of the ACC, I want to advocate for the long-term prosperity of the Maryland aquaculture industry and the benefits to the health of the Chesapeake and other Maryland coastal bays that a robust industry will bring. With abundant natural resources and a talented community of professionals, we can transform current challenges into long-term success. Recent progress, such as streamlined reporting requirements, demonstrates the positive results of collaboration between the State and industry. Now is the time for decisive action to build on that momentum. I respectfully request your support in advancing these priorities for the benefit of Maryland's aquaculture sector and the communities it sustains.

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. 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 Issues

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. Due to year-round oyster harvesting, more monitoring stations are needed to ensure adequate spatial coverage to protect public health. This has led to increased hours for personnel to conduct shoreline surveys and an increase in operational costs for equipment and resources to support monitoring and data collection.

Protection of Property

The Natural Resources Police (NRP) provide 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 to assist private growers in keeping crops secure. NRP must be able to respond quickly and effectively to problems as theft has repeatedly been identified as a principal issue.

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*”. 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. Additionally, watermen often have ideas for innovation that could aid them in their businesses.

Aquaculture Marketing

MDA has heard that the Maryland oyster industry is "soft," particularly shucked oyster meat. A concerted effort is needed to expand the reach of Maryland's aquaculture products beyond the state's borders and to strengthen the demand for our products, particularly value-added products such as shucked oysters and individually quick-frozen oysters. Strategically developing marketing and branding initiatives can effectively highlight Maryland's distinctive aquaculture heritage and attract new consumers.

Permitting and Leasing

The advancement of the aquaculture industry is presently impeded by administrative and regulatory delays. The permitting process is slow and cumbersome, and fees do not align with the current operational and regulatory landscape. A comprehensive review of these issues is needed to expedite necessary modifications. Streamlining the permitting process and ensuring that fees remain fair, sustainable, and reflective of the resources required will enhance support for the industry. This will enable the industry to innovate, invest with greater confidence, and compete more effectively with states that have made significant investments in aquaculture.

Diversify Aquaculture Production

While oysters remain an iconic species, a resilient and sustainable future requires the expansion into the cultivation of other commercially valuable species, such as clams, scallops, and finfish. Making these opportunities accessible to rural and underserved communities will promote fair growth and uncover new possibilities. Investment in outreach, research, infrastructure, and policies will be crucial in encouraging the expansion into other products.

Unify Maryland's Aquaculture Industry

While regional cooperatives have established valuable local foundations, to achieve substantial growth and compete effectively on a national scale, these entities must coalesce into a single, statewide Cooperative. Such unity will amplify the industry's collective voice in advocacy, optimize our efforts, and position Maryland as a preeminent leader in sustainable and innovative aquaculture practices.

Maryland 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:

- I. Formulate and make proposals to the Governor, and the Senate and House committees responsible for the Environment, to advance Maryland aquaculture, including recommendations for fees to reduce State expenditures on aquaculture programs
- II. Establish and monitor a grant program for the implementation of appropriate projects that support the economic health of the State aquaculture industry
- III. Conduct applied studies or projects and products to expand the aquaculture industry
- IV. Conduct market tests to determine acceptability and potential demand for new aquaculture products
- V. Implement pilot projects and small commercial demonstrations to resolve any outstanding quality or production issues, and to educate industry representatives, regulators, and other partners
- VI. Support the aquaculture industry in its efforts to implement innovative procedures and to comply with associated regulations
- VII. Enhance the awareness of innovative aquaculture products and programs among commercial buyers and the general public
- VIII. On or before December 31, 2006, develop Best Management Practices that:
 1. Provide guidance for freshwater and marine aquaculture permitting and compliance
 2. Serve as the basis for the adoption of State regulations regarding tidal and non-tidal aquaculture
- IX. Investigate and, to the extent feasible, enhance the area of State waters that is available to private lease for the purposes related to the aquaculture and seafood industries
- X. Provide for the establishment of Aquaculture Enterprise Zones in the Chesapeake and coastal bays, so as to:
 1. Streamline the permitting process in these zones
 2. Provide incentives for private investment in leasing operations
 3. Encourage individuals with historical records in the commercial fishery to adapt their expertise to the raising and harvesting of seafood by aquaculture
- XI. On a regular basis, review State regulations impacting aquaculture and make recommendations to the Aquaculture Review Board regarding any necessary or advisable regulatory changes

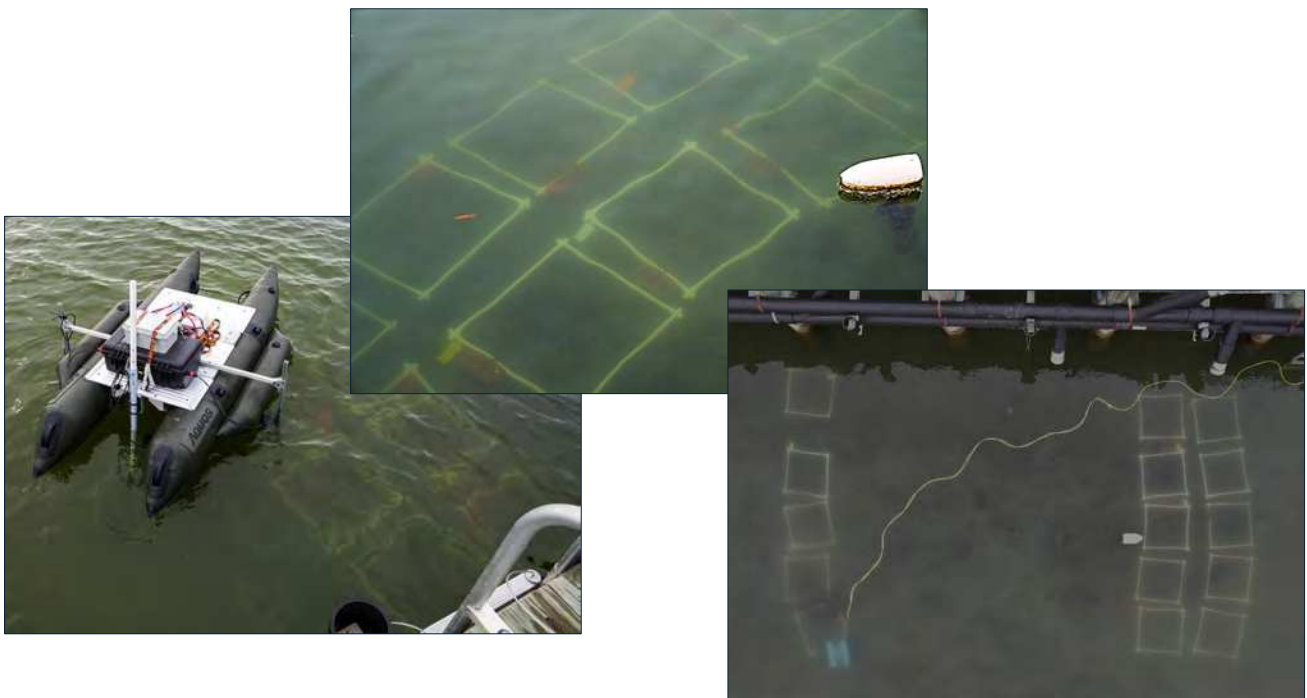
Engaging our Citizens

The Aquaculture Coordinating Council meets bi-monthly with work groups 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.



Images of ROV field tests.

Maryland 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; SAV-Aquaculture conflict surveys (*an annual report of these conflicts is prepared by DNR*); 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 the Maryland Department of 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. In early 2025, DNR developed a fact sheet detailing the state of the aquaculture program, staffing, and budgetary information.

(Please see Appendix for more information).



Upweller units for producing single oyster seed

Development of the oyster industry continues to be bolstered by privately-operated oyster hatcheries and shellfish nursery facilities in Maryland 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's Horn Point Oyster Hatchery in Cambridge. Nurseries are permitted by the Department and may consist of land-based (e.g., pier or wharf) units 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.

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's Supporting Oyster Aquaculture and Restoration (*SOAR*) program.

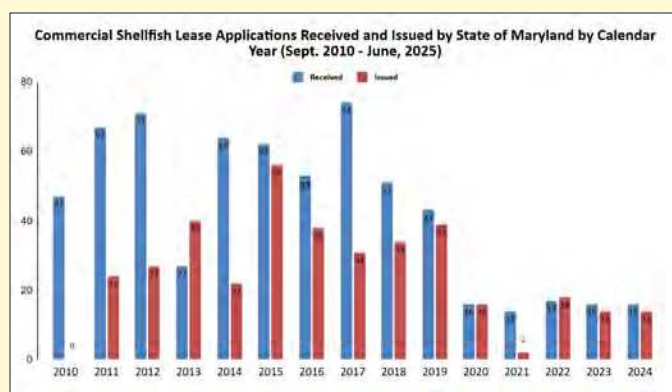
Several DNR processes were changed as a result of policy, regulatory, and legislative changes based on industry feedback and input through the Aquaculture Coordinating Council. First, harvest start time during summer months when the vibrio control plan is in effect has been moved to 30 minutes before sunrise to allow safe harvest during cooler periods of the day. The

shellfish relay process was also changed to allow greater flexibility for growers that conduct relay efforts through coordinating relays regionally. In 2024, regulations were adopted to allow the use of bulk tagging. Tags and fact sheets guiding the use of such tags were distributed and have been widely adopted by industry. The final change was a result of the Chesapeake Bay Legacy Act, which changed two major items related to shellfish aquaculture: 1) the shellfish aquaculture lease annual report due date was changed to January 31st of each year, allowing leaseholders more time during an especially busy period to complete reports, and 2) the shellfish lease application protest process was modified to allow a short period after a public information meeting to protest, but clarified criteria of a valid protest. This change also allows DNR to require protestors to engage in mediation prior to formal hearings.

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 45 shellfish lease applications and issued an average of 26 new leases per calendar year. Two types of commercial shellfish leases are offered in Maryland:

Submerged Land Leases (*SLL*) and Water Column (*WC*) Leases. *SLL* that are 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 equipment 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.



Shellfish Lease Activity Sept 2010 – June 2025	Total Sites	Total Acreage
All shellfish lease applications submitted	644	12,280
Submerged Land Leases executed	249	6,547
Water Column Leases executed	130	751
All new shellfish leases executed	379	7,298

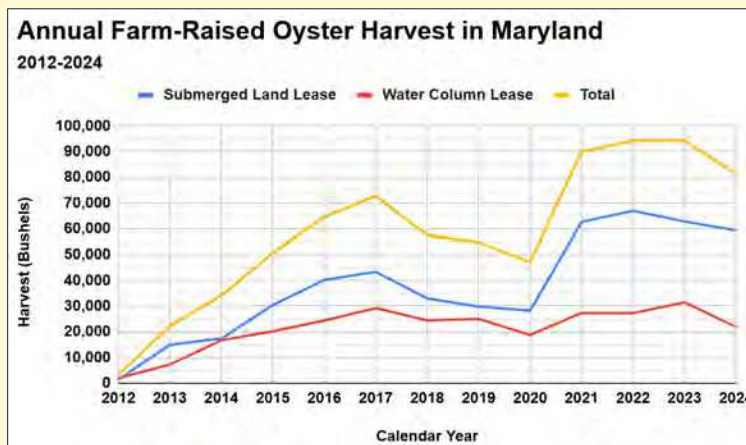
As of June 2025, there were a total of 753 persons who were issued a Shellfish Aquaculture Harvester Permittee Card for the year, which is representative of the number of leaseholders who are managing or co-managing lease operations. A total of 2,466 persons have been issued a Shellfish Aquaculture Harvester 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 2025)				
County	SLL - Number	SLL - Acres	WC - Number	WC - Acres
Anne Arundel	20	271	2	8
Calvert	11	147	6	35
Charles	5	89	1	8
Dorchester	90	2503	22	139
Kent	1	45	1	5
Queen Anne's	2	20	3	13
St. Mary's	90	864	28	133
Somerset	36	1039	1	5
Talbot	70	748	11	42
Wicomico	48	1160	0	0
Worcester	2	15	13	85
Total	375	6,901	88	473

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. Environmental factors like severe freshets in 2018 and 2019, seed and larvae shortages, and COVID19 have been attributed as causes of some decreases in production and harvest. Improved ecological growing conditions and improving markets were more favorable in 2020 and 2021, and growers continued to plant their leases. Farm-raised oyster harvest totals continued to rebound through 2023 but saw a slight drop in 2024, to a total of 81,373 bushels. Farm-raised bay scallop harvest was also reported again in 2024, from water column leases located in the Coastal Bays. In 2024, farm-raised clam harvest was reported from a shellfish lease for the second time since 2017. The decrease in 2024 is largely reported by growers to be due to decrease in market demand.

Annual Maryland Farm-Raised Shellfish Harvest in Bushels by Species and Lease Type				
SLL - Submerged Land Lease		WC - Water Column Lease		
Year	Species	SLL	WC	Total
2012	Clams	44.2	0	44.2
	Oysters	1,417.2	1,917.4	3,334.6
2013	Clams	58.0	0	58.0
	Oysters	14,965.2	7,232.0	22,197.1
2014	Clams	205.0	0	205.0
	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
	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
	Scallops	0	83.4	83.4
2022	Oysters	66,946.0	27,311.4	94,257.3
	Scallops	0	116.7	116.7
2023	Oysters	62,794.2	31,491.5	94,285.7
	Clams	0.6	0	0.6
	Scallops	0	169.2	169.2
2024	Oysters	59,402.4	21,970.8	81,373.2
	Clams	1.5	0	1.5
	Scallops	0	123.4	123.4



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. Production values are summarized below (*some species are aggregated or left off to protect production information when reporting could be attributed to a single farm only*).

Species	Amount	Unit
Tilapia	2,200	Pounds
Various Turtle spp.	45,000+	Individual
Bluegill	100	Pounds
Yellow Perch	225	Individual

Maryland Department of Agriculture



The Maryland Department of Agriculture operates a seafood marketing unit that creates demand for our quality products. In FY25 through their marketing arm, *Maryland's Best*, MDA has elevated the aquaculture industry through various campaigns. The annual *Shuck & Stout* campaign celebrates local oysters and beer, encouraging consumers to visit some of Maryland's best restaurants. The *Eat Like a Marylander* campaign highlights how to eat locally, encouraging consumers to eat more seasonal food from local growers, supporting local jobs and the economy. MDA also partners with the Oyster Recovery Partnership for *Chesapeake Oyster Week*. This weeklong event encourages consumers to show their appreciation to Bay-friendly businesses by dining at restaurants that participate in ORP's shell recycling program. MDA also promotes Maryland seafood at local and national events like the annual Seafood Expo North America. New to MDA's oyster promotion program is oyster farm tours for chef/influencers.

Maryland 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.

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.

Maryland 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 ensure 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.

Maryland Agricultural & Resource-Based Industry Development Corporation



Since the creation of the *Maryland Shellfish Aquaculture Financing Fund* in 2011, MARBIDCO has approved 90 loans to 54 borrowers totaling \$5,756,571 for projects located in 10 tidewater counties. Projects include 31 Submerged Land Leases, 50 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 88 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.

University System of Maryland



Within the University of Maryland's College of Agriculture and Natural Resources, the Extension (*UME*) department is a key component of the Land Grant System, providing Maryland residents with non-formal education and problem-solving assistance 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 in training industry members 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.

As part of the University of Maryland Center for Environmental Science (*UMCES*), the Oyster Hatchery at the Horn Point Laboratory (*HPL*) 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 (*USDA*) in 2020 to develop advanced technology and robotics for large-scale bottom culture of oysters. The project, known as "Smart, Sustainable Shellfish Aquaculture Management" (*S³AM*) is creating equipment to assess oyster populations using underwater drones to monitor populations, animal size, condition and potential predators of shellfish. This emulates what terrestrial farmers now have but with the challenge of poor visibility underwater and lack of GPS for location. Future plans include creating efficient planting and harvest gear to avoid the negative effects of currently used towed dredges, which damage small oysters and affect important bottom substrate. *S³AM* includes support for undergraduate education at the University of Maryland Eastern Shore and Salisbury University and has a unique 4-H component that complements the award-winning robotics work of UM Extension.

This USDA project is national in scope and has an Advisory Board of research and extension faculty, and shellfish farmers from all US coasts to guide the research and extension aspects. Faculty carry out trials on equipment in all coastal environments with the goal of creating technology that will move oyster aquaculture into the twenty-first century, thus paralleling modern land-based agriculture. Long-term project goals are to create more precise planting methods and mechanized processing, and to develop added-value products that expand oyster production to national markets through large-scale distribution. Achievement of these goals will establish Maryland as a leading center for applied, high-caliber aquaculture research.

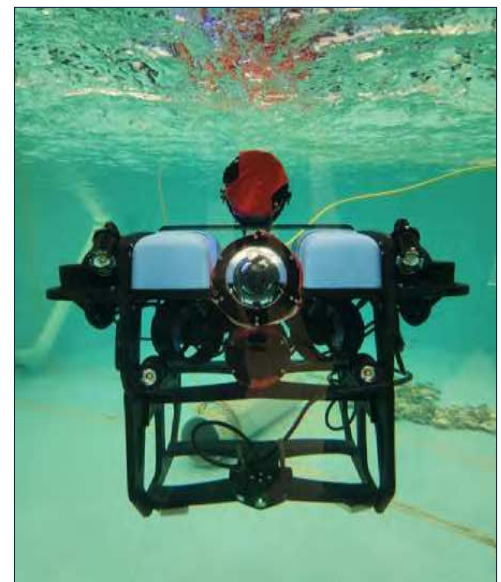


Image of an underwater remotely operated vehicle (ROV) used to collect data about oysters. The ROV has various sensors that collect optical, sonar, depth, temperature, salinity and location data which is then used to generate maps of the bottom and track the oysters. Sonar is used to collect data even when the water is too murky to see.

The Nature Conservancy

Supporting Oyster Aquaculture and Restoration (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 The Pew Charitable Trusts created the Supporting Oyster Aquaculture and Restoration program (*SOAR*) to purchase oysters from growers for transfer to sanctuaries to provide fish habitat, increased spawning stock, and improved nutrient cycling and water quality in the Chesapeake Bay. Several growers stated that these funds allowed their businesses to function, and keep their employees paid during that time while traditional markets were depressed.

In Maryland, we worked closely with MD Department of Natural Resources, University of Maryland Extension, Oyster Recovery Partnership (*ORP*) and Shore Thing Shellfish (*STS*), St. Mary's College of Maryland, and St. Mary's River Watershed Association to select areas to purchase oyster and to move oyster onto reefs, engage interested growers, purchase oysters, and transport oysters to reefs. In 2025, 91,000 oysters were purchased and deployed on sanctuary reefs for a cumulative total of 1,495,309 oysters sourced from 30 Maryland growers between 2020 and 2025. These oysters were placed on 17 acres of oyster reef in sanctuaries in the St. Mary's River, Eastern Bay, and the Nanticoke River.

Monitoring of survival of deployed oysters and nearby shorelines for erosion has been conducted and will continue through 2026. TNC will share a final report on the overall accomplishments, lessons learned, and monitoring results in 2026. The Nature Conservancy's Dr. Heidi Alleway gave a presentation on restorative aquaculture and the Monitor, Evaluate, and Learn framework (*MEL*) to the Restorative Aquaculture workgroup of the Aquaculture Coordinating Council. The discussion has enabled potential next steps, including a pilot program applying the MEL framework in support of restorative aquaculture.

TNC also established a Resiliency Fund Program as part of SOAR that supported three projects in Maryland including evaluation of new monitoring technology, improving production methods, and an internship program with Minorities in Aquaculture (*MIA*).

This work was made possible thanks to the generous support from these private donors: The Pew Charitable Trust, NOAA Fisheries' Office of Habitat Conservation, Chesapeake Bay Office, NOAA National Marine Fisheries Service, The Builders Initiative, and the National Fish and Wildlife Foundation. And a special thanks is given to U.S. Senators Chris Van Hollen and Ben Cardin from Maryland, and their staff, for their tireless work in securing federal funding for the SOAR program.

Oyster Recovery Partnership



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

In 2025 ORP led the development of the Maryland Farm Aquaculture Reporting and Management (*FARM*) app to digitize harvest reporting for Maryland's aquaculture industry. Built in partnership with leaseholders, a software developer, and the Maryland Department of Natural Resources (*DNR*), the app will launch in 2025 through DNR's pilot program and allow electronic submission of monthly harvest reports. *FARM* also includes interactive maps, messaging and alerts, data downloads, and tools to track planting events and upload receipts. ORP plans to expand its business and management features as funding allows.

ORP also worked with several aquaculture companies to produce and plant spat on public fishing grounds under the guidance of DNR management support of the public oyster fishery. The 2024 season was historic with a total of five companies producing and planting more than 460 million spat on shell. Under this program ORP continues to collaborate with the University of Maryland Center for Environmental Science (*UMCES*) and commercial watermen to evaluate alternate materials for Maryland spat production. This work follows recommendations developed by the Alternate Materials Workgroup, which ORP and the Aquaculture Coordinating Council (*ACC*) convened in 2022. ORP also served as a member of the Oyster Shell and Substrate Task Force, which submitted its findings and final recommendations to Governor Moore in November 2024.

As part of its leaseholder support, ORP worked with the USDA Natural Resource Conservation Service (*NRCS*) to develop leaseholder "Best Management Practices" through leaseholder oyster habitat assessments. These surveys help producers and NRCS identify optimal areas for planting and shell replenishment activities.

Beyond production, ORP supported the aquaculture industry through several additional programs including, including The Nature Conservancy's *Supporting Oyster Aquaculture and Restoration (SOAR) program*, 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.

Finally, ORP works alongside Maryland Department of Agriculture's Office of Seafood Marketing to promote Maryland's aquaculture industry and its products. Through traditional and social media, public events, and restaurant-based activities, ORP collaborates with state officials, food service industry representatives, chefs, and seafood wholesalers and distributors to market Maryland-based aquaculture products locally, regionally, and internationally. This partnership fosters direct connections between producers and restaurant staff, supporting a strong farm-to-table ethos and helping to elevate the visibility of Maryland seafood in local, regional, and international markets.

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.



Image of oyster seeding the Tred Avon Sanctuary

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 2025, the Council respectfully submits the following for consideration:

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 an increase in 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 two vehicles has put a strain on the budget at MDE. Many vehicles are towing 4,000-pound boats with vehicles with odometer readings 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 \$150,000 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.

Protection of Property

Issue:

The Natural Resources Police (NRP) provide 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 authorized positions were abolished or transferred to other agencies. Currently, NRP has an authorized strength of 279 with 19 vacancies and more to come. Only 186 positions are assigned to uniformed field patrol. These are the officers that do the actual, daily field work. 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.

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 FY2020-FY2025 that specifically addresses staffing needs. Funds should be allocated to support staffing recommendations as detailed in that document.

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. Project grant funds would not be allowed for salaries or the purchases of vehicles and vessels. It would be managed by a committee of institutional and industry representatives and project 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 \$250,000 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 of 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.

Aquaculture Marketing

Issue:

MDA has heard that the Maryland oyster industry is "soft," particularly shucked oyster meat. A concerted effort is needed to expand the reach of Maryland's aquaculture products beyond the state's borders and to strengthen the demand for our products, particularly value-added products such as shucked oysters and individually quick-frozen oysters. Strategically developing marketing and branding initiatives can effectively highlight Maryland's distinctive aquaculture heritage and attract new consumers. Bipartisan support will be instrumental in elevating Maryland's seafood products both nationally and internationally.

Recommendation:

To ensure sustainable growth, the Council recommends an investment of State funds to expand market opportunities beyond state borders. Brand and market strategies for value-added products, such as shucked and individually quick-frozen oysters should be developed. Identification of emerging markets can be made through market studies and participation at trade shows/expos. The ACC will advise on which markets and demographics to target.

Permitting and Leasing

Issue:

The advancement of the aquaculture industry is presently impeded by administrative and regulatory delays. The permitting process is slow and cumbersome, and fees do not align with the current operational and regulatory landscape. A comprehensive review of these issues is needed to expedite necessary modifications. Streamlining the permitting process and ensuring that fees remain fair, sustainable, and reflective of the resources required will enhance support for the industry. This will enable the industry to innovate, invest with greater confidence, and compete more effectively with states that have made significant investments in aquaculture.

Recommendation:

Form a workgroup to review the current permitting and leasing process. This group will reevaluate the current fee structure and identify any regulatory delays that slow industry progress. The group will then be tasked with developing a list of recommendations that will bring about the reform needed to expand Maryland aquaculture.

Diversify Aquaculture Production

Issue:

While oysters remain an iconic species, a resilient and sustainable future requires the expansion into the cultivation of other commercially valuable species, such as clams, scallops,

and finfish. Making these opportunities accessible to rural and underserved communities will promote fair growth and uncover new possibilities. Investment in outreach, research, infrastructure, and policies will be crucial in encouraging the expansion into other products.

Recommendation:

Provide funds to invest in outreach, research, and infrastructure to expand beyond oysters to include clams, scallops, and finfish. Ensure opportunities are accessible to rural and underserved communities.

Unify Maryland's Aquaculture Industry

Issue:

While regional cooperatives have established valuable local foundations, to achieve substantial growth and compete effectively on a national scale, these entities must coalesce into a single, statewide Cooperative. Such unity will amplify the industry's collective voice in advocacy, optimize our efforts, and position Maryland as a preeminent leader in sustainable and innovative aquaculture practices.

Recommendation:

Create a statewide cooperative by building on the foundation of regional cooperatives. This will strengthen advocacy and amplify Maryland's leadership in sustainable practices.

In Conclusion

Aquaculture can become a major economic generator for the State, preserve rural jobs, and remove nutrients from the Bay. The average price of single oysters has ranged from \$0.40 to \$0.50 per oyster since 2017. At the DNR rate of 300 oysters per bushel, that is \$120-150 per bushel. The average price of oysters sold as bushels has ranged from \$55 to \$63.85 per bushel. An economic impact study shows that in 2024 the impact to the entire oyster industry in Maryland was estimated to be \$11,516,932.

With the national focus to expand domestic seafood production, Maryland has the potential to significantly grow its aquaculture industry. Recent efforts, such as adjusting the end-of-year reporting deadline, alleviated unnecessary administrative burdens and illustrate how progress can be achieved through collaboration between the State and the industry. Maryland has the requisite talent, abundant natural resources, and significant opportunities to transform current challenges into noteworthy success and serve as a distinguished model of resilience, innovation, and sustainable growth.

The future prosperity of Maryland aquaculture is at a pivotal juncture. The Maryland Aquaculture Coordinating Council formally requests that the Governor and legislative leaders consider and support the recommendations in this report when formulating their budgets. The Council looks forward to continuing its work in the development of Maryland aquaculture for 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



Appendix

Aquaculture and Industry Enhancement Division

MARYLAND DNR



The Aquaculture and Industry Enhancement Division leads Maryland's commercial aquaculture activities, managing leasing, permitting, compliance, and industry development. We also house the Maryland Artificial Reef Initiative with 60+ partners, which acts as a funding mechanism (using private and corporate donations) for reef development.

2024 Economic Impact & Environmental Highlights

Economy	Production	Environmental Impact
• 472+ jobs directly supported by permitted aquaculture • \$6.4M dockside value • \$11.5M total economic impact • \$108M cumulative economic impact since 2012	• 81,373 bushels of shellfish harvested • 78 import permits issued for shellfish species and seed • 9 new shellfish nursery permits issued • 7,416 acres under shellfish aquaculture leases in 11 counties	• 5,700+ pounds of nitrogen removed from the Bay • 950+ pounds of phosphorus removed • \$112M worth of ecological benefits provided (compared to equivalent shellfish restoration costs)

FY 25 Budget

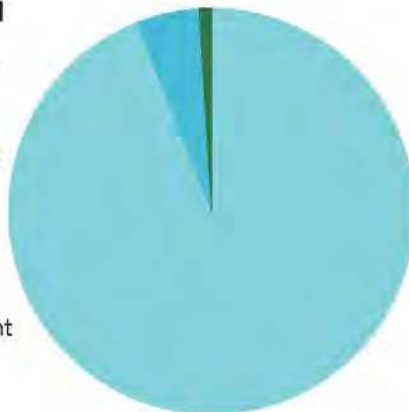
Operational budget: \$1,319,911

- **General Funds** – \$1,240,911 (94%)
- **Special Funds** – \$66,415 (5%)
- **Federal Reimbursable Funds** (1%)

Revenue: \$55,408

(4.25% of budget)

Primarily from application fees and annual shellfish aquaculture lease rent



Scan to visit the Aquaculture and Industry Enhancement Division webpage

Staff

11 full-time staff and 2 positions under contract with MES

Division-wide efforts are split between:

- Customer Service (24%)
- Data Management and Analysis (22%)
- Survey, Monitoring, and Compliance (18%)
- Policy Development and Implementation (7%)
- Public Safety Initiatives (11%)
- Administrative Tasks (18%)



Division Operations: Three Major Programs

Leasing & Permitting Program

(70% of budget allocation)

- Conducts joint federal/state review for all shellfish lease applications
- Leads the Maryland Aquaculture Review Board, enabling parallel state and federal review
- Partner Agencies: USACE, USCG, NOAA, EPA, MDE, MDH, MDP, DNR
- Conducts biosecurity reviews to ensure safe importations and minimize disease risks
- Recent temporary staff increase has made significant progress on permit/leasing backlog

National Shellfish Sanitation Program (FDA Compliance)

(30% of budget allocation with Field Operations)

- Maryland's participation in interstate shellfish commerce depends on strict compliance with FDA sanitation rules.
- Provide education to harvesters on regulations and safe practices
- Coordinate with Natural Resources Police and State's Attorneys for violation enforcement
- Subject to biennial FDA inspections of DNR's compliance efforts

Field Operations

(30% of budget allocation with Shellfish Sanitation) Compliance & Monitoring:

- Conduct compliance inspections across all permitted operations
- Relay Operations: Staff coordinate with industry and Natural Resource Police to move farmed shellfish from polluted to clean waters for contaminant purging
 - Dramatic increase: 2-3 days supervision in 2012 → average 23 days over past 3 years
 - Vessel-based supervision requires minimum 2 staff members

Submerged Aquatic Vegetation (SAV) Surveys:

- Natural Resources Article §4-11A-10(c) prohibits placement of shellfish operations on SAV
- Conflicts identified through aerial imagery, confirmed via field surveys
- Annual Impact: ~80% of leases flagged by aerial imagery are restricted based on field surveys
- Resource Requirement: ~20 work days for 2 staff to complete surveys
- Service prevents false restrictions, allowing continued operation of appropriately sited leases

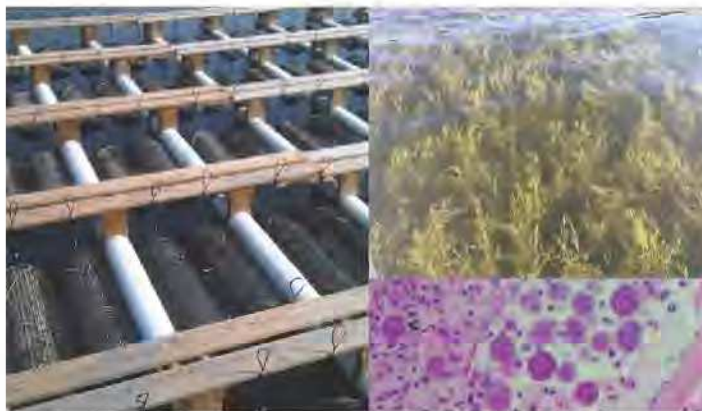
Fee Structure

Current fees were set low or at zero initially to promote industry growth and haven't changed in over 12 years.

Fee Type	Current Md. Fee
Lease Application	\$300
Application Advertisement	\$0
Metes & Bounds Survey	\$0
Biological Survey	\$0
Shellfish Harvester Permit	\$0
SLL Rent (per acre)	\$2.50
WC Rent (per acre)	\$25
Lease Renewal	\$0
Lease Transfer	\$0
Shellfish Relay	\$0
SAV Survey	\$0
Shellfish Nursery Permit	\$100
Non-Shellfish Aq. Permit	\$0

Non-Shellfish Aquaculture

20 active permits for re-circulating tank or pond systems producing: native fish, hybrid striped bass, channel catfish, tilapia, shrimp, turtles, koi, marine corals, ornamental fish, and aquatic plants



Submerged aquatic vegetation, Histological section of oyster tissue, Shellfish nursery with floating cages

For additional information, contact:

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