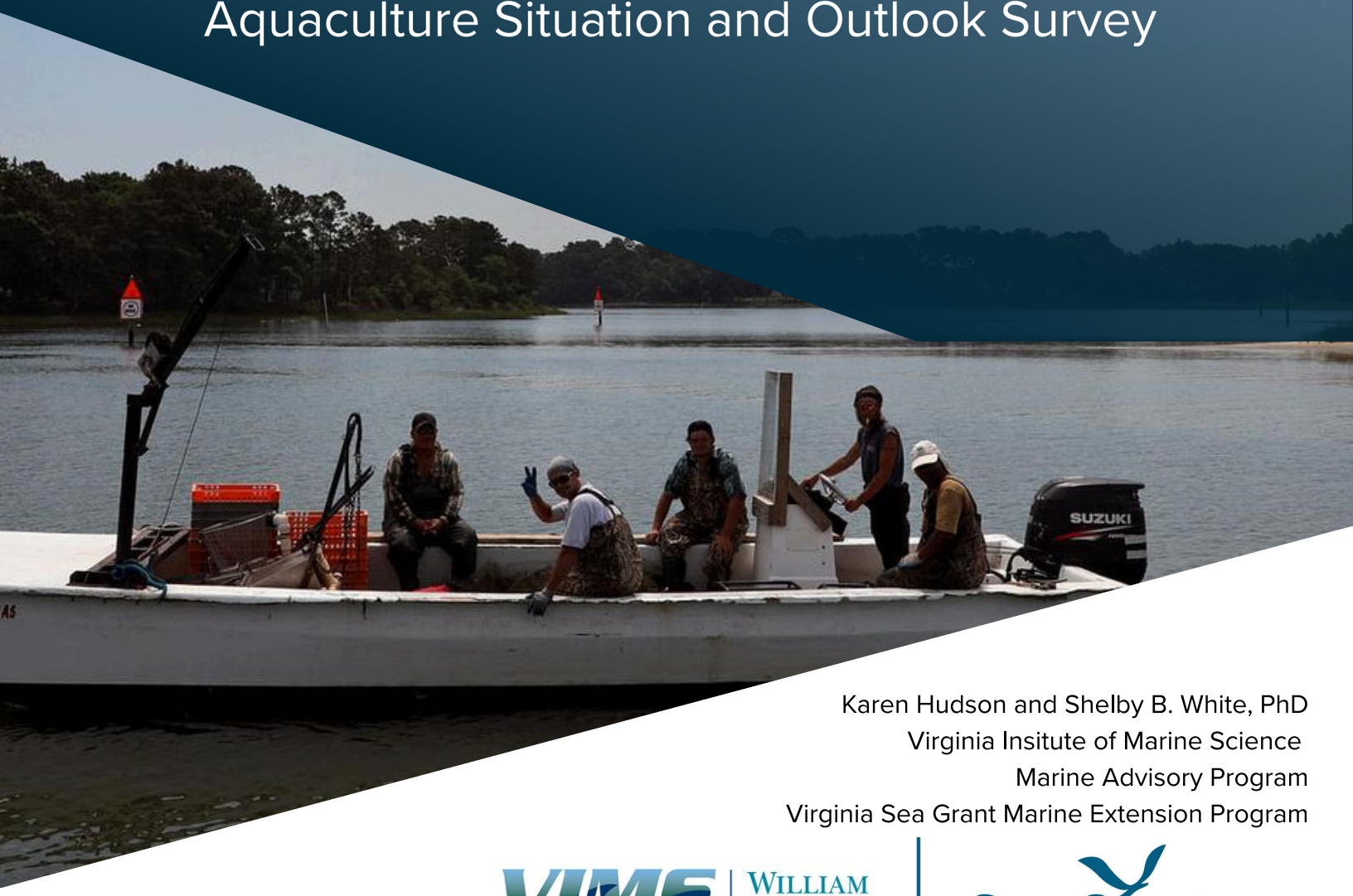
Virginia Shellfish Aquaculture Situation and Outlook Report

Based on the results of the 2024 Virginia Shellfish Aquaculture Situation and Outlook Survey



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VIMS Marine Resource Report No. 2025-5

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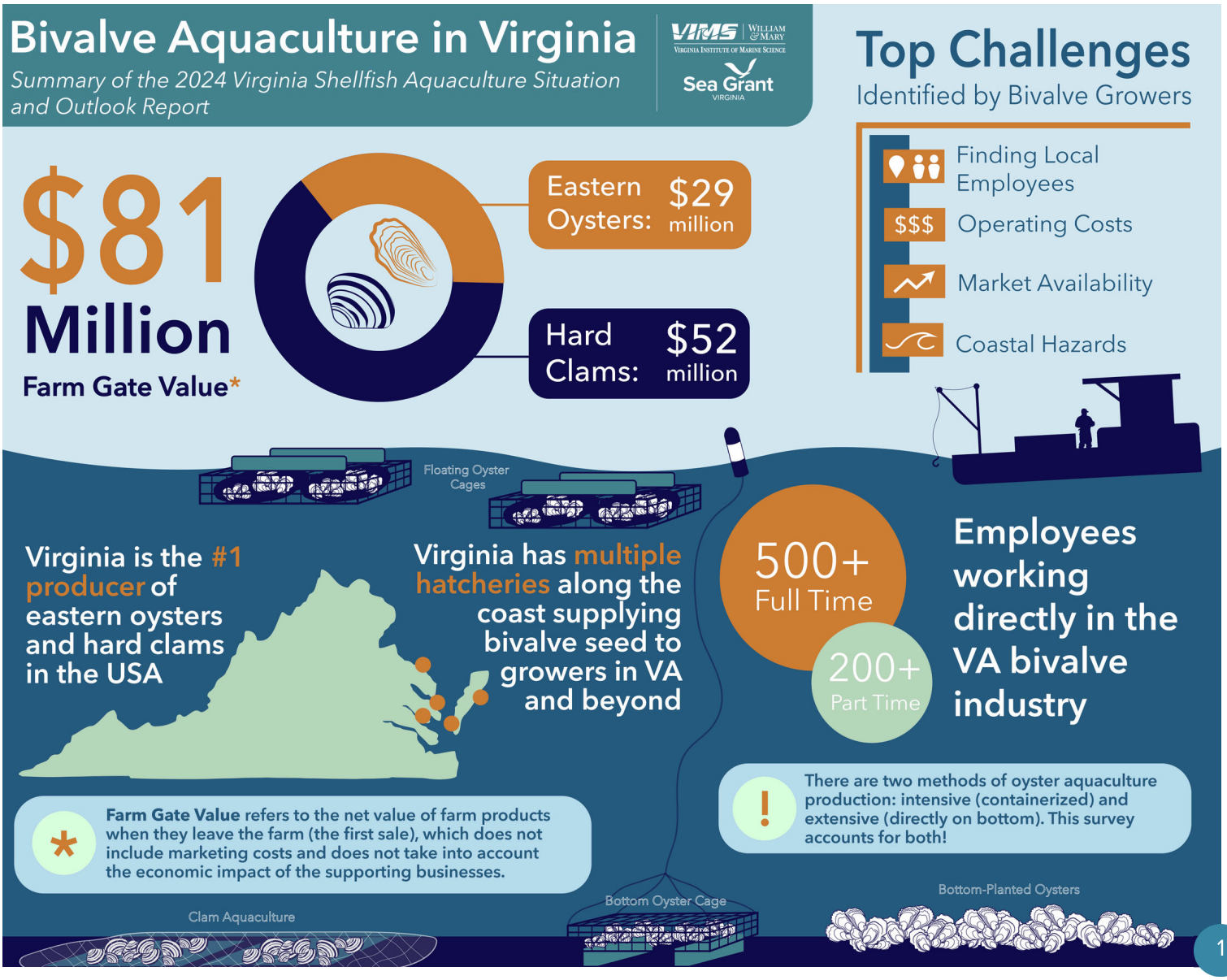
EXECUTIVE SUMMARY

Virginia's shellfish aquaculture industry adds significant value to the state's seafood economy through sales and employment. It is widely noted that Virginia is the primary producer of hard clams (*Mercenaria mercenaria*) and eastern oysters (*Crassostrea virginica*) in the nation. Since 2004, the Virginia Shellfish Aquaculture Situation and Outlook Survey ("Shellfish Survey") has been used to track trends in Virginia's aquaculture industry. Previous reports have highlighted the increased use of intensive aquaculture practices (e.g., using hatchery produced seed) due to increased oyster disease and predation, as well as the growing out of state market for Virginia's oyster hatchery products. Highlights from the 2024 Shellfish Survey include an $81 million farm gate value and more than 700 individuals directly employed in Virginia's shellfish aquaculture industry.



METHODOLOGY

WHAT'S NEW

Since it was last conducted in 2019, the Virginia Shellfish Aquaculture Situation and Outlook Survey has been restructured to integrate the current needs of the aquaculture industry based on feedback from industry advisory groups. The survey now represents all aspects of oyster aquaculture on private ground (containerized, spat-on-shell, and natural, private bottom), as well as hard clam culture (Appendix I).

SURVEY DEVELOPMENT

Surveys were distributed in November 2014 and finalized in February 2025. To ensure confidentiality of respondents, all information is presented in aggregate and represents both the eastern and western shores of Virginia. Three versions of the survey were developed: one for commercial clam aquaculture, one for all commercial oyster aquaculture, and one for combined commercial clam and oyster aquaculture. The final survey contained up to 22 questions, depending on how individuals responded and their level of participation in the industry (e.g., more questions were asked of individuals who participated in both commercial clam and oyster aquaculture). An online version of the survey was also created and restricted so that individuals would only be able to view questions relevant to their participation. The goal of administering different versions of the survey based on participation was to reduce the time it took to complete the survey and eliminate the chance for entering information in the wrong section.

SURVEY DISTRIBUTION

Mailing addresses were requested from the Virginia Marine Resources Commission (VMRC) for individuals who held an active Aquaculture Product Owner Permit in 2023. The survey frame included 430 individuals with a Virginia permit to grow shellfish on privately leased areas with individuals participating in oyster culture comprising the largest group (n=303). The combination of clam and oyster culture was the second largest group (n=73) and individuals participating in clam culture were the smallest (n=54). All individuals were mailed a version of the survey that included an introduction letter and a copy of the survey. Individuals had the option to complete and return the survey via mail using the prepaid return envelope or through a QR code that linked to an online version of the survey. All survey materials were approved by William & Mary's former Protection of Human Subjects Committee (Protocol PHSC-2024-10-25-17304-sbwhite01).

RESULTS

Sixty-one surveys were returned via mail or online (14% response rate, excluding individuals with undeliverable addresses). Of the surveys returned, only 46 were considered complete (11%) and a majority of these were returned via prepaid envelope (76%, or 35 individuals). Returned surveys included responses from all survey categories, including oyster growers (n=32), clam growers (n=5), and oyster and clam growers (n=9). In addition to participating in oyster aquaculture, two respondents noted participation in bay scallop (*Argopecten irradians*) culture. Seven responses were received from shellfish hatcheries. To ensure confidentiality of respondents, all information is presented in aggregate and represents both the eastern and western shores of Virginia.

Eastern Oyster (*Crassostrea virginica*) Aquaculture

Virginia's oyster aquaculture industry is made up of the traditional extensive plantings of "shell on bottom" and the more intensive, containerized aquaculture that utilizes cages, racks, and floats. The Shellfish Survey attempts to capture all oyster aquaculture activity on private ground by including containerized, spat-on-shell, and natural, private bottom aquaculture. The two methods of hatchery-based oyster aquaculture – intensive containerized and extensive spat-on-shell – typically use a higher percentage of genetically improved stocks and triploid, or "spawnless" oysters. Industry has previously noted that the sterile triploid seed is more viable from a commercial standpoint, as the oysters grow faster and do not diminish in quality with seasonal spawning.

Intensive Containerized Oyster Aquaculture

Response

Thirty-seven respondents reported using containerized culture methods and over half of those individuals indicated using bottom gear only (cages or rack and bag; n=22 or 59%). Two respondents indicated the use of floating or suspended gear only (bags, baskets or cages) and 13 respondents (or 35%) indicated a mix of bottom and floating or suspended gear. Virginia has used floating gear mainly for nursery seed, however, in recent years there has been increasing interest in this gear type for market products.

Respondents who reported using floating or suspended gear (inclusive of individuals that used a combination of this gear in addition to bottom gear) were asked what percentage of market oyster production was done using this gear. Over half (53%) of respondents noted between 51% to 100% of market oyster production was done with floating or suspended gear.

Eastern Oyster (*Crassostrea virginica*) Aquaculture

Intensive Containerized Oyster Aquaculture

Input

A reported 82.4 million single seed oysters were planted in 2024, with an outlook of 92.6 million in 2025. Triploids comprised 93% of seed plantings in 2024, which aligns with ranges reported in previous surveys (2014 – 2018). The percentage of seed purchased from out-of-state was relatively low (3%), indicating that Virginia's network of private hatchery facilities are meeting the demand for seed. This is further supported by the fact that availability of seed was not chosen as a primary challenge by any respondents who participate in containerized oyster aquaculture.

Output

Nearly 11% (4 out of 37) of respondents indicated some sort of cooperative relationship to market. Most arrangements, however, were similar to those with contractors where there is no equity exchange such as providing seed. The 2024 results indicate the total number of individual market oysters sold by Virginia growers (minus the reported sales from those indicating involvement with a cooperative), was 43.4 million (Figure 1) with an outlook of 50.5 million in 2025.

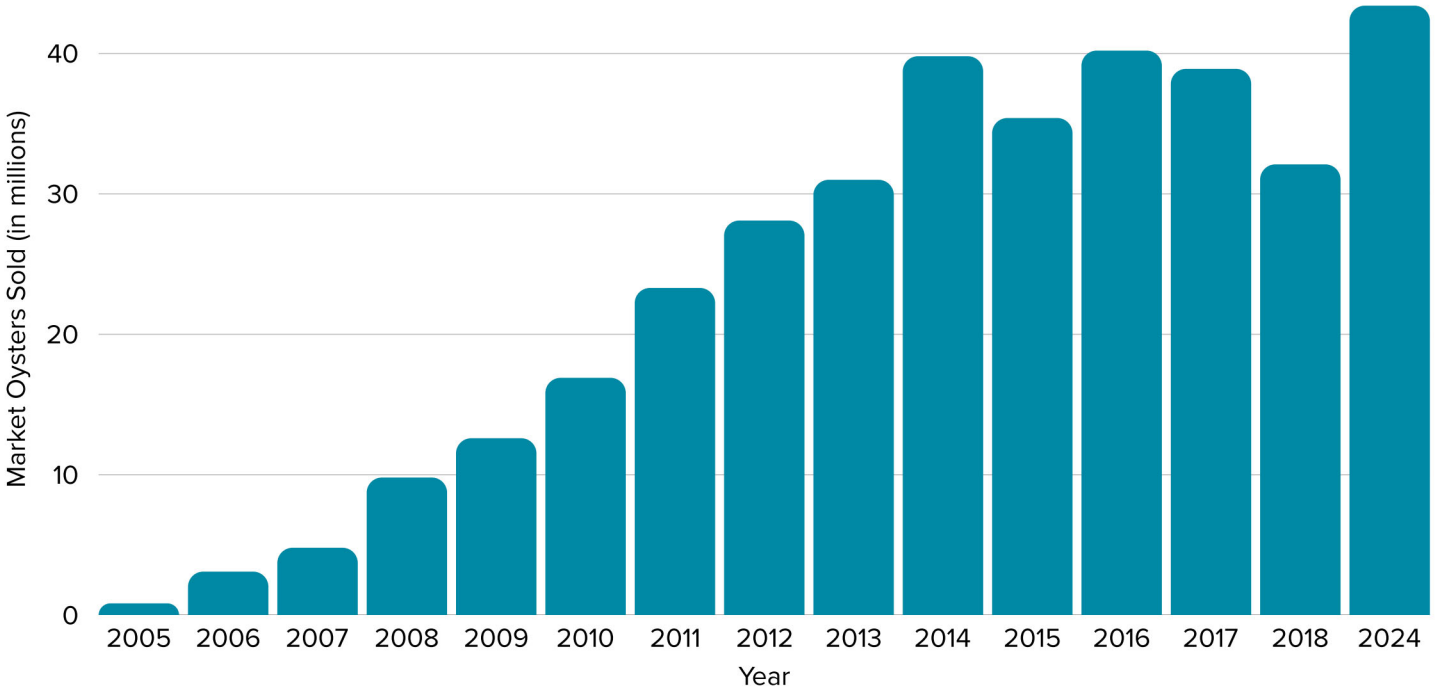


Figure 1. Intensive containerized market oysters sold from 2005-2024. Note that 2019-2023 are excluded due no data collection.

Eastern Oyster (*Crassostrea virginica*) Aquaculture

Intensive Containerized Oyster Aquaculture

For the purposes of this report, oyster prices are not broken down to market segment (e.g., primary wholesale, secondary wholesale, retail, etc.). Respondents noted an average price of $0.54 per oyster in 2024 (Figure 2). Trends in the percentage of single oysters sold into wholesale markets were reported to be 92%, which is consistent with previous reports (2009 – 2018). The percentage of single oysters sold out-of-state in 2024 was 42%. Combining the overall sales of single market oysters with the weighted average price of $0.43 per oyster, it is estimated that the total revenue for containerized oyster culture was $19.1 million in 2024.

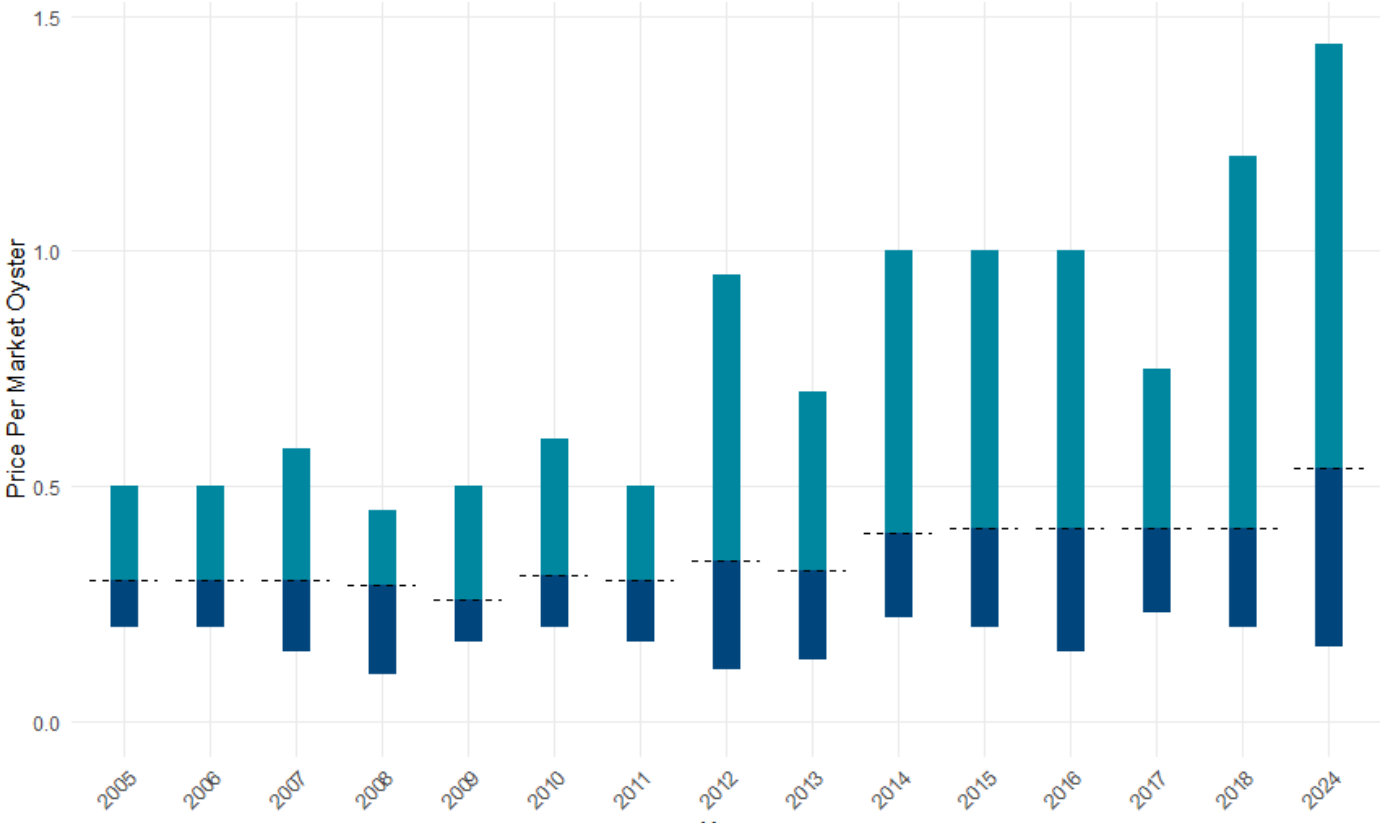


Figure 2. Intensive containerized market oyster price from 2005-2024. Note that 2019-2023 are excluded due to no data collection. The dashed line is the average for the individual year. Values above the dashed line (teal) indicate the maximum price and values below the dashed line (navy) indicate minimum price.

Eastern Oyster (*Crassostrea virginica*) Aquaculture

Extensive Spat-on-Shell Oyster Aquaculture

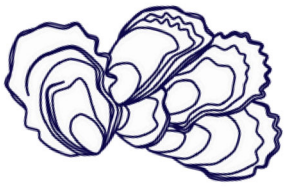
Response and Input

Responses from the survey indicate an average of 26,120 bushels of spat-on-shell were planted in 2024, with an outlook increasing to an average of 36,620 bushels (or a 40% increase) in 2025. The average percentage of triploid larvae used in 2024 was 67% (compared to 33% diploid larvae) with an expected average outlook of 71% in 2025.

Output

The farm gate value of spat-on-shell was estimated using the average natural, private bottom price of $49 per bushel and an estimated average harvest of 23,100 bushels for a total of $1.13 million in farm gate value. The average natural, private bottom bushel price was used due to the lack of price data reported by respondents in this category; however, bushel price should be comparable between the two culture methods. The spat-on-shell industry expansion depends on a consistent production of large quantities of eyed larvae, which can be problematic due to poor water quality.

Natural, Private Bottom Oyster Aquaculture



Response and Output

Ten respondents indicated participation in natural, private bottom culture and reported 177,771 bushels of harvest. The outlook for 2025 is an estimated increase of 24,000 bushels (or 14%). Natural, private bottom market prices vary throughout the season and with availability. The reported average bushel price for 2024 was $49 per bushel with an outlook of $56 per bushel predicted for 2025.

Clam (*Mercenaria mercenaria*) Aquaculture

Response and Input

In 2024, 14 clam growers reported seed plantings of 523 million clams. The industry outlook for 2025 predicts that seed plantings will increase to 630 million clams.

Sales of clam seed were reported to be $16 million from grower-operated nurseries with an average price of $0.025 per clam which has remained relatively stable over the years. Industry sources indicate that almost all of the seed clams produced are planted in Virginia.

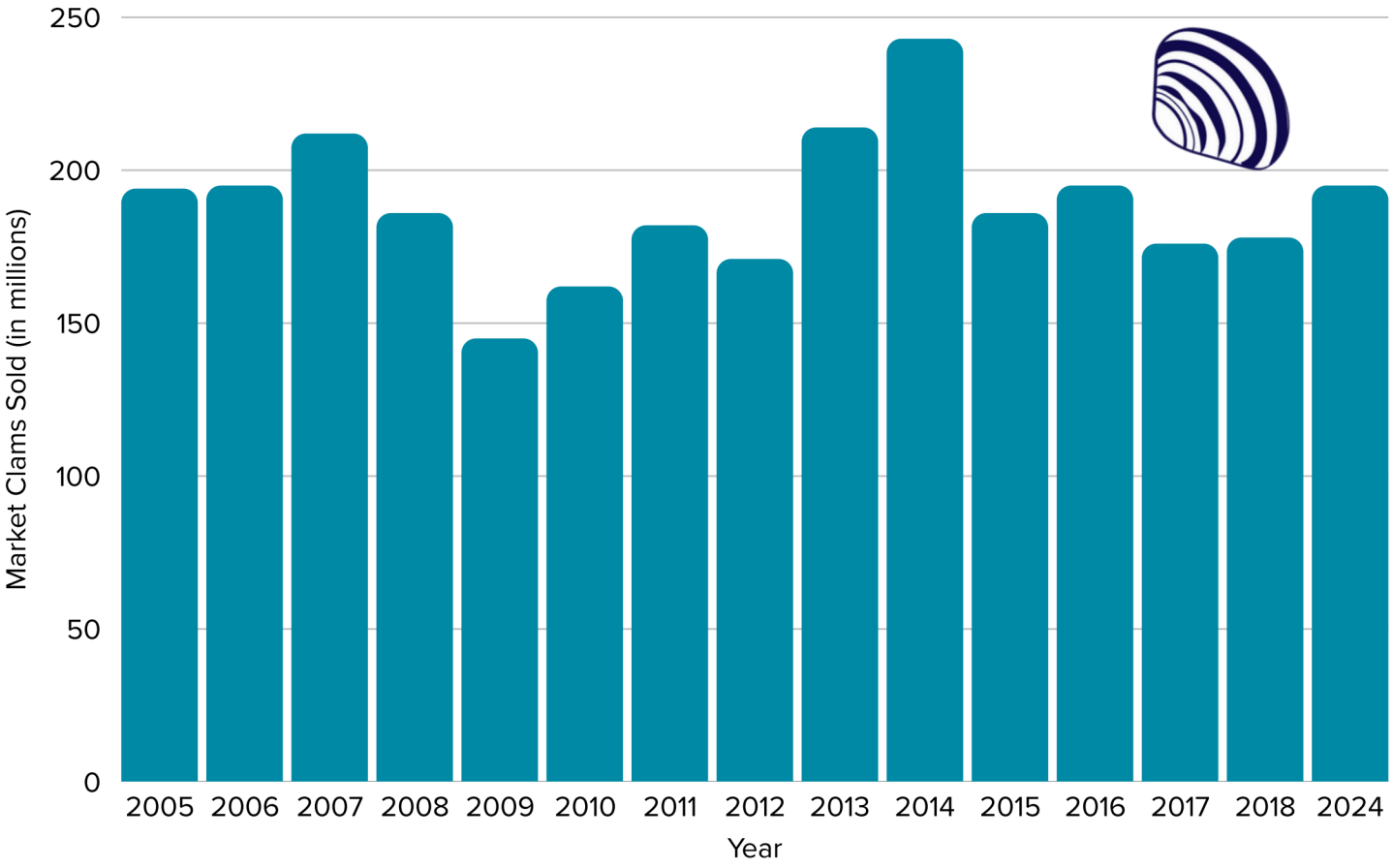


Figure 3. Market clams sold between 2005-2024. Note that 2019-2023 are excluded due to no data collection.

Clam (*Mercenaria mercenaria*) Aquaculture

Output

Approximately 29% (4 out of 14) of respondents indicated a cooperative relationship with a larger clam producer. Results indicate that the total number of market clams sold by Virginia growers (minus the reported sales from those indicating involvement with a cooperative) was 195 million (Figure 3) with a comparable outlook in 2025.

For the purposes of this report, clam prices are not broken down to market segment (e.g., primary wholesale, secondary wholesale, retail, etc.). An average price of $0.24 per clam was reported for 2024 (Figure 4). Trends in the percentage of clams sold into wholesale markets were reported to be 99%, which is consistent with previous reports (2009-2018). In 2024, 92% of clams were sold out-of-state.

Combining overall sales of market clams with a weighted average price of $0.27 per clam, it is estimated that the total revenue for hard clam culture was $52 million in 2024.

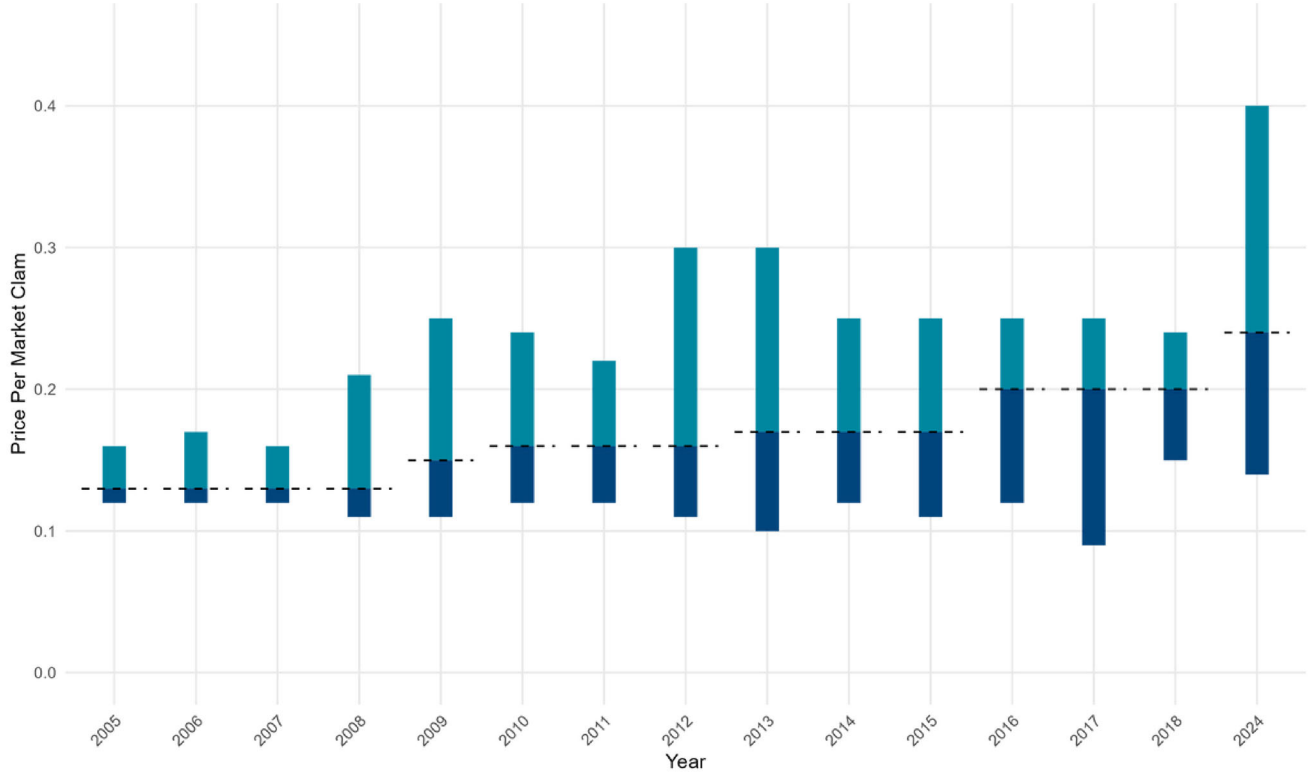


Figure 4. Market clam price from 2005-2024. Note that 2019-2023 are excluded due to no data collection. The dashed line is the average for the individual year. Values above the dashed line (teal) indicate the maximum price and values below the dashed line (navy) indicate minimum price.

Shellfish Hatcheries

SURVEY DEVELOPMENT & DISTRIBUTION

The hatchery survey (Appendix II) was distributed in November 2014 and finalized in February 2025. To ensure confidentiality of respondents, all information is presented in aggregate.

An online version of the hatchery survey was created and distributed by email directly to the hatchery operators in Virginia. It was restricted so that individuals would only be able to view questions relevant to their participation. Sales of hatchery products include the hatchery owner's own usage, as many hatcheries are vertically integrated.

Clam Seed Sales

Industry sources indicate much of the hatchery capacity is dedicated to producing seed for the hatchery owner's own planting and essentially all of the seed produced is planted in Virginia. This vertically integrated system with eventual sales to many out-of-state consumers has an important economic impact to local coastal communities. In 2024, hatcheries reported clam seed sales of 1.3 billion with an outlook of 1.4 billion in 2025.

Oyster Seed and Eyed Larvae Sales

In 2024, seven oyster hatcheries reported sales of 322 million single seed and 4.7 billion eyed larvae. The reported outlook for 2025 is 360 million seed and 11.1 billion eyed larvae.

Triploid seed and eyed larvae production are reported to be 79% and 68%, respectively. Compared to the last report (2018) this is an 18% reduction for triploid seed production and 21% reduction for eyed larvae production.

The average price of eyed larvae was $500 per million in 2024, which is a 38% increase from the last report (2018).

Out-of-state oyster seed and eyed larvae sales were reported to be 47% and 36%, respectively. This is an 13% increase in out of state oyster seed and a 33% increase in out-of-state eyed larvae sales compared to the last report (2018).

Shellfish Hatcheries

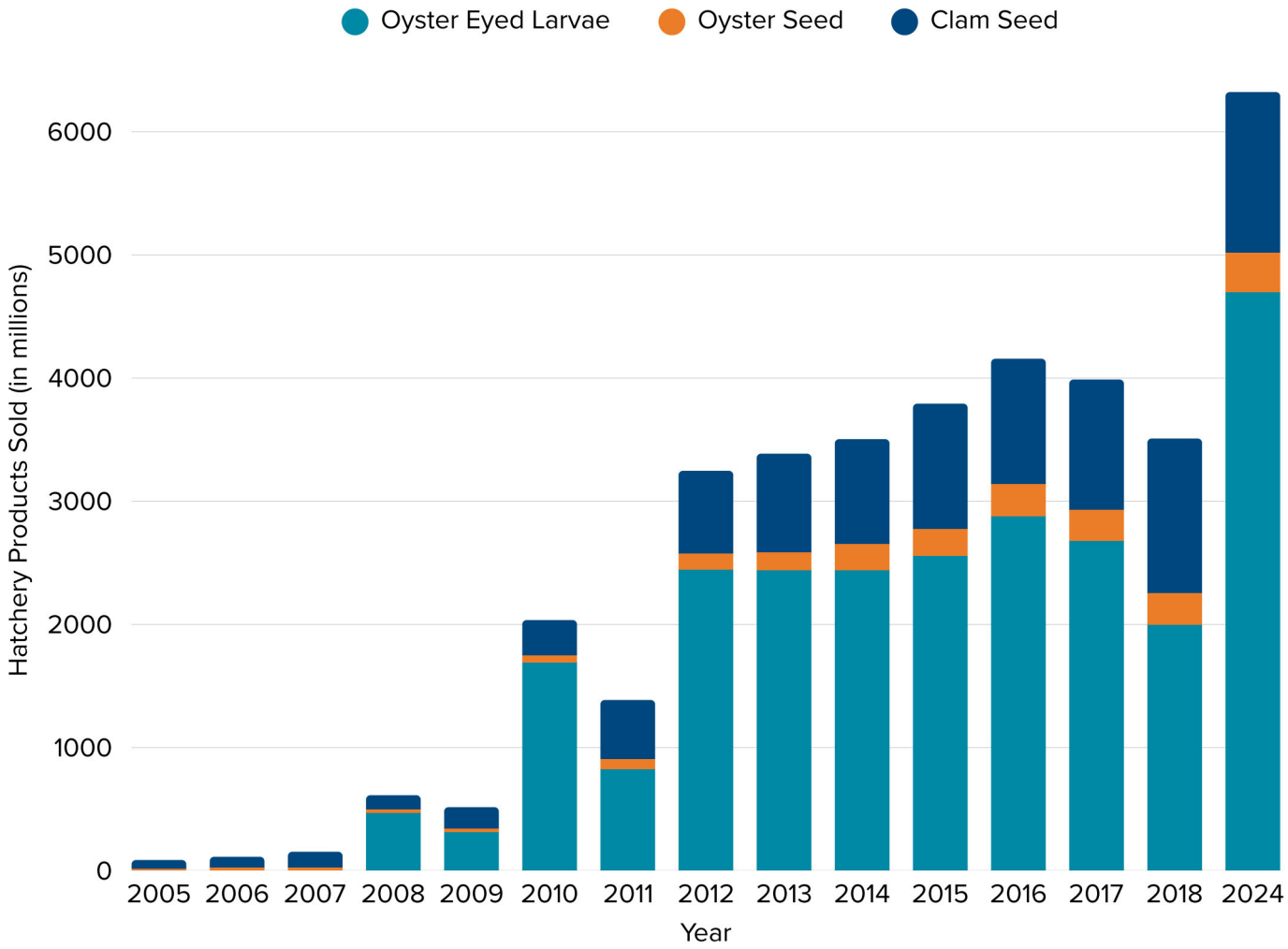


Figure 5. Hatchery products sold (in millions) from 2005-2024. Note that 2019-2023 are excluded due to no data collection.

Shellfish Aquaculture Employment

The employment situation for all shellfish aquaculture is complicated by the diversity of the firms involved and thus, the trends in these employment figures should not be overly interpreted (Figure 6). The difficulty of estimating the time and labor associated with relatively small-scale oyster aquaculture conducted in conjunction with other business lines makes estimates of oyster culture labor problematic. The majority of Virginia's clam production is conducted by relatively large and vertically integrated companies that often contract with self-employed grower cooperative. Similar to oysters, this complicates the estimates.

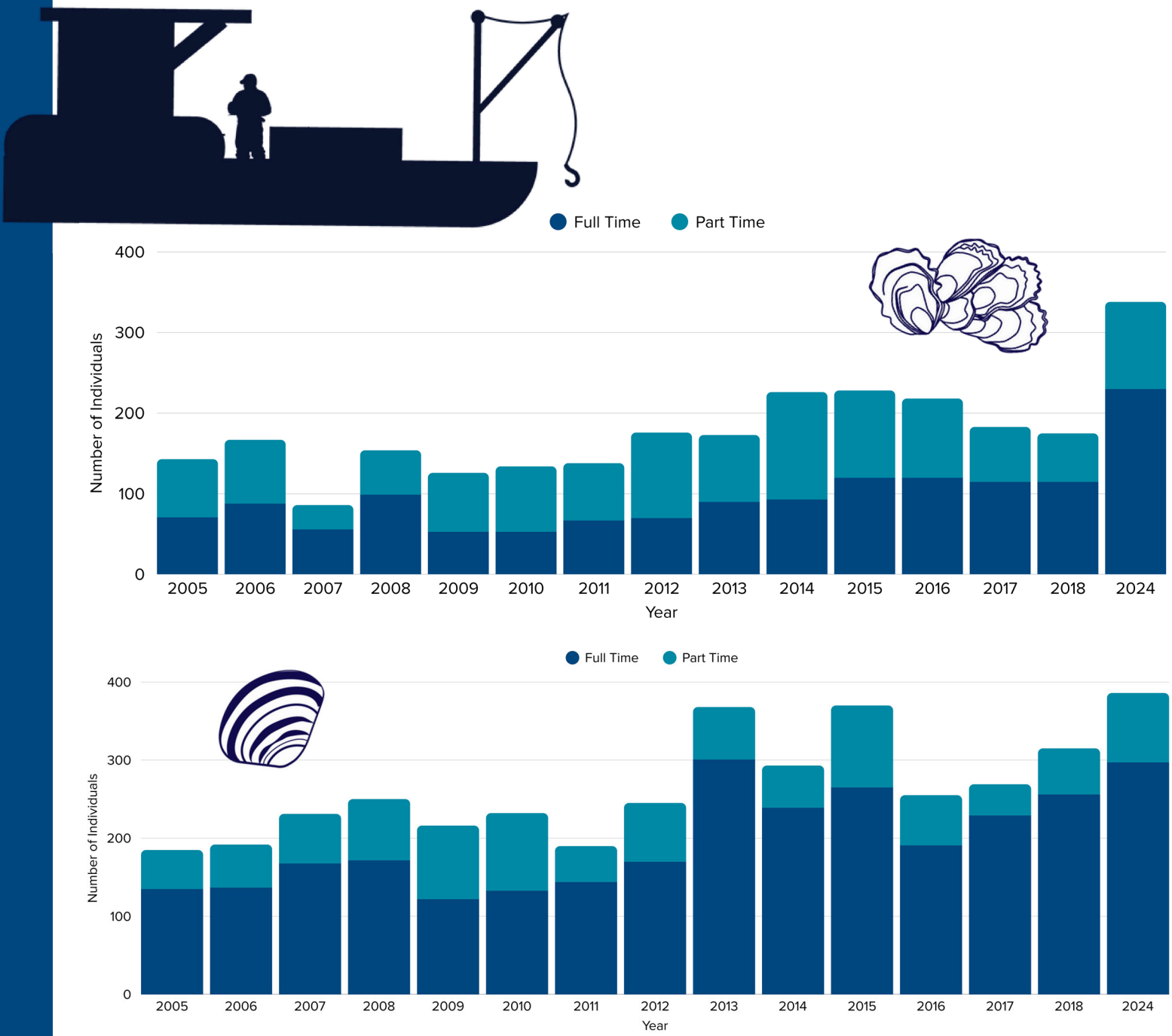


Figure 6. Full- and part-time employment on oyster (top) and clam farms (bottom) from 2005-2024. Note that 2019-2023 are excluded due to no data collection.

Additional Aspects of Shellfish Aquaculture in Virginia

LABOR AND INSURANCE COVERAGE

Individuals were asked if their firm participated in the H2A or H2B visa program in the previous year, as these programs can help with labor needs. Only 7 respondents indicated that they participated in either program, three of which participated in oyster aquaculture and two of which participated in both oyster and clam aquaculture. Individuals were also asked if their firm had crop insurance coverage and if so, which plan. For respondents that participated in clam aquaculture only, the USDA/Risk Management Agency: Cultivated Clam Pilot program was the primary coverage (71% of clam aquaculture respondents). The USDA/Farm Service Agency: Noninsured Crop Disaster Assistance Program was also common with nine respondents noting this coverage (8 responses were from individuals who participated in oyster aquaculture and one response participated both oyster and clam aquaculture). Only 2 respondents noted having the USDA/Farm Service Agency: Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish (ELAP) coverage (one individual participated in oyster aquaculture and the other in both oyster and clam aquaculture). The majority of respondents (n=33) had no crop insurance coverage.

INDUSTRY CHALLENGES

Individuals were asked to report the top three challenges to their aquaculture business. The challenges are aggregated across species and culture practices due to low response rates from specific groups. Nonetheless, the top three challenges indicated by respondents were 1) finding local employees; 2) operating costs; and equally, 3) market availability and coastal hazards. It is interesting that public perception was ranked low, as this is a common topic between industry and extension. Water quality was also not listed as a top challenge, but overlaps with coastal hazards (e.g., natural disasters may disrupt water quality).

FUTURE CONSIDERATIONS

There are several caveats to the Shellfish Survey that need to be considered in future iterations. The first is the overall low response rate from the shellfish aquaculture industry. This may be due to the fact that the survey was recently reinstated after nearly five years and individuals overlooked the value of their contribution. It is also possible that there has been turnover in the industry and individuals may not be as aware of what the Shellfish Survey entails or its value to growers and interested parties. The authors expect the response rate to increase with additional awareness and outreach efforts.

Based on survey responses, it appears that there is potential ambiguity between spat-on-shell and natural, private bottom culture. Spat-on-shell was intended to reference hatchery-based extensive culture; however, it was often reported as natural, private bottom culture. The response rate for both on-bottom categories was low, which the authors believe may improve with clarification of the survey language in future iterations. Similarly, some questions aren't completed as expected and these may need to be reevaluated for simplicity and readability.

In the next iteration of the Shellfish Survey, it would be ideal to have the VMRC contact list updated and checked for accuracy as several surveys were returned (n=7) or individuals received surveys that were not relevant to them (either the survey in general or the survey version did not apply). The authors are considering mailing surveys directly to the firm rather than individuals so that only one survey is completed per firm. Similarly, response rates from larger firms are typically higher and may bias the reported dollar estimates or percentages. The authors would also like to separate the cooperatives so that estimates are not double-counted with the responses of the 'parent' firm.

ACKNOWLEDGEMENTS

The authors would like to acknowledge Thomas J. Murray and Michael J. Oesterling for developing this survey tool which was first launched in 2004. Their leadership and vision endure as we continue to monitor these trends. The authors would also like to acknowledge the Virginia shellfish growers who took the time to respond, as this report wouldn't be possible without them.

In addition to photos from Karen Hudson, the authors would like to acknowledge the photo contributions of Aileen Devlin / Virginia Sea Grant and Mark Luckenbach / VIMS.

PRODUCTION METHODS

Intensive oyster culture uses cultchless (single seed) oysters in protective containers like off-bottom cages, rack-and-bag systems, floating gear, or suspended baskets, depending on site conditions. Though labor- and cost-intensive, this method produces high-quality, uniform oysters that command premium prices in boxed and half-shell markets. Planting to harvest can be as soon as 12 months, depending on the target size for market.

Hatchery-based Intensive Oyster Culture

Spat-on-shell oyster culture, involves setting hatchery eyed larvae onto containerized oyster shells, and then planting directly on the bottom. This method is less labor-intensive than single oyster cultivation, making it ideal for producing large volumes of oysters for Virginia processors. Since it yields clustered oysters, the product is mainly used for the shucked meat market. Producers report a return rate of one to two bushels harvested per bushel planted. Planting to harvest is a two-year process.

Hatchery-based Extensive Oyster Culture

Natural extensive culture includes the transfer of wild struck seed from private leases in high recruitment areas or from public ground via a state-managed program. This traditional method of culture requires a significant private investment in order to restore the bottom with shell substrate for oysters to settle on and move the seed to areas where there is an improved chance of survival.

Natural Extensive Oyster Culture

Hard clam aquaculture in Virginia has dominated over wild harvest for well over a decade. Clams are not as salinity-tolerant as oysters so the vast majority of production comes from the higher salinity areas of Virginia's Eastern Shore. Clams live burrowed into the sediment and the standard production method includes intertidal plots planted with hatchery-produced seed clams and covered with mesh net for predator protection. Planting to harvest is a two year process.

Clam Culture

APPENDIX I

VIRGINIA SHELLFISH GROWER SITUATION & OUTLOOK SURVEY

VIMS | William & Mary
Virginia Institute of Marine Science
Marine Advisory Program

The purpose of this survey is to capture trends in commercial shellfish aquaculture activity on private ground. You are receiving this survey because you hold a VMRC Aquaculture Product Owner License for clam and/or oyster culture (including containerized, spat on shell, or natural bottom activity). Your participation is vital to understanding the economic value of Virginia's aquaculture business and the needs of shellfish growers.

This survey will take approximately 10-20 minutes to complete. Participation in this research is voluntary and you are free to withdraw at any time without penalty. This survey collects personal identifiable information if you choose to identify yourself, however, only researchers will have access to the responses and any information presented outside of this survey will be aggregated and anonymous. Survey findings will be communicated through the Virginia Shellfish Aquaculture Situation & Outlook report.

If you have any questions or concerns regarding participation in this research, please contact Karen Hudson (khudson@vims.edu; 804-684-7742) or Shelby White (sbwhite@vims.edu; 804-684-7345) at the Virginia Institute of Marine Science.

You may report dissatisfaction with any aspect of this study to Dr. Jennifer A. Stevens, Ph.D., the Chair of the Protection of Human Subjects Committee by telephone (757-221-3862) or email (jastev@wm.edu).

By responding, you indicate that you agree to participate in this voluntary survey and consent to the information provided.

The survey can also be completed online by scanning the QR code.
Please complete the survey by February 1, 2025

Thank you for your time and participation!

Karen Hudson Shelby B White

PART I - INTRODUCTORY QUESTIONS

1. Which option best describes the aquaculture activity on your privately leased ground?

   ☐ Oyster culture only

   ☐ Clam culture only

   ☐ Oyster and Clam culture

   ☐ Other _____

2. Does your business participate in the H2A /H2B visa program?

   ☐ Yes ☐ No

3. What crop insurance coverage (s) do you have? **Select all that apply.**

   ☐ USDA/Risk Management Agency: Cultivated Clam Pilot

   ☐ USDA/Farm Service Agency: Noninsured Crop Disaster Assistance Program (NAP)

   ☐ USDA/Farm Service Agency: Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish (ELAP)

   ☐ None

PART II – COMMERCIAL OYSTER AQUACULTURE

This section is only to be completed by individuals who participated in <u>commercial oyster aquaculture</u> on private ground in 2024.

4. Which culture method(s) describes your aquaculture business? **Select all that apply.**

   ☐ Containerized (suspended, floating cages/bags/baskets, bottom cages, rack and bag, etc.)

   ☐ Spat-on shell

   ☐ Natural private bottom (natural seed moved from public to private ground; natural seed recruited on private ground)

5. Approximately how many individuals do you employ full-time for oyster aquaculture?

   _____

6. Approximately how many individuals do you employ part-time for oyster aquaculture?

   _____

Containerized Culture

7. If containerized, which type of containerized gear do you use?

   ☐ Floating or suspended gear (bags, baskets, cages)

   ☐ Bottom gear (bottom cages, rack and bag)

   ☐ Combination of floating/suspended gear and bottom gear

8. If floating/suspended gear, what percentage of your market oyster production is done with floating/suspended gear?

   ☐ 0-10% ☐ 11-25% ☐ 26-50% ☐ 51-75% ☐ 76-100%

9. Do you operate a seed nursery for resale to other growers? *This includes purchasing larvae and setting for single seed and/or growing small seed to a larger size for resale.*

   ☐ Yes ☐ No

10. If **Yes** to the question above, provide your best estimates for resale seed in 2024.

    Number of seed sold _____

    Percent of seed sold out-of-state _____

11. Are you in a cooperative agreement (co-op) with a larger oyster producer?
    ☐ Yes ☐ No

12. Please provide your best estimates for the following aspects of your containerized oyster business in 2024 (left column) and *projected* estimates for 2025 (right column). If an aspect does not apply to you, please leave it blank.

	2024	**2025**
Number of seed oysters planted	_____	_____
% Diploid	_____	_____
% Triploid	_____	_____
% Purchased from out-of-state	_____	_____
Average price of seed purchased (per 1,000)	_____	
Number of market oysters sold (non-seed)	_____	_____
% Wholesale	_____	_____
% Retail	_____	_____

% Sold out-of-state	_____	_____
% Sold to shucked/meat market	_____	_____
Average price per market oyster	_____	_____
Average price - wholesale	_____	_____
Average price - retail	_____	_____

Please provide any additional comments or notes on containerized oyster aquaculture.

Spat-on Shell Culture

13. Please provide your best estimates for the following aspects of your spat-on-shell business in 2024 (left column) and *projected* estimates for 2025 (right column). If an aspect does not apply to you, please leave it blank.

	2024	**2025**
Eyed larvae: % Diploid	_____	_____
Eyed larvae: % Triploid	_____	_____
Eyed larvae: % Purchased from out of state	_____	_____
Number of spat-on-shell bushels planted	_____	_____
Number of spat-on-shell bushels harvested	_____	_____
Average bushel price	_____	_____
% sold to box market	_____	_____

Please provide any additional comments or notes on spat-on shell aquaculture.

Natural Bottom Culture

14. Please provide your best estimates for the following aspects of your natural bottom oyster harvest in 2024 (left column) and *projected* estimates for 2025 (right column). If an aspect does not apply to you, please leave it blank.

	2024	**2025**
Number of bushels harvested	_____	_____
Average bushel price	_____	_____

Please provide any additional comments or notes on natural bottom aquaculture.

PART III - COMMERCIAL CLAM AQUACULTURE

This section is only to be completed by individuals who participated in <u>commercial clam aquaculture</u> in 2024.

15. Are you in a cooperative agreement (co-op) with a larger clam producer?
    ☐ Yes ☐ No

16. Do you own a clam hatchery?
    ☐ Yes ☐ No

17. Do you operate a seed nursery for resale to other growers (i.e., growing small seed to a larger size for resale)?
    ☐ Yes ☐ No

18. If **Yes** to the question above, please provide the following estimates for resale.

    Number of seed sold _____

    Percent of seed sold out-of-state _____

19. Approximately how many individuals do you employ full-time for clam aquaculture?

    _____

20. Approximately how many individuals do you employ part-time for clam aquaculture?

    _____

21. Please provide your best estimates for the following aspects of your clam business in <u>2024</u> (left column) and *projected* estimates for <u>2025</u> (right column). If an aspect does not apply to you, please leave it blank.

	2024	**2025**
Number of seed clams planted	_____	_____
Percent of seed purchased	_____	_____
Average price of seed purchased	_____	_____
Number of market clams sold (non-seed)	_____	_____
% Wholesale		_____
% Retail	_____	_____
% Sold out-of-state	_____	_____

Average price per market clam	_____	_____
Average price – wholesale	_____	_____
Average price – retail	_____	_____

Please provide any additional comments or notes on clam aquaculture.

Part IV - INDUSTRY PERSPECTIVE ON TOPICS OF IMPORTANCE

22. What are the biggest challenges to your aquaculture business? **Select <u>up to three</u> choices.**

- ☐ Regulations
- ☐ Water quality
- ☐ Finding local employees
- ☐ Utilizing H2A visa program
- ☐ Operating costs
- ☐ Market availability
- ☐ Availability of seed
- ☐ Coastal development
- ☐ Public perception
- ☐ Coastal hazards (algal blooms, storms, flooding, etc.)
- ☐ Other _____

Part V – ADDITIONAL COMMENTS

Please provide any additional comments regarding Virginia's shellfish aquaculture. industry.

Part VI – CONTACT INFORMATION

Name:

Company Name: _____

Email: _____

Please provide a valid email address if you wish to receive an electronic copy of the report.

Phone (xxx-xxx-xxxx): _____

We thank you for your time spent taking this survey. Please return your completed survey using the pre-paid envelope.

APPENDIX II

VIRGINIA SHELLFISH HATCHERY SITUATION & OUTLOOK SURVEY

The purpose of this survey is to capture trends in commercial shellfish aquaculture production. You are receiving this survey because you own/operate a clam and/or oyster hatchery. Your participation is vital to understanding the economic value of Virginia's aquaculture business and the needs of shellfish growers.

This survey will take approximately 5 minutes to complete. Participation in this research is voluntary and you are free to withdraw at any time without penalty. This survey collects personal identifiable information if you choose to identify yourself, however, only researchers will have access to the responses and any information presented outside of this survey will be aggregated and anonymous. Survey findings will be communicated through the Virginia Shellfish Aquaculture Situation & Outlook report.

If you have any questions or concerns regarding participation in this research, please contact Karen Hudson (khudson@vims.edu; 804-684-7742) or Shelby White (sbwhite@vims.edu; 804-684-7345) at the Virginia Institute of Marine Science.

You may report dissatisfaction with any aspect of this study to Dr. Jennifer A. Stevens, Ph.D., the Chair of the Protection of Human Subjects Committee by telephone (757-221-3862) or email (jastev@wm.edu).

By responding, you indicate that you agree to participate in this voluntary survey and consent to the information provided. You can complete the survey using the QR code or return the paper survey using the pre-paid envelope. **Please complete and return this survey by February 24, 2025.**

Thank you for your time and participation!

VIMS | WILLIAM & MARY
VIRGINIA INSTITUTE OF MARINE SCIENCE

Hatchery Production Output

Please provide your best CLAM SEED production/sales estimates for your hatchery business in 2024 (left column) and projected estimates for 2025 (right column). If an aspect does not apply to you, please leave it blank. *We are looking for the seed output sold or used by your business.*

	Clam Seed	
	2024	2025
Number of clam seed produced/sold		
Percent sold out-of-state		

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VIRGINIA INSTITUTE OF MARINE SCIENCE

Please provide your best OYSTER EYED LARVAE production/sales estimates for your hatchery business in 2024 (left column) and projected estimates for 2025 (right column). If an aspect does not apply to you, please leave it blank. *We are looking for the eyed larvae output sold (as larvae) or used for spat on shell.*

	Oyster Eyed Larvae	
	2024	2025
Number of eyed larvae produced/sold		
% Diploid		
% Triploid		
% Sold out-of-state		
Average price per million		
Average price per million - diploid		
Average price per million - triploid		

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Please provide your best OYSTER SEED production/sales estimates for your hatchery business in 2024 (left column) and projected estimates for 2025 (right column). If an aspect does not apply to you, please leave it blank. *We are looking for the seed output sold or used by your business.*

	Single Oyster Seed	
	2024	2025
Number of single oyster seed produced/sold		
% Diploid		
% Triploid		
% Sold out-of-state		

Please provide any additional comments regarding Virginia's shellfish hatchery situation.

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Name

Company Name

Approximately how many individuals do you employ full time in the hatchery?

Approximately how many individuals do you employ part time in the hatchery?

We thank you for your time spent taking this survey.
Your response has been recorded.

VIMS | William & Mary
Virginia Institute of Marine Science

Sea Grant
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