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Law on the Half Shell:

Applying a Right-to-Farm Framework to Virginia's Aquaculture Industry



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Fall 2020

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About the Virginia Coastal Policy Center

The Virginia Coastal Policy Center (VCPC) at the College of William & Mary Law School provides science-based legal and policy analysis of ecological issues affecting the state's coastal resources, by offering education and advice to a host of Virginia's decision-makers, from government officials and legal scholars to non-profit and business leaders.

With two nationally prominent science partners – the Virginia Institute of Marine Science and Virginia Sea Grant – VCPC works with scientists, local and state political figures, community leaders, the military, and others to integrate the latest science with legal and policy analysis to solve coastal resource management issues. VCPC activities are inherently interdisciplinary, drawing on scientific, economic, public policy, sociological, and other expertise from within the University and across the country. With access to internationally recognized scientists at VIMS, to Sea Grant's national network of legal and science scholars, and to elected and appointed officials across the nation, VCPC engages in a host of information exchanges and collaborative partnerships.

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VCPC grounds its pedagogical goals in the law school's philosophy of the citizen lawyer. VCPC students' highly diverse interactions beyond the borders of the legal community provide the framework for their efforts in solving the complex coastal resource management issues that currently face Virginia and the nation.

SUMMARY

Beginning in the 1970s and 1980s, states responded to mounting land use conflicts by enacting Right-to-Farm or “RTF” laws. These laws serve to protect farmers and other agricultural producers by shielding their operations from nuisance suits. Virginia’s RTF law has helped to resolve land use conflicts and has helped to protect an agricultural industry that is both culturally and economically vital to the state.

Commercial shellfish activity has also historically proven vital to Virginia’s unique coastal identity and economy. Further, over the last several decades, Virginia’s diverse aquaculture industry has grown, making Virginia one of the leading producers of aquacultural products in the United States. Despite its mighty contributions, aquaculture has yet to be included under Virginia’s RTF law and producers have not enjoyed its protections while facing scrutiny from private landowners and local authorities. As Virginia’s coastal regions continue to experience a population increase and waves of development, the likelihood of land use conflicts related to aquaculture activities is only increasing.

Other states -- such as neighboring Maryland and fellow aquaculture leader Washington State -- have moved to either include aquaculture under their RTF law or offer the industry similar levels of statutory protection via other provisions. These approaches suggest that extending RTF-type protections to the aquaculture industry in Virginia would not only benefit the industry - it is also possible. A combination of the following five solutions may offer a path towards resolution of land use conflicts. Some of these solutions may be combined, while others may be necessarily mutually exclusive. Each also presents unique challenges and considerations. As Virginia’s aquaculture industry, state regulators, and other stakeholders search for a solution to land use conflict, strategies that are inspired by these ideas may offer the best chance at coexistence and collaboration:

- **Including aquaculture under Virginia’s RTF law**
- **Developing aquaculture-specific “Best Management Practices”**
- **Revamping aquaculture zoning, leasing, and permitting processes**
- **Increasing public education, outreach, and communication**
- **Developing an independent “Right-to-Aquaculture” law**

INTRODUCTION

With thousands of miles of shoreline, Virginia is inseparable from the water.¹ Virginia's coastal areas have long been home to an array of commercial fishing and harvesting activities, a tradition which predates the colonial area.² In recent years, a rapidly expanding aquaculture industry has established a foothold in Virginia due to the state's abundant coastal resources. In 2018 alone, aquaculture in Virginia generated over \$112 million in revenue, the fourth highest figure nationwide that year (Fig 1).³ Currently, there are nearly 200 individual aquaculture operations within the state and state officials expect that number to grow.⁴ Several factors, including prominent advancement in aquaculture research and development from the Virginia Institute of Marine Science, have contributed to Virginia's dominance in the aquaculture industry.

Despite its strong contribution to the state's economy (Fig 3), aquaculture in Virginia faces a series of unique challenges. In addition to fostering a growing aquaculture industry, some parts of coastal Virginia are experiencing a dramatic population boom as part of a broader national trend.⁵ Coastal development and urbanization along Virginia's coastal corridors present questions about the "best" use of sensitive coastal environments, creating a fertile ground for land use conflicts. Simultaneously, environmental concerns and the pressures of increasing sea level rise have placed aquaculture producers at the center of a hotly contested debate about how to best manage coastal and wetland areas.

While Right-to-Farm (RTF) laws offer agricultural producers a shield against nuisance suits brought against their operations, Virginia has yet to adopt a regulatory framework that equally protects the livelihood of aquaculture producers.⁶ Subsequently, courts in Virginia have refused to incorporate RTF protections for aquaculture activities, leaving producers frustrated and an industry searching for more legal support.⁷ Industry advocates report a widespread feeling among aquaculture producers that the industry is plagued by both public and political misperception.⁸

¹ Marcia Berman, *How Long Is Virginia's Shoreline?*, VIRGINIA INS. MARINE SCI. (April 2, 2010), https://www.vims.edu/bayinfo/faqs/shoreline_miles.php.

² See James Kirkley, *Virginia's Commercial Fishing Industry: Its Economic Performance and Contributions*, VIRGINIA INS. MARINE SCI. (1997). See also Natalie Jacewicz, *Oyster Archaeology: Ancient Trash Holds Clues to Sustainable Harvesting*, NPR (Jul. 28, 2016, 7:00 AM), <https://www.npr.org/sections/thesalt/2016/07/28/487618421/oyster-archaeology-ancient-trash-holds-clues-to-sustainable-harvesting>.

³ Press Release, VIRGINIA DEP'T OF AGRIC. & CONSUMER SERVICES, Virginia Ranks 4th In the U.S. for Aquaculture Sales (Dec. 20, 2019), <https://www.vdacs.virginia.gov/press-releases-191223-us-aquaculture-service.shtml#:~:text=Data%20highlights%20for%20Virginia%20include,increase%20of%2035%25%20from%202013>.

⁴ *Id.*

⁵ NOAA, *Fast Facts: Virginia* (2015), <https://coast.noaa.gov/states/virginia.html>.

⁶ VA. CODE ANN. § 3.2-300 (West 2008) (et seq).

⁷ See e.g., *County of York v. Bavuso*, 2016 WL 6304568 (finding that oyster farming was not covered under Virginia's RTF law and that County could impose requirements on such operations); *Carter v. Garrett*, 2014 WL 11398526 (finding that despite compliance with Commonwealth zoning related to water activity, aquaculture producer was in violation of County zoning ordinance due to his land activity). See also *infra* Part V (discussing additional challenges facing Virginia's aquaculture industry).

⁸ Telephone Interview with Mike Oesterling, Executive Director, Virginia Shellfish Grower's Association (Oct. 1, 2020) [HEREINAFTER Oesterling Interview].

Meanwhile, despite the industry's overall strength, numbers of new aquaculture businesses in Virginia have steadily declined since 2015.⁹

Adapting the state's existing RTF regime to include aquaculture has the potential to help Virginia navigate an array of economic and legal challenges. This white paper examines the intersection of RTF law and aquaculture and discusses the role that RTF law may play in encouraging Virginia's expanding aquaculture industry. Part I offers an overview of RTF laws and their operation in Virginia. Part II discusses aquaculture generally and Virginia's expanding aquaculture industry. Part III documents problems faced by aquaculture producers in Virginia under Virginia's existing RTF law. Part IV details related challenges facing the industry. Part V concludes by detailing potential mechanisms that may protect Virginia aquaculture producers.

I. RIGHT-TO-FARM LAWS: A SHIELD FOR PRODUCERS

A. Right-to-Farm Laws

During the 1970s and 1980s, states struggled with mounting conflict between suburban land development and rural agricultural land uses.¹⁰ In response, states enacted various laws aimed at resolving "land use conflicts in advance" by limiting the availability of nuisance suits against pre-existing agricultural operations.¹¹ Rooted in the common law principle of "coming to the nuisance," these laws stood for the proposition that "existing farm operations should not become nuisances due to the later development of non-agricultural uses in the surrounding area."¹² Thus, because these laws broadly aimed to protect the property rights of farmers and allow the continuation of agricultural practices, they have become known as Right-to-Farm or "RTF" laws.

All fifty states have enacted their own RTF laws and most share four common features.¹³ First, these laws usually contain "a pro-agriculture sentiment."¹⁴ Second, these laws feature some combination of limitations on litigation, prohibitions on litigation, or mandated negotiation in lieu of litigation when nuisance claims arise.¹⁵ Third, RTF laws typically require an assessment of the challenged agricultural practice when a nuisance claim is brought.¹⁶ In many states, this assessment means that the protection of a RTF law hinges on whether the agricultural producer can show that they are following "generally accepted agricultural practices."¹⁷ This element is particularly controversial, as it requires courts and regulators to assess farming operations and may also cause

⁹ *Id.*

¹⁰ Susanne A. Heckler, *A Right to Farm in The City: Providing a Legal Framework Legitimizing Urban Farming in American Cities*, 47 VAL. U. L. REV. 217, 229-31 (2012).

¹¹ *Id.*

¹² Neil D. Hamilton, *Right-to-Farm Laws Reconsidered: Ten Reasons Why Legislative Efforts to Resolve Agricultural Nuisances May Be Ineffective*, 3 DRAKE J. AGRIC. L. 103, 104 (1998); see also Heckler, *supra* note 10 at 230.

¹³ Alexander Lizano & Rusty Rumley, *State Right-to-Farm Provisions*, NAT'L AGRIC. LAW CTR., 1 (2019); Judith Lisanky & George Clark, *Farmer-Non Farmer Conflicts in The Urban Fringe: Will Right-to-Farm Help?*, in SUSTAINING AGRIC. NEAR CITIES 219, 220 (William Lockeretz ed., 1987).

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ Hamilton, *supra* note 12 at 109.

farmers to fear suits for not “farming by the book.”¹⁸ Finally, many RTF laws tie protections to “the farmer’s participation in a farm-land preservation program.”¹⁹

Other aspects of RTF laws vary.²⁰ Most notably, the “triggering event” -- or the prerequisite for RTF law protections -- differs dramatically, with states generally following one or more of three basic approaches.²¹ Twenty-five states offer a “statute of repose” in their respective RTF laws.²² Under this model, an eligible agricultural producer is free from potential nuisance suits -- regardless of the operation’s location -- if that producer has been engaged in agricultural activities for a statutorily prescribed period.²³ In contrast, other RTF laws feature a “first in time provision,” providing that a farming operation will not be deemed a nuisance if it was “established before one or more uses of surrounding land.”²⁴ Finally, some states require that agricultural producers occupy areas zoned for agriculture in order to enjoy the statutory protection of the RTF law.²⁵

Generally, RTF laws also require at least three forms of compliance by farmers: (1) adhering to state and federal laws; (2) following good agricultural practices; or (3) ensuring public health and safety.²⁶ Some RTF laws may also cease to offer protection after farming practices have been expanded or changed significantly.²⁷ Finally, at least twenty-one states have imbued their respective RTF law with the power to preempt other government action or ordinances “that may conflict” with the RTF law itself.²⁸

RTF laws have faced criticism.²⁹ Critics suggest that these laws have not proven sufficiently protective of the “average farmer” and, worse yet, may be under-inclusive of current agricultural innovations.³⁰ Despite these concerns, RTF laws remain a critical tool for agricultural producers and advocates. RTF laws offer farmers a basic legal ground to defend against nuisance suits and place members of the broader public “on-notice” that nuisance suits may be foreclosed when individuals move into areas of high agricultural activity.³¹ More pragmatically, and as even critics of RTF laws concede, there is no evidence that the laws will ever “fall into disuse.”³² For both agricultural producers and surrounding property owners, RTF laws remain an inescapable component of land use conflicts.

¹⁸ *Id.*

¹⁹ Lisanky & Clark, *supra* note 13 at 220.

²⁰ Lizano & Rumley, *supra* note 13 at 1.

²¹ *Id.*

²² *Id.*

²³ *Id.*

²⁴ *Id.* at 2.

²⁵ *Id.*

²⁶ Lizano & Rumley, *supra* note 13 at 3.

²⁷ *Id.* at 2-3.

²⁸ *Id.*

²⁹ Hamilton, *supra* note 11 at 105 (arguing that current RTF laws may no longer be “an effective form of protection for farmers nor an appropriate use of legislative power.”).

³⁰ *Id.* at 106.

³¹ Hamilton, *supra* note 11 at 105.

³² *Id.* at 118.

B. Preserving the Right-to-Farm in Virginia: Virginia's RTF Law

Codified in 1981, Virginia's RTF law fits within the chronology of a nationwide response to land use conflict in the latter half of the 20th century.³³ Virginia's RTF law was originally conceived as one of "several pieces" of legislation "aimed at preserving agricultural land within the state."³⁴ It protects "agricultural operations" -- which are defined as:

"any operation devoted to the bona fide production of crops, or animals, or fowl including the production of fruits and vegetables of all kinds; meat, dairy, and poultry products; nuts, tobacco, nursery, and floral products; and the production and harvest of products from silviculture activity."³⁵

Like other RTF laws, Virginia's law contains a "trigger" or requirement that eligible agricultural producers must meet in order to be protected under the law.³⁶ In Virginia, this trigger is effectively first-in-time, as the statute provides that "no action shall be brought by any person against any agricultural operation" if that person knew or should have "reasonably" known that the agricultural operation was there before the person's "use or occupancy" of their property began.³⁷

Mirroring other states in assigning obligations in exchange for protections, agricultural producers in Virginia must be "in substantial compliance with any applicable best management practices" (BMPs) and with "any applicable laws and regulations of the Commonwealth relevant to the alleged nuisance" in order to enjoy the law's protection from nuisance suits.³⁸ Virginia's RTF law further defines "substantial compliance" as a "level of compliance with applicable best management practices, laws, or regulations."³⁹ Critically, however, agricultural operations are "presumed to be in substantial compliance" absent a contrary showing.⁴⁰

Virginia's RTF law also preempts state and municipal governments from restricting farming operations.⁴¹ Under the restrictive ordinance section of the statute, the law forbids localities from requiring agricultural producers to obtain a special exception or special use permit" when those producers are located in areas zoned for agricultural uses.⁴² Further, localities can only enact zoning ordinances that would "restrict or regulate" agricultural practices when "such restrictions. . . [effect] health, safety, [or] general welfare."⁴³

Since its enactment, Virginia's RTF law has largely remained unchanged. However, a recent controversy suggests that altering the scope of protections afforded to agricultural producers

³³ See *infra* Part II A; see also VA. CODE ANN. § 3.2-300 (West 2008).

³⁴ Jacqueline Waymack, *Agricultural Preservation Techniques in Virginia*, 18 Colonial Law 11, 12 (1989).

³⁵ See VA. CODE ANN. § 3.2-300 (West 2008).

³⁶ See *infra* Part II A.

³⁷ VA. CODE ANN. § 3.2-302(A) (West 2018).

³⁸ *Id.*

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ See VA. CODE ANN. § 3.2-301 (West 2014).

⁴² *Id.*

⁴³ *Id.*

is possible. In 2012, Martha Boneta was cited by Fauquier County officials who argued that increased traffic and crowds related to various commercial events on her farm property constituted a nuisance and that these events did not fall under the meaning of “agricultural production” as defined in Virginia’s RTF law.⁴⁴ Boneta countered that her agrotourism activity did fall under RTF protections because it ultimately related to agriculture.⁴⁵ In response to public outcry deriding what was characterized as an attack on farming, the Virginia state legislature passed what is known as the “Boneta Bill” in 2014.⁴⁶ The resulting law forbids localities from imposing regulations on commercial activities that occur at an agricultural operation, as defined by Virginia’s RTF law, “unless there is a substantial impact on the health, safety, or general welfare of the public.”⁴⁷

The “Boneta Bill” and its surrounding controversy highlight two considerations for the aquaculture industry. First, efforts towards expanding the scope of RTF protections may require public and political consensus regarding the inherent worth of aquaculture generally.⁴⁸ Secondly, the law’s caveat that commercial activities must take place at an agricultural operation to receive protection suggests zoning or land use restrictions may be important for aquaculture producers to consider. Under this framework, the location of a given aquaculture activity may prove even more important than the nature of the activity itself.

1. Right-to-Farm in Virginia Courts

In the forty years since Virginia’s RTF law was enacted, it has produced little litigation or formal dispute resolution. One case, *Wyatt v. Sussex Surry LLC*, highlights how Virginia’s RTF law and its BMP provision requires a threshold factual determination which courts may be ill-equipped to make. The importance of consensus regarding an industry’s BMPs is important to note if the aquaculture industry is to be brought under the protections of Virginia’s RTF law.

Wyatt involved a dispute between a tree farm and adjacent property owners, who objected to the farm’s use of sprayed biosolid fertilizer.⁴⁹ Remanding the case to state court, a federal district court rejected the company’s reliance on Virginia’s RTF law, primarily due to the court’s doubt that it would be able to determine “best management practices for such operations.”⁵⁰ On remand, the Virginia state court found that a BMP determination is a fact-specific analysis and thus presents a question for a jury.⁵¹ Ultimately, the court denied *Sussex Surry*’s motion to dismiss the plaintiff’s

⁴⁴ See “Boneta Bill” Easily Passes Va. House, Heads to Senate, FAUQUIER NOW (Feb. 6, 2013), https://www.fauquiernow.com/fauquier_news/article/boneta-bill-easily-passes-va.-house-heads-to-senate (detailing controversy and political response).

⁴⁵ *Id.*

⁴⁶ See *Landmark Agriculture Bill Now Law in Virginia*, ROANOKE STAR (Jul. 2, 2014), <https://theroanokestar.com/2014/07/02/landmark-agriculture-bill-now-law-in-virginia/>.

⁴⁷ See VA. CODE ANN. 15.2-2288.6(A) (West 2014)

⁴⁸ Ironically, Martha Boneta’s farm is marketed primarily as an agritourism attraction. Its website promotes property tours, an emu zoo, and tomato tasting bar. See <http://www.parisbarns.com/>. This further suggests the importance of public perception and political rhetoric to the legislative process.

⁴⁹ *Wyatt v. Sussex Surry, LLC*, 428 F.Supp.2d 740, 742 (E.D. VA 2007).

⁵⁰ *Id.* at 743-44.

⁵¹ *Wyatt v. Sussex Surry, LLC* 2007 WL 5969399 *2

nuisance claims, allowing the case to proceed to trial.⁵² However, as of 2020, no record exists of the case's ultimate dispensation.

Wyatt suggests that despite RTF's protection against nuisance suits, Virginia courts' discomfort with making BMP determinations may limit the ability of producers to rely on the RTF law. As aquaculture producers seek inclusion under either Virginia's RTF law or an analogous new law, arriving at consensus regarding BMPs for aquaculture will likely become a critical consideration.⁵³ This may also help aquaculture producers "future-proof" statutory protections, as clear BMP standards would help to avoid the judicial discomfort seen in *Wyatt*.⁵⁴

II. AQUACULTURE IN VIRGINIA AND BEYOND

A. Defining Aquaculture

Aquaculture is defined by the United States Department of Agriculture (USDA)⁵⁵ as:

"the farming of aquatic organisms, including baitfish, crustaceans, food fish, mollusks, ornamental fish, sport or game fish, and other aquaculture products. Farming involves some form of intervention in the rearing process, such as seeding, stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated, in a controlled environment at least part of the time. Fish, shellfish, and other aquatic products which are caught or harvested by the public from non-controlled waters or beds are considered wild caught and are NOT included as aquaculture farms."⁵⁶

It is important to note that with the exception of algae and sea vegetables, the USDA does not include facilities that rear and own aquatic plants as aquaculture farms, although other sources commonly include the growth of ornamental aquatic plants (i.e., water gardening) as a form of aquaculture.⁵⁷ Virginia defines aquaculture more broadly:

"the propagation, rearing, enhancement, and harvest of aquatic organisms in controlled or selected environments, conducted in marine, estuarine, brackish, or freshwater."⁵⁸

⁵² *Id.* at *3.

⁵³ See *infra* Part VI-B (discussing BMPs).

⁵⁴ See *Wyatt v. Sussex Surry, LLC* 2007 WL 5969399 *3; see also *infra* Part VI-B (discussing BMPs).

⁵⁵ It is worth noting aquaculture is coordinated nationally by the United States Department of Agriculture, not by the National Oceanic and Atmospheric Administration National Marine Fisheries Service.

⁵⁶ 2018 Census of Aquaculture, USDA, (Dec. 2019),

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Aquaculture/Aqua.pdf.

⁵⁷ See *Growing Ornamental Aquatic Plants as a Business in the Northeastern United States*, NORTHEASTERN REGIONAL AQUACULTURE CTR. (May 2008),

<http://agrillife.org/fisheries2/files/2013/09/NRAC-Publication-No.-301-2008-%E2%80%93-Growing-Ornamental-Aquatic-Plants-as-a-Business-in-the-Northeastern-United-States.pdf>.

⁵⁸ VA. CODE ANN. 3.2-600 (*et. seq*) (West 2014).

1. Aquaculture Globally

Aquaculture is the fastest growing animal food sector in the world, with an annual growth rate of approximately 6%.⁵⁹ In 2013, aquaculture surpassed wild capture fisheries as the main source of fisheries production globally.⁶⁰ In addition to serving as an affordable wellspring of protein, the aquaculture sector employs roughly twenty million people internationally.⁶¹ The depletion of wild fish populations, coupled with rising demands, have partially contributed to this rapid growth.⁶² Technological innovations during the last decade are also facilitating aquaculture's expansion. For example, there have been notable improvements to the genetic modification of commercially important aquatic organisms that enhance growth rates, prevent diseases, and improve taste.⁶³

The vast majority of aquaculture occurs in Asia, the “cradle of fish farming”.⁶⁴ Asia accounts for roughly 90% of global aquaculture production, with China producing approximately 61%.⁶⁵ Historically, Asian countries have much more cultural experience with fish farming compared to other regions; there is evidence of aquaculture dating back to the 11th century B.C.E. in China.⁶⁶ However, the success of aquaculture in China can largely be attributed to early investment and support from the government.⁶⁷ Small household farms have been pervasive in China for several thousand years, but the government began investing heavily in the 1970s to develop more centralized industries.⁶⁸ The Chinese have also successfully diversified their aquatic farming to supply several markets, growing over 150 different species of fishes, mollusks, plants, crustaceans, and other invertebrates.⁶⁹

2. Aquaculture in the United States

While aquaculture is rapidly growing in China, India, and other regions of the world, production has remained relatively stagnant in the United States. In 2016, the projected annual growth of aquaculture was a mere 0.3%.⁷⁰ Aquaculture in the United States was initially focused on growing fishes in hatcheries to stock freshwaters for fishing.⁷¹ Efforts to rear aquatic organisms

⁵⁹ See *Aquaculture is Fastest Growing Food Production Sector, According to FAO Report*, U.S SOYBEAN EXPORT COUNCIL (Jul. 16, 2019), <https://ussec.org/aquaculture-fastest-growing-food-production-sector-fao-report/>.

⁶⁰ See *Aquaculture production (metric tons)*, FOOD & AGRIC. ORG. (2020), <https://data.worldbank.org/indicator/ER.FSH.AQUA.MT>.

⁶¹ See *Can Sustainable Aquaculture Feed The World?*, REUTERS EVENTS (Aug. 26, 2020), <https://www.reutersevents.com/sustainability/can-sustainable-aquaculture-feed-world>.

⁶² See *Aquaculture May Replace Wild Fish Stocks*, SCIENTIFIC AMERICAN (Mar. 2, 2009), <https://www.scientificamerican.com/article/aquaculture-replace-fish-stocks/>.

⁶³ Subasinghe, R. P., Curry, D., McGladdery, S. E., & Bartley, D. (2003). Recent technological innovations in aquaculture. *FAO Fisheries Circular*, 886, 85.

⁶⁴ See *Aquaculture – Protein Provider For The World*, WORLD OCEAN REV. (2013), <https://worldoceanreview.com/en/wor-2/aquaculture/protein-provider-for-the-world/>.

⁶⁵ *Id.*

⁶⁶ Samantha Farquhar & Sebastian Sims et. al., *A Brief Answer: Why is China's Aquaculture Industry So Successful?*, 6 ENVTL. MGMT. & SUSTAINABLE DEV. 234 (2017).

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ Farquhar & Sims, et. al., *supra* note 66 at 234.

⁷¹ *Id.*

exclusively for human consumption did not begin until the 1960s with catfish farming.⁷² Large-scale aquaculture efforts of salmon and mollusks (e.g., oysters or clams) were not prevalent until the late 1970s.⁷³ In contrast, there were over three million terrestrial farms in the United States in 1970⁷⁴ and the agriculture industry accounted for roughly 4% of the employed labor force.⁷⁵ Herein lies the primary factor stunting the growth of American aquaculture: public perception.

Compared to the public and governmental support of farming aquatic animals in Asia, much of the United States population maintains negative views of the industry.⁷⁶ American consumers generally view the taste and quality of farmed fishes as inferior to wild caught.⁷⁷ Interestingly, consumers found farmed Atlantic cod (*Gadus morhua*) to be better tasting than wild caught cod when the method of production was not revealed.⁷⁸ However, once the cod was labeled as “wild” or “farmed”, consumers consistently gave wild caught fish a more positive evaluation.⁷⁹ As aquaculture is in its infancy in many states, development issues are commonly highlighted by local news outlets. This frequent exposure is one of the primary drivers of poor consumer reception in the United States to aquaculture.⁸⁰ Consumers also believe the industry is growing too quickly to be properly regulated by government agencies, which leads to doubt over the safety of farmed seafood and its impact on the environment.⁸¹ Many fishermen and associated groups in the United States view aquaculture as a threat to their livelihoods, although aquaculture jobs have been promoted as long-term, stable alternatives to seasonal jobs associated with some variable wild capture fisheries in Canada.⁸²

⁷² See National Aquaculture Sector Overview. United States of America, *FAO FISHERIES DIVISION* (Feb. 1, 2011), http://www.fao.org/fishery/countrysector/naso_usa/en.

⁷³ Gunnar Knapp & Michael Rubino, *The Political Economics of Marine Aquaculture in the United States*, 24 REV. IN FISHERIES SCI. & AQUACULTURE, 213-229 (2016).

⁷⁴ Jayson Lusk, *The Evolving Role of the USDA in the Food and Agricultural Economy*. MERCATUS RES. (2016).

⁷⁵ Carolyn Dimitri & Anne Effland, et al., (2005). *The 20th Century Transformation of US Agriculture and Farm Policy* (No. 59390). United States Department of Agriculture, Economic Research Service.

⁷⁶ Knapp & Rubino, *supra* note 73.

⁷⁷ Troy Hall & Shannon Amberg, *Factors Influencing Consumption of Farmed Seafood Products*, 66 APPETITE, 1-9 (2013).

⁷⁸ Adriaan Kole & Themistoklis Altintzoglou, et. al., *The Effects Of Different Types Of Product Information On The Consumer Product Evaluation For Fresh Cod In Real Life Settings*. 20 FOOD QUALITY & PREFERENCE 187-194 (2009).

⁷⁹ *Id.*

⁸⁰ Hall & Amberg, *supra* note 77.

⁸¹ Marit Olsen & Tonje Osmundsen *Media Framing Of Aquaculture*. 76 MARINE POL'Y, 19-27 (2017).

⁸² Christine Knott & Barbra Neis, *Privatization, Financialization And Ocean Grabbing In New Brunswick Herring Fisheries And Salmon Aquaculture*, 80 MARINE POL'Y 10-18 (2017).

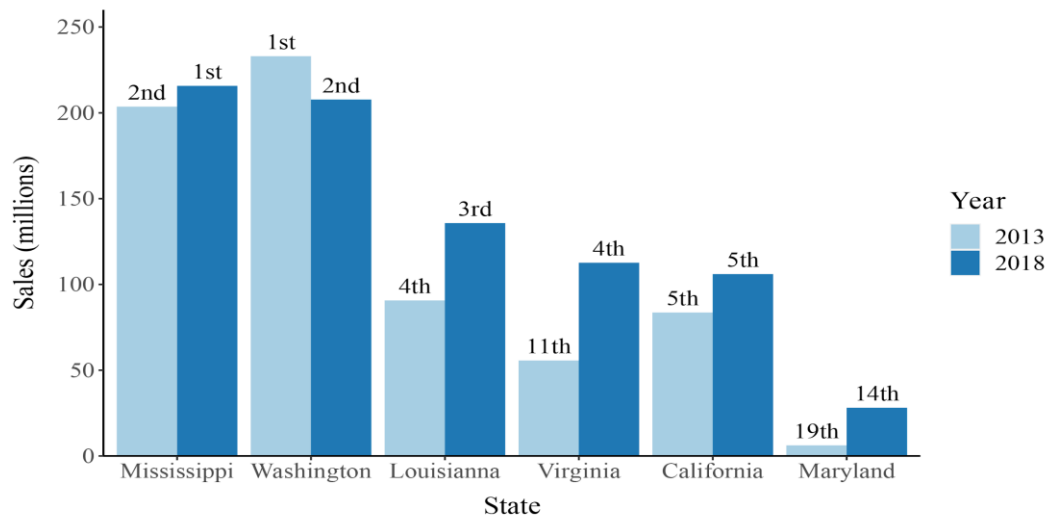


Figure 1. Total value in sales of aquaculture products for the years 2013 and 2018. The five most profitable states in 2018, and Maryland, are included. The individual rankings (out of the 50 states) are labeled above each bar. Data from the United States Department of Agriculture's (USDA's) 2018 Census of Agriculture, Volume 3, Part 2.

Mississippi leads the United States in aquaculture sales, generating nearly \$216 million in 2018 (Fig 1). Approximately 95% of 2018 sales were from catfish production.⁸³ The soil in the Mississippi Delta region is ideally suited for developing catfish holding ponds and there is an ample supply of clean groundwater.⁸⁴ Although Mississippi is the primary producer of catfish in the United States, the industry has been declining since 2002 due to increased competition from Asian markets.⁸⁵ Washington State is the closest competitor to Mississippi, with over \$207 million in sales during 2018 (Fig 1). Although data on the makeup of Washington aquaculture is difficult to obtain (Fig 2), sales are dominated by mollusks.⁸⁶ Correlatively, Washington also has a more extensive history of aquaculture than other states. Native American tribes, such as the Skokomish and Suquamish, have been cultivating wild oysters and other mollusks in Washington bays and Puget Sound for several centuries.⁸⁷

3. Aquaculture in Virginia

Virginia has the fourth most profitable aquaculture industry in the United States (Fig 1). It is one of the few states with annual aquaculture growth keeping pace with global trends; from 2013 to 2018, Virginia's aquaculture sales doubled (Fig 1). In 2018, Virginia was second nationally in mollusk sales, which comprised nearly 84% of total aquaculture in the state (Fig 2). The remaining

⁸³ 2018 CENSUS OF AQUACULTURE, USDA (Dec, 2019),

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Aquaculture/Aqua.pdf.

⁸⁴ See *Catfish*, MISSISSIPPI STATE UNIV. EXT. (Nov. 13, 2020), <http://extension.msstate.edu/agriculture/catfish>.

⁸⁵ See *How The Catfish Capital Of The World Was Hit By An Asian Fish Flood*, THE GUARDIAN (Apr. 10, 2019), <https://www.theguardian.com/environment/2019/apr/10/belzoni-mississippi-catfish-capital-world-asian-fish-flood>

⁸⁶ Sandi Doughton, *The Tiny But Mighty Olympia Oyster Regains A Foothold In Washington Waters*. PACIFIC NORTHWEST MAG. (2019).

⁸⁷ See *Tribes Work To Restore Native Olympia Oysters*, USDA (Jun. 19, 2003), <https://nwifc.org/tribes-work-to-restore-native-olympia-oysters/>.

sales came from food fishes, such as tilapia (*Oreochromis niloticus*) and trout species.⁸⁸ Hard clams (*Mercenaria mercenaria*) and the eastern oyster (*Crassostrea virginica*) are the two primary mollusk species grown in Virginia.⁸⁹ Although these species are commonly grouped together as the “shellfish industry”, there are several major differences between clam and oyster growing techniques, industries, and markets in Virginia.

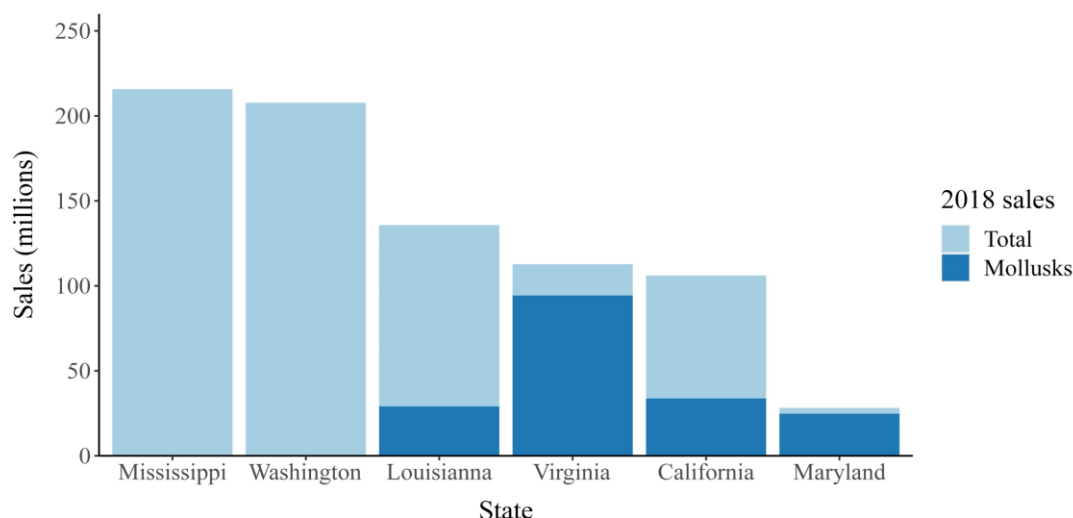


Figure 2. Contribution of mollusks (abalone, clams, mussels, oysters, and other mollusks) sales to total aquaculture sales in 2018. The five most profitable states, and Maryland, are included. Although mollusks comprise the majority of sales in Washington, data was not provided for the 2018 census. Data from the United States Department of Agriculture’s (USDAs) 2018 Census of Agriculture, Volume 3, Part 2.

In 2018, forty-three farms sold nearly 178 million individual hard clams⁹⁰ and generated approximately \$32 million in sales. Clams prefer high-salinity conditions and are generally grown on Virginia’s Eastern Shore. Clams are also burrowing mollusks, so their farm beds are generally near the bottom and do not extend above the surface of the water. The clam industry has matured, as production has fluctuated between 150 to 200 million clams annually since 2005.⁹¹ However, clam prices have steadily climbed from roughly \$0.13/clam to \$0.20/clam during the same period.⁹² Virginia is the second largest clam producer in the United States⁹³ largely due to the breeding efforts of VIMS, which began developing fast-growing clam stocks in the 1960s and continues to supply clam seed to growers.⁹⁴

⁸⁸ USDA, *supra* note 83.

⁸⁹ *Id.*

⁹⁰ Karen Hudson, *Virginia Shellfish Aquaculture Situation and Outlook Report: Results of the 2018 Virginia Shellfish Aquaculture Crop Reporting Survey*. Marine Resource Report No. 2019-8, VIRGINIA INS. MARINE SCI (2019).

⁹¹ *Id.*

⁹² *Id.*

⁹³ USDA, *supra* note 83.

⁹⁴ See Thomas J. Murray, *Early VIMS Work on Hard Clams Pays Off*, VIRGINIA SEA GRANT (2002),

The Virginia wild-caught oyster industry was enormously productive during the late 19th century. In 1880, nearly 117 million pounds of oysters were harvested from the Chesapeake Bay.⁹⁵ However, catches began to rapidly decline in the early 1900s due to overfishing, habitat loss, pollution, and newly emerging diseases.⁹⁶ Oyster culturing, or husbandry, also began in the early 1900s, where harvesters would congregate empty oyster shells in specific areas to attract the settlement of wild oyster larvae (i.e., spat). By the 1920s, oyster growers began harvesting wild young-of-the-year oysters (i.e., seed) to plant on empty shells in an attempt to replenish the fishery.⁹⁷ This spat-on-shell technique is commonly referred to as extensive culture, since the oysters are loose on the bottom.⁹⁸ Oyster diseases, such as dermo (caused by the protistan parasite *Perkinsus marinus*), continued to devastate wild oyster populations. Subsequently, oyster harvests flatlined at approximately 500,000 pounds⁹⁹ by the year 2000.¹⁰⁰

True oyster aquaculture, which utilizes hatchery-raised oyster spat, began around the early 1980s in Washington State.¹⁰¹ A pioneer of modern American oyster aquaculture, Dr. Standish K. Allen, had just invented a mutant type of oyster (i.e., triploid) that grows faster than wild oyster species. This rapid growth allows triploid oysters to reach market size before succumbing to diseases.¹⁰² These hatchery-raised oyster spat are grown in off-bottom containers for predator protection, a technique referred to as intensive culture.¹⁰³ Dr. Allen accepted a position at VIMS in 1998, bringing with him the best oyster spat and growing techniques currently available in the United States.¹⁰⁴ It is no coincidence that Virginia and Washington are now the two largest producers of farmed oysters in the country.¹⁰⁵

Oysters are predominantly grown in Virginia's tributaries and bays; they prefer lower-salinity waters than clams. Spat are initially raised in flow-through seawater tanks located on land or floating nursery systems called floating upwelling systems (FLUPSYs).¹⁰⁶ After the oysters reach approximately one inch in length, they are transferred to mesh cages where they grow for roughly two years until harvest. During the early years of oyster aquaculture in Virginia, most

<http://139.70.23.12/docs/EndNote62.pdf>.

⁹⁵ Darrel Bosch & Nicolai Kuminoff *et al.*, *Evaluation Of Policy Options For Expanding Oyster Aquaculture In Virginia*, 14 AQUACULTURE ECON. & MGMT., 145-163 (2010).

⁹⁶ *Id.*

⁹⁷ David M. Schulte, *History Of The Virginia Oyster Fishery, Chesapeake Bay, USA*, 4 FRONTIERS IN MARINE SCI., 127 (2017).

⁹⁸ Karen Hudson & Daniel Kauffman *et al.*, *Cultchess (Single seed) Oyster Crop Budgets for Virginia: 2012 User Manual*, VIRGINIA COOPERATIVE EXT. (2012).

⁹⁹ This calculation is assuming 50 pounds of oysters in a single bushel. *See Oysters*, FRESH SEAFOOD, <https://www.fresh-seafood.net/fish-shellfish/oysters/> (explaining bushel measurements).

¹⁰⁰ Schulte, *supra* note 97.

¹⁰¹ *See* Dennis Hollier, *Tasty Mutants: The Invention of the Modern Oyster*, THE ATLANTIC (Sep. 29, 2014), <https://www.theatlantic.com/technology/archive/2014/09/todays-oysters-are-mutants/380858/>.

¹⁰² *Id.*

¹⁰³ Hudson & Kauffman, *supra* note 98.

¹⁰⁴ Hollier, *supra* note 101.

¹⁰⁵ USDA, *supra* note 83.

¹⁰⁶ Mark Luckenbach & Doug Lipton *et al.*, *A Framework for Native Oyster Aquaculture Development in Maryland*, CRC PUB., 8-166 (2008).

cages were staked to the bottom. However, floating cages have become more common among farmers as oysters reach market size significantly faster near the surface.¹⁰⁷

Due to advances in nursery technology and the development of breeding efforts, the oyster industry has grown rapidly.¹⁰⁸ Virginia began publishing intensive oyster aquaculture harvest data in 2005, during which year approximately 840,000 oysters were sold.¹⁰⁹ During the next decade, there was an exponential increase in the industry, peaking at 40 million oysters sold in 2014. For the last five years, oyster production has fluctuated between 30 and 40 million oysters. Although growth has slowed, there is still significant potential for increased production, especially if the efficiency of leased bottomland usage¹¹⁰ is increased.¹¹¹ For example, only 33% of bottomland leases in Virginia during the years 2006 to 2016 were ever used for their intended purpose (oyster aquaculture).¹¹²

In addition to mollusks, Virginia is also farming tilapia on a massive scale. The largest indoor recirculating aquaculture system (RAS) globally is located in southwest Virginia and grows 4 million pounds of tilapia annually.¹¹³ Blue Ridge Aquaculture (BRA), which has been in continuous operation since 1993, is also one of the oldest aquaculture farms in the United States.¹¹⁴ Blue Ridge Aquaculture is entirely self-sufficient, producing their own tilapia larvae and controlling every aspect of their growth and transport to market.¹¹⁵ Additionally, BRA sells the majority of its product to the live-tilapia market, which fetches greater prices.¹¹⁶ Vertical integration and its niche market are the primary reasons BRA is one of the few tilapia aquaculture facilities in the United States that is able to compete with Asian imports.¹¹⁷

B. Virginia Aquaculture and the Environment

The development of aquaculture will be necessary to offset the plateau and eventual decline in capture fisheries due to overfishing and global climate change. However, aquaculture also comes with its own set of environmental concerns. When aquatic animal or plant storage areas are connected to waterways (e.g., floating fish pens), diseases and pharmaceuticals used for treatment can transmit from farmed organisms to wild populations.¹¹⁸ Additionally, the rapid expansion of

¹⁰⁷ Laura L. Thomas & S.K. Allen *et al.*, *The Effect Of Aquaculture Gear On The Growth And Shape Of The Oyster Crassostrea Virginica During A "Finishing Period" In Chesapeake Bay, USA*. 508 AQUACULTURE 1- 9 (2019).

¹⁰⁸ *Id.*

¹⁰⁹ Thomas Murray & Michael Oesterling, *Virginia Shellfish Aquaculture Situation and Outlook Report: Results of the 2009 Virginia Shellfish Aquaculture Crop Reporting Survey*, VIRGINIA INS. MARINE SCI. (2010).

¹¹⁰ See *infra* Part IV - Other Issues Facing Aquaculture Producers In Virginia.

¹¹¹ Jenifer Beckensteiner & David Kaplan *et al.*, *Barriers To Eastern Oyster Aquaculture Expansion In Virginia*. FRONTIERS IN MARINE SCI 53 (202).

¹¹² *Id.*

¹¹³ See *Tons of Tilapia: Va. Indoor Fish Farm Largest in World*, LANCASTER FARMING (Jan. 22, 2011), https://www.lancasterfarming.com/news/southern_edition/tons-of-tilapia-va-indoor-fish-farm-largest-in-world/article_c4a4a46c-da05-5f29-8e63-f9eca423d85d.html.

¹¹⁴ See *Key factors in creating the largest tilapia RAS in the world*, THE FISH SITE (Jun. 22, 2018), <https://thefishsite.com/articles/key-factors-in-creating-the-largest-tilapia-ras-in-the-world>.

¹¹⁵ *Id.*

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ Mickael Teixeira Alves & Nick Taylor, *Models Suggest Pathogen Risks To Wild Fish Can Be Mitigated By Acquired Immunity In Freshwater Aquaculture Systems*. 10 SCIENTIFIC REPORTS, 1-12 (2020).

fish farming requires an equally substantial supply of fish food. Aquaculture systems that farm piscivorous (i.e., fish-eating) animals can use between 2 to 5 times more fish protein by weight to feed fishes during their lifespan than is produced in the final market-ready product.¹¹⁹ Access to feed will likely become the primary limiting factor of aquaculture growth.¹²⁰ If fish farming is to remain sustainable, plant-based modes of feed production must become widespread.¹²¹

Oyster farms, the primary component of Virginia's aquaculture, are commonly viewed as a net positive impact on the marine environment. Depending on environmental conditions, a single eastern oyster weighing one gram can filter approximately 170 liters of seawater in a day.¹²² Oysters ingest nutritious particles and phytoplankton from the water they filter, which results in improved clarity.¹²³ Oysters are so effective at removing suspended sediment from the water, their propagation has been shown to be an influential factor governing the success of Chesapeake Bay seagrass restoration efforts, an important aquatic plant which relies on the clarity of estuaries to grow.¹²⁴ Comparatively, clams have a lower filtration rate and contribute less to water clarity improvement.¹²⁵

With oyster aquaculture growing rapidly throughout the coastal United States, several recent studies have analyzed a plethora of potentially negative environmental impacts associated with growing shellfish at high densities. There is some public concern regarding large congregations of farmed oysters harboring and spreading diseases, such as dermo. However, harvesting farmed oysters has been shown to actually reduce diseases by removing parasites from the ecosystem.¹²⁶ Cages associated with oyster aquaculture also have minimal impacts on the foraging behavior of shorebirds¹²⁷ and can function as important habitat for juvenile fishes.¹²⁸ Additionally, oysters contribute a negligible amount of greenhouse gas emissions from their respiration.¹²⁹

¹¹⁹ Rosamond L. Naylor & Rebecca J. Goldberg, *et. al.*, *Effect Of Aquaculture On World Fish Supplies* 405 NATURE, 1017-1024 (2000).

¹²⁰ Yngvar Olsen, *Resources For Fish Feed In Future Mariculture*. 3 AQUACULTURE ENV. INTERACTIONS, 1(3), 187-200 (2011).

¹²¹ See *Vegetarian Feed One Of The Keys To Sustainable Fish Farming*, INTL. UNION FOR CONS. OF NATURE, (Jun. 12, 2017),

<https://www.iucn.org/news/secretariat/201706/vegetarian-feed-one-keys-sustainable-fish-farming-%E2%80%93-iucn-report>.

¹²² Melinda K Ehrich & Lora A. Harris, *A Review Of Existing Eastern Oyster Filtration Rate Models*. 297 ECOLOGICAL MODELLING, 201-212 (2015).

¹²³ R.I.E. Newell & T.R. Fisher, *et. al.*, *Influence Of Eastern Oysters On Nitrogen And Phosphorus Regeneration In Chesapeake Bay, USA*. in NATO SCI. SERIES IV: EARTH & ENVTL SERIES, 99-120 (2005).

¹²⁴ R.I.E. Newell & Evamaria W. Koch, *Modeling Seagrass Density And Distribution In Response To Changes In Turbidity Stemming From Bivalve Filtration And Seagrass Sediment Stabilization*. 27 ESTUARIES, 793-803 (2004).

¹²⁵ *Id.*

¹²⁶ Tal Ben-Horin, & Colleen A. Burge, *et. al.*, *Intensive Oyster Aquaculture Can Reduce Disease Impacts On Sympatric Wild Oysters*. 10 AQUACULTURE ENV. INTERACTIONS 557-567. (2018).

¹²⁷ Brooke Maslo & J. Curtis Burkhalter, *et. al.*, *Assessing Conservation Conflict: Does Intertidal Oyster Aquaculture Inhibit Foraging Behavior Of Migratory Shorebirds?* 11 ECOSPHERE, e03097 (2020).

¹²⁸ Jessica Tallman & Graham E. Forrester, *Oyster Grow-Out Cages Function As Artificial Reefs For Temperate Fishes*. 136 TRANS. AMERI. FISHERIES SOC'Y. 790-799 (2007).

¹²⁹ Nicholas E. Ray & Timothy J. Maguire, *et. al.*, *Low Greenhouse Gas Emissions From Oyster Aquaculture*. 15 ENVTL. SCI. TECH. 9118-9127 (2019).

Compared with other aquaculture species, oyster farming generally requires no fertilizers or pest treatments for profitable success. Since the early 2000s, there have been several attempts by some oyster farmers in Washington to use pesticides, such as imidacloprid, to limit oyster losses from several species of burrowing shrimp.¹³⁰ However, there has been tremendous public pushback against the use of pesticides and in 2018 the Washington Department of Ecology denied a plan for the use of imidacloprid.¹³¹ In 2019, the Willapa-Grays Harbor Oyster Growers Association settled an appeal with the Department of Ecology's decision; the two parties agreed to develop alternative chemicals and approaches to control burrowing shrimp.¹³² There is currently no need for similar pesticides in Virginia oyster farming, as the problematic shrimps are native to the Pacific Northwest.¹³³

Ironically, negative environmental influences of oyster aquaculture are predominantly connected to marine plants. Oyster farms can alter the abundance of seagrass species, such as eelgrass (*Zostera marina*), as they commonly occupy the same nearshore environments. For example, floating oyster cages limit light transmission in the water column and have been shown to reduce nearby eelgrass growth.¹³⁴ In several Canadian bays, eelgrass biomass was correlated with the density of floating oyster cages.¹³⁵ Oyster operations that were older and contained greater densities of cages could reduce nearby eelgrass biomass by as much as 79%.¹³⁶ In Washington, on- and off-bottom oyster aquaculture methods were found to reduce eelgrass density in 27 separate locations.¹³⁷ There are also examples of oyster farmers inadvertently destroying seagrasses and other marine plants during oyster planting or maintenance efforts.¹³⁸ Currently, the Virginia Marine Resources Commission (VMRC) considers the presence of submerged aquatic

¹³⁰ See *Oyster Farmers Sacrifice Pesticide, Still Losing Ground To Shrimp*, THE DAILY NEWS, (Nov. 25, 2019), https://tdn.com/news/local/oyster-farmers-sacrifice-pesticide-still-losing-ground-to-shrimp/article_ad594a40-2d57-5dc1-a235-51b2a946c3ad.html.

¹³¹ See *Washington State Says No To Spraying Neurotoxic Pesticide On Oyster Beds*, THE SEATTLE TIMES, (Apr. 9, 2018), <https://www.seattletimes.com/life/food-drink/washington-state-says-no-to-spraying-neurotoxic-pesticide-on-oyster-beds/>.

¹³² See *Oyster Growers Agree To Abandon Quest To Use Controversial Insecticide In Southwest Washington Tidelands*, THE SEATTLE TIMES, (Oct. 22, 2019), <https://www.seattletimes.com/seattle-news/environment/in-settlement-with-state-oyster-growers-agree-to-abandon-quest-to-use-controversial-insecticide-in-southwest-washington-tidelands/>.

¹³³ Anthony F. D'Andrea & Theodore H. DeWitt, *Geochemical Ecosystem Engineering By The Mud Shrimp Upogebia Pugettensis (Crustacea: Thalassinidae) In Yaquina Bay, Oregon: Density-Dependent Effects On Organic Matter Remineralization And Nutrient Cycling*. 6 LIMNOLOGY AND OCEANOGRAPHY, 1911-1932 (2009).

¹³⁴ Marc A. Skinner & André L. Mallet, et. al., *Experimental Determination Of The Effects Of Light Limitation From Suspended Bag Oyster (Crassostrea Virginica) Aquaculture On The Structure And Photosynthesis Of Eelgrass (Zostera Marina)*. 459 J. OF EXPERIMENTAL MARINE BIOLOGY AND ECOLOGY, 169-180 (2014).

¹³⁵ Marc A. Skinner & Simon C. Courtenay, et. al., *Reductions In Distribution, Photosynthesis, And Productivity Of Eelgrass Zostera Marina Associated With Oyster Crassostrea Virginica Aquaculture*. 486 MARINE ECOLOGY PROGRESS SERIES, 105-119 (2013).

¹³⁶ *Id.*

¹³⁷ Heather M. Tallis & Jennifer L. Ruesink, et. al., *Oysters And Aquaculture Practices Affect Eelgrass Density And Productivity In A Pacific Northwest Estuary*. 2 J. of Shellfish Res. 251-261 (2009).

¹³⁸ S. Bastien-Daigle & M. Hardy et al., *Habitat Management Qualitative Risk Assessment: Water Column Oyster Aquaculture In New Brunswick*. OCEANS AND SCIENCE BRANCH, FISHERIES AND OCEANS, GULF REGION (2007).

vegetation (SAV) on a case-by-case basis when evaluating a proposal for the use of state-owned-bottomlands for activities such as oyster or clam farming.¹³⁹

Furthermore, the production of feces and pseudo feces (i.e., rejection of particles prior to digestion) by oysters can alter the marine benthic environment. For example, one study found that the deposition of organic matter within one oyster farm in the Chesapeake Bay was three times greater than the surrounding area.¹⁴⁰ This flux of feces into the sediment can alter benthic community structure, favoring species that are able to effectively consume the deposits.¹⁴¹ Several studies have found minimal evidence of organic enrichment within soils below oyster cages due to rapid infaunal processing;¹⁴² in other words, nitrogen produced by oyster feces is quickly incorporated into the soil by organisms living within the sediments.¹⁴³ Additionally, one experiment in the Chesapeake Bay found the macroalgae that grows on clam aquaculture gear sequesters the majority of nutrients released by clam excretion.¹⁴⁴

There is also evidence that the majority of particles produced by oyster defecation are moved away from the cages via local currents.¹⁴⁵ One study in eastern Canada proposed high densities of oyster cages to force currents to move underneath the floating structures, which transports the oyster feces.¹⁴⁶ It is important to note that many of these experiments and models use exceptionally high densities of oyster cages to detect effects, often several times greater than the average oyster cage density of approximately one ounce of oysters per square foot.¹⁴⁷

Virginia's land-based aquaculture farms come with their own set of environmental concerns which primarily consist of three topics: (1) sources of their freshwater; (2) the composition of their sewage; and (3) the location and quantity of their sewage outflow. Compared to the outdoor pond systems utilized by states such as Mississippi, indoor RASs partially treat and recycle water to reduce waste production and groundwater consumption.¹⁴⁸ Based on their website, BRA claims to recycle 85% of water used in production back into their tilapia tanks.¹⁴⁹ However,

¹³⁹ See VA. CODE ANN. § 28.2-1205 (West 2014). See also *Submerged Aquatic Vegetation (SAV) Guidance*, VMRC (Jul. 22, 2017),

[https://www.mrc.virginia.gov/regulations/Guidance for SAV beds and restoration final approved by Commission 7-22-17.pdf](https://www.mrc.virginia.gov/regulations/Guidance%20for%20SAV%20beds%20and%20restoration%20final%20approved%20by%20Commission%207-22-17.pdf).

¹⁴⁰ Jeremy Mark Testa & Damian Coman Brady *et al.*, *Modeling The Impact Of Floating Oyster (Crassostrea Virginica) Aquaculture On Sediment-Water Nutrient And Oxygen Fluxes*. 3 AQUACULTURE ENV'T. INTERACTIONS, 7(3), 205-222 (2015).

¹⁴¹ Chelsea E. Duball & Jose A. Amador *et al.*, *Impacts Of Oyster Aquaculture On Subaqueous Soils And Infauna*. 6 J. OF ENV'TL. QUALITY, 1890-1898 (2019).

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ Anna Murphy & Iris C. Anderson *et al.*, *Enhanced Nutrient Regeneration At Commercial Hard Clam (Mercenaria Mercenaria) Beds And The Role Of Macroalgae*. 530 MARINE ECOLOGY PROGRESS SERIES 135-151 (2015).

¹⁴⁵ Testa & Brady, *supra* note 140.

¹⁴⁶ Luc A. Comeau & Thomas Guyondet, *Impact Of High-Density Suspended Oyster Culture On Benthic Sediment Characteristics*. 58 AQUACULTURAL ENGINEERING, 58, 95-102 (2014).

¹⁴⁷ Luc A. Comeau, *Suspended Versus Bottom Oyster Culture In Eastern Canada: Comparing Stocking Densities And Clearance Rates*. 410 AQUACULTURE, 57-65 (2013).

¹⁴⁸ C.I.M. Martins & J.A.J. Verreth *et al.*, *New Developments In Recirculating Aquaculture Systems In Europe: A Perspective On Environmental Sustainability*. 3 AQUACULTURAL ENGINEERING, 83-93 (2010).

¹⁴⁹ See *About Us - Overview*, BLUE RIDGE AQUACULTURE, <http://www.blueridgeaquaculture.com/aboutus.cfm>.

BRA still produces between 390,000¹⁵⁰ to 600,000 gallons of wastewater per day, which outflows into the municipal sewer system.¹⁵¹ The BRA website states that this effluent is heavily treated to minimize their ecological footprint,¹⁵² but current wastewater treatment and solid waste disposal strategies are not provided.¹⁵³ It is unclear where this water is sourced and how it may impact the surrounding communities. The BRA RAS is entirely indoors,¹⁵⁴ which reduces the potential for untreated wastewater polluting nearby waterways during natural disasters and the creation of nuisances to the community, such as smell.

III. AQUACULTURE AND RTF: WHAT'S MISSING?

Due to a rapidly expanding aquaculture industry and a RTF law aimed at protecting agricultural producers, aquaculture producers in Virginia currently face significant barriers to successfully negotiating land use conflicts. Virginia courts and policy makers have thus far been unwilling to look beyond the text of the state's RTF law, creating a threshold, definitional problem not found in nearby Maryland or fellow aquaculture leader, Washington State. In addition, a zoning, leasing, and permitting process influenced by public perception serves to compound existing challenges facing Virginia aquaculture producers.

A. Aquaculture and RTF in Virginia

As of September 2020, Virginia courts have only waded into one significant dispute involving Virginia's RTF law and aquaculture. This dispute, along with an advisory opinion from the state's Attorney General, indicate that efforts to include aquaculture under the protections of the existing language of the RTF law may be hindered by a strict interpretation of the law's coverage. In *County of York v. Bavuso*, a conflict began when a York County resident, Anthony Bavuso, sought a declaration that a York County ordinance requiring special use permits (SUP) for oyster aquaculture were invalid.¹⁵⁵ The county had also imposed zoning restrictions which threatened the viability of Bavuso's operation.¹⁵⁶ Bavuso's claim centered on the provision of Virginia's RTF law that prohibits local governments from imposing permitting requirements on agricultural operations and restricts local zoning authority.¹⁵⁷

A trial court initially ruled in Bavuso's favor, finding that aquaculture activities -- such as oyster farming -- were included under the terms "agricultural products" and "production agriculture," triggering the protections of Virginia's RTF law and rendering the County's permit

¹⁵⁰ See *In Southside Virginia, Blue Ridge Aquaculture Gears for Growth*, COUNTRY FOLKS (May. 24, 2013), <https://countryfolks.com/in-southside-virginia-blue-ridge-aquaculture-gears-for-growth/>.

¹⁵¹ Simonel Sandu & Brian Brazil *et al.*, *Efficacy Of Pilot-Scale Wastewater Treatment Upon A Commercial Recirculating Aquaculture Facility Effluent*, *Aquaculture and the Environment: A SHARED DESTINY*, INTECH, 141-158 (2011).

¹⁵² See *About Us - Overview*, BLUE RIDGE AQUACULTURE, <http://www.blueridgeaquaculture.com/aboutus.cfm>.

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ *County of York v. Bavuso*, 160104, 2016 WL 6304568 *1.

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*; see VA. CODE ANN. § 3.2-301 (West 2014) ("no county shall adopt any ordinance that requires a special exception or special use permit be obtained for production agriculture activity" and "no locality shall enact zoning ordinances that would unreasonably restrict. . . farming practices.").

requirement invalid.¹⁵⁸ However, the Virginia Supreme Court departed from this inclusive reading of Virginia's RTF law and instead held that Bavuso's aquaculture activities did not fall under the law's protection from additional ordinances.¹⁵⁹ The Virginia Supreme Court looked closely at the text of the RTF law, suggesting that the omission of "aquaculture" from the law's definition section "strongly suggests that the General Assembly did not intend to include aquaculture" within the scope of the protections offered by Virginia's RTF law.¹⁶⁰ Moreover, the court reasoned that Bavuso's arguments for aquaculture's inclusion due to legislative intent or the term's common understanding were simply "not dispositive."¹⁶¹ Overall, *Bavuso* indicates that Virginia courts look narrowly to the text of Virginia's RTF when resolving land use conflicts.

Notably, the *Bavuso* court also relied on an official Virginia State Attorney General opinion, issued in 2012.¹⁶² In the opinion, then-Virginia Attorney General Kenneth Cuccinelli III advised that aquaculture does not constitute an agricultural operation under Virginia's RTF law.¹⁶³ Cuccinelli also looked narrowly at the text of Virginia's RTF law, focusing his analysis almost entirely on the inclusion of the word "fowl" in the law's definition of "production agriculture" after the word "animal."¹⁶⁴ According to Cuccinelli, the General Assembly would not have included the word "fowl" after the word "animal" if they intended the word "animal" to be inclusive of the entire animal kingdom and thus include aquaculture products.¹⁶⁵ Because of these word choices, Cuccinelli ultimately concluded that aquaculture production would not be included under the nuisance-suit shield of Virginia's RTF law and a Virginia court has not since refuted that Opinion.¹⁶⁶

B. Aquaculture and RTF Issues in Maryland

While *Bavuso* provides an example of the potential impossibility of including aquaculture under Virginia's existing RTF law, it also reflects an approach which stands in sharp contrast to the model followed in neighboring Maryland. Though Maryland's aquaculture industry is not yet as large or developed as Virginia's industry, it nonetheless contributes to the state's economy and represents the fourteenth largest aquaculture industry in the United States.¹⁶⁷ Aquaculture in Maryland -- as in Virginia -- reflects historical and cultural connections shared throughout the Chesapeake Bay region.¹⁶⁸ For example, the Maryland legislature acted as early as 1906 to survey the state's wild oyster grounds and assess what portions of these grounds should be permanently

¹⁵⁸ *County of York v. Bavuso*, 2016 WL 6304568 *1.

¹⁵⁹ *Id.* at *2.

¹⁶⁰ *Id.*

¹⁶¹ *Id.* at *3.

¹⁶² See Op. Atty. Gen., Opinion No. 11-127 (March 9, 2012), 2012 WL 891074.

¹⁶³ *Id.*

¹⁶⁴ *Id.* at 2; see also VA. CODE ANN. § 3.2-300 (West 2008).

¹⁶⁵ Op. Atty. Gen., Opinion No. 11-127 (March 9, 2012), 2012 WL 891074, 2.

¹⁶⁶ *Id.* at 3.

¹⁶⁷ See Memo Diriker & Sarah Guy *et al.*, *The Impact of Resource Based Industries on the Maryland Economy*, 35 BEACON - SALISBURY UNIV.,

http://www.gcedonline.com/resources/gced/pdf/Economic_Impact_of_Resource_Based_Industries_in_Maryland-BEACON-30JANUARY2018.pdf (finding that combined "Seafood and Aquaculture" sector "contributed nearly \$355 million" to Maryland's economy in 2015); see also Fig 1.

¹⁶⁸ See Donald Webster, *Maryland Oyster Culture: A Brief History*, HISTORICAL PERSPECTIVE UMD, 1 (Nov. 2007).

set aside for harvest.¹⁶⁹ Notably, this effort followed similar work completed in Virginia in 1895 with the publication of the “Baylor Report,” a “massive two-year survey” which similarly assessed Virginia’s oyster grounds.¹⁷⁰

Unlike Virginia, however, Maryland includes aquaculture under the state’s RTF law and has done so since 1998.¹⁷¹ Even further, aquaculture operations are explicitly included under the law’s definition of “agricultural operations,” eliminating the possibility of the definitional squabbling at issue in *Bavuso* and reflected in the influential 2011 Attorney General Opinion.¹⁷² Under Maryland’s law, agricultural operations are protected from nuisance suits if they have been engaged in their operations for one year, echoing provisions found in other states, including Virginia.¹⁷³ Maryland’s RTF law also requires that producers be in full compliance with “health, environmental, zoning, and permit requirements” related to any activities which may lead to a nuisance claim.¹⁷⁴ Notably, however, Maryland’s RTF law stops short of requiring agricultural operations to adhere to BMPs.¹⁷⁵ Instead, agricultural operations must only be “conducted in [a non]-negligent manner.”¹⁷⁶ As of October 2020, research found no nuisance suits brought against aquaculture producers in Maryland.¹⁷⁷

Maryland’s balanced approach to aquaculture has also engendered implicit support from the state’s agricultural lobby.¹⁷⁸ The Maryland Farm Bureau declared in its 2020 policy manual that it opposed efforts to impose additional requirements on aquaculture producers and that it considered aquaculture a component of agriculture.¹⁷⁹ Ultimately, the collaborative relationship between aquaculture and the land-based agriculture industry in Maryland is particularly notable when compared to Virginia, where potential RTF expansion has been met with opposition and anxiety.¹⁸⁰

C. Aquaculture and RTF Issues in Washington

Given the aquaculture industry in Washington is most similar to Virginia, it is relevant to evaluate differences between the regulatory frameworks of the two states. In 2011, Washington was the first state to join the National Shellfish Initiative (NSI).¹⁸¹ The NSI was established in

¹⁶⁹ *Id.* at 2.

¹⁷⁰ See HISTORICAL HIGHLIGHTS OF THE VIRGINIA MARINE RESOURCES COMMISSION, VMRC, <https://mrc.virginia.gov/vmrchist.shtm#eightenninetyfour> (last visited Nov. 22, 2020).

¹⁷¹ MD. CODE. ANN. CTS. & JUD.PROC. § 5-403(a)(1) (West 2014); see also 1998 Maryland Laws Ch. 386 (S.B. 404) (amending Maryland RTF law to include aquaculture)

¹⁷² See MD. CODE. ANN. CTS. & JUD.PROC. § 5-403(a)(1) (West 2014); see *County of York v. Bavuso*, 160104, 2016 WL 6304568 *1; Op.Atty.Gen., Opinion No. 11-127 (March 9, 2012), 2012 WL 891074.

¹⁷³ See MD. CODE. ANN. CTS. & JUD.PROC. § 5-403(c) (West 2014); but see VA. CODE ANN. § 3.2-302(A)(West 2018).

¹⁷⁴ See MD. CODE. ANN. CTS. & JUD.PROC. § 5-403(c) (West 2014).

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

¹⁷⁷ See *Id.*

¹⁷⁸ See e.g., 2020 POLICY BOOK, MARYLAND FARM BUREAU, 1, 16 (2020), <https://mdfarmbureau.com/wp-content/uploads/2019/12/2020-State-Policy-final.pdf>.

¹⁷⁹ *Id.* at 16.

¹⁸⁰ See *supra* Part III-A (detailing aquaculture and RTF conflict in Virginia).

¹⁸¹ Lindsey Ward, *The Legal and Environmental Implications of the Washington Shellfish Initiative: Is it Sustainable?*, 4 SEATTLE J. ENVTL. L. 1, 6 (2014).

2011 by the National Oceanic and Atmospheric Administration (NOAA) with the goal of “increasing populations of bivalve shellfish in our nation’s coastal waters—including oysters, clams, and mussels—through both sustainable commercial production and restoration activities.”¹⁸²

Washington was also the first state to adopt the Nationwide Permit (NWP) 48 in an attempt to centralize its aquaculture permitting process. The NWP 48, which is administered by the U.S. Army Corps of Engineers (USACE), initially authorized the use of shellfish growing technology (e.g., floating oyster cages) in navigable waters for existing aquaculture facilities.¹⁸³ However, an update to NWP 48 in 2012 allowed new aquaculture facilities in Washington to apply for the NWP 48 as a workaround for the numerous state-issued permits.¹⁸⁴ In 2017, the USACE loosened environmental impact restrictions under NWP 48, thereby allowing Washington farmers to disturb aquatic vegetation with mollusk aquaculture sites.¹⁸⁵ Following this change, the Coalition to Protect Puget Sound Habitat, an environmental non-profit, filed suit against the USACE et al. for violating the Clean Water Act and the National Environmental Policy Act.¹⁸⁶ In June 2020, a federal judge for the United States District Court for the Western District of Washington ruled the issuance of the NWP 48 was arbitrary and capricious because it failed to adequately consider the environmental impacts of aquaculture, vacating the permit.¹⁸⁷ Until further notice, the USACE is currently processing all aquaculture permits on an individual basis.¹⁸⁸

In 1985, the Washington State legislature and governor formally recognized aquaculture as a form of agriculture, which placed the oversight of all aquaculture under the state’s Department of Agriculture.¹⁸⁹ However, these changes were primarily focused on salmon production. The Washington State legislature amended their RTF act to include freshwater ponds and growing facilities under the definition of “farm” in 1991.¹⁹⁰ Freshwater fish and fish products were also added to the definition of “farm products”.¹⁹¹ Washington’s most profitable aquaculture industry, shellfish production, is currently excluded from statutory language and protections from nuisance suits,¹⁹² so its shellfish industry has a lack of protection in state law similar to Virginia’s.

¹⁸² See *National Shellfish Initiative*, NOAA FISHERIES (Mar. 14, 2019), <https://www.fisheries.noaa.gov/content/national-shellfish-initiative>.

¹⁸³ Ward, *supra* note 181.

¹⁸⁴ *Id.*

¹⁸⁵ See *U.S. Army Corps Proposes New Nationwide Permits for Seaweed and Finfish Aquaculture [...]*, LEXOLOGY, (Aug. 21, 2020), <https://www.lexology.com/library/detail.aspx?g=63fc58fc-f2f8-478d-8ff6-b9a1af990e5e>.

¹⁸⁶ See *Coalition to Protect Puget Sound Habitat v. United States Army Corps. of Engr’s*, 2020 U.S. Dist. LEXIS 102597, 2020 WL 3100829.

¹⁸⁷ *Id.*

¹⁸⁸ See *Shellfish Aquaculture*, U.S. ARMY CORPS OF ENGINEERS SEATTLE DISTRICT (Aug. 6, 2020), <https://www.nws.usace.army.mil/Missions/Civil-Works/Regulatory/Shellfish-Aquaculture/>.

¹⁸⁹ Kevin H. Amos & Andrew Appleby, *Atlantic Salmon In Washington State: A Fish Management Perspective*. WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (1999).

¹⁹⁰ See 1991 Wa. ALS 317, 1991 Wa. Ch. 317, 1991 Wa. HB 1954 (May 21, 1991), available at <https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:4J1H-7GP0-003S-S215-00000-00&context=1516831>.

¹⁹¹ *Id.*

¹⁹² See *Agricultural Activities And Forest Practices — Definitions*, Rev. Code Wash. (ARCW) § 7.48.310 (Statutes current with legislation from the 2020 Regular Session), available at <https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:5BB3-VPR1-66P3-202J-00000-00&context=1516831>.

Despite this lack of inclusion, however, research found no nuisance suits filed against shellfish aquaculture in Washington as of November 2020.¹⁹³ This is because most nuisance complaints are handled out of court by Washington Environmental and Land Use Hearings Office Boards, which normally consist of three board members appointed by the governor and confirmed by the state senate.¹⁹⁴ Several complaints during the 2010s involved issues with noises, lights, harvest times, and navigational impacts caused by shellfish aquaculture.¹⁹⁵ In addition, contrary to Virginia, which is a “Dillon Rule” state,¹⁹⁶ Washington allows cities and counties to exercise all regulatory powers possessed by the state under the concept of “home rule”, providing those powers do not violate Washington statutes.¹⁹⁷ As a result, individual localities in Washington, such as Greys Harbor County, have adopted their own RTF ordinances that extend protections to shellfish farms.¹⁹⁸ A commonality between the Greys Harbor and Washington State RTF statutes is that they include sections on mandatory disclosure.¹⁹⁹ The Washington Disclosure section requires the seller of a residential property to inform the buyer of its proximity to a farm protected under RTF.²⁰⁰ This required communication reduces the potential for surprised buyers and potential future nuisance suits.

IV. OTHER ISSUES FACING AQUACULTURE PRODUCERS IN VIRGINIA

Without the protections of Virginia's RTF law, much less the implicit endorsement seen in Maryland, Virginia's aquaculture producers currently face a difficult path to operating without fear of nuisance suits. Additionally, while demonstrating that Virginia courts are unwilling to extend RTF protections to aquaculture producers, the zoning conflict at the heart of *Bavuso* also highlights further challenges facing aquaculture producers in Virginia. Apart from potential nuisance suits, Virginia's aquaculture industry faces the hurdles of zoning restrictions and potential public misperception.²⁰¹

¹⁹³ A search for Washington State cases was conducted on 17 November 2020 using the LexisNexis Uni database.

¹⁹⁴ See *Geoduck Aquaculture in South Puget Sound*, UNIV. OF WASHINGTON ENVTL. MGMT. CERT. PROGRAM (Mar., 2015), <https://eos.ucs.uri.edu/EOSWebOPAC/OPAC/Common/Pages/GetDoc.aspx?ClientID=EOSMAIN&MediaCode=13993749>.

¹⁹⁵ *Id.*

¹⁹⁶ The “Dillon Rule” limits the regulatory powers of municipal governments in Virginia so that they must be expressly granted by the General Assembly. See Andrew R. McRoberts*, Annual Survey of Virginia Law: Local Government Law, 46 U. RICH. L. REV. 176, (2011), <https://advance-lexis-com.proxy.wm.edu/api/document?collection=analytical-materials&id=urn:contentItem:549T-TB30-00CV-R0S2-00000-00&context=1516831>.

¹⁹⁷ See *Washington Cities Have More Powers Than We Think*, MUNICIPAL RES. AND SERV. CTR. (Aug 25, 2016), <http://mrsc.org/Home/Stay-Informed/MRSC-Insight/August-2016/Washington-Cities-Have-More-Powers-Than-We-Think.aspx>.

¹⁹⁸ See Grays Harbor County, Washington Code of Ordinances § Sec. 8.34.020 (2020).

¹⁹⁹ See WASH. REV. CODE § 64.06.022 (2020) (disclosure of possible proximity to farm or working forest); see also WASH. REV. CODE § Sec. 8.34.040 (2020) (additional disclosure provisions).

²⁰⁰ WASH. REV. CODE § 64.06.022.

²⁰¹ Oesterling Interview, *supra* note 8.

Some confusion may stem from the regulatory framework between the state and localities. Under Virginia's existing framework, the state owns and maintains control over the "bottomland" or land beyond the mean low-water mark (MLW).²⁰² The Virginia legislature has further delegated the enforcement authority over this area to the VMRC.²⁰³ VMRC is tasked with management of the state's oyster ground leasing program.²⁰⁴ In contrast, Virginia law reserves exclusive zoning authority over "upland areas" -- areas on the landward side of the MLW -- to localities.²⁰⁵ However, an additional complication arises in regard to structures such as piers, docks, and wharves. Such structures that extend "along the waterfront" of a locality fall under concurrent jurisdiction of both the county or locality and the state.²⁰⁶

For aquaculture producers, this structure of mixed zoning authority is of critical importance. This is chiefly because many aquaculture producers, including oyster farmers, rely on the bottomland areas as a "field" for their products, while simultaneously conducting much of their operation -- preparing products for sale, maintaining equipment, conducting business activities -- on land, under the zoning authority of a locality. Effectively, this construction forces producers to straddle two jurisdictions. Subsequently, due to a lack of RTF protections, localities are free to impose zoning constraints and permitting requirements on aquaculture producers.²⁰⁷

An example of this is *Carter v. Garret*, a zoning dispute in York County that erupted after county officials notified an oyster farmer that the land-based components of his operation were in violation of the county zoning ordinance.²⁰⁸ Initially, a court found that the farmer -- Garrett -- acted in accordance with the county's zoning requirements, which permitted crop or livestock farming within an "RR" zoning district.²⁰⁹ However, the Supreme Court of Virginia overruled this decision, hinging its determination on the meaning of the word "livestock."²¹⁰ According to the court, Garrett's land operations were in violation of the county's ordinance because he was not engaged in crop or livestock farming.²¹¹ Because the county's ordinance defined "livestock" as animals and exclusively defined "animals" as vertebrates, oysters (invertebrates) could not be considered livestock.²¹² Ultimately, based solely on an inquiry into the statutory definition of "animal" offered in a county zoning ordinance, the court concluded that Garrett "had no right to continue his operation" because he was in violation of a county ordinance that applied solely to the land-based components of his operation.²¹³

The outcome of *Carter* suggests that without RTF protection, aquaculture producers may be burdened with county permit requirements that are not imposed on traditional agricultural activities. Notably, before beginning his operation, Garrett "obtained all necessary permits from

²⁰² VA. CODE ANN. § 28.2-1200 (West 1998).

²⁰³ VA. CODE ANN. § 28.2-1204 (West 1998).

²⁰⁴ VA. CODE ANN. §§ 28.2-600-650 (setting guidelines for VMRC management).

²⁰⁵ *Id.*

²⁰⁶ *See Jennings v. Northumberland*, 708 S.E.2d 841 (Va. 2011) (citing VA. CODE ANN. § 15.2-3105 (1997)).

²⁰⁷ *See Carter v. Garrett*, 2014 WL 11398526.

²⁰⁸ *Id.* at *1.

²⁰⁹ *Id.* at *1.

²¹⁰ *Id.* at *2.

²¹¹ *Id.*

²¹² *Id.* at *3.

²¹³ *Id.*

the state” related to aspects of his activity that would take place on state land -- “the low-lying areas of the York River.”²¹⁴ However, Garrett’s operation also took place on land under county authority and he was thus required to obtain a special use permit (SUP) from York County.²¹⁵ This additional permitting requirement was also at issue in *York v. Bavuso*, as York County officials similarly sought to exert county permitting control over activities on county land.²¹⁶ These permits may be difficult to obtain. In a strong contrast from typical RTF language, York County characterizes SUPs as a “privilege granted by the county” and requires an array of detailed information for an SUP application, including survey plats, sketches, and a permitting history.²¹⁷

Finally, the zoning and permitting issues in *Carter* highlight another challenge facing aquaculture producers: an administrative process that is partially reliant on public perception.²¹⁸ For example, while Virginia’s aquaculture leasing and permitting process is relatively streamlined, the existing framework contains the standard provisions of public notice and comment when a lease application is submitted.²¹⁹

For oyster producers in particular, this is further complicated by the imposition of permit requirements when cultivation techniques enter the water column, such as the implementation of floating cage techniques, even within an existing operation.²²⁰ These permit applications trigger additional public notice requirements, creating the potential for multiple periods of public notice and comment in relation to a single shellfish operation.²²¹ Notably, market pressures related to oyster production have incentivized the use of floating oyster cages, which lead to higher yields and larger individual oysters.²²² Because floating cages necessarily present a more severe navigational hazard and may be more visually unappealing, oystermen who seek to use the “floating cage method” must apply for a specific permit to do so, regardless of the fact that their previous production methods may have been in compliance with state requirements.²²³

Public perception of aquaculture in Virginia itself may also be changing due to a larger, national trend of coastal population growth. Coastal regions across the United States are home to a bulk of the nation’s population and are expected to grow increasingly crowded.²²⁴ Currently, nearly 60% of Virginia’s population resides in coastal areas.²²⁵ Moreover, Virginia’s population as a whole is increasingly made up of transplants, as approximately five in ten Virginia residents were born outside of the state.²²⁶ Some in the aquaculture industry have speculated that an infusion of non-native Virginians into coastal regions has resulted in an increase in use conflicts, as new

²¹⁴ *Carter v. Garrett*, 2014 WL 11398526 at *1.

²¹⁵ *Id.* at * 2.

²¹⁶ See *County of York v. Bavuso*, 160104, 2016 WL 6304568 *1.

²¹⁷ See SPECIAL USE PERMITS, YORK COUNTY, <https://www.yorkcounty.gov/184/Special-Use-Permits>.

²¹⁸ Oesterling Interview, *supra* note 8.

²¹⁹ VA. CODE ANN. § 28.2-606 (1992), VMRC also offers an online leasing and permit monitoring tracker. available to broader public. See <https://webapps.mrc.virginia.gov/public/habitat/>.

²²⁰ VA. ADMIN. CODE § 20-1130-30 (2007); see also VA. CODE ANN. § 28.2-606 (1992).

²²¹ VA. ADMIN. CODE § 20-1130-30; see also VA. CODE ANN. § 28.2-606.

²²² Oesterling Interview, *supra* note 8.

²²³ VA. ADMIN. CODE § 20-1130-30 (2007).

²²⁴ NATIONAL COASTAL POPULATION REPORT: POPULATION TRENDS FROM 1970 TO 2020, NOAA, 3 (2013).

²²⁵ NOAA, *Fast Facts: Virginia* (2015), <https://coast.noaa.gov/states/virginia.html>.

²²⁶ VIRGINIA SOCIO-DEMOGRAPHIC CHARACTERISTICS, VIRGINIA DEPT. OF HEALTH., 1 (2016).

property owners may not be accustomed to coexisting or living alongside existing aquaculture operations.²²⁷

V. POTENTIAL SOLUTIONS AND CONSIDERATIONS

Virginia's aquaculture industry faces significant challenges to securing the protections currently extended to traditional agriculture through Virginia's RTF law. A threshold problem of defining aquaculture and a complicated backdrop of public perception present two of the main hurdles for the industry's producers. Five approaches – each with their own challenges -- may offer an opportunity for aquaculture producers, regulators, and property owners to resolve use conflicts across Virginia.

A. Adding “Aquaculture” to Virginia’s Existing RTF Law

Perhaps the most straightforward solution -- including aquaculture under the definition of qualifying “agricultural operations” for the purposes of Virginia’s RTF law -- would protect an industry which contributes mightily to the state’s economy.²²⁸ An inclusive amendment to Virginia's RTF law would also help to eliminate the definitional problem reflected by the Virginia Supreme Court’s holding in *Bavuso*.²²⁹ However, conceptions of local authority primacy over waterside land and a concern about possible backlash in the form of restrictive zoning over traditional agriculture pose serious challenges for this solution.²³⁰

Extending Virginia's current RTF protections to aquaculture would have a threshold advantage: increased protection for one of Virginia’s most economically vibrant industries.²³¹ In fact, Virginia’s aquaculture industry currently outpaces several “traditional” agricultural industries in the state, including fruits, wheat, and hogs, for annual production value (Fig 3).

²²⁷ Oesterling Interview, *supra* note 8.

²²⁸ See *supra* Part II-A(3) (discussing economic impact of Virginia’s aquaculture industry).

²²⁹ *County of York v. Bavuso*, 160104, 2016 WL 6304568 *1.

²³⁰ See VMRC & VDACS, COMMERCIAL AQUACULTURE, PRIVATE LANDOWNER RIGHTS, AND LOCAL GOVERNMENT AUTHORITY, REPORT TO DELEGATE HARVEY B. MORGAN (Sept. 2011).

²³¹ See *supra* Part II-A(3) (discussing economic impact of Virginia’s aquaculture industry).

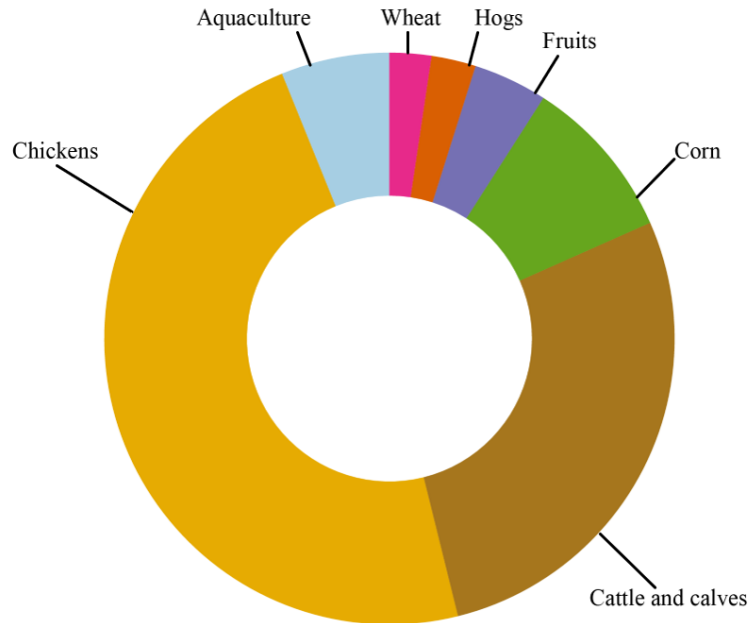


Figure 3. A comparison in annual value of production (dollars) of aquaculture in Virginia and several of the large Virginia agricultural industries. Aquaculture value was available for the year 2018; however, the most recent data for all other industries was 2017. It is important to note the chickens group represents broilers, corn does not include sweet corn production, and fruits includes apples, grapes, and peaches, which comprise the majority of all fruit sold in Virginia. Aquaculture data is from the United States Department of Agriculture's (USDA's) 2018 Census of Agriculture, Volume 3, Part 2. Agriculture data is from USDA's Virginia Agricultural Statistics 2018 Annual Bulletin.

As Virginia's aquaculture industry has expanded and increasingly contributed to the state's economy over the past decade, efforts have been made to include aquaculture under Virginia's RTF law. In 2011, Virginia Senator Thomas Norment introduced Senate Bill 1190 (SB 1190), which would have followed the "Maryland approach" by amending Virginia's RTF law to include aquaculture. Specifically, SB 1190 would have altered the law's definition section such that the term "agricultural operation" was inclusive of "the production and harvest of products from the practice of aquaculture."²³² Lurking behind the proposed legislation was a connection to *Carter v. Garrett*, the dispute in York County over the treatment of aquaculture under the local zoning ordinance.²³³ After being cited by the county, Garrett asked Senator Norment -- whose district includes York County -- for legislative assistance.²³⁴

Despite surviving a Senate vote, SB 1190 was met with swift and diverse opposition,

²³² S.B. 1190, *Aquaculture Production Activities, Authority of local Governments*, 2011 Session (Va. 2011).

²³³ See *supra* Part IV (discussing leasing and other issues).

²³⁴ Joanne Kimberlin, *Modified "Oyster Bill" Advances over York Objections*, VIRGINIAN PILOT (Feb. 8 2011), https://www.pilotonline.com/government/virginia/article_66f5e339-0756-5d31-a178-a9d1f28940f1.html.

suggesting that the political or public will to amend Virginia's RTF law may be lacking.²³⁵ Walter Zaremba, a member of the York County Board of Supervisors, denounced SB 1190 as an "outrageous end-run around County authority."²³⁶ Other York County officials expressed a fear that if aquaculture were to be included under RTF protections, the county's zoning and permitting authority would be constrained because counties would, for example, no longer have authority to require aquaculture producers to obtain SUPs.²³⁷

At the state level, a report co-authored by VMRC and the Virginia Department of Agriculture and Consumer Services (VDACS) and commissioned by the Virginia House of Delegates grimly cautioned that the proposed changes to the RTF law could "have unintended consequences" for the state's agricultural economy.²³⁸ According to the report, allowing aquaculture producers to enjoy RTF protections could incentivize fearful localities to restrict the amount of areas zoned for agricultural use, thereby lessening the amount of available land reserved for land-based agricultural producers.²³⁹ Representatives from the agriculture and aquaculture industries, along with VMRC and VDACS personnel contributing to the report were also unable to arrive at a "consensus" about the overall impacts of amending Virginia's RTF law.²⁴⁰ According to Andrew Smith, Associate Director of the Virginia Farm Bureau, an additional difficulty may arise because Virginia state lawmakers would be forced to add a provision to an RTF amendment which made clear that the amendment was "declarative of existing law."²⁴¹ This term is sometimes used by the Virginia General Assembly when it "wishes to clarify a statute or correct an interpretation of a statute."²⁴²

While a political stalemate and internal industry fears appear to have foreclosed the possibility of amending Virginia's RTF law to include aquaculture, Maryland's RTF law offers proof that inclusion is possible, even amid controversy. Maryland extended RTF protections to aquaculture in 1998.²⁴³ Unlike Virginia, opposition to formal, legal protection for aquaculture in Maryland has traditionally stemmed from watermen who rely on traditional wild harvesting for their business and who may view aquaculture as a competitive threat.²⁴⁴ Implicitly addressing this conflict, Maryland's inclusion of aquaculture under its RTF law has been accompanied by "more than \$2 million in subsidized loans" along with "training and technical help" to incentivize participation in the industry.²⁴⁵ Also, industry experts and producers have criticized Maryland's

²³⁵ See 2011 Session, LEGISLATIVE INFORMATION SYSTEM, VIRGINIA GENERAL ASSEMBLY <https://lis.virginia.gov/cgi-bin/legp604.exe?111+cab+HC10210SB1190+SB1REF>

²³⁶ Kimberlin, *supra* note 234.

²³⁷ *Id.*

²³⁸ VMRC & VDACS, *supra* note 230 at 9.

²³⁹ *Id.*

²⁴⁰ *Id.*

²⁴¹ Telephone interview with Andrew Smith, Associate Director of Virginia Farm Bureau, (Oct. 15, 2020) [HEREINAFTER Smith Interview].

²⁴² *Virginia International Gateway v. City of Portsmouth*, 834 S.E. 2d 234, n.1 (Va. 2019). There may be a resistance to "correcting" the interpretation of the RTF law, given its long history of operation within the state.

²⁴³ 1998 Maryland Laws Ch. 386 (S.B. 404).

²⁴⁴ See, e.g., AQUACULTURE POLICY, UNIV. MD. EXT., <https://extension.umd.edu/aquaculture/oysters/aquaculture-policy> (discussing a pattern of opposition since the early 1900s).

²⁴⁵ Timothy B. Wheeler, *Oyster Farming Off to a Slow Start in Maryland*, BALTIMORE SUN (Jun. 20, 2011), <https://www.baltimoresun.com/news/environment/bs-gr-aquaculture-delays-20110619-story.html>.

aquaculture permitting process as overly complicated.²⁴⁶ Still, the Maryland's efforts towards inclusion and stakeholder participation may offer a useful example for Virginia lawmakers to consider.

B. Establishing Best Management Practices for Aquaculture

At least eighteen states require terrestrial farms to follow some variation of BMPs in order to receive the protection of their respective RTF laws.²⁴⁷ These BMPs serve as important safeguards that Courts use to determine if a farm is conducting operations responsibly and without detrimental impacts to the environment.²⁴⁸ Given the variation of techniques that are used to farm different aquatic species, it is logical to assume aquaculture operations would be required to follow similar BMPs. However, of the twelve states which include aquaculture in their RTF laws, only three (New Jersey, Florida, and Louisiana) offer some form of mandatory BMPs.²⁴⁹ Several other states require farms to follow generally accepted practices,²⁵⁰ which can lead to subjective interpretation by multiple parties.

Florida created a BMP manual for aquaculture in 1998.²⁵¹ The manual, which was most recently amended in 2016, is maintained and distributed by the Florida Department of Agriculture and Consumer Services.²⁵² There are seven pages dedicated to shellfish culturing methods, including a section on harvesting restrictions.²⁵³ Louisiana's BMP manual, which was produced by faculty from the Louisiana State University Agricultural Center, is primarily focused on pond aquaculture methods for catfish, alligators, and crawfish.²⁵⁴ There are no sections specifically dedicated to shellfish culturing.²⁵⁵ The Rutgers Agricultural Experiment Station Cooperative Extension and New Jersey Department of Agriculture created the New Jersey BMP manual for aquaculture, which includes some requirements for oyster farming, most of which are focused on disease management.²⁵⁶

²⁴⁶ *Id.* at 244; *see also* Part IV- Other Issues Facing Aquaculture Producers in Virginia.

²⁴⁷ T.J. Centner, *Agricultural Nuisances: Qualifying Legislative "Right-To-Farm" Protection Through Qualifying Management Practices*, 3 LAND USE POL'Y. 259-267 (2002).

²⁴⁸ *See Best Management Practices for Maine Agriculture*, ME. DEPT. OF AGRIC. (Jan., 2007), http://mainegov.informe.org/dacf/php/nutrient_management/documents/BMP-Manual-Final-January-2007.pdf.

²⁴⁹ *See Comparison Of State Right-To-Farm Laws That Include Aquaculture*, SEA GRANT L. CTR. (Jun. 2018), <https://nsglc.olemiss.edu/projects/ag-food-law/files/rtf-comparison.pdf>.

²⁵⁰ *Id.*

²⁵¹ *See Aquaculture Best Management Practices*, FL. DEPT. OF AGRIC. AND CONSUMER SERVICES (2020), <https://www.fdacs.gov/Agriculture-Industry/Aquaculture/Aquaculture-Best-Management-Practices>.

²⁵² *See Aquaculture Best Management Practices Manual*, FL. DEPT. OF AGRIC. AND CONSUMER SERVICES (Nov. 2016), https://www.fdacs.gov/content/download/64045/file/BMP_Rule_and_Manual_FINAL.pdf.

²⁵³ *Id.*

²⁵⁴ *See Aquaculture Environmental Best Management Practices*, LA. STATE UNIV. AGRIC. CTR. (Jun. 2011), <https://www.lsuagcenter.com/~media/system/d/5/f/8/d5f8504ea9ec68e88875b15b969891f2/aquaculture%20bmpspdf.pdf>.

²⁵⁵ *Id.*

²⁵⁶ *See Recommended Management Practices For Aquatic Farms*, NJ. DEPT. OF AGRIC. (Mar. 2004), <https://www.state.nj.us/seafood/aquacultureamp.pdf>.

The main goal of each of the three existing BMP manuals is to limit the impact of aquaculture on the environment.²⁵⁷ However, a BMP manual for aquaculture also has underutilized potential to serve as an effective tool to prevent legal disputes between farmers and nearby landowners. With oyster aquaculture in mind, a BMP manual that limits sound and light levels during certain times of the day could be an effective compromise between the two groups. The density of floating cages and individual oysters within a farm has been correlated with environmental perturbation²⁵⁸ and could lead to increased visual nuisance for neighbors. Limits on cage density per acre would help manage both of these issues. Theoretically, a density limit for floating cages that is based on current scientific literature would fall at least three times above average densities currently used by Virginia oyster farmers.²⁵⁹

A BMP manual could also help improve public perception, and subsequently sales, of various farmed aquatic species in Virginia. Florida affirms that the commitment of agricultural operations to following BMPs demonstrates their dedication to protecting the environment.²⁶⁰ Additionally, farms that are found to be adhering to the BMP manual through independent inspection could be given an “eco-label”.²⁶¹ This process could tremendously benefit finfish aquaculture in Virginia, which faces an uphill battle to convince consumers of its quality and low impact on the environment.²⁶² In 2016, the Washington Shellfish Initiative (WSI) released their initial recommendations to promote the growth of environmentally-friendly shellfish aquaculture.²⁶³ One of the ten recommendations focused on the development of consistent BMPs.²⁶⁴

Virginia has already begun the difficult task of creating an aquaculture BMP manual. In 2008, VIMS scientists worked in collaboration with several oyster farmers to develop BMPs for the shellfish culture industry.²⁶⁵ The use of this manual, which was endorsed by VDACS and includes a section on preventing user conflicts, is not mandated by Virginia law.²⁶⁶ Similarly, the Maryland Aquaculture Coordinating Council developed a non-mandatory BMP manual for aquaculture in 2007.²⁶⁷ These BMPs are intended as a roadmap for farmers to avoid negative

²⁵⁷ See *Comparison of State Right-to-farm laws that include aquaculture*, SEA GRANT L. CTR. (Jun. 2018), <https://nsglc.olemiss.edu/projects/ag-food-law/files/rft-comparison.pdf>.

²⁵⁸ Comeau *et al.*, *supra* note 146.

²⁵⁹ *Id.*

²⁶⁰ See *Agricultural Best Management Practices (BMPs) – Why Participate, and How?*, UF/IFAS BLOGS (Aug. 22, 2012), <http://blogs.ifas.ufl.edu/calhounco/2012/08/22/agricultural-best-management-practices-bmps-why-participate-and-how/>.

²⁶¹ Claude E. Boyd & C. Wesley Wood, *Aquaculture Best Management Practices As A Possible Focus For Future PD/A CRSP RES.* (2000), <http://pdacrsp.oregonstate.edu/pi/WhitePapers.pdf>.

²⁶² See *supra* Part II (detailing public perception issues facing finfish aquaculture globally).

²⁶³ Raye Ophelia Evrard, *Washington Shellfish Aquaculture: Assessment of the Current Regulatory Frameworks* (2017) (Doctoral dissertation).

²⁶⁴ *Id.*

²⁶⁵ Michael Oesterling & Mark Luckenbach, *Best Management Practices For The Virginia Shellfish Culture Industry* (2008), <https://scholarworks.wm.edu/reports/1422/>.

²⁶⁶ *Id.*

²⁶⁷ *Best Management Practices - A Manual For Maryland Aquaculture*, MD. AQUACULTURE COORDINATING COUNCIL (2007), https://www.environment.gov.za/sites/default/files/legislations/guidebestmanagementpractice_aquaculturedevelopmentandoperation_maryland.pdf.

environmental impacts and prevent user conflicts.²⁶⁸ Maryland's BMP manual is remarkably comprehensive and includes several sections for minimizing conflicts.²⁶⁹ Both states relied on input from stakeholders when crafting their BMP manuals, a practice that results in good public policy and more widely supported BMPs.²⁷⁰

Another useful resource provided by Maryland is their Aquaculture Siting Tool.²⁷¹ This is an online, interactive map that is meant to serve as a guideline for individuals who are locating prospective areas for aquaculture development.²⁷² Similarly, the VMRC provides an interactive Chesapeake Bay Map (CBM) that includes the spatial distribution of various features that could potentially conflict with the establishment of shellfish aquaculture operations in Virginia, such as SAV coverage, active oyster leases, public grounds, and shellfish condemnation zones.²⁷³ Consulting the CBM tool could be emphasized in a prospective BMP manual when farmers are selecting sites for aquaculture.

C. Revamping Aquaculture Zoning, Leasing, and Permitting Processes

Notably, Virginia's current zoning, leasing, and permitting processes for aquaculture operations have received deserved praise for ease-of-use in comparison to similar processes in Maryland.²⁷⁴ Equally, the public notice and comment provisions related to these processes are indeed vitally important to resolving land use conflicts more generally. Accordingly, improvements to Virginia's regulatory framework would involve the adoption of two simple measures: (1) limiting the ability of localities to impose permit requirements on aquaculture producers when those producers are in compliance with state leasing and permitting, and (2) fortifying the public comment and notice period with public education.

In *Carter v. Garrett*, the aquaculture producer complied with all state-level permitting and leasing requirements. But, because his land-based operations fell under county zoning authority, he also had to comply with additional local requirements.²⁷⁵ Barring localities from imposing their own zoning or permitting requirements over an already compliant operation offers a straightforward solution to this problem. Moreover, curtailing a locality's permitting power over aquaculture may offer a compromise -- as it would not necessarily require adding aquaculture to the definition of "agricultural operation" for purposes of Virginia's RTF law.

Relatedly, the public notice and comment periods frequently attached to zoning and permitting decisions should be preserved. However, the process may benefit from the addition of a public education component, such as those discussed in Part V-D. For example, a public notice and comment period related to aquaculture permitting could trigger an automatic distribution of a

²⁶⁸ *Id.*

²⁶⁹ *Id.*

²⁷⁰ Michael D. Kaplowitz & Frank Lupi, *Stakeholder Preferences For Best Management Practices For Non-Point Source Pollution And Stormwater Control*, 3-4 LANDSCAPE AND URBAN PLANNING, 364-372 (2012).

²⁷¹ See *Maryland Aquaculture Siting Tool*, NCCOS, <https://coastalscience.noaa.gov/products/maryland-aquaculture-siting-tool/>.

²⁷² *Id.*

²⁷³ See *Chesapeake Bay Map*, VMRC, https://webapps.mrc.virginia.gov/public/maps/chesapeakebay_map.php.

²⁷⁴ See Wheeler, *supra* note 244.

²⁷⁵ See *Carter v. Garrett*, 2014 WL 11398526.

“guide to aquaculture.” Ultimately, public notice and comment could be used as a vehicle for increased collaboration and communication between property owners, aquaculture producers, and other stakeholders.

D. Improving Communication, Collaboration, and Education

When asked to identify the single most significant challenge facing aquaculture producers in Virginia, Virginia Shellfish Growers Association Executive Director Mike Oesterling gave a straightforward answer: communication.²⁷⁶ Oesterling explained that in his experience, the common root of use conflicts related to aquaculture is miscommunication, related either to the nature of specific aquaculture practices (like floating cages, for example) or to a more generalized lack of consensus between regulators, the traditional agriculture community, and the aquaculture industry.²⁷⁷ Current lack of consensus regarding the place of aquaculture alongside land-based agriculture is particularly noteworthy given the publicly pro-aquaculture positions of two major stakeholders: the Virginia Farm Bureau and Virginia localities. For example, the Virginia Farm Bureau features numerous pro-aquaculture articles on its website and its Associate Director Andrew Smith has reiterated that the group strongly supports aquaculture in Virginia.²⁷⁸ Several Virginia counties also espouse a pro-aquaculture position, with some even featuring dedicated websites detailing aquaculture’s history and growth in the respective area.²⁷⁹ Taken together, these implicit endorsements broadly suggest that pro-aquaculture sentiment indeed exists across Virginia.

Accordingly, the mechanisms needed to improve communication and foster increased collaboration among stakeholders may already exist. For example, the Virginia Shellfish Growers Association counts the Virginia Farm Bureau as one of its partners, strongly suggesting the possibility of increased communication and dialogue regarding aquaculture.²⁸⁰ Ironically, the collaboration behind the 2011 report outlining the potentially negative consequences of including aquaculture under Virginia’s RTF law also reflects a possible channel of communication: the report was prepared by VMRC and VDACS.²⁸¹ This collaboration between two state agencies -- one with authority over aquaculture and another with authority over agriculture -- indicates that future pro-aquaculture collaboration may be possible. Furthermore, a collaborative approach to aquaculture regulation or management may be the best approach to protecting the interests of all stakeholders. In Maryland, for example, interagency collaboration has been used to develop unique

²⁷⁶ Oesterling Interview, *supra* note 8.

²⁷⁷ Oesterling Interview, *supra* note 8.

²⁷⁸ See *Aquaculture*, VA. FARM BUREAU, <https://vfbarticles.personifycloud.com/news-and-features/categories/tag/aquaculture-1> (Virginia Farm Bureau site containing numerous articles promoting aquaculture); see also Smith Interview, *supra* note 241.

²⁷⁹ See, e.g., *Aquaculture*, NORTHAMPTON COUNTY, http://northampton.hosted.civillive.com/business/bountiful_northampton/aquaculture (Northampton County website detailing lengthy history of aquaculture and opportunities for expansion within the county).

²⁸⁰ Oesterling Interview, *supra* note 8.

²⁸¹ See S.B. 1190, *supra* note 232.

aquaculture BMPs and make recommendations to the Maryland general assembly about overall management of the state's industry.²⁸²

Concurrently, Virginia's aquaculture industry may face a problem of public perception, particularly in areas with higher populations of newcomers to the coast who may not be as accustomed to aquaculture activity.²⁸³ Mirroring a nationwide concern, Virginia aquaculture may also face an additional public perception challenge, as there may be a common and mistaken notion that aquaculture provides a breeding ground for diseases and imperils water quality.²⁸⁴

To help solve these problems, Virginia's aquaculture industry may benefit from a public education campaign -- as experts have noted that "better communication and investigation of the real versus perceived impacts of aquaculture could aid in clarifying the debate about aquaculture, and help support future sustainable growth."²⁸⁵ Again, the mechanisms for a public education effort related to aquaculture may already exist. For example, VMRC currently hosts a "Habitat Permit and Applications" search tool on its website.²⁸⁶ The tool allows the public to view detailed information about all permit and leasing applications, either pending or dispensed.²⁸⁷

Through this existing well-managed web platform, VMRC could also engage in public education efforts, such as providing a "neighbor's guide to aquaculture" alongside permit and lease application information. Doing so may help to quell fears related to aquaculture from adjacent property owners, who may be closely monitoring the VMRC application listings. Such a guide may offer concise information about the impacts of various aquaculture operations, illustrations of aquaculture practices, and contact information for the appropriate regulatory authority. Following the examples of Washington State and several Washington Counties,²⁸⁸ Virginia could also include a disclosure requirement for the sellers of a residential property within close proximity to an aquaculture site. As part of such disclosure requirement, sellers would inform the potential buyer of the nearby aquaculture operation and could share a "neighbor's guide to aquaculture". However, this approach would likely be met with strong opposition from Virginia's realtor community, which has previously fought the imposition of a similar disclosure requirement related to the flood history of residential properties.²⁸⁹

Virginia may also avoid future use conflicts between aquaculture producers and property owners by adopting a program to encourage public involvement in aquaculture techniques. Notably, the Maryland Department of Natural Resources currently operates the "Marylanders

²⁸² See *Managing Maryland Aquaculture*, TASK FORCE ON SEAFOOD & AQUACULTURE (2004), https://www.nab.usace.army.mil/Portals/63/9_Managing_Maryland_Aquaculture.pdf (BMP report created by numerous committees and subcommittees made up of state officials, aquaculture experts, and local residents).

²⁸³ Oesterling Interview, *supra* note 8.

²⁸⁴ Halley E. Froehlich & Rebecca R. Gentry *et al.*, *Public Perceptions Of Aquaculture: Evaluating Spatiotemporal Patterns Of Sentiment Around The World*. 1 PLOS ONE, e0169281 (2017).

²⁸⁵ *Id.*

²⁸⁶ See *Habitat Management Permits and Applications*, VMRC (application form), <https://webapps.mrc.virginia.gov/public/habitat/>.

²⁸⁷ See *id.*

²⁸⁸ See *supra* Part III (discussing aquaculture and RTF issues in Washington).

²⁸⁹ See Emily Snyder & Clay Kuleza, *Let The Buyer Beware: A Comparison of Flood-Related Real Estate Disclosure Laws of Virginia and Other States*, VIRGINIA COASTAL POL'Y CTR. (2020), <https://law.wm.edu/academics/programs/jd/electives/clinics/vacoastal/reports/realestatedisclosures.pdf>

Grow Oysters” program, in which “citizen partners” volunteer their private docks as fostering locations for young oysters.²⁹⁰ While Maryland’s program is primarily directed at restoring wild oyster beds, Virginia could follow a similar approach with respect to aquaculture. For example, neighboring property owners could be encouraged to similarly participate in the early stages of oyster growth. By developing a “Virginians Do Aquaculture” program, Virginia regulators could help create a sense of “buy-in” and collaboration which may eliminate future conflict between aquaculture operators and property owners. This strategy seems particularly viable given Virginia’s pre-existing “oyster gardening” program, which currently encourages property owners to develop their own mini-oyster cultures.²⁹¹ By adding a partnerships component to this program, Virginia may be able to foster positive relationships between aquaculture producers and property owners. For example, in exchange for growing out spat for aquaculture producers, property owners could be given a portion of the producer’s ensuing harvest.

E. Developing an Independent Right-to-Aquaculture Law

An aspirational approach to enhancing protections for aquaculture producers in Virginia could be the development of a new, Right-to-Aquaculture or “RTA” law. This model may help to alleviate pressures currently placed on Virginia’s RTF law, as aquaculture producers would no longer be forced to argue that their activities fit within a statutory definition of “agricultural operations” and members of the agricultural community would no longer have a reason to oppose it as a threat to their industry.²⁹² However, the development of an RTA law would require careful planning and collaboration among all possible stakeholders, suggesting the critical importance of both consensus regarding BMPs and improved communication among affected groups.²⁹³ A RTA law may also present significant challenges that should be mitigated in advance, within the text of the law itself.

A RTA law in Virginia could generally follow the framework of the state’s existing RTF structure. Of course, the RTA law would shield aquaculture producers from nuisance suits, provided their operation was “first in time.”²⁹⁴ In addition, a RTA law could, like Virginia’s current RTF law, prohibit localities from enacting zoning ordinances that “restrict or regulate” aquaculture practices unless there is a “health, safety, [or] general welfare” concern.²⁹⁵ Conceivably, a RTA law with this second element could foster harmony among stakeholders. Producers would enjoy added protection; localities would be empowered to continue their zoning oversight; and property owners would be assured that aquaculture operations which presented health and safety risks would be curtailed.

Developing an independent RTA law also presents an opportunity for an additional benefit to aquaculture producers, the possibility of *future-proofed* protections. Given that many

²⁹⁰ See *Citizens Working to Enhance Maryland’s Oyster Reefs*, MD. DEPT. OF. NAT. RES., <https://dnr.maryland.gov/fisheries/pages/MGO/index.aspx> (detailing Marylanders Grow Oysters program).

²⁹¹ See *Virginia Oyster Gardening*, VA. COASTAL ZONE MGMT. PROGRAM, <https://www.deq.virginia.gov/Portals/0/DEQ/CoastalZoneManagement/vaoystergarden.pdf> (guide to Virginia’s oyster gardening program).

²⁹² See *supra* Part III-A (discussing problems leading up to *Bavuso* case).

²⁹³ See *supra* Part V-D (discussing communication).

²⁹⁴ See VA. CODE ANN. § 3.2-302(A) (West 2018).

²⁹⁵ See VA. CODE ANN. § 3.2-300 (*et. seq*) (West 2014).

aquaculture producers -- and oyster producers in particular -- must respond to market pressures by continuously improving their techniques, a holistic RTA law would allow for this flexibility.²⁹⁶ A law that allows aquaculture producers the freedom to experiment with new technologies or techniques within a specified “experimental” zoning district would resolve some of the current permit challenges facing aquaculture producers in Virginia.²⁹⁷

However, constructing a new RTA law in Virginia would require a culmination of adequate, consensus-driven BMPs and effective communication between all stakeholders. As a threshold matter, BMPs would help to ensure both water quality protection and the non-obstruction of other uses, such as navigation. Adequate BMPs would also help in the event that aquaculture producers face legal action; as in the traditional RTF context, Virginia courts have expressed unease at making BMP determinations when adjudicating suits brought by adjacent property owners.²⁹⁸ Moreover, a lack of clarity regarding *who* determines what is an acceptable BMP has resulted in criticisms of RTF laws nationwide.²⁹⁹ Thus, a RTA law would require firm BMP guidance that is driven by both science and the participation of all stakeholders.³⁰⁰ Relatedly, a RTA framework would demand increased collaboration, both in the threshold determination of BMPs and in the law’s continuing operation.

VI. CONCLUSION

Escalating conflict of use between private landowners and aquaculture producers in coastal Virginia presents opportunities. A population infusion to the region offers the chance for environmentally and economically conscious development. With proper management, a mature clam farming industry and an expanding oyster industry can also offer benefits to both Virginia residents and the environment. More pragmatically, these two groups are reliant on each other: aquaculture producers need a market, many coastal home-owners want bivalves on their dinner table, and both need good water quality. It is the duty of Virginia legislators to ensure these coastal stakeholders may grow together peacefully.

While other aquaculture-leading states continue to develop nuisance protections for their expanding aquaculture industries, Virginia’s industry has been left without a meaningful safeguard against nuisance suits. Instead, Virginia lawmakers and courts have relied solely on a textualist reading of the state’s RTF law, preventing Virginia aquaculture producers from enjoying the same protections found in other states. After a thorough review of various RTF laws, agriculture, aquaculture, and related legal cases, this paper concludes that the most direct solution would be for the legislature to amend the Virginia RTF law to include aquacultural operations. However, to mitigate environmental impact and shield residents from unjust nuisances, it is critically important that some form of mandatory BMPs be concurrently developed with this statutory change. Additional solutions that warrant consideration include leasing and permitting reform, bolstering

²⁹⁶ Oesterling Interview, *supra* note 8.

²⁹⁷ See *supra* Part IV- Other Issues Facing Aquaculture Producers in Virginia (noting that an additional permit is required when new aquaculture techniques are used, even within an existing operation).

²⁹⁸ See *Wyatt v. Sussex Surry, LLC*, 2007 WL 5969399.

²⁹⁹ See *supra* Part I (discussing critique of RTF laws forcing agricultural producers “to farm by the book”).

³⁰⁰ See *supra* Part V - B (recommending strategies for developing aquaculture BMPs in Virginia).

communication between stakeholders, and the possible creation of a novel RTA law. With these considerations in mind, Virginia is capable of fostering responsible industry development.

As Virginia's aquaculture industry continues to impress on a national stage, the state should consider investing in the research, initiatives, and collaboration that would allow new aquaculture technologies to emerge. These technologies may allow for aquaculture expansion into less contested waters further offshore, thereby offering a more permanent solution to land use conflicts. Until then, Virginia should look to developing strategies which draw a careful compromise between all affected stakeholders.