Cage Fights:

Oyster Farming User Conflicts and Regulatory Responses in Three Southeastern States

*Katie Hill**

Introduction

The eastern oyster, *Crassostrea virginica,* has a long and storied history on America's eastern seaboard. Before colonization, near-shore waters were teeming with oysters,[1] and massive Native American shell mounds, known as middens, were found from Maine to Florida.[2] Oysters were a staple of colonial and early American diets, consumed in impressive quantities by all.[3] Although domestic and foreign appetites depleted many natural stocks, intrepid oystermen found ways to maintain their availability. Today, many coastal communities maintain historic, cultural, and economic ties to this precious bivalve.

This history of the oyster in America is marked by conflict. Colonial oyster farmers patrolled their beds with loaded muskets,[4] and turf disputes developed.[5] By the end of the 19th century,

* Research Professional, University of Georgia Carl Vinson Institute of Government. J.D. The author would like to thank Hunt Revell, Shana Jones, and Scott Pippin for their insights and support. Special thanks are extended to the state regulators who graciously answered many emails concerning their oyster farming programs. The development of this article was funded by a grant (NOAA-OAR-SG-2019-2005953) from the National Sea Grant Office, National Oceanic and Atmospheric Administration, United States Department of Commerce. All views, opinions, findings, conclusions, and recommendations expressed in this material are those of the author and do not necessarily reflect the opinions of the Sea Grant Program, National Oceanic and Atmospheric Administration, or the United States Department of Commerce.

[1] In the 1600s, Captain John Smith described oysters in the Chesapeake Bay "as thick as stones." ROWAN JACOBSON, THE LIVING SHORE: REDISCOVERING A LOST WORLD 58 (2009).

[2] *See* MARK KURLANSKY, THE BIG OYSTER: HISTORY ON THE HALF SHELL 14 (2007).

[3] *See id.* at 34-37, 79, 112, 134.

[4] *See id.* at 134.

[5] As early as 1700, Raritan Bay was the subject of numerous disputes between New York and New Jersey oystermen, leading the provincial government to divide the Bay in half. *See id.* at 90.

competition over dwindling stocks led to moonlight raids against "oyster pirates," acts of violence, and even death.[6] These disputes were less likely to result in bloodshed as states developed regulatory regimes governing oyster harvests, but conflicts remained, particularly between traditional oystermen and those using modern harvesting methods.[7]

Despite its tumultuous past, today's eastern oyster appears refined: bred for specific traits, raised in confinement, and manicured to appeal to the tastes of discerning gourmands. The taming of this delectable shellfish is accomplished through the use of oyster farms – groups of cages filled with growing oysters that either rest on the bottom of shallow coastal waters or float in deeper areas. Oyster farming has become an important industry in many coastal states but has also introduced a new chapter in oyster-related squabbles: conflicts with coastal water users and waterfront property owners vexed by oyster farming's potential impacts to recreation and riparian views.[8] Although not as bloody as past conflicts, these bivalve brouhahas are nevertheless a particularly slippery issue for the regulators charged with balancing competing interests in coastal waters.

[6] In the Chesapeake Bay in the late 1800s, violence erupted between oyster dredgers and harvesters using the less efficient hand tongs, who were concerned that the dredgers – who were operating in violation of an anti-dredging ban – would monopolize and destroy oyster beds. These conflicts resulted in several deaths. In February of 1882, the Governor of Virginia led a raid against a fleet of illegal dredgers near the mouth of the Rappahannock River, catching 46 dredgers who were all sentenced to a year in prison. By 1884, a state-owned steamer was patrolling the Chesapeake Bay for illegal dredgers. *See* James Tice Moore, *Gunfire on the Chesapeake: Governor Cameron and the Oyster Pirates, 1882-1885*, 90 VA. MAG. HIST. & BIOGRAPHY 367–8, 376 (Jul. 1982).

[7] *See, e.g.*, Associated Press, *Watermen Oppose Maryland Plan to Dredge Oyster Bar*, WASH. POST, Nov. 28, 1988, at BF4.

[8] This article does not cover another type of oyster conflict – that between "watermen" who harvest wild oysters and more modern oyster farmers who rely on cultivation. *See, e.g.*, Jennifer Steinhauer, *A New Bounty of Oysters in Maryland but There Is a Snag*, N.Y. TIMES, Nov. 6, 2014, at A12.

This article reviews oyster farming user conflicts[9] and regulatory responses in three southeastern states: North Carolina, South Carolina, and Georgia. The southeastern U.S. is an ideal environment for growing oysters. The region's coast is generally less densely developed than areas in the northeast, so the water quality issues detrimental to oyster farming in many areas are less of an impediment to the industry's growth. Southeastern waters are also relatively warm, so oysters grow to market size months or years faster than northern bivalves. Southerners love oysters, and the coastal and low country regions of the states covered here have important historical and cultural ties to this most delicious of mollusks.

In North Carolina, the rapid growth of oyster farming has engendered both excitement and concern, with the legislature and state agencies introducing many initiatives designed to mitigate disputes without forsaking industry growth. South Carolina has a much smaller industry than North Carolina, but recent high-profile conflicts prompted one state lawmaker to introduce legislation that could significantly curtail oyster farming in the state. In Georgia, one of the last coastal states to regulate oyster farming, avoidance of conflicts was a major factor in the unique, and somewhat controversial, policy that regulators utilize for siting farms.

As the experiences of these three southeastern states show, there is no magic formula for supporting a robust oyster farming industry while eliminating user conflicts. North Carolina is engaged in a challenging balancing act, enjoying the benefits of a growing coastal industry while

[9] Notably, riparian property owners' viewsheds do not make them public trust "users" according to most states' public trust doctrines, *see generally* Michael Blum, et al., *The Public Trust Doctrine in Forty-Five States*, LEWIS & CLARK LAW SCHOOL LEGAL STUDIES RESEARCH PAPER (March 2013), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2235329, but we still use the term "user conflict" to refer to disputes concerning views from waterfront homes.

contending with frequent conflicts concerning farm siting. South Carolina has taken a more laisse faire approach to industry growth, but has experienced high-profile conflicts that have reached the halls of its legislature. In Georgia, it remains to be seen whether the state's new, unique program will be able to support an economically significant industry. If it does, it could become a model for other coastal states.

Each state's goals for their aquaculture industries and public trust waters are unique, and as such this article does not make specific recommendations concerning approaches to mitigate user conflicts. Instead, it is the hope of the author that detailing the experiences of these states and providing examples of potentially useful techniques may help regulators and other stakeholders make decisions based on their own circumstances and priorities. Interestingly, as discussed in the conclusion, there has been a trend in recent years to place more responsibility for managing user conflicts with oyster farmers themselves under the theory of social license.

This article has six parts. Part I describes the history and modern practice of oyster farming in the U.S. In Part II, I describe the general approach for regulating oyster farming in the U.S. and in the southeastern states covered in this article. Here the focus is on the siting and approval processes for oyster farms. On-shore operations, which require a foray into local land use law, are not covered, nor are laws and other policies concerning health and safety in oyster sales and distribution. Part III summarizes the types of user conflicts commonly associated with the oyster farming industry and describes the three southeastern states' unique experiences. Part IV describes four common mechanisms states utilize to manage oyster farming user conflicts: farm siting and associated techniques, farmer suitability criteria and education, public notice and

comment, and public education and outreach. It also details how each of the three states covered uses each technique. Part V is the conclusion.

I. *How the shell did we get here? The history and modern practice of oyster farming.*

Shellfish have been cultivated for human consumption for at least 3,500 years.[10] On the coast of British Columbia, Indigenous Peoples constructed clam gardens to grow native shellfish for food.[11] The first evidence of oyster farming arrived a couple of millennia later. Aristotle wrote of fishermen transplanting oysters to a more favorable spot where the bivalves "fattened greatly."[12] Sergius Orata, Praetor of Rome in 97 B.C., farmed oysters in Lucrine Lake in Southern Italy; ancient vases depicting seaside scenes from this time suggest that the Romans may have grown oysters on thick ropes hanging in the water, a practice that continues today in some parts of the world.[13] Oyster farming continued in Europe, though large-scale cultivation accelerated in the 19th century when natural beds became depleted.[14]

In the U.S., oyster cultivation began with oystermen simply moving small "seed" oysters from one place to another. In the 19th century Chesapeake Bay seed oysters were moved to depleted beds further north, where they could reach a suitable market size in about a year.[15] Schooners filled with Chesapeake seed oysters would sail back and forth over northern beds while men

[10] *See* Nicole F. Smith et al., *3500 Years of Shellfish Mariculture on the Northwest Coast of North America*, PLOS ONE 13 (Feb. 27, 2019),, https://doi.org/10.1371/journal.pone.0211194 .
[11] *See id.* at 2.
[12] *See* KURLANSKY, *supra* note 2, at 115.
[13] *See* R.T. Gunther, *The Oyster Culture of the Ancient Romans*, 4 J. MARINE BIOLOGICAL ASS'N U.K. 360, 360–65 (1897); KURLANSKY, *supra* note 2, at 116.
[14] *See* KURLANSKY, *supra* note 2, at 117–21.
[15] *See* KURLANSKY, *supra* note 2, at 121–22.

shoveled them over the side.[16] As seems to be the case with all methods of oystering, conflicts arose. Those who planted oyster seed in depleted natural beds claimed that they had the exclusive right to harvest there, much to the chagrin of traditional harvesters who alleged that the beds were never totally depleted of wild oysters and were therefore open to harvest by any state resident.[17] These disputes led to the first shellfish leases in New York and New Jersey when courts decided that oystermen had the right to file for leases in areas they wanted to plant, so long as no natural beds were present.[18] Eventually, organizations were formed in New York and New Jersey that patrolled cultivated beds to guard against poachers.[19]

In recent years, another form of oyster farming has been growing in many parts of the U.S., including the southeast. Off-bottom oyster farming (also called intensive oyster farming) uses some variety of mesh container, such as a bag or a cage, that is held above the seafloor.[20] The container protects the oysters from predators, prevents burial in sediment, and allows the farmer to control fouling (the growth of other organisms, such as barnacles or even other oysters, on the gear and the oysters being grown for market).[21] Off-bottom farming promotes faster growth and increases survival, and even allows farmers to create a shell shape and appearance that is desirable for the high-end half-shell restaurant market.[22] These advantages, coupled with a

[16] *See* KURLANSKY, *supra* note 2, at 122.
[17] *See id.*
[18] *See id.*
[19] *See id.* Seed transplantation to shallow beds, known as bottom culture, continues today in places like the Chesapeake Bay, where the firm substrate and shallow depths needed for the practice are common. *See Bottom Culture*, UNIV. OF MD. EXTENSION, https://extension.umd.edu/resource/bottom-culture (last visited Mar. 10, 2023).
[20] *See* William C. Walton et al., *Off-Bottom Oyster Farming*, ALA. COOP. EXTENSION SYS. TIMELY INFO., FISHERIES & AQUACULTURE SERIES 1 (July 2012), https://www.researchgate.net/publication/301625835_OFF-BOTTOM_OYSTER_FARMING.
[21] Fouling is controlled by periodically exposing the containers to air and by cleaning them. *Id.*
[22] When brittle oyster shells come into contact with another object, they chip and then grow back with a deeper "cup" that holds more of the liquid, or oyster "liquor," that is popular with gourmands. Because oysters farmed in off-bottom operations are "singles" that are not clumped together like wild oysters, wave action in off-bottom

consistently high demand for pricey half-shell oysters in recent years, have resulted in the rapid growth of off-bottom oyster farming in some states.[23] [24]

In the three states I examine in this article, there are two off-bottom oyster farming methods that are commonly used. The first, utilized on shallower intertidal bottoms that are periodically exposed during low tide, involves the use of cages or racks that hold mesh bags of oysters off of the water bottom. The second, used above deeper water bottoms not exposed at low tide, utilizes cages or bags that float just below the surface of the water. These floating farms are attached to pilings or anchored buoys to secure them in place. In states with thick, muddy sediments in intertidal areas, floating farms can be more productive.[25]

Off-bottom oyster farming begins at an oyster hatchery. There, adult oysters spawn in tanks to create oyster larvae that eventually grow into baby oysters, also called oyster seed or oyster

operations knocks oysters against one another to create a deeper cup. Singles can also be placed in mechanical tumblers for the same effect. *See Oyster Grow-Out: How to Get the Prettiest Oyster of Them All*, ELEMENT SEAFOOD (June 14, 2016), https://www.elementseafood.com/oyster-grow-out-how-to-get-the-prettiest-oyster-of-them-all/; Laura Thomas, 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 1–2 (2019). The University of Florida has compared the appearance of oysters grown in different types of floating off-bottom gear. *See Online Resource Guide for Florida Shellfish Aquaculture: Floating Gear Comparison for Off-Bottom Oyster Culture*, UNIV. OF FLA. INST. OF FOOD & AGRICULTURAL SCIS., https://shellfish.ifas.ufl.edu/oyster-culture-other-projects/floating-gear-comparison-for-off-bottom-oyster-culture/ (last visited Nov. 13, 2023).

[23] *See, e.g.*, Frank Graff, *Oysternomics: New Report Highlights Economic Impact of Oysters in North Carolina*, PBS NORTH CAROLINA (Jan. 5, 2024) (stating that oyster harvests from oyster farms have increased by more than 500% since 2012 in North Carolina); Todd Price, *Why your next tasty Gulf Coast oyster could come from a cage*, DAILY ADVERTISER (Dec. 19, 2019) (describing the "rapidly growing business" of off-bottom oyster farming in some southern states).

[24] *See* UGA MARINE EXTENSION AND GEORGIA SEA GRANT, SINGLE SEED FLOATING CAGE OYSTER CROP BUDGET, (May 2020).

spat.[26] Oyster seed is then moved to a nursery[27] – either on-shore or in coastal waters (usually an upweller system on a dock) – operated either by the hatchery or the farmer. When the oysters reach a suitable size, typically between 1/8 to ¾ of an inch, they are moved to the farm.[28] The oyster farmer tends to their product, controlling fouling[29] and periodically sorting, tumbling, and culling oysters.[30] When oysters are ready to harvest, anywhere from six months to three years after planting depending on water temperature and other factors,[31] the farmer must abide by strict time and temperature handling requirements when getting the product to shore and distributed to consumers.[32] Oyster farming is hard, physically exhausting work, and farmers must contend with risks over which they have little to no control: storms, disease, pests, and water pollution, to name a few.[33]

---

[26] *See Oyster Aquaculture: Raising Oysters*, VA. INST. OF MARINE SCI., https://www.vims.edu/research/units/centerspartners/abc/aquaculture/index.php (last visited Nov. 13, 2023).
[27] *See* Ian Duthie, *Shellfish Production Aquaculture Technology: Global Perspective of Bivalve Hatchery Processes*, NUFFIELD AUSTRALIA FARMING SCHOLARS 36–38 (Oct. 2012).
[28] *See 2023 Seed Order Form*, DOWN EAST MARICULTURE SUPPLY CO., https://www.downeastmariculture.com/purchase-oyster-seed (last visited Nov. 13, 2023) (selling *Virginica* oyster seed between 4mm (~1/6 in.) and 3/4 in.); *Oyster Seed*, CHATHAM SHELLFISH CO., https://chathamoysters.com/oyster-seed/ (last visited Nov. 13, 2023) (selling *Virginica* oyster seed between ¼ in. and ¾ in.); *Oyster Seed Sales*, UNIV. OF MD. CTR. FOR ENV'T SCI. HORN POINT LAB'Y OYSTER HATCHERY, https://hatchery.hpl.umces.edu/oyster-seed-sales/ (selling *Virginica* oyster seed between 2-4mm (~1/12-1/6 in.) and 6-10mm (~1/4-2/5 in.)).
[29] *See* Shannon Hood et al., *Biofouling Control Strategies: A Field Guide for Maryland Oyster Growers*, UNIV. OF MD. EXTENSION (July 2020).
[30] *See* South Carolina Sea Grant Consortium, *Tank to Table: How Single Oyster Mariculture Works*, 31 COASTAL HERITAGE MAG., no. 2, Summer 2018, at 12.
[31] *See* Connie Lu, *The Relationship Between the Oyster Growing Cycle and Supply*, PANGEA SHELLFISH CO. (June 27, 2014), https://www.pangeashellfish.com/blog/oyster-life-cycle-on-farm (explaining that oysters take approximately eighteen to twenty-four months to grow to market size in New England waters); Rob Crabtree, *Bivalve Aquaculture: A Case for Oyster Farming*, EDIBLE (May 18, 2023), https://ediblenortheastflorida.ediblecommunities.com/food-thought/bivalve-aquaculture-oyster-farming (noting Florida oysters can grow to market size in as little as six months); *Oyster Prospecting with Landsat 8*, NASA LANDSAT SCIENCE (Aug. 24, 2017), https://landsat.gsfc.nasa.gov/article/oyster-prospecting-with-landsat-8/ (noting it takes roughly three years for oysters to reach marketable size in Maine's cold waters).
[32] *See* U.S. FOOD & DRUG ADMIN., NAT'L SHELLFISH SANITATION PROGRAM (NSSP): GUIDE FOR THE CONTROL OF MOLLUSCAN SHELLFISH 2019 REVISION 79–80 (2019) [hereinafter NSSP], http://www.fda.gov/Food/GuidanceRegulation/FederalStateFoodPrograms/ucm2006754.htm.
[33] *See generally* Rookie Mistakes for New Growers to Avoid, E. COAST SHELLFISH GROWERS ASSOC., https://ecsga.org/rookie-mistakes/ (last visited Dec. 20, 2023) (noting, among other things, that "Mother Nature is your partner, not your friend").

Proponents of oyster farming often point to its economic and environmental benefits. Oyster farming can support economic growth in coastal communities, and the industry has become significant in some states.[34] In North Carolina, it has emerged as a "key coastal industry," supporting 532 jobs and providing over $27 million in economic impact in the state.[35] In Georgia, researchers at the University of Georgia (UGA) estimate that if the state's industry grew from its current size of 54 acres of floating oyster farms to 500 acres it could support approximately 405 jobs with over $33 million in sales.[36]

Oyster farming can also provide important ecosystem services and improve coastal environments. One service these farms can provide is water quality improvements.[37] Oysters are filter feeders and require no outside source of food other than what they find in the ambient water.[38] They remove nutrients and particles from the water column as they feed, with a single adult oyster able to filter up to 50 gallons per day.[39] The farms themselves can also provide

[34] *See, e.g.*, JONATHAN VAN SENTEN ET AL., VA. TECH & ENGLE-STONE AQUATICS, ANALYSIS OF THE ECONOMIC BENEFITS OF THE MARYLAND SHELLFISH AQUACULTURE INDUSTRY 8–9 (showing a 24% annual growth of the oyster farming industry in Maryland between 2013 and 2018).
[35] *See* Eric Edwards, *The Economic Impact of North Carolina's Shellfish Mariculture Industry*, N.C. STATE UNIV. (May 17, 2021), https://content.ces.ncsu.edu/the-economic-impact-of-north-carolinas-shellfish-mariculture-industry#:~:text=North%20Carolina%27s%20shellfish%20industry%20provides,of%20wild%20clams%20and%20oysters..
[36] *See* UNIV. OF GA., ECONOMIC IMPACT ESTIMATES FOR SUB-TIDAL, FLOATING CAGE OYSTER AQUACULTURE LEASES IN GEORGIA 2 (2020), https://care.gacoast.uga.edu/wp-content/uploads/2022/08/Economic_Impact_Estimates_Oyster_Aquaculture.pdf.
[37] One study examining "non-fed" aquaculture practices (bivalve and seaweed farming) found that oyster aquaculture could remove between 150 and 612 kilograms of nitrogen per hectare per year, with a value of between $4,854 and $19,781 per hectare per year in areas where nutrient trading was in effect. *See* Luke Barrett et al., *Sustainable Growth of Non-Fed Aquaculture Can Generate Valuable Ecosystem Benefits*, 53 ECOSYSTEM SERVS., 2022, at 8.
[38] *See What Do Oysters Eat?*, IN A HALF SHELL https://www.inahalfshell.com/journal/what-do-oysters-eat (last visited Dec. 20, 2023).
[39] *See Water Cleaning Capacity of Oysters Could Mean Extra Income for Chesapeake Bay Growers*, NAT'L CTRS. FOR COASTAL OCEAN SCI. (Mar. 2, 2020), https://coastalscience.noaa.gov/news/water-cleaning-capacity-of-oysters-could-mean-extra-income-for-chesapeake-bay-growers-video/.

habitat and shelter for various species, including fish and other species that are commercially important.[40] This service may be most valuable in places where natural oyster reefs have been damaged or destroyed.[41]

Oyster farms can also play a role in restoring wild oyster populations. Oysters are a keystone species in coastal environments: oyster reefs provide critical habitat for other species and, as noted above, maintain and improve water quality. [42] They can also provide storm protection and other societal and economic benefits in coastal communities.[43] Unfortunately, unsustainable harvesting and pollution have decimated oyster reefs and the services they provide.[44] In recent years, oyster restoration efforts have been launched across the U.S., including in formerly significant oyster fisheries such as the New York Harbor[45] and the Apalachicola Bay.[46] Oyster farming can help support these and other restoration efforts through spawning at farm sites and, indirectly, through the use of recycled shell for restoration projects. Many farmed oysters spawn in their cages,[47] releasing larvae into coastal waters.[48] In areas with low wild oyster populations, these larvae can act as seed oysters that attach onto natural or installed substrate, becoming

[40] *See* Barrett et al., *supra* note 37, at 3.
[41] *See id.*
[42] *See Oyster Reef Habitat*, NOAA FISHERIES, https://www.fisheries.noaa.gov/national/habitat-conservation/oyster-reef-habitat (last visited Nov. 15, 2023).
[43] *Id.*
[44] *Id.*
[45] *See* THE BILLION OYSTER PROJECT, https://www.billionoysterproject.org/ (last visited Nov. 15, 2023).
[46] *See* Holly Binns & Chad Hanson, *Plan Unveiled for Restoring Florida's Apalachicola Bay and Its Oysters*, PEW (Nov. 16, 2021), https://www.pewtrusts.org/en/research-and-analysis/articles/2021/11/16/final-plan-unveiled-for-restoring-floridas-apalachicola-bay-and-its-oysters.
[47] Triploid oysters, which have three sets of chromosomes, are sometimes used by oyster farmers because they are sterile and do not expend energy spawning. These oysters can occur in the wild, though triploid oysters used on oyster farms are usually developed at a hatchery. *See* I*nterest in Shellfish Aquaculture Leads to Misconceptions About Triploid Oysters*, N.C. ENV'T QUALITY (May 2018), https://www.deq.nc.gov/about/divisions/marine-fisheries/news-media/insight-newsletter/may-2018/interest-shellfish-aquaculture-leads-misconceptions-about-triploid-oysters.
[48] *See* Melanie J. Bishop et al., *Oyster Reef Restoration – Aquaculture Interactions: Maximizing Positive Synergies*, FRONTIERS IN MARINE SCI., Sept. 19, 2023, at 4.

progenitors of future wild populations. Importantly, oyster farms can also support reef restoration efforts through shell recycling programs. Across the U.S., groups like New York City's Billion Oyster Project,[49] the Chesapeake Bay's Shell Recycling Alliance,[50] and Athens, Georgia's Shell to Shore[51] are partnering with restaurants to collect used shell and repurpose it in coastal oyster restoration projects. These programs can connect restaurants to oyster farmers and educate oyster consumers on the important environmental role oysters play. Interestingly, in a survey conducted by UGA's Carl Vinson Institute of Government, 85% of respondents indicated they would be willing to pay between 5 and 25 cents more for individual oysters if the extra money supported oyster shell recycling programs.[52]

II. *A bushel of rules: the regulatory framework controlling oyster farming in state waters*

a. General framework amongst the states

With some exceptions, oyster farming regulatory regimes are similar across coastal states.[53] Oyster farming occurs in shallow coastal waters, the vast majority of which are owned by the states and maintained in the public trust.[54] Decisions about siting and other regulation of oyster

[49] *See* THE BILLION OYSTER PROJECT, *supra* note 45.
[50] *See Shell Recycling*, OYSTER RECOVERY P'SHIP, https://www.oysterrecovery.org/get-involved/shell-recycling (last visited Nov. 15, 2023).
[51] *See* SHELL TO SHORE, https://www.shelltoshore.com (last visited Nov. 15, 2023).
[52] *See* BRIAN SIMMONS ET AL., UNIV. OF GA., CARL VINSON INST. OF GOV'T, OYSTER ECONOMIC OPPORTUNITIES: REGIONAL CUSTOMER SURVEY 44 (2023).
[53] For a review of the regulatory structures of five southeastern states – Georgia, North Carolina, South Carolina, Alabama, and Florida – *see* Hunt Revell, *Saltwater Ecology and Economics on the Half-Shell: Comparing Georgia's New Oyster Law to Its Southeastern Neighbors*, 12 ARIZ. J. ENVTL. L. & POL'Y 323 (Summer 2022) [hereinafter *Saltwater Ecology and Economics*].
[54] *See Overview of the Public Trust Doctrine*, SEA GRANT L. CTR., https://nsglc.olemiss.edu/projects/waterresources/files/overview-of-the-public-trust-doctrine.pdf (last visited Dec. 20, 2023).

farms must, therefore, conform to each state's version of the public trust doctrine, which is a legal principle that establishes preservation of certain natural resources for public use.[55] Typically applied to water resources, the public trust doctrine requires that states must, at a minimum, manage coastal waters to protect the public's navigation, commerce, and fishing rights.[56] (Notably, none of the three states examined in this article explicitly include riparian viewsheds – the waterfront views that can be seen from a particular property – in the rights protected under their public trust doctrines. As described below, aesthetics often come into play in oyster farming user conflicts with waterfront property owners.[57])

Because the public trust doctrine requires that states hold outright title to public trust waters,[58] oyster farming sites are secured under the auspices of a lease or permit. Typically, a prospective oyster farmer identifies a preferred farm location in coastal waters designated by the states as suitable for shellfish aquaculture due to water quality indicators and other characteristics.[59] The prospective farmer then submits necessary applications and other information to the state agency that regulates shellfish aquaculture, usually a state coastal environmental agency or, at times, the state's agricultural agency.[60] Farm locations must conform to siting rules that may include

[55] *See* Shively v. Bowlby, 152 U.S. 1, 26 (1894).
[56] *See id.* at 11.
[57] *See generally* Sarah Everhart & Danielle Naundorf, *The Oyster vs. The View: Legal Attempts to Hinder Maryland's Shellfish Aquaculture Industry*, 35 SPG NAT. RESOURCES & ENV'T. 19 (2021). For an examination of aesthetic considerations in environmental law, with a specific focus on coastal Maine see Nancy Walworth, *Regulating Aesthetics of Coastal Maine: Kroeger v. Department of Environmental Protection*, 11 OCEAN & COASTAL L.J. 99 (2006). *See also* Hope Babcock, *Is Using the Public Trust Doctrine to Protect Public Parkland from Visual Pollution Justifiable Doctrinal Creep?*, 42 ECOLOGY L.Q. 1 (2015).
[58] *See Shively*, 152 U.S. at 1. There are some limited exceptions to this requirement, such as when a landowner can show clear title to submerged lands stretching back to a grant from the King. *See id.* at 552.
[59] *See* NSSP, *supra* note 32, at 45–47, 49.
[60] Florida's shellfish aquaculture program is, for example, regulated by the Florida Department of Agriculture and Consumer Services. *See Shellfish*, FLA. DEP'T OF AGRIC. & CONSUMER SERVS., https://www.fdacs.gov/Agriculture-Industry/Aquaculture/Shellfish (last visited Nov. 15, 2023).

setbacks from shore;[61] compatibility with areas used for navigation, fishing, or other uses;[62] size limitations;[63] and other requirements. State laws and regulations may also place limits on the total number of acres a farmer may have the right to farm,[64] specify allowable gear types[65] and gear management requirements,[66] and stipulate required training or other qualifications.[67] Once an application has been received, agency officials review it for completeness and determine whether the site and application conform with siting standards and other requirements.[68] Public notice and/or meetings may be conducted,[69] after which the responsible agency decides whether or not to issue the oyster farming lease or permit. Lease or permitholders must secure any additional state and federal permits[70] before placing oyster farming gear at the site.

States also regulate shellfish sanitation and handling to protect public health; these requirements must conform to the standards of the U.S. Food and Drug Administration's National Shellfish Sanitation Program[71] and are beyond the scope of this article. Leases or permits for wild harvest

[61] *See, e.g.*, 15A N.C. ADMIN. CODE 3O.0201(a) (2022).
[62] *See, e.g.*, N.C. GEN. STAT. § 113-202(a).
[63] *See, e.g.*, *Leasing Shellfish Grounds and New Lease Opportunities*, CONN. DEP'T OF AGRIC., https://portal.ct.gov/DOAG/Aquaculture1/Aquaculture/Shellfish-Grounds-Leasing-Procedures-and-Lease-Opportunities (last visited Nov. 14, 2023) (stating the policy of a five-acre minimum and two-hundred-acre maximum bid for shellfish leases).
[64] *See, e.g.*, GA. DEP'T OF NAT. RES. COASTAL RES. DIV., SHELLFISH POLICY MANUAL 19–21 (2021) [hereinafter SHELLFISH POLICY MANUAL] (establishing a thirty-acre limit on subtidal oyster farms for individuals or partnerships).
[65] *See* HUNT REVELL, MARINE EXTENSION & GA. SEA GRANT, CARL VINSON INST. OF GOV'T, 2021 OYSTER MARICULTURE IN GEORGIA: UPDATES TO THE LEGAL AND REGULATORY FRAMEWORK 14 (2021) [hereinafter 2021 OYSTER MARICULTURE IN GEORGIA], https://gacoast.uga.edu/wp-content/uploads/2021/10/2107-OysterAquaculture-WhitePaper-7.pdf (footnote 35, noting that "[t]he fact that floating gear is prohibited on intertidal leases and subtidal leases must be at least six feet effectively prohibits the use of 'long-line' oyster farming systems . . .").
[66] *See, e.g.*, FL DEPT. OF AGRIC. & CONSUMER SERVS., AQUACULTURE BEST MANAGEMENT PRACTICES MANUAL 38–40 (2022).
[67] *See, e.g.*, 15A N.C. ADMIN. CODE 3O.0202(d) (2022). *See also* N.C. GEN. STAT. § 113-201(c) (2023) (lessees must complete required training).
[68] *See, e.g.*, S.C. CODE UNANN § 50-5-900(A) (2023); S.C. CODE UNANN § 50-5-910(A) (2023).
[69] *See, e.g.*, N.C. GEN. STAT. § 113-202(f) (2023).
[70] *See, e.g.*, Reissuance and Modification of Nationwide Permits, 86 Fed. Reg. 2744, (Mar. 15, 2021) (to be codified at 33 C.F.R. ch. undef.).
[71] *See* NSSP, *supra* note 32, at 2, 3, 156.

or traditional cultivation methods and recreational harvest areas open to the public are also regulated by the states and are not discussed here.

b. *Regulatory framework in North Carolina, South Carolina, and Georgia*

Here, we provide a general overview of North Carolina, South Carolina, and Georgia's regulatory frameworks for oyster farming. We provide oyster farm numbers for North Carolina and South Carolina from 2019, the last year for which accurate numbers for each were available. Current numbers are provided for Georgia's new oyster farming program.

1. *North Carolina*

In North Carolina, the Department of Environmental Quality Division of Marine Fisheries (NCDMF) regulates the issuance of oyster farming leases in the state's public trust waters.[72] North Carolina offers both on-bottom leases for intertidal farms and water column leases for floating farms.[73] Applicants propose lease locations, though NCDMF is considering siting clustered lease zones in some locations (see Section IV.a.1, below). Lease applications require, among other things, information on applicant qualifications, the location and diagrams of the proposed lease site, and a lease management plan.[74] New lease applicants and those being transferred leases must complete an educational program developed by NCDMF.[75]

[72] *See* N.C. GEN. STAT. § 113-201(b) (2023).
[73] *See* N.C. GEN. STAT. § 113-202 (2023); N.C. GEN. STAT. § 113-202.1 (2023).
[74] *See North Carolina Shellfish Lease Application: The Checklist*, N.C. DEP'T OF ENV'T QUALITY DIV. OF MARINE FISHERIES (Feb. 2022), https://www.deq.nc.gov/marine-fisheries/licenses-permits-leases/shellfish-lease-franchise/2022-shellfish-lease-application/open.
[75] *See* 15A N.C. ADMIN. CODE 3O.0202(d) (2023).

Once a lease application is submitted and is deemed to meet all requirements, the applicant must identify the area sought to be leased with stakes at each corner, marked with a sign provided by NCDMF.[76] NCDMF inspects staked sites for conformance with all applicable siting and other requirements. If the site is in compliance, the agency publishes notices of the intent to lease the site.[77] The NCDMF Secretary considers the lease application, NCDMF's site analysis, and public comments, and may "in [their] discretion" lease or decline to lease the proposed site.[78] The Secretary may also impose special conditions "so that shellfish leases may be issued that would otherwise be denied."[79]

As of 2019, North Carolina had approximately 56 floating and 232 on-bottom oyster farm leases.[80]

2. *South Carolina*

South Carolina's regulatory scheme for oyster farming is somewhat unique in that the state issues permits, rather than leases, for the use of state waters or water bottoms.[81] These permits are issued by the South Carolina Department of Natural Resources (SCDNR).[82] Once a permit application for an oyster farm is received, SCDNR reviews it and makes an issuance

[76] *See* 15A N.C. ADMIN. CODE 3O.0202(e) (2023).
[77] *See* N.C. GEN. STAT. § 113-202(d1), (f) (2023).
[78] 15A N.C. ADMIN. CODE 3O.0203(c) (2023).
[79] *Id.*
[80] *See Saltwater Ecology and Economics*, *supra* note 53, at 372.
[81] *See* S.C. CODE UNANN. § 50-5-900(A) (2023).
[82] *See* S.C. CODE UNANN. § 50-5-15(18) (2023); S.C. CODE UNANN. § 50-5-900(A) (2023).

determination based on the applicant's suitability and whether the application complies with applicable law.[83] If SCDNR finds that the permit application is sound and may warrant approval, it issues a conditional approval and the applicant engages in public notice.[84] After public notice, if a permit is issued, SCDNR may condition the permit on a number of requirements, including a "guarantee of public rights of access and nonconflicting uses of permitted areas".[85] This could, for example, include guaranteeing the public's right to navigate through and fish on the lease site.

The South Carolina Department of Health and Environmental Control (SCDHEC) is also involved. Oyster farm operators must submit an operational plan to SCDHEC,[86] and any person taking oysters from an oyster farm must have an individual harvesting permit, which requires completion of a SCDHEC training program.[87] In addition, SCDHEC establishes summer harvest requirements that oyster farming permittees must include in operations plans in order to receive an out-of-season (i.e., summer) harvest permit from SCDNR.[88] SCDHEC also issues Critical Area Permits required pursuant to the state's Coastal Zone Management Act for development activities in coastal waters, tidelands, and beach/dune systems.[89] The agency has issued General

[83] *See* S.C. CODE UNANN. § 50-5-900(A) (2023); S.C. CODE UNANN. § 50-5-910(A) (2023). Suitability factors include shellfish culture experience, ownership or access to necessary equipment and personnel, possession of appropriate licenses and permits, and previous performance and compliance with natural resource laws.
[84] *See* S.C. CODE UNANN. § 50-5-925 (2023).
[85] S.C. CODE UNANN. § 50-5-915(B) (2023).
[86] *See* S.C. CODE REG. 61-47 O.6 (2023).
[87] *See* S.C. CODE UNANN. § 50-5-965(A), (B) (2023).
[88] *See* S.C. CODE UNANN. § 50-5-997.
[89] *See* S.C. CODE UNANN. §§ 48-39-10 et seq. (2023).

Permits for activities that meet regulatory requirements and have little environmental impact, including mariculture.[90]

SCDNR, SCDHEC, and the U.S. Army Corps of Engineers have developed a Joint Shellfish Mariculture Application that allows mariculture permit applicants to apply for all required permits utilizing one form.[91]

As of 2019, South Carolina had between eight and ten floating and thirty-four on-bottom oyster farms.[92]

3. *Georgia*

In Georgia, approving intertidal (on-bottom) and subtidal (floating) oyster farming locations and issuing leases is the responsibility of the Georgia Department of Natural Resources Coastal Resources Division (GACRD).[93] Georgia's approach to siting oyster farms is unique: prospective oyster farmers do not propose their own sites; they are instead sited by GACRD.[94] On-bottom intertidal leases are sited individually and leased through a competitive bidding process.[95]

[90] *See* S.C. CODE UNANN. § 48-39-130(E) (2023). *See also Critical Area Permitting – General Permits*, S.C. DEP'T OF HEALTH & ENV'T CONTROL, https://scdhec.gov/environment/your-water-coast/ocean-coastal-resource-management-ocrm/critical-area-permitting/critical-area-permitting-general-permits (last visited Dec. 20, 2023).
[91] *See Joint Shellfish Mariculture Application for South Carolina*, S.C. DEP'T OF NAT. RES., https://www.dnr.sc.gov/marine/shellfish/pdf/Mariculture_App2023.pdf (last visited Dec. 20, 2023).
[92] *See* 2021 OYSTER MARICULTURE IN GEORGIA, *supra* note 65, at 26.
[93] *See* GA. CODE ANN. § 27-1-2(22) (2023); GA. CODE ANN. § 27-4-198 (2023); SHELLFISH POLICY MANUAL, *supra* note 64, at 5.
[94] *See* GA. CODE ANN. §27-4-198(a)(1), (b)(1) (2023).
[95] *See* GA. CODE ANN. §27-4-198(a)(1) (2023).

The process for siting subtidal (floating) leases has attracted more attention in Georgia because these types of operations are expected to be more profitable in Georgia's unique coastal environment.[96] Subtidal leases are grouped together in "Mariculture Zones" and leased through a lottery, requirements for which are described in Section __ below.[97] Subtidal leases are awarded through the lottery via a point system, also discussed in section ___. As of the writing of this article, GACRD has sited and leased six subtidal oyster farming leases in two Mariculture Zones, and has sited sixteen intertidal leases.[98]

III. *Spats about spat: common oyster farming user conflicts*

a. *User conflicts in general*

It should come as no surprise that the growth of oyster farming has resulted in conflicts in many states. Coastal population densities[99] and coastal property values have been booming in recent decades,[100] with an associated increase in coastal water recreation.[101] Finding a non-contentious

[96] Georgia's large tidal range means that bottom cages on intertidal leases are difficult to access during high tides. In addition, the prevalence of silty, muddy sediment can increase mortality of oysters grown in bottom cages in Georgia.
[97] The grouping of subtidal leases in Mariculture Zones is not required by Georgia law, but issuing subtidal leases through a lottery is. *See* GA. CODE ANN. §27-4-198(b)(2) (2023).
[98] Intertidal leases categorized as Wild Harvest may also be used for mariculture. There are also five leases on privately owned water bottoms. *See Georgia Shellfish Leasing Dashboard*, GA. COASTAL RES. DIV., https://experience.arcgis.com/experience/4d545949181444dab492a7ebdb4dae47?data_id=dataSource_1-182c6ef1252-layer-5%3A67&views=View-5 (last visited July 14, 2023).
[99] Between 1970 and 2010, coastal shoreline counties and coastal watershed counties added 125 and 99 people per square mile, respectively, compared to an additional 36 people per square mile across the U.S. as a whole. *See* NOAA, NATIONAL COASTAL POPULATION REPORT: POPULATION TRENDS FROM 1970 TO 2020 3 (Mar. 2013).
[100] *See* Jonathan Levin, *Coastal Real Estate Can't Seem to Predict Climate Risk*, Washington Post July 28, 2023.
[101] *See, e.g.*, Joann Muller, *America's Boating Passion Still Afloat after Pandemic*, AXIOS (June 6, 2023), https://www.axios.com/2023/06/06/americans-boating-passion-still-afloat-after-pandemic (noting that recreational boating saw a thirty-five percent increase in annual economic activity between 2018 and 2023).

site for an oyster farm can be difficult. These farms are private, for-profit endeavors[102] that physically occupy near-shore public waters with equipment that is fixed in place and that many find aesthetically unappealing. For some coastal water users and property owners, the environmental and economic benefits of oyster farming do not outweigh impacts to boating, fishing, and views from waterfront properties.[103]

The most common conflicts with oyster farms involve actual or perceived impacts to navigation, recreation, fishing, and aesthetics. I will briefly discuss each of these types of conflict here.

The public trust doctrine protects navigational rights, and most states' siting rules for oyster farms include navigational considerations. Boaters may, however, still have concerns sharing navigable coastal waters with rows of heavy oyster farming gear. Boats running at high speeds that accidentally hit an oyster farm can be damaged and in turn damage the farming gear.[104] Tidal creeks and other narrow coastal water bodies can pose particular challenges, as oyster farms sited in these locations will physically occupy a portion of the navigable channel.[105] Despite the fact that the public trust doctrine and state and federal law would prohibit oyster farms from entirely closing off navigation in any particular coastal water body,[106] and navigational maps show the location of farms,[107] navigation concerns are frequently cited when

[102] Some notable exceptions do exist, such as nonprofit organizations utilizing oyster farms to improve water quality. *See, e.g.*, MORICHES BAY PROJECT, https://morichesbayproject.org/ (last visited July 11, 2023).
[103] *See* Everhart & Naundorf, *supra* note 57, at 20.
[104] *See Inland Bay Oyster Farms Are Being Damaged By Boats*, DEL. SURF FISHING, https://www.delaware-surf-fishing.com/inland-bay-oyster-farms-are-being-damaged-by-boats/ (last visited Oct. 20, 2023).
[105] *See, e.g.*, GA. COMP. R. & REGS. 391-2-4.18(6)(b) (2023) (requiring subtidal lease sites to be at least two hundred feet wide at low tide).
[106] *See Overview of the Public Trust Doctrine*, *supra* note 54.
[107] *See, e.g., NOAA Custom Chart Version 2.0*, NOAA OFFICE OF COAST SURVEY, https://devgis.charttools.noaa.gov/pod/ (last visited Dec. 20, 2023); Dep't of Commerce & Dep't. of Defense, U.S. Chart No. 1, 58 (April 15, 2019) https://www.nauticalcharts.noaa.gov/publications/docs/us-chart-1/ChartNo1.pdf.

people oppose oyster farms.[108] In a case from South Carolina discussed in Section V.b.2 below, petitioners claimed that a floating oyster farm in a tidal creek posed a "navigational obstruction and hazard."[109]

Potential recreational detriments from oyster farms are another common concern, and have much in common with navigational impacts.[110] Oyster farm opponents may assert that a farm's location unreasonably impacts their ability to engage in waterskiing, kayaking, jet skiing, tubing, fishing, shrimping, hunting, and other activities. Oyster farms could reduce the area available for some recreational activities, and because many of these pursuits involve moving boats or people over the water at high speeds, it could be hazardous to conduct them around or near cages, pilings, or other gear or structures. The ability to engage in some stationary activities, such as shrimping, may be virtually extinguished at the oyster farming site.[111] Hunting in coastal duck blinds could be impacted because waterfowl may relocate due to noise and other disturbances when a farmer is working at a nearby site.[112]

---

[108] *See, e.g.*, Carol Britton Meyer, *Proposed Cohasset Harbor Oyster Farm Viewed from Two Perspectives; Proposed Navigation Bylaw Topic at Thursday Meeting*, ANCHOR COHASSET (Oct. 18, 2022), https://cohassetanchor.com/proposed-cohasset-harbor-oyster-farm-viewed-from-two-perspectives-proposed-navigation-bylaw-topic-at-thursday-meeting/; Nancy Lavin, *Contested Point Judith Pond Aquaculture Farm Heads to CRMC Tuesday*, R.I. CURRENT (Sept. 25, 2023), https://rhodeislandcurrent.com/2023/09/25/contested-point-judith-pond-aquaculture-farm-heads-to-crmc-tuesday/. *See also* Magdalena Puniewska, *Farmer, the World May Not Be Your Oyster*, HAKAI MAG. (Jan. 17, 2023), https://hakaimagazine.com/features/farmer-the-world-may-not-be-your-oyster/.

[109] Mulvihill v. South Caroline Department of Health and Environmental Control, No. 18-ALJ-07-0127-CC, 2020 WL 2096567, at *9 (S.C. Admin. L. Ct. Apr. 20, 2020).

[110] *See Mulvihill*, 2020 WL 2096567, at *9, 16; Puniewska, *supra* note 108.

[111] Recreational shrimpers in the southeast use a cast net to catch these shellfish. Cast nets are large circles of netting with weighted edges that are thrown out over the water. As the nets fall into the water, the weights sink and come together, trapping the baitfish or shrimp inside. *See* Richard Thomas, How to Find and Cast Net Your Own Shrimp, SaltStrong, Nov. 5, 2022, at https://www.saltstrong.com/articles/find-and-cast-net-your-own-shrimp/ .

[112] *See* Meeting Minutes, R.I. COASTAL RES. MGMT. COUNCIL (Feb. 9, 2016), http://www.crmc.ri.gov/meetings/2016_0209semi2.html (discussing concerns with an oyster farming application related to duck blinds).

Fishing deserves special mention here. Commercial fishermen may oppose farms that occupy existing fishing grounds, [113] though states typically avoid siting them in these areas. (Oyster farming can, however, be an opportunity for commercial fishermen who seek to diversify their businesses or want to move wholly into shellfish aquaculture due to declines in wild fisheries.[114]) Recreational fishermen can have similar concerns, but some studies[115] and anecdotal evidence[116] suggest that oyster farms actually provide habitat for fish, including sportfish. Indeed, some coastal fishing guides take clients to oyster farms because they can often find fish there.

A final common conflict with oyster farms is when coastal water users or waterfront property owners complain that the farms are smelly, noisy eyesores that ruin the natural beauty of coastal environments (and may impact property values).[117] Although, as noted above, viewsheds are not

[113] *See* Hannah Laclaire, Fishermen Speak Out Against Proposed Oyster Farm in Maquoit Bay, PORTLAND PRESS HERALD (Nov. 20, 2018), https://www.pressherald.com/2018/11/20/fishermen-speak-out-against-proposed-oyster-farm/.

[114] *See* Joshua S. Stoll et al., *Evaluating Aquaculture as a Diversification Strategy for Maine's Commercial Fishing Sector in the Face of Change*, 107 MARINE POL'Y 103583, June 28, 2019, at 3.

[115] A study from Connecticut found that oyster farms utilizing cages can "support ecologically valuable finfish and invertebrate communities." Renee Mercado-Allen et al., *Macrofaunal Assemblages on Oyster Aquaculture and Rock Reef Habitat in Long Island Sound*, 82 N. AM. J. AQUACULTURE 92, 99 (2019). A study in North Carolina found more fish present in areas with off-bottom culture oyster farms than in areas with no farms. *See* Sarah Loftus, *Do Oyster Farms Support More Fish?*, COASTWATCH CURRENTS (Jan. 17, 2020), https://ncseagrant.ncsu.edu/currents/2020/01/do-oyster-farms-support-more-fish/. *See also* Renee Mercaldo-Allen et al., *Oyster Aquaculture Cages Provide Fish Habitat Similar to Natural Structure with Minimal Differences Based on Farm Location*, 10 FRONTIERS IN MARINE SCI. 1058709, Apr. 5, 2023, at 2.

[116] *See Mulvihill*, 2020 WL 2096567, at *7 (noting testimony of oyster farmer that people fish "in and amongst his cages" with no issues navigating between them).

[117] *See generally* Everhart & Naundorf, *supra* note 57. *See also* Hannah Mateer, *As Virginia Strives for a Lead in the Aquaculture Industry, Issues Between Property Owners and Oyster Farmers Rise to the Surface*, 32 REGENT U.L. REV. 135, 146 (2019) (arguing that Virginia's riparian property rights include the right to a scenic view, which has been harmed by the permitting of visible oyster farms); Ben Finley, Associated Press, *A New Oyster War: Rich Homeowners vs. Working-Class Watermen*, WBAL NEWS RADIO (May 1, 2017), https://www.wbal.com/article/236173/130/a-new-oyster-war-rich-homeowners-vs-working-class-watermen; Molly Murray, *Oysters in our backyard? Not so fast*, THE NEWS JOURNAL (Oct. 2, 2014), https://www.delawareonline.com/story/news/local/2014/10/02/oysters-backyard-fast/16613579/. Interestingly, there have also been cases where shellfish growers groups have sued coastal landowners for activities they claimed led to contamination of shellfish beds and surrounding waters. *See* North Carolina Shellfish Growers Association v. Holly Ridge Associates, 278 F. Supp. 2d 654 (E.D.N.C. 2003).

included in the fundamental rights protected under the federal public trust doctrine or under the public trust doctrines of the states examined in this article, aesthetic impacts are often still at the heart of many oyster farm conflicts.[118] Oyster farmers themselves recognize their operations may be unappealing to coastal property owners. The East Coast Shellfish Growers Association's Best Management Practices for the East Coast Shellfish Aquaculture Industry includes a "good neighbor" policy that extolls the importance of operating farms "in a manner that respects the legitimate use of the area by the other stakeholders."[119]

Conflicts involving oyster farms typically play out in several ways. Citizens may comment on proposed farms at public meetings, in local news outlets, on social media, or in other forums.[120] They may organize anti-farming campaigns with petitions, signs, and other activities.[121] They may use regulatory procedures to appeal farm approval decisions,[122] or file private lawsuits.[123]

These conflicts increase the regulatory costs of oyster farming. Agency time and money must be spent responding to residents' concerns, conducting additional outreach, and defending decisions. Conflicts can also spur legislative action. Legislatures may commission studies on user conflicts, direct agencies to amend rules, or even adopt moratoriums in certain areas.[124] In

[118] *See* SHELLFISH LEASE AND AQUACULTURE PROGRAM, *infra* note 129, at 13; GA. CODE ANN. § 52-1-2 (2023); S.B. 648 *infra* note 141.
[119] E. COAST SHELLFISH GROWERS ASS'N, BEST MANAGEMENT PRACTICES FOR THE EAST COAST SHELLFISH AQUACULTURE INDUSTRY 26 (2010).
[120] *See, e.g.*, Randall T. Bentley, *Letter to the Editor: Proposed Oyster Farms: Please, Do Not Do This*, CARTERET COUNTY NEWS-TIMES (Mar. 2, 2022), https://www.carolinacoastonline.com/news_times/opinions/letters_to_editor/article_8685f5ce-997a-11ec-9693-9b7bf551734d.html.
[121] *See, e.g.*, *Protect Segar Cove*, SAVE POTTER POND, https://www.savepotterpond.org/ (last visited Nov. 16, 2023).
[122] *See* North Carolina Shellfish Cultivation Lease Review Committee Third Party Appeals Form, Petitioner's Name: Lukens Island Timber Enterprises, LLC, May 4, 2023 (on file with author).
[123] *See, e.g.*, *Mulvihill*, 2020 WL 2096567, at *1
[124] *See infra* Section b.1.

more extreme cases, as has occurred in South Carolina,[125] legislators may introduce bills that would stymy the growth of oyster farming.

b. User conflicts in North Carolina, South Carolina, and Georgia

1. *North Carolina*

Of the three states examined here, North Carolina has the most history of user conflicts. The state has had multiple legislative moratoriums on shellfish leases in specific areas since 1967; moratoriums put in place in the 1990s were in areas where hundreds of people signed petitions opposing leases.[126] (Some communities were, however, enthusiastic about shellfish aquaculture.[127])

North Carolina began to allow off-bottom oyster farming in 1989, but off-bottom leases were rare for many years.[128] Things changed around 2015, when legislation clarified the ability to acquire water column leases for floating oyster farms.[129] Applications for floating farms began to

[125] *See* S.B. 629, 124th Gen. Assemb., Reg. Sess. (S.C. 2021).
[126] A petition opposing a shellfish lease on the eastern side of Core Sound had over 875 names; it claimed that the lease would interfere with fishing and recreational activities in the area. A state oyster management plan noted that "threats, discriminatory actions, and general ill will" were reported by many involved in contested lease proceedings. *See* N.C. DIV. OF MARINE FISHERIES, NORTH CAROLINA OYSTER FISHERY MANAGEMENT PLAN 98, 100 (2001) [hereinafter N.C. OYSTER FISHERY MANAGEMENT PLAN].
[127] *See, e.g., id.* at 100 (noting that other counties passed resolutions asking the Governor to increase private shellfish farming in their communities).
[128] This may have been due to the fact that the state rental fees of $500/acre were too expensive for many prospective farmers. In 2008, there were only five off-bottom leases covering thirteen acres. *See* N.C. DIV. OF MARINE FISHERIES, NORTH CAROLINA OYSTER FISHERY MANAGEMENT PLAN AMENDMENT II 78 (2008).
[129] *See* 2015 N.C. Sess. Laws 221(water column leasing clarification). *See also* N.C. DIV. OF MARINE FISHERIES, SHELLFISH LEASE AND AQUACULTURE PROGRAM 3, 8 (Feb. 2020) [hereinafter SHELLFISH LEASE AND AQUACULTURE PROGRAM] (presentation to the Marine Fisheries Commission).

skyrocket in the state: shellfish lease applications in the period between 2012 and 2019 were approximately 5,200% higher than applications between 2005 to 2011.[130]A "substantial increase" in user conflicts followed,[131] with an increase in administrative and other legal challenges.[132] A 2019 study on oyster farming user conflicts conducted by the NCDMF and the Marine Fisheries Commission references several of these challenges.[133] In one case, the Administrative Law Judge (ALJ) – a state judge that oversees cases involving agency permits and other decisions – overturned NCDMF's denial of an oyster farming lease based on its finding that public trust user conflicts would result, noting that "[t]he law does not require an area to be traffic free to be approvable because it would not make any sense and would be an almost impossible requirement to meet."[134] The study notes that NCDMF considered appealing the decision to the Superior Court.[135] In another case concerning a homeowner's association's challenge to a lease granted by NCDMF, the ALJ deferred to the agency's determination that the lease was "compatible with lawful utilization by the public of other marine and estuarine resources," noting that NCDMF does not consider impacts to viewsheds when making leasing decisions and that viewsheds are not a criteria considered in any of the relevant statutes or rules.[136] Three other contested case filings referenced by the 2019 user conflicts study were resolved because the North Carolina Legislature placed a moratorium on the issuance of shellfish leases in the county at issue.[137]

[130] N.C. DIV. OF MARINE FISHERIES & N.C. MARINE FISHERIES COMM'N, STUDY ON HOW TO REDUCE USER CONFLICT RELATED TO SHELLFISH CULTIVATION LEASES 5–6 (Nov. 2019) [hereinafter STUDY ON HOW TO REDUCE USER CONFLICT].
[131] SHELLFISH LEASE AND AQUACULTURE PROGRAM, *supra* note 129, at 15.
[132] *See id.* at 12.
[133] *See id.* at 12–14.
[134] *Id.* at 12–13 (citing Sheffield v. North Carolina Division of Marine Fisheries, 16 EHR 02397 (2016)).
[135] *See id.* at 13.
[136] *Id.* (discussing 8.5 Marina Village John F. Matthews VP v. NCDEQ, 17 HER 01382 (2018)).
[137] *See* S.B. 648, 2019 Gen. Assemb., Sess. Law 2019-37 (N.C. 2019) (establishing moratorium on shellfish leasing in the New Hanover County area).

Since this surge in user conflicts, North Carolina has tried to support the growth of a lucrative coastal industry while minimizing impacts to users of public trust waters and coastal property owners, with considerable involvement from the North Carolina legislature. In 2016, the North Carolina General Assembly passed legislation directing a state policy group to hold stakeholder meetings designed to advance efforts to bolster the state's shellfishing industry.[138] The legislation was later amended to require the group to prepare a shellfish mariculture plan that would include, among other things, ways to reduce barriers to entry to shellfish mariculture and an "[a]nalysis of siting strategies that reduce potential user conflicts impeding the siting of shellfish mariculture operations and that protect riparian property owners and the public trust users of estuarine waters for navigation, fishing, and recreation."[139] In 2019, additional legislation required various activities related to user conflicts, including provision for the creation of shellfish enterprise areas and implementation of a shellfish cultivation lease review committee for shellfish lease appeals.[140] The 2019 legislation also established two moratoriums on shellfish leasing in the New Hanover County area, where Wilmington is located, and in Bogue Sound, located near Morehead City.[141] These resulting bills and the various plans, analyses, and regulatory reforms represent a concerted effort by North Carolina legislators, agency officials, and others to create a system where user conflicts are minimized as much as practicable while oyster farming industry is allowed to continue to grow. Despite these endeavors, North Carolina is still experiencing user conflict issues. In July of 2023, a hunting and fishing club's challenge to the issuance of a 3.72 acre bottom and water column lease in the

[138] *See* N.C. SHELLFISH MARICULTURE ADVISORY COMM., NORTH CAROLINA STRATEGIC PLAN FOR SHELLFISH MARICULTURE: A VISION TO 2030 5 (2018) (describing the North Carolina legislation).
[139] *Id.*
[140] *See* S.B. 648, 2019 Gen. Assemb., Sess. Law 2019-37 (N.C. 2019).
[141] *see id.*

South River in Carteret County was denied by the North Carolina Marine Fisheries Commission's Shellfish Cultivation Lease Review Committee.[142]

2. *South Carolina*

South Carolina's oyster farming industry is relatively small. User conflicts have, however, made oyster farmers the subject of both litigation and legislation.

In 2018, a legal action contesting an oyster farm outside of Charleston received significant attention.[143] A former mooring company that had expanded its operations to include on-bottom oyster farming had applied for a permit to install 330 floating cages in Green Creek, a tributary of the Stono River.[144] SCDHEC issued the company a Critical Area Permit with 17 special conditions, including a condition that required: "That if the structure and shellfish cages are determined by [SCDHEC], to be a navigation problem, restrict public access of the intertidal or sub-tidal area or cause degradation in water quality, the permittee may be required to reconfigure the permitted layout of the structure or remove the complete structure and cages from the critical

[142] *See* Brad Rich, *Fisheries committee denies hunt club's petition for administrative hearing on South River shellfish lease*, CARTERET COUNTY NEWS-TIMES (July 19, 2023),
[143] *See* Chloe Johnson, *Fight over Floating Oyster Farms Erupts Anew as SC Bill Could Pause Summer Harvest*, THE POST & COURIER (Mar. 5, 2021) [hereinafter *Fight over Floating Oyster Farms*], https://www.postandcourier.com/news/fight-over-floating-oyster-farms-erupts-anew-as-sc-bill-could-pause-summer-harvest/article_a141a46c-7d1a-11eb-bad1-4311f0d5c4fa.html; Glenn Smith, *Shell Game: Conflict, Secrecy Cloud Battle over SC Oyster Farming Permit*, THE POST & COURIER (May 9, 2022), https://www.postandcourier.com/uncovered/shell-game-conflict-secrecy-cloud-battle-over-sc-oyster-farming-permit/article_f7919a3e-97c3-11eb-8282-eb15352bf9aa.html. *See also* Chloe Johnson, *New SC Oyster Farm Raises Concerns About Floating Hazards, Growing Industry*, THE POST & COURIER (Feb. 26, 2019), https://www.postandcourier.com/news/new-sc-oyster-farm-raises-concerns-about-floating-hazards-growing-industry/article_4fe7c920-33ac-11e9-b7ab-bfb68190dc80.html (describing concerns with another oyster farm in the Charleston area).
[144] *See* Mulvihill, 2020 WL 2096567, at *3.

area at the permittee's expense."[145] Because of its small size and relatively calm waters, Green Creek was utilized for recreational boating and activities such as waterskiing, wakesurfing, tubing, fishing, jet skiing, kayaking, and shrimping.[146]

The petitioners, all owners of property adjacent to or in the vicinity of Green Creek, filed an administrative challenge to the permit. Among other things,[147] they claimed that DHEC failed to sufficiently analyze whether the permit would unreasonably impact public access to, uses of, and navigation in Green Creek.[148]

In a rather lengthy opinion, the Administrative Court upheld SCDHEC's issuance of the Critical Area Permit.[149] The court noted that the relevant statute did not require SCDHEC to deny a permit if it has *any* impact on existing public access or navigation; instead, it only requires a permit denial if the impacts are unreasonable.[150] The court found that the oyster farm would not pose an unreasonable interference with navigation, pointing to the available width of the creek for boats to continue to navigate, their ability to navigate in some fashion amongst the cages, and the required markings that would mitigate the risk that boaters would collide with cages.[151]

---

[145] *See Mulvihill*, 2020 WL 2096567, at *4.
[146] *See id.* at *3.
[147] Petitioners also claimed that SCDHEC did not properly analyze whether the oyster farm would impact natural resources in the area, cause erosion or shoaling, cause unavoidable environmental impacts, and negatively impact the value and enjoyment of adjacent properties. *See id.* at *8–10.
[148] *See id.* at *4.
[149] *See Mulvihill*, 2020 WL 2096567, at *17.
[150] *See id.*
[151] *See id.* at *21.

The court next examined the question of whether the oyster farm permit would create an unreasonable conflict with existing public uses, noting that it was a "closer question."[152] Based on testimony from petitioners and respondent's own expert witness, the court found that there would be some "curtailment" of public uses, particularly those such as "tubing, skiing, and wakesurfing."[153] But because "a lot of area" remained in the creek for recreational activities, the court found that that the permit did not create a severe restriction on public use, "albeit not without some reservations."[154]

The court emphasized that central to its conclusions was that the permit contained a special condition which allowed SCDHEC to require modification or removal of the oyster farming cages if it found such cages presented "a navigation problem, restrict[ed] public access of the intertidal or subtidal area or cause[ed] degradation in water quality."[155,156]

---

[152] *See id*. at *22.
[153] *See id*. at *23.
[154] *See id*. at *22–23. In doing so, the court referenced the rationale in *Kiawah Development Partners v.* South Carolina Department of Health and Environmental Control, 411 S.C. 16, 35 (2014), where the South Carolina Supreme Court deferred to SCDHEC's interpretation of the Critical Area Permit rules: to wit, that it should consider impacts to upland areas outside of the critical area permit zone when evaluating "the extent to which long-range, cumulative impacts of the project may result within the context of other possible development and the general character of the area" as required by the rules. The court found that the regulation was ambiguous as to the scope of the area to be considered and, as the agency's interpretation was not arbitrary nor capricious, it deserved deference. *Id*. Applying *Kiawah's* rationale to the oyster farming case, the Administrative Law Court noted that the rule was silent, or at least ambiguous, as to whether impacts should be considered only for the areas of Green Creek where the oyster cages should be located, where "Skiing Type Activities" would be "hindered, if not eliminated," or the entire creek, where SCDHEC "arguably" possessed regulatory authority given the public trust doctrine. ***Mulvihill***, 2020 WL 2096567, at *24. It deferred to the agency's interpretation that it should include consideration of the extent to which skiing activities could still take place in the entire creek, not only the oyster farming areas approved under the permit. *See id.*
[155] In addition, general permit conditions note that it is a revocable license and that SCDHEC may take a number of actions if the operation "violates the public's health, safety, or welfare, or if any activity is inconsistent with the public trust doctrine." Finally, the court noted that general permit conditions allowed SCDHEC to make "periodic inspections" of the operation and the agency had procedures in place to allow the public to "make complaints about noncompliance of a permitted project" that will result in site visits by compliance officers. *Id.* at *25.
[156] Interestingly, the permitting of the oyster farm at the center of the *Mulvihill* case was also the focus of a state ethics investigation that focused on the role of the owner of Charleston Mooring's brother, who was an employee in the SCDNR department that handled oyster farm permit applications, in the Green Creek permitting. Although the brother had not worked at the agency for several years by the time the permit was approved, he ended up entering

SB 629

Disputes over oyster farms in South Carolina have also spilled into the legislative arena. In early 2021, South Carolina Senate Bill 629 was introduced by a state senator from Charleston.[157] The proposed legislation would have added a single-sentenced subsection to the state's existing law on shellfish mariculture that read "The department may not issue an out-of-season harvest permit to a Shellfish Mariculture permittee for the privilege of harvesting oysters out of season."[158] Historically, oysters were not harvested for consumption in summer months because warmer waters increased the dangers of pathogen contamination.[159] Modern harvesting requirements and refrigeration have made dining on summer oysters safe,[160] and the ability to harvest year-round is critical for the success of today's oyster farmers. Indeed, although South Carolina began permitting oyster farming in 2000, the state did not see significant numbers of permit applications until it began allowing summer harvest in 2017.[161]

SB 629 was meant to hamstring oyster farming by eliminating summer harvest, a "backdoor approach" responding to conflicts between a fast-growing industry and recreational water users

into a consent agreement with the South Carolina State Ethics Commission in 2021, and had to pay $700 in fines and fees. *See* Glenn Smith, *supra* note 143.

[157] S.B. 629, 124th Gen. Assemb., Reg. Sess. (S.C. 2021).

[158] S.B. 629, 124th Gen. Assemb., Reg. Sess. (S.C. 2021).

[159] *See* 2021 OYSTER MARICULTURE IN GEORGIA, *supra* note 65, at 16.

[160] *See id.*

[161] SCDNR has been able to authorize year-round shellfish harvest since 2000, but state law changes specifically detailing how shellfish permittees could obtain an out-of-season harvest permit were not adopted until 2017. *See* S.C. CODE ANN. § 50-5-985 (2023) (authorizing year-round harvest); S.C. CODE ANN. § 50-5-997 (2023) (detailing permittee process).

in South Carolina's coastal waters.[162] Indeed, the bill's sponsor had a personal connection to the *Mulhivill* case, living on the Stono River and boating frequently in the area.[163] She has considered amending the bill to require more notification of farm permit applications to the people who live in the area, and even banning farms in coastal counties with large boater populations.[164] Heightened property owner notification requirements in the U.S. Army Corps Charleston District's permit for oyster farming operations in South Carolina, finalized thirteen days after SB 629 was introduced and described in Section __ below,[165] may have satisfied SB 629's sponsor: she has not introduced amendments to SB 629 or any new bills related to oyster farming since that permit was released.

3. *Georgia*

Georgia's nascent oyster farming program was designed, in large part, to avoid user conflicts. As described in Section __, below, regulators at GACRD select clustered subtidal farm sites according to myriad siting criteria meant to locate farms away from homes and areas used for recreation, fishing, and other uses.[166] Public meetings concerning the lease sites elicited few comments expressing concerns about user conflicts; those who spoke were more concerned with the program's limitations of oyster farming opportunities, which they viewed as an economic

[162] *See Fight over Floating Oyster Farms*, *supra* note 143.
[163] *See id.*
[164] *See id.*
[165] *See* U.S. ARMY CORPS OF ENGINEERS CHARLESTON DISTRICT, FINAL REGIONAL CONDITIONS FOR THE 2021 NATIONWIDE PERMITS IN CHARLESTON DISTRICT (SAC) 6 (2021) [hereinafter 2021 NATIONWIDE PERMITS]; S.B. 629, 124th Gen. Assemb., Reg. Sess. (S.C. 2021).
[166] *See* GA. COMP. R. & REGS. 391-2-4.18 (2023).

development opportunity for Georgia's coastal communities.[167] Indeed, the issue of limited subtidal lease sites has been a point of contention for proponents of oyster farming in Georgia.[168]

As of the writing of this article, only one of Georgia's six new subtidal oyster farming lessees has gear in the water,[169] and there are no reported instances of user conflicts with oyster farms in the state.[170] Research does, however, suggest that Georgia is not immune from the potential for such disputes. A 2021 survey of registered coastal boat owners in Georgia, conducted by the University of Georgia's Carl Vinson Institute of Government, found that while respondent sentiment concerning oyster farming was predominantly positive, support decreased for oyster farm locations close to people's homes or frequently used coastal waters.[171] Comments made by survey respondents varied, with many indicating that the location of the farms would be essential in avoiding impacts to boating, fishing, and other water activities.[172]

IV. *Slippery business: common techniques for managing user conflicts*

Coastal states utilize many techniques to avoid or manage user conflicts related to oyster farms. Here, I discuss rules for farm siting, farmer suitability and education, and public notice and comment. I also discuss public education and outreach: although not generally required by state

[167] Notes on file with author.
[168] *See* Nancy Badertscher, *Will Georgia's Fledgling Oyster Industry Sink Before It Swims?*, GA. PUBLIC BROAD. (Nov. 9, 2020), https://www.gpb.org/news/2020/11/09/will-georgias-fledgling-oyster-industry-sink-it-swims.
[169] *See* AJ Sisson, *Georgia's first floating oyster farm, right here in our backyard*, WJCL22 (Sept. 13, 2023), https://www.wjcl.com/article/georgias-first-floating-oyster-farm/45115808#.
[170] Prior to the development of Georgia's regulated oyster farming program, there were a handful of intertidal (on-bottom cages in shallow coastal waters) leases permitted by GACRD. No publicized incidents of on-water user conflicts occurred, though at least one farmer had issues with neighbors who found his on-shore processing facilities noisy and smelly. *See* ANDRE JOSEPH GALLANT, A HIGH LOW TIDE (2018).
[171] *See* CARL VINSON INST. OF GOV'T, UNIV. OF GA., OYSTER AQUACULTURE IN GEORGIA: COASTAL WATERS USER CONFLICTS SURVEY 29 (Mar. 2022) [hereinafter USER CONFLICTS SURVEY].
[172] *See id.* at 77.

law, it can be an important mechanism for increasing positive perceptions of oyster farming and ameliorating conflicts. After describing each technique, I provide an analysis of how it is utilized in North Carolina, South Carolina, and Georgia.

Of these three states, North Carolina has made the most robust use of all techniques for managing user conflicts, but disputes still persist as its industry continues to grow.[173] South Carolina has a much smaller industry and a more limited utilization of user conflict mitigation techniques, and as noted in Section III.b.2 above, recently weathered a very high-profile conflict. Georgia is relying on stringent siting policies and suitability to establish an industry with as few conflicts as possible; if its program can accomplish this while also creating real economic benefits for the state's coastal communities it may become a model for other states.

As noted in section IV.d below and in the conclusion, a recent trend in thinking on oyster farming user conflicts may redirect some of the onus of mitigation away from regulators and towards oyster farmers themselves. Under the theory of social license to operate, oyster farmers who want to operate in public trust waters may themselves need to make concerted efforts to gain the acceptance of coastal communities and water users.

a. *The world is (not) your oyster (farm): farm siting and associated techniques*

Siting policies are the most straightforward method for avoiding user conflicts with oyster farms. If farms are located away from waterfront homes and areas commonly used for recreation or

[173] *See* discussion *supra* Section III.b.1.

fishing or are otherwise spatially constrained, they are less likely to become a point of contention. Regulators use several techniques here.

Minimum setbacks require oyster farms to be located a specific minimum distance from developed shorelines.[174] They ensure a spatial separation from waterfront properties that can lessen aesthetic impacts to viewsheds and issues with odors and noise. This can, in effect, prohibit siting of oyster farms in narrower tidal creeks with developed shorelines if the creek is not wide enough to satisfy setback standards or if the setbacks would otherwise cause farms to impair navigability of the creek.

Another siting technique is prohibiting oyster farms in specific areas. Such measures can be proactive or reactive. State agencies or other researchers may conduct proactive studies to determine appropriate locations for oyster farms. Such studies can examine, among other factors, existing uses of coastal waters that may conflict with oyster farms. In Copano Bay, Texas, for example, researchers developed a siting tool intended to identify areas both environmentally suited for oyster production and where use conflicts would not be an issue.[175] Factors related to user conflicts that the tool considers are "multiple-use conflicts regarding navigation" and socioeconomics.[176] In other places, like North Carolina, officials have temporarily or permanently prohibited oyster farming and other shellfish aquaculture in response to public

[174] *See, e.g.*, 15A N.C. ADMIN. CODE 3O.0201(a) (2022).
[175] *See Development of a Siting Tool for Sustainable Oyster Aquaculture in Texas*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., https://coastalscience.noaa.gov/project/development-of-a-siting-tool-for-sustainable-oyster-aquaculture-in-texas/ (last visited Mar. 14, 2023).
[176] *See id.*

opposition to the practice.[177] Limiting the percentage of coastal waters occupied by oyster farms is another tactic. In Rhode Island, shellfish leases are limited to 5% coverage of the state's salt ponds.[178] Such limits can help assuage public concerns about local waters being "overrun" by oyster farming operations.

More subjective siting standards are also commonly used. Rules will often mandate that oyster farms cannot be sited in areas that may impede navigability or in places traditionally used for fishing or recreational boating.[179] Some require that regulators take the cumulative impacts of multiple leases into consideration when considering new applications in an area.[180]

A siting technique that has become more common in recent years is for regulators to establish sites where many farms can be grouped together. These clustered farm sites, often called shellfish aquaculture or mariculture zones, are sited in areas with a low risk for conflicts. Prospective farmers may find them desirable because they can avoid the hassle and time commitment of getting an individual site approved. These sites are sometimes utilized as industry enterprise zones – regulators acquire all necessary permits for the site,[181] removing one

[177] The legislature has issued four moratoriums between 1949 and 2019. *See* STUDY ON HOW TO REDUCE USER CONFLICT, *supra* note 130, at 11.
[178] *See CRMC's 5 Percent Aquaculture Rule Seeks to Balance Use of Salt Ponds*, R.I. COASTAL RES. MGMT. COUNCIL (June 4, 2018), http://www.crmc.ri.gov/news/2018_0604_aquaculture.html.
[179] *See* 15A N.C. ADMIN. CODE 3O.0201(a)(4) (2022) (requiring that shellfish leases "shall not interfere with … existing, traditional uses of the area").
[180] *See* 15A N.C. ADMIN. CODE 3O.0201(a)(4) (2022) (requiring that shellfish leases are considered individually and "cumulatively with existing leases in the area" when determining impacts to navigation and other uses).
[181] In Florida, aquaculture lessees only need to acquire an Aquaculture Certificate of Registration to raise and sell their product. Fla. Stat. § 597.004(1) (2024); *see also* Fla. Dept. of Ag. and Consumer Services, Florida's Aquaculture Lease Program 13 (2013) (noting that the only form of authorization needed for an aquaculture lease site is an Aquaculture Certificate, which is the "only form of authorization that you need to possess seedstock, to plant it on your lease, and to harvest the market size product on the lease site"). They are required to abide by Best Management Practices established by the state, and those who fail to do so must obtain all necessary permits from state and federal agencies. Fla. Reg. 5L-3.007(3) (2024).

significant barrier to market entry for those interested in becoming oyster farmers.[182] Utilizing zones can also help with user conflicts because it allows new farmers to test their mettle in a conflict-free area. Farmers who start in a zone and then procure an individual lease elsewhere will have already gained valuable experience, ostensibly allowing them to be better neighbors to waterfront property owners and users of public trust waters.

Siting standards are an effective tool for managing user conflicts, but they can impact the growth of oyster farming industries. Site selection is critical for an oyster farm's success – the farm's location dictates growing conditions, exposure to pollutants, susceptibility to disease, and oyster taste.[183] Different locations can also affect the difficulty of farming. Farms in deeper waters may, for example, be impacted by rougher seas, making handling heavy cages and other gear more difficult and time-consuming.[184] Farms also have to be close enough to a landing site – where oysters are brought to shore – to comply with regulated time limits designed to protect public

[182] *See* Jennifer Beckensteiner et al., *Barriers to Easter Oyster Aquaculture Expansion in Virginia*, 7 FRONTIERS IN MARINE SCI., Mar. 3, 2020, at 1 (identifying "regulatory inefficiencies" as a barrier to expansion of oyster farming in Virginia); Matt Parker et al., *Barriers to Entry in the Northeast US Aquaculture Industry*, NE. REG'L AQUACULTURE CTR., https://www.researchgate.net/publication/344785572_Northeast_Regional_Aquaculture_Center_Barriers_to_Entry_in_the_Northeast_US_Aquaculture_Industry_2020 (2020).

[183] *See* John Supan, *What to Consider in Farm Site Selection*, Course Subsection of *Oyster Online Oyster Culture Course*, TEACH:ABLE, https://oyster-culture.teachable.com/ (last visited Dec. 21, 2023); Binbin Jiang, et al., Oyster Aquaculture Site Selection Using High-Resolution Remote Sensing: A Case Study in the Gulf of Maine, United States, 9 Front. Mar. Sci. 1, 2 (2022) (explaining that oyster aquaculture operations in Maine "generally target estuaries with low freshwater input … to avoid water quality issues related to land-based pollution and maintain a particular flavor profile").

[184] *See, e.g.*, Whitney Pipkin, *Open-Water Sites Producing Oysters with Bay's Briny Sweetness*, BAY J. (Sept. 18, 2019), https://www.bayjournal.com/news/fisheries/open-water-sites-producing-oysters-with-bay-s-briny-sweetness/article_22e22da6-e196-5555-a7de-12da0529b51b.html (describing difficulties of working in open-water floating oyster farms).

health.[185] Landing sites, in turn, must be close enough to a farmer's home so profits are not limited by fuel costs.[186]

1. *North Carolina*

North Carolina has robust siting rules for oyster farms, many of which were adopted or enhanced in response to NCDMF's report on user conflicts. Bottom leases must be compatible with other public uses, including navigation, fishing, and recreation.[187] Bottom leases must also "not impinge upon the rights of riparian owners."[188] By virtue of the fact that they utilize floating cages, water column leases are guided by stronger siting language. These leases may not be in "a navigation channel marked or maintained by a state or federal agency,"[189] nor may they "significantly impair navigation."[190] They may not be sited in areas "traditionally used and available for fishing or hunting activities incompatible with [floating cages], such as trawling or seining,"[191] nor may they "significantly interfere with the exercise of riparian rights by adjacent property owners including access to navigable channels from piers or other means of access."[192]

[185] *See* NSSP, *supra* note 32, at 79–80 (explaining that state's must ensure that shellfish are received at a dealer's facility after a certain number of hours depending on the ambient air temperature (for example, product must be received by a dealer in twelve or less hours when average monthly maximum air temperature is eighty degree Fahrenheit or above)).
[186] *See* KAREN HUDSON ET AL., VA. COOP. EXTENSION, CULTCHLESS (SINGLE-SEED) OYSTER CROP BUDGETS FOR VIRGINIA: 2013 USER MANUAL 9 (2013) (noting that fuel is one variable that can impact the cost of production).
[187] *See* N.C. GEN. STAT. § 113-202(a)(3) (2023).
[188] N.C. GEN. STAT. §113-202(a)(4) (2023).
[189] N.C. GEN. STAT. § 113-202.1(b)(2) (2023).
[190] N.C. GEN. STAT. § 113-202.1(b)(1) (2023).
[191] N.C. GEN. STAT. § 113-202.1(b)(3) (2023).
[192] N.C. GEN. STAT. § 113-202.1(b)(4) (2023).

In 2022, in response to the NCDMF report on user conflicts,[193] setbacks from developed shorelines were increased from 100 to 250 feet, and these 250 foot setbacks are now also required from "water-dependent shore-based structure[s]," which include "docks, wharves, boat ramps, bridges, bulkheads, and groins."[194] A 250 foot setback was also required between leases.[195] Importantly, the rules now require a consideration of the cumulative impacts of multiple leases. When deciding whether to approve a lease site, agency officials must determine whether "the proposed shellfish lease area, either alone or when considered cumulatively with existing leases in the area, … interfere[s] with navigation or with existing, traditional uses of the area."[196]

North Carolina has also initiated moratoriums on issuance of shellfish leases in certain areas. The first, spurred by conflicts concerning limited public shellfishing grounds, was issued in 1949 for the waters of Brunswick County and was continued by legislation adopted in 1967.[197] The second, established in 1993 for Core Sound, was precipitated by conflicts with fishermen and other water users.[198] (A use mapping project for Core Sound was mandated by the North Carolina General Assembly in 1999,[199] but its subsequent use and effect are unclear.) The final two moratoriums were established in 2019 and resulted from the increase in user conflicts that

[193] N.C. Marine Fisheries Comm'n., Press Release: Marine Fisheries Commission looks at curbing user conflicts associated with shellfish leases, Aug. 24, 2020, at https://www.deq.nc.gov/news/press-releases/2020/08/24/marine-fisheries-commission-looks-curbing-user-conflicts-associated-shellfish-leases.
[194] 15A N.C. ADMIN. CODE § 3O.0201(a) (2023).
[195] *See* 15A N.C. ADMIN. CODE § 3O.0201(a)(3) (2023).
[196] 15A N.C. ADMIN. CODE § 3O.0201(a)(4) (2023).
[197] *See* N.C. DEPT. OF ENV. QUALITY, DIVISION OF MARINE FISHERIES, REPORT: IDENTIFICATION OF AREAS UNDER A MORATORIUM FOR SHELLFISH LEASING THAT COULD POTENTIALLY BE ESTABLISHED AS SHELLFISH AQUACULTURE ENTERPRISE AREAS 14 (2020) [hereinafter N.C. REPORT].
[198] *See id.* at 15.
[199] *See* S.B. 249, 1999 Gen. Assemb., Sess. Law 1999-209 (N.C. 1999).

coincided with the rapid expansion of oyster farming in the state.[200] They were established for Bogue Sound and New Hanover County.[201]

Caps on shellfish leases have been considered by North Carolina officials, but have never been adopted. In 1996, a legislative subcommittee was formed to study the state's shellfish leasing program and one of its charges was to consider caps on shellfish leases in specific water bodies.[202] The subcommittee proposed capping shellfish leasing to an additional 2% of the state's shellfish growing waters, but the North Carolina General Assembly did not adopt the recommendation.[203]

North Carolina is also investigating the use of agency-sited Shellfish Aquaculture Enterprise Areas (SEAs), larger areas pre-approved for oyster farming that are subdivided into multiple smaller leases. The same legislation adopted in 2019 that established two moratoriums also required NCDMF to identify areas in waters under those moratoriums that could be viable as SEAs.[204] NCDMF has noted that, while the primary benefit of SEAs is the shorter application process for leases, they can also encourage industry development while "potentially mitigating user conflict issues."[205] NCDMF has not yet established any SEAs but, as of the writing of this article, is developing a feasibility study for SEAs in Bogue Sound.[206]

[200] *See* N.C. REPORT, *supra* note 197, at 16–17.
[201] *See* S.B. 648, 1999 Gen. Assemb., Sess. Law 2019-37 (N.C. 1999).
[202] *See* N.C. OYSTER FISHERY MANAGEMENT PLAN, *supra* note 126, at 101.
[203] *See id*.
[204] *See* S.B. 648, 1999 Gen. Assemb., Sess. Law 2019-37 (requiring that "The [NCDMF] shall identify areas in waters that are under a moratorium for shellfish leasing that could potentially be established as a [SEAs]").
[205] N.C. REPORT, *supra* note 197, at 3.
[206] *See id.* at 12–13; *Meeting set on shellfish leasing in Bogue Sound*, COASTAL REVIEW.ORG, (June 20, 2022), https://coastalreview.org/2022/06/meeting-set-on-potential-shellfish-leasing-in-bogue-sound/.

2. *South Carolina*

South Carolina's siting standards are slimmer than its neighbor to the north. Its shellfish statutes, regulations, and agency guidance contain one setback requirement and some considerations of conflicts with public uses.

Oyster farming operations in South Carolina must be 50 feet from existing docks and may not block dock access.[207] Farms must move to accommodate new docks,[208] but SCDHEC must consider the rights of oyster farmers when deciding whether to approve or deny a dock or pier permit.[209]

When reviewing permit applications, SCDNR must "consider the allocation of shellfish bottoms and waters for public or private use."[210] When considering a Critical Area Permit application for an oyster farm, SCDHEC must consider whether the operation "would unreasonably conflict with existing public uses . . . [or] would unreasonably interfere with navigation."[211]

SC DNR's *BMPs for Shellfish Mariculture in South Carolina*, adherence to which is a condition of all mariculture permits,[212] contains recommendations for siting oyster farms related to user

[207] *See* S.C. CODE REGS. 30-12.O(3)(a) (2023).
[208] *See id*.
[209] *See* S.C. CODE REGS. 30-12.A(1)(j) (2023).
[210] S.C. CODE. UNANN. § 50-5-915 (2023).
[211] S.C. CODE REGS. 30-12.O(4) (2023).
[212] *See* S.C. CODE REGS. 30-12.O(d) (2023).

conflicts, including minimizing navigational impacts, considering conflicting uses in specific sites, and contacting neighboring property owners.[213]

3. *Georgia*

Georgia is the only state assessed here that does not allow prospective oyster farmers to propose their own farm sites. Instead, GACRD sites both intertidal leases (on-bottom farms) and subtidal leases (floating farms).[214] Intertidal leases are sited individually, while subtidal leases are grouped together in "Mariculture Zones."[215] As noted above, the decision to group subtidal leases in zones was influenced in part by a desire to minimize user conflicts.

Georgia currently has no written standards for siting intertidal leases except that they are in approved growing areas. Subtidal siting standards, on the other hand, are robust. When siting subtidal leases, GACRD must consider other uses of Georgia's state waters, such as commercial and recreational fishing, high boat traffic, riparian viewsheds,[216] research sites, areas where property owners may exercise riparian rights to construct docks or marinas, and areas of dynamic shorelines and shoaling.[217] In addition, subtidal water bottoms must be (1) located in approved

[213] *See* S.C. DEP'T. OF NAT. RES., BEST MANAGEMENT PRACTICES FOR SHELLFISH MARICULTURE IN SOUTH CAROLINA 1–2 (2021).
[214] *See* SHELLFISH POLICY MANUAL, *supra* note 64, at 5 (noting that state-owned water bottoms will be "offered" via public bid (intertidal) or lottery (subtidal). *See also*, Ga. Dept. of Natural Resources Coastal Resources Div., Shellfish Leasing Application Process, at https://coastalgadnr.org/shellfishleasing .
[215] *See* SHELLFISH POLICY MANUAL, *supra* note 64, at 5. State law and regulations do not require GACRD to site subtidal leases in Mariculture Zones, but the agency has done so for the six subtidal leases it has issued. *See, e.g.*, GACRD, Press Release: Public meeting set for new shellfish gear, leases (March 1, 2021), at https://coastalgadnr.org/public-meeting-set-new-shellfish-gear-leases.
[216] Interestingly, Georgia's public trust doctrine does not include viewsheds in its protected public uses. *See* GA. CODE ANN. § 52-1-2 (2023).
[217] *See* GA. COMP. R. & REGS. 391-2-4.18(e) (2023).

growing areas; (2) at least 200 feet wide at low tide; (3) at least six feet deep at low tide; (4) in areas that do not interfere with existing wild shellfish beds, live bottoms,[218] or salt marshes; (5) not within 150 feet of a federal project or federally maintained channel; (6) not within fifty feet of an existing commercial, communal, or private dock; and (7) not within fifty feet of shoreline at low tide.[219] If a site is within or adjacent to critical habitat for marine, threatened, or endangered species, bait shrimping zones, or state Heritage Preserves, GACRD must consult with appropriate local, state, or federal agencies to ensure the lease is compatible with those resources.[220]

b. *Culling and tumbling: farmer suitability criteria and education*

A second technique states use for managing oyster farming user conflicts is to establish farmer suitability criteria or education requirements. Suitability criteria are used to ensure that oyster farmers have the knowledge, experience, and resources to run a successful operation and be good stewards of their sites.[221] These criteria can include prior experience in shellfish aquaculture or other related industries, possession of a commercial fishing license, and an absence of fishing or other related violations.[222] In some cases, proof of funds to establish an oyster farming business

[218] Live bottoms are rocky areas on the ocean shore that are covered with invertebrates like algae, sponges, barnacles, and corals that provide habitat for marine life. *See* NOAA, Earth is Blue Magazine: Live Bottom Reefs, at https://sanctuaries.noaa.gov/magazine/2/live-bottom-reefs/ (describing live bottoms at Gray's Reef National Marine Sanctuary).
[219] *See* GA. COMP. R. & REGS. 391-2-4-.18(6)(b)-(c) (2023).
[220] *See* GA. COMP. R. & REGS. 391-2-4-.18(d) (2023).
[221] *See* SHELLFISH POLICY MANUAL, *supra* note 64, at Appendix C., Lottery Application for Subtidal Mariculture Leases (May 2021); 15A N.C. ADMIN. CODE § 3O.0202(d); *Shellfish Culture Permits*, S.C. DEP'T. OF NAT. RES., https://www.dnr.sc.gov/marine/shellfish/culturepermits.html (last visited Nov. 12, 2023).
[222] *See, e.g.*, SHELLFISH POLICY MANUAL, *supra* note 64, at 20–21.

may be required.[223] Some states also limit oyster farming to state residents or preference residents.[224] These policies may help assuage public fears that out-of-state individuals or corporations are going to profit off of local waters.

Education requirements are commonly used to ensure that new oyster farmers have the basic knowledge needed to successfully run their operation. They can be implemented via training programs and examinations, and may include components on shellfish biology, site selection, hatchery and nursery production, grow-out, proper gear management, disease and pest management, storm management, safe handling and harvest practices, permitting, and business management.[225]

1. *North Carolina*

North Carolina does not have suitability requirements in its statutes or laws, but it does require lease applicants to describe their "capability to conduct the proposed aquaculture activities" in

[223] *See id*. (stating policy of requiring "proof of finances" of at least $70,000 to enter subtidal lottery). The high cost of entry and issues obtaining financing can be a barrier to entry to aquaculture. *See* MATT PARKER ET AL, BARRIERS TO ENTRY IN THE NORTHEAST US AQUACULTURE INDUSTRY 19, 30, 43 (Northeast Regional Aquaculture Center 2020). Some states offer loan programs to make affordable, subsidized funding available to those wishing to start or expand oyster farming operations. *See, e.g.*, *Maryland Shellfish Aquaculture Financing Fund*, MD. AGRIC. & RES.-BASED INDUS. DEV. CORP. https://www.marbidco.org/_pages/programs_loans/loan_programs_msal.htm (last visited Nov. 12, 2023).

[224] *See Saltwater Ecology and Economics*, *supra* note 53, at 365 (noting that some states impose residency requirements or otherwise favor state residents when permitting oyster farms and examining legal issues that arise (Appx. A)).

[225] Many voluntary and mandatory oyster farming and shellfish aquaculture training programs exist across the country. *See, e.g.*, *Fundamentals of Shellfish Farming*, WOODS HOLE OCEANOGRAPHIC INST., https://seagrant.whoi.edu/community-engagement/aquaculturists/fundamentals-of-shellfish-farming/ (last visited Nov. 12, 2023); *Oyster Aquaculture Training*, VA. INST. OF MARINE SCI., https://www.vims.edu/research/units/centerspartners/abc/industry/oat/index.php (last visited Nov. 12, 2023); *Online Oyster Culture Course*, TEACH:ABLE, https://oyster-culture.teachable.com/ (last visited Nov. 12, 2023).

the lease application form.[226] Until 2022, prospective oyster farmers in North Carolina had to pass a required examination in order to receive a shellfish lease.[227] The examination requirement has now been replaced with a requirement that all lessees participate in a Shellfish Aquaculture Education Program, which includes, among other thing, instruction on user conflict avoidance.[228] As of fall 2023, a Shellfish Farming Academy offered through the coastal Carteret County Community College meets the requirements for the course and can be utilized by lessees; the NCDMF is developing its own class and materials that will be offered in the future.[229]

2. *South Carolina*

South Carolina considers a variety of factors when deciding whether an applicant is suitable for an oyster farming permit. Permits are only available to state residents.[230] When "exercising its discretion" in determining whether to issue permits, SCDNR "may consider applicants' previous performance and compliance with natural resource laws."[231] In addition, applicants must have "sufficient shellfish culture experience" and either directly manage the farm or employ a qualified individual to do so.[232] When reviewing permit applications, SCDNR must consider applicant qualifications and may conduct interviews.[233] SCDNR's website states that its decisions concerning oyster farm permitting are based on "shellfish culture experience",

[226] *North Carolina Shellfish Lease Application: The Checklist*, *supra* note 74, at 5.
[227] *See* 15A N.C. ADMIN. CODE § 3O.0202(d) (2011) (requiring potential shellfish lessees to complete an examination with at least seventy percent correct answers).
[228] *See* 15A N.C. ADMIN. CODE § 3O.0202(d); N.C. GEN. STAT. § 113-201(c) (2023) (lessees must complete required training).
[229] E-mail from Owen Mulvey-McFerron, Shellfish Lease and Aquaculture Program Coordinator, NCDMF (Jan. 12, 2022) (on file with author).
[230] *See* S.C. CODE ANN. § 50-5-900(A) (2023).
[231] *Id.*
[232] S.C. CODE ANN. § 50-5-910(A)(1) (2023).
[233] *See* S.C. CODE ANN. § 50-5-915(A)(1) (2023).

"ownership or access to necessary equipment and personnel", "possession of all appropriate licenses and permits", and "previous performance and compliance with natural resource laws".[234]

3. *Georgia*

In GACRD's competitive bidding process for intertidal on-bottom leases, it selects the bidder it considers "most advantageous to the state," and will give preference to residents over non-residents.[235] Georgia's vetting process for subtidal floating oyster farmers is the most stringent of the three states examined here. The process is intended to make sure candidates for subtidal leases will be successful and therefore good stewards of both their sites and relations with other coastal water users.

GACRD "select[s] the most qualified individuals who are likely to be successful" farming these sites.[236] Qualification is based on experience and financial means, which are determined according to a bank instrument requirement and lottery system.[237] In order to enter a lottery for a subtidal lease, applicants must provide a $70,000 bank instrument such as a proof of funds or a pre-approval letter.[238] This is intended to ensure that these leases are only offered to those who have the financial means to start an oyster farming business.

[234] *Shellfish Culture Permits*, S.C. DIV. OF NAT. RES., https://www.dnr.sc.gov/marine/shellfish/culturepermits.html (last visited Mar. 12, 2023).
[235] GA. CODE ANN. § 27-4-198(a)(3) (2023).
[236] SHELLFISH POLICY MANUAL, *supra* note 64, at Appendix C., Lottery Application for Subtidal Mariculture Leases.
[237] *See id.*
[238] *See id.*

The subtidal lease lottery is administered according to a point system. Applicants can receive up to one point each for being a resident of Georgia, certified to handle shellfish, a current lessee for commercial shellfish harvest, and up to three points for experience with commercial shellfish operations.[239] Once the application period for a particular mariculture zone is closed, applicants are put into points "pools" based on their total points. Beginning with the pool with the highest number of points, GACRD randomly pulls applications until that pool is exhausted. It then moves to the pools with lower point totals until all lease opportunities are filled. The first applicant pulled selects their lease site, followed by the second pulled, and so on.[240]

Georgia does not require prospective oyster farmers to engage in training or other education, though the University of Georgia Marine Extension has recently begun offering a Shellfish Aquaculture Training Course for those interested in oyster or clam farming.[241]

c. *Culturing input: public notice and comment*

Another standard mechanism for managing oyster farming user conflicts is to provide for public notice and comment for proposed farm sites. Being inadequately informed about proposed sites is a common complaint, particularly among waterfront property owners, and those who are surprised by the siting of an oyster farm may be more likely to oppose it.[242] Public notice and

[239] *See id.*
[240] *See id.*
[241] *See Shellfish Aquaculture Training Course*, UNIV. OF GA. MARINE EXTENSION & GA. SEA GRANT, https://gacoast.uga.edu/event/shellfish-aquaculture-training-course/ (last visited Mar. 14, 2023).
[242] *See, e.g.*, STUDY ON HOW TO REDUCE USER CONFLICT, *supra* note 130, at 11, 23 (noting that NCDMF "enlarged notice processes for public hearings on proposed leases" in response to a surge in user conflicts and recommending rule changes that would include a certified mail requirement to notify riparian landowners of proposed shellfish leases); Glenn Smith, *supra* note 143 (noting "[a]larm" from homeowners when they realized an oyster farm nearby

comment protocols can help regulators adequately inform property owners and coastal water users before decisions are made. They can also be a valuable source of information. Regulators may not always have complete knowledge of existing activities and conditions at proposed sites or public uses that may make oyster farming inappropriate.

Public notice and comment is a relatively straightforward endeavor. It may involve communication to adjacent landowners,[243] notification of pending lease decisions in local newspapers,[244] or public hearings.[245]

1. North Carolina

North Carolina's public notice and comment rules provide a straightforward process for informing the public of proposed lease sites and obtaining public comments. This process, which is the same for both bottom and water column leases, requires NCDMF to hold public hearings in the county where the proposed lease is located. Two public notices must be posted before the hearing date, and people can request notice of the lease decision at the hearing.[246]

2. South Carolina

had received conditional approval from regulators and describing how a South Carolina state senator had pushed for more public notice about plans for future farms).
[243] *See* S.C. CODE UNANN. § 48-39-140(c) (2023); S.C. REG. § 30-2.B(9)(c) (2023).
[244] *See* S.C. CODE UNANN. § 48-39-140(c) (2023); S.C. REG. § 30-2.B(7)(b (2023)).
[245] *See* N.C. GEN. STAT. § 113-202(f) (2023).
[246] *See* N.C. GEN. STAT. § 113-202(f), (g) (2023).

In South Carolina, public notice is required by the two state agencies involved in approving oyster farming sites.[247] In addition, the U.S. Army Corps of Engineers Charleston District requires that property owners adjacent to the site are notified pursuant to conditions it has imposed on NWP 48.[248]

Public notice is first conducted pursuant to SCDHEC's coastal zone Critical Area permitting program.[249] Once a permit application is received, SCDHEC's Office of Coastal Resources Management (OCRM) provides for written notice to "interested agencies, all adjoining landowners, local government units in which the land is located and other interested persons" within thirty days.[250] Public notice must be given at least once in state and local newspapers of general circulation in the area where permitted activities would be located.[251] Within fifteen days of this notice, the permit applicant must also publish notice of the proposed activity at least once in a newspaper of general statewide circulation and in a newspaper of local circulation in the county of the proposed activity.[252]

SCDHEC-OCRM is not required to hold public meetings on critical area permits unless it "deems a hearing [is] necessary"[253] or if twenty or more residents of the affected county or

[247] S.C. REG. § 30-2.C (2023); S.C. CODE UNANN. § 50-5-925 (2023).
[248] U.S. Army Corps, Charleston District, Final Regional Conditions for 16 Nationwide Permits in Charleston District (SAC), March 15, 2021.
[249] S.C. REG. § 30-2.C (2023).
[250] S.C. REG. § 30-2.C (2023).
[251] *See* S.C. CODE UNANN. § 48-39-140(c) (2023).
[252] *See* S.C. REG. § 30-2.B(7)(b) (2023).
[253] S.C. CODE UNANN. § 48-39-140(c) (2023).

counties request one.[254] Such requests must "be in writing and on a separate sheet of paper" and be received within thirty days of public notice of the permit application.[255]

SCDHEC also has a web-based GIS mapper that shows the location of all current public notices for permits the agency issues.[256] Users can access public notice documents, permit applications, and other documents, and can submit public comments on individual permit applications and request decision notifications.[257]

SCDNR rules require applicants to publish notice of the proposed mariculture operation once the agency has granted conditional approval to the mariculture application and map.[258] This notice must state that the applicant has applied for a mariculture permit and specifically describe the proposed site.[259] It "must be published once a week for three consecutive weeks in a newspaper of general circulation in the county" where the proposed site is located.[260]

Although not a matter of state law, a notice requirement of the U.S. Army Corps of Engineers Charleston District deserves mention here. As a regional condition of NWP 48, the Charleston District requires prospective permittees for floating oyster farms to provide adjacent property owners' contact information and signed letters of "no objection" from each.[261] If the prospective

[254] *See* S.C. CODE UNANN. § 48-39-150(B) (2023); S.C. REG. § 30-3 (2023).
[255] S.C. REG. § 30-3 (2023).
[256] *See Environmental Public Notices*, S.C. DEP'T OF HEALTH & ENV'T CONTROL, https://gis.dhec.sc.gov/publicnotice/.
[257] *See* i*d*. *See also* S.C. CODE UNANN. § 44-1-60(E)(2) (2023) (requiring DHEC to provide information on permitting decisions to those who request such updates).
[258] *See* S.C. CODE UNANN. § 50-5-925 (2023).
[259] *See id*.
[260] *See id*.
[261] *See* 2021 NATIONWIDE PERMITS, *supra* note 165, at 6.

permittee cannot obtain these letters, the Charleston District will notify the adjacent property owners by letter and give them fifteen days to provide comments.[262]

3. Georgia

Georgia's oyster farming statute, regulations, and policy documents do not currently require any form of public notice before siting mariculture zones. GACRD has, however, held public meetings for both of its existing mariculture zones, which it advertises via press release, email, and social media.[263] It has also developed a Shellfish Leasing Dashboard showing location, size, and other information for mariculture zones for floating leases and intertidal on-bottom leases.[264]

d. If you shuck it they will come: public education and outreach

Oyster farming is an unfamiliar concept to much of the general public. Uninformed residents may associate it with other forms of aquaculture maligned in recent years for having adverse environmental impacts, such as ocean-based salmon farming.[265] They may also be unaware of environmental and economic benefits of oyster farming, or the ways in which their state's program seeks to minimize impacts on homeowners and users of public trust waters. Finally,

[262] *See id.*
[263] *See* e-mail from Cason Kinstle, Ga. Dept. of Nat. Res. Coastal Res. Div. (June 14, 2022, 15:06 ET) (on file with author).
[264] *See Georgia Shellfish Leasing Dashboard*, GA. DEPT. OF NAT. RES. COASTAL RES. DIV., https://experience.arcgis.com/experience/4d545949181444dab492a7ebdb4dae47?data_id=dataSource_1-182c6ef1252-layer-5%3A67&views=View-5 (last visited Mar. 10, 2023).
[265] *See* Fiona Harvey, *Global Salmon Farming Harming Marine Life and Costing Billions in Damage*, THE GUARDIAN (Feb. 11, 2021), https://www.theguardian.com/environment/2021/feb/11/global-salmon-farming-harming-marine-life-and-costing-billions-in-damage.

residents may think that oyster farming methods and locations in their state will be similar to what they have observed in other places.

A survey of registered boat owners in coastal Georgia suggests that public education and outreach campaigns could help increase positive perceptions of oyster farming. In that survey, conducted by the University of Georgia Carl Vinson Institute of Government, over 1,000 registered boat owners answered questions concerning their familiarity with oyster farming and perceptions of oyster farming in coastal Georgia.[266] (Georgia's siting policies mean registered boat owners are the demographic group most likely to have conflicts with the farms.[267] In other states, such surveys would likely need to also focus on waterfront property owners.) Respondents who were more familiar with oyster farming had more positive perceptions in general and of the practice in Georgia waters.[268] Those who had seen an oyster farm in person in the South Atlantic region had even more favorable attitudes.[269] Interestingly, respondents who had seen an oyster farm in a different region of the country had more negative perceptions for some questions than those who had never seen a farm at all.[270]

Public education and outreach campaigns can take many forms and may be implemented by both state agencies and other organizations such as nonprofits, universities, or oyster farmers themselves. Indeed, it may be preferable for agencies to take a back seat in education and outreach, lest they appear too favorable towards the industry they regulate. As is discussed in the

[266] *See* USER CONFLICTS SURVEY, *supra* note 171, at 4–5.
[267] *See* GA. COMP. R. & REGS. 391-2-4.18(e) (2023); *see also*, CRD Shellfish Information Map, at https://gcmp.maps.arcgis.com/apps/instant/minimalist/index.html?appid=936bb5204379475eac1c630f681a6ad2&center=-81.4701,30.8696&level=12 (showing locations of approved growing areas).
[268] *See id* at 23.
[269] *See id*.
[270] *See id.*

Conclusion to this article, the expansion of the "social license to operate" concept to aquaculture suggests that oyster farmers playing a more active role in community outreach and education may help mitigate user conflicts.

1. *North Carolina*

North Carolina has invested in general education and outreach for the public at large and targeted education and outreach in individual communities. General public education and outreach activities concerning oyster farming have largely been guided by the North Carolina Oyster Blueprint, a restoration and protection plan that focuses on ways "to enhance native oyster populations and promote sustainable aquaculture."[271] The development and implementation of the Blueprint is led by a steering committee made up of a large and diverse group of agency, nonprofit, business, and other organizational stakeholders.[272] One of the Blueprint's approaches focuses on education, outreach, and engagement, with a goal to "[c]reate communication and outreach strategies that engage stakeholders and the general public to actively support the goals, strategies, and actions outlined in the Blueprint."[273] Since the inception of the Blueprint in 2003, the steering committee has implemented a variety of outreach and engagement activities, including website development, social media accounts, workshops and conferences, educational volunteer activities, and media engagement via press events and press releases.[274]

[271] N.C. COASTAL FED'N, OYSTER RESTORATION AND PROTECTION PLAN FOR NORTH CAROLINA: A BLUEPRINT FOR ACTION 2021-2025 (4TH EDITION) 3 (2021).
[272] *See id* at 37.
[273] *See id* at 35.
[274] The latest version of the Blueprint contains three actions for outreach and engagement: (1) Engage the Oyster Steering Committee and members' corresponding organizations to convey the work being done through the Blueprint; (2) Use digital and online media to expand the reach of the Blueprint; and (3) Engage stakeholders beyond the Oyster Steering Committee to help advance the work of the Blueprint. *See id.*

Education and outreach have become a priority for NCDMF shellfish leasing staff in recent years, following the surge in lease applications and marked interest in oyster farming from the North Carolina legislature.[275] The agency is working with NC Sea Grant and the North Carolina Shellfish Growers Association to develop outreach and educational materials,[276] and is engaged in an intensive public education campaign for a SEA pilot project in Bogue Sound in the Southern Outer Banks.[277] These efforts included individual meetings with municipal leaders and an open virtual informational and public comment meeting.[278] NCDMF staff plan on continuing these targeted education and outreach activities in the coming years. In particular, the agency has stated that "education and outreach to citizens and stakeholders will be a key element to the successful development of SEAs."[279]

2. *South Carolina*

Most of South Carolina's education and outreach efforts for oyster farming are spearheaded by the South Carolina Sea Grant Consortium, a network of eight South Carolina Sea Grant college programs and SCDNR.[280] The Consortium conducts research to inform outreach efforts (such as

[275] *See* e-mail from Jacob Boyd, Chief, Habitat & Enhancement Section, N.C. Dept. of Env't Quality, Div. of Marine Fisheries (July 22, 2022, 13:17 ET) (on file with author).
[276] *See id*.
[277] *See id*. *See also Shellfish Leasing Meeting Set in Bogue Sound*, CARTERET COUNTY NEWS-TIMES (June 21, 2022), https://www.carolinacoastonline.com/news_times/article_2f6d9910-f157-11ec-a136-8f5b18fea239.html.
[278] *See* Jacob Boyd, *supra* note 275; see also *Shellfish leasing meeting set in Bogue Sound*, *supra* note 277. Whether or not these efforts will succeed in assuaging dissent remains to be seen. Some residents, including town commissioners, have already expressed opposition to the Bogue Sound SEA in editorial pieces. *See* Randall T. Bentley, *Letter to the Editor: Proposed oyster farms: please, do not do this*, CAROLINA COAST ONLINE, Mar. 2, 2022.
[279] N.C. REPORT, *supra* note 197, at 13.
[280] *See About the Sea Grant Consortium*, S.C. SEA GRANT CONSORTIUM, https://www.scseagrant.org/about-us/ (last visited Nov. 16, 2023).

documenting the benefits of increasing shellfish farming in the state),[281] provides outreach materials and lesson plans for educators,[282] and facilitates meetings and public policy events.[283]

SCDNR does not have a dedicated public outreach and education strategy for communicating information about oyster farming to the public. Instead, the agency utilizes the Sea Grant Consortium and offers "science based" information when requested by the media or others.[284] In an attempt to be more transparent, SCDNR has built a stronger online presence on its website that includes maps, rules, and public notices about shellfish lease applications. [285]

3. *Georgia*

As is the case in South Carolina, most of Georgia's education and outreach efforts originate with the state's Sea Grant affiliate, Georgia Sea Grant. Located at the University of Georgia, Georgia Sea Grant and UGA's Marine Extension Service have an extensive shellfish research program and operate the state's only shellfish hatchery.[286] Researchers and outreach staff have, among other things, estimated the potential economic benefits of oyster farming to the state,[287]

---

[281] *See* Joseph C. Von Nessen, *The Economic Impact of Buying Local: Documenting the Potential Benefits of Increased Shellfish Mariculture Production in South Carolina*, S.C. SEA GRANT CONSORTIUM (Dec. 2021), https://www.scseagrant.org/benefits-of-increased-mariculture-production/.
[282] *See Aquaculture in South Carolina*, S.C. SEA GRANT CONSORTIUM, https://www.scseagrant.org/aquaculture/ (last visited Nov. 16 2023).
[283] *See Program Focus Area: Sustainable Fisheries and Aquaculture*, S.C. SEA GRANT CONSORTIUM, https://www.scseagrant.org/sustainable-fisheries-and-aquaculture/ (last visited Nov. 16, 2023).
[284] E-mail from Ben Dyar, Off. of Fisheries Mgmt., S.C. Dept. of Nat. Res., Marine Res. Div. (June 22, 2022,15:51 ET) (on file with author).
[285] *See* Glenn Smith, *supra* note 143
[286] *See Oyster Hatchery*, UNIV. OF GA. MARINE EXTENSION & GA. SEA GRANT, https://gacoast.uga.edu/outreach/programs/oyster-hatchery/ (last visited Dec. 20, 2023).
[287] UGA MAREX and Georgia Sea Grant, Economic Impact Estimates for Sub-Tidal, Floating Cage Oyster Aquaculture Leases in Georgia (on file with author).

conducted numerous tours and educational events at the hatchery, and educated the public at events such as the annual Oyster Roast for a Reason.[288]

Georgia Sea Grant's Legal Program, a partnership with UGA's Carl Vinson Institute of Government , has engaged in education and outreach since the inception of the new oyster farming industry, including those directly related to user conflicts. The Institute of Government has held workshops with local planning officials and economic development professionals on the coast, educated over 1,000 registered coastal boat owners through the user conflicts survey described in Section __ above, and conducted outreach and surveys on Georgia oysters with restaurants and other groups.

V. Conclusion

The three states examined in this article have very different approaches to managing oyster farming user conflicts. North Carolina, which is keen to both develop its oyster farming industry and mitigate conflicts with the public, has engaged in extensive rulemaking and other activities. It has by no means solved the user conflicts puzzle but has made a noteworthy effort. South Carolina has no state-led initiative to bolster oyster farming in the state, and its rules and other mechanisms for avoiding user conflicts are somewhat slim. Although it has a much smaller industry than North Carolina, it has experienced at least one high-profile user conflicts case and legislative action meant to hamstring the development of the industry. Finally, Georgia's program seems in large part designed to avoid user conflicts altogether by restricting the most

[288] UGA MAREX and Georgia Sea Grant, Oyster Roast for a Reason, at https://gacoast.uga.edu/oysterroast/.

attractive types of farms to limited sites selected by regulators. This approach has drawn the ire of some oyster farming proponents who see it as stymying an industry that could provide an environmentally sustainable business opportunity for the state's mostly rural coastal communities. If Georgia succeeds in developing a successful industry through agency siting according to strict standards, however, it may be a model for other states.

Regulators in these three states – and, indeed, all coastal states – have a tough row to hoe (or, perhaps, a tough bushel to shuck) when it comes to managing user conflicts. Tradeoffs are inevitable. Rules designed to limit these conflicts may stymy the growth of a potentially economically and environmentally significant industry for coastal communities. On the other hand, unchecked growth of oyster farms could interfere with the public's historic – and cherished – rights to use coastal waters. There are no easy answers to this conundrum, and each state must engage in its own balancing act based on its economic, environmental, and cultural goals and priorities.

As discussed herein, research suggests that public education and outreach may increase positive public perception of oyster farming in a community. Whether those charged with regulating the siting and operation of oyster farms should be involved in such activities is, however, another question entirely. Toeing the line between education and advocacy can be a difficult task, particularly for commercial enterprises located in public waters.

In recent years, a concept known as social license to operate has gained traction in the U.S. aquaculture industry. The term, which has been utilized in extraction industries (forestry, mining,

etc.) for quite some time, can be generally defined as "the informal, ongoing approval or acceptance of a project granted by communities."[289] Although trust in government can increase the likelihood that a social license to operate will be issued,[290] there are many other factors in play, and in general the onus appears to be on the companies themselves to engage in activities that strengthen community support.[291] More attention is being given to the notion of social license to operate in the oyster farming (and other shellfish) industry,[292] with industry leaders emphasizing that it is incumbent upon farmers to convince the public that they "are a good neighbor" and how important it can be for these businesses to become part of the "social and cultural ecosystem" of an area.[293] Oysters have been historically important in the south – economically, environmentally, and culturally – so oyster farmers in North Carolina, South Carolina, and Georgia have a strong foundation to build from.

Social license to operate suggests that, while regulations and regulators have a critical role to play in avoiding and mitigating user conflicts related to oyster farming, they cannot be the only solution to this devilishly tricky problem. To avoid costly, protracted conflicts concerning farming sites and operations, individual growers and state and regional trade organizations may need to focus efforts on connecting farmers with communities, and building trust and acceptance outside of the regulatory sphere.

[289] EMILY WHITMORE ET AL., SOCIAL LICENSE TO OPERATE IN THE AQUACULTURE INDUSTRY: A COMMUNITY-FOCUSED FRAMEWORK 3 (2022) (but noting that "the meaning of [social license to operate] varies by industry and remains vaguely defined").
[290] *See id.* at 9.
[291] *See id.* at 7.
[292] Bob Rheault, *Diving Into Social* License, EAST COAST SHELLFISH GROWERS ASS'N NEWSLETTER 1 (Oct. 2022), https://ecsga.org/newsletter-archives/ (focusing much of the issue on the concept of social license to operate).
[293] *Id.*