

Northeast Regional Aquaculture Center

Barriers to Entry in the Northeast US Aquaculture Industry

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United States Department of Agriculture
National Institute of Food and Agriculture

Northeast Regional Aquaculture Center

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Introduction

There is a variety of freshwater and marine species produced in aquaculture operations in the Northeastern United States. However, aquaculture regulations and resources for current and potential aquaculture producers vary greatly among states in the region. The key species, regulations, and resources have been identified for each state in the tables below. In addition, there are barriers to those interested in entering the aquaculture sector identified in each state. Some states have higher barriers to entry than other states.

Aquaculture information gathered for this project was divided into marine systems and freshwater/land-based culture systems. In some states, all aquaculture regulations and resources are combined into a single-resource agency. In others, there may be separate resource agencies responsible for marine and freshwater/land-based culture systems.

Individual contact information for those known to have aquaculture responsibilities in each state are identified. However, please note that employees may no longer be in those positions depending on when the data was collected.

Connecticut

Connecticut		Marine	Freshwater and Land-Based Culture
	Lead Agency	Department of Agriculture, Bureau of Aquaculture	
	Other Regulatory Agencies	<ul style="list-style-type: none"> • Department of Energy & Environmental Protection • Department of Consumer Protection and Economic Development • Department of Energy and Environmental Protection (DEEP) <ul style="list-style-type: none"> ❖ Bureau of Fisheries ❖ Water Management Bureau ❖ Wildlife Division • Connecticut Agricultural Experiment Station • Individual Municipalities • Environmental Protection Agency • Food and Drug Administration (in the case of food stock production) • Army Corps of Engineers 	
	Species Approved	<ul style="list-style-type: none"> • Native Species Sourced from Connecticut or New York only • Confirm with Department of Environmental Protection • Imported organisms must be inspected for health • Imported plants must be inspected by state or federal officials from the source state certifying plants are pest/insect/disease free 	

Connecticut		Marine	Freshwater and Land-Based Culture
	Links to Regulations	<ul style="list-style-type: none"> • https://www.cga.ct.gov/current/pub/chap_491.htm • https://www.cga.ct.gov/current/pub/chap_492.htm • https://www.cga.ct.gov/2013/act/pa/2013PA-00238-R00SB-00803-PA.htm 	<ul style="list-style-type: none"> • https://www.cga.ct.gov/current/pub/chap_490.htm#sec_26-149 • https://www.cga.ct.gov/current/pub/chap_054.htm • https://eregulations.ct.gov/eRegsPortal/Browse/RCSA/%7B6A0498A4-6F18-4B20-BFD2-E9DF5E245514%7D
	Licenses and Permits	<p>Required permits can be found at:</p> <ul style="list-style-type: none"> • https://www.ct.gov/doag/cwp/view.asp?a=3768&q=259186 • https://shellfish.uconn.edu/commercial/ • https://www.ct.gov/doag/cwp/view.asp?a=3768&q=259174 	
		<ul style="list-style-type: none"> • Joint Agency Application for Marine Aquaculture in Connecticut.docx • Natural Diversity Database (NDDB) Form (required for marine applications) • ENGR 4345 Form (required for marine applications) • Coastal Zone Management Statement.docx (required for marine applications) • Import Form.docx (required for import of marine species) • Eelgrass Survey Guidance 	<ul style="list-style-type: none"> • Application to Conduct Inland Aquaculture • Import Form (required for import of freshwater species) • Water Diversion (link to CT DEEP) • Water Discharge (link to CT DEEP) • Baitfish Dealers License Application • Live Aquatic Plants Nursery/Dealer License

Connecticut		
	Marine	Freshwater and Land-Based Culture
License and Permit Barriers	<p>Note: Several permits and certifications are needed depending on how and where operations will take place</p> <p>Leasing</p> <ul style="list-style-type: none"> • A Submerged Aquatic Vegetation survey may be required depending on location • Application fee of \$100 is required, in addition to a minimum bid of \$4/acre • Does not include rental fees • Bidder must also have leased area surveyed and buoyed, either independently, or pay DEEP to do so • Leases in state waters are also provided to highest bidders for a particular lot, and lots are divided out by minimums of 50 acres 	<ul style="list-style-type: none"> • Application for Commercial hatchery license - \$130 • Bait dealer's license fee - \$63 • Importation permit requires proof of legal possession, details regarding liberation or possession, organism enclosures, and backup plans for recapture or destruction in the case of escape or loss • Wastewater discharge permits may require several additional forms depending on the exact situation. At least one form is currently being developed. Applicants must call 860-424-3018 to contact DEEP on a case-by-case basis. A list of available forms is available at: https://www.recovery.ct.gov/deep/cwp/view.asp?q=324212 • Water Diversion Permits are available from the above address. Costs will vary depending on exact needs of the aquaculture operation. Costs of \$2500 or more if permits are required for the particular situation. <ul style="list-style-type: none"> ❖ The Live Aquatic Plants Nursery license, if it applies to the operation. Contact the <i>Connecticut Agricultural Experiment Station</i> to begin the process of registering for a nursery license.

Connecticut		Marine	Freshwater and Land-Based Culture
	Identified Barriers to Entry	<ul style="list-style-type: none"> • Process to obtain a permit can be slow. A year is not out of the question. • Currently, there are no available plots for lease in state waters. Some municipal waters may still have available lease sites. • Aquaculturists will also need boating safety licenses and seafood handling training 	<ul style="list-style-type: none"> • Permit requirements and locations are not intuitive, and require working with several different agencies. This will likely require assistance, with a great deal of time spent to complete all requirements. • Otherwise, inland aquaculture operations are treated as other businesses in the state. Other business regulations will apply. • If the aquaculture operation deals with food, then additional work must be done with the Dept. of Consumer Protection and Economic Development pertaining to production standards, labeling requirements, and so on.

Jurisdiction over Commercial Aquaculture in Connecticut

Connecticut	Federal	State	Local
	<ul style="list-style-type: none"> • US Congress • Dept. of Agriculture • Dept. of Environmental Protection Food and Drug Administration • USDA Animal and Plant Health Inspection Service 	<ul style="list-style-type: none"> • Dept. of Agriculture • Dept. of Energy & Environmental Protection • Connecticut Agricultural Experiment Station • Dept. of Consumer Protection • Law Enforcement 	<ul style="list-style-type: none"> • Local and County Zoning Boards • Municipality councils

Contacts

Connecticut	Name	Email	Phone
	Bureau of Aquaculture & Laboratory Services P.O. Box 97 190 Rogers Avenue Milford, CT 06460		(203) 874-0696
	David Carey Connecticut Commissioner of Aquaculture/ Bureau Director ❖ Primary Contact throughout the permitting process, marine or inland	david.carey@ct.gov	(203) 874-0696 x 103
	Shannon Kelly Administrative Assistant Bureau of Aquaculture	shannon.kelly@ct.gov	(203) 874-0696 x113
	University of Connecticut 1080 Shennecosett Road Groton, CT 06340-6048	shellfish@uconn.edu	(860) 405-9104
	Connecticut Sea Grant College Program University of Connecticut, Avery Point Marine Science Building 1080 Shennecosett Road Groton, CT 06340	seagrant@uconn.edu	(860) 405-9128

Contacts (cont.)

Connecticut	Name and Position	Email	Phone
	Tessa Getchis Aquaculture Extension Specialist Connecticut Sea Grant/ UConn Extension ❖ Shellfish husbandry, shellfisheries management and the aquaculture permitting process	tessa.getchis@uconn.edu	(860) 405-9104
	Anoushka Concepcion Aquaculture Extension Specialist Connecticut Sea Grant/ UConn Extension ❖ seaweed aquaculture, seaweed processing, and direct marketing of shellfish	anoushka.concepcion@uconn.edu	(860) 405-9105
	Nancy C. Balcom Senior Extension Educator UConn Extension ❖ seafood safety training courses for processors; contributes to ongoing initiatives in shellfish, seaweed culture, storm risk communication and marine spatial planning	nancy.balcom@uconn.edu	(860) 405-9107
	Robert Pomeroy UConn Extension Specialist ❖ marine resource economics and policy, specifically small-scale fisheries management & development, coastal zone management, aquaculture economics, international development, policy analysis, and seafood marketing	robert.pomeroy@uconn.edu	(860) 405-9215

Contacts (cont.)

Connecticut	Name and Position		Email	Phone
	CT Department of Energy and Environmental Protection (DEEP)			(860) 424-3000
	David Ellis CT DEEP Fisheries Division		david.ellis@ct.gov	
	Mike Payton CT DEEP Boating Safety Division		mike.payton@ct.gov	
	Connecticut Agricultural Experiment Station 123 Huntington Street P. O. Box 1106 New Haven, CT 06504-1106			(203) 974-8474
	Department of Consumer Protection 450 Columbus Boulevard Suite 901 Hartford, CT 06103-1840		dcp.foodandstandards@ct.gov	(860) 713-6160
	US Army Corps of Engineers New England District 696 Virginia Rd Concord, MA 01742			(978) 318-8238
	Cori M. Rose US Army Corps of Engineers		cori.m.rose@usace.army.mil	(978) 318-8238
	Taylor Bell US Army Corps of Engineers		taylor.m.bell@usace.army.mil	(978) 318-8238
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Connecticut	Town	Phone Number <i>Call to check status of shellfish beds</i>
	Branford	(203) 315-3909
	Darien	(203) 838-9807
	East Lyme	(860) 739-6233
	Fairfield	(203) 256-3074
	Greenwich	(203) 622-7777
	Groton	(860) 441-6793
	Guilford	(203) 453-8088
	Madison	(203) 245-5600
	Milford	(203) 874-0696
	Norwalk	(203) 838-9807
	Stamford	(203) 977-5889
	Stonington	(860) 599-7575
	Waterford	(860) 739-6233
	Waterford/East Lyme	(860) 739-6233
	Westport	(203) 838-9807

Delaware

Delaware		Shellfish Aquaculture	Non-Shellfish Aquaculture
	Lead Agency/Contact Person	<ul style="list-style-type: none"> Department of Natural Resources & Environmental Control (DNREC) - Division of Fish and wildlife <p>Zina Hense Environmental Scientist (302) 739-4782 https://dnrec.alpha.delaware.gov/fish-wildlife/fishing/shellfish-aquaculture/</p>	<ul style="list-style-type: none"> Department of Agriculture (DDA) <p>(302) 698-4524 https://agriculture.delaware.gov/contact-us/</p>
	Other Regulatory Agencies	Federal Agencies	
		<ul style="list-style-type: none"> Dept. of Agriculture Dept. of Environmental Protection Food and Drug Administration USDA Animal and Plant Health Inspection Service 	<ul style="list-style-type: none"> Dept. of Agriculture Dept. of Environmental Protection Food and Drug Administration USDA Animal and Plant Health Inspection Service Army Corps of Engineers
		State Agencies	
		<ul style="list-style-type: none"> DE Dept. of Agriculture DNREC Wetlands and Sub-Aqueous lands section 	<ul style="list-style-type: none"> DNREC Division of Water DNREC Division of Fish and Wildlife
		Local Agencies	
		<ul style="list-style-type: none"> Local and County Zoning Boards Law Enforcement 	<ul style="list-style-type: none"> Local and County Zoning Boards Law Enforcement

Delaware		
	Shellfish Aquaculture	Non-Shellfish Aquaculture
Species Approved	<ul style="list-style-type: none"> • Eastern Oyster (<i>Crassostrea virginica</i>) <ul style="list-style-type: none"> ❖ Rehoboth, Indian River, & Little Assawoman Bays • Hard Clam (<i>Mercenaria mercinaria</i>) <ul style="list-style-type: none"> ❖ Little Assawoman Bay only 	<ul style="list-style-type: none"> • Tilapia (<i>Oreochromis niloticus</i>) <p>➤ See Delaware Department of Agriculture's proposed aquaculture regulations (list updated yearly)</p> <p>https://regulations.delaware.gov/register/december2001/proposed/5%20DE%20Reg%201192%2012-01-01.htm</p> <ul style="list-style-type: none"> • Black crappie (<i>Pomoxis nigromaculatus</i>) • White crappie (<i>Pomoxis annularis</i>) • Striped bass (<i>Morone saxatilis</i>) • White perch (<i>Morone americana</i>) • Walleye (<i>Stizostedion vitreum</i>) • Northern pike (<i>Esox lucius</i>) • Chain pickerel (<i>Esox niger</i>) • Muskellunge (<i>Esox masquinongy</i>) • Tiger muskellunge (<i>Esox lucius</i> x <i>Esox masquinongy</i>) • Rock bass (<i>Ambloplites rupestris</i>) • Salmon and Trout <ul style="list-style-type: none"> ❖ except Pacific Salmon (<i>Salmonidae</i>) ❖ Includes Rainbow Trout (<i>Oncorhynchus mykiss</i>), but no other <i>Oncorhynchus</i> spp. • Sunfishes (<i>Lepomis</i> spp.) • Channel catfish (<i>Ictalurus punctatus</i>) • Yellow perch (<i>Perca flavescens</i>)

Delaware		Shellfish Aquaculture	Non-Shellfish Aquaculture
	Links to Regulations	<ul style="list-style-type: none"> Delaware Aquaculture Act http://delcode.delaware.gov/title3/c004/index.shtml 	
		<ul style="list-style-type: none"> Regarding use of Sub-Aqueous lands: http://regulations.delaware.gov/AdminCode/title7/7000/7500/7504.shtml 	
	Licenses and Permits	<ul style="list-style-type: none"> DNREC Division of Fish and Wildlife: Shellfish permits and leasing forms http://www.dnrec.delaware.gov/fw/Fisheries/Pages/ShellfishAquaculture.aspx Division of Wetlands and Subaqueous Lands permits https://dnrec.alpha.delaware.gov/water/wetlands-subaqueous/permits/ 	
	License and Permit Barriers	<ul style="list-style-type: none"> Fees for applying for leases for sub-aqueous land are non-refundable. Fees are less for <i>Shellfish Aquaculture Development Area (SADA)</i> leases. Non-SADA leases - must apply to three different agencies: <ul style="list-style-type: none"> ❖ DNREC Division of Fish and Wildlife ❖ DNREC Division of Wetlands and subaqueous land ❖ US Army Corps of Engineers, Philadelphia Branch 	<ul style="list-style-type: none"> Must register with Dept. of Agriculture (at no charge)
	Identified Barriers to Entry	<ul style="list-style-type: none"> Convenient SADA locations are limited, and distributed by a lottery system. They may also be further limited by changing natural conditions. Non-SADA locations have a lengthier application process. There are gear limitations - mechanized tools for harvesting/planting are forbidden - with the exception of winches. 	<ul style="list-style-type: none"> Limited online information for non-shellfish aquaculture species currently being cultured in Delaware Only closed systems are permissible

Delaware		Shellfish Aquaculture	Non-Shellfish Aquaculture
	Additional Resources	<ul style="list-style-type: none"> • Delaware Sea Grant <ul style="list-style-type: none"> ❖ list of businesses supplying aquaculture ventures: https://www.deseagrant.org/de-aquaculture-resource-center • USDA <ul style="list-style-type: none"> ❖ reports on the status of aquaculture in the United States: https://www.usda.gov/topics/farming/aquaculture 	
		<ul style="list-style-type: none"> • East Coast Shellfish Growers Association <ul style="list-style-type: none"> ❖ information for shellfish aquaculture: https://ecsga.org/ • DNREC Division of Fish and Wildlife Shellfish Aquaculture https://dnrec.alpha.delaware.gov/fish-wildlife/fishing/shellfish-aquaculture/ • Delaware Inland Bays – Shellfish Aquaculture https://www.inlandbays.org/projects-and-issues/all/aquaculture-initiative/ • Delaware Department of Agriculture- Aqua Network https://www.aquanet.com/dover/aquaculture-aquaponics/delaware-department-of-agriculture 	<ul style="list-style-type: none"> • Delaware Department of Agriculture <ul style="list-style-type: none"> ❖ Proposed Aquaculture Regulations: https://regulations.delaware.gov/register/december2001/proposed/5%20DE%20Reg%201192%2012-01-01.htm • Tilapia Farming – Delaware Aquaculture https://www.tilapia-farming.com/delaware-aquaculture
	Contacts	<ul style="list-style-type: none"> • Dennis McIntosh, Ph.D. <i>Professor & Extension Specialist - Aquaculture</i> Delaware State University 1200 N. DuPont Hwy. Dover, DE 19901 Phone: (302) 857-6456 Fax: (302) 857-6402 E-mail: dmcintosh@desu.edu 	<ul style="list-style-type: none"> • Edward A. Hale, Ph.D. <i>Marine Advisory Specialist, Delaware Sea Grant</i> University of Delaware College of Earth, Ocean and Environment 204H Cannon Lab 700 Pilottown Road Lewes, DE 19958 Phone: (302) 645-4060 E-mail: ehale@udel.edu
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Maine

Maine		Marine Culture	Freshwater and Land-Based Culture
	Lead Agency/ Contact Person	<ul style="list-style-type: none"> • Department of Marine Resources Marcy Nelson marcy.nelson@maine.gov (207) 633-9502 https://www.maine.gov/dmr/aquaculture/forms/index.html 	<ul style="list-style-type: none"> • Department of Marine Resources Erin Wilkinson Erin.wilkinson@maine.gov (207) 624-6577 https://www.maine.gov/dmr/aquaculture/land-based.html • Department of inland Fisheries & Wildlife David Russell david.russell@maine.gov (207) 287-2813
	Other Regulatory Agencies	Federal Agencies	
		<ul style="list-style-type: none"> • U.S. Army Corps of Engineers <ul style="list-style-type: none"> ❖ Structures permitting • U.S. Coast Guard <ul style="list-style-type: none"> ❖ Private aids to navigation • U.S. Fish & Wildlife Service <ul style="list-style-type: none"> ❖ Protected and endangered species and migratory birds and the Lacey Act • U.S. Food and Drug Administration <ul style="list-style-type: none"> ❖ Drugs used for disease prevention or control, extra label drugs, Investigational new animal drug ❖ Interstate Shellfish Sanitation Committee ❖ National Food Safety Act • U.S. Environmental Protection Agency <ul style="list-style-type: none"> ❖ Clean Water Act compliance • National Oceanic and Atmospheric Administration <ul style="list-style-type: none"> ❖ Endangered species, marine mammal protection act, critical habitat and federally managed species under Magnusson-Stevens 	<ul style="list-style-type: none"> • U.S. Army Corps of Engineers <ul style="list-style-type: none"> ❖ Structures permitting • U.S. Fish & Wildlife Service <ul style="list-style-type: none"> ❖ Protected and endangered species • U.S. Food and Drug Administration <ul style="list-style-type: none"> ❖ Drugs used for disease prevention or control, extra label drugs, Investigational new animal drug

Maine		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	State Agencies	
		<ul style="list-style-type: none"> • Department of Marine Resources <ul style="list-style-type: none"> ❖ Aquaculture Division <ul style="list-style-type: none"> ○ Administers leasing and licensing program, monitoring and compliance, aquatic animal health, and importation and transfer permits ❖ Licensing Division <ul style="list-style-type: none"> ○ Aquaculture licenses, administers seafood dealer licenses, wet storage permits, etc. ❖ Bureau of Public Health <ul style="list-style-type: none"> ○ Administers biotoxin monitoring program, water quality monitoring and management program, dealer certification and inspection program e.g. HACCP, National Shellfish Sanitation Program • Department of Environmental Protection, Bureau of Land and Water Quality, Division of Water Quality Management <ul style="list-style-type: none"> ❖ Maine Pollutant Discharge Elimination System Permit ❖ Maine Waste Discharge License • Department of Inland Fisheries & Wildlife <ul style="list-style-type: none"> ❖ Essential and significant habitat ❖ Endangered species • Department of Agriculture, Conservation and Forestry <ul style="list-style-type: none"> ❖ Aquatic animal health, animal welfare, vaccines and therapeutants 	<ul style="list-style-type: none"> • Department of Environmental Protection <ul style="list-style-type: none"> ❖ Maine Pollutant Discharge Elimination System (MEPDES) permit ❖ Maine Waste Discharge License ❖ Site Location of Development Act (SLODA) permit ❖ Natural Resources Protection Act (NRPA) permit • Department of Inland Fisheries & Wildlife <ul style="list-style-type: none"> ❖ Protected birds, mammals, etc. ❖ Transfer and Importation Permit

Maine		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	<i>Local Authorities</i>	
		<ul style="list-style-type: none"> • Riparian Landowners <ul style="list-style-type: none"> ❖ Notification and/or permission required depending on permit type and distance from project, e.g. intertidal • Harbormasters <ul style="list-style-type: none"> ❖ Required approval depending on permit type • Marine Warden <ul style="list-style-type: none"> ❖ Required approval when harbormaster not available • Marina or Pound Owner <ul style="list-style-type: none"> ❖ If project is located within a marina or lobster pound • Municipal Shellfish Committee <ul style="list-style-type: none"> ❖ Approval for intertidal projects 	<p><i>depending on project specifics:</i></p> <ul style="list-style-type: none"> • Local select board/ councilors/ planning board • Municipal officers • Water district

Maine			Marine Culture	Freshwater and Land-Based Culture
	Species Approved		<p>Finfish</p> <ul style="list-style-type: none"> Atlantic Salmon (<i>Salmo salar</i>) Atlantic Halibut (<i>Hippoglossus hippoglossus</i>) Atlantic Cod (<i>Gadus morhua</i>) <p>Shellfish</p> <ul style="list-style-type: none"> Eastern oyster (<i>Crassostrea virginica</i>) (including hatchery seed) Quahog (<i>Mercenaria mercenaria</i>) (including hatchery seed) Soft shell clam (<i>Mya arenaria</i>) (including hatchery seed) Bay scallop (<i>Aquiptecten irradians</i>) (hatchery seed only) Blue mussel (<i>Mytilus edulis</i>) Atlantic sea scallop (<i>Placopecten magellanicus</i>) Arctic surf clam (<i>Mactromeris polynyma</i>) Atlantic surf clam (<i>Spisula solidissima</i>) Razor clam (<i>Ensis leei</i>) Green sea urchin (<i>Stronglocentrotus droebachiensis</i>) European oyster (<i>Ostrea edulis</i>) Ocean Quahog (<i>Arctica islandica</i>) <p>Sea Vegetables (any species native to Maine)</p> <ul style="list-style-type: none"> Nori (<i>Porphyra</i> sp.) Sugar kelp (<i>Saccharina latissima</i>) “Skinny” kelp (<i>Saccharina latissima forma angustissima</i>) Horsetail kelp (<i>Laminaria digitata</i>) Winged Kelp (<i>Alaria esculenta</i>) Laver (<i>Porphyra umbilicalis</i>) Dulse (<i>Palmaria palmate</i>) <p>Other</p> <ul style="list-style-type: none"> Polychaete worm (<i>Nereis virens</i>) 	<ul style="list-style-type: none"> Clownfish (including <i>Amphiprion ocellaris</i>; <i>Amphiprion percula</i>; <i>Amphiprion sandaracinos</i>; <i>Amphiprion clarkia</i>; <i>Amphiprion barberi</i>) Dottyback (<i>Pseudochromis</i> sp.) Spotted Cardinalfish (<i>Sphaeramia nematoptera</i>) Brook trout (<i>Savlinus fontinalis</i>) Brown trout (<i>Salmo trutta</i>) Rainbow trout (<i>Oncorhynchus mykiss</i>) Atlantic Salmon (<i>Salmo salar</i>) Atlantic Halibut (<i>Hippoglossus hippoglossus</i>) California Yellowtail (<i>Seriola lalandi</i>) Atlantic Cod (<i>Gadus morhua</i>) American eel (<i>Anguilla rostrata</i>) Mozambique eel (<i>Anguilla mossambica</i>) Golden shiner baitfish (<i>Notropis</i> sp.) Rainbow Smelt baitfish (<i>Osmerus mordax</i>) Minnows baitfish (<i>Phoxinus phoxinus</i>) White suckers baitfish (<i>Catostomus commersonii</i>) Dace baitfish (<i>Leuciscus leuciscus</i>) Tilapia (<i>Oreochromis</i> sp.) Microalgae (various species)

Maine		Marine Culture	Freshwater and Land-Based Culture
	Links to Regulations	<ul style="list-style-type: none"> • Department of Marine Resources Regulations https://www.maine.gov/dmr/laws-regulations/regulations/index.html • Aquaculture Lease Applications and Forms https://www.maine.gov/dmr/aquaculture/forms/index.html • Department of Environmental Protection – Permits, Licenses, Certifications https://www.maine.gov/dep/permits/index.html • US Army Corps of Engineers – Regulatory https://www.nae.usace.army.mil/missions/regulatory.aspx 	<ul style="list-style-type: none"> • Department of Marine Resources https://www.maine.gov/dmr/aquaculture/land-based.html • Department of Inland Fisheries and Wildlife https://www.maine.gov/ifw/fish-wildlife/wildlife/environmental-review/rules-regulations.html • Department of Environmental Protection https://www.maine.gov/dep/permits/index.html
	Identified Barriers to Entry	<ul style="list-style-type: none"> • Department of Marine Resources Lease Decision Criteria: <ul style="list-style-type: none"> ❖ Ingress and egress of riparian owners ❖ Navigation ❖ Fishing or other uses of the area ❖ Ability of the site and surrounding areas to support ecologically significant flora and fauna ❖ Public use or enjoyment within 1,000 feet of beaches, parks, or docks owned by local, state, or federal governments or certain government-owned conserved land ❖ Availability of source of organisms to be cultured ❖ No unreasonable impact from noise or light at the boundaries of the lease site • Local opposition in some cases • Waterfront access • Financing for startups 	<ul style="list-style-type: none"> • Building permits • Discharge permits • Site permits from DEP <ul style="list-style-type: none"> ❖ if over 5 acres ❖ if digging ponds • IF & W fish culture permit • Importation permit • DMR land-based aquaculture license

Maine		Marine Culture	Freshwater and Land-Based Culture
	Additional Resources	<ul style="list-style-type: none"> • The Maine Aquaculture Association https://maineaqua.org/ • Maine Aquaculture Innovation Center https://www.maineaquaculture.org/ • Conducting Aquaculture in Maine https://www.maine.gov/dmr/aquaculture/ • University of Maine Aquaculture Research Institute https://umaine.edu/aquaculture/ • Downeast Institute for Applied Marine Research and Education https://downeastinstitute.org/ • Maine Sea Grant at the University of Maine https://www.seagrants.umaine.edu/ 	<ul style="list-style-type: none"> • Beginning Farmer Resource Network of Maine https://extension.umaine.edu/beginning-farmer-resource-network/find-resources-and-assistance/aquaculture/
Maine	Date Compiled	08/07/2020	

Maryland

Maryland		Marine Culture	Freshwater and Land-Based Culture
	Lead Agency/ Contact Person	<ul style="list-style-type: none"> • Maryland Department of Natural Resources Karl Roscher, Director <i>Aquaculture and Industry Enhancement Division</i> 580 Taylor Avenue, C-2 Annapolis MD 21401 (410) 260-8313 karl.roscher@maryland.gov 	
	Other Regulatory Agencies	<ul style="list-style-type: none"> • Maryland Department of the Environment <ul style="list-style-type: none"> ❖ Shellfish water classification • Maryland Department of Health <ul style="list-style-type: none"> ❖ Plant inspection ❖ Shellfish Shippers licenses • US Army Corps of Engineers, Baltimore District (in consultation with): <ul style="list-style-type: none"> ❖ US Environmental Protection Agency ❖ US Fish and Wildlife Service ❖ NOAA - Protected Resources ❖ NOAA - Essential Fish Habitat • US Coast Guard <ul style="list-style-type: none"> ❖ Private Aids to Navigation 	

Maryland		Marine Culture	Freshwater and Land-Based Culture
	Species Approved	Shellfish <ul style="list-style-type: none"> • Eastern oyster (<i>Crassostrea virginica</i>) • Quahog (<i>Mercenaria mercenaria</i>) • Bay scallop (<i>Aquiptecten irradians</i>) 	Finfish <ul style="list-style-type: none"> • Brown trout (<i>Salmo trutta</i>) • Channel catfish (<i>Ictalurus punctatus</i>) • Largemouth bass (<i>Micropterus salmoides</i>) • Bull minnow (<i>Fundulus grandis</i>) • Golden shiner (<i>Notemigonus crysoleucas</i>) • Tilapia (<i>Oreochromis niloticus</i>) • Koi (<i>Cyprinus carpio</i>) • Goldfish (<i>Carassius auratus</i>) Amphibians <ul style="list-style-type: none"> • Diamondback terrapin (<i>Malaclemys terrapin</i>) • Eastern painted turtle (<i>Chrysemys picta</i>) • Red-bellied turtle (<i>Pseudemys rubriventris</i>) • Snapping turtle (<i>Chelydra serpentine</i>) • Yellow-bellied slider (<i>Trachemys scripta scripta</i>) Aquatic plants (for) <ul style="list-style-type: none"> • Water garden • Shoreline stabilization

Maryland		Marine Culture	Freshwater and Land-Based Culture
	Licenses and Permits	<p><i>Aquaculture Permits</i></p> <ul style="list-style-type: none"> • MD Department of Natural Resources Aquaculture and Industry Enhancement Division • Varies, depending on species • In addition to the lease, the lessee must have a Permit for work on the ground (each lease requires an individual one) and workers must each have a Registration card to ensure they are legal to be there <p><i>Shellfish Lease</i></p> <ul style="list-style-type: none"> • MD Department of Natural Resources Aquaculture and Industry Enhancement Division • \$300 application fee • \$3.50/acre annual bottom lease • \$25.00/acre annual water column lease <p><i>Building permit</i></p> <ul style="list-style-type: none"> • County Planning Unit <p><i>Drainage/Discharge permitting and approval</i></p> <ul style="list-style-type: none"> • Maryland Department of the Environment <p><i>Fish/shellfish importation</i></p> <ul style="list-style-type: none"> • MD Department of Natural Resources Aquaculture and Industry Enhancement Division • Required application 30 days prior to importation • Permit require to import oyster or clam shell, seed, or larvae 	

Maryland		Marine Culture	Freshwater and Land-Based Culture
	Identified Barriers to Entry	<ul style="list-style-type: none"> • If piers or docks are required, a Tidal Wetland license is required from the Department of the Environment and Board of Public Works. In addition, building construction permits are processed through local county planning and zoning offices. • Protest process and user conflicts • Time to acquire a lease • Lack of accurate understanding of substrate characteristics • Capital • Labor 	
	Additional Resources	<ul style="list-style-type: none"> • Maryland Shellfish Growers Network https://www.cbf.org/how-we-save-the-bay/programs-initiatives/maryland/marylandshellfish-growers-network/ • University of Maryland Extension Aquaculture https://extension.umd.edu/aquaculture • Maryland Oyster Lease Siting Tool http://dnrweb.dnr.state.md.us/fisheries/aquatool/aquatool.asp • UMCES Horn Point Oyster Hatchery Larvae and Seed Sales http://hatchery.hpl.umces.edu/purchasing-information/ 	
		<ul style="list-style-type: none"> • MD DNR Aquaculture and Industry Enhancement Division https://dnr.maryland.gov/fisheries/pages/aquaculture/index.aspx 	

Contacts

Maryland	Name		Address	Phone/ Email
	State Shellfish Pathologist ❖ Shellfish health pathology		MD Department of Natural Resources Cooperative Oxford Lab 904 South Morris Street Oxford MD, 21654	(443) 258-6064
	Matt Parker <i>Aquaculture Business Specialist</i> <i>University of Maryland Extension</i> ❖ Aquaculture Education		Prince Georges County Extension Office 6707 Groveton Ave Clinton MD, 20735	(301) 868-8780 mparke11@umd.edu
	Catherine (Chengchu) Liu, Ph.D. <i>Seafood Technology Specialist</i> <i>University of Maryland Extension</i> ❖ Aquaculture Education		University of Maryland Eastern Shore Center for Food Science & Technology, Rm 2115 11868 College Backbone Rd. Princess Anne, MD 21853	(410) 651-6636 (<i>Office</i>) (301) 852-8410 (<i>Cell</i>) cathylu@umd.edu
	Don Webster <i>Regional Specialist</i> ❖ Aquaculture Education		Wye Research & Education Center PO Box 169 124 Wye Narrows Drive Queenstown, MD 21658	(410) 827-5377 x127 dwebster@umd.edu
	Brittany Wolfe <i>Shellfish Hatchery Manage/ Extension Specialist</i> ❖ Aquaculture Education		Morgan State University Patuxent Environmental & Aquatic Research Lab 10545 Mackall Road Saint Leonard, MD 20685	brittany.wolfe@morgan.edu
	Shannon Hood <i>Associate Agent</i> <i>University of Maryland Extension</i> ❖ Aquaculture Education		University of Maryland Center for Environmental Science 2020 Horns Point Road Cambridge, MD 21613	(410) 221-8225 shood@umces.edu
	Dr. Catherine Frederick, RAS-N <i>Extension Specialist</i> ❖ Aquaculture Education		Institute of Marine and Environmental Technology, University System of Maryland 7701 E. Pratt Street Baltimore , MD 21202	Phone: (410) 234-8810 Email: cfrederi@umd.edu
Date Compiled		07/28/2020		

Massachusetts

Massachusetts		Marine Culture	Freshwater and Land-Based Culture
	Lead Agency/ Contact Person	<ul style="list-style-type: none"> • Department of Marine Resources <ul style="list-style-type: none"> Sean Bowen Sean.Bowen@mass.gov (617) 626-1724 • https://www.mass.gov/service-details/aquaculture 	<ul style="list-style-type: none"> • Division of Agriculture Conservation and Technical Assistance (DACTA) <ul style="list-style-type: none"> Gerard Kennedy Gerard.Kennedy@mass.gov (617) 626-1773 • https://www.mass.gov/guides/division-of-agricultural-conservation-and-technical-assistance-dacta
	Other Regulatory Agencies	Federal Agencies	
		<ul style="list-style-type: none"> • U.S. Army Corps of Engineers <ul style="list-style-type: none"> ❖ Structures permitting ❖ Individual or Programmatic General Permit (PGP) • U.S. Coast Guard <ul style="list-style-type: none"> ❖ Private Aids to Navigation • U.S. Fish & Wildlife Service <ul style="list-style-type: none"> ❖ Protected and endangered species and migratory birds and the Lacey Act • U.S. Food and Drug Administration <ul style="list-style-type: none"> ❖ Drugs used for disease prevention or control, extralabel drugs, Investigational new animal drug ❖ Interstate Shellfish Sanitation Committee ❖ National Food Safety Act • U.S. Environmental Protection Agency <ul style="list-style-type: none"> ❖ Clean Water Act compliance • National Oceanic and Atmospheric Administration <ul style="list-style-type: none"> ❖ Endangered species, marine mammal protection act, critical habitat and federally managed species under Magnusson-Stevens 	<ul style="list-style-type: none"> • U.S. Army Corps of Engineers <ul style="list-style-type: none"> ❖ Individual or Programmatic General Permit (PGP) • U.S. Fish & Wildlife Service <ul style="list-style-type: none"> ❖ Protected and endangered species • U.S. Food and Drug Administration <ul style="list-style-type: none"> ❖ Drugs used for disease prevention or control, extralabel drugs, Investigational new animal drug

Massachusetts		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	<i>State Agencies</i>	
		<ul style="list-style-type: none"> • Division of Watershed Management <ul style="list-style-type: none"> ❖ Surface Water Discharge Permit • Division of Marine Fisheries <ul style="list-style-type: none"> ❖ Shellfish Grant Application ❖ Aquaculture Permit ❖ Dealer Permit ❖ Special Permit Application for Cultivation of Marine Finfish Species • Division of Fisheries and Wildlife <ul style="list-style-type: none"> ❖ Class VI Fish Propagation Possession Permit • Massachusetts Office of Environmental Affairs Coastal Zone Management <ul style="list-style-type: none"> ❖ Federal Consistency Determination – CZM Consistency 	<ul style="list-style-type: none"> • Department of Environmental Protection Surface Water Discharge Permitting <ul style="list-style-type: none"> ❖ National Pollutant Discharge Elimination System (NPDES) Permit ❖ Wetlands Permit Wetlands Protection Act • Division of Watershed Management <ul style="list-style-type: none"> ❖ Groundwater Discharge Permit ❖ Surface Water Discharge Permit ❖ Waterways License • Division of Marine Fisheries <ul style="list-style-type: none"> ❖ Aquaculture Permit • Division of Fisheries and Wildlife <ul style="list-style-type: none"> ❖ Class I and III Fish Propagation Possession Permit ❖ Class VI Fish Propagation Possession Permit • Department of Environmental Protection Watershed Planning and Permitting <ul style="list-style-type: none"> ❖ Water Withdrawal Permit • Massachusetts Environmental Policy Act Office <ul style="list-style-type: none"> ❖ MEPA Environmental Notification Form • Executive Office of Environmental Affairs Coastal Zone Management <ul style="list-style-type: none"> ❖ Federal Consistency Determination – CZM Consistency
		<i>Local Agencies</i>	
		<ul style="list-style-type: none"> • Local Board of Selectmen for each municipality <ul style="list-style-type: none"> ❖ Shellfish Grant Application 	<ul style="list-style-type: none"> • Town Conservation Commission or Department of Environmental Protection <ul style="list-style-type: none"> ❖ Request for Determination

Massachusetts		Marine Culture	Freshwater and Land-Based Culture
	Species Approved	<p>Finfish</p> <ul style="list-style-type: none"> • Steelhead trout (<i>Oncorhynchus mykiss</i>) • Black sea bass (<i>Centropristis striata</i>) <p>Shellfish</p> <ul style="list-style-type: none"> • Eastern oyster (<i>Crassostrea virginica</i>) (including hatchery seed) • Quahog (<i>Mercenaria mercenaria</i>) (including hatchery seed) • Soft shell clam (<i>Mya arenaria</i>) (including hatchery seed) • Bay scallop (<i>Argopecten irradians</i>) (including hatchery seed) • Blood arks (<i>Anadara ovalis</i>) • Blue mussel (<i>Mytilus edulis</i>) • Atlantic sea scallop (<i>Placopecten magellanicus</i>) • Atlantic surf clam (<i>Spisula solidissima</i>) • Razor clam (<i>Ensis directus</i>) • Ocean Quahog (<i>Arctica islandica</i>) <p>Sea Vegetables</p> <ul style="list-style-type: none"> • Sugar kelp (<i>Saccharina latissima</i>) 	<p>Finfish</p> <ul style="list-style-type: none"> • Barramundi (<i>Lates calcarifer</i>) • Brook trout (<i>Salvelinus fontinalis</i>) • Brown trout (<i>Salmo trutta</i>) • Rainbow trout (<i>Oncorhynchus mykiss</i>) • Golden shiner baitfish (<i>Notropis</i> sp.) • Minnows baitfish (<i>Phoxinus phoxinus</i>) • White suckers baitfish (<i>Catostomus commersonii</i>) • Dace baitfish (<i>Leuciscus leuciscus</i>) • Tilapia (<i>Oreochromis</i> sp.) • Largemouth bass (<i>Micropterus salmoides</i>)

Massachusetts		Marine Culture	Freshwater and Land-Based Culture
	Links to Regulations	<ul style="list-style-type: none"> • Division of Watershed Management https://www.mass.gov/orgs/dcr-office-of-watershed-management • Division of Marine Fisheries https://www.mass.gov/orgs/division-of-marine-fisheries • Division of Fisheries and Wildlife https://www.mass.gov/orgs/division-of-fisheries-and-wildlife • Massachusetts Office of Coastal Zone Management https://www.mass.gov/orgs/massachusetts-office-of-coastal-zone-management • US Army Corps of Engineers – Regulatory https://www.nae.usace.army.mil/missions/regulatory.aspx 	<ul style="list-style-type: none"> • Division of Watershed Management https://www.mass.gov/orgs/dcr-office-of-watershed-management • Division of Fisheries and Wildlife https://www.mass.gov/orgs/division-of-fisheries-and-wildlife • Department of Environmental Protection Surface Water Discharge Permitting https://www.mass.gov/service-details/surface-water-discharge-permitting-npdes • Department of Environmental Protection Watershed Planning and Permitting https://www.mass.gov/guides/watershed-planning-program • Massachusetts Environmental Policy Act Office https://www.mass.gov/orgs/massachusetts-environmental-policy-act-office • Massachusetts Office of Coastal Zone Management https://www.mass.gov/orgs/massachusetts-office-of-coastal-zone-management

Massachusetts		Marine Culture	Freshwater and Land-Based Culture
	Identified Barriers to Entry	<ul style="list-style-type: none"> • Navigational impairment/restrictions • Wild finfish and shellfish commercial/recreational harvest areas • Local opposition <ul style="list-style-type: none"> ❖ Noise and visual aesthetics issues • Waterfront access <ul style="list-style-type: none"> ❖ Limited access to boat launching sites • Financing for startups 	<ul style="list-style-type: none"> • Building permits • Discharge permits • Importation permit • Division of Fisheries and Wildlife permits
	Additional Resources	<ul style="list-style-type: none"> • Cape Cod Cooperative Extension <ul style="list-style-type: none"> ❖ https://www.capecodextension.org/ • Southeastern Massachusetts Aquaculture Center <ul style="list-style-type: none"> ❖ https://www.capecodextension.org/marine/semac/ 	<ul style="list-style-type: none"> • Tilapia Farming <ul style="list-style-type: none"> ❖ https://www.tilapia-farming.com/massachusetts-aquaculture
	Date Compiled	03/10/2020	

New Hampshire

New Hampshire		Marine Culture	Freshwater and Land-Based Culture
	Lead Agency/ Contact Person	New Hampshire Fish and Game Department <i>Marine Fisheries Division</i> Robert Atwood (603) 868-1095 Robert.atwood@wildlife.nh.gov	New Hampshire Fish and Game Department <i>Inland Fisheries</i> Jason Smith (603) 271-2501 Jason.smith@wildlife.nh.gov
	Other Regulatory Agencies	<i>Federal Agencies</i>	
		<ul style="list-style-type: none"> • U.S. Army Corps of Engineers <ul style="list-style-type: none"> ❖ Structures permitting • U.S. Coast Guard <ul style="list-style-type: none"> ❖ Private Aids to Navigation • U.S. Environmental Protection Agency <ul style="list-style-type: none"> ❖ Clean Water Act compliance • National Oceanic and Atmospheric Administration <ul style="list-style-type: none"> ❖ Endangered species, marine mammal protection act, critical habitat and federally managed species under Magnusson-Stevens 	<ul style="list-style-type: none"> • U.S. Army Corps of Engineers • U.S. Fish & Wildlife Service <ul style="list-style-type: none"> ❖ Protected and endangered species

New Hampshire		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	<i>State Agencies</i>	
		<ul style="list-style-type: none"> • NH Fish and Game Department <ul style="list-style-type: none"> ❖ <i>Marine Fisheries Division</i> - Administers aquaculture permit application, dive surveys, public hearing ❖ Seed importation permit - Application to Import Wildlife/Fish • NH Wetlands Program/NH Department of Environmental Services Wetlands Bureau <ul style="list-style-type: none"> ❖ Wetlands permit • NH Department of Environmental Services • NH Port Authority • NH Department of Health and Human Services <ul style="list-style-type: none"> ❖ Department of Public Health Services certification, manages the Interstate Certified Shellfish Shippers List, Shellfish Certification ❖ Shellfish Program – authorizes shellfish harvests 	<ul style="list-style-type: none"> • NH Fish and Game Department <ul style="list-style-type: none"> ❖ Aquaculture Application (Inland) ❖ Importation Permit • NH Department of Environmental Services <ul style="list-style-type: none"> ❖ NH DES Wastewater Engineering Bureau - Discharge Permit
		<i>Local Agencies</i>	
		<ul style="list-style-type: none"> • Riparian Landowners <ul style="list-style-type: none"> ❖ Notification required depending on permit type and distance from project 	<p><i>depending on project specifics:</i></p> <ul style="list-style-type: none"> • Local select board/councilors/planning board • Municipal officers • Water district

New Hampshire		Marine Culture	Freshwater and Land-Based Culture
	Species Approved	<p>Finfish</p> <ul style="list-style-type: none"> Steelhead trout (<i>Oncorhynchus mykiss</i>) <p>Shellfish</p> <ul style="list-style-type: none"> Eastern oyster (<i>Crassostrea virginica</i>) European oyster (<i>Ostrea edulis</i>) Quahog (<i>Mecenaria mercenaria</i>) Soft shell clam (<i>Mya arenaria</i>) Razor clam (<i>Ensis directus</i>) Blue mussel (<i>Mytilus edulis</i>) Sea scallop (<i>Placopecten magellanicus</i>) Green sea urchin (<i>Stronglocentrotus droebachiensis</i>) <p>Seaweed</p> <ul style="list-style-type: none"> Sugar kelp (<i>Saccharina latissimi</i>) Dulse (<i>Palmaria palmate</i>) Winged kelp (<i>Alaria marginata</i>) Winged kelp/wakame (<i>Alaria esculenta</i>) Horse tail kelp (<i>Laminaria digitate</i>) Sea lettuce (<i>Ulva lactuca</i>) Nori (<i>Porphyra</i> spp.) <i>Gracillaria</i> <p>Echinoderms</p> <ul style="list-style-type: none"> Green sea urchin (<i>Stronglyocentrotus droebachiensis</i>) 	<p>Freshwater Finfish</p> <ul style="list-style-type: none"> Brook trout (<i>Savlinus fontinalis</i>) Rainbow trout (<i>Oncorhynchus mykiss</i>) Brown trout (<i>Salmo trutta</i>) Atlantic salmon (<i>Salmo salar</i>) <ul style="list-style-type: none"> ❖ landlocked Tilapia (<i>Oreochromis niloticus</i>) Golden shiners (<i>Notemigonus crysoleuca</i>) <ul style="list-style-type: none"> ❖ for baitfish and pond forage, local harvest or imported, not propagated

New Hampshire		Marine Culture	Freshwater and Land-Based Culture
	Regulatory Information	<ul style="list-style-type: none"> NH Department of Health and Human Services 29 Hazen Drive Concord, NH 03301-6504 Contact: Justin McMath (603) 271-4589 Justin.McMath@dhhs.nh.gov NH Department of Environmental Services - Wastewater Engineering Bureau 29 Hazen Drive; PO Box 95 Concord, NH 03302-0095 Contact: Stergios Spanos (603) 271-6637 stergios.spanos@des.nh.gov 	
		<ul style="list-style-type: none"> New Hampshire Fish and Game Department Marine Fisheries Division 225 Main St. Durham, NH 03824 (603) 868-1095 Contact: Robert Atwood Robert.atwood@wildlife.nh.gov NH Department of Environmental Services Shellfish Program Portsmouth Regional Office Pease International Tradeport 222 International Drive, Suite 175 Portsmouth, NH 03801 Contact: Chris Nash <i>Shellfish Program Manager</i> (603) 559-1509 Chris.nash@des.nh.gov 	<ul style="list-style-type: none"> New Hampshire Fish and Game Department Inland Fisheries 2 Hazen Dr. Concord, NH 03301 Contact: Jason Smith (603) 271-2501 Jason.smith@wildlife.nh.gov

New Hampshire		Marine Culture	Freshwater and Land-Based Culture
	Regulatory Information (cont.)	<ul style="list-style-type: none"> NH Port Authority <i>Division of Ports and Harbors</i> 555 Market Street Portsmouth, NH 03801 Contact: Geno Marconi (603) 436-8500 United States Coast Guard <i>Sector Southeastern New England Command Center</i> 259 High Street South Portland, ME 04106-0007 (508) 457-3211 Army Corps of Engineers <i>USACE Regulatory Division</i> 696 Virginia Road Concord, MA 01742 Contact: David M Keddell David.M.Keddell@usace.army.mil 	
	Identified Barriers to Entry	<ul style="list-style-type: none"> Lack of suitable new sites Local opposition Limited public waterfront access Permitting information and applications not available online or difficult to find 	<ul style="list-style-type: none"> Lengthy permitting process

Additional Resources

New Hampshire	Name		Address	Phone/ Email
	Michael Chambers, PhD <i>Aquaculture Extension Specialist</i>		NH Sea Grant Morse Hall, Suite 164 8 College Road Durham, NH 03824	(603) 862-3394 Michael.chambers@unh.edu
	Steve Jones, PhD <i>Vibrio Specialist</i>		NH Sea Grant Jackson Estuarine Laboratory 85 Adams Point Road Durham, NH 03824	(603) 862-5124 Stephen.jones@unh.edu
	New Hampshire Sea Grant at the University of New Hampshire		https://www.seagrant.unh.edu/	
	Date Compiled	06/10/2019		

New Jersey

		Marine Culture	Freshwater and Land-Based Culture
New Jersey	Lead Agency/ Contact Person	<ul style="list-style-type: none">• New Jersey Department of Agriculture Amanda Wenczel <i>Aquaculture Development Specialist</i> Office of Aquaculture Coordination, Room 204 P.O. Box 330 Trenton, NJ 08625 (609) 984-2502 Amanda.Wenczel@ag.nj.gov https://www.nj.gov/agriculture/divisions/anr/sea/	
	Other Regulatory Agencies	<div><div>Federal Agencies</div><div><ul style="list-style-type: none">• U.S. Army Corps of Engineers<ul style="list-style-type: none">❖ Administers <i>Nationwide Permit 48</i> which authorizes shellfish aquaculture• U.S. Coast Guard<ul style="list-style-type: none">❖ Private Aids to Navigation• U.S. Environmental Protection Agency<ul style="list-style-type: none">❖ Informs <i>State Pollution Discharge Elimination System</i> policies• U.S. Food and Drug Administration<ul style="list-style-type: none">❖ Regulation of food safety- uses National Shellfish Sanitation Program (NSSP)• U.S. Fish & Wildlife Service<ul style="list-style-type: none">❖ Manages threatened and endangered species protections</div><div><ul style="list-style-type: none">• U.S. Army Corps of Engineers• U.S. Fish & Wildlife Service• U.S. Food and Drug Administration</div></div>	

New Jersey		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	State Agencies	
		<ul style="list-style-type: none"> • New Jersey Department of Agriculture <ul style="list-style-type: none"> ❖ Administers Aquatic Farmer License Program ❖ Permits importation of fish ❖ Provides health inspections for fish, conducts marketing ❖ Leads State Aquaculture Advisory Council 	<ul style="list-style-type: none"> • New Jersey Dept. of Environmental Protection <ul style="list-style-type: none"> ❖ Division of Water Quality – Administers NJPDES ❖ Division of Water Supply and Geoscience — Water allocation and use
		<ul style="list-style-type: none"> • State Aquaculture Advisory Council <ul style="list-style-type: none"> ❖ Informs aquaculture policy • New Jersey Dept. of Environmental Protection <ul style="list-style-type: none"> ❖ Bureau of Shellfisheries – Administers leasing program, harvest licenses, and seed importation permits ❖ Bureau of Marine Water Monitoring – Commercial Aquaculture Permits, monitors compliance with NSSP, monitors water quality, administers shellfish harvest classifications ❖ Division of Land Use - Regulates activities relating to land use, administer permits for shellfish aquaculture ❖ Bureau of Tidelands Resource Management – Grants permission for use of Tidelands ❖ Bureau of Law Enforcement - Enforces laws and regulations that protect wildlife/habitats, enforces aquaculture permits ❖ Division of Water Quality – Administers NJPDES ❖ Endangered and Nongame Species Program – endangered species and critical habitats • New Jersey Dept. of Health Seafood <ul style="list-style-type: none"> ❖ Administers shellfish dealer’s certifications 	

New Jersey		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	State Councils	
		<ul style="list-style-type: none"> • Delaware Bay Shellfish Council <ul style="list-style-type: none"> ❖ Approves shellfish leases for Delaware Bay • Atlantic Coast Shellfish Council <ul style="list-style-type: none"> ❖ Approves shellfish leases for Atlantic Coastal Bays • Tidelands Resource Council <ul style="list-style-type: none"> ❖ Approves Tidelands Licenses 	
	Species Approved	Shellfish <ul style="list-style-type: none"> • Eastern oyster (<i>Crassostrea virginica</i>) • Quahog (<i>Mercenaria mercenaria</i>) • Bay Scallop (<i>Aquiptecten irradians</i>) • Atlantic Surf Clam (<i>Spisula solidissima</i>) 	<ul style="list-style-type: none"> • Koi (<i>Cyprinus carpio</i>) • Tilapia (<i>Oreochromis niloticus</i>) • Rainbow Trout (<i>Oncorhynchus mykiss</i>) • Hybrid Striped Bass (<i>Morone chrysops</i> x <i>Morone saxatilis</i>) • Ornamental Goldfish (<i>Carassius auratus</i>) • Blue Crab (<i>Callinectes sapidus</i>)
	Links to Regulations	<ul style="list-style-type: none"> • NJDEP Bureau of Shellfisheries https://www.nj.gov/dep/fgw/shelhome.htm https://nj.aspirafocus.com/internetsales • NJDEP Land Use Resources Permitting https://www.nj.gov/dep/landuse/activity/aqua.html https://www.nj.gov/dep/landuse/forms.html https://www.nj.gov/dep/landuse/download/lur021.pdf • NJDEP Bureau of Tidelands Management https://www.nj.gov/dep/landuse/download/TD009.pdf 	<ul style="list-style-type: none"> • NJ Division of Water Quality https://www.nj.gov/dep/dwq/njpdes.htm • NJ Division of Water Supply and Geoscience https://www.state.nj.us/dep/watersupply/a_ag.html

New Jersey		Marine Culture	Freshwater and Land-Based Culture
	Links to Regulations (cont.)	<ul style="list-style-type: none"> • NJDEP Bureau of Marine Water Monitoring https://jerseyseafood.nj.gov/ConsolidatedApp2016.pdf https://www.nj.gov/dep/bmw/nssphome.html#harvestertraining https://www.state.nj.us/dep/bmw/nssphome.html • NJDEP Marine Enforcement https://www.state.nj.us/dep//fgw/lawhome.htm • NJ Department of Health Seafood https://www.state.nj.us/health/ceohs/food-drug-safety/industry-service-programs/#3 https://www.state.nj.us/health/ceohs/documents/food-drug-safety/Shellfish_Certification_Application.pdf https://www.state.nj.us/health/ceohs/documents/food-drug-safety/wholesale_food_cosmetic_application.pdf • NJ Department of Agriculture https://jerseyseafood.nj.gov/AFL_OperationalPlan_2016.pdf • US Army Corps of Engineers – Regulatory https://www.nae.usace.army.mil/missions/regulatory.aspx 	

New Jersey		Marine Culture	Freshwater and Land-Based Culture
	Licenses and Permits	<ul style="list-style-type: none"> • Nationwide Permit 48 <ul style="list-style-type: none"> ❖ Army Corps of Engineers ❖ No fee ❖ 5-year renewal • Shellfish Lease <ul style="list-style-type: none"> ❖ Shellfish Councils/NJDEP Bureau of Shellfisheries ❖ Fee application \$250, \$100 annually plus \$0.50-\$2.00 /acre ❖ Annual renewal • Aquaculture Development Zone Lease <ul style="list-style-type: none"> ❖ Shellfish Councils/NJDEP Bureau of Shellfisheries ❖ Limited availability, pre-permitted shellfish lease ❖ Fee \$1000 application and \$25-\$100 per acre annually • Commercial Shellfish License <ul style="list-style-type: none"> ❖ NJDEP Bureau of Shellfisheries ❖ Fee \$50 ❖ Annual renewal • Commercial Aquaculture License <ul style="list-style-type: none"> ❖ NJDEP Bureau Marine Water Monitoring ❖ No fee ❖ Annual Renewal 	<ul style="list-style-type: none"> • Aquatic Farmers License <ul style="list-style-type: none"> ❖ NJ Department of Agriculture ❖ No fee ❖ 5-year renewal • NJ Division of Water Quality <ul style="list-style-type: none"> ❖ May require permit • NJ Division of Water Supply and Geoscience <ul style="list-style-type: none"> ❖ May require permit • Local County Permits <ul style="list-style-type: none"> ❖ May be required

New Jersey		Marine Culture	Freshwater and Land-Based Culture
	Licenses and Permits (cont.)	<ul style="list-style-type: none"> • Aquatic Farmers License <ul style="list-style-type: none"> ❖ NJ Department of Agriculture ❖ No fee ❖ 5-year renewal • Tidelands License <ul style="list-style-type: none"> ❖ NJDEP Bureau of Tidelands Resource Management ❖ Fee \$0.01/square foot ❖ Annual renewal • Coastal Zone Management Permit <ul style="list-style-type: none"> ❖ NJDEP Division of Land Use ❖ Fee is activity dependent \$0-\$3000 ❖ 5-year renewal • Certified Dealer License (for distribution) <ul style="list-style-type: none"> ❖ NJ Department of Health ❖ Fee \$150 ❖ Annual renewal • Shellfish Seed Importation Import <ul style="list-style-type: none"> ❖ NJDEP Bureau of Shellfisheries ❖ No fee • Local County Permits <ul style="list-style-type: none"> ❖ May be required 	

New Jersey		Marine Culture	Freshwater and Land-Based Culture
	Identified Barriers to Entry	<ul style="list-style-type: none"> • Permitting across several agencies • Lease availability limited • Lack of turnover of unused leases • Ingress and egress access • Navigational restriction • Conflicts with fishing or other uses of the area • Critical and endangered habitats • Availability of source of organisms to be cultured • Cost of waterfront real estate • Financing for startups • Policy not yet developed for candidate species and state ocean waters 	<ul style="list-style-type: none"> • Building permits • Discharge permits
	Additional Resources	https://hsrl.rutgers.edu/ http://njseagrant.org/ https://aic.rutgers.edu/ https://ocean.njaes.rutgers.edu/marine/ https://njaes.rutgers.edu/	https://njaes.rutgers.edu/

Contacts

New Jersey	Name	Address	Phone/ Email
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	Megan Kelly <i>Environmental Specialist</i>	Marine Fisheries Administration Bureau of Shellfisheries Nacote Creek Research Station 360 N. New York Road, MM 51 Port Republic, NJ 08241	(609) 748-4235 megan.kelly@dep.nj.gov
	Jessica Cobb <i>Environmental Specialist</i>	NJDEP Division of Land Use Regulation 501 E. State Street PO Box 420 Trenton, NJ 08625-0420	(609) 292-1237 Jessica.Cobb@dep.nj.gov
	William J. Kresnosky <i>Supervising Environmental Specialist</i>	Bureau of Tidelands Management P.O. Box 420, Code 501-02B Trenton, NJ 08625-0420	(609) 292-2573 william.kresnosky@dep.nj.gov
	Tracy Fay <i>Principal Biologist</i>	Bureau of Maine Water Monitoring Stoney Hill Road Leeds Point, NJ 08220	(609) 748-2012 Tracy.fay@dep.nj.gov
	Virginia Wheatley <i>NJDOH Seafood/Shellfish Project Coordinator</i>	Food and Drug Safety Program Consumer, Environmental & Occupational Health Services PO Box 369 Trenton, NJ 08625-0369	(609) 826-4935 Virginia.Wheatley@doh.state.nj.us
	David Bushek <i>Director</i>	Rutgers University Haskin Shellfish Research Laboratory 6959 Miller Avenue Port Norris, NJ 08349	(856) 785-0075 Bushek@hsrl.rutgers.edu

Contacts (cont.)

New Jersey	Name		Address	Phone/ Email
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	Lisa M. Calvo <i>Aquaculture Program Coordinator</i> <i>NJ Sea Grant</i>		Rutgers University Haskin Shellfish Research Laboratory 6959 Miller Avenue Port Norris, NJ 08349	(856) 785-0074 lcalvo@hsrl.rutgers.edu
	Mike Hayduk <i>Chief Application Section</i>		U.S. Army Corps of Engineers Regulatory Branch 100 Penn Square East Philadelphia, PA 19107-3390	(215) 656-5822 Michael.H.Hayduk@usace.army.mil
	Date Compiled	01/01/2019		

New York

New York		Marine Culture	Freshwater and Land-Based Culture
	Lead Agency/ Contact Person	<ul style="list-style-type: none"> • NY State Department of Environmental Conservation Shellfish Management Unit Division of Marine Resources 205 North Belle Mead Road, Suite 1 East Setauket, NY 11733 (631) 444-0481 fw.marine@dec.ny.gov Contact: Wade Carden wade.carden@dec.ny.gov 	<ul style="list-style-type: none"> • NY State Department of Environmental Conservation Bureau of Fisheries (Regional Offices) https://www.dec.ny.gov/outdoor/7927.html Contact: Jim Daley Jim.daley@dec.ny.gov (518) 402-8959
	Other Regulatory Agencies	<p>Federal Agencies</p> <ul style="list-style-type: none"> • U.S. Army Corps of Engineers <ul style="list-style-type: none"> ❖ Structures permitting • U.S. Coast Guard <ul style="list-style-type: none"> ❖ Private Aids to Navigation • U.S. Fish & Wildlife Service <ul style="list-style-type: none"> ❖ Protected and endangered species and migratory birds and the Lacey Act • U.S. Food and Drug Administration <ul style="list-style-type: none"> ❖ Drugs used for disease prevention or control ❖ Interstate Shellfish Sanitation Committee ❖ National Food Safety Act • U.S. Environmental Protection Agency <ul style="list-style-type: none"> ❖ Clean Water Act compliance • National Oceanic and Atmospheric Administration <ul style="list-style-type: none"> ❖ Endangered species, marine mammal protection act, critical habitat and federally managed species under Magnusson-Stevens 	<ul style="list-style-type: none"> • U.S. Army Corps of Engineers • U.S. Fish & Wildlife Service <ul style="list-style-type: none"> ❖ Protected and endangered species • U.S. Food and Drug Administration <ul style="list-style-type: none"> ❖ Drugs used for disease prevention or control

New York		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	<i>State Agencies</i>	
		<ul style="list-style-type: none"> • New York State Department of State Office of Planning & Development <ul style="list-style-type: none"> ❖ Reviews consistency with Federal Regulations • New York Department of Environmental Conservation (NYDEC) <ul style="list-style-type: none"> ▪ Shellfish Management Unit - Division of Marine Resources <ul style="list-style-type: none"> ❖ Marine aquaculture permits (Hatchery & On/off-bottom) ▪ Shellfish Inspection Unit - Division of Marine Resources <ul style="list-style-type: none"> ❖ Harvesting and shipping permits/sanitation ▪ Division of Environmental Permits <ul style="list-style-type: none"> ❖ State Pollution Discharge Elimination System (sometimes needed) 	<ul style="list-style-type: none"> • New York State Department of State Office of Planning & Development <ul style="list-style-type: none"> ❖ Reviews consistency with Federal Regulations • New York Department of Environmental Conservation (NYDEC) <ul style="list-style-type: none"> ▪ Bureau of Fisheries (Regional Offices) <ul style="list-style-type: none"> ❖ Freshwater fish (stocking, ponds, preserves, and grass carp) ▪ Special Licenses Unit <ul style="list-style-type: none"> ❖ Freshwater fish hatcheries ▪ Division of Environmental Permits <ul style="list-style-type: none"> ❖ State Pollution Discharge Elimination System (sometimes needed)
		<i>Local Agencies</i>	
		<ul style="list-style-type: none"> • Suffolk County Department of Economic Development & Planning <ul style="list-style-type: none"> ❖ Leasing shellfish grounds • Town of Islip Bay Bottom Leasing Program <ul style="list-style-type: none"> ❖ Leasing shellfish grounds • Town of Brookhaven Bay Bottom Leasing Program <ul style="list-style-type: none"> ❖ Leasing shellfish grounds 	

New York		Marine Culture	Freshwater and Land-Based Culture
	Species Approved	<ul style="list-style-type: none"> • Eastern oyster (<i>Crassostrea virginica</i>) • Quahog (<i>Mecenaria mercenaria</i>) 	<ul style="list-style-type: none"> • Brook trout (<i>Salvelinus fontinalis</i>) • Brown trout (<i>Salmo trutta</i>) • Brown Bullhead Catfish (<i>Ameiurus nebulosus</i>) • Channel catfish (<i>Ictalurus punctatus</i>) • Golden shiner (<i>Notemigonus crysoleucas</i>) • Grass Carp (<i>Ctenopharyngodon idella</i>) • Largemouth bass (<i>Micropterus salmoides</i>) • Pumpkinseed sunfish (<i>Lepomis gibbosus</i>) • Rainbow trout (<i>Oncorhynchus mykiss</i>) • Rosy red minnow (<i>Pimephales promelas</i>) • Striped bass (<i>Morone saxatilis</i>) • Tiger trout (<i>Salmo trutta</i> × <i>Salvelinus fontinalis</i>) • Walleye (<i>Stizostedion vitreum</i>)
	Links to Regulations	<ul style="list-style-type: none"> • Marine Hatchery Permit https://www.dec.ny.gov/outdoor/110882.html • On/Off Bottom Culture Permit https://www.dec.ny.gov/outdoor/110882.html • Shellfish Shipper https://www.dec.ny.gov/outdoor/6215.html • https://www.suffolkcountyny.gov/Departments/Economic-Development-and-Planning/Economic-Development/Agriculture-and-Fishing#am • https://islipny.gov/community-and-services/bay-bottom-leasing-program • https://ecode360.com/32377484 • US Army Corps of Engineers – Regulatory https://www.nae.usace.army.mil/missions/regulatory.aspx 	<ul style="list-style-type: none"> • https://www.dec.ny.gov/permits/28664.html • Trout Hatchery Permit https://www.dec.ny.gov/permits/28664.html • Black Bass Hatchery Permit https://www.dec.ny.gov/permits/28664.html • Fish Stocking Permit https://www.dec.ny.gov/permits/25026.html

New York			Marine Culture	Freshwater and Land-Based Culture
	Licenses and Permits		<ul style="list-style-type: none"> • Marine Hatchery Permit <ul style="list-style-type: none"> ❖ Allows culture of marine plant and aquaculture species at inland-based facility or nursery ❖ Permits sale of products (any size) ❖ Fee \$100 ❖ Application to Shellfish Management Unit NYDEC ❖ Annual renewal ❖ Reporting required ❖ May require State Pollution Discharge Elimination System Permit (SPDESP) • On/Off-Bottom Culture Permit <ul style="list-style-type: none"> ❖ Allows purchase and possession, from within or without the state, marine plant and animal life authorized by the permit, allows sale of products to individual or commercial markets for consumption or resale ❖ Fee \$100 ❖ Application to Shellfish Management Unit NYDEC ❖ Annual renewal ❖ Reporting required • Seed Importation Permit <ul style="list-style-type: none"> ❖ Allows a shellfish culturist to import shellfish for cultivation ❖ Requires Marine Hatchery or On/off bottom permit • Shellfish Digger Permit <ul style="list-style-type: none"> ❖ Allows permit holder to harvest, cull, sort or tag clams, oysters, mussels, and scallops taken from certified or open waters for commercial purposes. ❖ Fee \$50 residents, \$150 non-residents ❖ Annual renewal ❖ Application made to Marine Permit Office 	<ul style="list-style-type: none"> • Trout Hatchery Permit <ul style="list-style-type: none"> ❖ https://www.dec.ny.gov/permits/28664.html ❖ Allows permittee to propagate, raise and sell hatchery-raised trout (species: Brook trout, Brown trout, Rainbow trout, Atlantic salmon, and other salmonid species) ❖ No fee ❖ 1-year license ❖ NY DEC Special Licenses Unit • Black Bass Hatchery Permit <ul style="list-style-type: none"> ❖ Allows permittee to propagate, raise and sell black bass (i.e., largemouth bass, smallmouth bass) ❖ No fee ❖ 1-year license ❖ NY DEC Special Licenses Unit • Fish Stocking Permit <ul style="list-style-type: none"> ❖ Allows stocking certified disease-free fish into waters of New York State ❖ Requires Fish Health Inspection ❖ Bureau of Fisheries Regional Office • Farm Fish Pond License <ul style="list-style-type: none"> ❖ Allows stocking fish in privately owned or leased ponds ❖ Bureau of Fisheries Regional Office • Fishing Preserve License <ul style="list-style-type: none"> ❖ Allows permittee to operate a commercial fishing facility on a privately-owned waterbody ❖ Bureau of Fisheries Regional Office

New York		Marine Culture	Freshwater and Land-Based Culture
	Licenses and Permits (cont.)	<ul style="list-style-type: none"> • Shellfish Digger Endorsement <ul style="list-style-type: none"> ❖ Extends shellfish digger permission to people on board vessel ❖ Fee \$50-150 • Shellfish Lease <ul style="list-style-type: none"> ❖ Leasing geographically limited to 29,969 Shellfish Cultivation Zone, Peconic and Gardiners Bay, Suffolk County, 60 acres per year ❖ Fee \$100 ❖ Renewal Fee \$100 ❖ Annual lease rental fee \$200 plus \$5 per acre ❖ Application to Suffolk County Department of Economic Development and Planning ❖ Application requires public notice, public meetings conducted by Aquaculture Lease Board ❖ Priority extended to first time applicants ❖ Random selection process applies when collective requested acreage exceeds limit, or when more than one applicant for a given lease ❖ Annual reporting required • Other minor leasing programs <ul style="list-style-type: none"> ❖ Town of Islip ❖ Town of Brookhaven ❖ Temporary Marine Area Use Assignment <ul style="list-style-type: none"> ○ Bureau of Marine Resources, presently applied in Long Island Sound 	<ul style="list-style-type: none"> • Triploid Grass Carp Stocking <ul style="list-style-type: none"> ❖ Allows permittee to stock certified triploid grass carp into private ponds to manage aquatic vegetation ❖ Bureau of Fisheries Regional Office

New York		Marine Culture	Freshwater and Land-Based Culture
	Licenses and Permits (cont.)	<ul style="list-style-type: none"> • Shellfish Shippers and Processors Permits <ul style="list-style-type: none"> ❖ Five types of permits: <ul style="list-style-type: none"> ○ <i>Class A - Shellfish Shipper</i>: Fee \$300 <ul style="list-style-type: none"> ▪ allows permit holder and employees to reship, pack, or repack shellfish which have been purchased from holders of valid shellfish shipper permits or shellfish digger permits in interstate or intrastate commerce ○ <i>Class B - Shellfish Processor</i>: Fee \$600 <ul style="list-style-type: none"> ▪ allows permit holder and employees to reship, pack, or repack and process shellfish which have been purchased from holders of valid shellfish shipper permits or shellfish digger permits in interstate or intrastate commerce ○ <i>Class C - Shellfish Reshipper</i>: Fee \$200 <ul style="list-style-type: none"> ▪ allows permit holder and employees to reship shellfish which have been shipped by the holders of valid shipper permits in intrastate commerce ○ <i>Class D - Shellfish Digger/Shipper</i>: Fee \$75 <ul style="list-style-type: none"> ▪ allows permit holder to ship shellstock which the permit holder has legally harvested from the shellfish lands of the state ○ <i>Class E - Bay Scallop Shucker Packer</i>: Fee \$50 <ul style="list-style-type: none"> ▪ allows permit holder to shuck and pack bay scallops received from the holder of a shellfish digger permit and to ship the shucked bay scallops in intrastate commerce 	

New York		Marine Culture	Freshwater and Land-Based Culture
	Licenses and Permits (cont.)	<ul style="list-style-type: none"> • Shellfish Shippers and Processors Permits (cont.) <ul style="list-style-type: none"> ❖ Application to Marine Permit Office - Division of Marine Resources ❖ Annual renewal ❖ Requires monthly landings report • Food Fish and Crustacean Dealers and Shippers License <ul style="list-style-type: none"> ❖ Allows purchase and sale marine fish or crustaceans as food or bait, operate a facility for packing, holding or storing marine fish, ship, transport or marine fish or crustaceans, export food fish or crustacea landed in New York to outside the state. ❖ Fee \$250 ❖ Annual renewal ❖ Application to Marine Permit Office 	
	Identified Barriers to Entry	<ul style="list-style-type: none"> • Access to underwater land • Tension public versus private use of underwater land 	
	Additional Resources	<ul style="list-style-type: none"> • https://www.businessexpress.ny.gov/app/home • http://ccesuffolk.org/marine/aquaculture • https://bee.cals.cornell.edu/ • https://seagrass.sunysb.edu/ • https://www.liogany.org/ • https://nysaquaculture.weebly.com/ • https://you.stonybrook.edu/madl/ 	<ul style="list-style-type: none"> • https://www.aquanet.com/new-york-aquaculture • https://www.businessexpress.ny.gov/app/home • https://nysaquaculture.weebly.com/ • https://blogs.cornell.edu/aquaculture/

Contacts

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	Stephanie Hampson <i>Town of Islip Bay Bottom Leasing Program</i>		(631) 224-5645 SHampson@islipny.gov
	Craig Strong <i>Town of Brookhaven Bay Bottom Leasing Program</i>		(631) 451-3779 cstrong@brookhavenny.gov
	Wade Carden <i>Shellfish Management Unit</i> <i>Division of Marine Resources</i>	205 North Belle Mead Road, Suite 1 East Setauket, New York 11733	(631) 444-0481 wade.carden@dec.ny.gov
	Marine Permit Office	Division of Marine Resources 205 North Belle Mead Road, Suite 1 East Setauket, New York 11733	(631) 444-0470 MPO@dec.ny.gov
	Jim Daley <i>Bureau of Fisheries</i>		(518) 402-8959
	Department of Environmental Conservation <i>Special Licenses Unit</i>	625 Broadway Albany, NY 12233	518-402-8985 SpecialLicenses@dec.ny.gov
	Division of Environmental Permits	4th Floor, 625 Broadway Albany, NY 12233-1750	(518) 402-9167

Contacts (cont.)

New York	Name		Address	Phone/ Email
	New York State, Department of State <i>Division of Coastal Resources</i>		One Commerce Plaza 99 Washington Avenue, Suite 1010 Albany, NY 12231	(518) 474-6000
	United States Army Corps of Engineers <i>New York District</i>		26 Federal Plaza New York, NY 10278	(917) 790-8511
	United States Coast Guard <i>First Coast Guard District Waterways Management Private Aids to Navigation Division (PATON)</i>		408 Atlantic Avenue Boston, MA 02110	(617) 223-8347 www.usharbormaster.com
	Gregg Rivara <i>Cornell Cooperative Extension</i>		3690 Cedar Beach Road Southold, NY 11971	(631) 852-8660 gjr3@cornell.edu
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Date Compiled		03/10/2020		

Pennsylvania

Pennsylvania		Marine Culture	Freshwater and Land-Based Culture
	Lead Agency/ Contact Person	<ul style="list-style-type: none"> • Pennsylvania Department of Agriculture Please Note: Pennsylvania does not have permitting forms for new aquaculturists. There is an application process that involves both the Pennsylvania Department of Agriculture (PDA) and the Pennsylvania Fish and Boat Commission. The application packet for dealers and/or propagators is located on the PDA website under licenses and certificates: https://www.agriculture.pa.gov/Animals/AHDServices/licenses-certificates/Aquaculture%20Licensing/Pages/default.aspx 	
	Other Regulatory Agencies	<ul style="list-style-type: none"> • Atlantic State Marine Fisheries Commission <ul style="list-style-type: none"> ❖ Dealers must report sales/purchases of American Eel 	<ul style="list-style-type: none"> • Pennsylvania Fish and Boat Commission, Bureau of Fisheries
	Species Approved		<ul style="list-style-type: none"> • Brook Trout (<i>Salvelinus fontinalis</i>) • Brown Trout (<i>Salmo trutta</i>) • Rainbow Trout, Steelhead (<i>Kamloops Oncorhynchus mykiss</i>) • Golden Rainbow Trout (<i>Oncorhynchus mykiss</i>) • Tiger Trout (<i>Salmo trutta</i> x <i>Salvelinus fontinalis</i>) • Albino Trout (All species) • Common Carp (<i>Cyprinus carpio</i>) • Koi (<i>Cyprinus carpio</i>) • Goldfish (<i>Carassius auratus</i>) • Comets (<i>Carassius auratus</i>) • Golden Shiner (<i>Notemigonus chrysoleucas</i>) • Fathead Minnow (<i>Pimephales promelas</i>) <ul style="list-style-type: none"> ▪ includes "Rosy Reds" • Bluntnose Minnow (<i>Pimephales notatus</i>) • Creek Chub (<i>Semotilus atromaculatus</i>)

Pennsylvania		Marine Culture	Freshwater and Land-Based Culture
	Species Approved (cont.)		<ul style="list-style-type: none"> • White Sucker (<i>Catostomous commersoni</i>) • Yellow Bullhead (<i>Ameiurus natalis</i>) • Brown Bullhead (<i>Ameiurus nebulosus</i>) • White Catfish (<i>Ameiurus catus</i>) • Channel Catfish (<i>Ictalurus punctatus</i>) • Margined Madtom (<i>Noturus insignis</i>) • American Eel (<i>Anguilla rostrata</i>) • Banded Killifish (<i>Fundulus diaphanous</i>) • Striped Bass (<i>Morone saxatilis</i>) • Striped Bass hybrid (<i>Morone chrysops</i> x <i>M. saxatilis</i>) • Rock Bass (<i>Ambloplites rupestris</i>) • Redbreast Sunfish (<i>Lepomis auritus</i>) • Pumpkinseed (<i>Lepomis gibbosus</i>) • Bluegill (<i>Lepomis macrochirus</i>) • Sunfish hybrid (<i>Lepomis cyanellus</i> x <i>L. macrochirus</i>) • Smallmouth Bass (<i>Micropterus dolomieu</i>) • Largemouth Bass (<i>Micropterus salmoides</i>) • White Crappie (<i>Pomoxis annularis</i>) • Black Crappie (<i>Pomoxis nigromaculatus</i>) • Yellow Perch (<i>Perca flavescens</i>) • Walleye (<i>Sander vitreus</i>) • Chain Pickerel (<i>Esox niger</i>) • Muskellunge (<i>Esox masquinongy</i>) • Northern Pike (<i>Esox Lucius</i>) • Hellgrammites (<i>Dobsonfly larvae</i>) • Mud bugs (<i>Dragonfly larvae</i>)

Pennsylvania		Marine Culture	Freshwater and Land-Based Culture
	Links to Regulations		<p>Closed-system propagation</p> <ul style="list-style-type: none"> • https://www.pacode.com/secure/data/058/chapter71/chap71toc.html • https://www.pacode.com/secure/data/058/chapter73/chap73toc.html <p>Crayfish Rules</p> <ul style="list-style-type: none"> • https://www.agriculture.pa.gov/Animals/AHDServices/licenses-certificates/Aquaculture%20Licensing/Documents/Crayfish%20Rules.pdf
	Licenses and Permits	<ul style="list-style-type: none"> • Aquaculture Dealer Packet 2018 (Licenses & Certificates) https://www.agriculture.pa.gov/Animals/AHDServices/licenses-certificates/Aquaculture%20Licensing/Documents/Aquaculture%20Dealer%20%20Packet%202018.pdf • Chapter 106: Aquaculture Development Plan https://www.pacode.com/secure/data/007/chapter106/007_0106.pdf or https://www.pacode.com/secure/data/007/chapter106/chap106toc.html • See <i>Marine Culture</i> column 	
	Identified Barriers to Entry		<ul style="list-style-type: none"> • Operation of Closed Systems <ul style="list-style-type: none"> ❖ 100% recycling of water as part of normal operations ❖ System housed indoors in a structure enclosed by solid walls, floor, and roof ❖ Water can only be added to the system for making up evaporative loss, cleaning and fish harvesting or to reduce toxic ammonia/nitrates by diluting ❖ No discharge of system water into the waters of this Commonwealth

Pennsylvania		Marine Culture	Freshwater and Land-Based Culture
	Additional Resources		<ul style="list-style-type: none"> • Loan Assistance Program https://www.pacode.com/secure/data/007/chapter106/007_0106.pdf or https://www.pacode.com/secure/data/007/chapter106/chap106toc.html
<h2>Jurisdiction over Commercial Aquaculture in Pennsylvania</h2>			
	Federal	State	Local Agencies
	<ul style="list-style-type: none"> • Department of Environmental Protection • U.S Congress • Food and Drug Administration • USDA Animal & Plant Health inspection Service 	<ul style="list-style-type: none"> • Pennsylvania Department of Agriculture • Pennsylvania General Assembly • Pennsylvania Department of Agriculture Bureau of Food Safety and Laboratory Services • Law Enforcement • Pennsylvania Department of Environmental Protection • Pennsylvania Aquaculture Advisory Committee 	<ul style="list-style-type: none"> • Law Enforcement • Local and County Zoning Boards

Contacts

Pennsylvania	Name		Email	Phone
	Ms. Ann Faulds <i>Pennsylvania Sea Grant</i>		afaulds@psu.edu	(215) 806-0894
	Dr. Steven Hughes <i>Aquaculture Research & Education Center</i>		shughes@cheyney.edu	(610) 399-2400
	Dr. Lauren Weiss <i>Aquaculture Licensing & Fish Importation</i>		laweiss@pa.gov	(717) 783-6851
	Jennifer Reed-Harry <i>Aquaculture Council</i> <i>Assistant Vice President</i>		jrharry@pennag.com	(717) 651-5920
	Laura England <i>Licensing and Permits</i> <i>Director, Bureau of Market Development</i>		laengland@pa.gov	(Office) (717) 783-8462 (Cell) (717) 562-2421
Date Compiled		12/15/2018		

Rhode Island

Rhode Island		Marine Culture	Freshwater and Land-Based Culture
	Lead Agency/ Contact Person	Coastal Resources Management Council Benjamin Goetsch <i>State Aquaculture Coordinator</i> 4808 Tower Hill Road Wakefield, RI 02879-1900 Email: bgoetsch@crmc.ri.gov Phone: (401) 783-3370 Fax: (401) 783-2069 http://www.crmc.ri.gov/aquaculture.html	
	Other Regulatory Agencies	<p>➤ Note: Primary responsibility for coordination of multiple-agency aquaculture permit applications rests with the <i>Rhode Island Coastal Resources Management Council</i> (RICRMC) [GLRI §20-10-03]. The State Aquaculture Coordinator, under the direction of the RICRMC [GLRI §36-4-2(21)], has the authority to review permits and to manage and enforce the granted permit conditions for both marine and freshwater aquaculture. The process begins with a preliminary assessment to determine relevant stakeholders and agency jurisdictions based on the nature of the individual project.</p>	<p>➤ Note: The same permitting procedures apply as for a marine aquaculture permit, but without the extra recommendations from federal, state, and local agencies that are exclusively concerned with public trust or marine governance. The <i>Division of Water Resources</i> review for compliance with Rhode Island Pollutant Discharge Elimination System (RIPDES) permitting of potential water discharges is a crucial step.</p>

Rhode Island		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	<i>Federal Agencies</i>	
		<ul style="list-style-type: none"> • U.S. Army Corps of Engineers <ul style="list-style-type: none"> ❖ Structures permitting • U.S. Coast Guard <ul style="list-style-type: none"> ❖ Private Aids to Navigation • U.S. Fish & Wildlife Service <ul style="list-style-type: none"> ❖ Protected and endangered species and migratory birds and the Lacey Act • U.S. Food and Drug Administration <ul style="list-style-type: none"> ❖ Drugs used for disease prevention or control, extralabel drugs, Investigational new animal drug ❖ Interstate Shellfish Sanitation Committee ❖ National Food Safety Act • U.S. Environmental Protection Agency <ul style="list-style-type: none"> ❖ Clean Water Act compliance • National Oceanic and Atmospheric Administration <ul style="list-style-type: none"> ❖ Endangered species, marine mammal protection act, critical habitat and federally managed species under Magnusson-Stevens 	

Rhode Island		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	State Agencies	
		<ul style="list-style-type: none"> • Department of Environmental Management <p>Note: There is a formal Memorandum of Agreement between RIDEM and RICRMC as to specific responsibilities regarding aquaculture farms. (See: http://www.crmc.ri.gov/aquaculture/smp_moa_dem_crmc.pdf)</p> <ul style="list-style-type: none"> ❖ Division of Water Resources <ul style="list-style-type: none"> ○ Administers the Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit ❖ Division of Water Resources - Shellfish Program Office <ul style="list-style-type: none"> ○ Administers the bio toxin monitoring program, water quality monitoring and management program ❖ Division of Fish & Wildlife and Division of Freshwater Wetlands <ul style="list-style-type: none"> ○ Review for critical habitat ○ Review for endangered species • Department of Health <ul style="list-style-type: none"> ❖ Seafood dealer licenses, wet storage permits, dealer certification and inspection program (e.g. HACCP), National Shellfish Sanitation Program • Rhode Island Aquatic Biosecurity Board <ul style="list-style-type: none"> ❖ Aquatic animal health, animal welfare, vaccines, therapeutants and quarantine issues 	

Rhode Island		Marine Culture	Freshwater and Land-Based Culture
	Other Regulatory Agencies (cont.)	Local Agencies	
		<ul style="list-style-type: none"> • Municipality <ul style="list-style-type: none"> ❖ Local municipalities are notified by the <i>State Aquaculture Coordinator</i> of applications involving aquaculture projects adjacent to or within their jurisdictions. ❖ Reviews by city or town conservation commissions, waterfront advisory commissions, planning boards or municipal councils are considered advisory to any RICRMC decision-making during the preliminary determination process. 	
	Species Approved	<ul style="list-style-type: none"> • Note: All species native or naturalized to Rhode Island's waters are preapproved for culture in Rhode Island. Permits for all other species must be reviewed by the <i>Aquatic Biosecurity Board</i> as part of the permitting process. 	<ul style="list-style-type: none"> • Follow the same criteria that applies to marine species • Rainbow Trout & Steelhead (<i>Oncorhynchus mykiss</i>) and Brown Trout (<i>Salmo trutta</i>) are approved on the basis of more than a one hundred year history of their being cultured in the state
	Links to Regulations	<ul style="list-style-type: none"> • Guide to Aquaculture Applications published by the RICRMC <ul style="list-style-type: none"> ❖ Includes a set of application forms and a synopsis of all aquaculture statutes, rules, and regulations pertaining to aquaculture in the waters of the state ❖ Covered in the guide are types of aquaculture permits, leasing of submerged lands in public trust waters and other useful information http://www.crmc.ri.gov/applicationforms/AquaApp.pdf 	<ul style="list-style-type: none"> • Supplemental publication on permitting review for freshwater aquaculture projects published by URI Cooperative Extension <ul style="list-style-type: none"> ❖ Focuses on management of ponds, water discharges and the requirements for a Rhode Island Pollution Discharge Elimination System (RIPDES) permit if needed https://web.uri.edu/coopext/files/RI-FW-Aquaculture2018.pdf
	Identified Barriers to Entry	In Rhode Island, the single biggest barrier to aquaculture development has been multiple-use conflicts (often referred to as NIMBYism) within the public trust waters of the state. In the case of development of freshwater aquaculture, the cost of farmland is the most frequently cited as a major barrier to entry.	

Additional Resources

Rhode Island	Name	Address	Phone/ Email
	Dr. Robert B. Rheault <i>Executive Director</i> <ul style="list-style-type: none"> ❖ Advocate for the aquaculture industry, frequently involved in public engagement on behalf of industry members 	East Coast Shellfish Growers Association 1121 Mooresfield Rd. Wakefield, RI 02979 https://ecsga.org/	Voice: (401) 783-3360 Email: bob@ecsga.org
	Dr. Michael A. Rice <i>Professor and Primary Aquaculture Extension Contact</i> <ul style="list-style-type: none"> ❖ Primary aquaculture extension contact for Rhode Island; puts aquafarmers in contact with educational resources in the state 	URI Cooperative Extension 126 Woodward Hall University of Rhode Island Kingston, RI 02879 https://web.uri.edu/coopext/aquaculture/	Voice: (401) 874-2943 Fax (401) 874-7575 Email: rice@uri.edu
	Azure D. Cygler <i>Fisheries and Aquaculture Extension Specialist RI Sea Grant</i> <ul style="list-style-type: none"> ❖ Conducts educational programs in shellfish aquaculture and other practical programs for growers through Rhode Island Sea Grant and the URI Coastal Resources Center 	Coastal Resources Center Graduate School of Oceanography University of Rhode Island 220 South Ferry Road Narragansett, RI 02882 https://www.crc.uri.edu/contacts_page/azure-cygler/	Voice: (401) 874-6197 Fax: (401) 874-6920 Email: acygler@uri.edu
	Dr. Roxanna Smolowitz, D.V.M. <i>Director, Aquatic Diagnostic Laboratory</i> <ul style="list-style-type: none"> ❖ The Aquatic Diagnostic Laboratory is an important first stop if aquatic veterinary services are needed 	Feinstein School of Social & Natural Sciences Roger Williams University One Old Ferry Rd. Bristol, RI 02809	Voice: (401) 254-3299 Email: rsmolowitz@rwu.edu

Additional Resources (cont.)

Rhode Island	Name		Address	Phone/ Email
	Susan Snyder <i>Office Administrator</i> ❖ The SBDC is a resource for aquaculturists and other entrepreneurs looking to develop a business plan and/or seek financing		RI Small Business Development Ctr. Univ. of Rhode Island Carlotti Admin Bldg. 75 Lower College Rd. Kingston, RI 02881 https://web.uri.edu/risbdc/	Voice: 401-874-7232 Email: ssnyder@uri.edu
	Kenneth Ayars <i>Chief, Division of Agriculture</i> ❖ Advocate for Rhode Island's farmers and farm community, including aquaculturists		RI Dept. of Environmental Management 235 Promenade Street Providence, RI 02908-5767 http://www.dem.ri.gov/programs/agriculture/farmland.php	Voice: (401) 222-2781 ext. 4500 Email: ken.ayars@dem.ri.gov
	Date Compiled	12/29/2019		

Vermont

Vermont		Freshwater and Land-Based Culture
	Lead Agency/ Contact Person	<ul style="list-style-type: none"> Vermont Agency of Natural Resources; Fish and Wildlife Department <div> <div>Adam Miller Adam.Miller@vermont.gov (802) 777-2852</div> <div>Tom Jones Tom.Jones@vermont.gov (802) 793-6781</div> </div> <p>https://vtfishandwildlife.com/about-us/departments-divisions/meet-the-staff#fishculture</p>
	Other Regulatory Agencies	Federal Agencies
		<ul style="list-style-type: none"> U.S. Army Corps of Engineers <ul style="list-style-type: none"> ❖ Individual or Programmatic General Permit (PGP) U.S. Fish & Wildlife Service <ul style="list-style-type: none"> ❖ Protected and endangered species U.S. Environmental Protection Agency
		State Agencies
		<ul style="list-style-type: none"> Vermont Fish And Wildlife Department <ul style="list-style-type: none"> ❖ Fish Breeders License ❖ Fish Importation Permit ❖ Yearly Pathology Testing and Property Inspection Vermont Agency of Nature Resources, Division of Fire <ul style="list-style-type: none"> ❖ Building Permit Vermont Department of Environmental Conservation <ul style="list-style-type: none"> ❖ Drainage/Discharge Permit

Vermont		Freshwater and Land-Based Culture
	Species Approved	<p>Finfish</p> <ul style="list-style-type: none"> • Brook trout (<i>Salvelinus fontinalis</i>) • Brown trout (<i>Salmo trutta</i>) • Rainbow trout (<i>Oncorhynchus mykiss</i>) • Tilapia (<i>Oreochromis</i> sp.) • Barramundi (<i>Lates calcarifer</i>) <p>Shellfish (Saltwater)</p> <ul style="list-style-type: none"> • Whiteleg shrimp (<i>Litopenaeus vannamei</i>)
	Links to Regulations	<ul style="list-style-type: none"> • Vermont Fish and Wildlife Department www.vtfishandwildlife.com • Vermont Agency of Natural Resources https://anr.vermont.gov/ • Vermont Department of Environmental Conservation https://dec.vermont.gov/
	Identified Barriers to Entry	<ul style="list-style-type: none"> • Wetland delineation and its implications on building and discharge permits • Importation permits • Division of Fisheries and Wildlife permits
	Additional Resources	<ul style="list-style-type: none"> • Vermont Fish Hatchery Farms http://www.voga.org/vermont_fish_hatcheries.htm • Right to Farm 101 for Aquaculture Stakeholders in Vermont http://nsglc.olemiss.edu/factsheets/files/vermont-rtf101.pdf • Tilapia Farming https://www.tilapia-farming.com/massachusetts-aquaculture
	Date Compiled	03/10/2020

Washington, DC

Washington, DC		Freshwater and Land-Based Culture					
	Lead Agency/ Contact Person	<ul style="list-style-type: none">Fisheries and Wildlife Division (FWD) Bryan King, Associate Director (202) 997-9607 bryan.king@dc.gov					
	Links to Regulations	<ul style="list-style-type: none">There are no mentions of aquaculture in Washington DC regulations. https://www.dcregs.dc.gov/Common/DCMR/RuleList.aspx?ChapterNum=19-15&ChapterId=149					
	Identified Barriers to Entry	<ul style="list-style-type: none">There is a lack of information on how to start an aquaculture business in Washington DC.					
	Additional Resources	<ul style="list-style-type: none">University of the District of Columbia<ul style="list-style-type: none">❖ Center for Urban Agriculture and Gardening Education<table><tr><td>Mchezaji “Che” Axum <i>Director</i> (202) 495-8990 mchezaji.axum@udc.edu</td><td>Matthew Gardine <i>Assistant Farm Manager</i> (202) 308-7113 matthew.gardine@udc.edu</td></tr><tr><td>Dr. Matthew Richardson <i>Assistant Director</i> (202) 274-5974 matthew.richardson@udc.edu</td><td>Renee Bellis <i>Staff Assistant</i> (202) 525- 9721</td></tr></table>		Mchezaji “Che” Axum <i>Director</i> (202) 495-8990 mchezaji.axum@udc.edu	Matthew Gardine <i>Assistant Farm Manager</i> (202) 308-7113 matthew.gardine@udc.edu	Dr. Matthew Richardson <i>Assistant Director</i> (202) 274-5974 matthew.richardson@udc.edu	Renee Bellis <i>Staff Assistant</i> (202) 525- 9721
		Mchezaji “Che” Axum <i>Director</i> (202) 495-8990 mchezaji.axum@udc.edu	Matthew Gardine <i>Assistant Farm Manager</i> (202) 308-7113 matthew.gardine@udc.edu				
Dr. Matthew Richardson <i>Assistant Director</i> (202) 274-5974 matthew.richardson@udc.edu	Renee Bellis <i>Staff Assistant</i> (202) 525- 9721						
	<ul style="list-style-type: none">Washington DC Dept. of Energy and Environment Aquatic Resources Education Center (AREC) 1900 Anacostia Drive SE Washington, DC 20020 <i>Inside Anacostia Park, Section E</i> (202) 535-2276 doee.arec@dc.gov						
Date Compiled	06/01/2020						

West Virginia

Freshwater and Land-Based Culture

Lead Agency/ Contact Person

- **WV Department of Agriculture**

Millie Taylor
(304) 558-2227
mtaylor@wvda.us

Other Regulatory Agencies

State Agencies

- **WV Department of Agriculture**
 - ❖ Permits and fish processing applications
- **WV Division of Natural Resources**
- **WV Department of Health and Human Resources**

Species Approved

Freshwater Finfish

- Brook Trout (*Savlinus fontinalis*)
- Brown Trout (*Salmo trutta*)
- Rainbow Trout (*Oncorhynchus mykiss*)
- Golden Trout (*Oncorhynchus mykiss aguabonita*)
- Atlantic Salmon (*Salmo salar*)
- Yellow Perch (*Perca flavescens*)
- Black Crappie (*Pomoxis nigromaculatus*)
- Grass Carp (*Ctenopharyngodon idella*)
- Koi (*Cyprinus carpio*)
- Gold Fish (*Carassius auratus*)
- Largemouth Bass (*Micropterus salmoides*)
- Hybrid Striped Bass (*Morone chrysops* x *Morone saxatilis*)

- Bluegill (*Lepomis macrochirus*)
- Hybrid Bluegill (*Lepomis cyanellus* x *Lepomis machrochirus*)
- Red Ear Sunfish (*Lepomis microlophus*)
- Bullhead Catfish (*Ameiurus nebulosus*)
- Channel Catfish (*Ictalurus punctatus*)
- Mosquito Minnow (*Gambusia affinis*)
- Fathead Minnow (*Pimephales promelas*)
 - includes "Rosy Reds"

Other

- Bull Frogs (*Lithobates catesbeianus*)
- Crayfish (*Cambarus* sp.)
- Snails (*Gastropoda*)

West Virginia		Freshwater and Land-Based Culture
	Links to Regulations	<ul style="list-style-type: none"> WV Department of Agriculture Regulatory and Environmental Division https://agriculture.wv.gov/divisions/regulatoryandenvironmental/Food_Products_and_Aquaculture/Pages/Aquaculture.aspx
	Identified Barriers to Entry	<ul style="list-style-type: none"> No aquaculture extension agent
	Date Compiled	03/11/2020