ENHANCING PRODUCTION OF AQUACULTURE SPECIES

Five projects based in Alabama, Florida, North Carolina and Oregon were selected for a total of $1,768,821 in funding to develop and refine methods, protocols, techniques and strategies to enhance the production of one or more life stages of aquaculture species. The overall goal of these projects is to improve the efficiency, output and profitability of commercial aquaculture businesses. Learn more about these projects below.

ALABAMA

Using machine learning to guide oyster aquaculture site selection

Principal Investigators: Lee Smee and Jessica Lunt, Marine Environmental Sciences Consortium, Dauphin Island Sea Lab; John Beck, University of Alabama Huntsville
Grant Amount: $483,642
Researchers will create a model to ascertain the best locations for oyster farming in Alabama using a combination of *in-situ* research and machine learning. Data for the model will come in part from citizen scientists in the oyster gardening program, who will raise oysters and provide oyster growth and water quality information. Oyster feeding efficiency will be assessed by the research team using an *in-situ* filter feeding technique at multiple sites along the coast. These data will be used to develop a machine learning tool that will create a model to predict oyster growth and survival for potential application in a publicly available online tool that ranks site suitability for oyster farming.

FLORIDA

Development and testing of an affordable and efficient marker panel to advance southern hard clam (*Mercenaria campechiensis*) aquaculture

Principal Investigators: Jan McDowell and Kimberly Reece, Virginia Institute of Marine Science; Stephen Hesterberg, Gulf Shellfish Institute; Curtis Hemmel, Bay Shellfish Co.; Angela Collins, University of Florida/Florida Sea Grant
Grant Amount: $536,061

This project will advance the production of the southern hard clam (*Mercenaria campechiensis*), the native *Mercenaria* species on Florida's Gulf Coast, by developing the genetic resources needed to quickly and affordably distinguish the southern hard clam from the northern hard clam (*M. mercenaria*), a species introduced to the Gulf Coast for aquaculture in the mid-to-late 20th century. Researchers will establish genetic baselines, develop rapid diagnostic testing, certify broodstock and work with local hatcheries to facilitate *M. campechiensis* production. Improving identification of hard clam species will aid Florida's shellfish aquaculture industry in assessing the commercial value of southern hard clam and meeting a growing call for native hard clam restoration in Gulf states.

The current and potential role of macroalgae aquaculture in Florida

Principal Investigators: Ashley Smyth and H. Dail Laughinghouse, University of Florida; Angela Collins and Andrew Ropicki, University of Florida/Florida Sea Grant

Grant Amount: $250,000

This research will increase knowledge about the production of tropical seaweed and its potential for commercialization alongside Florida shellfish aquaculture. Researchers will identify the dominant seaweed species that naturally occur at shellfish leases, assess available nutrients and impacts on water quality, perform experiments to optimize species growth and production practices, conduct market evaluation of tropical species, develop analyses to evaluate the economic feasibility of culturing methods and species, and engage interested parties to transfer project results to the industry for application. Results from this study will pave the way for expanding seaweed aquaculture in Florida.

NORTH CAROLINA

Sea Grant StriperHub: Improving growth and production efficiency of domestic striped bass through thiamine dietary supplementation and reduced frequency feeding

Principal Investigators: Benjamin Reading and Russell Borski, North Carolina State University; T. Gibson Gaylord, U.S. Fish and Wildlife Service; Eric Herbst, North Carolina Sea Grant

Grant Amount: $249,118

This work will build upon the Sea Grant StriperHub that was created to promote commercial domestic striped bass (*Morone saxatilis*) culture. This research segment aims to enhance striped bass aquaculture production and economic feasibility by improving growth and feed efficiency. Specifically, dietary thiamine supplementation and reduced frequency feeding regimes will be evaluated for impacts on domestic striped bass growth. In addition to supporting the striped bass aquaculture industry, activities will support the training of a graduate student who will contribute to the research, extension and outreach efforts of the project.

OREGON

Engineered cultivation of compact red seaweed morphologies for land-based aquaculture in raceway systems

Principal Investigators: Gregory Rorrer, Oregon State University; Samuel Chan, Oregon Sea Grant
Grant Amount: $250,000

To support red seaweed aquaculture in the United States, which is an emerging industry, this project aims to develop new cultivars of two red seaweed of commercial significance, *Gracilaria parvispora* and *Devaleraea mollis* (Pacific dulse). Researchers will demonstrate the productivity of compacted red seaweed balls in land-based raceway cultivation systems. The research will be leveraged to advance technology development interests for food products produced through red seaweed aquaculture. With the support of Sea Grant Extension at Oregon State University, the Red Seaweed Learning Collaborative will be established to integrate real-time research outcomes into the industry and broaden participation in land-based red seaweed aquaculture. This work will also engage undergraduate and graduate students, training the next generation of the aquaculture workforce.

REGIONAL AQUACULTURE COMMUNICATIONS AND LITERACY COLLABORATIVES

Three regional projects in the Great Lakes, the Southeast and the West Coast (including Alaska and the Pacific Islands) were selected for a total of $2,249,884 in funding to create regional aquaculture communications and literacy collaboratives. The projects are multi-Sea Grant program efforts to address aquaculture communications and literacy needs that will benefit the aquaculture community, seafood consumers and the general public. Learn more about these projects below.

Great Lakes Aquaculture Collaborative: Advancing aquaculture literacy

Principal Investigators: Amy Schrank, Donald Schreiner, Marie Thoms and Kieran Smith, Minnesota Sea Grant; Stuart Carlton, Kwamena Quhagrainie and Amy Shambach, Illinois-Indiana Sea Grant; John Brawley, Lake Champlain Sea Grant; Lauren Jescovitch and Elliot Nelson, Michigan Sea Grant; Stephanie Otts, National Sea Grant Law Center; Barry Udelson, New York Sea Grant; Nicole Wright, Ohio Sea Grant; Titus Seilheimer and Sharon Moen, Wisconsin Sea Grant

Grant Amount: $750,000

This work will build on the successes of the Great Lakes Aquaculture Collaborative (GLAC). The team will expand their state-based advisory groups, maintain and enhance productivity as a collaborative, and use the GLAC website as a source for accessible and innovative information. Outreach activities will aim to increase aquaculture literacy of consumers, youth audiences, regulators and legislators. GLAC will also co-create a Great Lakes seafood brand that can be used to market all locally produced, farmed and wild-caught seafood. An important theme throughout this project is that the aquaculture and commercial fishing industries are intertwined and that both are important to the Great Lakes food system. Additionally, the proposal activities will intentionally focus on diversity, equity and inclusion and will include tribal organizations and schools that serve historically marginalized communities.

Southeast Aquaculture Communication Collaborative

Principal Investigators: Sherry Larkin and Charles Sidman, Florida Sea Grant; Stephanie Otts, National Sea Grant Law Center
Grant Amount: $749,884
This project will use marketing and communications strategies that leverage the collective expertise of Sea Grant programs to increase public knowledge of the products, sources, uses and benefits of aquaculture in the U.S. Southeast. The project will first hire a Southeast Aquaculture Communication Collaborative (SACC) Coordinator to initiate and manage project activities. Then, products on aquaculture production and benefits will be created and distributed, particularly through websites, to support extension agents in the Gulf of Mexico and South Atlantic regions. Products will consider ways to humanize industry members, be translated into languages of regional importance, and integrate students for science communication training. The project will launch communication campaigns for priority audiences that will include an interactive online educational tool and policy tool kit for county and city commissioners. The efforts will be evaluated and summarized for transitioning the SACC into a continuing community of practice.

Understanding community perceptions of aquaculture in the West Coast/Alaska/Pacific region to advance aquaculture literacy through targeted outreach tools

Principal Investigators: Luke Gardner and Kevin Marquez Johnson, California Sea Grant; Amalia Almada, University of Southern California Sea Grant; Angee Doerr, Oregon Sea Grant; Melissa Good, Alaska Sea Grant; Bradley (Kai) Fox, Hawai'i Sea Grant
Grant Amount: $750,000
To address region-specific concerns and opportunities related to aquaculture in Alaska, California, Hawai'i and Oregon, this project will capture state-specific perspectives of aquaculture using professional surveys. The surveys will be administered through a multi-modal approach combining online, telephone and text message-based engagement to capture a diversity of public opinions. From these surveys, the project team will create and distribute state-specific outreach materials, leveraging digital and print media and in-person events to engage diverse audiences, including the public, policymakers and under-resourced communities. Collaboration with state aquaculture associations will increase the team’s ability to capture the needs of diverse industry members and identify appropriate audiences for each outreach product.

AQUACULTURE TECHNOLOGIES AND EDUCATION TRAVEL GRANTS

AquaCulture Shock: International internships for aquaculture knowledge exchange

Principal Investigators: Michael Triantafyllou, Lily Keyes and Danny Badger, MIT Sea Grant

Grant Amount: $26,000

Massachusetts Institute of Technology (MIT) Sea Grant will partner with MIT International Science and Technology Initiatives to recruit and support one MIT student to complete a 10-week aquaculture-focused internship with SINTEF Ocean, a research organization in Norway. Norway is the world's largest producer of farmed Atlantic salmon and a top exporter of aquatic animal products. The student intern will gain knowledge of offshore aquaculture systems and technologies for farming Atlantic salmon. MIT Sea Grant will share outreach materials focusing on innovative aquaculture systems and technologies from Norway with diverse audiences. This initiative will not only cultivate international partnerships that enhance aquaculture knowledge exchange but also support the development of a trained and diverse workforce.

AQUACULTURE SUPPLEMENTAL FUNDING

Sea Grant selected 24 projects for a total of $4,777,005 in funding to support and improve aquaculture capacity at Sea Grant programs. The funds will support new and existing staff to expand aquaculture-related activities. Learn more about these projects below.

ALASKA SEA GRANT

Principal Investigators: Ginny Eckert and Molly Cain; Brenda Konar, University of Alaska Fairbanks

Grant Amount: $106,950

Alaska Sea Grant will support graduate student research exploring how mariculture farms impact sea otter prey communities to help inform the management of potential sea otter-mariculture interactions.

CALIFORNIA SEA GRANT

Principal Investigators: Shauna Oh, Luke Gardner and Kevin Marquez Johnson; Ben Ruttenberg, California Polytechnic State University, San Luis Obispo
Grant Amount: $377,231
California Sea Grant will support two staff positions to build and further extension programs of integrated applied research, community engagement and education that will advance sustainable aquaculture and address coastal and marine issues in Central and Southern California.

CONNECTICUT SEA GRANT

Principal Investigators: Tessa Getchis and Michael Gilman
Grant Amount: $149,595
Connecticut Sea Grant will conduct two projects to gather data to improve understanding of the population status of the northern quahog clam (*Mercenaria mercenaria*) in Connecticut and analyze the nutritional content of cultivated sugar kelp (*Saccharina latissima*), which will fill key knowledge gaps for the local aquaculture industry.

FLORIDA SEA GRANT

Principal Investigators: Sherry Larkin, Charles Sidman and Andrew Ropicki; Mostafa Reisi Gahrooei, University of Florida
Grant Amount: $279,392
Florida Sea Grant will conduct two projects. The first will support research in the advancement of machine learning (i.e., artificial intelligence) as applied to aquaculture operations, particularly recirculating aquaculture systems. The second will continue to expand student training through their HARVEST program (Helping Aquaculture Reap Value and Enhance Student Training), placing 13 student interns with aquaculture businesses.

GEORGIA SEA GRANT

Principal Investigators: Mark Risse, Mona Behl and Tom Bliss
Grant Amount: $123,931
Georgia Sea Grant will establish an aquaculture research traineeship to enhance aquaculture knowledge in partnership with Valdosta State University.

GUAM SEA GRANT

Principal Investigators: Fran Castro
Grant Amount: $37,500
Guam Sea Grant will accelerate the expansion of Guam's aquaculture industry by researching and implementing targeted marketing strategies, including outreach collaborations with restaurants and hotels and a fish fry competition amongst Guam’s chefs

HAWAI'I SEA GRANT

Principal Investigators: Darren Lerner, Maya Walton, Kanesa Duncan Seraphin and Darren Okimoto
Grant Amount: $395,599
Hawai'i Sea Grant will support extension faculty to conduct outreach activities and technology transfer trainings that address aquaculture-related needs in Hawai'i and the U.S.-affiliated Pacific Islands and paid internships for students and community members to provide hands-on experience with aquaculture industry partners.

MAINE SEA GRANT

Principal Investigators: Ann Fagan and Natalie Springuel; Meggan Dwyer, Aquaculture Research Institute, University of Maine
Grant Amount: $99,634
Maine Sea Grant will further aquaculture outreach and education activities such as hands-on farmer training workshops, provide opportunities for Maine residents to learn about sea farming and its impacts and conduct applied research in partnership with farmers that addresses topics of emerging interest.

LOUISIANA SEA GRANT

Principal Investigators: Elizabeth Robinson and Sarah Bodenstein
Grant Amount: $159,069
Louisiana Sea Grant will test, advance and share quality management techniques for oyster nurseries to facilitate successful farmer-run nurseries and support reliable access to oyster seed.

MARYLAND SEA GRANT

Principal Investigators: Fredrika Moser
Grant Amount: $139,426
Maryland Sea Grant will further aquaculture-related research, outreach and education activities by supporting an aquaculture education and professional development coordinator and a proposal and reporting coordinator.

MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

Principal Investigators: LaDon Swann; Andrea Tarnecki and Russell Grice, Auburn University, Auburn University Shellfish Lab
Grant Amount: $286,523
Mississippi-Alabama Sea Grant Consortium will conduct a phase II for their Commercial Oyster Aquaculture Sector Training (COAST) Program, which began in 2023, to further training and networking for oyster industry apprentices. This workforce development initiative provides funding for apprentices to receive hands-on training in the oyster aquaculture industry.

MIT SEA GRANT

Principal Investigators: Michael Triantafyllou, Andrew Bennett and Danny Badger
Grant Amount: $399,999
MIT Sea Grant will continue a previous project that brings engineering students together with aquaculture practitioners to solve challenges with robotic and autonomous physical intervention, such as oyster basket management and oyster nursery processes, similar activities with the scallop aquaculture industry and general autonomous aquaculture environmental monitoring.

WHOI SEA GRANT

Principal Investigators: Matthew Charette and Arun Venugopalan
Grant Amount: $111,930
WHOI Sea Grant will investigate the viral genome and the expression of core viral genes within neoplastic cells of hard clams (*Mercenaria mercenaria*) to improve understanding of a disease leading to substantial mortality in farmed hard clams.

MICHIGAN SEA GRANT

Principal Investigators: Silvia Newell
Grant Amount: $30,000
Michigan Sea Grant will support graduate student research to determine the susceptibility of invasive Asian Carp species to two emerging viral infections that are co-circulating in Michigan in connection to carp aquaculture, which will guide wildlife management agencies about the design of adequate containment strategies

MINNESOTA SEA GRANT

Principal Investigators: Amy Schrank, Donald Schreiner and Kieran Smith
Grant Amount: $69,088
Minnesota Sea Grant will continue investigating a cost-effective diet for early stages of Yellow Perch and Golden Shiner, initiate a feasibility study for commercial aquaculture production of Golden Shiner and collaborate with Little Earth of United Tribes on outreach and youth workforce development for their aquaponics facility.

NEW HAMPSHIRE SEA GRANT

Principal Investigators: Erik Chapman and Gabriela Bradt; Alison Watts, University of New Hampshire
Grant Amount: $198,794
New Hampshire Sea Grant will conduct two projects to develop a roadmap for implementing professional trainings for local women in aquaculture and to better understand current and future crab communities in New Hampshire salt marshes and subtidal areas to help guide local management decisions.

NEW YORK SEA GRANT

Principal Investigators: Michael Ciaramella and Barry Udelson
Grant Amount: $239,896
New York Sea Grant will further support and provide guidance to the developing aquaculture industry in New York State by bringing together the diverse sectors in the Great Lakes (land-based finfish farms) and Long Island (shellfish and seaweed cultivation) regions and improving areas of need identified through industry assessment.

NORTH CAROLINA SEA GRANT

Principal Investigators: Eric Herbst and Frank Lopez
Grant Amount: $149,421
North Carolina Sea Grant will sustain support for the Shellfish Farming Academy, the extension pilot of alternative grow out practices to mitigate oyster mass mortality risk, and communications and outreach for public awareness of shellfish mariculture and coastal development challenges and solutions.

OHIO SEA GRANT

Principal Investigators: Nicole Wright
Grant Amount: $99,996
Ohio Sea Grant will run a research competition to answer key questions about Ohio markets for aquaculture versus stocking and food fish products to inform industry, agency, regulator and consumer audiences.

RHODE ISLAND SEA GRANT

Principal Investigators: Tracey Dalton, Rob Hudson and Azure Cygler
Grant Amount: $234,073
Rhode Island Sea Grant will provide a secondary level of educational programming for aquaculture industry members seeking to enhance their science-based knowledge related to advanced business practices, conflict mitigation for the community arena and accessing available government resources.

TEXAS SEA GRANT

Principal Investigators: Mario Marquez and Laura Picariello
Grant Amount: $400,000
Texas Sea Grant will support the nascent cultivated oyster mariculture industry in Texas by training restaurant servers to educate consumers about Texas oysters and assisting new farms in implementing sustainable practices and obtaining certifications.

VIRGINIA SEA GRANT

Principal Investigators: Troy Hartley, Lisa Eddy and Jay Clark
Grant Amount: $277,998
Virginia Sea Grant will partner to create fellowship and internship opportunities that benefit local students and the aquaculture industry and provide communications support to ongoing funded aquaculture projects, sharing the results of these projects via various conferences.

WASHINGTON SEA GRANT

Principal Investigators: Melissa Poe and Kate Litle
Grant Amount: $282,038
Washington Sea Grant will enhance the resilience of shellfish aquaculture in Washington by supporting capacity with ecosystem-based management operations in the Willapa-Grays Harbor Estuary Collaborative and Tide's Out—an aquaculture crew and manager training program.

WISCONSIN SEA GRANT

Principal Investigators: Sharon Moen
Grant Amount: $128,922
Wisconsin Sea Grant will sustain the reach and impacts of the Eat Wisconsin Fish initiative, revise the Consumer's Guide to Wisconsin's Farm-Raised Fish and organize and facilitate an aquaculture workshop and listening session in Madison, the state's capitol.

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