Sea Grant–NCCOS Gulf of Mexico Aquaculture Siting and Development Workshop
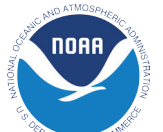
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February 23, 2023
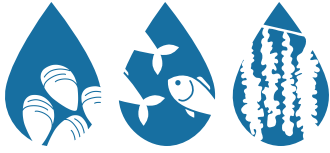
Sea Grant Maryland

Sea Grant Florida

Sea Grant LOUISIANA

Sea Grant Mississippi-Alabama

Sea Grant Texas AT TEXAS A&M UNIVERSITY

Sea Grant

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

Table of Contents

Welcome, and thank you for attending our Sea Grant–National Centers for Coastal Ocean Science (NCCOS) Gulf of Mexico Aquaculture Siting and Development Workshop. Our overarching priority today and throughout the project is to build capacity and collaboration among coastal ocean stakeholders for environmentally, economically, and socially equitable aquaculture development. We request that you review our workshop guidelines on page 8, which we rely on for to create a safe and welcoming environment for all. We appreciate your participation in this effort.

Background

This workshop is part of a four-year project that connect 15 state Sea Grant programs, the National Sea Grant College Program (NSGCP), NCCOS, and coastal stakeholders engaged in ocean and coastal aquaculture siting and sustainability. Funded primarily by a grant from the NSGCP, this collaboration has three goals: 1) Extend the reach of NCCOS aquaculture planning resources; 2) Conduct regional workshops to improve connections among scientists, extension specialists, and other coastal stakeholders around the siting and development of ocean and coastal aquaculture; and 3) Inform broader Sea Grant–NCCOS marine planning efforts.

Purpose

The purpose of the workshop today is to advance understanding about tools and resources available for aquaculture siting and development in the Gulf of Mexico region. Through presentations and discussions, we will explore aquaculture siting tools, discuss ongoing offshore aquaculture projects, and introduce ideas around collaboration for developing effective tools. We aim to identify ways we can collectively develop sustainable coastal and ocean aquaculture to meet US domestic seafood demand.

In this workshop, we plan to use "co-production" when discussing aquaculture siting tools. Co-production (also referred to as collaborative learning, participatory research, or collaborative modeling) can be defined as "iterative and collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge" (Norström et al., 2020, p. 183)[1]. In the context of this workshop, "co-production" is a process that uses two-way communication and information exchange to build community among diverse interest groups who want to address complex social and environmental challenges around aquaculture siting and development. This approach is easily identified through its intent to empower all voices in the process. It can be characterized by frequent question asking.

Throughout the day, workshop participants will engage in discussion and apply the tenets of co-production towards informing current and future aquaculture tools. We ask workshop participants to be open to fielding thought-provoking questions throughout the day. How might this tool be useful in your area? What functionality is particularly pertinent? Could this tool be useful for a certain type of stakeholder, or does it prompt ideas of how you might expand who you work with? The questions intend to spur conversation so that we may listen and learn from each other.

Key outcomes for today's workshop are for participants to identify ways to make future aquaculture siting tools more accessible and useable for broad audiences, and to contribute to conversations regarding aquaculture siting and development. This work will inform our future workshops with participants in Southern California, the Pacific Northwest, the Pacific Islands, and the New England regions. Together, the outcomes from these workshops are to provide direction on how to advance tool development, tool dissemination, and tool value to end users, in order to help move forward sustainable domestic aquaculture production.

Thank you for your support!

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1   Norström, A. V., Cvitanovic, C., Löf, M. F., West, S., Wyborn, C., Balvanera, P., et al. (2020). Principles for Knowledge Co-Production in Sustainability Research. Nat. Sustain. 9, 182–190. doi: 10.1038/s41893-019-0448-2

Workshop Agenda

Workshop Goal and Objectives

Goal

To build capacity and collaboration among the National Oceanic and Atmospheric Administration (NOAA) Sea Grant network, NOAA National Centers for Coastal Ocean Science (NCCOS), and other coastal ocean stakeholders for environmentally, economically, and socially equitable aquaculture siting and development.

Objectives

- Present and explore existing aquaculture siting tools and data resources
- Introduce methods of co-production in the context of aquaculture siting tools

- Identify ways to advance:
  - Use of co-production in aquaculture siting tools
  - Existing and future aquaculture siting tools
  - Delivery of aquaculture siting tools to end users
  - Applicability for aquaculture siting end users
- Build understanding among participants of each other's perspectives and integrate the diversity of aquaculture knowledge and expertise present at the workshop

Agenda

9:00 a.m.	Check-In *Light refreshments served*
9:30 a.m.	**Welcome** Fredrika Moser, *Maryland Sea Grant*
9:35 a.m.	**Session 1: Introduction and Background**

Icebreaker Exercises

Fredrika Moser, *Maryland Sea Grant*

Aquaculture in the Gulf

Mario Marquez, *Texas Sea Grant*

Workshop Overview and Intent

Fredrika Moser, *Maryland Sea Grant*

Workshop and Project Evaluation

Cat Davis, *University of Maryland Center for Environmental Science, Appalachian Laboratory*

Sea Grant and NCCOS Collaboration

Chuck Weirich, *National Sea Grant Office*

NOAA NCCOS Overview

James Morris, *NCCOS*

NOAA Fisheries Regional Aquaculture Coordinator Overview

Andrew Richard, *NOAA Fisheries*

10:30 a.m.	**Session 2: Aquaculture Tool Discussion (Part 1)**
	Overview and Background
	Breakout Group Discussions
	See 'Session 2' on page 5 for more information
11:00 a.m.	Break
11:10 a.m.	**Session 3: Information and Tools**
	Gulf of Mexico Coastal Ocean Observing System (GCOOS) Ocean Data: Introduction and Opportunities
	Jorge Brenner, *GCOOS*
	State of Federal Aquaculture Regulation
	Stephanie Showalter-Otts, *National Sea Grant Law Center*
	NCCOS and the Coastal Aquaculture Planning Portal (CAPP)
	James Morris, *NCCOS*
11:40 a.m.	**Session 4: Gulf AquaMapper Exercise**
	Presentation and Demonstration
	Ken Riley, *NCCOS*
	Gulf AquaMapper Group Exercise
	See 'Session 4' on page 5 and the exercise on page 13 for more information
12:30 p.m.	Lunch
1:15 p.m.	**Session 5: Industry and Community Engagement Panel**
	Moderator: Laura Tiu, *Florida Sea Grant*
	Industry Panelists: Donna Lanzetta, *Manna Fish Farms* and Dennis Peters, *Gulfstream Aquaculture, LLC*
	Community Engagement Panelists: Hayley Lemoine, *Florida State University* and Adriane Michaelis, *NOAA Fisheries*
1:45 p.m.	**Session 6: Aquaculture Tool Discussion (Part 2)**
	Overview and Background
	Breakout group discussions
	See 'Session 6' on page 6 for more information
2:45 p.m.	Break
2:55 p.m.	**Session 7: Next Generation Tools: OceanReports**
	Presentation and Demonstration
	James Morris, *NCCOS*
	Breakout group discussions
	See 'Session 7' on page 6 for more information
3:55 p.m.	**Session 8: Evaluation**
	Fredrika Moser, *Maryland Sea Grant*
4:00 p.m.	Workshop concludes

Workshop Logistics

Our workshop will be divided into eight sessions of varying lengths with several opportunities for discussion. At the tables, there are sticky notes, markers, and flip charts and flip charts to capture brainstorming discussions. Additionally, each table/group will have a facilitator and note taker to help guide and capture the conversation. Facilitators are to ensure everyone can contribute.

Session 1: Introduction and Background

The morning introduction session begins with introductory exercises between participants, followed by an introductory talk about aquaculture in the Gulf of Mexico. The purpose of the talk is to familiarize everyone in the room with the aquaculture basics relevant to workshop discussions. Continuing our morning session, we will have a quick overview of the workshop's purpose, its evaluation, and introductions from our NCCOS collaborators and our National Sea Grant Office program managers.

Session 2: Aquaculture Tool Discussion (Part 1)

There is a lot of aquaculture expertise convened at this workshop, and it is vital all participants recognize the value of everyone and listen to the diverse perspectives in the room.

During session 2, discussions will happen within small groups. Each participant will be asked to give a brief overview (2-3 minutes) of their connection to aquaculture and their expertise and knowledge regarding aquaculture.

In the remaining time (~10 minutes), tables will discuss the following questions:
- What does the term aquaculture "tool" mean to you?
- Are you aware of aquaculture tools?
- How or where would you look for an aquaculture tool?
- What does co-production mean to you?
- Are you aware of some examples of co-production and some examples that are not co-production?

Session 3: Information and Tools

In this session, there will be an overview of some of the information and tools available for aquaculture siting. Each of our speakers will give a brief presentation on the following:
- Gulf of Mexico Coastal Ocean Observing System (GCOOS) Ocean Data: Introduction and Opportunities
    Jorge Brenner, *GCOOS*
- State of Federal Aquaculture Regulation
    Stephanie Showalter-Otts, *National Sea Grant Law Center*
- NCCOS and the Coastal Aquaculture Planning Portal (CAPP)
    James Morris, *NOAA NCCOS*

After each presentation, there will be a short Q&A. If participants have additional questions, please feel free to reach out to the workshop organizing committee and we can help connect you with the appropriate panelist to answer your question.

Session 4: Gulf AquaMapper Exercise

Gulf AquaMapper is an example of an aquaculture siting tool that exists for the Gulf of Mexico region. Participants will be using the Gulf AquaMapper tool created by NCCOS. After a brief presentation by Ken Riley (NOAA NCCOS) on

the history and uses of Gulf AquaMapper, participants will get to test out the tool by completing the group exercise on page 13.

Session 5: Industry and Community Engagement Panel

During this session, a panel of industry and community engagement research specialists will speak on the challenges and opportunities facing aquaculture in the Gulf of Mexico region. Each panelist will give a brief overview of their background and experiences, followed by time for questions. The panel will be moderated by Laura Tiu (Florida Sea Grant) and the panelists are:

- Industry Panelists
    - Donna Lanzetta, *Manna Fish Farms*
    - Dennis Peters, *Gulfstream Aquaculture, LLC*
- Community Engagement Panelists
    - Hayley Lemoine, *Florida State University*
    - Adriane Michaelis, *NOAA Fisheries*

Session 6: Aquaculture Tool Discussion (Part 2)

In this session, participants will be asked to deliberate about aquaculture tools, keeping in mind what was learned from the previous sessions. The first part of the discussion will be focused on the following questions (40 minutes):

- What would be your ideal aquaculture or marine spatial planning tool? What do you want from that tool?
    - Environmental data? Economic data? Cultural landscape? Regulations and Permitting information?
    - Is it for initial aquaculture site identification (i.e., strategic) or to begin developing an aquaculture site (i.e., tactical)?
- How would you develop an ideal tool from a co-production approach?
- How would you like assistance with using your ideal tool (e.g., accessing and using the tool on your own, collaborative use with tool developers, technical assistance from tool experts, site visits, one-on-one discussions)?

The second part of the discussion session will be dedicated to comparing what the groups have determined as their ideal tool(s) with either existing tools (e.g., Gulf AquaMapper, OceanReports, tools in CAPP, etc.) or other participants' ideal tools. Discuss the following questions:

- How could you improve or modify existing tools to get closer to an ideal tool?
- How could co-production be effectively used to modify a tool?
- How would you like assistance with using these tools (e.g., accessing and using the tool on your own, collaborative use with tool developers, technical assistance from tool experts, site visits, 1:1 discussions)?
- Would you use these tools for initial aquaculture site identification (i.e., strategic) or to begin aquaculture site development (i.e., tactical)?

Session 7: Next Generation Tools: OceanReports

OceanReports is a newer iteration of the Gulf AquaMapper that provides additional data layers. After a brief presentation by James Morris (NCCOS) on development and uses of OceanReports, participants will test out the tool in a group exercise.

After the presentation and exercise, discuss the following questions:

- How could you improve or modify tools used or discussed to get closer to an ideal tool?
- How could co-production be effectively applied to advance tools used or discussed?
- How would you like assistance with using tools (used or discussed) (e.g., accessing and using the tool on your own, collaborative use with tool developers, technical assistance from tool experts, site visits, 1:1 discussions)?

- Would you use tools used or discussed for initial aquaculture site identification (i.e., strategic) or to begin aquaculture site development (i.e., tactical)?

Session 8: Evaluation

During this session, participants will be asked to complete a short evaluation developed by our external evaluator so that we can improve our workshop process.

Next Steps

In March, the workshop team will host a follow-up focus group session. This session is aimed at continuing the conversations from the workshop and building capacity and collaboration among coastal ocean audiences for environmentally, economically, and socially equitable aquaculture development. If you are interested in participating in this focus group, please sign up here: bit.ly/Post_Workshop_Discussion.

After the focus group session, the team will synthesize the findings from our work in the region and create a summary paper to distribute to all participants and others interested in the findings. Additional information on that process and the materials will be also listed on our website (www.mdsg.umd.edu/GulfofMexicoAquacultureWS).

Acknowledgements

We would like to thank our speakers and the following groups for their contributions to the success of this workshop, as well as the Meraux Foundation for their generous donation of the meeting space.

Steering committee/planning team members: Seth Blitch, Eric Brazer, Jr., Jorge Brenner, Jenna Clark, Marcy Cockrell, Hannah Cooper, Cat Davis, Zach Davonski, Andrea Hance, Cynthia Heil, Jim LaChance, Donna Lanzetta, Sherry Larkin, Julie Lively, Mario Marquez, Fredrika Moser, Stephanie Showalter-Otts, Dennis Peters, Laura Picariello, Ivan Puckett, Portia Sapp, Kent Satterlee, Steve Sempier, Elizabeth Staugler, Leslie Sullivan, Laura Tiu, Madelyn Wampler, and Jeff Watters

Sea Grant partners: Laura Tiu, Mario Marquez, Laura Picariello, Dominique Seibert, Rusty Grice, Sherry Larkin, Julie Lively, Pam Plotkin, Stephanie Showalter-Otts, and LaDon Swann

Facilitators and notetakers: Sarah Bodenstein, Sharon Cilano, Chris Flight, Kathleen Hartman, Shannon Hood, Mark Johannemann, Sherry Larkin, Hayley Lemoine, Adriane Michaelis, Fredrika Moser, Shauna Oh, Uchechukwu Ohajiudu, Sara Pedigo, Laura Picariello, Mya Sharpe, Stephanie Showalter-Otts, Sara Stewart, Kaitlyn Theberge, Laura Tiu, and Madelyn Wampler

NOAA partners: Gretchen Bath, Alicia Bishop, Kevin Madley, James Morris, Megan Munkacsy, Mark Rath, Andrew Richard, Ken Riley, Chris Schillaci, Tori Spence, Chuck Weirich, and Diane Windham

External Advisory Board: Rod Fujita, Laura Rickard, Kenny Rose, and Kris Sarri

Maryland Sea Grant Communications: Madeleine Jepsen and Ashley Goetz
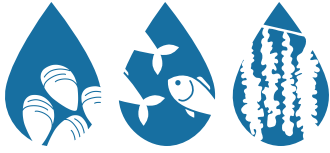
Workshop Guidelines

Maryland Sea Grant (MDSG) is committed to providing safe and welcoming environments for all who participate in MDSG events. MDSG prohibits and will not tolerate any form of harassment, bullying, or discrimination. Together, through the following guidelines, we can ensure that this workshop supports free expression and exchange of ideas in environments that are positive and productive for all.

We value all perspectives. We encourage everyone to share. We are here to listen and understand. If you prefer not to answer, you can say pass, or pass for now.

Please note that disagreement is welcome for the purpose of understanding, but not for convincing. Critique ideas, not individuals. Please actively listen to everyone. We ask that you avoid interrupting others when speaking. Please try to minimize distractions when possible.

During this workshop we will be developing a shared language. It is always okay to ask what a word or phrase means, or to ask for further clarification, as we will be doing the same of you!

If you know that you need to leave the meeting early, please let the project team, facilitator, or notetaker know ahead of time so that we can allot your time first when doing our breakout sessions.

If you believe that you or someone else is being subjected to inappropriate conduct, or if you have any other concerns, please do not hesitate to contact MDSG event staff who can work with MDSG leadership to resolve the situation. If the project team determines that any behavior is inappropriate or violates the above guidelines, participants will be reminded of these ethics and/or asked to leave the meeting.

Gulf of Mexico Coastal Ocean Observing System (GCOOS): Data and Tools

The Gulf of Mexico Coastal Ocean Observing System (GCOOS) is the only Regional Coastal Observing System (RCOS) working with the Integrated Ocean Observing System that is certified by NOAA in the Gulf of Mexico large marine ecosystem. GCOOS focuses solely on gathering data in the Gulf of Mexico from buoys, autonomous underwater vehicles, satellites, high frequency radars, coastal stations and other sensors and in ensuring that the information is timely, reliable, accurate and—above all—available to those working to understand current and future conditions in ocean systems. GCOOS operates inclusively, transparently and seeks user input to determine system priorities for data gathering.
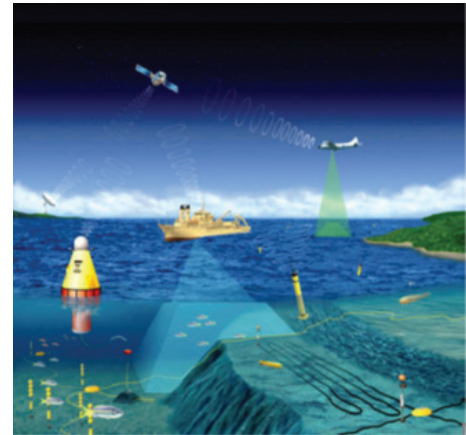
Data Summary

As a certified RCOS, GCOOS implements specific data collection and management practices, including a thorough vetting and documentation process. The organization includes 58 academic, governmental, nongovernmental and industry data partners, and hosts data from more than 1,600 sensors throughout the Gulf. At present, GCOOS supports partners and coordinates data collection in all five states in the Gulf. It offers webservices via different frameworks, in multiple formats, and for large temporal frames—e.g., netCDF, ERDDAP, WAF, HTTP, etc. In addition to providing access to historical and real time physical oceanography data (e.g., temperature, salinity, currents), GCOOS also provides large databases of biological and chemical coastal and offshore data.

Relevant data access points and tools for marine aquaculture:

- Moorings and Coastal Stations—Data Portal (https://data.gcoos.org)
- Coastal Currents—high-frequency radars (HFR) (https://data.gcoos.org/hfradar/)
- Water Column Profiles—GANDALF AUV Piloting Tool (https://gandalf.gcoos.org/)
- Water Quality (https://wq.gcoos.org/)
- Bathymetry and Coastlines (https://geo.gcoos.org/data/topography/Introduction.html)
- Satellite Products (https://products.gcoos.org/satellite)

For more information

Jorge Brenner
Gulf of Mexico Coastal Ocean Observing System
Oceanography Department, Texas A&M University
jorge.brenner@gcoos.org

The Coastal Aquaculture Planning Portal: An Overview of Tools for Rules

Tool summary

In an effort to obtain global food security, many countries, including the United States, are turning towards the expansion of marine aquaculture. This effort requires a need for support in the decision making and planning process for future site suitability and development of aquaculture infrastructure. The Coastal Aquaculture Siting and Sustainability (CASS) program, under NOAA/ National Ocean Service (NOS)/ National Centers for Coastal Ocean Science (NCCOS), has developed a marine aquaculture toolbox comprised of coastal aquaculture planning tools. The Coastal Aquaculture Planning Portal (CAPP) is a consolidation of a wide range of existing tools and applications, which were created to assist managers, planners, and industry in the development of sustainable aquaculture. Private universities, state/federal government agencies, and global organizations have developed these tools to provide the most accurate and up to date data and environmental analysis possible. These tools range from state specific shellfish mappers to global geospatial ecology overviews. The portal is organized into four subcategories, each of which pertain to marine aquaculture and/ or environmental interactions. The CAPP was developed in partnership with Digital Coast, a product of the NOAA/ NOS Office of Coastal Management, in efforts to support the growth and expansion of resilient and sustainable marine aquaculture within the United States and abroad.
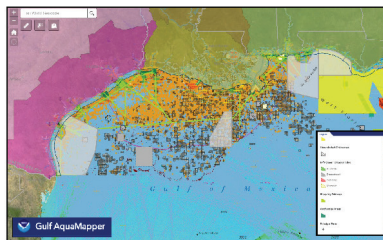

Tools for the Future…

Managers — Marine Cage Culture and the Environment. Assessment of marine cage culture and environmental interactions. Aquaculture application: This state of science analysis provides information for environmental assessments and consultations for aquaculture permitting of net-pen and other types of marine cage aquaculture. Contributing Partners: NOAA NOS NCCOS

Gulf AquaMapper

Industry — Alabama Shellfish Aquaculture Siting Tool. This interactive map viewer allows users to view current shellfish harvest restrictions along the Alabama coastline. Aquaculture application: This map viewer can be used for aquaculture screening and risk communication for lease bed harvest closures. Tutorial: Download under site selection. Contributing Partners: Alabama Marine Resource Division, Sea Grant

Planners — CanVis. Visualize seascape from various types of coastal development using your photographs and the CanVis library. Aquaculture application: Use the aquaculture library to create visions by adding to your seascape aquaculture. Instructional video: https://goo.gl/tFrmUE Webinar: https://goo.gl/Jdoi7G Contributing Partners: NOAA OCM, NOAA NCCOS, USDA National Agroforestry Center

…Tools for Planning

https://coastalscience.noaa.gov/research/marine-spatial-ecology/coastal-aquaculture-planning-portal-capp/

For more information

Kenneth Riley
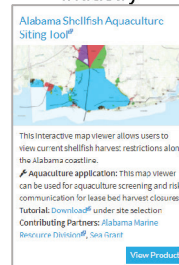NOAA National Ocean Service
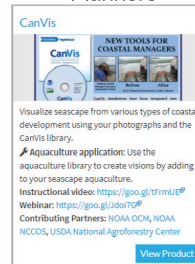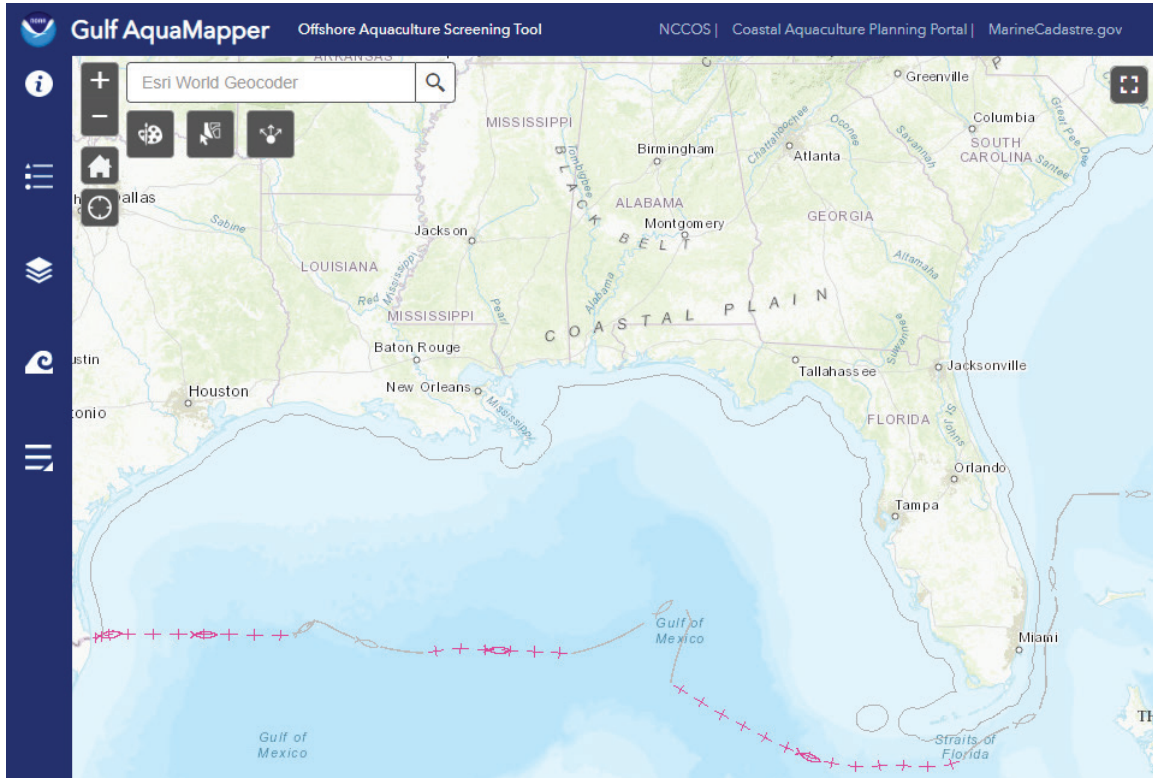National Centers for Coastal Ocean Science
ken.riley@noaa.gov

Gulf AquaMapper: US Gulf of Mexico

Tool Summary

The Gulf AquaMapper is a web-mapping application designed to assist managers and industry in identifying suitable areas for aquaculture development in the US Gulf of Mexico. The application provides high resolution maps to improve the coordination and transparency of permits and siting, which in turn reduces planning costs on industry and regulatory agencies and allows for more investment opportunities in domestic seafood production and macroalgal mariculture. Data products presented are the result of synthesizing decades of research mapped to provide smart planning tools for users. The tool is specifically designed to inform aquaculture planning efforts during the early stages of exploring the coastal ocean for suitable aquaculture development. For any location in the Gulf of Mexico, data layers (e.g., navigation, infrastructure, military, biological, geophysical, boundaries & charts) can be viewed simultaneously, and maps can be printed and shared. The Gulf AquaMapper is useful for identifying interactions with ocean use and public trust resources, as not all data layers require avoidance. This improves efficiency and increases the area that may be potentially suitable for aquaculture installations. While this tool is good for screening and guiding engineering, a detailed site assessment is recommended to verify environmental conditions and establish specific designs. National Centers for Coastal Ocean Science supported the development of the Gulf AquaMapper as it helped build spatial data and infrastructure. Data and functionality from the Gulf Aquaculture Marine Mapper were harvested to create the National AquaMapper.
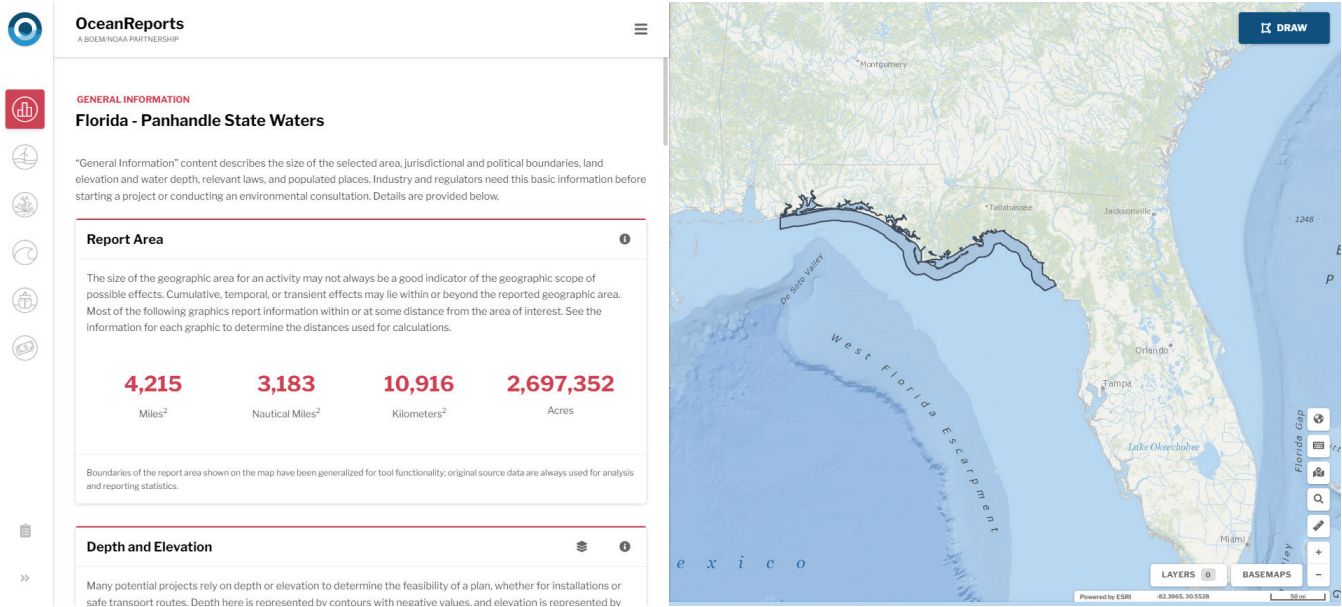
ArcGIS Online viewership counts for the Gulf AquaMapper total 6,334 from its launch in September 2017 to present.

https://coastalscience.noaa.gov/products/gulf-aquamapper/

For more information

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OceanReports

Tool Summary

The OceanReports web tool provides specialized "ocean neighborhood analyses," including maps and graphics, by analyzing more than 100 ocean datasets instantaneously. The web-based interactive tool for ocean mapping and planning, created by NOAA and the Department of the Interior's Bureau of Ocean Energy Management, provides professional users and the general public with opportunities to explore the ocean from their own computer.

US ocean waters comprise nearly four million square miles, forming one of the largest Exclusive Economic Zones (EEZ) in the world. Now, when users outline any area in the US EEZ using the OceanReports tool, they can get detailed information about habitats and species, industries in the area, potential hazards (such as undersea cables or shipwrecks), the economic value of ocean commerce, and other detailed oceanographic information.

OceanReports builds on more than a decade of data collection to transform how seemingly disparate ocean information can be delivered to the nation's ocean and coastal industries, which add $320 billion in gross domestic product to the nation's economy.

And while OceanReports provides a fountain of data for use by industry and science, it's easy enough to use in the classroom to aid students studying biology, chemistry, geography, or economics.

For more information

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OFFSHORE AQUACULTURE EXPLORATION IN THE GULF OF MEXICO

ACTIVITY DESCRIPTION

The aim of this activity is for workshop participants to explore and use the **NOAA Gulf AquaMapper**, a web-based tool for exploration, permitting, and siting of offshore aquaculture in the Gulf of Mexico. This activity will use a plausible scenario wherein an aquaculture company seeks to identify sites for establishing an offshore marine cage operation in the Gulf of Mexico.

HOW TO PLAY

Workshop participants should organize themselves into teams. Each team will seek to identify an offshore site that is suitable for aquaculture development while also minimizing conflicts with commerce, navigation, recreation, oil and gas development, natural resource conservation, and national security.

BACKGROUND STORY

Your aquaculture team has been approached by a group of investors who are interested in developing an offshore operation along the northern Gulf of Mexico. The investors' home office is located in Pensacola, Florida. The investors request that all marine cage operations and land-based infrastructure be sited within 100 miles of the home office situated in the Port of Pensacola.

EXPLORE THE NOAA GULF AQUAMAPPER

Direct access: http://arcg.is/0GeLnm

Google | Gulf AquaMapper

SITING GUIDELINES

Offshore operations: The farm will consist of 24 submersible net pens. The surface footprint will occupy approximately 0.3 km² (0.12 mi²). The anchoring footprint will occupy approximately 2.6 km² (1 mi²). An additional 2.6 km² (1 mi²) will be allocated for fallowing purposes or flexibility in placement of systems, moorings/anchors, and cage arrays within the site. The entire site to be permitted will be contiguous and occupy 5.8 km² (2 mi²).

Siting requirements: minimum depth (30 m; 100 feet); maximum depth (120 m; 393 feet); maximum current (<1 m/s; 2 kts; 2.2 mph); optimal current (<0.25 m/s; 0.5 kts; 0.6 mph).

Constraints to consider: military zones, navigation fairways, vessel traffic, oil and gas activities (rigs, wells, pipelines), communication lines (submarine cables), habitat conservation, protected resources, fishing/diving (artificial reefs), and others.

Recommended buffer distances: 500 m (0.3 mi) for navigation channels, oil and gas infrastructure, pipelines, submarine cables, shipwrecks, and artificial reefs.

ACTIVITY INSTRUCTIONS

(1) Name your company.

(2) Identify an *Area of Interest* within 100 miles of the Port of Pensacola. *This requires using the measure tool*.

(3) Select a species. Do you know a thermal range for your species? If not, explore the maximum and minimum temperatures in your *Area of Interest* and identify a range for which you would need to select a candidate species.

(4) Explore the depth requirements for your operation within the Area of Interest. *This requires using the depth contours, bathymetry, or navigation charts*.

(5) Explore ocean currents (surface and bottom) within the *Area of Interest*.

(6) Evaluate siting constraints beginning with military and navigation.

(7) Assess environmental data, habitat conservation, and protected resources.

(8) Identify your preferred site for development. Record the latitude and longitude for center of area.

(9) Evaluate the siting process. Describe why your team ultimately chose the site.

(10) Make a prioritized list of major constraints and other concerns.
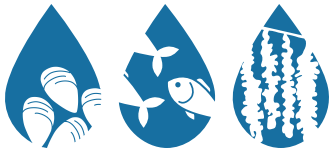
Appendix: Additional Materials

Project Overview and Personnel

Connecting Sea Grant, NCCOS, and Coastal Stakeholders to Improve Sustainable Aquaculture Siting and Development

In the last few years, decision makers and constituents have worked together to identify Aquaculture Opportunity Areas (AOAs) in US waters. It is as an approach to improving development of sustainable off-shore aquaculture. However, whether discussing inshore or offshore, sustainable aquaculture wades into crowded waters where complex layers of multiple stakeholders are present. The National Centers for Coastal Ocean Science (NCCOS)—and particularly the Coastal Aquaculture Siting and Sustainability Program (CASS)—are well-equipped to meet these challenges and have created resources and tools to aid in decision making by people interested in the use of the coastal ocean. NCCOS tools and services are key to a science-based approach to siting and developing sustainable coastal ocean aquaculture. These tools often use marine spatial information as an evolving method to analyze and address the challenges of ecosystem and human interactions in coastal ocean areas.

Goal

The primary goal of this proposal is to build capacity and collaboration among the National Oceanic and Atmospheric Administration (NOAA) Sea Grant network, National Centers for Coastal Ocean Science (NCCOS), and other coastal ocean stakeholders for environmentally, economically, and socially equitable aquaculture siting and development.

Approach

Six regional workshops will take place: the Mid-Atlantic (Summer 2022); Gulf of Mexico (Winter 2023); Southern California (Fall 2023); Pacific Northwest (Summer 2024); Pacific Islands (Fall 2024); and New England (Spring 2025). The process of co-production guides interactions with workshop participants to build a pathway for developing future aquaculture siting tools that are accessible and useful to broad audiences. In addition, workshops are designed to advance the reach of NCCOS aquaculture planning tools.

Workshop Objectives

To meet the goal and approach outlined above, each workshop has four objectives:
- Present and explore existing aquaculture siting tools and data resources
- Introduce methods of co-production in the context of aquaculture siting tools
- Identify ways to advance:
    - Use of co-production in aquaculture siting tools
    - Existing and future aquaculture siting tools
    - Delivery of aquaculture siting tools to end users

- - Applicability for aquaculture siting end users
- Build understanding among participants of each other's perspectives and integrate the diversity of aquaculture knowledge and expertise present at the workshop

Workshop Outcomes

- Because of this workshop, participants will have a better understanding of the following in the context of aquaculture siting tools
  - co-production
  - each other's perspectives
- Because of the workshop, participants feel they can
  - identify ways to make future tools more accessible to other stakeholders interested in aquaculture siting
  - identify communication gaps in understanding aquaculture siting tools
  - identify communication gaps in delivering aquaculture siting tools
- Participants feel they and others were heard in creating aquaculture siting tools

Project PI

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Dr. Shauna Oh, Director, California Sea Grant

Dr. Pamela Plotkin, Director, Texas Sea Grant
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Dr. Susan White, Director, North Carolina Sea Grant
Dr. Gayle Zydlewski, Director, Maine Sea Grant

For more information, please visit:

https://www.mdsg.umd.edu/sustainable-aquaculture-siting

**Helps industry and coastal managers find the right space for offshore aquaculture in the Gulf of Mexico**

GULF AQUAMAPPER

The Gulf AquaMapper is a web-mapping application designed to assist managers in identifying suitable areas for aquaculture development in the Gulf of Mexico. The application provides high-resolution maps to improve the coordination and transparency of permits and siting, which in turn reduces planning costs on industry and regulatory agencies and allows for more investment opportunities in domestic seafood production.
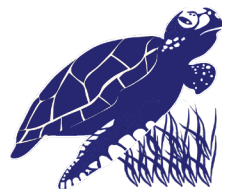
Minimizes user conflicts with:

MILITARY
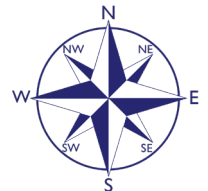
NAVIGATION

COMMERCIAL

BIOLOGICAL

OCEANOGRAPHIC

NOAA National Ocean Service
National Centers for Coastal Ocean Science
For questions contact: James.Morris@noaa.gov
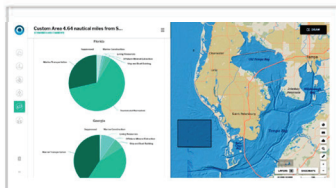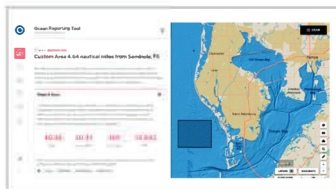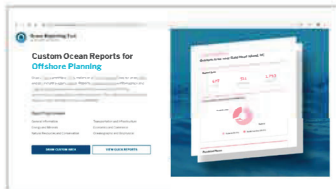http://coastalscience.noaa.gov

A trusted one-stop tool for custom, automated spatial analyses for authoritative ocean data to streamline permitting, decrease costs, and increase transparency for all ocean industries

OceanReports

Explore Your Ocean with OceanReports

OceanReports Quickfacts

• Over 100 datasets including energy and minerals, natural resources, transportation and infrastructure, oceanographic and biophysical conditions, and the local ocean economy

• Provides custom automated geospatial analyses for exploring the entire US ocean

• Made for all ocean industries including energy, shipping and transportation, aquaculture, fisheries, and seabed mining

• Users include ocean industries, permitting agencies, consultants, marine planners, physical scientists, policy analysts, and the general public

• The only tool that generates comprehensive spatial reports for the entire US ocean
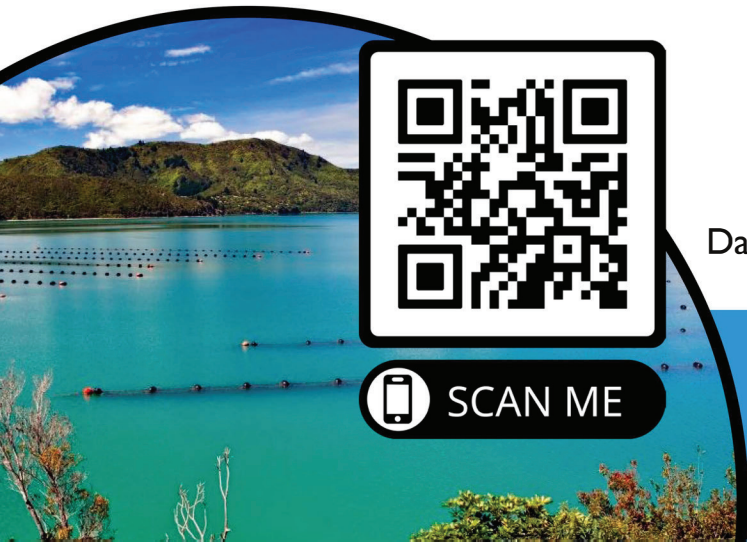
This tool was developed by NOAA, the Bureau of Ocean Energy Management, the Department of Energy, and Esri.

For questions contact: James.Morris@noaa.gov, Dave.Stein@noaa.gov, and Christine.Taylor@boem.gov

SCAN ME

NOAA National Ocean Service
National Centers for Coastal Ocean Science
Office of Coastal Management
http://coastalscience.noaa.gov

OFFSHORE AQUACULTURE

Sea Grant Florida
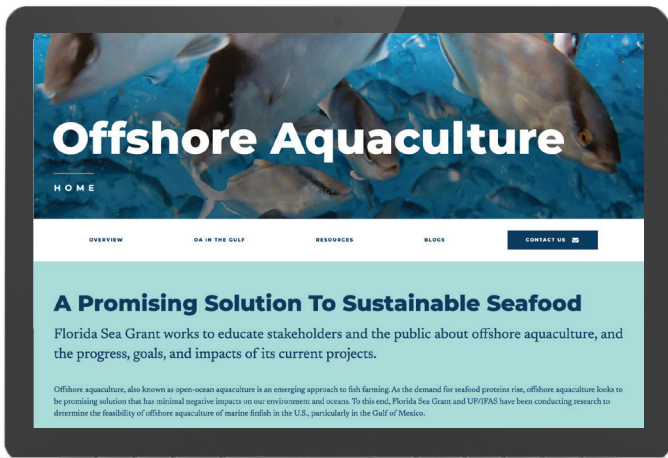
Florida Sea Grant recently launched a new **Offshore Aquaculture webpage** and **blog series** to provide a one-stop shop for the current state of knowledge about offshore aquaculture.

The OA webpage features a library of accurate, best available science and literacy resources, including peer-reviewed publications, industry and NGO reports, factsheets, infographics and more. The blog series, released every other month, breaks down important and popular topics related to finfish aquaculture in the U.S. into quick, digestible blogs.

LEARN MORE: **FLSEAGRANT.ORG/AQUACULTURE/OFFSHORE**

Offshore Aquaculture

HOME

OVERVIEW   OA IN THE GULF   RESOURCES   BLOGS   CONTACT US ✉

A Promising Solution To Sustainable Seafood

Florida Sea Grant works to educate stakeholders and the public about offshore aquaculture, and the progress, goals, and impacts of its current projects.

Offshore aquaculture, also known as open-ocean aquaculture is an emerging approach to fish farming. As the demand for seafood proteins rise, offshore aquaculture looks to be promising solution that has minimal negative impacts on our environment and oceans. To this end, Florida Sea Grant and UF/IFAS have been conducting research to determine the feasibility of offshore aquaculture of marine finfish in the U.S., particularly in the Gulf of Mexico.

Offshore Aquaculture Literacy Resources

Florida Sea Grant has gathered a variety of pertinent resources and information for those interested about the current state of knowledge of offshore aquaculture.

REPORTS   ›

SCIENTIFIC ARTICLES   ›

FACT SHEETS   ›
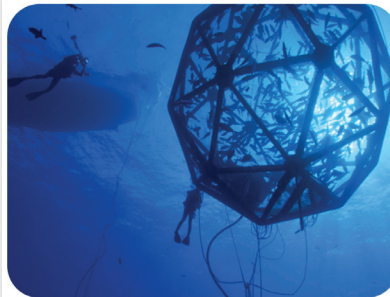
Latest Blogs

The Future of American Seafood: Will It Include Offshore Aquaculture?

LEARN MORE ⊕   VIEW ALL ⊕

For more information:

Dr. Laura Tiu
County Extension Director, Florida Sea Grant Agent
UF/IFAS Extension Walton County
lgtiu@ufl.edu

Workshop Shuttle Information

A free shuttle will be provided from the hotel of the Aquaculture America 2023 conference, New Orleans Marriott, for workshop participants. The shuttle is run by Burton Transit. The schedule of the shuttle is as follows:

Morning Schedule

Pick-up
8:00 a.m.
New Orleans Marriott
555 Canal Street, New Orleans, LA 70130

Arrive at Workshop
9:00 a.m.
Docville Farm
5124 East Saint Bernard Highway, Violet, LA 70092

Afternoon Schedule

Pick-up
4:30 p.m.
Docville Farm
5124 East Saint Bernard Highway, Violet, LA 70092

Arrive at Hotel
5:00 p.m.
New Orleans Marriott
555 Canal Street, New Orleans, LA 70130

Please fill out the following form if you are interested in taking the shuttle:
https://bit.ly/Shuttle_Transport

More information regarding the transit company's COVID procedures can be found here:
https://www.burtontransit.com/covid