



Sea Grant–NCCOS Mid-Atlantic Aquaculture Siting and Development Pilot Workshop

College Park, Maryland
June 30, 2022



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Workshop Background and Purpose

Welcome and thank you for attending our Sea Grant–NOAA National Centers for Coastal Ocean Science (NCCOS) Mid-Atlantic Aquaculture Siting and Development Pilot Workshop. Our priority today is to extend the reach of aquaculture tools and learn more about tools that stakeholders want, while also collectively developing an effective workshop process. We request that you review our workshop guidelines on page 7, which we rely on for creating 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 connects Sea Grant, the National Sea Grant Program, NCCOS, and coastal stakeholders engaged in aquaculture siting and sustainability. Funded primarily by a grant from the National Sea Grant College Program, this collaboration will extend the reach of NCCOS aquaculture planning resources, improve connections between scientists, extension specialists, and other coastal stakeholders through a series of regional workshops, and inform broader Sea Grant–NCCOS marine spatial planning efforts.

Purpose

Today we are meeting to participate in the pilot workshop for this project, where we will learn about several tools available for aquaculture siting and development, hear about the broader resources available through the Coastal Aquaculture Planning Portal (CAPP)¹, and engage thoughtfully in various small-group discussions. In addition to discussions focused on tools, we will also ask you to reflect on the project's process and future efforts.

We will seek to hone a process that emphasizes co-production and encourages two-way communication about aquaculture siting and development tools. 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? We will ask questions like these as we share several resources, but we also intend to listen and learn from each other. To this end, the workshop will contribute to a roadmap document that outlines key themes as well as future directions, as informed by the perspectives of all attendees. We hope to improve future workshops as we proceed over the next 4 years to engage with regional stakeholders in the Gulf of Mexico, Southern California, the Pacific Northwest, the Pacific Islands, and the New England regions. Thank you for your support!

¹ 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.



Workshop Agenda

- 8:30 a.m. Check-In
Light refreshments served
- 9:00 a.m. **Welcome**
Fredrika Moser, *Maryland Sea Grant*
- 9:05 a.m. **Introduction and background**
Sea Grant and National Oceanic and Atmospheric Administration National Centers for Coastal Ocean Science (NOAA NCCOS) collaboration
Chuck Weirich, *National Sea Grant Office*
NCCOS and the Coastal Aquaculture Planning Portal (CAPP)
Ken Riley, *NOAA*
Workshop overview and approach
Jim LaChance, *Maryland Sea Grant*
Workshop and project evaluation
Cat Davis, *University of Maryland Center for Environmental Science, Appalachian Laboratory*
- 9:40 a.m. **Case Study: Co-production in aquaculture**
University of Maryland Online Economic Spreadsheet Tool for Oyster Aquaculture
Matt Parker, *University of Maryland Sea Grant Extension*
- 10:00 a.m. **Breakout group discussions**
See 'Breakout group discussions' on page 5 for more information
- 10:20 a.m. **Lightning report outs**
2 minutes per group
- 10:30 a.m. Break
- 10:40 a.m. **NCCOS tool presentation: Wave Energy Model (WEMo)**
Presentation and demonstration
Ken Riley, *NOAA*
Meg Munkacsy, *NOAA NCCOS Coastal Aquaculture Siting and Sustainability (CASS)*
- 11:10 a.m. **Breakout group discussions**
See 'Breakout group discussions' on page 5 for more information
- 11:55 a.m. **Lightning report outs**
2 minutes per group

12:05 p.m.	Lunch
1:00 p.m.	<p>NCCOS tool presentation: Best harvest windows and <i>Vibrio</i> harvest calculator</p> <p>Presentation and demonstration</p> <p>Bob Daniels, <i>I.M. Systems Group, Inc. at NOAA/National Weather Service</i></p> <p>Ava Ellett, <i>NCCOS Oxford Laboratory</i></p>
1:30 p.m.	<p>Breakout group discussions</p> <p><i>See 'Breakout group discussions' on page 5 for more information</i></p>
2:15 p.m.	<p>Lightning report outs</p> <p><i>2 minutes per group</i></p>
2:25 p.m.	Break
2:40 p.m.	<p>Engaging Diverse Audiences</p> <p>Overview and background</p> <p>Jim LaChance, <i>Maryland Sea Grant</i></p> <p>Breakout group discussions</p> <p><i>See 'Breakout group discussions' on page 5 for more information</i></p> <p>Lightning report outs</p> <p><i>2 minutes per group</i></p>
3:25 p.m.	<p>Looking Ahead to Workshop 2: Gulf of Mexico</p> <p>Overview and background</p> <p>Jim LaChance, <i>Maryland Sea Grant</i></p> <p>Breakout group discussions</p> <p><i>See 'Breakout group discussions' on page 5 for more information</i></p> <p>Lightning report outs</p> <p><i>2 minutes per group</i></p>
3:45 p.m.	<p>Concluding remarks and evaluation</p> <p>Jim LaChance, <i>Maryland Sea Grant</i></p>
4:00 p.m.	Workshop concludes





Workshop Logistics

Workshop overview

As outlined in the agenda (see page 3), the first session will share introductory information about the Sea Grant–NCCOS collaboration and go into detail about the resources found in the NOAA NCCOS Coastal Aquaculture Planning Portal. There will also be a brief description of this project’s approach and our collaborators. The workshop will then transition into a series of presentations and breakout group discussions that focus on co-production, aquaculture siting and development tools, inclusivity and the workshop process. We will end with an online survey from our external evaluator.

Please see the appendices beginning on page 12 for a list of attendees and additional information on this project’s approach.

Below, you can find details for each breakout group discussion.

Breakout group discussions

Each of you has been assigned to a separate breakout group for the morning and afternoon sessions. Some breakout group discussions will take place at your table, while some will involve circulating to other tables. The specific approach to each is explained below and will also be described before each discussion.

Breakout group discussion #1: Co-production in aquaculture

Co-production is an intentionally participatory way of reaching a collective outcome and a useful approach for questions such as the siting and development of aquaculture. In this breakout session, we will ask you to think of an example of a project where you were engaged in co-production. If you can’t think of an example, then consider a project where a co-production approach could have been useful. The facilitator will then ask the group to list some ideas of what works and what might be challenging with this approach. Our intention is to think about lessons learned from this example, and to bring this lens of co-production to all of our breakout group discussions throughout the day.

Breakout group discussion #2 and #3: Discussion of aquaculture siting and development tools

In these two discussions, we aim to gather feedback on the tools as well as input on how best to improve use and dissemination of the tools. Needs can vary significantly by locality and type of user, and we appreciate hearing your unique perspective. We will explore this through a series of structured questions that focus on five key areas:

1. Tool functionality
 - a. When would you most likely use this tool?
 - b. Which function is most useful? Which function would you like to see improved or augmented?
 - c. Do you have any further questions about its use?
2. Tool strengths and opportunities
 - a. Identify a list of strengths and opportunities to improve any aspects of the tool.
3. Tool access and knowledge
 - a. How do you prefer to learn about and access these types of tools? For example, from a video guide, a webinar, a written guide, or a different method altogether? Specific examples of useful tool guides (or types of guides) are also helpful.

4. Complementary resources
 - a. Do any additional needs or complementary tools come to mind? Please list any examples/ideas and describe how they could complement the tool you just learned about
 - b. What type of additional data or knowledge would you also consult when using this tool?
 - Where or how would you find this information. Please describe where or how you would find this information.
 - Would this data/knowledge be useful in a new tool or as an addition to the current tool?
5. Audience
 - a. Who do you view as the target audience and what approach might broaden the audience that uses this tool?
 - b. What group, organization, or community would you most likely consider sharing this tool with? Least likely?
 - c. Do you see any opportunities or challenges to user engagement with this tool?

Breakout group discussion #4: Engaging a diverse audience

In this breakout group discussion we will touch on the idea of engaging underrepresented groups in discussions around the topic of aquaculture siting and development. We will focus on two main questions:

- Who do you usually engage in your aquaculture programming (e.g., individuals, organizations, industries, and more)?
- Who do you think is interested in the programming but hasn't been as effectively reached?

Breakout group discussion #5: Looking forward to future workshops

In this final breakout group discussion, we would like to take a minute to think about the workshop process as it continues. In other regions, we propose to conduct similar workshops that focus on regionally relevant tools. Some questions for reflection:

- What ideas do you have for a hands-on workshop that focuses on tools?
- What are your initial reflections on today's approach?

While you will have an opportunity to share specific reflections in the more formal evaluation, this is an opportunity to think about how tools are showcased, and how the breakout discussions on tools proceeded. Also, if you have experience working in the Gulf of Mexico, we would like to hear any thoughts on what types of tools or issues come to mind for that region.



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 you are being subjected to inappropriate conduct, believe someone else is being subjected to inappropriate conduct, or 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.



Pilot Workshop Tools and Resources

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

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

[View](#)

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

[View Product](#)

Planners

CarVis



Visualize seascape from various types of coastal development using your photographs and the CarVis library.
Aquaculture application: Use the aquaculture library to create visions by adding to your seascape aquaculture.
Instructional video: <https://goo.gl/3f8nu4>
Webinar: <https://goo.gl/3d0t0P>
Contributing Partners: NOAA OCH, NOAA NCCOS, USDA National Agroforestry Center

[View Product](#)



... Tools for Planning

Tool summary

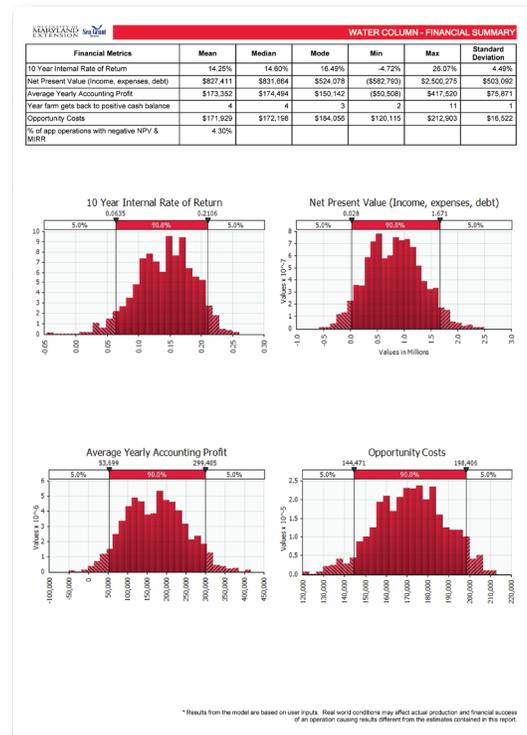
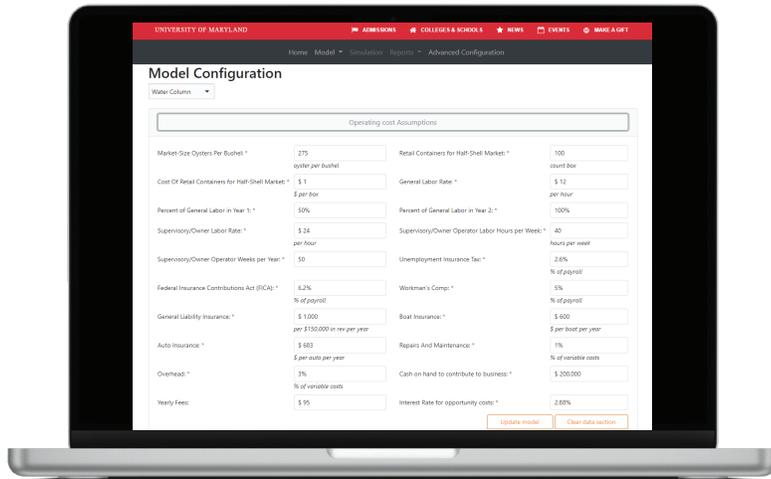
In an effort to obtain global food security, many countries, including the United States, are turning towards the expansion of marine aquaculture. This effort requires a need for support in the decision making and planning process for future site suitability and development of aquaculture infrastructure. 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.

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

For more information

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Maryland Shellfish Aquaculture Business Planning Tool



Tool summary

The Maryland Shellfish Aquaculture Business Tool is in the process of converting an existing Microsoft Excel based business planning tool, which uses Monte Carlo simulation to estimate a shellfish farm's likelihood of success into a web-based model. The development of a web-based model will increase the availability of the tool to Maryland stakeholders, as well as stakeholders in other regions of the United States. This tool will inform stakeholders of an estimated net present value of their operation over a 10 year period. It will also estimate the rate of return on the project. The model will be able to compare self-financed operations with the effects of debt financing on farm financial performance. These metrics will allow stakeholders to make informed financial decisions on starting a shellfish farming operation.

For more information

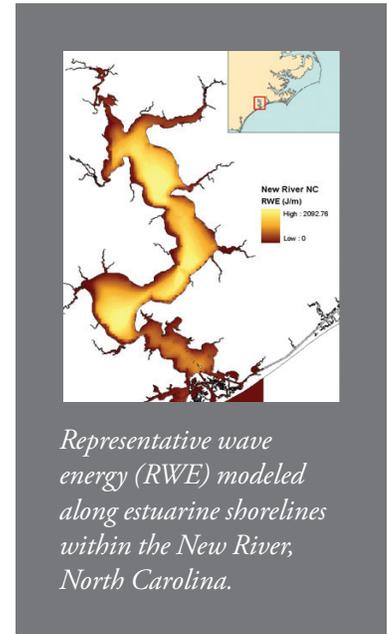
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Wave Exposure Modeling To Support Aquaculture Siting

Tool summary

Wave energy forecasting is an essential exercise to understand its impact on engineering and biological structures. A wind wave-forecasting model, Wave Exposure Model (WEMo), was designed specifically for shallow water areas in confined water bodies with minimum effects from open ocean swells. WEMo explicitly uses wave generation, shoaling and nonlinear dissipative processes as wave breaking and bottom friction to calculate wave energy. The model works in a Geographic Information System (GIS) format in association with ArcGIS. A newer version of WEMo will soon be released with added functionality of handling batch datasets and faster processing that could make it a suitable tool for aquaculture applications.

Wind wave energy is an essential component in siting new or expanding aquaculture facilities. Surface conditions such as waves and high currents during storms can add stress to aquaculture gear leading to structural failures and detrimental effects on production schedules and operational costs. WEMo could provide a wind wave energy regime for siting a potential aquaculture operation at various temporal and geographical scales. Output from WEMo along with other information will be a part of aquaculture siting tools provided by NOAA for shellfish or finfish aquaculture around the country. WEMo wave energy profiles will also give the aquaculture industry and engineers a means to calculate added stress due to waves on aquaculture structures, including nets, bags, lines, anchors, and other ground tackle.



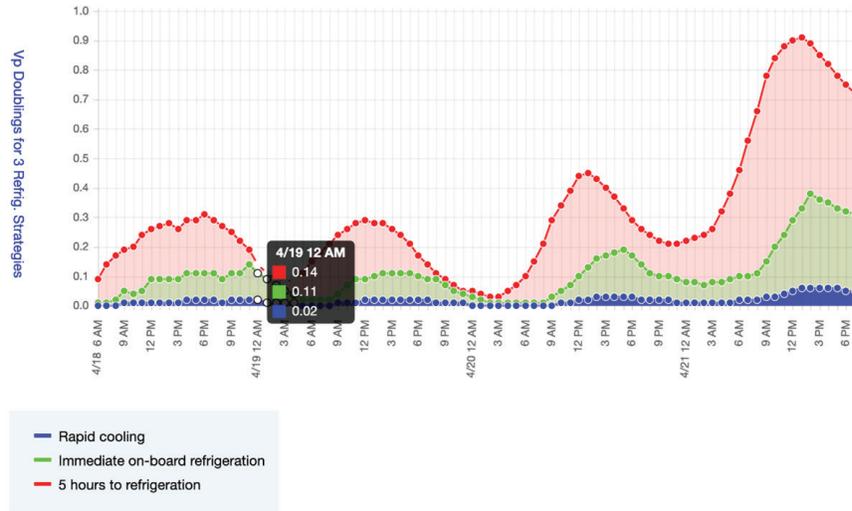
For more information

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Best Harvest Windows (Delaware) and *Vibrio* Harvest Calculator (Long Island)

Best Harvesting Windows

Rehoboth Bay, DE



Tool summary

These two similar tools available to growers, farmers, and managers allow users to see how much *Vibrio* growth they might encounter when harvesting oysters.

NCCOS produces several [Vibrio Predictive Models](#) that improve the safety of oysters by assisting coastal managers and shellfish growers in oyster harvest decision making nationwide. *Vibrio* are bacteria that occur naturally in our coastal waters, but certain species and strains can also be harmful to human health.

Vibrio parahaemolyticus (*Vp*) can cause infection commonly associated with the consumption of raw or undercooked seafood, and usually results in an intestinal infection that will resolve itself without treatment. *Vp* has one of the fastest growth rates of all estuarine bacteria, and the population can replace itself, or double, every hour at 90°C.

The Best Harvest Windows tool for [Delaware Bay](#) and [Delaware Inland Bays](#) show the doublings of *Vp* resulting from choosing a range of cooling scenarios at common growing locations when harvesting within the next 4 days.

The *Vibrio* Harvest Calculator for Long Island Sound is an evolution of the above tool and allows the user to predict *Vp* growth scenarios based on harvest location, date, and time—up to seven days in advance—in Long Island Sound.

<https://products.coastalscience.noaa.gov/vibrioforecast/>

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Appendix A: Project Personnel and Description

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

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Project Duration

December 1, 2021 – November 30, 2025

Project Summary

Recent efforts focus on identifying Aquaculture Opportunity Areas (AOAs) in U.S. waters as Congressional interest in improving aquaculture regulation increases. Whether inshore or offshore, sustainable aquaculture wades into crowded waters where multiple, complex layers of 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 many resources to aid decision making by coastal ocean stakeholders. Key to a science-based approach, these NCCOS tools and services often use marine spatial planning as a continually evolving method to analyze and address the challenges of ecosystem and human interactions in coastal ocean areas.

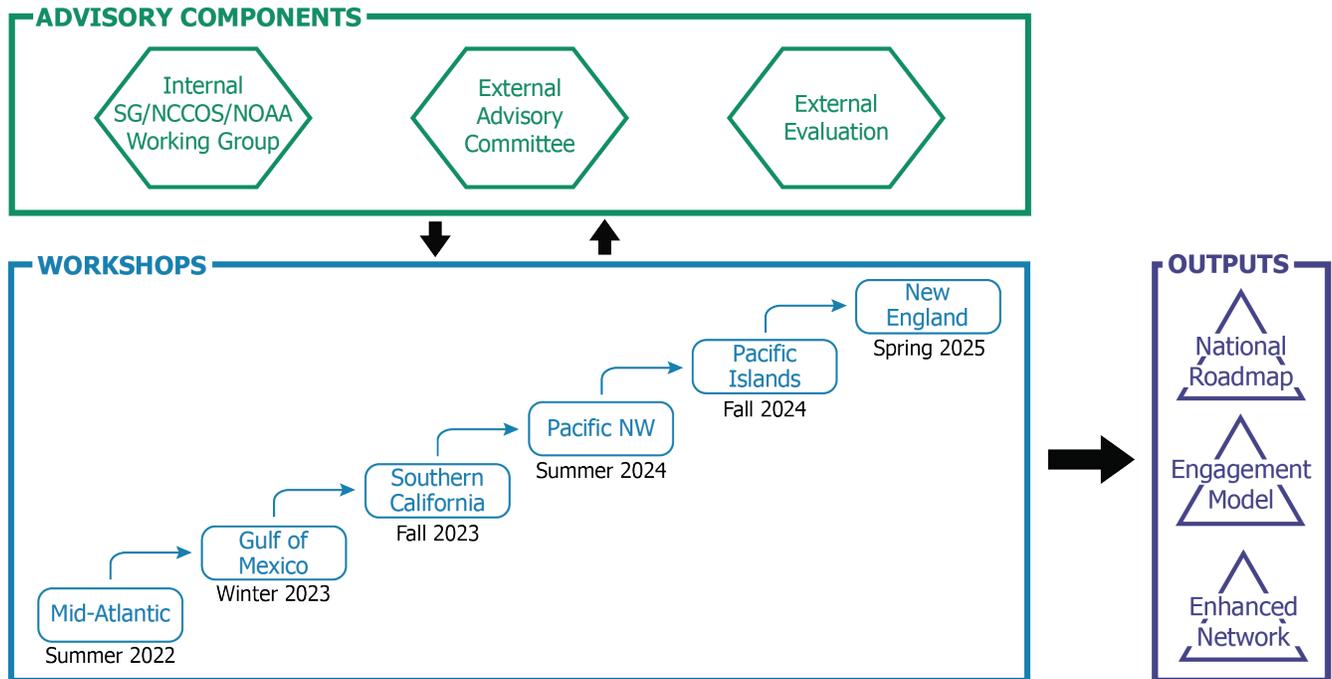
The goal of this project is to build the capacity of the Sea Grant Network to assist stakeholders in using and informing the coastal science products and resources developed by NCCOS CASS. We propose a comprehensive project that will build capacity and collaboration among Sea Grant (SG), NCCOS, and other coastal ocean stakeholders for environmentally, economically, and socially equitable aquaculture development. Central to this work is the creation of a National Aquaculture Extension Coordinator position (Coordinator) to oversee extension of NCCOS resources, inform broad SG/NCCOS marine spatial planning efforts, and facilitate a series of collaborative, regionally tailored workshops to advance aquaculture siting conversations. Workshops will take place in 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).

Project Objectives

1. Extend the reach of NCCOS aquaculture planning resources;
2. Improve Sea Grant–National Sea Grant Program–NCCOS–Stakeholder connections through regional workshops that co-create aquaculture siting and development roadmaps;
3. Inform broader Sea Grant/NCCOS marine spatial planning efforts.



Appendix B: Project Components



Graphic showing the advisory components and workshop process.



Appendix C: Workshop Participants

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