

2ND MAINE COASTAL CARBON ECOSYSTEMS SYMPOSIUM

Bigelow Laboratory for Ocean Sciences
East Boothbay Maine | October 21st, 2025

SYMPOSIUM REPORT



MAINE BLUE CARBON NETWORK



Dear colleagues and friends,

The **Maine Blue Carbon Network** was born out of a simple need: those of us working along this beautiful coastline and Maine’s marshes, eelgrass, and seaweed ecosystems needed a place to share emerging science, compare notes and help each other navigate an issue that was larger than any single organization. In 2020, following our collaboration on the Blue Carbon Optimization Strategy for the Maine Climate Council, scientists from Bates College, Bigelow Laboratories, The Nature Conservancy, the Maine Natural Areas Program, the Maine Department of Environmental Protection, Maine Coast Heritage Trust, the Island Institute, the Wells National Estuarine Research Reserve and the Maine Coastal Program formed the Maine Blue Carbon Network. We set out to provide a forum where researchers and coastal managers could exchange information, to be a technical forum for coastal carbon science and restoration methods, to advance research that better quantifies Maine’s blue-carbon resources, and to communicate our findings more broadly. For over a decade, it has been clear we need space to connect on these issues.

Since its inception, this community has grown rapidly. Our inaugural Blue Carbon Symposium in March 2023 was supported by the Maine Climate Science Information Exchange and took stock of the science and convened a shared understanding of the key uncertainties facing Maine and northern New England. The event built capacity and momentum and aligned our research agenda for a science-integrated path toward coastal management and climate action. We earned philanthropic funding to carry our initiatives forward, adding partners including Friends of Casco Bay, the Gulf of Maine Research Institute, legislative advisors, and partners from the Maine School of Law. In October 2025, we convened again for the second Coastal Carbon Ecosystems Symposium at the Bigelow Laboratory for Ocean Sciences. The goal was to think creatively and strategically about our long term land-use plans and the stewardship of remarkable but vulnerable coastal habitats.

Our enthusiasm is rooted in the potential of Maine’s coastal ecosystems. Although we use the term “Maine” to describe this geographical region, we acknowledge that this region was stewarded historically and presently by Wabanki Nations. We hope to strengthen our collaboration and partnerships with members of the Wabanaki to ensure that indigenous knowledge and experiences inform this work.

Salt marshes, eelgrass meadows, tidal flats, and kelp forests are critical “blue carbon” landscapes that store carbon, sustain fisheries, buffer shorelines from erosion and infrastructure damage and provide myriad ecosystem and community benefits. Coastal carbon is sequestered in these places, and understanding the magnitude and drivers of this sequestration has become a major scientific priority. Our state agencies and partners are working together to improve mapping and inventories so that these habitats are accurately reflected in Maine’s greenhouse-gas accounting. Through this work we are reminded daily that these ecosystems are not just numbers in a ledger; they are nursery grounds for numerous fish species, buffers against storm surge, and the foundation of Maine’s coastal heritage. Protecting them reinforces our commitment to protect biodiversity and supports the iconic species and working waterfronts that define our sense of place. While the work of this group has thus far focused on these nearshore ecosystems, there is also research in the region to understand more about the role of the “biological

pump” in marine waters – this includes understanding the role that plankton and marine foods webs serve in removing carbon from the atmosphere. In the coming years, we hope to integrate this work in the Maine Blue Carbon Network. Blue carbon has proven to be a powerful theme for policy innovation. Maine’s existing framework already integrates blue carbon into the state’s climate action plan and coastal management program, and requires mapping and greenhouse-gas accounting. Yet, our [white paper on Maine’s Blue Carbon Future](#) points out that our approach is still fragmented and identifies opportunities to consolidate strategies into a unified plan, expand monitoring and mapping to include additional ecosystems, set explicit habitat-restoration targets and address regulatory barriers. Other states are demonstrating how dedicated task forces, targeted restoration, financing mechanisms, and market-based strategies can accelerate conservation.

In our recent event series we invited speakers from other states—Massachusetts, Washington, California and Virginia—to share insights on their blue-carbon programs, specifically their restoration and market projects. Learning from these experiences has underscored the value of sustained collaboration and underscored the potential for advancing blue carbon projects in Maine. The Steering Committee is optimistic about adopting and adapting such policies to Maine. We see promise in advancing research to understand carbon dynamics, reducing barriers to restoration activities, improving analysis and documentation of the ecosystem services these environments provide, promoting management and policy that supports these ecosystems, and thoughtfully exploring the institutional and financial capacity needed to steward a hazard-informed and responsible balance between coastal protection and development.

As you read the report that follows, you will gain a deeper sense of the energy and direction of this work. The report summarizes the insights from our second symposium, including presentations that compared blue-carbon policies across the United States, breakout sessions that charted priorities for statewide planning, actionable research, policy and management reforms, and financing and quantification strategies. You will learn about the key strengths and weaknesses identified by participants and the concrete opportunities they see for Maine to lead. Throughout the report, we hope that you will feel the momentum created by this community; a momentum built not on rhetoric but on pragmatic collaboration and a shared love for our coast.

On behalf of the Steering Committee, thank you for being part of this journey. Our coastline is rugged and timeless, but it also demands the best of us. By embracing blue carbon as a unifying theme, we can link climate mitigation with biodiversity conservation, fisheries management and community resilience. We can honor the self-reliant spirit that makes Maine a beacon of leadership across the nation, and we can do so in a way that invites others to join. We are proud of what we have built together and even more excited about what lies ahead.

Sincerely,

The Maine Blue Carbon Network Steering Committee



The Maine Blue Carbon Network is a voluntary group of partners working to advance blue carbon work in Maine, facilitated by the Maine Coastal Program.

The Steering Committee includes:

- Beverly Johnson, Bates College
- Nichole Price, Bigelow Laboratory for Ocean Sciences
- Ivy Frignoca, Friends of Casco Bay
- Claire Enterline, Gulf of Maine Research Institute
- Susie Arnold, Island Institute
- Devin Domeyer, Maine Coastal Program
- Jeremy Gabrielson, Maine Coast Heritage Trust
- Parker Gassett, Maine Climate Science Information Exchange, University of Maine
- Angela Brewer, Maine Department of Environmental Protection
- Kristen Puryear, Maine Natural Areas Program
- Laurie Osher, Maine State Legislature
- Helena Tatgenhorst, The Nature Conservancy
- Chris Feurt, Wells National Estuarine Research Reserve

Special thanks to the Maine Coastal and Marine Climate Action Fund for granting the funds necessary to host the 2nd Coastal Carbon Ecosystems Symposium. All photo credits are listed on page 48 of this report.



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EXECUTIVE SUMMARY



The 2nd Coastal Carbon Ecosystems Symposium, convened by the Maine Blue Carbon Network (MBCN), welcomed leaders from science, policy, Tribal Nations, municipal government, nonprofits, and Maine’s working waterfront to advance a shared understanding of the state’s coastal carbon (blue carbon) opportunity. Building on pre-Symposium learning—including three [educational webinars](#) highlighting innovative blue carbon programs around the country and creating blue carbon fact sheets summarizing Maine’s tidal marshes, eelgrass meadows, seaweed, and tidal flats—participants arrived grounded in the ecological, economic, and climate significance of these ecosystems. The Symposium sought to connect coastal carbon science with policy, management, and the blue economy, while charting concrete pathways for action that inform Maine’s blue carbon future.

Morning presentations provided the scientific and policy context needed to anchor the day’s work. Speakers emphasized that Maine’s coastal ecosystems store carbon at rates rivaling or exceeding terrestrial forests, while also serving as important habitat for many commercial and recreational fish species, buffering storm impacts, and sustaining cultural identity. Presenters also underscored that despite these important values, major data gaps, mapping limitations, and fragmented policy frameworks limit Maine’s ability to integrate blue carbon into climate change planning and coastal management. A keynote address from Representative Victoria Doudera reinforced the relevance of this work to ongoing legislative efforts and climate policy implementation, urging participants to think boldly about engaging legislators and aligning science, community needs, and policy innovation.

A panel of coastal carbon experts then explored Maine’s emerging knowledge base on this topic and its limitations. Discussion highlighted uneven data availability across ecosystem types, the need for coordinated monitoring and synthesis, and the challenge of navigating scientific uncertainty while enabling timely action. Panelists pointed to significant opportunities—such as expanding coastal mapping programs, deepening partnership with Indigenous stewardship, investing in restoration, strengthening interagency coordination, and integrating blue carbon considerations into municipal and state regulatory frameworks. Throughout the session, the message was clear: Maine has the expertise and momentum necessary to lead, provided coordination and sustained investment continue and expand.

The afternoon transitioned from shared learning to collective problem-solving and mapping out Maine’s coastal carbon future. A presentation on the recently developed [Maine Blue Carbon Network \(MBCN\) white paper](#) compared Maine’s blue carbon policy to that of other states, and set the stage for discussion of whether and how Maine should advance policy and management to ensure these habitats can endure into the future. Small breakout groups focused on four priority areas identified by the white paper: **statewide and landscape-scale planning, actionable research, policy and management, and financing, crediting, and quantification**. Each group conducted a structured analysis followed by action planning. These collaborative efforts produced insights into Maine’s strengths—such as a strong stewardship ethic, robust research community, and existing

climate policy frameworks—as well as weaknesses including fragmented authorities, data inconsistencies, limited municipal capacity, and permitting challenges.

Across groups, several cross-cutting themes emerged. Participants repeatedly emphasized the need for centralized data coordination, clear communication tools, and greater integration of Indigenous Traditional Ecological Knowledge. Groups expressed strong interest in developing statewide and regional planning frameworks that incorporate blue carbon, strengthening municipal training and technical assistance, advancing restoration-friendly permitting and management frameworks, and creating funding mechanisms to support long-term monitoring and site-based projects. Some proposed paths forward include maintaining a coordinated blue carbon task force or steering committee, building a shared data and project hub, expanding public and community-science engagement, and identifying pathways to integrate blue carbon into [Maine Won't Wait](#) implementation.

The Symposium concluded with a shared sense of urgency and possibility. Participants recognized that Maine sits at an inflection point: its iconic coastal ecosystems face accelerating climate and development pressures, yet Maine also possesses an unusually strong network of researchers, managers, communities, and policymakers capable of collaborating and applying new and old techniques of conserving these vital places. This network also has an opportunity to strengthen our relationship with tribal communities to enhance our shared understanding and work. The collective efforts captured during the Symposium—combined with pre-event learning and the ongoing work of the MBCN—lay the groundwork for a coordinated statewide approach that can strengthen ecosystem resilience, support coastal economies, and ensure that coastal carbon ecosystems are allowed to thrive and contribute meaningfully to Maine's climate mitigation and adaptation goals.



PURPOSE AND FOCUS OF THE SYMPOSIUM



The 2nd Coastal Carbon Ecosystems Symposium began with a welcome from Seatone facilitator Rich Wilson, who emphasized the importance of the day. He oriented attendees to the daylong agenda and encouraged shared commitment to productive, forward-looking dialogue.

Mr. Wilson framed the Symposium's goals and structure, emphasizing its focus on assessing Maine's coastal carbon landscape, strengthening scientific and governance pathways, and charting new opportunities for environmental and community benefit. The morning began with presentations from scientific and policy leaders and a keynote address on Maine's coastal carbon opportunities. This was followed by a panel discussion with coastal carbon experts and a moderated Q&A session. The afternoon transitioned into topic-based breakout groups before the full group reconvened for report-backs and closing reflections on next steps ahead.



COASTAL BLUE CARBON: POSSIBILITIES AND PROMISE FOR MAINE



Session objective: Understand the coastal carbon opportunity in Maine and set the stage for collaborative engagement.

Dr. Parker Gassett, Assistant Director, Maine Climate Science Information Exchange, opened the morning presentations by grounding attendees in Maine’s long tradition of pragmatic, science-based coastal management. He reflected on how deeply the state’s identity, economy, and sense of place are tied to the coastline, and how the ecosystems under discussion at the Symposium—marshes, eelgrass meadows, tidal flats, and seaweed—are central to that identity. These coastal ecosystems, he emphasized, are Maine’s living infrastructure—vital for fisheries, water quality, storm protection, and carbon sequestration at a time when all of these services are becoming increasingly important. Dr. Gassett also acknowledged the MBCN and its partners who have spent years building the scientific and collaborative foundation for this work, tracing the MBCN’s roots to the [2020 Blue Carbon Optimization Strategy](#) and its integration into [Maine’s Climate Action Plan](#).

Devin Domeyer, Coastal Resiliency Specialist, Maine Coastal Program, followed with a concise primer on four key blue carbon ecosystems in Maine and their importance for both carbon sequestration and community resilience. Prior to the Symposium, the MBCN convened [blue carbon webinars](#) and distributed [blue carbon fact sheets](#) to all expected attendees. The fact sheets offer a concise overview of Maine’s major coastal carbon ecosystems—tidal marshes, eelgrass, seaweed, and tidal flats—summarizing their carbon storage value, ecological benefits, and key threats. Each highlights current research and restoration efforts in Maine and the Northeast and explains how these habitats contribute to climate mitigation and coastal resilience. The materials also outline practical actions for policymakers, municipalities, property owners, and the public, and introduce the MBCN as a collaborative effort advancing this work.

During her presentation Ms. Domeyer highlighted the exceptional carbon-storing capacity of coastal wetlands—up to five times greater per unit area than tropical rainforests—and walked attendees through the ecological roles and mounting pressures facing each habitat type. She underscored how coastal carbon storage remains significantly underestimated in Maine’s greenhouse gas accounting – for example, it currently does not include tidal mud flats – and pointed to substantial data gaps that constrain accurate valuation and management. She also emphasized important co-benefits of these habitats, from fish and wildlife habitat to storm buffering and water filtration. She encouraged attendees to understand their work as part of a larger, interconnected effort in which the MBCN is helping to link science, policy, and community needs.

Representative Victoria Doudera delivered the Symposium’s keynote address with a call for bold and innovative leadership. Speaking as Chair of the Maine Legislature’s Environment and Natural Resources Committee, and as a member of the Maine Climate

Council’s Science and Technical Subcommittee, she described the bipartisan origins of [Maine Won’t Wait](#), a plan built on the principle that climate action should deliver multiple benefits—economic, environmental, and social. She noted that coastal blue carbon already features in the state’s climate policy framework and argued that Maine now has an opportunity to connect emerging science with practical legislation. Drawing on multiple examples—from procurement reforms that reduce emissions and strengthen local supply chains, to housing and land-use decisions that should integrate blue carbon science—Representative Doudera illustrated how policy gains may come from both direct blue carbon bills and adjacent efforts that promote resilience and sustainable coastal development. Representative Doudera concluded her remarks by encouraging attendees to use the afternoon working sessions to surface policy innovations and make new connections.

Together, the opening presentations and keynote address established a shared narrative arc: Maine’s coastal carbon ecosystems are central to the state’s past, current, and future; the scientific and collaborative foundations are strong but there are significant questions still to be addressed; and the work ahead requires sustained partnership across science, policy, local knowledge, and community priorities. With the grounding provided by these opening presentations, participants entered the later morning and afternoon sessions prepared to explore what it would take to secure Maine’s blue carbon future.



UNLOCKING OPPORTUNITY: A CONVERSATION WITH COASTAL CARBON LEADERS



Session objective: Understand carbon potential in key ecosystems including tidal marsh, eelgrass, mudflat, and seaweed. Explore ways to scale Maine’s coastal carbon potential, drawing from both local insight and external innovation.

A panel discussion brought together coastal carbon experts—Dr. Beverly Johnson (Bates College), Dr. Nichole Price (Bigelow Laboratory for Ocean Sciences), Dr. Hannah Baranes (Gulf of Maine Research Institute), Claire Enterline (Gulf of Maine Research Institute), and Dr. Janelle Goeke (Casco Bay Estuary Partnership)—for a facilitated dialogue about Maine’s blue carbon potential. The session aimed to illuminate the carbon dynamics of tidal marshes, eelgrass, mudflats, and seaweed, while exploring pathways to scale Maine’s efforts through local insight and emerging innovation. Panelists opened by describing their work across these ecosystems and emphasized the advances that have been made in understanding carbon stocks and sequestration regionally (Colarusso et al., 2024; Duarte et al., 2025) and the inclusion of blue carbon as a sink in the [Maine Department of Environmental Protection Greenhouse Gas Inventory](#). Although Maine has a growing base of scientific information, there is a need to continue advancing this research through enhanced collaboration and information sharing across institutions.



A recurring theme was the unevenness of data across ecosystem types. Salt marshes are relatively well studied at the surface, but major uncertainties exist regarding deeper carbon stores, vulnerability to sea-level rise, and the fate of carbon once exported from the system. Eelgrass meadows are declining statewide, yet critical drivers of this decline remain poorly understood, in part due to substantial mapping gaps. Mudflats were described as the least understood system, with open questions about carbon origin, accumulation, and the influence of coastal change. Seaweed systems, particularly farmed sugar kelp, show strong potential but lack comprehensive biomass or distribution data. Panelists repeatedly pointed to the need for expanded mapping, more consistent monitoring, and greater synthesis of existing datasets.

Discussion also underscored the interconnectedness of coastal carbon ecosystems and the broader environmental forces shaping them. Habitat fragmentation, ocean warming, increasing storm events, nutrient inputs, and shifting sediment dynamics all affect carbon storage in ways that are still being quantified and understood. New monitoring tools—such as environmental DNA (eDNA) analysis, high-resolution satellite imagery, and drone surveys—may help fill key knowledge gaps, but panelists stressed that local knowledge, traditional ecological insight, and field-based work remain essential.

Looking ahead, the panel highlighted several opportunities for statewide progress. These included improving mapping programs for each of these habitats, expanding restoration and tidal flow restoration efforts, developing cooperative approaches to responsible carbon market participation, and integrating blue carbon science into local planning and coastal development. With federal funding uncertain, panelists emphasized the importance of continued state support for monitoring programs and coordination among agencies, non-governmental organizations (NGOs), colleges and universities, and community partners. Additionally, the panelists noted that recent funding support through foundations has spurred new research and restoration advances, with hopes that this support will continue in the future. The discussion closed with a shared sense that Maine has the expertise, momentum, and collaborative foundation needed to advance blue carbon innovation—provided that investment, coordination, and engagement remain sustained.



CHARTING A PATH FORWARD ON COASTAL CARBON IN MAINE

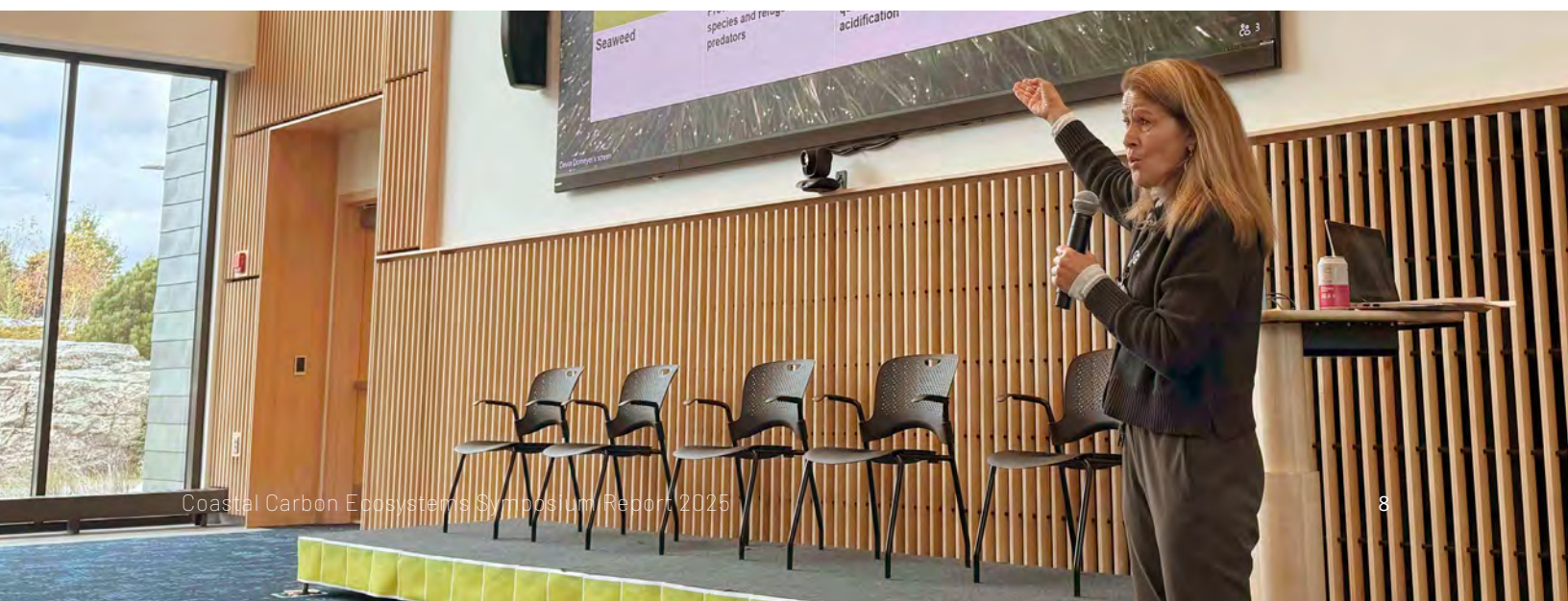


Session objective:

- Review lessons from the MBCN white paper “Maine’s Blue Carbon Future” and set the stage for afternoon working sessions
- Facilitate breakout discussions to identify opportunities, barriers, and next steps for strategic coastal carbon action in Maine in four priority areas:
 - Statewide and Landscape Scale Planning
 - Actionable Research
 - Policy and Management
 - Financing, Crediting and Quantification

Overview of Maine Blue Carbon Network White Paper

Ivy Frignoca, Casco Baykeeper with Friends of Casco Bay and a member of the MBCN Steering Committee, opened the afternoon by summarizing the white paper written in advance of the Symposium. She described how the MBCN Steering Committee—formed in early 2021—started work in 2024 to assess Maine’s progress on blue carbon policy and compare it to approaches in other states. Ivy explained the national and state definitions of blue carbon, noting that Maine’s statute currently focuses on carbon removed by coastal estuarine/marine vegetation but does not explicitly include carbon fluxes in coastal marine waters (while the 2023 Maine Carbon Report includes an estimate for coastal waters, it is based on national carbon cycling estimates through hydrologic processes, and does not include the potential sequestration by marine organisms). She highlighted the ecological and economic importance of coastal carbon ecosystems, reviewed Maine’s carbon budget requirements, and emphasized that existing carbon sink estimates are highly conservative due to limited seaweed biomass data and other gaps. Her presentation framed key policy, management, and funding “buckets” for improvement, and encouraged attendees to build on these ideas in the breakout sessions.



Collaborative Breakout Group Work

Participants moved into topic-focused breakout groups designed to surface practical strategies for Maine's blue carbon future. Four optional topics were offered, each corresponding to a core dimension of the white paper's recommendations.

- Statewide and landscape-scale planning
- Actionable research
- Policy and management
- Financing, crediting and quantification

Each breakout topic had a two-part structure: an analysis of strengths, weaknesses, opportunities and threats (SWOT) of the topic under consideration, followed by an action planning brainstorm of key next steps.

Groups began with a short silent-generation of ideas exercise using four primary questions specific to each topic. These questions explored key elements of the SWOT across Maine's coastal carbon landscape—from planning frameworks and research capacity to management practices, permitting challenges, and emerging financing pathways. Facilitated group discussion followed the silent work of each individual to address the prompting questions.

After a break, groups reconvened for action planning. Facilitative leads briefly summarized the SWOT discussions for any new participants, invited additional reflections, and then guided the groups to identify practical next steps, potential partnerships, and areas where policy, research, or financing tools could accelerate progress. To close the session, all participants returned to the main room, where a representative from each breakout group offered a brief verbal summary of their discussion.

The summary information below reflects the combined contributions from small breakout groups who conducted SWOT analyses and follow-on action planning during the afternoon session. Notes have been collated and organized for clarity, with emphasis retained on recurring or widely supported points. At times, language is kept in the conversational style in which it emerged. Given the nature of idea generation on multiple topics, some repetition of text both within and across topics is expected. Symposium attendees may find this report and additional information about blue carbon on the [MBCN website](#).



Statewide and Landscape-Scale Planning

Participants in the **Statewide and Landscape-Scale Planning** breakout generally agreed that Maine possesses strong policy frameworks, active coalitions, and a deeply rooted culture of stewardship that provide a solid platform for coastal carbon planning. Yet they also discussed that statewide coordination is hindered by data fragmentation, limited integration across agencies, uneven municipal capacity, and gaps in knowledge to advance carbon accounting. Opportunities focused on embedding blue carbon within existing planning tools, expanding regional collaboration, linking land-sea data systems, and developing a statewide landscape blueprint that incorporates coastal carbon priorities. A persistent theme was the need for improved coordination, communication, and data integration to move from isolated efforts toward a cohesive statewide strategy.

Actionable Research

The **Actionable Research** breakout groups emphasized that Maine benefits from a strong collaborative research community, numerous monitoring programs, and growing statewide interest in coastal carbon science. Yet participants consistently noted major data gaps, fragmented monitoring efforts, and limited integration across habitats and institutions, all which constrain decision-making and long-term planning. The group discussed opportunities such as creating a statewide inventory of monitoring efforts, improving data coordination, expanding interdisciplinary and community-engaged research, and aligning blue carbon science with policy needs. A recurring theme was the need for a centralized data hub and sustained funding to support long-term monitoring, communication, and collaboration.



Policy and Management

The **Policy and Management** breakout participants noted that Maine already has a strong foundation of regulatory frameworks, community stewardship, and interagency collaboration that indirectly support blue carbon ecosystems. However, fragmented authority, complex permitting processes, inconsistent municipal capacity, and limited integration of carbon considerations into existing policies remain significant obstacles. Opportunities include developing statewide marine spatial planning, streamlining restoration permitting, strengthening Tribal and community partnerships, and expanding municipal training and technical assistance. Across the discussion, participants emphasized the importance of aligning coastal management with regenerative, ecosystem-based approaches while ensuring meaningful inclusion of Tribal voices and local communities.

Financing, Crediting and Quantification

Participants in the **Financing, Crediting and Quantification** breakout described a landscape of emerging blue carbon financing opportunities—ranging from philanthropic investments and federal programs to evolving carbon market standards—while acknowledging that current quantification and verification challenges limit Maine’s ability to participate fully. Major barriers include high monitoring costs, methodological inconsistencies, limited financial returns, and skepticism or misunderstanding across scientific, financial, and community sectors. The discussion highlighted opportunities to build financing literacy, develop cross-sector partnerships, streamline permitting for restoration, and create centralized tools to help practitioners navigate funding pathways. A central theme was that blue carbon finance must complement, not replace, ecological stewardship, and must be grounded in transparent, scientifically credible approaches.



BRINGING IT ALL TOGETHER: BREAKOUT GROUP HIGHLIGHTS



As the breakout sessions concluded, participants reconvened in the main room for a facilitated report-back to the full group, with one representative from each topic summarizing key insights from their small group.

The **Statewide & Landscape-Scale Planning** report emphasized Maine’s well-established networks, cross-sector partnerships, and strong policy foundations. At the same time, participants noted the need to more clearly map existing policy frameworks, link them to blue carbon priorities, and strengthen programs such as *Maine Won’t Wait*. The conversation stressed that statewide planning depends on adequately funding data work, improving coordination among agencies and NGOs, and building on existing regional collaborations to ensure that coastal carbon priorities are embedded within broader landscape planning structures.

For **Actionable Research**, representatives highlighted Maine’s collaborative scientific strengths alongside persistent gaps in data integration, long-term monitoring, and representation of Indigenous and community voices. Across groups, participants emphasized the need for a centralized research hub, stronger cross-ecosystem collaboration, and dedicated funding for data collection, mapping, and student and community engagement. Communication and outreach emerged as a cross-cutting priority, including creative approaches to reach broader audiences and clearer links between research and *Maine’s Climate Action Plan*.

In the **Policy & Management** groups, speakers highlighted that Maine already has many strong programs, but most do not explicitly reference blue carbon, and permitting systems often hinder rather than help restoration. Participants emphasized the need to “reinflate existing tires” by strengthening and aligning current programs, while also reducing regulatory barriers that slow beneficial restoration work. Ideas included creating new revenue mechanisms to support coastal ecosystems, developing regional meeting frameworks tied to mapping efforts, and establishing a blue carbon task force modeled after innovative programs in other states. The need to meet people where they are—through relationship-building, accessible communication tools, and direct engagement with Tribal Nations and local communities—was repeatedly underscored.

The **Financing, Crediting & Quantification** group emphasized that blue carbon funding opportunities exist but require clearer organization, better communication, and an understanding of how different carbon pathways connect to different capital sources (e.g., sequestration vs. storage). Breakout participants noted the importance of distinguishing among philanthropic funding, public programs, and private investment, as well as the opportunity to catalog these mechanisms in a shared database. They also stressed the importance of storytelling—both to build public trust and to counter harms created when companies apply low-integrity accounting—while recognizing that misunderstandings around carbon finance remain a major barrier.

SYMPOSIUM CLOSING



To close out the 2nd Coastal Carbon Ecosystems Symposium, Dr. Nichole Price, Senior Research Scientist and Director of the Center for Seafood Solutions at the Bigelow Laboratory for Ocean Sciences, reflected on common threads she observed while visiting each small breakout group. She stressed the common theme of a need for centralized information access, clearer interagency coordination, and improved public awareness of blue carbon's value. She noted the opportunity for the MBCN to collaborate with others to enhance online resources, such as a simple mapping interface, improved access to funding information, and better visibility for success stories—and recommended continuing the webinar series to learn from other states. Dr. Price described the opportunity for harnessing the strengths of young communicators, exploring parallels with land-based carbon programs, and reconvening this community of Symposium attendees more frequently to sustain momentum. She closed by urging participants to stay inspired, continue building a shared body of knowledge, and carry forward insights and relationships formed during the Symposium.



APPENDIX A: ACRONYMS AND ABBREVIATIONS



AI	Artificial Intelligence
CRRC	Climate Resilience Regional Challenge
DEP	Maine Department of Environmental Protection
DMR	Maine Department of Marine Resources
DOT	Maine Department of Transportation
eDNA	Environmental DNA
GMRI	Gulf of Maine Research Institute
LMF	Land for Maine's Future
MBCN	Maine Blue Carbon Network
MNRCP	Maine Natural Resource Conservation Program
NEMO	Nonpoint Education for Municipal Officials
NGO	Non-governmental organization
NOAA	National Oceanic and Atmospheric Administration
NRPA	Maine Natural Resources Protection Act
RGGI	Regional Greenhouse Gas Initiative
SWOT	Analysis of Strengths, Weaknesses, Opportunities, and Threats
TEK	Traditional Ecological Knowledge
USM	University of Southern Maine
VERRA VCS	VERRA Voluntary Carbon Standard

APPENDIX B:

BREAKOUT SESSION NOTES



Below are the full notes from breakout sessions at the Coastal Carbon Ecosystems Symposium. These do not reflect the opinion of the Maine Blue Carbon Network but rather are a distillation of stakeholder input from a wide array of partners.

Statewide and Landscape Scale Planning

Step 1: SWOT Analysis

STRENGTHS

Primary prompting question: What existing policy/regulatory frameworks, coalitions, or planning efforts in Maine support the sustainable use, management, and restoration of coastal carbon ecosystems?

- **Comprehensive Policy Frameworks**
 - Maine Won't Wait serves as the overarching statewide climate action plan linking land, water, and fisheries policy. Repeatedly cited as Maine's strongest unifying framework.
 - The Maine Natural Resources Protection Act (NRPA), State Wildlife Action Plan, and Comprehensive Municipal Land-Use Plans together provide mechanisms that directly and indirectly support blue carbon ecosystems.
 - Maine Tidal Marsh Restoration Network, Maine Coastal Program, Maine Nearshore Marine Resources Program, and the marsh migration Sentinel Sites Program under the Maine Natural Areas Program provide coordinated approaches to long-term coastal and marsh management.
 - Salt Marsh Restoration Teams (SMARTeams), Maine Coast Heritage Trust, and Ducks Unlimited are leading projects at multiple scales.
 - Land for Maine's Future (LMF) program influences funding and land acquisition priorities aligned with conservation and potential blue carbon co-benefits.
- **Existing Coalitions and Training Programs**
 - Beginning with Habitat, CoastWise, and the Maine Department of Environmental Protection (DEP) OUR SHORE programs are successful statewide tools for technical assistance, sharing skills, building capacity, and linking planning with conservation.
 - Numerous regional and local conservation networks like land trusts, parks, and wildlife refuges contribute to a strong statewide stewardship ethic.
- **Cross-Sector and Social Networks**
 - Maine's "small town" interconnectedness is a strong asset. Collaboration across agencies, NGOs, and universities allows for rapid communication and adaptation.
 - Island Institute and similar organizations serve as convening hubs for marine industries and local governments.

Secondary prompting question: What environmental, policy, or societal advantages does Maine have?

- **Cultural and Social Foundations**

- Maine communities demonstrate a deep sense of place, strong stewardship, and active volunteerism
- Maine's long coastline (at least 5,400 miles) and economic dependence on marine resources foster broad support for sustainable management.
- There is strong integration between ocean health and economic identity including fishing, aquaculture, and tourism.

- **Institutional and Funding Strengths**

- Both the Community Resilience Partnership at the Maine Office for Community Assistance and the NOAA Climate Resilience Regional Challenge (CRRC) grant of \$69 million provided unprecedented capacity for coordinated climate action.
- Strong agency collaboration and stakeholder engagement through Maine Sea Grant, Maine Department of Environmental Protection, Maine Coastal Program, Maine Geological Survey, and the Maine Department of Marine Resources (DMR).

- **Track Record and Reputation**

- Maine is recognized regionally for effective resource management and stakeholder collaboration. Its networks are tightly knit but nimble.
- Existing mapping and monitoring tools offer a solid technical foundation, though underutilized by some municipalities.



WEAKNESSES

Primary prompting question: Where do planning gaps, disconnects, or inefficiencies exist in Maine as it relates to how work on coastal carbon is currently progressing?

- **Quantification and Carbon Accounting Gaps**
 - Data gaps that hinder the accuracy of quantifying blue carbon within the state's carbon budget.
 - Maine's carbon budget currently minimizes the contribution of coastal ecosystems relative to forests, creating a perception problem that undervalues marine systems.
 - Lack of national or state standards for blue carbon accounting and uncertainty about spatial boundaries further limit inclusion in budgets (e.g., intertidal vs. offshore).
- **Governmental Siloes**
 - Legislative committees and agencies operate in sectoral silos, with limited cross-committee coordination on climate and carbon policy.
 - Absence of integrative or cross-agency decision-making slows cohesive statewide planning.
- **Regional Variation**
 - Vast differences between southern and Downeast Maine (e.g., capacity, population density, land use, and ecosystem types) complicate uniform policy approaches.
 - Localized management leads to uneven implementation and resource capacity.
- **Institutional and Capacity Constraints**
 - Aging workforce, limited technical staff, and heavy reliance on volunteers at the municipal level.
 - Municipal staff shortage and “planning fatigue” is often seen in smaller towns.
 - Insufficient tracking of “who is doing what.” There is no central data coordination or repository.
- **Communication and Public Understanding**
 - Lack of public awareness about the value of ecosystem services.
 - Difficulty conveying climate or carbon topics in a bipartisan, accessible way.
 - “Fear of change” and low social acceptance in some regions limit political traction.

Secondary prompting question: What tools, data, or capacity are lacking?

- **Data Integration and Use**
 - Abundance of tools and datasets in southern and Midcoast Maine, but poor dissemination and training for local users.
 - Need for a centralized data coordination taskforce to compile and standardize information.
 - Missing inter-state coordination and data sharing across the northeast region.
- **Monitoring and Verification**
 - No systematic Monitoring, Reporting, Verification system for blue carbon comparable to forest inventories.
 - Lack of redundancy in data sets. Monitoring and data collection are often dependent on single programs or individuals.

OPPORTUNITIES

Primary prompting question: Where could blue carbon be integrated into existing land-use or coastal zone planning processes?

- **Integration with or Expansion of Existing Programs**

- The Beginning with Habitat (BWH) program could expand to include data layers for more blue carbon ecosystems (BWH currently includes wetlands and marshes).
- Maine Coastal Program and Coastal States Organization networks provide access to regional expertise for data coordination and policy harmonization.
- National Estuarine Research Reserves could enhance their role in carbon accounting and research.
- Maine Forest Service's carbon advisory model could be adapted for municipalities or coastal regions.
- DOT and DEP partnerships present opportunities to align infrastructure planning with ecosystem restoration (e.g., culverts, tidal crossings, fish passage).
- Expand CoastWise and municipal public works trainings to integrate coastal carbon literacy and restoration best practices.
- Build on current DEP OUR SHORE nature-based strategies program for coastal hazard reduction and shoreline stabilization.
- Expand collaboration with the Gulf of Maine Council and Northeast Regional Ocean Council on living shorelines and data sharing.
- Cross-state partnerships can help Maine access new funding and adopt shared spatial planning tools.

- **Economic and Regulatory Innovation**

- Opportunity to embed carbon incentives within existing regulatory frameworks (e.g., DEP's permitting for wetlands, DMR's fisheries plans).
- Consider certification schemes, similar to sustainable seafood labels, to incentivize carbon-friendly aquaculture practices.
- Align Land for Maine's Future (LMF) and state grant priorities with blue carbon objectives.

Secondary prompting question: What new partnerships or cross-sector efforts could be developed?

- **Community and Working Waterfront Partnerships**

- Collaborate with fisheries, aquaculture, and harbor masters as data collectors and advocates.
- Encourage synergy rather than competition among resource users.

- **Cross-Sector Learning**

- Connect forest carbon and blue carbon practitioners to share carbon accounting methods and conservation financing approaches.
- Universities, NGOs, and municipalities could jointly pilot regional planning templates.

- **Multi-Municipal Collaborations**

- Strengthen community resilience partnerships at the regional scale.
- Develop an inter-agency contact dashboard for improved coordination.

THREATS

Primary prompting question: What environmental, political, or economic trends could undermine coastal carbon planning?

- **Climate and Environmental Pressures**

- Increasing storm intensity, saltwater intrusion, and sea-level rise are outpacing planning.
- Declining offshore kelp populations, invasive species (e.g., green crabs), and habitat loss.

- **Political and Social Challenges**

- Federal political shifts and polarization over climate policy.
- Resistance to retreat or relocation in high-risk coastal areas—sometimes viewed as loss of culture or identity.
- Short-term economic priorities overshadowing long-term resilience planning.

- **Economic and Demographic Changes**

- Hedge funds and out-of-state buyers acquiring marinas, coastal land, and forests potentially reduce local control and stewardship alignment.
- Changing demographics and new property owners potentially less connected to Maine's coastal ethic.
- Tax structure dependence on high-value coastal property deters managed retreat.
- Insufficient cost-benefit analysis for habitat restoration and resilience investments.
- Reactive spending patterns (“crisis response” rather than prevention).

Secondary prompting question: What conflicts might hinder statewide coordination?

- While no explicit conflicts were listed, participants noted tensions among user groups such as harvesters, landowners, and developers, and potential policy jurisdiction overlaps between state, municipal, and federal entities.



Step 2: Action Planning

PRIORITY ACTIONS IN THE NEXT 6–12 MONTHS

Prompting question: What are the top 1–3 priority actions we can take in the next 6–12 months to build momentum on statewide and landscape-scale planning in Maine (i.e., innovative policies, partnerships, projects)?

- **Strengthen Interagency Coordination**
 - Continue and expand cross-agency collaboration among DEP, DMR, NOAA and the Maine Department of Transportation (DOT).
 - Consider funding a dedicated state coordination position or task force.
 - Develop a network map of programs and data efforts to clarify roles (i.e., who does what).
- **Advance Public Education and Training**
 - Highlight pilot projects and share outcomes through training, webinars, and case studies.
 - Expand municipal training about how to support blue carbon ecosystems, especially in places where the connection may be unclear like from Coastwise, OUR SHORE and Nonpoint Education for Municipal Officials (NEMO).
- **Develop a Landscape Conservation Blueprint**
 - Create a statewide or regional Landscape Conservation Blueprint that incorporates blue carbon priorities alongside land conservation and development planning.



LESSONS FROM OTHER STATES

Prompting question: What policies, resources or innovative programs can we draw on from other states, and how do these link to the priority actions we identified?

- **Virginia**
 - Eelgrass Blue Carbon Project as a model for habitat-based carbon crediting.
 - Wetlands Watch as a training model for nature-based solutions at local levels.
- **Massachusetts**
 - Herring River Project for large-scale tidal restoration integrating carbon benefits.
- **Washington and Hawaii**
 - Marine spatial planning initiatives as examples for integrating coastal and offshore uses.
- **West Coast Port-to-Port Networks**
 - Peer-to-peer learning models for transportation sector sustainability programs and resilience building.
- **Regional Greenhouse Gas Initiative (RGGI)**
 - Potential funding mechanism for coastal carbon projects.

RESOURCES NEEDED TO ADVANCE THE WORK IN MAINE

Prompting question: What resources are essential to support statewide and landscape-scale planning, and how can we begin or continue securing them (e.g., funding, data, partnerships, communication tools)?

- Dedicated funding for interagency coordination and municipal training.
- Comprehensive, accessible statewide data hub and map of projects and programs.
- Communication tools for science translation and community engagement.
- Partnerships with philanthropic and academic institutions to sustain long-term monitoring.



KEY ACTORS AND ROLES

Prompting question: Who are the key actors (or missing actors) that need to be involved for Maine to achieve success, and what role will they play?

- **Educators and Communicators** to translate data for decision-makers and the public. Suggest engaging filmmakers, storytellers, and communicators.
- **Technical and Planning Experts** such as ecologists, planners, data scientists, and recent graduates.
- **Local Government Staff** such as code enforcement officers, municipal climate committees, and public works departments.
- **Academic and NGO Partners** like Maine Sea Grant, research labs, and conservation nonprofits.
- **Foundations** to support pilot projects, data integration, and outreach.
- **Contractors and Practitioners** as on-the-ground implementers.

POTENTIAL MEASURES OF SUCCESS

Prompting question: How will we measure success?

- Creation and use of a Landscape Conservation Blueprint including blue carbon priorities.
- Measurable increase in interagency collaboration and data sharing.
- Evidence of public and municipal engagement (e.g., attendance at events, training participation, awareness).
- Integration of blue carbon metrics into *Maine Won't Wait* implementation and future carbon budgets.
- Documented progress toward improved statewide coastal carbon inventory.



Actionable Research

Step 1: SWOT Analysis

STRENGTHS

Prompting question: What existing or emerging local research, institutions, or ongoing programs or projects already address key questions?

- **Active and Collaborative Research Community**
 - Maine has a robust network of universities, agencies, NGOs, and scientists already engaged in blue carbon–related research.
 - Collaboration, rather than siloed work, was noted as a major strength and emphasized by all groups.
 - The MBCN, Tidal Marsh Restoration Network, and Maine Seagrass Consortium are recognized as interdisciplinary conveners driving both research and applied science.
- **Existing Monitoring and Mapping Programs**
 - Regionally distributed data collection and analysis via the Maine eDNA project and Friends of Casco Bay monitoring.
 - Ocean acidification monitoring via DMR, DEP, Maine Ocean Climate Collaborative, and community surveys.
 - Ongoing eelgrass and marine vegetation mapping, with emerging use of artificial intelligence (AI).
 - Long-term mudflat, rockweed, and green crab monitoring.
 - Geomorphology and sediment sampling (e.g., core samples from Beverly Johnson’s laboratory at Bates College).
 - Wells National Estuarine Research Reserve collaborations and Schoodic Institute–Manomet–Gulf of Maine Research Institute (GMRI) mudflat carbon monitoring projects.
- **Other Types of Programs or Partnerships**
 - Inclusion of Indigenous knowledge systems across projects and in Maine’s colleges and universities.
 - The Maine Climate Council links research to policy priorities.
 - Partnerships with working waterfront industries help communicate economic relevance to legislators.
- **Additional Noted Strengths**
 - Maine has strong expertise in mapping, AI, and coastal data collection tools.
 - Growing enthusiasm and productive dialogue statewide around blue carbon science.
 - Maine’s state agencies and public demonstrate strong environmental commitment, with communities eager to learn and volunteer.
 - “Human infrastructure”–scientists, students, local governments, land trusts, volunteers, etc.–also noted as a major asset.

WEAKNESSES

Prompting question: What critical knowledge or monitoring gaps limit decision-making, funding and advancement of research?

- **Data Gaps and Fragmentation**
 - Data often exist but are difficult to locate or integrate
 - Several groups called for a centralized data clearinghouse.
 - Groups repeatedly mentioned limited long-term monitoring and lack of baseline data.
 - Mapping is “piecewise” and not yet integrated across habitats or ecosystems.
 - Uneven monitoring effort across ecosystems—for example, salt marshes and eelgrass are relatively well-studied, seaweed and mudflats less so.
- **Funding Constraints**
 - Limited funding for staff and long-term monitoring. Reliance on short (3-5 year) grant cycles hinders continuity.
- **Conceptual and Terminological Uncertainty**
 - Lack of consistent definitions for “blue carbon,” “seaweed,” and “habitat types.”
 - Difficulty communicating technical terms and uncertainties to the public and policymakers.
 - Question raised: should seaweed be considered a blue carbon “habitat”?
- **Cross-Habitat and Connectivity Gaps**
 - Limited understanding of benthic–pelagic coupling and ecosystem linkages.
 - Need for multi-habitat approaches.
- **Industry Instability**
 - Economic drivers affect industry engagement, such as fluctuations in kelp farming.
- **Science Translation and Public Understanding**
 - Gaps in communication among researchers, policymakers, and the public.
 - General public may not grasp the relevance of blue carbon.
 - A need for accessible communication and education to bridge technical and community knowledge.
 - Scientists were noted as not always the best communicators to nontechnical audiences.
- **Limited Diversity of Voices**
 - Desire for greater inclusion of Indigenous communities, harvesters, artists, historians, social scientists, and other local knowledge holders in blue carbon research and outreach.
- **Inadequate Integration with Restoration Projects**
 - Blue carbon is often treated as an afterthought in restoration design and monitoring.
- **Funding Landscape Unclear**
 - Confusion exists about available funding programs and barriers to access, particularly for long-term or cross-sector research.

- **Risk of Overemphasizing Carbon**

- Several groups warned that pursuing “perfect” carbon accounting may delay broader ecosystem protection.

OPPORTUNITIES

Prompting question: What are the most pressing questions that, if answered, could accelerate coastal carbon research in Maine?

- **Enhanced Funding and Incentives**

- Create or expand the *Maine Coastal and Marine Climate Fund* to sustain monitoring and new projects.
- Encourage private philanthropy and corporate funding.
- Offer financial incentives for protecting blue carbon habitats.

- **Education and Communication**

- Increase public awareness of blue carbon, including its economic and ecological value.
- Collaborate with artists and educators to communicate science through creative media.
- Tie blue carbon to tourism, job creation, and coastal identity.

- **Interdisciplinary Collaboration**

- Combine science with social science, industry, and biotechnology.
- Engage Indigenous communities and incorporate traditional ecological knowledge (TEK).
- Frame research as part of the blue economy to access new funding avenues.

- **Research Priorities and Innovative Technologies**

- Identify and prioritize restoration sites based on stressor management and habitat viability.
- Study carbon fluxes, ecosystem resilience, and cross-habitat interactions (e.g., eelgrass–oyster benefits).
- Distinguish between restoration and enhancement goals, ensuring ethical, evidence-based approaches.
- Expand eDNA, qPCR (Quantitative Real-time Polymerase Chain Reaction)/Loop-mediated Isothermal Amplification (LAMP) testing and AI-supported mapping—this work could fill gaps efficiently.
- Increase research on connectivity between systems, such as marsh–eelgrass–seaweed systems, to inform restoration and carbon models.

- **Policy Alignment**

- Develop measurable goals. For example, habitat protection targets by specific dates.
- Integrate blue carbon metrics into state conservation, fisheries, and shoreline management policies.
- Use the Maine Natural Resource Conservation Program (MNRCP), as well as mitigation banking programs, to guide where funds should flow. Align restoration site selection with carbon and ecosystem co-benefits.

- **Community Engagement and Community Science**

- Use participatory approaches to include fishing communities, youth, and rural voices.
- Build connections between research and local economies.
- Engage lobstermen, coastal residents, and students in monitoring (e.g., marsh gas sensors, eDNA citizen science). Utilize inclusive terms like “community scientists.”
- Incorporate blue carbon content into existing outreach programs, such as Maine Sea Grant, Island Institute, and NEMO municipal training.
- Promote understanding of “blue carbon jobs” and pathways into this field.

- **National Linkages**

- Build connections with other state and national networks. Examples include: Restore America’s Estuaries, Northeast Regional Ocean Council, National Estuary Program.



THREATS

Prompting question: What risks are associated with policy and actions that do not consider research findings?

- **Uncertainty and Overconfidence**
 - Acting prematurely without full understanding risks ineffective or harmful interventions. Conversely, waiting for perfect information risks inaction and ecosystem collapse.
 - This tension underscores the importance of employing adaptive management approaches.
 - Concerns about entities overselling sequestration potential or prioritizing profit over ecological accuracy.
- **Policy and Legislative Risks**
 - Narrow definitions or wording in legislation and calls for funding may inadvertently exclude blue carbon activities.
 - Insufficient legal authority to ensure protection of coastal habitats.
- **Fragmented Collaboration and Funding**
 - Without coordination, work may become fragmented or data lost, producing limited inference from small, disconnected studies.
 - Competition for limited funding may stifle collaboration, and underfunding could slow progress.
- **Ethical and Social Risks**
 - Monetizing ecosystem services such as through offsets may lead to inequities or “greenwashing.”
 - Assigning dollar values to ecosystems may not be appropriate or effective.
 - Data are sometimes “weaponized” or misapplied in policy or industry contexts.
 - If policies fail to reflect observed conditions, the public may lose faith in science.
- **Political Climate**
 - A growing perception that environmental work is politically contentious may be considered a serious threat.
- **Cultural Challenge**
 - The invisibility of carbon dioxide and the abstract nature of carbon accounting make communication difficult.
 - Need to retain optimism and public support despite challenges.

Step 2: Action Planning

PRIORITY ACTIONS IN THE NEXT 6–12 MONTHS

Prompting question: What are the top 1–3 priority actions we can take in the next 6–12 months to build momentum on actionable research in Maine (i.e., innovative policies, partnerships, projects)?

- **Conduct a Comprehensive Inventory**
 - Develop a full statewide inventory of blue carbon habitats and ongoing projects (i.e., “state assets”), integrating mapping and research data.
- **Create a Centralized Data Hub**
 - Develop a shared platform to connect researchers, agencies, and the public.
 - Rank and track opportunities and research gaps.
- **Strengthen Collaboration and Communication**
 - Maintain momentum through regular convenings and outreach.
 - Engage policymakers early and often with clear, actionable recommendations.
 - Broaden participation to include Indigenous communities and fishing communities, social scientists, and creatives.
 - Partner with media (e.g., Maine Monitor, Maine Public) and educational programs to make findings accessible.
- **Establish Funding and Coordination Mechanisms**
 - Secure funding for research staff and centralized data systems.
 - Designate a point person or entity to prioritize research and facilitate data sharing.
 - Develop standardized monitoring protocols and harmonized sampling efforts.
- **Explore Innovative Funding Mechanisms**
 - Consider creative models (e.g., coastal development fees, “blue carbon license plate,” or public–private partnerships).
 - Learn from models in other states, such as Alaska, Washington, Virginia, Massachusetts.
- **Form a Maine Blue Carbon Task Force or Commission**
 - Establish measurable statewide goals and oversight for restoration and monitoring efforts.
 - Ensure representation from diverse sectors and provide sustained funding support.
- **Align Research with Restoration Plans**
 - Identify upcoming restoration projects and embed monitoring or research components.

LESSONS FROM OTHER STATES

Prompting question: What policies, resources or innovative programs can we draw on from other states, and how do these link to the priority actions we identified?

- **Dedicated Fees for Conservation and Research**
 - Examples include park maintenance/research fees and program-specific surcharges like vessel registration.

- Link to priority actions from above question: fund a *Maine Coastal and Marine Climate Fund* to sustain long-term monitoring, staffing, and a centralized data hub.
- **Inclusion of Indigenous Perspectives as a Norm**
 - Other states promote the inclusion of Tribal/Indigenous knowledge on research teams and projects as common practice, not by mandate
 - Link to priority actions from above question: Embed compensated Indigenous participation in task force charters and grant criteria.
- **Permitting Pathways that Enable Restoration**
 - Alaska and Washington have seaweed industry sector experience and streamlined processes.
 - Virginia and Massachusetts have supported marsh restoration with state funding and clear permit guidance.
 - Link to priority actions from above question: develop alternative or expedited permitting for low-conflict areas and publish a Maine restoration projects map/hub.
- **Goal-Setting Frameworks**
 - States use specific, measurable targets (e.g., California’s 30x30 Initiative; habitat restoration acres by year; carbon neutrality timelines).
 - Link to priority actions from above question: the proposed *Maine Blue Carbon Task Force* should set numeric targets and track progress in the centralized data hub.
- **Living Shorelines Policy**
 - Several states prioritize nature-based strategies for shoreline management, like Washington.
 - Link to priority actions from above question: coordinate with Maine DEP to reinforce living shorelines as the default where feasible and integrate blue-carbon metrics into decision frameworks.
- **Project Siting to Minimize Conflict**
 - Some states convert degraded or low-use areas into restored spaces, reducing user conflicts and maximizing ecological return with ‘halo effects’ to adjacent areas.
 - Link to priority actions from above question: incorporate conflict-screening and benefit-spillover criteria in site selection tools.
- **Commission/Study Models**
 - Analogues like an ocean acidification commission provide structure, authority, and continuity.
 - Link to priority actions from question above: establish a Maine Blue Carbon Commission with authority to manage a fund, coordinate agencies, and issue annual progress reports.
- **Centralized Hubs and Project Registers**
 - Massachusetts hosts mapped restoration portfolios and status tracking.
 - Link to priority actions from question above: build Maine’s centralized data and project hub to harmonize standard operating procedures, share data, and rank opportunities.

- **Communications and Education Partnerships**

- Some states have programs that pair science with artists, educators, and tourism boards to connect coastal identity and jobs with habitat restoration.
- Link to priority actions from question above: fund communications mini-grants tied to research milestones and community outreach.

KEY ACTORS AND ROLES

Prompting question: Who are the key actors (or missing actors) that need to be involved for Maine to achieve success, and what role will they play?

- State and Federal agencies, notably Maine DMR and DEP, Maine Office of Community Affairs, NOAA, and federal research funders.
- State and federal policymakers, including legislators.
- Indigenous nations and knowledge holders.
- Fishers, aquaculturists, and working waterfront representatives.
- Municipal and regional planning leaders.
- Research scientists, land trusts, NGOs, economists, and educators.
- Artists, historians, and social scientists can aid communication and engagement.
- Youth and seasonal community members.
- Media and education partners.
- Compensation for participation, particularly for underrepresented groups, was emphasized as essential.

POTENTIAL MEASURES OF SUCCESS

Prompting question: How will we measure success?

- Establishment and achievement of clear, time-bound goals (1-year, 5-year benchmarks).
- Increased coordination, communication, and trust across sectors.
- Expanded datasets and reduced uncertainty.
- Visible integration of blue carbon into public dialogue and state policy. For example, “blue carbon economy” becomes common language.
- Development of a comprehensive action plan that aligns research with management and community needs.



Policy and Management

Step 1: SWOT Analysis

STRENGTHS

Primary prompting question: What policies or management practices already support sustainable coastal carbon use, management, or restoration?

- **Existing Local and State Regulatory Frameworks**
 - Maine NRPA protects wetlands, sand dunes, and waterbodies.
 - Maine DEP and DMR enforce permitting that indirectly supports blue carbon habitats.
 - Shoreland Zoning and CoastWise tidal road crossing principles help reduce coastal impacts and guide resilient siting of infrastructure.
 - Working Waterfront Tax Credit supports economic resilience and helps maintain traditional maritime uses.
 - Stream Smart and CoastWise Programs support crossing design and tidal habitat restoration.
 - Community Resilience Partnership enables municipal access to resilience funding.
- **Municipal and Regional Governance**
 - Town-level shellfish ordinances and committees give local control, fostering stewardship and, in some regions, inter-town collaboration (e.g., Bristol and South Bristol joint management).
 - Several towns conduct their own shellfish surveys and manage harvesting limits and reseedling.
 - Regional committees offer a scalable model for shared coastal management.
- **Tribal and Community Leadership**
 - Tribal resolutions and resource councils emphasize regenerative, community-based management rooted in TEK.
 - Tribal and community engagement groups foster reciprocal relationships with natural resources.
- **State Agency Collaboration**
 - Active collaboration among DEP, DMR, and municipal officials to manage wastewater, aquaculture, and habitat protection (e.g., nitrogen discharge limits in southern Maine).
 - DEP and DMR staff cited strong working relationships with municipalities and wastewater facilities.
- **Integration Across Sectors**
 - Examples of cooperative management in aquaculture include spacing rules and co-location of species (e.g., Bangs Island Mussels).
 - Eelgrass, kelp, and shellfish restoration efforts are increasingly viewed through both ecological and carbon-benefit lenses.

Secondary prompting question: What enabling legal or institutional frameworks exist in Maine?

- **Public Trust Doctrine** establishes shared use of the intertidal but creates uncertainty over ownership and access.
- **Home Rule Authority** allows local ordinances tailored to coastal management needs.
- **The Natural Resources Protection Act** regulates wetlands, waterbodies, and sand dunes.
- **The Coastal Zone Management Act** provides federal–state coordination.
- **Land Trusts** and **Conservation Frameworks** such as Kennebec Estuary Land Trust and Natural Resources Council of Maine operate as key intermediaries between communities and state agencies.

WEAKNESSES

Primary prompting question: What regulatory, permitting, or management challenges limit effective stewardship of coastal carbon resources?

- **Permitting Complexity and Delays**
 - Restoration projects often face the same regulatory hurdles as development projects, despite differing environmental impacts.
 - The Maine NRPA does not distinguish between beneficial restoration and development fill, slowing implementation of thin layer placement restoration on marshes.
 - Tribal and municipal projects often experience lengthy, duplicative permitting pathways.
- **Intertidal Ownership and Access**
 - Fragmented property rights and unclear ownership impede restoration, monitoring, and research.
 - Some ordinances and access rules exclude Tribal harvesters from traditional territories.
- **Fragmented Authority and Inconsistent Regulations**
 - Coastal management varies by town, creating a “patchwork” of policies.
 - Inconsistent enforcement and variable municipal resources widen disparities between wealthy and less-resourced towns.
 - Limited State staff capacity to monitor, coordinate, or enforce at scale.
- **Narrow Policy Focus**
 - Current frameworks emphasize fisheries and aquaculture rather than habitat protection or carbon sequestration.
 - Lack of a comprehensive marine spatial plan means limited coordination across agencies or between land–sea interfaces.
- **Data and Knowledge Gaps**
 - Poor integration of coastal mapping, monitoring, and impact quantification.
 - Lack of cumulative impact analysis across small projects (decisions remain site-by-site).
 - Limited technical expertise and communication between scientists, planners, and regulators.

Secondary prompting question: Are there unclear or conflicting mandates as it relates to policies or management of coastal carbon resources?

- Conflicts among municipal, state, and Tribal jurisdiction.
- Ongoing ambiguity surrounding intertidal ownership and public access.
- Fragmented and sometimes conflicting mandates among DEP, DMR, and municipal authorities, particularly for eelgrass, kelp, and mudflat management.

OPPORTUNITIES

Primary prompting question: What new or updated policies could enable benefits and foster sustainable use and management?

- **Marine Spatial and Ocean Management Planning**
 - Potential to establish a statewide marine spatial planning framework that integrates aquaculture, fisheries, and restoration within a holistic blue carbon context.
 - Active efforts underway in Harpswell and through new DMR working groups such as....
- **Integrated and Regenerative Management**
 - Opportunity to shift from restorative to regenerative management that pairs resource use with ecosystem recovery.
 - Tribal models of sustainable harvesting (e.g., reseeded shellfish, youth involvement, all-female aquaculture cooperatives) are instructive.
- **Policy Updates and Incentives**
 - Suggested tax incentives or credits for shoreline protection and salt marsh migration zones.
 - Align NRPA, DEP, and DMR rules to explicitly consider carbon benefits.
 - Review and streamline restoration-related regulations.
 - Develop simplified permitting tracks for experimental and low-impact restoration projects.
- **Capacity and Technical Support**
 - Municipalities could receive technical assistance from state agencies or NGOs for resilience planning and carbon accounting.
 - Proposed creation of a statewide consortium or “coastal council” for small bays and estuaries to build shared vocabulary and training resources.

Secondary prompting question: How could existing resource management programs incorporate coastal carbon goals?

- Enhance NRPA monitoring protocols to include carbon-relevant parameters (e.g., rockweed, green crab, infaunal communities).
- Expand data programs for long-term coastal monitoring.
- Integrate carbon quantification into coastal permitting reviews and environmental impact assessments.
- Broaden data-sharing between agencies and networks. Establish a common platform for coastal resource data.

THREATS

Primary prompting question: What political roadblocks, societal resistance, or other challenges stall needed policy changes?

- **Funding Limitations**
 - DMR and DEP collectively have a small percent of the state budget. (Common challenge cited in groups.)
 - Municipalities lack revenue tools (e.g., no local option sales tax). Restoration depends on property taxes or external grants.
 - Coastal development pressures, especially in southern Maine, outpace monitoring and permitting capacity.
- **Political and Social Resistance**
 - Regional differences in values and awareness create uneven support for coastal conservation.
 - Public misunderstanding of ecosystem service value and “blind spot” toward blue carbon benefits.
 - Fear of increased regulation among traditional resource users.
- **Tribal Sovereignty and Trust**
 - Land Claims Act limits Tribal jurisdiction. Difficulties fitting traditional knowledge into Western permitting frameworks.
 - Distrust stemming from historical tokenism. Tribal representation too often perceived as “checklist engagement” rather than partnership.
 - Need for respectful co-management frameworks and data sovereignty.
- **Cumulative Impacts and Regulatory Lag**
 - Permitting and sanitation cycles lag behind the pace of development and environmental change.
 - Cumulative coastal impacts not assessed collectively, leading to policy blind spots.

Secondary prompting question: What legal risks or ambiguities in state law inhibit blue carbon activities?

- Public Trust Doctrine: persistent uncertainty in intertidal rights and overlapping jurisdictions.
- Lack of clear legal pathways for Tribal or community-led restoration.
- Need for modernized statutory definitions to encompass blue carbon habitats.



Step 2: Action Planning

PRIORITY ACTIONS IN THE NEXT 6–12 MONTHS

Prompting question: What are the top 1–3 priority actions we can take in the next 6–12 months to build momentum on policy and management issues in Maine (i.e., innovative policies, partnerships, projects)?

- **Build a Grassroots-to-Statewide Network**
 - Emphasis on local conversations feeding into regional coordination: “building from the bottom up.”
 - Regional mapping discussions should coincide with community forums for tailored input.
- **Advance Public Engagement and Awareness**
 - Develop a community-based symposium series modeled on the Fishermen’s Forum, bringing scientists, harvesters, and residents together.
 - Create media partnerships and storytelling initiatives (e.g., local newspapers, documentaries, “Did You Know?” campaigns).
 - Focus on experiential and oral learning modes.
 - Connect blue carbon to familiar livelihoods like clamming, fishing, and boating.
- **Reduce Regulatory Barriers**
 - Establish a navigational “how-to” guide for restoration and permitting.
 - Convene interagency workgroups (e.g., DEP, DMR, Army Corps) to identify rules needing amendment.
 - Create a pilot “Blue Carbon Seed Fund” to support small restoration projects and research.

LESSONS FROM OTHER STATES

Prompting question: What policies, resources or innovative programs can we draw on from other states, and how do these link to the priority actions we identified?

- Marine spatial planning programs from Massachusetts Department of Ecological Restoration and Hawaii Blue Carbon Task Force.
- Ecosystem-based management and cumulative impact assessment approaches used in New England and Mid-Atlantic states.
- Regional collaboration to align planning and funding examples from Massachusetts and New Hampshire through the Northeast Regional Ocean Council.
- Co-Beneficiary and TEK integration combine western and traditional knowledge frameworks for shared stewardship.
- Some states allocate dedicated restoration budgets.

RESOURCES NEEDED TO ADVANCE THE WORK IN MAINE

Prompting question: What resources are essential to support policy and management work, and how can we begin or continue securing them (e.g., funding, data, partnerships, communication tools)?

- **Funding and Staffing:** Expanded budget for DEP/DMR, technical staff, and municipal planners.
- **Data Infrastructure:** Shared digital platform for mapping, monitoring, and reporting.
- **Communications Tools:** Storytelling assets, visual aids, and public education materials.
- **Partnership Networks:** Regional consortia or technical assistance “teams” connecting towns, NGOs, and state agencies.

KEY ACTORS AND ROLES

Prompting question: Who are the key actors (or missing actors) that need to be involved for Maine to achieve success, and what role will they play?

- **Tribal Nations:** Co-managers and knowledge holders. Ensure inclusion in all policy and planning frameworks.
- **Municipalities and Local Leaders:** Primary implementers of ordinances, permitting, and restoration projects.
- **State Agencies** (DEP, DMR, DOT): Facilitate policy alignment and funding, staff interagency workgroups.
- **Industry and Associations:** Harbor Masters, fishermen’s unions, aquaculture operators, and developers to align practices with blue carbon goals.
- **Legislators and Policy Makers:** Essential to champion reforms and funding allocations.
- **Private Sector Partners:** Realtors, contractors, and engineers play practical roles in implementing coastal policy.
- **Public and Education Partners:** Schools, youth programs, and local media critical for awareness and long-term culture change.

POTENTIAL MEASURES OF SUCCESS

Prompting question: How will we measure success?

- Demonstrated increase in coordination among municipalities, tribes, and agencies.
- Streamlined permitting and improved restoration throughput.
- Public awareness measured through participation, surveys, and educational programming.
- Creation of a statewide blue carbon data and policy hub.
- Visible integration of blue carbon principles in state and municipal policy.



Financing, Crediting and Quantification

Step 1: SWOT Analysis

STRENGTHS

Prompting question: What existing funding sources or emerging crediting programs or projects are underway or available?

- **Blue Carbon Financing and Crediting Sources**
 - Venture capital investments in carbon storage businesses (e.g., Running Tide).
 - Impact investing and philanthropy through program-related investments from 501(c)(3) endowments, community development financial institutions, and foundations.
 - Blue bonds as thematic debt instruments linked to conservation outcomes (e.g., The Bahamas, New York Climate Week, Colby College initiative).
 - Federal programs under the United States Department of Agriculture, Small Business Administration loan guarantees, Environmental Protection Agency/Department of Energy programs for electrification, and the Natural Resources Conservation Service Environmental Quality Services Program for water quality and habitat projects.
 - Integrating programs within corporations that offset emissions internally (e.g., Organic Valley's anaerobic digesters).
 - State programs such as Land for Maine's Future and MNRCP's in-lieu fee restoration funding.
- **Emerging Markets and Standards**
 - High-integrity voluntary carbon market frameworks for their role in setting methodologies for marine systems, such as the VERRA Voluntary Carbon Standard (VERRA VCS), Gold Standard, Frontier Fund.
 - Maine's active scientific institutions and policy integration provide a strong foundation for future blue carbon finance initiatives.
- **Cross-Sector Collaboration**
 - Interdisciplinary expertise across science, finance, and philanthropy.
 - Strong coordination among Maine's universities, agencies, and conservation groups such as the Bigelow Laboratory for Ocean Sciences, Maine Department of Inland Fisheries and Wildlife, and GMRI)
- **Public and Legislative Interest**
 - Alignment with broader Maine climate goals, with potential to leverage federal NOAA and the Governor's Office of Ocean Policy Innovation and the Future, funding for blue carbon-related conservation and restoration.

WEAKNESSES

Prompting question: What makes quantifying or verifying carbon from these systems challenging in Maine (e.g., eelgrass, saltmarsh, mudflat, seaweed)?

- **Quantification and Verification Challenges**
 - Difficulties quantifying fluxes, storage, and transport of carbon in dynamic coastal ecosystems.

- o Small, fragmented saltmarsh parcels make feasibility studies costly relative to carbon yield.
- o Sampling frequency and representativeness remain major hurdles.
- o Monitoring, reporting, and verification can cost \$10,000–\$20,000 per metric ton, deterring participation.
- o Climate-driven disturbances threaten long-term carbon storage commitments (e.g., hurricanes, fires, erosion).
- **Economic and Market Barriers**
 - o Few revenue-generating mechanisms. Most blue carbon projects lack clear financial returns, limiting private investment.
 - o Investors cannot assess or price projects without standardized climate-risk accounting.
 - o Insurance products are limited for aquaculture and coastal assets.
- **Methodological Fragmentation**
 - o Each carbon registry, such as VERRA VCS, Gold Standard, Frontier, applies different methods, complicating overlapping ecosystems (e.g., kelp/ mudflat systems).
 - o Lack of a standardized methodology for Maine’s habitats hinders comparability.
- **Capacity and Expertise Gaps**
 - o Need more technical experts on carbon flux measurement and financial modeling.
 - o Limited awareness among scientists of investor needs and among financiers of ecological constraints.
- **Cultural and Communication Gaps**
 - o Distrust between scientists and investors.
 - o Need clearer translation between scientific outcomes and investment metrics.

OPPORTUNITIES

Prompting question: What innovative financing mechanisms exist and where could they be deployed?

- **Innovative Financing Mechanisms**
 - o Expansion of blue bond models to fund marine restoration or infrastructure.
 - o Cooperative or blended finance combining grants, loans, and private equity.
 - o Web-based financing portal to centralize Maine blue carbon funding opportunities.
 - o Climate finance “office hours” at GMRI and the University of Southern Maine (USM) to connect researchers and project developers with financial experts.
- **Integration with Existing Programs**
 - o Potential to align blue carbon activities with NRCS EQIP, and other land–sea funding mechanisms.
 - o Use of in-lieu fee mitigation programs for blue carbon restoration (e.g., MNRCP).
 - o Reforesting kelp forests and other habitat projects can deliver co-benefits to fisheries and climate goals.
- **Research and Market Development**
 - o Incorporate sustainable development goals into project evaluation. This is already valued by international investors.

- o *UN Ocean Breakthroughs* initiative could unlock new international blue carbon finance pathways if Maine signs on.
- **Knowledge Translation and Accessibility**
 - o Develop communications channels for informal knowledge sharing (e.g., a Maine Blue Carbon Financing WhatsApp group).
 - o Use the MBCN website as a hub for financial resources and project data.
- **Cross-Sector Partnerships**
 - o Bring together scientists, social scientists, policy makers, funders, and community members to co-design projects.
 - o Pair investors and researchers early to align data collection with market requirements.

THREATS

Prompting question: What market, verification, trust or other issues could undermine financing efforts?

- **Market and Trust Risks**
 - o Public failures or scandals could erode confidence (e.g., Running Tide).
 - o Greenwashing and lack of transparency undermine credibility of carbon markets.
 - o Overestimation of sequestration potential could destabilize financial markets.
- **Ethical and Social Concerns**
 - o Privatization of public waters for carbon projects may limit traditional uses such as fishing and recreation.
 - o Double counting across supply chains or overlapping habitats (e.g., farmed kelp versus processed products).
 - o Equity and access concerns for Tribes and small coastal communities.
- **Regulatory and Policy Barriers**
 - o Misalignment between scientific opportunity and permitting locations as the best research sites may not be permissible.
 - o Lack of standardized approval frameworks for marine carbon storage technologies.
- **Systemic Risk**
 - o Insufficient risk modeling makes investors reluctant to fund unquantified projects.
 - o “Patient capital” models are rare; fast-return expectations from venture capital investors can pressure projects toward premature scaling.

Step 2: Action Planning

PRIORITY ACTIONS IN THE NEXT 6–12 MONTHS

Prompting question: What are the top 1–3 priority actions we can take in the next 6–12 months to build momentum on financing, crediting and quantification issues in Maine (i.e., innovative policies, partnerships, projects)?

- **Establish a Centralized Finance Resource Hub**
 - Create a shared database or web portal listing funding programs, grants, and carbon market tools (www.maine.gov/moca/funding).
 - Build on existing consortia and integrate with the MBCN website (e.g., Marsh Network, Seagrass Consortium).
- **Strengthen Cross-Sector Communication and Partnerships**
 - Expand GMRI/USM Climate Finance Office Hours and promote them broadly.
 - Develop informal networking tools to share funding and event updates (e.g., WhatsApp group).
 - Encourage collaboration between scientific and financial communities to bridge language and goals.
- **Advance Restoration and Permitting Readiness**
 - Identify opportunities to simplify permitting for coastal restoration projects.
 - Explore new funding linkages between NRCS, NOAA, and state-level blue carbon initiatives.
- **Promote Awareness and Technical Assistance**
 - Develop storytelling and communications strategies to highlight successful Maine-based projects.
 - Provide capacity-building and grant-writing support for practitioners.

LESSONS FROM OTHER STATES

Prompting question: What policies, resources or innovative programs can we draw on from other states, and how do these link to the priority actions we identified?

- **Regional Greenhouse Gas Initiative:** Modeled on New Jersey’s use of RGGI funds for conservation. Potential to allocate Maine proceeds toward blue carbon restoration.
- **Washington’s Cap-and-Invest Program:** Caps emissions and channels revenue to nature-based solutions. Could serve as a model for state-level blue carbon finance.
- **Massachusetts Executive Order on Biodiversity and the “Mass Ready Act”:** Sets ecosystem health targets for 2030–2050. Demonstrates how policy mandates can guide blue carbon investment.
- **United Nations Ocean Breakthroughs:** Offers template policies for marine conservation financing. Maine could sign on to access international partnerships and funding.
- **Blue Bond Initiatives:** Used in The Bahamas and New York, these instruments attract capital with lower risk profiles.
- **Lessons from Other States:** States with task forces or commissions illustrate the benefits of formal blue carbon governance (e.g., California, Massachusetts). Maine could consider a Blue Carbon Commission to coordinate across sectors.

RESOURCES NEEDED TO ADVANCE THE WORK IN MAINE

Prompting question: What resources are essential to support financing, crediting and quantification work, and how can we begin or continue securing them (e.g., funding, data, partnerships, communication tools)?

- **Strategic Communication**
 - Public storytelling and media engagement are essential to build support and investor confidence (e.g., Maine Monitor, Maine Public).
 - Highlight visible success stories such as marsh or culvert restorations.
- **Blended and Flexible Funding**
 - Blue carbon finance should complement, not replace, existing restoration funds.
 - Because viable carbon-credit projects require large acreage (~1,000 acres), blue carbon should be treated as a co-funding mechanism rather than a standalone driver.
- **Data and Science Integration**
 - Funders and practitioners need accessible, quantifiable data on wetland and carbon outcomes.
 - Research should directly inform where and how projects are prioritized.
- **Holistic Approach**
 - Integrate blue carbon into broader ecosystem and community frameworks, and recognize connections between carbon, biodiversity, and local livelihoods.
- **Program and Capacity Support**
 - Agencies and nonprofits need staff and technical assistance to navigate funding sources, coordinate across sectors, and build community capacity to implement blue carbon projects.

KEY ACTORS AND ROLES

Prompting question: Who are the key actors (or missing actors) that need to be involved for Maine to achieve success, and what role will they play?

- **Tribal Governments and Indigenous Representatives:** Essential to include, as many Tribes have lost access to coastal areas and lack blue carbon-specific environmental programs.
- **Scientists, Economists, and Financial Experts:** Must work jointly to translate ecological data into investor-grade metrics.
- **Industry and Aquaculture Leaders:** Can model local success stories, integrating sustainability into operations.
- **Community Representatives:** Fishermen, landowners, and youth must have meaningful participation to ensure buy-in.
- **Media and Storytellers:** Outlets like Maine Monitor and Maine Public can elevate blue carbon narratives and counter misinformation.

POTENTIAL MEASURES OF SUCCESS

Prompting question: How will we measure success?

- Clear metrics defined by project and stakeholder group (e.g., economic return, habitat restored, community participation).
- Creation and use of a Maine Blue Carbon funding database or portal.
- Demonstrated increase in partnerships and collaborative projects.
- Visible public communication of blue carbon benefits through stories and not just data and related information.
- Integration of blue carbon into state climate finance and restoration frameworks.
- Greater trust and coordination between science, finance, and community sectors.



APPENDIX C: SYMPOSIUM AGENDA



COASTAL CARBON ECOSYSTEMS SYMPOSIUM

**BIGELOW
LABORATORY
FOR OCEAN
SCIENCES**

**EAST
BOOTHBAY,
MAINE**

**October 21, 2025
8:00AM – 5:00PM**

REGISTER HERE

Join leaders from across Maine and beyond to learn about the state of coastal carbon in Maine, recommend strategies to strengthen these ecosystems, and identify new pathways to leverage coastal carbon to the greatest benefit for communities and the environment.

SYMPOSIUM AGENDA

Connecting coastal carbon science with policy, management and the blue economy

Time	Topic
8:00	Registration, Coffee/Snacks, Meet-and-Greet
9:00	Welcome, Purpose of the Symposium, and Agenda Review <i>Session objective:</i> Understand the coastal carbon opportunity in Maine and set the stage for collaborative engagement Dr. Parker Gassett , Marine Specialist, Maine Climate Science Information Exchange Devin Domeyer , Coastal Resiliency Specialist, Maine Coastal Program
9:25	Keynote: Coastal Blue Carbon – Possibilities and Promise for Maine Representative Victoria Doudera , Chair of the Environment and Natural Resources Committee, Maine House of Representatives
9:45	Unlocking Opportunity – A Conversation with Coastal Carbon Leaders <i>Session objective:</i> Understand carbon potential in key ecosystems including tidal marsh, eelgrass, mud flat, and macroalgae. Explore ways to scale Maine's coastal carbon potential, drawing from both local insight and external innovation. Dr. Beverly Johnson , Professor of Earth and Climate Sciences, Bates College Dr. Nichole Price , Senior Research Scientist, Bigelow Laboratory for Ocean Sciences Dr. Hannah Baranes , Coastal Scientist, Gulf of Maine Research Institute Claire Enterline , Program Manager, Gulf of Maine Research Institute Dr. Janelle Goeke , Staff Scientist, Casco Bay Estuary Partnership Moderator: Rich Wilson, Executive Director, Seatone Consulting
10:30	Break
10:50	Moderated Q&A with Coastal Carbon Leaders
11:45	Wrap Up: Connecting Opportunity to Action
12:00	Lunch
1:00	Maine's Blue Carbon Future <i>Session objective:</i> Review lessons from the MBCN white paper "Maine's Blue Carbon Future" and set the stage for afternoon working sessions. Ivy Frignoca , Casco Baykeeper, Friends of Casco Bay
1:15	Charting the Path Forward on Coastal Carbon in Maine <i>Session objective:</i> Facilitate breakout discussions to identify opportunities, barriers, and next steps for strategic coastal carbon action in Maine in four priority areas: • Statewide and landscape scale planning • Actionable research • Policy and management • Financing, crediting, and quantification
2:45	Break

COASTAL CARBON ECOSYSTEMS SYMPOSIUM

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8:00AM - 5:00PM**

REGISTER HERE

**3:00 Charting the Path Forward on Coastal Carbon in Maine
(continued)**

4:30 Next Steps

Dr. Nichole Price, Senior Research Scientist, Bigelow Laboratory for Ocean Sciences

5:00 Symposium Adjourns

The Maine Blue Carbon Network produced a white paper to foster informed conversation at the Coastal Carbon Symposium on blue carbon planning, management, and funding.

MAINE'S BLUE CARBON FUTURE

Erwin, A., Frignoca, I.*, Kenyon, H.*, Gassett, P., Gabrielson, J., Tatgenhorst, H., Brewer, A., Price, N., Johns, B., Arnold, S., Feurt, C., Enterline, C., & Puryear, K. (2025, Oct). "Maine's Blue Carbon Future" [Unpublished White Paper, Version 1.2] *Proceedings of the Maine Blue Carbon Network, Coastal Carbon Ecosystems Symposium, October 21, 2025.*

Maine's coastal ecosystems—salt marshes, eelgrass meadows, and kelp forests—are critical "blue carbon" landscapes that store carbon, sustain fisheries, buffer shorelines, and provide myriad ecosystem and community benefits and services. Yet these habitats are degrading at alarming rates, and face continued risks with implications for ecological resilience and economic stability. This white paper, prepared by Maine's Blue Carbon Network, reviews Maine's current policies, compares them to approaches in other states, and outlines potential next steps to strengthen planning, management, and funding for blue carbon protection and restoration. Maine's existing framework includes integration of blue carbon into the state's climate action plan and coastal management program, statutory requirements for mapping and greenhouse gas accounting, and support for restoration projects through regulatory mechanisms and limited funding programs. However, compared to peer states with targeted blue carbon initiatives, dedicated task forces, or market-based funding strategies, Maine's approach remains fragmented. The paper identifies opportunities to consolidate strategies into a unified blue carbon plan, expand monitoring and mapping to include additional blue carbon ecosystem types, set explicit habitat restoration targets, or address regulatory barriers to resilience and restoration projects. It also recommends exploring sustainable financing mechanisms, from dedicated state funds and tax incentives to leveraging private investment. By pursuing these measures, Maine can further safeguard its iconic coast, sustain vital fisheries, and ensure that blue carbon ecosystems contribute meaningfully to climate mitigation and adaptation goals.



Scan this QR code to access the white paper about Maine's Blue Carbon Future.



MAINE BLUE CARBON NETWORK

About the Convener of the Symposium:

The [Maine Blue Carbon Network](#) provides a forum to exchange information about advances in blue carbon science, policy, markets, carbon inventory methods, and other emerging issues. Blue carbon (or coastal carbon) is a term that refers to the carbon that is sequestered by coastal ecosystems like salt marshes, seagrasses, and seaweeds.

APPENDIX D: SYMPOSIUM PARTICIPANTS



Name	Professional Affiliation
<i>In-person attendees</i>	
Cheyenne Adams	Maine Department of Environmental Protection
Erin Anderson	University of New England
Susie Arnold	Island Institute
Bethany Atkins	Maine Department of Inland Fisheries
Hannah Baranes	Gulf of Maine Research Institute
Elia Betschen	Team Zostera
Cara Blaine	Atlantic Sea Farms
Damian Brady	University of Maine
Angela Brewer	Maine Department of Environmental Protection
Melissa Britsch	Maine Coastal Program
Max Burtis	Bombazine Oyster Company
Emily Carty	Maine Natural Areas Program
Peter Craig	Bigelow Laboratory for Ocean Sciences
Emily Cyr	Maine Department of Environmental Protection
Carmine DeStefano	Maine Department of Environmental Protection
Dan Devereaux	Town of Brunswick
Anna DiChiara	York Land Trust
Devin Domeyer	Maine Coastal Program
Victoria Doudera	Maine House of Representatives
Genevieve Doughty	Sipayik Resilience Committee
Bruce P. Doughty	Sipayik Environmental Department
Sarah Douglas	Bigelow Laboratory for Ocean Sciences
Meggan Dwyer	University of Maine
Claire Enterline	Gulf of Maine Research Institute
Ivan Fernandez	University of Maine
Chris Feurt	Wells National Estuarine Research Reserve
John Fisher	Maine Department of Environmental Protection
Kyle Francis	Sipayik Environmental Department

Name	Professional Affiliation
Sara Freshley	Friends of Casco Bay
Ivy Frignoca	Friends of Casco Bay
Jeremy Gabrielson	Maine Coast Heritage Trust
Sam Gamber	Maine Department of Marine Resources
Parker Gassett	University of Maine
Valli Geiger	Maine House of Representatives
Devon Gleason	Penobscot Nation
Sarah Gladu	Coastal Rivers Conservation Trust
Janelle Goeke	Casco Bay Estuary Partnership
Alex Groblewski	Maine Department of Inland Fish and Wildlife
Rhiannon Hampson	Gulf of Maine Research Institute
Allison Hepler	Maine House of Representatives
Malcolm Hill	Bates College
Jamie Hollander	Wells National Estuarine Research Reserve
Ruth Indrick	Kennebec Estuary Land Trust
Beverly Johnson	Bates College
Heather Kenyon	Friends of Casco Bay
Therese Lamperty	Scarborough Land Trust
Olivia Lenfestey	Wells National Estuarine Research Reserve
Keiran Lorentzen	Friends of Casco Bay
David Ludwig	Maine Department of Agriculture, Conservation and Forestry
Ethan Mackie	Maine Department of Marine Resources
Zachary May	Maine Department of Marine Resources
Corinne Michaud-LeBlanc	Maine Department of Inland Fisheries & Wildlife
Katie Miller	DMR Nearshore Program
Farley Miller	Bigelow Laboratory for Ocean Sciences
Kyle Oliveira	Bigelow Laboratory for Ocean Sciences and the University of Maine
Laurie Osher	Maine House of Representatives
Kyler Phillips	Kennebec Estuary Land Trust
Nichole Price	Bigelow Laboratory for Ocean Sciences

Name	Professional Affiliation
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Charlotte Quigley	Bigelow Laboratory for Ocean Sciences
Mike Ray	Maine House of Representatives
Jessica Reilly-Moman	Island Institute
Stacia Reynolds	Maine Coastal Program
Jeremy Rich	University of Maine Darling Marine Center
Heather Richard	University of Maine
Joshua Richards	Maine Aquaculture Innovation Center
Robert Van Riper	Maine Coastal Program
Nathan Robbins	Maine Department of Environmental Protection
Elliott Roberts	NuWa Solutions/Downeast Institute
Melissa Rocker	Bigelow Laboratory for Ocean Sciences
Jocelyn Runnebaum	Maine Coastal Program
Justin Schlawin	Maine Department of Inland Fisheries & Wildlife
Robin Sleith	Bigelow Laboratory for Ocean Sciences
Karen Stamieszkin	Bigelow Laboratory for Ocean Sciences
Holly Stover	Maine House of Representatives
Annie Tamalavage	Smithsonian Environmental Research Center
Samuel Tan	University of Maine and Bigelow Laboratory for Ocean Sciences
Helena Tatgenhorst	The Nature Conservancy
Katie Tilton	Marine Department of Marine Resources
Jay Turnure	Marine Department of Marine Resources
Meghan Vigeant	Friends of Casco Bay
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Lisa White	Maine Department of Marine Resources
Rich Wilson	Seatone Consulting (facilitator)
Erin Wilson	Maine Coastal Program
Meagan Wylie	Seatone Consulting (facilitator)

Name	Professional Affiliation
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Reyn Yoshioka	Bigelow Laboratory for Ocean Sciences
Alex Zipparo	Lincoln County Regional Planning Commission
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Tatia Bauer	Maine Coast Heritage Trust
Annina Breen	Maine House of Representatives
Steve Crooks	Silvestrum
Ashley Davies	Fidelity Foundations
Mike Doan	Friends of Casco Bay
Alexandra Doudera	Saltwater Classroom
Kara Gadeken	College of the Atlantic
Richard Hilliard	Mount Desert Island Biological Laboratory
Kohl Kanwit	Maine Department of Marine Resources
Penny Overton	Portland Press Herald
Melissa Paly	Conservation Law Foundation
Seneca RiceWoolf	Duke University
Geoffrey Smith	The Nature Conservancy
Lauren Tisdale	Environmental Protection Agency
Vinton Valentine	University of Southern Maine
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