



Proceedings from the May 2025 Convening

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INTRODUCTION

MOCEAN (Mission is the OCEAN) hosted a multi-day convening in May 2025, bringing together key players in the future of our ocean spaces. The event gathered leaders from science, industry, government, and communities to explore how underwater infrastructure can be designed and deployed in ways that support ocean health and the economies of communities on the coast and beyond.

This convening, supported by the National Science Foundation, aimed to advance the policy and regulatory frameworks needed to support nature-inclusive infrastructure, foster innovation ecosystems that include community-based economic opportunity, and set the stage for real-world testing and demonstration projects. Activities included a showcase of ongoing pilot initiatives, a policy panel and open discussion, a fireside chat, breakout working sessions, and an “Open Space” marketplace of ideas proposed by participants.

Participants came from a variety of fields, reflecting the cross-sector nature of the work. Invitations went out to ecosystem actors up and down the Atlantic Coast, with a focus on Massachusetts due to the Commonwealth's leadership in this space. We were also joined by a European expert who helped us benchmark against international progress and thinking on these issues. Attendees included offshore energy developers, fisheries advocates, representatives from heavy marine industry, staff from state and federal agencies, ocean technology entrepreneurs, educators, engineers, marine biologists, climate scientists, community advocates, graduate students, and NGO leaders.

Participants engaged actively throughout the event – sharing insights in plenary sessions, leading breakout groups, and proposing new ideas and discussing them in Open Space conversations. Topics included ideas for pilot projects, materials innovation, co-location of energy development with aquaculture, restoration of the seafloor and other habitats, the need for better policy tools, and how to execute this work in true partnership with communities on the coast and beyond. Participants pointed to opportunities for better measurement and monitoring, data sharing, and approaches incorporating social and economic good through cross-sector communication and collaboration and through consideration of the dynamics – and needs – of our oceans.

This convening is part of MOCEAN's broader effort to help overcome key barriers to development of ocean-based energy in the Mid- to North-Atlantic – particularly those around community acceptance, environmental impact, and fragmented infrastructure planning. MOCEAN, which stands for *Mission is the OCEAN*, is a network of individuals from more than 100 organizations in research, industry, education, and regulation. We are working together to build a Regional Innovation Engine that supports a regenerative ocean economy – connecting the offshore energy, seafood, and ocean technology sectors in ways that strengthen ocean ecosystems and human livelihoods alike.

MOCEAN's approach is to convene people across the ocean economy to co-design regenerative infrastructure. This convening is a key example of that work: bringing together people who often don't find themselves in the same room, surfacing both challenges and shared priorities, and laying the groundwork for continued progress. As we move forward, we are building on the ideas and relationships that emerged from this event to inform new projects, partnerships, and funding proposals.

We are grateful to all who participated, and we are excited for what comes next.

Below you will find a list of key takeaways from the event, possible next steps for MOCEAN, and summaries of the various sessions.

OVERALL KEY TAKEAWAYS

Here are some overall takeaways from what was presented across the panels, breakouts, and open space discussions.

1. There is multi-sector, statewide and cross-state interest in advancing the design of underwater infrastructure to strengthen marine ecosystems.
2. Given the complex and varied nature of marine ecosystems, region- and site-specific learning is needed to determine how to advance Nature-Inclusive Design (NID) in any particular environment and which specific objectives should be set for each environment.
3. This learning can be achieved by executing pilot projects, considering global experience to date, and creating a regional innovation ecosystem around NID that leverages the exceptional marine science assets, mechanisms for advancing innovation, and engaged and experienced communities in our region.
4. Data standardization and sharing can contribute to effective and efficient NID by advancing scientific and engineering models and policy.
5. The Mid- to North-Atlantic – and Massachusetts in particular – is well positioned to be a global leader in NID, given state commitments to offshore wind development, the strength of our marine science communities, the scale and importance of our seafood industry, and the capacity of our innovation ecosystem.
6. Policy innovation will be needed to catalyze the effective, systematic integration of NID as standard design practice for offshore infrastructure.
7. We should not wait for others to take the lead; MOCEAN connects ecosystem actors who together can take on several key responsibilities.

ABOUT MOCEAN, AND NEXT STEPS

NSF award and associated deliverables

Funded through a two-year development award through the U.S. National Science Foundation's Regional Innovation Engines program, MOCEAN (Mission is the OCEAN) is committed to developing a strategic plan and growing an innovation ecosystem around nature-inclusive design of underwater infrastructure in the Mid- to North-Atlantic region of the U.S. for the benefit of local maritime economies and ocean health.

MOCEAN is a Tufts-led initiative that has about a dozen “core-partners” organizations, including UMass Boston, the New England Aquarium, Hampton University, Marine Biological Laboratory, Woods Hole Oceanographic Institution, and Responsible Offshore Science Alliance (ROSA). MOCEAN's work is roughly organized into six focus areas: nature-enhancing offshore infrastructure; advancing ocean science; future fisheries; education, workforce development, and outreach; and ocean technology innovation.

We presently advance the initiative by organizing and supporting workshops and the participation of individuals at conferences and other events to learn and make others aware of MOCEAN's objectives. Here are a few examples of MOCEAN's past and ongoing activities: convening researchers from disparate fields and coordinating test site access for a Massachusetts Clean Energy Center (MassCEC) joint-industry funded project "Promoting beneficial colonization of offshore wind infrastructure" focused on the development of nutrient-infused coatings for underwater infrastructure to support growth of desirable organisms; supporting workshops around the seeding of atlantic surf clams as mitigation that offshore wind developers could execute, an idea developed through collaboration between fishers and marine scientists. A website <https://mocean.us> is being developed to share information about MOCEAN-associated projects and general information about nature-inclusive design of underwater infrastructure.

We are considering several possible deliverables for the NSF grant period. Ideas include journal articles, white papers, workshop reports, web resources, pilot projects, and created communities. We will be reaching out to relevant communities for input and feedback on these products, and we invite the perspectives of all who are interested.

We thank the participants of the present convening for their presence, questions, and ideas about how underwater infrastructure can be designed and deployed in ways that support ocean health and the economies of communities on the coast and beyond, and we look forward to integrating these contributions into the deliverables to advance policy and regulatory frameworks, promote innovation ecosystems and community-based economic opportunity, and create testbed frameworks and initiate pilot projects in advance of our award end date of February 2026.

Growing the MOCEAN initiative

We intend to leverage our convening power and experience around Nature-Inclusive Design (NID) of underwater infrastructure to serve – for the long-term – in a convening role around this topic and to lead or co-lead pilot projects and other focused initiatives. As “connective tissue” among innovators, universities, laboratories, industry, accelerators, investors, and others, MOCEAN strengthens and coordinates the already exceptional individual assets in the Commonwealth, supporting a nationally leading Ocean Innovation Network that delivers economic opportunities to the most deserving communities across the entire state and beyond.

We are always looking for others who are interested in our mission: to convene partners across the ocean economy to *co-design and champion regenerative ocean infrastructure* to revive oceans and help communities – on the coast and beyond – prosper through traditional and new opportunities. We are considering various models for funding and welcome suggestions about funding models, possible funding sources, and collaborations.

Should you wish to learn more – and/or potentially contribute to the near-term deliverables or the planning and running of future activities – please contact us at mocean.contact@gmail.com

SESSION SUMMARIES

Plenary 1 - Showcase of Pilot Projects - Integrating marine science, engineering, and new ocean technology

The first plenary shared background and findings from a range of pilot projects, each exploring innovative possibilities for catalyzing positive outcomes from an intervention associated with offshore wind infrastructure. Speakers described a range of approaches, including testing coatings that attract kelp and small animals; surf clam seeding outside offshore wind lease areas to mitigate for lost fishing access within wind farms; 3-D printed reefs and “cod pipes” that shelter fish; and co-locating low-trophic level aquaculture with offshore energy infrastructure.

Structures in the water change the ecological function of a particular site through colonization and also impact the use of the location for other human activity. Pilot projects are a necessary step in understanding the complex processes at the interface of subsea infrastructure, the marine environment and human use – uncovering opportunities to make the related changes beneficial to ocean health and economies on the coast and beyond.

Speakers suggested that we develop a framework for where, when and why to pursue particular interventions and how to assess their effects. Goals for nature inclusive design will vary from region to region based on local ecology, uses and community/cultural values. Determining goals for Nature-Inclusive Design (NID) requires input – from technical experts (in ecology, engineering, fisheries management, and fishing) and other community members – to determine which ecosystem services to prioritize in particular locations.

Well-designed monitoring programs are critical for learning from pilot projects. The pilot projects discussed employ different ‘metrics of success’, including species richness, biodiversity, and impacts to critical ecosystem functions (*e.g.*, foraging grounds, nursery habitat). Data sharing across projects could accelerate learning.

Key Takeaways

- MOCEAN’s broad definition of nature positive design can include management and mitigation measures, as in the surf clam example, not just manipulation of structural features. We need to develop a common language: What do we mean by “NID”?
- We need to be clear about what we want to achieve: restore naturally occurring assets, optimize necessary infrastructure to achieve NID goals, or include add-on structures to achieve even greater ecosystem change? Are we focusing on, for example, restoration of naturally occurring habitat, or new types of habitat to support commercially important species, or carbon sequestration?

- We need to consider the time horizon for NID: permanent (leave in after project is decommissioned) or temporary (remove after project life)?
- Comparative eDNA monitoring nearby and distant from the new structures may help address the question of whether observed changes in species presence are due to aggregation or new biomass.
- To create a systematic, long-term approach to advancing NID and understanding micro and macro scale (cumulative) ecological interactions with what we put in the water will require new approaches to financing, possibly including diversification of funding sources.
- Mitigation to create certain habitats or species can look more like farming than creating a balanced ecosystem. How should we account for both environmental impacts and socioeconomic considerations?
- There are great opportunities for ocean technology innovation to support NID in offshore infrastructure. Connecting scientists and existing ocean industries with the start-up community to explore challenges and solutions will be beneficial.
- When we talk about tradeoffs, we have to remember that decarbonization is part of the picture, offering a socioeconomic and environmental rationale for offshore renewables.
- How does what we're doing with NID overlay with efforts to protect existing habitat? Let's consider the importance of sand plains and gravel beds in concert with hard substrates.

Plenary 2 - Policy Drivers Panel & Open Discussion - How can we make innovative co-use & nature-enhancing design strategies buildable, bankable, permitable, and effective as a priority in U.S. offshore energy infrastructure development?

The second plenary turned to policy. Panelists said developers designing and constructing offshore infrastructure should aim for a net-positive impact on nature that goes beyond current regulations that require them to avoid, minimize and mitigate negative ecosystem impacts. They compared European approaches, where biodiversity enhancement is incentivized and valued in the procurement process, to the U.S. system that is much less strategic. They emphasized how, in the U.S., state offshore wind initiatives have driven some of the fundamental support structures – like data sharing, required investment in ecosystem research, and collaboration with fisheries – necessary to promote nature inclusive design. However, they noted that clearer signals, like those embedded in the Netherlands, Belgium and German procurement processes, could be adapted to the U.S. context – specifically through state procurement processes – to systematically advance nature inclusive design domestically.

Key Takeaways

- In addition to advances in technology and scientific analysis, innovation in policy and regulation will be essential to support the systematic adoption of nature inclusive design and multi-use in the U.S. offshore wind enterprise.
- People and local economies – as well as nature – will benefit from a policy framework that operates across Economic, Social, Technological and Ecosystem functions and engages with community values in offshore infrastructure development, moving us towards a *Restoration Economy*.
- Offshore wind has been a major driver of advancements in marine data collection, hardware and analytics, also revealing gaps that call for ocean technology innovation to support ecosystem functions.
- Barriers to commercialization of innovative technologies include overly-burdensome, unclear regulatory requirements for pilot projects, difficulty accessing testing infrastructure, and lack of clear pathways to acceptance – by regulators – of new technologies.

Breakout 1 - Advancing Nature-Enhancing Design & Ocean Science

In this breakout, engineers and ecologists from several academic institutions, environmental NGOs, offshore wind developers, and consultants discussed what Nature Inclusive Design (NID) may look like within the context of offshore wind projects off the U.S. east coast. To start the conversation, two brief presentations were given. An overview of different design concepts being employed in the North Sea was presented along with some factors that may influence the goals of intentional engineering, including of concrete and nature-based designs: environmental, engineering, and societal considerations.

During the subsequent open discussion, some key themes emerged:

Building social license to develop offshore wind

The health of the ocean and quality of marine habitats is poor and deteriorating, in part due to changing climate and the way we've interacted with the ocean to-date. Offshore wind development can be leveraged to improve the health of the ocean and the human communities who depend on it. But public concerns about offshore wind development exist and differ depending on the nearby coastal communities and include disruption to fisheries access and production – this looks different in New England versus Mid-Atlantic depending on the primary fisheries in the region – threats to tribal lands, and the well-being of particular kinds of organisms.

NID as an approach to the design of marine structures

NID is, in its most mild form, consideration of the likely effect of design options in the overall decision-making process. Using engineering and economic criteria to govern essentially all design decisions – with the requirement to avoid the use of certain materials such as a specific type of galvanic anode, as well as the requirement to remove offshore wind installations after the end of the “operational period” of the wind

farm (typically 20-30 years) – affects the type of material used (i.e. steel vs. concrete), the geometry of that material, and the types of coatings applied to that material, and this in turn affects the types of marine growth that occurs and the habitats which are supported. The greater benefits of the use of concrete, gravity-based designs over steel structures were discussed.

Managing the space

We discussed how offshore wind farms should be managed from an ecological perspective. There was much discussion about what to focus on in managing the outer continental shelf Marine Protected Areas (MPAs): optimizing production or conserving the natural environment. Some participants were for offshore wind farms being managed with the goal of maximizing production, while others thought conservation (and preservation) was a better priority, and still others questioned why both objectives could not be met.

Metrics of success

This was a continuation of a discussion started during the first panel: regulators are looking for a metric – and a threshold of this metric – which can indicate success of a design. Participants discussed how this is more complicated than simply identifying a number – this metric or metrics should be determined based on the goal of the structure (see above), which is shaped by the environmental and ecological conditions, the societal values, and the engineering constraints.

Identifying key iconic species for each region

Several participants pointed to the value of identifying particular species whose health and abundance the intentional engineering could enhance. These species would be of particular societal (*e.g.*, economic and/or cultural) value. If we can select regionally appropriate and valuable charismatic species to target, this could help with the above points (identifying metrics of success, obtaining social license, designing the space, and managing the space). Potential species of interest are region-specific, and, in New England, include lobster, cod, blue mussels, and kelp.

The group broke out into smaller subgroups to discuss which species would be on the list for the U.S. east coast. There was some hesitation from researchers in definitively identifying particular species that would be promoted given the unknown trajectory of outside stressors that are driving the decline in species such as lobsters and cod. These species are not necessarily declining due to lack of habitat (although that may be contributing to the dynamic), but rather warming waters and fishing pressure.

Breakout 2 - Future Fisheries

The objective of this breakout session was to develop a shared understanding of what we mean by supporting *Future Fisheries* in the context of the multiple challenges confronting the sector, the values the sector represents in terms of food production, local culture and community economics – and MOCEAN’s overall objectives.

We began by defining a future fisheries that thrives given increasing conflicting uses of the ocean space, discussed current conditions within the sector, and then considered influences and barriers to innovation in order to understand the range of actions that could be prioritized to move towards the desired future.

We used ongoing work in two specific commercial sectors – surfclam and squid fisheries – as case examples to highlight general principles and types of research and innovation that would ensure the vitality of the fishery. The conversation was wide-ranging, providing rich material for a deeper-dive.

Envisioning Future Fisheries

Participants identified a range of indicators of a sustainable, robust domestic fisheries sector, including:

- Fresh wild seafood is available in the US; *local* seafood is available locally.
- The fishing industry is economically profitable.
 - There is financial stability, with a predictable market share in relation to imports, over time.
 - Fish stocks are managed so the resource is viable and flexibility for the industry to adapt to changing conditions.
 - There are mentorship and training opportunities for the next generation of fishers.
- There is community support for the fishing industry and a clear connection between net and plate; people understand the economic impact of the industry on the community.
- Fishers, scientists and fisheries managers are working collaboratively to solve problems and innovate to support a healthy fishing resource and a sustainable industry.
- The management process considers ocean variability and effectively incorporates industry knowledge and experience.

What is the current reality?

Participants highlighted troubling **trends** including limited flexibility in the management process and the move from small business operators to corporate ownership. While the total revenue may be the same industry-wide, the number of participants is down while the median age of commercial fishers is going up. It is **extremely expensive** for new market entrants. There's a significant risk of losing essential operational knowledge without apprenticeship opportunities for a **next generation**.

Many different **stressors** on the fishing industry were discussed, as well as the interactions among them. Climate change impacts, the need to now coexist with a new offshore wind industry, multiple market factors; limited access to fishing grounds, to quotas/permits and to shoreside facilities were identified as key concerns.

Challenges and opportunities:

More and better data is needed to manage and to catch fish. The good news is that commercial fishers are collecting the data and using it. Data sharing is one important way to invest in coexistence between fisheries and other offshore human activities. We should continue to cooperatively expand the types of sensors that are going on commercial fishing vessels (*e.g.*, collecting the bottom temperatures through EMOLT). We should better leverage the huge investment in data collection by using the data for a broader range of purposes. For example, multiple offshore industries, academic research, and government entities are collecting similar environmental and ecological data, often in different formats. Looking forward we should move towards **standardization** so that the data can be aggregated and serve multiple decision-making processes. ROSA and Regional Wildlife Science Collaborative (RWSC) have made great progress in making data sharable and accessible and in exploring the best options for managing large volumes of data. BSEE and BOEM are also working on a data sharing pilot project. Finally, fishing vessels are platforms of opportunity for data collection: we need to continue integrating technology like sensors in fishing gear. **Collaborative research is the key.**

It was noted that there are limitations to the data available for stock assessments. Fishing fleets collect catch data – **fishing-dependent data**, but NOAA may have a hard time maintaining long-term datasets for **fisheries-independent data** if surveys change due to offshore wind development. There is concern that the limited funds available for data collection will be channeled away from physical sampling and towards investment in AI, which means we won't be able to validate statistical or assessment models. The relocation of the Pioneer Array will also add to uncertainty in climate models. But it's important to remember that AI needs data to learn. If federal funding for data collection is cut, could we instead harness private sector resources like Amazon or Google?

How do we drive innovation in fisheries?

To thrive in a rapidly changing world, the **way we fish** and the **way we monitor fish populations** may have to change. Developers and states must partner with fishers to fund innovation. Fishers need to be supported and compensated for their innovation to expand the reach of their impact through partnerships with the private sector and their markets. For example, fishers transformed a costly \$25,000 tool into an affordable \$600 version attracting interest from private sector providers.

Through these partnerships, the **cost** of innovative gear can be maintained within reason and/or accompanied with financial incentive for wider adoption across fishing fleets.

Another big barrier to innovation is the inflexible, **non-adaptive management system**. Scientists do effective innovative gear development, but the fishermen may not be able to use it due to restrictions in the management systems. It puts the fishers in a box. Programs in place to **exempt fishermen from gear requirements** are needed to **encourage innovation**.

Synergy with offshore wind: The conversation touched on the idea of aquaculture in windfarms. Any new structures create competition for limited space with commercial fisheries. **“Aquaculture” needs to be defined:** finfish aquaculture has a different risk profile than a kelp farm. If we are considering seeding to enhance scallop or surf clam stocks, is it aquaculture? What regulations and management-body would it fall under? Another consideration is **liability:** the scale of value for an aquaculture operation compared to an offshore wind farm is small – if something goes wrong, who will be prioritized. Two other possible targets were suggested for co-investment by the offshore wind industry in fisheries: **electrifying fishing vessels** to make up for increased steaming time and expanded co-investing in **safety-related infrastructure.**

Future fisheries innovation and tool development for pelagics: (*This conversation focused on squid as an example.*) Gear innovation often targets improving **fish quality vs. quantity**, resulting in a higher price point per fish (*e.g.*, jigging for squid) but sometimes the market doesn’t respond to quality. Some markets are very responsive to local sourcing, whereas others are more price sensitive. Asian communities consume more seafood than other demographics – how can we get more populations consuming seafood?

The **seasonality and dynamics of pelagic fisheries** raise different research questions. For example, there’s an interest in mapping egg patches, called *squid mops*, on the bottom – do these show up in offshore wind surveys? We don’t know because we aren’t asking the question. There may be an opportunity using already-collected visual data to uncover important life history information. What other questions should we be asking? The MTS (Marine Technology Society) is having a tech surge focusing on fisheries and benthic innovation – this is an opportunity to raise these issues and connect with tech innovators.

All of our discussions are about *right now*, but managers are already talking about 2027; squid quotas are being set based on their “great-great grandparents’ data”. Can we develop a predictive model for warm core rings – we know they influence squid movement and abundance – and **can we use such a model to make better, more time-scale appropriate management decisions?** What other questions should we be asking?

We need oceanographic data to show phenology and life-stage data. We need to get environmental data into stock assessments. We need to flip the questions we ask in fisheries management governance. Everything assumes an equilibrium condition based on the Great Lakes, but these laws are based on a framework that doesn’t exist in the ocean. Setting up a control in the ocean isn’t possible. We need to be much more flexible. The question is **how do we align the time scales into how the system is actually varying?**

Look at more dynamic management examples from other parts of the world – *e.g.*, The Falklands. Globally, U.S. fisheries are considered to be very well managed, but are there regions or countries we can learn from? Much of the discussion centered on the improvement in observing and modeling dynamic ocean conditions relevant to squid distribution. Collaborative research that delivers this more timely and dynamic understanding could inform a more dynamic management decision-making process. Additionally new analysis techniques could address questions over longer time scales.

Can we use **genomics** to increase the hardiness of wild stock fish to combat climate change?

And finally, how do we balance trying to solve everything all at once for all fisheries? Fishermen want to fish; they need to be at the table but there is extreme meeting-fatigue “and they all tell me I have to change how I’m fishing”. Successful cooperative research is **efficiently** engaging all the right community members, focusing on **priority issues** and structuring the process to meet their needs.

This discussion will help inform the development of a **MOCEAN white paper** that explores the definition of future fisheries through the lens of two case studies, examining both common challenges and differing strategies to addressing them.

Breakout 3 - Communicating the Case for Offshore Wind Energy and Nature-Enhancing Underwater Infrastructure

In this breakout, participants considered the status of offshore wind (OSW) development in the U.S. and what might be achievable in federal government, state government, business, education and other community spaces through strategic (albeit time-intensive) relationship-building, listening, and messaging by trusted messengers. There was a sense that MOCEAN could serve as a bridge across communities (*e.g.*, for coalition building) and help counter misinformation about OSW by producing simple, positive messages that allow people to see themselves as part of it, through examples and stories.

Some specific ideas are listed below:

- Join and/or form coalitions
- Reconsider current Time-to-Decommission (*e.g.*, to increase ROI)
- Frame OSW as meeting the tremendous (and growing) electricity demand of AI
- Connect across companies, outside of the constraints of project timelines
- Include – in the conversation – union reps as well as utilities like National Grid
- Broadcast the broader map of economic-benefits
- Discover and respond to people’s concerns
- Educate youth and others re: financial benefits of union OSW jobs
- Make lesson plans for schools
- Calculate and broadcast the comparative societal cost of OSW vs. some alternatives

Open Space Discussions

In [Open Space](#), participants had the opportunity to create and manage their own agenda of parallel working sessions, diving into topics of personal interest towards advancing our shared purpose. Everyone had the chance to propose topics and actively engage in multiple conversations. Nineteen topics were raised, ranging from “What marine science questions do we still need to answer?” to “How to use art to tell a Nature-Inclusive Design story”. Four examples are summarized below to illustrate the thinking and connections the discussions inspired.

Can Nature Inclusive Design contribute to achieving social license for offshore wind?

Offshore wind (OSW) development across the US continental shelf presents an opportunity to scale decarbonization efforts like never before. However, concerns towards environmental impact, visual impact, and disruption to the local coastal economy (e.g., fisheries) act as significant barriers to widespread social acceptance. Much of the current dialogue has focused on increasing acceptance through cross-sector collaboration, particularly by integrating Nature-Inclusive Design (NID) features that could support fish stocks and benefit the fishing industry.

However, as discussions progressed, it became clear that even well-designed NID solutions cannot eliminate all negative impacts. For instance, approximately 70 clambers operating out of New Bedford will be displaced within the wind lease areas due to the spatial requirements of bottom trawling, which demands at least 3.5 miles of unobstructed seabed. To address such challenges, supplementary measures such as establishing artificial seeding zones for clams outside wind lease areas have been proposed.

This example underscores a broader reality: the negative impacts of OSW development will vary depending on which communities are consulted. As such, there is a pressing need to extend and deepen these conversations to fully understand and address localized, demographic-specific impacts.

Key Takeaways

- NID offers an avenue to mediate some of the concerns on OSW development, potentially leading to accumulation of greater social license.
- How to communicate the benefits must be experimented with – and refined.
- NID is not a silver bullet that solves all problems.
- Greater community engagement efforts must be made to address issues from every demographic.
- Addressing negative impacts must be explicit and negotiated transparently.

- Gaining social license is not a “one-stop shop”. It must be continuously addressed through iterative dialogue to maintain trusting relationships.

During this pause, draft guidance to develop offshore wind projects responsibly

This group discussed using this time effectively to identify gaps in existing guidance, in particular for benthic and fisheries monitoring, to improve consistency (balanced with flexibility) and certainty for developers in terms of acceptance and costs.

ROSA or RWSC could be possible conveners for this collaborative effort.

This group also discussed how this time could be used to gather best practices and a potential menu of pre-vetted acceptable NID for developers to consider. MOCEAN could take the lead in developing these deliverables, and if states include incentives for using NID in power purchase agreements that could help increase the use of NID.

What scientific research to inform setting biodiversity goals, and how can I help?

This group had a diverse representation in the group that included perspectives for agencies, NGOs, consultancies and developers.

This group talked about various scientific research and guidance information that would assist in defining how Nature-Inclusive Designs (NID) may benefit marine projects and setting biodiversity goals. This group discussed research topics that may help identify NID concepts applicable to specific environments in the U.S., including New England, New York Bight, and Mid-Atlantic regions. Initial desk-based studies could help identify NID specific concepts and benefits for the respective environments. Those concepts could then further be evaluated through research studies. Goals of research studies would also include evaluation of best practices for monitoring and quantifying the effects of the NID concepts.

This group discussed potentially developing a list of the NID concepts, conceptual designs, benefits (which could be used to assist developing biodiversity goals), and monitoring methods. This information could benefit states or others awarding PPAs / OSW development projects by identifying NID concepts. If such concepts are validated by subject-matter experts via research, then this would help reduce the burden of states defining beneficial NID concepts.

This would also provide potential benefit to developers by completing some level of NID design or providing valid concepts that could be readily incorporated into the project. This group noted that by the time a PPA is awarded, the project designs are already fairly developed, and it may not be efficient or feasible to incorporate NID concepts at that point if they had not already been implemented. Having NID concepts (or best practices) defined, may help get those concepts implemented at early stages of the project.

This group also explored areas where research could support or augment existing guidance. For example, research could be performed to evaluate best practices for benthic and fisheries monitoring of wind projects after they are constructed. At this time, little information exists in guidance documents from BOEM or NMFS regarding frequency and amount of benthic monitoring, how long monitoring occurs, and methods for monitoring, and what will be acceptable to agencies. This creates – for a project – unknown financial efforts and potential risk that is challenging for developers and their consultants to plan for.

OSW as a tech platform

Opportunities

- Opportunities are immense, and there is much interest from the science community. The offshore wind (OSW) infrastructure (turbines/substations) allow for hardline connections to internet and power, and shelter from the weather, which is a unique opportunity for ocean science. Further, the cables and vessels can collect data over wide ranges.

Challenges

- Incentives: We need to find ways to incentivize developers to offer this (*e.g.*, through state offtakes, reduction in other regulatory requirements, etc.).
- Contractors: We need to get contractors to cooperate. The supply chain is small, and contractors are hesitant to add any scope that can add risk.
- Timing: These additions would need to be integrated early into project designs, which is many years before construction and many projects are well advanced.
- Design: To integrate into project designs, the monitoring systems need to be designed and provided to the main OSW design teams.
- Sustainability: We need to find long term funding for supporting the work.
- Health and Safety: Health and safety of increasing activities offshore
 - Cybersecurity: Cybersecurity issues

Potential paths forward

- Leverage work funded by NJ Research Monitoring Initiative, led by Rutgers.
- Integrate into state offtake solicitations (*e.g.*, extra points in evaluation).
- Create standard designs that are open access.
- Convene turbine OEMs (turbine, transition piece, and offshore substation) and fabricators.