Criteria for Prioritization of Offshore Wind-Related Environmental and Fisheries Research

Meeting Summary

13 July 2022

Meeting hosted by the Responsible Offshore Science Alliance and the Regional Synthesis Workgroup of the Offshore Wind Environmental Technical Working Group (E-TWG)

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Disclaimer: Opinions expressed in this document are intended to reflect input received by expert stakeholders and members of the public during public feedback opportunities. While all efforts were made to accurately represent these views, this summary may not represent the views of all meeting participants. Likewise, it does not necessarily reflect the opinions of the Responsible Offshore Science Alliance, the regional synthesis workgroup of the E-TWG, or the New York State Energy Research and Development Authority (NYSERDA).

Introduction

A public meeting was held on 13 July 2022 to facilitate communication and coordination among groups that are focused on identifying research needs and/or funding regional research to better understand the effects of offshore wind energy development on wildlife, fisheries, and marine ecosystems in the eastern United States. Coordinating groups that contributed to the organization of this meeting included the Offshore Wind Environmental Technical Working Group, Responsible Offshore Science Alliance, and Regional Wildlife Science Collaborative for Offshore Wind, among others.

Environmental Technical Working Group (E-TWG)

The Environmental Technical Working Group (E-TWG) is an independent advisory body to the State of New York, formed in 2017, with a regional focus on offshore wind and wildlife issues from Maine to North Carolina.[1] It is comprised of offshore wind developers, science-based environmental non-government organizations (NGOs), and state and federal wildlife agencies. The E-TWG provides feedback and expertise to inform the environmentally responsible development of offshore wind energy. In 2020, the E-TWG identified as a priority the development of guidance for regional monitoring and research related to offshore wind energy development and wildlife[2]. The E-TWG convened a Specialist Committee (including both E-TWG and non-E-TWG members with a range of scientific and technical expertise) in late 2021 to develop guidance for regional-scale research and monitoring in the eastern U.S. This committee, the regional synthesis workgroup, is working to synthesize previously identified research needs that are best addressed at the regional scale, as well as develop general recommendations to inform the implementation of regional research and monitoring activities in the immediate term.

Responsible Offshore Science Alliance (ROSA)

The Responsible Offshore Science Alliance (ROSA)[3], founded in 2019, is a non-profit organization seeking to advance regional research and monitoring of fisheries and offshore wind interactions through collaboration and cooperation. ROSA is organized to convene the scientific community, fishermen, offshore wind developers, and government agencies to identify priorities for understanding the coexistence and interactions between ocean resources. ROSA is currently undergoing a similar effort to that of the E-TWG's regional synthesis workgroup, synthesizing existing research priorities for fish and fisheries and ongoing research to identify research gaps related to offshore wind energy development. ROSA staff participate in the regional synthesis workgroup to help encourage collaboration across these groups.

Regional Wildlife Science Collaborative for Offshore Wind (RWSC)

The Regional Wildlife Science Collaborative for Offshore Wind (RWSC)[4] aims to conduct and coordinate relevant, credible, and efficient regional monitoring and research of wildlife and marine ecosystems that supports the advancement of environmentally responsible and cost-efficient offshore wind energy development activities in the U.S. Atlantic collaboratively and effectively. The regional synthesis workgroup (with the RWSC director as a workgroup participant) intersects with the RWSC's current

[1] www.nyetwg.com
[2] For more information: www.nyetwg.com/regional-synthesis-workgroup
[3] For more information: www.rosascience.org
[4] https://rwsc.org

expert Subcommittees' work by developing products to support the development of the RWSC Science Plan, while also filling a more immediate need to inform regional-scale research that is already being planned and implemented.

Workshop Goals

There are several current efforts to identify research needs and/or fund regional research to better understand the effects of offshore wind energy development on wildlife, fisheries, and marine ecosystems in the eastern United States, as described above. Several of these collaborative groups, including ROSA and the regional synthesis workgroup of the E-TWG, recognized that these individual efforts could be collectively more effective with a shared set of criteria with which to help prioritize future work. Thus, ROSA and the regional synthesis workgroup hosted a conversation via video conference on 13 July 2022, to discuss prioritization criteria and processes to help identify priority studies for funding in the immediate term (Appendix A). It was recognized that each funding or research entity will likely have its own specific criteria for prioritizing research and monitoring efforts, and moreover may choose to apply criteria in different ways (for example, in scoping Requests for Proposals or reviewing proposals once they have been received). As such, the goal for the meeting was to have a transparent conversation about ideas for general prioritization criteria that all entities may want to consider using in different ways and/or augmenting with their own additional organization-specific criteria. The resulting catalog of general criteria is intended to be a flexible tool that may help entities in a range of decision-making processes.

Stakeholder Workshop and Meeting Summary

Two hundred and six individuals from various stakeholder groups participated in the July 13 discussion, including environmental NGOs, offshore wind energy developers, state and federal agencies, fisheries representatives, scientific researchers, and environmental consultants (Appendix B). During the meeting, an online survey (Appendix C) was distributed to solicit additional feedback from the group on the topic of prioritization criteria for regional-scale research. The below summary captures the key points of discussion identified during the meeting, as well as from the 68 written responses to the online survey. Opinions are not attributed to specific individuals unless there is a clear reason to do so.

This meeting summary will be made publicly available on the E-TWG website for future reference at: www.nyetwg.com/regional-synthesis-workgroup and on the ROSA website at: https://rosascience.org/offshore-wind-and-fisheries-resources. Feedback on the prioritization criteria will be incorporated into the general guidance for regional-scale research and monitoring that is in development by the E-TWG regional synthesis workgroup. The guidance will be posted to the above E-TWG web link when available. ROSA, RWSC, and other related efforts may also use and/or reference outputs from these discussions.

Utility of Developing Prioritization Criteria

Kate McClellan Press (NYSERDA), Lyndie Hice-Dunton (ROSA), Emily Shumchenia (RWSC), and Jennifer Dupont (Equinor) kicked off the meeting by introducing their respective organizations and briefly discussing why they see value for their organization in developing prioritization criteria to help select research priorities. From a state perspective, Kate indicated that this discussion provides an opportunity

to inform decision-making around current and future investments in regional-scale environmental and fisheries research. For regional research groups (ROSA, RWSC), Lyndie and Emily mentioned that given long lists of potential research gaps, prioritization of research will aid in efforts to determine where to focus, recognizing that criteria will need to be adapted to each funding scenario and the current set of ongoing/pending research projects and data collection efforts underway whenever new research is being scoped. Jennifer indicated that from an offshore wind energy developer's perspective, this discussion will help to shape funding already committed to regional-scale research as well as helping to shape the path forward as the offshore wind energy industry develops.

Potential Criteria for Prioritizing Research and Monitoring on the Environmental Effects of Offshore Wind Energy Development

Kate Williams (Biodiversity Research Institute) introduced six proposed "straw dog" prioritization criteria that were developed with input from the E-TWG regional synthesis workgroup and ROSA:

1. **Urgency of need.** Urgency should be defined with input from stakeholders and advisory groups and may be informed by public perception. Several bases for urgency were suggested including development phase, species/habitat status, likelihood of impacts, and relevance to commercial fisheries.
2. **Utility of helping to fill key data gaps and reduce uncertainty.** Considerations include the level of which the study contributes to filling key data gaps that have yet to be addressed elsewhere, and how complete and/or informative the answer from the individual study would provide, including improving the understanding of the associated uncertainty.
3. **Achievability.** This includes effective study design and testability of hypotheses, and whether the research can be achieved on the necessary timeline and within the boundaries of funding and may also include the amount of data needed to answer the question.
4. **Leverages existing resources and data through partnerships and collaborations.** This criterion would prioritize projects that center collaborations and partnerships among researchers, government agencies, regional groups, and others, which are important for multiple reasons, including cost-effectiveness. Building on existing data may also lead to greater efficiency and immediacy of results.
5. **Contributes to understanding of regional- and population-level effects.** This includes ecosystem-based and cumulative effects studies. If we can understand mechanistic aspects of responses, we can make sensible predictions for other regions/species without monitoring everything everywhere.
6. **Informs decision making.** Considerations includes decisions such as siting, permitting, assessment of site-level impacts, adaptive management of projects, and cumulative impact assessments, and could possibly include the development of decision-support tools.

Lyndie Hice-Dunton presented a proposed conceptual approach to tiered decision-making by funding entities, whereby general prioritization criteria represent one part of a multi-step decision making process. She suggested that each entity would identify a process based on its unique needs or focus, but that a possible process for identifying research and monitoring priorities for funding could include:

- Tier 1: Filtering identified needs (e.g., research focus areas, temporal scale, species/taxa)

- Tier 2: Applying prioritization criteria (proposed above and others emerging from discussion)
- Tier 3: Considering overall funding needs (e.g., various species/taxa of focus, grantees from multiple institutions).

Discussion and Feedback

During the meeting, Bennett Brooks (Consensus Building Institute) led a full group discussion to solicit general feedback, questions, and ideas for each of the prioritization criteria. Additional feedback from the online survey has also been incorporated below.

General Discussion

- **Purpose of this guidance and timeline.** Several groups are thinking of using prioritization criteria like this, such as regional entities and working groups like the E-TWG. Right now, the regional synthesis workgroup is focused on trying to collate a large list of already-identified research needs and develop criteria that could be used to narrow down funding/research topic areas. This step is not a final decision-making step, but rather a collaborative discussion and brainstorming step. From the funder's perspective, this type of discussion and development of criteria can help to provide transparency in decision-making processes.
- **The use of European data to help inform research priorities in the U.S.** All groups are drawing heavily from European data to inform understanding of potential effects, because that is where most offshore wind effects research has been conducted to date. European scientists are collaborating with U.S. scientists to share lessons learned on offshore wind/environmental research. Participants identified the EC Horizon program, and others in Europe, as potential resources. However, there is also a recognition that there are some limitations in how transferable these data are to new geographic areas.
- **Importance of coordination with efforts/entities that can contribute to answering research questions** (e.g., U.S. Department of Energy [DOE], National Science Foundation). There are multiple existing coordination efforts and opportunities to help answer these research questions and priorities, that also include ROSA and/or RWSC, such as direct advisory board participation between the new DOE/Bureau of Ocean Energy Management-funded Project WOW and the emerging UK ECOWind program to cross-fertilize the projects in real time.
- **Consideration of offshore wind in the context of ecosystem impacts in the Atlantic.** What other comparative risk activities may be relevant (e.g., trawling, shipping, warming and acidic oceans)? Stakeholders indicated the importance of not looking at offshore wind in isolation from these other significant risks.
- **The degree to which funding allocated for regional research by states will be applied to different geographies.** There was a question on the degree to which funding for regional-scale research in state offshore wind procurements will be pigeonholed for specific regions (e.g., will "regional" research money from New York only be applied to the New York Bight or is it available for the most needed research regardless of location?) Kate Press clarified that the New York State funding requirement says that regional research funds should advance the responsible development of the industry, not an individual project.

- **Importance of periodically revisiting and updating the criteria.** It was suggested that evolution of criteria would be beneficial and should be addressed on a development-scale basis (e.g., after each 1000 MW is installed, for example) rather than after some set period.
- **The urgency of coming to an agreed-upon set of criteria and methods for conducting studies.** Once construction begins, there will be a limited ability to collect true baseline data to aid in distinguishing effects resulting from wind development versus those occurring by natural processes, including climate change. As such, there is real urgency to identify priorities and conduct standardized monitoring now to help establish that baseline.
- **The distinction between research and monitoring, and the relative contribution of one vs. the other in planning efforts.** We need both, and the line between the two is sometimes fuzzy. Participants indicated that long-term environmental monitoring of effects is critical, especially for long-lived species, and should be explicitly accounted for in funding and development considerations.
- **Building a workforce that can respond to the diverse research and monitoring needs as OSW develops will be critical**. Stakeholders expressed that as the industry develops, there will be increased needs for researchers with capacity to conduct various research and monitoring, thus building a workforce to handle this increased demand will be important.
- **Coordination of timelines** among developers, researchers, and federal regulators would be beneficial, along with a consistent process for research approvals.

Overall Considerations on Criteria

- **Consider whether criteria are related to evaluating "research needs" or "research projects."** In the context of the above example of a tiered selection process, some of the suggested criteria seem to belong more clearly to the third tier where different projects are compared for funding, while others are more clearly related to the second tier in the scoping step. "Research needs" are defining what knowledge is needed while "research studies" and "projects" are defining how to get to that knowledge. Distinguishing between "what" and "how" is very important when it comes to prioritization because each needs a different set of criteria and come in at different steps in the identification and selection of research projects.
- **Relationships among criteria.** Stakeholders indicated the importance of recognizing that the criteria are not independent. For example, filling data gaps could contribute to understanding population-level impacts and also could help inform permitting.
- **Data sharing and transparency.** Participants urged to explicitly state that all data from funded research and monitoring programs should be shared. Data needs to be shared in a timely and, if possible, standardized manner.
- **Effective outreach to stakeholders and others who may want to collaborate**. Concern was expressed regarding the potential for duplicative work because of lack of communication among entities conducting and coordinating research – there is so much interest/information out there from so many sources.
- It was suggested that **additional emphasis on climate change** is needed within the criteria, given how climate change can confound results of most or all projects.

Criterion 1: Urgency of Need

General comments from stakeholders

- **Weighting** of these different sub-bullets may vary by need/organization/funder.
  - May consider alignment with regional/state goals, collaboration opportunities, etc.
  - May consider agreement on level of urgency among stakeholders as urgency is in the eye of the beholder. This should be very carefully defined to reduce language-based ambiguity to ensure consistent answers among funders, assuming that is a goal.
- **Risk should be explicitly called out** in the criterion, specifically risk from development to environmental systems.
- **Need to consider urgency of both long-term and short-term needs** for various reasons (e.g., can a specific research effort address management or regulatory needs? Can it address occurrence of an unusual event/incidence?).
- **The process of determining urgency should be dynamic and adaptive.** We should make sure this does not lead to being reactive without anticipating less urgent needs that may become more urgent in the future. We may also need to adapt to changing political processes (e.g., changes in funding, increased attention to a specific issue/threat regionally, nationally, internationally, and shifts in priorities).
- **Too broad a criterion**. Arguably, 'Urgency of Need' is a descriptor of what a research prioritization is overall.
- **Leverage existing knowledge in our assessment of urgency**. In particular, need to assess the applicability of existing European studies to the eastern U.S. There also needs to be a communication effort to ensure people and organizations are aware of existing work and this informs assessments of urgency.
- **Critical evaluation of decisions made from previous studies**. For example, there have been some studies done on the effects of electromagnetic fields (EMF) or acoustic noise to marine species. A critical evaluation of those studies reveals there are several important questions that remain unanswered which, thanks to those early studies, can now be addressed.
- **Applicability.** It may be valuable to consider the number of wind energy areas/projects/fisheries this research might inform, in order to leverage the results. This could also include how broadly the research can be used by other researchers for subsequent studies/applications. An additional caveat could be related to research that can help avoid potential critical failures that could be replicated across facilities before there is a chance to correct the problem.
- **Timing of when we need information** and how long it will take to get it. We should consider prioritizing research that can be used in a timely fashion and will still be relevant once the study is completed. It is also important to consider when and how preliminary data is available and made publicly accessible.

Comments on development phase

- **Value of including development phase in criterion.** Development phase alone may not be reason enough to be considered urgent. There are many opportunities for studies across phases. In addition, long-term monitoring should have some priority and requires significant lead time in planning, integration into equipment and operations, and funding commitments.
- **Importance of prioritizing post-construction monitoring and studies** since there are so few built offshore wind farms in the U.S. and a paucity of information on “actual” versus predicted

impacts. Understanding what happens post-construction can inform future offshore wind projects.

- **Collecting baseline data prior to development**. This is particularly important as baseline data needs to be collected now. It is also important to consider the buildout timelines of the wind energy areas across projects. Once construction begins in one lease area, the collection of baseline data for adjacent projects is compromised. The development timelines of the region – not those of a single lease or project – should be driving urgency of need for baseline data collection. Some participants indicated that urgency of need should not be a limiting factor for project development, and development projects should not be delayed due to the need for additional pre-construction data.

Comments on species/habitat status

- **Importance of monitoring common species in addition to protected/sensitive species**. While prioritizing protected and sensitive species or habitats is critical, we will also need to monitor common species/stable populations to ensure these do not become tomorrow's urgent issues.
- **Additional ways to define priority species.** This could include keystone species, indicator species, species where there is a lack of existing data (e.g., marine mammals, sea turtles).
- **Need to understand effects on forage fish** that are important to wildlife, as well as commercially important species.
- **Should include a focus on vulnerable species that do not currently have a protected status.** Prioritization based on species' use of the space and need of the space would not only focus on species that are already protected by regulations/agencies.
- **Regulatory status**. In addition to the National Environmental Protection Act (NEPA), other regulatory protections (Essential Fish Habitat under Magnuson-Stevens, Marine Mammal Protection Act, Endangered Species Act) should be considered. Could also consider species listed under State Wildlife Action Plans.
- **Beneficial to have general guidelines for how to assess a species/habitat of particular concern.** Sensitivity mapping/risk assessment might be helpful to inform the definition of sensitive species/habitats. Developing a vulnerability framework is critical to preemptively avoiding adverse effects to species that are not currently considered protected/sensitive species.
- **Additional considerations.** We should consider how invasive species relate to this topic in relation to sensitivity.

Comments on likelihood of impacts

- **Consider splitting this sub-bullet out from the rest of the "urgency of need" criterion,** as this may be a different issue than timing/conservation related issues.
- **Should incorporate interaction of OSW effects with those of climate change**, as a species' habitat could change not because of wind farms but because of temperature changes.
- **Coupling of likelihood with severity/magnitude.** Even if an effect is likely, the magnitude of the effect may be small, thus it would be considered a minor impact overall and would not warrant prioritization. Are the consequences far reaching in space and time? How severe could they ultimately be (e.g., extinction)? How likely are they to be severe?
- **Current state of knowledge (data gaps)** should also be considered, particularly if the anticipated effect is large but poorly understood.

- **Balancing positive and negative effects** to different species.
- **Validation of risk**. Identification of species with high-risk profiles (collision risk, high avoidance, or displacement risk, etc.) may be model-driven, and the models often require ground-truthing/validation.

Comments on relevance to commercial fisheries

- **Include relevance to commercial and recreational fishing.** For some species/regions, and by some metrics, recreational fisheries have a larger economic and biological impact. Could include "relevance to fisheries of all sectors" as some consider for-hire to be a third sector not included in recreational fishing.
- **Include importance to landside-dependent fisheries economies.**
- **Key in addressing fisheries compensation**.
- **Consider how climate change will potentially shift fisheries distributions.**
- **Broaden this aspect to capture public perception of effects as well as predicted/actual effects.**

Comments on this criterion's relationship with other potential criteria

- **Urgency of need is related to informing decision-making.**
    - Urgency of need should be informed by regional development activity, including where there are active leases/auctions occurring.
    - There may be more urgency for information within development areas to help inform management practices, regulatory decision-making (including siting), and cumulative assessments.
    - Topics may be urgent if their findings help drive consensus around a particular issue and in turn aid in decision-making.
- **Likelihood of impact is dependent on prior knowledge** of the effect, which relates to the other criteria and thus perhaps should not be included in "urgency of need."

Criterion 2: Utility of Helping to Fill Key Data Gaps and Reduce Uncertainty

General comments from stakeholders

- **Determination of utility should be driven primarily by managers and decision makers** rather than just scientists/researchers.
- **The connection between the data gap and research objectives needs to be clear.**
- **Reducing uncertainty requires review of existing data to leverage knowledge** to help ensure study design is compatible with existing data. It also needs to address where it fits within what has been done and what needs to be done. If very little is known, then we need to establish standardized methods that others can follow in order to better collaborate and compare results.
- **Applicability.** Replication of past studies may be important in addition to filling key data gaps. There may be a lot of knowledge on an impact/effect, but it may not be applicable to other sites/regions or to specific resources.
- **Studies/research that have greater extensibility** (inferences to similar situations elsewhere) could be prioritized., with consideration of prioritizing gaps that have the broadest application.
- **High levels of uncertainty in marine systems**. The uncertainty in all of these studies will be quite large (maybe too large to draw any conclusions) given the dynamic and highly variable marine

environment. As a result, it may be challenging to find results without large associated uncertainty.

- **Importance of data availability**. Are some data gaps a result of inaccessible data that has already been collected? If so, we should focus on data access. How and where the data from a study are made available is an important aspect of meeting this criterion, such that findings and data can influence and leverage future work.
- **Attribution of impact**. This criterion should include establishing that the study is collecting enough data to answer questions around attribution of effects to offshore wind energy development to allow a thorough understanding of the underlying conditions leading to any observed phenomena/changes.
- **Utility should not be confused with immediacy of answers,** as some data gaps will require long-term monitoring projects.
- **How do you decide to off-ramp impacts or end some studies of risks?** For example, EMF impacts have been studied extensively and scientific studies are inconclusive. Should more funds be spent on this uncertainty or just conclude that more science will not solve this and move on?
- **By definition, all studies will reduce uncertainty**, but some will do a better job than others. The key issue here is in the identification of "key data gaps," which actually is the aim of applying the prioritization criteria. We also need to consider the importance of the uncertainty relative to other uncertainties.
- **Potential to foster a non-collaborative approach to research funding** (from a developer standpoint). There is already a lot of pressure to be doing something novel/unique, and to focus on areas not being addressed by others. It may be useful to remove the caveat 'not being addressed elsewhere' and replace it with 'recognized needs to advance the state of the ‘science' to prevent the tendency to become siloed.
- **Spatial and temporal scale.** Consider whether the "gap" in data or research is temporal or spatial relates to scale and it may be that some projects lack utility at a particular spatial or temporal scale.

Comments on defining key data gaps

- **Requires a narrow definition** as most research and monitoring could be viewed as addressing key data gaps, particularly because we currently have so many data gaps regarding offshore wind development. We should avoid research on pet projects that do fill knowledge gaps, but that might not necessarily be "key." We need to make clear the connection/application to impacts on wildlife and habitats (i.e., minimize focus on gaps in more basic research questions).
- **This assumes key data gaps are predefined**. There would be value in having published or consensus views about what the gaps are and how those gaps should be filled. It would be beneficial to develop an inclusive process that identifies the known data gaps and tries to anticipate the unknown data gaps.
- **“Key data gap" across taxa/interest/location may be different**. Should we identify synergistic data gaps across groups to rank them as "key"?
- **Key could relate to the importance but also the urgency of filling the gap** to enable co-existence of the key stakeholders and to inform decision-making.
- **Data gaps for well-studied vs. poorly studied topics**. Need to determine whether we want to prioritize topics that are well-studied (e.g., artificial reef effect) vs. building knowledge where

there is very little known (e.g., wind-wake effects on biological production and ecological processes).

- **We should ensure we are not prioritizing intractable data gaps.** We should cast priorities in terms of what can actually be measured/achieved. Stakeholders indicated that a clear pathway to statistically robust results is important and power analyses or other pre-study assessments to understand how much data are necessary to reduce uncertainty are important.
- **Both spatial and temporal elements** of data gaps should be considered.
- **Requires certainty that the research question is not being addressed adequately elsewhere.**

Comments on clearly defining uncertainty

- **Different types of uncertainty** require different strategies. Different types of uncertainty include model predictions, forecasts, decision outcomes, and relevance of key hypotheses. Uncertainty could also be defined as spatial-, temporal-, process-, or management-related. Some uncertainties require more modeling, statistical data, or validation studies, while others are unknown unknowns that are not solvable with current science. Uncertainty may be defined differently depending on the end user, so it is important to define the type of uncertainty being considered.
- **Conceptual ecological models** could help identify uncertainties, rate degree of uncertainty, and help define whether reducing the uncertainty for a given topic is critical.
- **New uncertainties may be introduced due to climate change** and our ability to disentangle effects from multiple stressors. There is an important distinction between uncertainty due to few studies vs. uncertainty due to variable/shifting baselines.
- **Aspects of hypothesis evaluation**. Rushing et al. (2020)[5] framework for reducing uncertainty may be a beneficial reference whereby hypothesis evaluation relates to 1) magnitude of uncertainty, 2) relevance of resolving uncertainty to meeting fundamental objectives, and 3) degree to which uncertainty could be reduced through research and monitoring.

Comments on this criterion's relationship with other potential criteria

- **Consider combining with the 'urgency of need' criterion above.** Elements of this may already be captured in the "urgency" criterion.
- **Connection with decision-making.** Utility needs to be defined based on impact for informing decisions – e.g., if we reduce uncertainty does it change any decision-making processes?

Criterion 3: Achievability

General comments from stakeholders

- **Criterion may be too subjective**, at least in early stages of planning of research and monitoring.
- **Funding levels should be matched to achievability**, with larger amounts awarded to better/stronger hypotheses and likelihood of meeting deadlines.
- **May be up to applicants (e.g., those proposing to conduct research) to define**.

[5] Rushing, C.S., M. Rubenstein, J.E. Lyons, and M.C. Runge. 2020. Using value of information to prioritize research needs for migratory bird management under climate change: a case study using federal land acquisition in the United States. Biological Reviews 95:1109-1130.

- **Implicitly favors "bench" or "simulation" studies** which will be "achievable" but may not have any validation or testing done to determine how well they work (outside of using the same data the models were built with).
- **Important in avoiding data rich-information poor (DRIP) science[6].** There must be a clear question that each study answers, a clear application for how that answer will influence development, and proof that it has not been answered elsewhere.
- **Should include effectiveness and whether results can be reasonably achieved and repeated.** Considerations include: 1) clarity of the objectives of the study, 2) achievability of those objectives, 3) timelines for data availability/dissemination, 4) balance or shorter- and longer-term studies, 5) expertise of the team, and 6) scalability and repeatability for validation.
- **Scalability, repeatable methods, and broad inference spaces**. We can consider scalability on the front end of the project such as: Can the research/study methods be implemented in other areas? Can the same methods be used when implemented on a much larger or much smaller scale (e.g., for research)? Can the field collection methods be used for both a research and monitoring study? Scalability on the back end would ask whether the results are applicable to a large area, do they scale up or down? We should prioritize projects with well-defined inference spaces in order for site-specific projects to inform regional development.
- **Consider splitting this criterion into multiple criteria.** Scientific rigor of a study, the amount of time a study takes to conduct properly, and necessary funding are all conflated.
- **Recognize that the hardest things to achieve may be the most important** (e.g., high risk, high reward proposals). Achievability is important to prevent waste, but some risk should be tolerated and welcomed, and its level articulated and justified, both by the funder and by the applicants, in order to move science forward.
- **Could also be considered 'reducibility,'** or how likely it is that we can reduce the uncertainty in the process/question.
- **Part of achievability is sustainability** given the funding boundaries, particularly for long-term monitoring. Many of the critical studies and questions surrounding OSW development cannot be answered or addressed on typical funding timelines (1-3 years).
- **Relates to understanding factors/drivers that influence outcomes.** We need to understand the why, not just the what.
- **Achievability may be influenced by regulatory timelines/approval processes** that could inhibit progress, particularly in terms of obtaining permits for research.
- **Relationship between monitoring and hypothesis-driven research.** Achievability relates more clearly to hypothesis-driven research. However, thoughtful, well-designed long-term monitoring will be important given various stages of offshore wind development, changing ocean conditions, and competing ocean uses.

Comments on this criterion's relationship with other potential criteria

- **This is also related to urgency** (i.e., is something so urgent that by the time results are available they are no longer relevant?), informing decision making, as well as leveraging partnerships.

[6] Wilding et al. 2017. Turning off the DRIP ('Data-rich, information-poor') – rationalizing monitoring with a focus on marine renewable energy developments and the benthos. Renewable and Sustainable Energy Review 74: 848-859.

There may be some great research and/or monitoring priorities that may not be achievable at the necessary temporal or spatial scale without leveraging resources across multiple entities.

Criterion 4: Leverage Existing Resources and Data Through Partnerships and Collaborations

General comments from stakeholders

- **This criterion should not be used to exclude proposed projects that are particularly innovative**. We want to encourage collaboration, but not at the expense of stifling creativity/innovation.
- **Lower priority than other criteria.** Developing partnerships could give a project a higher rating within the decision-making process but this seems to be a much lower priority than other criteria. Would add value in terms of economy, but not sure it is necessary. In some cases, existing data and resources may not be available, so this provision should be considered in this context. The quality of the science is not always related to partnerships.
- **This should be a requirement**, especially for looking forward at identifying future partnerships/collaborations using the results and availability/sharing of data for any others to conduct follow-up/validation studies. A track record of this should also be taken into consideration, if appropriate. We should consider how these collaboration efforts will be funded as well as the studies themselves.
- **Need to consider how best to avoid possible conflicts of interest.**
- **This is going to favor existing scientists who have established partnerships, data sets, and collaborations in a given area**. It may be tough for people to "break into" these groups and can create bias or "anchoring" so that only those with funding/partnerships get future funding. Give applicants the opportunity to describe the partnerships or collaborations they have attempted and why it may/may not make sense for a project. Conversely, funding entities or reviewers should consider if there are additional partners the applicant simply is unaware of or does not have a relationship with.
- **Should consider data transparency and availability/access of results**. Any pre-existing databases, portals, or apps should be contributed to (or created if needed) to encourage a broad place where all of this effort can be accessed and built upon and avoid overlapping effort/ or duplicated studies.
- **Scope beyond wildlife and fisheries**. All long-term monitoring needs should be considered, including meteorological and oceanographic monitoring, to reduce overlap and cost.
- **Relates to being able to make attribution of any observed changes** to the new presence of offshore wind, or other stressors (e.g., climate change) vs. natural variability in a dynamic ocean.

Comments on existing data

- **Comparability across studies at different geographic scales.** It is valuable to use existing data sets to conduct comparative analyses and encourage projects that bring together multiple research bodies to extend both temporal and spatial coverage.
- **Limitations of existing data.** Existing data helps with power analysis and survey scoping, but in some cases, it cannot replace new data collection due to mismatched resolution or other factors.
- **Incorporating existing data and resources to disentangle offshore wind-related impacts** from climate change is valuable**.**

- **Ensure the use of existing data is appropriate.** Leveraging such data can be a positive or a negative. We do not want to encourage reliance on sub-optimal data given that it is 'existing.'

Comments on partnerships and collaborations

- **Include partnerships with underrepresented/minority communities or entities** that will be impacted, like fishermen, as well as with outreach/extension programs.
- **There needs to be clear synthesis of what existing resources are used and how a proposed collaboration will further offshore wind development.**
- **Could help establish the vital roles of collaborations and existing data in setting benchmarks,** evaluating observed changes, and attributing those changes to the correct causes.
- **Could help improve buy-in from various parties** in addition to cost-effectiveness and efficiency. There is likely to be a lot of overlapping effort, and it needs to be highly coordinated and collaborative to be effective and efficient.
- **Could benefit from a framework** that defines how to more successfully build, establish, and maintain these research partnerships and collaborations.

Comments on this criterion's relationship with other potential criteria

- **Tightly linked to achievability**, so we may need to consider how they are related and what the goals are. Data sharing versus a multi-entity research project would leverage resources in very different ways.

Criterion 5: Contributes to Understanding of Regional- and Population-level Effects

General comments from stakeholders

- **Narrowly focused, local research can be informative and have value.** We need to have a better understanding of how to interpret the responses we observe in individuals from a population-level perspective, but it is equally important to focus on active development areas and individual-level effects as they are often used to build an understanding of population-level effects.
- **Scalability of results seems to be particularly vital.** Criteria should define whether a study contributes directly to this understanding or needs multiple follow-up studies to scale up results. A study should either provide a framework for understanding broad-scale effects or contribute to an existing knowledge base. This seems particularly relevant for geographic areas with multiple adjacent leases.
- **Beneficial to support broad level research** that can be revisited to help answer finer-level questions. In the case of passive acoustic data, for example, the largest question of species occurrence can be a primary goal, but then finer-detailed analyses and questions can be expanded on with the correct data collection.
- **We need a multiscale approach.** For initial site selection we need a regional-scale approach to broadly identify which areas are most important for wildlife. Once a development location has been decided, we then need site level analyses to understand mitigation and monitoring needs.
- **Inference about population-level effects may require a timeframe beyond most funding cycles**, but it is still essential.
- **Add a technology/methodology development component**. For example, the criterion as written may not apply to a project that proposes to test a novel technology. The "contributes"

term gets to this indirectly, but an important component of this will be standardizing metrics and methods for further research/monitoring of effects, as there are not likely to be many studies capable of addressing regional and population-level effects directly.

- **The title of this criterion does not capture a key part of the description of the criterion,** the "mechanistic aspects" of the subject under any proposed study. The contributions of the proposed work to the development, validation, and calibration of fundamental and ecosystem-level models will be quite important.

Comments on definitions of terms

- **The term "regional" needs a clear definition.** "Regional" is a spatial term and "population-level" aggregates space, time, and biological processes. Separation of spatial and temporal scales would be helpful. Should also add an environmental predictability component. In addition, there are some significant differences in species distributions and seasonal oceanographic features between the South Atlantic Bight and Mid-Atlantic Bight, and the Gulf of Maine which should be considered in how we define "regional."
- **Clearly define "sensible prediction"** and **"contribute"** as any study could conceptually contribute to population-level understanding.
- **Carefully define "population" and "effect."** A sensitivity analysis is required to put this "effect" in context.
- **Avoid using the word "ecosystem-based"** because that word is very often linked to managerial aspects. The key point is that knowledge on the effects of offshore wind development on ecosystem structure and functioning are crucial, in addition to effects on species of commercial and conservation interest.

Comments on this criterion's relationship with other potential criteria

- **Relates to leveraging resources**, as collaborations would allow regional use of data in the future.
- **Interplays with achievability** for understanding ecosystem effects, given variability and number of stressors acting on ecosystems.
- **Should be linked to 'so what?' of decision-making and adaptive management**.
- **Related to urgency criterion** to focus onto where those effects are most likely to be greatest and could have the greatest consequences.

Criterion 6: Informs Decision Making

General comments from stakeholders

- **May be difficult to evaluate** research needs under this criterion, given that our understanding of how to influence siting, permitting, and assessment is so rudimentary. Researchers often do not have a strong regulatory understanding and may not know what will help decision makers.
- **Recognize that valuable studies may inform future decision-making at a range of scales**, i.e., studies on existing construction are incredibly valuable, even if they do not inform that particular project, because they can inform future projects.
- **Temporal scale.** It is important to define this criterion to include short-term decision-making (i.e., siting, permitting) as well as long-term outcomes (i.e., application to other similar projects).

- **Consider subdividing this criterion related to the type of decision-making** – including siting, regulatory decisions, mitigation/compensation, and future decisions for the project (e.g., decommissioning/re-powering).
- **Criterion seems too broadly defined.** Whose decisions? How pivotal?
- **Focus should be on aspects of the development/permitting process that are currently highly subjective and qualitative, and on creating quantitative approaches and decision support tools that are transparent.**
- **It is important that existing research be leveraged to help the permitting/approval process for future work**. Recently, existing research and surveys have not been considered in informing new methods and research.
- **Consider adding in 'Best Management Practices'** to convey responsibility on the developer themselves to incorporate the most current research to inform decisions around pre-construction surveys, construction, operations, and eventual decommissioning of these projects.
- **Other potential additions** include decisions related to monitoring techniques, technologies, and protocols as well as the design and construction of turbines and associated infrastructure.
- **Consider interplay with political context**, as there are many other political and socioeconomic factors in play that have nothing to do with impacts on the environment. Thus, a focus should be on adaptive management.
- **Stakeholder representation.** Consider the degree of participation of industry, regulators, and others relevant groups in the proposed work, and their expressed interest and commitment in using the results of the proposed work in their decision making.
- **Requires buy-in from regulatory agencies** to effectively inform decisions.
- **If a topic does not support decision-making in some way, then would it be a priority?** Informing decision-makers is the entire basis of this prioritization and is fundamentally baked into the reasons why you want to know anything.

Comments on this criterion's relationship with other criteria

- **Consider if this falls under the "contributes to broader understanding"** and other criteria listed.
- **Timescale on which advice is needed relates to urgency.** The ability of research to inform decision making is very important, and therefore this criterion should be merged with the urgency criterion. Once a decision is made, with or without supporting data, the effects on the environment will happen. If the research is compensation-related, this is time sensitive as this is set prior to the Record of Decision for a project.

Next Steps

Feedback on the prioritization criteria will be considered by the regional synthesis workgroup, which includes representation from both ROSA and RWSC, and a revised version of these criteria will be developed for inclusion in the interim guidance for regional-scale research and monitoring. This meeting summary, as well as the interim guidance document, will be made publicly available on the E-TWG website: www.nyetwg.com/regional-synthesis-workgroup.

This summary, as well as the guidance for regional scale research and monitoring document that will include the updated criteria, are not intended to be standalone or final end products. Rather, both products are part of a larger process of communication, coordination, prioritization, and standardization of data collection and analysis that will help to make the research and monitoring efforts of the broader stakeholder community as effective as possible as the offshore wind industry progresses.

Appendix A: Meeting Agenda

Meeting Agenda: Criteria for Prioritization of Offshore Wind-Related Environmental and Fisheries Research

Hosted by the Responsible Offshore Science Alliance (ROSA) and the regional synthesis workgroup of the Offshore Wind Environmental Technical Working Group (E-TWG)

13 July 2022 (10:30 am - 12 pm EDT)

Overall Meeting Goal: Facilitate communication and coordination among groups that are focused on identifying research needs and/or funding regional research to better understand the effects of offshore wind energy development on wildlife, fisheries, and marine ecosystems.

Meeting Objectives:

- Discuss criteria for prioritizing research and monitoring on the environmental effects of offshore wind energy development: Are there any important criteria that are missing from the "straw dog" list of potential criteria? Do any criteria already on the list need to be clarified?
- Begin to identify a possible shared set of criteria with which to help prioritize future work.

Note: Each funding entity or research entity will have its own specific criteria for prioritizing research and monitoring efforts, which we are not trying to supersede. Rather, we hope to have a transparent conversation about ideas for general prioritization criteria that all entities may want to consider, and which they can augment with their own additional organization-specific criteria as needed.

Time	Agenda Item
10:30-10:45 am	**Welcome and Background**
10:45-11:10 am	**Potential Criteria for Prioritizing Research and Monitoring on the Environmental Effects of Offshore Wind Energy Development**
11:10-11:40 am	**Breakout Room Discussion**
11:40-11:55 am	**Full Group Discussion**
11:55-12:00 pm	**Wrap Up & Next Steps**

Appendix B: List of Participants

**Meeting participants listed alphabetically by last name*

First Name	Organization
Pete Aarrestad	CT DEEP Fisheries Division
Evan Adams	Biodiversity Research Institute
Katie Almeida	The Town Dock
Scott Ambrosia	Vineyard Wind
Michelle Bachman	New England Fishery Management Council
Lesley Baggett	AKRF
Helen Bailey	University of Maryland Center for Environmental Science
Tom Barracca	Stony Brook University
Cory Barringhaus	Cierco Energy
Katy Bland	NERACOOS and NH Sea Grant
Henry Bokuniewicz	Stony Brook University
Tracy Borneman	U.S. Fish and Wildlife Service
Sarah Borsetti	VIMS
Avalon Bristow	RWSC & MARCO
Joseph Brodie	AKRF
Allen Brooks	BOEM
Tracy Brunner	Western EcoSystems Technology, Inc.
Merry Camhi	Wildlife Conservation Society / New York Aquarium
Alicia Caporaso	Bureau of Ocean Energy Management
Kyle Cassidy	Ørsted
Yong Chen	Stony Brook University
David Ciochetto	Rhode Island
Jeff Clerc	Normandeau Associates
Kaycee Coleman	Rutgers University
Vicki Cornish	Marine Mammal Commission
Sarah Courbis	Advisian Worley Group
Dave Cowan	Diamond Offshore Wind
Corrie Curtice	Duke University Marine Geospatial Ecology Lab
Tobey Curtis	NOAA
Genevieve Davis	NOAA NEFSC
Greg DeCelles	Ørsted
Steven Degraer	Royal Belgian Institute of Natural Sciences
Anthony DiLernia	DiLernia Marine Services, Inc. / NYSERDA
Brian Dresser	Tetra Tech, Inc.
Keith Dunton	Monmouth University
Jennifer Dupont	Equinor
Michelle Duval	Mellivora Consulting
Kevin Dyer	Total Energies
Caglar Erdogan	Florida Tech
Bob Erickson	CSA Ocean Sciences Inc
Sharon Farris	Ocean Winds East, LLC
Pasha Feinberg	Independent eNGO Consultant
Marianne Ferguson	NMFS
Greg Forcey	Normandeau Associates, Inc.
Carol Foss	NH Audubon
Gwen Gallagher	NY Sea Grant
Garry George	Audubon
Brian Gervelis	INSPIRE Environmental
Katherine Gideon	RPS Group
Dan Giza	ASA Analysis & Communication, Inc.
Tre Glenn	BOEM

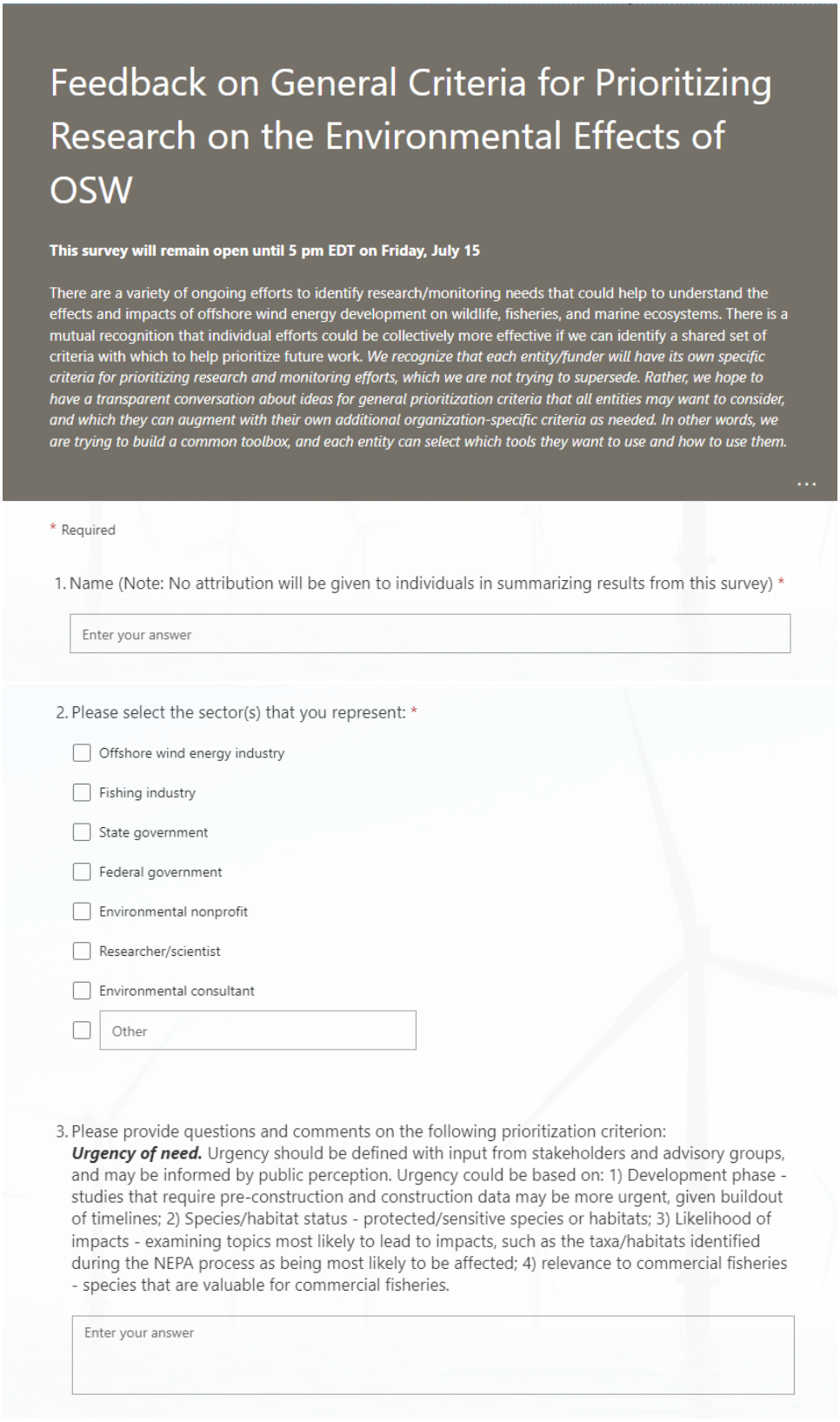
First Name	Organization
Chandra Goetsch	Biodiversity Research Institute
Holly Goyert	AECOM
Mike Graybill	SCLC
Rebecca Green	NREL
Thomas Grothues	Rutgers University, Department of Marine and Coastal Sciences
Julia Gulka	Biodiversity Research Institute
Patrick Halpin	Marine Geospatial Ecology Lab, Duke University
J. Christopher Haney	Terra Mar Applied Sciences, LLC
Emerson Hasbrouck	Cornell Univ.
Lyndie Hice-Dunton	ROSA
Fiona Hogan	RODA
Shay Howlin	WEST Inc.
Terry Jennings	Electric Power Research Institute
Hayley Karrigan	BOEM
Isabel Kaubisch	Total Energies Renewables
Atma Khalsa	Avangrid Renewables
Connie Kot	Duke University
Justin Krebs	AKRF, Inc.
Dan Kuchma	Tufts University
Juliet Lamb	The Nature Conservancy
Kira Lawrence	NJBPU Division of Clean Energy
Matthew Leslie	USGS
Weiting Liu	Observer Consultant
Ashley Lohr	NC Museum of Natural Sciences
Chris Manhard	AKRF, Inc.
Noelle Mathies	WSP
Christie Mazzeo-Pfoertner	NY Department of State
Chris McGuire	The Nature Conservancy
Megan McKinzie	ATN/MBARI
Elizabeth Methratta	NOAA
David Mizrahi	NJ Audubon
Laura Morales	AKRF
Trish Murphey	NC DMF
Annie Murphy	INSPIRE
Jim Murphy	National Wildlife Federation
Christian Newman	EPRI
Marianne Ferguson	NMFS
Mark Severy	Pacific Northwest National Laboratory
Mary Newton Lima	MIT Sea Grant
Matthew Leslie	USGS
Megan McKinzie	ATN/MBARI
Merry Camhi	Wildlife Conservation Society / New York Aquarium
Michelle Bachman	New England Fishery Management Council
Michelle Duval	Mellivora Consulting
Mike Pol	Responsible Offshore Science Alliance
Mike Graybill	SCLC
Nellie Tsipoura	NJ Audubon
Nick Sisson	NOAA Fisheries
Noelle Mathies	WSP
Orla O'Brien	New England Aquarium
Pasha Feinberg	Independent eNGO Consultant
Patricia Perez	Department of Energy
Patrick Halpin	Marine Geospatial Ecology Lab, Duke University
Pete Aarrestad	CT DEEP Fisheries Division
Rebecca Green	NREL

First Name	Organization
Reneé Reilly	NJDEP
Ruth Perry	Shell Renewables and Energy Solutions
Samantha Robinson	Delaware Division of Fish & Wildlife
Sarah Borsetti	VIMS
Sarah Courbis	Advisian Worley Group
Scott Ambrosia	Vineyard Wind
Sharon Farris	Ocean Winds East, LLC
Shay Howlin	WEST Inc.
Steven Degraer	Royal Belgian Institute of Natural Sciences
Susan Tuxbury	NOAA
Terry Jennings	Electric Power Research Institute
Thomas Grothues	Rutgers University, Department of Marine and Coastal Sciences
Thomas Shyka	NERACOOS
Tobey Curtis	NOAA
Tom Barracca	Stony Brook University
Tracy Brunner	Western EcoSystems Technology, Inc.
Tracy Borneman	U.S. Fish and Wildlife Service
Tre Glenn	BOEM
Trish Murphey	NC DMF
Vicki Cornish	Marine Mammal Commission
Weiting Liu	Observer Consultant
Will Shoup	ROSA/VIMS
Yong Chen	Stony Brook University

Support Staff

Bennett Brooks (Consensus Building Institute)
Julia Gulka (Biodiversity Research Institute)
Lindsey Popken (Cadmus Group)
Kate Williams (Biodiversity Research Institute)

Appendix C: Survey Questions



Feedback on General Criteria for Prioritizing Research on the Environmental Effects of OSW

This survey will remain open until 5 pm EDT on Friday, July 15

There are a variety of ongoing efforts to identify research/monitoring needs that could help to understand the effects and impacts of offshore wind energy development on wildlife, fisheries, and marine ecosystems. There is a mutual recognition that individual efforts could be collectively more effective if we can identify a shared set of criteria with which to help prioritize future work. *We recognize that each entity/funder will have its own specific criteria for prioritizing research and monitoring efforts, which we are not trying to supersede. Rather, we hope to have a transparent conversation about ideas for general prioritization criteria that all entities may want to consider, and which they can augment with their own additional organization-specific criteria as needed. In other words, we are trying to build a common toolbox, and each entity can select which tools they want to use and how to use them.*

...

* Required

1. Name (Note: No attribution will be given to individuals in summarizing results from this survey) *

Enter your answer

2. Please select the sector(s) that you represent: *

- [ ] Offshore wind energy industry
- [ ] Fishing industry
- [ ] State government
- [ ] Federal government
- [ ] Environmental nonprofit
- [ ] Researcher/scientist
- [ ] Environmental consultant
- [ ] Other

3. Please provide questions and comments on the following prioritization criterion:
Urgency of need. Urgency should be defined with input from stakeholders and advisory groups, and may be informed by public perception. Urgency could be based on: 1) Development phase - studies that require pre-construction and construction data may be more urgent, given buildout of timelines; 2) Species/habitat status - protected/sensitive species or habitats; 3) Likelihood of impacts - examining topics most likely to lead to impacts, such as the taxa/habitats identified during the NEPA process as being most likely to be affected; 4) relevance to commercial fisheries - species that are valuable for commercial fisheries.

Enter your answer

4. How should this "urgency of need" criterion be applied? For example, if a funder is assessing a specific research project to determine how well it meets this criterion, should that assessment be a simple "yes, it meets this criterion", or something more like "It's a 3 out of 5 for how well it meets this criterion"?

- ◯ Yes/no
- ◯ 5-point scale
- ◯ Other

5. Please provide questions and comments on the following prioritization criterion: ***Utility for helping to fill key data gaps and reduce uncertainty.*** At what level does the study contribute to filling key data gaps that are not being addressed elsewhere? How complete/informative an answer would the individual study provide, including improving our understanding of associated uncertainty?

Enter your answer

6. How should this "utility" criterion be applied? For example, if a funder is assessing a specific research project to determine how well it meets this criterion, should that assessment be a simple "yes, it meets this criterion", or something more like "It's a 3 out of 5 for how well it meets this criterion"?

- ◯ Yes/no
- ◯ 5-point scale
- ◯ Other

7. Please provide questions and comments on the following prioritization criterion: ***Achievability.*** This includes effective study design and testability of hypotheses, and whether the research can be achieved on the necessary timeline and within the boundaries of funding. May also include the amount of data needed to answer the question.

Enter your answer

8. How should this "achievability" criterion be applied? For example, if a funder is assessing a specific research project to determine how well it meets this criterion, should that assessment be a simple "yes, it meets this criterion", or something more like "It's a 3 out of 5 for how well it meets this criterion"?

- ◯ Yes/no
- ◯ 5-point scale
- ◯ Other

9. Please provide questions and comments on the following prioritization criterion:
Leverages existing resources and data through partnerships and collaborations. Collaborations and partnerships among researchers, government agencies, regional groups, and others are important for multiple reasons, including cost-effectiveness. Building on existing data may also lead to greater efficiency and immediacy of results.

Enter your answer

10. How should this "leverages existing resources" criterion be applied? For example, if a funder is assessing a specific research project to determine how well it meets this criterion, should that assessment be a simple "yes, it meets this criterion", or something more like "It's a 3 out of 5 for how well it meets this criterion"?

- ◯ Yes/no
- ◯ 5-point scale
- ◯ Other

11. Please provide questions and comments on the following prioritization criterion:
Contributes to understanding of regional- and population-level effects. This includes ecosystem-based and cumulative effects studies. If we can understand mechanistic aspects of responses, we can make sensible predictions for other regionals/species without monitoring everything everywhere.

Enter your answer

12. How should this "contributes to a broader understanding" criterion be applied? For example, if a funder is assessing a specific research project to determine how well it meets this criterion, should that assessment be a simple "yes, it meets this criterion", or something more like "It's a 3 out of 5 for how well it meets this criterion"?

- ◯ Yes/no
- ◯ 5-point scale
- ◯ Other

13. Please provide questions and comments on the following prioritization criterion:
Informs decision making. This includes decisions such as siting, permitting, assessment of site-level impacts, adaptive management of projects, and cumulative impact assessments. This could also include development of decision-support tools.

Enter your answer

14. How should this "informs decision-making" criterion be applied? For example, if a funder is assessing a specific research project to determine how well it meets this criterion, should that assessment be a simple "yes, it meets this criterion", or something more like "It's a 3 out of 5 for how well it meets this criterion"?

- ◯ Yes/no
- ◯ 5-point scale
- ◯ Other

15. Are there any other general prioritization criteria that you think should be considered?

Enter your answer

16. Other comments/questions on this effort?

Enter your answer

Submit