Modern Fisheries Engineering

Realizing a Healthy and Sustainable Marine Ecosystem

Edited by
Stephen A. Bortone and Shinya Otake


CRC Press
Taylor & Francis Group
Boca Raton London New York

CRC Press is an imprint of the
Taylor & Francis Group, an **informa** business

First edition published 2020
by CRC Press
6000 Broken Sound Parkway NW, Suite 300, Boca Raton, FL 33487-2742

and by CRC Press
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

CRC Press is an imprint of Taylor & Francis Group, LLC

ISBN: [978-0-367-34792-5] (hbk)
ISBN: [978-0-429-32803-9] (ebk)

Typeset in Times
by Deanta Global Publishing Services, Chennai, India

12 Offshore Wind Energy and the Fishing Industry in the Northeastern USA

Michael V. Pol and Kathryn H. Ford

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ABSTRACT

The offshore wind industry in the northeastern United States is on the verge of developing more than a 21 GW capacity in the next few years. The first offshore wind farm proposed in the region was never built, in part due to stakeholder lawsuits. Therefore, outreach to stakeholders has been emphasized as a necessity for newer projects. Fishing stakeholders represent economically and culturally important industries and are potentially heavily impacted by the development of offshore wind farms, so robust efforts have been made to engage fishing stakeholders through many forms of outreach, both formal and informal. Working groups organized by individual states have successfully identified several key issues from fishing stakeholders' perspectives, including access and safety, transit corridors, and impacts on marine resources. The fishing stakeholders have also influenced offshore wind development designs, research priorities, construction timing, and financial compensation arrangements. However, several conflicts remain unresolved and recent press reporting indicates that fishing stakeholders feel voiceless and powerless in the process of offshore wind energy development, potentially threatening development. Further outreach efforts should: establish a process to engage stakeholders at crucial offshore wind farm development steps such as siting and turbine placement, not just during permit review; establish the means and expectations for conflict resolution; build trust between developers and fishing stakeholders; and should seek help and advice from social sciences.

INTRODUCTION

Electrical generating capacity in the United States of America (USA) has declined due to the decreasing economic viability of coal-burning plants and the senescence of nuclear plants (ISO New England 2019). A possible renewable, low-carbon energy replacement is wind energy, as abundant wind resources are available in the middle of the country and along its coastlines (AWS Truepower 2012). Currently, infrastructure is lacking to distribute electricity generated by wind farms from the central USA to the demand centers along the coasts. The coastal waters of the shallow continental shelf off the Atlantic coast of the USA are close to the demand centers, and are targeted for renewable energy infrastructure development, primarily through the development of offshore wind farms.

Projects in shelf waters under federal jurisdiction in the USA require offshore wind developers to lease their proposed site from the Bureau of Ocean Energy Management (BOEM), the lead federal agency for offshore wind development. There is a competitive lease issuance process, after which developers begin to study their lease area, design a turbine array, and apply for permits to build their offshore wind farm. As of May 2019, 15 leases with a total area of 7,000 km^2 have been issued for offshore wind farm development on the Atlantic coast off the states of Massachusetts, Rhode Island, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina (Figure 12.1). As many as 3,000 individual turbines of 7 MW capacity or higher are expected to be built during the next decade, creating a total generating capacity of 21 GW (Bureau of Ocean Energy Management 2019).

The first project in the USA to lease an area to develop an offshore wind farm, Cape Wind, was located off the coast of Massachusetts. The permitting process for the 130-turbine, 450 MW project was completed, but construction faced lengthy delays due to lawsuits by stakeholders including non-governmental groups and fishing stakeholders. Ultimately, the project was not built as a result of these delays (Seelye 2017). In an effort to minimize delays in future projects, the federal government created Wind Energy Areas. Wind Energy Areas are designated through a public process that assesses ecological value and stakeholder conflict and attempts to identify regions where leasing for offshore wind development will have fewer adverse impacts. Developers are not required to lease

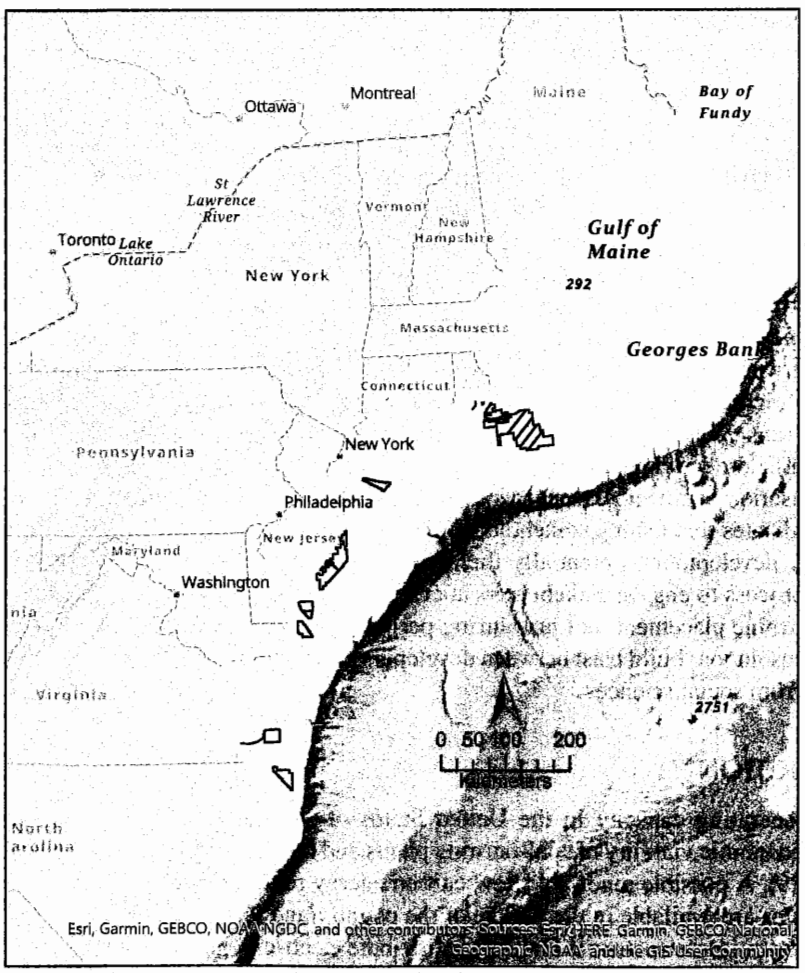


FIGURE 12.1 Areas leased (polygons outlined in black) for offshore wind farm development on the Atlantic coast of the USA in May 2019.

within a Wind Energy Area, but are encouraged to do so. To date, all leased areas are within a Wind Energy Area and all Wind Energy Areas are fully leased. Planning is underway for additional Wind Energy Areas off the coasts of New York, New Jersey, and further south. Planning is also ongoing for Wind Energy Areas northward in the Gulf of Maine and along the USA's west coast (Bureau of Ocean Energy Management 2019).

Continental shelf waters are used by a large variety of stakeholders including the US military, mineral interests, shippers, recreational boaters, and recreational and commercial fishermen (Nicholson et al. 2016). Therefore, despite efforts to minimize conflicts, Wind Energy Areas still overlap with other users. All of the current leased areas are partially or entirely open to recreational and commercial fishing and are anticipated to remain accessible to fishing after construction of offshore wind farms. Fishing has a high economic and cultural value in the USA and fishing stakeholders are a large and diverse group of both recreational and commercial fishing interests. Commercial fishing stakeholders include industries using a variety of commercial gears (otter trawls, scallop dredges, hydraulic clam dredges, bottom gill nets, and pots) to target midwater fish, groundfish, and shellfish (Pol and Carr 2000). Some of these commercial entities fish across the areas planned for wind development and land their catches in multiple states along the Atlantic coast. The recreational fishing stakeholders are primarily individual anglers using hook-and-line from a variety of platforms: private/rental boats, party/charter boats, and the shoreline. The majority of recreational fishing in the USA takes place on the Atlantic coast and is an important economic sector in all states on the Atlantic coast (National Marine Fisheries Service 2018). There is no known subsistence fishing in Wind Energy Areas or areas leased for wind energy development.

Federal law, through the US National Environmental Policy Act, requires the evaluation of potential socio-economic impacts of any development, including offshore wind farms. Due to the economic and cultural value of fishing in the USA, offshore wind farm development must by law account for adverse socio-economic impacts on fishing stakeholders and their home ports. Since offshore wind farms connect to shore through power cables that cross state, regional/county, and local boundaries, developers are also subject to permitting processes across multiple government jurisdictions and agencies. In general, outreach to stakeholders is required at each stage of the permitting process and by each governmental entity. Outreach methods include the solicitation of public comments on permitting documents, holding public meetings to discuss projects and project changes, and, in the case of offshore wind, requiring targeted communication with fishing stakeholders.

The purpose of outreach to stakeholders is to modify proposed offshore wind farms to minimize adverse effects on the environment and the stakeholders using the project site. For the purposes of this chapter, successful outreach is defined as creating engagement. Engagement connotes a level of stakeholder participation that results in modifications of offshore wind farms. Engagement is viewed by developers and regulators alike as improving the likelihood of successful permit application by decreasing opposition (Bureau of Ocean Energy Management 2015).

This chapter describes the types and methods of outreach used to communicate with fishing stakeholders and the resulting level of engagement of the fishing stakeholders in Massachusetts. We also assess how successful fishing stakeholder engagement has been in Massachusetts as of September 2019. Outreach is still ongoing and, therefore, different approaches are described and evaluated based on their immediate effectiveness.

MATERIALS AND METHODS

At the federal level, the permitting process for development mandates stakeholder outreach via public comment and also during subsequent appeals processes. In Massachusetts, reviews at the state, regional/county, and local stages of the permitting processes also provide opportunities for public comment. The typical process includes public notice of the action and solicitation of written comments at each stage. Public hearings and informational sessions may also be held to solicit comments (Bureau of Ocean Energy Management 2016) and are required for larger developments.

Other activities related to offshore wind farm development may be initiated that also require outreach via public notices, hearings, and comment periods. For example, in addition to permitting and public hearings for individual offshore wind farms, other public hearings were held by the US Coast Guard (USCG) to prepare for the possibility of altering vessel traffic in response to offshore wind farm construction and maintenance activities (United States Coast Guard 2015). At the federal level, permitting documents and the public comment period are organized by the lead federal agency of that action (e.g., BOEM or the USCG), whereas at the state, regional/county, and local levels the developer organizes the permitting documents and responses to comments, while the regulatory agency notifies the public and receives public comment.

Outreach requires identifying and communicating with affected stakeholders, which can be difficult for project developers who may be unfamiliar with the region. To address this challenge, BOEM developed guidelines for outreach to fishing industries affected by wind energy development. These guidelines are based on an outreach model from the United Kingdom (Fishing Liaison with Offshore Wind and Wet Renewables Group 2014), as modified by feedback gathered at public workshops with US fishing stakeholders (Bureau of Ocean Energy Management 2014). These guidelines recommend the development of communication plans that use Fisheries Liaisons and Fisheries Representatives. Liaisons are individuals hired by an offshore wind developer to be the developer's primary point of contact with fishing stakeholders. Fisheries Representatives are the fishing stakeholders' primary point of contact through which they can communicate concerns to the developer (Bureau of Ocean Energy Management 2015).

The Fisheries Liaisons employed by each offshore wind farm developer typically have prior experience, name recognition, and credibility in the region, and may have fished commercially in the past. Fisheries Representatives are either actively fishing or representatives of organizations which are often organized according to fishing gear types or species-targeted, such as groundfishing and scalloping. Liaisons and Representatives attend all outreach events and communicate with fishermen directly through conversations with individuals or small groups as a means to engage fishing stakeholders. Either through Liaisons or directly, developers use electronic communication media including email lists, social media, and text messages to alert fishermen of operations and changes in operations in lease areas, including geotechnical, fisheries, and other surveys.

Additional communication methods have evolved in each state to accommodate the needs and requests of developers, fishing stakeholders, or by government agencies. These methods vary in formality, structure, and function. The most formal process was developed in the state of Rhode Island, which legislated a process through its coastal zone management program that empowered an appointed board of commercial and recreational fishermen to speak for, and to negotiate with, developers on behalf of the fishing industry (McCann 2010). The Rhode Island Fisheries Advisory Board is formally organized, with defined membership that represents specific commercial gear types and recreational fishing sectors, as well as specific geographical regions. The Fisheries Advisory Board meets regularly, has a defined remit, posts minutes on a website, and some meetings are recorded.

In Massachusetts, the coastal zone management office and energy development agency created the Massachusetts Fisheries Working Group. This working group is informal, with open membership, no fixed terms of reference, and meetings on an as-needed basis. These meetings augment the BOEM planning process and provide a forum for fishing stakeholders to communicate directly with BOEM and offshore wind farm developers. Organizers disseminate information about upcoming meetings and public comment periods related to wind energy development to the Fisheries Working Group through an email list organized by the Massachusetts state agencies for this purpose. The Fisheries Working Group has met since 2009 primarily in in-person meetings. Since 2014, agendas have been available online (Massachusetts 2019).

The state of New York hired a mediator to serve as a point of contact for fishing stakeholders during the initial planning phases for locating offshore wind farms. In later phases of planning, the energy authority, marine fisheries agency, and the department of state invited specific fishing industry members to form the Fisheries Technical Working Group to provide guidance and advice on

how to implement offshore wind farms. The group developed a framework document to define mission, objectives, and membership criteria (New York 2018). This group uses facilitators and remote attendance technologies, records its meetings, and produces minutes and work items.

For each of these working groups, government staff scientists and consultants generate information to be provided to the group to stimulate and to advance discussions on relevant topics. Along with Fisheries Liaisons and Fisheries Representatives, representatives from offshore wind farm developers and fishing stakeholders attend the meetings. These state working groups seek fishing stakeholder engagement on major topics, such as economic analyses and necessary research studies.

Regional fishery management organizations do not have a statutory role in the permitting process, but have also communicated information to fishing stakeholders via websites, email distributions, and by holding informational sessions. The Mid-Atlantic and New England Fishery Management Councils developed policies with respect to best management practices for offshore wind farm development and engagement of fishing industries (http://www.mafmc.org/northeast-offshore%20wind).

Private individuals have also communicated with fishing stakeholders. In at least one case, an interested party traveled on his own to Europe to speak to fishermen and to report back to US-based fishing stakeholders.

Through involvement in the Massachusetts and New York fisheries working groups, and participation in multiple task forces, research discussions, and individual conversations with fishermen, personal reflections are provided here on the success of stakeholder outreach efforts at generating engagement with fishing stakeholders to date. This discussion is focused on experience in Massachusetts related to the Massachusetts Wind Energy Area and the Fisheries Working Group.

RESULTS AND DISCUSSION

The minimum expectations for stakeholder outreach associated with the permitting of construction projects in the USA and suggested by BOEM appear to have been exceeded for offshore wind farm development. Government agencies, non-governmental organizations, and offshore wind farm developers have provided multiple communication pathways and outreach opportunities to engage fishing stakeholders both within and outside the formal permitting process.

Attendance and participation at meetings of the state-based working groups was, and remains, high, which can be interpreted as a validation of the value of the meetings and as a sign of engagement. Fishing stakeholders commonly respond to public comment periods associated with permitting. Written and verbal concerns and comments by these stakeholders have identified many topics at broad and specific levels. Concerns expressed by fishing stakeholders related to the design, construction, and operation of offshore wind farms focus on five main subjects: the specific location of Wind Energy Areas, leases, and offshore wind farms; obstruction of traditional transit routes; loss of fishing grounds due to inability or unwillingness to fish among the turbines; impacts on fishery resources; impacts on safety due to radar interference by turbines; and access for search-and-rescue personnel. The identification of these issues is helpful to government agencies and developers and indicates engagement by fishing stakeholders.

Further indication of engagement is that fishermen have identified many issues related to risk of impact from wind farm development on fishery resources, particularly the artificial reef effect, disruption of larval settlement, and the potential for interaction with fish sensitive to electromagnetic fields. These issues also concern scientists and managers (Massachusetts Division of Marine Fisheries 2018). Fishing stakeholders have been vocal advocates of the need to move beyond monitoring impacts within a single leased area and to meaningfully address cumulative impacts resulting from multiple offshore wind farms through the development of research plans to measure or mitigate cumulative impacts. Fishing stakeholder engagement is evident in their feedback on how to fund and manage programs. Fishing stakeholder concerns have led to additional funding for fisheries-related research for projects undertaken by BOEM, the USCG, offshore wind developers,

and through state-supported research. Notably, a regional science organization, the Responsible Offshore Science Alliance (ROSA) was recently created. The Alliance is a collaboration among governments, developers, and the fishing industries intending to advance regional research and monitoring of fisheries and offshore wind interactions in federal waters.

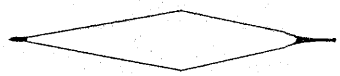
Through engagement of fishing stakeholders, the need for appropriate spacing and corridors for fishing and transit to offshore fishing grounds was identified after leases had been issued to developers. The distance between turbine towers is relevant for fishing within offshore wind farms, since certain fisheries, particularly those using otter trawls, scallop dredges, or long-lines, have restricted mobility and need large areas for productive fishing. The first offshore wind farm developer held workshops to discuss fishing within offshore wind farms with fishing stakeholders in towns located closest to the offshore wind farm development. Fishing stakeholder engagement thus led to the first proposal for tower spacing and orientation. When the proposal was made public, fishing stakeholders that represented a larger geographic region were critical, and multiple conflicts resulted. Attempts were made to reach a consensus on the tower spacing and orientation. Information presented to fisheries working groups to facilitate discussion and resolution included scaled drawings that illustrated the relative scale of the gear to the towers (Figure 12.2), fishermen's chart plots, and federal vessel-tracking data. Regardless of the information available, fishing stakeholders counterproposed as great a distance as possible between towers. To accommodate this concern, developers altered the distance between towers to 0.7–1.0 nm (1.3–1.9 km).

The second offshore wind farm developer held workshops with fishing stakeholders that represented a broader, regional perspective. These workshops led to a second proposal using a minimum of 1 nm (1.9 km) spacing between towers and a standard north–south–east–west orientation. The developer that made the first proposal eventually agreed to use the tower spacing and orientation from the second proposal in later phases of wind farm development. This adjustment seemed to be a successful resolution of an issue identified through stakeholder engagement.

However, as discussions progressed, fishing stakeholders began to assert that fishing, especially with otter trawls and scallop dredges, could not occur within offshore wind farms regardless of the turbine spacing, due to radar interference and adverse weather conditions increasing the risk of allision. Additionally, the increased allision risk was linked to changes in vessel insurance policies that exclude coverage in offshore wind farms. The perceived level of risk of mobile gear interaction varied, but many stakeholders suggested that mobile gear fisheries simply would not be able to operate within offshore wind farms under any proposed configurations and distances.

A more nuanced conversation on optimal tower spacing was of interest to managers. If fishing is not possible in an offshore wind farm regardless of tower spacing, then the spacing could, in theory, be optimized to reduce the overall footprint of the development. Consequently, this arrangement could reduce habitat impacts and/or maximize power generation efficiency within the wind farm location. Maximization of efficiency could also result in less need for additional Wind Energy Areas and less area leased overall. However, fishing stakeholders also opposed closer spacing of the towers, presumably to protect potential fishing opportunities. A result was that several proposed wind developments have towers maximally spaced to be compatible with fishing. If fishing stakeholders are correct in asserting that they cannot fish within wind farms regardless of tower spacing, wider tower spacing may result in unnecessary costs to the wind farm developer and additional area occupied without achieving the goal of enabling fishing within. Nevertheless, accommodating fishing activities remains a priority, and the state of New York has provided funding to study mobile gear access in potential Wind Energy Areas. The conflict has also helped identify a need to better understand how alternative fishing gear could enable fishing in wind farms.

Fishing stakeholders also transit through the lease areas to access fishing grounds. The possible loss of this use of the areas was identified after leases were issued. To establish transit corridors, multiple meetings were held by the Massachusetts Fisheries Working Group to determine corridor widths and desired routes. These meetings led to the development of conflicting plans and



Turbine base

Typical otter trawl, Northeastern USA

Vessel length:	87 ft
Turbine distance:	0.78 nm
Turbine base:	70 ft x 70 ft
Depth:	30 fm
Wire ratio:	4.17:1
Wire out:	125 fm
Ground cables (with legs):	80 fm
Door spread:	47 fm
Net length:	240 ft
Total (bow to codend):	1540 ft

Note – gear dimensions vary with conditions, species, captain's preference and other factors

Drawn by Mike Pol – 13 August 2017

FIGURE 12.2 Scale drawing of a typical New England otter trawler within a proposed wind array of 0.7 nm (1.3 km) spacing.

recommendations and no consensus was achieved. The lack of resolution in part led to a formal analysis by the USCG, the federal agency responsible for navigation. The analysis, currently underway, provides additional stakeholder engagement opportunities and will determine if formal vessel routing measures are needed. Some meetings held for this study appeared sparsely attended by fishing stakeholders. Wind Energy Areas currently being planned in the New York Bight identified transit corridors by using vessel-tracking technology and through stakeholder engagement. These areas will not be leased for offshore wind farm development.

Fishing stakeholders were also influential in the development of compensatory mitigation plans that address the potential loss of revenue and fishing opportunity within offshore wind farms. Financial compensation arrangements were discussed at public and individual meetings with fishing stakeholders and a claims procedure for an existing 5-turbine offshore wind farm was developed with fishing stakeholders. The fishing stakeholders in both Rhode Island and Massachusetts were influential in assessing the quality and form of financial compensation agreements and their engagement modified the total compensation amount and compensation process.

Another example of engagement was the development of a specific sequence of construction activities for an offshore export cable that connects the offshore wind farm to the electrical grid on land. The cable was traversing squid grounds that have a short fishing season. In order to minimize the impact on the fishing activity, the cable-laying was timed to avoid the squid season.

As demonstrated above, fishing stakeholders have influenced the identification of research topics and the funding and initiation of research projects and financial compensation, the spacing and orientation of turbines within wind farms, the development of transit corridors, and the timing of construction. These examples suggest that outreach has been successful and has led to engagement, resulting in modifications to offshore wind farms to minimize adverse effects on fishing stakeholders. However, much conflict still exists. Both resolved and unresolved conflicts continue to be raised at meetings with fishing stakeholders after nearly ten years of discussion. Recently, fishing industry publications have described fishing stakeholders as being "drowned out," "shouted down," not being heard, and generally disrespected, thus concluding that outreach to fishing stakeholders has failed (Hathaway 2019, Parry 2019). This negative representation of interaction is inconsistent with the significant role outlined above.

The perception of lack of participation and engagement may delay development through resistance as previously occurred for Cape Wind. The first proposed offshore wind project, Vineyard Wind, south of Massachusetts, recently faced local and federal permit delays linked to disgruntled fishing stakeholders due to inadequate fisheries impact assessments.

Permitting delays due to unresolved issues and a perception of inadequate stakeholder engagement suggest that outreach and communication strategies are poorly managed, insufficient, or overconfident. More importantly, inadequate stakeholder engagement now and earlier may have resulted in flawed offshore wind farm siting and design decisions with far-reaching consequences.

The expectation by management agencies that a communication and outreach strategy will result in engagement by fishing stakeholders that will identify and resolve conflict and thus achieve co-existence of the two industries may be, in retrospect, naïve or an incorrect implicit assumption. Differing incentives of the different groups involved in outreach can lessen the degree of engagement. Managers and offshore wind developers want to develop renewable energy for policy and financial goals, but fishing stakeholders have less incentive to alter the status quo. Unspoken and unrecognized assumptions about the commonality of motivations and attitudes among fishing stakeholders, scientists, and managers and within these groups exist and act as obstacles to better understanding and conflict resolution. For example, co-existence of fisheries and wind energy development was declared at the Massachusetts Fisheries Working Group as a common goal, but not formally committed to or discussed by fishing stakeholders. Also, agencies and others commonly underestimate the complexity of attitudes among the fishing stakeholders with regard to change (Eayrs and Pol 2018). Engagement and conflict resolution might be more successful if the common benefits of renewable energy development were established and emphasized over individual or group impact. As required by statute and the usual practice, the framing of outreach efforts has concentrated on negative impacts to individual fishing operations. However, potential impacts to fishing operations by climate change may be far greater than offshore wind farm development. Replacing the recent loss of generating capacity by continuing previous energy policy via offshore oil and gas developments in this region is possible and would likely result in more sévere impacts to fishing operations. These impacts are why, in part, there is a legislative mandate to replace energy supply to mitigate climate change brought on by greenhouse gas emissions. The potential impacts of maintaining the status quo and not building offshore wind farms have not been presented in the context of fishing stakeholder outreach for offshore wind farm development.

Other variables may have limited the effectiveness of outreach to fishing stakeholders. At the beginning of planning for offshore wind, the failure of the Cape Wind project introduced a natural skepticism that wind development would be successful, in turn limiting the participation and engagement of fishing stakeholders for subsequent offshore wind development activities. Despite multiple public meetings and formal comment periods over 5 years, after the first Wind Energy

Area was defined, many fishing stakeholders objected to the methods and outcomes. Fishing stakeholders indicated that fishing effort in the Wind Energy Area was underestimated due to known flaws of their self-reports and incomplete coverage by other monitoring systems. The insufficient stakeholder engagement during the siting of the Wind Energy Area consequently eroded trust during later actions. A marked increase in participation in outreach activities as specific potential threats to individual fishing stakeholders was observed once wind farm developers acquired leases and proposed turbine layouts. However, the distrust developed in the Wind Energy Area planning appeared to result in less cooperative conversations about how to address fishing stakeholder concerns through modifications of planned offshore wind farm developments.

The stakeholder outreach for the development of this new industry had other inherent flaws. Providing feedback on specific, consequential decisions in the development process has been difficult because of the timing of decisions. For example, for the Vineyard Wind project, the decision on spacing and orientation of the towers preceded any formal opportunities to comment or any requirement for stakeholder outreach. The Massachusetts Fisheries Working Group provided an opportunity to hear from developers and for the developers to interact with stakeholders. However, there was no process to discuss multiple layout options and the costs and benefits of those options, receive stakeholder feedback publicly, and come to a resolution.

A similar complicating factor in the permitting process also related to timing was the requirement that financial compensation for loss of fishing access be negotiated with fishing stakeholders prior to issuance of permits. Some permit issuance is on predetermined timelines related to financial incentives to the developers, with unclear capacity to modify the timelines. As a result, negotiations may have necessarily proceeded as rushed compromises rather than as thoughtful discussions. And, despite the level of involvement of the fishing stakeholders in the development of financial compensation agreements and a transparent procedure for establishing the level of compensation, the agreement approved for Vineyard Wind was perceived as unsatisfactory by some fishing stakeholders.

A clear shortcoming of the engagement process is that while conflicts are identified, a process for conflict resolution was never formalized or prioritized. For example, when the need for transit corridors was identified in the Massachusetts Wind Energy Area, subsequent meetings and discussions focused on producing a resolution were insufficiently planned and documented and lacked a systematic approach to solicit information from stakeholders and to resolve the issue. Failing to resolve conflicts such as this one has led to delays, further erosion of trust, and the need to revisit conflicts in subsequent meetings.

The reported perception and declaration of limited influence on decision-making by fishing stakeholders has itself increased distrust in the process, likely further reducing the effectiveness of future engagement efforts. Understanding and trust need to be re-established and maintained in outreach and engagement efforts by regulators and the wind energy developers with fishery stakeholders for successful development of wind energy. At the same time, the fishing stakeholders need to appreciate their influence and continue to engage constructively. The emergence of new organizations such as the Responsible Offshore Science Alliance is evidence of attempts at more constructive approaches to engagement.

CONCLUSIONS

Outreach and communication for the purposes of engagement could be judged to have been successful, but nevertheless, recent delays of the wind development process have resulted. Several explanations for perceived and real failures of the stakeholder engagement process for offshore wind are suggested. Among these are: unspoken assumptions about common goals and uncooperative approaches on the part of the stakeholders, poor timing of engagement on key decision points, and inadequate framing of discussions and conflict resolution by those responsible for outreach. Initially, limited stakeholder engagement was driven by the perception that offshore wind farm development was not immediate and it had a low probability of success. Offshore wind farm development is now

viewed by many stakeholders as a present threat. To maximize the effectiveness of engagement with fishing stakeholders, outreach efforts should focus on 1) building or rebuilding trust through the creation of common goals by providing more information about the need for offshore wind and potential impacts of other energy developments; 2) building engagement around crucial development steps preceding permitting; and 3) identifying a clearer approach to conflict resolution. Conflict resolution may require specialized meeting structures and approaches. We recommend the use of social sciences in developing these strategies. To this end, a growing literature on the engagement of the public in wind energy development deserves fuller attention (e.g., Haggett 2011).

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