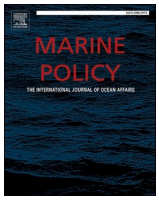
Marine Policy 186 (2026) 107002

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol



The power of place: The role of place attachment in the offshore wind debate in the Gulf of Maine

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ARTICLE INFO

Keywords:
Place attachment
Interviews
Social acceptance
Fisheries
Lobstering
Offshore wind

ABSTRACT

The momentum to develop offshore wind has built across the globe in recent years. In the United States, previous federal climate goals prioritized decreasing dependence on fossil fuels, and offshore wind was identified as a key technology in the clean energy transition. The state of Maine has proposed two projects to test floating turbine technology and research the ecological, economic, and social impacts of offshore wind development. Commercial lobstermen are one stakeholder group that has been outspoken about these projects. Here, we examine the role of place attachment—or the elements of a place that evolve to have meaning among individuals and communities—in the perspectives of commercial lobstermen regarding the development of offshore wind in the Gulf of Maine. We analyzed 55 written public testimonies and conducted 16 semi-structured phone interviews with randomly selected lobstermen. Written public testimony showed higher rates of opposition than randomized interviews. A qualitative analysis of these data indicated the presence of place attachment among commercial lobstermen and highlighted four prominent themes that encapsulated both positive and negative attitudes towards offshore wind: 1) community reliance on lobstering; 2) communal ties; 3) stewardship of the ocean; and 4) costs for local communities. These findings suggest that contextualizing offshore wind management among other place-based challenges and grounding engagement efforts at the local scale could better address the specific priorities and concerns of communities. Additionally, these findings raise considerations about compensation strategies for the negative impacts of offshore wind development to account for both economic and social impacts.

1. Introduction

The renewable energy transition is occurring rapidly. As climate change worsens globally, many governments have committed to decarbonizing energy grids and incentivizing renewable energy generation. Offshore wind is an attractive technology for generating renewable energy and has been identified as a key technology in the clean energy transition. Asia and Europe account for 99.9 % of the world's offshore wind capacity [3], while in the United States (U.S.), there has been growing interest in developing offshore wind, with wind farms slowly becoming operational [37]. These developments were advanced substantially with the Biden-Harris Administration's prioritization of offshore wind expansion to reach federal climate goals. Although the Trump-Vance Administration has vowed to halt further offshore wind development, the previous administration's goal to deploy 30 gigawatts of offshore wind by 2030 created momentum to expand the industry that will likely continue to have an impact on a state and community level.

Offshore wind farms (OWFs) present a myriad of ocean use conflicts, resulting in potential burdens on people who use the ocean and coasts. Notably, commercial fishing operations may be impacted, potentially restricting gear types, fishing behavior, catch and effort [22,52]. Depending on the region, OWFs can result in fisheries exclusions due to spatial closures during construction and no-take zones around the wind turbines [22,26]. Additionally, OWFs may result in regulations on acceptable gear and fishing practices near the array [19]. These concerns and considerations about fishing around wind turbines have, in some instances, resulted in "de facto" exclusion of fisheries around OWFs, even where legal frameworks do not exist specifically restricting access to traditional fishing grounds [48,52,56].

Given the potential impacts on fisheries, fishing communities are

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https://doi.org/10.1016/j.marpol.2025.107002
Received 17 March 2025; Received in revised form 14 June 2025; Accepted 10 December 2025
Available online 17 December 2025

sometimes outspoken about OWFs based on their perception of impacts. Perceptions often include physical conflict that includes concerns over navigational interference, loss of access to fishing grounds, and incompatible gear conflicts [32,38,49]. Fishermen also express ecological concerns about offshore wind and its impacts on fish stocks [32,48], and others have cited economic concerns about fuel expenditures, loss of revenue, insurance costs, and impacts on fishery support businesses [9,32]. Studies have also shown that social attributes of OWFs can be drivers of opposition in some communities and vary with local context. Fishermen's attitudes are also influenced by concerns about meaningful representation, process, and changes to place [26,46]. For example, several studies have documented the importance of place-based landscape (or seascape) attributes in explaining attitudes toward wind energy [6,12,57,58].

The Gulf of Maine presents an interesting region to study the role of place in understanding perceptions and attitudes toward OWFs among the commercial fishing community. The history of Maine's coastal communities, of which many have and continue to depend heavily on commercial fishing as sources of livelihood, has produced a unique identity that defines much of the state and its residents. Maine's lobster industry has strong economic, political, and cultural influences. In 2024, lobster accounted for 74 % of Maine's commercial landings by value and contributed over $709 million to Maine's economy [33]. The evolution of the industry has resulted in economic and social dependence on lobstering and has left many coastal communities with low resilience to ecological change or other challenges [36,47]. Maine's current push to develop offshore wind has been salient and controversial among members of the lobster industry, yet the social and community dimensions of development have not been extensively studied. Here, we examine place attachment as a theoretical construct that may explain the nuanced attitudes both in support of and opposition to OWFs. Using the backdrop of Maine's nascent floating wind industry, we explore the conceptualization of place and how offshore wind does or does not fit into this conceptualization among the iconic lobstering community. To that end, we investigate 1) lobstermen's attitudes towards offshore wind; and 2) the role place attachment plays among lobstermen in the debate on offshore wind development in the Gulf of Maine. After ascribing lobstermen's arguments for and against wind, we thematically characterize the narratives voiced by lobstering families when discussing offshore wind in Maine. Finally, we look for elements of the first dimension of place attachment (physical attachments) and the second dimension of place attachment (social attachments) by examining lobstermen's narratives and identifying whether place attachment is an underlying construct driving perceptions and attitudes towards offshore wind.

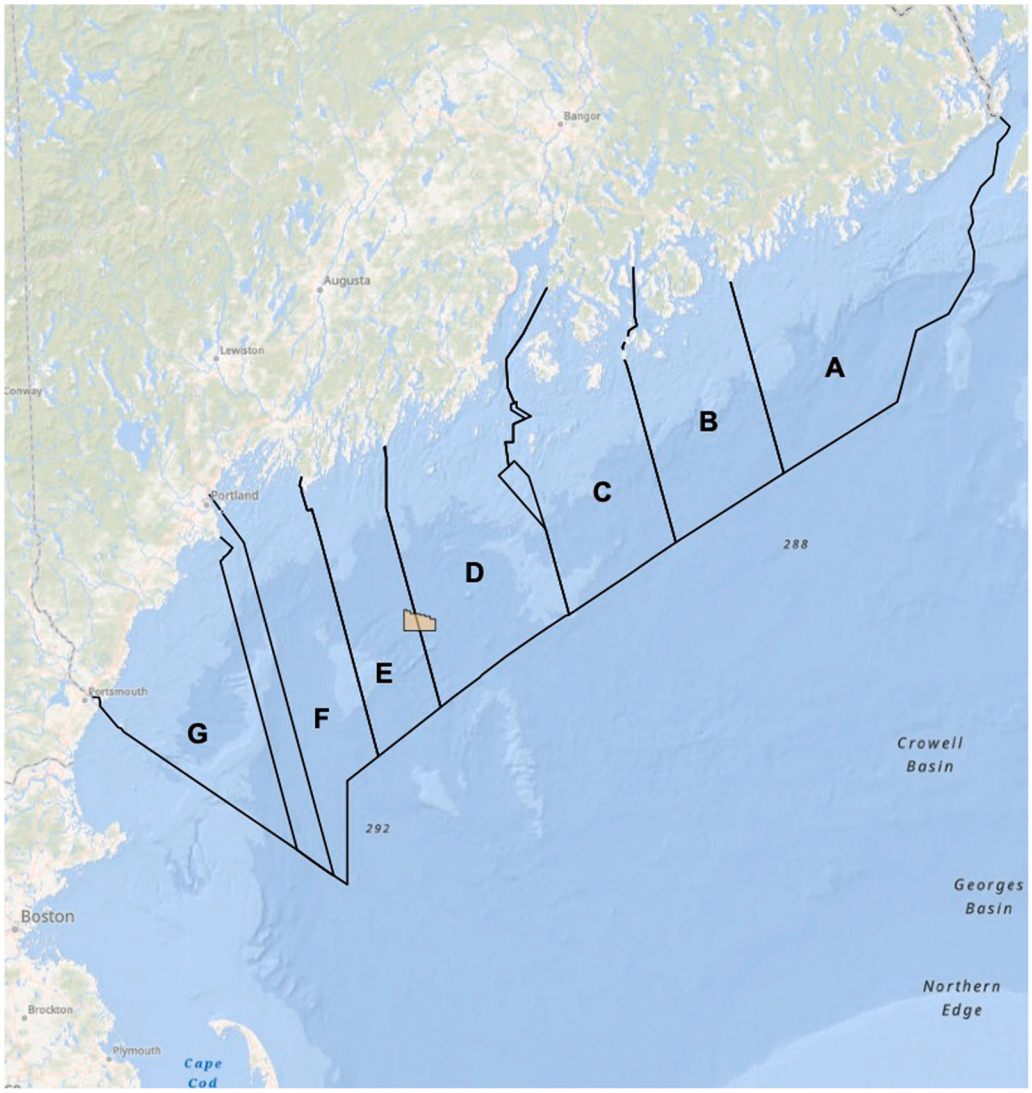

Fig. 1. A map of the seven Maine lobster management zones labelled A-G, and the Gulf of Maine Research Lease highlighted in yellow. The lease, approved by BOEM on August 19, 2024, is a 15.2 square mile area located within management zones D and E.

1.1. Study location and local context

In response to growing commercial interest in developing offshore wind in the Gulf of Maine, the State of Maine has been working to develop a research OWF to explore the viability of floating technology and its potential impacts in the region. The State has pursued a 15.2 square mile federal lease located about 30 miles offshore from southern Maine (Fig. 1). The project is led by the Governor's Energy Office with public and private partnerships as a research development project to investigate impacts on marine ecosystems and coastal communities. The Bureau of Ocean Energy Management (BOEM) approved the research lease in August 2024. Throughout the leasing process, the State has sought feedback from stakeholder groups and industry representatives and has been met with mixed responses.

In 2021, Maine's 130th Legislature passed two seemingly contradictory bills related to offshore wind. LD 1619 created a moratorium on all offshore wind projects in state waters, while LD 336 endorsed a demonstration project for a floating offshore wind research array, to design, construct, install, operate, maintain and eventually decommission a wind farm at a test site, and instructs the Public Utility Commission to enter into a power purchase agreement for up to 144 MW of offshore wind energy. A third bill (LD 101) was introduced with broad support from the Maine fishing industry, but did not pass, which would have prohibited any state agency from permitting or approving an offshore wind project. These three bills provide the context of our study.

The interest in commercial-scale offshore wind in the Gulf of Maine continued to grow between 2021 and 2024. In October 2024, BOEM completed an auction for four lease areas in the Gulf of Maine. While the status of these commercial leases is still evolving, these projects were not introduced until after data collection for this study was completed, and therefore are out of the scope of this project.

2. Theory

A growing body of literature has documented attitudes towards wind energy through national surveys, as well as case studies where perceptions of projects are examined in local communities. Much of the attitudinal research is framed as social acceptance, where studies aim to elicit the drivers of opposition or support towards wind energy generally, or towards a specific project. Local projects often face opposition even when support for wind energy in general is relatively high [7,8,55]. A common framework of acceptance towards wind energy is the "triangle" of acceptance, which defines three interdependent levels of acceptance needed to bridge the gap where most people support renewable energy, but clean energy targets are difficult to achieve due to local opposition: socio-political, market, and community acceptance [59]. Socio-political acceptance refers to generalized acceptance by stakeholders and policymakers and the implementing policies that support clean energy development. Market acceptance refers to the adoption of clean energy technology into energy markets, evidenced by the diffusion of technology and by the adoption of clean energy by investors and consumers at various scales. Finally, and most relevant to this study, community acceptance refers to localized responses to the siting and development of specific wind energy projects. Ellis et al. [18] extend the triangle of acceptance framework by incorporating elements of time, scale, and social power dynamics [18].

Social acceptance theory has been conceptually challenged because it suggests a dichotomy of acceptance vs non-acceptance, yet remains a useful heuristic for further exploring community response to wind energy [18]. Opposition, or non-acceptance, is sometimes viewed as something to be overcome, but more critical and complex understandings of acceptance (or non-acceptance) offer a more holistic way to consider the nuanced community responses towards renewable energy [5]. The theory of energy justice offers insights about social responses towards wind energy. Energy justice is most commonly described in a tenets-based framework, including procedural, distributional, and recognition justice: procedural justice concerns fair process in decision-making, distributive justice concerns the equitable distribution of benefits and burdens, and recognition justice concerns adequate representation of all actors [34]. Deficiencies in fair and equitable decision-making process have been implicated in opposition to offshore wind, where community members distrust either actors and institutions, or have unmet expectations for engagement [17]. Furthermore, the perception of unfair distribution of benefits and burdens is frequently invoked to explain why affected communities push back against offshore wind, bearing disproportionate costs of development [2]. While conceptualizations of energy justice are undoubtedly a component of social responses towards offshore wind, ocean users also frequently describe the intrusion of industrial apparatus (wind turbines) as something that does not fit in the seascape [14–16].

Studies have demonstrated that the conceptualization of place, and further, of place-technology fit, is critical in assessing attitudes towards offshore wind energy [14–16]. For example, communities that find offshore wind developments consistent with their conceptualization of place meaning are more likely to support the development of these projects [16,44].

The concepts of place identity and place attachment can characterize a person's connection to a place. Place identity describes how an individual's physical and symbolic surroundings aid their construction and understanding of self [42]. Place attachment is the "emotional bond between individuals and/or groups and the familiar locations they inhabit or visit, such as the home or neighbourhood" [14]. These two phenomena are not one and the same, yet they are related, and place attachment is often seen as a precursor to place identity [14,15,60]. Place attachment is typically divided into a two-dimensional framework that includes the physical elements that impact an individual's identity and the socialized symbols of a place that evolve to have meaning among individuals and communities [25,53]. Indicators of physical elements of place attachment are economic dependence on natural resources or physical attributes of a place that allow for certain activities. Indicators of the symbolic dimensions of place attachment include elements of a place that have socially constructed meanings or provide social relationships that make a place important to an individual. Together, the dimensions of place attachment can influence or drive attitudes toward actions that affect that place [13,16]. Place-protective actions can define local opposition to wind projects and are often driven by a sense of place disruption [13]. Place disruption is contingent on strong feelings of place attachment and explores how physical changes to a place can alter the symbolic meanings attributed to said place and communities' place-based identities [28].

Place attachment research has pushed beyond traditional NIMBYism (Not In My Backyard) frameworks [12,13,41] which use geographical proximity to explain community opposition to developments and land-use planning [11]. Rather, research on the social acceptance of renewable energy projects has begun to examine the role of place as it factors into positionality and action toward renewable energy developments. Research on place attachment frequently focuses on community acceptance of energy developments and perceptions of environmental change and typically takes an interview or survey-based approach to determine the role of place attachment in the formation of individuals' opinions and actions [45,53,54].

3. Methodology

In the U.S., Maine, New Hampshire, and Massachusetts each have jurisdiction over parts of the Gulf of Maine within their respective state waters, while the federal government manages the Gulf of Maine three to 200 miles from shore. For this study, we only sought input from commercial lobstermen who held state permits to fish in Maine. In Maine, the state lobster industry is managed through a co-management structure in which seven distinct management zones (Fig. 1) recommend regulations to the Maine Department of Marine Resources (DMR).

The study design implemented a multi-method qualitative approach using two forms of data. We used a qualitative study framework, similar to van Veelen and Haggett, which is designed to allow individuals to identify the nuanced ways in which place is conceptualized in relation to proposed renewable energy developments [53]. Our study included an analysis of 55 written testimonies to proposed offshore wind legislation and semi-structured interviews with 16 commercial lobstermen. We identified indicators of place attachment among respondents but allowed their words to speak to the subjective ways that place attachment emerges.

3.1. Written public testimonies

To analyze the stances of lobstermen towards OWFs in the Gulf of Maine, we first gathered data from written public testimonies submitted as public comments in response to three state legislative bills related to offshore wind development in the Gulf of Maine during the Maine State Legislature's 130th Legislative Session. In total, 55 individual written testimonies were submitted by self-identified commercial fishers and were used in our analysis (Table 1).

After the public testimonies were sorted, three individuals thematically coded the text of each testimony. First, we open coded the data by using six public testimonies responding to LD 101. This allowed us to develop both broader themes and child codes for which we organized, defined, and provided target examples in order to standardize coding and test for inter-coder reliability. After creating our codebook, we uploaded the texts of all of the public testimonies into the qualitative data software program Dedoose and completed the thematic coding process.

3.2. Interview sample

We used publicly accessible Maine DMR data from 2020 to 2022 to identify commercial lobster permit holders. The database included a list of 6126 permit holders who actively held a commercial license or had held one at some point since 2020. In June 2022, we conducted initial outreach to lobstermen using the DMR database, sorting permit holders into seven distinct management zones (Zones A-G) and randomly selecting 20 individuals from each zone.

After receiving ethics approval for research involving human subjects (IRB #2022–050), we used the names and mailing addresses provided in DMR's database and sent out an initial letter by mail to 20 individuals from each zone. Approximately two weeks later, we sent a follow-up email to the same individuals for whom an email was provided within the database. An additional two weeks later, we sent a second and final reminder email. We then made phone calls to individuals who did not have email addresses listed in the database. Due to a low response rate after the first cycle of the outreach process, we repeated these steps in August 2022 to complete outreach to an additional 140 permit holders. In total, we sent letters and emails requesting interviews to 280 individuals.

Due to the nature of the qualitative study design, we aimed to gather enough data to reach a saturation of concepts [21,24]. Of the 280 individuals contacted, we received 26 affirmative responses and completed 16 interviews, representing each of the seven management zones. This sample size is comparable to the study conducted by van Veelen and Haggett [53], which used a similar qualitative approach and is in line with Hennink and Kaiser's [27] review of sample sizes used in a variety of qualitative studies [27]. The interviews averaged 30 min and were conducted by phone using a semi-structured interview protocol.

Interviews were structured to first ask respondents about their fishing experience and the role of lobstering in their community. We read a short, generalized statement about offshore wind on a global scale, projects that were being developed elsewhere in the U.S., and the projects proposed in the Gulf of Maine. The interview questions were designed to facilitate conversation and ask participants about the role of lobstering in their community, their opinions on offshore wind, and what factors contributed to those opinions. We followed by asking how they thought offshore wind might interact with the lobster industry, them specifically, and their community more broadly.

Of the 16 respondents, ages ranged from 24 to 81 years old. The mean age of respondents was 56.3, compared to the average age of Maine's lobster fleet of 49.5 [29]. Two of the respondents (12.5 %) were female, and 14 were male, whereas statewide, 4.8 % of lobster license holders are female [35]. Although all respondents were active permit holders, not all were actively fishing or relying fully on lobstering for their livelihoods. Six respondents indicated they were retired or semi-retired yet still held onto their permits. Seven respondents indicated that all or nearly all of their income came from fishing, and three respondents did not indicate what percentage of their income came from fishing.

3.3. Interview data analysis

Once all interviews were conducted, we transcribed and cleaned the recordings using Otter.ai. We then uploaded the cleaned and de-identified transcriptions into Dedoose and analyzed them using a deductive qualitative analysis by thematically coding the transcriptions to gather prominent trends and themes [20]. We began by open coding the data and proceeded to group the codes thematically. Once codes and sub-codes were finalized, one individual coded and organized the data thematically, pulling out prominent excerpts that fit within the framework of place attachment.

4. Results

Attitudes towards OWFs by lobstering communities in Maine are multifaceted and nuanced. Lobstermen identified a range of issues, such as impacts on community relationships, a sense of group consciousness, environmental values, and the perceived imbalances of benefits and costs of offshore wind development. Both dimensions of place attachment were articulated among respondents. The following themes and their relation to place attachment are further explored in the sections below.

4.1. Stance

We found that written public comments voluntarily submitted to proposed legislation did not reflect the nuance of responses gathered in the interviews. Written testimony to the three proposed pieces of

Table 1
List of Legislative Bills and Respective Testimonies from the Maine Legislature's 130th session and the respective written testimonies utilized in data collection.

Legislative Session	Bill	Name of Bill	Public Hearing Date	Total testimonies	Testimonies from lobster fishers
130	LD 101, HP 67	An Act to Prohibit Offshore Wind Energy Development	May 4, 2021	161	51
130	LD 336, SP 142	An Act to Encourage Research to Support the Maine Offshore Wind Industry	May 11, 2021	54	1
130	LD 1619, SP 512	An Act to Establish a Moratorium on Offshore Wind Power Projects in Maine's Territorial Waters	May 18, 2021	23	3

legislation was 100 % negative. Every self-identified lobsterman was opposed to offshore wind. On the other hand, interview respondents were more varied in attitudes: six (37.5 %) opposed OWFs altogether, while four (25 %) supported OWFs, and six (37.5 %) expressed "qualified" support: they were supportive of offshore wind conceptually, but not without changes to the decision-making process in the Gulf of Maine.

4.2. Community reliance on lobstering

Respondents demonstrated physical and social place attachment through their connection to their local community. Most respondents discussed community in two different ways: in terms of members and families that participate in local fishing and the downstream local economy, as well as home location as a geographic and cultural entity of shared space. People described how lobstering is an integral part of their community's identity, indicating that communities relied heavily on this natural resource and industry as a means of income and livelihood, reflecting physical place attachment. The impact of OWFs on relationships was also referred to in the second framing of community, noting the critical cultural role that lobstering played in their communities, demonstrating social place attachment. For example, one lobsterman from Zone D said, "Lobstering is basically the lifeblood of this community. Without lobstering, this community would probably crumble. It keeps everything going."

The importance of lobstering to community relationships was relatively consistent among respondents who supported and opposed OWFs. However, how individuals saw community relationships changing as a result of OWFs differed. Individuals who supported OWFs did not voice concerns that community relationships or economies would be significantly or negatively impacted. Conversely, individuals opposed to OWFs perceived that such development would inherently change the role that lobstering played in their community. These respondents cited concerns that OWFs would close fishing grounds, displace lobstermen, and profoundly impact the economic viability and character of their communities. Many people mentioned the impact that a changed lobster industry would have on livelihoods, local businesses and the region's economic viability. This was particularly true for small, isolated island communities, where one individual who fishes in Zone C noted that "on the offshore islands, that is the industry, there is nothing else…it's lobstering or nothing."

This economic reliance, or physical place attachment, was echoed in the written testimony that was analyzed as well. One individual submitted the following testimony to LD 1619 illustrating the limited and lobster-dependent job opportunities in rural, coastal Maine:

> "We live in small coastal communities and on remote islands…We don't have cell service, traffic lights or McDonalds. Our job opportunities are limited. We fish, work on the docks, truck supplies in/out, bring bait, ship lobsters out, repair and build boats, sell marine supplies… We are rural Maine!"

Furthermore, many respondents implied that the lobster industry has cultural and social influence in addition to economic importance. Most people viewed the potential decline of the lobster industry as inherently changing the way of life in coastal communities. They articulated the social dimension of place attachment, expressing that the implications of these changes reached into the fabric of communities, from schools to families to the overall identity of communities. For example, one written testimony to LD 101 read, "I am asking whether you believe my child's future, my home, my family, my wellbeing is more important than any revenue that may be generated from offshore windmills? Maine fishing families matter."

These findings show that many lobstermen view lobstering as a critical element of the economic and cultural fabric of their communities. Additionally, some lobstermen perceive that OWFs would significantly change the role that lobstering plays in their communities by displacing lobstermen, closing fishing grounds, and impacting the region's economic viability. This perceived decline would thus alter the sense of community and the evolved identity linked to the working waterfronts of many coastal Maine communities.

4.3. Communal ties

Respondents indicated a degree of group consciousness through strong communal ties, in which members of the lobstering industry prioritized group interests over individual interests. Few respondents indicated that OWFs would *personally* impact them or their immediate family; rather, individuals shared a more general concern about how OWFs would impact commercial fishermen as a collective. A sense of linked fate to other coastal communities, working waterfronts, and the fishing industry was integral to negative sentiments towards OWFs. For example, one respondent explained that while they or their family would not be directly impacted, they were still concerned about the impacts it would have on industry members with whom they did not have a direct relationship. A lobsterman who fishes out of Zone C described it in the following way:

> "I mean [offshore wind] has no effect on me or anybody in my family or anyone I really know. But certainly, people that have traditionally fished in that area are being affected by it…it would affect all those guys that are fishing in that area, wherever they choose to put them."

In general, respondents did not feel that the development of OWFs in the Gulf of Maine would personally inhibit them from fishing or would displace them from the grounds where they typically set traps. However, many of these same respondents also shared strong opposition to the projects on the basis that it would displace some fishermen and would impact other individuals or communities that relied heavily on the lobstering industry. One element of this finding was a projected fear that early projects would set a precedent for future development that would more directly impact them and their communities. For example, one interviewee said, "It's not necessarily right in our backyard where we fish, where they're proposing it. But it's not real far away. So it's only a matter of time."

Individuals noted that because OWF projects would likely be offshore in federal waters, where fishing requires different licenses or permits than fishing in state-controlled waters in the U.S., the group of fishermen who would be impacted varies with location because only a subset of fishermen are allowed to fish those locations. Respondents acknowledged that development would not occur within the three-mile line in state waters where they held permits to fish, but were concerned about the impacts that development would have on boats that fished "offshore," or those that held federal permits. For example, this written testimony submitted in support of LD 101 expressed this solidarity when they wrote, "We also stand with our fellow fishermen that will be directly affected by offshore wind - the groundfish boats that work the deeper waters, the scallop boats that many of us also own, the tuna fishermen that fish the shoals in the summer when we are not there, and the herring fishermen that we rely on for bait."

The concern about the impacts of development was less focused on the individual scale but rather on the community or industry scale. Respondents were worried about the industry as a collective rather than just personal interests, as expressed by this written testimony: "I want a future lobstering but I also want a future for the rest of the community, my friends, and also the lobsters, fish and other creatures in the water." Although individuals indicated that their ability to fish would not necessarily change, the perceived threat of closed fishing grounds led to concerns about the impact it would have on other lobstermen in their community and the well-being of the community as a whole.

4.4. Caretakers and stewards of the ocean

Respondents articulated both physical and social dimensions of place attachment as seen through connection to the natural landscape. Many

respondents expressed perceptions that Maine lobstermen are stewards of the environment and natural resources and viewed their actions as contributing to a sustainable fishery. This particular attachment and dependency on natural resources is an example of the first dimension of place attachment, in which the physical environment has shaped local economies and has developed into place dependence. Furthermore, a socialized understanding has evolved in which many lobstermen feel connected to the environment as stewards of these natural resources.

Lobstermen demonstrated an attachment to the natural environment by expressing the value they placed on working on the water. Many respondents articulated that maintaining a connection with their surrounding environment was an important part of their identity, and this connection drove them to continue lobstering. For example, the natural environment and ocean have inspired this 81-year-old interviewee (Zone F) to pursue their livelihood, explaining: "I've been on the ocean all my life, and I love the water…That's what got me into lobstering. That's why I'm still lobstering today."

Lobstermen expressed a particular emotional connection to the natural environment that they work in and live near, at times attributing it to the management history of Maine's commercial lobster industry and other times to the nature of working closely with the environment. This second dimension of place attachment was apparent among respondents who supported and opposed OWFs. Respondents reflected on an identity shaped by a perception of protecting natural resources and their surrounding environment. For example, a lobsterman who fished out of Zone E described in an interview, "I think the image of the fisher—the way of life is under siege quite a bit…I think that commercial fishermen—or at least lobstermen in Maine—are some of the most sustainably minded, and have such an appreciation for the nature that they work and what they're doing." Another individual, in response to LD 101, wrote, "As stewards of the sea and our small owner operator businesses, we operate the most sustainable fishery in the world. We work our butts off to protect the environment and save it for the next generation."

Moreover, lobstermen viewed their stewardship as being threatened by the introduction of other ocean uses. Respondents felt the industry had worked hard to sustain and protect natural resources and the environment they were connected to, only to be displaced by other industries that would disrupt the integrity of the place and the legacy of their stewardship. One fisherman referred to the complexity of decommissioning wind turbines at the end of life in Europe, noting that fishermen were concerned about whose responsibility it would be to take down the turbines. Fishermen referred to the concept of industrialization of the ocean as a negative social construct. A lobsterman from Zone B stated the following concern:

> "Nobody wants to take responsibility for taking these things down… We've been doing everything we can to be environmentally conscious, to take care of these waters for generations. I've got friends who—they're fifth, sixth generation fishermen. It's a shame to see us displaced to come in and industrialize it."

Several pieces of written testimony echoed concerns that OWFs in the Gulf of Maine would industrialize a natural resource they viewed as being stewarded by lobster fishers. For example, one response to LD 101 stated, "We look at ourselves as caretakers and stewards of the ocean, and we believe it is our responsibility to protect its future for our children and their children to be able to experience and enjoy." The lobster industry's perceived stewardship of this natural resource and the marine environment has contributed to a sense of identity within the community that is linked to the physical surroundings of the Gulf of Maine. The written testimonies and interview responses illustrate the perception that the familiarity and stewardship of the marine environment contribute to place attachment that is threatened by external pressures.

4.5. Local costs for the "little guy"

Interviewees commonly discussed their perception that OWFs benefit the wealthy at the expense of local industry and community. Many respondents expressed concerns that developing renewable energy projects, and OWFs more specifically, was simply a move by out-of-state corporations to increase their profits. For example, one testimony in response to LD 101 states, "We certainly are not ready to risk the heritage of future generations so foreign developers can collect quick cash and leave a mess in the Gulf of Maine for the taxpayers to clean up. Let's make sure we invest in truly green energy that puts Maine first, not the profits of a selected few." Similarly, a lobsterman from the Zone B area expressed the following:

> "None of the stuff is Maine-owned…Those onshore wind turbines haven't really benefited Maine people. I mean, they've benefited society to put more clean electricity into society, but none of the profits come to Maine. It's just one of those places that society has always taken from and kind of forgotten. Third World State."

Many respondents expressed concern that OWFs would benefit large corporations, foreign companies, and outsiders at the expense of their communities. These beliefs about the disproportionate costs and benefits alluded to a perception from some lobstermen that outsiders have the political and economic power to profit off the backs of "the little guy." Additionally, respondents voiced apprehension that these developers and businesses could gain capital without redistributing those benefits to impacted communities. One Zone B lobsterman discussed how laws requiring local labor could be circumvented, and therefore, the argument that fishermen could transfer into new offshore wind jobs was unrealistic:

> "It seems like there's a lot of money to be made for someone and it's not us…they're trying to get around having U.S. crew. So don't try to tell us that well, even if you can't fish in this area, there'll still be work because we're bringing in new careers to build and service these windmills."

Additionally, respondents expressed concern that OWFs would specifically hurt these communities, and they would incur the costs. For example, this interviewee, who fishes out of Zone C, said, "It's going to cost a lot more for this electricity. For 10 or 20 years it's going to cost twice as much money…Is that saving enough on the carbon credits or whatever, to offset the increase in the electricity costs for the little guy that lives around here?" This framing, where lobstermen saw themselves in an "us" versus "them" scenario, also indicates a social dimension of place attachment. Individuals identified their community as the "little guy" based on the place they lived in and the identities that resulted from that place. Additionally, lobstermen expressed concerns that the distribution of benefits from OWFs was unjust and would benefit rich companies "from away" at their expense.

5. Discussion

This study aimed to explore how place attachment theory might be explanatory in understanding the narratives brought forth by commercial lobstermen about offshore wind development in the Gulf of Maine. We find that lobstermen's concerns are largely framed around the impact on place, effects on place identity, as well as broader issues such as concerns of the distribution of potential benefits and costs. Both the first and second dimensions of place attachment are apparent, in which commercial lobstermen express the importance of access to the lobster fishery to their community's economic viability and cultural identity. Overall, these findings align with previous research that finds place attachment contributes to oppositional views on OWFs [14].

Although mainstream media and general rhetoric about the lobster industry have typically presented the industry as united in their stances towards offshore wind, these findings indicate more nuance among

lobstermen as a group than is often suggested. The diversity in stance provides an alternative outlook on the opinions of the commercial lobster industry when compared to testimonies submitted by lobstermen to the State in response to the three legislative bills that were proposed by the 130th Legislature regarding offshore wind. While 100 % of submitted public testimony was opposed to OWFs, the findings of this study indicate that the industry is not monolithic in its views towards OWFs. This may be a product of those whose opinions were salient enough to opt into participating in the stakeholder engagement process, which raises questions about the accessibility of these processes. These findings suggest that engagement processes should be examined for accessibility and participation to help explain differences in the stances of a randomly selected group of commercial lobstermen versus the stances of individuals who submit testimony to the State. On the other hand, this may suggest the nuanced ways that communities are grappling with the tensions of a clean-energy transition, the need for renewable energy, and the impacts that it can have on community structures. This dissonance could be explored through a lens of cognitive polyphasia [51].

5.1. The role of place attachment

Both the functional and social dimensions of place attachment were apparent in interview responses. For those who expressed opposition based on the perception that community relationships would change with OWFs, this suggests that respondents felt a physical dependence on the resource and a social and symbolic tie to the place in which they live. Furthermore, these respondents felt that the presence of offshore wind was inherently contradictory to their attachment to place. Conversely, although respondents who supported offshore wind demonstrated similar degrees of place attachment, the prospect of offshore wind did not pose the same place disruption, and fit within their conceptualization of place. These findings are consistent with previous research that describes how place attachment and place-technology fit contribute to support for or opposition to offshore wind developments [16,44].

The prominence of place attachment regarding community relationships, prioritizing group interests over individual interests, and ties to the natural environment expands the narrative that exists about the perceptions of lobstermen on OWFs. These findings contribute to the existing literature that pushes new frameworks of understanding public acceptance of renewable energy projects and highlights the limits of using NIMBY as a theoretical framework [12–14]. Whereas NIMBYism ascribes opposition, place attachment can contribute to both the opposition to and support for renewable energy projects [53]. Understanding how individuals form opinions about OWFs and the role that place plays is beneficial to determining what attributes of a project are aligned or at odds with the perceived values and characteristics of a place. Accounting for this nuance allows us to better categorize the perceptions of commercial lobstermen, a population for which there is little data to support the characterization of attitudes towards OWFs.

The presence of place attachment in lobstering populations has important management implications. It is evident within these findings that the attachments individuals hold to place inform the responses they have to various management and development changes. Understanding perceptions of commercial lobstermen on the community and place-wide scale alludes to how communities experience the compounding impacts of multiple challenges. The lobster industry is facing several challenges that they perceive as threats to the economic and cultural well-being of the industry and the communities that depend on it. However, management strategies typically operate on a single-issue basis, overlooking how communities are impacted by multiple and overlapping issues. Adopting a multi-issue and holistic approach to management strategies, using tools such as cumulative social impact assessments, would better account for how issues are interconnected and impact a place and community as a whole [1,4,23].

The finding that place attachment informed attitudes towards offshore wind qualifies previous research that has suggested the use of compensation packages to improve support for such infrastructure development. Scholars have encouraged the use of compensation packages to make up for economic impacts that result from OWFs, noting that these projects may impact access to fishing grounds, catch rates, or the viability of certain livelihoods [26,31,49]. However, our findings illustrate that lobstermen are concerned with more than just economic and personal impacts and are instead concerned about cultural and social changes. Compensation packages may still be an important element in accurately accounting for impacts to commercial fishermen, but the perceived losses are greater than livelihoods. These findings support a growing focus on community benefits agreements (CBAs) and other forms of equitable distributional benefits, rather than compensation to address unmitigated impacts [46,50].

Furthermore, the presence of place attachment reinforces the importance of localized and meaningful engagement processes [6,26,46]. The connection that respondents have to place plays a role in how they think about OWFs, in addition to other challenges that they face. Thus, grounding stakeholder engagement opportunities and community benefit negotiations on a local scale enables individuals to express concerns about place-based impacts from OWFs and tailor benefits agreements to address local priorities [30,43].

5.2. Future research opportunities

The perception that the distribution of benefits from offshore wind development is disproportionate was an important finding among lobstermen. These findings give insight into other frameworks that could be utilized to better understand the dynamics of how social, political, and economic factors drive perceptions of renewable energy development and conservation efforts. The field of political ecology, which studies power dynamics in relation to the natural environment, offers other ways to assess these results through economic and political lenses [40].

Future research should continue to explore the results of this study through alternative political ecological lenses. While place attachment offers one approach to look at the current debate among lobstermen about offshore wind development, there are other multidisciplinary frameworks within which this case study could be explored. One example is the theory of rural consciousness or rural resentment. Rural resentment is a theory of political science that encapsulates feelings of urban misunderstanding of rural culture and way of life, exclusion from political processes, and unjust distribution of resources that benefit urban dwellers [10,39]. Energy justice frameworks would also be applicable in this case study. Distrust in governmental actors, skepticism towards companies and individuals “from away” profiting from offshore wind, and concerns about the distribution of benefits offer important insights into the perspectives on recognition, procedural and distributional justice. In particular, when respondents are talking about “local costs for the little guy,” they are describing a perceived distributional injustice. Offshore wind continues to be a timely and evolving issue in Maine and across the United States. It is important to continue to advance the theoretical frameworks that are used to study this topic and push past historically accepted explanations for the dynamics that are present today.

6. Conclusion

Offshore wind is rapidly becoming an important piece of the renewable energy transition in Maine and across the United States. This study highlights that place attachment can help explain the nuanced attitudes towards offshore wind by lobstering communities, whereby lobstermen expressed a physical reliance on the area they lived in as well as the importance of the social connections that are present in those places. A better understanding of how commercial lobstermen perceive the impacts that OWFs would have on their physical and cultural surroundings can help regulators, developers, and state officials more effectively engage with these stakeholders.

As interest in OWFs continues to grow, a just transition that includes the voices of coastal communities is vital. These findings have management implications for how officials seek input and engagement from communities and stakeholders. Engaging on localized and smaller scales could result in more meaningful feedback and a more complete understanding of the diverse set of perspectives that are present within the commercial lobster industry. Reconsidering the approaches used to guide the development and regulation of a new industry can also better account for how commercial lobstermen are feeling the impacts of multiple and overlapping challenges. Operating on a place-based scale, rather than on a single-issue basis, offers the opportunity to consider the concerns of lobstermen and the future of the coastal communities more holistically as their surrounding environment evolves.

CRediT authorship contribution statement

Eliza Batchelder: Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Loren McClenachan:** Writing – review & editing, Supervision. **Alison Bates:** Writing – review & editing, Supervision, Methodology.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We thank the Colby College Environmental Studies Department, the F. Russell Cole Research Fellows Program, the Colby College Government Department, and Dr. Dan Shea for their research support. We also thank Josh McCarthy and Henry Menz for their data analysis support. LM was supported by the Canada Research Chairs program (#2020-00204). We are grateful to the lobster fishers who shared their time and perspectives with us.

Data availability

Data will be made available on request.

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