

# Maine Policy Review

---

Volume 21 | Issue 2

---

2012

## Attitudes toward Offshore Wind Power in the Midcoast Region of Maine

James Acheson

*University of Maine*, [acheson@maine.edu](mailto:acheson@maine.edu)

Follow this and additional works at: <https://digitalcommons.library.umaine.edu/mpr>



Part of the [Energy Policy Commons](#), [Environmental Policy Commons](#), and the [Oil, Gas, and Energy Commons](#)

---

### Recommended Citation

Acheson, James. "Attitudes toward Offshore Wind Power in the Midcoast Region of Maine." *Maine Policy Review* 21.2 (2012) : 42 -55, <https://digitalcommons.library.umaine.edu/mpr/vol21/iss2/7>.

This Article is brought to you for free and open access by [DigitalCommons@UMaine](#).

# Attitudes toward Offshore Wind Power in the Midcoast Region of Maine

by James M. Acheson



*Given the likelihood of the development of offshore wind farms in Maine and the increasingly politicized nature of discussions about wind power in general, there is a need for more systematic information on Mainers' opinions about offshore wind power. In this article, James Acheson provides information on the range of public opinion about offshore wind power based on a survey of people in Midcoast Maine. He also assesses the accuracy of some public concerns and discusses the broader policy issues raised about offshore wind development. 🐉*

Developing alternative energy sources is not just a technical or scientific problem. Sociocultural and political factors are also important components. In this article, we present findings from a study of attitudes about offshore wind-power development in Maine. There is a practical reason for wanting to understand the public's attitude towards this type of development: public support or opposition to energy projects can easily translate to political support or opposition and can affect policy and public financing (Kintisch 2011).

There is a high probability that wind turbines will be placed in waters off the Maine coast in the near future. In the last three years, planning has begun to establish an offshore wind farm in federal waters using floating wind turbines. The DeepCwind Consortium, made up of the University of Maine and several other agencies and businesses, issued the "Maine Deepwater Offshore Wind Report" regarding a study on the feasibility of such a wind farm in the Gulf of Maine and specifying a five-phase plan for its development (University of Maine and James Sewall Co. 2011). Tentatively, the University of Maine would establish a 1:3-scale floating tower located near Monhegan Island in 2013. More small turbines would be constructed at a later date. The number of turbines would gradually be expanded, so that by 2020-2030 four to eight wind farms, each producing between 500 and 1,000 megawatts of electricity would be in place between 18.5 and 93 km from shore (University of Maine and James Sewall Co. 2011). In addition, the University of Maine and Maine Maritime Academy are placing a test buoy and scale models in the waters off Castine in Penobscot Bay, which may result in placement of other wind-power devices in this area in the future. In the summer of 2012 hearings were held by Statoil, a Norwegian firm wanting to establish a wind farm in the ocean near Boothbay (Betts 2012).

In the past few years, wind power has become increasingly politicized both in Maine and elsewhere. Articles have appeared in the Maine press presenting arguments of both proponents and opponents hoping to influence the Maine public. Advocates promise a variety of benefits ranging from increasing renewable energy supplies and reducing greenhouse gases and dependence on oil from countries not friendly to the U.S. to jobs, economic development, tax reductions,

and a reduction in the balance of payments problem (Curtis 2011). Opponents see wind power as threatening the Maine way of life (DiCenso 2011). They point to problems that can come on the heels of industrial wind power, including noise, damage to aesthetics, reduction of stocks of birds, threats to endangered species, and for offshore wind-power projects, navigational hazards, reductions in fish stocks, and conflicts over fishing grounds (Sambides 2011; Turkel 2010). In 2011, the controversy took on a nastier edge when several anti-wind-power demonstrators were arrested (*Bangor Daily News* 2011). The battle ranges far beyond Maine, attesting to the large amount of money involved (*The Economist* 2010).

In the ebb and flow of the controversy over wind-power development in Maine, there is little systematic information on public opinion about offshore wind power. In this article, we seek to provide information on the range of public opinion in Maine about offshore wind power; the focus is on those in the Midcoast region, who will be the first to experience offshore wind-power development. A secondary concern is to assess the accuracy or validity of some issues of concern to the public. Finally, we discuss the broader policy issues raised in the examination of people's attitudes about offshore wind power development.

## METHODOLOGY

The data on which this article is based were gathered in 2010 and 2011 by a large-scale mail survey of three groups of people in Midcoast Maine (Lincoln and Knox counties): fishermen; owners of tourism-related businesses; and coastal landowners. The sample for each group was selected by different means. We obtained names and addresses of Midcoast fishermen from the official 2008 lobster license list from the Department of Marine Resources, and drew a random sample from that list. We purchased a list of

...public support or opposition to energy projects can easily translate to political support or opposition and can affect policy and public financing.

business names and addresses and supplemented and corrected this list by using local and regional Chamber of Commerce, tourism, and municipality websites. This sample included almost all businesses in categories we defined as being tourism-related (e.g., hotels and motels, gift shops, convenience stores, tour boats). This is a saturation sample of tourism-related businesses in the selected Midcoast towns. For the coastal landowner random sample, we used a combination of town tax maps and records for towns that had these online and visits to town offices for those towns that did not have online records. For both methods, we obtained the names and addresses of coastal landowners from current tax maps and town lists of taxpayers and drew the random sample from these names. All of these records are in the public domain except for the list of fishermen, which we obtained from the Department of Marine Resources with the permission of the commissioner at the time, George Lapointe.

**A majority of our respondents agreed or strongly agreed that humans had done great damage to the environment and that offshore wind power would help solve this problem.**

Response to the survey was fairly good, but not superlative. No incentive was offered to respondents for returning the forms. We sent 1,442 questionnaires and 402, or 28 percent, were returned: 401 surveys to fishermen—79 (20 percent) returned; 543 to business owners—150 (28 percent) returned; and 498 to landowners—173 (35 percent) returned. The survey included four different kinds of questions:

1. Demographic information: legal residence, number of months (or weeks) residing in Maine, age, education level, work status, whether they owned property in Maine, the location of the property and whether the

property had shore frontage, and questions concerning occupation (e.g., work in or own tourism business, fishing business).

2. We gave 25 statements about offshore wind power and its effects and about environmental attitudes in general and asked respondents to indicate the extent to which they agreed or disagreed with each statement using a five-point scale.
3. We asked three open-ended questions in which respondents had to write a short answer. The questions asked respondents to comment on the “positive and negative aspects of offshore wind power;” the “most important issues related to offshore wind power;” and finally, “the most important questions researchers should study related to offshore wind power.”
4. We asked questions about the amount of experience and knowledge people had with wind power.

#### ATTITUDES ABOUT THE ENVIRONMENT AND OFFSHORE WIND POWER

A majority of our respondents agreed or strongly agreed that humans had done great damage to the environment and that offshore wind power would help solve this problem. Sixty-eight percent of respondents (273 of 396) agreed or strongly agreed with the statement that “humans have seriously overexploited natural resources of the world.” Only a relatively small proportion of respondents (104 of 398 or 26.1 percent) agreed or strongly agreed that “the seriousness of environmental problems has been over exaggerated by environmentalists.” When respondents were asked to rate agreement or disagreement with the statement “offshore wind power will help to reduce greenhouses gases in the atmosphere,” 265 of 399 (66.4 percent) agreed or strongly agreed.

The respondents largely agreed that offshore wind power will help to solve some serious economic problems for Mainers. When respondents were asked whether “offshore wind power will result in jobs for

Maine coastal people,” 246 of 400 (62 percent) agreed or strongly agreed. Moreover, 57 percent (225 of 400) agreed or strongly agreed with the statement that “Maine needs jobs and industry and offshore wind power will help to increase both.” Of the 398 people who answered the question, 242 (60.8 percent) agreed or strongly agreed that “offshore wind power will increase economic opportunities in Maine.” Seventy-two percent (289 of 398) agreed or strongly agreed with the statement that “offshore wind will help reduce reliance on foreign oil.”

On the whole, the respondents in our study were mildly positive about the prospects of developing offshore wind power. When asked to rate their agreement with the statement “I think the benefits of offshore wind power outweigh the potential negative impacts,” a total of 222 of 398 (55.7 percent) who answered the question agreed or strongly agreed. A total of 216 of 400 who answered the question (54 percent) agreed or strongly agreed that “offshore wind power should be developed in the Gulf of Maine.”

#### RESPONSES OF FISHERMEN, COASTAL LANDOWNERS, AND TOURISM BUSINESS OWNERS

The fishermen in our study were more negative about the prospects for offshore wind power than either landowners or business owners. On virtually every question fewer fishermen than landowners or business owners agreed that offshore wind power will solve problems, and more fishermen agreed that it would cause more problems than did the landowners or business owners. Many, but not all, fishermen in our study appear to think that wind turbines are likely to be placed in offshore areas now used by fishermen, which will result in gear tangles or their being forced to abandon those areas for fishing. This is reflected in their answers to a number of questions. For example, 40.2 percent (37 of 92) of the fishermen agreed or strongly agreed that “offshore wind power will reduce fish catches,” but only 6.4 percent (9 of 140) of the business owners and 9.7 percent (15 of 154) of the landowners agreed or strongly agreed with that statement. Of the fishermen respondents in the sample, 56.5 percent (52 of 92) agreed or strongly agreed that

“offshore wind power will conflict with use of fishing gear,” compared with 17.4 percent (27 of 155) of the landowners and 12.2 percent (17 of 139) of the business owners. Of the fishermen who answered the question, 52.8 percent (48 of 91) agreed or strongly agreed that offshore wind power will pose a navigational hazard, compared with only 20.7 percent (32 of 155) of the landowners and 14.8 percent (22 of 149) of the business owners.

These themes about the potential problems for fishermen from wind power also came out strongly in telephone interviews with 172 fishermen that were conducted late in 2010 and early in 2011. Fishermen are clearly concerned about the possible effect of offshore wind power on their fishing operations.

At the same time, fewer fishermen in our survey thought that offshore wind power would solve environmental problems than did coastal landowners or business owners. For example, for the statement “offshore wind power will help to reduce greenhouse gases,” 72.4 percent (113 of 156) of the landowners agreed or strongly agreed as did 71.2 percent (99 of 139) of the business owners. Only 50 percent (46 of 92) of the fishermen agreed or strongly agreed. Seventy-eight percent (121 of 155) of the landowners agreed or strongly agreed that offshore wind power would help reduce reliance on foreign oil; only 55.4 percent (51 of 92) of the fishermen agreed or strongly agreed with this statement. Not surprisingly, fishermen were less sanguine than either landowners or business people about the desirability of developing offshore wind power. Only 37 percent (34 of 92) of the fishermen agreed or strongly agreed that offshore wind power should be developed in the Gulf of Maine, while 53.8 percent (84 of 156) of the landowners and 64.3 percent (90 of 142) of the business owners agreed or strongly agreed. It is quite clear from fishermen’s responses on this survey and in conversations that they believe that offshore wind power will limit the area they can fish, or result in territorial conflicts over fishing space as boats dislodged from one area by wind-power developments try to find new locations in which to fish. This colors their whole attitude toward the wind-power enterprise.

But fishermen were not consistently more negative about all aspects of offshore wind power than the other groups in our sample. For example, when asked whether

“offshore wind power will result in jobs for Maine coastal people,” 64 percent (100 of 156) of the landowners and 64.3 percent (90 of 140) of business people agreed or strongly agreed with the statement, along with 51 percent (47 of 92) of the fishermen. When respondents were asked whether “humans have seriously over-exploited natural resources of the world,” 62.6 percent (57 of 91) of the fishermen agreed or strongly agreed, which was not all that different from the percentage of landowners (106 of 154 or 58.8 percent) or of business owners (100 of 139 or 71.9 percent).

### *Attitudes and Demographic Characteristics*

Demographic characteristics are singularly unhelpful in explaining responses of people in our study. Attitudes towards wind power or the environment do not correlate with age, legal residence, work status (i.e., working full time, retired). There is one exception to this generalization: respondents with lower educational levels were less supportive of offshore wind power than those with higher educational levels. This relative lack of commitment shows in the responses to a number of questions. Eighty percent of the 141 people with graduate or professional degrees agreed or strongly agreed that offshore wind power will result in less reliance on foreign oil, compared with 61 percent of the 94 with a high school education or less. Seventeen percent of the 141 people with graduate or professional degrees agreed or strongly agreed that “environmental problems have been exaggerated,” while 34 percent of the 94 people with high school education or less said the same. Ninety-one of the 139 people with graduate or professional degrees (65.5 percent) agreed or strongly agreed that “offshore wind power would be good for Maine and the nation,” compared with 48 (51 percent) of the 94 with a high school education or less.

There is a strong suggestion in the data that differences in attitudes towards offshore wind power are linked to knowledge of wind power. Of the 140 people in the sample with graduate degrees, 18 (13 percent) said they have a good deal of knowledge about offshore wind power. Only four percent of the 96 people with a high school diploma or less said they had a lot of knowledge. Moreover, 74 percent of the 141 people with advanced degrees said they had seen a wind farm,

compared with 51 percent of the 86 respondents with a high school education or less.<sup>1</sup>

### RESPONDENTS’ VIEWS ON POSITIVE AND NEGATIVE ASPECTS OF OFFSHORE WIND POWER

Respondents’ possible support or opposition to offshore wind power came out most clearly in answers to the open-ended questions. The ones that proved to be most informative were, “What do you think are the positive aspects of offshore wind power development along the Maine coast?” and “What do you think are the negative aspects of offshore wind power development along the Maine coast?” The responses were coded into the categories shown in Table 1. Overall, there were more responses regarding positive aspects than negative aspects.

Some of these responses are quite obvious, but others require explanation. The largest percentage of positive responses was that offshore wind energy would reduce reliance on foreign oil (20.8 percent). These responses suggest that respondents did not like the U.S. to be dependent for a critical resource on “enemy” or unfriendly countries. The second largest set of positive responses, almost equal to the first, was that offshore wind power could “reduce pollution” (20.6 percent). This reason suggests that respondents were concerned with global climate change and damage to the environment. “Renewable energy” was the third most important positive aspect mentioned. By this, respondents indicated that wind energy does not deplete any resource and is sustainable. These responses indicate that the respondents are concerned about running out of oil or gas. A smaller proportion of respondents (12.6 percent) gave a fourth response—namely, that offshore wind power would lower electric costs or help with heating costs. The people giving this response appeared to be among a minority aware of the benefits Mainers could gain from using heat pumps or thermal storage devices. The “other” category of positive responses fell into no easily definable category. These included “low impact,” “self reliance,” “energy of the future,” “consistent winds,” and an enigmatic “it’s all positive.” Forty-two responses (12 percent) indicated “none” or something similar. By this, respondents

**TABLE 1: Views on Positive and Negative Aspects of Offshore Wind Power Development**

Aspects (coded)	Mention #1	Mention #2	Total Responses	% Responses
<b>Positive Aspects</b>				
Reduce reliance on foreign oil	58	41	99	20.8
Reduce pollution/clean energy	65	33	98	20.6
Renewable energy	81	10	91	19.2
Lower heat/electricity costs	44	16	60	12.6
Other	47	1	48	10.1
None (no favorable trait)	42		42	8.8
Jobs	13	24	37	8.0
Total			475	100.0
<b>Negative Aspects</b>				
Appearance, aesthetics	84	25	109	26.6
Potential harm to birds and whales	28	22	50	12.2
Gear conflict, loss of fishing grounds	41	6	47	11.5
Cost (construction, maintenance)	39	5	44	10.7
Noise	33	11	44	10.7
Other	36	6	42	10.2
None (no unfavorable trait)	33		33	8.0
Navigation hazard	15	9	24	5.9
Technical feasibility	7	4	11	2.7
Subsidies	5	1	6	1.5
Total			410	100.0

meant that there was nothing positive about offshore energy; they were solidly against it.

Responses regarding negative aspects of offshore wind power were more complicated. The largest percentage of negative responses was because of “appearance” or “aesthetics” (26.6 percent). These responses suggest that people think the turbines would be close enough to shore to be visible and that they would spoil the view. The second largest percentage of negative responses was because of potential harm to birds and whales (12.2 percent).<sup>2</sup> The third largest group of negative responses (11.5 percent) was that the turbines would conflict with fishing operations. By this, respondents meant that the turbines and anchor cables would make it difficult or impossible to use certain kinds of fishing gear in certain places. The fourth largest set of negative responses (10.7 percent) was that costs would be too high and that this would result in high electric bills for consumers. The responses mentioning “subsidies” as a negative aspect (1.5 percent) appeared to assume that offshore wind power would not be competitive with other sources of electricity and that it could only operate if the government subsidized it substantially, at great cost to the taxpayers. Responses in the “other” category of negative aspects included a variety of reasons such as “negative effect on tourism,” “rapid obsolescence,” and “need gas or nuclear backup.” Those mentioning “none” were favorable to offshore wind power because they saw no negative characteristics. The other categories, we believe, are self explanatory.

A surprisingly small number of responses mentioned jobs as a positive aspect of offshore wind power in the open-ended question, whereas in the structured questions, 59 percent (236 of 400) of respondents agreed or strongly agreed that offshore

wind development would produce jobs. There is, in fact, strong evidence that development of a large-scale offshore wind farms will produce large numbers of jobs. In Maine alone, Fisher et al. (2010) estimate that building a five-gigawatt wind farm would produce an estimated 16,700 jobs for 20 years. Maine needs jobs, and Maine people were aware of this fact as their responses to the structured questions concerning jobs indicates, but the responses to the open-ended questions suggests “jobs” was not a primary positive aspect of offshore wind development.

We were impressed that the majority of positive responses to offshore wind power were for altruistic reasons or because it would benefit society as a whole (e.g., reduce pollution, a sustainable resource, reduce reliance on foreign oil). One of those favoring a wind-power project said, “wind power will help address

the issue of rising and unstable fossil fuel costs.” Another wrote, “we feel this is a project for the future.” Only a small number said that it would produce tangible economic benefits (e.g., jobs, cheaper electricity) for individuals in the short run. A large number of the positive responses to offshore wind power were focused on the common good.

Despite the welter of conflicting information bombarding the public, in our study respondents voiced relatively strong support for the development of offshore wind power.

Responses about negative aspects of offshore wind power were different in this respect. Many of these responses could be classified as the NIMBY (“not in my backyard”) effect, i.e., that wind power would result in some cost to them or their neighbors (e.g., appearance, conflict with fishing gear, noise, a navigation hazard, higher electric rates). These types of responses have been common in media reports about opposition to land-based wind projects. For example, one woman was quoted as saying at a hearing that she opposed a proposed wind installation because she has “not heard enough assurances that the turbines would not affect the health of nearby residents or harm local property values.” Others quoted in the article said, “I don’t want to move. I have a gorgeous property.” “I do not want to be treated as a guinea pig.” Another who rose in opposition said that “having a 476-foot tall turbine towering over her property will have a permanent negative effect on her property” (Trotter 2011a). Her concerns were echoed by many of the responses regarding negative aspects of offshore wind power.

Most of our respondents mentioned either primarily positive or primarily negative aspects of offshore wind power. Some, however, gave more nuanced answers and mentioned both positive and negative effects. One, for example, said, offshore wind power

will “help to keep down air pollution, and reduce our balance of payments problem with Persian Gulf countries, but it probably will kill a lot of migratory birds.”

#### WIND POWER IN MAINE AND BEYOND: KNOWLEDGE, ATTITUDES, AND MISUNDERSTANDINGS

Despite the welter of conflicting information bombarding the public, in our study respondents voiced relatively strong support for the development of offshore wind power. In this respect, the people in our Midcoast Maine study are different from people in Massachusetts questioned about proposed wind-power development in Cape Cod. The authors of a study on wind-power development on Cape Cod conclude, “the overwhelming majority of the population expects negative impacts from the project; much smaller numbers expect positive effects” (Firestone and Kempton 2007: 1584). Moreover, those who opposed the Cape Cod wind-farm development gave a different list of reasons from those mentioning negative aspects in Maine, including environmental damage, higher electricity rates, aesthetics and impacts on recreational fishing and boating.

According to the data at our disposal, Maine people had more accurate information about offshore wind power than people in Massachusetts. Regarding Cape Cod wind power, Firestone and Kempton report that, “many of the beliefs upon which opinion are based appear to be factually incorrect” (2007:1584). At least some of the blame is attributable to the newspapers whose reporting concentrates on conflict and controversy and ignores the “expertise of nearby research institutions” (Thompson 2005). In Maine, many of our respondents showed a lack of awareness of certain issues, but were quite sophisticated about others. Five issues deserve to be discussed in more detail.

#### *Subsidies*

A small number of respondents said in the open-ended question that the primary negative aspect of wind power was subsidies; the idea is that wind power is not viable without being propped up by government funds, which would cost taxpayers a good deal. It is true that the wind-power projects in Maine



and the experimental offshore wind-power project of the University of Maine do receive financial help (i.e., subsidies and grants) from the federal government. What no one mentioned on their survey form or in telephone interviews is that all forms of energy are subsidized—most far more heavily than wind power. In 2006, the federal subsidy to energy producers was 13.6 billion dollars (Combs 2011). Of that amount, 34.6 percent went to ethanol, 25.7 percent went to the oil and gas industries, and 20.2 percent went to coal. These three industries received 80.5 percent of the total federal subsidy in that year. Wind energy received only 3.4 percent of the total or 458 million dollars.

### *Heating*

Offshore wind turbines will produce large amounts of electricity, and one of the uses of that electricity is for heating. This possibility was not recognized by the vast majority of the people in our study. Only 25.3 percent (100 of 394) agreed or strongly agreed with the statement, “offshore wind power will lower heating costs,” and 27.4 percent (108 of 394) said they did not know. In addition, only 12.6 percent of responses in the open-ended question about positive aspects of offshore wind power mentioned that it could lower heating costs. Only two respondents mentioned the possibility of using electricity to power heat pumps or thermal-storage devices although such devices are widely used in the southern states and are beginning to be sold in New England. The Maine legislature has recently enacted a “Heat Pump Pilot Program” to encourage homeowners to install this technology (Bangor Hydro Electric Co. 2012). (Some did mention that the electricity could be used to power electric cars although we did not ask about cars.) It is our impression that Mainers were aware of the possibilities of electric cars, but that the majority know little about electric heat pumps or heat storage devices. In addition, no one brought up that many houses in the Atlantic Provinces and Quebec are heated with electricity using resistance heaters. Resistance electric heat becomes a possibility if the price of electricity goes low enough, as is the case in the eastern provinces of Canada. Despite the high price of heating oil, our study suggests that Maine

people have not really begun to explore alternatives to oil-fired or gas furnaces.

### *Environmental Concerns*

Many people in our study had little knowledge of the potential effects of offshore turbines on the ocean and marine life. Most had little to say about such issues, and there was no consensus among those who did hazard an opinion. When we asked whether offshore wind turbines may increase mortality on birds and whales, 33.3 percent (132 of 397) agreed or strongly agreed, 22.2 percent (88 of 397) disagreed or strongly disagreed, and 29.2 percent (116 of 397) said they did not know. Twenty percent (81 of 396) agreed or strongly agreed that offshore wind turbines would enhance fish habitat, 21.5 percent (85 of 396) disagreed or strongly disagreed, and 35.9 percent (142 of 396) said they did not know.

Offshore wind power can create some problems and help solve others. Environmental issues are used by both sides involved in the debate concerning offshore wind power. Those favoring establishing offshore wind power point out that it will reduce greenhouse gases, which will help solve the global climate-change problem (Fisher et al. 2010; Sambides 2011). In addition, turbine platforms can act as artificial reefs and no-take zones for fish (Punt et al. 2009). Those opposed believe that wind turbines may kill birds and have a negative effect on whales, which means violating the Endangered Species Act, and may harm fish habitat (Deese and Schmitt 2010). There has been considerable research on the effect of turbines on fish and marine mammals. The evidence is that the overall effect of wind turbine noise on fish appears to be slight (Hoffman et al. 2000). Marine mammals are affected within 200 meters (Koschinski et al. 2003), but apparently not beyond that limited range. The noise generated by wind turbines shrinks to insignificance when compared with other sources of noise. Large boats generate 30 times the noise of the maximum estimate for offshore wind-turbine developments.

Dr. Peter Jumars (personal communication) points out that the environmental effect of the wind turbines planned by the DeepCwind Consortium will likely be less than those in Europe. Wind turbines in Europe have been placed on stationary platforms in shallow

water where there is considerable “scour” on the bottom. The wind turbines being planned by the DeepCwind Consortium will be placed on floating platforms miles from shore in water more than 300 meters deep so that little scour will occur. The effect of wind turbines on the marine environment will depend on the type of turbines employed and their placement, but this point was made by only one or two of our respondents.

### *Noise and Aesthetics*

If our respondents underestimated the importance of some of the effects and issues of offshore wind power, they overestimated the importance of others. Noise and aesthetics were in this category.

In our open-ended questions asking respondents for the most important negative aspects of offshore wind power, 10.7 percent of total responses concerned the noise turbines would create. There has been a lot of discussion about the “noise problem” of land-based turbines. It is possible that some people were confusing offshore turbines with onshore turbines.

We can find no studies of human perception of noise levels of offshore turbines. Turbines placed within a few miles of shore might make audible noises, but the noise problem would almost certainly shrink to insignificance if the turbines were placed miles from shore where planners are proposing to place the offshore wind farms in the Gulf of Maine.

In the open-ended question, the largest set of negative responses (109 of 410, or 26.6 percent) regarding offshore wind power mentioned aesthetic or visual problems. The people mentioning this are assuming that the wind turbines would be placed within a few miles of shore where they would impair the seascape. In fact, the tentative plan is to put the turbines from three to 20 miles offshore. Turbines placed within three miles of shore would certainly be visible; those placed 20 miles at sea would be visible, if at all, only under the best conditions.

We had assumed that the visual problems with wind turbines would shrink to insignificance if turbines were placed a number of miles at sea. Many of the respondents in our survey assumed this was true. Of the 397 people who responded to our statement that “the effect of offshore wind power will depend on how far offshore the turbines are placed” 241 (60.7 percent)

agreed or strongly agreed. But this was not universally the case. For some people, turbines were a problem regardless of distance. One of our respondents, who lived in South Thomaston, said he was bothered by the sight of wind turbines on Vinalhaven some 15.5 miles distant. A number of others said that wind turbines in the far distance would “spoil the view.” One said, “I love unfettered views and panoramas;” another said wind turbines would “spoil the scenic aspects of the coast.” These people did not want to see any wind turbines, regardless of distance.

### *Fishing*

The unhappiness of fishermen in our study is not completely unwarranted. In other jurisdictions, the concerns of fishermen and fishing communities have been largely ignored in the placement of wind turbines, to the detriment of the fishing industry. Martin and Hall-Arber (2008) argue that human coastal communities are largely left out of marine planning. “Resource areas” on which “stakeholders and communities are dependent are neither mapped nor integrated into the planning process” (Martin and Hall-Arber 2008: 778). Offshore wind farms in Germany were placed by analysts and officials who assumed that the costs to fishermen would be negligible since the wind sites took only a small percentage of the bottom (Berkenhagen et al. 2010). The fishermen, for their part, did not make an effective case for protecting any specific locations. Colin Woodward points out that as a result, “they ended up protecting nothing,” which resulted in very substantial reductions in areas they could fish and a sharp decline in catches (Woodward 2011: 78–79). Woodward advises the fishing industry to plan ahead.

Fishermen in New England are beginning to become aware of the potential effects of offshore wind power on their livelihoods. In Maine, fishermen are lobbying to become involved in the ocean-planning process established by the administration of President Obama (Trotter 2011b), and fishermen in Massachusetts have successfully lobbied Governor Duval Patrick to press the federal government to remove a large portion of ocean area from consideration as locations for future wind farms (Wicked Local Wareham 2011). Fishermen in other areas have taken a more active role. A group of fishermen in New Jersey has

organized a corporation, Fishermen's Energy, and is seeking to develop a large offshore wind farm (Windpower Monthly 2011).

## POLICY ISSUES

Public attitudes can quickly manifest themselves in the form of political support or severe opposition in the political arena. The lack of action on global climate change is a case in point. A growing percentage of the U.S. population is convinced—despite a good deal of evidence to the contrary—that humans are not responsible for global warming, and an even larger percentage of the population appears confused on accuracy of science in general (Mooney and Kirshenbaum 2009).

At present, our data indicate that a majority of the public in the Midcoast seem to be generally in favor of developing offshore wind turbines in Maine. Our results may underestimate support for offshore wind power by the Maine population at large. We surveyed populations that are most likely to be affected by offshore wind-power development in the near future, especially fishermen. A study of attitudes towards wind power of all types among respondents in the state as a whole yielded more strongly supportive results than what we found (Marrinen et al. 2012).

There are substantial pockets of unhappiness that might develop into severe opposition under the right circumstances. The responses of respondents to our survey suggest that opposition to establishing offshore wind power could arise for two reasons. One concerns the public trust doctrine and the common-pool nature of the ocean. The other is the collective-action problem posed by offshore wind development

### *Common-Pool Fisheries and the Public Trust Doctrine*

Fishermen in our study generally seemed to assume that they had a right to fish in areas where they had fished in the past and that they had cause for complaint if the placement of offshore wind turbines would dislodge fishermen or make it impossible for them to carry out traditional activities. Some fishermen assumed that they would have to share the ocean space with others, but they didn't like it. Others assumed that people and companies using the oceans for other

purposes had no right to dislodge them. One said, “we [fishermen] have been fishing in these waters for centuries. No one has a right to take them away from us.” There is some justice in these sentiments.

There are substantial pockets of unhappiness that might develop into severe opposition under the right circumstances.

According to the law, the oceans and fish in them are protected by the public trust doctrine: “The Public Trust Doctrine provides that public trust lands, waters and living resources in a State are held by the State in trust for the benefit of all of the people, and establishes the right of the public to fully enjoy public trust lands, waters and living resources for a wide variety of recognized public uses” (Slade et al. 1997: 1). But the policy issues involved in the rights of fishermen are scarcely clear cut. Each state has its own body of case law specifying how the oceans and resources may be used under the trust doctrine. In addition, the federal government regulates access to ocean space and resources through a variety of laws, regulatory devices, and agencies. Some of the most important laws are the Marine Mammal Act, Endangered Species Act, the Fisheries Conservation and Management Act, the Submerged Land Act, Outer Continental Shelf Lands Act, Clean Water Act, and Coastal Zone Management Act. These laws are administered by a number of agencies, e.g., Coast Guard, Federal Aviation Agency, Department of Transportation, NOAA, Army Corps of Engineers, Minerals Management Service of the Department of the Interior, or Environmental Protection Agency. These agencies have different mandates and functions that they use to allow access to the various resources of the oceans under different conditions. The result is a “hodgepodge of legislation and jurisdiction” that creates bureaucratic competition and conflict (Firestone et al. 2005: 72). It is far from clear what the law is regarding the management of resources or even which regulatory framework

applies. As a result, deep-sea mining, drilling for oil, and commercial fishing take place in a contentious environment marked by conflict and lawsuits. The same will be true of offshore wind power development.

Officials in government agencies have no doubt that they have the right and duty to regulate access to different kinds of ocean resources. User groups (e.g., fishermen) have a different perspective. One lawyer familiar with maritime law agrees that fishermen have been using the ocean so long that they do have some “property rights” to ocean waters. Exactly what rights they have *vis à vis* owners of wind turbines will likely only be clarified after a number of court cases take place. There were two cases brought by fishermen’s groups in Massachusetts seeking to block a wind farm slated for development off Cape Cod; one case with a Martha’s Vineyard group was settled in June 2012, but the other, with a larger group of Cape fishermen, is still pending as of this writing.

The important point is that fishermen are likely to have enough “property rights” that they can cause substantial problems for anyone obstructing their use of the ocean and access to fish. This should be of concern to proponents of offshore wind power and a source of hope for those opposed.

### *Collective-Action Problems*

The crux of most of the political problems with offshore wind power is that it is likely to pose a collective-action problem. The essence is that there is a divergence between what is rational for individuals and what is optimal for society (Elster 1989; Ostrom 2000; Taylor 1990). In collective-action dilemmas, it is rational for individuals to select the strategy that brings the highest individual reward for them even though doing so would result in poor results for the society as a whole. Collective-action problems are common. Taylor goes so far as to say that “politics is the study of ways of solving collective action problems” (Taylor 1990: 224)

Marine fisheries present the quintessential collective-action dilemma. It is in the self-interest of skippers to catch as many fish as possible and to resist establishing rules to conserve the stocks. The result, all too

often, is overfishing, destruction of the breeding stocks, stock failure, low incomes for fishermen, and high prices for consumers. All skippers have acted rationally, but the result is negative for everyone. Such failures to solve the collective-action problem have been documented in great detail in the literature on common property resources (Ostrom 2000).

Efforts to establish offshore wind power present another collective-action problem. There is a strong argument to be made that society as a whole would gain a great deal by developing alternative sources of energy that do not emit greenhouse gases and will make the U.S. less dependent on foreign oil. But it is in the short-term interest of some sets of people to oppose such developments. Among those are fishermen whose fishing operations could be disrupted; people with homes near the turbines who could hear the noise; and people with land on the shore whose views could be disrupted. It makes perfect sense for people in these categories to oppose offshore wind power (Haggett 2011). Virtually all of the lobbying in opposition to offshore wind power comes from these people, who assume, perhaps for good reason, that they are the losers in the game.

There are several ways to solve collective-action dilemmas (see Dixit and Skeath 2004), but it is always difficult to do so because it means asking people to sacrifice private goals for the benefit of the public. In the case of wind power in general, the dilemma may have no good solution. One solution to collective-action problems is to impose a penalty scheme on those who do not cooperate. But predictably, it will be difficult to get people to support rules they see as antithetical to their own interest.

Our study suggests that there are two patterns of responses to offshore wind power development. Some respondents appear to be unwilling, at the present at least, to support developing offshore turbines because they assume the costs to them would be larger than the gains. But there are many others whose responses support the development of offshore wind power to promote the common good, even though it may cost them personally. The future of offshore wind power may well depend on which point of view gains ascendancy.

## CONCLUSION

More work will need to be done to expand our understanding of all the factors influencing attitudes of the public toward offshore wind power. Scientists and engineers could overcome all of the technical problems, but if there is no public support for policies and financing available, alternative energy development such as floating offshore wind turbines may not be realized.

Attitudes are complicated. The press tends to support the idea that people are for or against policies (e.g., offshore wind power). Some articles feature people and statements that are highly critical (e.g., Sambides 2012; Turkel 2010); others that are far more positive (see, for example Betts 2012). But the situation is far more complicated. Not only are attitudes in a single community highly differential, with some people supporting and others opposing a policy, but attitudes of a single person can be contradictory. As Anderson, Noblet and Teisl (2012: 106) write, many people hold multiple values at the same time, and, in fact, many of these environmental values “are not mutually exclusive.” Some of our respondents, for example, want renewable energy, but they still object to wind turbines close to their homes. Complicating the situation further, some of the variables influencing public opinion in one area appear to be quite different from those taken into account in others (Haggett 2010). Variables which are not important at one time may appear critical under other circumstances. 🐙

## ACKNOWLEDGMENTS

The research on which this article is based was funded by the Advanced Structures Composite Center’s DeepCwind Consortium Research Program, with a grant from the U.S. Department of Energy, P.I. Habib Dagher, P.E., director of the Advanced Structures and Composite Center and professor of civil engineering, University of Maine. Ann Acheson, research associate at the Margaret Chase Smith Policy Center, University of Maine, oversaw administration of the offshore wind-power survey and provided editorial assistance in the preparation of this article.

## ENDNOTES

1. A chi square test on the question “have you seen a wind farm” is significant at the 0.01 level; the results on the question about knowledge of offshore power was not significant (chi square = 0.12).
2. The literature on the effect of humans and human activity on marine life is truly massive. Although it is not our goal to review this literature, readers interested in the topic might begin by looking at Desholm and Kahlert (2005), for impact on birds, and a recent comprehensive report done by the Department of Energy and Climate Change (2009) in the UK, as well as some of the other references cited in later sections of this article.

## REFERENCES

- Anderson Mark, Caroline Noblet and Mari Teisl. 2012. “Our Environment: A Glimpse at What Mainers Value.” *Maine Policy Review* 21(1): 104–111.
- Bangor Daily News. 2011. “Wind Power Fight Not Over, Say Activists.” *Bangor Daily News* (June 24): 5B.
- Bangor Hydro Electric Company. 2012. “Heat Pump Pilot Program.” *Keeping Current* 10(1).
- Berkenhagen, Jorg, Ralf Doring, Heino O. Fock, Matthias H.F. Kloppmann, Soren A. Pedersen and Torsten Shulze. 2010. “Decision Bias in Marine Spatial Planning of Offshore Wind Farms: Problems of Singular Versus Cumulative Assessments on Economic Impacts on Fisheries.” *Marine Policy* 34:733–739.
- Betts, Stephen. 2012. “Wind Project Warmly Received.” *Bangor Daily News* (7 June): B2
- Combs, Susan. 2011. “Government Financial Subsidies.” Chapter 28. *The Energy Report 2008*. Texas Comptroller of Public Accounts, Austin. [www.window.state.tx.us/specialrpt/energy/subsidies/](http://www.window.state.tx.us/specialrpt/energy/subsidies/) [Accessed November 1, 2012]
- Curtis, Abigail. 2011. “Wind Company Works to Gain Support in Town.” *Bangor Daily News* (May 4): B1.

Please turn the page for more references and information about the author.

- Deese, Heather and Catherine Schmitt. 2010. "What Are the Impacts of Offshore Wind Turbines?" *The Working Waterfront* 23(1): 1.
- Department of Energy and Climate Change. 2009. *UK Offshore Energy: Strategic Environmental Assessment, Non-technical Summary* January 2009. Department of Energy and Climate Change, Great Britain.
- Desholm Mark and Johnny Kahlert 2005. "Avian Collision Risk at an Offshore Wind Farm." *Biology Letters* 1:296–298
- DiCenso, Mike. 2011. "Time for a Wind Energy Reality Check." *Bangor Daily News* (May 18): A5.
- Dixit, Avinash K., and Susan Skeath. 2004. *Games of Strategy*. Norton, New York.
- The Economist. 2010. "Not on My Beach Please." *The Economist* (August 21): 47–48.
- Elster, Jon. 1989. *The Cement of Society*. Cambridge University Press, Cambridge.
- Firestone, Jeremy and Willett Kempton. 2007. "Public Opinion about Large Offshore Windpower: Underlying Factors." *Energy Policy* 35(3): 1584–1598.
- Firestone, Jeremy, Willett Kempton, Andrew Kreuger and Christen Loper. 2005. "Regulating Offshore Wind Power and Aquaculture: Messages from Land and Sea." *Cornell Journal of Law and Public Policy* 14:71–111.
- Fisher, Curtis, Suraj Patel, Catherine Bowes and Justin Allegro. 2010. *Offshore Wind in the Atlantic: Growing Momentum for Jobs, Energy, Independence, Clean Air and Wildlife Protection*. National Wildlife Federation, Reston, VA.
- Haggett, Claire. 2011. "Understanding Public Responses to Offshore Wind Power." *Energy Policy* 39:503–510.
- Hoffman, Erik, Jens Astrup, Finn Larsen, Sten Munch-Petersen and Josianne Strottrup . 2000. *Effect of Marine Windfarms on the Distributions of Fish, Shellfish and Marine Mammals in the Horns Rev Area*. Baggrundsrapport nr. 24. Danish Institute for Fisheries Research, Department of Marine Fisheries, Charlottenlund.
- Kintisch, Eli. 2011. "Arts and Sciences Academy Tackles Social Science and Green Power." *ScienceInsider* (May 20). <http://news.sciencemag.org/scienceinsider/2011/05/arts-and-sciences-academy-tackle.html?ref=hp> [Accessed May 22, 2012]
- Koschinski, Sven, Boris M. Culik, Oluf D. Henriksen, Nick Tregenza, Graeme Ellis, Christoph Jansen and Gunter Kathe. 2003. "Behavioural Reactions of Free-ranging Porpoises and Seals to the Noise of a Simulated 2 MW Windpower Generator." *Marine Ecology Progress Series* 265:263–273.
- Marrinen, Sarah, Mario Teisl, Caroline Noblet and Hsaing-tai Cheng. 2012. "Deep-water and Land-based Wind Power as Substitutes: Measuring the Influences for Wind Power Support in Maine." Paper presented at the 2012 Northeastern Agricultural and Resource Economics Association Meetings, Lowell, MA.
- Martin, Kevin and Madeleine Hall-Arber. 2008. "The Missing Layer? Geo-technologies, Communities, and Implications for Marine Spatial Planning." *Marine Policy* 32:779-786.
- Mooney, Chris and Sheril Kirshenbaum. 2009. *Unscientific America: How Scientific Illiteracy Threatens our Future*. New York: Basic Books.
- Ostrom, Elinor. 2000. "Collective Action and the Evolution of Social Norms." *Journal of Economic Perspectives* 14(3): 137–158.
- Punt, Maarten, Rolf Groeneveld, Ekko van Ierland and Jan H. Stel. 2009. "Spatial Planning of Offshore Wind Farms: A Windfall to Marine Environmental Protection?" *Ecological Economics* 69(1): 93–103.
- Sambides, Nick. 2011. "National Prowind Campaign Has Maine Voice." *Bangor Daily News* (April 21).
- Sambides, Nick. 2012. "Residents Protest Passadumkeag Wind-Site Proposal." *Bangor Daily News* (July 12): B3.
- Slade, David C., R. Kerry Kehoe and Jane K. Stahl. 1997. *Putting the Public Trust Doctrine to Work: The Application of the Public Trust Doctrine to the Management of Lands, Waters and Living Resources of the Coastal States*, 2nd ed. Prepared by Coastal States Organization, Inc., for the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, DC.

- Taylor, Michael. 1990. "Cooperation and Rationality: Notes on the Collective Action Problem and its Solutions." *The Limits of Rationality*, ed. Karen Cook and Margaret Levi. University of Chicago Press, Chicago. pp. 222–249
- Thompson, Robert. 2005. "Reporting Offshore Wind Power: Are Newspapers Facilitating Informed Debate?" *Coastal Management* 33(3): 247–262.
- Trotter, Bill. 2011a. "Wind Farm Proposal Debated at Hearing." *Bangor Daily News* (May 19): B1.
- Trotter, Bill. 2011b. "Fishermen Criticize Federal Plans for Coordinated Ocean Policy and Planning Efforts." *Bangor Daily News* (March 4).
- Turkel, Max. 2010. "Wind Power Foes Target First Wind." *Bangor Daily News* (Nov 15): B1.
- University of Maine and James Sewall Co. 2011. *Maine Deepwater Offshore Wind Report*. Funded by U.S. Department of Energy.
- Wicked Local Wareham. 2011. "Patrick Administration Requests Wind Power Steer Clear of Fishing Sites." *Wareham Courier* (April 19). [www.wickedlocal.com/wareham/news/x396826868/Patrick-administration-requests-wind-power-steer-clear-of-fishing-sites#axzz1YPhQfsow](http://www.wickedlocal.com/wareham/news/x396826868/Patrick-administration-requests-wind-power-steer-clear-of-fishing-sites#axzz1YPhQfsow)
- Windpower Monthly. 2011. "Fishermen's Energy Receives State Approval for Offshore Project." *Windpower Monthly* (May).
- Woodward, Colin 2011. "Word from Europe: Plan Ahead." *Island Journal* 27:78–82



**James M. Acheson** is a research professor of anthropology and marine sciences at the University of Maine. His research focuses on economic anthropology and on social science aspects of resource management, including marine resources and forests. He has published four books and more than 100 articles in professional journals in these areas.