Report of the Michigan Great Lakes Wind Council

October 1, 2010

Prepared for
Governor Jennifer M. Granholm

Submitted by
Michael Klepinger
Mikinetics Consulting LLC
Portland, Oregon

and

Public Sector Consultants Inc.
Lansing, Michigan
www.pscinc.com

On behalf of
Michigan Great Lakes Wind Council

Acknowledgments

This report was prepared by Public Sector Consultants Inc. and Michael Klepinger, Mikinetics Consulting LLC, at the direction of the Michigan Great Lakes Wind Council. Council and staff would like to acknowledge the innumerable important contributions of Stanley "Skip" Pruss, retired GLOW Council Chair and former Director of the Michigan Department of Energy, Labor & Economic Growth.

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Executive Summary

BACKGROUND

The Great Lakes Wind Council was created in January 2009 as an advisory body within the Michigan Department of Energy, Labor & Economic Growth to examine issues and make policy recommendations related to offshore wind energy development in Michigan. The council consists of key state agency representatives and stakeholders appointed by Governor Jennifer M. Granholm.

The council's first report was issued in September 2009[1] in response to Executive Order No. 2009-1. The September 2009 report discussed offshore wind energy development trends and the impetus for the council. It also recommended criteria and buffer areas (such as sensitive species and habitats, shipping lanes, etc.) to be used in mapping the "least" and "most" favorable areas for offshore wind energy development in Michigan's Great Lakes.[2] The broad, statewide planning exercise engaged by the council revealed that the placement of turbines in only a small fraction of the state's Great Lakes could produce significant amounts of wind energy, making it possible to generate power in areas with few competing uses of the lakes. Recognizing that Michigan lacked adequate regulatory guidelines to govern such development, the council also recommended that the state enact new laws for the leasing of bottomlands and permitting of offshore wind facilities in Michigan's Great Lakes.

After receiving the 2009 report, Governor Granholm issued Executive Order No. 2009-46, which charged the council to continue its work by identifying and mapping potential leasing areas for offshore wind energy development, providing guidance on model legislation governing such development, and informing and engaging the public on offshore wind energy development issues. The Executive Order (see Appendix A) extended the service of the council until December 31, 2010, and added four members (see Appendix B for a list of council members).

This report summarizes the Phase II activities of the council, and, combined with the 2009 report, concludes the council's reporting in response to the governor's charge. The council remains prepared to provide input on proposed legislation and rulemaking and to perform other functions as requested by Governor Granholm until December 31, 2010.

[1] *Report of the Michigan Great Lakes Wind Council, September 1, 2009* (Lansing, Mich.: Mikinetics Consulting LLC and Public Sector Consultants Inc., 2009); available at www.michiganglowcouncil.org.
[2] These terms are used throughout this report. The areas designated "most" and "least" favorable are based on the application of the council's mapping criteria that identify features that should be considered in the placement of an offshore wind energy project. The designations do not consider economic variables that would be important in specific siting, such as wind power classification, transmission costs, or water depth.

PHASE II ACTIVITIES AND RECOMMENDATIONS

Public Engagement

The council organized and hosted public events in five communities across Michigan during the spring and summer of 2010 to present and take input on the council's recommendations to date. More than 500 people attended. The council also accepted comments from hundreds of individuals before, during, and after the public meetings. In this report, the council has outlined how the public could and should be engaged in decision-making processes related to offshore wind energy developments in the Great Lakes. The council recognizes that the Great Lakes bottomlands are held in the public trust and that it is essential that offshore wind siting standards be rigorous and that decision-making processes be transparent with ample public engagement at all stages.

In late fall 2009 a private development company proposed a $3 billion, 1,000-megawatt wind farm consisting of 100–200 turbines in Lake Michigan, close to the shore. While some viewed this proposal as a significant economic development opportunity for Michigan's west coast, the proposal also generated significant public opposition and substantially changed the level of awareness and involvement by the public in offshore wind energy development issues.

Recommended Most Favorable Areas for Leasing

In this second report, the council further refined its data collection and thus also refined the initial recommendations based on the set of 22 criteria established by the council in 2009 to help identify the most and least desirable areas for offshore wind energy development in the state's Great Lakes. Using those criteria and new data, the council identified a total of 13,339 square miles of bottomlands classified as "most favorable" for wind energy development. These areas are at least six miles offshore and avoid shipping lanes, sensitive fish and wildlife habitats, etc.

The findings were further refined based on more current offshore wind energy technology allowing development in "shallow water" up to a depth of 45 meters (148 feet). Of the total 13,339 square miles identified, 565 cover water of 45 meters or less in depth. Additionally, the council determined that to be favorable for development, areas must consist of at least 20 contiguous square miles.

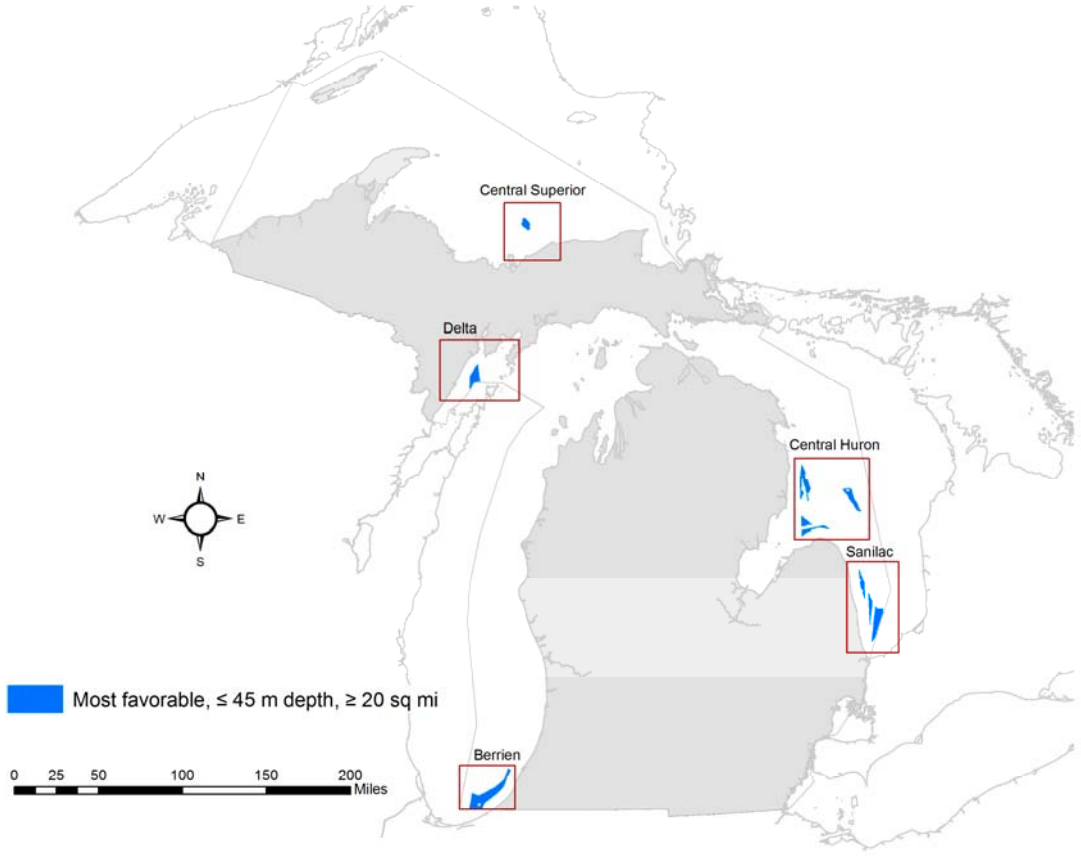
Ultimately, five priority areas were identified. Known as wind resource areas, or WRAs, they are located in Lakes Michigan, Superior, and Huron (see Exhibit 1):

- Southern Lake Michigan near Berrien County
- Northern Lake Michigan near Delta County
- Central Lake Superior near Alger County
- Central Lake Huron (out from Saginaw Bay)
- Southern Lake Huron near Sanilac County

Based on data currently available and included in the mapping tool used by the council, these areas appear to be the most suitable for offshore wind energy leasing. Any area chosen would, however, require extensive, site-specific studies and permitting. Statewide

mapping efforts will continue to evolve as new data become available and the state's leasing and permitting will always use the most recent data available.

EXHIBIT 1
Wind Resource Areas, June 2010



SOURCE: Institute for Fisheries Research, UM/MDNRE, 2010.

Input on Legislation

The council also provided input on a legislative framework for leasing Michigan's Great Lakes bottomlands and permitting offshore wind energy systems. The legislative framework outlined in this report includes a recommendation that the state offer certain parcels of Great Lakes bottomlands within the most favorable wind resource planning areas at a competitive public auction as soon as practicable following enactment of new legislation. It suggests permitting guidelines, leasing methods, and payment structures, and a proposed process for public input in decision-making. The council's recommendations are being considered by legislators and stakeholders in the crafting of state legislation.

CONCLUSION

The council's work is the first step in a long-term process that will ultimately define whether and how offshore wind energy facilities are constructed in the state's Great Lakes. The council's work sets the stage for understanding the most and least favorable areas for leasing and related data needs and recommends criteria and processes for permitting and leasing of offshore wind energy developments. The council was not charged with advocating for or against offshore wind energy development in general or for specific development proposals. With this report, the council is presenting state policymakers a way to establish a balanced permitting and leasing structure. This new structure is necessary to prepare the state to effectively handle future development proposals with clear guidelines and open, transparent processes for all parties.

Introduction

Executive Order 2009-46 charged the Great Lakes Wind Council with the following tasks, to be completed by December 31, 2010:

- Identify those areas most favorable to lease for offshore wind development
- Inform, engage, and solicit feedback from the people of Michigan on the identified most favorable leasing locations to ensure that statewide interests are considered whenever significant permitting decisions are made
- Provide guidance to legal and technical experts as they develop model lease and solicitation documents
- Recommend options for how the public could be compensated for bottomland leasing and wind rights for wind energy systems, and advise on an incentive structure for early investors in wind development
- Provide guidance to the State Wind Outreach Team created within the Department of Energy, Labor & Economic Growth in the team's execution of an outreach and education plan related to offshore wind energy
- Provide input on proposed and new Great Lakes wind development legislation and rulemaking as appropriate
- Represent the interests of the state of Michigan in the Great Lakes Wind Collaborative and other multi-sector and interstate efforts to facilitate the sustainable development of Great Lakes wind resources
- Perform other functions related to the council's responsibilities as requested by the governor

This report summarizes progress to date and concludes the work and recommendations of the council in response to the first five tasks in the governor's charge. The council remains prepared to provide input on proposed legislation and rulemaking and to perform other functions as requested by the governor until December 31, 2010. The report is organized into three major sections:

- Mapping the most favorable lease areas
- Proposed legislative framework for permitting and leasing of offshore wind energy facilities
- Guidelines for public engagement

Separate work groups of the council handled each of these topics to develop the recommendations contained in this report, which were presented to the full council for review and consent.

Most Favorable Lease Areas

Following its September 2009 report to the governor, the council further refined the set of 22 criteria it had initially used to identify and map the "most" and "least" desirable areas for offshore wind energy development in Michigan's Great Lakes, shown in Exhibit 1. Each of the mapping criteria was assigned one of three designations with an associated color for visual representation in the geographic information system (GIS) mapping tool used by the council.[3]

- **Categorical exclusion areas (red):** Bottomlands that are not suitable for development based on exiting uses and/or state or federal laws that provide for other exclusion uses (e.g., navigational channels, coastal airport setbacks, etc.)
- **Conditional areas (yellow):** Bottomlands that may have potential for development, but contain one or more potentially significant competing values such as wildlife habitat, harbors, commercial fishing, scenic vistas, shipwrecks, etc. (These are also referred to as buffered areas.)
- **Most favorable areas (green):** Bottomlands outside of categorical exclusion areas and conditional areas that do not contain any known features defined by the mapping criteria

These criteria are summarized in Exhibit 2 and described in greater detail in the September 2009 report. The council recommends that these criteria be considered by state or federal agencies as part of any leasing and siting processes. Exhibit 3 illustrates the bottomlands designated as categorical exclusion areas, conditional areas, and most favorable areas using currently available data.

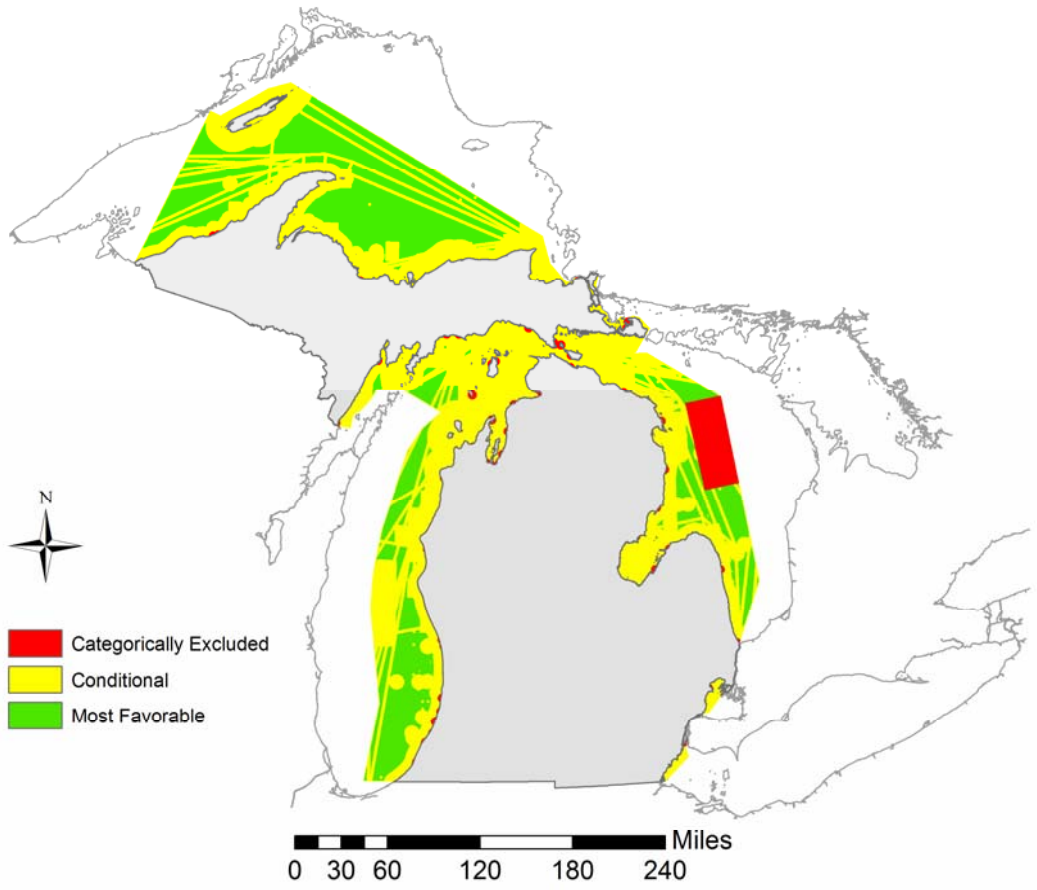
[3] The mapping tool, also known as the Lakebed Alteration Decision Support Tool, was developed by the Institute for Fisheries Research (IFR), a joint initiative of the Michigan Department of Natural Resources and Environment and the University of Michigan. Funding is provided, in part, by Michigan's Coastal Management Program. The IFR maintains the tool to incorporate new data sources and information as they become available.

EXHIBIT 2
Summary of Mapping Criteria

Criteria	Buffer distance
Criteria to Define "Conditional" Areas	
Scenic vistas	6 miles
National park lakeshores	13 miles
Shoreline parks and wilderness	6 miles
Shipwrecks	0.5 miles
State bottomland preserves	Addressed during permitting
Underwater archeological sites	Addressed during permitting
Habitat/biological (5 criteria) • Concentrations of bird or bat species of conservation concern • Threatened and endangered species • Recreational fish spawning sites and refuges • Very high concentrations of birds or bats on at least a seasonal basis • Nearshore zone of biological productivity	 5 miles 5 miles 1 mile 5 miles 3 miles
Commercial fishing areas	0.5 miles
International and state boundaries	0.5 miles
Shipping lanes (pursuant to NOAA nautical chart data)	1 mile
Disposal sites	0.5 miles
Harbors/marinas	5 miles
Large river mouths	5 miles
Criteria for "Categorical Exclusion" Areas	
Military operation areas	Addressed during permitting
Submerged transmission lines	Addressed during permitting
Aids to navigation	Addressed during permitting
Buoyed navigation channels	Addressed during permitting
Coastal airport zones	Addressed during permitting

SOURCE: Michigan Great Lakes Wind Council, 2010. Data on underwater archaeological sites, buoyed navigation channels, and submerged transmission lines are not currently available and therefore are not reflected in the maps in this report. Data for some of the mapping criteria, such as commercial fishing, shipwrecks, and habitat, are incomplete.

EXHIBIT 3
Application of Mapping Criteria as of October 2010



SOURCE: IFR October 2010.
NOTE: Data on underwater archaeological sites, buoyed navigation channels, and submerged transmission lines are not currently available and therefore are not reflected in the maps in this report. Data for some of the mapping criteria, such as commercial fishing, shipwrecks, and habitat, are incomplete.

When the council's mapping criteria were applied using data available in September 2009, there were six "most favorable" areas of at least 20 contiguous square miles in shallow waters 30 meters or less in depth. These become known as wind resource areas or WRAs. The initial WRAs were located in southern Lake Michigan near Berrien County, northern Lake Michigan near Delta and Mackinac Counties, inner and outer Saginaw Bay, and Lake Huron near Sanilac County. Over the course of the council's Phase II work, however, new data related to habitats, shipping lanes, and commercial fisheries were incorporated into the mapping tool, which changed the location and configurations of WRAs. In addition, the council determined that the WRAs should include bottomland areas up to 45 meters in depth instead of 30 meters. This report summarizes the refinement and application of the new data and presents the resulting WRAs as of August 2010.

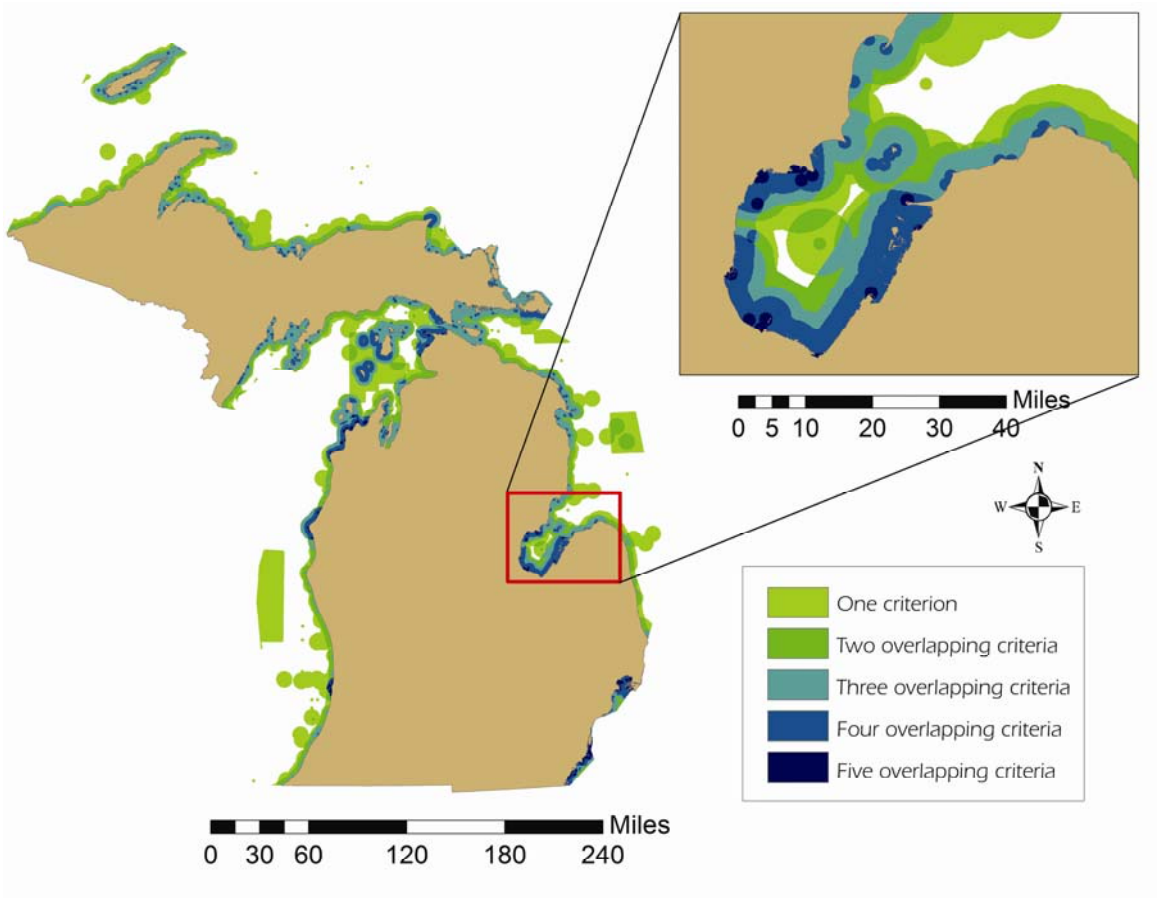
REFINING DATA LAYERS

The council refined the maps that reflect biological and habitat data, and it adopted a higher quality National Oceanic and Atmospheric Administration (NOAA) data layer for shipping lanes. The council also developed a method to map commercial and tribal fishing activities in the Great Lakes.

Biological and Habitat Criteria

In late 2009, the council gathered additional information related to biological values and habitat and subsequently included it in the mapping tool. These updates added threatened and endangered species data layers and new avian habitat data. The number of fish species in the spawning site data layer also increased. These additions resulted in the reclassification of the inner Saginaw Bay wind resource area as "conditional," thereby reducing the number of WRAs from six to five in January 2010. A map showing all the biological and habitat data as of January 2010 is shown in Exhibit 4. The shading on the map illustrates how the sensitive habitat and species overlap (fish spawning sites, threatened or endangered species, etc.). For example, the darkest shading reveals that all five biological criteria used by the council are overlapping in that area, whereas the lightest shading shows the presence of only one biological criterion. The data clearly suggest that the highest concentrations of sensitive biological areas are close to shore.

EXHIBIT 4
Biological Data Layers – January 2010



SOURCE: Institute for Fisheries Research, UM/MDNRE, 2010.

Commercial Fishing

Background

Experience in European countries suggests that commercial fishing and offshore wind development are not incompatible as long as good planning takes place during the siting process. The Great Lakes support a valuable commercial fishery. The activity of this commercial fishery varies from state to state and within the province of Ontario. Commercial fishery operations may be licensed through their respective state, provincial, or tribal governments. Every lake has a Native American component of the commercial fishery except Lake Erie. The commercial fishery is generally regulated by the amount of fish that may be harvested (quota) and/or the amount and type of gear that can be used (effort).

Michigan has a robust state-licensed and tribal commercial fishery. Currently there are 54 state-issued licenses, though approximately 20 of these licenses are not actively fished. Of those that are actively fished, the licenses are held by approximately 20–25

commercial fishing businesses. Of the 54 state licenses, 23 are issued in Saginaw Bay, which is characterized by fishery resource managers as an "area of congestion" due to the volume of commercial fishing activity. In addition to state-licensed commercial fishing, approximately 125 tribally-licensed commercial fishers were active in the northern portions of Lakes Huron and Michigan and in Lake Superior in 2009.

Although the council identified state- and tribal-licensed commercial fishing as a mapping criterion in 2009, data on commercial fishing patterns had not been analyzed and applied to the GIS mapping tool in time for the council's September 2009 report. With the council's input in early 2010, data on commercial and treaty fishing activities were incorporated with the other data layers in the delineation of the "most favorable" and "conditional" areas. This was done by using a scoring index initially proposed to the council by the Michigan Department of Natural Resources and Environment (MDNRE). The scoring index and its application are discussed in detail below.

Scoring Index

Due to the broad geographical area where commercial fishing occurs in Michigan, the council determined that a good proxy was necessary to assess the relative fishing effort for mapping purposes. The MDNRE analyzed commercial fishing data and developed a scoring index for commercial fishing activity that predicts the potential for future conflicts with wind turbine siting based on commercial fishing patterns in a particular area. The analytical approach accounts for the dynamic nature of commercial fishing operations.

The scoring index analyzed commercial fishing catch reports using three scoring categories based on: (1) the reported level of fishing activity, (2) fishing consistency, and (3) recent activity, using commercial fishing data from 2001 to 2008. All three categories were weighted equally (zero or 10). Commercial fishing grid size, used in this analysis, is a geographical unit based on ten minutes of latitude by ten minutes of longitude (approximately 90 square miles in Michigan waters), which is used by most tribal, state, provincial, and federal governments for reporting fishery statistics.

The scoring categories were defined as follows:

1. **Net lifts during 2001–2008:** The number of commercial fishing days was totaled for each grid across the eight-year period. This is the total number of days a commercial fisher reported pulling one or more nets from the water. Grids with a cumulative activity level greater than 73[4] days were given 10 points. Grids with a cumulative activity level less than or equal to 73 days were given 0 points. The intent was to identify an activity level separating low-level experimental or unsustained use of fishing grids while still retaining activity levels suggestive of seasonal fisheries.

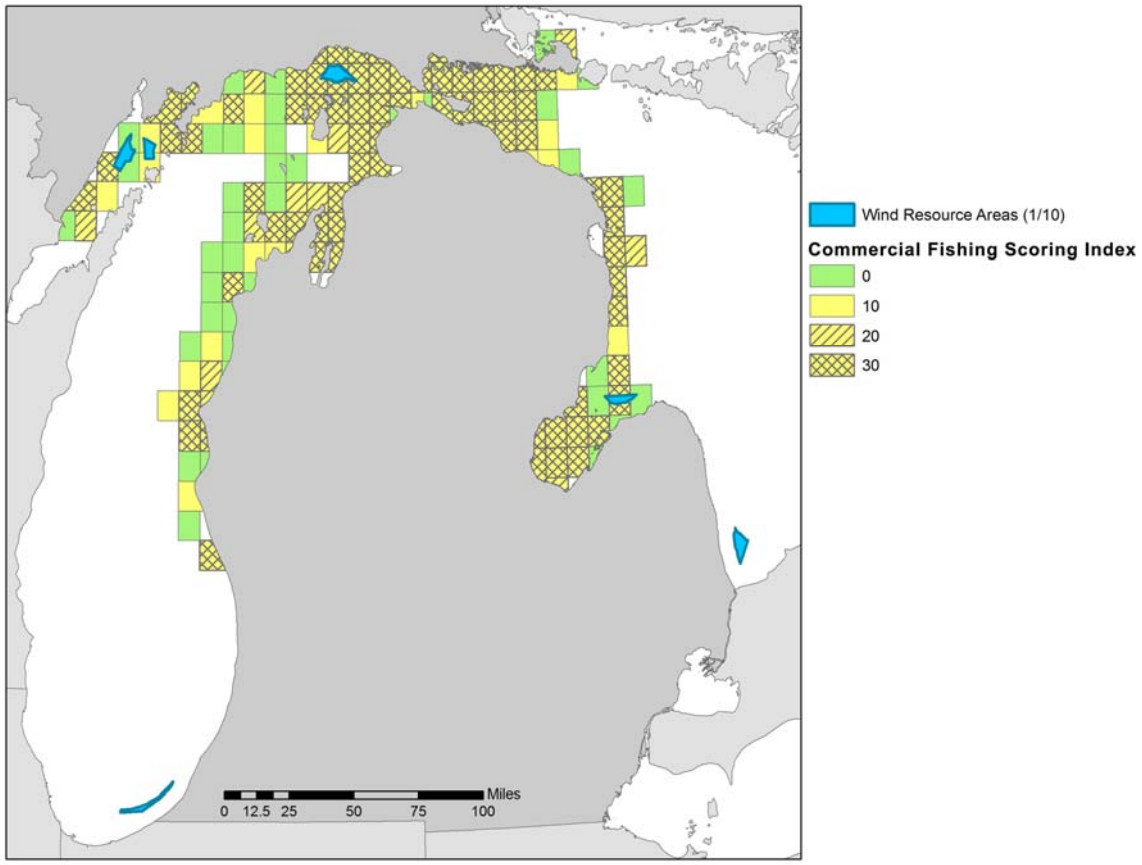
[4] The 73-day cutoff was chosen because 74 days of fishing activity represents 0.5 percent of the total (state-licensed) commercial activity during the eight-year time period (74/14,674 activity days = 0.005 * 100 = 0.5%). State + tribal data totals 60,580 activity days and 0.5 percent of that number is 303. The MDNRE used the lower 73-day cutoff because tribal fishing results in a higher number of activity days due to gear type; gill nets need to be lifted more frequently and the number of nets authorized on tribal licenses tend to be higher. The 73-day threshold retains more tribal fishing activity in the yellow map layer.

2. **Consistently fished in six of the eight years:** If a grid was fished in at least six of the previous eight years it was considered to have consistent annual commercial importance and received a score of 10 points. If a grid was fished less than six of the previous eight years it received a score of zero.
3. **Recently fished:** If a grid was fished in both 2007 and 2008, it was considered to have recent commercial importance and received a score of 10 points. If a grid was not fished in both 2007 and 2008 it was considered not to have recent importance to the fishery and received a score of zero.

Exhibit 5 illustrates the scoring results and the five WRAs that existed as of January 2010 (i.e., prior to the application of the commercial fishing and other data). Seventy percent of commercial fishing activity falls within the yellow (conditional) classification for wind siting purposes across the lakes. Specific areas within the yellow layer may have scores of 10, 20, or 30, indicating progressively more intense levels of commercial fishing (satisfying one, two, or three of the scoring index criteria). The precise score and other detailed commercial fishing activity (e.g., tribal-licensed vs. state-licensed) can be obtained during site-specific analysis, similar to work that may need to be done to identify any other potential conflicts within a WRA. The council envisions that in the evolution of the mapping tool, the development of a weighted scoring system will enhance resource management decision making.

Based on the data weighting and scoring process described above, the January 2010 Outer Saginaw Bay and Mackinac wind resource areas shown in Exhibit 5 were reclassified from "most favorable" to "conditional" status and are no longer WRAs. These areas support significant commercial fishing activity and have a higher potential to be incompatible with offshore wind development. Based on the available data, there are no commercial fisheries operating in the southern Lake Michigan and southern Lake Huron WRAs, and the northern Lake Michigan WRA supports a low level of commercial fishing, indicating low potential for development conflicts. Thus, the commercial fishing data did not affect these other three WRAs shown in Exhibit 5.

EXHIBIT 5
Commercial Fishing Scoring Results and Wind Resource Areas, Early 2010



SOURCE: Institute for Fisheries Research, UM/MDNRE, 2010.
NOTE: The commercial fishing map layer does not contain western Lake Superior tribal commercial fishery data, which uses different reporting metrics. Review of this fishery will require investigation during siting.

NOAA Shipping Lane Data

Improved NOAA shipping lane data resulted in reclassification of the Sanilac wind resource area as "conditional," further reducing the number of WRAs.

REVISED WIND RESOURCE AREAS

When the council's mapping criteria were first applied, in September 2009, there was an initial set of six "most favorable" areas that were at least 20 contiguous square miles large and 30 meters or less in depth. As discussed above, additional data related to biological species and habitat, shipping, and commercial fishing reduced the number of shallow wind resource areas, and the size of one of the remaining WRAs was somewhat reduced.

After additional review and discussion of advanced turbine foundation, the council agreed in June 2010 that the updated wind resource area maps should reflect a 45 meter

depth limit, which would continue to provide ample guidance to the state for selecting priority lease sites. This change was adopted with the understanding that developers would not be precluded from nominating parcels for lease in the state's (yellow) conditional areas.

Exhibit 6 identifies the number of square miles in each of the council's mapping classifications and at two different depths after applying the updated data layers described above in June 2010.

EXHIBIT 6

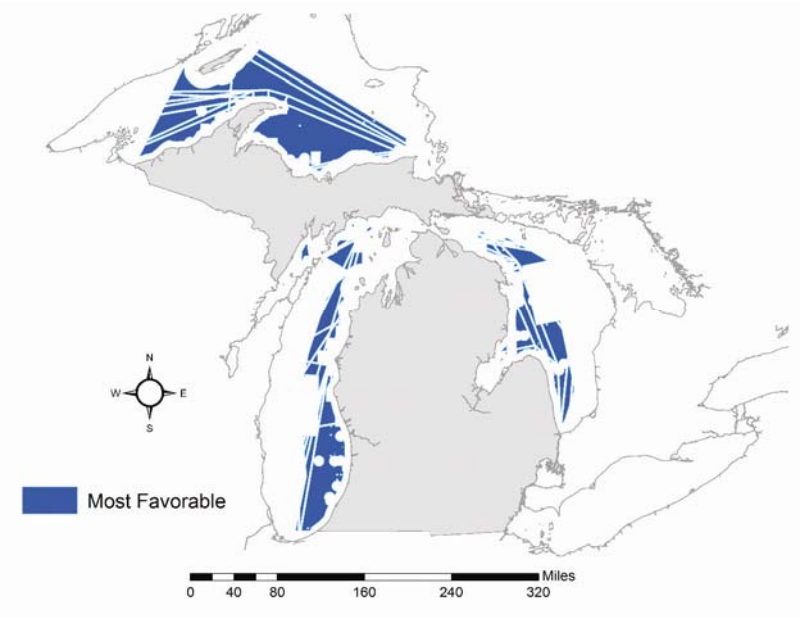
Square Miles in Categorical Exclusion, Conditional, and Most Favorable Areas

Area type	No depth restriction (sq. miles)	45 Meters or less (sq. miles)	30 Meters or less (sq. miles)
Categorical exclusion area	1,710	521	349
Conditional area	23,399	9,554	7,363
Most favorable area	13,339	565	157
Total	**38,448**	**10,640**	**7,869**

SOURCE: Institute for Fisheries Research, UM/MDNRE, June 2010.

When water depth is removed from consideration, Michigan has identified 13,339 square miles of bottomlands classified as "most favorable" for wind energy development. The location of these areas is shown in Exhibit 7. Within the areas shown, there is a total of 565 square miles designated most favorable that are shallow enough for today's development practices—not more than 45 meters deep. And within these shallow bottomlands in the most favorable areas, approximately 475 square miles are found in contiguous areas of at least 20 square miles. These are the areas that have been designated as wind resource areas. Simply put, the difference between "most favorable" and "wind resource area" relates to water depth and bottomland parcel size—two commercially important factors.

EXHIBIT 7
Most Favorable Areas in Michigan's Great Lakes—No Depth Limit



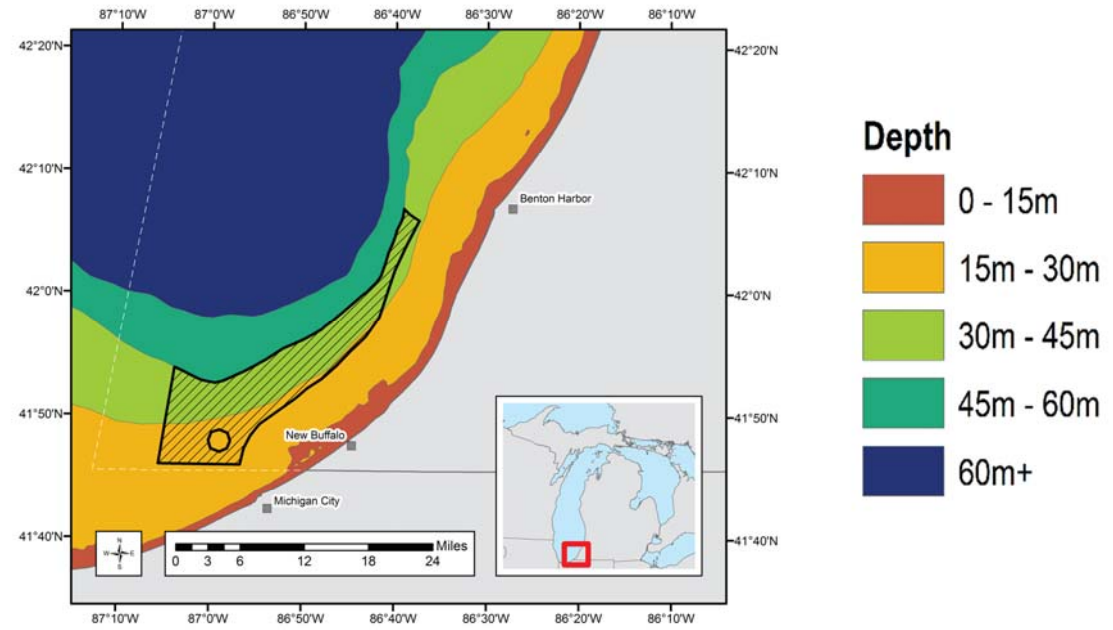
SOURCE: Institute for Fisheries Research, UM/MDNRE, June 2010.

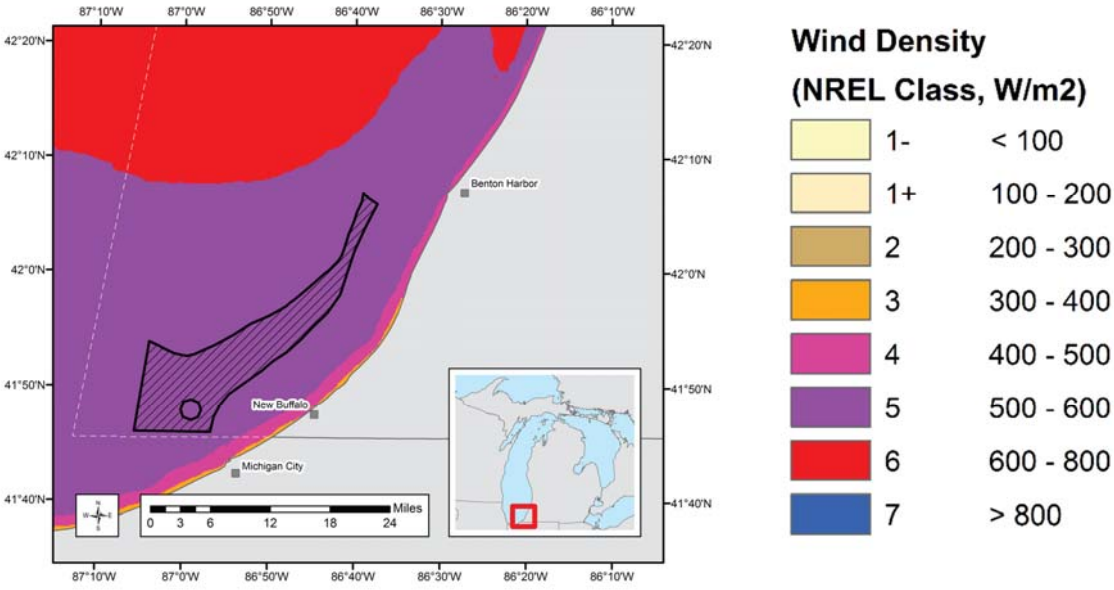
It is important to note that areas categorized as "conditional" (some 23,399 square miles of state bottomlands) represent extensive development potential, although they will require additional site assessment activities to ensure that they are suitable for offshore wind energy development. The majority of these bottomlands are also very deep, which reduces their marketability due to higher anticipated capital costs and risks associated with emerging deep water technologies.

At its June 2010 meeting, the council designated five wind resource areas at a 45 meter depth limit. As shown in Exhibit 1 in the executive summary, they are located in southern Lake Michigan near Berrien County, in northern Lake Michigan near Delta County, in central Lake Superior near Alger County, in central Lake Huron, and in southern Lake Huron near Sanilac County.

Close-up images of the five WRAs (at ≤45 meters depth) are shown in Exhibits 8 through 12. These images highlight the depth and wind density. The hatched areas show the WRA boundaries.

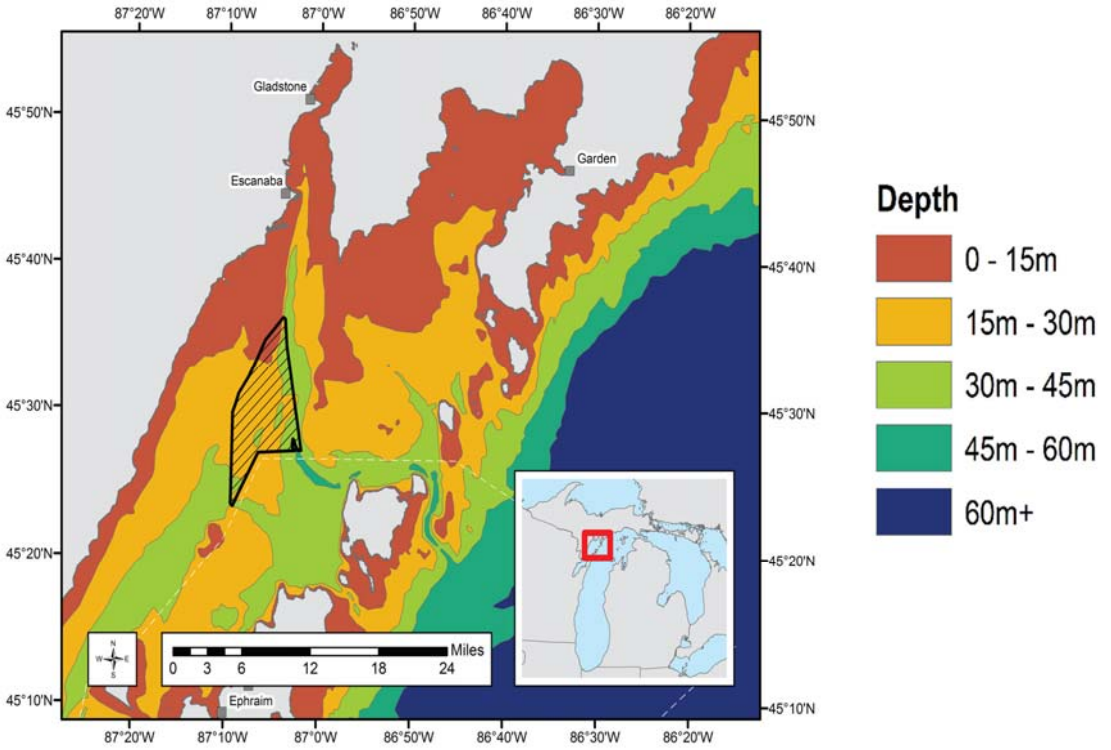
EXHIBIT 8
Southern Lake Michigan

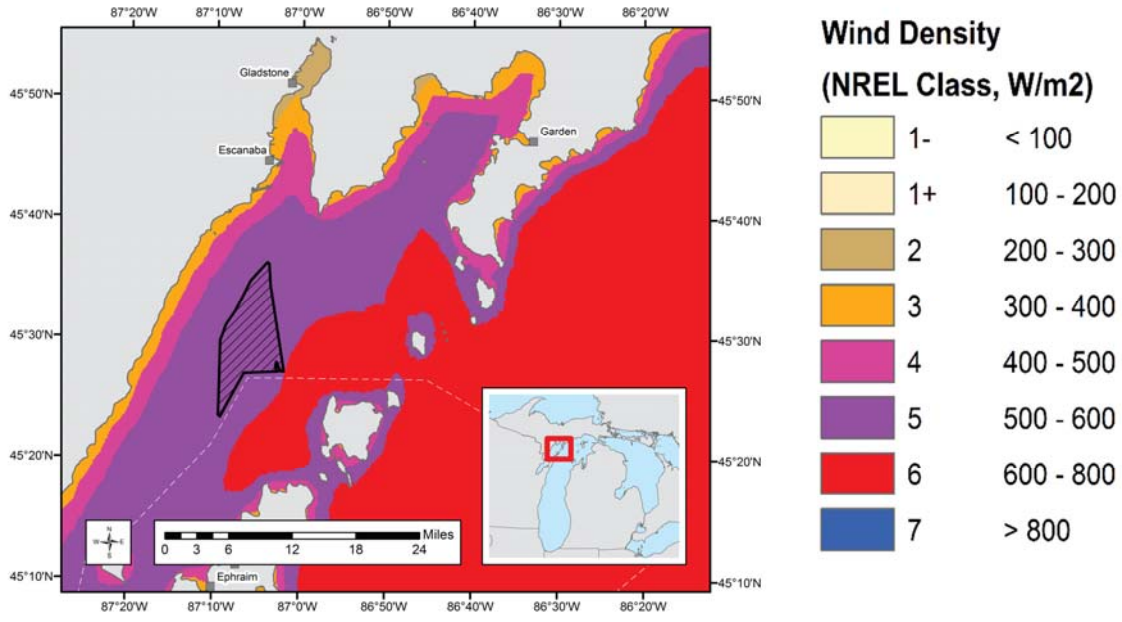




SOURCE: Institute for Fisheries Research, UM/MDNRE, 2010.
NOTE: Hatched area = WRA.

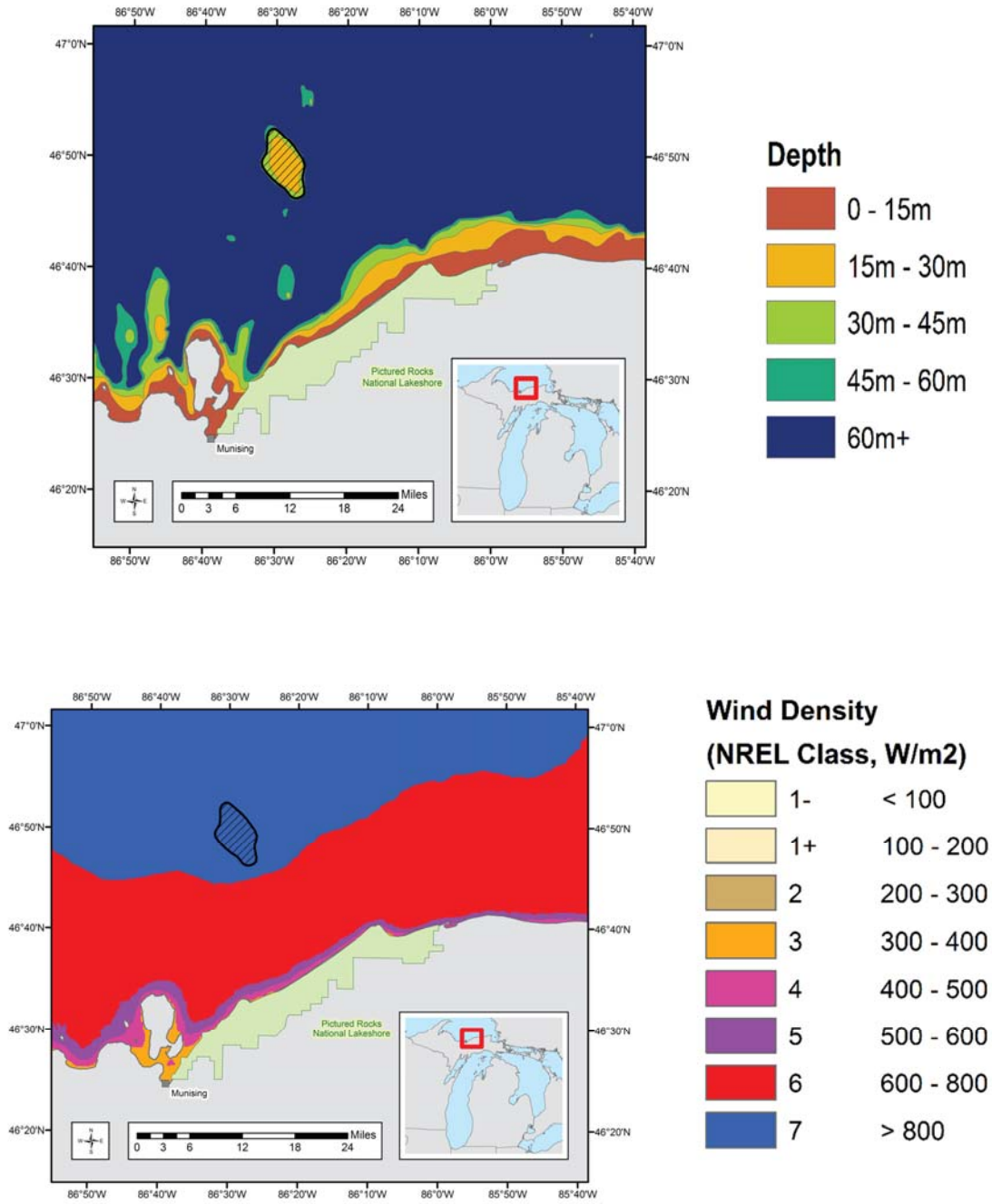
EXHIBIT 9
Northern Lake Michigan





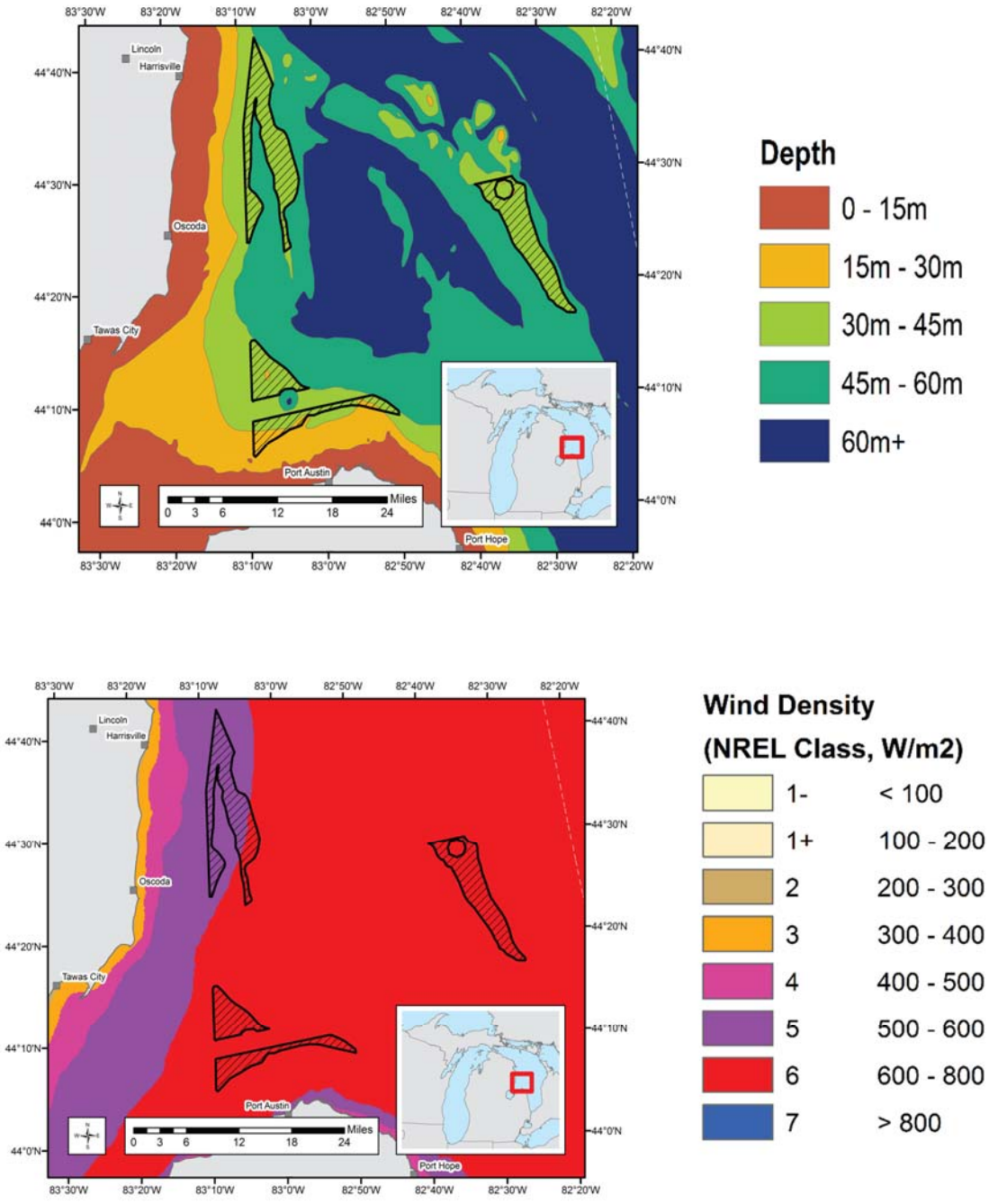
SOURCE: Institute for Fisheries Research, UM/MDNRE, 2010.
NOTE: Hatched area = WRA.

EXHIBIT 10
Central Lake Superior



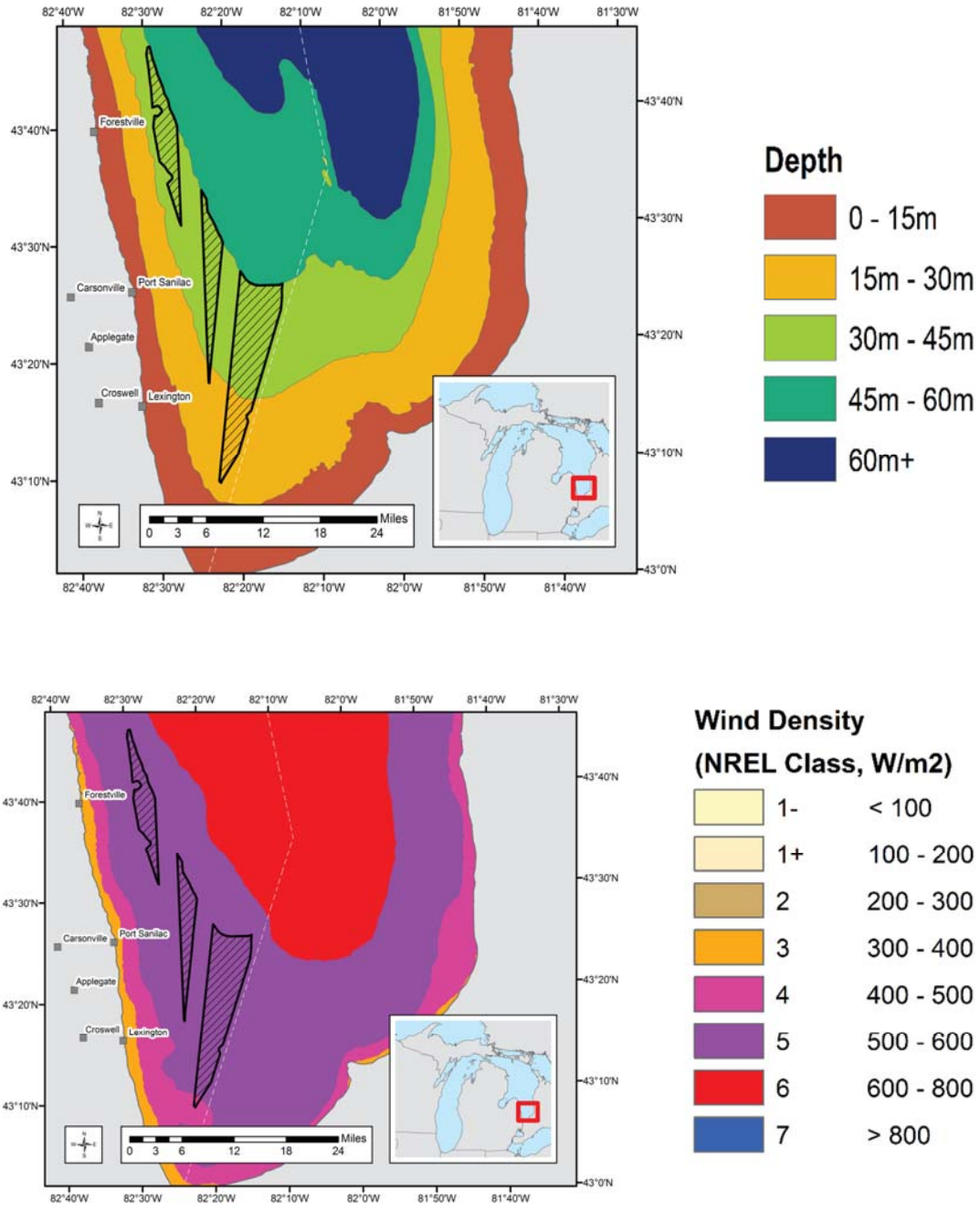
SOURCE: Institute for Fisheries Research, UM/MDNRE, 2010.
NOTE: Hatched area = WRA.

EXHIBIT 11
Central Lake Huron



SOURCE: Institute for Fisheries Research, UM/MDNRE, 2010.
NOTE: Hatched area = WRA.

EXHIBIT 12
Southern Lake Huron



SOURCE: Institute for Fisheries Research, UM/MDNRE, 2010.
NOTE: Hatched area = WRA.

PUBLIC AVAILABILITY OF THE GIS TOOL

At the time of this report, the University of Michigan/Michigan Department of Natural Resources and Environment Institute for Fisheries Research (IFR) is making data from the mapping tool available to members of the public upon request. The council supports public access to the information it used and recognizes that access to the tool is based on adequate funding and agency approval and must follow guidelines to protect sensitive data.

The Lakebed Alteration Decision Support Tool is being prepared for distribution on the Internet. The tool will be offered as a free download of approximately 150MB in size. However, a copy of the ArcGIS software package, version 9.2 or later, including the Spatial Analyst extension, is required in order to use the tool. For more information, go to the Lakebed Alteration Decision Support Tool website, at: http://ifrgis.snre.umich.edu/projects/LADST/ladst.shtml, or contact the Michigan Coastal Management Program at MDNRE. Contingent upon the resources available and the potential interest of other parties to assist (e.g., National Oceanic and Atmospheric Administration), the IFR will make efforts to continue to update the mapping data and to improve public access.

Proposed Legislative Framework for Permitting and Leasing

Executive Order 2009-46 charged the council to "provide input on proposed and new Great Lakes wind development legislation and rulemaking as appropriate." The council developed suggestions for a regulatory framework to fulfill that charge. The framework is summarized below and is available in full on the council's website.

KEY PROVISIONS

The council recommends key provisions for inclusion in any bill introduced to regulate offshore wind energy development in the Great Lakes, as follows:

- An acknowledgement that the existing Part 325, Great Lakes Submerged Lands, of Michigan's Natural Resources and Environmental Protection Act of 1994 (PA 451) does not regulate offshore wind energy facilities
- A process for identifying sites for offshore wind energy leasing
- An auction process for assigning development rights to the identified sites
- A detailed set of requirements for site assessment plans, development plans, construction plans, operation plans, and decommissioning plans
- A process for public involvement in decision making, including notice and comment opportunities throughout the auction, site assessment, and development processes
- A framework for collecting lease payments and operation royalties and for distributing those funds to administer the regulatory program, to foster renewable energy production and energy efficiency, and to monitor the impacts of offshore wind facilities and offset any impacts through habitat protection and improvements in the Great Lakes

RECOMMENDED PROCESS: ACCESS TO BOTTOMLANDS

The council has outlined a leasing and permitting process for offshore wind development that addresses site selection, lease auction, site assessment, and leasing and permitting for construction and operations.

State Site Selection or Nomination by a Prospective Developer

The council recommends two options by which a site may be made available for offshore wind development: selection by the state regulatory authority or identification and nomination by a prospective developer. Either of these options would be followed by a public auction.

State Site Selection

Under the first option, the council recommends that the state agency responsible for regulating offshore wind development identify Great Lakes bottomlands areas most favorable for offshore wind energy development, called offshore wind resource areas, and offer certain parcels of Great Lakes bottomlands within those wind resource planning

areas for lease at a public auction as soon as practicable following enactment of the new regulatory framework.

Selection and Nomination by a Prospective Developer

In addition to lease-site identification by the state, the council recommends that pre-qualified developers be allowed to identify and nominate a site outside of the WRAs for offshore wind development. In this scenario, the agency would approve a nominated parcel for auction if the agency determines that there is a reasonable likelihood that the site will support development of offshore wind energy facilities in accordance with the regulatory program. In making its determination, the agency would consider all available information about the site and relevant scientific data and studies, including the recommendations in this report.

Competitive Public Auction

The council recommends that once potential development sites are identified, the agency hold public hearings and conduct fact-finding in the nearest county before offering the parcels for auction. If the agency preliminarily approves the site for auction, the council recommends that the agency publish a proposed lease auction notice, followed by a 60-day period for public comment. If, after the comment period, the agency elects to auction the site, then the agency would publish a final lease auction notice at least 21 days before the auction. The agency would hold in-person, oral auctions.

Initial Site Assessment

The council recommends that all leases provide for a three-year period that may be extended by two one-year extensions. Activities under the initial lease would be limited to site assessment.

The council envisions that within six months of receiving a site assessment lease and prior to conducting any site assessment activities, the lessee would submit a site assessment plan (SAP) to the agency for approval. When approved, the SAP would be the basis for a site assessment permit, which would run concurrently with the site assessment lease term. Further, the council recommends that the permittee submit an annual progress report that summarizes site assessment activities for the previous year.

Lease and Permit for Construction and Operation

The council recommends that after site assessment activities are complete, the developer submit a detailed application for a construction and operation permit that would include construction, operation, and conceptual decommissioning plans for all planned structures at the site. The agency would issue a notice for public comment on the construction and operation permit and hold at least one public hearing in the county nearest the site. The agency would collect public comment for 30 days after the public hearing. When a construction and operation permit application is approved, the agency would convert the site assessment lease to a construction and operation lease. The construction and operation lease would initially be established for a 25-year period, which could be extended in 10-year increments as long as the facility is operating in compliance with its permit.

Public Engagement Process

The council recommends engaging the public at several points during the development of offshore wind energy: first, prior to the auction of a site assessment lease; then, prior to the approval of a site assessment plan; and finally, prior to the approval of a construction and operation permit. Exhibit 13 outlines the council's recommended process, which was presented at the community meetings discussed in the next section.

EXHIBIT 13
Recommended Permitting Process and Related Public Engagement Activities

Permit or Lease Activity	Related Public Engagement Activities
Site Selection, Pre-Lease and Permit After the department identifies or a developer nominates a lease site	▪ Department publishes proposed lease auction notice and receives comments for a 60-day period. ▪ Department holds public meeting in county nearest selected parcel. Public comment shall extend 30 days beyond the date of the public meeting.
Site Assessment Planning After lessee submits site assessment plan (SAP)	▪ Lessee holds at least one informational meeting on the SAP in the county nearest the lease site. ▪ State approves, approves with modifications, or denies SAP.
Construction and Operation Permit and Lease When site assessment is complete, lessee files complete construction and operation (C&O) permit and lease application.	▪ If application meets standards, department publishes notice of the draft C&O permit ▪ Department holds one public meeting in the county nearest the lease site. ▪ Department accepts public comment on draft permit for 30 days after the date of the public meeting.

SOURCE: Michigan Great Lakes Wind Council, 2010.

Because the MDNRE operates under a joint permitting process with the U.S. Army Corps of Engineers, which has responsibilities under the federal Rivers and Harbors Act, the Clean Water Act, and the National Historic Preservation Act, the permit for an offshore wind project would be expected to trigger review under the National Environmental Policy Act (NEPA). NEPA has well-established processes for public participation and comment that would need to be coordinated with the state permitting and leasing activities. [5]

[5] See, for example, http://www.nae.usace.army.mil/projects/ma/ccwf/windfarm.htm. Preliminary discussions among states and federal agencies, including the Army Corps of Engineers, Coast Guard, Fish and Wildlife Service, Environmental Protection Agency, have occurred through several forums, including the Great Lakes Commission's Great Lakes Wind Collaborative.

RECOMMENDED COMPENSATION TO THE PUBLIC

The council was charged with recommending "options for how the public could be compensated for bottomland leasing and wind rights for wind energy systems." To that end, the council recommends that a combination of rent and royalties should be collected from developers. The council also recommends a mechanism to direct the royalties to benefit the public, through the establishment of a Great Lakes Wind Energy Trust Fund.

Rent

The council recommends that the agency collect rent from all lessees of Great Lakes bottomlands in the amount of $3 per acre per year. Rent would be collected starting at the execution of the site assessment lease and would continue to be collected until the completion of all decommissioning and removal activities.

Royalties

The council recommends that the agency collect annual royalty payments in an amount determined by the Michigan Public Service Commission. The council recommends that the royalties should not be less than 3 percent of the gross revenue of the project each year.

While the council recommends these specific parameters for rents and royalties as part of the legislative framework, it also discussed the need for flexibility in the legislation given the experience and policies of the federal government related to offshore wind energy developments on the outer continental shelf. It is possible that the Michigan Public Service Commission may want to retain the flexibility to waive royalties for early projects in order to encourage development, as necessary.

Great Lakes Wind Energy Trust Fund

The council recommends the establishment of a Great Lakes Wind Energy Trust Fund that would be funded, at least in part, by royalty payments from offshore wind energy project operations. The council envisions that the trust fund would be used to (1) research, monitor, and address any impacts of offshore wind development; (2) foster the use of renewable energy or promote energy efficiency; and (3) administer the offshore wind regulatory program.

CURRENT STATUS

The council submitted its recommendations to the legislature in March 2010. Since then, a bipartisan, bicameral group of interested legislators has been reviewing and discussing the recommendations with an expectation that legislation would be introduced in late 2010.

Public Engagement

Executive Order 2009-46 charged the council with the following responsibilities related to public engagement:

- Inform, engage, and solicit feedback from the people of Michigan on the identified most favorable leasing locations
- Provide guidance to the State Wind Outreach Team (SWOT) in the team's execution of an outreach and education plan related to offshore wind energy

To fulfill these responsibilities the council undertook the following activities:

- Recommended a process for public engagement as part of agency decision making in the council's proposed legislative framework for Great Lakes wind energy
- Hosted five public meetings in communities across Michigan to provide educational materials about offshore wind development, present the criteria used by the council to establish the most favorable leasing locations, provide the status of legislative recommendations, and solicit feedback from the public
- Received and, whenever possible, responded to public input through council meetings, e-mail, and the council's website
- Established an e-mail distribution list to inform individuals and organizations of developments related to the council and offshore wind energy
- Invited members of the SWOT to attend the council's work group meetings on public engagement. The materials developed for use at the community meetings were also provided to the SWOT for use in its outreach and education activities
- Responded to invitations from stakeholder organizations and the SWOT to speak at various events
- Provided recommendations on public engagement processes for consideration in the development of legislation and rules

PUBLIC INPUT RECEIVED BY COUNCIL

The council received public input through a variety of channels, listed below.

- Written, spoken, and survey response input received at public meetings
- Letters and electronic correspondence sent to the council, council staff, and individual council members
- Comments submitted via the council's website

This input was compiled, analyzed, and shared with the council. A summary of the input is provided below.

COMMUNITY MEETINGS

After the council's January 19, 2010, meeting in Lansing, the council hosted five public events in the spring and summer of 2010 to provide educational materials about offshore wind energy development, present the most favorable leasing locations and legislative

recommendations, and solicit feedback from the public. These events were held in Saginaw on March 25, Escanaba on April 14, Muskegon on May 4, Grand Rapids on July 20, and Dearborn on July 21.

Meeting Format and Topics

Given its charge to engage and educate the public, the council structured the meetings to provide information about offshore wind energy and the council's work and to allow for both formal and informal exchange with council members. It was important to the council that the meetings not be structured as traditional public hearings. The meetings were held in the evening, beginning with an open-house session for attendees to view posters featuring various offshore wind energy topics and to mingle with council members and other attendees. Following the open house, individuals from the council presented on the following topics:

- Emerging offshore wind energy trends and the impetus for creation of the council.
- Criteria recommended by the council to identify and map the least and most favorable areas for development of offshore wind energy in the state's Great Lakes. The results of this evolving mapping work were also shared, with an emphasis on the most favorable areas for offshore wind leasing identified by the council.
- Elements of a proposed regulatory framework to establish a clear process in state law to review and permit any siting applications for offshore wind energy projects on state-owned bottomlands.
- Proposed process for public engagement in any offshore wind energy siting process.

Interspersed with the presentations were several opportunities to allow for public input. First, the council used polling software to have the attendees provide their opinions related to offshore wind energy and to share with the audience the real-time results (see Audience Polling Results section below). Second, the attendees, seated at round tables, had opportunities to discuss and respond to three questions posed by the council and to provide any additional comments in writing. Third, the council accepted additional public comment at the end of some of the presentations.

Meeting Publicity

The council used a variety of approaches to publicize the meetings:

- Personal communications and distribution of flyers to local officials and various organizations involved in local, state, regional, and federal government, water resource management, business development, conservation and environmental protection, tribal issues, commercial and recreational fishing, etc.
- Postings on e-mail distribution lists, including the council's list of subscribers and the Great Lakes Information Network, Michigan Renewable Energy Program (MREP) list, Energy Tidbits (Michigan Department of Energy, Labor & Economic Growth), Enviro-mich, etc.
- Media advisories, on-camera television interviews, and other outreach to local and statewide media outlets
- Meeting information and materials posted on the council's website

Attendance and Meeting Feedback

Attendance at the public events varied, as shown in Exhibit 14. The largest turnout was in Muskegon, where there has been considerable interest in offshore wind energy since the announcement of an offshore project in Lake Michigan in the late fall of 2009.

To gather feedback on the meeting process, format, and content, the council asked attendees to complete evaluation forms. Feedback on the forms was positive. Respondents indicated that they "strongly agreed" or "somewhat agreed" that:

- they learned a lot about offshore wind energy,
- the meeting was useful,
- the meeting provided a meaningful opportunity to voice their opinions, and
- the meeting was conducted in a fair manner.

See Appendix C for a complete record of the meeting evaluation data.

EXHIBIT 14
Summary of Participation at Meetings

Place and date	Approximate number of attendees	Evaluation forms received
Saginaw (March 25, 2010)	80	24
Escanaba (April 14, 2010)	40	31
Muskegon (May 4, 2010)	270+ (exceeded room capacity)	135
Grand Rapids (July 20, 2010)	110	51
Dearborn (July 21, 2010)	75	40
Total	**575+**	**281**

SOURCE: Michigan Great Lakes Wind Council, 2010.

Audience Polling Results

During the community meetings the council used audience response polling software with hand-held "voting clickers" to gather audience opinions and perspectives. In addition to the benefit of creating interactive sessions as a break from the formal presentations from the podium, the polling software was used for three reasons:

- To give everyone attending the meetings equal time and opportunity to record their opinions
- To give participants a sense of their neighbors' opinions through instant feedback
- To provide data for council consideration and for use by social scientists in the future

More than 480 people participated in the polling. A tabulation of audience polling results for the spring and summer 2010 meetings is presented in Appendix D.[6] The data collected in the meetings were considered by the council and may be used as a baseline or benchmark by those involved in future research and policy development. Research indicates that audience polling gives participants, including those who may not be otherwise inclined to express opinions, a sense that they are contributing to the process and being heard.[7]

The audience was asked a series of 26 questions[8] in three segments over an approximately 30-minute period during each of the meetings. The audience polling software displayed results immediately after each question. Council members (who did not vote) and participants saw graphs that displayed the anonymous poll responses, which engaged and informed the audience.

The first series of questions asked for opinions about wind energy: how support for offshore wind energy compared to coal, gas, and nuclear power plant development in coastal areas to meet the state's new renewable energy standard; and how turbine installation distances from shore might influence public support for wind field development. The second set of questions asked for attendee perceptions on the impacts of a wind field on a dozen important resource issues, including: fishing, boating, energy prices, tourism, aesthetics, and job creation, among others. The final set of questions, which were primarily demographic in nature, was intended to allow comparisons between respondent groups.

Though responses were collected "anonymously"—that is, data could not be attributed to individuals in the audience—each remote-control clicker logged a unique code in the software so that groups could be created. Of the 484 people who logged on to the system, 444 indicated whether or not they had a coastal residence with a view of the Great Lakes horizon. A total of 161 people (36 percent) were grouped as "coastal residents" and 283 people (64 percent) were grouped as "inland residents." It should be noted that polling data drawn from a valid statistical sample (rather than self-selected group) will be needed to get a more accurate idea of local or statewide opinions and perspectives on offshore wind. Self-selected attendee response rates do not represent statewide public opinion.

[6] Michigan Sea Grant Extension Educators Dr. Dan O'Keefe and Brandon Schroeder performed audience response software management and compiled the response data for the council. Not all respondents answered every question.

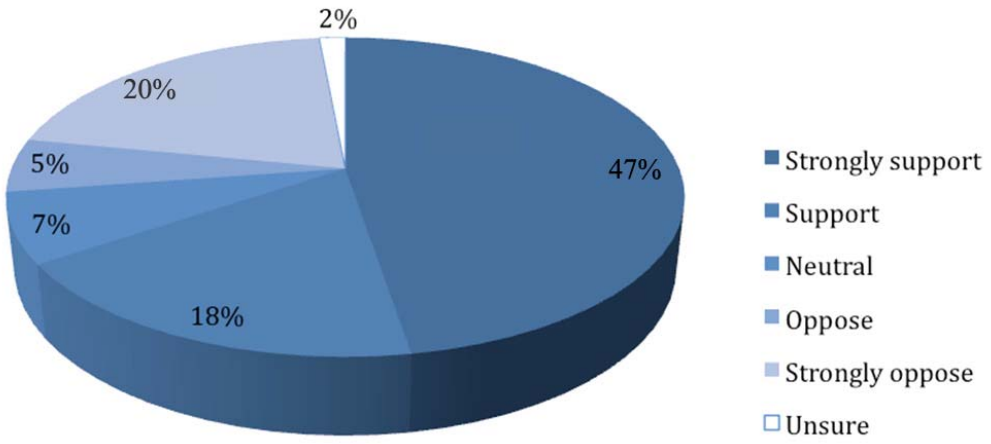
[7] In a recent survey of instructors who have used this type of software, 94 percent either agreed or strongly agreed with the claim, "Clickers increased student engagement in the classroom," and 74 percent of the faculty respondents agreed or strongly agreed with the claim, "Clickers have been beneficial to my students' learning." Students similarly reported that the use of clickers increased their engagement, involvement, and interaction. Robert Kaleta and Tanya Joosten, Student Response Systems: A University of Wisconsin System Study of Clickers, *Educause Center for Applied Research Bulletin* 2007, Issue 10 (May 8, 2007): 4–6.

[8] The questions were adapted from the research of University of Delaware professor Jeremy Firestone et al. by Michael Klepinger, the meeting facilitator, and approved by the council's Public Engagement Work Group.

Wind Power versus Other Energy Sources

Nearly two-thirds (65 percent) of respondents at all five meetings indicated support or strong support for development of commercial wind farms **offshore** to help utilities meet the Renewable Portfolio Standard (RPS), while a minority (25 percent) opposed or strongly opposed development.[9] Respondents were asked the following question: "To what extent do you support development of commercial wind farms **offshore** to help utilities meet the Renewable Portfolio Standard?" Answers are illustrated in Exhibit 15.

EXHIBIT 15
Support for Offshore Wind Farms to Help Meet RPS



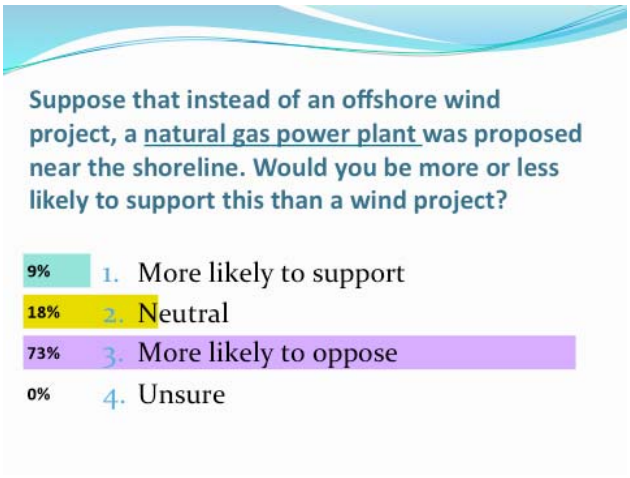
Answer Option	Number	Percentage
1. Strongly support	227	47%
2. Support	87	18%
3. Neutral	34	7%
4. Oppose	26	5%
5. Strongly oppose	98	20%
6. Unsure	7	1%

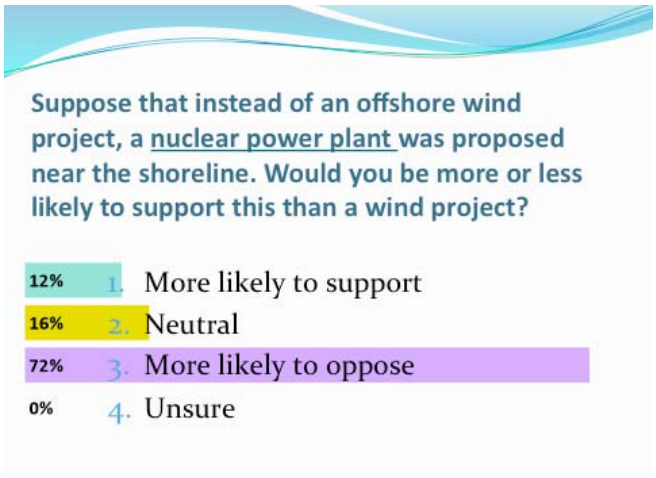
SOURCE: Michigan Great Lakes Wind Council, 2010.

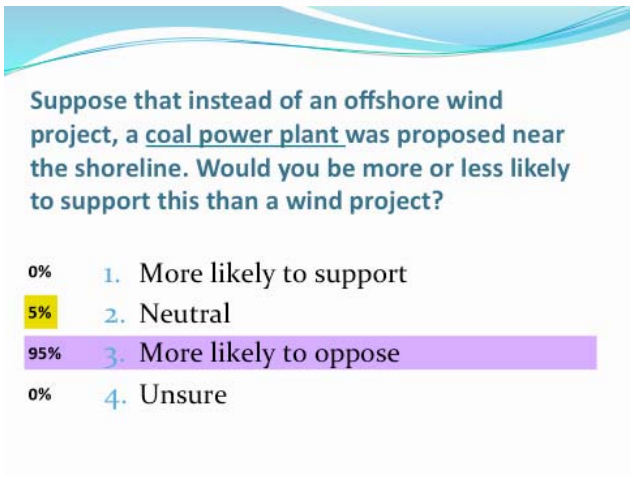
When offered a choice between **offshore** wind power development and either coal, nuclear, or natural gas power plant development near the shoreline, support was consistently greater for offshore wind. This was most pronounced at the July 21, 2010, meeting held in Dearborn, as can be seen in Exhibit 16.

[9] In comparison, when asked about **onshore** wind farm development, the spread was greater between support or strong support (81 percent) and opposition or strong opposition (11 percent).

EXHIBIT 16
Support for Offshore Wind When Given Choice of Other Supply Options
(Dearborn Meeting Audience Polling)







SOURCE: Michigan Great Lakes Wind Council, 2010.

The results averaged across all five meetings revealed that 73 percent of respondents would more likely oppose a coal power plant, 57 percent would more likely oppose a nuclear plant and 55 percent would more likely oppose a natural gas power plant.

Preferences and Location of Residence

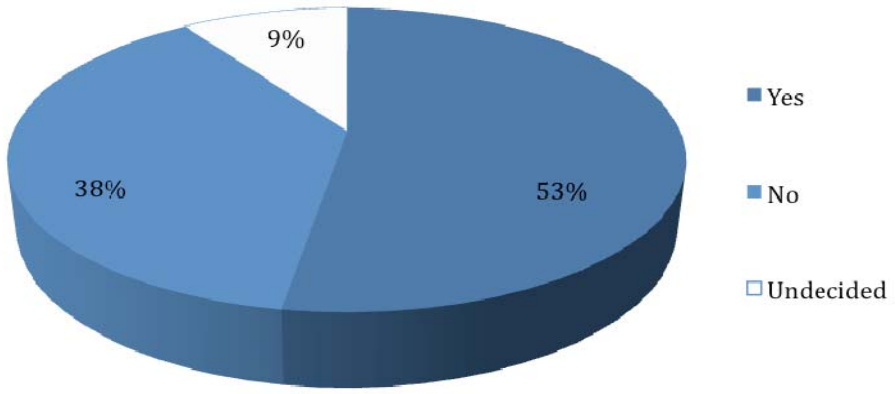
The most striking differences of opinion and perceptions about offshore wind power development among meeting participants were found between coastal and inland residents. Coastal residents (161 respondents, or roughly one-third of the aggregated audience in the five meetings) were identified as respondents who answered, "Yes" to owning a primary and/or secondary place of residence within sight of the Great Lakes horizon. Coastal resident answers differed significantly from inland resident answers for all questions included in the statistical analysis. In all cases, the median response value was lower for inland residents when presented with a scale of possible answers ranging from one (1 = strongly benefit or support) to five (5 = strongly harm or oppose). This trend was most pronounced in answers to the initial question about support for offshore wind to fulfill Renewable Portfolio Standard goals: the median score for coastal residents was 4, while the median score for inland residents was 1, indicating that, among those who attended these meetings, inland residents supported offshore wind development while coastal residents did not.

Visual Preferences at Varying Distances

Participants were given a set of three photographs and asked to indicate a level of support for each offshore wind development depicted. Photo A showed a field of several dozen turbines (of the size currently being installed around the world) located six miles offshore, which is the distance council recommended for a Michigan shoreline visual buffer. Photo B showed the same field at a distance of 13 miles and Photo C showed the field 20 miles from shore. Respondents were asked the following question: "If a proposed wind project appeared as shown in Photo A, would you support the project?" Responses are illustrated in Exhibit 17.

All three images presented a "clear day" view from an average person's height (elevation 5.25 feet), which provided respondents with a common reference from which opinions and perceptions could be gauged. Not surprisingly, distance of turbines from shore affected support: about half of respondents (53) percent said they would support an offshore wind development like the one in Photo A, 59 percent said they would support a development like the one in Photo B, and 71 percent would support a development like the one shown in Photo C.

EXHIBIT 17
Preference for Offshore Wind Turbines Located Six Miles from Shore



Answer Option	Number	Percentage
1. Yes, I would support it.	249	53%
2. No, I would oppose it.	180	38%
3. Undecided.	45	9%

SOURCE: Michigan Great Lakes Wind Council, 2010.

Perceived Positive and Negative Impacts of Offshore Wind Energy

Next, the audience was asked to consider Photo A (showing turbines six miles from shore, the visual buffer distance recommended by council) while they provided responses to a series of 12 questions about perceived impacts of offshore wind development. They were asked to use their best judgment when responding, even if they had few facts or experiences to go by. Each question in the series began with the phrase, "How do you think this project would affect _____?" A scale of one (1 = strongly benefit) to five (5 = strongly harm) was offered. Participants were asked about effects on fishing, tourism, jobs, air quality, electricity rates, aesthetics, property values, aquatic life, avian life, boating, climate change, and energy independence.

For some of the topics, including fishing, tourism, electricity rates, boating, and aquatic life impacts, the responses are quite evenly distributed across the benefit-harm scale. Other topics, however, show a stronger public perception of negative impacts (e.g., aesthetics and avian impacts) or a stronger perception of positive impacts (e.g., jobs, air quality, climate change, and energy independence). Appendix D includes graphs that highlight these response trends.

Opinions about the Meeting

Finally, after responding to questions about coastal land ownership and the amount of time spent at the shore, participants answered two questions about the council's meetings. When asked, "Compared with how you felt before this meeting, how have your opinions of offshore wind on the Great Lakes changed?", 40 percent said they were more supportive, 41 percent said their opinions had not changed, and 14 percent said they were more opposed. When asked, "Do you agree or disagree with this statement: 'The Great Lakes Offshore Wind Council is acting openly and transparently.'?", a majority of meeting participants (75 percent) agreed with the statement, a few had no opinion (8 percent), and a minority (17 percent) disagreed.

Community Meeting Round Table Discussion Sheets

At the community meetings, the council distributed a handout to encourage discussion among the people at each round table. Council members seated themselves at the tables among the participants. The handout posed three questions and left space for written comments. One question asked how the state could encourage renewable energy development through policies and incentives; another question asked for suggestions about "anything else the council should consider" in completing its work; and a third question asked if the council's 22 mapping criteria "seem reasonable and comprehensive for new statewide policy and planning." A summary of the input received on the "reasonable and comprehensive" question is presented below, followed by excerpted audience suggestions and questions for the council.

Q: You just learned about the council's exclusion areas and buffering criteria. Do they seem reasonable and comprehensive for new statewide policy and planning?

- ***YES (count = 119).*** This group of respondents wrote the word "yes" or was otherwise unequivocal in their replies. Examples include one-word answers and phrases such as: "very;" "they do;" "I think they are."
- ***NO (count = 31).*** This group of respondents wrote the word "no" or was otherwise unequivocal in their replies. Examples include one-word answers and phrases such as: "absolutely not;" "they are too restrictive;" "they are not comprehensive;" "I don't think so."
- ***INDISCERNIBLE (count = 35).*** This group entered comments that did not make clear whether the participant agreed or not. Examples include phrases such as: "yes, as far as they go;" "reasonable, but;" and "maybe."
- ***NO RESPONSE (count = 42).*** This group did not respond to the question.

The list below includes unique ideas and questions excerpted from the tabletop discussion sheets (audience notes about issues not addressed in the council's presentations).

- "Are you aware there is an important butterfly migration in northern Lake Michigan, perhaps near the Delta [WRA] area?"
- "Begin an education program with high school students."

- "Both legislators and the general public need more opportunities to hear this information."
- "Council should share information with public and conduct statewide straw votes with a larger population than what shows up at these meetings."
- "Even the playing field between fossil fuel energy production and solar and wind."
- "Get rid of fossil fuel and nuclear subsidies."
- "Get unions involved."
- "GLOW should consider cost."
- "Increase incentives for offshore…. I refuse to pay more for 'green' energy."
- "Increase our RPS. Adopt a feed in tariff."
- "Interior of farm would produce higher fish populations because of reef effect, could boaters go inside?"
- "It would be less confusing and less costly for business to know up front if your GIS maps have more info and not let them start the process to have a 'gotcha' moment."
- "I was worried about a company coming into an area and bulldozing a project through that doesn't meet official goals."
- "Keep supply chain in Great Lakes region."
- "Need a realistic future cost of various electrical energy options."
- "Small boats do not have radar to avoid towers in a dense fog."
- "Need to have wind in less than 5 years, get funding so you can train people to work on turbines."
- "No mention was made of offshore ice…"
- "No permitting for foreign, inexperienced companies."
- "Only those with proven experience should be allowed to touch Lake Michigan."
- "Permitting process is too long."
- "Provide tax incentives/grants to promote research and development."
- "Will counties with affected viewsheds be allocated an extra portion of revenues?"
- "Reduce the red tape."
- "Shoreline counties need veto power."
- "The people that live on the shores of the Great Lakes do not own the lake."
- "Use renewable energy as a tourist and industry attraction."
- "We need to see costs for new wind vs. new coal or new nuclear."
- "What about possible water contamination from machine oil?"
- "What about repairing turbines in the winter?"
- "Who pays for angler who does not catch fish in wind farm areas?"
- "Why are we not requiring the new gearless [low oil, low maintenance] turbines?"
- "You didn't address the responsibility for the cost of decommissioning."
- "200 rusting hulks would not be conducive to tourism."

CORRESPONDENCE RECEIVED BY THE COUNCIL

Scandia Aegir Project in Lake Michigan

A proposal for an offshore wind energy development in Lake Michigan, the Scandia Aegir project, was the subject of considerable press and public comment after the developer's announcement of the project in late fall 2009. The media and public response to this project was likely heightened because it was the first time a preliminary proposal for Great Lakes offshore wind energy development was made public.[10] Several dozen members of the public sent very thoughtful messages to the council, most opposing the Scandia Aegir project, before the council responded to individual letters and then posted a notice on its website to clarify that the council was not charged with providing input on or deciding upon specific proposals. The Scandia Aegir project, while not directly related to the council's role to provide guidance and recommendations on statewide policy and planning, no doubt influenced levels of public acceptance of offshore wind energy development during the life of the council, particularly in coastal communities adjacent to the site of Scandia Aegir's Lake Michigan proposal. It also accentuated the need for new laws to clarify state offshore wind development requirements.

Correspondence Received

The council received—by U.S. mail, e-mail, and website input form—approximately 300 comments and questions about offshore wind energy, the Scandia Aegir project, the council's work process, and the council's policy recommendations.

As might be expected, many people expressed support or concerns related to offshore wind energy development, and some did not comment on the substance of the issues, but rather had questions or comments regarding the process. Individuals who supported or opposed offshore wind energy development usually had more than one reason for their views. The major themes from the comments are summarized in Exhibit 18, along with excerpts from the correspondence. It is important to emphasize that the Scandia Aegir project was the impetus for the majority of the comments received and, in particular, the comments expressing opposition to or concerns with the process of siting offshore wind energy. After an initial backlash against the Scandia Aegir proposal, however, the council began receiving more comments in support of offshore wind energy development in Michigan.

EXHIBIT 18
Major Themes from Public Correspondence

Common reasons stated	Example excerpt from comments
Support for offshore wind energy	
Job creation/economic opportunity	I was born and raised in Muskegon, Michigan. We have the highest unemployment rate in the nation. Not only do we want wind power....we need it. Muskegon is a wonderful place to live, and I can't stand the idea that we might go under. We NEED this in our area.

[10] The Scandia Aegir project was not formally proposed to the state.

Common reasons stated	Example excerpt from comments
Clean, renewable energy	The lakeshore is an ideal location for producing needed energy and SHOULD BE USED. Personally, I would like to look out offshore and see windmills, knowing that they are producing clean energy rather than adding more coal/gas plants. Everywhere we look these days we hear the NIMBY wail. Well, it is time to get over it if it means not getting another ugly and polluting coal, gas or nuclear plant.
Concerns with offshore wind energy	
Opposition to Scandia/Aegir project	I am writing to voice my opposition and request your consideration in denying development of wind-energy projects currently being targeted for Lake Michigan. Your support in keeping Lake Michigan pristine and undisturbed is greatly appreciated and needed.
Tourism impacts	Long-term negative impact on tourism. Tourism, currently a primary source of jobs, will undoubtedly be negatively impacted. Families come to Western Michigan for its natural beauty—nothing is beautiful about large wind turbines next to the shores.
Habitat impacts	The rapidly spinning blades would kill much of the avian life in the area, including bald eagles, cormorants, geese, ducks, monarchs, and other birds and wildlife.
Property value impacts	The real estate market for high value Lake MI property will be seriously damaged and will be set back decades if a wind farm as illustrated in the press recently is allowed to go ahead.
Performance or other effects of wind turbines (power output, oil leaks, flicker and noise impacts)	The noise and "flicker" effects that will most certainly result from the placement of these turbines. The flicker effect would turn the sun into a giant strobe light most afternoons until late night sunset (as late as 10:00 P.M. in the summer months).
Use of the Great Lakes for private purpose/gain; public trust issues	The bottomlands of the Great Lakes are held in trust by the State of Michigan for use and enjoyment by citizens and the general public. The state has a perpetual responsibility to the public to maintain and protect the public's fundamental rights to use this property. Private use of the bottomlands and waters are subject to the public trust.
Other comments and questions	
Public access for fishing and boating near turbines	Question: Would any area built be off limits to people or could fishing still be done in the area?
Public input process	You require some public hearings, but it appears to us that even overwhelming opposition could be ignored. Public hearings must allow for input that can lead to meaningful change, and not simply be window dressing.
Local government authority and role in siting decisions	Affected communities must be given a role in the decision-making process.*
Proximity to shoreline / use of deep water technology	Wind farms should be located far enough out in Lake Michigan so that you are unable to see them from shore. Six miles is not far enough out.
Accuracy of data using in council's mapping	Not at all adequate information about bird migration pathways.

Common reasons stated	Example excerpt from comments
Other comments and questions (cont.)	
Alternative technology such as solar, nuclear, etc.	I have heard solar is more practical.
Role and work of the council	See additional discussion below

SOURCE: Michigan Great Lakes Wind Council, 2010.
* NOTE: In late May and early June 2010, three local governments (City of Ludington, Pere Marquette Charter Township, and the City of Charlevoix) passed a resolution (each of them containing nearly identical language) stating that approval from the governing bodies of the local communities that would be affected by, or would be able to view, an offshore wind farm must be obtained before any permit is issued for an offshore wind farm located within 15 miles from the shoreline on the Great Lakes.

Many of the comments indicated that the council was doing a good job given its mandate. One of the most serious concerns expressed was that the public's voices on the issue might be obfuscated by the political process, thereby negating the council's process and recommendations.

Concerns about Public Input Having Meaningful Effect on Decisions

The single biggest concern expressed in the comments received by the council (other than comments directly related to the Scandia project) was that despite public opposition to offshore wind energy development in the Great Lakes, the public's concerns would have no real impact on the development process. Many people think local government has authority over Great Lakes bottomland leasing. Some of the comments opined that the state would enact legislation that ignores their pleas.

- *"You require some public hearings, but it appears to us that even overwhelming opposition could be ignored. Public hearings must allow for input that can lead to meaningful change, and not simply be window dressing. We note, for example, that GLOW is planning three public hearings, yet it appears that these may be held after the legislative proposal is finalized. This strikes me as being disrespectful of public opinion."*
- *"One of the charters of the GLOW council is: To inform, engage and solicit feedback from the people of Michigan to insure that statewide interests are considered. This means not just hear the opposition but to act on the people's wishes, and to create a framework of legislation and regulations which reflect the wishes of the opposition. Public meetings mean nothing unless the concerns of the people are acted upon."*
- *"There is not now nor does it seem that there will be any process of direct voting on the project. Will it be up to the county commissioners and state representatives to vote? Will the public only have an indirect effect on the approval process? Will lobbyists have more influence than county citizens?"*

Council Performance

The great majority of comments received on the council's performance were positive.

Positive

- *"You have diligently pursued your mission as evidenced by the Council meeting minutes and the September 1, 2009, report. The charge of developing guidelines for*

offshore wind farm development, and identifying the most favorable sites, is a daunting task considering the variety of stakeholder interests present. We appreciate your recognition that many companies will approach the state with offshore wind farm proposals and your proactive approach in developing guidelines that balance stakeholder interests."

- *"I appreciate each of your efforts and continued work on the Great Lakes Wind Council. I'm pleased that our state Rep. Goeff Hansen has proposed legislation to give the state time to implement guidelines for regulation of offshore wind farms."*
- *"GLOW has developed an impressive Final Report, which addresses many of the complex issues. An attempt has been made to synthesize these issues into categories of suitability for offshore turbines."*
- *"We would like to thank you for all your public service and for promoting green renewable energy in Michigan."*

Negative

- *"Highlighting GLOW's desperation and single-minded focus of ramrodding offshore wind power development down the throat of Michigan are their recent activities. Specifically, GLOW indicated within the past several days that it is already abandoning some of the recommendations that it made in its September 2009 report. In particular, GLOW had previously recommended that any offshore wind farm be located outside of a 6-mile buffer from the shoreline. They now suggest—just a mere 4 months from issuing that recommendation—that no such buffer is necessary. Never mind that even a 6-mile buffer is ridiculously close to shore; GLOW is so rabid about pushing their agenda, they are now willing to forsake their own recommendations."*

FURTHER PUBLIC ENGAGEMENT

Since late fall 2009 when the council began its second phase, it has received a significant amount of feedback from the public, in terms of both the sheer volume and the extent of the comments. The input received was informative and it is evident that many individuals researched issues at length. Many issues identified relate generally to offshore wind energy—including the potential positive and negative impacts—and will be addressed along with mitigation of impacts as part of the permitting and leasing processes of state and federal agencies. The council is not a siting or permitting body, but it appreciates all input related to its policy recommendations and broad, statewide planning related to offshore wind energy. As part of its proposed legislative framework for the permitting and leasing of offshore wind energy projects, the council has outlined how the public should be engaged in the decision-making process. The council recognizes that the Great Lakes bottomlands are held in the public trust and it is essential that the siting process and siting standards be rigorous and transparent with ample public engagement to avoid misguided developments. Federal permitting and NEPA review during site development will also involve the public in decision making.

Conclusion

When the council began its work in early 2009, offshore wind energy in the Great Lakes was not a common topic of discussion among policymakers or the public. That is no longer the case. The council's efforts during the past two years were aimed at helping the state prepare to deal with future development proposals. The council's work is the first step in a long-term process to determine whether and how offshore wind energy facilities are constructed in the state's Great Lakes. The council's efforts set the stage for understanding the most and least favorable areas for leasing and related data needs, and they lay the groundwork for defining the criteria and process for permitting and leasing of offshore wind energy developments. The council was not charged with advocating for or against offshore wind energy development. It was not charged with review of development proposals. The council is putting forward a policy proposal to state policymakers to establish a balanced permitting and leasing structure. This is necessary so that the state is prepared to effectively handle future development proposals with clear guidelines and open, transparent processes for all parties.

Appendices

Appendix A: *Executive Order 2009-46, Great Lakes Wind Council Department of Energy, Labor & Economic Growth*

Appendix B: *Great Lakes Wind Council Members*

Appendix C: *Community Meeting Participant Evaluation*

Appendix D: *Community Meeting Polling Results 2010, Participant Response Tabulation*

Appendix A:

Executive Order 2009-46, Great Lakes Wind Council
Department of Energy, Labor & Economic Growth

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
OFFICE OF THE GOVERNOR
LANSING

JOHN D. CHERRY, JR.
LT. GOVERNOR

EXECUTIVE ORDER
No. 2009 - 46

AMENDMENT OF EXECUTIVE ORDER 2009-1

GREAT LAKES WIND COUNCIL

DEPARTMENT OF ENERGY, LABOR, AND ECONOMIC GROWTH

WHEREAS, Section 1 of Article V of the Michigan Constitution of 1963 vests the executive power of the State of Michigan in the Governor;

WHEREAS, Section 2 of Article V of the Michigan Constitution of 1963 empowers the Governor to make changes in the organization of the executive branch of state government or in the assignment of functions among its units that the Governor considers necessary for efficient administration;

WHEREAS, the Great Lakes Wind Council was created by Executive Order 2009-1;

WHEREAS, Executive Order 2009-1 was subsequently amended by Executive Order 2009-19 in order to expand the membership of the Great Lakes Wind Council from thirteen to seventeen members;

WHEREAS, it is necessary and desirable to again amend Executive Order 2009-1 to expand the membership and responsibilities of the Great Lakes Wind Council, as well as to extend the date by which the Great Lakes Wind Council must complete its work;

NOW, THEREFORE, I, Jennifer M. Granholm, Governor of the State of Michigan, by virtue of the power and authority vested in the Governor by the Michigan Constitution of 1963 and Michigan law, order the following:

A. Section II.B.9.j. of Executive Order 2009-1 is amended to read as follows:

"j. Eleven other residents of this state."

B. Section II.C. of Executive Order 2009-1 is amended to read as follows:

"C. Members of the Council shall serve until December 31, 2010."

C. Section III of Executive Order 2009-1 is amended to read as follows:

"III. CHARGE TO THE COUNCIL

A. The Council shall act in an advisory capacity and shall do all of the following:

1. Identify those areas most favorable to lease for offshore wind development.

2. Inform, engage, and solicit feedback from the people of Michigan on the identified most favorable leasing locations to ensure that statewide interests are considered whenever significant permitting decisions are made.

3. Provide guidance to legal and technical experts as they develop model lease and solicitation documents.

4. Recommend options for how the public could be compensated for bottomland leasing and wind rights for wind energy systems, and advise on an incentive structure for early investors in wind development.

5. Provide guidance to the State Wind Outreach Team created within the Department of Energy, Labor, and Economic Growth in the Team's execution of an outreach and education plan related to offshore wind energy.

6. Provide input on proposed and new Great Lakes wind development legislation and rulemaking as appropriate.

7. Represent the interests of the state of Michigan in the Great Lakes Wind Collaborative and other multi-sector and interstate efforts to facilitate the sustainable development of Great Lakes wind resources.

8. Perform other functions related to the Council's responsibilities as requested by the Governor.

B. The Council shall provide a report of its activities to the Governor no later than November 15, 2010.

C. The Council shall complete its work by December 31, 2010."

This Order is effective upon filing.

Given under my hand and the Great Seal of the State of Michigan this 8th day of October in the year of our Lord, two thousand nine.

JENNIFER M. GRANHOLM
GOVERNOR

BY THE GOVERNOR:

Secretary of State

FILED WITH SECRETARY OF STATE
ON 10/8/09 AT 1:04pm

Appendix B:
Great Lakes Wind Council Members

Member	Position/Affiliation
State Agencies	
Andrew Levin (council chair)	Director, Michigan Department of Energy, Labor & Economic Growth
Jim Sygo, Deputy Director	Deputy Director, Michigan Department of Natural Resources and Environment
Ken DeBeaussaert	Director, Office of the Great Lakes, Michigan Department of Natural Resources and Environment
John Halsey, State Archeologist	Office of State Archeologist, Michigan Sate Housing Development Authority
Dennis Knapp	Assistant to Resource Management Deputy, Michigan Department of Natural Resources and Environment
Orjiakor N. Isiogu	Chairman, Michigan Public Service Commission
Cindy Douglas	Vice President of Business Development, Michigan Economic Development Corporation
Roberta “Bobbi” Tisdale	Chair, Green Initiatives Team, Michigan Department of Transportation
Additional Members Appointed by the Governor	
Adesoji O. Adelaja	Director and founder, Michigan State University Land Policy Institute, John A. Hannah Distinguished Professor in Land Policy, Michigan State University
T. Arnold Boezaart	Director, Grand Valley State University, Michigan Alternative and Renewable Energy Center
Dennis Assanis	Director, Michigan Memorial Phoenix Energy Institute, Arthur F. Thurnau Professor, and Jon R. and Beverly S. Holt Professor of Engineering, University of Michigan College of Engineering
Leonard J. Bohmann	Associate Dean of Engineering, Michigan Technological University
James P. Clift	Policy Director, Michigan Environmental Council
J. Wilfred Cwikiel	Harbor Springs, Michigan
Frank D. Ettawageshik	Executive Director, United Tribes of Michigan
Brett French	Senior Regional Manager-External Relations Michigan, American Transmission Company
Margaret R. Gale	Dean, School of Forest Resources & Environmental Science, Michigan Technological University
Dennis L. Grinold	State Affairs Officer, Michigan Charter Boat Association
Curtis A. Hertel Sr.	Executive Director, Detroit-Wayne County Port Authority
Thomas L. Hickner	Bay County Executive
M. Jack Knowles	Vice President, Dietrich, Bailey and Associates, PC
Steven E. Kurmas	President and Chief Operating Officer, Detroit Edison
Marty G. Lagina	Chief Executive Officer, Heritage Sustainable Energy, LLC
James D. MacInnes	Co-owner and Chief Executive Officer, Crystal Mountain Resort and Spa
Michael O’Brien	Great Lakes Project Director, Bluewater Wind
John G. Russell	Chairman and Chief Executive Officer, CMS Energy Corporation and Consumers Energy Company
Christopher M. Trebilcock	Principal, Miller, Canfield, Paddock and Stone, PLC
Richard F. Vander Veen	President, Mackinaw Power
Joseph L. Welch	Chairman, President, and Chief Executive Officer, ITC Holdings Corp.

Appendix C:
Community Meeting Participant Evaluation

The following table aggregates participant evaluations for the Great Lakes Wind Council community meetings in the spring/summer of 2010 in Saginaw, Escanaba, Muskegon, Grand Rapids, and Dearborn

Responses on Evaluation Forms

Evaluation Question	Strongly agree	Agree	Disagree	Strongly disagree	Number answering
1. Overall, this was a useful event.	47.8%	46.4%	2.5%	2.9%	276
2. This meeting provided a meaningful opportunity for me to voice my opinions.	24.9	62.7	8.7	3.7	241
3. The meeting was conducted in a way that was fair to everyone.	36.8	53.3	6.1	3.8	261
4. I learned a lot today about issues concerning offshore wind.	32.6	50.2	13.5	3.7	267
5. I made valuable contacts today with others in my community.	15.6	50.2	30.7	3.6	225
6. Before today, I already knew a lot about offshore wind energy development and was actively involved in this issue.	21.3	49.1	25.1	4.5	267

Evaluation Question	Too short	About right	Too long
7. The length of the meeting was…	1.2%	82.5%	16.3%

Evaluation Question	Great Lakes Wind Council	Media	Other organization	Word of mouth	Other
10. How I heard about the meeting	28.9%	61.1%	80.5%	74.7%	17.9%

Appendix D:
Community Meeting Polling Results 2010, Participant Response Tabulation

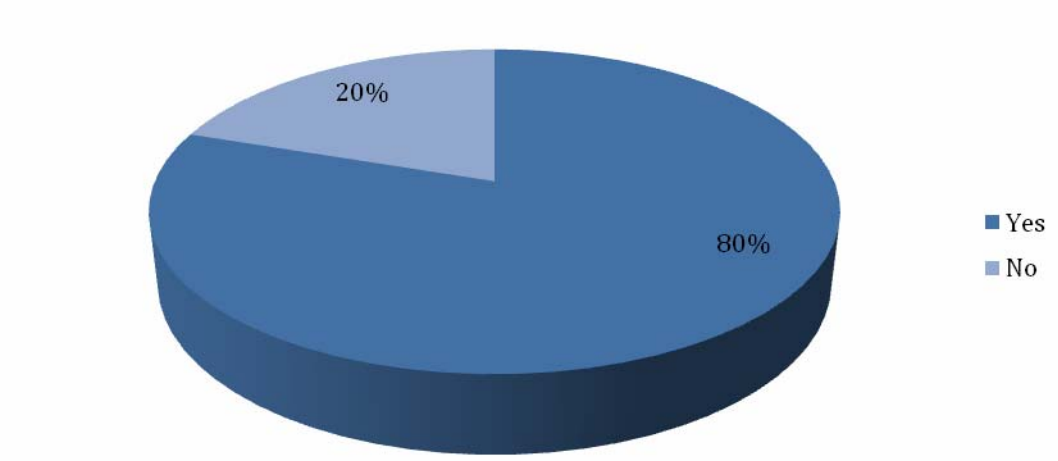
Community Meeting Polling Results 2010, Participant Response Tabulation [1]

August 15, 2010

I. Preliminary Questions

After a short introduction, participants were asked two preliminary questions to test equipment and familiarize the audience with use of the response pads. Data were not recorded consistently for the first test question; hence response enumeration in this report begins with "Q2."

Q2. Have you ever seen a wind turbine in operation from outside your car?



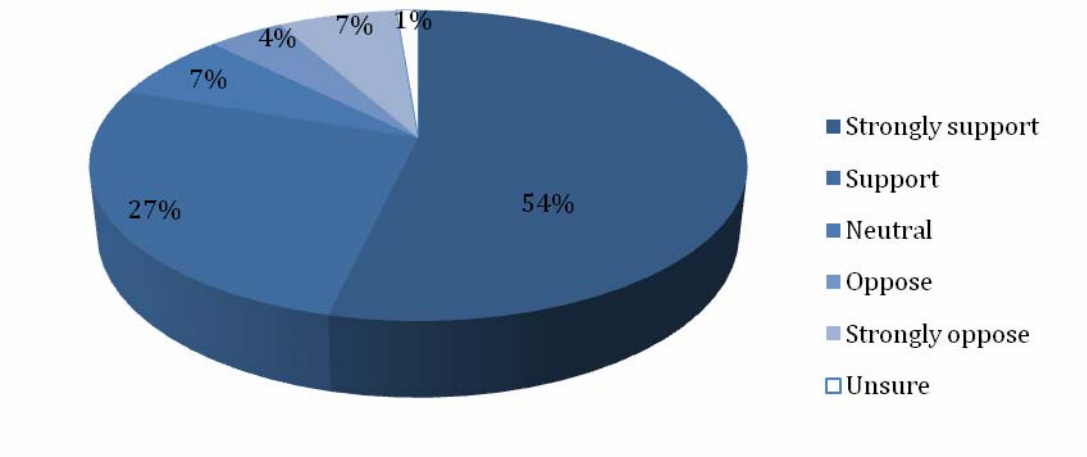
Answer Option	Number Answered	Percentage
1. Yes	375	80%
2. No	93	20%

[1] Survey questions adapted from the work of Jeremy Firestone *et al.* by Michael Klepinger and approved by the council's Public Engagement Work Group. Audience response software management and compilation of results by Dan O'Keefe and Brandon Schroeder, Michigan Sea Grant & MSU Extension.

II. Opinions on Wind Power

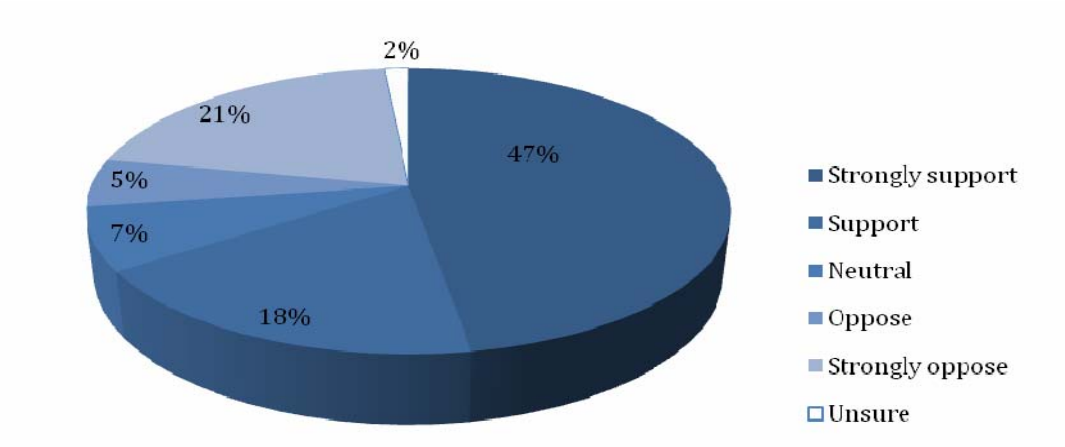
Before answering the next 5 questions, participants were read the following statement: "In 2008, Michigan passed a new Renewable Portfolio Standard law, which requires that electric utilities derive 10 percent of the power they sell from renewable sources by 2015."

Q3. To what extent do you support development of commercial wind farms <u>on land</u> to help utilities meet the Renewable Portfolio Standard?



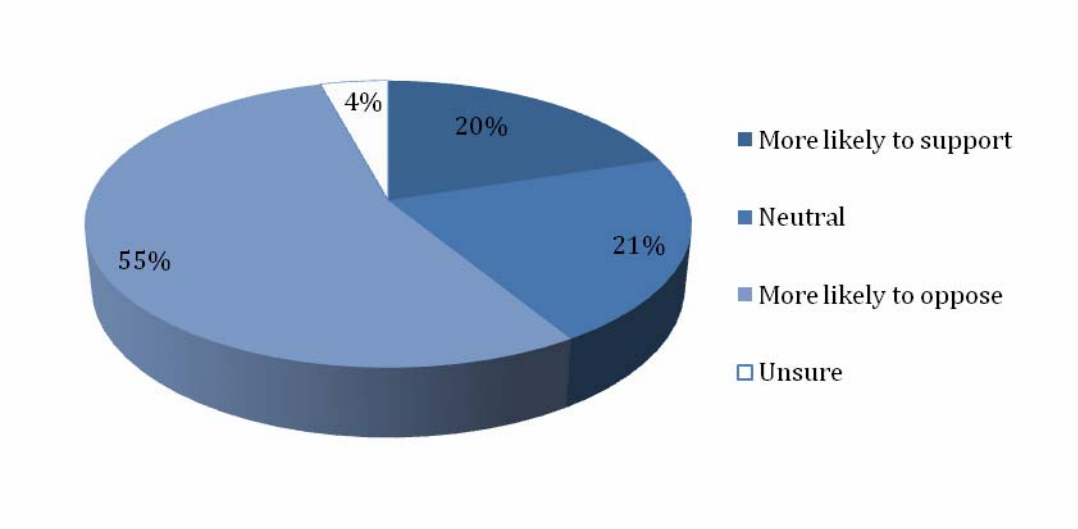
Answer Option	Number Answered	Percentage
1. Strongly support	255	54%
2. Support	126	27%
3. Neutral	34	7%
4. Oppose	21	4%
5. Strongly oppose	33	7%
6. Unsure	6	1%

Q4. To what extent do you support development of commercial wind farms <u>offshore</u> to help utilities meet the Renewable Portfolio Standard?



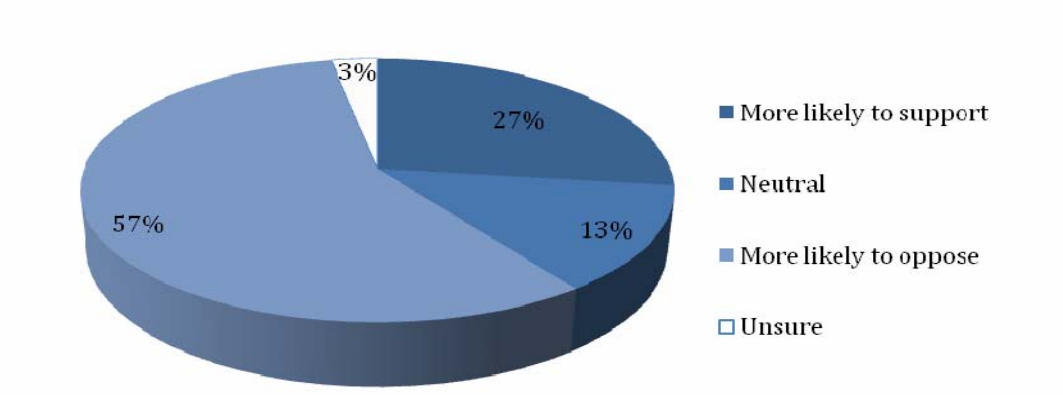
Answer Option	Number Answered	Percentage
1. Strongly support	227	47%
2. Support	87	18%
3. Neutral	34	7%
4. Oppose	26	5%
5. Strongly oppose	98	21%
6. Unsure	7	2%

Q5. Suppose that instead of an offshore wind project, a <u>natural gas power plant</u> was proposed near the shoreline. Would you be more or less likely to support this than a wind project?



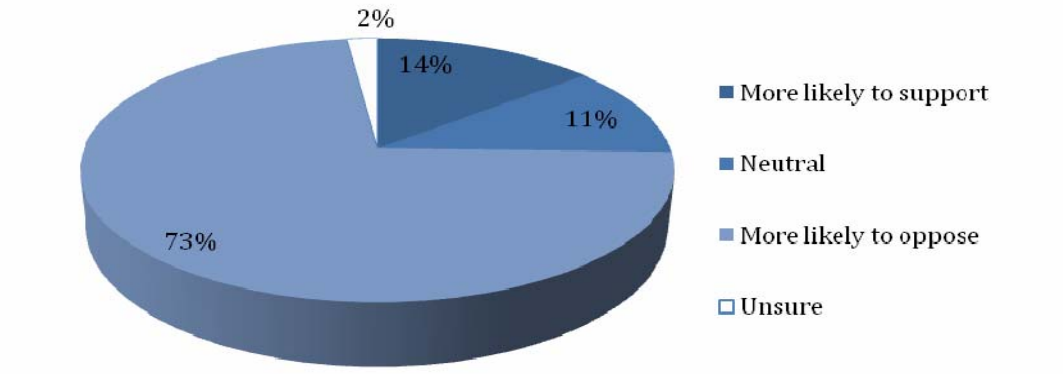
Answer Option	Number Answered	Percentage
1. More likely to support	95	20%
2. Neutral	100	21%
3. More likely to oppose	258	55%
4. Unsure	20	4%

Q6. Suppose that instead of an offshore wind project, a <u>nuclear power plant</u> was proposed near the shoreline. Would you be more or less likely to support this than a wind project?



Answer Option	Number Answered	Percentage
1. More likely to support	129	27%
2. Neutral	62	13%
3. More likely to oppose	272	57%
4. Unsure	14	3%

Q7. Suppose that instead of an offshore wind project, a <u>coal power plant</u> was proposed near the shoreline. Would you be more or less likely to support this than a wind project?

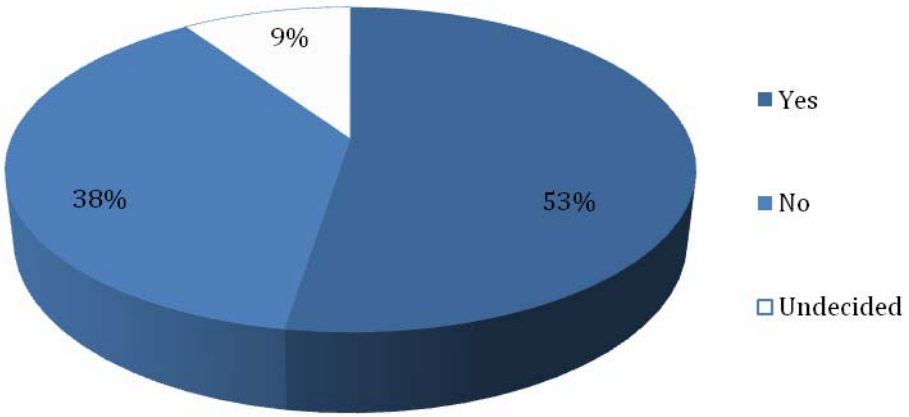


Answer Option	Number Answered	Percentage
1. More likely to support	67	14%
2. Neutral	53	11%
3. More likely to oppose	343	73%
4. Unsure	9	2%

III. Visualizations

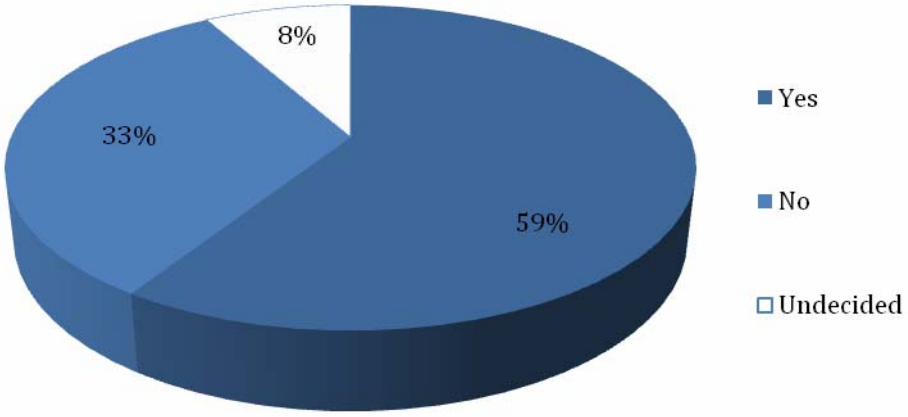
Before answering the following questions, participants were told to refer to handouts found on their tables. The handouts included three images of hypothetical wind projects as they would appear from a beach. Participants were not told how far offshore the turbines were prior to answering the questions. Photo A depicted a project 6 miles offshore. Photo B depicted a project 13 miles offshore. Photo C depicted a project 20 miles offshore.

Q8. If a proposed wind project appeared as shown in Photo A, would you support the project?



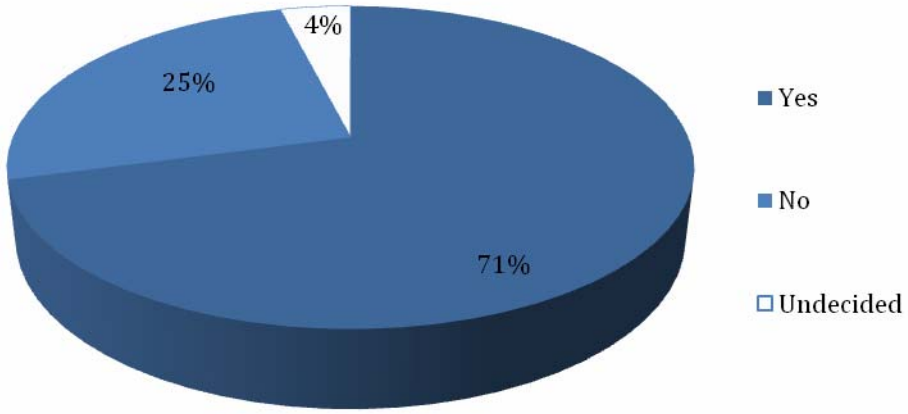
Answer Option	Number Answered	Percentage
1. Yes, I would support it.	249	53%
2. No, I would oppose it.	180	38%
3. Undecided.	45	9%

Q9. If a proposed wind project appeared as shown in <u>Photo B</u>, would you support the project?



Answer Option	Number Answered	Percentage
1. Yes, I would support it.	281	59%
2. No, I would oppose it.	155	33%
3. Undecided.	39	8%

Q10. If a proposed wind project appeared as shown in <u>Photo C</u>, would you support the project?

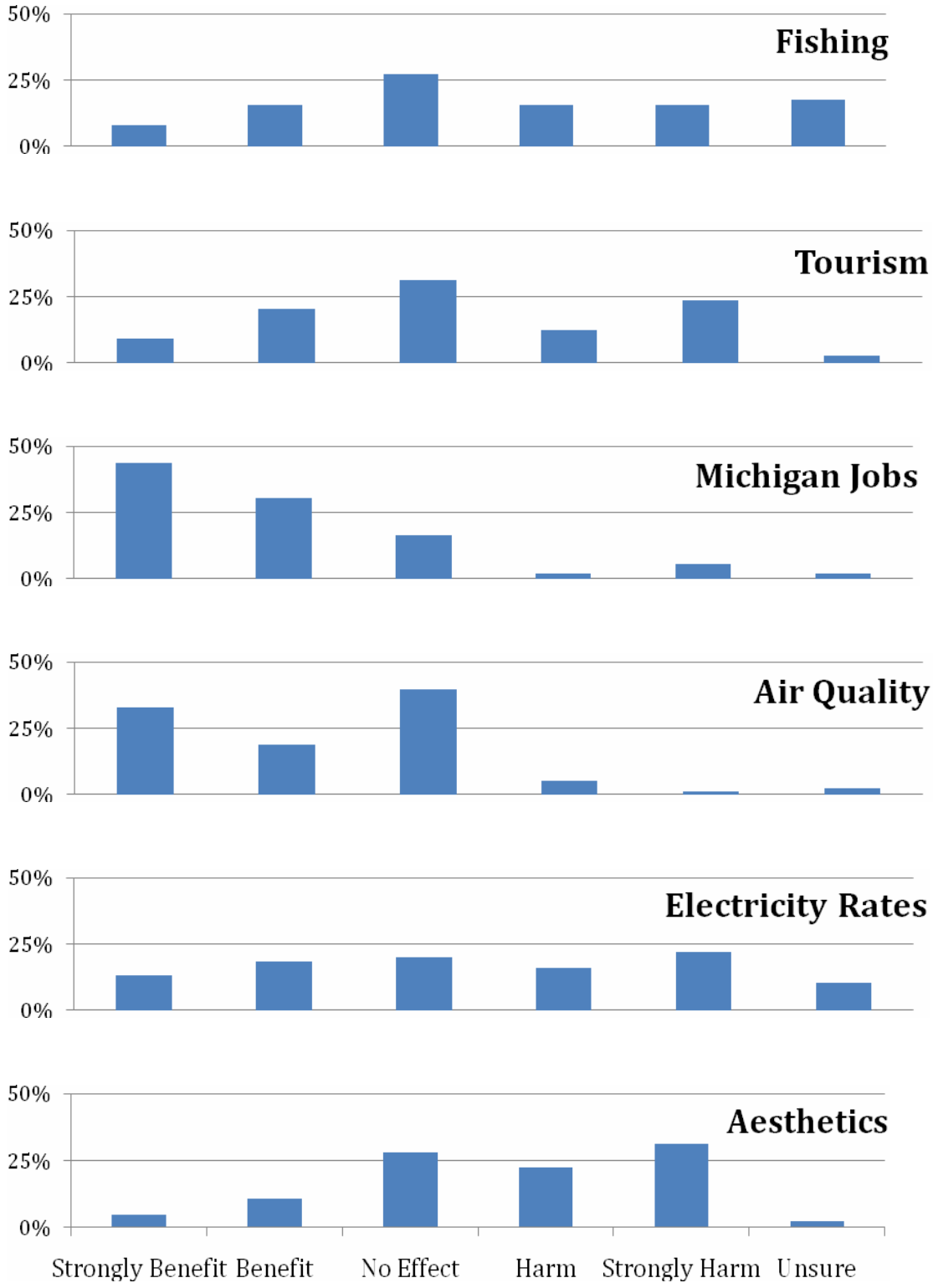


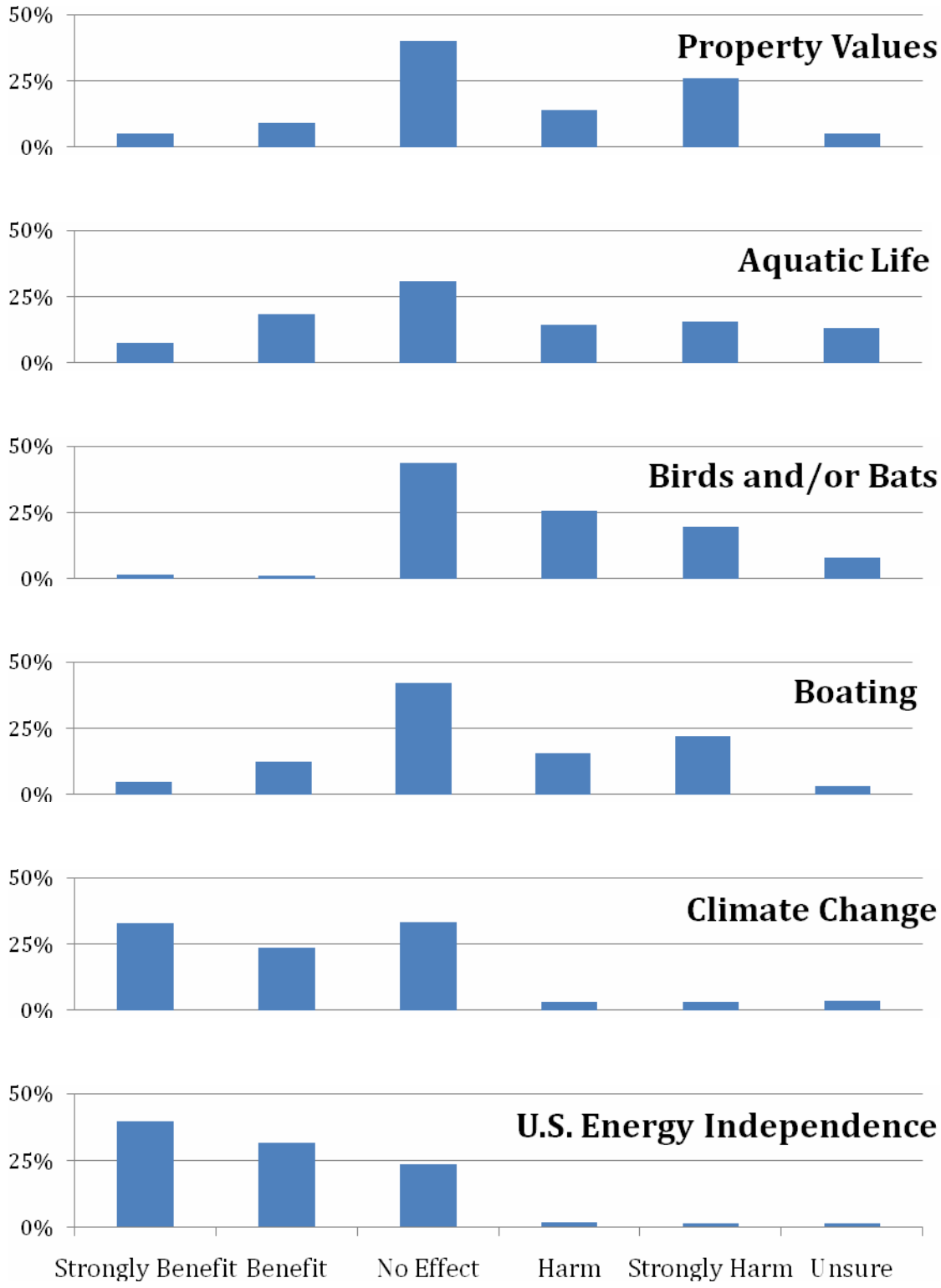
Answer Option	Number Answered	Percentage
1. Yes, I would support it.	340	71%
2. No, I would oppose it.	121	25%
3. Undecided.	19	4%

IV. Impacts of Wind Energy Development

Before answering the questions 11–21, participants were told that "The following series of questions involves potential impacts of the hypothetical Great Lakes wind energy project pictured in Photo A." (Photo A depicted a wind project located 6 miles offshore.) Answer choices were the same for each question, representing a 5-point scale and a sixth option of "Unsure." The table below includes answers from participants at all 5 meetings and the mean Likert value for participants who did not answer "Unsure."

Q11–22. How do you think this project (Photo A) would affect _____?



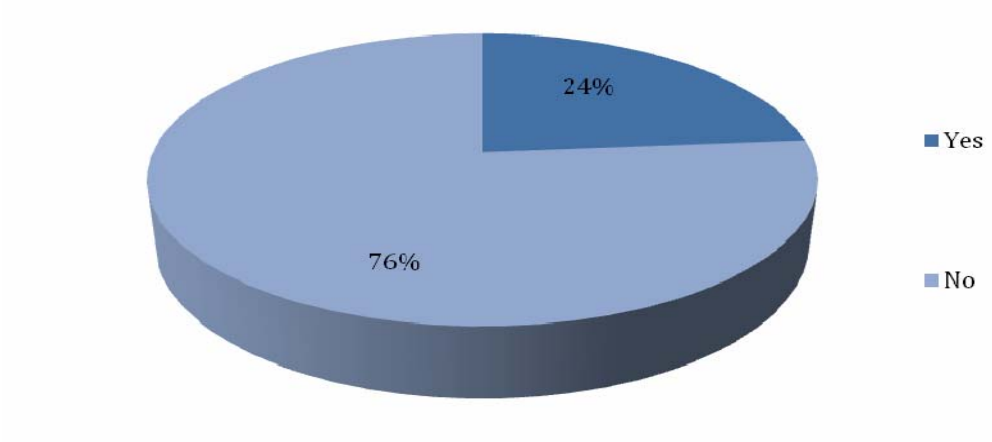

Property Values
Aquatic Life
Birds and/or Bats
Boating
Climate Change
U.S. Energy Independence
50%
25%
0%
Strongly Benefit
Benefit
No Effect
Harm
Strongly Harm
Unsure

	N	Strongly Benefit (1)	Benefit (2)	No Effect (3)	Harm (4)	Strongly Harm (5)	Unsure	Mean
Fishing	474	8%	16%	27%	16%	16%	18%	3.19
Tourism and related businesses	479	9%	20%	31%	13%	24%	3%	3.21
Michigan job creation	479	44%	30%	16%	2%	5%	2%	1.93
Air Quality	478	33%	19%	40%	5%	1%	2%	2.21
Electricity Rates	473	13%	18%	20%	16%	22%	10%	3.17
Aesthetics of the lake view	483	5%	11%	28%	23%	31%	2%	3.67
Property values	480	5%	9%	40%	14%	26%	5%	3.49
Aquatic life	476	8%	18%	31%	14%	16%	13%	3.14
Birds and/or bats	479	1%	1%	44%	25%	20%	8%	3.66
Recreational boating	477	5%	12%	42%	16%	22%	3%	3.39
Climate change	479	33%	24%	33%	3%	3%	4%	2.17
U.S. energy independence	484	40%	32%	24%	2%	2%	1%	1.92

V. Demographic and Wrap-up Questions

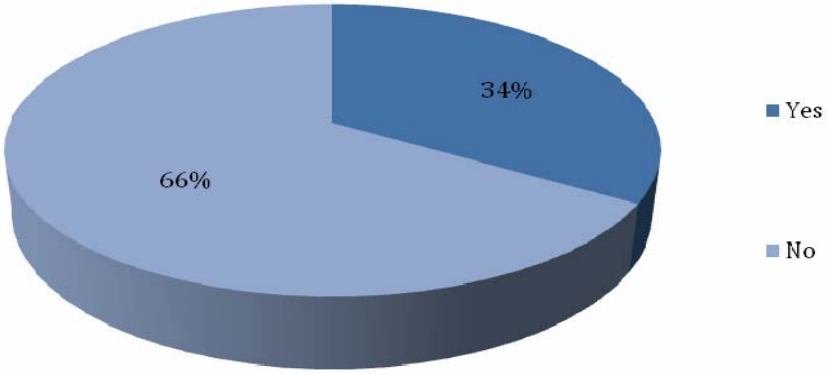
The final series of questions provides the ability to link demographic factors to previous answers. Although respondents remained anonymous, all answers from a given response pad were linked together. Participants were asked at the beginning of the evening to use the same response pad throughout the meeting.

Q23. Can you see the Great Lakes horizon from your primary residence?



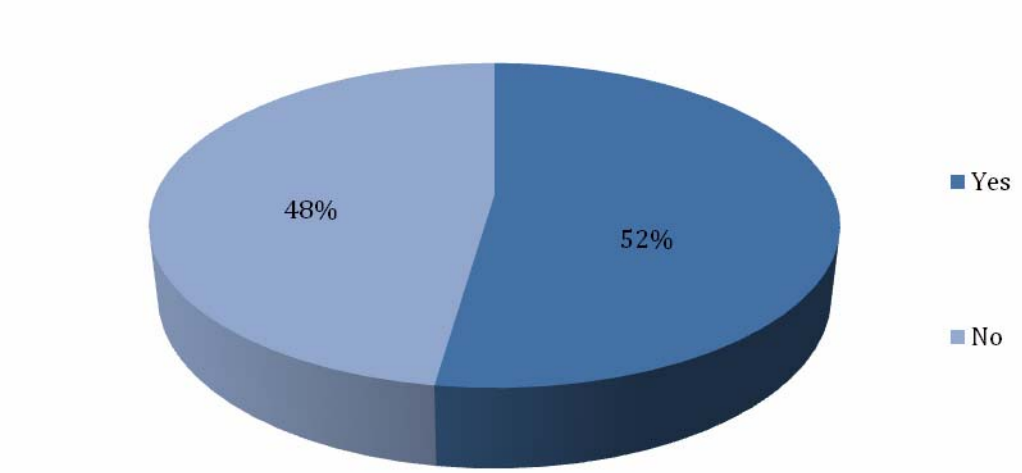
Answer Option	Number Answered	Percentage
1. Yes	105	24%
2. No	339	76%

Q24. If you have a second residence, can you see the Great Lakes horizon from there?



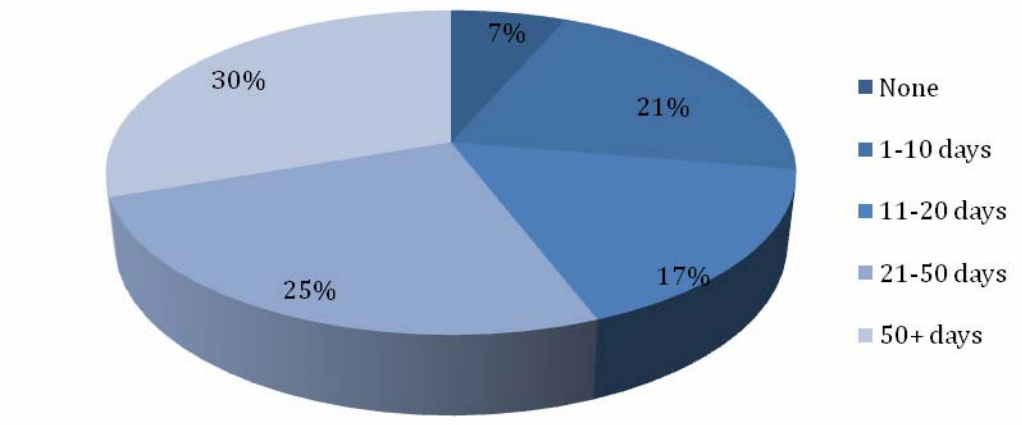
Answer Option	Number Answered	Percentage
1. Yes	93	34%
2. No	183	66%

Q25. No matter where you live, can you see the Great Lakes horizon during your day-to-day routine?



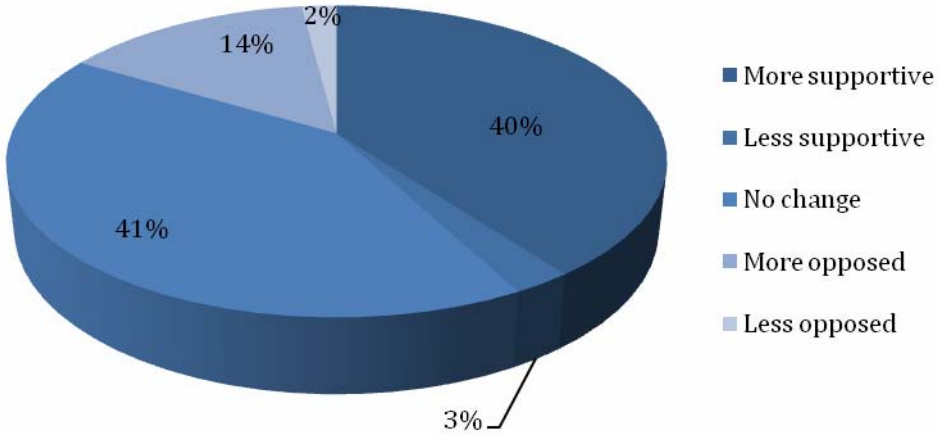
Answer Option	Number Answered	Percentage
1. Yes	227	52%
2. No	207	48%

Q26. Approximately how many days did you spend at Great Lakes beaches or on the water during the past 12 months?



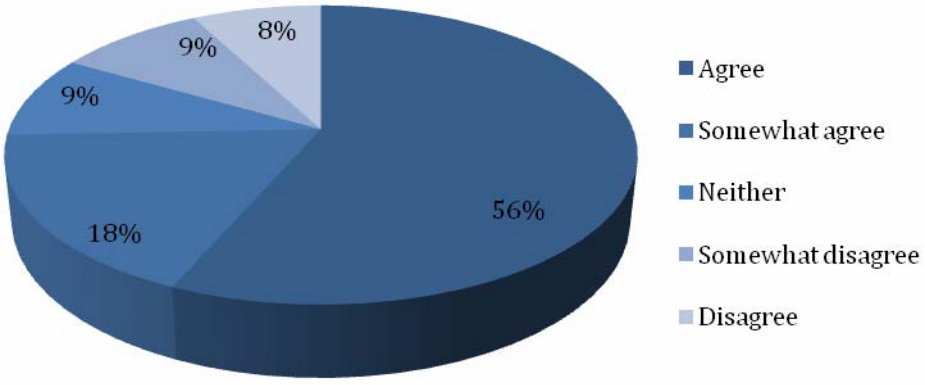
Answer Option	Number Answered	Percentage
1. None	29	6%
2. 1-10 days	95	21%
3. 11-20 days	74	17%
4. 21-50 days	114	25%
5. 50+ days	136	30%

Q27. Compared with how you felt before this meeting, how have your opinions of offshore wind on the Great Lakes changed?



Answer Option	Number Answered	Percentage
1. I am more supportive of wind.	176	40%
2. I am less supportive of wind.	11	2%
3. No change.	183	41%
4. I am more opposed to wind.	64	14%
5. I am less opposed to wind.	9	2%

Q28. Do you agree or disagree with this statement? The Great Lakes Offshore Wind Council is acting openly and transparently.



Answer Option	Number Answered	Percentage
1. Agree.	254	57%
2. Somewhat agree.	80	18%
3. Neither agree nor disagree.	40	9%
4. Somewhat disagree.	40	9%
5. Disagree.	35	8%

VI. Demographic Comparisons

The effects of two demographic characteristics on respondent answers were examined. The first independent variable was the meeting venue that a respondent attended (Saginaw, Escanaba, Muskegon, Grand Rapids or Dearborn), and the second independent variable was the respondent's place of residence (coastal or inland). For all questions, the meeting venue attended had no significant effect.[2]

Coastal residents were identified as those respondents who answered "Yes" to owning a primary and/or secondary place of residence within sight of the Great Lakes horizon (Q23 and Q24). Inland residents were identified as those who answered "No" to either question and did not answer "Yes" to either question.

The place of residence (Coastal or Inland) variable had a strong influence on other variables. For example, responses to Q26 show that Coastal residents spend significantly more days per year on the beach and Inland residents spend fewer days on the beach,[3] as might be expected.

Coastal resident answers differ significantly from inland resident answers for all questions included in the analysis. In all cases, the median value is lower for Coastal residents. This trend is most pronounced in answers to Q4, the question about support for offshore wind to fulfill Renewable Portfolio Standard goals. The median value of 1 for inland residents indicates strong support for development of offshore wind, while the median value of 4 for Coastal residents indicates opposition.

Public Meeting	Number of Poll Participants
Saginaw (Mar 25, 2010)	73
Escanaba (Apr 14, 2010)	37
Muskegon (May 4, 2010)	249
Grand Rapids (July 20, 2010)	74
Dearborn (July 21, 2010)	51
Total	**484**

Place of Residence	Number of Participants
Coastal	161
Inland	283
Total	**444**

[2] Nonparametric statistics were used to analyze ordinal Likert-scale data from self-selected respondents, which precluded the use of a two-way ANOVA to examine interaction between meeting venue attended and place of residence in addition to main effects. To retain an α level of 0.05, Bonferroni's correction was used and *P* values less than 0.025 were considered significant. Kruskal-Wallis tests were used to examine the effects of meeting venue on Likert-scale answers, and Mann-Whitney *U* tests were used to examine the effects of place of residence (Coastal or Inland).

[3] χ^2 test for independence $P<0.001$

Comparison 1. Effect of meeting venue on answers to scaled questions.[4]

Question	Topic	Kruskal-Wallis *P* value
3	Land-based wind	0.940
4	Offshore wind	0.440
11	Fishing	0.906
12	Tourism	0.039
13	Jobs	0.874
14	Air quality	0.134
15	Electricity rates	0.630
16	Aesthetics	0.027
17	Property values	0.043
18	Aquatic life	0.084
19	Birds and bats	0.096
20	Boating	0.058
21	Climate change	0.594
22	Energy independence	0.388
28	GLOW transparency	0.350

Comparison 2. Effect of place of residence (Coastal or Inland) on answers to Likert-scale questions.

Question	Topic	Coastal resident median	Inland resident median	Mann-Whitney *U P* value
3	Land-based wind	2	1	<0.001
4	Offshore wind	4	1	<0.001
11	Fishing	4	3	<0.001
12	Tourism	4	3	<0.001
13	Jobs	2	1	<0.001
14	Air quality	3	2	<0.001
15	Electricity rates	4	3	<0.001
16	Aesthetics	5	3	<0.001
17	Property values	5	3	<0.001
18	Aquatic life	4	3	<0.001
19	Birds and bats	4	3	<0.001
20	Boating	4	3	<0.001
21	Climate change	3	2	<0.001
22	Energy independence	2	1	<0.001
28	GLOW transparency	2	1	<0.001

[4] Comparative test discontinued after the first three meetings.