Journal of Leisure Research
2015, Vol. 47, No. 2, pp. 263–284

Place Attachment and Marine Recreationists' Attitudes toward Offshore Wind Energy Development

Matthew T. J. Brownlee
University of Utah

Jeffrey C. Hallo
Laurie W. Jodice
DeWayne D. Moore
Robert B. Powell
Brett A. Wright
Clemson University

Abstract

Renewable energy initiatives are increasing and many locations selected for offshore wind farms are close to recreation resources. Public involvement processes to assess project support are standard in offshore wind energy planning. However, often missing from these assessments are investigations into subpopulations, such as marine recreationists. Using mixed methods, researchers evaluated a scale that measures marine recreationists' (n = 483) attitudes toward offshore wind energy. Researchers also examined the relationships between place attachment and opposition and support for the proposed projects. Results suggest that place attachment can assist in predicting attitudes toward offshore wind energy development, but the explanatory power and the nature of the relationships differed between two communities. Implications for communication, outreach, and recreation management are discussed.

Keywords: *comparative analysis, marine recreationists, place attachment, wind energy*

Matthew T. J. Brownlee is an assistant professor in the Department of Parks, Recreation, and Tourism at the University of Utah. **Jeffrey C. Hallo** is an associate professor in the Department of Parks, Recreation, and Tourism Management at Clemson University. **Laurie W. Jodice** is a research associate Department of Parks, Recreation, and Tourism Management at Clemson University. **DeWayne D. Moore** is a professor in the Department of Psychology at Clemson University. **Robert B. Powell** is an associate professor and Director of Research for Institute for Parks at Clemson University. **Brett A. Wright** is professor and interim dean, College of Health, Education, and Human Development at Clemson University. The authors acknowledge and thank the South Carolina Sea Grant (with support from the National Oceanic and Atmospheric Administration [NOAA]) for funding the research. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of South Carolina Sea Grant or NOAA. Additionally, the authors thank the Georgetown County Government, the Horry County Government, South Carolina Energy Office, Santee Cooper Energy Corporation, the South Carolina Coastal Conservation League, and two anonymous local liaisons for their non-monetary support and assistance. Please send correspondence to Matthew Brownlee, matthew.brownlee@hsc.utah.edu

Offshore wind energy initiatives are increasingly prevalent and cited by developers and agencies as viable avenues to provide energy for a growing population, increase energy security, and mitigate global climate change (Devine-Wright, 2011; Pasqualetti, 2011). In 2010, the U.S. Department of the Interior (USDOI) released its “Smart from the Start” program intended to facilitate siting and construction of wind energy along the U.S. eastern seaboard. In 2012, the Bureau of Ocean Energy Management (BOEM) announced new wind energy leases in Maryland, Virginia, New Jersey, and Delaware (Clayton, 2012). Also in 2012, the largest offshore wind farm (102 turbines producing 367.2 megawatts) was launched in the United Kingdom (REM, 2012). The BOEM anticipates future commercial leases along the eastern seaboard and the USDOI reports a high commitment to continue initiatives that accelerate the siting, leasing, and construction of new offshore wind energy projects (Clayton, 2012).

Public involvement processes aimed to assess project support from community stakeholders are standard in offshore wind energy planning and are often required prior to actual development (Ellis, Barry, & Robinson, 2007; Pasqualetti, 2011). Although these assessments employed varying methods (Devine-Wright, 2005), most studies used public opinion polling to identify the levels of acceptance for proposed projects within a community or region (Szarka, 2006). Often missing from these assessments are focused investigations into subpopulations that may be more sensitive to development or more affected by offshore wind energy development than the general public (Ellis, Barry, & Robinson, 2007). One relevant subpopulation is *marine recreationists* (e.g., boaters, anglers, beach users) because they may frequently use and enjoy the near shore waters proposed for turbine siting.

Concurrently, many locations cited as “ideal” for offshore wind energy projects are close to important marine recreation resources, including tourism destinations (Gamboa & Munda, 2007). Marine recreationists engage in activities such as general beach use, boating, and angling in many of the areas proposed for offshore wind energy and often seek out these areas for their unique site attributes, such as unobstructed waters and viewsheds (Woosnam, Jodice, Von Harten, & Rhodes, 2008). For example, the Cape Wind project in Massachusetts proposed siting 132 turbines in the shallow waters of Horseshoe Shoal (Nantucket Sound; Firestone & Kempton, 2007), an area highly frequented by anglers and tourists (CCHFA, 2009). Additionally, people often return to nature-based recreation areas repeatedly to experience the benefits derived from recreation activities (Manning, 2011).

Because of this repeated activity involvement in one location, recreationists often develop strong emotional and cognitive connections with a specific place (i.e., place attachment or place bonding; Hammitt, Kyle, & Oh, 2009). The strength and type of these bonds can lead to varying levels of acceptance for recreation resource management actions (Kyle, Graefe, & Manning, 2005), such as opposition and support for offshore wind energy development (Devine-Wright & Howes, 2010). Development action or even proposed wind energy projects may interrupt or potentially enhance these place-based bonds (Devine-Wright, 2009). Furthermore, high place attachment may lead to increased opposition or support for offshore wind energy, which could result in civic actions that could decrease or promote project success (e.g., voting, attending public meetings, writing opinion articles; Devine-Wright, 2005; 2009; Devine-Wright & Howes, 2010). Therefore, evaluating and identifying marine recreationists’ levels of place attachment may help explain variation in their opposition and support for offshore wind energy, and their potential civic action in response to proposed projects.

Although, offshore wind energy development is increasing, and its development often converges with marine recreation resources where place-based bonds develop, there are limited investigations of marine recreationists' attitudes toward offshore wind energy development. Furthermore, researchers have not created, tested, and validated scales to capture marine recreationists' levels of opposition and support for offshore wind energy development. Such scales could be helpful as offshore wind energy development increases and researchers, recreation resource managers, and developers need accurate and reliable measures to assess marine recreationists' opinions. Additionally, the concept of place attachment has not been used within a recreationist subpopulation to explain levels of opposition and support for offshore wind energy. Therefore, the purpose of this study was threefold: 1) to develop a scale to accurately and reliably measure marine recreationists' opposition and support for offshore wind energy, 2) to evaluate marine recreationists' opposition and support for proposed offshore wind energy development across two coastal communities, and 3) to identify how marine recreationists' place attachment relates to opposition and support for offshore wind energy development.

Literature Review

Attitudes toward offshore wind energy may be different from attitudes toward other energy initiatives, including *onshore* wind energy, offshore oil extraction, and high-voltage transmission lines (Devine-Wright, 2011; Devine-Wright & Batel, 2012; Kempton, Firestone, Lilley, Rouleau, & Whitaker, 2005; Whitmarsh et al., 2011). Therefore, this literature review first focuses on attitudes toward offshore wind energy development across domestic and international studies. Because the amount of U.S. studies is limited, the domestic portion of the review mostly contains results from the Cape Wind Project in Massachusetts. In the second section of the literature review, the more prevalent international literature is reviewed to provide background and rationale for including place attachment as a concept to help explain support and opposition for offshore wind energy development.

Support and Opposition related to Offshore Wind Energy Development

Pasqualetti (2011) suggests that four themes influence support for and opposition to wind energy development. First, wind turbine placement is *immobile* because turbine siting is influenced by available wind resources, shipping routes, and flight patterns. Consequently, the choices for wind turbine placement are relatively limited, and this immobility often results in a conflict between placement of turbines and the public's perceptions of existing features (Devine-Wright, 2010). A study in North Wales discovered that respondents who viewed their community as having high scenic beauty had higher opposition for proposed wind energy development (Devine-Wright, 2010) and in New Zealand, respondents opposed development because turbine placement contrasted with specific viewscapes (Graham, Stephenson, & Smith, 2009).

A second theme in the acceptability of wind energy is *immutability* or perceptions of setting permanence. Pasqualetti (2011) explains by stating

> it is part of the human condition to believe that the landscapes with which we are most familiar, those that provide both our livelihoods and our greatest comfort, will not change over time. Such faith in landscape permanence is common in all cultures, as Jackson (1994) often reminded us, but few energy projects change a landscape as quickly and as fundamentally as a large collection of wind turbines (p. 914).

This notion of setting permanence relates to a third theme in opposition and support—*solidarity*, which suggests that the public may oppose or support wind energy development because the area selected for development is uniquely linked to the human condition. This proposition is supported by earlier work that indicates 'place' holds symbolic meaning beyond utilitarian value (Altman & Low, 1992). Finally, the literature indicates that another theme in opposition and support for wind energy development is *imposition*, which stems from the fact that many wind projects are proposed by entities external to a local community (e.g., multinational energy developers). As a result, local stakeholders may view proposed projects as 'someone else's idea' that will benefit individuals outside of the local communities where turbines will be placed (Pasqualetti, 2011).

Factors Influencing Opposition and Support in the U.S.

Although these four broad themes (immobility, immutability, solidarity, and imposition) are helpful, studies investigating U.S. residents' acceptability of wind energy provide insight into the specific factors related to opposition and support. In the U.S., the most well-known case of offshore wind energy is *Cape Wind* in the Nantucket Sound of Massachusetts, where 42.4% of citizens opposed the project, 24.6% supported the project, and approximately one third were undecided (Firestone & Kempton, 2007).

Most of the objection to Cape Wind pertained to the potential aesthetic impacts in the area due to the visibility of turbines from shore (Kempton et al., 2005), which relates to the immobility theme present in the broader literature. Firestone and Kempton (2005) reported that 72% of respondents believed Cape Wind would negatively impact aesthetics and this belief contributed direct*y* to opposition. This is potentially important because marine recreationists often indicate that viewscapes are important to their coastal experiences (Oh, Draper, & Dixon, 2009).

Although immobility and perceived aesthetic impacts may contribute to opposition, U.S. citizens also believe wind energy can create environmental impacts (Firestone, 2007; Kempton et al., 2005). In the case of Cape Wind, DeSantis and Reid (2004) found that other than aesthetic impacts, environmental concerns were reported most often and some respondents reported perceived potential damage to wildlife, conservation, and fishing as additional reasons for opposing the project. In addition, 57% of respondents reported that if the project harmed marine life then they would support the project "much less" (Firestone & Kempton, 2007). These findings coincide with the solidarity theme noted earlier, indicating that respondents assign worth to settings beyond utilitarian value.

Other researchers suggest that some U.S. citizens oppose proposed offshore wind energy because of the belief it will harm the local economy. For example, Massachusetts residents (n = 501) of six coastal towns designated for offshore wind energy expected a 10.9% decrease in their property values if wind development occurred (Haughton, Giuffre, & Barrett, 2003). These findings are closely related to the imposition theme reviewed earlier because Cape Wind was initially proposed and potentially financed by parties external to the Nantucket area (Firestone & Kempton, 2007).

A primary reason for supporting offshore wind energy is the perception that offshore wind energy provides clean and renewable energy. For example, 55% of voters in Massachusetts supported proposed projects because they thought it would generate clean energy (ODC, 2002). Similarly, 43.6% of respondents supported proposed projects thought wind energy was a clean alternative or was renewable (DeSantis & Reid, 2004).

Support is also attributed to economic and environmental reasons, and to decrease dependence on foreign derived fossil fuels (DeSantis & Reid, 2004). Semi-structured interviews (Kempton, Firestone, Lilley, Rouleau, & Whitaker, 2005) revealed that pollution prevention and energy independence from foreign sources were cited most frequently by respondents as reasons to support offshore wind energy. A portion of this information is supported by Firestone and-

Kempton (2007), who indicate that 24% of respondents supporting Cape Wind did so because they thought offshore wind energy would improve air quality and 37% supported the project to decrease dependence on foreign oil.

No studies that specifically investigated marine recreationists' were uncovered. However, 54% of respondents who reported opposition to Cape Wind, indicated one of their reasons for not supporting the project was the perceived potential impact to recreational boating (Firestone & Kempton, 2007). This finding relates to the solidarity theme and suggests marine recreation resources are uniquely linked to the "human condition."

An investigation of the potential influences of offshore wind energy on beach tourism in Delaware provided three major findings (Blaydes, Firestone, & Kempton, 2008). First, potential for loss of beach tourism due to near shore wind facilities does exist, but the perceived loss is less than a fossil fuel plant located the same distance away. Second, tourists' potential opposition may decrease with the facility's distance from shore. Third, 44.4% of tourists expressed interest in taking a boat tour to an offshore wind facility and 65.7% reported they were likely to visit a new or different beach to view an offshore wind farm (Blaydes, Firestone, & Kempton, 2008).

Place Attachment and Attitudes towards Renewable Energy

Place attachment is the emotional and cognitive connections between a person and a place (Altman & Low, 1992) and often contains subdimensions of place identity, dependence, belongingness, social relationships, rootedness, and affect (Devine-Wright & Clayton, 2010; Hammitt, Kyle, & Oh, 2009; Kyle, Graefe, & Manning, 2005). Place attachment has been of particular interest among recreation resource managers and researchers (see Manning, 2011 for a review) because outdoor recreationists often form special bonds with the areas they frequent (Hammitt, Kyle, & Oh, 2009; Kyle, Bricker, Graefe, & Wickham, 2004).

Researchers propose that place attachment may relate to an individual's level of opposition or support for renewable energy projects (Devine-Wright, 2009; Devine-Wright & Howes, 2010; McLachlan, 2009), but it has not been used to explore marine recreationists' acceptance of offshore wind energy. McLachlan (2009) suggests that companies involved in renewable energy development should consider a community's place-based attachments during the project planning stage. The assertion that place attachment may influence opposition and support for wind energy aligns well with the immutability and solidarity themes discussed in the broader literature. Specifically, some people may hold symbolic meanings for specific areas and limited options for turbine placement may conflict with these attachments. However, the relationship between place attachment and acceptance of wind energy is not fully understood (Devine-Wright & Howes, 2010).

The few studies investigating place attachment and renewable energy development often cite a negative relationship between place attachment and support for projects (Devine-Wright & Howes, 2010; Vorkinn & Riese, 2001). However, high place attachment will not necessarily always lead to higher opposition for development, and place attachment may not predict acceptance of development in the same manner across all settings and all communities. Devine-Wright (2009) attributes this lack of consistent prediction to a variety of factors, including how respondents interpret the potential changes to the area from a proposed project. Although it seems logical that place attachment may influence opposition and support for wind energy, this proposition has not been explored in the U.S.

Place attachment was first used to understand public opinions regarding renewable energies in Norway. Researchers concluded that place attachment predicted 20% of the variance in attitudes toward energy development, which exceeded the explanatory power of sociodemographic variables (Vorkinn & Riese, 2001). In addition, strong attachment to the "natural area" produced opposition to the project while attachment to the "municipality" was related to project support (Vorkinn & Riese, 2001). This finding relates to the immobility theme from the broader wind energy literature and strengthens the notion that distinct groups may have different levels of acceptance for wind energy based on their attachment to specific settings (e.g., natural vs. industrial).

Devine-Wright and Howes (2010) first explored the notion that place attachment may explain acceptance of offshore wind energy differently across two communities. The results indicated that different patterns existed between place attachment and acceptance. Specifically, one community displayed a significant positive relationship between place attachment and acceptance, but this relationship did not exist in the second community. Devine-Wright and Howes (2010) attributed these differences to residents' interpretation of their environment as a "fit" for offshore wind energy.

Overall, the North Wales study (Devine-Wright & Howes, 2010) suggested that place-based connections may influence acceptance for a proposed project, but nearby communities may not have similar levels of place attachment or opposition and support for wind energy development. However, this finding has not been tested in the U.S., where permits for wind energy development are increasing. Also, Devine-Wright and Howes (2010) concluded that more complex analytical tools, such as structural equation modeling, should be employed, and that more studies are needed to determine the relationships between place attachment and acceptance of offshore wind energy. Furthermore, the authors indicate more cross-community studies are needed if we are to understand the multifaceted relationships between place attachment and opposition and support for offshore wind energy development. This study addresses these gaps and extends the literature by comparing two nearby communities of marine recreationists and the complex relationships between their acceptance of wind energy and place attachment.

Study Sites and Proposed Projects

Approximately four years of wind resource testing and ocean floor evaluations in the State of South Carolina resulted in the selection of two coastal communities optimally suited for offshore wind energy: 1) North Myrtle Beach, South Carolina (NMB), and 2) Georgetown, South Carolina (GTN). Both are located in the northern region of the state and although these two coastal communities are approximately 50 miles driving distance from each other, they differ in many ways. First, the size of the resident population differs between the two (GTN = 8,441; NMB =16,221) as well as the median household income (GTN = $29,831; NMB = $48,707) and race (GTN White/Black = 44.5%/48.1%; NMB White/Black = 89.9%/2.5%; CDNMB, 2011; CDGTN, 2011).

Perhaps the most pronounced difference between the two communities is that the NMB area is commercially developed for mass tourism and the GTN area is positioned within a series of protected estuaries with limited tourist infrastructure. Although each place hosts tourism and marine recreation activities, the amount of tourism development and setting attributes are very different. For example, NMB has high-rise condominiums, long fishing piers, and billboards targeting tourists. GTN has unobstructed viewsheds, no high-rise buildings, and a relatively undisturbed natural seascape. The setting differences between GTN and NMB represent an ideal opportunity to investigate the relationships between place attachment and the acceptance of a proposed wind energy project among two groups of marine recreationists.

Despite the differences in setting, proposed offshore wind energy in each location is similar. In both NMB and GTN, Santee Cooper, Inc. (the SC State Energy Corporation) has proposed the potential placement of 3 to 4 turbines approximately 3.5 to 7 miles from shore. Each turbine would extend approximately 300 feet above the water's surface and would provide power to the SC coastal region. In both locations, turbines would be visible to marine recreationists in a variety of locations (e.g., beaches, offshore waters).

Research Questions and Hypotheses

Based on the literature review, more research is needed to identify the role of place attachment in explaining acceptance for offshore wind energy initiatives across different communities. Additionally, researchers have not investigated marine recreationists as a distinct subpopulation to explore these relationships. These research gaps, as well as the needs of local decision-makers for information about marine recreationists' support and opposition, led to two research questions and four hypotheses tested in this study:

RQ1: What is the performance of a scale used to measure marine recreationists' opposition and support for offshore wind energy?

H1: Related to immobility and immutability, and due to a more developed setting in NMB, marine recreationists in NMB will have a significantly higher level of support and lower level of opposition to offshore wind energy development than GTN marine recreationists.

H2: Informed by the solidarity theme, marine recreationists in NMB and GTN will not differ significantly in their levels of place attachment.

H3: Informed by immobility, solidarity, and immutability, GTN marine recreationists' place attachment will relate negatively to support and positively to opposition related to wind energy development.

H4: Related to H3, NMB marine recreationists' place attachment will relate positively to support and negatively to opposition.

RQ2: *Within* a single community, does place attachment influence opposition and support with equal strength?

Methods

For a guiding framework, the researchers chose an exploratory mixed methodology with three phases (Creswell & Plano Clark, 2011). In Phase 1, the researchers conducted interviews with marine recreation stakeholders. These results were used to develop a measurement instrument (Phase 2), which in Phase 3 was administered to marine recreationists in both GTN and NMB. This sequential process (i.e., the Instrument Development Variation; Creswell & Plano Clark, 2011) was selected because 1) not all quantitative measures for the phenomenon under investigation were available, 2) some variables were unknown, and 3) due to the novelty of the investigation, numerous frameworks or theories could be applied (Morgan, 1998; Morse, 1991).

Phases 1 and 2: Interviews and Instrument Development

Researchers conducted semi-structured individual interviews (M = 50 minutes; n = 17) using a modified Seidman Approach (Seidman, 2006) to understand the variety of opinions regarding proposed wind energy development in both communities. Phase 1 interview participants were purposely selected based on the potential diversity of viewpoints (Creswell, 2007; see Table 1 for respondent categories), and interviews were audio-recorded to identify response patterns through open-topic coding (Creswell, 2007; Richards & Morse, 2007).

Table 1

Respondent Categories for Participants in Phase 1 Interviews

Respondent category	Respondents
Beach side residents	4
Marine recreationists (e.g., beach users, anglers, boaters)	14
Community leaders	4
Marina managers and operators	2
Researchers involved in marine resource management	3
Resort owners and managers	4
Tourists (non-county residents visiting the area)	4
Regional wind energy leaders	6

Note. n = 17; an individual respondent may hold membership in multiple categories

Phase 1 results were used to develop measurement items (following processes recommended by Devellis [2003] and Noar [2003]), which represent two constructs: *support* and *opposition* for wind energy development. The research team adapted previously validated measures to the context of each community to measure: 1) *place identity* (Hammitt, Kyle, & Oh, 2009; Kyle, Graefe, & Manning, 2005; Raymond, Brown, & Weber, 2010), 2) *place dependence* (Hammitt, Kyle, & Oh, 2009; Kyle, Graefe, & Manning, 2005; Raymond, Brown, & Weber, 2010), and 3) *community social attachment* (Brehm, Eisenhauer, & Krannich, 2004; Devine-Wright, 2011; Raymond, Brown, & Weber, 2010). All items for support, opposition, and place attachment were measured using a seven point Likert scale (see Table 2 for support and opposition, and Table 3 for place attachment).

Experts in recreation resource management and wind energy development (n = 4) reviewed all items for content validity, and to assess item clarity a pilot study with recreation stakeholders (n = 32) was conducted. The results of the expert review and the pilot study were used to guide slight revisions in item wording to improve clarity.

Phase 3: Administration of the Instrument

Trained research assistants intercepted marine recreationists in GTN and NMB in the summer of 2011 and provided a self-administered paper questionnaire. To ensure diverse but representative samples, the researchers selected two boat ramps, one beach, one coastal walking area, and one marina in each community as intercept locations. A stratified sampling method was used across days of the week and time of day (Bryman, 2008; Vaske, 2008).

Research assistants provided respondents with two information items: 1) a color map identifying the political boundaries of each community and the general area of offshore waters proposed for wind energy development, and 2) a paragraph objectively describing the proposed project (e.g., general turbine height, distance from shore). Respondents were instructed to address items in the questionnaire related to the wind energy development area identified on the map.

Table 2

Factor Loadings, Means, and Fit Indices of Marine Recreationists' Support and Opposition for Offshore Wind Energy Development

Construct and items [a]	GTN λ	Mean[a] *(SD)*	NMB λ	Mean[a] *(SD)*
Support for potential offshore wind energy development (Support)				
"I support offshore wind energy in this area because I think it will…"				
Increase energy independence (from foreign sources, produce own energy)	0.95	5.45 (1.99)	0.94	5.95 (1.42)
Help the environment (prevent pollution, decrease reliance on fossil fuels)	0.96	5.43 (1.95)	0.94	5.96 (1.42)
Benefit future generations (help the community into the future)	0.96	5.36 (1.97)	0.95	6.04 (1.37)
Improve the marine habitat for fish (attract fish, improve recreational fishing)	0.85	4.95 (2.01)	0.81	5.67 (1.52)
Give the area a positive reputation (new reason for people to visit, be a green energy leader)	0.92	4.92 (2.06)	0.90	5.73 (1.46)
Improve the local economy (more jobs, new businesses, increase property values)	0.90	4.88 (2.01)	0.86	5.62 (1.47)
Opposition for potential offshore wind energy development (Opposition)				
"I oppose offshore wind energy in this area because I think it will…"				
Decrease scenic and natural beauty (harm ocean views, be a visual eye-sore)	0.91	3.72 (2.24)	0.92	3.37 (2.03)
Ultimately, not be as productive as promised (only produce when wind is blowing, not meet energy demands)	0.89	3.69 (2.12)	0.91	3.39 (1.89)
Negatively influence the marine environment (harm animals/plants, harm natural cycles)	0.87	3.32 (1.98)	0.93	3.23 (1.98)
Drive visitors away from the area	0.94	3.14 (2.06)	0.93	3.01 (1.94)
Harm the area's economy (job loss, repel new businesses, decrease property values)	0.90	2.95 (1.95)	0.91	2.93 (1.90)
Standardized covariance between support and opposition	- 0.78	-	- 0.43	-
	GTN		NMB	
CFI	0.976	-	0.963	-
NNFI	0.969	-	0.951	-
RMSEA	0.082	-	0.074	-
SBχ^2 (*df*)	145.05* (42)		121.60* (42)	
SRMR	0.023	-	0.024	-

Note. [a] Rated as agreement on a seven-point Likert scale (1 = *completely disagree*, 7 = *completely agree*); λ = standardized factor loading; CFI = Comparative Fit Index; *df* = degrees of freedom; GTN = Georgetown, SC; NMB = North Myrtle Beach, SC; NNFI = Non-Normed Fit Index; RMSEA = Root Mean Square Error of Approximation; SB χ^2 = Satorra-Bentler Scaled Chi-Square; *SD* = standard deviation; SRMR = Standardized Root Mean Squared Residual; * $p < 0.05$

Table 3

Factor Loadings, Means, and Fit Indices for Marine Recreationists' Place Attachment (Second Order Factor) Across Communities

Dimensions and items [a]	GTN λ	Mean[a] *(SD)*	NMB λ	Mean[a] *(SD)*
Place identity (first order dimension)				
This area is very special to me	0.95	6.34 (1.25)	0.88	5.96 (1.21)
This area means a great deal to me	0.98	6.22 (1.35)	0.96	5.77 (1.28)
I am very attached to this area	0.95	6.18 (1.36)	0.94	5.69 (1.34)
I identify strongly with this area	0.96	6.09 (1.38)	0.91	5.64 (1.38)
Standardized estimate between the dimension and the second order factor	0.95	-	0.94	-
Place dependence (first order dimension)				
This area is the best place for the coastal recreation activities I like to do	0.95	6.01 (1.46)	0.88	5.70 (1.35)
I enjoy doing coastal recreation activities in this area more than in any other location	0.97	5.86 (1.52)	0.94	5.43 (1.56)
Participating in coastal recreation activities in this area is more important to me than doing them in any other area [b]	0.94	5.71 (1.63)	0.93	5.16 (1.61)
No other place can compare to this area for the types of coastal recreation activities I do[b]	0.84	5.49 (1.74)	0.88	4.99 (1.77)
Standardized estimate between the dimension and the second order factor	0.93	-	0.85	-
Place community bonding (first order dimension)				
The people in this area are very important to me	0.92	5.78 (1.48)	0.89	5.43 (1.46)
People in this area mean a great deal to me	0.98	5.58 (1.63)	0.93	5.26 (1.65)
I have a lot of ties with the people in this area [c]	0.92	5.39 (1.76)	0.88	4.86 (1.77)
Many of my friends and/or family are in this area [c]	0.87	5.18 (1.88)	0.81	4.73 (1.87)
Standardized estimate between the dimension and the second order factor	0.78	-	0.84	-
	GTN		NMB	
CFI	0.959	-	0.966	-
NNFI	0.944	-	0.954	-
RMSEA	0.076	-	0.078	-
$SB\chi^2$ (*df*)	161.83* (49)		154.14* (49)	
SRMR	0.042	-	0.048	-

Note. [a] Rated as agreement on a seven-point Likert scale (1 = *completely disagree*, 7 = *completely agree*); [b, c] error covariance between items with matching superscripts; λ = standardized factor loading; CFI = Comparative Fit Index; *df* = degrees of freedom; GTN = Georgetown, SC; NMB = North Myrtle Beach, SC; NNFI = Non-Normed Fit Index; RMSEA = Root Mean Square Error of Approximation; SB χ^2 = Satorra-Bentler Scaled Chi-Square; *SD* = standard deviation; SRMR = Standardized Root Mean Squared Residual; * $p < 0.05$

Analysis

First, researchers used standard calculations for leverage, kurtosis, and skewness to identify statistical outliers and to verify univariate and multivariate normality of the data (Tabachnick & Fidell, 2012). A small number of cases (n = 19; 0.04% of data) were excluded from subsequent analysis due to extreme violations of multivariate normality and missing data (> 50% of questionnaire). Next, researchers evaluated the research questions and hypotheses using Structural Equation Modeling (SEM) approaches with EQS 6.1 software.

Since the researchers hypothesized that differences in support or opposition existed between two communities of marine recreationists, and that place attachment would display different relationships with opposition and support, verifying consistent measurement performance across communities was critical. In short, the research team sought to ensure any identified differences in responses between communities were attributed to true score variance and not statistically confounded by differences in measurement performance. Byrne (2006) refers to this process as verifying *metric invariance*, which is critical when using multiple item constructs to compare differences in groups.

Consequently, for all multiple item measurements, a process outlined by Byrne (2006) was followed, which starts with a baseline configural measurement model for both communities. Next, equality constraints were placed on factor loadings and error covariances (Metric Invariance Test 1), and then on first order parameter estimates of place attachment (Metric Invariance Test 2). In the final Metric Invariance Test (3), the researchers included constraints on the factor covariance between opposition and support. As recommended, the researchers evaluated harm to fit between each metric invariance test using the change in absolute and relative fit indices and the Satorra-Bentler χ^2 Difference Test (SBχ^2; Satorra & Bentler, 2001; Byrne, 2006). Byrne (2006) indicates metric invariance is assumed when no significant harm to the model fit occurs between models (i.e., non-significant change in the SBχ^2). Through imposing these constraints and evaluating the outcome, the performance of the scale was assessed (RQ1).

After testing for metric invariance, the researchers introduced a constant into the model, which allowed for evaluation of the differences in the estimated means of support, opposition, and place attachment across the communities of marine recreationists. This procedure provided a rigorous method to evaluate H1 (NMB marine recreationists will report higher support and lower opposition than GTN marine recreationists) and H2 (marine recreationists in NMB and GTN will not differ significantly in their levels of place attachment). Finally, researchers followed a similar process to the metric invariance testing to identify the *structural invariance* of the relationships between place attachment, and support and opposition. During this final step, the researchers tested if place attachment related to support and opposition *identically in both* communities (H3 and H4) and *equally within* a single community (RQ2).

Results

On-site 635 visitors were approached and 483 elected to participate, yielding a 76% response rate and achieving a 4.55% confidence interval at a 95% level of confidence. The GTN area yielded 231 respondents and NMB yielded 252.

Description of the Sample

Respondents self-reported their demographic categories using standard classes from the U.S. Census Bureau. A three item Experience Use History (EUH) index was adapted from previous studies (Schreyer, Lime, & Williams, 1984) and used to quantify respondents' past experiences with the area's marine recreation resources. Approximately two-thirds of the marine recreationists identified themselves primarily as anglers (GTN = 38.7%; NMB = 39.0%) or beach users (GTN = 23.6%; NMB = 28.8%) with moderate EUH levels (see Table 4). The majority of respondents self-identified as white (GTN = 76.9%; NMB = 93.3%) and approximately 50% reported earning less than $75,000 (GTN = 48.1%; NMB = 57.2%).

Table 4

Description and Comparison of the Two Communities of Marine Recreationists

	GTN (n = 231)		NMB (n = 252)		χ^2	t
		% of n		% of n		
Activity	Angler	38.7	Angler	39.0	4.23	-
	Boater (non-angler)	19.2	Boater (non-angler)	16.6		
	Board walk user	18.5	Board walk user	15.6		
	Beach user	23.6	Beach user	28.8		
EUH (M)	Moderate	-	Moderate	-	-	1.74
Gender [a]	Female	28.3	Female	50.0	22.79*	-
	Male	71.7	Male	50.0		
Education	< High school degree	4.4	< High school degree	1.7	7.79	-
	High school degree	45.4	High school degree	54.6		
	College degree	29.7	College degree	29.8		
	Graduate degree	20.5	Graduate degree	13.9		
Race	White	76.9	White	93.3	31.88*	-
	Black	16.0	Black	1.8		
	American Indian	2.1	American Indian	1.3		
	Hispanic or Latino/a	1.7	Hispanic or Latino/a	1.3		
	Asian	1.3	Asian	0.9		
Income	< $75,000	48.1	< $75,000	57.2	3.83	-
	$75,000 – $99,000	33.0	$75,000 – $99,000	25.6		
	> $100,000	18.9	> $100,000	17.2		
Age (M)	46.62 years	-	49.93 years	-	-	0.84
County resident	Yes	51.0	Yes	28.4	22.44*	-
	No	49.0	No	71.6		

Note. GTN = Georgetown, SC; NMB = North Myrtle Beach, SC; χ^2 = Chi-Square value; t = t-value from independent t-test; EUH = Experience use history calculated using a three question index adapted from Schreyer, Lime, & Williams (1984); [a] = gender was significantly correlated with opposition and support and therefore retained in the model; * $p < 0.05$

Statistical differences in activity type, demographics, and EUH were compared across the two communities resulting in three identified differences (p > 0.05; see Table 4). Specifically, respondent groups across the communities differed in county residency (more within county residents in GTN), race (more respondents self-identified as black in the GTN sample), and gender (more males in the GTN sample). County residency or race did not influence the degree of support or opposition (p > 0.05) for proposed offshore wind energy. However, women were more likely to report higher levels of support than men ($\beta = 0.10$; $p < 0.05$), and therefore gender was retained in subsequent models to control for confounding effects.

Performance of the Scale

Byrne (2006) and Kline (2011) advise fit indices should be interpreted holistically with theoretical and conceptual insight and suggest the following as acceptable levels of fit: $SB\chi^2$ non-significant, CFI > 0.9, NNFI > 0.90, SRMR < 0.1, and RMSEA < 0.08. Following these guidelines, fit indices for support, opposition, and place attachment were deemed appropriate for both communities (see Table 2 and 3 for fit indices). The factor loadings of all items used were > 0.80, signifying that the item is a reliable indicator of the construct (Byrne, 2006; see Table 2 and 3). Parameter estimates between the second order factor of place attachment and its underlying dimensions were > 0.77, which is one indication that place attachment was suitably reflected by the specified dimensions (Kline, 2011).

Metric invariance testing indicated measurements for support, opposition, and place attachment operated equivalently across communities (see Table 5). Only two model paths were not equal: The loading of one opposition item (the attitude that offshore wind energy will negatively influence the marine environment; $\lambda = 0.87$ for GTN and $\lambda = 0.93$ for NMB), and the negative relationship between support and opposition (r = - 0.78 for GTN and - 0.43 for NMB). Addressing Research Question 1, the three constructs of interest in this study (support, opposition, and place attachment) exhibited limited change and model fit indices remained stable between the hierarchical constraints and across communities.

Differences in Support and Opposition between Communities

It was hypothesized that related to immobility and immutability, and due to a more developed setting in NMB, marine recreationists in NMB would report significantly higher support and lower opposition to offshore wind energy development than GTN marine recreationists (H1), which was substantiated by the data. The model assessing the mean differences in support, opposition, and place attachment between communities displayed appropriate fit (see Table 5; $SB\chi^2$ (df) = 1101.06 (480), $p < 0.05$; CFI = 0.966; NNFI = 0.962; SRMR = 0.090; RMSEA = 0.052). The GTN and NMB estimated means for support were 5.20 and 5.83 respectively, resulting in a significant mean difference (see Figure 1; $Z = 5.14$). NMB respondents reported *benefit to future generations* as the highest reason to support offshore wind energy development ($M = 6.04$; $SD =$ 1.37), and GTN respondents reported to *increase energy independence* as the highest reason for support ($M = 5.45$; $SD = 1.99$; see Table 2). The responses for the belief that offshore wind energy would *improve the local economy* received the lowest agreement for support by both GTN ($M =$ 4.88; $SD = 2.01$) and NMB ($M = 5.62$; $SD = 1.47$; see Table 2).

On average, marine recreationists' reported lower levels of opposition than support (M for GTN = 3.49; M for NMB = 3.19; Figure 1; $Z = 2.21$). For GTN, the belief that offshore wind energy development would *decrease scenic beauty* received the highest agreement ($M = 3.72$; $SD =$ 2.24), compared to the belief that wind energy would *not be as productive as promised* for NMB ($M = 3.39$; $SD = 1.89$; see Table 2). Neither community perceived that offshore wind energy development would *harm the local economy* (M for GTN = 2.95; SD for GTN = 2.24; M for NMB = 2.93; SD for NMB = 2.24; see Table 2).

Table 5

Fit Indices and Testing Outcomes for Metric Invariance, Structural Invariance, and the Latent Mean Differences for Marine Recreationists' Place Attachment, and Opposition and Support for Offshore Wind Energy Eevelopment across Communities

Model	CFI [a]	NNFI [a]	SRMR	RMSEA [a]	$SB\chi^2$ *(df)*[a]	Δ $SB\chi^2$ *(Δ in df)*[a f]
Tests of metric invariance						
Configural measurement model	0.967	0.963	0.035	0.056	914.77* (442)	
Metric invariance test one [b]	0.966	0.963	0.040	0.056	951.78* (460)	36.89* (18)
Modified metric invariance test one [b]	0.967	0.963	0.038	0.056	942.82* (459)	24.61 (17) n.s.
Metric invariance test two [c]	0.967	0.963	0.039	0.056	946.23* (461)	3.96 (2) n.s.
Metric invariance test three [d]	0.964	0.961	0.150	0.058	987.95* (464)	53.98* (3)
Modified metric invariance test three [c]	0.966	0.963	0.054	0.056	950.82* (462)	4.24 (1) n.s.
Test of latent mean differences						
Structured latent means model	0.966	0.962	0.090	0.052	1101.06* (480)	
Tests of structural invariance						
Structural configural model	0.967	0.963	0.035	0.056	914.66* (442)	
Structural invariance test one [c]	0.966	0.963	0.039	0.056	946.17* (461)	28.65 (19) n.s.
Structural invariance test two [e]	0.966	0.962	0.079	0.056	957.71* (462)	13.34* (1)
Structural invariance test three [e]	0.966	0.963	0.077	0.056	955.27* (462)	12.51* (1)

Note. [a] robust statistics; [b] constraints on factor loadings and error covariances added; [c] constraints on first order parameter estimates added; [d] constraints on factor covariances added; [e] constraints placed on factor loadings, error covariances, first order parameter estimates, and parameter estimates between constructs; [f] difference calculated using the Satorra-Bentler Scaled Chi-square adjusted difference test (Satorra & Bentler, 2001); CFI = Comparative Fit Index; *df* = degrees of freedom; NNFI = Non-Normed Fit Index; n.s. = not significant; RMSEA = Root Mean Square Error of Approximation; $SB\chi^2$ = Satorra-Bentler Scaled Chi-Square; SRMR = Standardized Root Mean Squared Residual; * $p < 0.05$

Differences in Place Attachment between Communities

Informed by the solidarity theme, we hypothesized that marine recreationists in NMB and GTN would not differ significantly in their levels of place attachment (H2), which was not supported by the data. Marine recreationists in GTN reported higher levels of place attachment (M = 5.82) than respondents in the NMB sample (M = 5.38; Z = 4.46). Compared to NMB, respondents in the GTN area reported significantly higher levels of place identity (M = 6.21; M = 5.76; Z = 5.25), place dependence (M = 5.78; M = 5.32; Z = 4.32), and community social attachment (M = 5.48; M = 5.07; Z = 3.74).

The Relationship between Place Attachment, and Support and Opposition between Communities

Informed by immobility, solidarity, and immutability, we hypothesized that GTN marine recreationists' place attachment would relate negatively to support and positively to opposition (H3), and that the inverse would occur for NMB marine recreationists (H4). The results support Hypothesis 3 for GTN but did not support Hypothesis 4 for NMB.

The model (Structural Invariance Test 1) assessing the influence of place attachment on support and opposition produced acceptable fit (Table 4; $SB\chi^2$ (df) = 946.17 (461), $p < 0.05$; CFI = 0.966; NNFI = 0.963; SRMR = 0.039; RMSEA = 0.056). The parameter estimates between place attachment and support differed in direction between the GTN (β = - 0.18; $p < 0.05$) and NMB samples (β = 0.16; $p < 0.05$), indicating that GTN respondents' place attachment is negatively related to support, while NMB marine recreationists' place is positively related to support. GTN respondents' place attachment was positively related to opposition (β = 0.21; B = 0.34; $p < 0.05$) but the relationship between place attachment and opposition was not significant for the NMB sample (β = 0.03; B = 0.05; $p > 0.05$). The non-significant relationship between NMB respondents' place attachment and opposition did not support Hypothesis 4.

The $\Delta SB\chi^2$ between Structural Invariance Test 1 and 2 (see Table 4), which equalized the parameter estimate between place attachment and support across communities, was significant ($p > 0.05$). This finding suggests that the *strength* of the relationship between place attachment and support across communities was not equal. Specifically, the negative influence of place attachment on support in GTN was stronger than the positive influence of place attachment on support in NMB.

Also notable is the limited variance in support and opposition that was explained by place attachment ($R^2 \leq 0.04$), suggesting that numerous factors other than place attachment influence marine recreationists' acceptability of offshore wind energy development. Also tested were the relationships between the three place attachment dimensions on opposition and support to investigate if any dimensional influences existed beyond the second order factor. Within each community, the estimates from each place attachment dimension to support and opposition were constrained and the $\Delta SB\chi^2$ was not significant ($p > 0.05$). This finding indicates that the dimensional influences of place identity, place dependence, and community social attachment on opposition and support were equal within each community. Therefore, the relationship between place attachment and opposition and support is accounted for entirely by the second order factor of place attachment and not separately by its first-order dimensions.

The Relationship between Place Attachment and Support within a Single Community

In Research Question 2, we asked if place attachment influences opposition and support with equal strength *within* a single community. Structural Invariance Test 3, which addressed this question displayed appropriate fit (Table 5; $SB\chi^2$ (df) = 955.27 (462), $p < 0.05$; CFI = 0.966;

NNFI = 0.963; SRMR = 0.077; RMSEA = 0.056). The parameter estimate between place attachment and support, and place attachment and opposition, was constrained to be equal within the GTN sample, and the $\Delta SB\chi^2$ between the Structural Invariance Test 1 and 3 was significant ($p >$ 0.05). This finding indicates that within the GTN area, place attachment has a stronger positive effect on opposition than the negative effect on support.

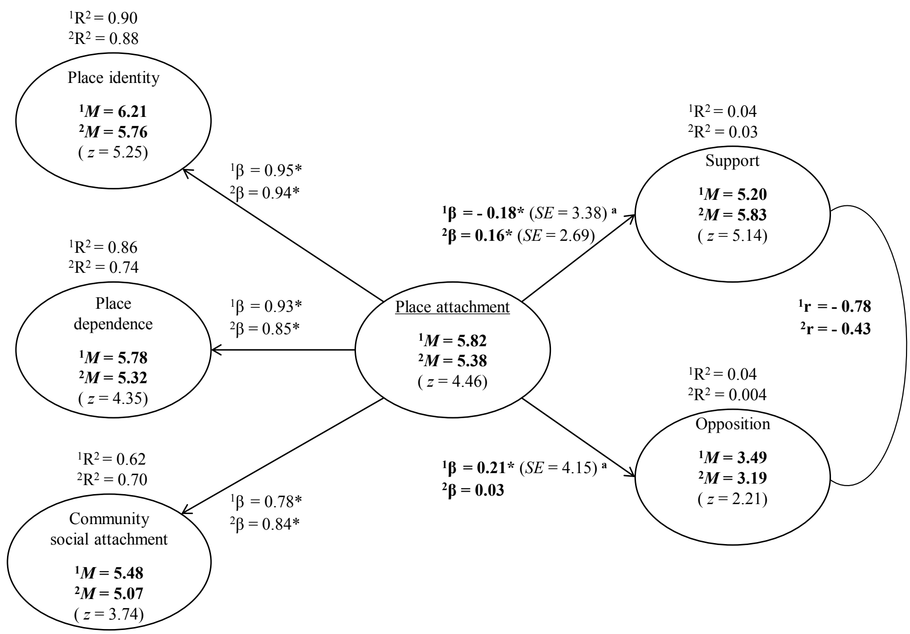

Figure 1. Standardized parameter estimates and latent mean differences for support and opposition for offshore wind energy development across communities. Bolded text indicates significant differences *between GTN and NMB communities* at $p < 0.05$. All measures robust. [1]Georgetown, SC; [2]N. Myrtle Beach, SC; [a]significant difference between the parameter estimates within GTN community; β = standardized parameter estimate; r = standardized covariance; R^2 = variance accounted; z = z-value. CFI = 0.966; NNFI = 0.962; SRMR = 0.090; $SB\chi^2$ (df) = 1101.06* (480); $^{*}p < 0.05$

Discussion

Although offshore wind energy development often converges with marine recreation resources where place-based bonds develop, there has been limited investigation of marine recreationists' attitudes toward offshore wind energy development. Therefore, in this study, the research team a) developed and evaluated the performance of a scale to measure marine recreationists' support and opposition toward offshore wind energy; b) investigated if marine recreationists' levels of support, opposition, and place attachment differed between two coastal communities targeted for wind energy development; and c) evaluated if place attachment influenced support or opposition equally within and across the communities. The findings from this study provide many points for discussion, four of which are presented here.

Scale Performance

The developed scale to assess opposition and support for offshore wind energy displayed desirable and equal performance across both communities. The scale exhibited appropriate sensitivity, which enabled it to identify differences between two populations of marine recreationists and the items demonstrated appropriate convergent validity when used in a structural regression model with other multi-dimensional constructs (e.g., place attachment). Therefore, one outcome of this study is a confirmed scale (within one regional setting) that can be applied by other researchers investigating marine recreationists' opposition and support for offshore wind energy. However, this scale can be developed further. Specifically, the items used in the scale could represent first order dimensions of opposition and support, and future research could expand the items to reflect multidimensional factors. Additionally, the reliability of this scale requires further investigation across different cultural groups and geographic regions to determine its performance with more diverse populations.

Individual Items and Strategic Communication

The *items* that comprise the scale may help inform wind energy communication campaigns targeting marine recreationists in GTN and NMB. This proposition is supported by the recommendation that prescriptive communication that resonates with an audience's existing attitudes is substantially more effective for conservation and sustainability initiatives (CRED, 2009; Jacobson, 1999). For example, NMB respondents reported *benefit to future generations* as the most salient reason to support offshore wind energy development and GTN respondents reported an *increase in energy independence* as the most important reason for support. Therefore, if communication campaigns aim to increase support for offshore wind energy within the sampled population, then direct messaging should be designed in a manner that includes and perhaps highlights the benefits to future generations and contributions to energy independence. Conversely, since the item *improve the local economy* received the lowest agreement by both GTN and NMB, discussing any improvement to the local economy due to proposed wind energy development may not provide the most powerful message to promote wind energy support within the GTN and NMB marine recreation population.

Communication professionals and recreation resource managers could also use the opposition items to identify areas for increasing public education within these two communities of marine recreationists. For example, the belief that offshore wind energy development would *decrease scenic beauty* received the highest agreement in GTN, compared to the belief that wind energy would *not be as productive as promised*, which received the highest agreement for opposition for NMB. Therefore, communication strategies aimed at marine recreationists in these communities could use these items to guide education development and increase awareness in these two areas. Furthermore, public officials and energy developers should likely plan to address GTN and NMB marine recreationists' questions related to aesthetic impacts and productivity since they are the two main areas of opposition in the studied areas. This finding of opposition due to perceived aesthetic impacts relates to previous reviews (e.g., Wolsink, 2007) that indicate the conflict between turbine siting and the public's perception of the landscape (immobility and immutability) may be an influential factor in determining support for wind energy development.

Attitudes toward Wind Energy Development and Differences between Communities

Marine recreationists in this study expressed stronger support for offshore wind energy development than opposition. This is a unique finding since marine recreationists' opposition and support for wind energy has not been previously investigated and support appears higher than general population studies of Massachusetts residents (Firestone & Kempton, 2007). The results also indicate that although the pattern of support and opposition between communities was consistent (i.e., high support and low opposition for each sample of marine recreationists), the *levels* of opposition and support within each community were significantly different.

Similarly, place attachment and its dimensions differed significantly between samples not supporting the researchers' second hypothesis. This result indicates that resource managers and energy developers cannot assume that different communities of marine recreationists in close proximity (< 50 miles) and similar culture (i.e., South Carolina Low Country) hold the same level of attachment to place. This finding suggests that the solidarity theme proposed by Pasqualetti (2011) may be quite complex and that very similar communities of marine recreationists may hold different *levels* of special connections to the physical areas selected for wind energy development.

These differences are potentially attributed to the fact that the two samples were derived from places that had very different physical characteristics—a highly developed tourist location and a protected estuary in a relatively undeveloped setting. This suggests that the differences between the communities' support and opposition are potentially related to the sample's relationships with different place attributes and settings. This finding aligns with the immobility and immutability theme from the broad wind energy literature suggesting that the contradiction between the natural settings found in GTN compared to NMB may have contributed to higher levels of opposition and lower levels of support than NMB marine recreationists.

This differing level of opposition and support between communities can perhaps be further explained by what Devine-Wright (2011) refers to as the symbolic contradictions between nature and industry. For example, GTN marine recreationists may report lower levels of support and higher levels of opposition because of the interpretation that turbines (i.e., development) do not "fit" with the attributes of a relatively undeveloped protected estuary. Conversely, in a highly developed tourism community, such as NMB, turbines may more likely be interpreted to "fit" with the surrounding landscape and the level of existing infrastructure (e.g., high-rise condominiums and billboards). Devine-Wright's (2011) notion of 'symbolic contradiction' not only helps explain this study's findings but aligns well with the immobility and immutability theme offered by Pasqualetti (2011).

The high levels of support for offshore wind energy development by marine recreationists in this study may be partially explained by research that suggests outdoor recreationists in general are predisposed to support pro-environmental initiatives due to high underlying values for plants, animals, and wildlife (i.e., biospheric values; Larson, Whiting, & Green, 2011). Although values were not measured in this study, if the population holds high levels of biospheric values it may contribute to high support for renewable energy initiatives, which are often viewed as environmentally-friendly forms of energy. Future studies could explore this relationship between value orientations and support or opposition for wind energy within the marine recreation population.

The Role of Place Attachment

As hypothesized by the research team the relationship between place attachment and opposition and support for wind energy was different within each community (H3 and H4). For example, in GTN, place attachment was negatively related to support and positively influenced opposition. Conversely, in NMB place attachment was positively related to support and had no relationship with opposition. These results suggest that although place attachment has relationships with opposition and support for offshore wind energy, the *direction* of this relationship can vary significantly across locations that are in close proximity. These findings align with similar studies (Devine-Wright, 2011; Devine-Wright & Howes, 2010) and suggest that resource managers and energy developers cannot assume place attachment plays a similar role in all places. These findings also indicate that higher levels of place attachment will not *always* lead to more place protective behaviors stemming from opposition to offshore wind energy development.

Specifically, for NMB respondents place attachment may have led to more support because respondents felt it would enhance or improve NMB. As a result, the authors conclude that levels of acceptance for wind energy in this study are likely attributed to how respondents interpret, view, and deduce the *potential* impacts from proposed projects. Therefore, future research should perhaps employ qualitative methods to understand how individuals and groups perceive potential impacts from a proposed project.

Although examining place attachment may offer insight for researchers and managers, the power of place attachment to fully explain opposition and support may be limited (e.g., $R^2 = 0.04$). This low explanatory power suggests many factors influence acceptability of wind energy development beyond marine recreationists' place-based connections. Therefore, researchers should include additional factors beyond place attachment in marine recreation wind energy studies to explain correlates of opposition and support. Additionally, researchers could segment marine recreation activity groups (boaters, anglers, beach users, walkers) to analyze distinct differences in place attachment, opposition, and support between groups and the consistency of within group perspectives regarding proposed wind energy development.

Conclusion

As society confronts new energy initiatives and increased population growth, the convergence between recreation resources and renewable energies will likely increase substantially. Therefore, offshore wind energy initiatives will continue and assessments of stakeholders' opposition or support will be necessary in offshore wind energy planning processes. Additionally, many locations cited as "ideal" for offshore wind energy projects will continue to be close to important marine recreation resources. Therefore, marine recreationists will be a particularly relevant and important subpopulation to study and understand. The developed scale, subsequent analysis, and discussion presented here may provide a foundation for continued investigations and measurement development.

References

Altman, I., & Low, S. M. (Eds.). (1992). *Place attachment.* New York: Plenum Press.

Blaydes, M., Firestone, J., & Kempton, W. (2008). *The effects of windpower on beach tourism.* Retrieved from http://www.ocean.udel.edu/windpower/docs/ AWEA_TourismSvy_9_8_08.pdf

Brehm, J. M., Eisenhauer, B. W., & Krannich, R. S. (2004). Dimensions of community attachment and their relationship to well-being in the amenity-rich rural west. *Rural Sociology, 69(3)*, 405–429.

Bryman, A. (2008). *Social research methods*. New York: Oxford.

Byrne, B. M. (2006). *Structural equation modeling using EQS.* New York: Psychology Press.

Cape Cod Commercial Hook Fisherman's Association. (2009). *Boater's guide to Nantucket Sound*. Retreived from http://www.ccchfa.org/programs/documents/2009BOATERSGUIDEwebfinal.pdf

City Data for Georgetown, South Carolina. (2011). Retrieved from http://www.city-data.com/city/Georgetown-South-Carolina.html

City Data for North Myrtle Beach, South Carolina. (2011). Retrieved from http://www.city-data.com/city/North-Myrtle-Beach-South-Carolina.html

Clayton, M. (2012). Obama opens the door to offshore wind power along mid-Atlantic coast. *The Christian Science Monitor*. Retrieved from http://www.csmonitor.com/USA/2012/0202/Obama-opens-door-to-offshore-wind-power-along-mid-Atlantic-coast

Center for Research on Environmental Decisions. (2010). *The psychology of climate change communication*. Retrieved from http://www.cred.columbia.edu/guide/.

Creswell, J. W. (2007). *Qualitative inquiry and research design*. London: Sage Publications.

Creswell, J. W., & Plano Clark, V. L. (2011). *Mixed-methods research.* London: Sage Publications.

DeSantis, V. S., & Reid, J. (2004). *Cape Cod Times*/WCAI Poll 2004. Bridgewater State College, Institute.

Devellis, R. F. (2003). *Scale development: Theory and applications in applied social research methods* (2nd ed.). Thousand Oaks, CA: Sage Publishing.

Devine-Wright, P. (2005). Beyond NIMBYSIM: Toward an integrated framework for understanding public perceptions of wind energy. *Wind Energy, 8*, 125–139.

Devine-Wright, P. (2009). Rethinking NIMBYSIM. *Journal of Community and Applied Social Psychology, 19,* 426–441.

Devine-Wright, P. (2011). Place attachment and public acceptance of renewable energy: A tidal case study. *Journal of Environmental Psychology, 31*(4), 336–343.

Devine-Wright, P., & Clayton, S. (2010). Introduction to the special issue: Place, identity, and environmental behavior. *Journal of Environmental Psychology, 30*, 267–270.

Devine-Wright, P., & Batel, S. (2012). Explaining public preferences for high voltage pylon designs: An empirical study of perceived fit in a rural landscape. *Land Use Policy*.

Devine-Wright, P., & Howes, Y. (2010). Disruption to place attachment and the protection of restorative environments: A wind energy case study. *Journal of Environmental Psychology, 30*, 271–280.

Ellis, G., Barry, J., & Robinson, C. (2007). Many ways to say 'No', different ways to say 'yes': Applying Q-Sort Methodology to understand public acceptance of wind farm proposals. *Journal of Environmental Planning and Management, 50*, 517–551.

Firestone, J., & Kempton, W. (2005). Reflections from Cape Wind. *Cornell Journal of Law And Public Policy, 14,* 71–111.

Firestone, J., & Kempton, W. (2007). Public opinion about large offshore wind power: Underlying factors. *Energy Policy, 35,* 1584–1598.

Gamboa, G., & Munda, G. (2007). The problem of windfarm location: A social multi-criteria evaluation framework. *Energy Policy, 35,* 1564–1583.

Graham, J. B., Stephenson, J., & Smith, I. (2009). Public perceptions of wind energy developments: Case studies from New Zealand. *Energy Policy, 3*, 3348–3357.

Hammitt, W. E., Kyle, G. T., & Oh, C. (2009). Comparison of place bonding models in recreation resource management. *Journal of Leisure Research, 41*(1), 57–72.

Haughton, J., Giuffre, G., & Barrett, J. (2003). *Blowing in the wind: Offshore wind and the Cape Cod economy.* Unpublished report by Beacon Hill Institute at Suffolk University (Boston, MA). Retrieved from from http://www.beaconhill.org.

Jacobson, S. K. (1999). *Communication skills for conservation professionals.* Washington: Island Press.

Kempton, W., Firestone, J., Lilley, J., Rouleau, T., & Whitaker, P. (2005). The offshore wind power debate: views from Cape Cod. *Coastal Management, 33*, 119–149.

Kline, R. B. (2011). *Principles and practices of structural equation modeling.* New York: Guillford.

Kyle, G., Bricker, K. S., Graefe, A., & Wickham, T. (2004). An examination of recreationists' relationships with activities and settings. *Leisure Sciences, 26*(2), 123–142.

Kyle, G., Graefe, A., & Manning, R. (2005). Testing the dimensionality of place attachment in recreational settings. *Environment and Behavior, 37*(2), 153–177.

Kyle, G., Mowen, A., & Tarrant, M. (2004). Linking place preference with place meaning: An examination of the relationship between place motivation and place attachment. *Journal of Environmental Psychology, 24,* 439–454.

Larson, L. R., Whiting, J. W., & Green, G. T. (2011). Exploring the influence of outdoor recreation participation on pro-environmental behavior in a demographically diverse population. *Local Environment, 16*(1), 67–86.

Manning, R. (2011). *Studies in outdoor recreation* (2nd ed.). Corvalis, OR: Oregon State University Press.

McLachlan, C. (2009). "You don't do a chemistry experiment in your best china": Symbolic interpretations of place and technology in a wave energy case. *Energy Policy, 37,* 5342–5350.

Morgan, D. L. (1998). Practical strategies for combining qualitative and quantitative methods. *Qualitative Health Research, 8*(3), 362–376.

Morse, J. M. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing Research, 40*, 120–123.

Noar, S. M. (2003). The role of structural equation modeling in scale development. *Structural Equation Modeling, 10*(4), 622–647.

Oh, C., Draper, J., & Dixon, A. (2009). Assessing tourists' multi-attribute preferences for public beach access. *Coastal Management, 37*, 119–135.

Pasqualetti, M. J. (2011). Opposing wind energy landscapes: A search for a common cause. *Annals of the Association of American Geographers, 101,* 907–917.

Raymond, C. M., Brown, G., & Weber, D. (2010). The measurement of place attachment: Personal, community, and environmental connections. *Journal of Environmental Psychology, 30*(4), 422–434.

Renewable Energy Magazine. (2012). World's largest offshore wind farm opens. *Renewable Energy Magazine.* Retrieved from http://www.renewableenergymagazine.com/energias/renovables/index/pag/wind/colleft/colright/wind/tip/articulo/pagid/19146/botid/48/

Richards, L., & Morse, J. M. (2007). *Qualitative methods.* London: Sage Publications.

Satorra, A. & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika, 66,* 507–514.

Schreyer, R., Lime, D. W., & Williams, D. R. (1984). Characterizing the influence of past experience on recreation behavior. *Journal of Leisure Research, 16*(1), 34–50.

Seidman, I. (2006). *Interviewing as qualitative research.* New York: Teachers College Press.

Stedman, R. (2002). Toward a social psychology of place. *Environment and Behavior, 34,* 561–581.

Szarka, J. (2006). Wind power, policy learning, and paradigm change. *Energy Policy, 34,* 3041–3048.

Tabachnick, B., & Fidell, L. (2012). *Using multivariate statistics.* New York: Pearson.

Vaske, J. J. (2008). *Survey research and analysis: Applications in parks, recreation, and human dimensions.* State College, PA: Venture.

Vorkinn, M., & Riese, H. (2001). Environmental concern in a local context. *Environment and Behavior, 33,* 249–263.

Whitmarsh, L., Upham, P., Poortinga, W., McLachlan, C., Darnton, A., Devine-Wright, P., Demski, C., & Sherry-Brennan, F. (2011). *Public attitudes, understanding, and engagement in relation to low-carbon energy.* A report for the RCUK Energy Programme.

Wolsink, M. (2007). Wind power implementation. The nature of public attitudes: equity and fairness instead of 'backyard motives'. *Renewable and Sustainable Energy Reviews, 11*, 1188–1207.

Woosnam, K., Jodice L., Von Harten, A., & Rhodes, R. (2008) Investigating Marine Recreational Fishing Stakeholders' Perspectives across Three South Carolina Coastal Regions: The First Step towards Collaboration. *Journal of Extension, 46*(2).