Comparing two tourism-dependent, coastal communities and their opinions of local marine renewable energy projects

by

Brian DeSanti II, M.S.

A Dissertation

In

Media & Communication

Submitted to the Graduate Faculty
Of Texas Tech University in
Partial Fulfillment of
The Requirements for
The Degree of

DOCTOR OF PHILOSOPHY

Approved

Trent Seltzer, Ph.D.
Chair of Committee

Coy Callison, Ph.D.

Asheley Landrum, Ph.D.

Warren Conway, Ph.D.

Patrick Rice, Ph.D.

Mark Sheridan
Dean of the Graduate School

December 2020

ACKNOWLEDGMENTS

The saying "it takes a village" comes to mind when I think about the journey of my Ph.D. The support and effort of many allowed me to accomplish this milestone. I would first like to thank my family for supporting me through the ups and downs of graduate school. My father Brian DeSanti, my mother Deborah DeSanti, and my brother and best friend Robert DeSanti have all been a source of continual love and encouragement.

I would like the thank my chair, Dr. Trent Seltzer, towards whom I am eternally grateful for his steady guidance. Your patience was admirable as I figured my way through an unfamiliar field asking obvious questions. You always encouraged and advocated for me at the college, even while I pushed every boundary.

I would also like to thank my committee for their help during this journey. Their expertise and advice were invaluable to me throughout this project. Dr. Coy Callison, I want to thank you for your honesty as I joined the College of Media and Communication and for the motivation you provided over the last two years. Dr. Asheley Landrum, thank you for helping me navigate the new direction in my career. It was your advice that helped me seek out my own niche when I questioned my choice to change disciplines. Dr. Warren Conway, it is safe to say I would not have had the opportunity for this experience at all if not for your generosity and time. The many late-night conversations over adult beverages and encouragement to step outside of my comfort zone were instrumental to push me to finish my degree at Texas Tech University. To Dr. Patrick Rice, words cannot express my gratitude for what you have done for me over the years. From letting me crash at your home as a young man, to supporting me through my

graduate career, I know that you have always had my back. I would also like acknowledge the Texas Tech College of Media and Communication for making this project possible through the support of a fellowship. You have all allowed me to grow immensely as a person and scholar.

I would like to thank both my friends at home and the new friends I have made here at Texas Tech. To Darren Alvaranga, Ashalee Stickel, Chris Lewis, and Andrew Anglin, thanks for always listening when I need someone to talk to. A special thanks to Gabriel Castillo for many long nights dreaming about the future, even though you won't be a part of it; rest in peace. To the many wonderful friends that I have met at Texas Tech, of which there are too many to name, you know who you are and all the help you have given me. Finally, I would like to thank my partner, Kimberly Hencken. Your encouragement, support, and love never wavered throughout this journey and made the entire process better.

TABLE OF CONTENTS

ABSTRACT

Increasing atmospheric levels of greenhouse gases, such as CO_2 and CH_4, have been linked to ocean acidification, rising temperatures, and overall climate change. To combat climate change a transition to more renewable energy sources such as solar, wind, and hydrokinetic has been offered as part of the solution. However, most renewable energy projects are met with local opposition. Environmental communication campaigns have shown to be effective when done properly. The Integrative Model of Behavioral Prediction posits there are an infinite number of variables affecting behavior, but focusing on attitudes, social norms, and efficacy should allow campaign planners to determine factors that are most likely to change behavior. To that end, an elicitation study should be performed to determine which attitudes, beliefs, and norms are influential in a specific community. In order to accomplish this goal, in-depth interviews were conducted in two tourism-dependent, coastal communities in Florida. Twenty-five interviews suggested that local attitudes are driven by knowledge of local energy generation, familiarity with renewable energy sources, economics, NIMBY-ism, and politics. Perceived norms are driven by family, friends, and community influencer groups. Efficacy is driven by both self- and response efficacy beliefs regarding residents current environmentally friendly behaviors and the ability of business and government to support and implement such projects. One final driver of acceptance, place attachment, shows that projects should be compatible with how community members view their community. This research sets the stage for further testing of behavioral models in tourism-dependent, coastal communities to drive communication efforts focused on renewable energy acceptance. It also underscores the need for considering self- and response efficacy

separately in future renewable energy acceptance research. Additionally, place attachment and cultural worldviews should be included in future acceptance research to boost the utility of the IMBP in the renewable energy context. Lastly, the research highlights the need for targeted, simplistic, and transparent messaging distributed through local channels within the studied communities further showing that best practices for renewable energy messaging varies by community.

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Increases in atmospheric levels of greenhouse gases, such as CO_2 have been linked to rising global temperatures, ocean acidification, and an overall trend of changing climate (Doney et al., 2009). These changing environmental conditions have led to rising sea levels as ice caps melt and altered plant physiology, which threaten coastal communities and terrestrial watersheds (Meehl et al. 2005; Taub, 2010). If our current consumption of fossil fuels continues, global temperatures could reach their greatest levels in the last 10 million years (Dickinson & Cicerone, 1986). A recent Intergovernmental Panel on Climate Change (IPCC) report warned without drastic changes to our fossil fuel consumption in the next decade irreparable damage could be done to the environment (Masson-Delmonte et al., 2018).

Until 2017, carbon dioxide (CO_2) emissions in the US have been decreasing towards a 40 year low due to federal incentives including the Production Tax from the All-of-the-Above Energy Strategy which aimed to double wind and solar generation by 2025 (Whitehouse, 2014). This trend changed in 2018, with an increase in fossil fuel emissions from the US (Houser et al., 2019). Energy strategy under the Trump administration has focused on fossil fuel-based resources driving production increases in coal, crude oil, and natural gas (Whitehouse, 2019). However, renewable energy (RE) produced 11.9% of the United States' consumed energy, which represents nearly a 20% increase over the last five years (EIA, 2019a). The largest portions of this energy are from biofuels, hydroelectric (i.e. dams), and wind (EIA, 2019b). Making a switch from

traditional fossil fuels to multiple forms of RE sources has been offered as one part of the solution to reduce the use of fossil fuels (IEA, 2011).

Other solutions for reducing greenhouse gases and fossil fuels include carbon sequestration (Lackner 2003), the capturing of carbon dioxide via storage in old wells and saline aquifers (Chadwick et al., 2002; Herzog et al., 2000). However, these methods of sequestration are often done on land owned or leased out of the eye of the public. In the United States, residents are accustomed to flipping a switch for power (Sovacool, 2009) and not having to know where it comes from much less see source of power production (Pasqualetti, 2000). This could be one reason why renewable energy projects are often met with resistance from the community they are proposed in.

Despite renewable energy projects receiving support on a national scale in North America (Bidwell, 2013; Leiserowitz et al., 2016), local projects often can be difficult to build in a given community (Lantz & Flowers, 2011). This issue may be a cultural phenomenon because Americans are not accustomed to seeing where their energy is produced (Pasqualetti, 2000); therefore, communities are often resistant to new energy development. Local projects may also struggle to find traction due to the nature of the communications efforts used to promote those projects. Often, one-way communication techniques (e.g. websites, government fact sheets, news pieces) are utilized (e.g. Hobman & Ashworth, 2013), which is problematic as new research suggests involving residents in the planning and siting process would be more effective (Devine-Wright, 2011).

Research suggests that strategic communication for environmental topics can be successful if done correctly (Brulle, 2010; Maibach, 1993; Mosler & Martens, 2008). To narrow the variables affecting the outcome of strategic communication efforts, a more

targeted approach should be used. A model such as the Integrated Model of Behavioral Prediction (IMBP) can target a situation such as communication with a local community in an attempt to influence behavior (Fishbein & Ajzen, 1975; 2010). This model has proven successful in changing behavior related to health (e.g. Montaño et al., 2014; Robbins & Niederdeppe, 2015). To make it more specific to renewable energy development other factors must be considered alongside the traditional IMBP variable of social norms, efficacy, and attitude. Place attachment can briefly be described as the emotions one holds for a place or location (Gieryn, 2000; Tuan, 1977). As renewable energy projects are often within eyesight for local stakeholders, the phenomena must be examined in addition to IMBP. Before anything with this amount of specificity can be used, a deeper exploration of factors influencing attitudes needs to be examined in the target communities (Yzer, 2012). Gaining a stronger understanding of the underlying themes behind these variables is the aim of this research.

A changing environment and the recognition our current energy strategy cannot work long-term has led to alternative options to reduce greenhouse gas emissions (Doney et al., 2009; Hughes, 2000). A carbon-neutral emissions future may be needed to continue our growth as a country (Hoffert et al., 2002). Renewable energy has been suggested as part of the movement in this carbon-neutral direction (IEA, 2011). In order for this to work, communities will have to support the effort. The question then becomes will residents' support such energy sources in their communities? To answer this question, how renewable energy fits into a specific community must also be examined. Ultimately to understand if and how local renewable energy projects fit into a community, members of these communities should be interviewed. Devine-Wright (2011a) suggests more

qualitative work is needed before we understand how to properly reach these communities. However, Bidwell (2016) believes more targeted goals should be developed. Hence, in addition to attitudes towards marine renewable energy, this study will seek to discover what actions residents might be willing to take if a renewable energy project was proposed in their community. Furthermore, residents will be asked about what kind of information and sources from which they would prefer to receive future energy information communications.

In this study, 25 residents from two coastal Florida communities were interviewed regarding their attitudes towards marine renewable energy projects to determine what influences a community member's decisions about a local project. Additionally, residents were asked where they get their information from and how they would want future information on the topic of renewable energy distributed.

This research will provide a better understanding of what factors influence residents when making decisions about a local renewable energy project. This data can serve as the groundwork for future behavioral model studies on marine renewable energy and community acceptance. The findings also provide both researchers and practitioners with valuable information on what these communities need regarding messaging and information channels for future studies or potential projects. Finally, these results can be compared with current renewable energy messaging best practices and provide feedback to on techniques that are viable in these communities.

CHAPTER II

LITERATURE REVIEW

As the IEA (2011) suggests, renewable energy could be part of the solution to neutralize our carbon footprints. In order to understand this solution, renewable energy, its place in the United States (US), and its future potential should be examined in further detail. This will include its current status in the US power production industry today, examples of current successful projects and the potential for the study's selected communities to host the technology. Lastly, the variables shown to help predict behavior for local renewable energy projects will be discussed in detail. These variables and the accompanying model, which will not be tested in this research, will serve as the framework of examination of the phenomena.

Renewable Energy in the United States

The International Environmental Agency defined renewable energy as any "energy derived from processes that are replenished constantly" (UNEP, 2013 pp. 220). These renewable sources can include wind, solar, geothermal, biomass, hydrokinetic, among other sources (IEA, 2011). The United States currently has 96 gigawatts (GW) of utility scale wind energy installed onshore with nearly 7600 MW being installed in 2018 (Musial et al., 2019). Conversely in the US, there are only 30 megawatts (MW) offshore in a single installation, Block Island Wind Farm (Hartman, 2019). For comparison, there is currently 1127 MW of distributed wind power systems, which is similar to a co-op with the power being connected to the costumer end of the meter, in the United States. This amount of utility scale wind energy powers 10% of the demand in 14 states and 30%

of the power demand in three states (Musial et al., 2019) and 6.5% of total electricity generation in the US in 2018 (Wiser & Bolinger, 2019).

In 2008, the Department of Energy (DOE) estimated that 54 GW of offshore wind energy is currently unused with the potential for more because their site selection was conservative and did not account for military zones, commercial shipping lanes, and sites of environmental concern. A more recent report predicts nearly 86 GW of offshore wind energy potential by 2050 (DOE, 2017). The Bureau of Ocean Energy Management (BOEM) has granted thirteen offshore wind leases in the last six years with 15 active leases covering nearly two million acres (BOEM, 2019). A recent auction of three sites with an area of nearly 400,000 acres received $405M in total bids (DOI, 2019). This is a significant increase over the $135M received for three sites in December 2018 (AWEA, 2019). Since the permitting of Block Island Wind Farm, which took 12 years, subsequent permits have been approved in 2-4 years (DOE, 2014).

Tidal range energy is energy that relies on difference between the low and high tides to produce energy (Kempener & Neumann, 2014). An example of this would be water that enters into a bay and back out every day. Tidal stream or current energy is generated by an ocean current. There is currently no utility scale offshore tidal energy installed in the United States or anywhere worldwide. Most of the existing technology is currently in the prototype and demonstration phases (Kempener & Neumann, 2014; Magagna et al., 2014). Similarly to the early days of offshore wind with many agencies having oversight and no official permitting process (Wright, 2013), time needed to get a tidal or wave energy permit can be arduous, and frustrating for investors. In-stream hydrokinetic energy systems, such as those that could potentially be deployed in the Gulf

Stream, face different permitting challenges with a minimum of five separate agencies overseeing permits (VanZwieten et al., 2015). Currently, over 23 agencies have jurisdiction on ocean energy projects in the United States (Leary & Estaban, 2009). Despite this industry market reports suggest this technology is expected to hit the market in the upcoming years (Magagna & Uihlein, 2015).

Moving Renewable Energy Forward

The DOE has several initiatives to help further tidal energy's potential to get to market. The uniform methods, small business, grid modernization, and education initiatives are all working together to accomplish this goal. The uniform methods project works to develop uniform measurements for residential, commercial, and industrial energy savings and efficiencies. The DOE has two separate small business initiatives, the small business innovation research (SBIR) program and the small business technology transfer (SBTT) program. These programs offer grants to small businesses to develop and commercialize new technology. The grid modernization initiative (GMI) works with public and private sectors to modernize the grid with technologies to analyze, predict, protect, and control our future energy grid. They also provide educational resources such as lesson plans and science projects, as well as renewable energy and energy efficiency contests for students and resources for individuals looking to get into the renewable energy field. (DOE, 2019a). These initiatives together provide funding to improve technology and allow small businesses to receive funding through avenues that were not previously available.

Furthermore, the National Science Foundation's I-Corps program works with the DOE Office of Energy Efficiency and Renewable Energy (EERE) to help researchers

bring promising energy technologies to market. The program helps researchers address market barriers by having them perform intensive market research. Additionally, they help researchers transition from the research mindset needed to develop the technology to business-oriented professionals equipped to bring the technology to market (DOE, 2019b).

Renewable energy currently has high levels of support throughout North America (Bidwell, 2013; Leiserowitz et al., 2016), but local projects are often met with resistance from the communities in which they are proposed (Lantz & Flowers, 2011). These communities can impact policy from the local, state, and national levels (Matisoff, 2008), as well as the likelihood of a renewable energy project ever breaking ground in a region (Ogilvie & Rootes, 2015; Shaw et al., 2015). For example, on July 12, 2018 the County of San Diego heard a proposal to place 30 wind turbines on Big Country Ranch, in an area now known as Ribbonwood Road (County of San Diego, 2018). As of February 2020, this project is still experiencing strong local opposition citing reasons such as water scarcity, adverse health effects, noise, pollution from construction, shadow flicker, and proximity to federal lands (NBC7, 2018; Person, 2020). One appeal to the planning group stated they were turning the community in "renewable energy sacrifice zone" (NBC7, 2018). As renewable energy projects become more prevalent and fossil fuel prices rise, more interaction between communities and projects are inevitable. Having a better understanding of what factors drive decisions in these communities will be important as the technology continues to spread. Given the push to deploy more residential RE technologies in the Florida Keys and Panama City, FL region post 2018 hurricanes,

examining the residents' intentions to support or oppose the technology in the community is important.

The Florida Keys and Renewable Energy Potential

The Florida Keys (FK) (Figure 1) is a unique region that could potentially house three major sources of renewable energy: Solar, wind, and hydrokinetic (i.e. tidal range and ocean current energies). Within the Florida Keys is the world's strongest consistent tidal current, the Gulf Stream, which is capable of moving water millions of cubic meters/second (Lee et al., 1994; Schimitz & Richardson, 1968). With the presence of a consistent current and the infrastructure of 43 bridges connecting the islands, the Florida Keys could potentially harness large amounts of hydrokinetic energy from the ocean. Moreover, Key West is the twelfth sunniest city in the United States (National Climate Data Center, 2004), and has the highest wind speeds in the state (FSU, 2008). These conditions could be used to develop offshore power plants with the potential to power the entirety of Monroe County and more. Akin to most regions that have strong ocean energy potential, the Florida Keys is remote and would require extensive upgrades to the existing electrical grid to reach its potential (Magagna & Uihlein, 2015).

With multiple possible types of renewable energy, the Keys could generate enough power for themselves and export the additional power to Miami. Previously, deploying new renewable energy technology in the Florida Keys failed because of public opposition when the Florida Keys Hydro Power Corporation attempted to implement tidal turbines in the Bahia Honda State Park Pass (McLean, 2009). The project was met with heavy opposition from the community and was tied up in legal proceedings until the project was eventually abandoned (Shirley Freeman, personal communication, September

03, 2018). Furthermore, the College of the Florida Keys (CFK), formerly known as the Florida Keys Community College (FKCC), received a National Science Foundation (NSF) Advanced Technology Education (ATE) grant which trains technicians in solar, wind, and hydrokinetic fields. The College of the Florida Keys is the first college in the nation to have certified hydrokinetic technicians. These unique factors make studying the Florida Keys community's support of local renewable energy important for both the community and furthering of renewable energy acceptance science.

Given the potential to produce large amounts of energy from renewable sources in the Keys and the previous failed attempt at a local renewable energy project over a decade ago, residents' likelihood to support renewable energy needs to be investigated to gain a better understanding of the community. In order to determine what variables might influence the community, in-depth interviews were conducted examining factors identified in previous research that showed positive results.

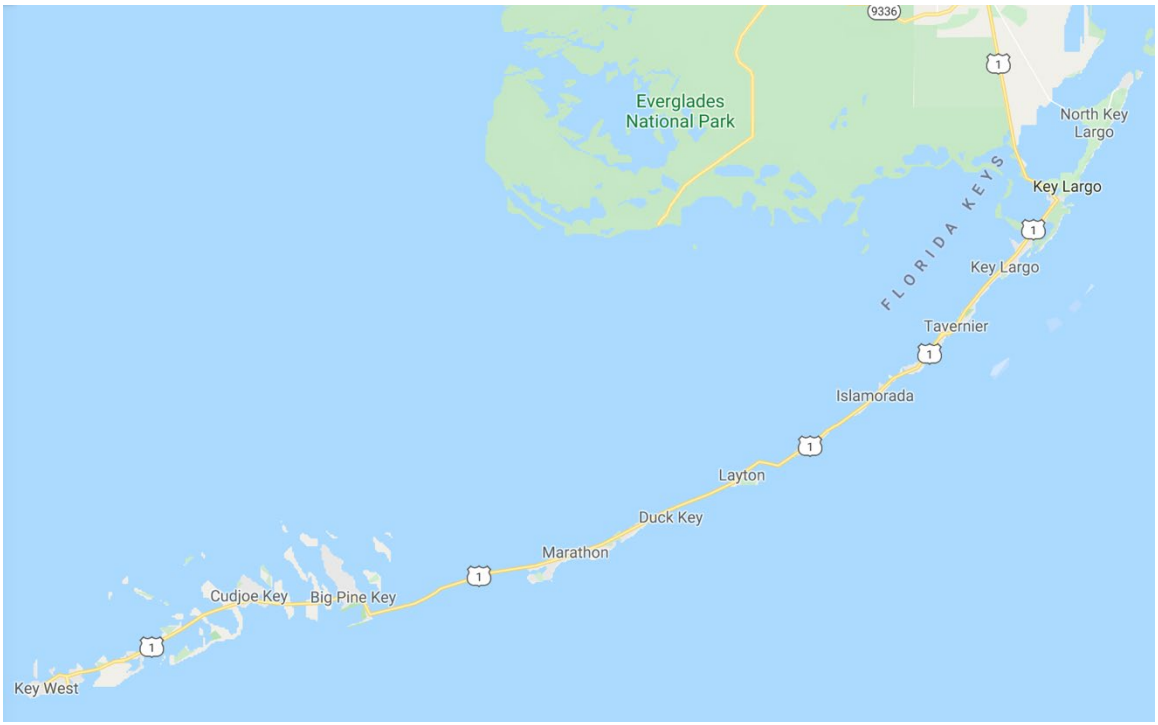

Figure 1. Map of the Monroe County, Florida showing the locations from Key Largo to Key West.

Panama City Region and Renewable Energy Potential

The Panama City region (PCR) in Bay County, Florida (Figure 2) includes Panama City, Panama City Beach, and the City of Lynn Haven. The West coast of Florida does not have the same wind speeds such as states like Massachusetts; however, it does have a wide continental shelf and abundance of water that is shallower than 60 meters. This tidal energy resource could potentially produce roughly three times the amount of the electricity currently used in the state (Musial et al., 2016). Currently, Florida is fifth in installed solar power, and has some of the greatest potential for solar energy growth in the U.S. (SEIA, 2020). While not rated as high as Key West, Panama City is surrounded by neighboring counties that have cities in the top 100 sunniest cities in the country (National Climate Data Center, 2004). Bay County is also home to St. Andrew Bay which is a tidal system connected to the Gulf of Mexico. St. Andrew Bay is

a diurnal tidal system which moves in and out of the bay through the cut twice daily (Ichiye & Jones, 1960). This water movement could provide a source of hydrokinetic energy to the community.

Gulf Coast State College (GCSC) is the local state college located in Bay County, where GCSC has established an alternative energy systems specialist certification which prepares students from careers as solar and smart grid technicians and energy auditors. Given the potential for renewable energy expansion in the region, the importance of learning how the community thinks regarding local projects is important to any future developments.

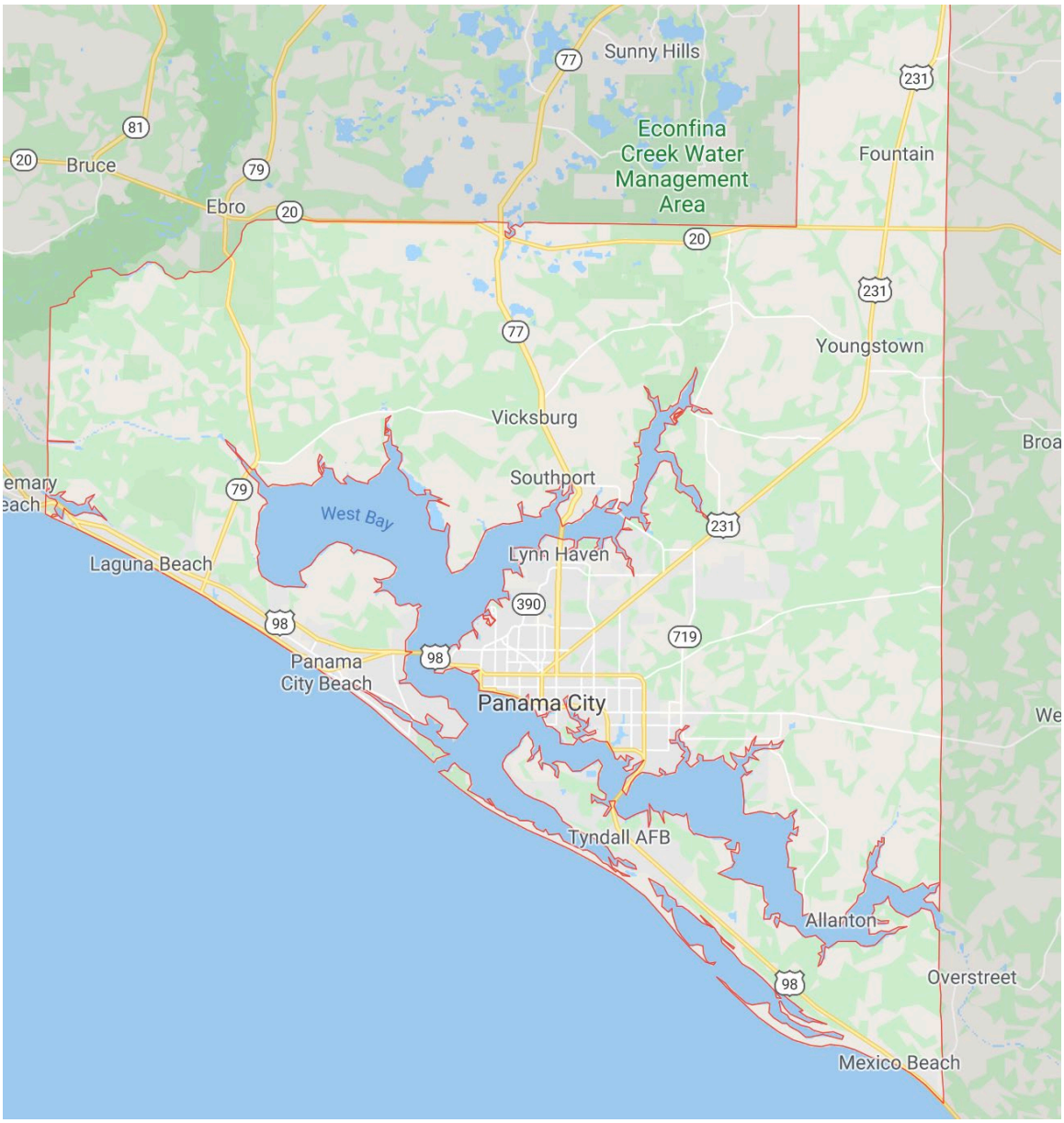

Figure 2. Map of Bay County, Florida showing the locations of Panama City Beach, Panama City, and the city of Lynn Haven.

Comparing the Two Cities

The two communities selected for this study were chosen on their potential to build future renewable energy projects. To the author's knowledge, no offshore wind or hydrokinetic projects are currently in a demonstration phase in either community. These

communities where also selected because they have keys similarities and differences that need to be explored.

For instance, both are tourism-dependent communities along the Gulf Coast of Florida. The Florida Keys had 5.1 million visitors in 2018 (Rockport Analytics, 2018) and about 74,000 permanent residents (Census, 2019a), while the Panama City region has a large volume of tourist and seasonal residents (PCB, 2009) with nearly 17 million visitors annually (Chamber of Commerce 2020) and a population of 174,000 (Census, 2019a). Furthermore, in 2018 both regions were struck by Category 5 hurricanes with the Keys being hit by Irma, and the Panama City region taking a direct hit from Michael. These environmental and economic similarities suggest that similar messaging approaches could be used to encourage community support of renewable energy development.

On the other hand, there are some differences between the communities. The power supply and options for residents vary within and between regions. Within the Florida Keys, there could be a pronounced difference between the Upper (Key Largo through Marathon) and Lower (Scout Key to Key West) Keys. This stems from the distinction of power distribution between the two regions. The Upper Keys region has a large co-op named the Florida Keys Electric Cooperative. The Lower Keys regions power is distributed by Keys Energy Service. There is potential for cost differences to the customers in these regions due to the varying structures of current power agreements. Panama City and the surrounding communities are powered by Gulf Power Company which is owned by Next Era, the world's largest producer of solar and wind energy. Duke Energy and the Gulf Coast Electric Cooperative are also in the region but provide limited

service to a subpopulation of residents within the area targeted in this study (i.e. rural hard to reach roads in rural areas). Another difference between the regions is the diversity of power production. The only power production currently from the Keys region is from solar panels the residents own, while the Panama City region has a waste burning plant and coal burning plant to produce energy in the region. It should be noted that most of the power consumed in the Keys is produced at Turkey Point Nuclear Plant located in Homestead, Florida.

One more factor playing into potential differences and ultimately messaging is the political differences between the communities. The Keys is recognized by its residents as a more liberal community from a political ideological standpoint. When compared to the Panama City region, the voting data confirm this. The Florida Keys voted 57.57% Republican and 44.66% Democrat in 2016 Presidential election, while the Panama City region voted 71.12% Republican and 24.92% Democrat (SDOE, 2016).

Finally, more people who reside in Monroe County, FL are not lifelong residents. In fact, a large portion of Keys residents' have resided in the region for less than 10 years (Klingener & Bellido, 1999). Residents in Monroe County are three times more likely to be born in another country than those in Panama City. Homeownership is nearly 5% more prevalent in Panama City (63.3%) versus Monroe County (58.7%). Both regions have nearly two times as many people working in service-based industries, such as restaurants and bars, compared to other places in the US. Meanwhile, Monroe County has nearly three times as many people working in the fishing industry than other counties nationwide (Data USA, 2020). These important similarities and differences are worth

investigating within the realm of known factors that can influence local development and action.

Now that the current status of renewable energy in the US and potential resources in two coastal Florida cities have been described, we are going to talk about how they are going to be studied. The background below will describe the framework that will support how the study data was collected and analyzed.

Integrative Model of Behavioral Prediction

The integrative model of behavioral prediction (IMBP) (Figure 3) is the next iteration in a line of behavioral models which include theory of reasoned action (TRA) and theory of planned behavior (TBP). These models are intended to predict the behavioral intention of a specific, defined behavior (Fishbein & Ajzen, 2010). The TRA states that behavioral intention can be predicted through attitudes and social norms (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The authors argue that behavioral intentions are a precursor to a voluntary behavior and can be predicted with the measurement of the attitude, social norms, and efficacy. The TBP states in addition to attitude and social norms, perceived behavior control can better predict behavioral intentions. They also examine the control beliefs that are behind the predicted behavioral control (Ajzen, 1991). Building on the science of TRA, TBP and the weaknesses and criticisms of these theories, the integrative model of behavioral prediction (IMBP) (Fishbein, 2000; 2008) was developed, which has the potential for more accurate predictions of behavioral intention and ultimately behavior. For both TRA and TPB were criticized for not accounting the environmental barriers that may prevent someone from performing a behavior. For instance, if a homeowner wants to place solar panels on your

home, in most cases you must have a down payment. Therefore, you could have high intention of putting solar panels on your home, but the environmental barriers could prevent you from performing the behavior. These new measurements could allow the model to be tested with new types of behaviors potentially producing a more refined model.

In addition to accounting for environmental behaviors and skills that can alter behavior after intention, the IMBP includes background variables, such as demographics, culture, socioeconomics, etc. The addition of these variables can help account for differences in behaviors between genders, political ideologies, or varying incomes. One example from the literature highlighting this point is men and women exhibit different behaviors regarding the use of sunscreen (Abroms et al., 2003). Abroms (2003) suggests not only different behaviors, but different norms for this activity.

Generally, this model has been used in health communication; therefore, it is possible that other variables need to be explored for the renewable energy context. This model has been used for other environmentally friendly behaviors such as water conservation in the United Stated and Australia where attitudes, norms, and perceived control over the behavior were used to predict behavioral intention (Holland, 2019). Holland's study found that attitudes were the strongest predictor of behavioral intention in both countries.

As the body of energy acceptance literature has grown, strides have been made and many of the variables in the IMBP model have been tested separately or in closely related natural resource and tourism literature (e.g. Litvine & Wüstenhagen, 2011; Ozaki, 2011). For instance, Esfandoar et al. (2019) used TRA and TBP to examine the use of

trash bins in Australian national park. The study concluded that pro environmental behaviors such as using trash bins in a national park, are driven by personal norms. Another example uses TBP to predict behavioral intention of walking off marked trails in Australian national parks (Goh, 2015). Goh (2015) found subjective norms to be the strongest predictor of behavioral intentions of park visitors going off the marked trials. Goh (2015) aims to use the findings to develop messaging to discourage non-compliant behaviors in parks. Additionally, other important variables have been discovered when dealing with local development and how people perceive unfamiliar technologies. One such variable is place attachment, the perceived psychological connection one feels with a location due to natural, physical, civic, and social characteristics (e.g. Devine-Wright & Howes, 2010; McLachan, 2009; Vorkinn & Riese, 2001).

Within the framework of IMBP, background variables are the variables that may influence attitude, perceived norms, and efficacy (Fishbein & Ajzen, 1975; 2010). These variables can be different from person to person and behavior to behavior. For instance, Holland (2019) found that citizens in the United States and Australia have different challenges when asked about water conservation, highlighting that the same behavior may be influenced by different factors in different communities.

Knowledge of different renewable energy types (e.g. solar, wind, tidal) has been shown to shape attitudes towards renewable energy. A study by Hobman and Ashworth (2013) showed that participants with higher knowledge of a source of renewable energy usually have a more favorable view of that source. Hobman and Ashworth's study suggests that more knowledge of renewable sources leads to greater support while more knowledge of fossil fuel sources leads to a decline in support.

One of most criticized weaknesses of the IMBP and its predecessors is that the behaviors may not reflect the population (Fishbein, 2000; Fishbein & Cappella, 2006). The idea of uniformly applying a behavioral model to all behaviors was the central argument of Sniehotta et al.'s (2014) criticism. In response Ajzen (2015) suggested several strategies to address criticisms to behavioral models, one of which was an elicitation study (Fishbein & Ajzen, 2010). Asking members of the target population questions regarding both positive and negative experiences allow researchers to gain insight on attitudes, norms, efficacies, and environmental factors that specifically affect the population (Middlestadt et al., 1996). In the case of marine renewable energy, it would be the perceived benefits and detriments of establishing the technology in the community.

The current study serves as an "elicitation" study that determined the factors and vernacular that were specific to the population in question (Fishbein, 2000). To that end, this study sought to identify the attitudes, social norms, and perceptions of efficacy that are essential to properly using the IMBP to guide message design in the interest or promoting a specific behavior – in the case, support for renewable energy. To that end, this study stops short of testing the full IMBP model; rather, this study used IMBP as a framework to guide the development of research questions and data analysis. Additionally, place attachment was examined in the two communities and incorporated into the theme of this research.

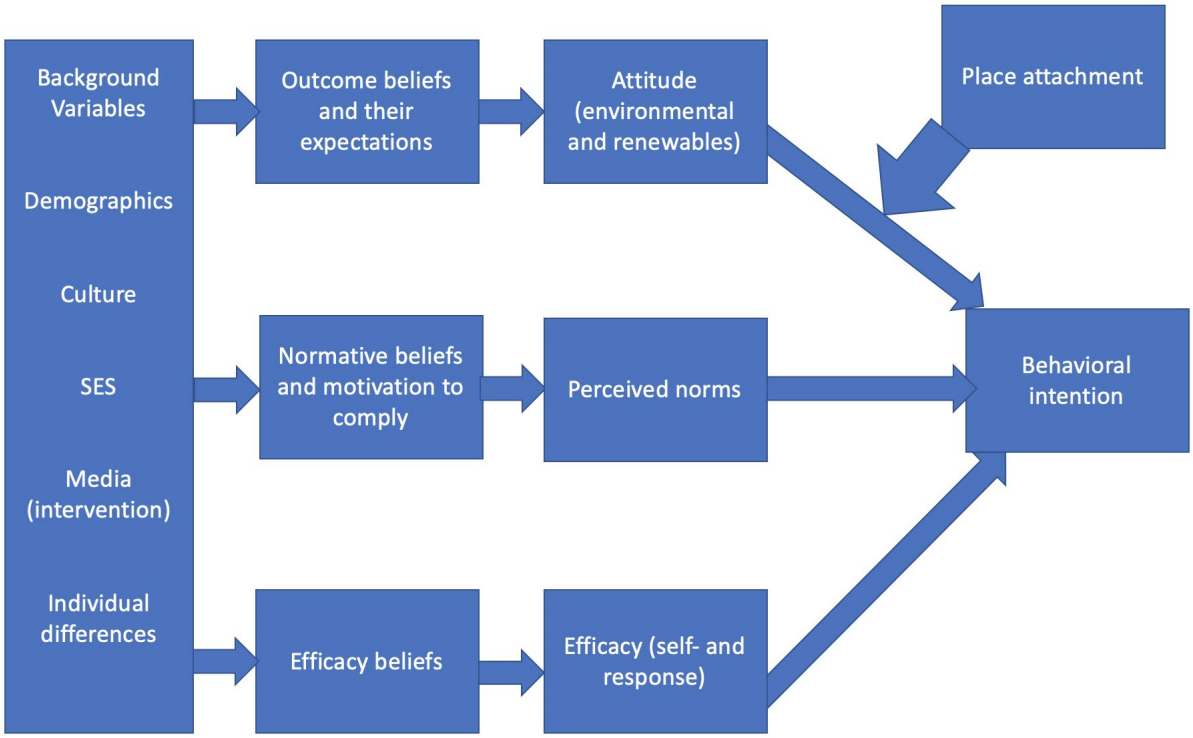

Figure 3. Integrated Model of Behavioral Prediction (IMBP) with place attachment moderator.

Attitude

Attitudes in this instance can include both attitudes towards renewable energy technologies and environmental attitudes. Within IMBP an attitude can be defined as favorability of a certain outcome from performing a behavior (Yzer, 2012). To this author's knowledge no research has used attitude towards renewables in determining whether a community is willing to support a local renewable energy projects; however, self-report and actual knowledge has been used to determine adoption (Hobman &Ashworth, 2013). The New Ecological Paradigm (NEP) scale has been commonly used in renewable energy research (e.g. Olson-Hazboun et al., 2016; Pierce et al., 2009). This scale assesses environmental attitudes from ecocentric (i.e. humans are part of nature) to anthropocentric (i.e. humans are above nature) (Bechtel et al., 2016; Dunlap et al., 2000). Environmental attitudes have been shown to be strong predictors of environmental

behaviors (Gadenne et al., 2011). For this research we will be addressing what attitudes towards different types of renewable energy are and what factors might be behind them in two different coastal Florida communities.

Research Question 1: What factors influence attitudes towards renewable energy technology?

Perceived Norms

Presenting a favorable image and socially acceptable behaviors to one's social group of preference helps individuals conform to the group's behaviors and gives them a sense of group belonging (Gadenne et al., 2011). Research has shown that people's actions are influenced by their family, friends, and associates' opinions and actions (Jager, 2006; Pickett-Baker & Ozaki, 2008; Sidiras & Koukios, 2004), as well as their culture (Chan, 2001). Social norms have been shown to be a strong predictor in both renewable energy support at the community and policy levels (Bauwens, 2016; Hobman & Ashworth, 2013; Kalkbrenner & Roosen, 2016; Ozaki, 2011) and of behavioral intentions (Bamberg, 2003). With environmentally friendly foods (EFF), consumers who compared themselves to others were more likely to have pro-EFF behaviors (Hynes & Wilson, 2016). These authors suggest that individuals participating in pro-environmental behaviors have a strong sense of environmental importance in their life, although they suggest those with high social norms might not perform pro-environmental behaviors because they do not see enough people practicing the behavior. With the Florida Keys already having an established electric cooperative, the Florida Keys Electric Cooperative, and two others being discussed in the lower and upper Keys, social norms have the potential to be a strong predictor of participation in the region. On the opposite spectrum,

the Panama City region has only one power producer currently available to its residents. These differences have potential to influence the individual norms.

Research Question 2: What are the drivers of social norms regarding renewable energy in these two communities?

Efficacy

Self-efficacy or perceived self-efficacy is a person's belief that they can perform a behavior (Bandura, 1994) and is dictated by one's perceived ability in a specific condition or circumstance (Yzer, 2012). Response efficacy is how effective you believe a behavior would be (Rasmussen & Ewoldsen, 2016). Previous literature within protection motivated reasoning and the extended parallel processing model has combined these two measures of efficacy into one (Witte & Allen, 2000) and this could be the case in renewable energy adoption literature as well. Bandura (1997) states that self-efficacy is important for the explanation of developed interest and satisfaction in an activity when there was no prior interest, such as recycling or water conservation. Additionally, self-efficacy can help focus attention (Kanfer & Ackerman, 1996), determine perceived difficulty of behaviors and commitment to goals (Locke & Latham, 2002), and help determine more efficient goal achievement strategies (Tabernero & Wood, 1999).

Much of the differences seen in behavioral intention can be accounted for by self-efficacy (Cheung & Chan, 2000). For activities that require greater effort on the part of the participant, self-efficacy is the best predictor of the behavior being performed (Bandura, 2002). A community renewable energy project could be viewed as an arduous task for those involved in its opposition and its promotion. Tabernero and Hernández (2011) argue residents who place higher value on participation have higher self-efficacy,

especially when dealing with environmentally responsible behaviors. In a study examining what motivated people to buy green electricity in Switzerland, response efficacy was shown to predict behavioral intention (Litvine & Wüstenhagen, 2011). Knowing whether residents think local renewable energy projects can be a positive addition to the community and whether they feel they can help is a topic that needs to be further explored in these two communities.

Research Question 3: Do residents believe they can make the change to renewable energy in their community?

Research Question 4: Do residents believe renewable energy can make a difference in their community?

Place attachment

Place can be defined as a location where emotions and meanings associated with the location can be held by an individual or entire group (Gieryn, 2000; Tuan, 1977). Therefore, place attachment would occur when positive experiences have occurred over time, potentially without the individual or group of individuals knowing, creating a community identity (Brown & Perkins, 1992). People may feel attached to location for physical, natural, social, and civic characteristics (Hidalgo & Hernandez, 2001; Scannell & Gifford, 2010). People can grow strong feelings of attachment to scenic and wilderness areas (Davenport & Anderson, 2005) and select these places to live and visit (Korpela et al., 2009). This affinity towards the aesthetic elements is known as natural place attachment (Manzo, 2005). Physical place attachment can best be described as fondness for places in which you feel comfortable. Examples include: (1) the weather is similar to where you grew up or (2) the buildings remind you of home (Knez, 2005). A sense of

belonging in the community constitutes a social place attachment (Lalli, 1992). Feeling part of a group at the city level is known as civic place attachment (Hidalgo & Hernandez, 2001; Vorkinn & Riese, 2001).

Place attachment may not be known until some aspect is changed or proposed to be changed (e.g. proposal for energy development) (Bonaiuto et al., 1996; Brown & Perkins, 1992). Depending on the community and the development proposals, negative reactions resulted in voting for laws of opposition and joining protest groups (Stedman, 2002). A strong civic sense in community identity can indirectly lead to involvement in community renewable energy projects (Kalkbrenner & Roosen, 2016).

The first use of place identity in examining renewable energy support came in 2001 from a study on hydropower in Norway (Vorkinn & Riese, 2001). Their study yielded the first evidence of place attachment being a factor in supporting or opposing renewable energy projects. McLachan (2009) examined place attachment in a community with a proposed wave energy project and found different levels of attachment for opposing and supporting residents, but support was overwhelmingly negative. Devine-Wright and Howes (2010) examined two coastal communities and found they differed in their levels of place attachment. They concluded that more research on which communities are selected and how to analyze the importance of the attachment are needed. These previous studies all showed negative associations between place attachment and support for local renewable energy projects. However, Devine-Wright (2011a) showed positive associations between place attachment and a tidal energy project and concluded that if the project is a good fit in the community it can further strengthen the place attachment. Furthermore, reports suggest that residents who are more involved

socially and politically can be linked to having stronger place attachment (Mesch & Manor, 1998).

Research Question 5: Are residents considering how renewable energy technology fits "their" community when making decisions about supporting local renewable energy projects?

Energy and Environmental Campaigns

Renewable energy currently has high levels of support throughout North America (Bidwell, 2013; Leiserowitz et al., 2016), but local projects are often met with resistance from the communities they are proposed in (Lantz & Flowers, 2011). Over the decades many attempts, and different campaign strategies have been used in efforts to produce more environmentally friendly behaviors from people. In the last year Hardin, Madison, and Adair counties in Iowa have experienced local opposition to commercial solar and wind projects. Members of these communities pushed hard enough to either outright ban renewable energy projects in these counties or get moratoriums on new wind turbines. Adair County went as far as capping the number of wind turbines to 535 while there were 532 already constructed or in construction. This has led to the creation of a local group pushing back although it is too early to tell if the group will have any influential results (Uhlenhuth, 2020). Another example comes from No Name Key, in the Florida Keys, where a lengthy legal battle over electrical gird lasted for more than 15 years (Alvarez, 2012). Originally, a lack of information was blamed as the culprit for the bad decisions spurring campaigns that provided more environmental information. This idea is known as the public deficit model (Suldovsky, 2016) and the model is still a central part of science

communication plans despite evidence of it not being effective (Holland et al., 2007; Nisbet & Mooney, 2007).

Research suggests the provisions of more information on energy or the environment needs to be replaced with messaging that is better attuned to the way people make decisions. This includes other factors of today's highly interconnected society such as social, economic, and environmental factors (Foster, 2001; Sterling, 2001; Tilbury 1995). This can be done be creating a vision that blends well with the target audiences' values not trying to force the audience's attitude to change (Crompton, 2008; Cross et al., 2010). This vision will ideally provide a safe link between the action and commonly held goals (Dopplet, 2003; Kotter, 1996). The use of success stories is also important in achieving and getting communities on board with local energy projects (Denning, 2007).

The Block Island wind farm, the United States only operating offshore wind farm, was initially met with strong community opposition. The communication showed residents options with fiber optic internet and electricity from the turbines, both of which residents of the community felt were needed (Smith et al., 2018). Companies going into communities need to be respectful and listen to those communities' concerns about the energy project and make a genuine effort to address them. There has been a call by researchers to allow residents to be part of planning and citing of local renewable energy projects (Devine-Wright, 2011). This is supported by Wrench (2017) suggesting that listening is important in renewable energy development. Bush and Hoagland (2016) suggest that education and public discussion may overcome public concerns for a project.

Best practices for renewable energy communication were identified in a meta-analysis of 15 cases studies ranging from private industry to government campaigns

(Bridle, 2013). These recommendations for communication strategies included partnering and financing, pre-campaign research, definition of objectives, time planning and duration, audience definition and segmentation, campaign messaging, campaign creatives, campaign channels, evaluation, and proactive response to negative media coverage. The authors emphasize making goal-based adjustments throughout this process to ensure the best outcome (Bridle, 2013). It should be noted that while the case studies were pulled from regions all over the world, the United States was not one of the countries included.

Interviewing residents about a potential marine renewable energy (MRE) project in their community will add insight to the factors that they are most concerned about; this in turn will allow campaign planners to design effective messages as well as understand the best means to deliver messages to the communities. This study expands on research that addresses offshore marine renewable energy and will be beneficial to the fields of renewable energy acceptance and environmental communication. Furthermore, it allows researchers to examine which, if any of the best practices suggested by Bridle et al. (2013) could be effective in the selected communities.

Research Question 6: What types of information are residents looking for when deciding to support or oppose a local renewable energy project?

Research Question 7: What are the preferred channels to receive the desired information through when deciding to support or oppose a local renewable energy project?

CHAPTER III

METHOD

One acknowledged weakness of renewable energy acceptance research is that lack of direction and a target goal of the studies (Bidwell, 2016). As the field continues to grow, it has been acknowledged that more qualitative work, mainly interviews, needs to be conducted to get a better understanding of the parts at play in communities with regards to renewable energy acceptance (Bidwell, 2016). To begin answering the research regarding renewable energy acceptance presented above, an elicitation study was conducted using two tourism-based, coastal communities in Florida.

Specific questions on both positive and negative experiences allow researchers to gain insight on attitudes, norms, efficacies, and environmental factors that specifically affect the population (Middlestadt et al., 1996). In the case of marine renewable energy, it would be benefits and detriments of the technology in the community. This study will allow researchers to determine factors and vernacular that are specific to the populations in question (Fishbein, 2000). The aim is to not only find out what drivers of a local MRE project might be, but to find to best way to present the information to the public. The interview process will ask residents where and how they would like potential future communication on a local MRE project.

In the past, researchers have used five to seven participants to get this information (Montaño & Kasprzyk, 2015; Robbins & Niederdeppe, 2015) with others suggesting 15-20 participants should be interviewed (Yzer, 2012). For this study, interviews were conducted until saturation was reached in each community. Saturation is reached during the interview process when participants are no longer providing salient information

(Weller et al., 2018). During this process, saturation was when no new answers were provided by residents. An additional three interviews were conducted beyond the saturation point to ensure the saturation point was reached. The Keys population hit saturation with 14 participants and the Panama City region reached saturation at 11 participants for a total of 25 interviews. Participants for the study were recruited from an existing network previously developed by the researcher. Preliminary information to develop contacts in the target area was conducted prior to the current study. During the recruitment period, these contacts were asked to distribute materials within their networks to assist in finding people for this study. Once initial contacts were established, additional participants were recruited via snowball sampling. The researcher asked if the interviewee knew anyone who might be willing to participate in the research. The interviewee would either provide contact information to the researcher or pass the researcher's contact information to the possible participant.

Procedure

The research protocol was reviewed and approved by Texas Tech University's Institutional Review Board (IRB#2020-214). Residents were informed of what this study entailed, the risk to them, what was required for their participation, and what the compensation was. Residents were also asked if they were comfortable being recorded. This verbal agreement was considered consent for the interview. The interviews were recorded using the TapeACall Pro application, which allows a phone call to be recorded and downloaded at a later time. All interviews are stored on the website associated with the application and at secure location that only the research team has access to. In addition to the recorded interviews, the researcher took notes for follow up questions and

as back-up should the recording application fail to work properly. These notes were stored in a secure location so that only the research team can access.

The conversations were started in a light manner to get participants comfortable with talking to the researcher. From there, the questions (Appendices A and B) focused on assessing attitudes towards RE, perceived norms, self- and response efficacy, as well as place attachment to the community. The questions had several additional prompts and probes in case the participants were non-communicative. Descriptions of the technologies were used as a follow-up to the first question on attitude towards renewable energy. As most tidal energy systems are in demonstration phases (Kempener & Neumann, 2014; Magagna et al., 2014), it is likely that the residents may not have direct knowledge of these systems and are forming opinions in other ways. This has been the case with nanotechnology (Scheufele & Lewenstein, 2005). There might be a difference in attitude towards wind versus tidal energy systems. Wind turbines often are cited as visual obstructions on the landscape (e.g. Bosley & Bosley, 1988; Bush & Hoagland, 2016), while the proposed tidal system would be under water (See Kempener & Neumann, 2014).

Participants

Interviews were conducted via telephone that lasted between 36-93 minutes and varied due to participant knowledge. For the Florida Keys, the average interview was 56 minutes with a range of 32-82 minutes. The average excludes the one interview where the recording was unable to be used. The researcher used the notes taken during the interview in lieu of a voice recording for analysis. In the Panama City region, the average interview was 50 minutes with a range of 15-93 minutes. The 15-minute interview was a result of

the recording application failing after that time frame leaving only the first part of the conversation able to be transcribed. Interviews were downloaded as MP3 audio files from the TapeACall Pro application and uploaded to rev.com were they were transcribed by human coders and returned as Microsoft Word documents. Rev.com is a transcription service that employs professional transcribers and guarantees 99% accuracy of all transcriptions. All transcriptions were completed with 48 hours of being sent to the service. The total number of transcribed pages was 478, with 287 pages from the Florida Keys and 191 pages from the PCR. The interviews were conducted in a conversational manner and participants were compensated for their time with a 20-dollar Amazon e-gift card as a thank you for participating in this research.

Analysis

To determine what characteristics were most important to residents in the two regions, a thematic analysis was conducted (Attride-Stirling, 2001). This multi- stage and step process allowed the researcher to determine dominant and pervasive themes within and between the regions. This analysis method utilizes deductive reasoning which allows researchers to use general and then more specific themes to determine outcomes (Ary et al., 2014 pp.4). To start organizing the data, NVivo, a qualitative analysis software, was used to sort and curate the data in the proper manner to produce the most accurate results.

For this study a three-stage, six-step analysis process was used to determine themes among residents in the two regions. The first stage of data analysis included the reduction and breakdown of text. The textual data for this research was the transcriptions from the in-depth interviews conducted in both regions. This three-step process involves coding the material, identifying themes, and constructing thematic networks. Coding the

material started with building a framework to work within, which was driven by the research questions on attitudes towards renewable energy, efficacy, social norms and place attachment. Additional themes were also derived from the data. Once the framework was constructed, the data were placed within pieces of the framework. This was done using NVivo and helped the researcher begin to identify themes, which was the third step in the process.

The second stage of the process involved exploring and describing themes from the thematic network developed in the previous stage. Using direct quotes from different networks is helpful when trying to describe the networks. It is similar to using numbers to support hypothesis in a quantitative project. After exploring and describing the networks, step four, a summary of the networks was developed, which is step five. This is where the main themes and patterns are described.

The final stage and step are where it all came together with the interpretation of observed patterns. The final step is where the researcher explains the findings and how they tie back into the original framework and any new patterns or themes that may have been previously undescribed (Attride-Stirling, 2001). For this research, this includes presenting the underpinnings that may support or refute previous research variables that have been used to examine local renewable energy projects. It also includes making future messaging recommendations for the communities involved in the research, should such a project be developed in the future.

Reflexivity

Reflexivity is one of the most challenging parts of social science and can present as strong challenge to qualitative researchers. This process can leave the researcher

feeling vulnerable as he/she goes through their own mistakes during the research process. However, it can help the audience determine the trustworthiness of the researcher or research team (Probst & Berenson, 2014). Below is thought process and lessons learned by the researchers during the research process.

The first part of this research I would like to address is the site selection. Beyond the major similarities these cities present, the research team has spent significant time in these communities in the past. Before returning to graduate school I was a fisheries biologist who worked in the Florida Keys and Florida Panhandle. The connections made during this time were the basis of how I was able to attain the initial interviews. Snowball sampling occurred from these initial interviews. While I do not personally know anyone interviewed, there is potential for them to possibly know others on the research team. My dissertation chair is from Panama City and a second committee member works and live in the Lower Keys.

Notes were taken during every interview. These notes served multiple purposes including serving as a backup when the recording application failed (it did twice) and to document the ideas I felt were noteworthy during the interview process. These notes noticeably changed between the first and last interviews. I believe this stems from hearing certain points multiple times that I no longer found them worth noting as they were well represented in transcripts. I noticed the points I recorded during the latter interviews were more nuanced points. These were points I believed were worth researching as the analysis and writing process began. I can say that my opinion of the topic has been changed over the course of these interviews.

When this process started, I thought renewable energy projects could be implemented in any community where the resources were available. The in-depth interviews allowed for more time for residents to open up about how they saw their communities and what these projects could do to the area. I am still very much supportive of more renewable energy projects, but I think the literature and research, including this research, are just touching the surface of what will ultimately help these technologies get deployed on a larger scale.

I noticed a trend that many of the residents thought I was an expert on all things renewable energy. While my background in marine biology and knowledge of the natural environment surrounding Florida provides me with insight into the subject that many of the research subjects may not have, there is still much to learn about marine renewable energy and the different systems and environments in which they can possibly be deployed. I would add this is something that we, as researchers and a society, are working on together. Many questions still remain and my hope for this research is that it contributes to this growing body of knowledge and can guide future research in a more valuable and productive manner.

This assumed expertise was evident in the phrase, "you probably know more than me…", which I heard often during the interview process. Some of my questions put ideas into their heads that were not there before. For example, several participants were unaware of what hydrokinetic energy was. Their opinion came from the brief description I was able to provide over the phone. Many residents did not know wind was viable offshore in Florida and then they adjusted their thinking to this new evidence when the idea of a potential project was presented. To think I had no potential influence on the

answers given to me would be naïve. Other interviewees looked for validation of their answers, as if they wanted to sound knowledgeable to an "expert". Several residents commented with apologies that they were not being helpful. I assured them their opinion was equally as valuable as the next persons because they were all stakeholders in the community. This was a new experience for me as all of the residents were older than me in both study communities.

To control for my biases, I directly asked participants for what they needed to know going forward regarding hypothetical commercial renewable energy projects in their community instead of assuming I had figured out the answer as the research process unfolded. I used hypothetical situations as there are no current plans for commercial offshore marine renewable energy projects sited in Florida waters of which the author is aware. I felt the more direct questioning allowed the participants to dive into their thoughts about the subject and walk me through their decision-making process. Now that I have addressed some of the struggles during the research process, I would like to encourage you to continue reading below to find out the results of my research.

CHAPTER IV

RESULTS

The results below present themes to each research question starting with attitude and ending with messaging. The meaning of the themes, implications, and impact on future research will be discussed in the discussion section to follow.

The Florida Keys

The Florida Keys community was broken down into the Upper (Key Largo to Marathon) and Lower (Scout Key to Key West) Keys sections. There was a total of 14 interviews with eight residents residing in the Upper Keys and six residents in the Lower Keys. This separation was divided by the power distribution options in the Keys, with the Upper Keys having the Florida Keys Electric Cooperative and the Lower Keys power provided by Keys Energy Services. For some themes both regions are grouped together due to similarities while other themes were clearly distinct among the divide. One characteristic that stood out among the interviewees is none of them were life-long Florida Keys residents.

Panama City Region

In the Panama City Region 11 residents were interviewed. Eight residents lived in Panama City, two lived in Panama City Beach, and one lived in the City of Lynn Haven. These three cities were selected to expand the resident pool and because of their location. Panama City Beach is located on the beach side, Panama City is located on Saint Andrew Bay, and Lynn Haven sits on North Bay. One striking difference between this population and the Keys was all but three residents were life-long residents of the region.

Table 1

Interviews by region, refusals, and completions

Location	Initial Contacts	Refusals and no responses	Completed interviews
Florida Keys Region	18	4	14
Panama City Region	16	5	11

Attitudes

To address the first research question about the factors influencing attitudes towards marine renewable energy, the residents were asked what their thoughts about three different types of renewable energy were to determine if they had positive or negative attitudes about the technology. Residents in both the Florida Keys and Panama City region had positive attitudes towards renewable energy. However, these attitudes were influenced by knowledge of local energy, knowledge of renewable energy, economics, environmental concerns, NIMBY-ism, and politics.

For knowledge a series of open-ended questions were asked about local energy generation and renewable energy. To gauge knowledge of the residents, they were asked what they knew about local power generation. For the Keys, all residents knew who their power provider was and were aware of the power situation in the other region. However, they told two different stories about the power companies. The residents of the Upper Keys were able to talk about the infrastructure, the power mix (what sources generated

the power and percentages of those sources powering their area), and where the additional power, over what was generated by their solar panels, was purchased from. As this region's power is provided by a cooperative, residents own some stake in the small solar field on Marathon and additionally some residents have solar panels on their homes, although a majority of the residents interviewed during this research did not currently have solar panels on their homes. Every resident interviewed gave the cooperative high remarks and considered them a forward-thinking power company especially when compared to prior places they had lived. One resident mentioned going to meetings held by the company to receive the latest updates and stay informed. I believe the following quote exemplifies how the residents feel about the region when it comes to the power system in the Upper Keys.

> *Florida Keys' Resident (FKR) 04 "And we have some of the beefiest infrastructure on the planet for managing the power lines and at least I'm convinced that from what I read and see here..."*

On the other hand, a different story was told about the power in the Lower Keys. Most residents were aware the Keys Energy Service was a power distributor and did not produce any of its own electricity, rather it purchased the power from the Florida Municipal Power Agency. At first mention of renewable energy, residents talked about the local ordinances that kept them from either putting solar panels on their home or tying solar panels into the grid if they could place them on their home. Several residents spoke of community-led talks to bring solar cooperatives to certain neighborhoods, similar to what has happened in Key Largo under the efforts of the Upper Keys League of Women Voters (Catherine Bosworth, Personal Communication, February 26, 2020). Overall,

these residents didn't express good remarks for the power supply in the region and would be open to some change to the current system. However, others expressed a lack of confidence when it came to changing a system currently stuck in a 25-year contract that automatically renews yearly.

FKR 11 "...I'd be happy to give them the extra. Why wouldn't I just give it to them? ...Because I appreciate the privilege of being connected to the grid."

FKR 12 (sarcastic tone) "This is the price we pay to live in paradise."

In the PCR, all residents knew their power provider was Gulf Energy which was recently bought by NextEra. Several residents even pulled their power bills up during the conversation to provide a better example of from where they were getting their information. Most residents were also aware of the power generation sources in the region. The two examples cited by residents were the coal-burning power plant that now used natural gas and the local trash-burning plant, colloquially known as the incinerator. While residents had a knowledge about their local power sources, there was ample conversation about how local renewable energy projects would do in each region.

To further assess knowledge, questions were specifically about solar, wind, and hydrokinetic energy. Knowledge differed depending on the source of renewable energy. As expected, residents were most familiar with solar and least familiar with hydrokinetic energy. The latter term was a new form of energy for several residents.

For solar energy most residents were comfortable with the technology and incorporating the systems into our current grid. Several believed it was the most efficient of the technologies due to the abundance of sun in Florida. Residents in both regions were also for the expansion of commercial grade solar energy. Most of the residents felt

solar power should be a bigger focus in the region both commercially and residentially as it is an untapped natural resource.

> *Panama City Region Resident 04 (PCR) "I love solar power because we got nothing but sun down here in Florida…"*
>
> *FKR 10 "They don't call this the sunshine state for nothing and why Florida isn't the largest producer of power, I don't know."*

Regardless of the type of marine renewable energy project proposed to the residents, the questions about the technology were the same in both communities. Efficiency of the energy technologies was a theme. Residents wanted to know how it compared to current sources, such as the natural gas and trash-burning plant in the PCR and the nuclear plant, Turkey Point Nuclear Generating Station, which supplies much of the power to the Florida Keys. The efficiency of the technology also came into question

> *PCR 01 "So if you have a wind farm, let's say 150 wind turbines and maybe a small percentage, maybe 5% are not producing, they're actually consumes [sic] consuming, so there's some cons to it"*
>
> *FKR 04 "If there were to be some targeting whether it be environmental targeting from a catastrophe, natural hazard or terrorist, I'm not so sure that we would be able to recover because of the way the system is designed with very few backups.."*

The durability of the equipment when placed offshore came into question for both technologies and in both communities. The equipment's ability to last through storms, especially hurricanes, was a something residents wanted more information about. This is a concern that has come up in other coastal communities in regard to marine renewable

energy (Stokes et al., 2014). The life span of the equipment in the marine environment was questioned.

> *FKR 04 "so it may be more viable on the land in the Glades that it would be on the ocean because of the turmoil of the depth of the water and so on."*
>
> *PCR 08 "The sea will reclaim, so the lifespan is probably going to maybe be 25 years, tops, if you put them out [sic] the Gulf, unless you've got something that doesn't get eaten by salt."*

When looking at hydrokinetic energy specifically, several residents were concerned about how moving parts would perform over time when inundated in saltwater. Marine debris and Sargassum seaweeds were mentioned in addition to wildlife as possible objects that might block or jam up the device.

> *FKR 10 "The bridge also moves a heck of a lot of seaweed and floating sargassum, as well as a lot of fish."*
>
> *PCR 02 "I also know that saltwater is super destructive to just about anything that's near it. You're going to have to convince me about tidal power"*

Themes about how the technology would function with our current energy system and how it would perform in the harsh marine environment were quick to be brought up. As the conversations went past the nuts and bolts of potential ways the system would operate in the community, the cost of doing business was the next natural theme.

Another theme that presented itself during the thematic analysis was the economics of a local renewable energy project. The economics of such a project are both personal and community based. Residents in both communities asked how this would affect the price of their monthly power bill and would be open to knowing more about

any local renewable energy projects that could potentially lower their power bills. Opinions were mixed if the project were to raise the cost of energy. For residential solar, the upfront cost of the system was often cited as the reason someone would not put solar panels on their home by every person interviewed, including the ones who currently had systems on their homes.

PCR 02 "The barrier is the upfront cost of putting the panels on."

FKR 03 "Well, there's a high cost of living here, so adding on the costs. Its's only a startup cost, right? To put solar in. But some people are living paycheck just because it's so expensive to live here."

PCR 03 "If power was abundant and less expensive, don't think many people would oppose."

For the marine renewable systems residents in the Keys noted this was the cost of innovation, while PCR residents were worried about the power company making them pay for the upgrades.

FKR 01 "You know that where there's high energy cost, it's for innovation. And because our energy costs here in Florida, and even here in the Keys isn't extraordinarily high."

PCR 08 "Being in business, I can afford it. I just pass it on to the customer. The customer paid for it in the form of increasing my prices."

Overall, residents in both regions were concerned about the economics of bringing either offshore wind or hydrokinetic power to the region. Residents of both Keys regions were concerned about the effects such installation may have on tourism. One resident residing in the Lower Keys painted a stark picture of what a marine renewable

energy project could do citing a drop in tourism cascading into a significant decline in tax dollars to the Tourism Development Council (TDC). The TDC's vision is to "set an overall direction for the Monroe County tourism marketing effort in a manner that will assure long-term sustained growth in tourism revenues while also guaranteeing the sustainability and improvement of our product, including both our man-made and natural resources, and improvements to the quality of life of our residents." (TDC, n.d.). While this resident gave the greatest detail of the ramifications of a poorly executed renewable energy project in the Keys, several others had questions about the effects a project would have on tourism and were unsure if the project would be beneficial or detrimental.

FKR 09 "People still come down and think it's beautiful. That's our industry. It's our tourist industry and it's our fishing industry."

FKR 02 "There could be some secondary benefits here. Like you said, there's fishing, There could be tourism."

Another resident tied this idea together with the environment by connecting how the environment was good for business. Other residents stated they believe it would be good for economics if the project was able to create jobs in the area.

FKR 02 "People of the Florida Keys are probably more ecologically in tune than a lot of areas in the country because a lot their livings depend on it."

PCR 04 "Is it going to create jobs? Jobs are on the top of everyone's minds."

Residents in the PCR were also concerned about the economics of a local marine renewable energy project, but not for the same reasons. Instead of concerns for drops in tourism, effects on marine trade and traffic were a brought up several times throughout interviews. Like their counterparts in the Florida Keys, the job creation of a local project

would be an influencing factor. Similar to The CFK which produces renewable energy technicians, the Gulf Coast State College has a similar program, although it has no specific marine focus. Panama City is also home to DeTect, Inc., a company that produces radar and sensor systems that can be used for detection and deterrent of wildlife from energy production systems (DeTect, 2020). In a community where the average income is $28,017 USD a year (Census, 2019b), these jobs could have some influence on the community's decision. Beyond purely the economics many residents questioned what the positive and negative effects would be on the environment.

As stated in the renewable energy acceptance literature, the attitude towards the environment has some effect on the attitude towards more environmentally friendly technologies such as wind or solar (e.g. Hobman & Ashworth, 2013). Both communities expressed reservations when it came to having offshore wind or hydrokinetic energy installations in their communities. In both communities, the topic of a hypothetical offshore wind energy project brought up several concerns. First, 25 of 25 residents mentioned that wind turbines kill birds, and most were concerned about this. One resident in the PCR held a different view.

> *FKR 10 "They're only doing a research test to see what it was, but we would never allow it because of the birds."*
>
> *PCR 06 "I would rather do that (referring to putting up wind turbines) than have birds have to change their migration policies or practices due to global climate change."*

Additionally, bats were mentioned as wildlife concerns in both regions for offshore wind energy production. Residents were also worried about unintended or

unforeseen consequences that come from renewable energy technology being placed offshore. In the Keys there was a concern for the reefs and sea grasses in the region. Several residents had lived in regions throughout the country that already have wind energy projects active and brought up concerns about microclimate shifts (i.e. from taking energy from the wind), light pollution, and leaking of hydraulic fluids from the operation of the turbines.

FKR 06 "I can't see that we could do that without disturbing animal life underwater."

PCR 01 "You put solar panels everywhere then you're reducing flowers, you're reducing areas for bees to pollinate. There's just a chain of ripple effect, that you could go into."

On the more hopeful side of environmental effects for offshore wind energy, some residents did acknowledge some positive benefits. Residents in the PCR made mention that offshore wind would be cleaner and better than drilling. They as well as residents in the Keys mentioned this technology could combat climate change.

PCR 02 "I think it is a great way to reduce the impacts of climate change"

One idea that stood out in the PCR region, from all lifelong residents, were the fish congregations around the base of the wind turbines. You could hear the joy in their voices as they spoke of the different species they would be catching if they were allowed to fish within the installation. This notion was mentioned in the Keys, but not with the same enthusiasm as the Panama City region.

When it came to hydrokinetic energy the first concern for residents interviewed was fish. Concerns about fish and other marine wildlife (e.g. turtles, dolphins, and

whales) came up multiple times. What does this technology do to the water? This question was raised several times in regard to how alterations to the water flow would change the environment and how much additional sound would be added to the marine environment.

FKR 06 "Things travel through the water. I don't like that idea. It's not going to be totally quiet. I just see it affecting (reference to wildlife) on so many levels."

After environmental concerns were brought up, many residents brought up a topic academics considered past its time as an explanation for local opposition, Not In My Back Yard (NIMBY) (e.g. Devine-Wright, 2005; Wolsink, 2006).

Throughout the interview process the theme of NIMBY was directly mentioned by residents in both the Keys and the PCR. Residents said they believe there were enough "not in my back yard people" or "not in my house area people" to oppose projects in the community. One resident in the PCR was particularly familiar with the Block Island Wind Farm and believed a similar initial opposition would occur should an offshore wind farm be proposed in the region.

FKR 07 "And so I'm not sure I'd want it in my back yard or my neighbor's back yard. But I could see them offshore."

This could represent the rate at which renewable energy information is disseminated to the general public. As a comparison, when given up-to-date information about the improvement of wind turbines over the last two decades, people were more willing to have a conversation about wind turbines as an energy source (DeSanti & Gong, 2020). Given the right information, views could be changed in the communities.

When questioned about barriers that would keep a local renewable energy project from being built in their community, residents often blamed "the other side". This belief that the other side came from people on both sides of the proverbial aisle. The people that identified as moderate, either slightly to the left or right of center in their political ideology, they just said politics would prevent a local project from being established in their community.

One resident said sarcastically, "I know they don't cause cancer". Another resident in the Upper Keys said their church group wouldn't even bring up the topic of renewable energy. Interviewees from all communities said there are number of people in the communities that didn't want to change the status quo. Several residents in the PCR talked about the local and state politics of bringing a local energy project to the community. During the interview process it was mentioned the state of Florida's Chief Financial Officer, Jimmy Patronis, lives in the area. The more politically active members of the community I interviewed brought him up on multiple occasions and how he could potentially influence the process.

Other decisions the residents believed would be in political play are the military training zones offshore outside of Panama City Beach, the Florida Keys National Marine Sanctuary, and the Everglades National Park on the bay side of the Keys. At first glance, these seem like purely political influences, yet no resident towed the party line on anyone of these energy projects during the course of an interview. They had many points, but no one's complete thoughts fit into one party and many were able to find positive or negative reasons regardless of their support or opposition level towards a local project. Political ideology has been used as variable in past acceptance literature with mixed

results (e.g. Rand & Hoen, 2017), and these conversations show the need for a more refined variable.

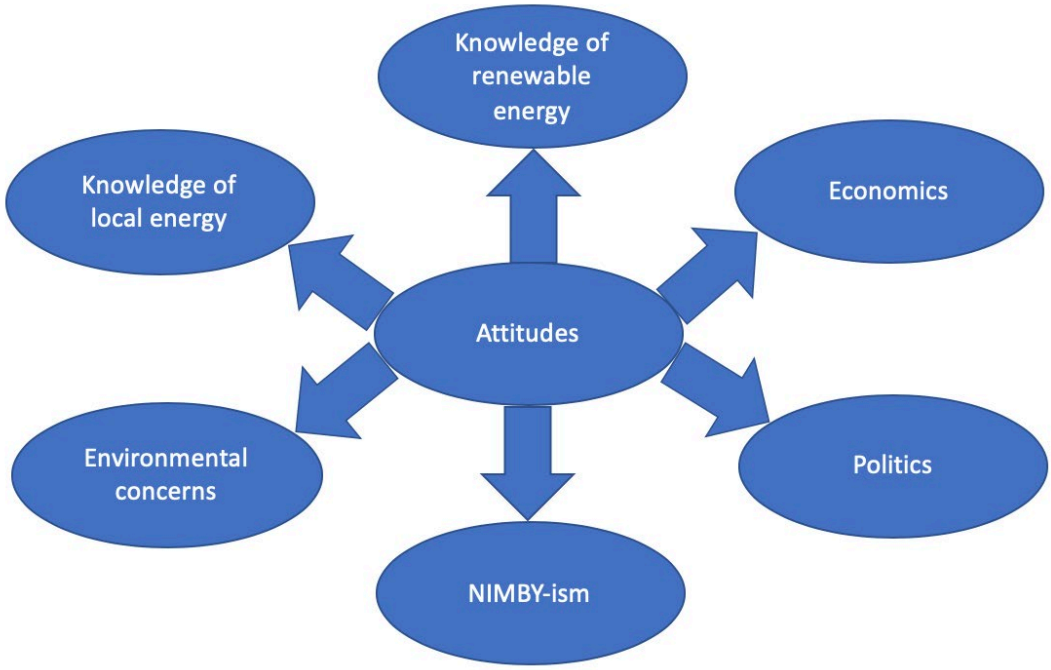

Figure 4. Visualization of factors influencing attitude towards local renewable energy projects.

Perceived Norms

To address research question 2 regarding which perceived social norms were relevant in the study communities, residents were asked who in their life would support and/or oppose a local marine renewable energy project. They were also asked what members or groups in the community would support or oppose a local project. In both communities, residents stated that they were most influenced by family and friends. Additionally, residents mentioned different group and community leaders that may influence the broader public.

To prominent themes stood out as potential influencers to individual residents. The first group, not surprisingly, was family.

PCR 07 "My mom put solar on her roof and I have been considering it"

PCR 07 "Well, my wife and I have discussed it, but like I said, I know people who have pulled the trigger on it, including my mom."

The next most likely individual to influence these residents were their friends. Many of the people interviewed had friends that livelihoods relied on the environment in some way. Some residents had friends that worked in the oil fields, wind fields, or the fishing industry. Another potentially strong influencer would be neighbors in the community. This group came up multiple times, especially if the neighbor already had solar panels on their roof.

PCR 01 "They've got too many friends in a different industry or in the gas and oil industry."

FKR 07 We have fishermen that go that far out, too, and I know they would cause a lot of uproar."

After talking about individuals who were most likely to influence them, residents were asked about influential groups in the community. Both communities agreed leaders from multiple groups would be needed. The most likely groups to come out in support or opposition of a local renewable energy project would be the environmentalists, business (e.g. the power companies), local government, homeowner associations, and church groups.

FKR 13 "Because these people are in the business of energy production. And that's where I see a real change, gaining traction is the people who have the money and expertise."

The residents elaborated by explaining further there were conditions to how the endorsement would be received. Mistrust in the government and others in the community could cause negative reactions to a local project. Any social stigma could quickly cause a lack of support among community members.

PCR 07 "People are always a little distrustful of their elected officials"

FKR 09 "But the things that keeps us or some what keeps us from changing is money and power where it is right now."

PCR 01 "People aren't going to say anything or get behind anything if they are socially downgraded for that."

Even if people are convinced by their family member to support a local RE project, they may have questions of can they help or will it make a difference? This leads to the next theme examined, perceived efficacy.

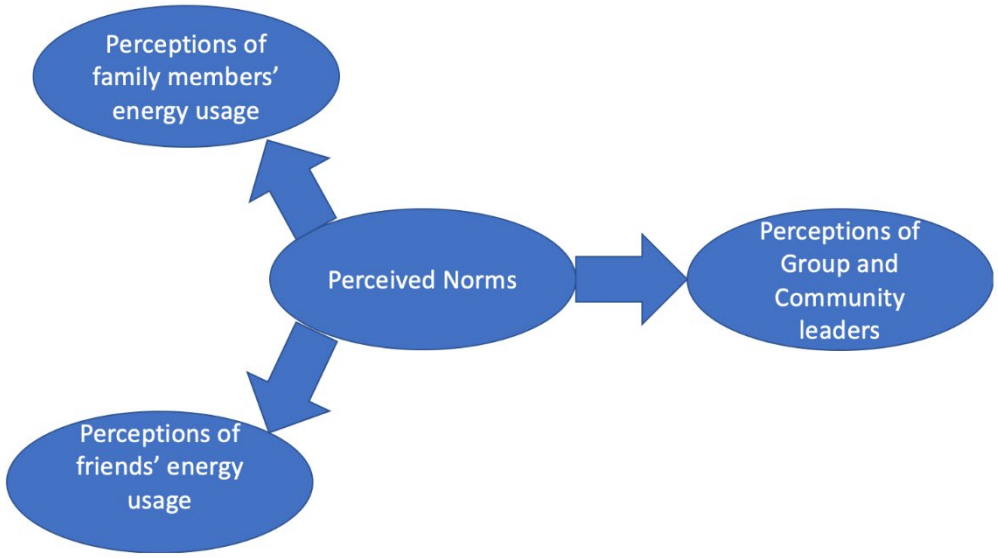

Figure 5. Visualization of factors influencing perceived norms towards local renewable energy projects.

Efficacy

To examine research questions 3 and 4 on resident's perceived efficacy of a local marine renewable energy project, a series of questions on the benefits and detriments of projects was asked. Additionally, residents were questioned regarding on what barriers the residents believed could prevent the community from completing a renewable energy project. For self-efficacy, themes of energy efficient behaviors and personal cost emerged. For response efficacy, residents in both communities questioned whether the government or power companies would allow such technology and if the different forms of renewable energy would be viable in their region. The type of technology differed between the Florida Keys and Panama City region.

One theme that developed under self-efficacy was energy efficient behaviors already being performed. Residents claimed to making energy efficient additions to their

homes or already been using energy efficient technologies such as LED bulbs or energy efficient appliances.

PCR 08 "We put LED lights in it. We don't have fluorescents. We got low energy."

PCR 11 "I wanted to make sure that we were able to take advantage of whatever those credits were and I wanted to get energy efficient units as well because of the power bills."

FKR 07 "When I had my house, every year we'd pick something and put in about $2,000 worth of money towards our energy use. So one year out we put in new windows that was double-glazed. And then another year I replaced the refrigerator, and then another year the washer/dryer to Energy Star."

A second theme emerged from both communities. The theme of cost was either positive or negative. Many residents could not afford the upfront cost of installing solar panels on their home. The ones that could afford the cost upfront and collect the rebates afterwards talked about how quickly they were going to make their money back. For the marine renewable projects, a monthly increase in their power bills could put a local project out of much of the community's reach.

PCR 08 "It paid for itself. I think it's a [sic] breakeven this year or next year. Anyway, we're real close to having it 10 years now."

FKR 11 "It's cost prohibitive, I know that it's cost prohibitive. There's a lot. I know that it is cost prohibitive, Because you need a permit for it and that cost money. You need somebody who knows how to do it to install it. That costs money."

Lastly, the theme of just not being permitted to do such an activity appeared in the Keys. This was mainly in regard to not being allowed to place solar panels on their homes or tie solar panels into the existing grid. For local commercial scale marine renewable energy projects, several residents believed they would have no say in a project.

FKR 01 "Okay, siting something ocean side beyond the reef track only because the people in the Keys really wouldn't have much to say about it. It's federal land."

There were many residents that felt they could do activities around their home to help renewable energy grow in their community, but with larger marine renewable energy projects residents felt less empowered that their individual efforts could amount to change. Although, residents did believe large supportive groups for a local project could tip the scale.

PCR 01 "And the people just aren't going to be as vocal about it just like other things in politics. It's really going to take a larger group to get a lot more people on board then,"

After discussing what people thought they could do about bringing renewable energy to their region, the questioning turned to their response efficacy or beliefs a local MRE project would be effective in their community. Several residents in both regions thought it would be a positive economic force that could lower monthly power bills and create jobs. Meanwhile, other felt the local governments and power companies wouldn't support projects of the nature.

FKR 04 "If they were to somehow be incentivized to support a national, or state-wide, or local type of energy farm that is not coal-fired, or gas-fired, or especially

nuclear fired that that might help but it's unlikely considering the political economics that go into something that big wouldn't be easy to pull off."

FKR 13 "So that's where I see the real traction coming in, our elected officials, our elected representatives, they're running around, holding babies, putting out fires, trying to calm people down from the Coronavirus."

In an interesting split on renewable energy choices, most residents in the Keys didn't believe wind would be something that is viable in the region. Even if they were supportive of a wind farm project, they did not believe it was something that would ever happen in the region.

FKR 07 "So now I know, and if anybody's talking to ranting or raving, whatever, about wind turbines in Florida, I'll go, Ain't happening. Don't worry."

Yet, in the Panama City region, there was no belief among residents that a hydrokinetic tidal system would be viable in the region.

PCR 04 "I don't think from a practical standpoint of view it would work here because I don't think there'd be enough tidal action for it to happen here like it could in the Keys…"

Lastly, the theme of buyer's remorse was found in both communities. Some residents were concerned that spending money on underdeveloped technology would be regrettable in 10 years when the technology will likely have improved immensely.

PCR 05 "Got some concerns about the technology is still developing. And if we buy now, then we may regret it a few years down the road. Yeah. It might be able to a have a lot fewer panels or something like that on my house."

Self- and response efficacy will likely be factors in these communities should a local marine renewable energy project be proposed. These results indicate there would need to be information to address barriers and concerns within the community. Now that the variables within the IMBP have been examined, the next variable to be explored is place attachment.

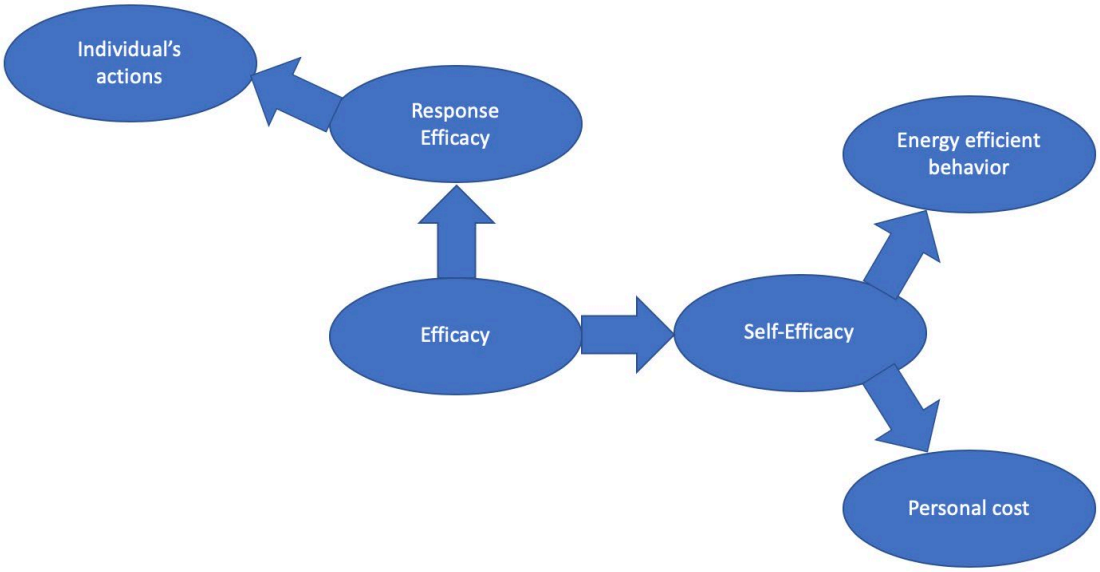

Figure 6. Visualization of factors influencing self- and response efficacy towards local renewable energy projects.

Place attachment

Research Question 5 asked how place attachment influenced attitudes towards renewable energy acceptance. To discover how place attachment manifested in the study communities, residents were asked what their favorite part about living in the region was and what kept them in the community.

For both communities all four place attachment characteristics were mentioned by community members. Phrases such as the weather, coastal lifestyle, and beautiful scenery were used to describe the physical attachment. The natural environment, the water, and a

tropical island without a passport where descriptors for the natural aspects of place attachment in the communities. Small town feel was a common description in both communities and relates to the social place attachment the residents have. For civic engagement, the Upper Keys and the Panama City region talked about supportive communities where it was easy to engage. None of the residents I spoke to in the Lower Keys made mention of this. The variety of reasons residents stayed in the community developed into a couple themes for local marine renewable energy projects.

Aesthetics was something that talked about multiple times throughout almost every interview. Residents wanted to know if the wind farm or tidal equipment would be visible. Complaints about seeing wind farms down the entire island chain were common. Several members residing in the PCR questioned if they would create light pollution visible from the beach.

> *PCR 05 "I would think the wind would probably be more offensive because you have the visual aspect to it. I'm assuming that would be more of an eyesore than the underwater." (referring to the hydrokinetic system)*

While many residents were concerned or knew other members of the community, they believe would be concerned by the visual impacts of an offshore wind farm, they suggested placement of the proposed project could shape how the community reacts to the project.

> *FKR 03 "I guess it would depend on how close to shore it was. If it was way offshore, then it wouldn't be so noticeable. And I think people might be okay with that."*

PCR 07 "But if you were 10 miles offshore you'd have a really hard time being noticed from land, especially a windmill that's not going to paint the big picture that an oil rig thing would."

To residents, the thought of where to place a local MRE project appears to be incredibly important. In a community such as Panama City region, the only question pertained to how far offshore the turbines would be placed. In the Florida Keys, there was no agreeance among residents whether an offshore wind farm should be placed on the oceanside or bayside of the islands.

FKR 04 "I can't say. Bayside, if we went up into the Everglades no one can see up there I'm on the water, the ICW is just a half a mile away and I look north, and when my line of sight, even when I go up to touch the edge of Florida on Florida Bay on the water, you can only see for a mile or something."

FKR 07 "And I think they'd have a hissy fit on the ocean side, and you can't do anything bayside, period, so that's completely off limits to even the fishermen anymore."

Information Sources

Research question 6 addressed from which information sources residents were getting their information about renewable energy from. The general consensus from all communities was the Internet, more specifically social media. Additional sources included print media such as the local newspaper or the Wall Street Journal. Only the Upper Keys residents mentioned interpersonal discussion about renewable energy among community members.

FKR 01 "Yeah, Facebook like everyone else. We don't just go off of what people are saying on Facebook, but we actually go and look at what the actual data is"

FKR 03 "Mostly online, Yeah. And Yeah, everything was online that I read."

PCR 03 "I've seen different things on whatever social media or National Geographic or something about that potential, but I don't know a whole lot about it"

PCR 05 "Well, I've done quite a bit of reading online."

The Upper Keys had more social attachment to the community which may have led to the comments of residents sharing information. This was not mentioned by residents from the Lower Keys or the PCR.

FKR 07 "People I know talk about this stuff like that. So we're all doing a little reading, but mostly talking with friends."

Messaging

To address research question 7 regarding messaging channels, residents were asked where and how they would like to receive future renewable energy information on a local project. Residents in both communities mentioned they wanted scientifically backed data, the good and bad. Both communities also stated that local channels and community leaders would be the best way to distribute this information.

FKR 01 "You know, would be helpful moving something like that forward would really be, you, partnering with a university to get that, you know, true impact study done and to be able to refute the environmental concerns."

PCR 07 "Again with proper research beforehand and getting an idea of the best places to put the wind turbines and other devices, I think that you could present

that to the public in a way that explained to them the benefits of it, shows them the pros and cons and whatnot."

PCR 07 "But if you could get leaders from the environment, leaders from the state, local leaders, business leaders, and local community leaders, local business leaders, and then have some buy in from the tourism as well."

Using a modified version of the integrative model of behavioral prediction as a framework to investigate the potential influences towards opposition or support of a local renewable energy project, residents from the Florida Keys and the Panama City region were interviewed. The in-depth nature of the interviews and the following thematic analysis allowed researcher to find several themes with the IMBP framework. These themes can help guide researchers in the future when examining the acceptance of local marine renewable energy projects.

CHAPTER V

DISCUSSION

One of the main weaknesses or criticisms of the integrative model of behavioral prediction and its predecessors (theory reasoned action and theory of planned behavior) is the lack of predictability of the model (Sniehotta et al., 2014). The elicitation portion for the IMBP model is vitally important to getting the best results (Fishbein & Ajzen, 2010), but many studies utilizing this model have failed to complete this step (Ajzen, 2015). As this behavioral model has never been applied in the renewable energy context, the elicitation portion was the focus of this research. Within in renewable energy acceptance literature there has been a call for more qualitative research to get a better understanding of the variables that influence the process in communities (Bidwell, 2017). The behavior being examined is the support or opposition of a local marine renewable energy project in a community. Past studies have used open-ended questionnaires to conduct the elicitation portion of the study (e.g. Holland, 2019; Montaño & Kaspzryk, 2015; Robbins & Niederdeppe, 2015). This research used in-depth interviews with residents from two tourism-dependent, coastal communities located along Florida's Gulf Coast. The communities selected were the Florida Keys (Monroe County) and the Panama City region consisting of Panama City, Panama City Beach, and Lynn Haven located in Bay County, Florida.

The results suggest that the main measures of IMBP have potential to develop messages to influence behaviors when used in a renewable energy context. Additionally, the inclusion of place attachment may strengthen IMBP-based messages illuminating how residents may behave when a renewable energy project is proposed in their

community. For attitude, perceived social norms, and efficacy common themes emerged from both communities. Themes that influenced attitude were knowledge of local energy sources, knowledge of renewable energy, economics, NIMBY, and politics. For social norms the most influential people were family and friends. The influential groups depended on the individual community. Self-efficacy and response efficacy were shown to differ. Many residents felt they could do small behaviors to help or support renewable technology, but ultimately believed this wouldn't happen in their community. Residents showed strong physical and natural place attachment to their communities. The themes derived from the thematic analysis suggest that IMBP measures would be useful in changing perception of renewable energy projects locally if the correct messaging was utilized.

Attitudes

To address the research question, "What factors influence attitudes towards marine renewable energy technology?", a series of questions were asked about participants knowledge of solar, wind, and hydrokinetic technology. The six major themes emerging from the thematic analysis were knowledge of local power generation, knowledge of MRE technology, economics, environmental attitude, NIMBY-ism, and the perception of politics.

Multiple forms of knowledge have been shown to be important when deciding attitude towards renewable energy adoption (Hobman & Ashworth, 2013). The residents interviewed in the study communities demonstrated knowledge of their local power generation and were able to ask for more information on how local renewable energy projects, both on land and in the marine environment, would work with their current

power system. The awareness these communities demonstrated could be attributed to the hurricanes, Irma and Michael, that struck the regions in 2018. Residents described in detail the amount of work that went into rebuilding the electrical grid. Other regions where power production is more out of sight may yield different knowledge. In the Upper Keys, the Florida Keys Electrical Cooperative is active and holds regular meetings to keep it members updated. This finding could indicate that situations where communities are knowledgeable and comfortable with their current power options, local renewable energy projects could have a hard time gaining momentum in the communities. This was certainly not the only knowledge that proved to be important for attitudes towards marine renewable energy.

Hobman and Ashworth (2013) provided residents with information on cost and emissions of different renewable and non-renewable energy sources. However, the residents interviewed for this study wanted to know more about to efficiency of these technologies compared to current systems such as natural gas or nuclear. Providing this information alongside the cost of all technologies could prove to move the needle in the deciding direction for these communities.

For marine renewable technologies, residents wanted to know more about how the equipment would last in the marine environment. This question came up often with the hydrokinetic technology. As expected, residents were the least familiar with the hydrokinetic technology. It should be noted that residents might decide the fate of a project on a technology by technology basis (Stokes et al., 2014). For example, United Kingdom (UK) residents differed on different applications of wave energy technology. Durability of equipment is something that seems relevant given their locations and recent

Hurricane strikes. Residents in a Southwest portion of the UK where wave energy technology was deployed had similar concerns of the technology breaking apart and washing ashore (Stokes et al., 2014). Durability might also be a concern for Gulf Coast residents after the wake of the 2010 Macondo well head accident, now known as the Deepwater Horizon oil spill event. The event took an economically substantial toll on the Florida Panhandle in 2010 (Harper, n.d.). In communities that have experienced past environmental harm from human energy generation activities may be more sensitive to additional project (Stokes at al. 2014). This leads to our next major theme of economics.

Another factor driving residents' attitudes towards marine renewable energy was the potential impact of renewable energy on local economics. Hobman and Ashworth (2013) demonstrated how change in cost of different sources could affect adoption. A similar notion was put forth by our residents in both communities. For solar energy, the upfront cost of the system was a barrier to many. The residents in the Florida Keys and Panama City regions did express concerns about what a local renewable energy project would do to the community from an economic standpoint. Job creation and impact on tourism were at the forefront of this theme. As stated above, both of the regions have a local college that could help fulfill the need for technicians should a project come to the community. Currently in the US, renewable energy jobs employ over 350,000 people which is nearly a 3-to-1 ratio when compared to the fossil fuel industry (Schneer & McGinn, 2019). The average salary for a wind turbine technician according to the U.S. Bureau of Labor Statistics (2019) was $52,910 USD a year and the annual income for a resident in Monroe County, Florida was $43,477 USD a year (Census, 2019b). These jobs could be beneficial to a place many residents described having a high cost of living.

When it comes to tourism and recreation, the Block Island Wind Farm has been a welcome addition by the seasonal visitors (Smith et al., 2018). After the economic factors were expressed, environmental effects were brought into the discussion by residents.

When it came to the factor of the environment, residents expressed both positive and negative viewpoints of having a local renewable energy project in their community. Environmental attitude has been shown to have strong associations with environmental behaviors (Gadenne et al., 2011). Using the NEP scale would be the best way to measure the environmental attitude of residents when using the IMBP for a local renewable energy project. It is the most widely used environmental attitude scale (Milfont & Duckitt, 2010) and has been proven to work in multiple regions and cultures (e.g. Ogunbode, 2013). The topics brought up during the interviews will be valuable when creating messaging for these communities.

Another theme that appeared within the large attitude theme was NIMBY. While NIMBY has fallen out of favor with academics as an explanation for community opposition towards local renewable energy projects (Devine-Wright, 2005; Wolsink, 2006), yet it still appeared to be a significant factor influencing for people in the study communities. This information represents the reach of academic research and the accompanying messaging. Researchers should continue to seek a better understanding of the variables at play in communities via qualitative methodology.

The theme of politics came up many times when speaking with residents in both communities. Many residents felt politics had the ability to dictate whether a local marine renewable energy project would be viable in the area. This belief comes from not only the notion that “the other side”, referring to two dominant political parties in American

politics, but that current elected officials would likely not support such a project in the community. However, the residents did not tow party lines on any of the renewable energy technology. This speaks to something more nuanced happening when a project is proposed locally compared to nationally. For future research, cultural worldviews represent an opportunity to get a more nuanced measure of how someone sees the world (Jones, 2011; Wildavsky & Dake, 1990) rather than fitting them into a narrow political ideology. Cultural worldviews place an individual in one of four groups. These groups focus on their views of authority and individualism which include hierarchy to egalitarianism and individualism to communism. The four groups include hierarchy-individualism, hierarchy-communitarianism, egalitarian-individualism, and egalitarian-communitarianism (e.g. Figure 4, Kahan et al., 2017).

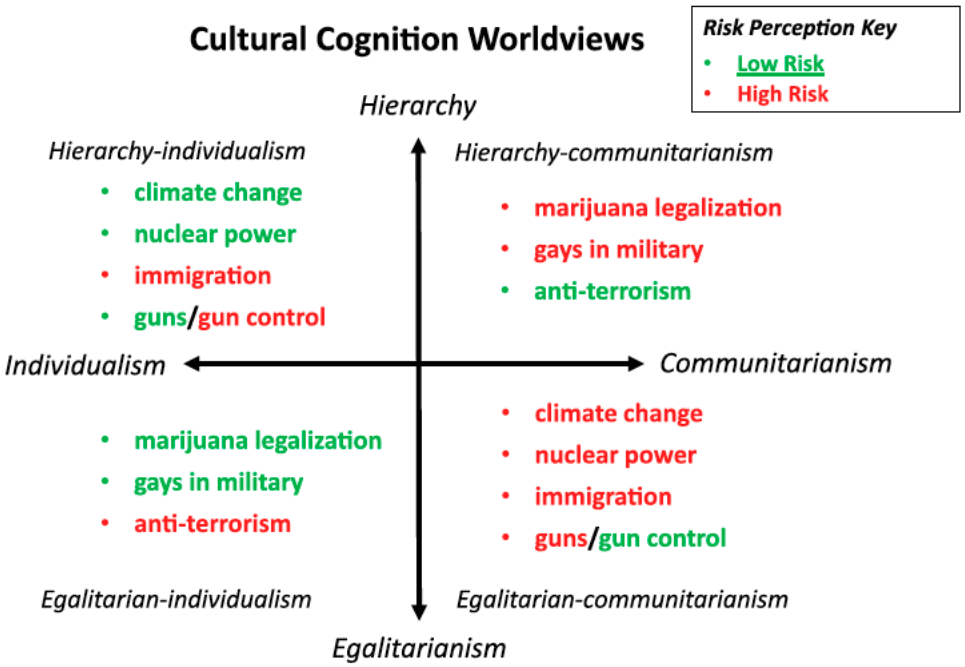

Figure 7. Visualization of Cultural Cognition Worldviews on controversial topics from the Kahan et al. (2017).

Using cultural worldviews in the context of renewable energy adoption combined with IMBP could allow researchers to have more predictive power when compared to political ideology which generally is measured from conservative to liberal. Renewable energy has become the second most polarized scientific topic in the United States, behind only climate change (Pew, 2015). Demographic variables such as ideology have shown mixed results within the wind energy adoption literature (Rand & Hoen, 2017).

Two quadrants specifically should showcase the difference in response efficacy among individuals. The individuals in the hierarchy-individualism quadrant believe there is a power structure in our society and want to reduce the range and size of our government (Douglas, 1970; Rayner, 1992). These individuals will likely have a stronger response efficacy, believing their individual behavior can affect the outcome of an activity. On the opposite end of the spectrum is the egalitarian-communitarianism quadrant. This latter quadrant mentioned would have lower response efficacy because they believe that the government should be doing more and that all peoples actions are equal (Douglas, 1970; Rayner, 1992).

This research suggests that cultural worldview variable has the potential to be a stronger predictor of MRE support than political ideology. In previous research using the theory of reasoned action, political ideology was shown to be a predictor of pro-environmental behavior. The study showed liberals were more likely to recycle, whereas conservatives were less likely (Kim et al., 2012). With the similar polarization of topics such as climate change and renewable energy in the United States (Pew, 2015) and the mixed results of political ideology as a predictor in wind energy literature (Rand & Hoen, 2017), the positive results of cultural worldview in climate change gives cause to use it in

place of political ideology when studying the acceptance of renewable energy technologies. Cultural worldview has the potential to better explain how an individual sees the world thus how effective they feel an activity such as adopting a local RE project would be.

This research shows there are many factors that affect attitude towards a local renewable energy project. Within the modified IMBP framework guiding this research there are an additional three factors to examine. The perceived social norms that would influence an individual on a local marine renewable energy project will be discussed next.

Perceived Norms

The primary goal of this research is to gain a better understanding of the variables that influence support or opposition for a local marine renewable energy project. In both communities, family members (e.g. partners, parents, or children) and friends/neighbors were seen as being supportive local renewable energy project. Additionally, local government officials and business leaders were also seen as being potentially supportive of a local renewable energy project. One the other hand, community members saw these same groups, environmentalist, as well as the power companies being against a local renewable energy project. There was no specific definition of an environmentalist given by the residents, but rather they painted a picture of someone who opposed any human development or expansion into the natural environment.

By definition an environmentalist is someone concerned about environmental quality especially of the human environment with respect to the control of pollution (Merriam-Webster, n.d.). When developing a questionnaire for perceived social norms,

researchers should be careful when using this term. Making a clear definition of what the researcher means by this term will help better define social norms in these communities.

Residents also expressed concern over not doing something that get them socially chastised. Weber 2017 states that others might not begin to perform more environmentally friendly behaviors until they see others doing so. The next variable examined within the IMBP framework will be efficacy.

Efficacy

Efficacy during this research was addressed by asking residents what they believed the benefits and detriments of a local marine renewable energy project be in their community. Residents were also asked about the barriers they perceived when it came to a project in their community. Interestingly, many residents were already performing energy saving or efficient activities such as using LED light bulbs, energy efficient appliances, or rebuilding their homes with better insulation and windows to reduce their power bills. It appears that many residents in both regions are already taking smaller actions that are shown to be more energy efficient. The actions performed by these residents are considered best practices from ENERGY STAR partners (Energy Star, n.d.). This could be a result of not having low socio-economic status (SES) residents in the study. However, residents in the Lower Keys did not feel they could be impactful when it came to bringing a renewable project to the region. Self-efficacy has been shown the be strong predictor of behavior that require great effort (Bandura, 2002). Low self-efficacy individuals might not feel inclined to take action as they don't feel responsible, but rather would let others, such as the national government, take action (Gifford, 2011).

Response efficacy is a person's belief of how effective a behavior will be (Rassmussen & Ewoldsen, 2016). In this instance, researchers wanted to know if residents felt a local marine renewable energy project would be beneficial to the community. Residents thought these projects have potential to create jobs in the community. Currently (2019) the solar industry provides 242,343 jobs and the wind industry employs another 111,166 people (Schneer & McGinn, 2019). Furthermore, residents said they believe these technologies could lower their power bills but were skeptical if they would in reality. Price was shown to be an influencer of willingness to purchase power renewable energy sources, however the effect was dampened by other positive effects (Litvine & Wüstenhagen, 2011). This suggests that other positive impacts to the community such as job creation and tourism benefits need to be highlighted in these communities. However, support and adoption for environmental policy is believed to be tied to larger social structure, which in turn may take the choice away from an individual (Shove 2010).

Place Attachment

Place attachment is described as a location people form a strong bond with. This bond can be for the natural or social settings (Gieryn, 2000; Tuan, 1977). In the PCR and the Lower Keys the residents overwhelmingly have bonded with the natural and physical aspects of their community. This includes the water, warm weather, and ocean view. Research shows when people develop a strong bond with natural characteristics of a region, even a proposal of a wind farm can bring up feelings of loss (Devine-Wright & Howes, 2010). Recent research suggests the bond formed with the ocean is something more primal often leading residents to have a deep connection and concern for its well-

being (Gelcich et al., 2014; Steel et al., 2005), and therefore needs to be considered when examining place attachment in context with marine renewable energy projects (Bidwell, 2017).

In the Upper Keys, the residents were connected to the social and civic aspects of the community. While the natural settings where certainly appreciated, the small town feel and supporting community where emphasized by residents. Research suggests a strong civic sense can indirectly lead to involvement in a community renewable project (Kalkbrenner & Roosen, 2016). Strong place attachment doesn't directly lead to opposition of a local project. However, a local project is more likely to be completed when the community members feel the project is a good "fit" for the community (Devine-Wright & Howes, 2010).

Messaging

Residents were asked where they currently receive energy-related information and what information they would need to make an informed decision about a local marine renewable energy project. Furthermore, they were questioned on what the preferable way would be to receive the information. Research suggests varying levels of success when it comes to media campaigns aimed to educate and encourage people to participate in more environmentally friendly behaviors and actions (De Vries et al., 2020). Hence, asking residents what they believe would work best to target these specific communities.

As expected, Internet-based sources such Facebook, news alerts, and online media outlets were the primary source in which residents in both communities claimed to get information on renewable energy sources. A smaller group of residents still relied on print media with sources such as National Geographic and the Wall Street Journal. In the

Upper Keys, a region showing signs of strong social place attachment, the residents received a great deal of information from community members. Research has shown the media to be one of the strongest informers in marine renewable technology (Stokes et al., 2014; West et al., 2010).

Since residents in these regions are primarily getting their information online, knowing what kind of information needed to make informed decisions would be beneficial to targeted messaging. Residents preference for information was a message that was simple, relatable, transparent and from a legitimate source. An example for these communities would be an Environmental Impact Assessment (EIA) from the University of West Florida or Florida International University. Conversely, past research has shown the general public rarely seeks out such information (Stokes et al., 2014). Another example of targeted messaging could present side-by-side data to residents comparing the efficiency of the different technologies. DeSanti and Gong (2020) found an increase in willingness to consider wind energy as a preferred source of energy after a side-by-side comparison of the of older and newer wind turbine technologies.

Simple messages have been shown to improve people's understanding of environmental topics and policies (e.g. De Vries et al., 2020; Sousa Lourençco et al., 2016) by presenting a message with a central idea and no extraneous information (De Vries et al., 2014). Research suggests that in order to make environmental messages relatable there needs to be action component (Stajkovic & Luthans, 1998). For these communities, this would direct them to actions that can potentially be taken in the community, such as writing letters to their local elected officials, attending community meetings on the project, or voting for legislation.

To target these regions, local news and online coverage from legitimate sources with simple, easy to understand information would be the best way to target them. Overall, locally focused messaging with a local fit or emphasis to the community and a call to action has proven to be the most effective when it comes to environmental communications (Brügger & Pidgeon, 2018; Scannell & Gifford, 2013) even when inaccurate and false information has already been presented (De Vries et al., 2020).

Implications

Theoretical

The insights gained from this study provide future researchers with direct and indirect attitudes and beliefs to test the IMBP within a renewable energy context. The variables of attitude, social norms, and efficacy have been used in a past environmental study using IMBP on water conservation (Holland, 2019), however the different attitudes and beliefs seen during this study are needed for the context on renewable energy. The additional exploration of place attachment and cultural worldviews provide the potential for more explanatory power of behavioral models looking into community renewable energy acceptance. Place attachment alone has been used as an explanation in renewable energy acceptance literature (Bell et al., 2013; Devine-Wright, 2009; Devine-Wright & Howes, 2010) but has not been paired with a behavioral model. Cultural worldview has been used to explain different views of controversial topics such as climate change (Jones, 2011; Wildavsky & Dake, 1990) and could add value the growing body of renewable energy acceptance literature.

Practical

For practical purposes, knowing the types of messages and information sought by residents in these communities is important, but knowing what kinds of actions community members are willing to take during a proposed project is equally as important. Residents answers ranged from getting politically involved to no action taken at all. Several residents interviewed had experience in previous political action for other causes where they organized groups, setup informational events, and lobbied local officials. Others simply said they would be willing to offer their time by talking to other community members spreading their viewpoint. Other residents worried about legal action, such as the lawsuits that kept hydrokinetic energy from being used in the Keys or the lengthy legal battle over getting No Name Key hooked into the public electrical grid. The No Name Key legal battle lasted for over 15 years (Alvarez, 2012).

In order to avoid some of these potentially community dividing pitfalls, communication best practices should be used in these communities. Some of these practices include the elicitation research done here which involved getting to know the community and their concerns. Additional best practices include building messages to fit the different community segments, deploying them in a timely manner for the appropriate length of time, and being proactive in responses to negative media coverage (Bridle, 2013). This proactive messaging coupled with a more involved, inclusive process for residents can help provide a model for the more dialogue-based participatory siting and planning process called for by renewable energy scholars (Devine-Wright, 2011).

Limitations

One of the major limitations of this research was the age range and diversity of residents interviewed. These two communities were chosen for their abundance of marine resources, but also their similarities in populations. They tend to skew to the older demographic. All residents interviewed were over the age of 40 with more than half of the residents being retired. This was more evident in the Keys where all but three of the 14 respondents were retired. Many of them stated they believed that retired people would be the residents making a push for support or opposition and were drivers of such movements in the community. The same sentiment was expressed in the Panama City region.

The lack of diversity stems from the sampling method. Snowball sampling can often leave gaps in the participants recruited. However due to constraints this is a common sampling method in qualitative research (Ary et al., 2014 pp. 456). A more age and race diverse sample could be beneficial going forward in similar research projects. However, the sampling method is not the only culprit to be blamed during the data collection process. During March 2020, the month the interview process started, the US was struck with the COVID-19 pandemic. For the context of this project it has made it more difficult to reach people in rural areas. This pandemic could continue to be an issue for the next several years as new emerging research suggests the pandemic could last another 2 years (Khan et al., 2020). Often times renewable energy projects have been sited in rural areas (DOE, 2015) and researchers should keep this in mind when trying to conduct research with harder to reach population, such as those in a rural community.

This study also had an inherent socioeconomic status bias. This stems from the definition used to define resident. Resident was defined as a homeowner who could vote in the county. By purposefully choosing homeowners, renters and other low-income groups were left out of this discussion. Although several residents during the interview process mentioned this group was not traditionally active in the community because they were working too much to do be active in this arena. This is a group that needs to be further examined in both communities for future research. However, the group of people interviewed are the most likely to be politically active during RE siting and development.

Another limitation due to sampling methodology was the how the people were recruited. It is likely that the interviewees only gave me other recommendations of people they knew would talk about this subject. Even with these potential recommendations, many people were still unwilling to interview for this project. Willing participants were asked about political ideology to determine the spread of views on the subject. This could potentially mean that views collected during this research are missing several points of view.

Completely knowing the saturation of the interviews presents another limitation of this research. Within an individual interview it may be hard to determine if a resident was able to give all their desired information in one sitting. As these interviews averaged under an hour, rapport may not have been fully built in this time. The lack of follow up interviews after residents had time to think about our conversation was also an aspect that was unable to be explored during this research. With quantitative work, researchers have the ability to follow up and address concerns of nonresponse bias (Fowler, 2014 pp. 44). There was no way to do this with this research's methodology.

The generalizability to general population is another concern of this research method, however it builds a strong case for a model and variables that need to be tested in a more quantitative fashion going forward. That research may be limited to other communities that have enough marine resources to host this kind of renewable energy technology. For instance, this research may serve little more than a starting point for a landlocked community. They may need to go back to a starting point and conduct interviews and analysis similar to the kind performed in the research before conducting any quantitative research. Furthermore, the residents interviewed potentially only represented a small subcommunity of members in each community, although they are the residents more likely to act should a project be proposed in the community.

Finally, this study examined the broad topic of factors influencing the general support or opposition of a local marine renewable energy project. A traditional IMBP study would test attitude, perceived social norms, and perceived efficacy regarding a well-defined behavior. Any future research would need to define a specific behavior in order to use this data for testing a behavioral model.

Future Research

The real-world application of these findings could prove fruitful in future research, especially in the specific regions. Only attempts in these communities will prove how insightful this research ultimately will be. Nonetheless, this research contributes important in-depth details from the communities. This information in turn can inform variables for behavioral models to be tested when examining community support for marine renewable energy. IMBP works best when focusing on a single behavior. This study took a broad approach to RE acceptance and recommends further defining the

behavior before testing the model in the renewable energy context. Furthermore, the research sheds a light on the need for future renewable energy acceptance studies to explicitly define self- and response efficacy instead of treating them as one variable. For instance, this study shows people may believe they can do something themselves, but don't think it will affect the overall outcome of a project in their community. Lastly, the variables of place attachment and cultural worldview could offer more explanatory power to behavioral models when looking at local renewable energy acceptance.

This research also directly asked the communities what information they were seeking when it came to making decisions on renewable energy projects. The research went one step further and proceeded to ask residents how they would want to receive the information and from whom the information should come. Directly testing the effects of such messaging and delivery channels could be beneficial for future renewable energy messaging. This could offer future best practice for renewable energy messaging in the United States.

CHAPTER VI

CONCLUSION

This research fills the need for a deeper understanding of the variables behind the acceptance of renewable energy. This was done using the integrative model of behavioral prediction as a framework. Additionally, place attachment was examined as it has been emerging from research as important when residents debate the possibility of a local renewable energy projects (Bell et al., 2013; Devine-Wright, 2009; Devine-Wright & Howes, 2010). Furthermore, Bidwell (2017) suggested that researchers gain a greater understanding of variables used in renewable energy acceptance. Using in-depth interviews, major themes regarding acceptance of a local marine renewable project were found in two tourism-dependent, coastal communities within the IMBP framework. This research will allow future researchers to develop direct and indirect measures for these communities and test the IMBP in a renewable energy context.

As this model acknowledges that every behavior is different, the themes found in this research will allow future researchers to test the model without the elicitation portion. Knowledge of local power generation and attitudes towards renewable energy were explored during the course of this research. In the past most research in the renewable energy acceptance literature has used environmental attitude (e.g. Firestone & Kempton, 2007) or place attachment (e.g. Devine-Wright, 2009). This research highlights the need to include these additional variables into the attitude of any behavioral models testing for local renewable energy acceptance. Additionally, this research demonstrated the need to test the difference between self- and response efficacy in renewable energy acceptance. As there is a difference between being able to do something and believing it is beneficial.

The only research to the author's knowledge to directly address this is Litvine and Wüstenhagen (2011). Furthermore, this research concludes that a more nuanced variable such as cultural worldview needs to be used as it has shown better explanatory power in other controversial topics such as climate change (Jones, 2011; Wildavsky & Dake, 1990).

Not only does this research provide good insight to how residents are making decisions, it provides options for future messaging in the event that a local project comes to the community. Research supports the residents desire for relevant, simplistic, and transparent messaging (De Vries et al., 2020; Sousa Lourençco et al., 2016). Targeted messaging in a community can present a challenge with extra effort, time and cost. Past research has shown that this specific targeting can improve message effectiveness (Hornsey & Fielding, 2020). Although the messaging technique being described here is expensive, this research should serve as base to build from, potentially eliminating some of the burdens from future researchers or practitioners.

Publication Plans

For this dissertation research, the research will be revised to a more journal friendly format and sent out for publication in a journal such as Renewable Energy & Social Science, Ocean & Coastal Management or the Journal of Environmental Psychology. No title for the paper has been decide upon. Additionally, this work will be submitted to a conference, likely the International Conference on Energy Research and Social Science when conferences are able to be attended in person.

BIBLIOGRAPHY

Abroms, L., Jorgensen, C.M., Southwell, B.G., Geller, A.C., & Emmons, K.M. (2003). Gender differences in young adults' beliefs about sunscreen use. *Health Education & Behavior, 30*, 29-43.

Ajzen, I. (2015). The theory of planned behavior is alive and well, and not ready to retire: a commentary on Sniehotta, Presseau, and Araújo-Soares. *Health Psychology Review, 9*(2), 131-137.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50(*2), 179-211

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice Hall.

Alvarez, L. (2012, May 27). A tiny Florida outpost divides over getting on the power grid. The New York Times. https://www.nytimes.com/2012/05/28/us/no-name-key-electricity-plan-divides-residents.html

American Wind Energy Association. (2019). U.S. Offshore Wind Industry Status Update – August 2019. Retrieved from https://www.awea.org/Awea/media/Resources /Fact%20Sheets/Offshore-Fact-Sheet-Aug-2019_1.pdf

Ary, D., Chester Jacobs, L., Sorensen, C., & Walker, D.A. (2014). *Introduction to research in education* (9th edition). Wadsworth Cengage Learning

Attride-Stirling, J. (2001). Thematic networks: an analytic tool for qualitative research. *Qualitative Research, 1*(3), 385-405.

Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology, 23*(1), 21-32.

Bandura, A. (2002). Environmental sustainability by sociocognitive deceleration of population growth. In P. Schmuch & W. Schultz (Eds.*), The psychology of sustainable development* (pp. 209-238). Dordretcht, the Netherlands: Kluwer.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bandura, A. (1994). Self-efficacy. In V.S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (pp.71-81). New York, NY: Academic Press.

Bauwens, T. (2016). Explaining the diversity of motivations behind community renewable energy. *Energy Policy, 93*, 278-290. doi: 10.1016/j/enpol.2016.03.017

Bay County Chamber of Commerce. (2020). Retrieved from https://panamacity.org/relocate-to-bay-county/communities/

Bechtel, R.B., Corral-Verdugo, V., Asai, M., & Riesle, A.G. (2006). A cross-cultural study of environmental belief structures in USA, Japan, Mexico, and Peru. *International Journal of Psychology, 41*, 145-151.

Bell, D., Gray, T., & Haggert, C., & Swaffield, J. (2013). Re-visiting the 'social gap': public opinion and relations of power in the local politics of wind energy. *Environmental Politics, 22*(1), 115-135. doi: 10.1080/09644016.2013.755793

Bidwell, D. (2017). Ocean beliefs and support for an offshore wind energy project. *Ocean & Coastal Management, 146*, 99-108. doi: 10.1016/j.ocecoaman.2017.06.012

Bidwell, D. (2016). Thinking through participation in renewable energy decisions. *Nature Energy, 1*(5), 1-4. doi: 10.1038/nenergy.2016.51

Bidwell, D. (2013). The role of values in public beliefs and attitudes towards commercial wind energy. *Energy Policy, 58*, 189-199.

Bonaiuto, M., Breakwell, G.M., & Cano, I. (1996). Identity process and environmental threat: The effects of nationalism and local identity perception of beach pollution. *Journal of Community & Applied Social Psychology, 6*, 157-175.

Bosley, P., & Bosley, K. (1988). Public acceptability of California's wind energy development: three studies. *Wind Engineering, 12*(5), 311-318.

Bridle, R., Collings, J., Cottrell, J., & Leopold, A. (2013). Communication best-practices for renewable energy (RE-COMMUNICATE) – scoping study. IEA – Renewable Energy Technology Deployment. https://www.osti.gov/etdeweb/servlets/purl/22125475

Brown, B., & Perkins, D.D. (1992). Disruptions to place attachment. In I. Altman & S. Low (Eds.) *Place attachment* (pp. 279-304). New York, NY: Plenum.

Brügger, A., & Pidgeon, N.F. (2018). Spatial framing, existing associations and climate change beliefs. *Environmental Values, 27*, 559-584.

Brulle, R.J. (2010). From environmental campaigns to advancing the public dialog: Environmental communication for civic engagement. *Environmental Communication, 4*, 82-98. doi: 10.1080/17524030903522397

Bureau of Ocean Energy Management. (2019). Lease and grant information. Retrieved from https://www.boem.gov/Lease-and-Grant-Information/

Bush, D., & Hoagland, P. (2016). Public opinion and the environmental, economic and aesthetic impacts of offshore wind. Ocean & Coastal Management, 120, 70-79. doi: 10.1016/j.ocecoaman.2015.11.018

Chadwick, R.A. Kirby, G.A., Holloway, S., Gregersen, U., Johannessen, P.N., Zweigel, P., & Arts, R. (2002). Saline aquifer CO_2 storage (SACS2) final report: Geological characterization of the Utsira sand reservoir and caprocks (Work Area 1). Retrieved from http://nora.nerc.ac.uk/id/eprint/511461/1/CR02153N.pdf

Chan, R.Y.K. (2001). Determinants of Chinese consumers' green purchase behavior. *Psychology and Marketing 18*(4), 389-413.

Cheung, S.F., & Chan, D.K.S. (2000). *The role of perceived behavioral control in predicting human behavior: A meta-analytic review of studies on the theory of planned behavior*. Unpublished manuscript, Chinese University of Hong Kong.

Chu, H., & Yang, J.Z. (2018). Taking climate change here and now – mitigating ideological polarization with psychological distance. *Global Environmental Change, 53*, 174-181. doi: 10.1016/j.gloenvcha.2018.09.013

County of San Diego (2018*). County of San Diego Boulevard planning group meeting agenda/notice.* https://www.sandiegocounty.gov/content/dam/sdc/pds/Groups/boulevard/2018_Agendas_Minutes/BL180712AG.pdf

Crompton, T. (2008). Weathercocks and signposts: The environment movement at a crossroads. Surrey, UK: World Wildlife Fund.

Cross, J.E., Byrne, Z.S., & Lueck, M.A.M. (2010). Organizational change for energy conservation: A case study of Poudre School District. Fort Collins, CO: Colorado State University.

Data USA. (2020). DataUSA: Panama City, FL Monroe County, FL. https://datausa.io/profile/geo/panama-city-lynn-haven-panama-city-beach-fl-metro- area?compare=monroe-county-fl

Davenport, M.A., & Anderson, D.H. (2005). Getting from sense of place to place-based management: An interpretive investigation of place meanings and perceptions of landscape change. *Society and Natural Resources, 18*, 625-641.

DeSanti II, B.A., & Gong, H. (2020). *An investigation into the relationship between energy information and energy preference*. Unpublished Manuscript.

Denning, S. (2007). *The leader's guide to storytelling: Mastering the art and discipline of business narrative*. San Francisco, CA: John Wiley & Sons Inc.

Department of Energy (2015). Wind vision: A new era for wind power in the United States. https://www.energy.gov/sites/prod/files/WindVision_Report_final.pdf

Department of Energy. (2014). National offshore wind energy grid interconnection study. https://www.energy.gov/sites/prod/files/2014/08/f18/NOWEGIS%20Executive%20Summary.pdf

Department of Energy (2008). 20% wind energy by 2030: Increasing wind energy's contribution to U.S. electricity supply. https://www.nrel.gov/docs/fy10osti/40745.pdf

Department of Energy. (2017). Offshore wind initiative at the U.S. Department of Energy. Retrieved from https://www.energy.gov/sites/prod/files/2017/02/f34/EERE-offshore-wind-fact-sheet- 02072017.pdf

Department of Energy. (2019a). EERE initiatives and projects. Retrieved from https://www.energy.gov/eere/about-us/initiatives-and-projects

Department of Energy. (2019b). About the technology-to market program. Retrieved from https://www.energy.gov/eere/technology-to-market/about-technology-market-program

Department of Interior. (2019, September 12) BIDDING BONANZA! Trump administration smashes record offshore wind auction $405 million in winning bids [Press Release]. Retrieved from https://www.doi.gov/pressreleases/bidding-bonanza-trump-administration-smashes-record-offshore-wind-auction-405-million

DeTect, Inc. (2020). About DeTect, Inc. https://detect-inc.com/about/

Devine-Wright, P. (2011b). Public engagement with large-scale renewable energy: Breaking the NIMBY cycle. *Wiley Interdisciplinary Reviews: Climate Change, 2*, 19-26.

Devine-Wright, P. (2011a). Place attachment and public acceptance of renewable energy: A tidal energy case study. *Journal of Environmental Psychology, 31*, 336-343. doi: 10.1016/j.envp.2011.07.001

Devine-Wright, P. (Ed.). (2011). *Renewable energy and the public: from NIMBY to participation*. Routledge.

Devine-Wright, P. (2009). Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action. *Journal of Community & Applied Social Psychology, 19*, 426-441. doi: 10.1002/casp.1004

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

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.

De Vries, G., Rietkerk, M., & Kooger, R. (2020). The hassle factor as a psychological barrier to a green home. *Journal of Consumer Policy, 43*, 345-352. doi: 10.1007/s10603-019-09410-7

De Vries, G., Terwel, B.W., & Ellemers, N. (2014). Spare the details, share the relevance: The dilution effect in communications about CO_2 capture and storage. *Journal of Environmental Psychology, 38*, 116-123.

Dickinson, R.E., & Cicerone, R.J. (1986). Future global warming from atmospheric trace gases. *Nature, 319*, 109-115.

Doney, S.C., Fabry, V.J., Feely, R.A., & Kleypas, J.A. (2009). Ocean acidification: the CO2 problem. *Annual Review of Marine Science, 1*, 169-192.

Dopplet, B. (2003). *Leading change towards sustainability: A change-management guide for business, government and civil society*. Sheffield, UK: Greenleaf Publishing.

Douglas, M. (1970). *Natural symbols: Explorations of cosmology*. London, UK: Barrie & RocKliff the Cresset P.

Dunlap, R.E., Van Liere, K.D., Mertig, A.G., & Jones, R.E. (2000). Measuring endorsement of the New Ecological Paradigm: A revised NEP scale. *Journal of Social Issues, 56*(3), 425-442.

Energy Star. (n.d.) Low and no-cost energy-efficiency measures. Retrieved from https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/stamp-out-energy-waste

Esfandiar, K., Pearce, J., & Dowling, R. (2019). Personal norms and pro-environmental binning behavior of visitors in national parks: the development of a conceptual framework. *Tourism Recreation Research, 44*(2), 163-177. doi: 10.1080/02508281.2019.1580936

Firestone, J., & Kempton, W. (2007). Public opinion about large offshore wind power: underlying factors. *Energy Policy, 35*(3), 1584-1598.

Fishbein, M. (2008). A reasoned action approach to health promotion. *Medical Decision Making, 28*, 834-844.

Fishbein, M. (2000). The role of theory in HIV prevention. *AIDS Care, 12*, 273-278.

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York, NY: Psychology Press.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Fishbein, M., & Cappella, J.N. (2006). The role of theory in developing effective health communications. *Journal of Communication, 56*, S1-S17.

Florida Department of State Division of Elections (2016). November 8, 2016 general results. Retrieved from https://results.elections.myflorida.com/Index.asp?ElectionDate=11/8/2016&DATAMODE=

Florida State University (2008). *Average wind speed*. Retrieved from http://climatecenter.fsu.edu/products-services/data/other-normals/average-wind-speed.

Fowler Jr., F.J. (2014). *Survey research methods*. Sage.

Foster, J. (2001). Education as sustainability. *Environmental Education Research, 7*, 153-165.

Gadenne, D., Sharma, B., Kerr, D., & Smith, T. (2011). The influence of consumers' environmental beliefs and attitudes on energy savings behaviours. *Energy Policy, 39*, 7684-7694. doi: 10.1016/j.enpol.2011.09.002

Gelih, S., Buckley, P., Pinnegar, J.K., Chilvers, J., Lorenzoni, I., Terry, G., Guerrero, M., Castilla, J.C., Valdebenito, A., & Duarte, C.M. (2014). Public awareness, concerns, and priorities about anthropogenic impacts to marine environments. *Proceedings of the National Academy of Sciences, 111*(42), 15042-15047. doi: 10.1073/pnas.1417344111

Gieryn, T. (2000). A space for place in sociology. *Annual Review of Sociology, 26*, 463.

Gifford, R. (2011). The dragons of inaction: Psychological barriers that limit climate change mitigation and adaption. *American Psychologist, 66*, 290-302.

Goh, E. (2015). *Understanding non-compliance in national parks: An extension of the theory of planned behavior.* (Thesis). The University of Queensland, Queensland, Australia.

Harper, R. (n.d.) *The economic impact to Northwest Florida of the Deepwater Horizon oil spill.* Hass Center for Business Research and Economic Development.

https://www.frbatlanta.org//media/documents/rein/southpoint/harpereconomicimpact.pdf

Hartman, L. (2019). Top 10 things you didn't know about wind energy. Department of Energy, Energy Efficiency and Renewable Energy, USA. Retrieved from https://www.energy.gov/eere/wind/articles/top-10-things-you-didn-t-know-about-offshore-wind-energy

Herzog, H., Eliasson, B., & Kaarstad, O. (2000). Capturing greenhouse gases. *Scientific American, 282*(2), 72-29.

Hidalgo, M.C., & Hernandez, B. (2001). Place attachment: Conceptual and empirical questions. *Journal of Environmental Psychology, 21*, 273-281.

Hobman, E.V., & Ashworth, P. (2013). Public support for energy sources and related technologies: The impact of simple information provision. *Energy Policy, 63*, 862-869. doi: 10.1016/j.enpol.2013.09.011

Hoffert, M.I., Caldeira, K., Benford, G., Criswell, D.R., Green, C., Herzog, H., Atul, K.J., Kheshgi, H.S., Lackner, K.S., Lewis, J.S., Lightfoot, H.D., Manheimer, W., Mankins, J.C., Manuel, M.E., Perkins, L.J., Schlesinger, M.E., Volk, T., & Wigley, T.M.L. (2002). Advanced technology paths to global climate stability: energy for a greenhouse planet. *Science, 298*(5595), 981-987.

Holland, D. (2019). *Water as a social science: An international examination of water conservation behaviors under the umbrella of the integrated model of behavioral prediction*. (Dissertation). Texas Tech University, Lubbock, TX.

Holland, E.M., Pleasant, A., Quantrano, S., Gerst, R., Nisbet, N.C., & Mooney, C. (2007). The risks and advantages of framing science. *Science, 317*(5842), 1168-1170.

Hornsey, M.J., & Fielding, K. (2020). Understanding (and reducing) inaction on climate change. *Social Issues and Policy Review, 14*(1), 3-35. doi: 10.1111/spir.12058

Houser, T., Pitt, H., & Hess, H. (2019). Final US emissions estimates for 2018. New York, NY: Rhodium Group. Retrieved from https://rhg.com/research/final-us-emissions-estimates-for-2018/

Hughes, L. (2000). Biological consequences of global warming: is the signal already apparent? *Trends in Ecology and Evolution, 15*, 56-61.

Hynes, N., & Wilson, J. (2016). I do it, but don't tell anyone! Personal values, personal and social norms: Can social media play a role in changing pro-environmental behaviours? *Technological Forecasting & Social Change, 111*, 349-359. doi: 10.1016/j.techfore.2016.06.034

Ichiye, T., & Jones, M.L. (1961). On the hydrology of the St. Andrew Bay system, Florida. *Limnology and Oceanography, 6*, 302-311.

Jager, W. (2006). Stimulating the diffusion of photovoltaic systems: A behavioural perspective. *Energy Policy, 34*(14), 1935-1943.

Jones, M.D. (2011). Leading the way to compromise? Cultural theory and climate change opinion. *PS Political Science and Politics, 44*(4), 720-725.

Kahan, D. M., Jamieson, K.H., Landrum, A., & Winneg, K. (2017). Culturally antagonistic memes and the Zika virus: an experimental test. *Journal of Risk Research, 20*(1), 1-40. doi: 10.1080/13669877.2016.1260631

Kanfer, R., & Ackerman, P.L. (1996). A self-regulatory skills perspective to reducing cognitive interference. In I.G. Sarason, B.R. Sarason, & G.R. Pierce (Eds.), *Cognitive interference: Theories, methods, and findings* (pp. 153-171). Mahwah, NJ: Erlbaum.

Kalkbrenner, B.J., & Roosen, J. (2016). Citizens' willingness to participate in local renewable energy projects: The role of community and trust in Germany. *Energy Research & Social Science, 13*, 60-70. doi: 10.1016/j.errs.2015.12.006

Kempener, R., & Neumann, F. (2014). Tidal energy technology brief (June 2014). International Renewable Energy Agency, Bonn, Germany.

Khan, Z.S., Van Bussel, F., & Hussain, F. (2020). *A predictive model for Covid-19 spread applied to six US states*. Manuscript Submitted for Publication.

Kim, S., Jeong, S., & Hwang, Y. (2012). Predictors of pro-environmental behaviors of American and Korean students: The application of the theory of reasoned action and protection motivation theory. *Science Communication, 35*(2), 168-188. doi: 10.1177/1075547012441692

Klingener, N., & Bellido, S. (1999). Possible solutions to ease shortages. Miami Herald. Sunday April 4, 1999.

Knez, I. (2005). Attachment and identity as related to a place and its perceived climate. *Journal of Environmental Psychology, 25*, 207-218.

Korpela, K. Yien, M., Tyrvainen, L., & Silvennoinen, H. (2009). Stability of self-reported favourite places and place attachment over a 10-month period. *Journal of Environmental Psychology, 29*, 95-100.

Kotter, J.P. (1996). *Leading change*. Boston, MA: Harvard Business School Press.

Lackner, K.S. (2003). A guide to CO_2 sequestration. *Science, 300*, 1677-1678.

Lalli, M. (1992). Urban-related identity: theory, measurement and empirical findings. *Journal of Environmental Psychology, 12*, 285-303.

Lantz, E., & Flowers, L. (2011). Social acceptance of wind energy projects: country report of the United States. IEA Wind Task 28.

Leary, D., & Estaban, M. (2009). Climate change and renewable energy from the ocean and tides: calming the sea of regulatory uncertainty. *The International Journal of Marine and Coastal Law, 24*, 617-651. doi: 10.1163/092735209X12499043518269

Lee, T.N., Clark, M.E., Williams, E., Szmant, A.F., & Berger, T. (1994). Evolution of the Tortugas Gyre and its influence on recruitment in the Florida Keys. *Bulletin of Marine Science, 54(*3), 621-646.

Leiserowitz, A., Maibach, E., Roser-Renouf, C., Rosenthal, S, & Cutler, M. (2016). Politics & global warming, November 2016. *Yale Program on Climate Change Communication, December 13*.

Litvine, D., & Wüstenhagen, R. (2011). Helping "light green" consumers walk the talk: Results of a behavioural intervention survey in the Swiss market. *Ecological Economics, 70*, 462-474. doi: 10.1016/j/ecolecon.2010.10.005

Locke, E.A., & Latham, G. (2002). Building a practically useful theory of goal setting and task motivation. A 35-year Odyssey. *American Psychologist, 57*, 705-717.

Lutchyn, Y., & Yzer, M. (2011). Applying temporal construal theory to the theory of planned behavior to examine time frame effects on belief generation. *Journal of Health Communication, 16*, 595-606.

Magagna, D., MacGillivray, A., Jeffery, H., Hanmer, C., Raventos, A., Badcock-Broe A., & Tzimas, E. (2014). Wave and tidal energy strategic technology agenda. Strategic initiative for ocean energy (SI ocean), 2014.

Magagna, D., & Uihlein, A. (2015). JRC ocean energy status report. Publications Office of the European Union, Luxembourg. doi: 10.2790/866387

Maibach, E. (1993). Social marketing for the environment: using information campaigns to promote environmental awareness and behavior change. *Health Promotion International, 8*(3), 209-224. doi: 10.1093/heapro/8.3.209

Manzo, L.C. (2005). For better or worse: exploring multiple dimensions of place meaning. *Journal of Environmental Psychology, 25*, 67-86.

Masson-Delmonte, V., Zhai, P., Portner, H.O., Roberts, D., Skea, J., Shukla, P.R., Pirani, A., Moufouma-Okia, W., Péan, C., Pidcock, R., Connors, S., Matthews, J.B.R., Chen, Y., Zhou, X., Gomis, M.I., Lonnoy, E., Maylock, T., Tignor, M., & Waterfield, T. (2018). IPCC, 2018: Summary for Policymakers. In: Global warming of 1.5 C. An IPCC Special Report on the impacts of global warming of 1.5 C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global. *Geneva, Switzerland.*

Matisoff, D.C. (2008). The adoption of state climate change policies and renewable portfolio standards: Regional diffusion or internal determinants? *Review of Policy Research, 25*(6), 527-546.

Merriam-Webster. (n.d.). In *Merriam-Webster.com dictionary*. Retrieved from https://www.merriam-webster.com/dictionary/environmentalist?src=search-dict-box

Mesch, G.S., & Manor, O. (1998). Social ties, environmental perception, and local attachment. *Environment and Behavior, 30*, 504-519.

McLachan, 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.

McLean, D. (2009, March 27) *Tidal turbines hope to bring renewable power to the Keys*. Keys Weekly. https://keysweekly.com/42/tidal-turbines-hope-to-bring-renewable-power-to-the-keys/

Meehl, G.A., Washington, W.M., Collins, W.D., Arblaster, J.M., Hu, A., Buju, L.E., Strand, W.G., & Teng, H. (2005). How much more global warming and sea level rise? *Science, 307*, 1769-1722.

Middlestadt, S.E., Bhattacharyya, K., Rosenbaum, J., Fishbein, M., Shepherd, M. (1996). The use of theory based semistructured elicitation questionnaires: Formative research for CDC's prevention marketing initiative. *Public Health Reports, 3*(1), 18-27.

Milfont, T.L., & Duckitt, J. (2010). The environmental attitudes inventory: A valid and reliable measure to assess the structure of environmental attitudes. *Journal of Environmental Psychology, 30*, 80-94. doi: 10.1016/j.jenvp.2009.09.001

Montaño, D.E., & Kasprzyk, D. (2015). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In K. Glanz, B.K. Rimer, & K. Viswana (Eds.), *Health Behavior and Health Education: Theory, Research and Practice* (pp. 67-96). Jossey-Bass

Montaño, D.E., Kaspryzyk, D., Hamilton, D.T., Tshimnaga, M., & Gorn, G. (2014). Evidence-based identification of key beliefs explaining adult male circumcision motivation in Zimbabwe: Targets for behavior change messaging. *AIDS and Behavior, 18*(5), 885-904

Mosler, H-J., & Martens, T. (2008). Designing environmental campaigns by using agent-based simulations: Strategies for changing environmental attitudes. *Journal of Environmental Management, 88*(4), 805-816. doi: 10.1016/j.jevman.2007.04.013.

Musial, W., Beiter, P., Slitsen, P., Nunemaker, J., & Gevorgian, V. (2019). 2018 Offshore wind technologies market report. Department of Energy, Energy Efficiency and Renewable Energy, USA.

Musial, W., Heimiller, D., Beiter, P., Scott, G., & Draxl, C. (2016). 2016 Offshore wind energy resource assessment for the United States. Retrieved from www.vrel.gov/publications.

National Climate Data Center (2004). *Ranking of cities based on percentage annual possible sunshine.* Retrieved from http://www1.ncdc.noaa.gov/pub/data/ccd-data/petposrank.txt.

NBC7 (2018, August 15). *Proposed wind project meets strong opposition in Boulevard*. NBC San Diego 7. https://www.nbcsandiego.com/news/local/proposed-wind-projects-meets-strong-opposition-in-boulevard/49916/

Nisbet, M.C., & Mooney, C. (2007). Framing science. *Science 316*(5821), 56.

Ogilvie, M., & Rootes, C. (2015). The impact of local campaigns against wind energy development. *Environmental Politics, 24*(6), 874-893.

Ogunbode, C.A. (2013). The NEP scale: measuring ecological attitudes/worldviews in an African context. *Environment, Development and Sustainability, 15*, 1477-1494. doi: 10.1007/s10668-013-9446-0

Olson-Hazboun, S.K., Krannich, R.S., & Robertson, P.G. (2016). Public views on renewable energy in the Rocky Mountain region of the United States: Distinct attitudes, exposure, and other key predictors of wind energy. *Energy Research & Social Science, 21*, 167-179. doi: 10.1016/j.erss.2016.07.002

Ozaki, R. (2011). Adopting sustainable innovation: What makes consumers sign up to green electricity? *Business Strategy and the Environment, 20*, 1-17.

Panama City Beach (2009). Growth plan. Retrieved from http://www.pcbgov.com/home/showdocument?id=168

Pasqualetti, M.J. (2000). Mortality, space, and the power of wind-energy landscapes. *Geographical Review, 90*, 384-386.

Person, R. (2020, February 03). *Giant wind projects draw strong opposition from rural residents and tribal members: Deadline for comments is today*. East County Magazine. https://www.eastcountymagazine.org/giant-wind-projects-draw-strong-opposition-rural-residents-and-tribal-members-deadline-comments

Pew Research Center. (2015). *American, politics and scientific issues*. Retrieved from http://www.pewinternet.org/files/2015/07/2015-07-01_science-and politics_FINAL.pdf

Pierce, J.C., Steel, B.S., & Warner, R.L. (2009). Knowledge, culture, and public support for renewable-energy policy. *Comparative Technology Transfer and Society, 7*(3), 270-286. doi: 19.1353/cct.0.0047

Prickett-Baker, J. & Ozaki, R. (2008). Pro-environmental products: Marketing influence on consumer purchase decisions. *The Journal of Consumer Marketing, 25*(2), 281-293.

Probst, B., & Berenson, L. (2014). The double arrow: How qualitative social work researchers use reflexivity. *Qualitative Social Work, 13*(6), 813-827. doi: 10.1177/1473325013506248

Rand, J., & Hoen, B. (2017). Thirty years of North American wind energy acceptance research: What have we learned? *Energy Research & Social Science, 29*, 135-148. doi: 10.1016/j.erss.2017.05.019

Rasmussen, E.E., & Ewoldsen, D.R. (2016). Treatment via television: The relationship between watching Dr. Phil and viewers' intentions to seek mental health treatment. *Journal of Health Communication*, 1-9. doi: 10.1080/10810730.2015.1114054

Rayner, S. (1992). Cultural theory and risk analysis. In S. Krimsky & D. Golding (Eds.) *Social theories of risk*. Westport, CT: Praeger.

Robbins, R., & Niederdeppe, J. (2015). Using the integrative model of behavioral prediction to identify promising message strategies to promote healthy sleep behavior among college students. *Health Communication, 30*(1), 26-38.

Rockport Analytics. (2018). 2018 Tourism in the Florida Keys & Key West: Stable growth despite challenging times. Retrieved from https://www.monroecounty-fl.gov/DocumentCenter/View/21667/Economic-Impact-of-Tourism-in-The-Florida-Keys-?bidId=

Scannell, L, & Gifford, R. (2013). Personally relevant climate change: The role of place attachment and local versus global message framing in engagement. *Environmental and Behavior, 45*, 60-85.

Scannell, L., & Gifford, R. (2010). The relations between natural and civic attachment and pro-environmental behavior. *Journal of Environmental Psychology, 30*, 289-297.

Scheener, K., & McGinn, A. (2019). *Jobs in renewable energy, energy efficiency, and resilience (2019).*https://www.eesi.org/files/FactSheet_REEE_Jobs_0719.pdf

Scheufele, D.A., & Lewenstein, B.W. (2005). The public and nanotechnology: How citizens make sense of emerging technologies. Journal of Nanoparticle Research, &, 659-667. doi: 10.1007/s11051-005-7526-2

Schively, C. (2007). Understanding the NIMBY and LULU phenomena: Reassessing our knowledge base and informing future research. *Journal of Planning Literature, 21*(3), 255-266. doi: 10.1177/0885412206295845

Schmitz Jr, W.J., & Richardson, W.S. (1968). On the transport of the Florida Current. *Deep Sea Research and Oceanographic Abstracts, 15*(6), 679-693.

Shaw, K., Hill, S.D., Boyd, A.D., Monk, L., Reid, J., & Einsiedel, E.F. (2015). Conflicted or constructive? Exploring community response to new energy developments in Canada. *Energy Research & Social Science, 8*, 41-51. doi: 10.1016/j.erss.2015.04.003

Shove, E. (2010). Beyond the ABC: climate change policy and theories of social change. *Environment and Planning A, 42*(6), 1273-1285. doi: 10.1068/a42282

Sidiras, D.K., & Koukios, E.G. (2004). Solar systems diffusion in local markets. *Energy Policy, 32*(18), 2007-2018.

Smith, H., Smythe, T., Moore, A., Bidwell, D., & McCann, J. (2018). The social dynamics of turbine tourism and recreation: Introducing a mixed-method approach to the study of the first US offshore wind farm. *Energy Research & Social Science, 45*, 307-317. doi: 10.1016/j.erss.2018.06.018

Sniehotta, F.F., Presseau, J., & Araújo-Soares. V. (2014). Time to retire the theory of planned behavior. *Health Psychology Review, 8*(1), 1-7.

Solar Energy Industries Association. (2020). State Solar Fact Sheet. Retrieved from https://www.seia.org/sites/default/files/2020-03/Florida.pdf

Sousa Lourençco, J., Ciriolo, E., Rafael Almeida, S., & Troussard, X. (2016). *Behavioural insights applied to policy: European Report 2016* (EUR 27726 EN). Brussels, Belgium: European Commission Joint Research Centre. doi: 10.903938

Sovacool, B.K. (2009). The cultural barriers to renewable energy and energy efficiency in the United States. *Technology in Society, 31*, 365-373.

Stajkovic, A.D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin, 124*, 240-261.

Stedman, R.C. (2002). Toward a social psychology of place: Predicting behavior from place-based cognitions, attitude, and identity. *Environmental and behavior, 34*(5), 561-581.

Steel, B.S., Smith, C., Opsommer, L., Curiel, S., & Warner-Steel, R. (2005) Public ocean literacy in the United States. *Ocean & Coastal Management, 48*(2), 97-114.

Sterling, S. (2001). *Sustainable education: Re-visiting learning and change. Schumacher Briefings*. Schumacher UK: CREATE Environmental Centre

Stokes, C., Beaumont, E., Russell, P., & Graves, D. (2014). Anticipated coastal impacts: What water-users think of marine renewables and why. *Ocean & Coastal Management, 99*, 63- 71. doi: 10.1016/j.ocecoaman.2014.04.003

Suldovsky, B. (2016). In science communication, why does the idea of the public deficit always return? Exploring key influences. *Public Understanding of Science, 25*(4), 415-426. doi: 10.1177/0963662516629750

Tabernero, C., & Hernández, B. (2011). Self-efficacy and intrinsic motivation guiding environmental behavior. *Environment and Behavior, 43*(5), 658-675. doi: 10.1177/0013916503797 59

Tabernero, C., & Wood, R.E. (1999). Implicit theories versus the social construal of ability in regulation and performance on a complex task. *Organizational Behavior and Human Decision Processes, 78*, 104-127.

Taub, D. (2010). Effects of rising atmospheric concentration of carbon dioxide on plants. *Nature Education Knowledge, 3*, 21.

Tilbury, D. (1995). Environmental education for sustainability: Defining the new focus of environmental education in the 1990s. *Environmental Education Research, 1*, 195-212.

Tourism Development Council. (n.d.). Tourism development council (TDC). https://www.monroecounty-fl.gov/328/Tourist-Development-Council-TDC

Tuan, Y. (1977). *Space and place: The perspective of experience*. Minneapolis: University of Minnesota Press.

Uhlenhuth, K. (2020, June 17). *In Iowa, conservative group looks to counter local wind, solar opposition*. Energy News Network. https://energynews.us/2020/06/17/midwest/in-iowa-conservative-group-looks-to-counter-local-wind-solar-opposition/

VanZwieten, J., McAnally, W., Ahmad, J., Davis, T., Martin J., Bevelhimer, M., Cribbs, A., Lippert, R., Hudon, T., Trudeau, M. (2015). *In-stream hydrokinetic power: Review and appraisal*. Journal of Energy Engineering, 41(3), 04012024

Vorkinn, M., & Riese, H. (2001). Environmental concern in a local context: The significance of place attachment. *Environmental and Behaviour, 34*, 249-263.

United Nations Environmental Program. (2013). Green economy and trade – trends, challenges, and opportunities. Retrieved from https://www.google.com/url?q=http://web.unep.org/greeneconomy/sites/unep.org.greeneconomy/files/field/image/fullreport.pdf

U.S. Census Bureau. (2019a). 2019 Population Estimates. https://www.census.gov/searchresults.html?searchType=web&cssp=SERP&q=florida%20population%20number%20by%20county

U.S. Census Bureau (2019b). QuickFacts Monroe County, Florida. https://www.census.gov/quickfacts/monroecountyflorida

U.S. Energy Information Administration. (2019a). U.S. energy facts explained. Retrieved from https://www.eia.gov/energyexplained/us-energy-facts/

U.S. Energy Information Administration. (2019b). Monthly energy review (April, 2019). Retrieved from https://www.eia.gov/energyexplained/us-energy-facts/

Weber, E.U. (2017). Breaking cognitive barriers to a sustainable future. *Nature Human Behaviour, 1*, 0013. doi: 10.1038/s41562-016-0013

Weller, S.C., Vickers, B., Russell Bernard, H., Blackburn, A.M., Borgatti, S., Gravlee, C.C., & Johnson, J.C. (2018). Open-ended interview questions and saturation. *PLoS one, 13*(6), e0198606. doi: 10.1371/journal.pone.0198606

WEO, IEA. (2011). International Energy Agency (IEA), 2011. *World Energy Outlook, Special Report.*

West, J., Bailey, I., & Winter, M. (2010). Renewable energy policy and public perceptions of renewable energy: a cultural theory approach. *Energy Policy, 38*, 5739-5748. doi: 10.1016/j.enpol.2010.05.024

Whitehouse. (2014). All-of-the-Above Energy Strategy for economic growth. Retrieved from https://www.whitehouse.gov/sites/default/files/docs/clean_energy _record.pdf.

Whitehouse. (2019). Facts sheets: Donald J. Trump is unleashing American energy dominance. Retrieved from https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-unleashing-american-energy-dominance/

Wildavsky, A., & Dake, K. (1990). Theories of risk perception: Who fears what and why? *Daedalus, 119*(4), 41-60.

Williams, D.R., & Vaske, J.V. (2003). The measurement of place attachment: Validity and generalizability of a psychometric approach. *Forest Science, 49*(6), 830-840.

Wiser, R.H., & Bolinger, M. (2019). *2018 Wind technologies market report*. DOE/GO-10201905191. Berkeley, CA: Lawrence Berkeley National Laboratory.

Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior, 27*, 591-615. doi: 10.1177/109019810002700506

Wolsink, M. (2006). Invalid theory impedes out understanding: A critique on the persistence of the language of NIMBY. *Transactions of the Institute of British Geographers, 31*(1), 85-91.

Wrench, J. (2017). The importance of listening in effective communication. Retrieved from https://brewminate.com/the-importance-of-listening-in-effective-communication/

Wright, G.W. (2013). Ocean energy: a legal perspective. *Journal of Ocean Energy, 8*(1), 26-32.

Yzer, M. (2012). The integrative model of behavioral prediction as a tool for designing health messages. *Health and communication message design: Theory and practice*, 21-40.

APPENDIX A

IN-DEPTH INTERVIEW QUESTIONS FOR RESIDENTS OF THE FLORIDA KEYS

1. What is your favorite part of living in the Florida Keys?
2. How long have you been living in the Florida Keys?
3. What do you know about your power supply (How you get the power for your home)?
4. How do you feel about the cost of your monthly power bill?
5. What comes to mind when I say renewable energy?
6. Do you know of any renewable energy examples in the Florida Keys?
7. Where did you find this information?
    a. If no, where would you go to find this information?
8. What do you know about Solar Energy?
    a. Where did you find information?
    b. What are your thoughts on expansion of solar power in the Florida Keys?
    c. Why or why not?
    d. What do you think the benefits or detriments would be?
    e. What regions would benefit most from it or what areas would be most impacted by it?
9. What do you know about Wind Energy?
    a. Where did you find this information?
    b. What are your thoughts on expansion of offshore wind in the Florida Keys?
    c. Why or why not?

   d. What do you think the benefits or detriments would be?
   e. What regions would benefit most from it or what areas would be most impacted by it?

10. What do you know about Hydrokinetic Energy? (Explain tidal and current if clarification is needed)
   a. Where did you find this information?
   b. What are your thoughts on expansion of offshore wind in the Florida Keys?
   c. Why or why not?
   d. What do you think the benefits or detriments would be?
   e. What regions would benefit most from it or what areas would be most impacted by it?
11. Who in your life would support marine renewable energy in the community?
   a. Why would this person support you?
   b. How important is this person's opinion to you?
12. Who in your life would not support marine renewable energy in the community?
   a. Why would this person not support you?
   b. How important is this person's opinion?
13. What things would make it easier to support marine renewable energy in the community?
   a. Do you see any examples of this in your community?
   b. How would you achieve this?

14. What things would make it more difficult to support marine renewable energy in the community?
    a. Are there any examples you currently deal with in the community?
    b. What are some barriers that make it challenging for you to envision MRE in the Florida Keys?
15. How politically active do you consider yourself?
    a. Example activities?
16. Who did you vote for in the last election? Or who would you have voted for (if they didn't vote)?
17. What actions would you be willing to take if there was a project proposed in your area?
18. Is there anything you'd like to add that we haven't discussed?
19. Do you know anyone else in the Keys that might being willing to participate in the survey?

APPENDIX B

IN-DEPTH INTERVIEW QUESTIONS FOR RESIDENTS OF THE PANAMA CITY REGION

1. What is your favorite part of living in the Panama City Region?
2. How long have you been living in the Panama City Region?
3. What do you know about your power supply (How you get the power for your home)?
4. How did you feel the power resiliency was after Hurricane Michael?
5. How do you feel about the cost of your monthly power bill?
6. What comes to mind when I say renewable energy?
7. Do you know of any renewable energy examples in the Panama City Region?
8. Where did you find this information?
    a. If no, where would you go to find this information?
9. What do you know about Solar Energy?
    a. Where did you find information?
    b. What are your thoughts on expansion of solar power in the Panama City Region?
    c. Why or why not?
    d. What do you think the benefits or detriments would be?
    e. What regions would benefit most from it or what areas would be most impacted by it?
10. What do you know about Wind Energy?
    a. Where did you find this information?

   b. What are your thoughts on expansion of offshore wind in the Panama City Region?
   c. Why or why not?
   d. What do you think the benefits or detriments would be?
   e. What regions would benefit most from it or what areas would be most impacted by it?

11. What do you know about Hydrokinetic Energy? (Explain tidal and current if clarification is needed)
   a. Where did you find this information?
   b. What are your thoughts on expansion of offshore wind in the Panama City Region?
   c. Why or why not?
   d. What do you think the benefits or detriments would be?
   e. What regions would benefit most from it or what areas would be most impacted by it?
12. Who in your life would support marine renewable energy in the community?
   a. Why would this person support you?
   b. How important is this person's opinion to you?
13. Who in your life would not support marine renewable energy in the community?
   a. Why would this person not support you?
   b. How important is this person's opinion?
14. What things would make it easier to support marine renewable energy in the community?

   a. Do you see any examples of this in your community?
   b. How would you achieve this?

15. What things would make it more difficult to support marine renewable energy in the community?
   a. Are there any examples you currently deal with in the community?
   b. What are some barriers that make it challenging for you to envision MRE in the Panama City Region?
16. How politically active do you consider yourself?
   a. Example activities?
17. Who did you vote for in the last election? Or who would you have voted for (if they didn't vote)?
18. What actions would you be willing to take if there was a project proposed in your area?
19. Is there anything you'd like to add that we haven't discussed?
20. Do you know anyone in the Panama City Region that might being willing to participate in the survey?