

A Current Look at Marine Renewable Energy in Oregon:
Oregon MRE Policy and the role of Public Perception and Participation in Oregon's MRE Future

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Abstract

To meet growing energy demands and climate change goals, the use of renewable energy is increasingly becoming a policy priority globally, nationally, and at the state levels. In Oregon, the use of marine renewable energy and offshore wind remains part of this discussion but has yet to result in operational installations. Social science research on renewable energy looks at how public perceptions, place attachment, and public participation play a role in the success of projects pointing to the role of early public engagement and participation and understanding of local attachments to the place as part of public views and attitudes towards renewable energy projects. Looking more closely at these areas in Oregon along with an understanding of current MRE policy, will perhaps offer insights into an aspect of offshore renewable energy feasibility in Oregon.

Looking at recent survey data, interviews with stakeholder organizations, and existing policy indicate that participation and place attachment are important elements of current Oregon marine renewable energy considerations. In a survey on wave energy perceptions, Oregon respondents indicated strong coastal attachment regardless of ideology, age, or distance to coast, and even though the majority of respondents visited the coast on a monthly or less basis. Oregon's policy framework for offshore renewable energy is fully formed but remains largely untested as only one pilot and one research wave facility have received approval. While federal and state entities share jurisdiction on MRE approvals, Oregon plays a leading role in determining the fate of projects off its coast. Interviews and documents indicated a proactively formed precautionary policy towards MRE which consulted the large number of MRE and ocean stakeholders. While the MRE application and approval process requires public engagement and comment periods, interviews indicated that consideration of local inputs prior to the approval process was desired to ensure an equitable distribution of benefits and to have concerns fully considered. Results indicate early and meaningful engagement of stakeholder views will be crucial for MRE projects in the future.

1. Introduction

The Oregon coast holds some of the highest offshore wind and wave energy potentials on the West Coast and in the United States (ODOE 2020). Known for unspoiled views and rocky beaches, Oregon relies on its natural surroundings and resources for much of its economic activity and wellbeing?. This close connection to nature characterizes much of the Pacific Northwest, placing natural resources at the center of the region's identity and resource management policies. In Oregon, the nineteen Statewide Land Use Planning Goals, centered around citizen participation (Goal 1), enshrine the protection and conservation of natural resources and existing or traditional activities which rely upon the continued existence and health of those natural resources. This is true of both terrestrial and ocean resources with the latter providing for a robust fishing industry, recreational activities, and tourism (ODFW 2016).

With increasing efforts to combat climate change impacts through carbon emission mitigation, the exploration of carbon-free renewable energy sources has increased. While alternative energy options have developed over the years, they carry with them inherent space use conflict potential as many renewable energy sources – like wind and solar – require siting that could potentially overlap with key existing uses such as agriculture for terrestrial installations and commercial fishing in offshore areas. Marine renewable energy (MRE) is one of the renewable energy options which looks to the ocean for siting and raises potential use conflicts with existing activities and conservation efforts in the process. Questions remain around the potential economic and environmental impacts of MRE installations. In the policy context, while the use of renewable energy is linked to reducing environmental impacts of carbon emissions, pursuing climate action through increasing the use of renewable energy sources is not always inherently compatible with protection and conservation given the potential for space use conflicts in the siting of renewable energy facilities.

Public perception of climate change and renewable energy has evolved over the years with increasingly positive views on climate change action in general. However, as seen with

several projects facing local opposition, this does not always translate to successfully building renewable infrastructure (Henkel 2013, Haggett 2010, Rand 2017, Devine-Wright 2010). Often simplistically attributed to NIMBYism (not in my backyard), or that communities simply don't want something within their field of view, research indicates that opposition to renewable energy installations is more complicated and varies depending on the local situation (Hazboun 2020, Haggett 2010, Rand 2017). Oregon's diverse political spectrum, connection to natural resources, and the centrality of citizen involvement in Oregon's land use planning system make the increased siting of renewable energy facilities in-state a complex policy discussion.

MRE has played an important part in this policy discussion. Spurred by interest in Oregon MRE projects in 2006, especially wave energy installations, which coincided with evolving federal regulations on offshore renewable energy development, Oregon drafted its own policy and procedures for developing renewable energy facilities. Even with this policy evolution, since 2006 only one wave test facility has been installed in Oregon's territorial sea (within 3 nmi from shore) and one wave energy research facility has been approved on the Outer Continental Shelf (OCS) outside of Oregon's territorial waters. However, interest in Oregon waters for siting of offshore renewable energy projects persists with the expansion of offshore wind projects in the United States and the high wind energy potential off Oregon's shores.

Considering the potential role that MRE can play in Oregon's production of clean energy in the broader context of climate change mitigation efforts, a closer look at the current status of MRE policy in Oregon and public opinions affecting its use is warranted. In order to understand how Oregon's MRE policy and position on its development has evolved since 2006, I look at key state and federal policy documents and review process documents for MRE activity in Oregon to understand the evolution of current policies and construct a timeline of key events. Using this, I consider semi-structured interviews of some key MRE organizations and stakeholders to compare this with the document review and understand how organizations participate and

include citizen input in the policy process. I compare this with the questionnaire data indicating Oregon respondents' views on MRE, renewable energy, and the importance of the Oregon coast and industries. These discussions follow a review of literature on public perceptions of renewable energy and how this often reflects place attachment and identity. An exploration of place attachment theory links to citizen participation in planning of renewable energy facilities and how this, in turn, impacts evolving public perceptions around development of renewable energy facilities.

A consideration of these elements allows a discussion of how the Oregon MRE situation, and potential future development, might benefit from understanding the views of residents around place attachment, renewable energy, and how citizen input is regarded in the policy process. While an understanding of the overarching policy at the federal and state level is imperative to understand the "how" of building offshore renewable energy infrastructure, consideration of these elements related to the citizens most directly impacted by the development will add to the "why" of renewable energy expansion. Finally, I will consider how this impacts the feasibility of potential offshore renewable energy development in Oregon.

2. Background

2.1 Federal and State Approaches to Ocean Based Solutions to Climate Change

Much of the United States' federal policy on climate change mitigation has been inconsistent, with most statutory moves resulting at the state level. Oregon's current climate policy includes a renewable production standard (RPS) for large utilities – those that provide 3% or more of total state retail electricity sales – to have 50% of their power generated by renewable sources by 2040 (ODOE 2020), and a statewide greenhouse gas emissions reduction goal of 45% below 1990 levels by 2035 and 80% below by 2050 (EO 20-04).

Recently, the federal government has also shown renewed movement on climate change. On January 27, 2021, the Biden Administration announced Executive Order (EO) 14008 "Tackling the Climate Crisis at Home and Abroad." This federal policy notably directed

the United States to rejoin the Paris Agreement and established a Special Presidential Envoy for Climate, a White House Office of Domestic Climate Policy, and a National Climate Task Force effectively elevating the issue of climate change to a national priority. Specific to offshore energy and public lands use for energy generation, it directs the relevant agencies to increase renewable energy production on those lands and waters and a pause, as possible, on oil and gas leases, pending a review to include climate impact considerations and recommend action to account for corresponding climate costs. (EO 14008) At the same time, the EO directs the conservation of 30 percent of the United States' land and waters by 2030. Since the EO's release, the Biden Administration has given other positive signals in support of offshore renewable energy development with the appointment of the former Rhode Island Governor Raimondo, a supporter of offshore renewable energy, as Secretary of Commerce, which has jurisdiction over several marine activities, and setting a target of deploying 30 gigawatts of offshore wind by 2030. (Rhode Island 2020, White House 2021)

While oceans play a central piece of the climate change policy discussion, they are not immune to the effects of climate change, the global ocean is seeing rising temperatures, rising levels of acidification as oceans absorb more than a quarter of annual carbon dioxide emissions and increasing deoxygenation. Regardless, offshore renewable energy production, especially offshore wind, is noted in Biden's recent EO on climate change, and National Renewable Energy Laboratory (NREL) reports document offshore wind and wave energy potential as higher than terrestrial potentials and more consistent (Kilcher et al. 2021).

2.2 Ocean as Energy Resource: From Oil to MRE

Much of the regulations and laws on ocean management formed in response to the oil industry. Offshore oil exploration started as early as the 19th century, but began in earnest after President Eisenhower signed into law the Submerged Lands Act (SLA) and the Outer Continental Shelf Lands Act (OCSLA) of 1953 which declared the outer continental shelf (also referred to as the Exclusive Economic Zone, or EEZ) - from 3 nmi offshore to the edge of the

continental shelf - seabed and its resources under U.S. jurisdiction. This created certainty, at least in the view of U.S. courts of law, that exploration of the seabed in deep waters for oil and minerals was considered lawful. This was responding to the 1950's post war boom demand for energy, as the law stated it's goal was to "meet the urgent need for further exploration and development of the oil and gas deposits of the submerged lands of the outer continental shelf" (Baur 2015 p.393). The law also delegated the Secretary of the Interior authority to offer leases on the OCS, with proceeds going directly to the Treasury Department (Baur 2015), an authority with remains today and applies to MRE projects in the OCS.

Over the years, key events in the offshore oil industry continued to shape federal policy and regulations including demonstrating the need for balancing environmental protection with increasing demand for reliable domestic energy as highlighted by the Santa Barbara 1969 oil spill and the 2010 Deepwater Horizon accident. The 1978 OCSLA Amendments codified environmental protections and prohibited the export of OCS oil and gas, among other revisions that enhanced oversight, safety standards, and environmental safeguards. The Deepwater Horizon accident ended up creating the current Bureau of Ocean Energy Management (BOEM) in 2011 after a review of the Department of Interior Minerals Management Service (MMS) which oversaw the increased Gulf of Mexico offshore operations after the 2008 OCS lease moratorium lifting (which had been in place since 1990). It is worth noting that the lifting of the moratorium is attributed to public outcry over high fuel costs (Baur).

2.3 Evolution of Marine Renewable Energy Policy

Marine renewable energy (MRE) typically includes wave, tidal, and other technologies which create energy from ocean resources. Offshore wind is not part of this definition. However, it falls under much of the same regulations when it comes to leasing and state offshore renewable energy policies. It also played a significant role in urging the creation of federal policies and procedures for offshore renewable energy. The first proposed offshore renewable energy project was Cape Wind in the Nantucket Sound in November 2001 ("Cape Wind" n.d.). As an

emerging technology, the jurisdictional authority was unclear and the original lead federal agency was the U.S. Army Corps of Engineers. The resulting jurisdictional discussions resulted in clarifications enacted in the Energy Policy Act of 2005 (EPAct) which added offshore renewable energy projects on the OCS to the Secretary of the Interior's authorities, which is delegated to BOEM.

While this settled offshore wind, hydrokinetic energy projects such as wave and tidal installations still required clarification. Under the Federal Power Act (FPA) of 1920, the Federal Energy Regulatory Commission (FERC) held authority over non-federal hydropower projects in navigable waters. As such, early wave energy projects on the coast of Oregon pursued preliminary permit approvals from FERC. The majority of the applications for wave energy installations were within Oregon's territorial sea, avoiding the need for a BOEM OCS lease. This changed with a November 2006 application for a Coos County Offshore Wave Energy Project located 2-4 miles off the southern Oregon coast, spanning both territorial sea and the OCS. The previous form of BOEM – the Minerals Management Service (MMS) – lodged a January 2007 protest disputing FERC's authority to grant a permit to the project given its proposed presence in federal waters (FERC docket 12752, 1/30/2007). This overlap in jurisdiction was further clarified in a 2009 memorandum of understanding (MOU) between FERC and the Department of the Interior, effectively granting BOEM leasing authority for all renewable energy projects in the OCS, including hydrokinetic, and FERC the licensing authority for hydrokinetic projects in the OCS and in state waters (MOU 2009).

2.4 Federal-State Balance in Ocean Governance: State has Strong Voice, Includes Local Impact

Federal and state level agencies share jurisdiction and governance of the ocean space, as outlined in various policy documents. Roles are well defined and have evolved over time to reflect changing uses of and concerns around the ocean space. Figure 1 outlines the federal-

state jurisdictional relationship offshore. Figure 2 lists the key documents for ocean governance and notes any expressed goals and priorities for the given legislation, policy, or guidance.

Perhaps the most central document for current ocean management and policy decisions is the Coastal Zone Management Act (CZMA) of 1972. As Oregon is part of the CZMA, it has a say in offshore projects with potential effects on Oregon's territorial sea. As a CZMA requirement, Oregon maintains a coastal management policy which outlines goals that focus on conserving and protecting coastal and marine resources. Federal policy and regulation confers the state authority to enforce this (figure 2).

Process Required	Location (OR)	
	OCS (3-200 nmi from coast)	State Territorial Sea (within 3 nmi from coast)
FERC License/ Permit	Hydrokinetic projects – Yes	Hydrokinetic Projects – Yes
BOEM Lease	Yes	No
State Lease	No	Yes
Federal Consistency Review	Yes – for areas in GLD	Yes

Figure 1. Offshore Renewable Energy Project Authorities Off Oregon Coast

The delineation of the state territorial sea (three nautical miles from shore) and federal waters (which extends to 200 nautical miles from shore) relies on the 1953 acts of the Outer Continental Shelf Lands Act (OCSLA), the Submerged Lands Act (SLA), and the Coastal Zone Management Act (CZMA). These acts served to set state territorial sea borders and divide management responsibilities of federal and state agencies. Under the CZMA, the state is delegated authority over its territorial sea through an approved Coastal Management Plan (CMP) determined and drafted by the state and approved federally by NOAA's Office of Coastal Management.

Oregon's NOAA approved CMP includes the TSP and its amendments, Land Use Planning Goals 16-19 which address coastal zone management priorities, and the Geographic Location Description (GLD). These approved documents offer Oregon a voice in projects under consideration off Oregon's shores - even those in federal waters given the potential impacts on the State's Ocean Stewardship Zone which state agencies are tasked with managing under the Oregon Ocean Resource Management Act. Notably, Oregon is the only state with an approved GLD which is specific to marine renewable energy projects in federal water areas defined in the GLD – should a project be proposed in these defined sites, or anywhere in the state's territorial sea, the State would conduct a Federal Consistency Review of the project. The Consistency review process would study the potential impacts of the project and determine if the project is consistent with Oregon's CMP policies and goals as set forth in the TSP, Goals 16-19, and the GLD.

Oregon Executive Order (EO) 08-07 issued in March 2008 added another element to the wave energy churn. It directed state agencies to consider the needs of coastal residents when planning wave energy projects. As an effort to establish state marine reserves was occurring simultaneously, there was concern over the cumulative impacts on Oregon ocean resources, as mentioned in the EO. The EO also directed the Department of Land Conservation and Development (DLCD) to start drafting TSP part 5, which would eventually become part of the state's federally approved CMP.

	Document	Type	Purpose/Authority	Goal (if any)
Federal	Federal Power Act (1920) 16 USC 792-823a (Section 797. General Powers of Commission)	Law	Establishes FERC authority over power regulation and hydrokinetic projects	
	Truman Proclamation (Proclamation no. 2667, EO 9633)	Law	U.S. claims subsoil and seabed of continental shelf contiguous to U.S. as under U.S. jurisdiction	Coastal nation self-protection and encourage exploration for new petroleum and minerals sources
	Outer Continental Shelf Lands Act 43 USC 29.III.1331 (1331. Congressional declaration of policy)	Law	Defines the OCS as all submerged lands seaward of state coastal waters (3 mi offshore) and under U.S. jurisdiction	
	Submerged Lands Act – 43 USC 1301	Law	Gives title of territorial sea to states, in most cases 3 nmi from the shore	To promote exploration and development of petroleum deposits in coastal waters
	CZMA 16 USC 1456	Law	Provides for management of the nation's coastal resources including the National Coastal Management Program	To encourage state management of coastal waters
	Energy Policy Act (2005) 42 USC 13201	Law	Included enactment of OCSLA amendment giving Sec. of Interior authority to issue OCS lease, easement, right-of-way for activities not otherwise authorized by OCSLA such as energy sources other than oil and gas	
	Executive Order Tackling the Climate Crisis at Home and Abroad (EO 14008)	Law	Direction for climate change mitigation actions including increasing renewable energy production on public lands – terrestrial and sea.	
	FERC – Department of Interior MOU (2009)	Regs/ Admin	MMS (then BOEM) will issue leases, easements, and rights-of-way for OCS energy projects, including hydrokinetic. FERC will issue licenses for OCS hydrokinetic projects, but not preliminary permits.	Develop a cohesive, streamlined process that would help accelerate development of renewable energy projects (solar, wind, hydrokinetic) on the OCS.
	FERC – Oregon MOU (2008)	Regs/ Admin	FERC and OR will coordinate on wave energy in the territorial sea; allow for a pilot project license.	Allow shorter-term, experimental projects with environmental safeguards.
	30 CFR 585 – BOEM Process for Renewable Energy Leases	Regs/ Admin	Outlines process for BOEM leases for renewable energy projects	
	15 CFR 930 – Federal Consistency with Approved Coastal Management Programs	Regs/ Admin	Establishes authorities for state level coastal management programs and the federal consistency review process	
State	18 CFR Part 4&5 – FERC Licensing Regulations	Regs/ Admin	Outlines FERC licensing procedures and authorities	
	Handbook of Marine Hydrokinetic Regulatory Processes, June 2019, DOE Water Power Technologies Office	Guidance	Prepare hydrokinetic developers and stakeholders to navigate the permit process for OCS projects	
	CZMA Federal Consistency Overview, NOAA Office for Coastal Management (Section 307 of the Coastal Zone Management Act of 1972)	Guidance	Provides an overview of CZMA authorities for federal consistency	
	Citizen's guide to BOEM's Renewable Energy Authorization Process, December 2016	Guidance	Help the public understand BOEM process for renewable energy projects on the OCS	
	Oregon EO 08-07 Protecting Coastal Communities in Siting Marine Reserves and Wave Energy Projects	Law	DLCD to begin TSP amendment drafting before July 31, 2009 for wave energy siting	Balance needs of coastal communities and ocean users with economic development opportunities
	Oregon EO 20-04 Climate Action Order – Take Action to Reduce and Regulate Greenhouse Gas Emissions	Law	Sets state GHG emissions reduction goal to 45% below 1990 levels by 2035 and 80% by 2050 with specific actions for state agencies	Take action on climate change at the state level
	Oregon Planning Goals and Guidelines, Goal 19: Ocean Resources (OAR 660-015-0010(4))	Regs/ Admin	Tasks agencies to consider protection of ocean resources where natural phenomena and human uses can affect uses and resources of Oregon's territorial sea.	To conserve marine resources and ecological functions to provide long-term ecological, economic, and social value and benefits to future generations.
	Oregon Ocean Resource Management Act (ORS 196.425)	Regs/ Admin	Establishes Oregon's Coastal Management Program, OPAC, the TSP as Oregon's Ocean Resource Management Act	To ensure conservation and development of ocean resources affecting Oregon
	Oregon Territorial Sea Plan Part 5 (2019)	Regs/ Admin	Sets guidance for development of renewable energy in the territorial sea including specifying areas for siting	Protect renewable marine resources, ecosystem integrity, marine habitat and areas important to fisheries
	Oregon Geographic Location Description	Regs/ Admin	Gives federal consistency review for MRE projects in specified areas in federal waters	To give the state a voice in MRE projects occurring in federal waters adjacent to state territorial sea

Figure 2. Reviewed Policy Documents Overview

2.5 History of Oregon MRE Projects: Many Applied, Few Progressed

Figure 3 contains a summary of Oregon wave energy projects since 2006 and their current status or fates as indicated in the FERC elibrary. Of the nine wave energy projects which

applied for FERC approvals, only one is still in an active status - the PacWave South project (listed as PMEC-SETS) which is a fully approved, yet to be built, research project through the Pacific Marine Energy Center (PMEC) based at Oregon State University. Out of the nine projects which applied to FERC (not counting PMEC North Site as it was fully approved under State authority), only three progressed to the license application stage – Reedsport OPT, Coos Bay OPT, and PacWave South. The remaining projects ended in dismissed applications, surrendered permits, or withdrawn applications. The timeline and locations of these projects coincide with the Oregon's offshore renewable energy policies, and raised the awareness in the state around MRE as a potential new use of the ocean space for Oregon.

Project	Docket No.(s)	Distance from Shore	Prelim. Permit Request Date	Final Status	Other
Reedsport OPT Wave Park (Incl. Phase III)	P-12713/P-13666	2.5 mi	7/14/2006	Decommissioned 12/14/2017; permit surrendered 1/9/2018	Left behind concrete anchors, FERC requested removal 6/8/2016
Lincoln County Wave Energy Power Project	P-12727	3 nmi	8/17/2006	Application dismissed 4/4/2008	Request was for length of Lincoln County territorial sea
Douglas County Wave and Tidal Energy Project (County Commissioners)	P-12743/P-13722	3 mi	9/20/2006	Permit surrendered 5/29/2013	Application was originally for entire territorial sea along county coast, narrowed on location near mouth of Umpqua River
Coos Bay OPT Wave Park (Oregon Wave Partners I, LLC)	P-12749	2.5 mi	11/2/2006	Permit surrendered 6/11/2013	Submitted six month reports indicating they were supporting TSP amendment process
Newport OPT Wave Park (Oregon Wave Energy Partners II, LLC)	P-12750	3-6 mi	11/2/2006	Permit surrendered 3/17/2009	MMS protested OCS location of project 2/20/2007
AquaEnergy/Finavera Coos County Offshore Wave Energy Power Plant	P-12752	2-4 mi	11/22/2006	Preliminary Permit Cancelled 6/26/2008	MMS protested OCS location of project 1/30/2007; Prototype sank 11/2007
Florence Energetech American LLC	P-12793	.6-2.9 mi	4/16/2007	Application withdrawn 3/31/2008	
Tillamook Intergovernment Development Entity (TIDE) (Green Wave Energy Solutions)	P-13047	3 mi	10/1/2007	Permit surrendered 6/14/2010	
PMEC-South Energy Test Site (PMEC-SETS)	P-14616	6 nmi	4/15/2014	Issued ALT license 3/1/2021	
PMEC North Site	NA	2 mi		Active	Issued under state authority for test site, no FERC approval needed

Figure 3. Oregon Wave Energy Projects Since 2006

2.5.1 OR MRE Interest Piqued, Planning Concerns Spur FERC-OR MOUPublic

From July 2006 through 2007, eight preliminary permits for wave energy projects were requested, with six requested in the first five-month period. In response to this intense interest, which was nation-wide and not just in Oregon (O’Neil 2019), FERC held a Wave and Tidal Development Technical Conference (Docket AD06-13) in December 2006 to discuss the status of ocean-based hydroelectric technologies. The conference elicited response from Lincoln County’s Legal Counsel (Docket AD06-13, 12/19/2006) which noted that FERC had clearly defined itself as a regulatory agency, not a planning agency and raised the concern about “the lack of pre-project planning and direct involvement of stakeholder interests determining the appropriate location of these projects before a siting proposal is laid out.” The response from the Lincoln County Legal Counsel continued that “absent local involvement at the front end, we think you will unleash currents of opposition, possible litigation and unnecessary focus on fighting siting proposals rather than developing appropriate locations, which will slow down the process for many years.” This call for planning in advance of siting in order to avoid conflict with other ocean uses is mentioned in other letters of support and comment such as that filed by Lincoln County in support of the Florence Wave Park (Docket P-12793 8/10/2007).

FERC additionally published a request for inputs on the permitting process given the intense interest in wave energy projects (Docket RM 07-8), proposing preliminary permit application alternatives such as setting more strict boundaries, declining to issue permits altogether for new technologies, or continuing in the same manner. In March 2008, FERC signed a Memorandum of Understanding with the State of Oregon around Wave Energy which clarified the roles of FERC and the State and allowed for certain pilot projects in state waters without FERC permits.

2.5.2 Local Governments Get Creative on Planning

The Lincoln and Douglas County projects notably lodged preliminary permit requests for the entire territorial sea bordering their counties. Many criticized this as “site banking” but had wide support from all levels of government in an effort to study the area for the best siting option, which is consistent with concerns expressed in Lincoln County’s response to FERC’s lack of planning function. Lincoln County (Docket P-12727) eventually did not move forward with its project, while Douglas County identified a location near the mouth of the Umpqua River for an oscillating water column (Dockets P-12743, P-13722). Eventually, the permit was surrendered in 2013. However, this highlights the continued desire for local government participation in the planning process from the beginning.

2.5.3 Organizations Involved: Stakeholders and Public Participation

In addition to adding to a timeline of MRE projects (appendix 4) and policy evolution, the FERC docket showed organizations and stakeholders involved in MRE in Oregon. These are listed in appendix 2 which notes organizations mentioned in the FERC dockets and interviews. As involvement in the FERC process is one avenue for citizen participation, it is worth noting the spectrum of those engaged. While fishing organizations, tribal entities, county governments, local governments, industry, conservation groups, individual citizens, and others weighed in, the format for input in this process is very specific and often confined to comment periods. In a later discussion of citizen participation in policy, this will be an important aspect to consider.

3. Theoretical Framework

The success of renewable energy projects are dependent on a variety of factors from technical, economic, social, and others. Research on the barriers to renewables focuses on these areas, with a growing body of literature looking into the human dimensions of renewables which is defined as areas where human interactions are central, such as policy and regulation, siting decisions, or public perceptions. To add to this understanding of human dimensions in the context of Oregon MRE, this section outlines the existing research on public perceptions and how they connect with place attachment and public participation. Often linked to the success

and failure of renewable energy projects even more than technical barriers, this theory will frame the discussion of survey data and interviews.

3.1 Public Perception and Renewable Energy Projects

Public perceptions and opinion play an important part in policy and in the success of renewable energy projects with much documentation of project failures in face of public opposition (Rand and Hoen 2017, Firestone 2012, Henkel 2013). Much of the acceptance of renewable energy projects relate to both specific projects and towards policy promoting renewable energy in general. Each of these areas is important to understand for the formation of policy at all levels (the latter) and for the successful development of individual installations (the former). (Teisl 2015, Hazboun 2020)

Public perception research around renewable energy projects suggests common concerns for all technologies and on and off shore – impacts on local economies, environment, and visual impacts in addition to concerns about procedural fairness and threats to place attachment (Rand and Hoen 2017, Teisl 2015, Dreyer 2017, Haggett 2010). The literature firmly cautions against oversimplifying public response or potential opposition as NIMBY (not in my backyard) which is resoundingly regarded as insufficient to capture the context and nuance of public opinion (Haggett 2010, Devine-Wright 2009, Devine-Wright 2010). Equally, researchers caution against focusing on opposition to renewable energy development as something to simply counter or overcome – often simply attributed to “selfish” behavior or lack of sufficient information (Haggett 2010, Henkel 2013). The growing body of research on the human dimensions of MRE – which is dwarfed by the number of articles on the technical and deployment aspects of MRE (Ruano-Chamorro 2018) – offers a more nuanced understanding of what is behind public perceptions of MRE and renewable energy installations.

While common concerns emerge with public perception research around renewable energy development, and especially given the many uncertainties which still surround MRE

(Ruano-Chamorro 2018, Henkel 2013, Conway 2010), it also suggests that the public is not a homogenous group and opinions reflect local context and emotional attachments (Haggett 2010). Not only is there variation based on geography (Hazboun 2020), but also within groups as shown with time series surveys with communities throughout the lifecycle of projects (Dreyer 2017). This only emphasizes the necessity of continually engaging with the public to understand local context concerns and potential changing perspectives (Conway 2010, Haggett 2010).

Public perception research also points to this engagement as an aspect that influences opinions of renewable energy projects with sense of fairness in the process influencing its acceptance (Rand and Hoen 2017) and concerns around procedural and distributional justice (Dreyer 2017, Haggett 2010). Several authors suggest that the way to approach public perception is to not view it as an oppositional barrier to simply overcome, essentially trivializing the concerns of a community and missing the opportunity of understanding more about how renewable energy can work for a community and its best practices (Rand and Hoen 2017, Teisl 2015, Haggett 2010). This suggests that the importance of understanding a community's potential objections through understanding its context not only facilitates renewable energy development by addressing concerns that could potentially create opposition, but ensures that there is greater potential for the local community to benefit in the process. This means acknowledging local impact and concerns, and finding ways forward with the people rather than against it or in spite of it (Haggett 2010).

3.2 Role of Place Attachment

Public response to energy development in areas is often linked to emotional attachments to the place where development will occur, or place attachment. Defined as "emotional bonds that form between people and their physical surroundings" (Manzo 2013), they are often looked at to explain a community response or action around development, natural resource management, and climate change. A concept first published by Altman and Low in their 1992 book *Place*

Attachment regarding human behavior, it has since taken hold as an important topic for research and environmental design (Manzo 2013). While the definition of place attachment has evolved through its use in various fields, it is generally viewed as a complex phenomenon that includes emotional bonds between people and familiar locations they visit or inhabit (Altman & Low 1992).

In the context of the environment, place attachment has come into play to offer insights into local opposition to renewable energy installations, especially wind and offshore wind installations, often attributed to NIBMY. However, as mentioned previously, various researchers have discounted this terminology, seeing it as an oversimplification of a community or individual's response to development. Devine-Wright (2009) asserts that 'NIMBY' oversimplifies resistance to change as it relies on human rationality and often attributes reactions to ignorance, and, in doing so, downplaying local reactions and concerns. These reactions can be linked back to place attachment and identity and framed as a "place-protective" reaction (Devine-Wright 2009, Russell 2020). Place attachment theory further categorizes potential development as a disruption to the "place" as viewed by those attached to it, creating threats to emotional bonds and place-related identity, resulting in the place protective action seen expressed as opposition to renewable energy projects.

Further research explores the connections between place attachment and community planning and participation. The importance of a sense of place, as expressed by place attachment, influences how an individual and community will engage on planning processes. (Manzo 2006) Manzo and Perkins (2006) suggest that the disruptions to a place mentioned by Devine-Wright could create opposition to projects regardless of the potential benefits given the perceived threat to their relationship with their communities. In the context of Oregon marine renewable energy development, this is an important aspect to consider given the small communities which make up the Oregon coast and its identity as a recreation and tourism destination which also supports a robust fishing industry. Development of offshore

renewable energy facilities could indeed be perceived as disruptions to this identity and central activities.

Survey tools measuring place attachment use questions which gauge both how the individual sees their identity as part of a place, such as their emotional ties and symbolic meanings of locations, and their dependence upon a place for its attributes or characteristics (Perry et al 2014). In the context of how place attachment can inform views and potential opposition to new development, understanding coastal attachment in Oregon is important for considering the current setting for marine renewable energy and the potential areas where place protective actions can be expected around offshore development.

3.3 Citizen Participation

Understanding what makes a place important to a community is only a piece of the picture. Much research indicates that involving the citizens affected is a strong determinate in the success of the project (Henkel 2013). In place attachment applications around energy projects, they can be split into consideration of the process and the outcome (Devine-Wright 2009). The importance of the former is emphasized in the work by Manzo and Perkins (2006) in linking place attachment to the planning process and participation.

Just as NIMBY is regarded as overly simplistic in its assessment that most opposition is due to lack of knowledge, so does meaningful citizen participation go beyond simply sharing of information to increase acceptance. Although, this does not mean that keeping citizens informed does not have value. Investigations into the timing of keeping citizens informed about a project showed that the earlier residents learn about potential projects from official sources, the higher the chances were for support (Petrova 2015). Several studies have shown involving citizens throughout the process – from siting to construction – adds to the positive views of the project (Petrova 2015, Firestone 2020) and potentially ascribes it value for the community because of the participation of its citizens (Petrova 2015).

Citizen participation is not all created equal, as mentioned. Sherry Arnstein creates a ladder of citizen participation with eight levels from “manipulation” up to “citizen control” (Arnstein 1969). Arnstein states that citizenship participation means citizen power but notes there is a difference between going through a “ritual of participation” and having the power to affect the process. The eight steps in the ladder illustrate this with increasing roles and citizen power with each new step. The eight steps are called, in increasing order of citizen autonomy and power, manipulation, therapy, informing, consultation, placation, partnership, delegated power, and citizen control. The first two are deemed “nonparticipation,” the next three are “degrees of tokenism,” and the final three are “degrees of citizen power” (Arnstein 1969).

These varying levels of agency within citizen participation can be seen in the renewable energy field with public perception surveys around citizen approval of renewable energy projects. Studies around procedural justice, or how the public perceives fairness in a planning process, and best practices on public engagement emphasize the importance of early and meaningful public engagement in fostering acceptance (Wiersma 2014), although “meaningful” was not fully defined.

There is a growing body of literature on offshore wind endeavors in the east coast waters of the United States which looks at community response to offshore wind projects. Klain et al. (2017) found that good public engagement included providing community benefit and allowing a two-way flow of “learning.” The surveyed inhabitants indicated that the most effective decision processes were those where citizen values and technical expertise were exchanged between citizens, experts, and stakeholders, and where there was a negotiated community benefit (Klain et al. 2017). Both of these aspects indicate a more meaningful level of participation by the citizens in that they are not simply receiving information (a degree of tokenism on Arnstein’s scale), but having agency in the outcomes.

A separate study on the Block Island offshore wind installment also pointed to perceptions of fairness and transparency in the process (Firestone 2020) playing an important

role in acceptance of the project. Indeed, the perception of process fairness was a greater predictor than how an individual would be impacted directly or how the project might impact the place. In this case, the study found that a community liaison – a local citizen – was essential in connecting information between the community and the developer (Firestone 2020) and creating a sense of fairness and transparency essential to acceptance of the project.

While this may seem at odds with the importance of place attachment, it points to the necessity to understand the area where potential development will occur. Indeed studies into public perception of “unwanted” development from nuclear siting and waste disposal point to both as important factors (Pidgeon 2012). Pidgeon (2012) points to the effects of a lack of local benefit, as Klain et al also mention; threats to community identity or valued landscape, or place attachment; a distrust of outside agencies; and poor communication as driving local opposition or escalating concerns.

4. Methods

To assess the situation of MRE in Oregon, I deployed a mixed methods approach using semi-structured interviews and survey data analysis. I conducted a cursory document review using coursework and research on existing policy to identify key organizations in Oregon MRE policy as a starting point and used a snowball method for follow up interviews to ask questions about how the organizations viewed MRE and participated in MRE policy discussions. I then analyzed responses from 500 Oregon residents in a 2020 survey on perceptions of wave energy which included a question set on place attachment and renewable energy sources.

4.1 Data Collection

4.1.1 Semi-Structured Interviews

The interviews draw on the grounded theory approach of qualitative research by focusing on a specific process or action - in this case MRE policy in Oregon - to establish a theory for it (Creswell 2007). Grounded theory dictates that the study participants (interviewees) should have experienced the process in question and can add further explanation as to how it

functions in reality. While the purpose of this essay is not to test a theory but to explore existing policy and how it impacts MRE in Oregon, adding the real-life experience to what is known in policy and process documents offers a clearer assessment of the Oregon MRE policy space, and allows for analysis of how the process connects to the theory of public perception, place attachment, and public participation.

The semi-structured interviews of organizations included government agencies and offices at the federal, state and local levels, environmental and renewable energy development advocates, and others. I started with four individuals and used snowball sampling to determine the remaining 5 interviews for a total of 9 interviews. Due to time constraints, I did not interview every suggested organization representative, instead focusing on overlapping contact suggestions. Interviews were conducted remotely via online conferencing platforms from December 2020 through February 2021 and lasted on average 60 minutes, ranging from 40 to 80 minutes in length. A list of other organizations mentioned in interviews and documents are listed in appendix 2 and appendix 6 has a table of key organizations with defined roles and mandates.

Following an interview guide focused on the role of the organization in the policy process and the organization's views of MRE (Appendix 1), the interviews were recorded with the interviewees' consent and then transcribed for analysis purposes. Again, drawing from the grounded theory approach, I employed open coding and memoing for analysis of the interviews, identifying major themes that emerged and linking the information to the policy process as outlined from the document background research.

4.1.2 Survey Data

The survey data supplemented this policy framework picture with Oregon public perceptions of wave energy and opinions on energy sources. The survey resulted from a Spring 2020 PPOL 524 Applied Research Methods course, which was part of a class project on the human dimensions of wave energy (HDWE). The survey was sent via the online platform YouGov to

West Coast residents of California, Oregon, Washington, and British Columbia, and was funded by the Pacific Marine Energy Center (PMEC). There were over 2,000 responses, of which YouGov used 2,000 by matching respondents to a sampling frame based on demographics from the 2017 American Community Survey for the U.S. participants and the 2016 Census Public Use Microdata File for Canadian participants. The final sample had 500 residents from each state and province.

4.2 Analysis

4.2.1 Semi-Structured Interviews

The overarching themes of the policy process, the balance between state and federal roles, and the inclusion of citizen voices were clear from the interviews and included discussions of how the different stakeholders participated and interacted with policy makers, how the public participated in the policy process, the role of informal networks and interactions, the precautionary principles governing the approach to MRE in Oregon, the creation of MRE policy in Oregon, and the “right” time for MRE progress. Additionally, common to these theme areas were related discussions of equity such as ensuring equal access to reliable electricity throughout the state, ensuring equal access to public inputs into the policy process including from traditionally marginalized communities, and ensuring the equitable distribution of renewable energy benefits.

4.2.2 Survey Data

For this study, I only used the Oregon participant responses for analysis and focused on specific question sets (Appendix 7) in order to better understand the respondents in terms of key demographics (age, employment, and political ideology), place attachment, and views on renewable energy including wave energy. Considering the small sample size of 500 respondents, I focused on descriptive statistics and bivariate comparisons such as cross tabs and related analysis to determine statistical significance using a standard SPSS statistics

package. YouGov provided calculated weights for the data using propensity scores including age, gender, race/ethnicity, years of education, and region. Weights were used unless noted.

5. Results and Analysis

Interviews with organizations involved in MRE policy discussions confirmed the shared jurisdiction of the marine space between federal and state authorities and state preferences for planning and conservation as indicated in policy and process documents. Interviews also reinforced the strong role of the state in managing its territorial sea, as outlined in policy documents. Additionally, interviews indicated the importance of citizen participation and informal relationships in local level policy decisions while expressing concern that incorporating input is part of the process. Survey data suggests that Oregonian respondents have a low familiarity with wave energy, but have positive attitudes towards its development. Results also show strong agreement with coastal place attachment statements regardless of age or political ideology. Equally, survey participants indicated broad support for the increased use of renewable energy sources, including wave energy, in the future to meet electricity needs.

5.1 Interviews

5.1.1 Strong State Role and Desire for Early Local Consultation

Interview	Organization Type	Role
INT1	State Government	<i>Review of Federal Consistency Certifications</i>
INT2	Local Government	<i>Coastal County Commission</i>
INT3	NGO – Development	<i>Promoting use of wave energy</i>
INT4	NGO – Conservation	<i>Promoting conservation of ocean space</i>
INT5	State Government	<i>Coastal Management Program coordination with federal and state agencies</i>
INT6	NGO – Development	<i>Promoting renewable energy use in coastal community</i>
INT7	NGO – Development	<i>Promoting renewable energy use in coastal community</i>
INT8	Federal Government	<i>Coastal Management Program review authority</i>
INT9	Federal Government	<i>Regional review authority</i>

Figure 4. List of Interview Organizations

The nine interviews included two representatives from state government, one from local government, two from federal government, two from coastal NGOs supporting the development of offshore renewable energy, one from an NGO supporting the development of wave energy, and one from an NGO focused on conservation. The interviewees described their organization's role in MRE policy in Oregon, both historically and

currently, how their organization worked with other organizations on MRE policy, and any views held on MRE.

Interviewees mentioned key policy documents and organizations involved in MRE policy discussions and implementation. These frequency of mentions confirmed background research on the key documents and organizations. The most commonly mentioned document was the Territorial Sea Plan (TSP) and Oregon's Geographic Location Descriptor (GLD) and Planning Goal 19. (Figure 5) Respondents from the state government (INT5), federal government (INT8), and an NGO engaged in the drafting of the TSP (INT3) offered insights into the drafting process and the jurisdiction of the documents which were consistent with federal-state jurisdictional balances and included opportunity for input from stakeholders.

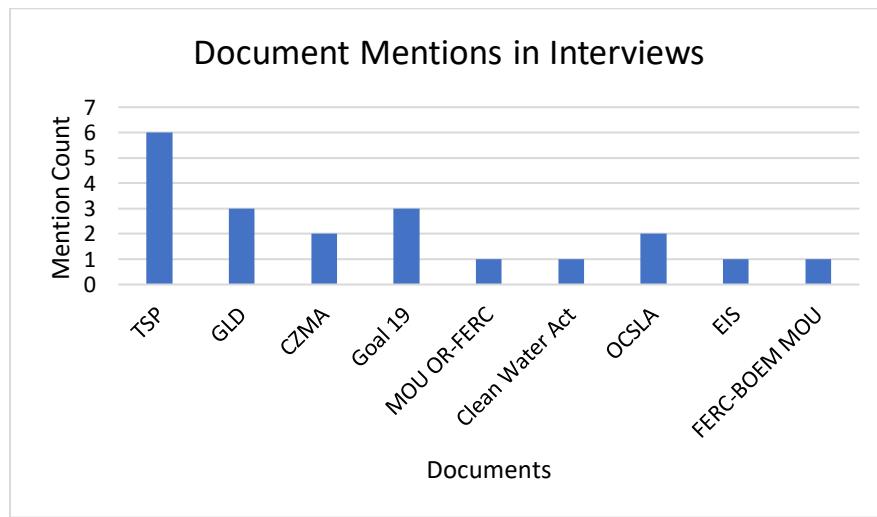


Figure 5. Document Mentions in Interviews (If mentioned at all, not frequency)

Organizations mentioned in more than one interview are listed in figure 6 with the number of interviews in which they were mentioned. The most commonly mentioned organization in MRE policy was BOEM followed by DLCD, OPAC, and FERC. Overall, the number of organizations mentioned in interviews indicates the large number of stakeholders involved in the MRE policy process confirms that the process matches what is in policy

documents, and reaffirms the importance of BOEM, FERC, DLCD, and OPAC to the MRE space in Oregon.



Figure 6. Organization Mentions in Interviews (If mentioned at all, not frequency)

5.1.2 Organization views on MRE: Neutral to “Need More Info”

In response to what their organization's view of MRE was currently, the responses included supportive of its use (3), neutral (4), and if it is done right or when we have more information (2). The responses were consistent with the roles of the organizations with government agencies and offices being neutral and renewable energy development NGOs in support. The other two, an environmental conservation group and local government, indicated a need for wanting more information and stressing the importance of “doing it right,” which related to ensuring sufficient public consultation and consideration of stakeholder views throughout MRE development.

5.1.3 Policy Process - Evolving Federal and State Jurisdiction

Interviews confirmed the evolution of federal and state policies around MRE as indicated in background policy documents, and often in response to a problem or event, such as the creation of BOEM after the Deepwater Horizon incident. On the state level, this meant the creation of TSP part 5 and the GLD to establish a state policy and procedure for MRE in response to citizen concerns about the cumulative impacts on ocean resources from MRE facilities without sufficient planning (Lincoln County letter to FERC, INT5). As the process documents indicate, coastal bodies recognized that FERC was not performing this role, thus necessitating the state's action (EO 08-07).

On the whole, these jurisdictions and review authority as outlined in policy documents give Oregon a strong voice in their coastal management, both within the territorial sea and in the adjacent OCS. This was confirmed in interviews, as one interviewee noted, Oregon is in the driver's seat when it comes to their coastal zone management (INT 8). This, in conjunction with the proactive TSP part 5 amendment drafting and GLD, firmly establishes the state's role in reviewing marine renewable energy projects off the coast of Oregon.

The federal-state jurisdiction balance evolution, as indicated in background research, was confirmed in interviews. From descriptions of how the federal consistency review process works (INT1, INT5, INT8, INT9) to comments on the realignment of BOEM away from oil and gas in the Gulf of Mexico to include offshore renewables around the country in the last decade (INT9), the interviews indicates a dynamic federal-state relationship in Oregon that is collaborative and in constant discussion (INT1, INT5, INT8, INT9).

5.1.3.1 Oregon MRE Policy and Political Support

The emergence of wave energy interest in Oregon started with a flurry of requests in 2006 and with support from the Governor (EO 08-07, INT3) and played a central role in Oregon MRE policy formation. The discussions at the local and state levels identified a need for developing policy for this new, potential use of the ocean space as seen with FERC docket comments in

2006 emphasizing the need for planning and consideration of local community inputs and the following Governor's EO 08-07, directing DLCD to draft the TSP part 5 (Use of the Territorial Sea for the Development of Renewable Energy Facilities or Other Related Structures, Equipment or Facilities). Drafted in consultation with the NOAA Office for Coastal Management (INT8), TSP Part 5 and the GLD were ultimately approved as part of Oregon's CMP, giving the state the desired seat at the table in order to proactively manage Oregon's territorial sea (INT5). Or, as more than one interviewee put it, to not be at the mercy of unsolicited BOEM lease requests (INT1, INT2, INT5, INT9) which would drive the process, instead of the state being at the helm.

The result after years of litigation and protests over the TSP part 5 drafting process (INT3, INT5), is a complete, if yet untested, MRE policy for Oregon that is consistent with Oregon land use goals and relies on a precautionary approach for allowing this new ocean use (TSP, INT1, INT3, INT5, INT8).

5.1.4 Local Government and Public Voices: Desire to be Considered Early and Often

Comments regarding the need for greater collaboration with local government and communities earlier in the process were common (INT2, INT3, INT6, INT7). Under Oregon's state political structure, county commissions oversee local regulations including for land use. These local governments have inputs into Oregon's CMP with seats on OPAC (INT2, INT9 and TSP review), giving coastal communities a voice in forming enforceable coastal management policy. The FERC docket comments lodged by local governments and the more recent comments from interviewees from local government (INT2) and coastal-based development NGOs (INT6, INT7) indicate a desire in coastal communities to carefully consider development of the ocean against the potential impacts and benefits (INT2). This local voice, which interviewees expressed was typically not sufficiently regarded early enough in the offshore renewable energy project development process, was also how the communities could ensure

equitable benefit from the development (INT6 INT7 INT2). Locally elected county commissions do have a seat at OPAC, offering an opportunity to inject a local voice into the policy discussion, but much of the dissatisfaction centered around the federal process which allows public inputs during specified comment periods during the process.

Several interviewees commented on the strength of informal relationships on the Oregon coast between residents and their elected officials (INT2, INT3, INT4, INT6, INT7, INT9). This served to inject local opinions into the local policy process. Beyond the state policy level, several interviewees (INT2, INT4, INT6, INT7) stated they gave comments directly to BOEM employees about the MRE process, remarking on the apparent receptivity. In a more formalized platform, Oregon has partnered with BOEM in an Intergovernmental Renewable Energy Task Force, with DLCD as the lead state agency, and has a comprehensive planning strategy which includes outreach and constructing an offshore wind planning tool (*Oregon Activities* n.d., INT5). Again, by participating in the process with the lead federal agencies, the state ensures it has a voice in the process, which structurally includes local voices, to proactively manage its coastal zone.

However, even with these robust informal networks and structures which allow for inclusion of public opinion, interviewees also noted the difficulty of public comment (INT2, INT4, INT7). For instance, one NGO, which conducts citizen participation education as part of its activities, pointed to their ongoing efforts to simply help local citizens navigate the public comment system, and how to access their elected officials - beyond the informal networks noted previously (INT4). Some of the difficulties identified included short notice public hearings, difficulty in navigating the public comments system, and not long enough comment periods, all of these could apply to MRE as future projects would follow similar processes.

5.1.4.1 MRE Policy Considerations for Public Views & Stakeholders

The process of drafting the TSP part 5 amendment included several stakeholders – including fishing interests, local governments, conservation groups, state agencies, recreation and

tourism groups (INT3 INT9 INT5) – and reflected the various interests in the ocean in the identification of Renewable Energy Facility Suitability Study Areas (REFFSAs) as those with the lowest potential for conflict with ecological resources and existing uses. Mandated public comment periods and public engagement requirements are in both federal and state processes, however, these are well into the permitting and leasing review processes. Indeed, prior coordination and consultation before starting the application process is “highly encouraged” but not required (INT1).

It is clear that prior consultation was part of PacWave South’s process as its initial filing documents outlined the public engagement process already completed prior to the application. As one interviewee noted on this, “OSU did it right” in engaging the public beforehand (INT9). Given the comments noted above, the current requirements for public comments and engagement during the process (not prior) may not be sufficient to truly gauge public inputs and include the public voice, although a more expansive public outreach effort could extend what is already a lengthy process.

5.1.5 “Right Time”

In addition to the inclusion of all voices and stakeholders, interviewees also noted the importance of the “right time” for offshore energy to progress. The formation of state level policy to guide MRE was a key step in this process and the result – TSP part 5, GLD, Goal 19 – is a comprehensive policy waiting to be tested (INT1, INT5). A local government interviewee noted the importance of federal and state policy focus on renewable energy, as the money usually follows the policy focus which they noted was key in nascent technologies requiring significant investment to become market viable (INT2).

Others noted the difference between the wave industry previously and the current offshore wind industry looking at Oregon (INT3, INT6, INT9). While interviewees from state government and a development NGO noted the forward push from wave industry and executive support from the Governor in the late 2000s (INT3, INT5), others noted that the companies

faced difficulties in the long approval process (INT9). Indeed, policy and process documents show support from various levels of state government for the development of wave energy in Oregon. Despite this support, the proposed projects did not come to fruition.

In contrast, the offshore wind companies expressing interest in Oregon as noted in interviews (INT6, INT7, INT9), are entering the scene with a fully formed state policy for offshore renewables in place, a federal administration support of a renewable energy “scale up,” and companies with “deeper pockets” to weather the lengthy approval processes (INT6, INT7, INT9). In addition, development focused, community-based NGOs are proactively engaging with industry and state planners in order to shape the potential projects, in effect addressing the weaknesses in the process identified by more than one interviewee – that the BOEM and FERC processes formally allow for public comment only after the project is well along in its formation instead of designing projects around community needs and inputs (INT2, INT4, INT6).

5.2 Survey Data

5.2.1 *Strong Place Attachment, Openness to Renewables*

With this MRE policy scene in Oregon, and with the importance placed on public input and views, a 2020 YouGov wave energy survey of Oregon residents offers insights into how Oregon public perceptions might align. In an online survey deployed through YouGov, 568 Oregon residents participated in the survey on wave energy. YouGov matched this set of respondents to a sample frame of 500 using gender, age, race, and education data from the 2017 American Community Survey (ACS). The matched cases were weighted to the sampling using propensity scores including gender, age, race/ethnicity, years of education, and region and then post-stratified on 2016 Presidential vote choice, gender, age, race, and education to produce the final weight. Weights were used for descriptive statistics, but not for mean comparisons. Although a comparison of weighted and non-weighted results showed little difference in results.

5.2.2 Oregon Respondents: Demographics and Relationship with Coast

Respondents ranged in age at the time of the survey from 19 to 91 with an average age of 48.9.

To better use age in bivariate analysis, respondents were grouped according to five generations: Generation 1 – 1925-1945, Generation 2 –1946-1964, Generation 3 – 1965-1979, Generation 4 – 1980-1994, and Generation 5 – 1995-2012. This showed that 8.9% (n=45) of respondents were from the first group, 32.4% (n=162) in the second, 21.8% (n=109) in the third, 22.5% (n=112) in the fourth, and 14.4% (n=72) in the fifth generation group. Generation 2 had the largest number of respondents at n=162. This is also reflected in employment responses which reported 23.0% retired among respondents. This was second to full-time employed respondents of 32.8%. Among coastal respondents, 40.7% were retired while 22.0% of inland respondents were retired.

34.1% of Oregon respondents indicated they were liberal (very liberal and liberal), 30.5% conservative (very conservative and conservative), 24.6% moderate, and 10.9% were unsure. Among the liberal respondents, 26.9% were from the gen 2 group, 26.3% from gen 4, and 24.0% from gen 3. Gens 1 and 5 had the lowest percentages at 10.5% and 12.3%, respectively. For conservative respondents, the majority were from Gen 2 at 42.8% and the least were from Gen 5 at 8.6%. Gen 2 also made up the majority of moderate respondents at 34.1%. Among the “not sures,” 44.4% were in gen 5, 20.4% in gen 4, 14.8% in gen 3, 16.7% in gen 2, and 3.7% in gen 1. For gen 5, the “not sures” accounted for 33.3% of that generation’s respondents. In general, this indicates the group is fairly evenly split ideologically.

Industries linked to natural resources and tourism were the most important as indicated by respondents. Presented with 10 different industries to rate on a 4-point scale of importance – from 1 – not at all important to 4 – very important – Oregon respondents indicated that agriculture had the highest importance with a mean of 3.43 followed by forestry at 3.37, and technology and tourism both at 3.04. Between coastal and inland participants, tourism (3.83)

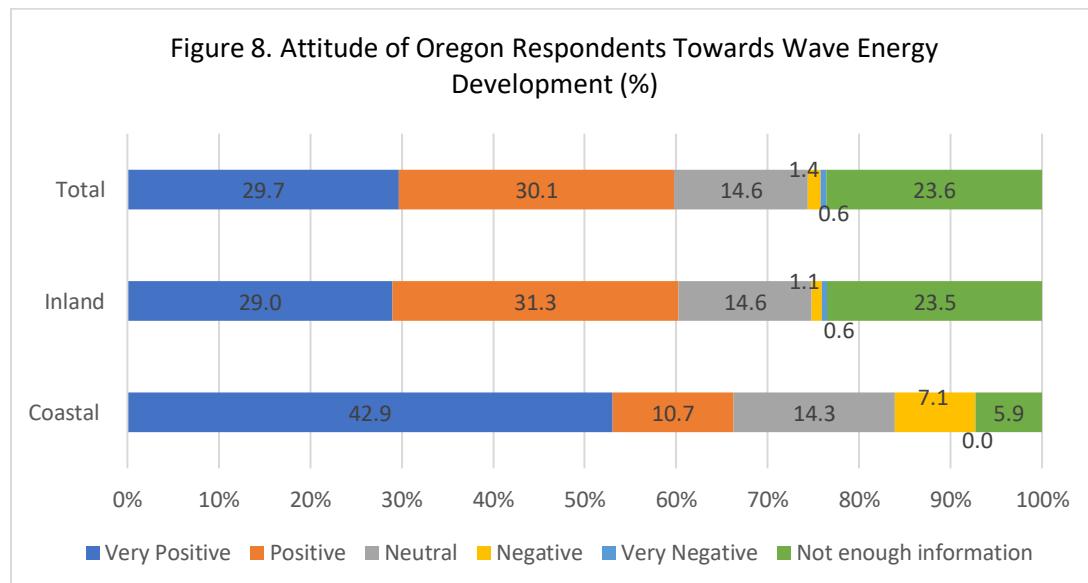
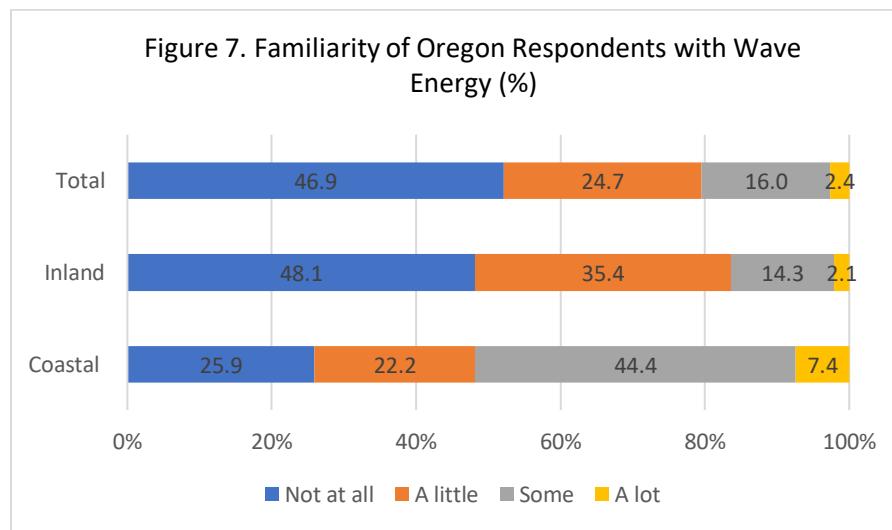
and fishing (3.79) were the highest in importance on the coast while agriculture (3.44) and forestry (3.36) were the highest among inland respondents.

In relation to the coast, respondents were asked about their visit frequency and the importance of the coast to them and their activities in a six-question set based on place attachment theory. The majority of Oregon respondents visit the coast less than monthly (57.7%) while 23.8% indicated they never visit the coast, 11.7% visit monthly, 1.6% visit weekly, and 5.2% visit daily or almost daily. On a 5-point scale (1 – strongly disagree to 5 – strongly agree), Oregon respondents indicated in a set of six questions on coastal importance agreement that the coast is important with means ranging from 3.23 to 3.99. The set of questions was able to be grouped together, or indexed, to make a single variable (Cronbach's α = .929; see Appendix 9.1) to compare with other respondent characteristics such as age and ideology (Appendices 9.3 and 9.4). When compared with the generation bands, all generations had means above 3.00 indicating agreement with the importance of the coast. Means ranged from 3.43 with the fourth generation to 3.85 with the second generation, also the largest generation group. Between ideological categories, the means ranged from 3.30 among those not sure about their ideology to 3.77 among liberals. Similarly with age, all groups agreed about the importance of the coast to their lives and activities, suggesting strong coastal attachment among respondents.

5.2.3 Views on Wave Energy and Other Renewables

The Oregon respondents indicated a positive attitude towards wave energy development (mean = 4.14, where 1=very negative and 5 = very positive) despite a low awareness of the technology (mean = 1.74, where 1 = no awareness at all and 4 = a lot of awareness). Of the Oregon respondents, 23.2% (n=116) indicated they did not have enough information to form an opinion on wave energy and indicate their attitude towards it. A higher percentage of coastal residents indicated "some" or "a lot" of familiarity with wave energy at 51.8% than inland residents at 16.4%. Inland residents had a higher percentage of no familiarity at 48.1% than coastal

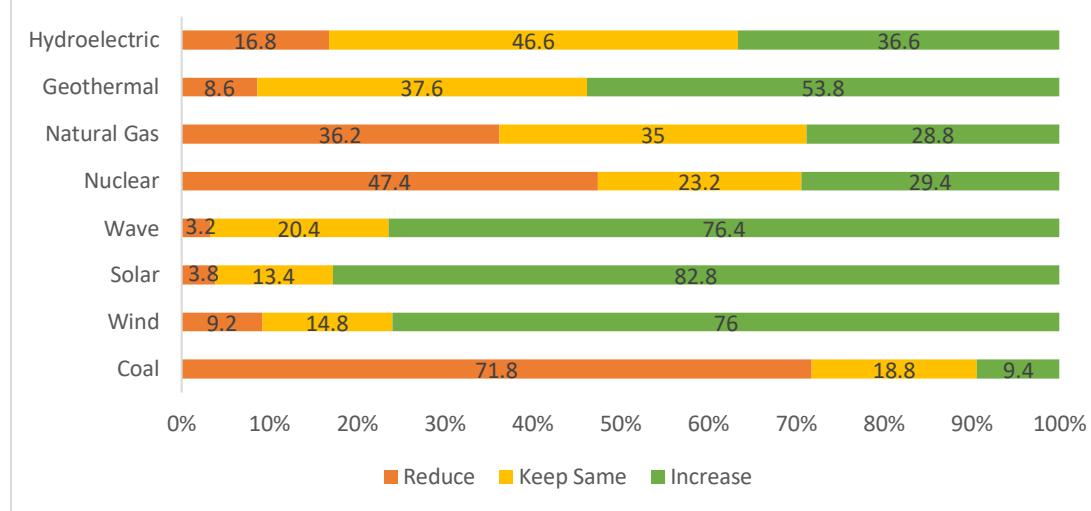
residents at 25.9%. Oregon respondents indicated a positive attitude towards wave energy development with a mean of 4.14 on a 5-point scale with 1 – very negative to 5 – very positive. Coastal respondents had a higher percentage of “very positive” responses at 42.9% than inland respondents at 29.0%. Regardless of this difference based on proximity to the coast (which was defined as a zip code within 5 km of the ocean), Oregon residents had positive attitudes towards wave energy development. (Figures 7 and 8)



More generally, respondents were asked if they thought a set of energy sources should increase or decrease in the next 25 years to meet the country's electric power needs. The

energy sources included were coal, wind, solar, wave, nuclear, natural gas, geothermal, and hydroelectric dams. Wind, solar, and wave had the highest percentages of “increase” among Oregon respondents at 76.0%, 82.8%, and 76.4%, respectively. 71.8% of respondents indicated coal should decrease in use and 47.4% thought a decrease in nuclear energy was necessary. For natural gas, 36.2% thought a decrease was needed, however, 35.0% said to keep it the same and 28.8% said to increase. 91.4% of respondents thought geothermal should stay the same or increase (37.6% keep same, 53.8% increase), and 83.2% thought hydroelectric should stay the same or increase (46.6% keep same, 36.6% increase). There were no significant differences between coastal and inland respondents.

Figure 9. Oregon Respondent Views on Future Use of Energy Sources (%)



Looking at the three renewable sources, which received the highest ‘increase’ responses, comparison with respondents’ ideology (χ^2 analysis) indicates support for increase across ideologies. For wind, 94.2% of liberals, 82.2% of moderates, 51.3% of conservatives, and 72.7% of not sures indicated wind should increase. This was similar for solar with 95.9% of liberals, 90.1% of moderates, 63.1% of conservatives, and 81.8% of not sures supporting its

increase, and with wave energy where 87.7% of liberals, 83.1% of moderates, 62.5% of conservatives, and 62.5% of not sures indicated it should increase.

Figure 10. Comparison of Views on Future Energy Source Use with Ideology (%)

Variable	Percentages within Ideology											
	Liberal			Moderate			Conservative			Not Sure		
	Reduce	Keep	Increase	Reduce	Keep	Increase	Reduce	Keep	Increase	Reduce	Keep	Increase
Indicate whether the US should reduce or increase these power sources to meet electric power needs in the next 25 years												
Wind	1.2	4.7	94.2	7.2	10.5	82.2	20.4	28.3	51.3	9.1	18.2	72.7
Solar	0.6	3.5	95.9	1.6	8.2	90.1	9.9	27	63.1	1.8	16.4	81.8
Wave	1.2	11.1	87.7	1.6	15.3	83.1	7.9	29.6	52.5	1.8	35.7	62.5
Coal	94.1	2.9	3.0	83.6	12.3	4.1	38.8	37.5	23.7	67.3	30.9	1.8
Natural Gas	61.2	26.5	13.3	34.5	36.9	28.7	10.5	41.8	47.7	33.4	38.9	27.8

When comparing ideology with views on coal, the largest percentage within ideology groups indicated that coal use should reduce with 94.1% of liberals, 83.6% of moderates, 38.8% of conservatives, and 67.3% of not sures answering “reduce.” Notably, 37.5% of conservatives responded to keep it the same, which is close to the reduce percentage. Natural gas did not have consistency between groups with the highest percentages within ideology groups differing – 61.2% of liberals support reduction of use, 36.9% of moderates support keeping the same (and 34.5% support reduction), 47.7% of conservatives support an increase in use, and 38.9% of not sures support keeping the same use (33.4% support decreasing use).

Overall, views among Oregon respondents indicate a fairly consistent stance on the future use of energy sources even based on ideology with the largest percentages within ideology groups favoring increasing renewable energy sources and decreasing coal. Natural gas shows a more complex view of its use with a mix of responses along ideology lines.

5.3 Public Views in Oregon on MRE and Renewable Energy

Oregon participant responses to the wave energy questionnaire indicate a sense of importance attached to the Oregon coast and a broad agreement that renewable energy sources should

increase in the coming years, regardless of age, ideology, or proximity to the coast. In the areas where conservatives differed from the other groups, the percent in “agreement” with liberals and moderates was not much different from their differing viewpoint percentage.

Strong coastal attachment was generally high among respondents regardless of age, ideology, or location (coastal or inland). This connection to nature is also seen in the most important industries to respondents: forestry, agriculture, fishing, and tourism and recreation. These are important to note in context of existing research indicating the role of place protection responses in predicting potential opposition or support for renewable energy projects, in this case Oregon MRE and offshore renewable energy development.

6. Discussion and Conclusion

The policy structure for MRE in Oregon is well thought out and integrated into existing and long-standing policy processes, if still untested, and places much control in the hands of the state and local governments. As such, Oregon’s overarching goals – as outlined in the Statewide Land Use Goals – remain to conserve and protect existing resources. As related to MRE, this specifically means Goal 19 and protecting marine resources, ecological systems, and existing activities. It is clear that these priorities have carried into the state’s Coastal Management Plan and the TSP part 5 and GLD, emphasizing a precautionary approach towards new uses of the ocean space.

The importance of citizen participation, Goal 1 of Oregon’s Land Use Goals, is also part of the policy process; however, interviewee comments indicate there is room for improvement. While the suggestions of process improvements were focused on the federal process, and specifically the BOEM and FERC lease and permitting processes to include local input upfront, there is a role for the state in this. The state responded proactively when the interest in wave energy appeared and local governments and citizens expressed concern. While this resulted in a lengthy TSP part 5 drafting process, it did result in state guidance for offshore renewable energy which considered stakeholder input.

The strong place attachment indicated by survey respondents suggests that Oregon's policies for protection and conservation are in line with the views of those surveyed. This precautionary approach to offshore development also mitigates potential threat-responses to any changes to place, as suggested by the literature as an underlying motivator for opposition to renewable energy development.

While the public perceptions of wave energy in Oregon remain fairly positive, it is not entirely clear if the strong place attachment translates to potential opposition and could be an area for future research, either through a broader Oregon-focused survey or focus groups. The PacWave South and North facilities have the potential to fill the data gap that currently justifies the precautionary approach to offshore renewable energy deployment, although, as the research suggests, simply increasing information on a new technology or installation is only part of gaining acceptance in a community.

As suggested in the literature, a large piece of understanding why a community could be or is in opposition to a project is to be familiar with the context of the area. In this case, the survey data offers insights into some of these elements, from the important industries which rely on natural resources and positive views of future renewable usage to strong coastal attachment, these are indicators for future offshore renewables planning of important areas to note and potential areas for future inquiry.

The strong coastal attachment, regardless of political ideology and frequency of visiting the coast, suggests that Oregonians will be keenly interested in any development that could affect their emotional attachment to place or ability to continue their coastal-dependent activities. Likewise, the views on increasing future use of renewable energy sources is a potential indicator for policy-makers that there is support for the ongoing efforts to de-carbonize the electricity system. However, it is not clear from these results if the general positive view of renewables would translate to local support of larger, commercial-scale renewable energy

projects – as is distinguished as a dividing point in public opinion in research on renewable energy (see Theoretical Framework section).

While the wave energy flurry of activity previously seen seems to have passed, Oregon still holds a high wave and offshore wind energy potential that could play an important role in a clean energy transition. Given the recent federal and state executive orders promoting clean energy and the increasing prominence of offshore wind, there is a good chance that Oregon's MRE policies will finally be tested. While the policy picture is mostly defined, the public piece is less clear. Given some indications that public input into the process is not seamless, and possibly not sufficient to fully capture citizen inputs from those who might not be adept at navigating the policy process. While this is a goal and concern of governments – to reflect and listen to the will of the public – it is equally a concern for renewable energy developers hoping to avoid local opposition to projects. Given the complexity and length of the process currently, the uncertainty of public acceptance is another variable for consideration.

While there have yet to be grid-connected MRE projects completed in Oregon, it is not certain that this strong coastal attachment would create a barrier to development. However, considering place attachment theory, universal strong place attachment in Oregon, and the indications in the interviews that local governments and citizens want a voice from the outset, points to the importance of including public input from the beginning in an effort to not run afoul of strong attachment and potentially trigger place-protection responses to development. As suggested in interviews, this prior consultation with stakeholders is “strongly encouraged” but not required in the pre-application process. Given the potential importance of this for local acceptance, and the recognition that “OSU did it right” through its outreach, perhaps this is an area for expansion for policymakers.

While this study did not look at how powerful of a factor place attachment is in decision-making, it would be a fruitful area for future research with a larger sample size. As Oregon is at the early stages of offshore renewable energy in terms of projects in the water, and given the

interest in developing such a high energy potential area, following the public response to future proposals would be a ripe area for further research on the role of place attachment and public participation in acceptance of new development that could have impact on existing resources and activities.

The current balance set between conservation and development in Oregon's policy could equally be tested as renewable energy projects are not without impacts. Balancing the need to transition from carbon-based fuels to renewables with conservation of the marine environment will be a challenge for state and local decision makers in determining if this use of the coastal zone is consistent with Oregon's Coastal Management Plan and Land Use Goals. Equally, the use of the ocean space for new activities will present challenges to ongoing marine resource management efforts to balance the potential development that could help meet climate change mitigation goals, but places increasing pressure on a critical environment.

6.1 Moving Forward

The documents and interviews tell mostly the same story of MRE policy - an evolving landscape of regulations and guidance in response to shifting political conditions, the interest of industry, and allowing for the entrance of new technologies into the energy generation scene. The Oregon specific inputs highlighted the importance of citizen inputs, with the concerns of coastal residents about the cumulative impacts of wave energy projects resulting in a state executive order and formation of new policy to guide the planning and siting. This is consistent with the overarching land use planning goals governing Oregon's approach to land management – protecting existing ecosystems and economic activities.

While the ocean is an important piece of climate change action - both as providing a platform for solutions and due to its own vulnerability to climate change impacts - the potential for overlapping uses and conflict is high, placing importance on the planning and regulatory process. The process is well defined, if not complex and lengthy, and given the importance of allow for public input, could be even longer. It is unclear how the political calls for streamlining

the process to ramp up renewable energy production will occur given the need to allow for sufficient review and public comment, looking to the oil and gas industry as a cautionary tale of the potential for unintended environmental damage when quick development is prioritized.

However, some view this cautionary approach at odds with the urgency of climate change mitigation attempts. Oregon's place as a driver of its offshore policies puts it in an excellent position to again lead efforts to reconsider shifting pressures and priorities for its ocean space – including in federal waters. EO 20-04 started the discussions to implement a reduced reliance on carbon-based fuels, but the impacts on the offshore renewable energy space are yet to be determined. What is certain and clear, is that the large number of stakeholders and interests present in Oregon's waters creates a complicated policy space, requiring much deliberation in order to formulate inclusive and equitable policies. There is the risk that in trying to satisfy all the interests and stakeholders present, it results in maintaining the status quo with little progress towards seeing and using the ocean as a climate change solution.

The consistency with which Oregon applies its land use planning goals ensures a seamless and consistent policy landscape; however, being adopted in the 1970s means there are no mentions of climate change considerations. Given the centrality to Oregon's policies, the impact of additional measures and legislation – such as RPS and Carbon-Zero goals – will only extend so far. How Oregon land management strikes this balance will be key to potential future deployment of offshore renewable energy. The next five years will likely show how this balance will play out.

6.2 Policy Implications

The large number of stakeholders mentioned around MRE policy is an indicator of how broadly ocean activity impacts individuals and communities. This, arguably, makes stakeholder engagement all the more important around ocean-based activity in order to consider potential impacts of policy. Coastal attachment and important industry survey results indicate that Oregon is no exception to this, as the sense of attachment to the Oregon coast was broadly

indicated regardless of frequency of visits, location, age, or political ideology and considering the central role that natural resources – like fishing and coastal tourism – play in livelihoods as well as identities.

Equally, the positive views on increasing renewable energy sources in the future should not be conflated with tacit agreement or support for renewable energy development, as cautioned in the research around public perceptions – that general support for renewables does not always translate to specific support for projects. This points to the necessity of community engagement as part of the planning process to gain support for projects, and to understand local communities and potential opposition.

The siting of offshore renewable energy projects will be complicated given the large number of stakeholders – from government agencies to individuals who identify or derive their livelihoods from the coast – and the growing push for renewable energy sources to meet climate change goals. Balancing the existing uses with these new “climate change” uses will test Oregon’s policies.

6.3 Study Limitations

This study is by no means a comprehensive catalogue of the Oregon marine renewable energy story but is an initial review of the policy structure, the various stakeholders, key policy documents, and a snapshot of MRE projects since 2005 paired with some descriptors of Oregon respondents and their views on MRE and the coast. Limitations of time and the constraints on travel due to the ongoing COVID pandemic presented difficulties for conducting interviews. However, the use of online conference platforms eased this challenge, and perhaps eliminated geographical constraints on interviews. The short time frame for completing the project was perhaps the greatest limiting factor towards gathering more data from interviews, or looking more deeply at policy and process documents or specific cases. However, this cursory look identifies areas for future research such as an in-depth case study of the MRE projects and analysis of the barriers to their continued operation could offer insights into how the industry

could move forward in the future. Additionally, the list of stakeholders mentioned, a topic on which there is some existing literature, provides a road map for future interviews to gain a greater understanding of participation in the Oregon MRE policy making process. As much of the wave energy story in Oregon revolved around the role of FERC, I focused on that process review. However, as BOEM is a key organization, a thorough review of BOEM process documents would also benefit a fuller understanding of the offshore renewable energy landscape which is evolving rapidly in Oregon, based on interviewee comments.

6.4 MRE Stakeholders: A Word on Inclusion and Equity

The interviewees represent a small portion of the stakeholders in the MRE space in Oregon, as indicated by the wide range of organizations and stakeholders mentioned during interviews and in FERC docket documents (Figure 6, Appendix 2). More than one interviewee mentioned the importance of including all voices in the MRE discussion, even specifically pointing to the negative impacts on tribal nations from energy decisions made without their input, such as historic hydroelectric projects. Oregon energy and climate change policy includes discussion on stakeholders and equitable energy transformations. As such, future work on MRE and offshore renewable energy would be incomplete without consideration of equity and inclusion in the process and benefits of deployment. Studies centering on inclusive energy transformation, especially for Oregon where offshore renewable energy would impact the uniquely rural and natural resource reliant areas, could greatly benefit the research field and potentially offer practical insights into making an equitable energy transition a reality.

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8.0 Appendices

8.1 Appendix 1. Interview Guide

1. Tell me about how your organization views marine renewable energy.
2. I would like to understand more about how your organization participates in marine renewable energy projects or discussions.
 - a. Tell me about a time when your organization was involved in discussions about marine renewable energy policy or a specific project. What concerns did your organization express? What aspects of the project was your organization most excited about? In what ways did your organization express its opinions? How, if at all, did your organization influence the outcome?
 - b. Tell me about the other organizations involved in this instance and their roles. How did your organization interact or coordinate with them?
3. Is your organization currently engaged in a MRE discussion or project and can you tell me about your organization's role? What is your organization's goal in participating in this discussion/project? What other organizations (including government agencies) are important in marine renewable energy discussions and what are their roles? How do you interact with or coordinate with them?
4. Tell me about an energy challenge or need your community/organization faced recently and how it was dealt with. Was marine renewable energy part of the discussion? (Follow up: Have you had any discussions around the blue economy?)
5. Are there any other comments you would like to add, or is there something that I should have asked?

8.2 Appendix 2. Full List of Organizations Mentioned

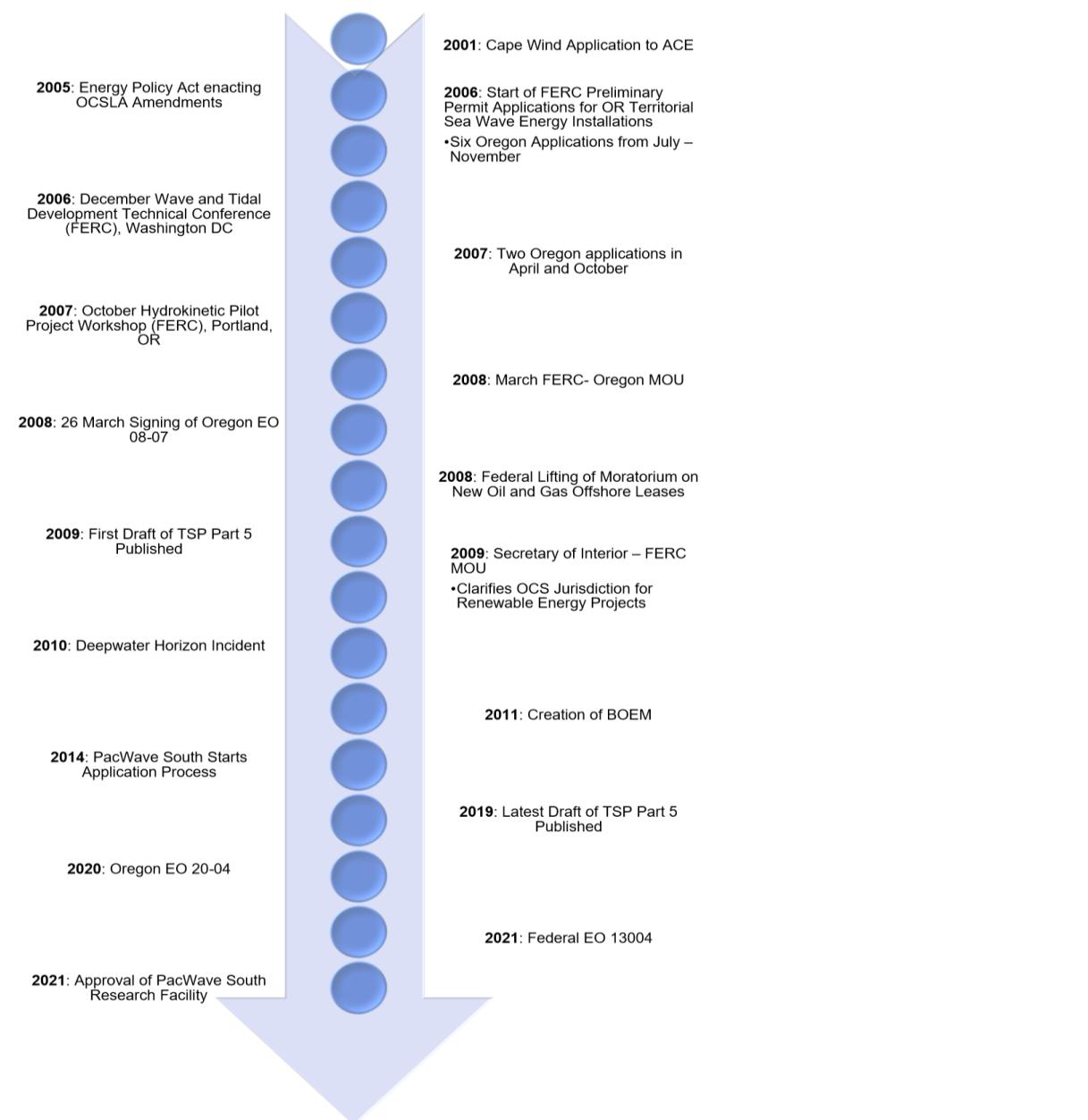
Organization Mentioned in Interviews and Process Documents (Category/Type)
In order of most mentioned to least mentioned

BOEM (Federal Govt)	Seafood Commodity Commissions
DLCD (State Govt)	Oregon Trout Commission (Commercial Fishing)
OPAC (State Govt)	Oregon Salmon Commission (Commercial Fishing)
FERC (Federal Govt)	Dungeness Crab Commission (Commercial Fishing)
NOAA (Federal Govt)	PEW
Counties (Local Govt)	Oregon Coast Alliance (ORCA)
OWET/POET (NGO)	OR Shores Conservation Coalition
OCEAN (NGO)	Southern Oregon Climate Action Now
LCDC (State Govt)	Southwestern Workforce Investment Board
DSL (State Govt)	ODOE (State Govt)
ODFW (State Govt)	Northwest Power Planning Council
Sea Grant	Northwest Energy Coalition
Surfrider (Conservation NGO)	Renewable Northwest
OCZMA	IOU (Utility Provider)
Oregon Fishermen's Cable Commission, Inc	Affiliated Tribes of Northwest Indians (Tribal Govt)
DEQ (State Govt)	Pacific Corp (Utility Provider)
PMEC	South Coast Economic Development Council
Oregon Albacore Commission	Boost Southern Oregon
Ports	Pacific Seafood (Commercial Fishing)
Governor's Office (State Govt)	West Coast Ocean Alliance
PUC (Utilities Regulation)	West Coast Ocean Data Portal
OSU (Education/ Research)	EPRI
Army Corps of Engineers (Federal Govt)	UW
Oregon Parks and Rec (State Govt)	Whiting Fleet (Commercial Fishing)
Association of Oregon Counties	OPT (Wave Energy Developer)
Coastal Shores Coalition	NMFS Science Centers (Federal Govt)
PacWave	Oregon Anglers
FINE (Fishing Interests)	Tribal Governments
FACT (Fishing Interests)	Port Orford Ocean Resource Team
Southern Oregon Ocean Resource Coalition	

8.3 Appendix 3. Draft Codebook

Themes	Codes	Definitions
Policy Process		<i>The collaboration, balance between powers, public input, and process that governs MRE decisions</i>
	Fed-State-Local-Tribal	Collaboration and process that governs MRE in OR and roles of fed, state, local, tribal officials/agencies
	Public Voice and Input	How citizens are part of the policy process and the BOEM process for MRE and wind call areas. How citizens are heard or the difficulties of being heard.
	Informal Interactions and networks	The role of informal relationships and networks in policy making discussions and decisions. How connections and influence play a central role in coastal areas in Oregon.
	Stakeholders	Those impacted by changes in marine policy and ocean conditions and how they are part of the MRE policy process
Conservation and Development		<i>How impact on the environment and existing ocean users are regarded and considered in policy decisions and how that impacts MRE development/approvals</i>
	Policy focus (EOs, climate goals)	The shifting policy focus either from federal or state level and (potential) impact on OR land use planning goals
	Demographics and infrastructure pressure	The increase of coastal population, energy demand, and infrastructure pressures
	Resilience and independence	Identification of energy resilience and independence as benefit of MRE or need of community; aging infrastructure; post-disaster recovery (Cascadia) or not reliant on transmission over coastal range
	Ocean use (space use)	Potential for conflicts in the ocean space due to overlapping use areas
	Climate	Observations about changes in climate, the ocean environment, or changes in fish populations
Process - progress		<i>Tension around lengthy process and moving forward on projects in a timely manner (which can drive up project costs).</i>
	Creation of OR MRE Policy	Description of the TSP and GLD process
	"Right" time	The factors (mentioned) that are part of successful forward movement of MRE such as policy focus, money, technology "ripeness," industry interest, etc.
	Industry (wave vs wind)	The difference between the wave industry at the beginning of the MRE policy process (mid-2000s) and the current offshore wind industry and how they are/might be impacted differently by the process.
	Precautionary TSP	Principles or actions operating on the assumption that there is impact until proven otherwise
	Divided opinions	Divisions in opinion or barriers to accepting change such as "status quo" or fear, or the split opinion on MRE from fishermen
	Politicization of Renewables	Politicization of renewable energy and influence of political ideology on MRE views/public opinions.
Equity		<i>The need for greater stakeholder input, especially from areas and communities typically less represented in policy discussions such as rural, coastal or tribal</i>
	Equity - hear all voices	The need for greater stakeholder input, especially from areas and communities typically less represented in policy discussions such as rural, coastal or tribal
	Equity - OR socio-econ realities of coastal areas	The influence of social and economic factors of coastal communities such as unemployment, poverty, need for job training, and reliance on extractive industry.

8.4 Appendix 4. Timeline of Some Key Documents and Events for Oregon MRE Policy



8.5 Appendix 5. Federal Authorizations and Lead Agencies

Summary Table of Federal Authorizations (From Handbook of Marine Hydrokinetic Regulatory Processes, June 2019, Department of Energy Water Power Technologies Office)

Permit/Approval	Primary Legal Authority	Lead Agency	Other Agencies ^[1]	Anticipated Process Time
Federal Hydroelectric License	Federal Power Act, Energy Policy Act of 2005	FERC	COE, BOEM, FWS, NOAA, USCG, BIA, EPA, NPS, USFS, ACHP, USGS, BLM; tribal governments; other relevant federal, state, and/or local agencies	2-6 years
Preliminary Permit				At least 60 days
Nationwide Permit 52	Rivers and Harbors Act; Clean Water Act	COE	FWS, NOAA, NPS, ACHP, tribal governments; other relevant federal, state, and/or local agencies	Varies; at least 40 days
Commercial Renewable Energy Lease	Outer Continental Shelf Lands Act, Energy Policy Act of 2005	BOEM	COE, FERC, FWS, NOAA, USCG, BIA, EPA, NPS, USFS, ACHP, USGS, BLM; tribal governments; other relevant federal, state, and/or local agencies	6-8 years if competitively issued; 3+ years if no competitive interest
CWA § 404 Permit	§ 404 Clean Water Act	COE	EPA, FWS, NMFS	60-120 days, more if EIS needed
COE § 10 Permit	§ 10 Rivers & Harbors Act	COE	FWS, NMFS	60-120 days, more if EIS needed
Private Aids to Navigation Permit	Coast Guard Regulations	USCG	COE, state resource agencies	3 months+
NEPA Analysis (ROD, FONSI, Categorical Exclusion)	National Environmental Policy Act	FERC	EPA, NOAA, other relevant federal and state agencies	2-6 months for an EA; 12-24 months for an EIS ^[2]
§ 7 ESA Consultation ^[3]	Endangered Species Act	NMFS, FWS	FERC, COE, USCG	4-6 months ^[4]
Marine Mammal Consultation	Marine Mammal Protection Act	NMFS, FWS	None specified	4-24 months ^[5]
Essential Fish Habitat Assessment	Magnuson-Stevens Act	NMFS	Regional Fisheries Management Council, FERC, BOEM, COE	30-60 days ^[6]
Fish and Wildlife Coordination Act Consultation	Fish and Wildlife Coordination Act	FWS	FERC, NMFS	Varies
Migratory Bird Consultation	Migratory Bird Treaty Act	FWS	FERC, COE, state resource agencies	Varies
§ 106 NHPA Consultation	National Historic Preservation Act	Advisory Council on Historic Preservation	FERC, BOEM, COE, state resource agencies	2-6 months ^[7]
CZMA Federal Consistency Determination	§ 307 Coastal Zone Management Act	Designated State Agency	Relevant federal and state agencies	6 months
Water Quality Certification	§ 401 Clean Water Act	Designated State Agency	Relevant federal and state agencies	Up to 1 year

^[1] These are agencies that are likely to be involved in project evaluation for a particular authorization or environmental review. Some of the agencies listed may not be involved and other agencies may be involved even though they are not listed here.

^[2] Process time is per NEPA document; multiple NEPA documents may be required.

^[3] One coordinated review may occur, but multiple ESA consultations could be required.

^[4] Process time is per consultation; multiple consultations may be required.

- Process time will vary depending on complexity and the NEPA documentation required.
- Process time may vary if the review is concurrent with an ESA Biological Opinion.
- At least 30 days for each stage of consultation: (1) Concurrence on area of potential effect (APE); (2) No adverse effect to cultural resources; and/or (3) Concurrence on mitigation measures.

8.6 Appendix 6. Tables of Key Organizations Mentioned in Interviews and Document Review

Federal Organization Mentioned	Mission/ Mandate	Relevant Authority (if any)
Bureau of Ocean Energy Management	<i>Manage development of OCS energy and mineral resources</i>	EPAAct of 2005 MOU with FERC 2009
Federal Energy Regulatory Commission	<i>Ensure economic, efficient, safe, reliable energy services; Oversight of hydrokinetic projects</i>	Federal Power Act 1920 EPAAct of 2005 MOU with Secretary of Interior 2009
NOAA (Office of Coastal Management)	<i>Review and approval of state coastal management plans</i>	CZMA
NOAA (Fisheries)	<i>Steward of ocean resources and habitat, consults and gives input on offshore energy projects</i>	Endangered Species Act Marine Mammal Protection Act Magnuson-Stevens Act
Army Corps of Engineers	<i>Protect aquatic resources and navigation capacity</i>	Clean Water Act

State Organizations Mentioned	Mandate/Mission	Relevant Authorities (if any)
Department of State Lands	<i>Holds state seabed in trust for public, seabed leases, oil/gas/mineral leases, cables</i>	Submerged Lands Act Submersible Lands (ORS 274.005)
Department of Land Conservation and Development	<i>Coastal program coordinator, oversees federal consistency reviews</i>	CZMA Ocean Resources Management Act
Ocean Policy Advisory Council	<i>Advises on ocean issues, recommends policy updates; Membership includes seats for coastal counties and city officials</i>	Ocean Resources Management Act (ORS 196.405) (Membership: ORS 196.438)
Land Conservation and Development Commission	<i>Adopts land use goals and implements rules, assures local plan compliance with goals, coordinates planning, and oversees coastal zone management program</i>	Statewide Land Use Planning (ORS 197.005)
Department of Environmental Quality	<i>Water quality and pollution control</i>	Marine Water Quality (ORS 468) Oil Spill Contingency Planning (ORS 468B.300)
Oregon Department of Fish and Wildlife	<i>Oversight of fisheries, biological consults, and marine research</i>	Fish and Wildlife Laws (ORS 496 et seq)
Oregon Parks and Recreation Department	<i>Oversight of state parks, beach permits, dry sand areas</i>	Ocean Shores (Beach Bill) (ORS 390.605 et seq)
County Commissions	<i>Local land use plans and ordinances, coastal parks, local economy</i>	
Oregon Department of Energy	<i>Maintain resilient and affordable energy system; advance solutions for equitable clean energy transition...</i>	
Public Utility Commission	<i>Access to safe, reliable, high quality utility services</i>	

8.7 Appendix 7: Table of Descriptive Statistics for Independent Variables

Appendix 7. Descriptive statistics for independent variables (n=500)

Variable	Question/Response Categories	Frequency (n) or Mean (sd)
Age	In what year were you born? (Subtracted from survey year, 2020) Range = 19 to 91	48.9 (18.4)
Employment	What is your employment status? (1) Full-time; (2) Part-time; (3) Temporarily laid off; (4) Unemployed; (5) Retired; (6) Permanently disabled; (7) Homemaker; (8) Student; (9) Other	32.8% (164) Full-time; 23.0% (115) Retired; 9.0% (45) Part-time
Area	Respondents' county classified as coastal or inland.	5.3% (27) Coastal; 94.7% (473) Inland
Industry	Indicate the importance of the industries [Agriculture; colleges and universities; construction; fishing/aquaculture; forestry; manufacturing; mining, refining, and utilities; renewable energy production like wind, solar, or hydroelectric; technology, such as computers, software, and the internet; tourism/recreation] to your area. (1) Not at all important; (2) A little important; (3) Moderately important; (4) Very important.	Agriculture 3.43 (.754); Colleges and Universities 2.98 (.946); Construction 2.98 (.828); Fishing/Aquaculture 2.93 (1.001); Forestry 3.37 (.846); Manufacturing 2.74 (.939); Mining, refining, and utilities 2.18 (.947); Renewable energy 2.98 (.986); Technology 3.04 (.928); Tourism/recreation 3.04 (.868)
Ideology	How would you describe your political viewpoint? (1) Very liberal; (2) Liberal; (3) Moderate; (4) Conservative; (5) Very conservative; (6) Not Sure. Variable collapsed to (1) Liberal; (2) Moderate; (3) Conservative; (4) Not sure	Original coding: 2.89 (1.33) without Not sure; 18.5% (92) Very liberal; 15.6% (78) Liberal; 24.6% (123) Moderate; 18.0% (90) Conservative; 12.6% (63) Very conservative; 10.9% (54) Not sure. Collapsed variable: 34.1% (170) Liberal; 24.6% (123) Moderate; 30.5% (153) Conservative; 10.9% (54) Not sure
Environmental priority	With which one of these statements do you most agree? (1) Protection of the environment should be given priority, even at the risk of curbing economic growth; (2) Economic growth should be given priority, even if the environment suffers to some extent.	73.0% (365) Environment
Climate Change	From what you've read and heard, is there solid evidence that the average temperature on earth has been getting warmer over the past few decades, or not? (1) Yes; (2) No; (9) I don't know.	73.0% (365) Yes; 17.0% (85) No; 10.0% (50) I don't know
Anthropogenic warming	Assuming the earth is getting warmer, do you think it is... ? (1) Caused mostly by human activities; (2) Caused mostly by natural changes in the environment; (3) Caused equally by human	53.8% (269) Human activity; 17.4% (87) Natural; 22.3% (112) Both; 4.5% (23) None; 1.9% (10) Other

activities and natural changes; (4) None of the above because the earth is not getting warmer; (5) Other.

Place attachment	How strongly do you agree or disagree with each of the following? [Areas along Oregon's coast are very special to me. Areas along Oregon's coast are some of the best places for doing what I like to do. I am very attached to areas along Oregon's coast. I would not substitute any other place for doing the types of things that I do in areas along Oregon's coast. I identify strongly with areas along Oregon's coast. Doing what I do in areas along Oregon's coast is more important to me than doing it in any other place.] (1) Strongly disagree; (2) Somewhat disagree; (3) Neither agree nor disagree; (4) Somewhat agree; (5) Strongly agree. Variable combined to one index	Index variable 3.65 (.997)
Visit frequency	In the past 12 months, how often have you visited the Oregon Coast? (1) Never; (2) Less than monthly; (3) Monthly; (4) Weekly; (5) Daily or almost daily.	23.8% (119) Never; 57.7% (289) Less than monthly; 11.7% (59) Monthly; 1.6% (8) Weekly; 5.2% (26) Daily or almost daily
Energy sources	For each power source listed below [coal, wind, solar, wave, nuclear, natural gas, geothermal energy, hydroelectric (dams)], indicate whether you feel the United States should reduce or increase its use to meet the country's electric power needs over the next 25 years. (1) Reduce a lot; (2) Reduce somewhat; (3) Keep same; (4) Increase somewhat; (5) Increase a lot	Coal 1.90 (1.145); Wind 4.04 (1.133); Solar 4.34 (.913); Wave 4.05 (.876); Nuclear 2.68 (1.369); Natural gas 2.85 (1.184); Geothermal 3.60 (.987); Hydroelectric 3.27 (.955)
Familiarity	How much have you heard or read about wave energy? (1) Not at all; (2) A little; (3) Some; (4) A lot.	46.9% (235) Not at all; 34.6% (173) A little; 16.1% (80) Some; 2.4% (12) A lot
Wave Attitude	Wave energy refers to the extraction of electricity from the up-and-down motion of ocean waves using buoys or devices in the form of "wave energy farms." What is your general attitude toward the development of wave energy off of the Oregon Coast? (1) Very positive; (2) Positive; (3) Neutral; (4) Negative; (5) Very negative; (9) Do not have enough information to form an opinion	29.7% (149) Very Positive; 30.1% (151) Positive ; 14.6% (73) Neutral; 1.3% (6) Negative; 0.7% (3) Very negative; 23.6% (118) Not enough information

8.8 Appendix 8: Survey Tool

[Q1] {short text box: varlabel “Top of mind”} **What is the first thing that comes to your mind when you think of “wave energy”?**

[Q2] {single choice: varlabel “Familiarity”} **How much have you heard or read about wave energy?**

- <1>Not at all
- <2>A little
- <3>Some
- <4>A lot

[Q3] {single choice: varlabel “Energy source knowledge”} **The largest source of energy for electricity in [California/Oregon/Washington/British Columbia] is:**

- <1> Coal
- <2> Hydroelectric
- <3> Natural Gas
- <4> Nuclear
- <9/fixed> I don’t know

[Q4] {single choice: varlabel “Off grid”} **Being “off-grid” means:**

- <1> Producing one’s own electricity
- <2> Getting electricity from another state
- <3> Having no electricity
- <4> Being energy efficient
- <9/fixed> I don’t know

[Q5] {single choice: varlabel “Wave Attitude”} **Wave energy refers to the extraction of electricity from the up-and-down motion of ocean waves using buoys or devices in the form of “wave energy farms.” What is your general attitude toward the development of wave energy off of the [California/Oregon/Washington/British Columbia] Coast?**

- <1> Very positive
- <2> Positive
- <3> Neutral
- <4> Negative
- <5> Very negative
- <9/fixed> Do not have enough information to form an opinion

How strongly do you agree or disagree with the following statements about the potential **benefits** of the development of wave energy off of the [California/Oregon/Washington/British Columbia] Coast?

- [q6] It is cheaper than other energy sources.
- [q7] It is more reliable than other energy sources.
- [q8] It contributes to [the United States/Canada’s] energy independence.
- [q9] It is a renewable energy source.
- [q10] It is an effective way to help the economy and provide jobs.
- [q11] It can provide a sense of pride for the region.

- <1> Strongly disagree
- <2> Somewhat disagree
- <3> Neither agree nor disagree
- <4> Somewhat Agree
- <5> Strongly Agree

How strongly do you agree or disagree with the following statements about the potential **risks** of the development of wave energy off of the [California/Oregon/Washington/British Columbia] Coast?

- [q12] It is too big of a public safety risk.
- [q13] It is not a good use of taxpayer money.
- [q14] It negatively impacts the beauty of the coast.
- [q15] It negatively impacts ocean marine life.
- [q16] It negatively impacts commercial and sports fishing industries.
- [q17] It negatively impacts recreational use of the ocean.

- <1> Strongly disagree
- <2> Somewhat disagree
- <3> Neither agree nor disagree
- <4> Somewhat Agree
- <5> Strongly Agree

For each power source listed below, indicate whether you feel [the United States/Canada] should reduce or increase its use to meet the country’s electric power needs over the next 25 years.

- [q18] Coal energy
- [q19] Wind energy

[q20] Solar energy
 [q21] Wave energy
 [q22] Nuclear energy
 [q23] Natural gas
 [q24] Geothermal energy.
 [q25] Hydroelectric (dams)

<1> Reduce a lot
 <2> Reduce somewhat
 <3> Keep same
 <4> Increase somewhat
 <5> Increase a lot

How strongly do you agree or disagree with the following statements concerning energy policy?

[q26] Decreasing our dependence on foreign oil and gas is important to our national security.
 [q27] I am concerned about foreign ownership of our energy resources.
 [q28] I am concerned about being personally affected by a shortage of electricity in the next five years.
 [q29] Not enough money is being spent on research and development of alternative fuels.
 [q30] It is possible to increase energy supplies while protecting the environment at the same time.
 [q31] New technologies will make it possible to have enough electricity for all of us in the future.

<1> Strongly disagree
 <2> Somewhat disagree
 <3> Neither agree nor disagree
 <4> Somewhat Agree
 <5> Strongly Agree

[Q32] {single choice: varlabel “Fossil fuels”} **Exporting fossil fuels involves transporting these fuels over land from their point of extraction, typically via railroad or pipeline, to an export terminal for processing and transfer to a ship for transport overseas. To what extent do you oppose or support [the United States/Canada] exporting fossil fuels to other countries?**

<1>Strongly oppose
 <2>Somewhat oppose
 <3>Somewhat support
 <4>Strongly support
 <9/fixed>Not sure

[Q33] {single choice: varlabel “Coast visits”} **In the past 12 months, how often have you visited the [California/Oregon/Washington/British Columbia] Coast?**

<5>Daily or Almost Daily
 <4>Weekly
 <3>Monthly
 <2>Less than Monthly
 <1>Never

How strongly do you agree or disagree with each of the following?

[q34] Areas along [California’s/Oregon’s/Washington’s/British Columbia’s] coast are very special to me.
 [q35] Areas along [California’s/Oregon’s/Washington’s/British Columbia’s] coast are some of the best places for doing what I like to do.
 [q36] I am very attached to areas along [California’s/Oregon’s/Washington’s/British Columbia’s] coast.
 [q37] I would not substitute any other place for doing the types of things that I do in areas along [California’s/Oregon’s/Washington’s/British Columbia’s] coast.
 [q38] I identify strongly with areas along [California’s/Oregon’s/Washington’s/British Columbia’s] coast.
 [q39] Doing what I do in areas along [California’s/Oregon’s/Washington’s/British Columbia’s] coast is more important to me than doing it in any other place

<1> Strongly disagree
 <2> Somewhat disagree
 <3> Neither agree nor disagree
 <4> Somewhat Agree
 <5> Strongly Agree

[Q40] {single choice: varlabel “Environment economy”} **With which one of these statements do you most agree?**

<1>Protection of the environment should be given priority, even at the risk of curbing economic growth.
 <2>Economic growth should be given priority, even if the environment suffers to some extent.

[Q41] {single choice: varlabel “Climate change”} **From what you’ve read and heard, is there solid evidence that the average temperature on earth has been getting warmer over the past few decades, or not?**

<1>Yes
 <2>No
 <9>I don’t know

[Q42] {single choice: varlabel "Anthropogenic"} **Assuming the earth is getting warmer, do you think it is...?**
<1>Caused mostly by human activities

<2>Caused mostly by natural changes in the environment
<3>None of the above because the earth is not getting warmer
<4>Other (please specify):

How strongly do you agree or disagree with each of the following?

[q43] The world would be a more peaceful place if its wealth were divided more equally among nations

[q44] In my ideal society, all basic needs (food, housing, health care, education) would be guaranteed by the government for everyone

[q45] I support government programs to get rid of poverty

[q46] If the government spent less time trying to fix everyone's problems, we'd all be a lot better off

[q47] Our government tries to do too many things for too many people. We should just let people take care of themselves

[q48] The government interferes too much in our everyday lives

[q49] Government regulation of business usually does more harm than good

[q50] People should be allowed to make as much money as they can, even if it means some make millions while others live in poverty

<1> Strongly disagree

<2> Somewhat disagree

<3> Neither agree nor disagree

<4> Somewhat Agree

<5> Strongly Agree

Please indicate how important the following industries are to your area:

[q51] Agriculture

[q52] Colleges and universities

[q53] Construction

[q54] Fishing / aquaculture

[q55] Forestry

[q56] Manufacturing

[q57] Mining, refining, and utilities.

[q58] Renewable energy production, like wind, solar, or hydroelectric

[q59] Technology, such as computers, software, and the internet

[q60] Tourism / recreation

<1> Not at all important

<2> A little important

<3> Moderately important

<4> Very important

8.9 Appendix 9: Survey Tables

Table 1. Reliability analysis of place attachment variables

Variables	M	SD	Item total correlation	Alpha (α) if deleted	Cronbach alpha (α)
<i>Areas along Oregon's coast:</i> ¹	3.65	1.00			0.93
Are very special to me	3.99	1.09	0.82	0.91	
Are some of the best places for doing what I like to do	3.74	1.15	0.79	0.91	
I am very attached to	3.86	1.17	0.81	0.91	
I would not substitute any other place for doing the types of things that I do there	3.42	1.19	0.76	0.92	
I identify strongly with	3.67	1.18	0.82	0.91	
Doing what I do in areas along Oregon's coast is more important to me than doing it in any other place	3.23	1.18	0.76	0.92	

¹ 5-point scale 1 "strongly disagree" to 5 "strongly agree"

Table 2. Coastal Attachment¹ by Coastal Visit Frequency

	M	SD	Sig.
Visit Frequency			0.00
Never	3.03	1.07	
Less than monthly	3.74	0.88	
Monthly	3.97	0.91	
Weekly	4.44	0.63	
Daily or Almost Daily	4.52	0.61	

¹ 5-point scale 1 "strongly disagree" to 5 "strongly agree"

Table 3. Coastal Attachment¹ by Ideology

	M	SD	Sig.
Ideology			0.02
Liberal	3.77	0.98	
Moderate	3.70	0.92	
Conservative	3.60	1.00	
Not Sure	3.30	1.15	

¹ 5-point scale 1 "strongly disagree" to 5 "strongly agree"

Table 4. Coastal Attachment¹ by Generation

	M	SD	Sig.
Generation			0.004
1	3.80	0.76	
2	3.85	0.97	
3	3.65	1.00	
4	3.43	0.95	
5	3.47	1.16	

¹ 5-point scale 1 "strongly disagree" to 5 "strongly agree"

Table 5. Employment Status Frequency Among Respondents

Employment Status	Freq	Coastal		Inland		Total
		% of Coastal	Freq	% of Inland		
Full time	3	12.9	160	33.9	164	
Part time	3	9.8	42	8.9	45	
Laid Off	3	11.4	12	2.4	15	
Unemployed	3	9.5	47	9.8	49	
Retired	11	10.7	104	22	115	
Disabled	3	11.8	31	6.5	34	
Homemaker	0	0	34	7.1	34	
Student	0	0	31	6.6	31	
Other	1	3.9	13	2.6	14	
Total	27		473		500	

Table 6. Comparison of Coastal Attachment¹ with Independent Variables

	M	SD	Sig.
Environment-Economy Balance			0.004
Environment over Economy	3.73	0.97	
Economy over Environment	3.44	1.05	
Climate Change Evidence			0.001
Yes	3.75	0.97	
No	3.34	1.16	
Climate Change Cause			0.16
Anthropogenic	3.69	1.02	
Natural	3.51	0.96	
Both Human and Natural	3.76	0.88	
Neither, no warming	3.30	1.26	
Other	3.46	1.05	

¹ 5-point scale 1 "strongly disagree" to 5 "strongly agree"

Table 7. Comparison of Views on Future Energy Source Use with Ideology (%)

Variable	Percentages within Ideology											
	Liberal			Moderate			Conservative			Not Sure		
	Reduce	Keep	Increase	Reduce	Keep	Increase	Reduce	Keep	Increase	Reduce	Keep	Increase
Indicate whether the US should reduce or increase these power sources to meet electric power needs in the next 25 years												
Wind	1.2	4.7	94.2	7.2	10.5	82.2	20.4	28.3	51.3	9.1	18.2	72.7
Solar	0.6	3.5	95.9	1.6	8.2	90.1	9.9	27	63.1	1.8	16.4	81.8
Wave	1.2	11.1	87.7	1.6	15.3	83.1	7.9	29.6	52.5	1.8	35.7	62.5
Coal	94.1	2.9	3.0	83.6	12.3	4.1	38.8	37.5	23.7	67.3	30.9	1.8
Natural Gas	61.2	26.5	13.3	34.5	36.9	28.7	10.5	41.8	47.7	33.4	38.9	27.8

8.10 Appendix 10: Oregon's Statewide Planning Goal 19: Ocean Resources

Oregon's Statewide Planning Goals & Guidelines
GOAL 19: OCEAN RESOURCES
OAR 660-015-0010(4)

To conserve marine resources and ecological functions for the purpose of providing long-term ecological, economic, and social value and benefits to future generations.

To carry out this goal, all actions by local, state, and federal agencies that are likely to affect the ocean resources and uses of Oregon's territorial sea shall be developed and conducted to conserve marine resources and ecological functions for the purpose of providing long-term ecological, economic, and social values and benefits and to give higher priority to the protection of renewable marine resources—i.e., living marine organisms—than to the development of non-renewable ocean resources.

OCEAN STEWARDSHIP AREA

The State of Oregon has interests in the conservation of ocean resources in an Ocean Stewardship Area, an ocean area where natural phenomena and human uses can affect uses and resources of Oregon's territorial sea. The Ocean Stewardship Area includes the state's territorial sea, the continental margin seaward to the toe of the continental slope, and adjacent ocean areas. Within the Ocean Stewardship Area, the State of Oregon will:

- Use all applicable state and federal laws to promote its interests in management
- and conservation of ocean resources;
- Encourage scientific research on marine ecosystems, ocean resources and uses, and oceanographic conditions to acquire

information needed to make ocean and coastal-management decisions;

- Seek co-management arrangements with federal agencies when appropriate to ensure that ocean resources are managed and protected consistent with the policies of Statewide Planning Goal 19, Ocean Resources, and the Territorial Sea Plan; and
- Cooperate with other states and governmental entities directly and through regional mechanisms to manage and protect ocean resources and uses.

The Ocean Stewardship Area is not intended to change the seaward boundary of the State of Oregon, extend the seaward boundaries of the state's federally approved coastal zone under the federal Coastal Zone Management Act, affect the jurisdiction of adjacent coastal states, alter the authority of federal agencies to manage the resources of the United States Exclusive Economic Zone, or limit or otherwise change federal agency responsibilities to comply with the consistency requirements of the federal Coastal Zone Management Act.

INFORMATION AND EFFECTS ASSESSMENT REQUIRED

Prior to taking an action that is likely to affect ocean resources or uses of Oregon's territorial sea, state and federal agencies shall assess the reasonably foreseeable adverse effects of the action as required in the Oregon Territorial Sea Plan. The effects assessment shall also address reasonably foreseeable adverse effects on Oregon's estuaries and shorelands

as required by Statewide Planning Goal 16, Estuarine Resources; Goal 17, Coastal Shorelands; and Goal 18, Beaches and Dunes.

IMPLEMENTATION REQUIREMENTS

1. Uses of Ocean Resources

State and federal agencies shall carry out actions that are reasonably likely to affect ocean resources and uses of the Oregon territorial sea in such a manner as to:

- a. maintain and, where appropriate, restore the long-term benefits derived from renewable marine resources;
- b. protect:
 1. renewable marine resources—i.e., living marine organisms—from adverse effects of development of nonrenewable resources, uses of the ocean floor, or other actions;
 2. the biological diversity of marine life and the functional integrity of the marine ecosystem;
 3. important marine habitat, including estuarine habitat, which are areas and associated biologic communities that are:
 - a) important to the biological viability of commercially or recreationally caught species or that support important food or prey species for commercially or recreationally caught species; or
 - b) needed to assure the survival of threatened or endangered species; or
 - c) ecologically significant to maintaining ecosystem structure, biological productivity, and biological diversity; or
 - d) essential to the life-history or behaviors of marine organisms; or
 - e) especially vulnerable because of size, composition, or location in relation to chemical or other pollutants, noise, physical disturbance, alteration, or harvest; or
 - f) unique or of limited range within the state; and
 4. areas important to fisheries, which are:

- a) areas of high catch (e.g., high total pounds landed and high value of landed catch); or
- b) areas where highly valued fish are caught even if in low abundance or by few fishers; or
- c) areas that are important on a seasonal basis; or
- d) areas important to commercial or recreational fishing activities, including those of individual ports or particular fleets; or
- e) habitat areas that support food or prey species important to commercially and recreationally caught fish and shellfish species.
- c. Agencies, through programs, approvals, and other actions, shall
 1. protect and encourage the beneficial uses of ocean resources—such as navigation, food production, recreation, aesthetic enjoyment, and uses of the seafloor—provided that such activities do not adversely affect the resources protected in subsection 1., above; avoid, to the extent possible, adverse effects on or operational conflicts with other ocean uses and activities; and
 2. comply with applicable requirements of the Oregon Territorial Sea Plan.
2. Management Measures

Management measures for ocean resources and uses shall be appropriate to the circumstances and provide flexibility for future actions. Such management measures may include:

- a. Adaptive Management: to adapt management programs to account for variable conditions in the marine environment, the changeable status of resources, and individual or cumulative effects of uses;
- b. Condition Approvals or Actions: to place conditions or limit actions to protect or shield other uses and resources;
- c. Special Management Area

Plans: to develop management plans for certain marine areas to address the

unique management needs for resource protection, resource utilization, and interagency cooperation in the areas;

d. Intergovernmental Coordination and Cooperation: to coordinate, integrate, and co-manage programs and activities with all levels of government, including Indian tribal governments;

e. Regional Cooperation and Governance: to cooperate with other coastal states, countries, organizations, and federal agencies within the larger marine region to address common or shared ocean resource management issues;

f. Public Involvement: to involve the public and affected groups in the process of protecting ocean resource, especially through public awareness, education, and interpretive programs;

g. Precautionary Approach: to take a precautionary approach to decisions about marine resources and uses when information is limited.

3. Contingency Plans:

State and federal agencies, when approving or taking an action that could, under unforeseen circumstances, result in significant risks to ocean resources and uses, shall, in coordination with any permittee, establish appropriate contingency plans and emergency procedures to be followed in the event that the approved activity results in conditions that threaten to damage the marine or estuarine environment, resources, or uses.