

Winchester Bay Coastal User Survey^{1,2}:

A look at the intersection of recreational use
and renewable energy project siting
on the Oregon coast

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¹ This is one of several studies that was requested by the Federal Energy Regulatory Commission (FERC) on September 29, 2008 in response to Douglas County's Pre-Application Document (PAD) for the Douglas County Wave & Tidal Energy Project [4,12]. Results of the study may be considered by both Douglas County and FERC in the planning and permitting process for Project No. 12743-001 that proposes installation of an Oscillating Water Column (OWC) generator and turbine directly into the structure of the south jetty of Winchester Bay.

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Executive Summary

"To make informed decisions, coastal professionals require complete information about the users and constituents that will be affected by coastal policies and activities, especially those that involve development..." [6]

This report focuses on a specific wave energy project proposed by Douglas County for installation on, or adjacent to, the South Jetty of Winchester Bay, Oregon. Utilizing technology that has previously not been employed in the United States, Douglas County submitted a pre-application document (PAD) to the Federal Energy Regulation Commission (FERC) proposing a near-shore Oscillating Water Column (OWC) generator and turbine [12].

A project such as this has implications for the recreational community enjoying the current services of the South Jetty due to the project's modification of specific environmental factors on site. This is evident in reading comments submitted to FERC by the non-profit Surfrider Foundation and many individuals following the county's PAD submission, as well as multiple coastal development research projects worldwide [2,11].

To inform the decision-making process and gain a more comprehensive understanding of the use of the South Jetty, this study examines current recreational use at the site, as well as estimates of the effect that potential environmental changes due to wave energy project development might have on recreational use.

Surfers are a focus of this study due to their known sensitivity to environmental changes resulting from development and their relatively unstudied habits and demographics [6,2,11]. Fishermen and beach goers are also of interest as contrasting recreational user groups with different environmental needs.

Estimating Recreational Use

A survey instrument was deployed at the South Jetty of Winchester Bay from June 19th to August 24th, 2009. A written questionnaire³ was handed out in person to all users that approached the study site during pre-determined surveying hours.

Recreational users were questioned about:

- visitation rate
- expenditures in the local area
- recreational activity they would engage in at the site
- and other visitation parameters

Impact of Environmental Conditions on Recreational Users

As introduced above, tradeoffs are involved in the construction of renewable energy technologies. Decision makers must weigh the consequences of many complicated

³ Refer Appendix A for complete survey.

tradeoffs. Only one of this multitude is highlighted by this study and that is a change in the environmental parameters at the South Jetty with construction of a proposed OWC generator and turbine. Potential effects of the project on wave quality, shark abundance and jetty access were hypothesized to potentially change recreational user visitation rates at the South Jetty.

The potential environmental changes associated with the OWC were consequently shown to affect expected visitation rates of both surfers and fishermen more dramatically than beach goers. Surfers were specifically sensitive to changes in wave quality while fishermen responded strongly to changes in jetty access. Beach goers reported limited sensitivity to wave quality and reacted mostly to changes in access. None of the groups responded that they were sensitive to changes in shark abundance in the area.

Economic Impact of Recreational Users

Overall, the recreational users surveyed during the course of this study spent a total of \$39,245 each day in the local area. That averages out to just under \$60 per day per survey. This amount includes expenditures from a variety of activities, including eating and drinking in the local area, renting gear, buying gas, staying in hotels, and shopping in the vicinity of Winchester Bay.

The three recreational user groups of interest in this study (surfers, fishermen and beach goers) spent approximately the same amount per day of their visit to the area, with surfers spending the least (\$52) and beach goers spending the most (\$58). This suggests that all three groups are important when considering the economic impact of OWC construction in Winchester Bay.

Economic Impact of Visitation Rate Change

Potential changes in the rate of visitation by recreational users combined with an analysis of economic impact of these same users illuminates a potential decrease in local spending with the construction of a wave energy project on the South Jetty. Recreational users who will visit less often if wave quality decreases account for approximately 20% of the average annual spending of all users surveyed in this study. Recreational users who would visit less often if access was restricted account for 41% of the average annual spending.

If the visitation rate was cut in half by only the 30% of recreational users that indicated in this survey that they would visit less often if access was restricted and wave quality decreased, the local area would lose over \$400,000 of local spending annually.

Working with stakeholders during the OWC placement design phase, may have a more positive economic impact than the scenario described above. If wave quality could be increased at the site through the stakeholder involvement process, spending in the local area is likely to increase a minimum of \$160,000 annually.

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Introduction

Development, the Renewable Energy Portfolio, and Recreational Use

Recent interest in renewable energy development in the United States has manifested in many different types of projects across the country (e.g. wind, solar, geo-thermal, etc). However, as with all infrastructure development, these technologies require space and fundamentally change the environment in which they are built.

Wave energy is no exception. Coastal managers need information about all marine area users and potential impacts of wave energy project development on coastal ecosystems, coastal economies, and coastal societies to make just policy decisions.

Recreational users are an important constituency in coastal zones. Many recreational activities depend on specific environmental conditions and cannot be performed if these conditions change. Surfing is one of these recreational activities [6].

This study examines the surfing community's current behavior and potential responses to specific potential environmental changes due to near shore wave energy project development. For perspective and context, all users of the proposed site of development were surveyed. After sampling occurred, fishermen and beach goers were identified as common site users that could lend context to the surfing community's perspective on the proposed project's development.

Winchester Bay Study Site

In 2006, a near-shore wave energy project was proposed for the Oregon coast. The proposed site of this project is just south of Reedsport in Winchester Bay. Due to the nature of near-shore technologies, rocky structure is needed to stabilize the OWC device. The jetty built at the mouth of the Umpqua River in Winchester Bay provides this structure. The proposal was submitted by Douglas County and was reviewed by FERC [4,12].

The South Jetty of Winchester Bay is located approximately two miles off of Highway 101 at the mouth of the Umpqua River. It is less than 2000 feet from the entrance of the Oregon Dunes National Recreation Area. The Umpqua River Lighthouse is located a half mile inland from the jetty on the site of a Coast Guard station. Salmon Harbor marina also sits just inland on the Umpqua River and is homeport to many commercial and recreational fishing vessels. This proximity to the Oregon Dunes, the Umpqua River lighthouse, and Salmon Harbor marina attract many tourists to Winchester Bay and specifically to the South Jetty.

The mouth of the Umpqua River attracts many locals seeking the specific water and wave conditions the river and jetty provide. Surfers and fishermen, both local and visiting, find excellent conditions for fishing a variety of species and for surfing a premier quality right-handed surf break.

Methods⁴

Study Site delineation

The study area (the South Jetty of Winchester Bay) has two primary access points⁵. They are referred to in this study as the Main Site and the Triangle Site. People were surveyed at these two locations throughout the summer. The location of these sites in relation to the jetty is shown in Figure 1 below.



Figure 1: Study Sites in Relation to the South and North Jetty of Winchester Bay (map obtained from Google Earth)

Both sites provide free parking to residents and tourists, while the Oregon Dunes National Park lot (3 miles further from Highway 101 along Salmon Harbor Drive) charges per car to park. Access to the Main Site is paved and connects directly to Salmon Harbor Drive with signage indicating beach access. The Main Site consists of a paved parking lot that can accommodate over 50 vehicles. The Triangle Site, on the other hand, is not signed and users must drive along a gravel road off of Salmon Harbor Drive to find the access road. The last portion of the road is mostly sand and requires all terrain vehicles. The Triangle Site does not provide paved parking spaces and is located at the base of a coast guard tower that prohibits parking directly in front of its gates.

⁴ All methods were based on methodology employed in a 2008 study of the coastal uses of Elkhorn Slough in Central California [8]. The sampling schedule has been altered slightly in the Winchester Bay study to account for different activities of the Oregon coast. Verbal filter questions were also added to the original methodology.

⁵ Study sites were determined through observation and local knowledge of employees of the Surfrider Foundation.

Survey Instrument

A written survey⁶ was administered via in-person intercept survey methods during June, July, and August 2009. Because both study sites are beach access parking areas, they create a natural bottleneck between parking spaces and the beach. This created an ideal location for the surveyor to intercept most users as they entered the site.

Every adult that arrived at a survey site during a survey shift and walked down the main sandy path was approached and asked to complete a survey. If the written survey was refused, each intercepted user was asked to complete the survey as a verbal interview on the spot.

If a survey was accepted, respondents were asked two filter questions verbally before beginning: 1) "Are you at least 18 years old?" and 2) "Do you do any fishing, surfing or diving here at the South Jetty?" If a coastal user was under the age of 18 they were not asked to complete a survey following the Yale University IRB guidelines overseeing this project. If a respondent answered that did not do any of the three activities mentioned in the second filter question, they were handed the four page regular survey. If a respondent participated in any of the three target activities, they were handed a half-page subsection corresponding to their chosen activity in addition to the four page regular survey. (If a respondent answered that they only fished on the ocean from a boat as opposed to off of the jetty, they were not given the fishing subsection.)

Sampling Schedule

To determine when to sample, the random number generator in Microsoft Excel was used to choose the date of each survey day:

- "weekends" were defined as Friday, Saturday and Sunday
- "weekdays" were defined as Monday, Tuesday, Wednesday and Thursday

In general, most recreation occurs on non-weekdays. Therefore, 67% of the "weekend days" and 50% of the "weekdays" between June 19th and August 24th were randomly selected. These proportions were chosen in an attempt to maximize the number of coastal users that were intercepted.

Due to the nature of coastal activities that take place on at the study site, a day was divided into three different shifts: 0700-1000, 1200-1500, and 1700-2000. Consultation with knowledgeable locals informed the division of the day into these shifts. They were chosen to capture the full range of activities that occur at the South Jetty. On each randomly selected date, all shifts were surveyed.

⁶ The survey instrument itself is comprised solely of questions used in by published work by Pendleton and Nelsen [6,8]. Minor changes were made to the survey questions to reflect its use in Oregon as opposed to California. Q-14 was the only question created by the author of the Winchester Bay study. Refer Appendix A for complete survey.

The site at which each shift took place was also randomly selected. Data was collected 67% of the time at the Main Site and 33% of the time at the Triangle Site. This proportion was determined by initial pre-summer observation at both sites again to maximize the number of coastal users (specifically surfers) that were intercepted.

Results

During sampling from June 19th through August 24th, a total of 668 groups of users, representing 1,206 adult visitors, agreed to respond and properly completed a survey.

There were approximately the same number of surfers and fishermen surveyed over the course of the study, each making up nearly 9% of respondents. Beach goers were the largest group surveyed representing over 60% of total population surveyed.

A total of 648 people refused to take the survey when approached. This indicates a 65% response rate (1,206 people who accepted out of 1,854 total people approached).

Questionnaire Responses

The response rate of each question in the survey was calculated within Microsoft Excel. The proportion of total users answering with a specific answer was then calculated for each question, as well as those who did not answer properly. Please see Appendix B for a tabulated summary of responses to each question of the survey instrument.

Discussion

Summary of Recreational Uses at the South Jetty

All respondents were asked to indicate which recreational activities they would be partaking in during their visit to the jetty. A selection of activities was supplied with the question to narrow the scope of answers to activities that were most interesting to this study, namely surfing, fishing, diving and wildlife viewing.

Beach Going emerged overall as the most popular activity undertaken at the South Jetty during the study period. *Hiking/Walking* was indicated as a South Jetty activity by about half as many people as indicated *Beach Going*. The third and fourth most

popular activities were *Wildlife Watching* and *Dog Walking*. See Figure 2 below for a breakdown of all activities⁷.

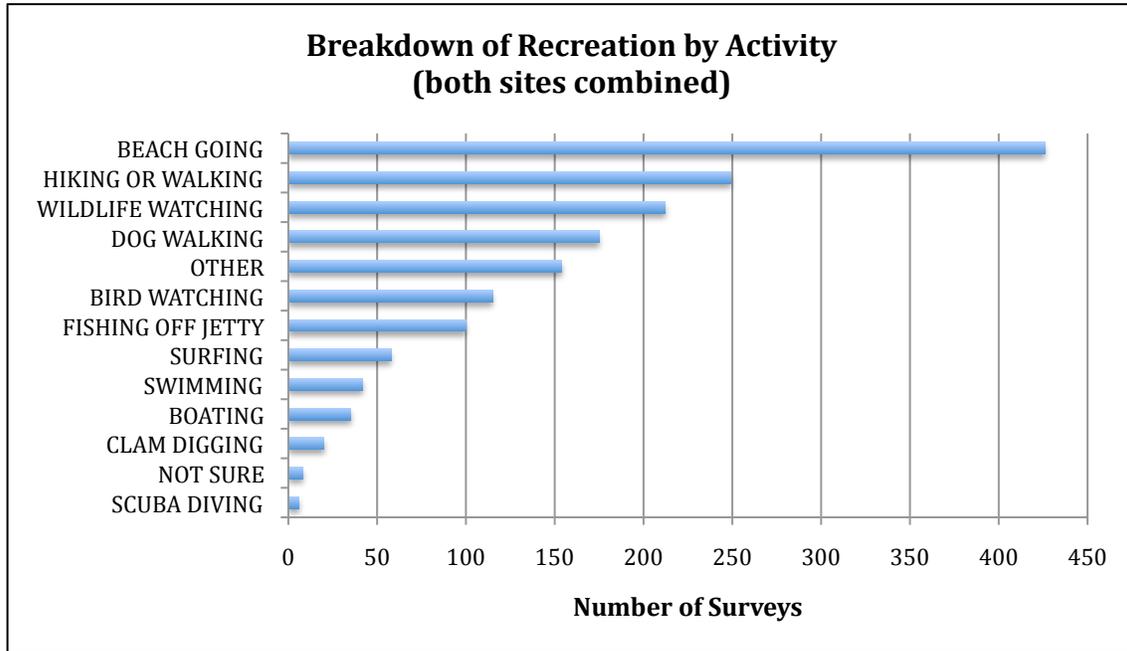


Figure 2: Number of responses to the question: “Today, which activities did/will you undertake at the South Jetty?” at both the Main Site and the Triangle Site combined

From this graph it is also apparent that consumptive recreational uses, namely *Fishing off Jetty* and *Clam Digging*, are undertaken by less of the total user population than more generic non-consumptive uses such as *Beach Going* or *Wildlife Watching*. Likewise, activities that take place within the water itself, namely *Surfing* and *Swimming*, were indicated by only an eighth as many respondents as the sand-based and most popular activity of *Beach Going*.

Functionality of the Main Site vs. the Triangle Site

When the two survey sites are disaggregated, a different recreational use pattern appears. In Figure 3 below, the same activity choices are displayed for the surveys collected at the Main Site and Triangle Site separately. (Please refer to Figure 1 for mapped location of each site). The graph of the Main Site follows a similar pattern of recreational activity popularity as the previous analysis of combined sites. However, at the Triangle Site, *Fishing off Jetty* becomes the most prominent activity in front of *Beach Going*.

Figure 3 below suggests that there is a functional difference between the two sites sampled. One explanation for this functional difference is the distance of each access point from the rock jetty itself. The Triangle Site gives a user direct access to the jetty, whereas a user must walk 5-7 minutes through the sand to reach the rock

⁷ Because respondents were able to circle multiple activities in this question, the total number of people represented in Figure 2 is much greater than the total number of surveys collected.