

DRAFT

June 10, 2008

Director Randall Luthi
Minerals Management Service
Offshore Minerals Management
Alternative Energy and Alternate Use Team
381 Elden Street
Herndon, Virginia 20170-4817

Re: Docket ID MMS-2008-OMM-0020

Dear Director Luthi and Alternative Energy and Alternate Use Team:

These comments on Minerals Management Service's (MMS) designation of five areas off the outer continental shelf for alternative energy testing sites are being submitted by the Pacific Fishery Management Council (Council) in fulfillment of its federal statutory mandates and prerogatives. Since federal waters off California are within our jurisdiction, we are particularly concerned with the two sites proposed off Mendocino and Humboldt Counties, Ukiah NJ 1—02 (which contains 14 MMS blocks of approximately nine square miles each) and Eureka NK 10-10 (which contain 24 MMS blocks). These sites were nominated to accommodate the WaveConnect projects proposed by Pacific Gas and Electric Company (PGE) in each area. We understand that you also received applications for wave energy lease sites off Washington and Oregon, but are not proposing sites in waters off those states at this time.

We note that you seek comments and information related to the environmental values of the selected sites, effects on other ocean users, and applicable policies; and that you seek information on how to coordinate and consult effectively with federal, state, and local counterparts about the nomination sites and the interim process for these test facilities. We thank you for that interest.

The Council is one of eight regional fishery management councils established by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976, 16 USC 1801 et seq. The Council manages fisheries in the Exclusive Economic Zone off the west coast states, including California. It works closely with relevant state and tribal governments to coordinate sound fisheries and habitat management practices. The Council operates under federally approved fishery management plans (FMP) for Pacific Coast Salmon (three species), Pacific Coast Groundfish (8 species), Coastal Pelagic Species (five species); and Highly Migratory Species (13 species). These FMPs have been implemented through federal regulations issued by the National Marine Fisheries Service (NMFS), an agency within the National Oceanic and Atmospheric Administration under the U.S. Department of Commerce.

An integral part of fishery management plans is the designation of “Essential Fish Habitat” (EFH) for the managed species and consideration of actions to ensure the conservation and enhancement of such habitat. EFH is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.” When actions are taken by a federal agency that may adversely affect EFH, MSA requires that the agency consult with NMFS on the activity. Under the MSA, the Council **must** comment on and make recommendations to MMS concerning any activity that, in the Council’s view, is likely to substantially affect the EFH of the anadromous fishery resources under its authority; and it **may** comment on actions that adversely affect the habitat of other species under its authority. In an effort to improve coordination between the Council and MMS, we request that MMS directly engage the Council via written correspondence to solicit input on actions that may affect fishery management practices.

The Council is concerned that the proposed wave facility test areas on the Northern California outer continental shelf may adversely affect fish and fisheries, as well as EFH for various federally managed species identified in the Pacific Coast Groundfish, Coastal Pelagic Species, Pacific Coast Salmon, and Highly Migratory Species FMPs. Furthermore, this is the first research license application process for wind, wave and ocean current energy development being proposed by MMS and is likely to set a precedent for other energy projects in the future. Therefore, we ask that MMS work closely with the Council before issuing any licenses to ensure that the Council’s concerns are addressed.

Our concerns and suggestions are as follows:

1) *Precautionary approach*. The Council urges the MMS take a precautionary approach with the development of this new technology. Location and design criteria should avoid unnecessary risks until more is known about the impacts of this technology and which wave energy design will yield the least environmental risk. We request that MMS avoid siting projects in sensitive or biologically rich habitats. If test areas are successful, they are likely to be commercially developed. Therefore, each of the blocks nominated by applicants should be screened by MMS to determine which have the least resource and user conflicts or sensitive habitat. Additionally, MMS has established no upper limit on the number or size of facilities allowed, or their maximum “footprint.”

2) *Scale of projects and cumulative effects*. As noted above, MMS has established no limit on the number of total test facilities that will be allowed within the nominated areas. In addition, there is no limit on the scale at which wave energy test projects are being considered in the Pacific Northwest (both in state and federal waters), and we have very little knowledge of their effects on marine species and the environment. Not enough testing of wave energy technology has occurred to allow us to understand the impacts of even a single project; yet it is unclear how many individual projects might be developed. Multiple wave test projects distributed across multiple blocks could have cumulative effects on marine fish, mammals, and habitats, as well as on the commercial fishing fleet. A large number of projects could compromise healthy ecosystems, and should be evaluated at a regional ecosystem scale before projects are installed. How these outer continental shelf projects will interact with wave energy projects in state waters also needs to be considered in a cumulative fashion.

3) *Impacts to fisheries and species*. Fishing is likely to be prohibited in designated wave energy test areas for safety and liability reasons. Spatial data for most of these fisheries is lacking,

making it difficult to estimate the economic impact this and expanded or subsequent wave energy projects will have on the local fishing industry. Impacts to these fisheries will occur as either reduction in total fishing effort and lost productivity (economic impact) or displacement of fishing effort to areas outside the area closed to fishing due to these test facilities. Displaced fishers will likely concentrate their efforts on areas immediately outside the wave park boundary, resulting in increased pressure on fish and habitat in those areas. These indirect impacts should be included in the project's assessed impacts.

The NEPA analysis must include fishing effort information, compiled in cooperation with the fishing sector, in order to identify important fishing areas and to minimize the placement of wave energy facilities in these areas. In addition, potential economic losses should be estimated as part of this and future applications.

4) Need for site-specific information. The potential impacts of wave energy development on fish species and their habitat must be assessed on a site-specific basis. Site-specific information will be necessary for the applicant to conduct *in situ* baseline studies within the proposed project area to characterize the species community and determine relative importance of local habitats. Baseline studies should be conducted prior to a final MMS decision on site location, and prior to project construction, to minimize unnecessary impacts.

5) Technology standards to minimize footprint of test facilities. The Council is concerned about the size of the potential test sites. In order to minimize the size of the area needed, standards for high energy-efficient turbine design should be implemented. Testing inefficient technologies may be an unnecessary risk.

In the attached appendix, the Council recommends specific project development and management requirements in the lease related to:

- Baseline studies on biological and physical characteristics
- A site-specific monitoring plan
- Addressing cumulative impacts from multiple projects
- Efforts to minimize emissions from electro-magnetic, acoustic and light sources and monitoring of these potential effects
- Adaptive management conditions or lease termination provided for during the lease term if sensitive species, habitats are found to be affected
- A decommissioning plan
- Fiscal mechanisms that assure removal of all equipment and site remediation that will survive bankruptcies, corporation name changes, etc.

Additional comments on environmental concerns are summarized below and provided with more detail in Appendix A, including:

- Alteration in species composition and abundance in and around the project area, including trophic level impacts
- Electromagnetic fields
- Acoustical effects
- Collision, entanglement and entrapment

- Project site location
- Habitat alterations
- Effects on spawning habitat
- Areas of concentrated prey species
- Changes to habitat quality
- Physical dynamics of habitat displacement

Knowledge of potential impacts of this technology is rapidly developing. Oregon State University's Hatfield Marine Science Center recently hosted a scientific forum of 50 scientists to consider the range of potential environmental impacts of wave energy (<http://hmsc.oregonstate.edu/waveenergy/index.html>) that may be helpful in your efforts.

We hope the Council's comments are helpful to MMS in developing this new licensing program and that a wave energy program takes advantage of the collective wisdom of the scientists and resource managers.

Sincerely,

D. O. McIsaac, Ph.D.
Executive Director

JDG:xxx

cc: Council members
Habitat Committee
Council staff

APPENDIX

Project Development and Management:

- a. *MMS leases should be designed to gather baseline biological and physical data.*

In the context of living marine organisms and dynamic environments, “baseline” is not a static point in time, but rather a “trend analysis” that takes into account the natural variability in nature, both temporally and spatially. Baseline information of the biological and habitat resources at the site allows for a) characterization of species community, diversity, and abundance and habitat, and b) a benchmark on which to monitor and measure short and long term effects of wave energy projects on natural resources. Additionally, it will be necessary to identify such features as current convergence zones, migration corridors, spawning and settlement aggregations and other essential habitat factors that are unique or specific to the project area. Baseline information is also needed in reference or control areas outside the project boundary in order to differentiate between naturally occurring phenomena and artificial changes. To account for changing climatic conditions, El Nino/La Nina weather patterns, hypoxia events, and other annual environmental variables, baseline data are needed over a five-year period.

Baseline information of particular interest to the Council includes:

- 1) Characterization of the substrate
- 2) Characterization of the benthic and epibenthic invertebrate communities on which several Council-managed species prey
- 3) Characterization of the entire fish community, including forage species during spring, summer and winter to account for seasonal migration patterns

- b. *Site-specific monitoring plans are needed to monitor changes to the biological and physical environment.*

As there no other full-scale wave energy projects in the U.S. on which to gauge environmental impacts, a comprehensive monitoring plan is needed for the MMS test projects. This plan would serve as a template for subsequent projects as well. The monitoring plan should be developed in coordination with state and federal regulatory agencies. The monitoring plan should also include a requirement for monitoring following decommissioning, should that occur.

- c. *Determine and manage for cumulative impacts of multiple projects.*

The cumulative impacts of multiple wave energy projects along the coast are unknown. Factors such as size, spacing, spatial relationship to littoral drift, currents, etc. may have unforeseen impacts on the overall dynamics of the environment. Cumulative impact studies should be developed as part of a larger, regional wave energy program, incorporating expertise in the fields of physical and biological oceanography, marine geology, marine ecology and fisheries.

- d. *MMS test leases should be required to meet minimum construction standards to minimize emissions from electro-magnetic, acoustic and light sources and to help test if these standards are adequate to protect fish and wildlife species.*

The Council recommends establishing standards for construction of all wave energy devices to minimize electromagnetic, acoustic and light emissions in order to reduce exposure of susceptible marine species to such impacts. Such a standard protocol could minimize or eliminate the need to evaluate their utility with each new wave energy proposal.

- e. *License conditions should require adaptive management.*

As wave energy technology is early in the developmental phase and will continue to evolve with studies and advances in technology, environmental impacts remain unpredictable. To best manage wave energy projects, including test projects, for unforeseen impacts, a management and monitoring plan should be responsive, flexible and adaptive to ensure that necessary safeguards for the marine environment are put in place as needed. In practice, this could include modifying existing equipment where demonstrated impacts are unacceptable or may be reduced. It could also mean minimizing the size of the overall project footprint, if results can be achieved operationally in a smaller overall area.

- f. *License conditions should require curtailment and/or decommissioning of unsuccessful projects.*

If adaptation is unsuccessful, ESA-listed species or sensitive species are taken, or habitat impacts are beyond those anticipated, the project should be curtailed or decommissioned. Given the lack of knowledge about impacts of wave energy projects, a condition of impact review and mandatory consultation and response before any lease renewal is requested or granted.

Impacts to Species and Habitat:

Species Concerns

- a. *Alteration in species composition and abundance in and around the project area, including trophic level impacts*

The installation of buoys, anchors and associated structures will add hard substrate to an otherwise uniform sandy environment, and will possibly attract an entire community of rocky reef fishes and invertebrate species not normally present there. It is unknown what the ecological consequences will be over the extent of the project area, including displacement of resident fishes. Another consideration is the potential increase in seabird and marine mammal activity in response to concentrations of prey organisms, and increased risk for collisions with structures while diving and swimming. As stated previously, it is necessary to establish the natural, baseline population to determine relative habitat value of the area and to monitor changes throughout the permit period.

- b. *Electromagnetic fields*

Electromagnetic fields (EMF) may impact organisms such as elasmobranchs, sea turtles, and marine mammals that use electric and/or magnetic sense in detecting predators and prey, orientating to ocean currents, and sensing their magnetic compass headings. Information on EMF emanating from wave buoys is lacking. Studies would be needed to evaluate the impacts of EMF on these species and evaluate the effectiveness of any device installed to minimize impacts.

c. Acoustics

Fish and seabirds are highly sensitive to sound, and marine mammals use sound for communication and detection of prey. Sounds and vibrations created by movements of the structure above and below the water surface, along with acoustic guidance devices that may be deployed to direct marine mammals around the array, could disturb or displace fish, diving seabirds and mammals. Studies are needed to determine specific acoustic signatures of test devices and site-specific ambient transmissions.

d. Collision, entanglement and entrapment

All mobile marine animals are susceptible to collision, entanglement and entrapment at varying degrees. Assessment of these impacts would be necessary during and post-construction, and modifications to the structural design may be necessary to reduce observed impacts.

Habitat Concerns

a. Project site location

Wave projects should not be sited in or near areas that are known to be important ecological habitats (e.g., rare, sensitive, vulnerable). Areas that have been designated by the Council as HAPCs should be off limits to wave energy development, and areas closed by the Council to protect certain species from fishing should be given particular attention.

b. Habitat alterations

Artificial structure (i.e., fish aggregating devices) may be created in what appears to be an otherwise uniform sand environment. Effects on species are noted above under Species Concerns (a).

c. *Effects on spawning habitat*

It is unknown if the proposed area is located in fish spawning habitat. Changes in habitat dynamics, including current dynamics and sand movement, could have negative impacts on spawning success. Visual recording of fish use activities on a random sampled design (both day and night) should be considered.

d. *Upwelling areas with high concentrations of prey*

Local topographic features can create local upwelling areas or other conditions that serve to distinguish areas from each other and support areas of higher primary (plant) and secondary (zooplankton) production, as well as concentrate forage species. Identification and avoidance of such areas would be important.

e. *Changes to habitat quality*

Grain size, homogeneity, and amount of organic material in the sediment are characteristics that contribute to defining a habitat. These characteristics are likely to change as energy is removed from the wave train and deposition of finer sediments occurs. Analysis of these potential effects should be required.

f. *Toxins and chemicals*

The release of anti-fouling agents, chemical byproducts from the manufacturer of the facility's components, and chemicals associated with operation could contaminate habitat and impact species. This factor should be addressed.