Cordell Bank National Marine Sanctuary

Alternative Energy

Management Issue

The development of alternative energy in offshore environments of the United States West Coast has been proposed, and such activity within Cordell Bank National Marine Sanctuary (CBNMS or Sanctuary) would have an unknown effect on living resources and habitats.

Description

As the United States' demand for energy resources grows, alternative energy production (including wind, tidal, and wave energy) is expanding to offshore environments. Construction and operation of alternative energy infrastructure would likely impact sanctuary resources in a variety of ways. The initial construction and deployment of anchors and cables could cause substantial habitat alteration and directly affect living resources dependent upon these habitats. Operation of energy-capturing equipment could have a negative impact on living resources by altering behavior of individuals or causing direct mortality as organisms come in contact with equipment in the offshore environment. Placement and operation of energy-capturing equipment could also impact commercial and recreational users of the Sanctuary.

An example of a buoy design (AquaBuOY) that can be used to convert the kinetic energy of the vertical motion of on-coming waves to electricity. Photo credit: Finavera Renewable. www.finavera.com

Questions and Information Needs

1) Are there sensitive habitats in the sanctuary not conducive to alternative energy projects?

2) How would nocturnal seabirds be affected by lighting of sea surface equipment?

3) What would be the impact of installation and operation of energy-capturing equipment on benthic habitats, epifauna and infauna?

4) How would these energy-capturing operations affect whale migration?

5) How would these installations affect coastal currents, wave propagation and sediment transport?

6) How would these installations impact vessel traffic?

7) Would these installations limit access to historic fishing grounds?

8) What are the economic impacts to commercial users, recreational users and coastal communities?

Scientific Approach and Actions

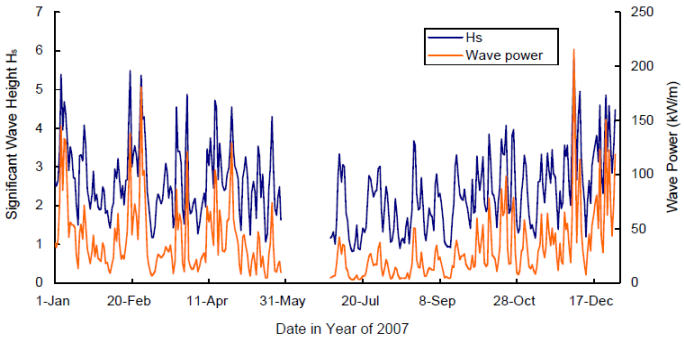
- Compile information on the distribution and abundance of pelagic and benthic organisms, including species of threatened or endangered status
- Assess currents and physical oceanographic features in the region
- Conduct bathymetric and habitat surveys of the Sanctuary seafloor and examine organism-habitat relationships
- Conduct socioeconomic analysis of user activities in the sanctuary and the region
- Identify migration corridors and habitat use patterns for cetaceans along the west coast
- Conduct experiments to determine effects of light on nocturnal seabirds
- Collate vessel traffic information for vessels entering and leaving San Francisco Bay
- Compile local oceanographic data and create a summary of climatology

Potential Key Partners and Information Sources

- US Coast Guard, University of California-Bodega Marine Laboratory, San Francisco State University Romberg-Tiburon Lab, Moss Landing Marine Lab, US Geological Survey, California State University at Monterey Bay, Ecotrust, Pacific Federation of Fishermen's Association, Pacific Fisheries Management Council, NOAA Fisheries, PRBO Conservation Science.
- Consult with authors who presented research recommendations in the October 2008 project report prepared for the California Energy Commission and the Ocean Protection Council titled "Developing wave energy in coastal California: Potential socio-economic and environmental effects."

Management Support Products

- Habitat maps and maps of the distribution and abundance of benthic organisms
- Species list and community composition of benthic soft bottom community
- Oceanographic climatology for the region
- Socioeconomic report on value of use and impacts from inability to use
- Maps with vessel traffic routes in and out of San Francisco Bay
- Report with information on nocturnal behavior of seabirds and impacts of lights
- Maps of finer resolution coastal migration routes for cetaceans



Daily average significant wave height Hs (m, blue line) and wave power (kW/m, orange line) observed at CDIP Pt Reyes Buoy (within Cordell Bank NMS) in 2007. Source: J. Largier et al.

Planned Use of Products and Actions

- Utilize oceanographic climatology to evaluate change over time and understand potential project impacts
- Identify areas where activities may not be appropriate based upon environmental sensitivity maps
- Use socioeconomic report to understand user conflicts and economic viability of project
- Use maps with vessel traffic routes to ensure maintenance of safe navigation corridors
- Ensure protection for listed species using information on coastal migration routes and habitat use for cetaceans
- Provide information to larger ocean community to support ocean conservation and responsible energy development

Program References

<u>CBNMS Management Plan</u>

- Conservation Science Action Plan, strategy CS-2, CS-3, CS-4, CS-7

<u>CBNMS Condition Report</u>

- Abundance and distribution of habitat types (question 5)
- Status of key species (question 12)

<u>ONMS Performance Measures</u>

- By 2015, 100% of the sanctuary system is adequately characterized.