

## **ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES**

**MMS OCS Region:** Pacific

**Title:** Effects of EMF from Transmission Lines on Elasmobranchs and Other Marine Species

**Total Cost:** \$249,989

**Period of Performance:** FY 2009-2011

**Conducting Organization:** Normandeau Associates

**MMS Contact:** Dr. Donna Shroeder

### **Description:**

Background Alternative energy technologies, for the foreseeable future, will be focused on the generation of electricity. In all cases, the individual devices will be interconnected with power cables to transmit the electricity to a platform or gathering site and a single cable will connect the entire facility to shore. The power cable will transmit either alternating current or direct current. If the cable uses alternating current, then it will generate both electric and magnetic fields. Proper shielding can block electric fields but not magnetic fields, which in turn, can induce secondary electric fields.

During scoping meetings for the Alternative Energy and Alternate Use Program Environmental Impact Statement, concerns were raised about the possibility of these fields attracting sharks and rays to an area around the cable. Furthermore, a power cable may bisect the entire width of coastal habitat and perhaps pose a barrier to EM-sensitive animals with alongshore migration patterns.

Recent studies of electromagnetic fields (EMFs) at European wind facilities have yielded inconclusive results, either related to the design of the experiments or the relatively low level of impact (summarized in Michel et al. 2007). More definitive studies are needed to demonstrate whether marine species are sensitive to these fields and, if so, whether there is significant alteration in behavior that could lead to population level effects.

Objectives The objectives of this study are to determine: (1) the strength, spatial extent, and variability of EMFs; (2) whether sharks and rays are sensitive to the types of magnetic fields that would be created by these cables; and (3) whether migratory fish interact with these fields.

Methods The evaluation would initially involve a synthesis of existing information about EMF fields; a summary of the strengths and weaknesses of field studies that have already been conducted; the species that may be affected by these fields, both vertebrate and invertebrate; a summary of existing transmission lines on the OCS and international waters; and propose experimental designs to determine whether EMF does affect marine species.

Importance to MMS The MMS requires more detailed information concerning the level of impacts of EMF on some marine species. The information will be applicable to all alternative energy technologies that produce electricity and will be used to address public perception about the impacts of EMF and help define appropriate mitigation measures.

Current Status: The contractor is reviewing literature and preparing a draft report.

Final Report Due: March 2011

Publications: None.

Affiliated WWW sites: None.

Revised date: October 15, 2009