Supporting Renewable Energy - 2013

Discipline	Title	Rank
PO	**Predicting the Consequences of Wave Energy Absorption from Marine Renewable Energy Facilities on Nearshore Ecosystems**	**5**
Needed now to perform timely environmental review for renewable energy projects		

OCEAN POWER TECHNOLOGIES

BOEM Information Need:

To predict impacts from potential commercial-scale wave energy developments, BOEM requires information to assess how reductions in wave energy may affect nearshore habitats, particularly kelp forests.

## Relationship to Previous BOEM-Supported Research:

Examining the sensitivity of these factors to wave exposure requires a long data set where community time series can be analyzed at several different sites. These long-term data sets exist and are presently being organized and analyzed by the BOEM-funded *DOI Partnership: Distinguishing Between Human and Natural Causes of Changes in Kelp Forests Using Long-term Data from DOI Monitoring Programs*.

OBJECTIVE

Develop a statistical model that predicts the potential effects of wave energy absorption from marine renewable energy projects on nearshore ecosystems
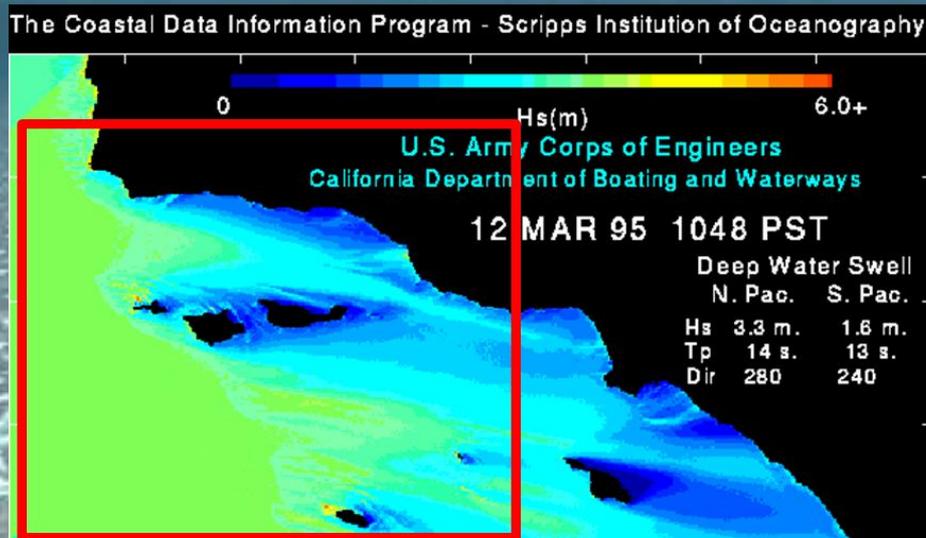
Peak swell (mean significant wave height, Hs) for storm event March 12, 1995, for the Southern California Bight (image courtesy of William O'Reilly)
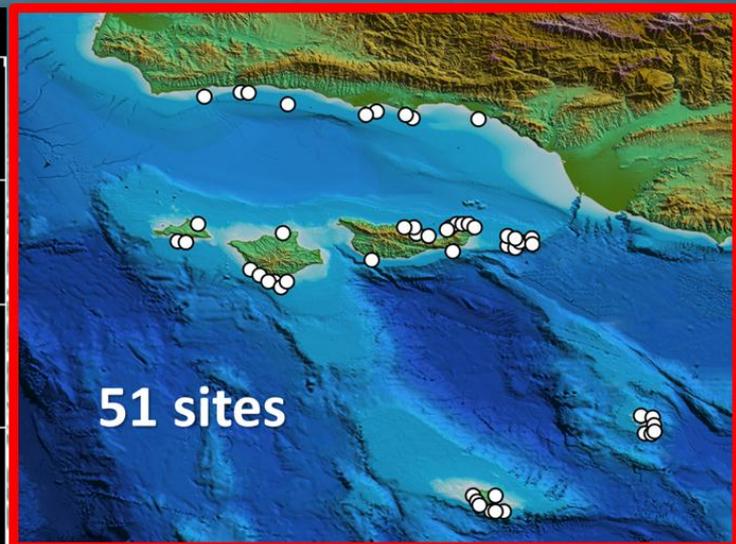
Kelp forest sites with long-term data

BOEM Pacific Region

METHODS

1) Determine the distribution of wave period and amplitude across the study region

2) Determine how wave model predictions relate to empirical observations along a depth gradient.

3) Determine how marine communities respond to variation in wave exposure
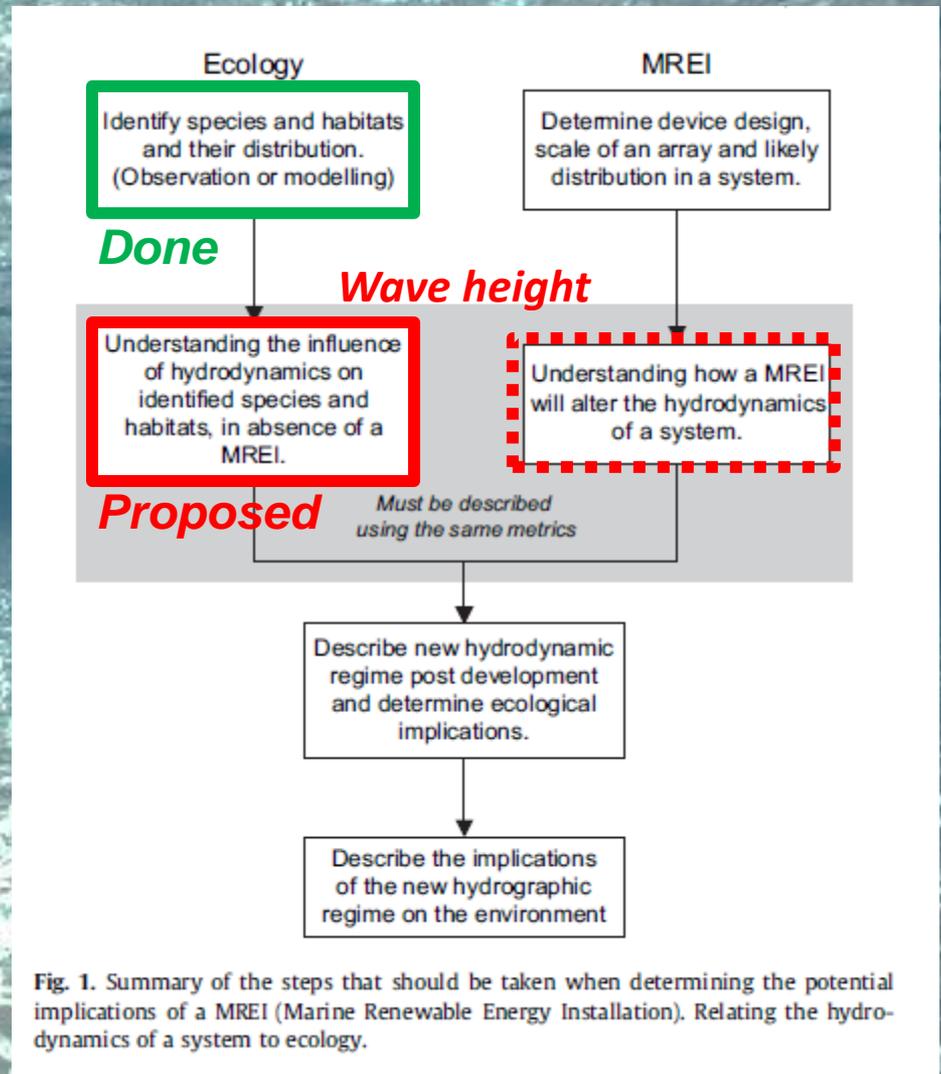
BOEM Pacific Region

Fig. 1. Summary of the steps that should be taken when determining the potential implications of a MREI (Marine Renewable Energy Installation). Relating the hydrodynamics of a system to ecology.

Shields et al. 2011 Ocean and Coastal Management

Marine renewable energy: The ecological implications of altering the hydrodynamics of the marine environment