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## SSIO 2015 Internship Opportunity Position

### Internship Information

Project title: **Data-mining to develop environmental predictors of deep-sea coral habitat in the Remote Pacific Islands**

NOAA mission goal: **Healthy Oceans**

Hypothesis or objectives: **Remote areas of the Pacific Islands region (RPI), beyond the exclusive economic zone of the Main Hawaiian Islands, represent a major challenge for scientists and managers trying to understand the distribution of deep sea corals. Few deep coral records exist in the RPI, and few of the data sources that we have come to rely on for habitat suitability modeling in other regions are available (e.g. long-term records of bottom temperature and salinity, benthic substrate, surficial sediment). Remote-sensing data are available (e.g. SST, Chl-a), but are likely to be less relevant to deep sub-surface ecosystems in this oligotrophic, stratified region of the ocean. At the same time, major planning decisions must be made regarding investments of field resources in the region, including the Okeanos Explorer and other NOAA ships. These decisions are non-trivial and must be made well in advance given the transit distance between potential areas of work in the RPI. There is an opportunity here for modeling to help inform prioritization and decision-making regarding field work in the RPI, but only if the modeling can improve on existing coarse-resolution global models of deep coral distribution. This proposed small project will explore, identify, assess, and develop potential sources of consistent environmental predictors across the RPI region. This will include investigating new products that describe the climatology of environmental drivers relevant to deep coral ecosystems, including subsurface upwelling and near-bottom conditions (temperature, salinity, currents). We will develop and compile these potential predictor variables, and explore correlations with available existing coral observations.**

Academic status: **Undergraduate**

Area(s) of discipline: **Earth Science, Ecology, Geography, Marine And Aquatic Sciences, Oceanography, Remote Sensing Technology**

Internship location: **Silver Spring, MD**

Duties and responsibilities: **The student will be involved in identifying, downloading, formatting and exploring potential sources of consistent environmental predictors for deep corals across the RPI region. This will include investigating how the new 1/12 degree (~9km)**

**Global HYCOM 1992-2012 Reanalysis can be merged with new, improved bathymetry products (e.g. the soon-to-be released GEBCO\_14 product and new multibeam for middle depths collected by PIFSC) to create products that describe the climatology of environmental drivers relevant to deep coral ecosystems.**

Special skills/training required: **The student will need a basic understanding of geographic information systems (GIS) for this internship. Knowledge of Matlab or R scientific programming languages and/or Python is**

also desirable. They will learn and have opportunities to apply advanced GIS and ocean model processing techniques to numerical ocean model results in the RPI. The student will also learn about oceanography and our understanding of environmental drivers for deep coral ecosystems in the RPI.

Expected outcomes: **The student will benefit by learning new GIS and oceanographic data/model processing techniques in a hands on way, which will be applicable to many other career paths in the marine and earth sciences. They will also benefit by experiencing what it is like to work in an interdisciplinary environment, including oceanographers, marine biologists, geospatial scientists, developers, social scientists and landscape ecologists. This experience will give the student a good understanding of what it is like to work in the dynamic and cross-cutting field of coastal and ocean science.**

Guidance and supervision: **The student will be guided by marine scientists working in the fields of marine science, oceanography, remote sensing, statistics, geospatial information sciences and spatial modeling. They will receive guidance about cutting edge spatial processing and analysis techniques used to link environmental conditions with the distribution of living marine resources.**

Posted or modified date/time: **Wednesday, October 01, 2014 - 8:27:00 AM**

### Internship Travel Information

Purpose (student's role): ---

Mode of transportation: ---

Date(s): ---

Destination: ---

Estimated cost: ---

Source of funding: ---

### Mentors Contact Information

Name: **Costa**

Organization: **National Ocean Service (NOS)**

Program office: **NCCOS/CCMA/BB**

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Silver Spring, MD 20910**

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Co-Mentor name: ---

Co-Mentor email: ---

Agency or organization: ---



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