**Predicted Coral Distribution**

Scleractinian coral cover data was used in conjunction with environmental data to predict the distribution of scleractinian coral in mesophotic depths throughout the Au’au Channel, using a modeling technique called Maximum Entropy modeling.

Freely available Maximum Entropy (MaxEnt) modeling software (MaxEnt 3.3.3e) was used to create four separate maps of predicted habitat suitability for: (1) all mesophotic hard corals combined, (2) *Leptoseris*, (3) *Montipora*, and (4) *Porites*.

MaxEnt works by analyzing the distribution of environmental variables where species are present, so it can find other areas that meet all of the same environmental constraints. Georeferenced records containing information about mesophotic coral occurrence and 34 environmental predictors describing the seafloor’s depth, vertical structure, available light, surface temperature, currents and distance from shoreline were used to train MaxEnt. A subset of the georeferenced coral records were set aside to assess model accuracy.

Models were developed for all hard corals combined, and then separately for *Leptoseris, Montipora* and *Porites.* These three corals were chosen, as they were the most common genera of mesophotic corals observed, and there were sufficient observations of these genera to create a model.

Results from this study can be used for a range of management applications including identifying likely areas for protection within marine protected areas, targeting areas for research activities, and evaluating potential conflict with human activities in the area.

These models do not replace accurately obtained direct observations (e.g., from towed camera, ROV or AUV surveys) but they do help to fill some gaps about the likely distribution of mesophotic coral ecosystems within the Au’au Channel.

This project, was carried out by Biogeography Branch, Center for Coastal Monitoring and Assessment (CCMA), NOAA National Centers for Coastal Ocean Science (NCCOS). The detailed report of methods and results can be downloaded from here:

<http://ccma.nos.noaa.gov/ecosystems/sanctuaries/hwnms/>

**Predicted Distribution of Hard Coral Habitat**

INSERT MAP: HARD CORAL DISTRIBUTION

The map above shows the predicted habitat suitability of hard coral in the Au’au Chanel, from MaxEnt model. Influential environmental variables in this model were mean euphotic depths, mean depth, and standard deviation of euphotic depth.

**Predicted distribution of *Leptoseris* coral**

MAP: LEPTOSERIS CORAL DISTRIBUTION

The map above shows the predicted habitat suitability of *Leptoseris* coral in the Au’au Chanel, from MaxEnt model. Influential environmental variables in this model were slope of slope (at 200-m analysis scale), mean and standard deviation of euphotic depth, and mean depth (at 25-m analysis scale).

**Predicted distribution of *Montipora* coral**

MAP: MONITOPORA CORAL DISTRIBUTION

The map above shows the predicted habitat suitability of *Montipora* in the Au’au Chanel, from MaxEnt model. Influential environmental variables in this model were mean euphotic depth, mean depth (at 10-m scale), and mean sea surface temperature.

**Predicted distribution of *Porites* coral**

MAP: PORITES CORAL DISTRIBUTION

The map above shows the predicted habitat suitability of *Porites* in the Au’au Chanel, from MaxEnt model. Influential environmental variables in this model were mean depth calculated at 10-m and 25-m analysis scale.