

The Del Monte Shalebeds are located in Monterey, CA between Cannery Row and Del Monte Beach. They support a relatively low-relief rocky habitat, providing habitat for approximately 20 species of rockfish. Gopher (*Sebastes carnatus*) and Yellowtail/Olive (*Sebastes flavidus/serranoides*) Rockfish are of high importance due to high commercial and recreational fishing pressures. Predictive habitat suitability models can be used by management to determine areas essential to maintaining fish stocks.

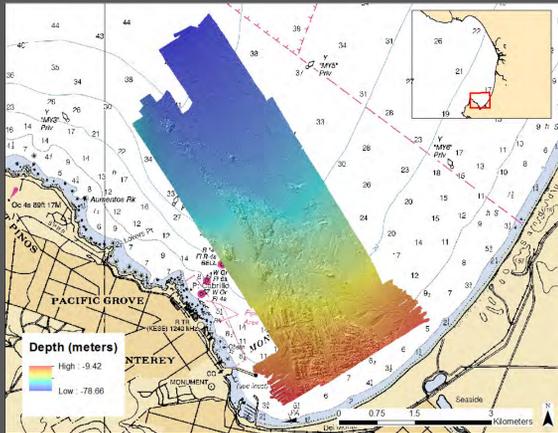
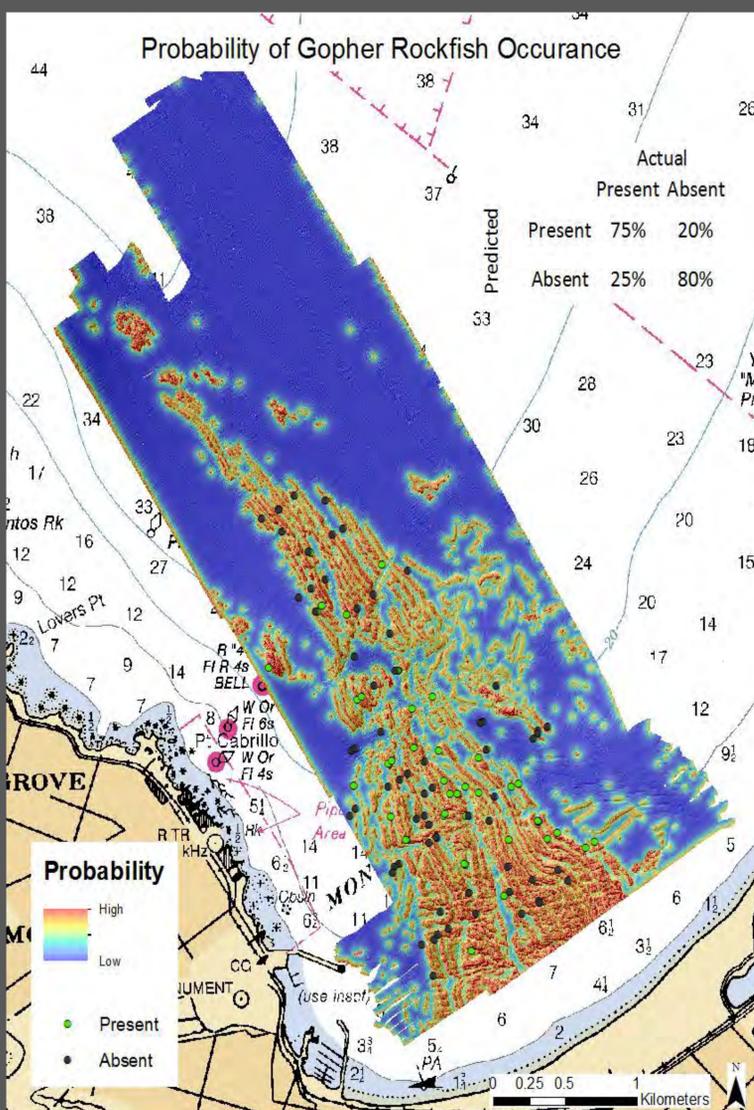


Figure 1. The Del Monte Shalebeds shaded relief DEM colored by depth.



Figure 2. Species of interest for this study; the Gopher and Yellowtail/Olive Rockfish.



This model predicted 75% of the presence points correctly and 80% of the absence points correctly. The model was in moderate agreement with the data (Cohen's Kappa = 0.534).

Conclusions for Gopher Rockfish

The highest probability of seeing gopher rockfish at the Del Monte Shalebeds is at rocky areas and areas close to rocks. Depth did not appear to play a significant factor in Gopher habitat predictability. The model had moderate agreement with data. More data points may improve this agreement. Management should consider rocky areas for possible protection sites.

Acknowledgements

I'd like to thank Pat lampietro and Mary Young for helping guide me in this project. Thank you Seafloor Mapping Lab at CSUMB for providing the fish and bathymetry data used to create these models.

Habitat Data Collection and Processing

Bathymetry data was collect in Spring 2012 by the Seafloor Mapping Lab (SFML) at California State University Monterey Bay on the R/V *Harold Heath*. Soundings were processed in the lab. A 50 cm resolution digital elevation model (DEM) was created from the data.

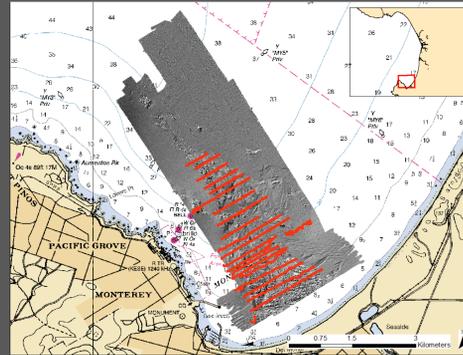


Figure 3. Del Monte Shalebeds, Monterey Bay, CA bathymetry data at 50 cm resolution with 2003 transect lines.

Biological Data Collection

Fish point data was collected in Spring 2003 by SFML using a Hyball remotely operated vehicle (ROV) launched from the R/V *MacGinitie*. The ROV data was analyzed in the lab where species identification, abundance, depth, substrate classification, and other features were recorded.

GIS Analysis

Random absence points for each fish species were created from the transect data. Generalized Linear Models (GLMs) were created for each fish species based on significant habitat characteristics. Twenty percent of the data was reserved to test the model using Cohen's Kappa values for model agreement.

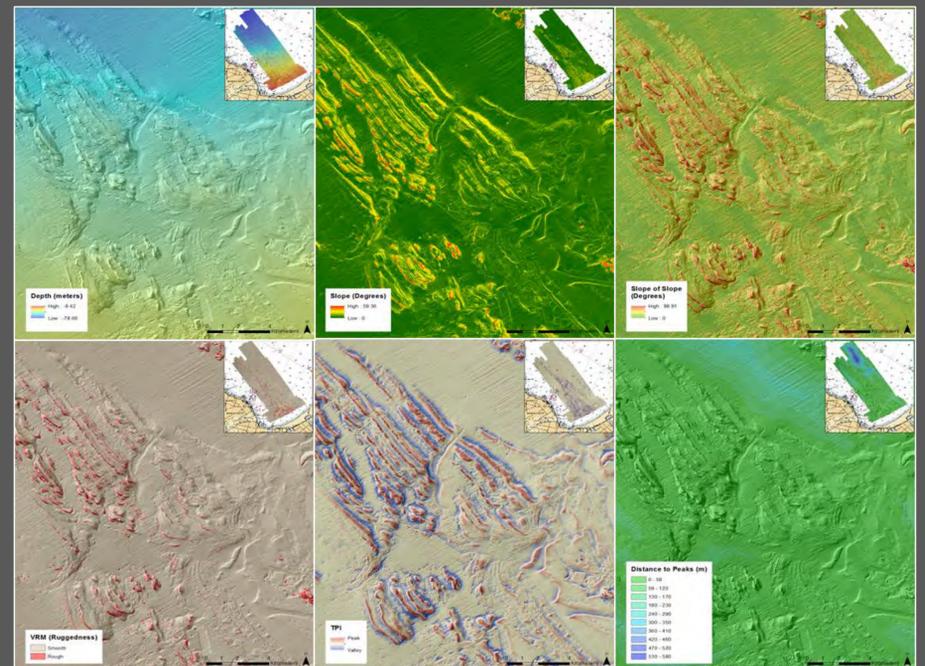
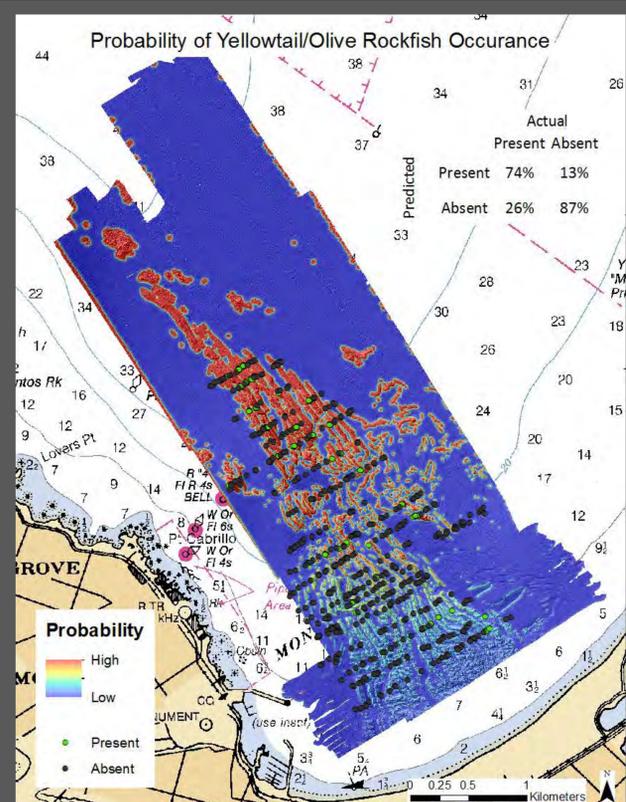


Figure 4. Possible factors considered for GLMs. Depth, slope, slope of slope, VRM, TPI, and distance to peaks.



This model predicted 74% of the presence points correctly and 87% of the absence points correctly. The model was in substantial agreement with the data (Cohen's Kappa = 0.615).

Conclusions for Yellowtail/Olive Rockfish

The highest probability of seeing yellowtail/olive rockfish at the Del Monte Shalebeds is at rocky areas, areas close to rocks, and at depth ranges from approx 40 – 70m. The model had substantial agreement with the data and can be considered to be highly accurate. Management should consider rocky areas at specified depth ranges for MPA placement.