

Using Machine Learning to Identify the Habitat Preference of the Sea Cucumber, *Holothuria leucospilota* on Rarotonga, Cook Islands.

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In the Pacific Islands, invertebrates including sea cucumbers are among the most valuable and vulnerable inshore fisheries resources. As human activities continue to force substantial impacts on coral reef ecosystems, the management of inshore fisheries has become an increasingly important priority. Knowledge of the distribution, biology and habitat requirements of a species can significantly enhance conservation efforts. The sea cucumber, *Holothuria leucospilota* forms an important part of the traditional subsistence fishery on Rarotonga, Cook Islands, yet little is known of this species' present spatial distribution and abundance around the island.

We apply three machine learning approaches to predict sites with a high number of sea cucumber individuals from site characteristics, such as the percentages of different sea-bed covers (sand, rubble, gravel). The machine-learning methods used are rule induction, decision tree induction, and instance-based learning. The most understandable descriptions of the characteristics of sites preferred by the sea cucumber are obtained using rule induction, which also provides the most accurate predictions.

Keywords: machine learning, tropical marine ecology, habitat preference, sea cucumber.