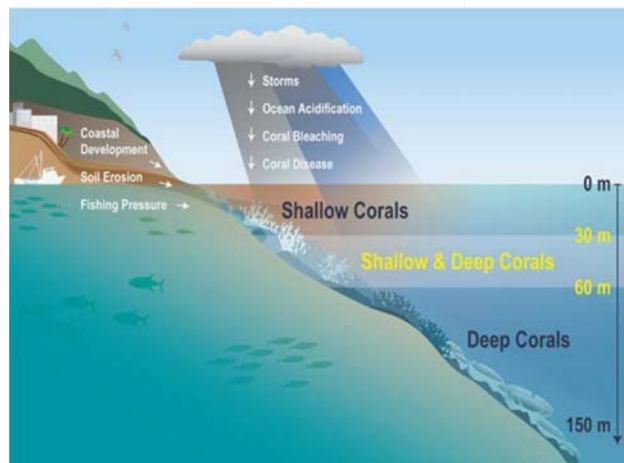




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## Expanding Benthic Habitat Mapping: West Maui Priority Area

Research within the West Maui Priority Area and elsewhere have documented a decline in coral cover over the past two decades. The coral reef habitats in shallow water are increasingly stressed by rising temperatures, ocean acidification, sedimentation, nutrification (pollution), and fishing pressure (Figure 1). However, little is known about coral reef habitats in deeper water and how they are being impacted by these threats. This knowledge gap emphasizes a need to locate and map coral reef habitats in deeper water to guide research, management and conservation efforts.



**Figure 1. Conceptual graphic of deep coral ecosystems and their relationship with other coral ecosystems and the potential threats they face.**

Because deep coral reef habitats (mesophotic depths, greater than 30 m that receive low levels of light) are more difficult to access by diver surveys, the benthic features and biological cover within these habitats are not well understood. It is important to know this information because the health and abundance of fish and coral species depends on the availability and condition of essential seafloor habitats. A few surveys have explored the deeper depths of the West Maui Priority Area and identified corals that extend to depths of 30–150 m and deeper. To better monitor the health and resilience of these deeper coral reef ecosystems, scientists require improved habitat maps showing their location and structural complexity.

To meet this need, the NOAA Pacific Islands Fisheries Science Center’s Ecosystem Sciences Division (ESD) used a combination of multibeam sonar and optical data (collected with a camera sled pulled from a small research vessel) to collect habitat data within the West Maui Priority Area from the shoreline to depths of 250 m. This is an ecosystem-based approach that also includes the shallow portion of the Essential Fish Habitat (EFH) for Hawai‘i bottomfish (< 400 m depth). The Hawai‘i Coral Reef Strategy identified West Maui as a priority management area and the West Maui Ridge to Reef Initiative is to “restore and enhance the health and resiliency of West Maui coral reefs and nearshore waters through the reduction of land-based pollution threats from the summit of Pu‘u Kukui to the outer reef”. This project supports this initiative by providing better management tools in the form of benthic habitat maps and data with easily accessible information available online (see link provided below) that will aid informed decisions.

## Data & Maps

The data and maps created from the benthic habitat surveys provide detailed information for the resource managers about the characteristics of the seafloor habitats within the whole West Maui Priority Area (Figure 2). For instance, the types of habitat (such as hard bottom or sand) as well as the biological cover (such as coral, algae and coralline algae), is now mapped. The surveys identified areas where shallow water habitats and species overlap with deep-water habitats. This overlap highlights the potential for deeper habitats to serve as refuge areas for fish and other species when habitat losses occur in shallow areas. The surveys also show that corals are a limited resource that cover 0.87 km<sup>2</sup> of the West Maui Priority Area with 57% of that coral in shallow water (less than 30 m) where impacts from a changing marine environment and human activities are intense. A large portion (44%) of the coral-rich habitat (0.38 km<sup>2</sup>) is deeper than 30 m. This distribution underlines the importance of also protecting and properly managing coral reef habitat in deeper waters, where an important component of the coral population exists.

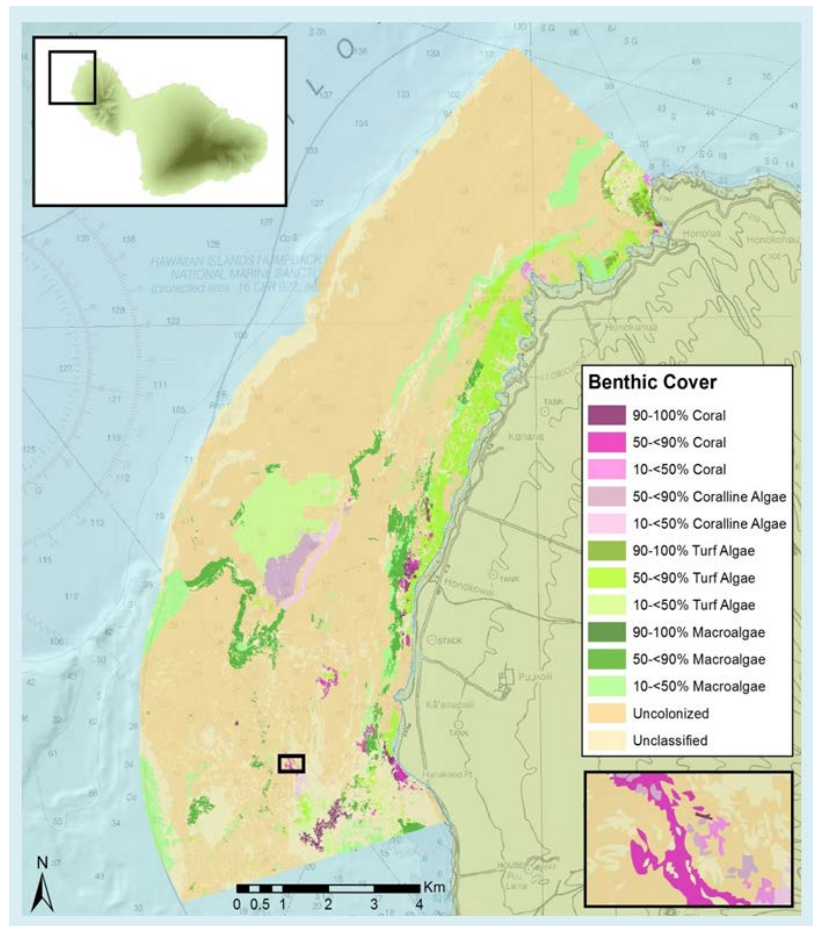


Figure 2. Benthic Cover map derived for the West Priority Area. Inset map shows a close-up of an area with multiple benthic cover classes.

The benthic habitat maps produced during this project are already in use by resource managers and are available to the public (see link below). The Maui Ridge to Reef Initiative Watershed Coordinator has been using the new maps to initiate and inform discussions with stakeholders about the locations of coral reefs and how to improve management of these coastal resources. By providing a baseline characterization of the benthic habitats within the West Maui Priority Area, the data and maps created will help facilitate the development of actionable policies, plans, and management activities.

## Acknowledgement

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### Website:

<http://www.soest.hawaii.edu/pibhmc/cms/data-by-location/main-hawaiian-islands/maui/maui-habitat/>

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