

BLENDING SPACE-BASED TECHNOLOGY WITH COMMUNITY-BASED KNOWLEDGE TO ADDRESS CORAL REEF MANAGEMENT

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In 2008, the U.S. Coral Reef Task Force recognized an urgent need to address the state of coral reef management and science, and to reduce threats to coral reef ecosystem health to make reefs more resilient in the face of climate change.

Healthy coral reefs are among the most biologically diverse and economically valuable ecosystems on earth. However, land-based sources of pollutants and sediments are significant threats to coral reef health in many island environments. Studies suggest that successful management of fringing coral reefs adjacent to volcanic islands may not be possible without proper land use management. This paper presents an approach that feeds high resolution remote sensing data products into community-based watershed management activities as a strategy to systematically address land-based threats to coral reef ecosystems in the Pacific Region.

Modern high resolution remote sensing systems allow analysts to generate accurate map products that are effective tools for resource management in small, high island environments. Lidar-derived elevation data and satellite-derived land cover data were instrumental in performing watershed analyses in the Territory of Guam and the Commonwealth of the Northern Mariana Islands. Standard tools, such as geographic information systems (GIS) and the Nonpoint-Source Pollution and Erosion Comparison Tool (N-SPECT), were used to process the data and generate watershed assessment maps. Additional techniques and tools, such as the Habitat Priority Planner (HPP), were used in conjunction with local expert opinion to refine the strategies needed to address watershed management stressors and ultimately coral reef protection.

High resolution and high accuracy elevation and land cover data products that are consistent across islands and regions provide a data-rich framework within which individual communities can assess threats and design solutions. Future community-based coral reef conservation efforts in the Pacific Region will continue to benefit from the fusion of traditional ecological knowledge and remotely-sensed geospatial data.

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