

Coral Reef Habitat Mapping of Bunaken National Park

Using Landsat 8 Imagery

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Coral reef is highly dynamic and productive marine ecosystems. They provide habitat for a number of marine organisms including fish, algae, vertebrates, and invertebrates. Coral reefs are not only one of the most spectacular marine ecosystems on the Earth, but also offering valuable economic resources for the people living along the coast. Biodiversity on coral reefs are routinely investigated using conventional field survey. Since the field surveys are usually time-consuming and expensive to conduct over a wide scale, alternative and more feasible methods are needed to tackle this problem. The only feasible way to assess the life coral cover over large spatial and temporal scale is to use remote sensing. It offers many advantages while field survey is complicated to do particularly in remote areas. Launched in February, 11 and ready to deliver the free of charge product in April, 11 2013 Landsat 8 have 2 sensor onboard namely Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS). The OLI sensor equipped with a new dedicated ultra-blue band (0.43 - 0.45 μ m) for coastal and aerosol studies. This research is aim to assess the capability of Landsat 8 images for coral reef habitat mapping in Bunaken National Park (BNP). The coral reef that becomes focus in this research is the fringing reef on Bunaken Island and Tombariri, represent of the northern and southern section part of BNP respectively. The very first published image of BNP acquired by Landsat 8 in July, 2 2013 has been geometrically corrected, haze removed, and water column corrected before classification process. The classification methods used is supervised classification using mahalanobis distance approach. In addition, the visual image interpretation of Aerial photograph also combined for this classification as expert justification. Field data which used to train the classification process is based on fieldwork conducted on September until October 2009. Coral reef habitat in the research area as detected by Landsat 8 images can be discriminated in to 5 class ie. life coral, dead coral, rubble, sand, and seagrass. The seagrass in Tombariri area can be distinguished in to two types, the *Thalassia sp.* dominated and the *Enhallus sp.* dominated seagrass area. The new generation of Landsat has a great advance for coral reef habitat mapping while maintain the free of charge satellite image provider.

Keywords : Coral Reef Habitat Mapping, Landsat 8, Bunaken National Park