

BBG006-P04

Room: Convention Hall

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Development of a new technique using visible and near-infrared lights for on-site monitoring of coral health

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Rapid degradation of coral reefs is a key issue of global concern. Monitoring coral health has been conducted based on observations by divers in various areas. In order to provide a simple instrument to those divers for monitoring coral health, we developed a remote-sensing-based monitoring method that could detect concentrations of symbiotic algae in coral colonies. The spectral reflectance of partly bleached coral colonies were measured in situ by a fiber spectrometer. The normalized difference vegetation index for coral (NDVI_c) and the normalized difference coral index (NDCI) were calculated based on the reflectance at red/infrared and blue/infrared wavelength regions, respectively, from various part of colonies. Photosynthetic capacity, measured by the pulse amplitude fluorometer (Diving-PAM) showed a good correlation with NDVI_c and NDCI. Then, by using a commercially available digital camera, which can take both visible and near infrared images, NDVI_c and NDCI pseudo color images were visualized from the images obtained with appropriate optical filters. NDCI was proved better to be used for checking the degree of health in coral colonies in deeper water due to the high spectral sensitivity at the blue region of the camera.

It was clarified to be able to make the stage that was not able to be confirmed by watching between states that made to bleach by this technology.

The change of the health degree by the period was able to be observed as a result of doing this technology in site of Ishigakijima Shiraho coral reef.

Keywords: coral, monitoring, coral health, near-infrared lights, visible lights