



Contribution of fluorescence to the spectral signature and perceived color of corals

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Limnol. Oceanogr., 48(1_part_2), 2003, 390-401 | DOI: 10.4319/lo.2003.48.1_part_2.0390

ABSTRACT: Solar-induced fluorescence from pigments in the host tissues of reef corals can make a significant contribution to their spectral signature and can affect their apparent color as perceived by a human observer. The relative magnitudes of the reflectance and fluorescence contributions to the spectrum can vary as a function of illumination conditions. We have combined measured coral reflectance and fluorescence spectra with modeled downwelling spectral irradiances to investigate the contribution of fluorescence to coral spectra and color. Variations in depth, fluorescence efficiency, and solar zenith angle were modeled. Fluorescence enhancement is greatest when the coral absorbs light at wavelengths that are transmitted well by seawater and emits light efficiently at wavelengths that are moderately attenuated. The methodology provides a means of predicting the combined reflectance and fluorescence spectral signatures and perceived colors of fluorescent corals under arbitrary illumination conditions.

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