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Algal Bloom Detection from HICO

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Ocean color satellites provide daily, global views of marine bio-optical properties in the upper ocean at various spatial scales. The most productive area of the global ocean is the coastal zone which is heavily impacted by urban and agricultural runoff, transportation, recreation, and oil and gas production. In recent years, harmful algal blooms (HABs) have become one of the serious environmental problems in the coastal areas on a global scale. The global nature of the problem has expanded in its frequency, severity, and extent over the last several decades. Human activities and population increases have contributed to an increase in various toxic and noxious algal species in the coastal regions worldwide. Eutrophication in estuaries and coastal waters is believed to be the major factor causing HABs. In this study, we assess the applicability of the Red Band Difference (RBD) HAB detection algorithm on data from the Hyperspectral Imager for the Coastal Ocean (HICO). Our preliminary results show that due to various uncertainties such as atmospheric correction, calibration and possibly also the relatively low signal-to-noise ratio of HICO for fluorescence detection, it is difficult to extract the fluorescence portion of the reflectance spectrum that RBD uses for bloom detection. We propose an improved bloom detection technique for HICO using red and NIR bands. Our results are validated using other space-borne and ground based measurements.