BRINGING THE OCEAN INTO FINER FOCUS AT THE LAND-SEA INTERFACE THROUGH THE NASA COAST, OCEANIA, AND HyspIRI SUBORBITAL MISSIONS

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Monterey Bay, CA is highly productive and lies within the California Current System. It is characterized by seasonal upwelling, harmful algal blooms, and episodic terrestrial run-off. High-quality ocean color measurements and algorithms are needed to characterize water quality in these typically Case 2 waters. Accurate ocean color retrievals nearshore are often confounded by inadequate atmospheric correction. The recent NASA COAST, OCEANIA, and HyspIRI suborbital missions used novel instruments in a multi-sensor, multi-platform approach to collect simultaneous atmospheric column, surface, and in-water measurements to characterize ocean color through improvements in instrument dynamic range and attention to atmospheric correction. High-level objectives included characterizing the coastal ocean through end-to-end assessment of image acquisition, atmospheric correction, algorithm application, and sea-truth observations to improve vicarious calibration and validation of satellite ocean color products. Our specific objective was to conduct sensitivity analyses of two atmospheric correction algorithms, Tafkaa Tabular and Second Simulation of a Satellite Signal in the Solar Spectrum (6S) for correction of imaging spectrometer data using input parameters of atmospheric aerosol optical depth and column water vapor obtained from the Ames Airborne Tracking Sunphotometer (AATS-14) collected during COAST. Use of the high dynamic-range, in-water Compact-Optical Profiling System (C-OPS) and above-water Coastal Airborne In-situ Radiometers (C-AIR) with matched wavelength channels enabled accurate observations of exact water-leaving radiance to validate imagery and atmospheric correction. Knowledge gained from these missions will improve vicarious cal/val of legacy (MODIS) and future (PACE, GEO-CAPE, HyspIRI) satellite sensors and hyperspectral atmospheric correction algorithms to better characterize coastal ecosystems using ocean color.

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