

Airborne oceanography: using manned and unmanned aircraft for air-sea interaction and coastal processes research

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3:00-3:30 pm Coffee Hour

3:30-4:30 pm Seminar

Abstract

Aircraft provide an efficient way to sample meter to mesoscale atmospheric and ocean surface processes synoptically over extended areas, filling an important niche between coarse, global satellite observations and fine-scale, limited-area in situ measurements. A portable scanning lidar (light detection and ranging) system was developed for oceanographic and coastal measurements from manned aircraft. Applications of the system include coastal topographic surveys, wave measurements, and coral reef research. Using this system, wave energy fluxes and dissipation were measured across the fore-reef and lagoon of Lady Elliot Island in Australia's Great Barrier Reef. With the potential for extensive spatial coverage, such airborne measurements can be applied to improve models of mixing and nutrient uptake and, more generally, monitoring of large reef systems. Instrumentation packages were also developed for small unmanned aerial vehicles (UAVs) to measure the surface topography along with momentum fluxes and latent, sensible, and radiative heat fluxes in the atmospheric boundary layer. Ship-launched and recovered Insitu ScanEagle UAVs were recently deployed during an experiment aboard the R/V *Roger Revelle* in a coordinated effort to characterize the marine atmospheric boundary layer structure and dynamics while other groups measured turbulence and mixing in the upper ocean. The combination of ship and UAV-based observations provides unique opportunities for air-sea interaction and atmospheric boundary layer studies.

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