

Oceanography Seminar

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“Mesoscale Biogeochemical Variability North of Hawaii”

Mesoscale motions in the ocean influence the structure and function of pelagic ecosystems through different mechanisms, but a comprehensive understanding of their ecological impact is still missing. In this talk, I will describe the mesoscale biogeochemical variability observed north of the Hawaiian archipelago from 1) a retrospective analyses of the Hawaii Ocean Time-series, and 2) preliminary analyses on targeted observations from mesoscale eddies of different polarity.

The comparison of twenty-three years of satellite observations and biogeochemical measurements from Station ALOHA shows that sea surface height controls the depth of isopycnal surfaces and is associated with numerous biogeochemical changes in different layers of the water column. In waters below ~100 m depth, increases in sea surface height are associated with increases in sea surface temperature (SST) and chlorophyll *a* (chl *a*) concentration. In waters above ~100 m depth, increases in sea surface height are associated with decreases in SST and chl *a* concentration. These changes are consistent with the formation of a warm core eddy (WCE) and a cold core eddy (CCE) respectively. The WCE and CCE are associated with different biogeochemical signatures, including changes in nitrate, phosphate, and silicate concentrations. The WCE is associated with higher concentrations of nitrate and phosphate, and lower concentrations of silicate. The CCE is associated with lower concentrations of nitrate and phosphate, and higher concentrations of silicate. These changes are consistent with the formation of a WCE and a CCE respectively.

Thursday November 16, 2017 3:00p.m. MSB 114