# Title: The effects of Climate variability on phytoplankton composition in the Equatorial Pacific Ocean using a model and a satellite-derived approach.

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## Abstract

Compared the interannual variation in diatoms, cyanobacteria, coccolithophores and chlorophytes from the NASA Ocean Biogeochemical Model with those derived from satellite data (Hirata et al. 2011) between 1998 and 2006 in the Equatorial Pacific. Using NOBM, La Niña events were characterized by an increase in diatoms (correlation with MEI, $r=-0.81$, $P<0.05$), while cyanobacteria concentrations decreased significantly ($r=0.61$; $P<0.05$). El Niño produced the reverse pattern, with cyanobacteria populations increasing while diatoms plummeted. This represented a radical shift in the phytoplankton community in response to climate variability. However, satellite-derived phytoplankton groups were all negatively correlated with climate variability (r ranged from -0.39 for diatoms to -0.64 for coccolithophores, $P<0.05$). Spatially, the satellite-derived approach was closer to an independent in situ dataset for all phytoplankton groups except diatoms than NOBM. However, the different responses of phytoplankton to intense interannual events in the Equatorial Pacific raises questions about the representation of phytoplankton dynamics in models and algorithms: is a phytoplankton community shift as in the model or an across-the-board change in abundances of all phytoplankton as in the satellite-derived approach.