



## **Holocene dinoflagellate cyst record of climate and marine primary productivity change in the Santa Barbara Basin, southern California.**

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High-resolution sedimentary records of dinoflagellate cysts and other marine palynomorphs from the Santa Barbara Basin (Ocean Drilling Program Hole 893A) demonstrate large variability of primary productivity during the Holocene, as the California Current System responded to climate change. Throughout the sequence, dinoflagellate cyst assemblages are characterized by the dominance of cysts produced by heterotrophic dinoflagellates, and particularly by *Brigantedinium*, accompanied by other upwelling-related taxa such as *Echinidinium* and cysts of *Protoperidinium americanum*. During the early Holocene ( $\sim 12-7$  ka), the species richness is relatively low (16 taxa) and genus *Brigantedinium* reaches the highest relative abundance, thus indicating nutrient-rich and highly productive waters. The middle Holocene ( $\sim 7-3.5$  ka) is characterized by relatively constant cyst concentrations, and dinoflagellate cyst assemblages are indicative of a slight decrease in sea-surface temperature. A noticeable increase and greater range of fluctuations in the cyst concentrations during the late Holocene ( $\sim 3.5-1$  ka) indicate enhanced marine primary productivity and increased climatic variability, most likely related to the intensification of El Niño-like conditions.

Keywords: dinoflagellate cysts, Holocene, North Pacific, climate, primary productivity.