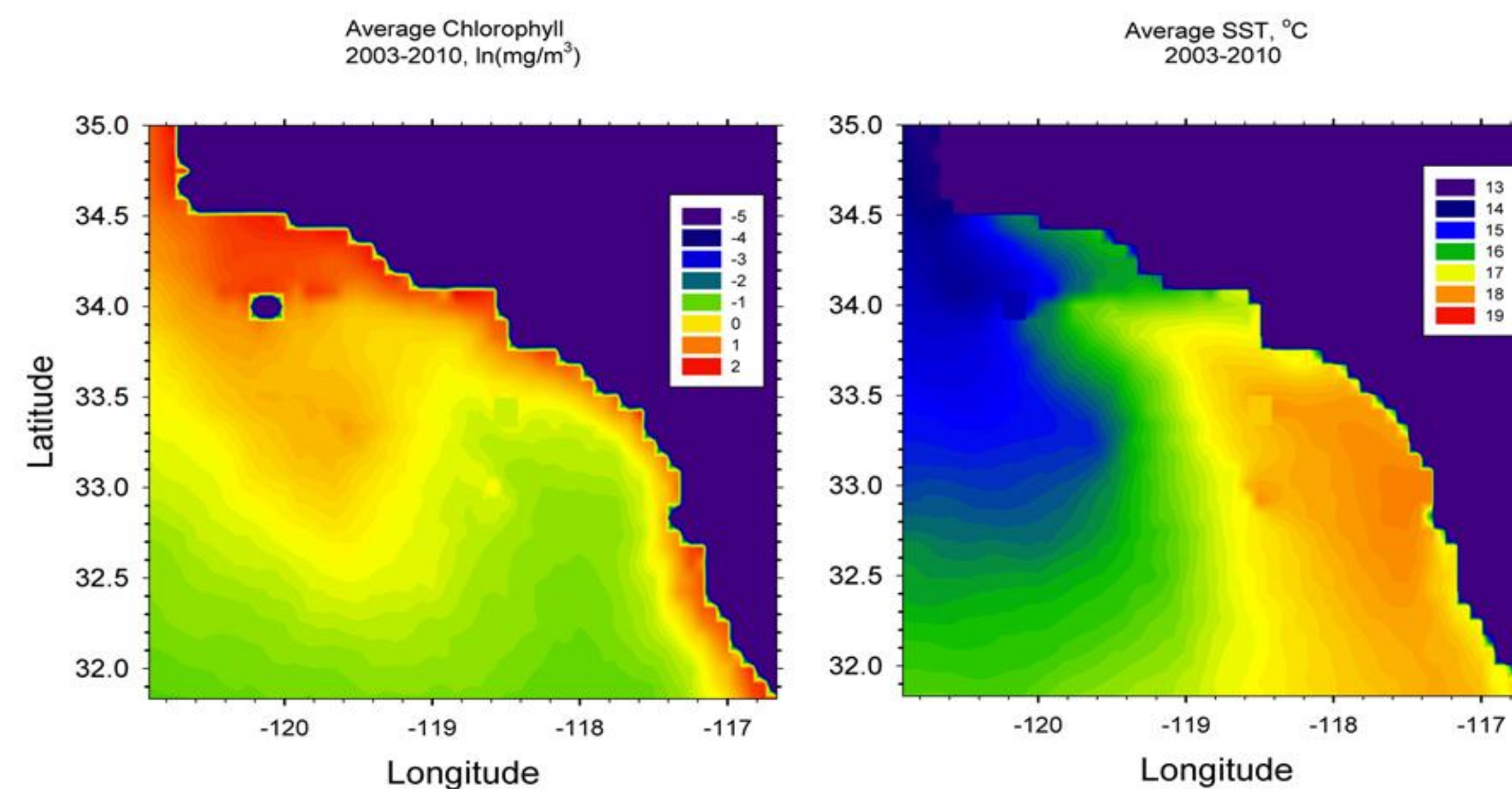


Chlorophyll Dynamics at Santa Catalina Island

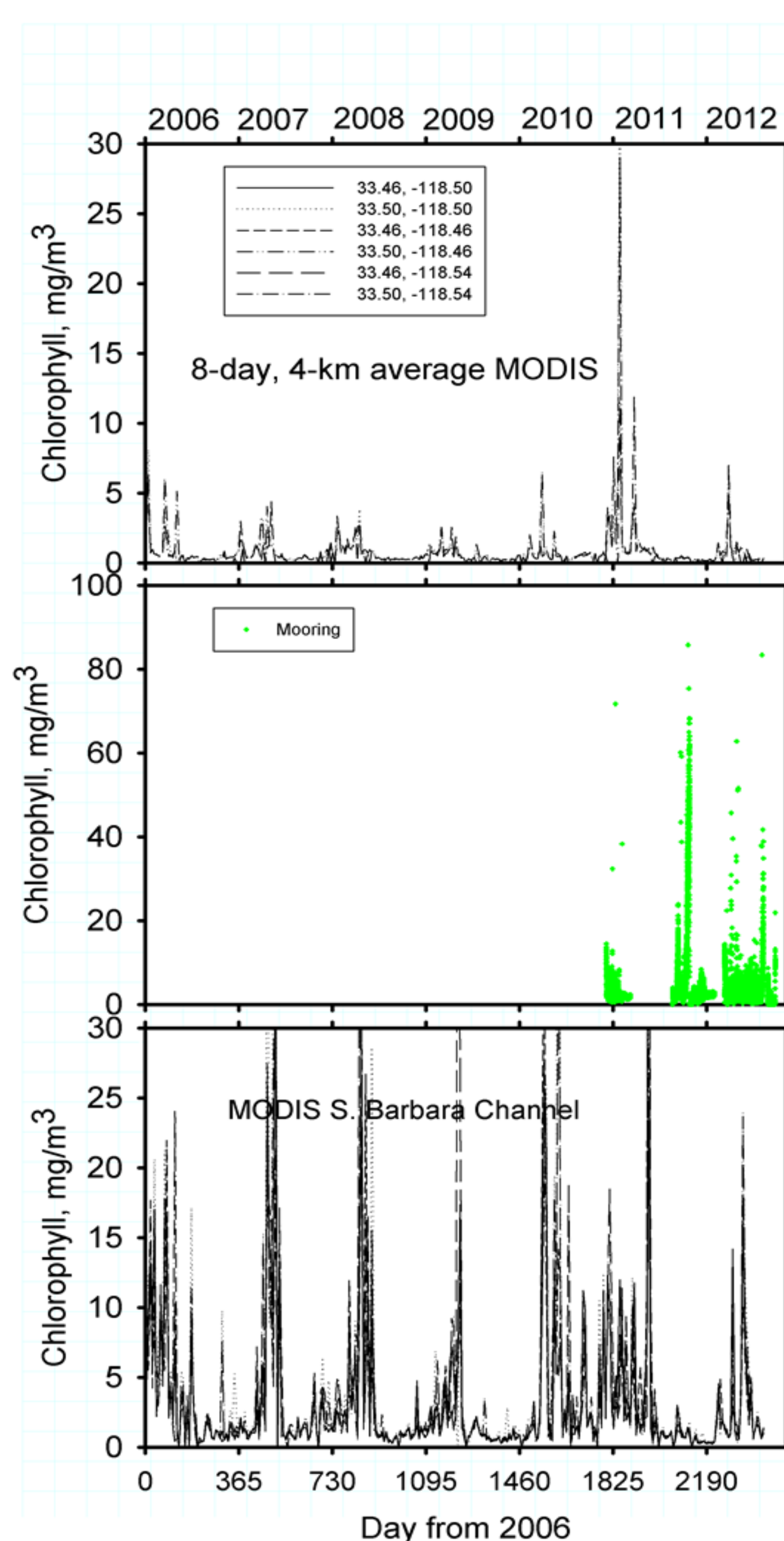
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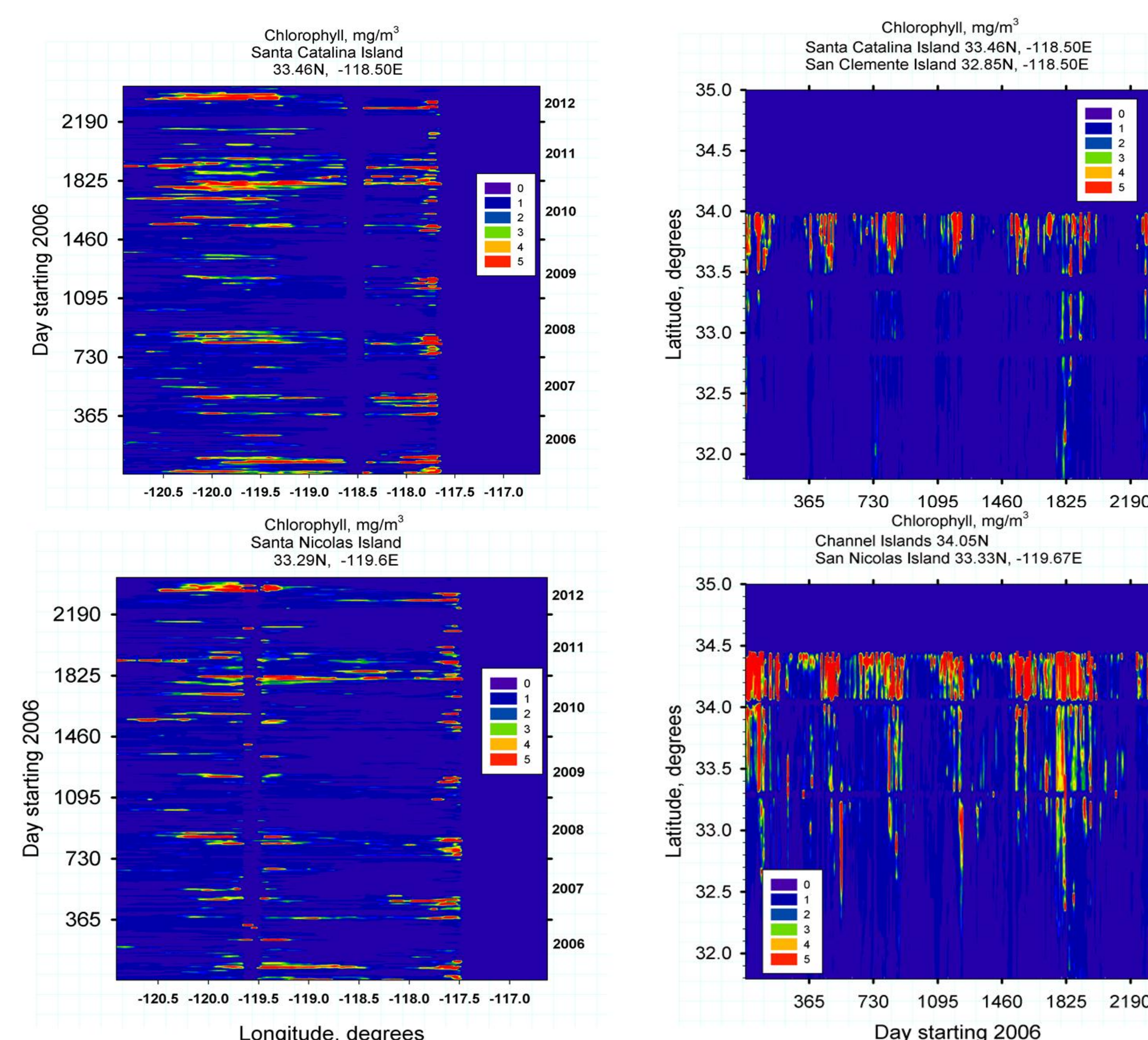
Santa Catalina Island is expected to be an insignificant source of nutrients for algal blooms as the island has little agriculture, no rivers and few streams that reach the ocean. However, it experiences episodic blooms and two mechanisms, one local and the other regional, have been suggested as sources. Locally, the island is a site of intense internal waves that can promote mixing and diffusion of nutrients from depth. Regionally, nutrients and phytoplankton may also drift to the island from more productive areas. This study quantifies the frequency of blooms, using chlorophyll products obtained from MODIS on the Aqua satellite mission and in situ chlorophyll measurements made at the Wrigley Institute of Environmental Studies located near Two Harbors. Regional chlorophyll dynamics are examined using the satellite data, while local dynamics are investigated using the mooring data.



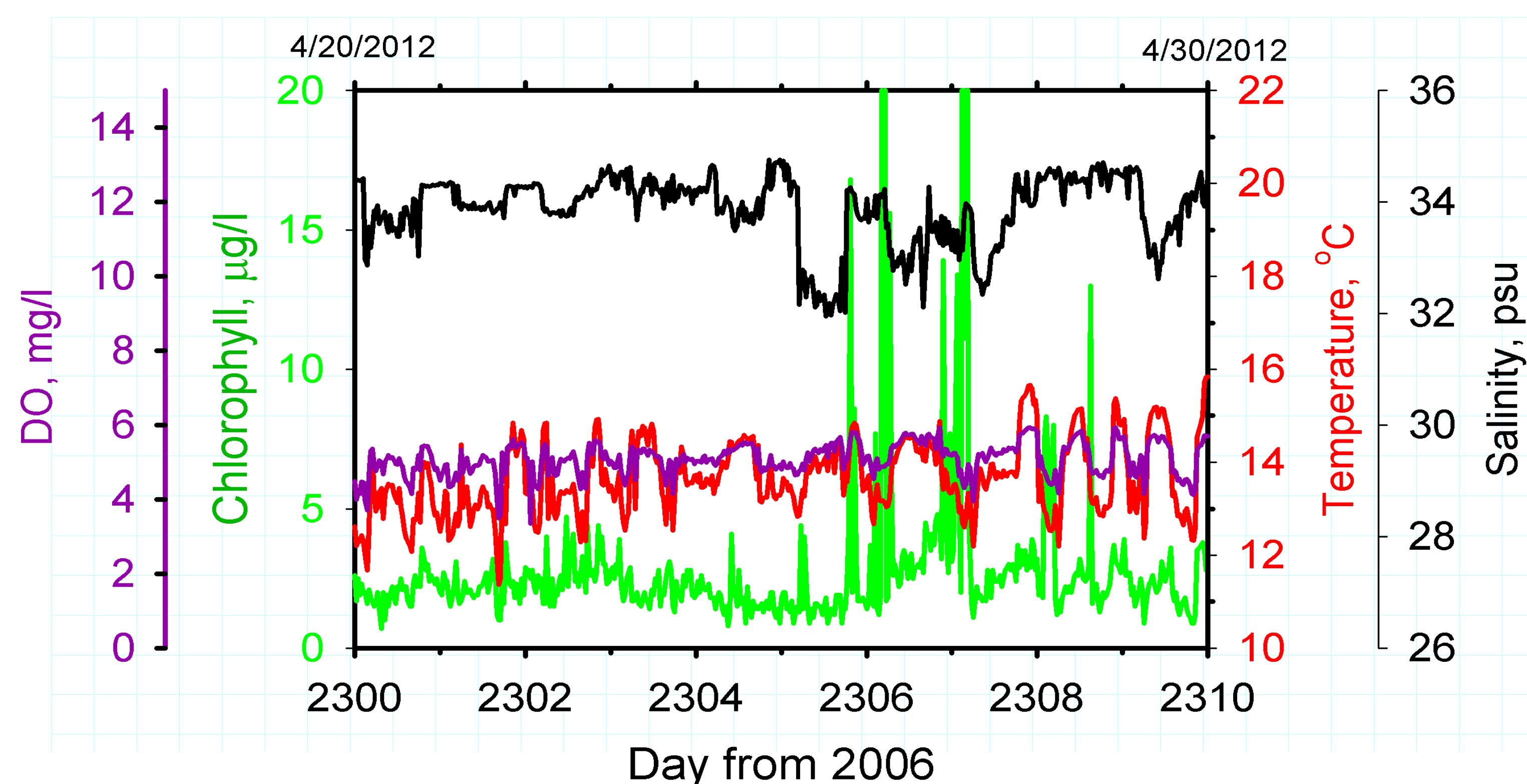
1. Average Chlorophyll and SST for the Southern California Bight. They are anticorrelated. Catalina lies in a relatively warm and chlorophyll-poor region.



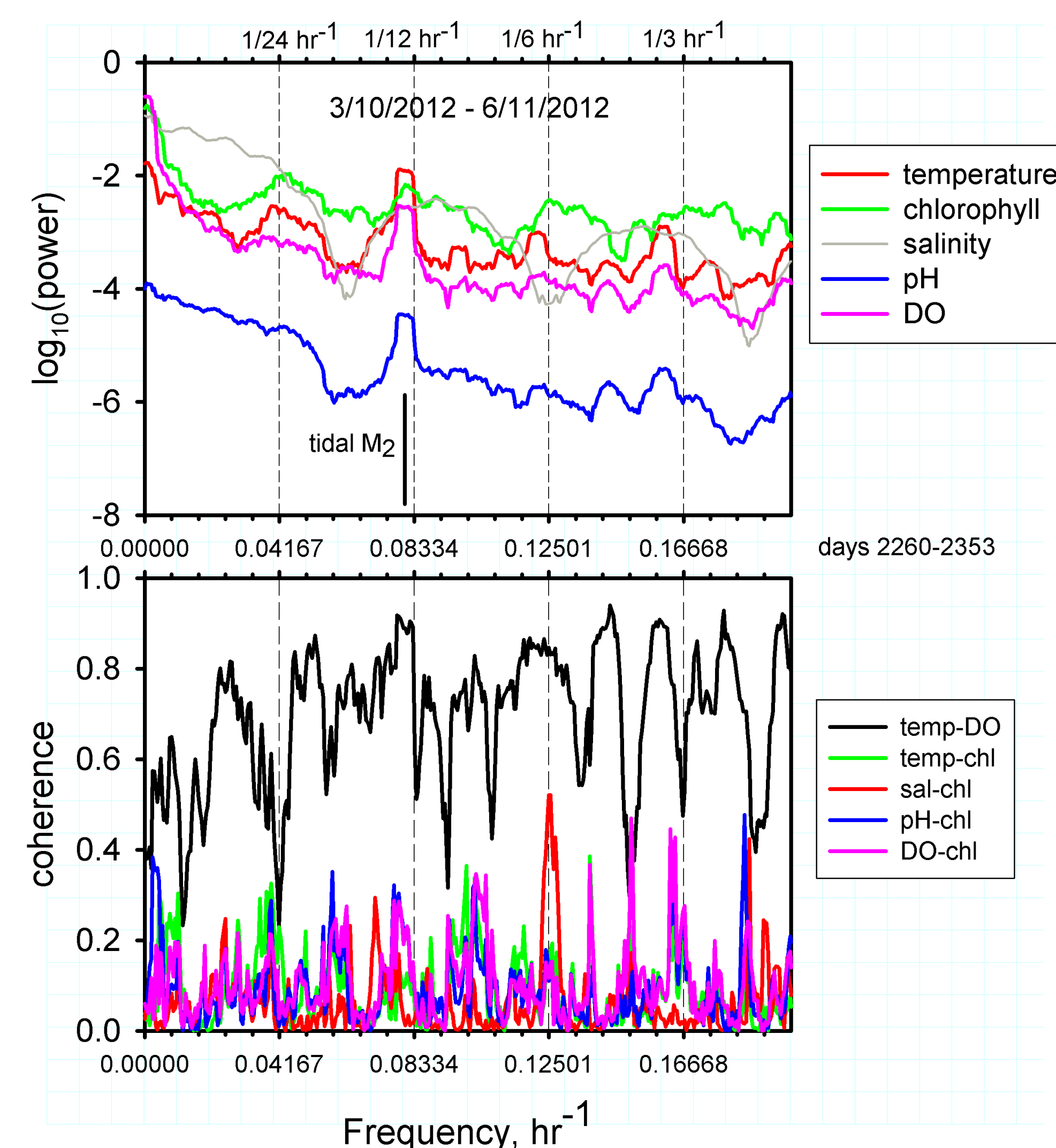
2. Seasonal MODIS chlorophyll near WIES and in situ values at WIES. Also shown for comparison are the values for the middle of the Santa Barbara Channel. MODIS data indicate the annual spring bloom. Note that a bloom appears near WIES that is not detected with MODIS.



3. Latitudinal and longitudinal profiles of chlorophyll as a function of time for San Nicolas, Santa Catalina and San Clemente. S. Nicolas is seen as a source of chlorophyll, S. Catalina is not.



4. Time series of select data from WIES during April bloom. Bloom initiates after a fresher-water intrusion is reduced. Chlorophyll also varies with temperature near the end of the series.



5. Coherence between chlorophyll and other measured values including temperature, salinity, pH and dissolved oxygen. DO and temperature coherence is shown for comparison.

Summary

Measured from space, Santa Catalina lies in a chlorophyll-poor region of the Bight and its seasonal spring bloom is smaller when compared to adjacent areas. Santa Catalina is not found to be a major source for advected chlorophyll. However, not all island blooms are measured from orbit and they may occur outside the typical seasonal pattern. These blooms must be driven by a variety of factors as their coherence with specific parameters is low.

Acknowledgments Thanks to Mike Doran for organizing the diving effort and the Catalina Conservancy Divers who participated. We especially thank Kellie Spafford and Lauren Czarnecki-Oudin for providing lab support. This work was sponsored by the Catalina Marine Society.