

# Chlorophyll and Sea Surface Temperature Time Scales for Global Oceans and Nearshore Retentive Embayments off California

---

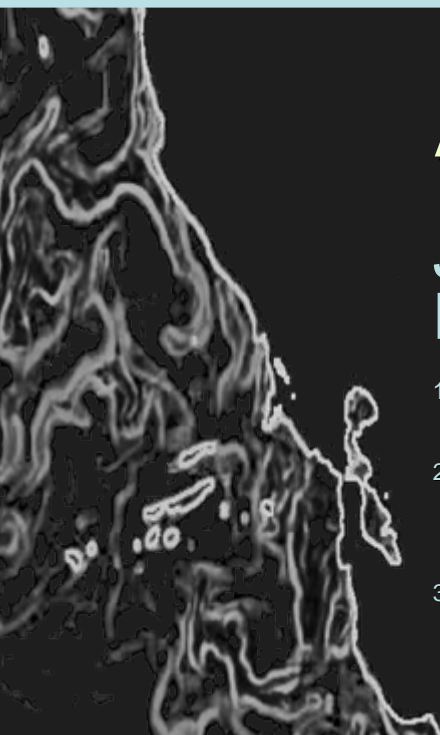
**A.J. Vander Woude<sup>1</sup>**

John Moisan<sup>2</sup>, John Largier<sup>3</sup>, Raphael Kudela<sup>1</sup>

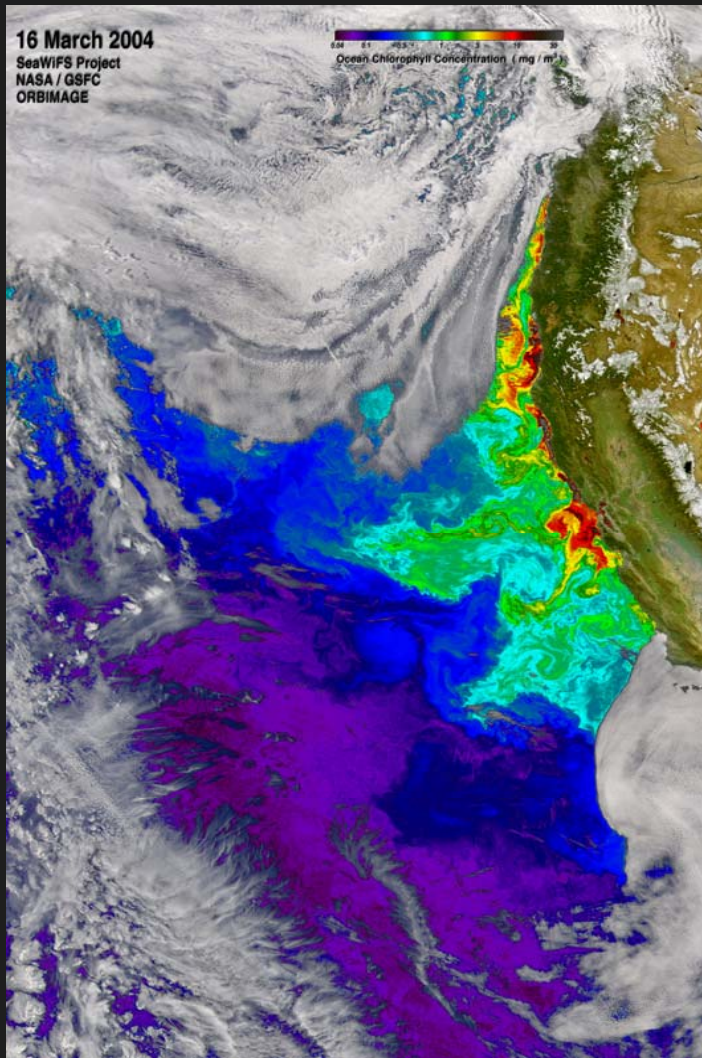
<sup>1</sup>University of California, Santa Cruz, Santa Cruz, CA

<sup>2</sup>Observational Science Branch, Laboratory for Hydrospheric Processes, NASA/GSFC Wallops Flight Facility, Wallops Island, VA

<sup>3</sup>University of California, Davis, Bodega Bay Marine Labs, Bodega Bay, CA



# Context of Work

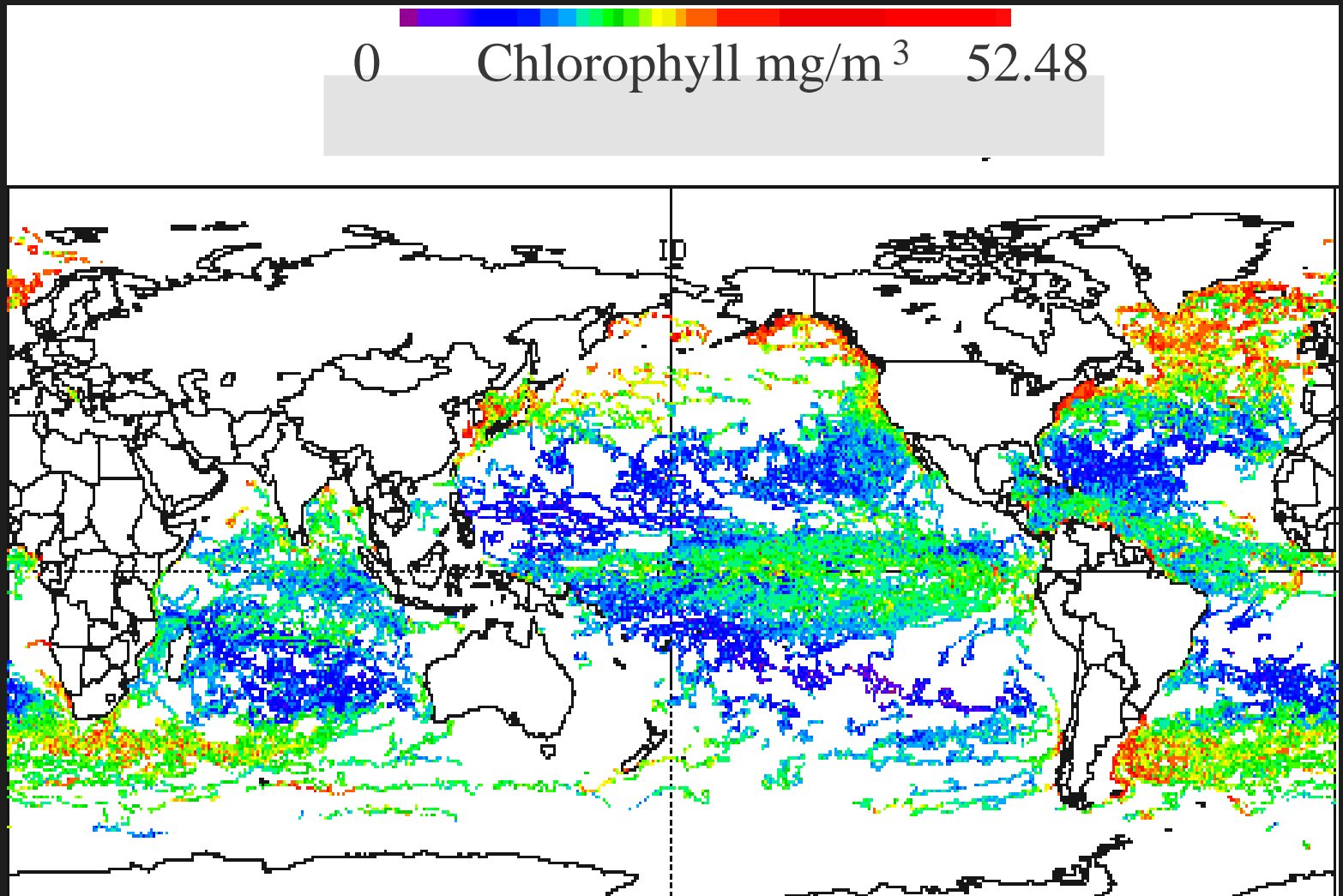


chlorophyll and sea surface temperature (SST) spatial patterns and time scales

Time scales globally and specifically within retentive embayments

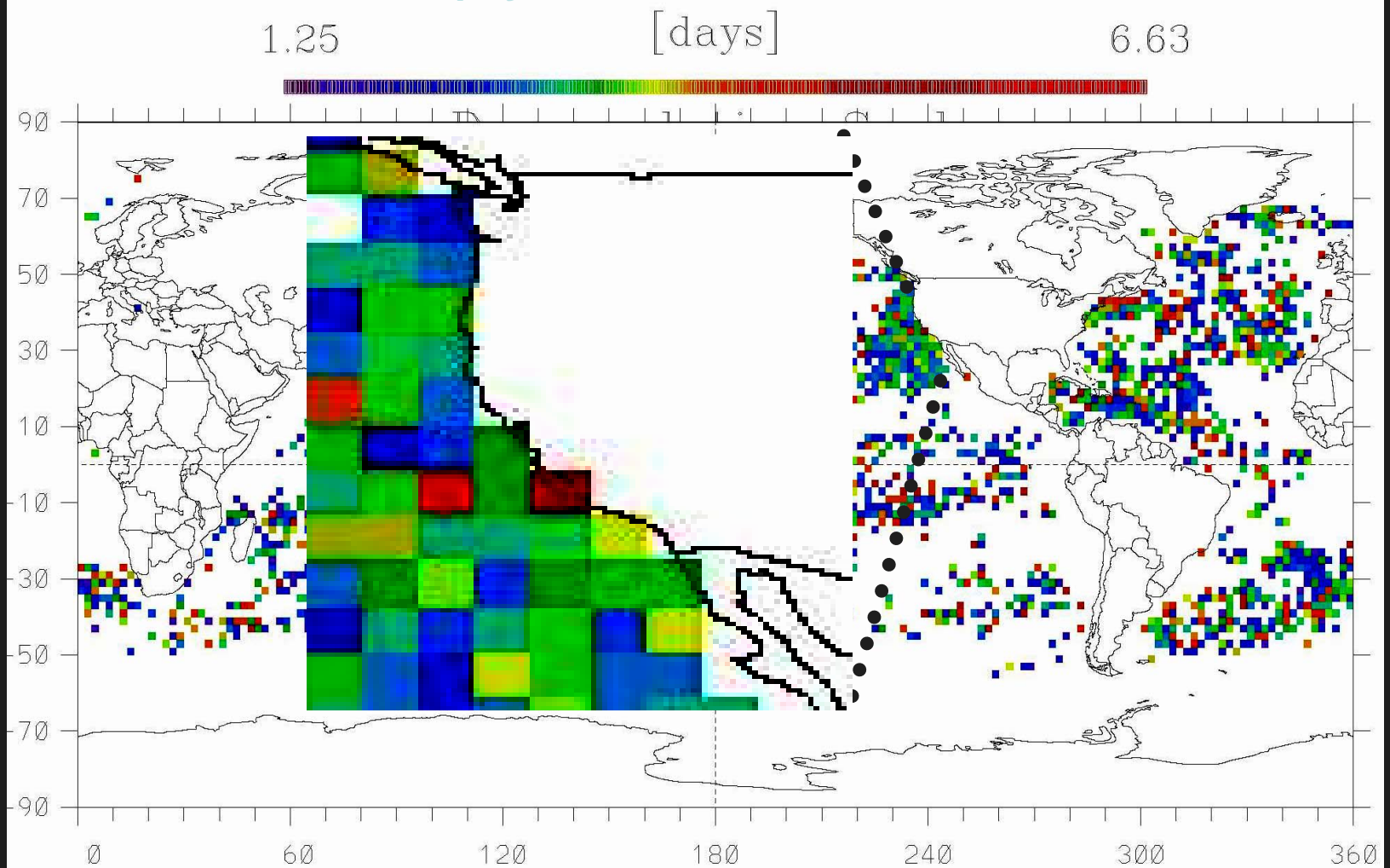
new method with satellite data acting as a sensor on the drifter data

# Drifter Chlorophyll Patterns



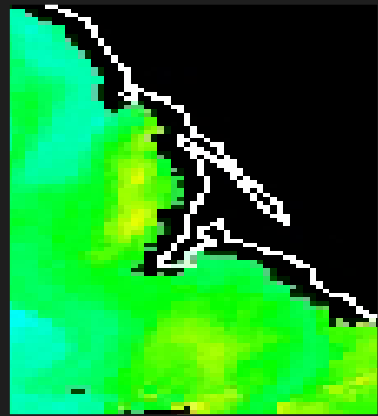
# Global Lagrangian Time Scales

From SeaWiFS: Chlorophyll a

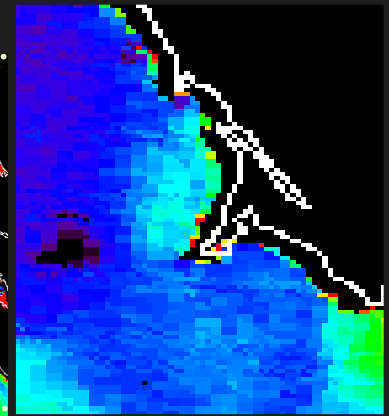
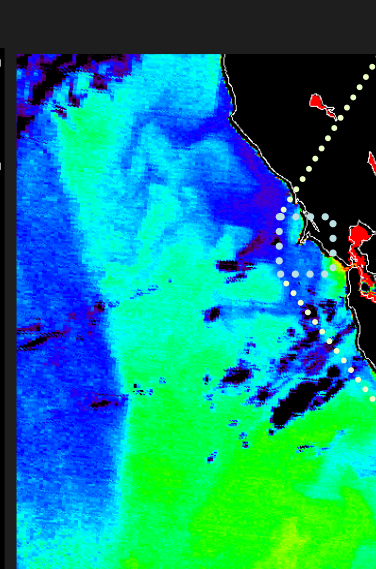
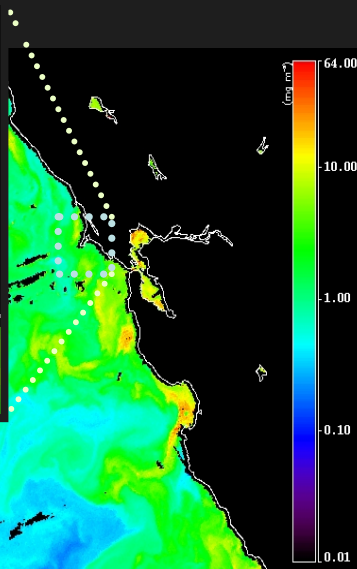




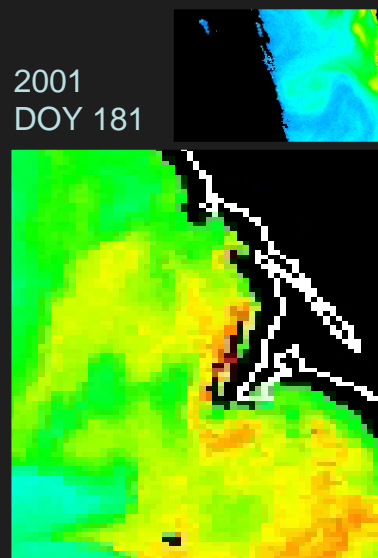
# Retentive Embayments



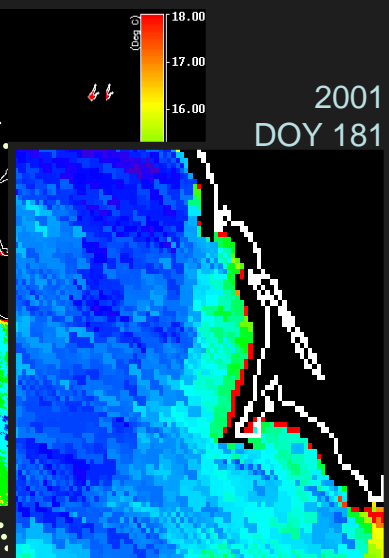
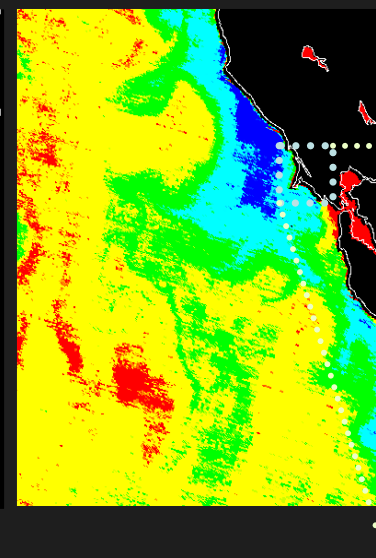
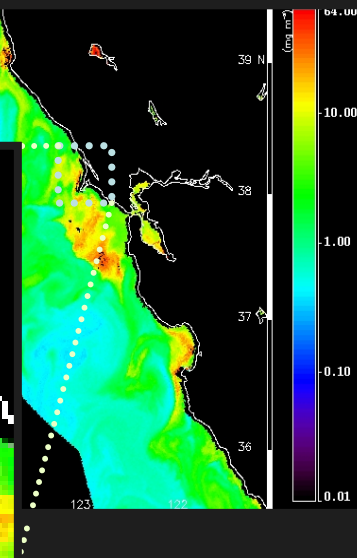
DOY 158  
2000



DOY 158  
2000



2001  
DOY 181



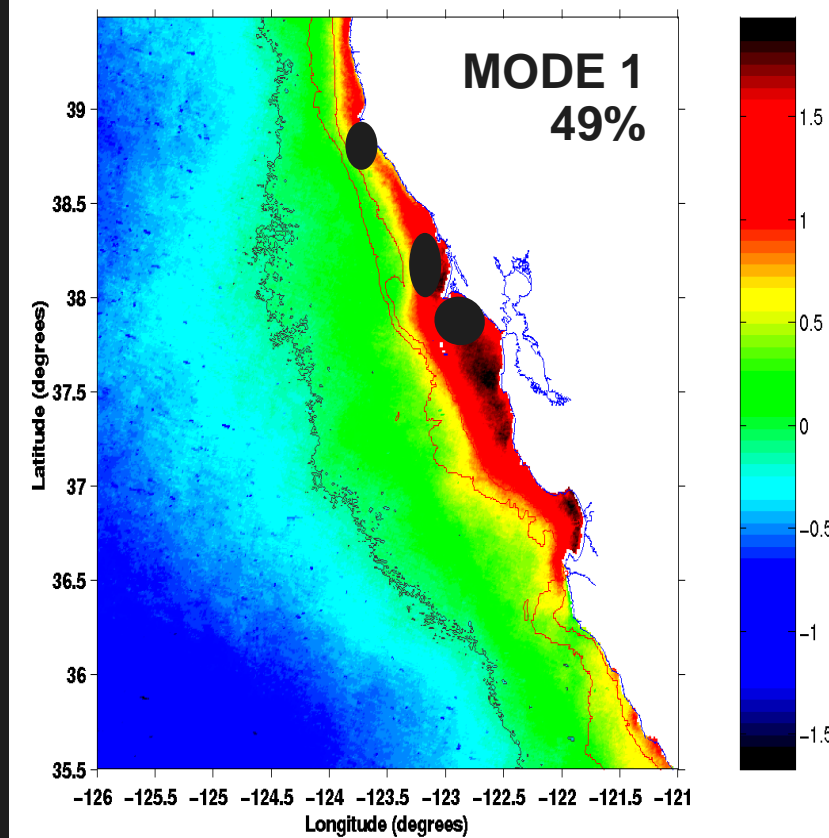
2001  
DOY 181

SeaWiFS: Chlorophyll a

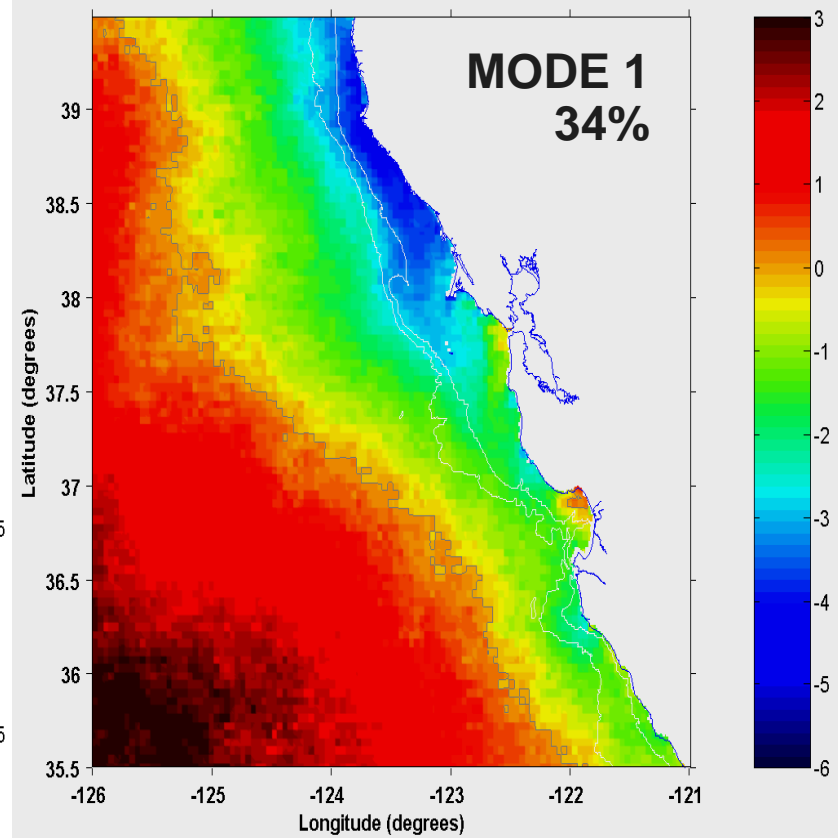
MODIS: SST

# Spatial Patterns: EOF Results

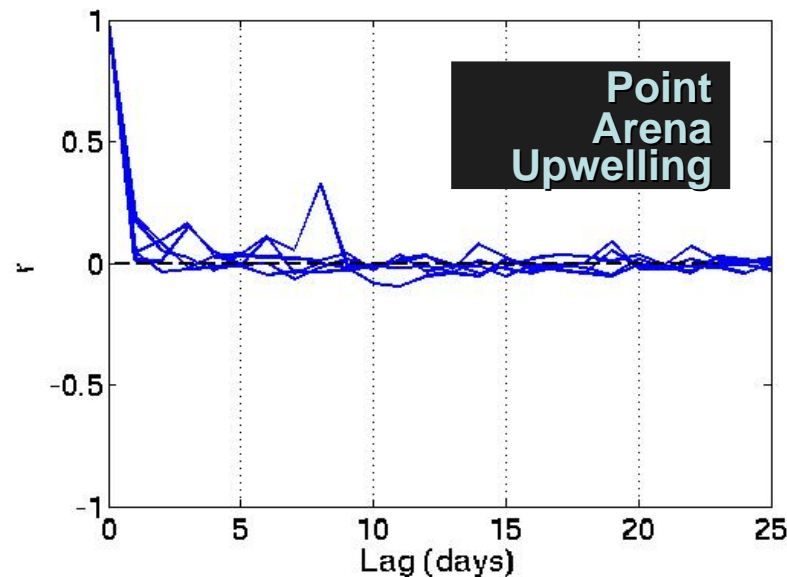
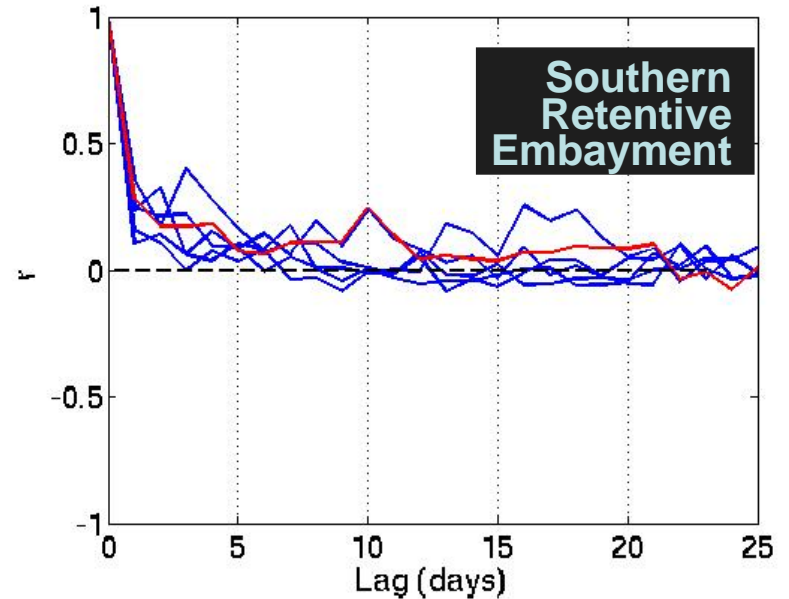
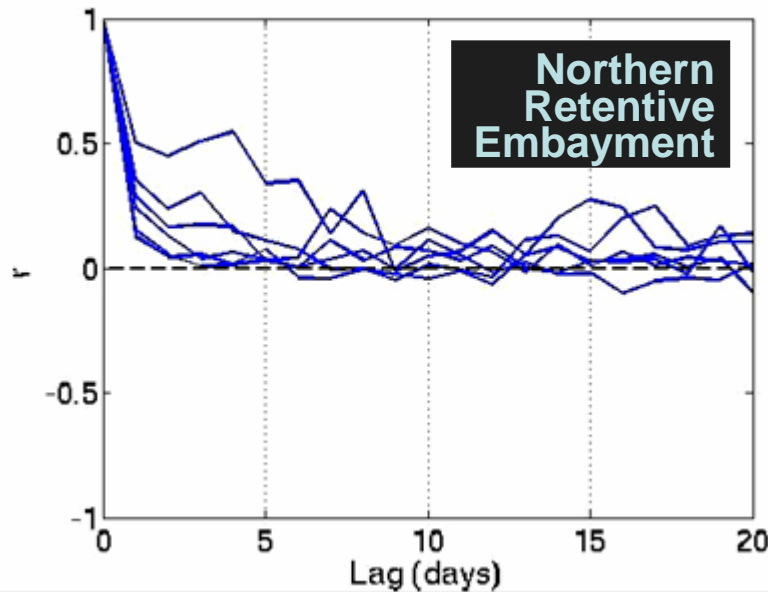
SeaWiFS: Chlorophyll *a*



MODIS: SST



# Eulerian Time Scales for CHL A

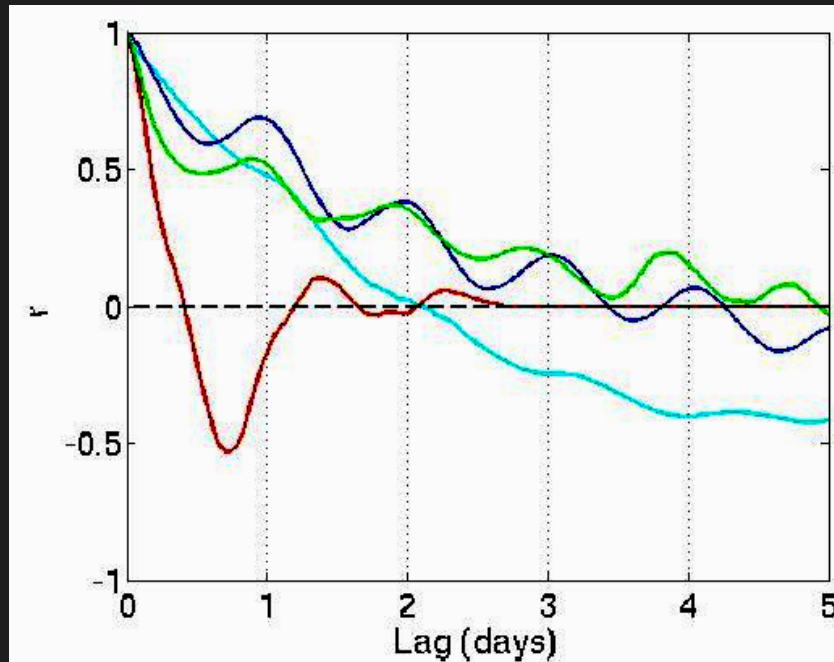


**Northern Retentive Embayment**  
**Decorrelation scale= 7-14 Days**

**Southern Retentive Embayment**  
**Decorrelation scale= 7-23 Days**

**Point Arena Upwelling Center**  
**Decorrelation Scale= 3-7 Days**

# Lagrangian Time Scales: In Situ SST

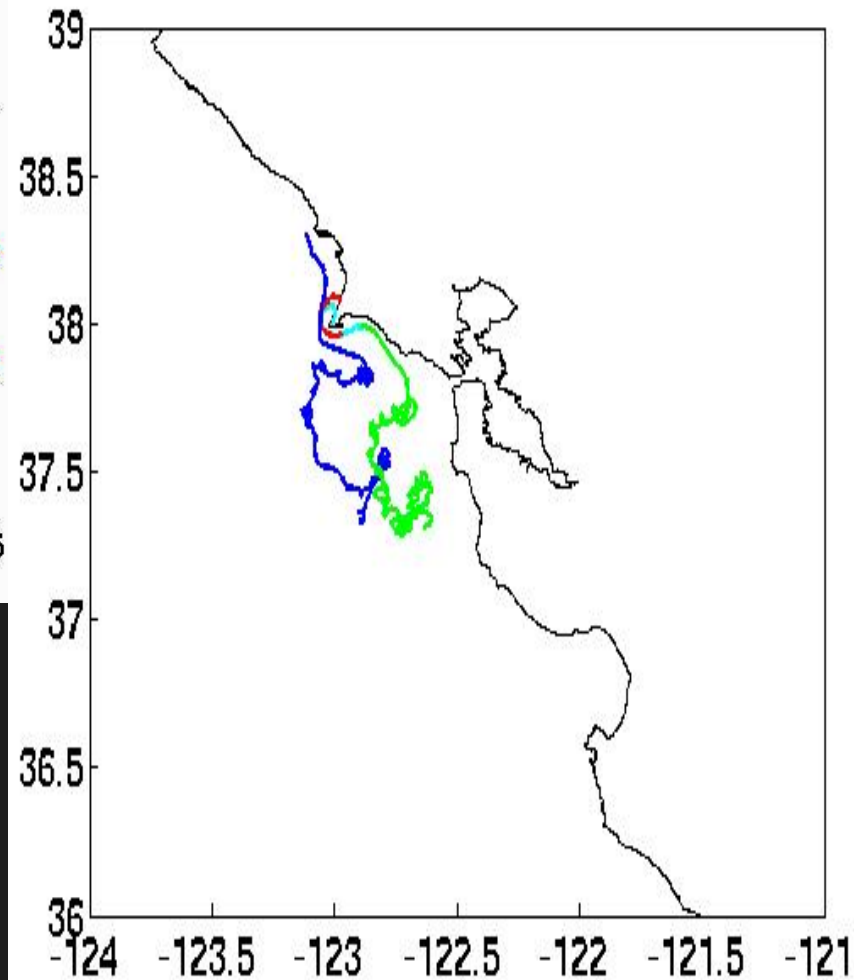


**Southward Drifters:**

**Decorrelation scale= 4-5 days**

**Northward Drifters:**

**Decorrelation scale= .5-2 Days**



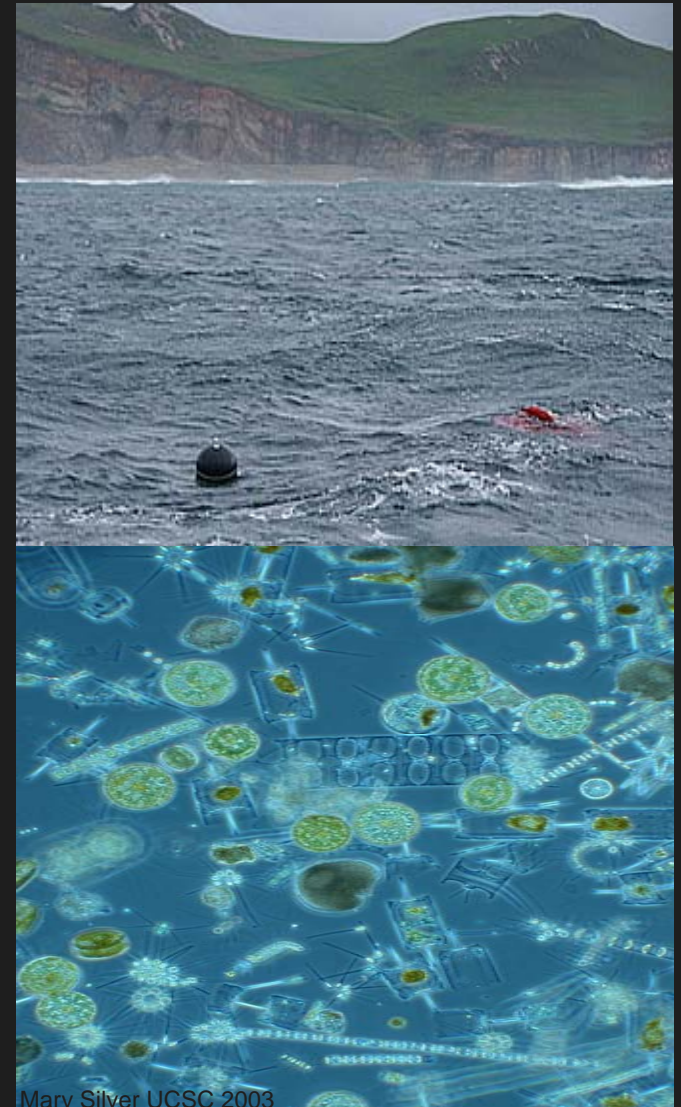


## **Time Scales are Valuable for:**

Shipboard sampling  
measurements

Carbon cycle and ecosystem  
modeling

Physical and biological  
mechanisms for transport



Mary Silver UCSC 2003

# Acknowledgements

---

We would like to acknowledge those that provided insight , including Patrick McEnaney and John Ryan from the Monterey Bay Aquarium Research Institute. Also, the participants of the CoOP WEST program, David Kaplan, Dwight Peterson and Atma Roberts for the processing of the data, along with aid from the captain and crew of the R/V Point Sur.

Funding was provided by NSF grant OCE-9912361 to RK and by the Graduate Areas of Assistance and National Need (GAANN) to AJVW, along with a Goddard Coastal Research Graduate Fellowship from NASA-Goddard.

# Temporal Patterns

From Satellite dATA: SeaWiFS / Chlorophyll a ( $\text{mg}/\text{m}^3$ )

