

## What is UP With the California Coast?

The making of productive habitat  
School of Environmental and Biological Sciences

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### Introduction

What makes the California Coast so inviting for marine sediments? This poster will investigate sea surface temperature, chlorophyll concentration, and migration data on the Ocean Tracks website to explore some of what makes the California coast such a popular ocean destination. We will use data from Ocean Tracks on the Pacific Bluefin Tuna to demonstrate coastal upwelling, explain migration through seasonality, and also habitat usage for oceanographic conditions.

#### Coastal Upwelling

- Upwelling zones can be identified by cool sea surface temperatures and high levels of chlorophyll
- Surface water is transported away from the coast and replaced by nutrient- rich deep water
- The California Coast
  - This Coastal upwelling is attracting the Pacific Bluefin Tuna because the water is biologically productive by providing more nutrients

#### -Seasonality of the California Coast

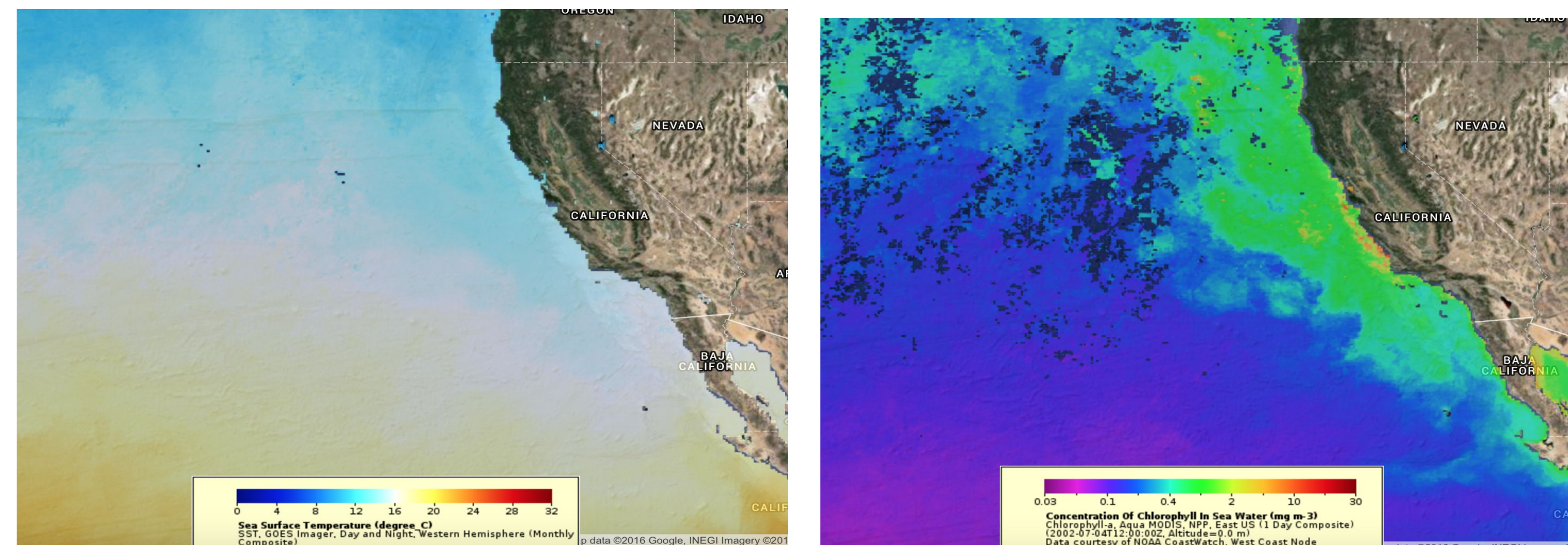
- In the winter, the winds blow from the south to the north, which results in down welling
  - This causes the coast to not be as biologically productive
  - During the summer, winds blow from the north to the south and due to the Eckman effect the water is moving offshore
  - Ekman Effect: is a structure of currents or winds near a horizontal boundary in which the flow direction rotates as one moves away from the boundary.
  - When the wind blows south to north the Ekman effect causes the water to move towards the shore
  - When the wind blows north to south the Ekman effect causes the water to move away from the shore

### Aim

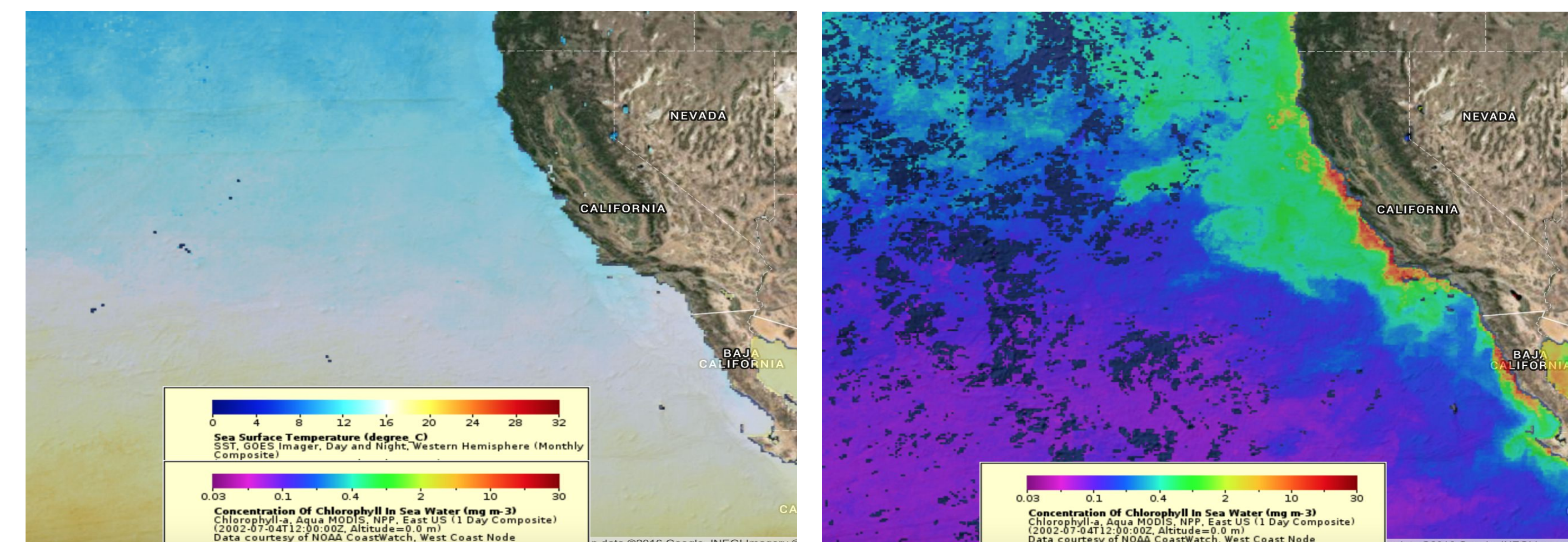
We will analyze sea surface temperature, chlorophyll concentration, and migration data to demonstrate due to coastal upwelling the California coast becomes a biological hotspot.

### Methods

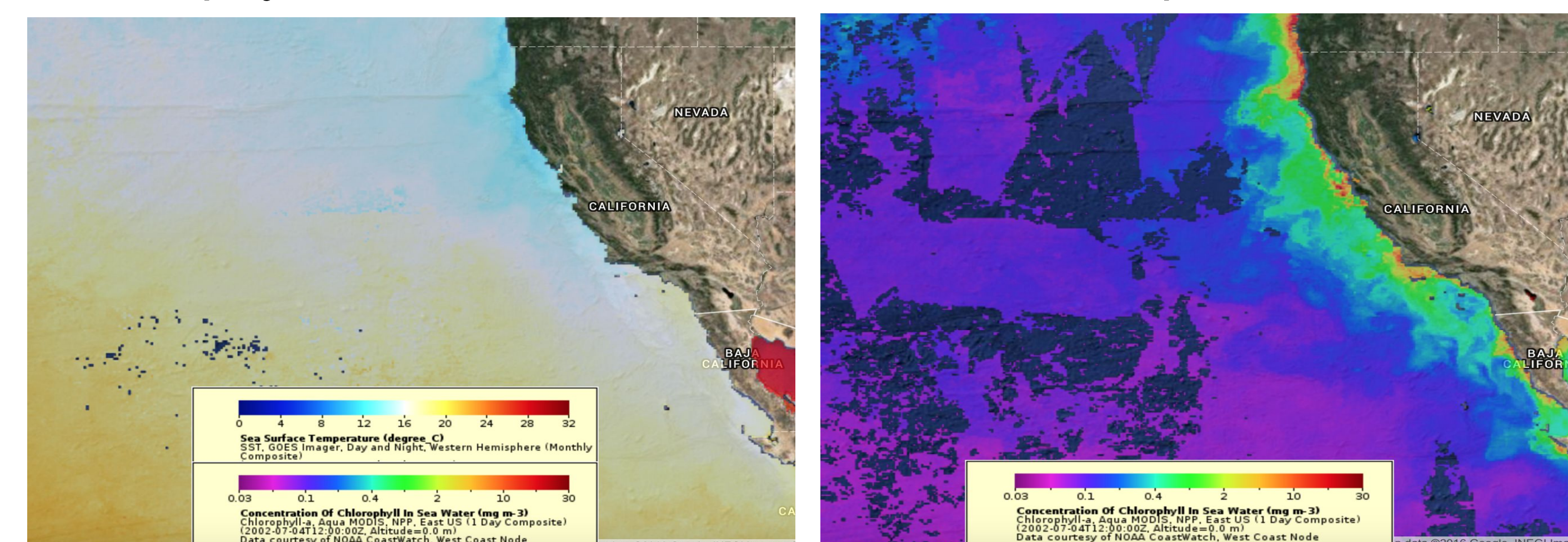
Winter 2010: lower temp around the coast; around 14 degrees C, & along some parts of the coast there are high levels of chlorophyll but most of the coast has an average amount.



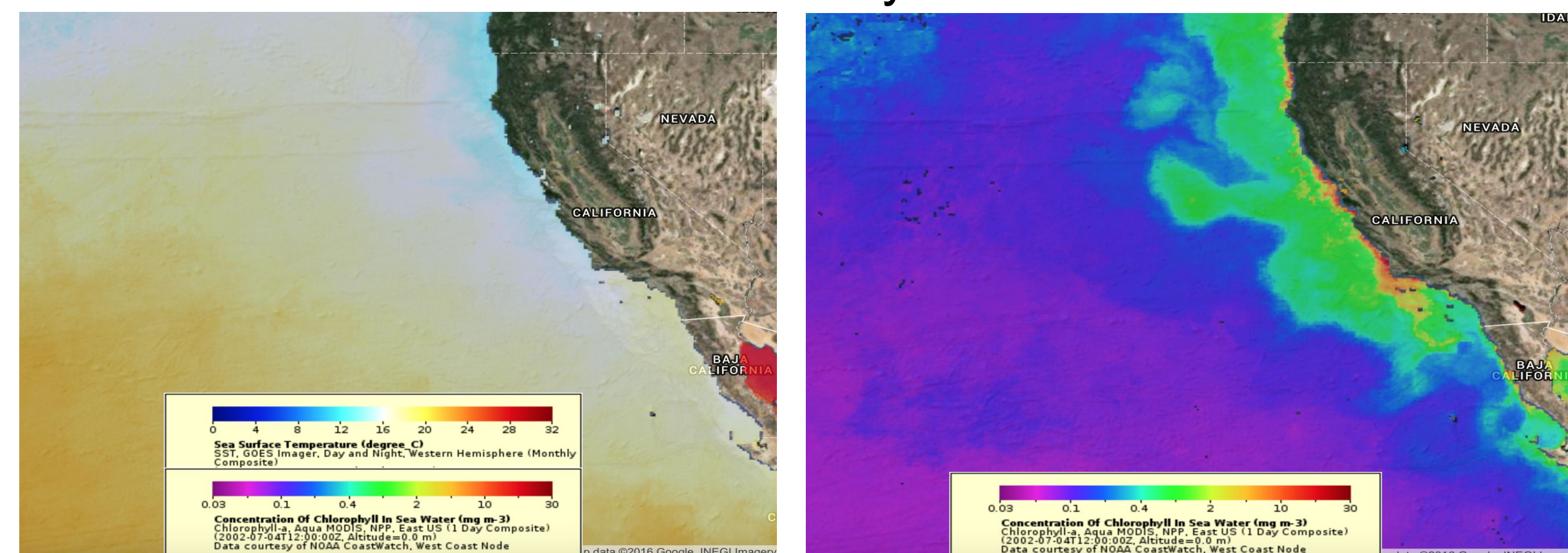
Spring 2010: there are still lower temp, that didn't change much but, the concentration of chlorophyll increased from last season.



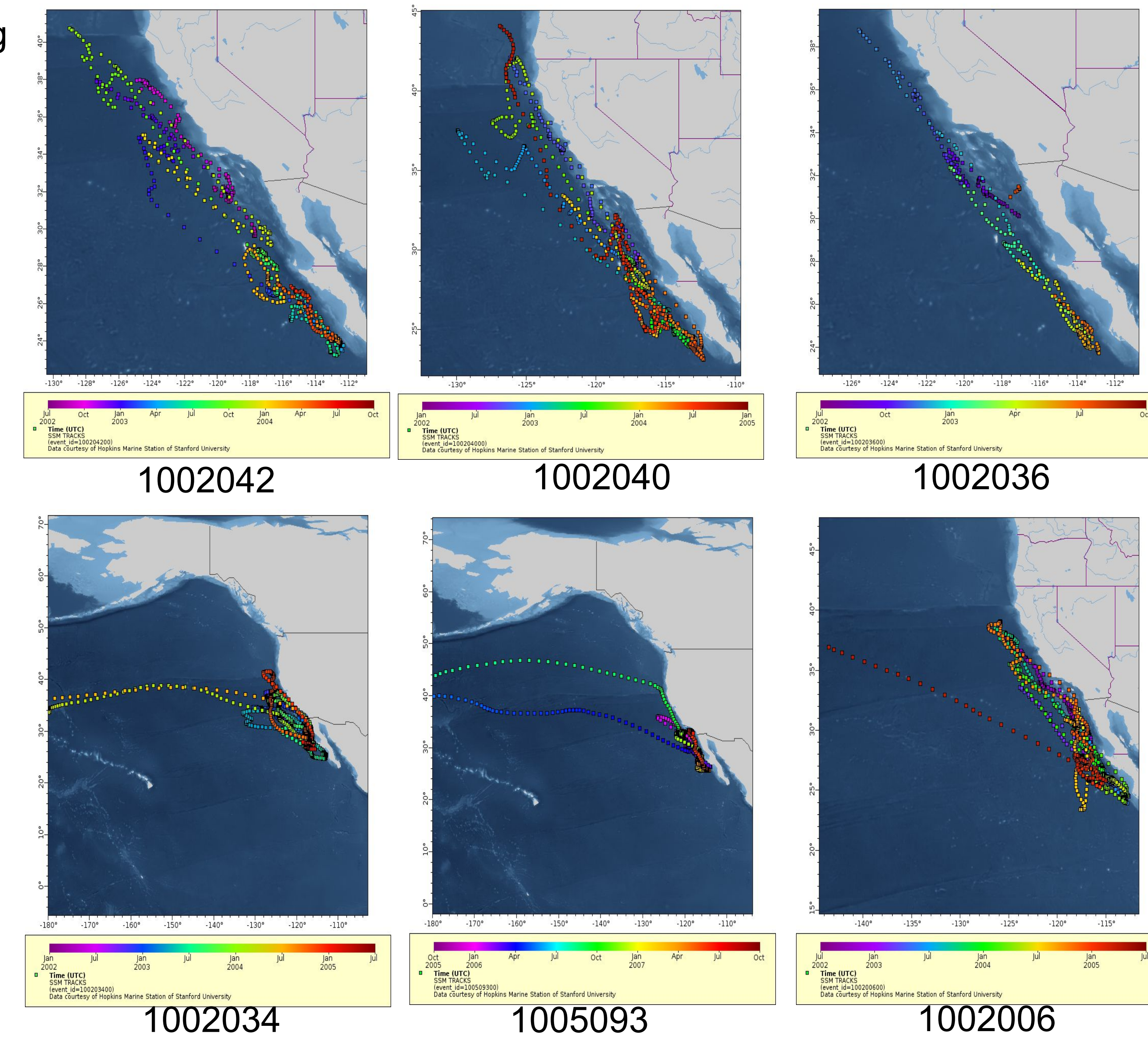
Summer 2010: the temp around the coast are getting warmer, but the chlorophyll concentrations decreased from the previous season.



Fall 2010: the temp are slightly cooler than summer, but almost remained the same. The chlorophyll levels went up also but not drastically.



### Results



Chlorophyll Concentration and Sea Surface Temperature increase productivity in the ocean. This relationship between the two proves that during the summer when chlorophyll is highest and water is warmest marine animals migrate to the coast.

### Conclusions

The upwelling levels are higher in Fall and Spring than in Winter and Summer because of the high levels of chlorophyll and the cooler sea surface temperatures.

### Bibliography

"Ocean Tracks." *Ocean Tracks*. EDC and Stanford University, n.d. Web. 19 Apr. 2016.

### Acknowledgements

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