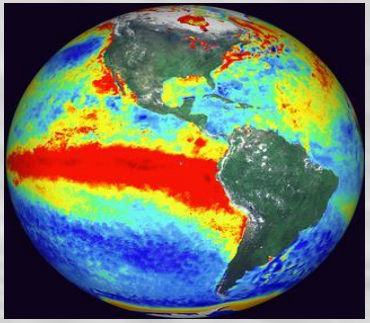
Harmful Algal Blooms and Domoic Acid: Latest Forecast and a Look Ahead to the Upcoming Season

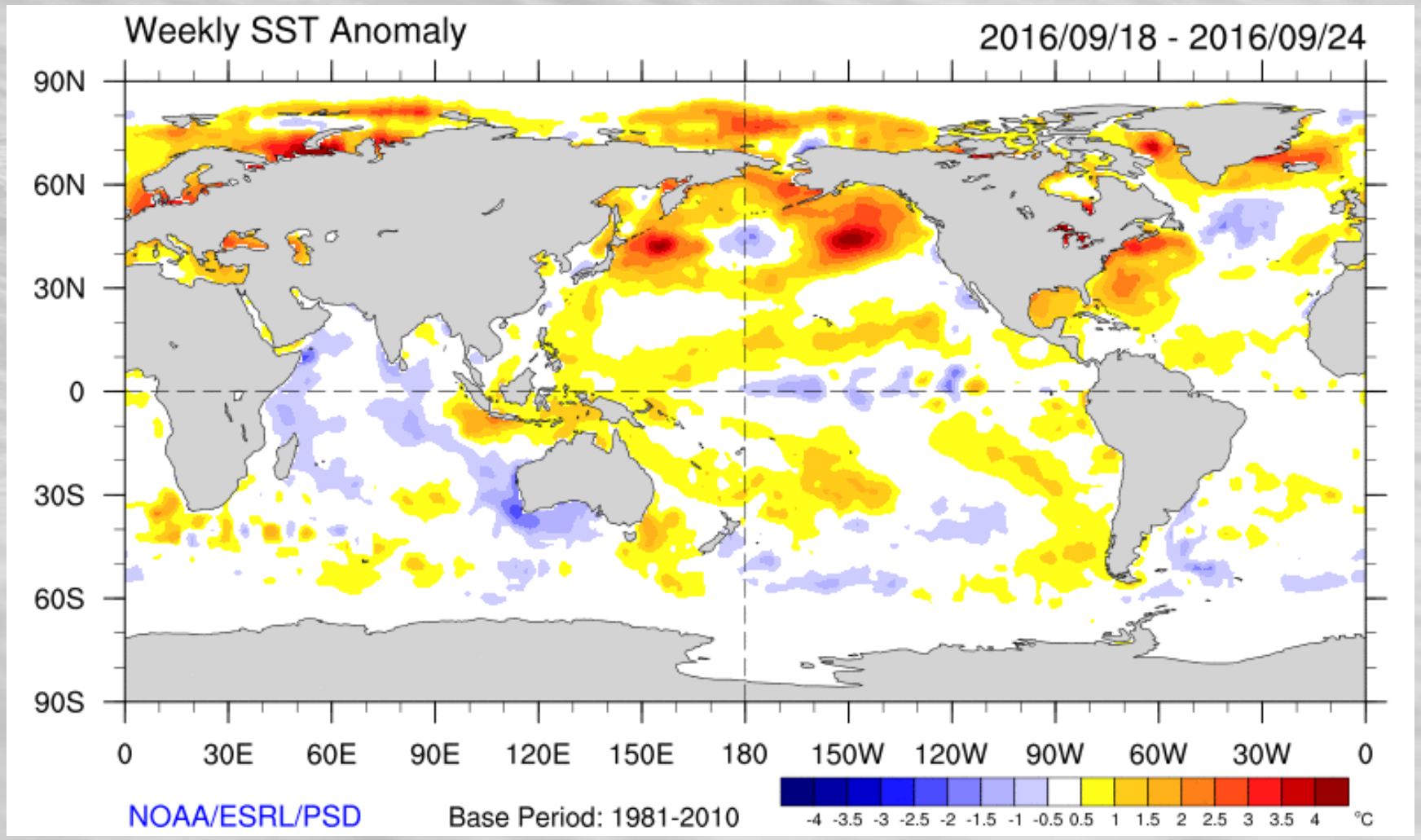
Raphael Kudela & Clarissa Anderson
University of California Santa Cruz

Summary of 2016

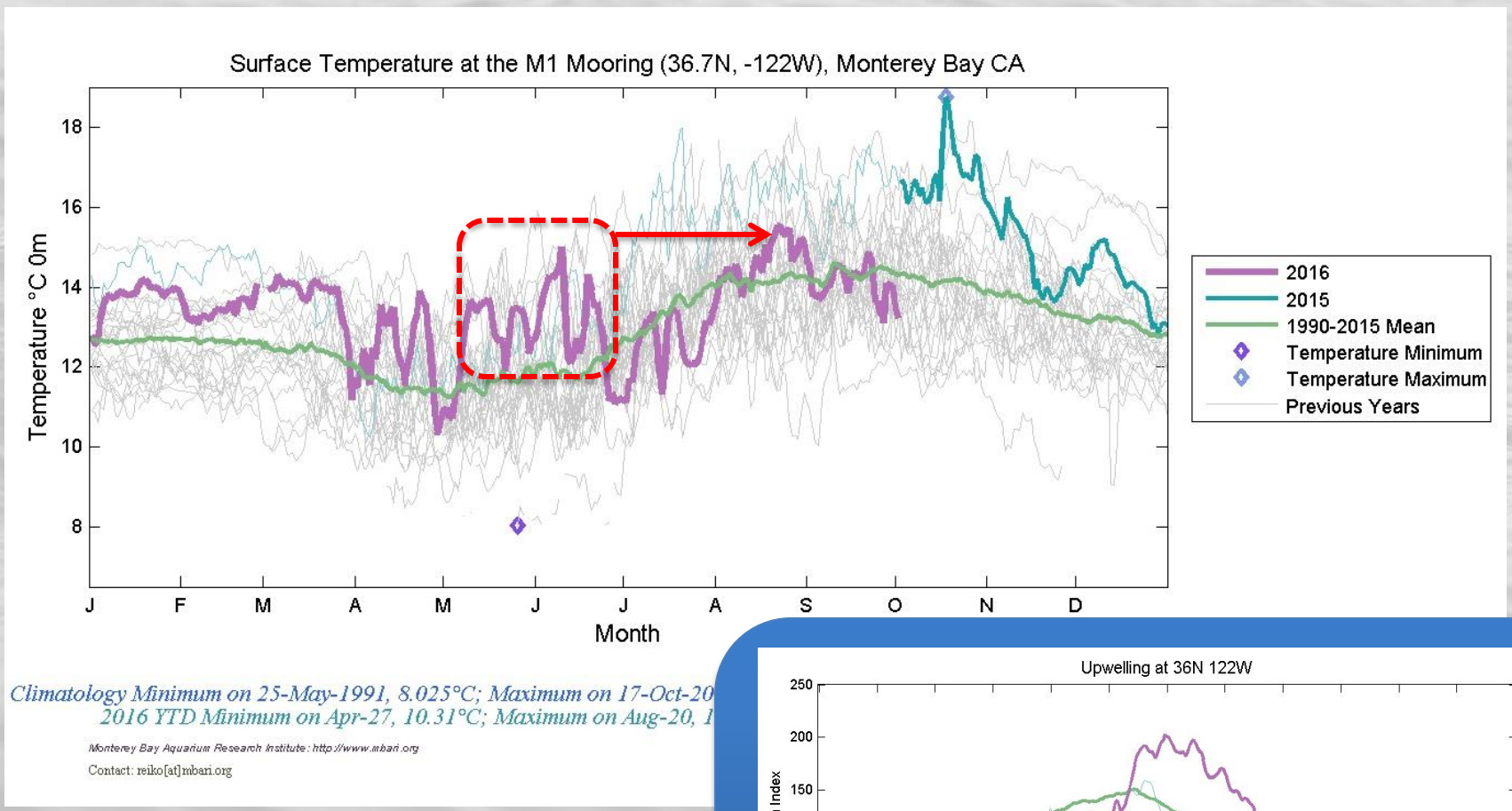


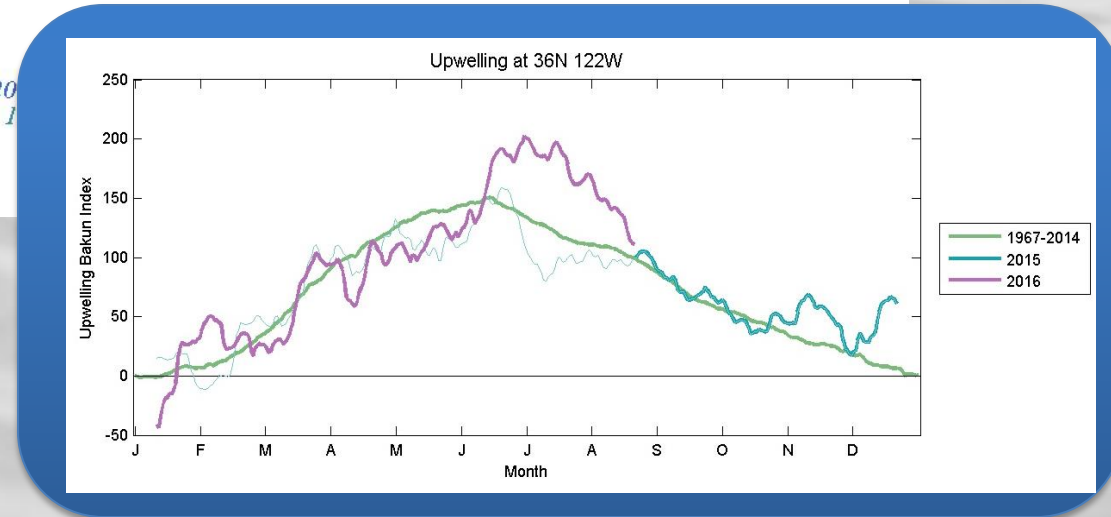
- Transition to La Nina in 2016, return to climatologically normal
- *Pseudo-nitzschia* & toxins started late (June), on track for a significant Autumn bloom
- 2016 is very warm and toxic, but more spatially variable—the late development of the bloom could result in trophic transfer to the benthic environment similar to 2015
- Toxicity may have peaked in September

Global Temperature Anomaly

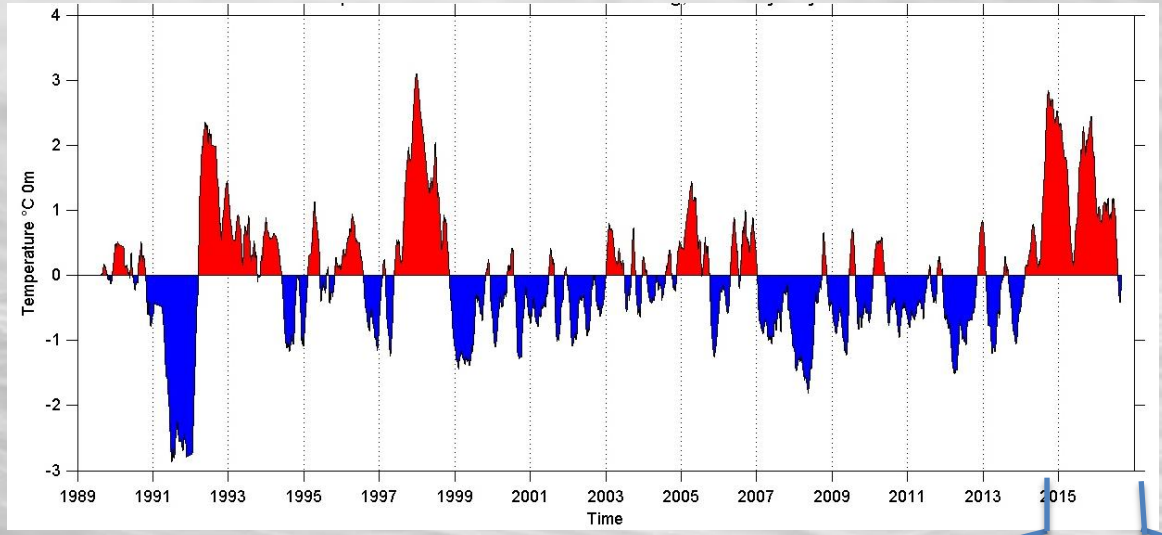


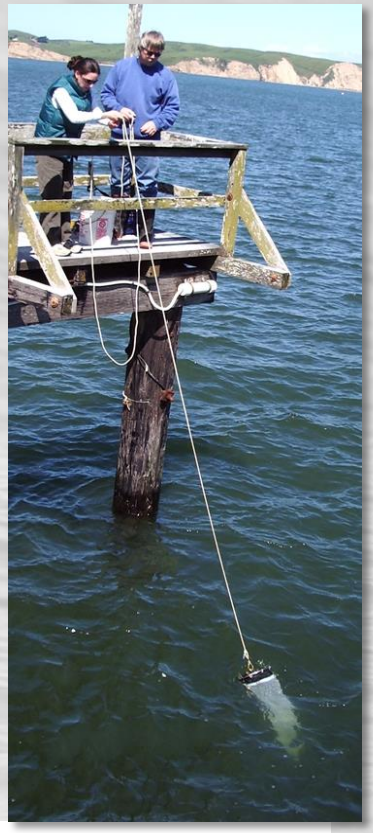
Monterey Bay Temperatures



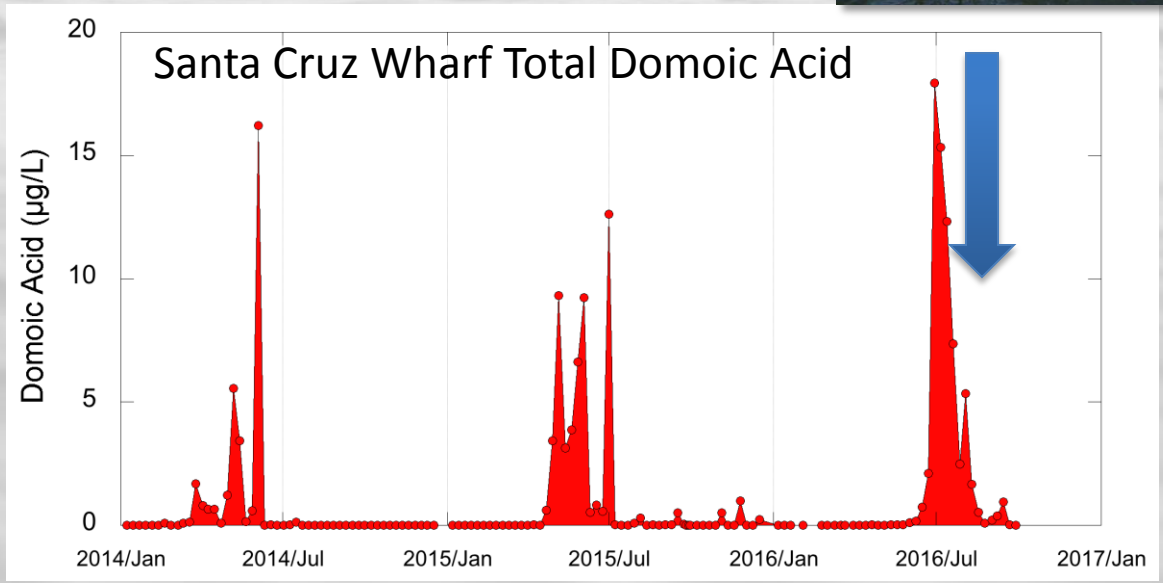


2016 is Warm & Toxic

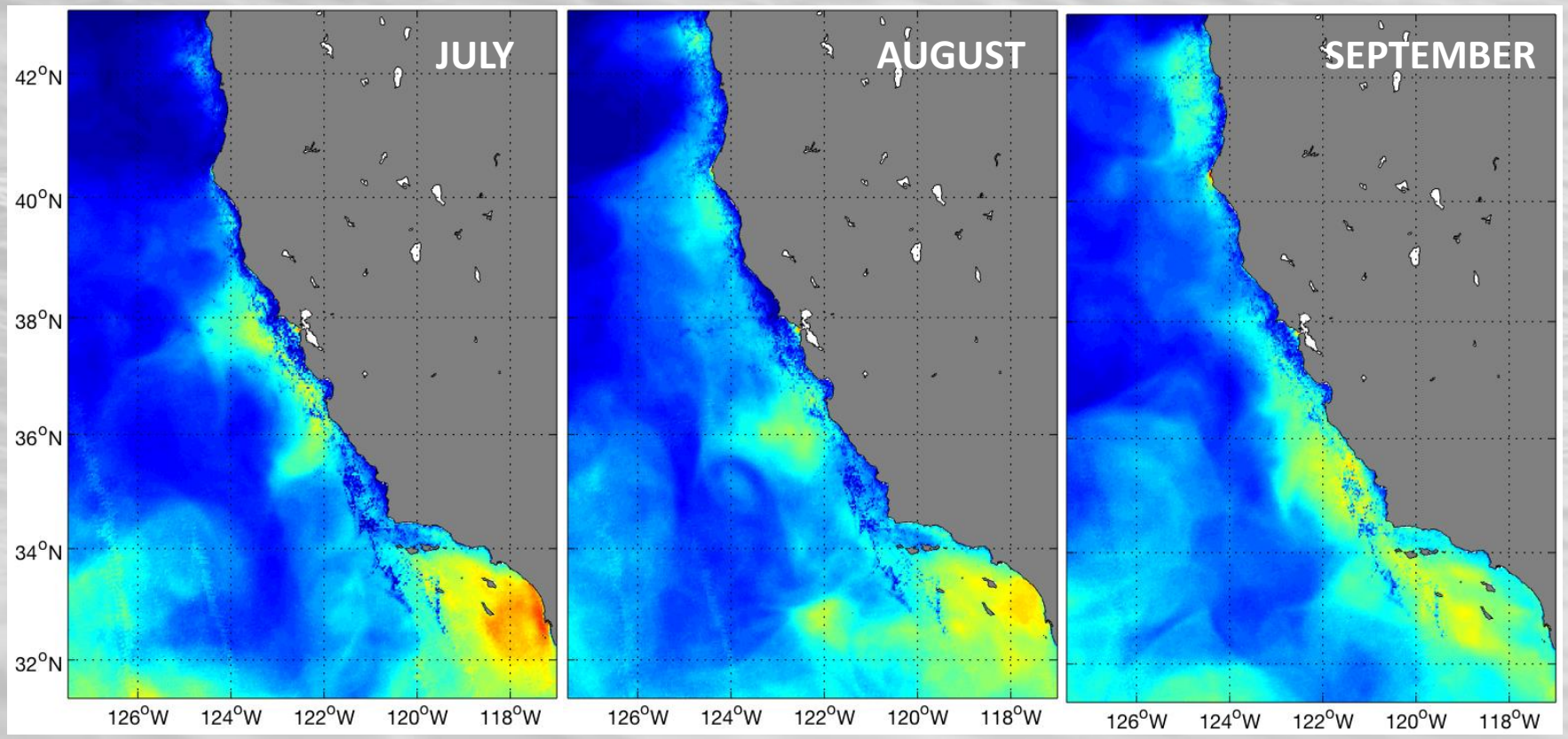




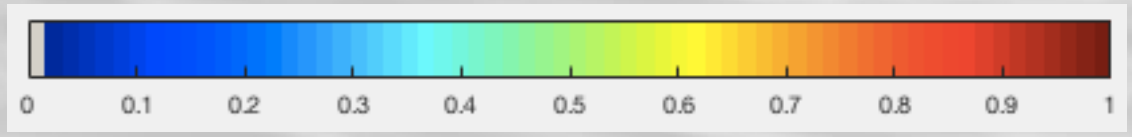
A warmer Eastern Pacific with localized upwelling would (statistically) increase the chance of more large-scale bloom events in the future



2016 Predicted Domoic Acid

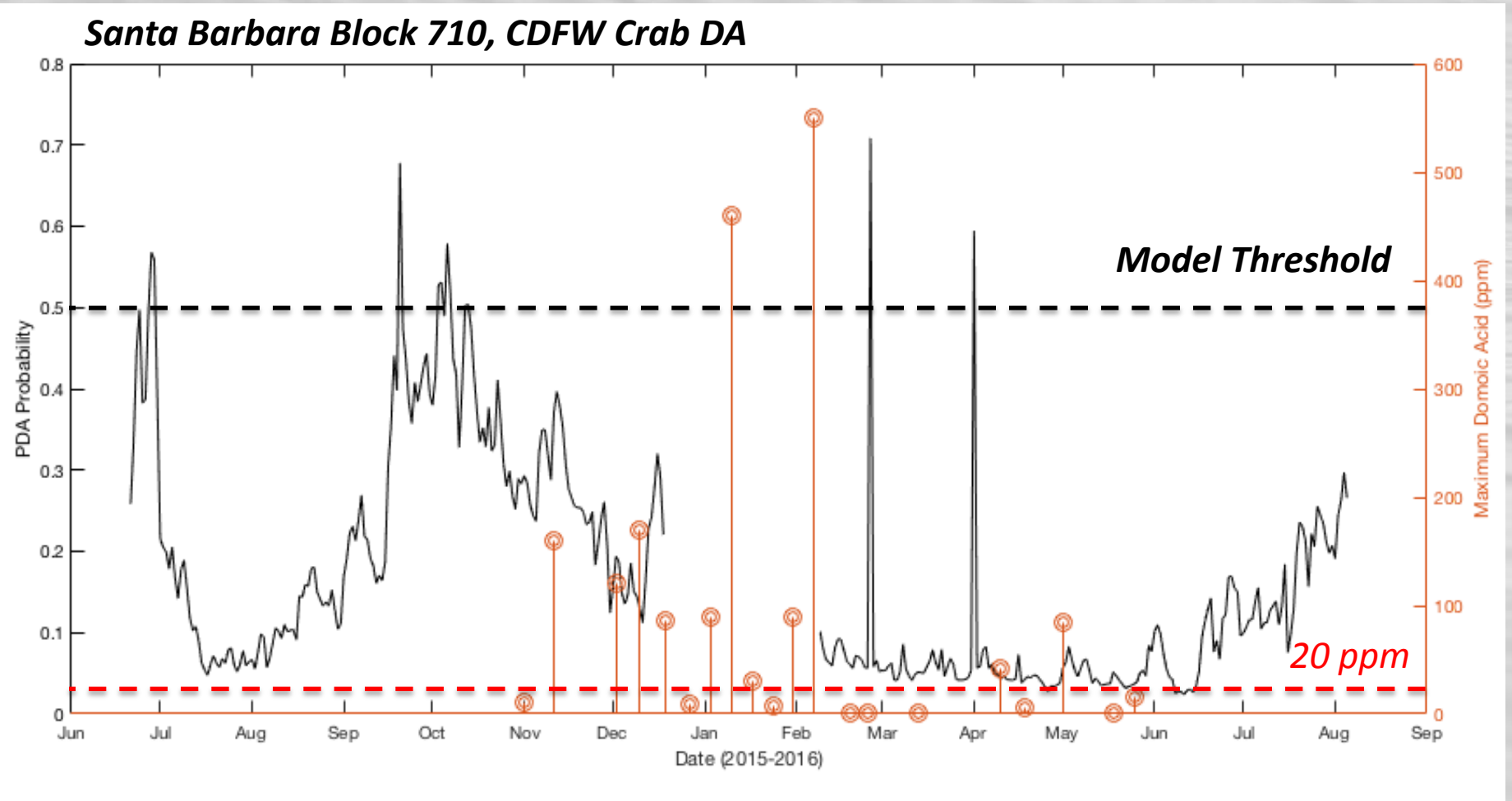


http://www.cencoos.org/data/models/habs

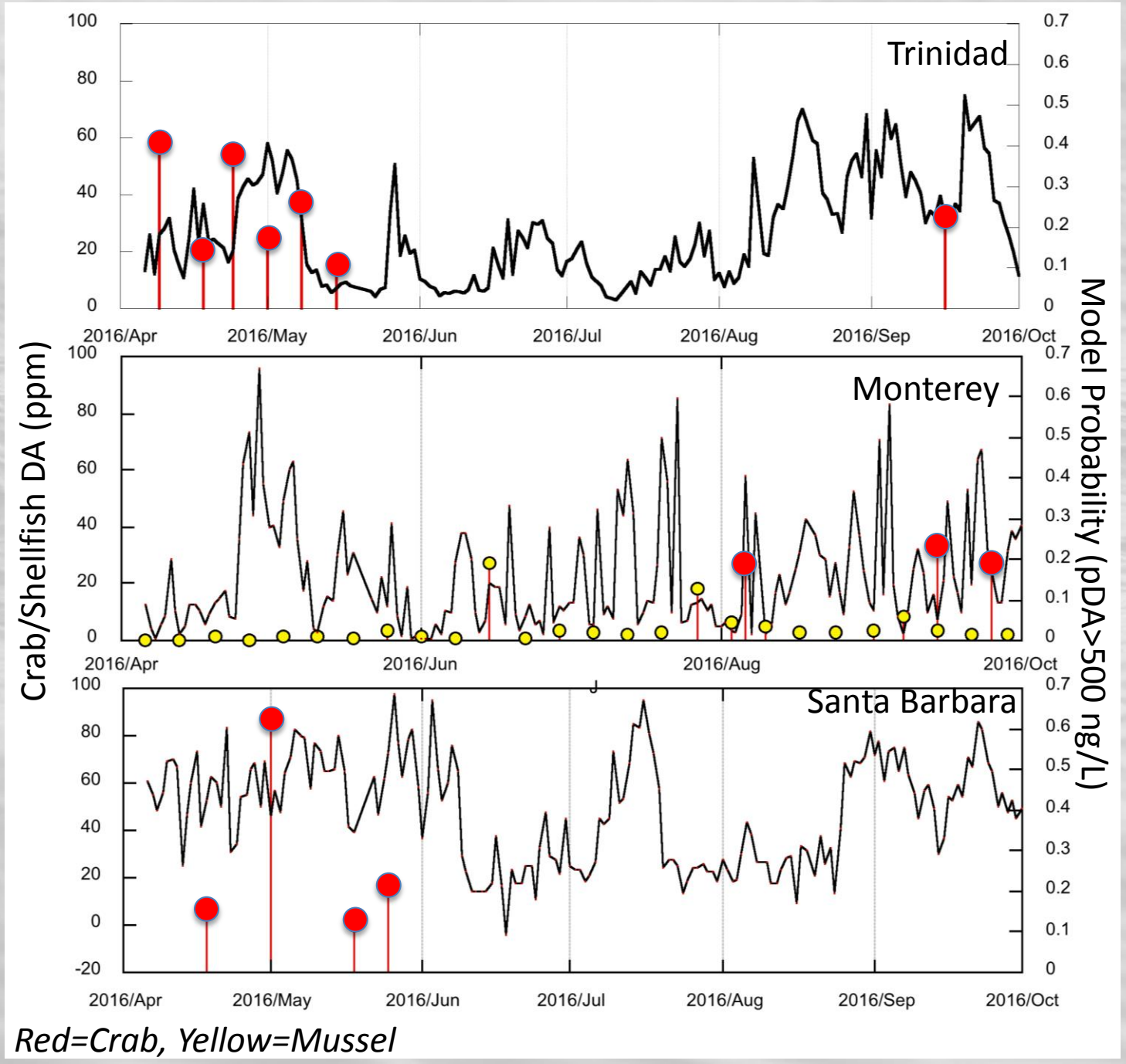


PDA Probability

PDA Model Tracks Crab Toxicity

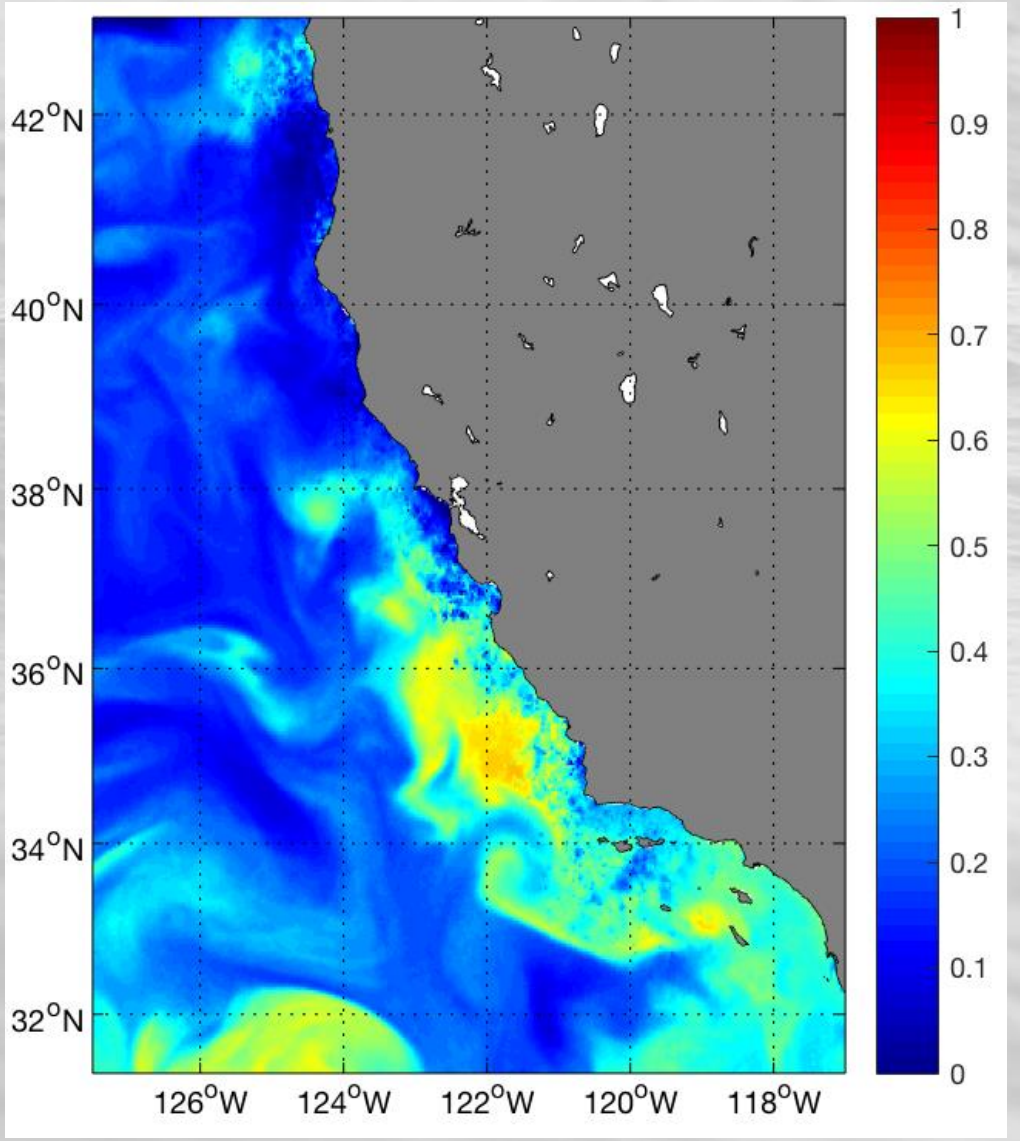


The Water-column model leads crab toxicity by about one month

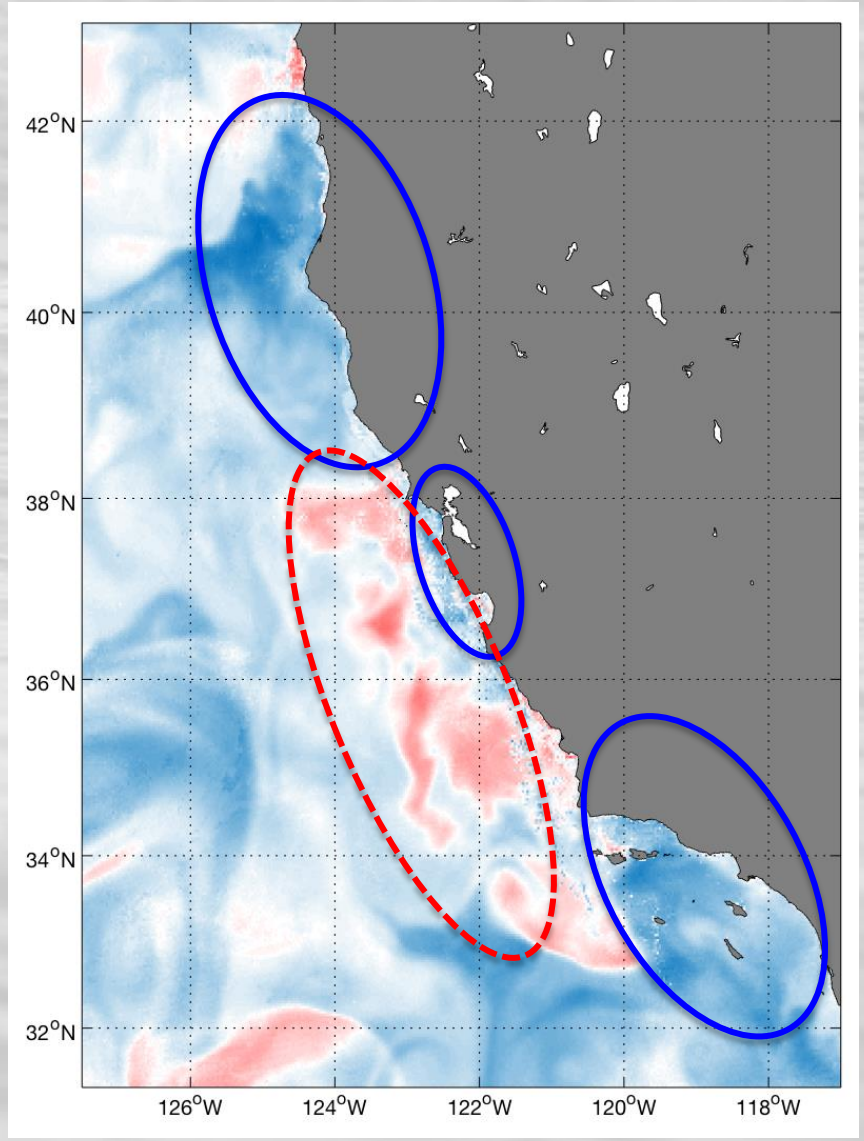


Crab Data from: http://www.cdph.ca.gov/healthinfo/pages/fdbdomoicacidinfo.aspx

pDA Probability October 3-5



Probability of Domoic Acid > 500 ng/L



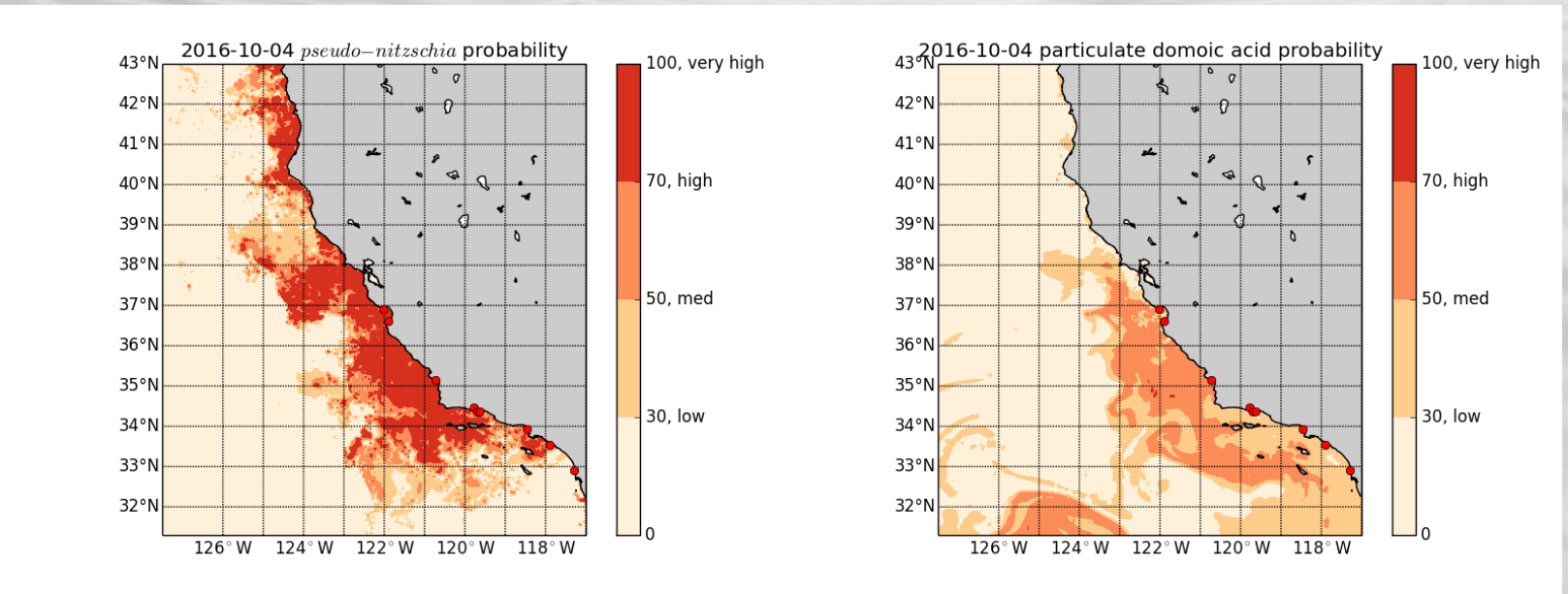
Change in Probability, September to October

Current Status

- **Observations and models suggest patchy, high-toxin regions that could accumulate (locally) in crabs and other organisms but not as widespread as 2015**

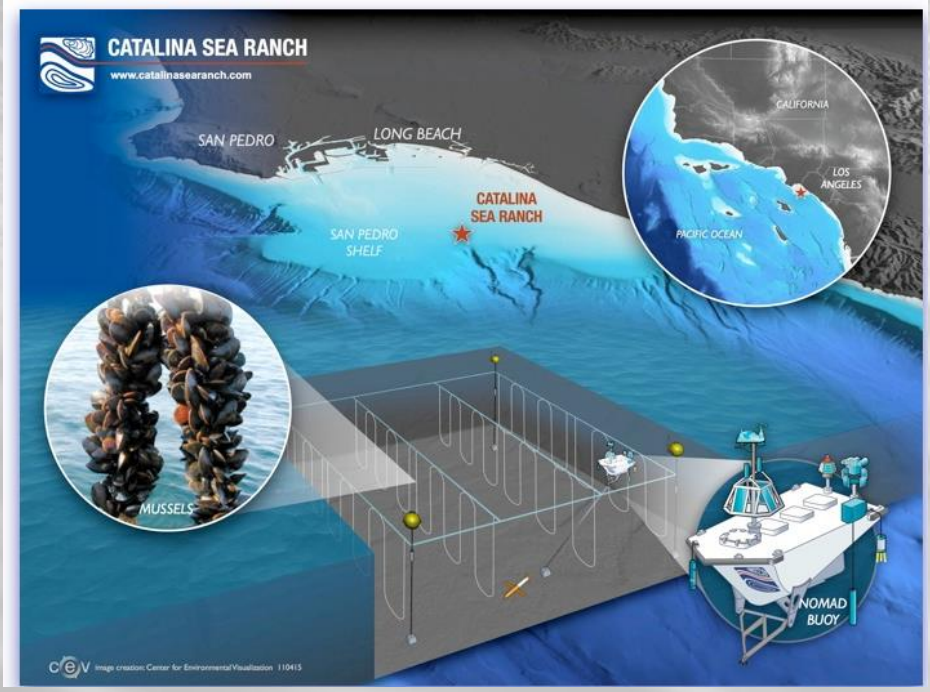
- **Seasonal decrease in bloom activity started at end of October (good news!)**

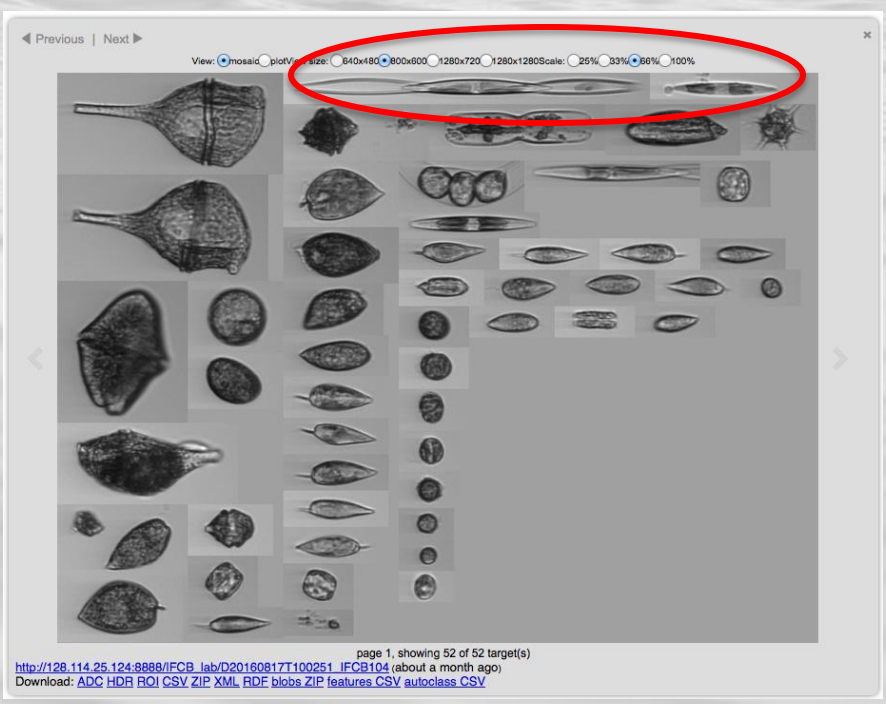
- **Models and limited observations suggest that the bloom has been pushed offshore. This and the "warm blob" in the Pacific Northwest are similar to conditions prior to 2015, suggesting 2017 has the potential to be another bloom year if this persists through the winter, but is highly dependent on winter/spring conditions**



Improving Predictive Capability

New Saltonstall-Kennedy (NOAA) funded project to add continuous plankton monitoring offshore





Thank You

Raphael Kudela
University of California Santa Cruz

kudela@ucsc.edu
831-459-3290