

Joint Committee on Fisheries and Aquaculture

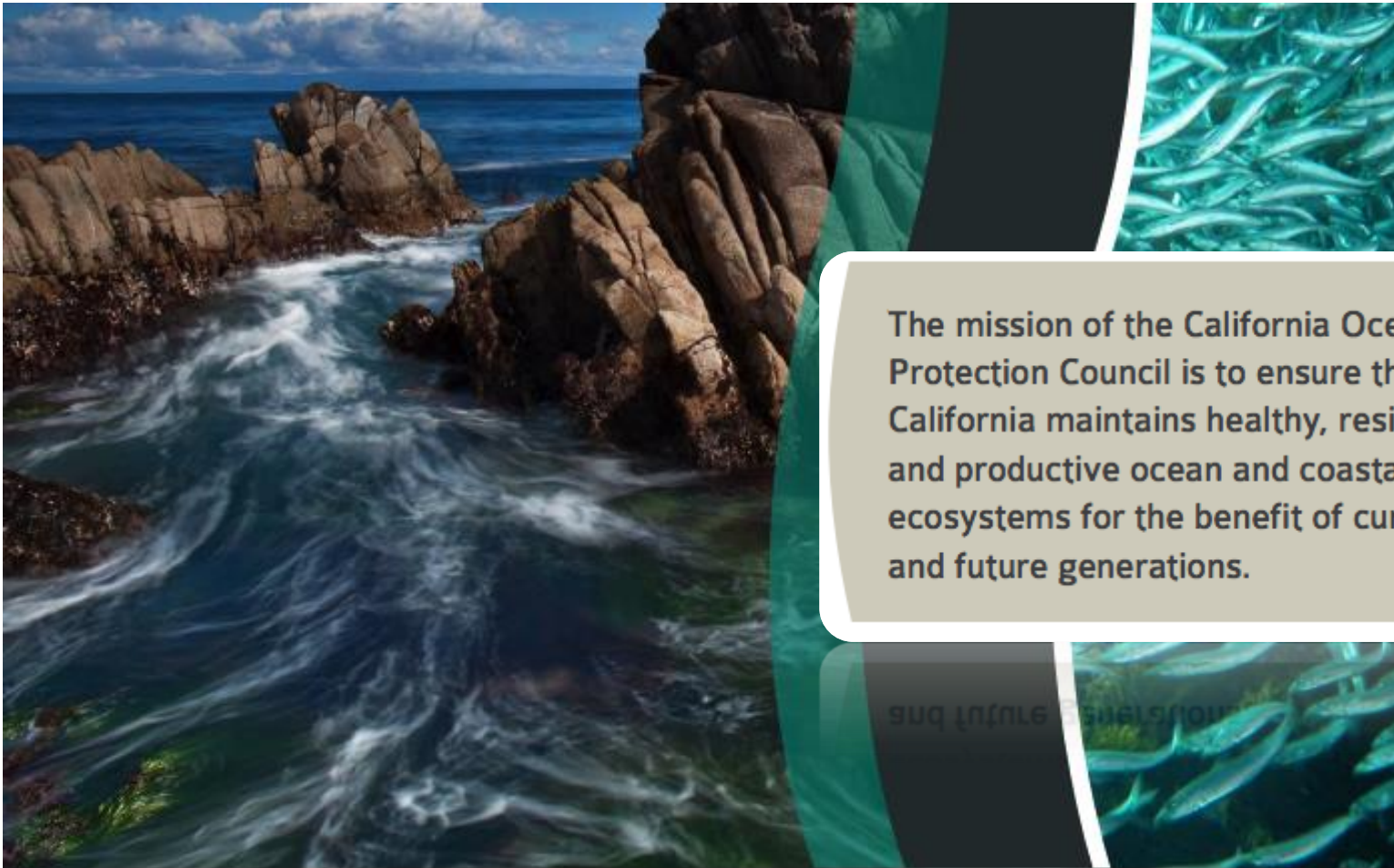


Catherine Kuhlman

*Deputy Secretary for Ocean & Coastal Policy
Executive Director, Ocean Protection Council*



OCEAN PROTECTION COUNCIL



The mission of the California Ocean Protection Council is to ensure that California maintains healthy, resilient, and productive ocean and coastal ecosystems for the benefit of current and future generations.

A Vision for Our Ocean and Coast

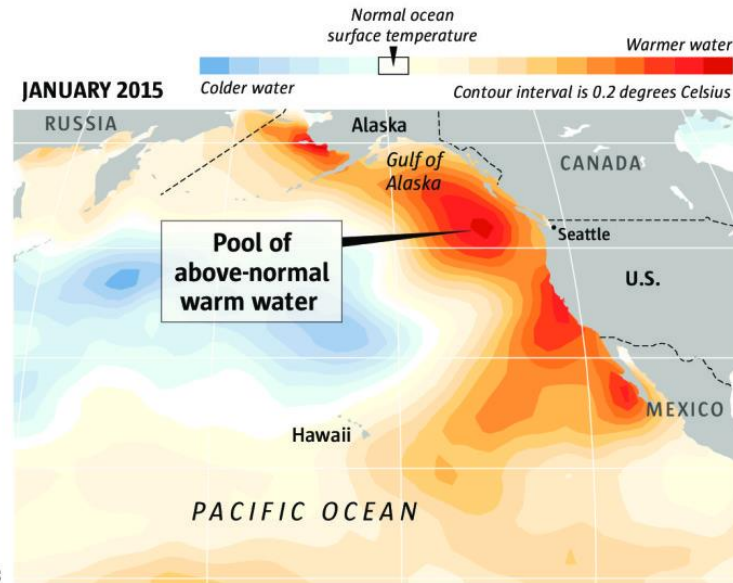
The ocean is changing

The blob off our coast

Scientists say a vast pool of warm water off our coast is affecting marine life and local weather, and is part of a bigger pattern that includes California's drought and East Coast blizzards.

Source: Department of Atmospheric Sciences, University of Washington

MARK NOWLIN / THE SEATTLE TIMES



Changing ocean temperatures, ocean acidification, hypoxia and harmful algal blooms (HABs) threaten ocean and coastal species, ecosystems, industries and communities along the West Coast.



What made 2015 even more unique

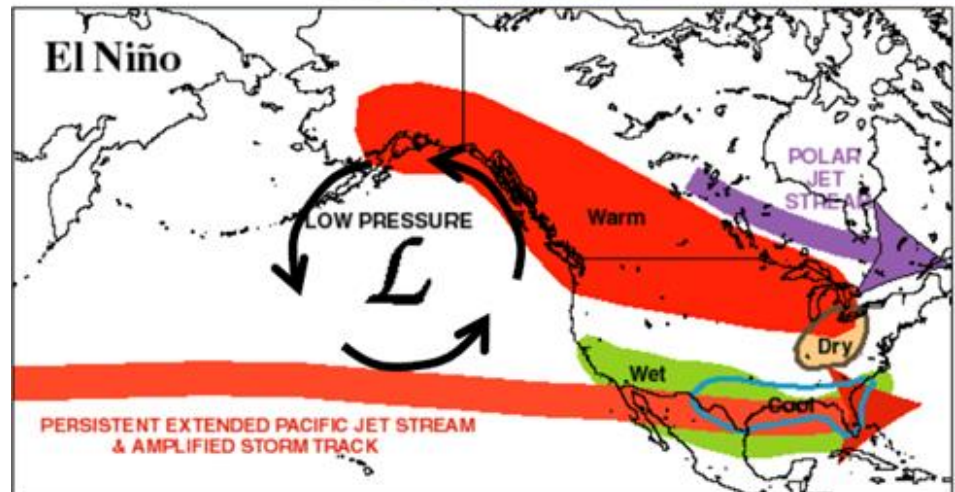
The Ridiculously Resilient Ridge

- Extending CA's drought
- Causing the 'blob' of warm water in the NE Pacific (2013-2015)

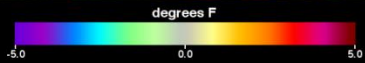
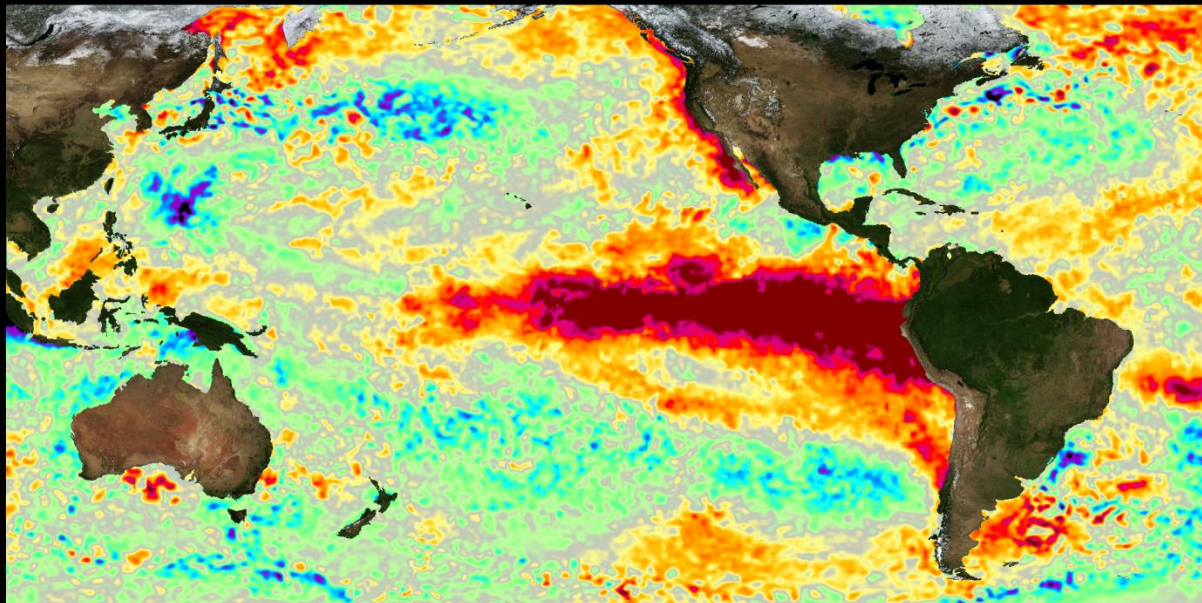


El Niño

- Ocean warmer
- Upwelling and productivity ↓
- Storms (wind and rain) ↑



Sea Surface Temperature Anomaly (SSTA)
November 12, 1997



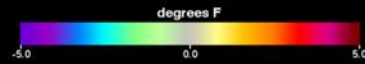
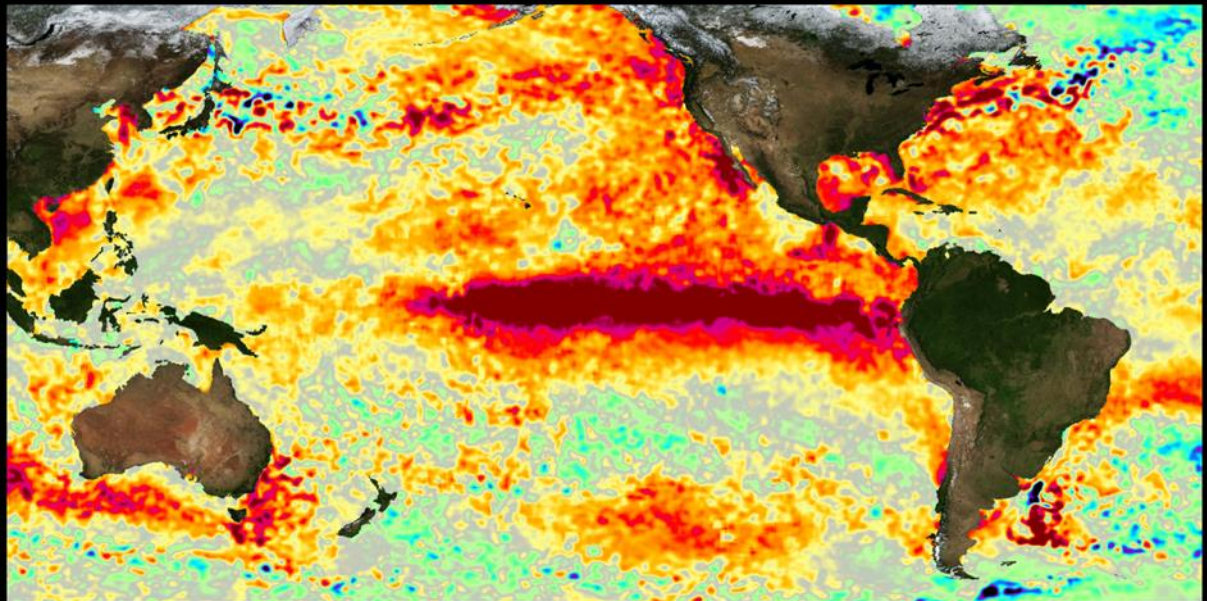
1997

Sea Surface Temperature
Anomaly

2015

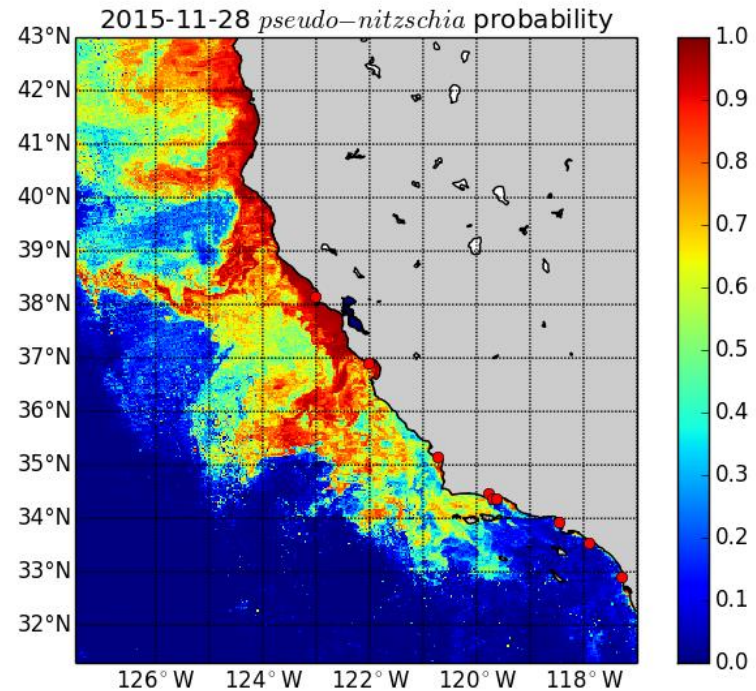
Sea Surface Temperature
Anomaly

Sea Surface Temperature Anomaly (SSTA)
November 12, 2015



2015 was truly unprecedented. The bloom was record-setting in:

- *size*
- *duration*
- *toxicity*



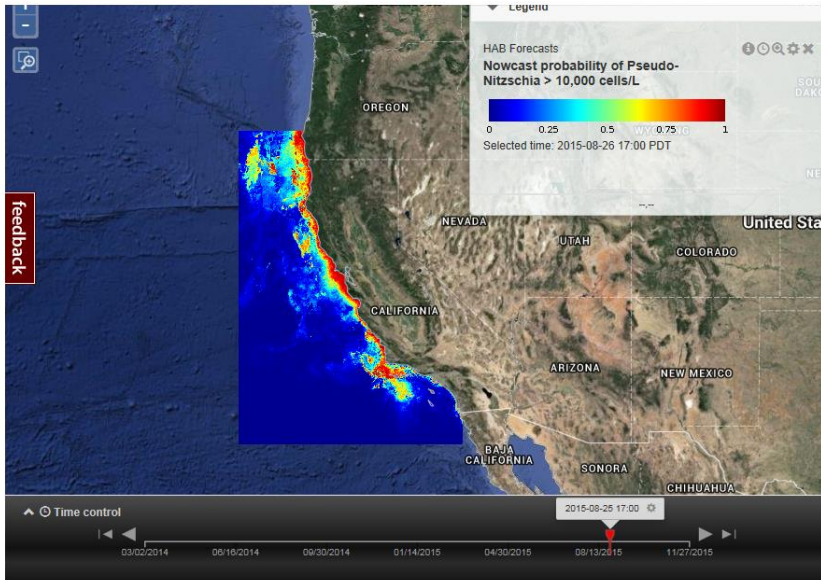
With our partners, OPC funded timely work:

ICOOS INTEGRATED OCEAN OBSERVING SYSTEM

CeNCOOS

DATA LEARN ABOUT COMMUNITY

Pseudo-nitzschia Particulate Domoic Acid Cellular Domoic Acid



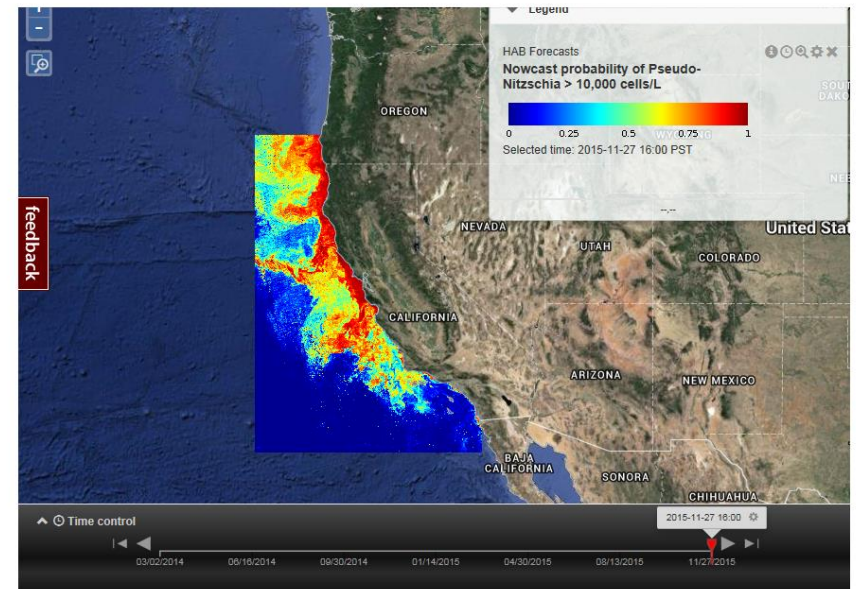
The map image displays the probability that the abundance of toxin-producing species of the diatom *Pseudo-nitzschia* in coastal waters is at or above the "bloom" threshold of 10,000 cells per liter. A value of 0.7, for example, means there's a 70% predicted probability of *Pseudo-nitzschia* blooms in that pixel.

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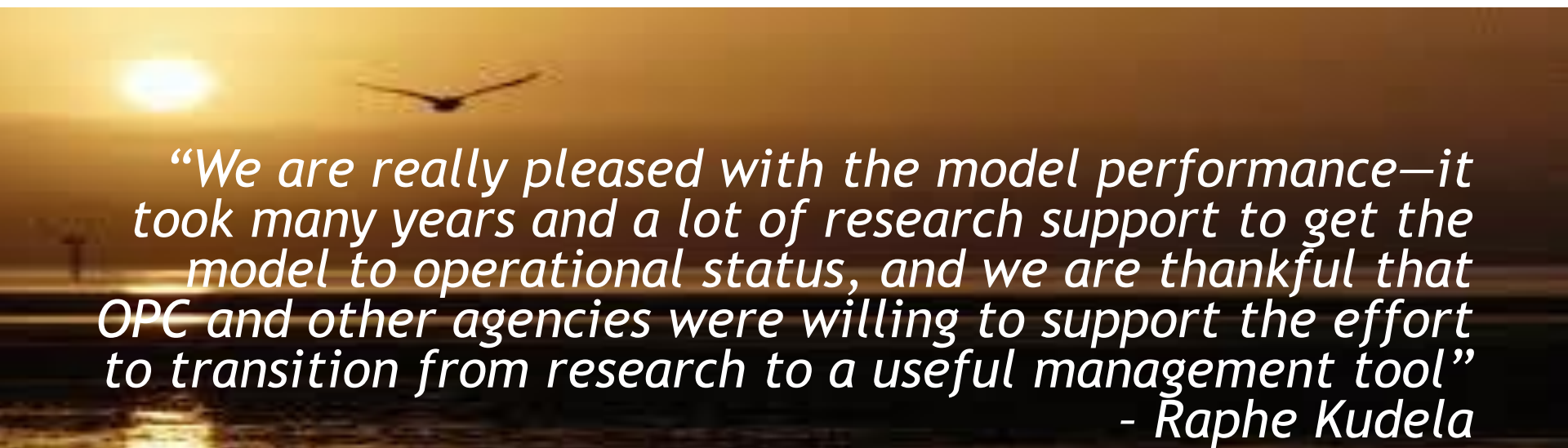


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Investing for the Future

- These investments help us plan and prepare for an uncertain future
- For example, these efforts led to earlier detection and therefore earlier action in Humboldt Bay this past summer:

A photograph of a sunset over a body of water. The sun is low on the horizon, creating a bright glow and reflecting on the water. A bird is seen in flight against the orange and yellow sky.

“We are really pleased with the model performance—it took many years and a lot of research support to get the model to operational status, and we are thankful that OPC and other agencies were willing to support the effort to transition from research to a useful management tool”
- Raphe Kudela

At a recent conference in Sweden on that very question, everyone agreed that “climate change, including warmer temperatures, changes in wind patterns, ocean acidification, and other factors will influence harmful algal blooms,” Kudela wrote. “But we also agreed we don’t really have the data yet to test those hypotheses.” - Seattle Times, June 2015



Next Steps

OPC is interested in furthering understanding of changing ocean conditions and providing coastal communities information to act.



