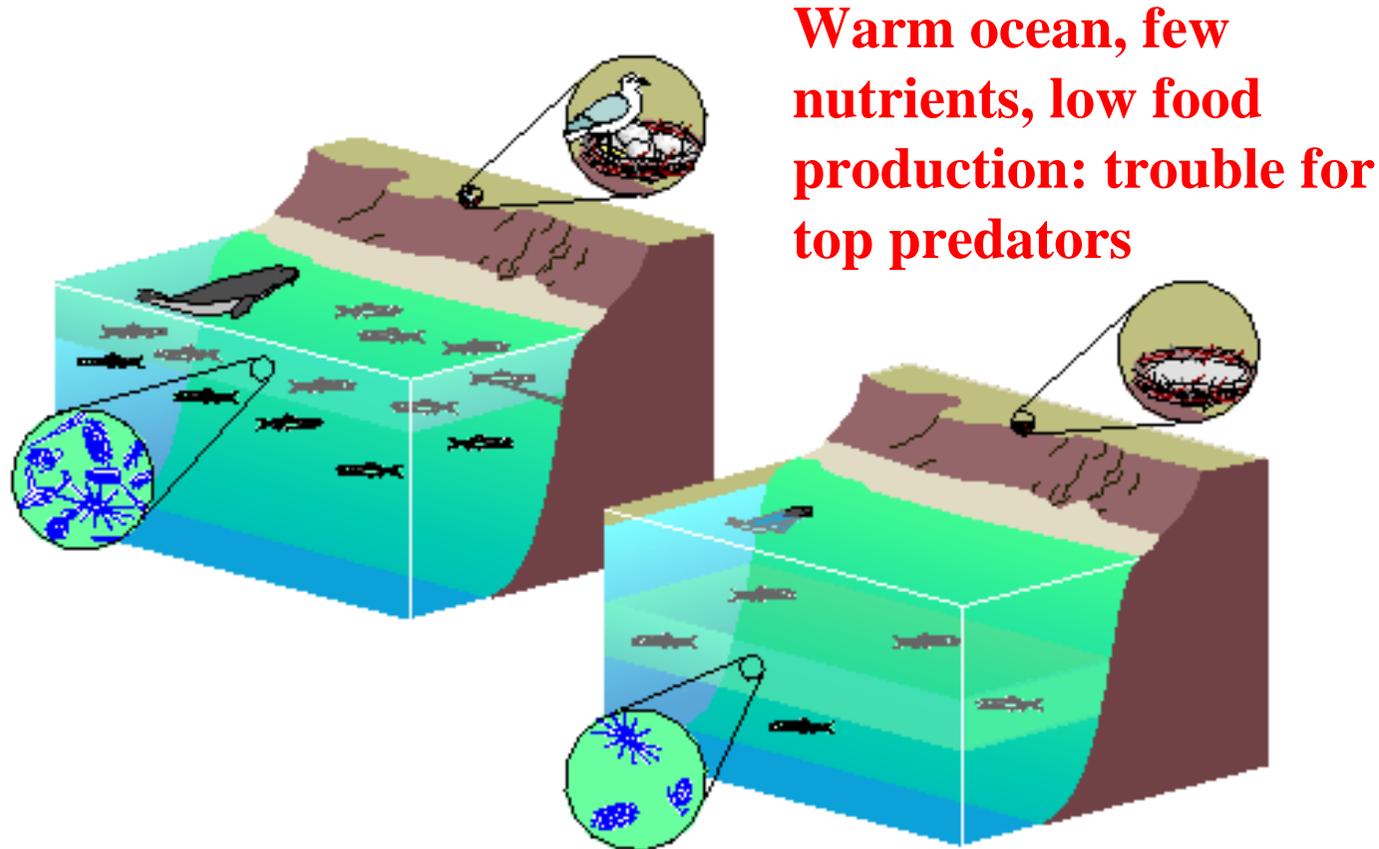


How bad were ocean conditions for CA salmon?

- Mostly really bad!
- Record high temperatures from 2014-2016
- Poor conditions for CA salmon and other top predators
- Affected salmon abundance and fisheries 2016-2017, and will likely affect abundance through at least 2018
- High temperatures were caused by “the blob”, weak winds, and the extreme tropical El Niño in 2015-16

The California Current Ecosystem food web

- When the upper ocean is cool: abundant nutrients, high productivity, and large zooplankton like krill
- This feeds higher trophic levels (forage fish, sea birds, salmon, mammals)



Biological Impacts

Warming Pacific Makes for Increasingly Weird Ocean Life

A "blob" of warm water that's partly to blame for dead birds and stranded sea lions in the Pacific may share a cause with Boston's snows and California's drought.



Mysterious Sea Lion Die-Off Strikes Again on California Coast

Tiny sea lion pups are washing up on beaches in unusually high numbers—for the third winter in a row.

Experts puzzled as 30 whales stranded in 'unusual mortality event' in Alaska

Scientists 'very concerned' and suspect toxic algae, though NOAA concedes 'bottom line is we don't know what's causing deaths'

Unusual warm ocean conditions off California, West Coast bringing odd species



Huge Toxic Algal Bloom Shuts Down West Coast Fisheries

Pacific Ocean 'blob' draws scrutiny of researchers

A huge swath of unusually warm water that has stretched to the normally cool Pacific has grown to the size of the entire ocean temperature anomaly on record, researchers now say, profoundly affecting climate and marine life from Baja California to Alaska.

Record Algae Bloom Laced With Toxins is Flourishing in "The Blob" — and Spreading in the North Pacific

Unusual species in Alaska waters indicate parts of Pacific warming dramatically

The Gulf of Alaska is unusually warm, and weird fish are showing up

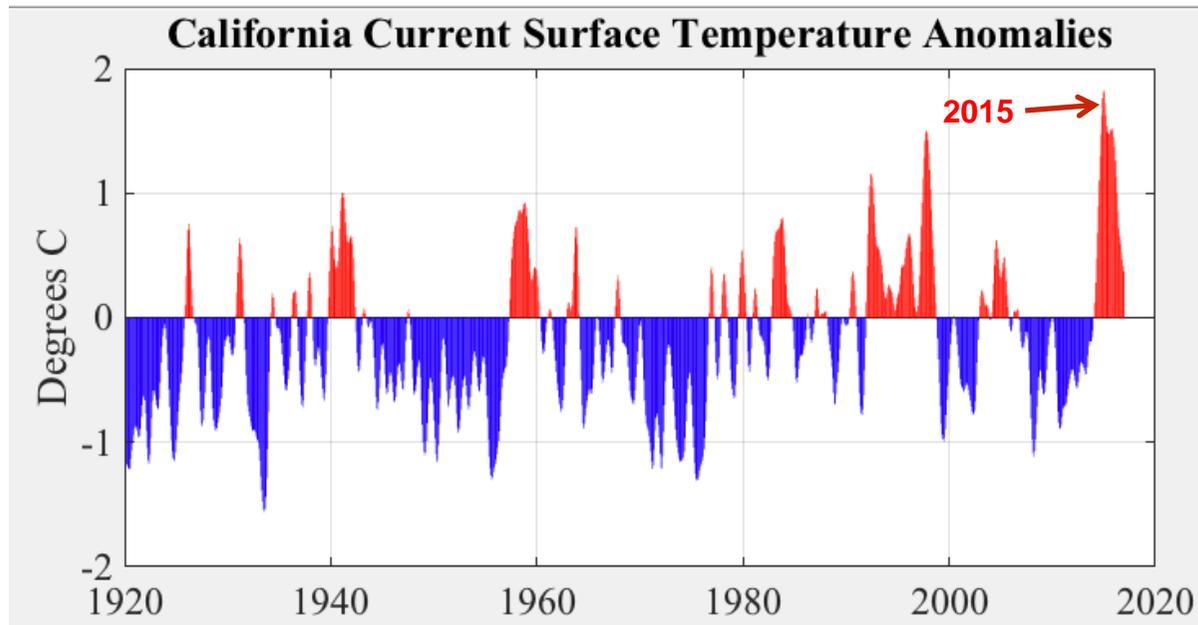
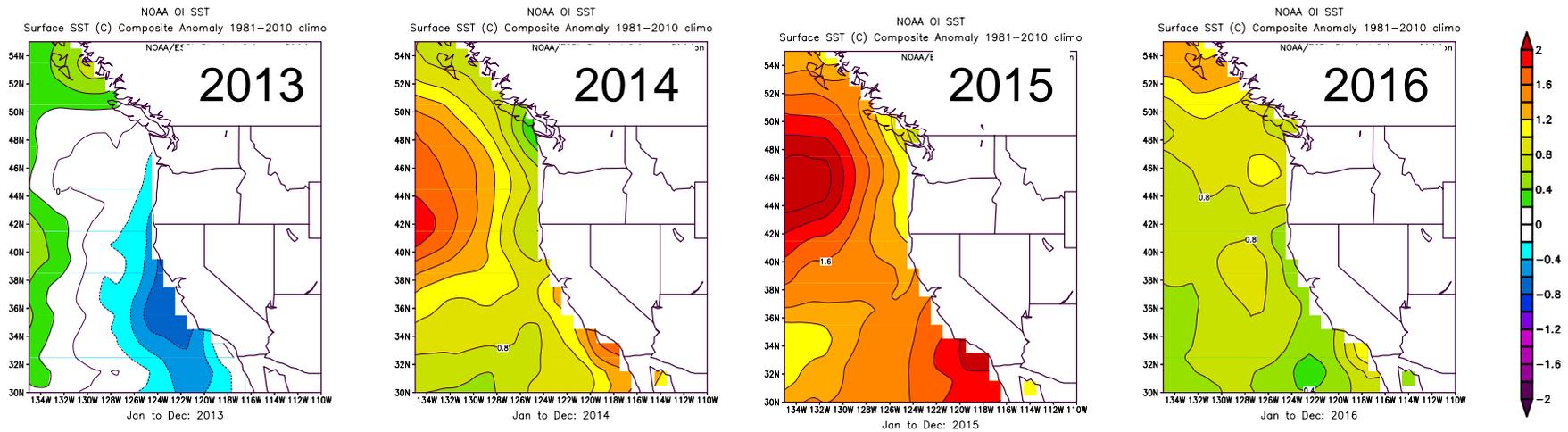


In this Aug. 29 photo, a 7-foot ocean sunfish rarely seen in Washington waters washed ashore on a beach near Ilwaco, Wash., with June Mohler, a biological technician working as an interpretative assistant. (AP Photo/Coco Disappointment State Park, Eric Wall)



Why are so many whales dying on California's shores?

Ocean temperatures from 2013-2016



The ocean is starting to look more normal...

