West Coast waters cool but Gulf of Alaska remains warm. Blob heat wave envelops West Coast. 
Elevated temperatures ashore. 
El Niño develops.

2014
With little wind to cool ocean, blob develops in winter. Very low snowpack in 2014 / 2015.

2015
Blob heat wave envelops West Coast. Elevated temperatures ashore.

2016
West Coast waters cool but Gulf of Alaska remains warm.

2017
Cooling continues, ocean trends back. Arctic remains warm.

**ECOLOGICAL CHANGES**

- Krill plentiful off West Coast.
- Salmon migration routes shift.
- Upwelling of cool water near the coast keeps temperature lower.
- Species shifting north to cooler waters.
- Sardine spawning farther offshore.
- Warmer water species such as skipjack tuna found in Alaska.
- About 95 percent of endangered winter-run Chinook salmon eggs are lost to drought.
- Pyrosomes multiply to extent never seen before.
- Lacking krill, humpback whales feed on anchovy closer to shore, where crab traps are.
- Shift in food web from crustaceans to gelatinous organisms with less value to fish.
- Pyrosomes appear farther north than ever recorded before.
- Clamming shut down, Dungeness crab season delayed by algal toxins.
- Large whale unusual mortality event (UME) in Alaska.
- Some 4,000 stranded California sea lions.
- Seabird die-offs.
- Reduced size and survival of salmon going to the ocean. Cod in Alaska skinnier than usual.
- Fishing nets clogged with pyrosomes.
- Dungeness crab season opens.
- Increase in whale entanglements.
- Some fish smaller, poorer body condition.
- Reduced salmon survival leads to reduced returns.
- Sea lion strandings continue.
- Pacific cod decline in Alaska.

**IMPACTS**

- Elevated sea lion strandings in Southern California, as sardines farther away.
- Cooler conditions.
- Surge in krill, increase in anchovy.

**FISHERIES DISASTERS**

- Some 4,000 stranded California sea lions.
- Many different species, including salmon, Dungeness crab, and sardine, have been affected.
- Reduced salmon survival leads to reduced returns.
- Some fish smaller, poorer body condition.
- Reduced salmon survival leads to reduced returns.
- Sea lion strandings continue.
- Pacific cod decline in Alaska.

**NOAA FISHERIES**

The Rise and Fall of “The Blob”

Sea surface temperatures anomaly maps from NOAA National Centers for Environmental Information. The darker the red, the farther temperatures are above average. The darkest reds indicate about 3 degrees Celsius above average.