

# Regional Environmental Conditions & Impacts Coordination

**NOAA West**

**Kevin Werner, Timi Vann, Tim Brown, Andrea Bair**

**September 21, 2015**

# Call Agenda

- Project Recap (Kevin Werner)
- El Niño and Regional Climate brief (Kevin Werner)
- Environmental conditions and impacts reporting and discussion:
  - NWS (Andrea Bair)
  - NMFS (Ruth Howell)
  - Regional Media (Timi Vann)
  - Others
- State of the Climate Primer (Deke Arndt)
- Discussion

# Regional Coordination Goals

1. Document and share environmental conditions information and their impacts on human systems at the regional scale.

2. Improve internal awareness of unusual environmental observations across NOAA mission lines.

3. Improve regional communication and coordination:
   - Across NOAA mission lines – e.g., NMFS science centers and region, NWS region, NOS OCM and OCS, NESDIS NCEI, and OAR PMEL and ESRL; and

   - Between NOAA and NOAA-funded regional partners involved in monitoring and communicating changing climate conditions and impacts (e.g., IOOS, Sea Grant, RISA, State Climatologists, Western Regional Climate Center, etc.)

4. Improve external communication of regional impacts from changing climate conditions, including but not limited to El Niño. Target audience is regionally connected elected officials and representative groups (e.g., WGA)

# Regional Coordination Action Plan

**Monthly webinars**

- Brief on regional climate conditions/forecast and discuss deviations from "normal".
  - NWS, NESDIS and OAR report on terrestrial observations;
  - NMFS and NOS report on coastal and marine observations; and
  - Partner network observations (WRCC, IOOS, RISA, Sea Grant, etc)

- Exchange information on terrestrial and coastal-marine impacts

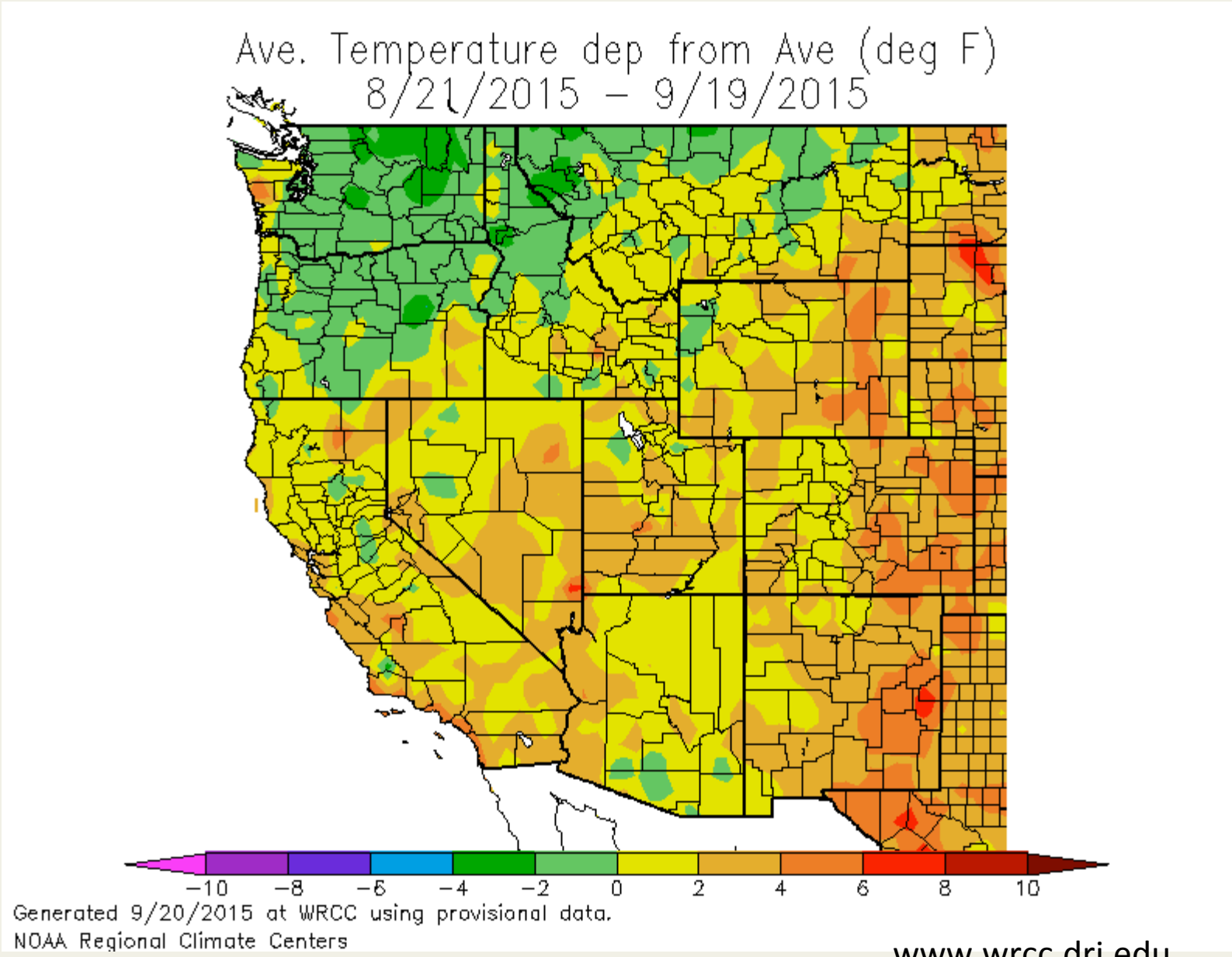
**Monthly communication**

- Information will enrich existing products such as the State of the Climate monthly summaries
- Communication to in-region elected officials (in coordination with NOAA OLIA).
- A NOAA Rotational Assignment (NRAP) has been submitted to recruit communications expertise and additional coordination capacity

**Documentation**

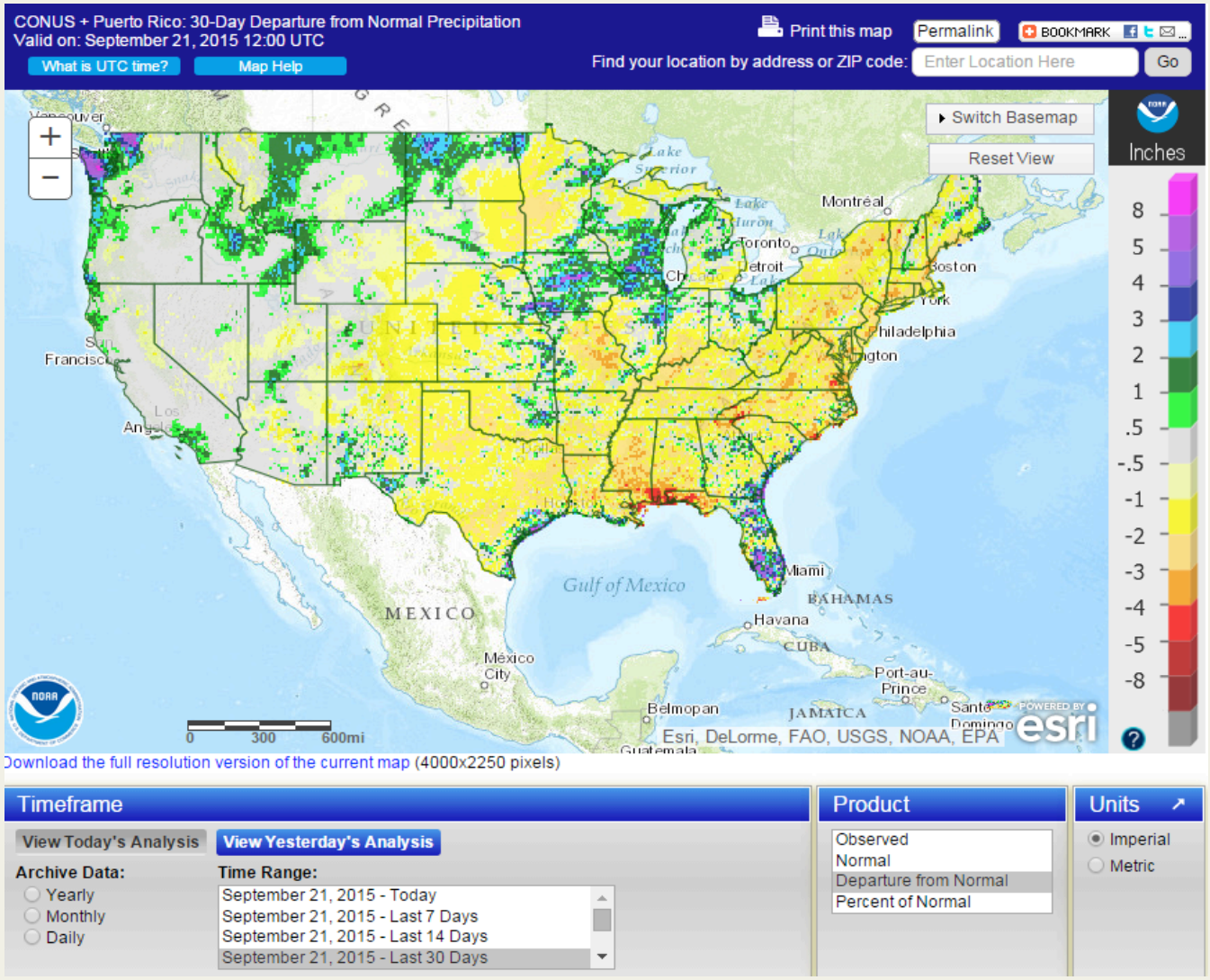
- Regionally specific updates and observed changes in the terrestrial and coastal and marine environments (as informally reported) will be summarized in the spring timeframe.
  - The summary will informally characterize changing environmental conditions and impacts over the 2015 Fall and 2016 Winter.
  - The summary will not include attribution of impacts, but rather could serve to inform a retrospective analysis of the human system and mission impacts of anomalous environmental phenomena – including ENSO.

# Status of Regional Climate Conditions




www.wrcc.dri.edu

# Status of Regional Climate Conditions




Water.weather.gov/precip

# El Nino Status

- ENSO Alert System Status: El Niño Advisory
- El Niño conditions are present
- Positive equatorial sea surface temperature (SST) anomalies continue across most of the Pacific Ocean.
- There is an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16, gradually weakening through spring 2016.*

**Credit: CPC**

*** Note: These statements are updated once a month (2nd Thursday) in association with the ENSO Diagnostics Discussion, which can be found by clicking here.**

# Current Story on ENSO Blog

## September 2015 El Niño Update and Q&A

*Author:* Emily Becker
*Thursday, September 10, 2015*

The CPC/IRI ENSO forecast says there's an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16, gradually weakening through spring 2016. It's question & answer time!

**How strong is this El Nino now?**

The only real way to answer this is to throw a bunch of numbers at you. Essentially, it's "pretty strong." The three-month, June-August average of sea surface temperatures in the Niño3.4 region (the Oceanic Niño Index) is 1.22°C above normal, via the ERSSTv4 data set. This is the third-highest June-August value since records start in 1950, behind 1987 (1.36°C) and 1997 (1.42°C).

The August average is 1.49°C, second behind August 1997 (1.74°C). The August Equatorial Southern Oscillation Index (which measures the strength of the atmospheric part of ENSO) was -2.2, second to 1997's -2.3. There are many ways of measuring El Niño, so the ranking of El Niño will change depending on which variable (winds, pressure, etc.) or time period (monthly, seasonal) you want to examine.

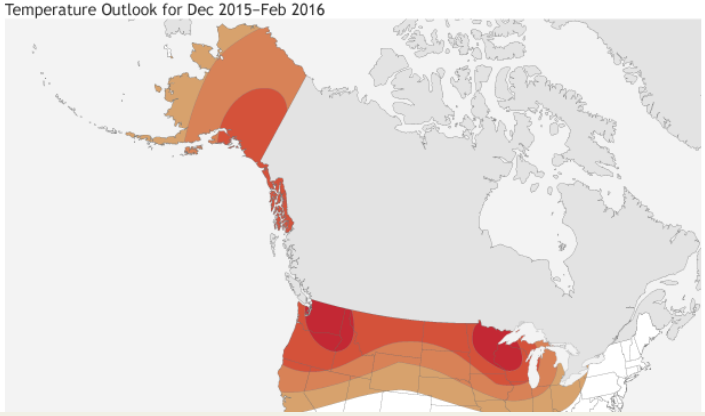
**When is El Niño going to hit?**

El Niño isn't a storm that will hit a specific area at a specific time. Instead, the warmer tropical Pacific waters cause changes to the global atmospheric circulation, resulting in a wide range of changes to global weather. Think of how a big construction project across town can change the flow of traffic near your house, with people being re-routed, side roads taking more traffic, and normal exits and on-ramps closed. Different neighborhoods will be affected most at different times of the day. You would feel the effects of the construction project through its changes to normal patterns, but you wouldn't expect the construction project to hit your house.

**Okay, then... but what's going to happen in my home town?**

The expected changes in regional weather patterns due to El Niño are a big part of the NOAA Climate Prediction Center's seasonal forecasts. Over North America, the Pacific jet stream (a river of air that flows from west-to-east) often expands eastward and shifts southward during El Niño, which makes precipitation more likely to occur across the southern tier of the United States. Check out the winter (December-February) forecasts here.

Temperature Outlook for Dec 2015–Feb 2016

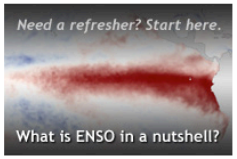


### ENSO Blog

A blog about monitoring and forecasting El Niño, La Niña, and its impacts.

*Disclaimer:*

The ENSO blog is written, edited, and moderated by Michelle L'Heureux (NOAA CPC), Emily Becker and Tom DiLiberto (contractors to CPC), Anthony Barnston (IRI), and Rebecca Lindsey (contractor to NOAA CPO). Posts reflect the views of the bloggers themselves and not necessarily Climate.gov, NOAA, or Columbia University/IRI.




*Rating:*

★★★★☆
Average: 3.6 (10 votes)

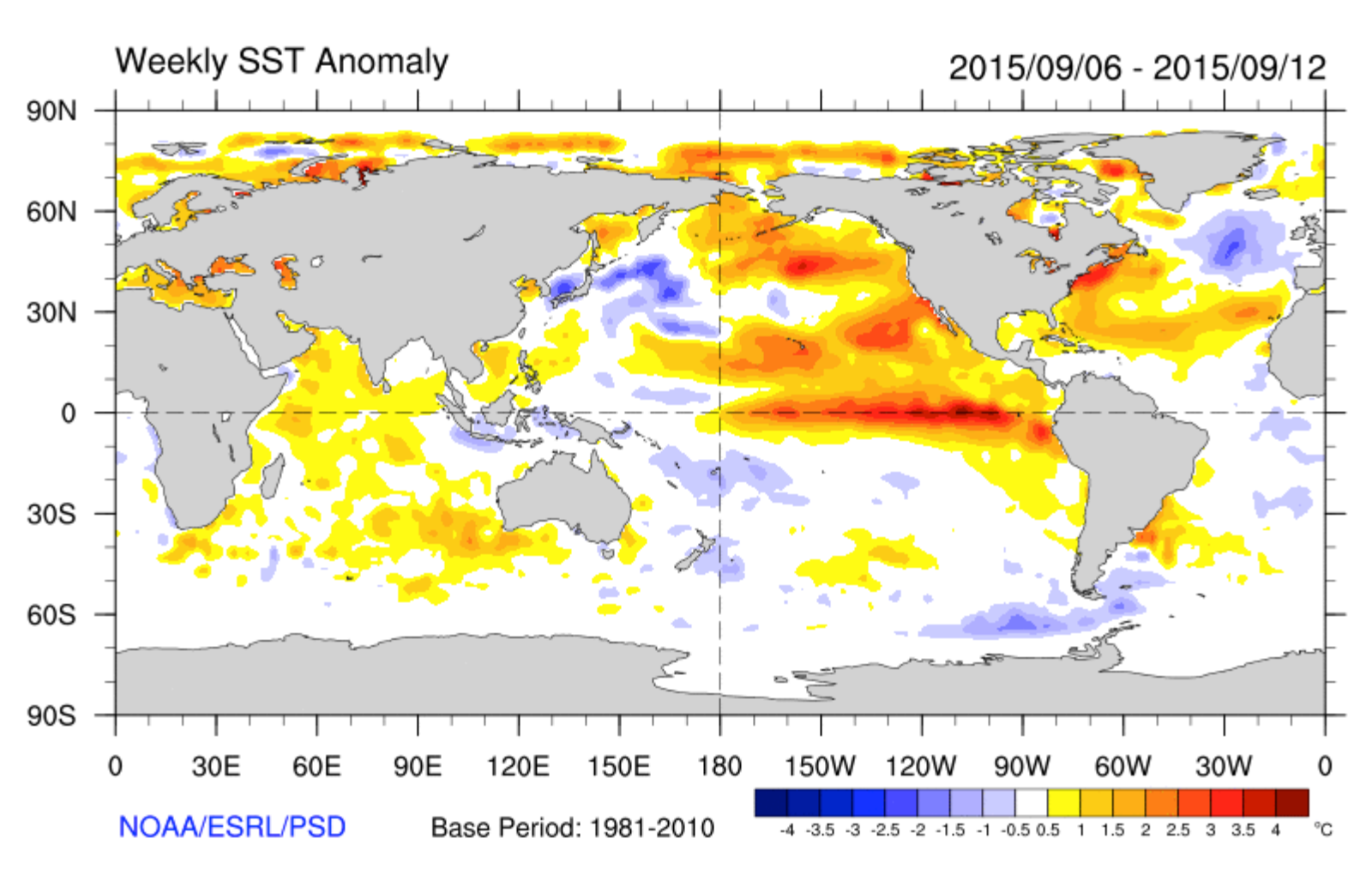
*Share This:*

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*Department:*
ENSO Blog

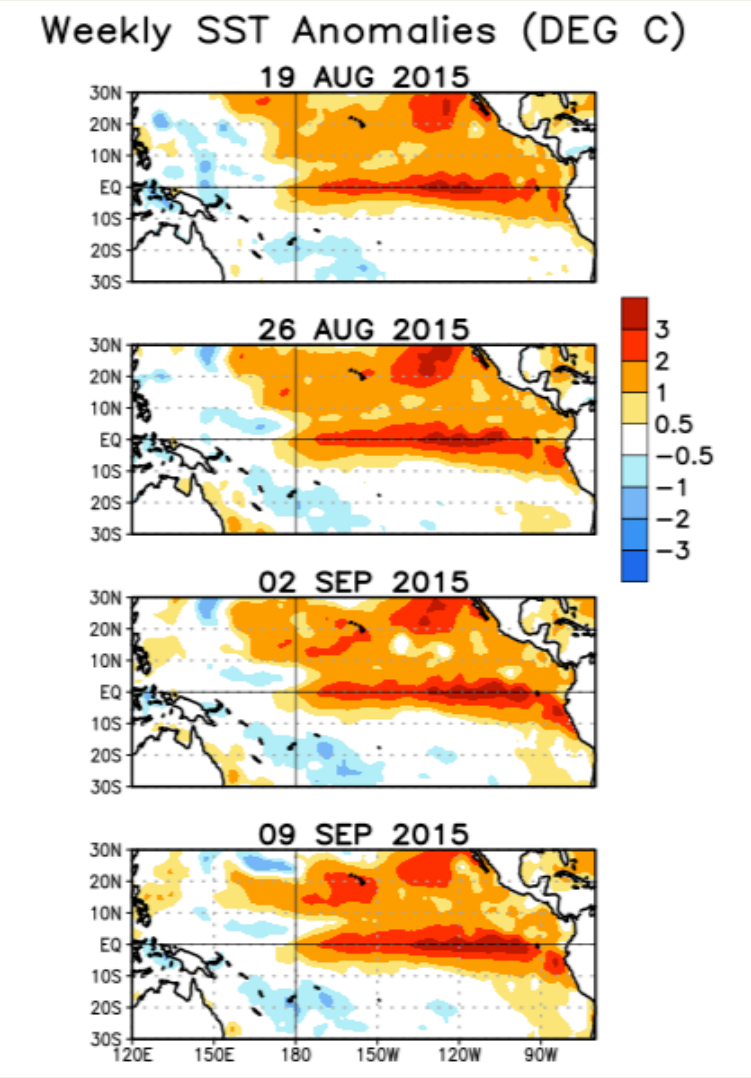
**Source: www.climate.gov**

# Current Sea Surface Temperatures




**Source: NOAA/ESRL**

# Current Sea Surface Temperatures

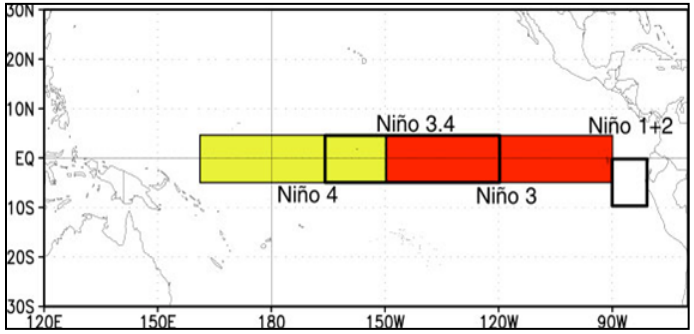


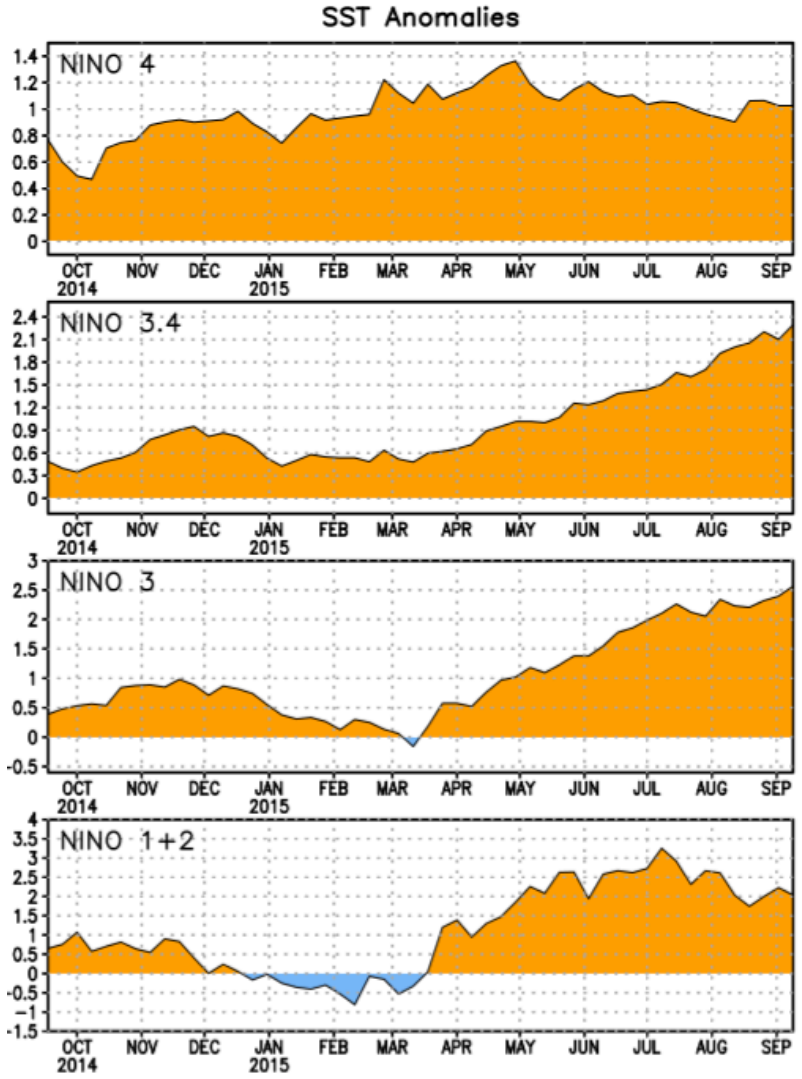

**Source: NOAA/CPC**

# Niño Region SST Departures (ºC) Recent Evolution

**The latest weekly SST departures are:**

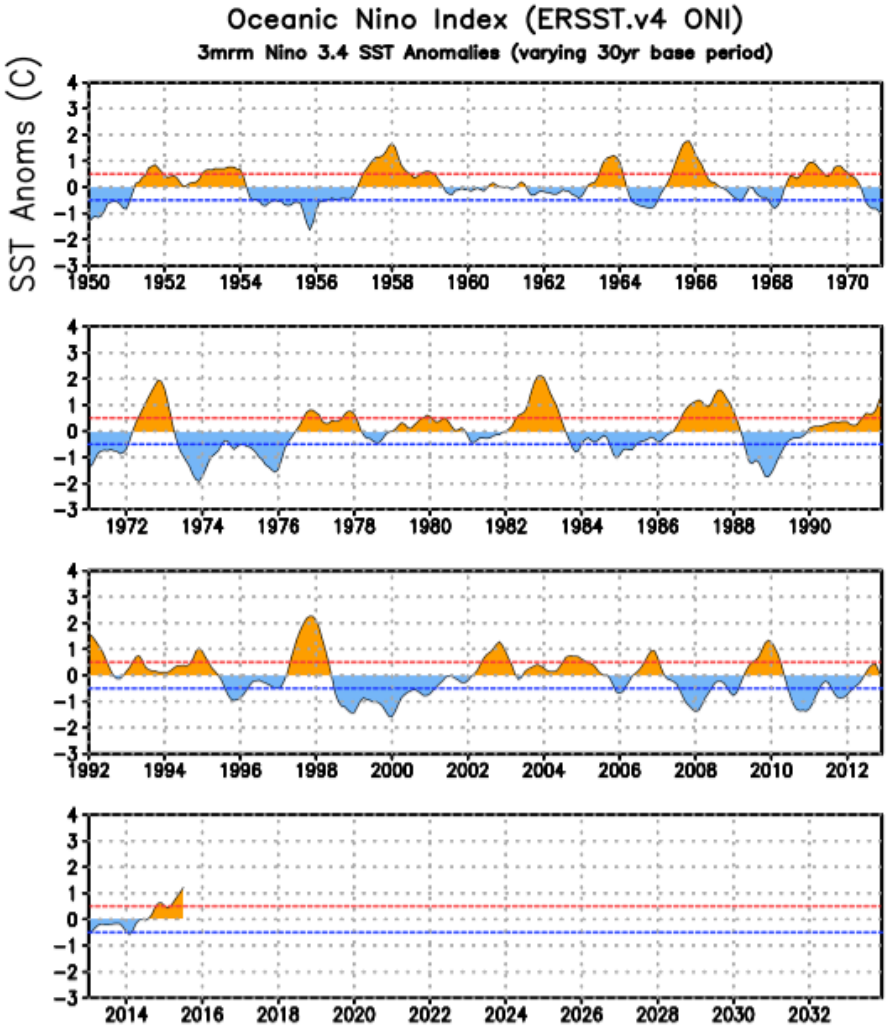
| | |
|---|---|
| **Niño 4** | **1.0ºC** |
| **Niño 3.4** | **2.3ºC** |
| **Niño 3** | **2.6ºC** |
| **Niño 1+2** | **2.0ºC** |



# ONI (ºC): Evolution since 1950

**The most recent ONI value (May – July 2015) is 1.0ºC.**

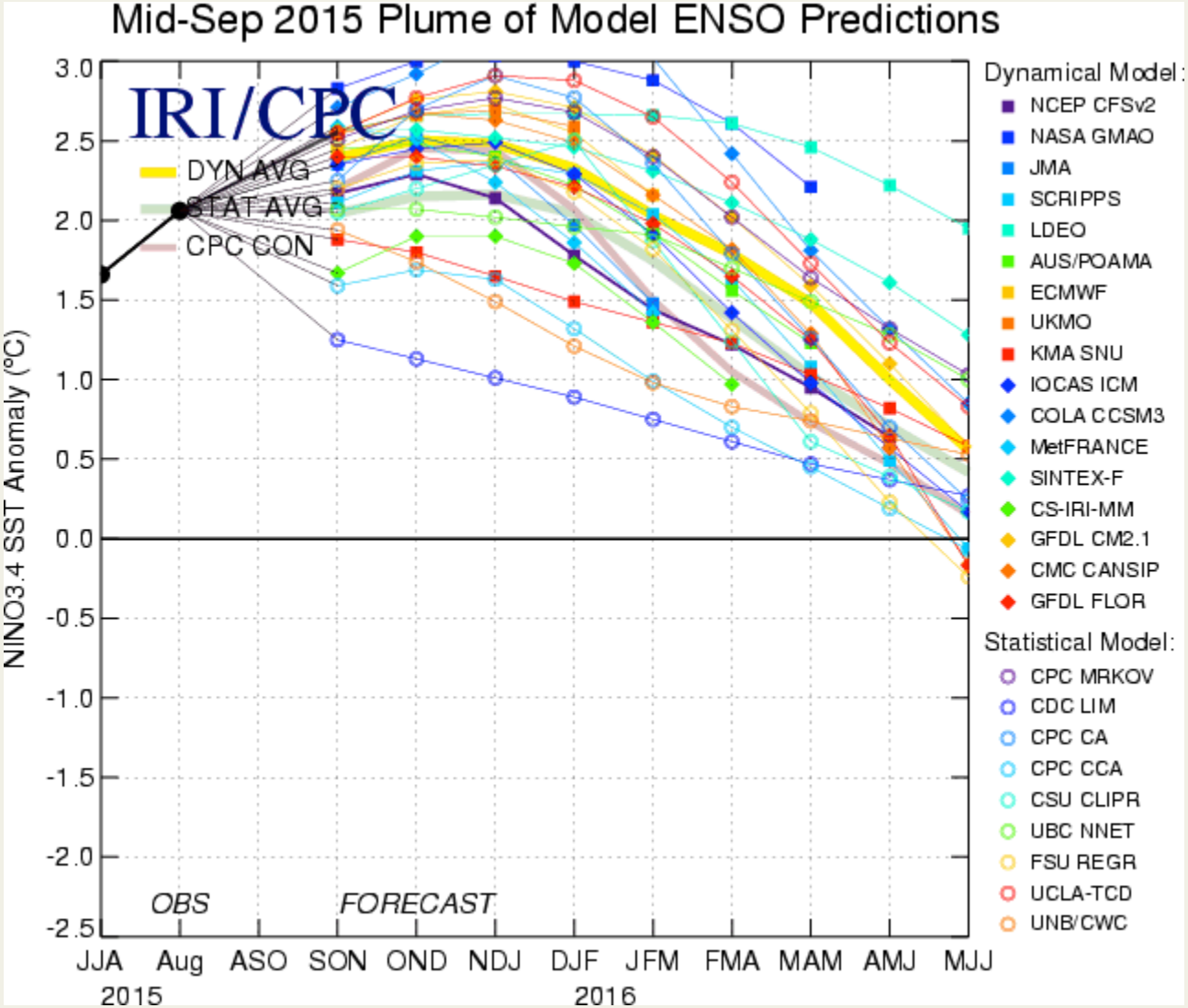



El Niño

Neutral

La Niña

# ENSO Forecasts




**Source: NOAA/CPC and the International Research Institute**

# Diagnostic Discussion

## DIAGNOSTIC DISCUSSION

issued by
CLIMATE PREDICTION CENTER/NCEP/NWS
and the International Research Institute for Climate and Society
10 September 2015

**ENSO Alert System Status:** El Niño Advisory

Synopsis: **There is an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16, gradually weakening through spring 2016.**

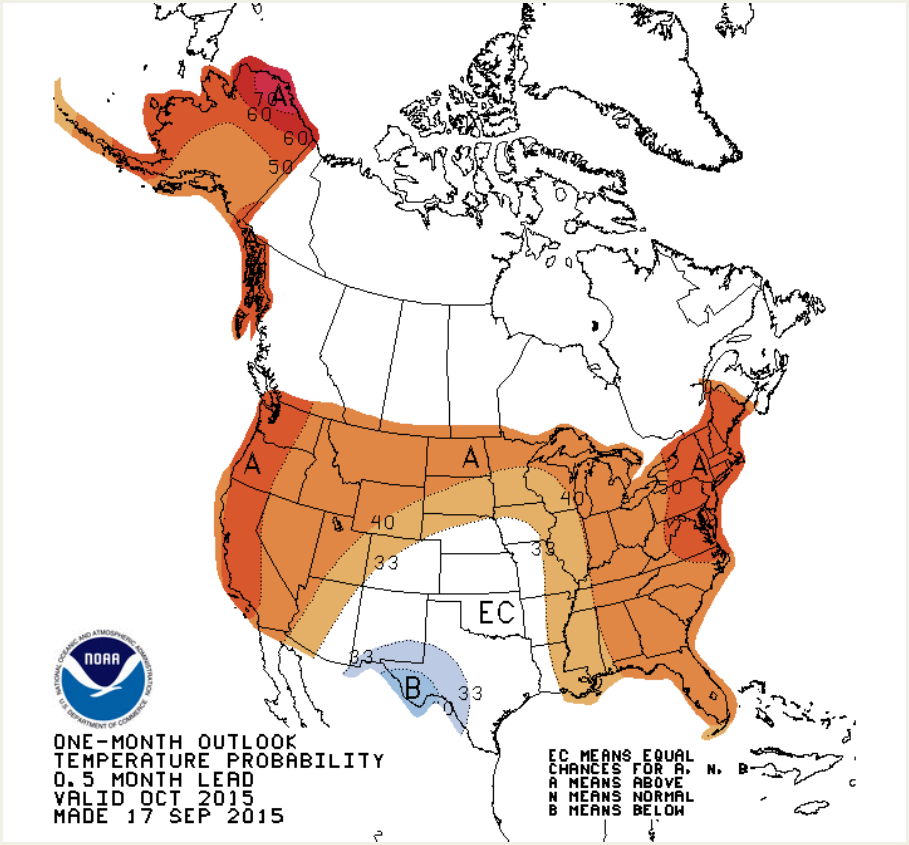
During August, sea surface temperature (SST) anomalies were near or greater than +2.0°C across the eastern half of the tropical Pacific (Fig. 1). SST anomalies increased in the Niño-3.4 and Niño 3-regions, were approximately unchanged in the Niño-4 region, and decreased in the Niño-1+2 region (Fig. 2). Large positive subsurface temperature anomalies persisted in the central and east-central equatorial Pacific during the month (Fig. 3), with the largest departures exceeding 6°C (Fig. 4). The atmosphere remained coupled to the anomalous oceanic warmth, with significant low-level westerly wind anomalies and upper-level easterly wind anomalies persisting from the western to east-central tropical Pacific. Also, the traditional and equatorial Southern Oscillation Index (SOI) were again negative, consistent with enhanced convection over the central and eastern equatorial Pacific and suppressed convection over Indonesia (Fig. 5). Collectively, these atmospheric and oceanic anomalies reflect a strong El Niño.

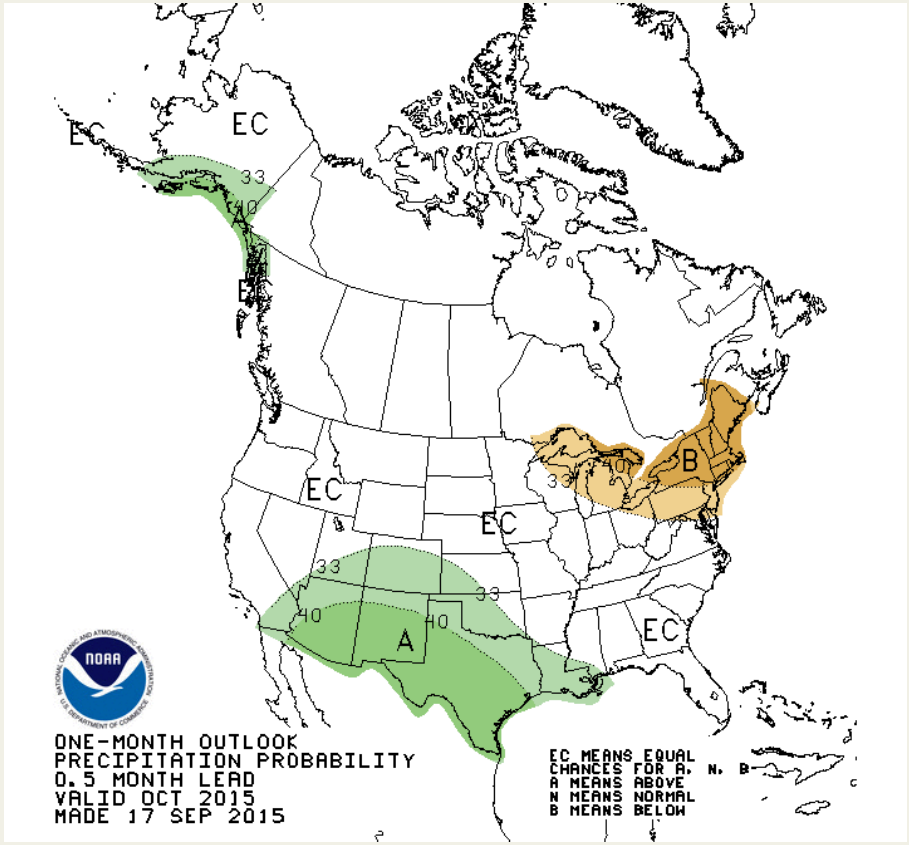
All models surveyed predict El Niño to continue into the Northern Hemisphere spring 2016, and all multi-model averages predict a peak in late fall/early winter (3-month values of the Niño-3.4 index of +1.5°C or greater; Fig. 6). The forecaster consensus unanimously favors a strong El Niño, with peak 3-month SST departures in the Niño 3.4 region near or exceeding +2.0°C. Overall, there is an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16, gradually weakening through spring 2016 (click CPC/IRI consensus forecast for the chance of each outcome for each 3-month period).

Across the contiguous United States, temperature and precipitation impacts associated with El Niño are expected to remain minimal during the early Northern Hemisphere fall and increase into the late fall and winter (the 3-month seasonal outlook will be updated on Thursday September 17th). El Niño will likely contribute to a below normal Atlantic hurricane season, and to above-normal hurricane seasons in both the central and eastern Pacific hurricane basins (click Hurricane season outlook for more).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site (El Niño/La Niña Current Conditions and Expert Discussions). Forecasts are also updated monthly in the Forecast Forum of CPC's Climate Diagnostics Bulletin. Additional perspectives and analysis are also available in an ENSO blog. The next ENSO Diagnostics Discussion is scheduled for 8 October 2015. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

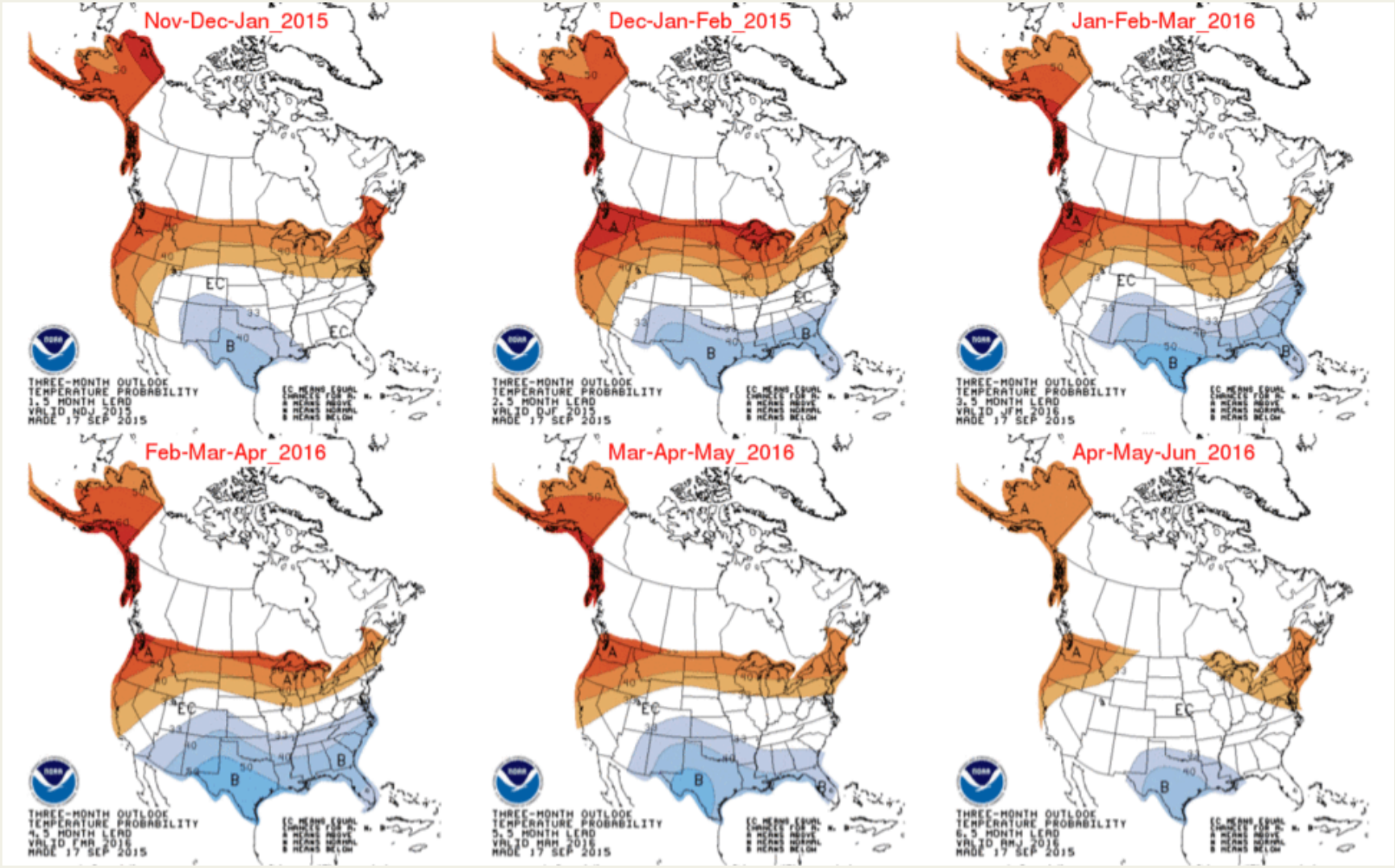
# October U.S. Forecasts



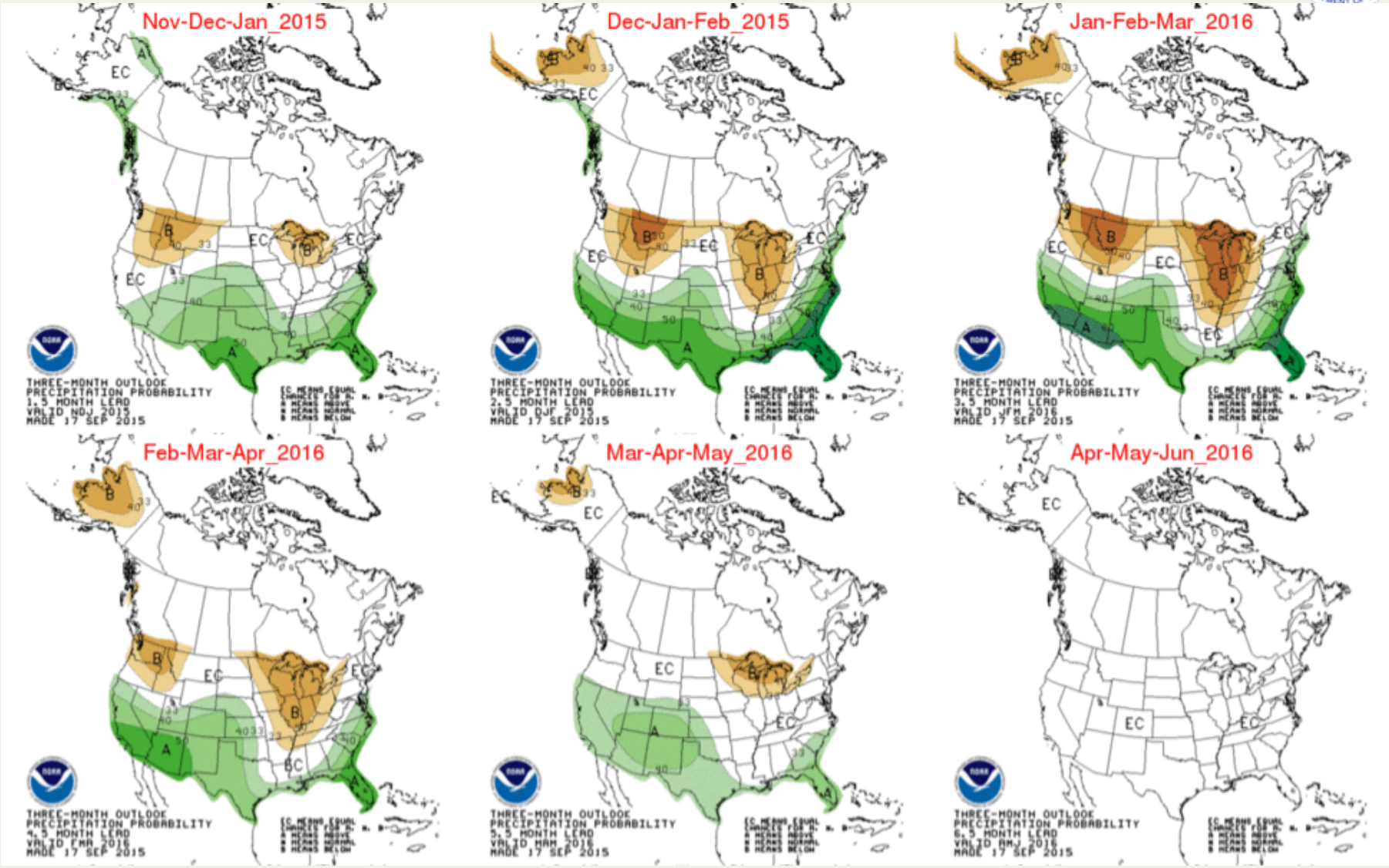

**Source: NOAA/CPC**

# U.S. Temperature Forecasts




Source: NOAA/CPC

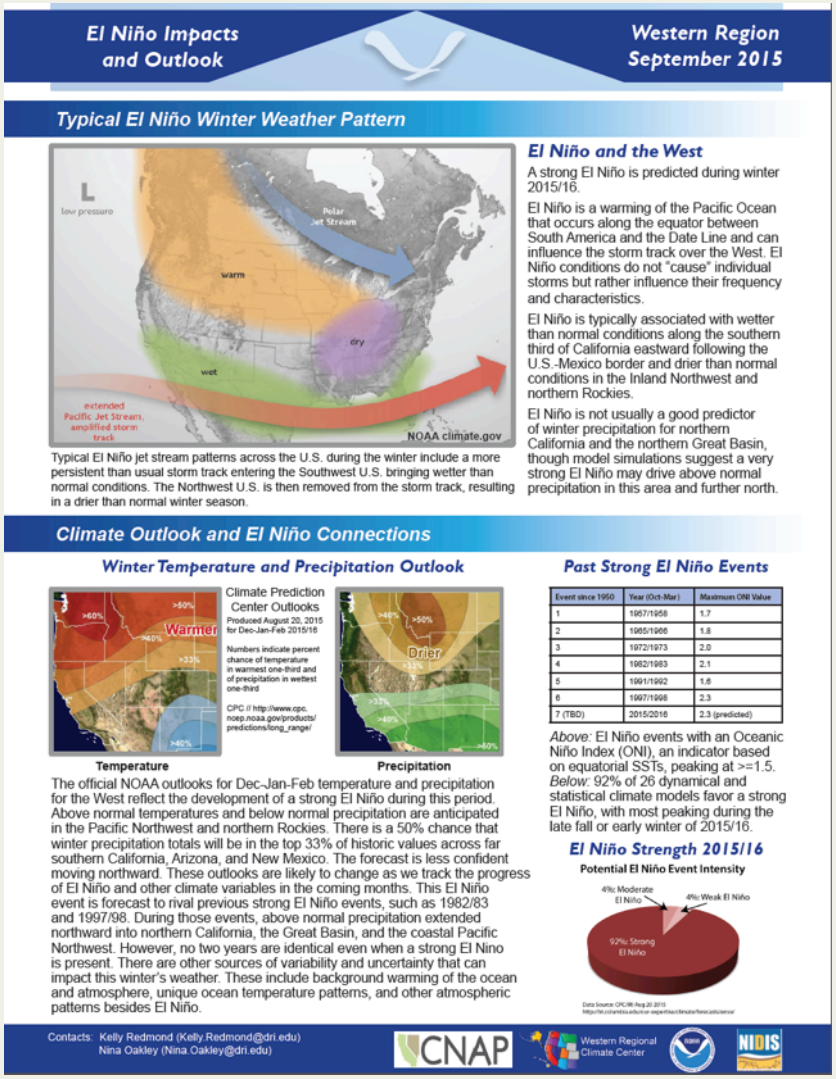
# U.S. Precipitation Forecasts




Source: NOAA/CPC

# Resources

- CPC (www.cpc.noaa.gov)
- Western Region El Niño Impacts and outlook (WRCC)
- Resources folder on WRECIC project google drive to collect more




**Source: NOAA/CPC**

# Regional Impacts - September

**Goal:** Document information on regional anomalies and impacts. To insert a regional impact, click on the Google Doc.

**Reports:**

- NWS (Andrea Bair)
- NMFS (Ruth Howell)
- Regional Media (Timi Vann)
- Others – Open floor

# NWS (Andrea Bair)

NWS Western Regional Operations Center Significant Reports discussion (Andrea will demonstrate via google hang out)

# NMFS (Ruth Howell)

- Developing plan for collecting and sharing environmental conditions and impacts across NMFS offices in region.

- Following slides are a sample of the sort of information NMFS collects (credit: Laurie Weitkamp for assembling)

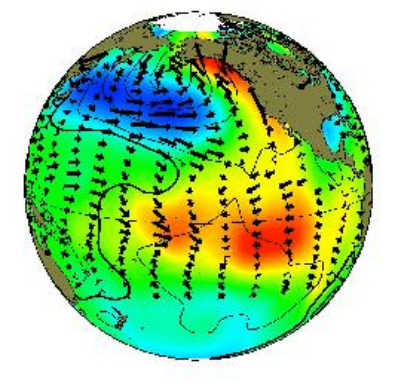
# Species benefiting from - or + PDO

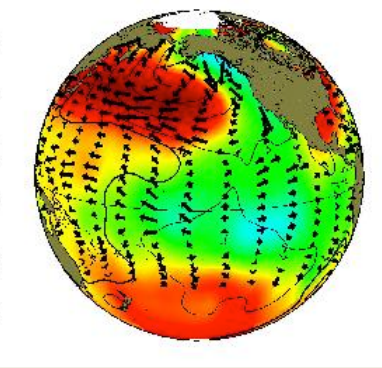
## Positive (warm) PDO

- Alaskan salmon
- Pacific sardines
- Pacific Hake
- Mackerel
- CA market squid

## Negative (cold) PDO

- NW salmon
- Dungeness crab
- Northern anchovy
- Rockfish
- Sablefish





# Unusual observations in 2015



Joe Orsi (AFSC) with ocean sunfish in SE Alaska, June 2015

# Unusual sightings on the OR coast (previous strong El Niños)

Striped marlin




Dorado



Lumptail searobin



Humboldt squid



California barracuda



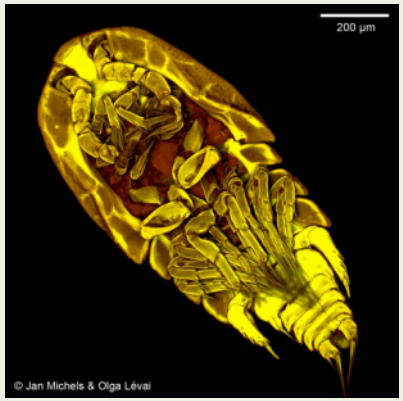




Pearcy 2002

# Unusual sightings on the OR coast - this El Niño

Unusual copepods



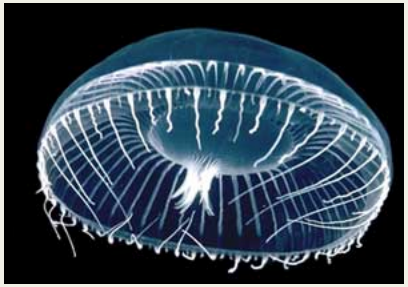

Pelagic molluscs



Pelagic tunicates



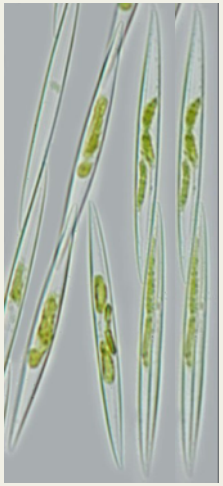
Jellyfish



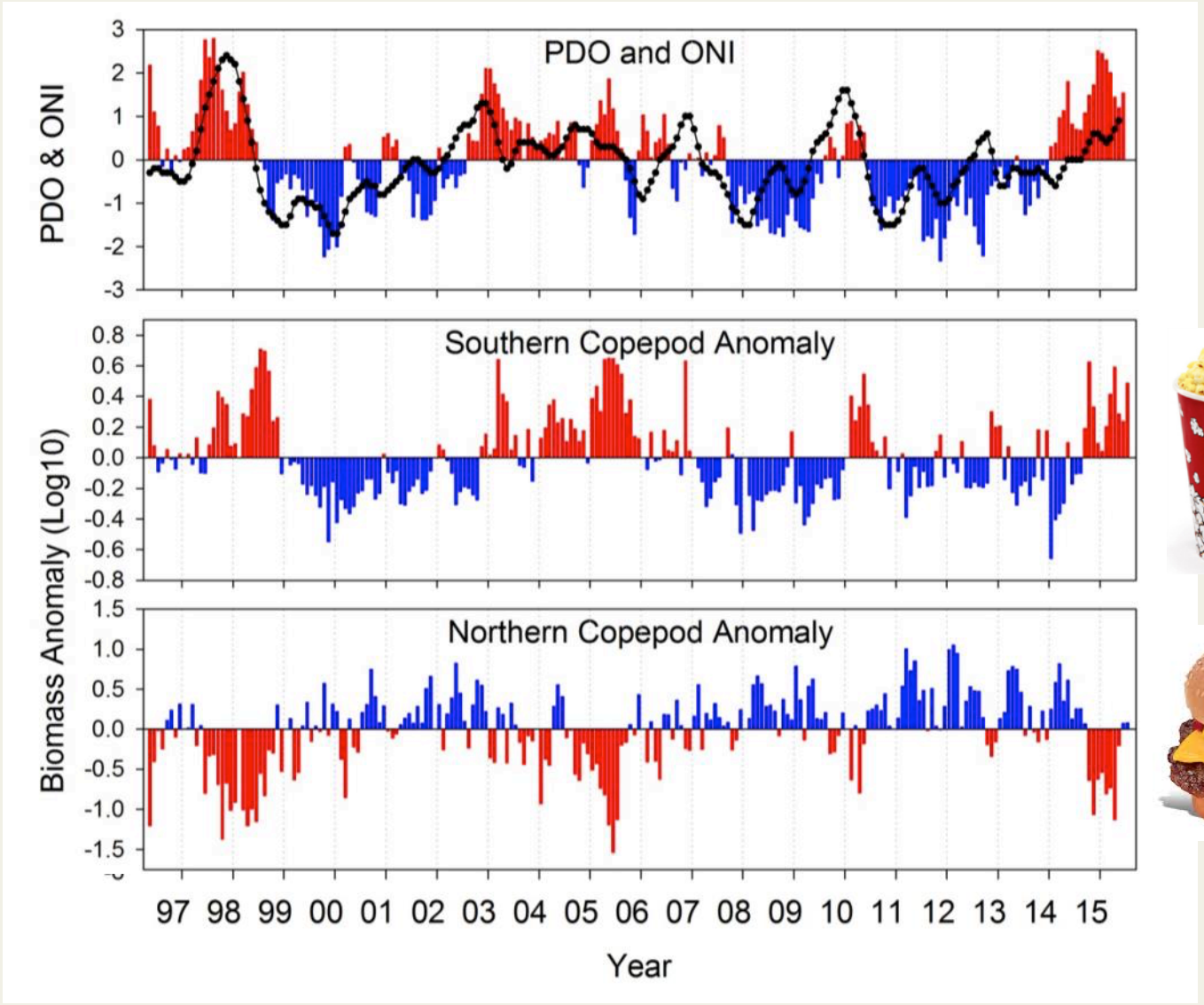
Skinny salmon in ocean



Pseudo-nitzschia bloom



# NH05 Southern copepod biomass anomalies have been extremely high

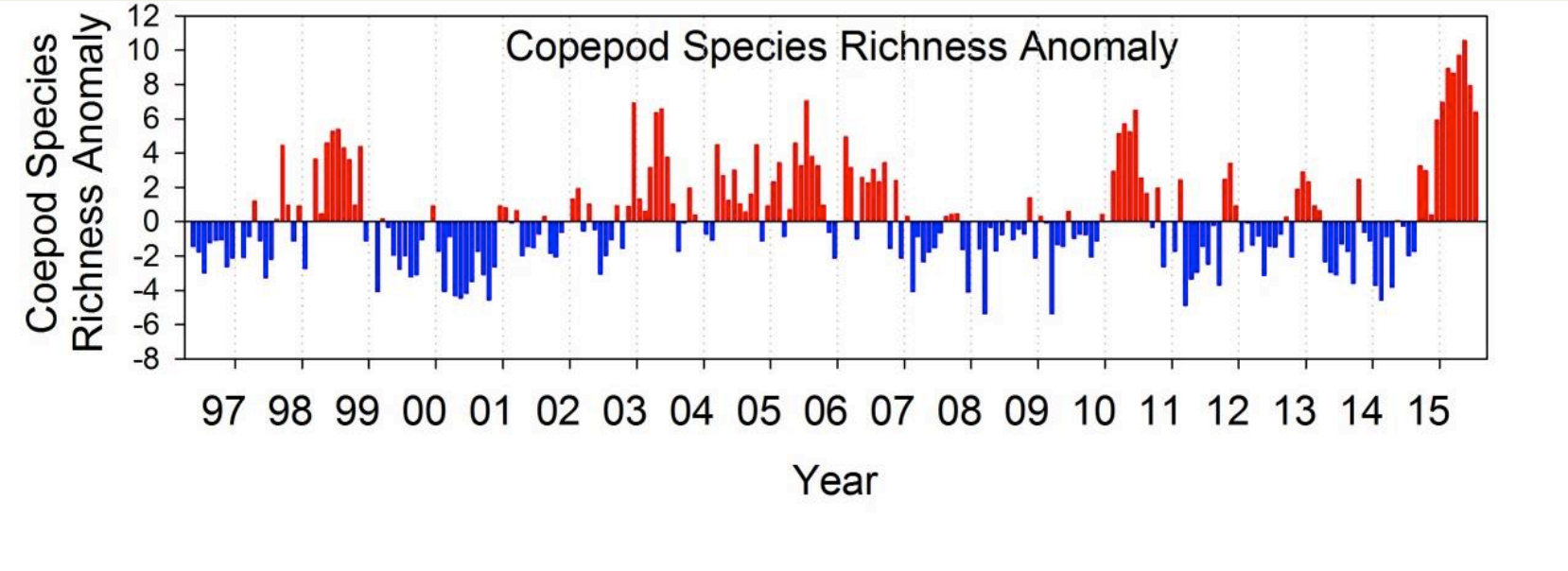








# NH05 copepod species richness breaking records due to high S. species




**17 new copepod species observed in 2014-2015, many with oceanic and/ or sub-tropical affinities**

# Other indicators that pelagic/subtropical water is on the OR/WA shelf



The doliolid
*Dolioletta gegenbauri*



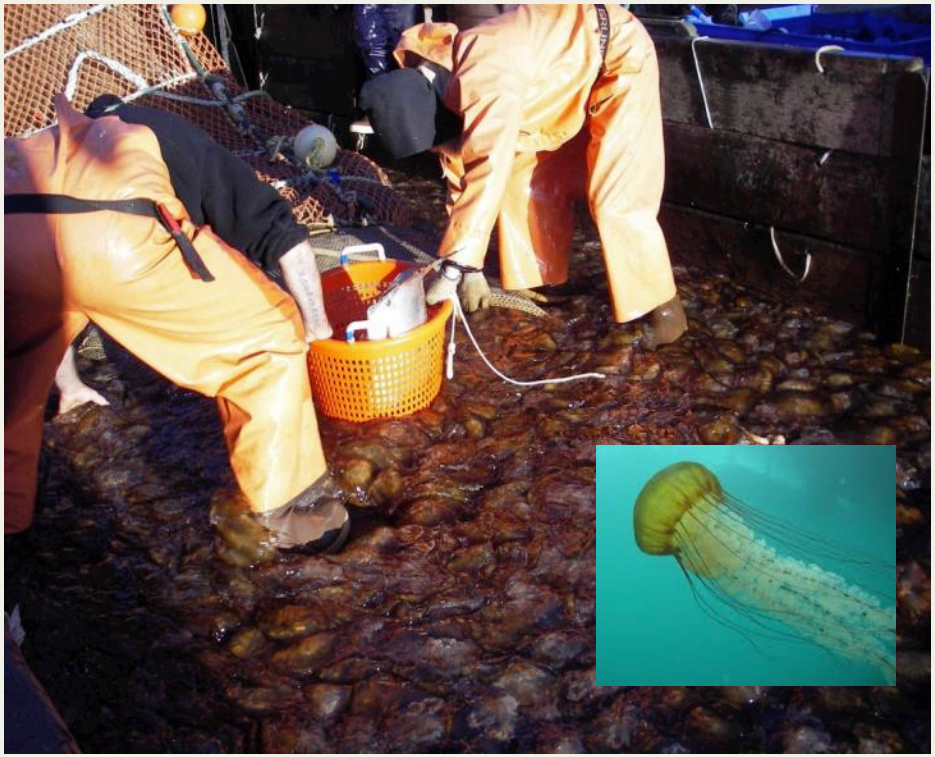



*Carinaria sp.*



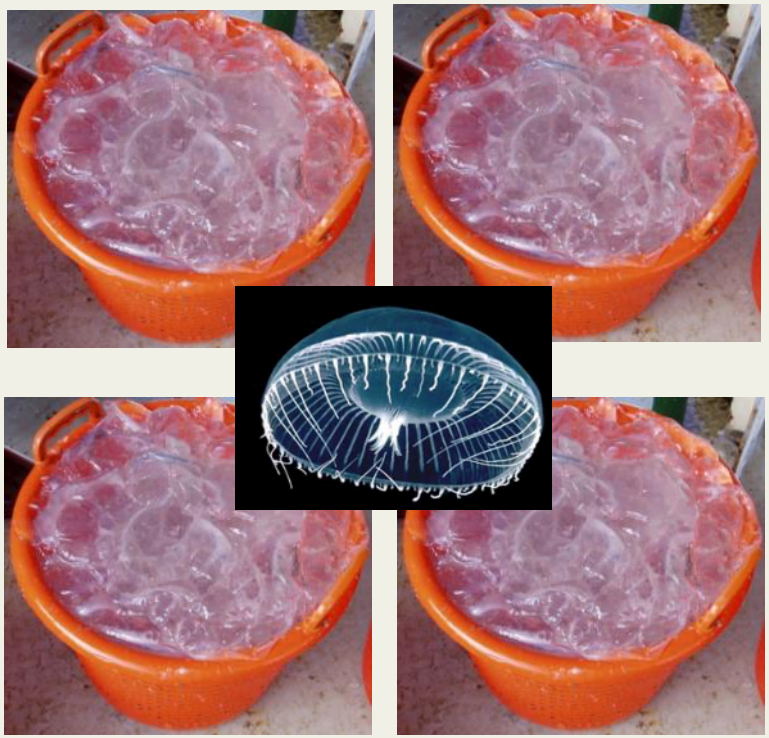
# Huge change in jellyfish community of WA/OR coast in 2015

Normal year



Sea nettle, *Chrysaora*

Summer 2015



Water jelly, *Aqueora spp.*

# Also seeing large aggregations of moon jellies (*Aurelia labiata*)



# June 2015 NWFSC Juvenile salmon survey: some very skinny coho but plump Chinook

## Coho salmon



Salmon distributions also much closer to shore than normal

- restricted to cold water near shore

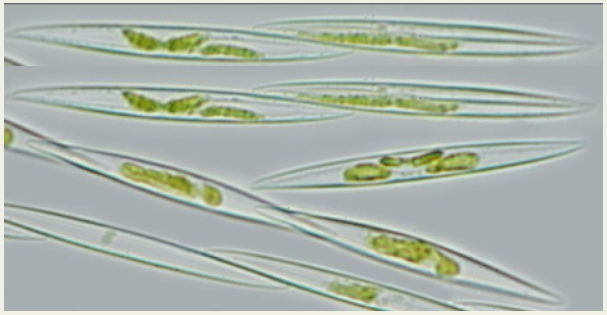
## Chinook salmon



# Largest *Pseudo-nitzschia* bloom on record

- From Southern California to Alaska, out beyond shelf break
- Neurotoxin (domoic acid) produced by algae can be fatal to mammals
  - 1 confirmed sea lion death due to toxicity (Long Beach, WA)
  - Suspected in recent pinniped deaths along WA/OR coast, also unusual Common Murre die offs (August)
  - Suspected in “unusual mortality event” for fin, humpback and gray whales in Alaska





# Regional Impacts Summary – September

Conditions noted in the Google spreadsheet:

1. Warm temperature
2. Heat wave
3. Drought
4. Wildfire
5. Flash Flood

Impacts noted in the Google spreadsheet:

1. Agriculture
2. Finance/Insurance
3. Terrestrial wildlife habitat
4. Federal (NWS) resources
5. Forestry
6. Recreation
7. Power Generation
8. Energy Infrastructure
9. Loss of life
10. Loss of property
11. State emergency declaration (CA)



Faced with one of the nation's largest wildfires, Lt. Brandon Gardner sets a backfire in Okanogan, Wash., in an attempt to block a huge advancing fire from consuming nearby houses. Photo by Elaine Thompson, courtesy of AP Images.



A burned trucks sits next to the remains of the Kings Canyon Lodge, burnt by the so-called "Rough Fire" in the Sequoia National Forest, California, August 21, 2015. REUTERS/Max Whittaker



Doug Grumback, 52, a fourth generation Ferry County rancher, stands in a forest near the Canadian border where the northern portion of the Stickpin Fire overtook 12 head of his cattle during a wildfire near Frog Spring in the Colville National Forest near Danville, Wash. (Tyler Tjomsland/The Spokesman-Review, via AP) COEUR D'ALENE OUT; MANDATORY CREDIT



At least 12 people in two vehicles died in a flash flood Monday in Hildale, Utah. On Tuesday, members of the victims' church searched the remains of the vehicles. Credit:  Isaac Brekken for The New York Times



The Sonoma power plant converts steam into energy at the Geysers in Middletown, Calif. The Valley Fire burned some structures at a few of the 14 geothermal plants in the 45-square-mile complex. Photo: Sarah Rice, Special To The Chronicle

# Other Reports?

# NCEI State of the Climate

- Deke Arndt will discuss and demonstrate NOAA's State of Climate Report via google hang out.

- Deke is the NOAA/NCEI Monitoring Branch Chief.

# Announcements

1. Next WRECIC call:  October 19, 1pm PT Monday*
   *Note: conflicts with standing CA drought monitor call. What about noon PT or 2pm PT?

2. Public webinar on El Nino and western drought being organized likely for week of October 19 being organized by NCEI (Kevin), CPO (David Herring, Toni Parham), NIDIS (TBD), and NWS (Andrea Bair).

3. NRAP recruitment open! Please share with interested people.

# Open Discussion