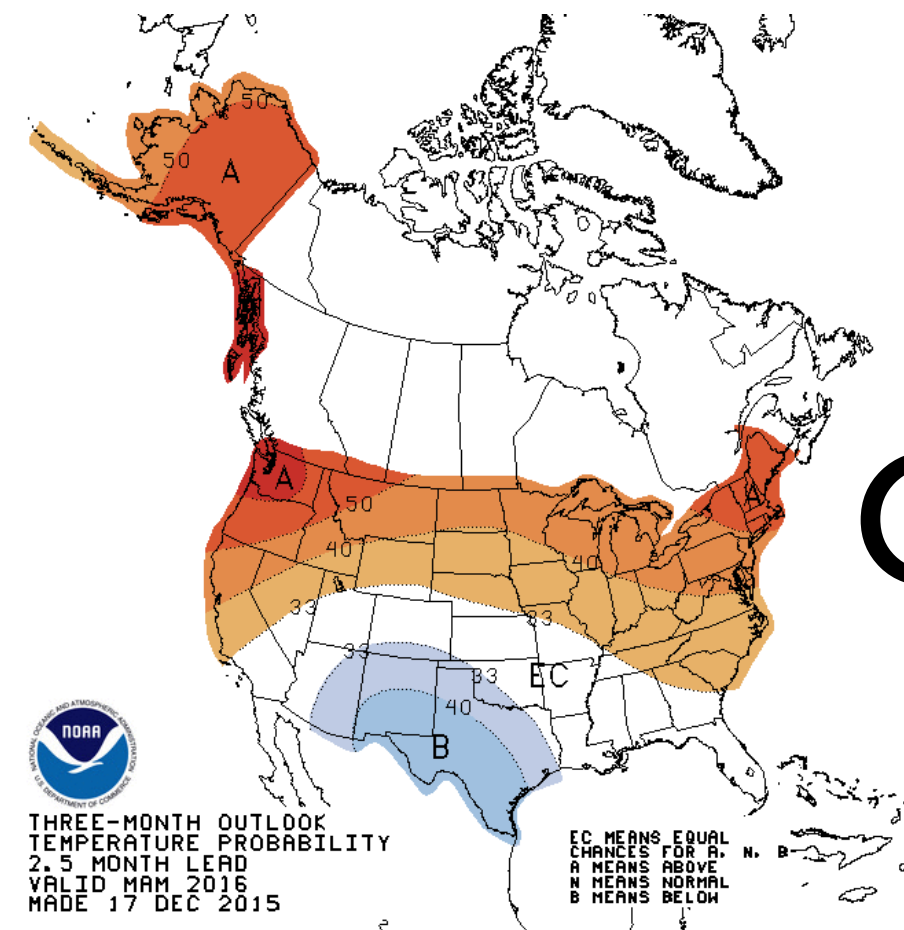


El Nino's Influence on Global and Midwestern Climates



Bill Bland
Department of Soil Science,
UW-Madison
UWEX Soil and Water
Conservation Specialist



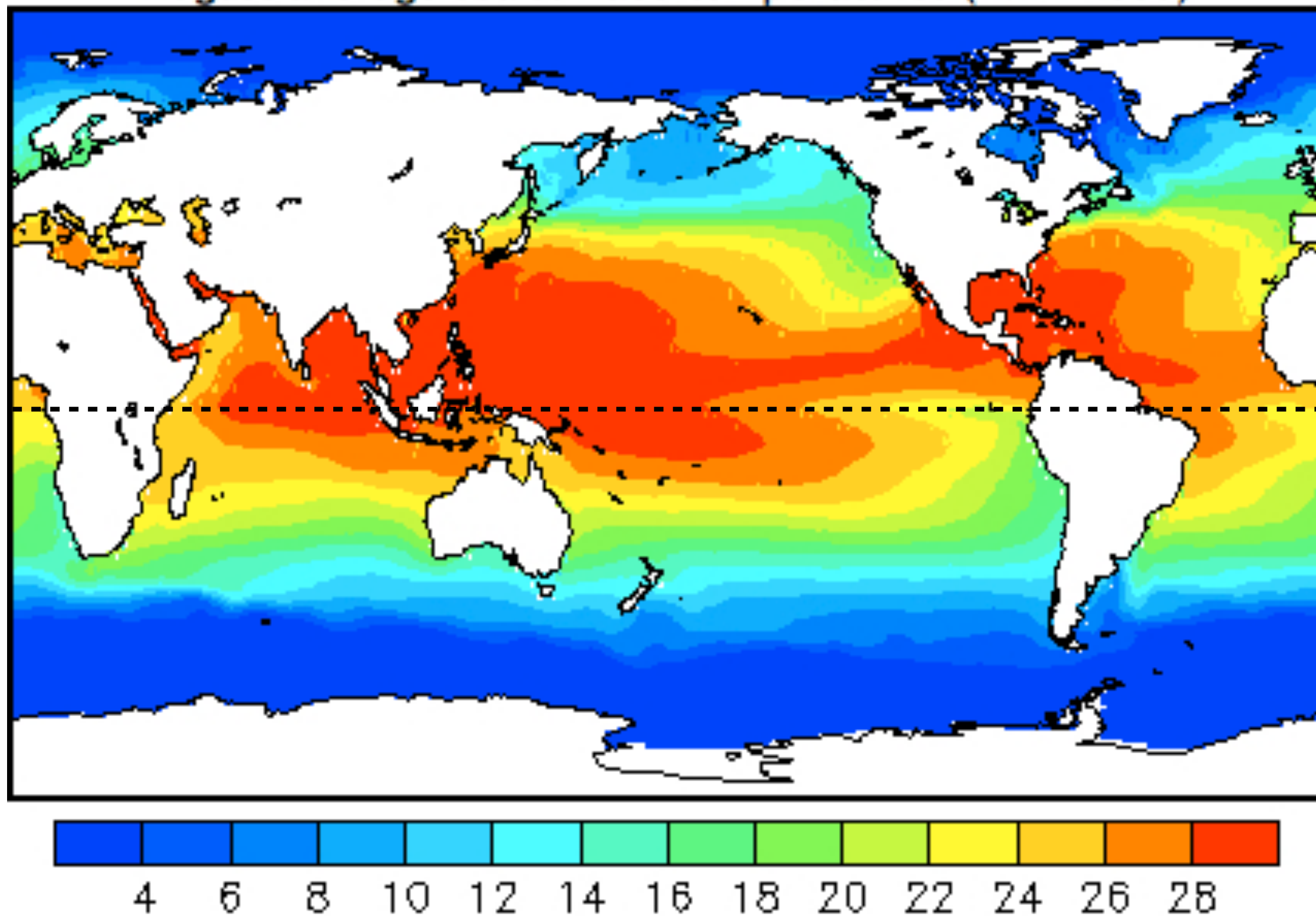
outline

- what is it
- the current event
- what typically happens in...
 - globally, Wisconsin
- what might impacts be?
 - globally, Wisconsin

ENSO is...

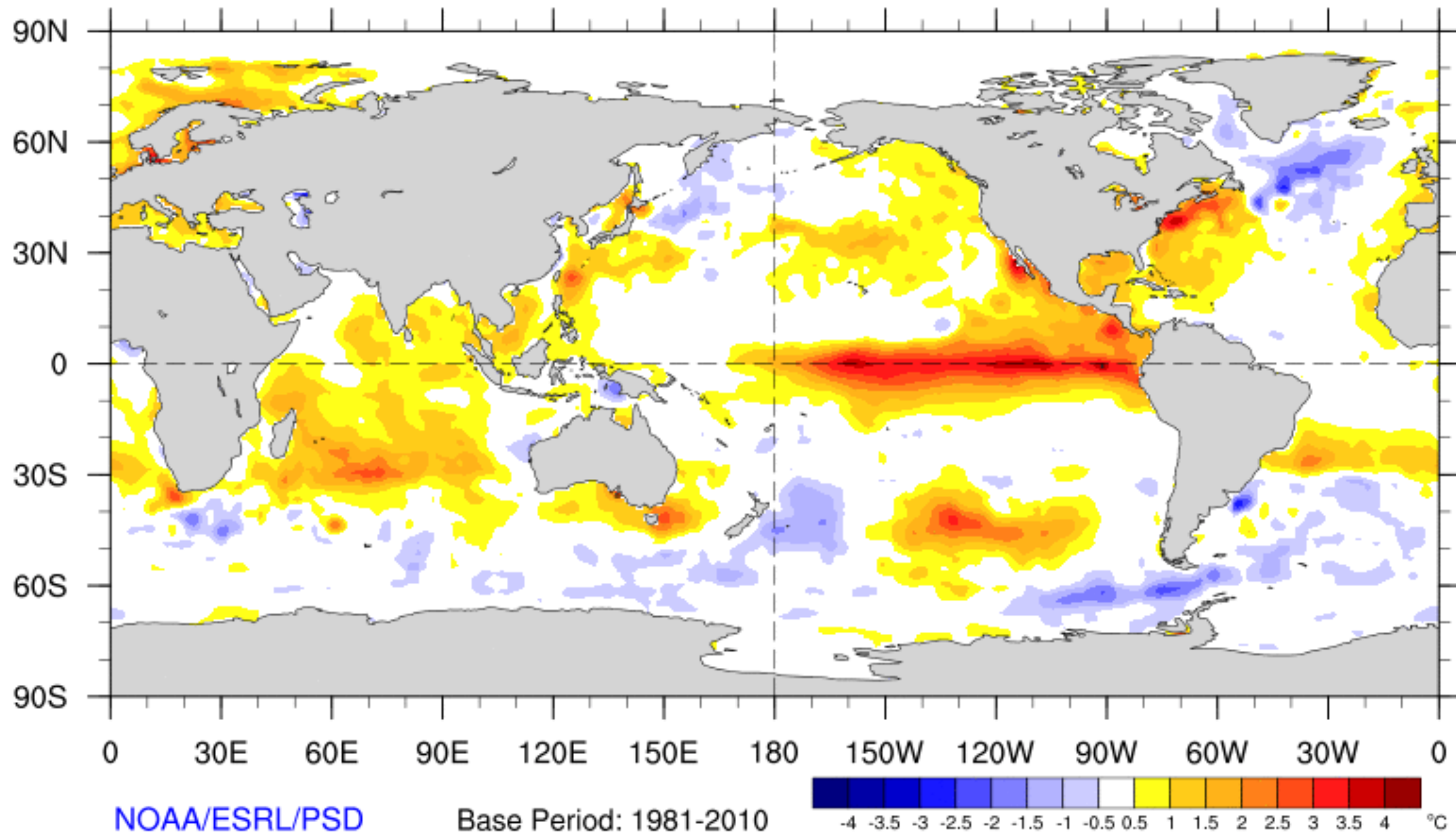
- EN 🖐️ El Niño refers to *unusual* ocean temperatures
- SO 🖐️ “Southern oscillation” refers to *unusual* atmospheric pressure differences

August average sea surface temperatures (1971-2000)

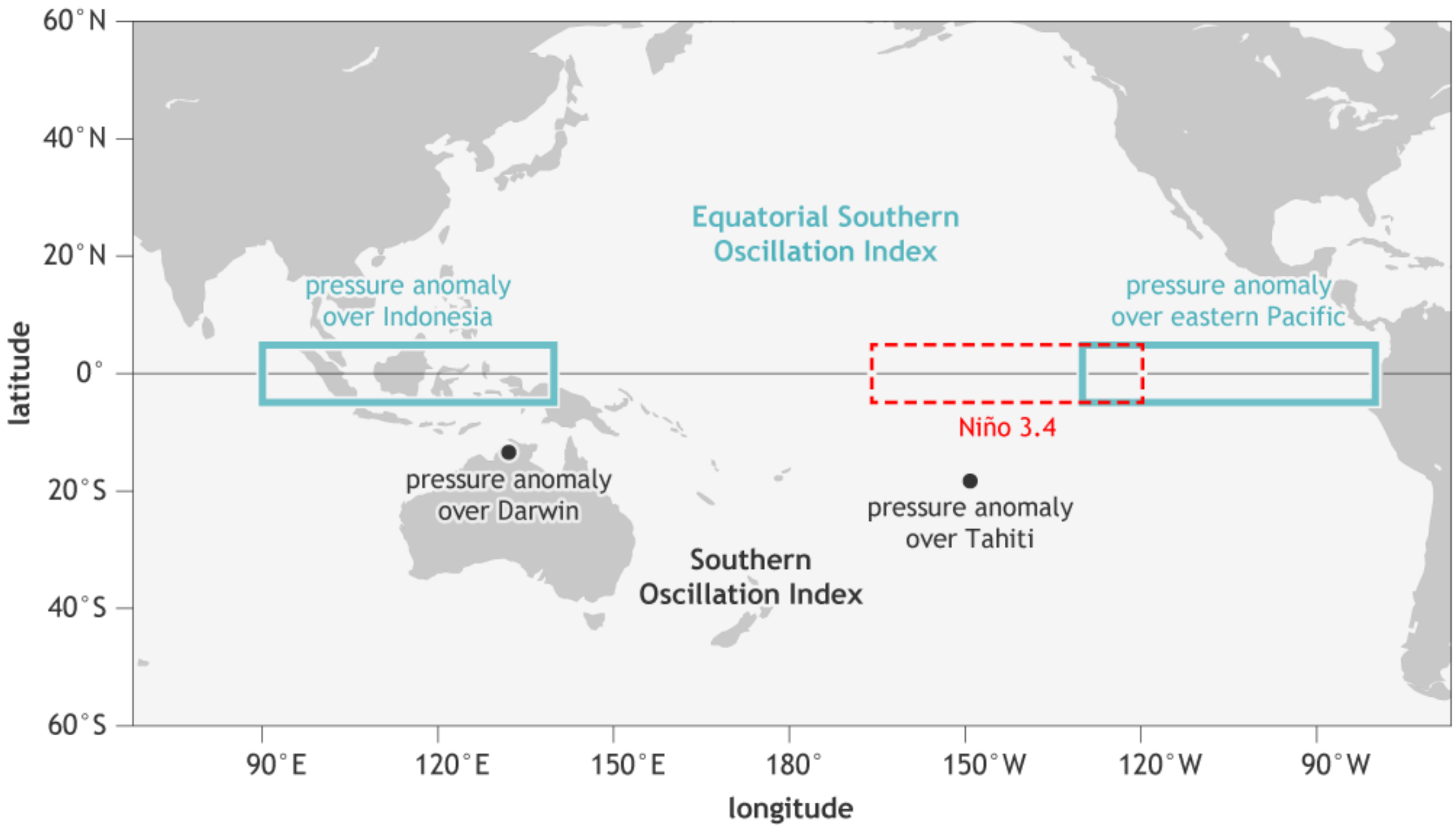


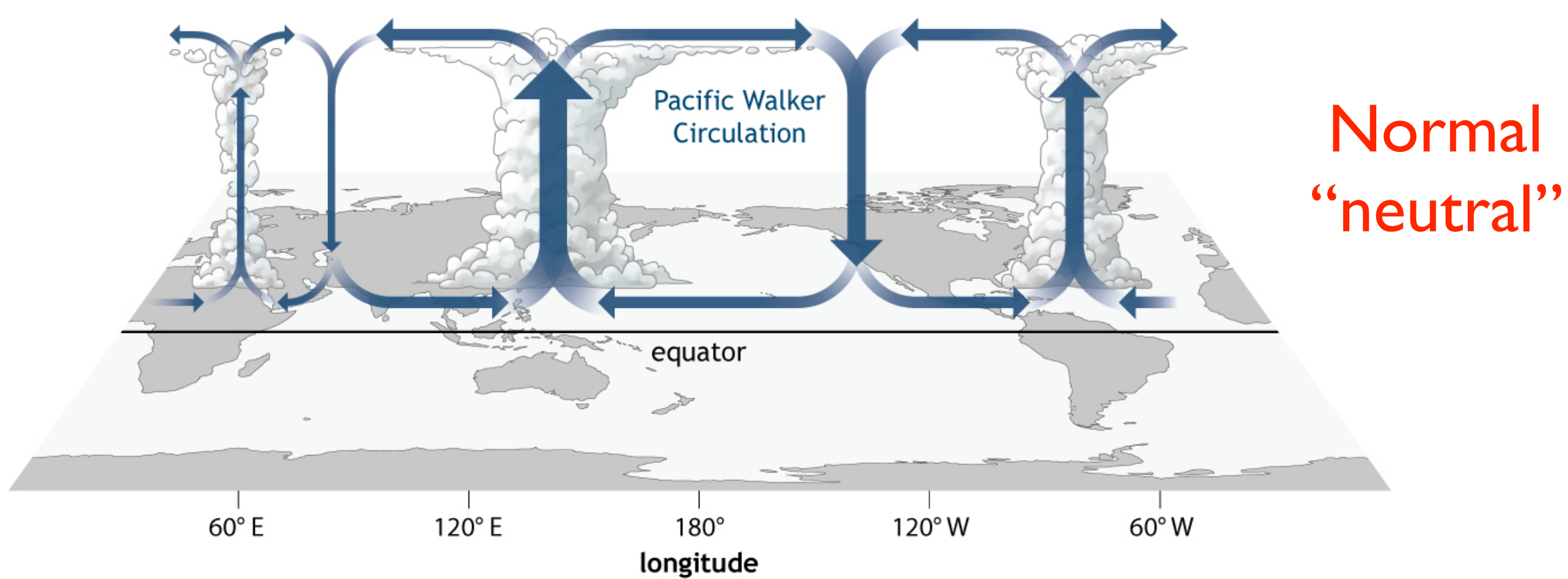
Weekly SST Anomaly

2015/12/20 - 2015/12/26



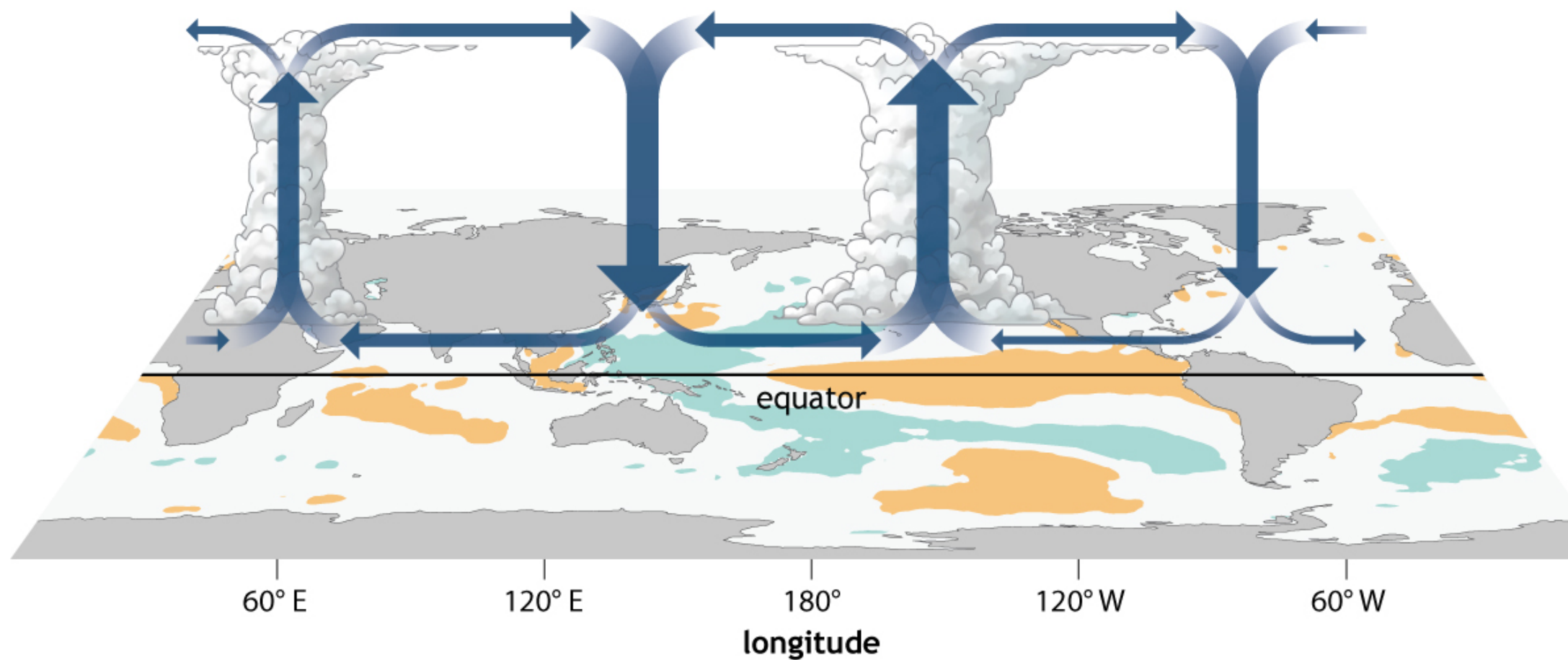
ENSO indexes





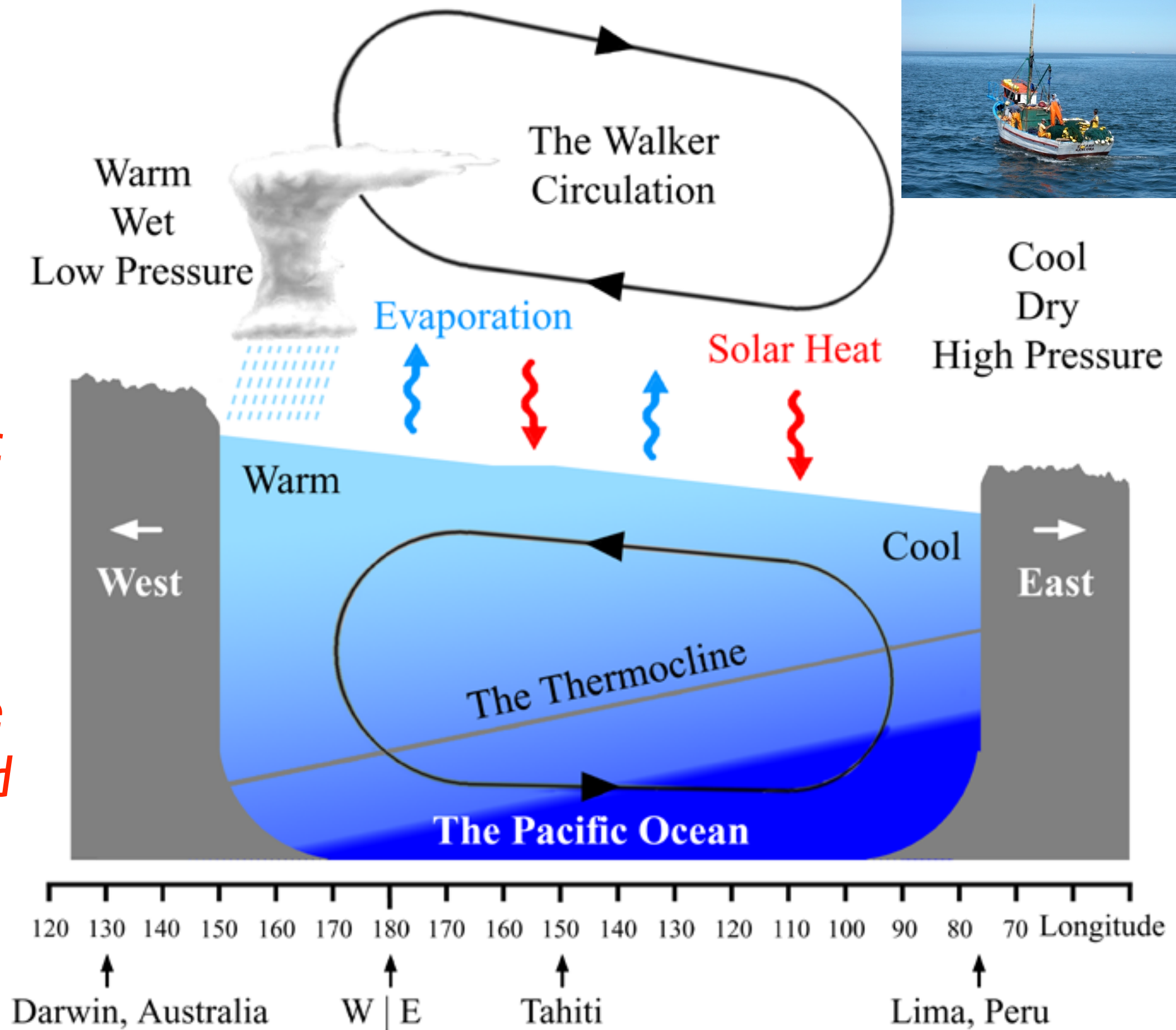
NOAA Climate.gov

El Niño





*atmospheric
pressure,
winds, and
ocean
temperature
all connected*



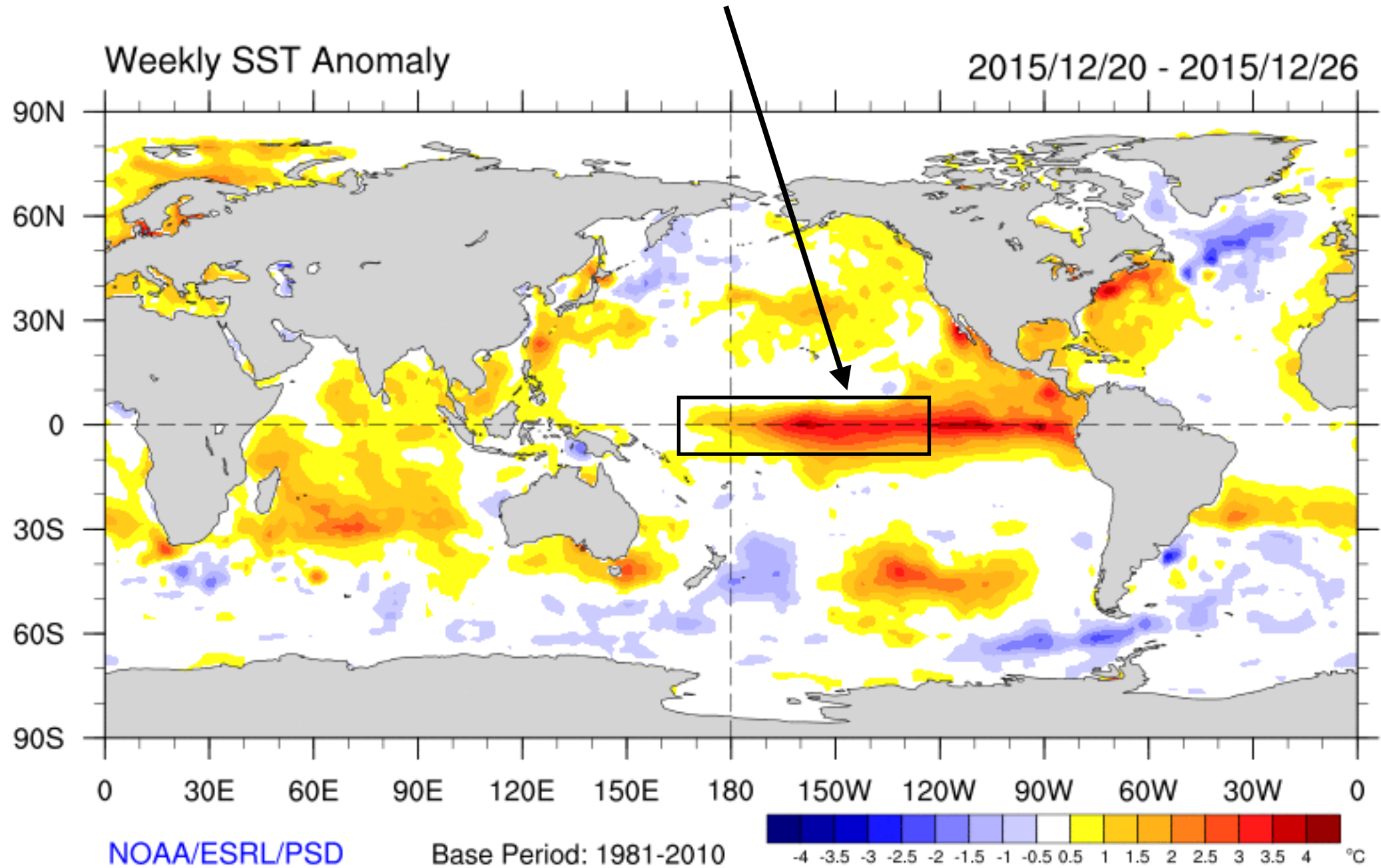
The current event - a big one



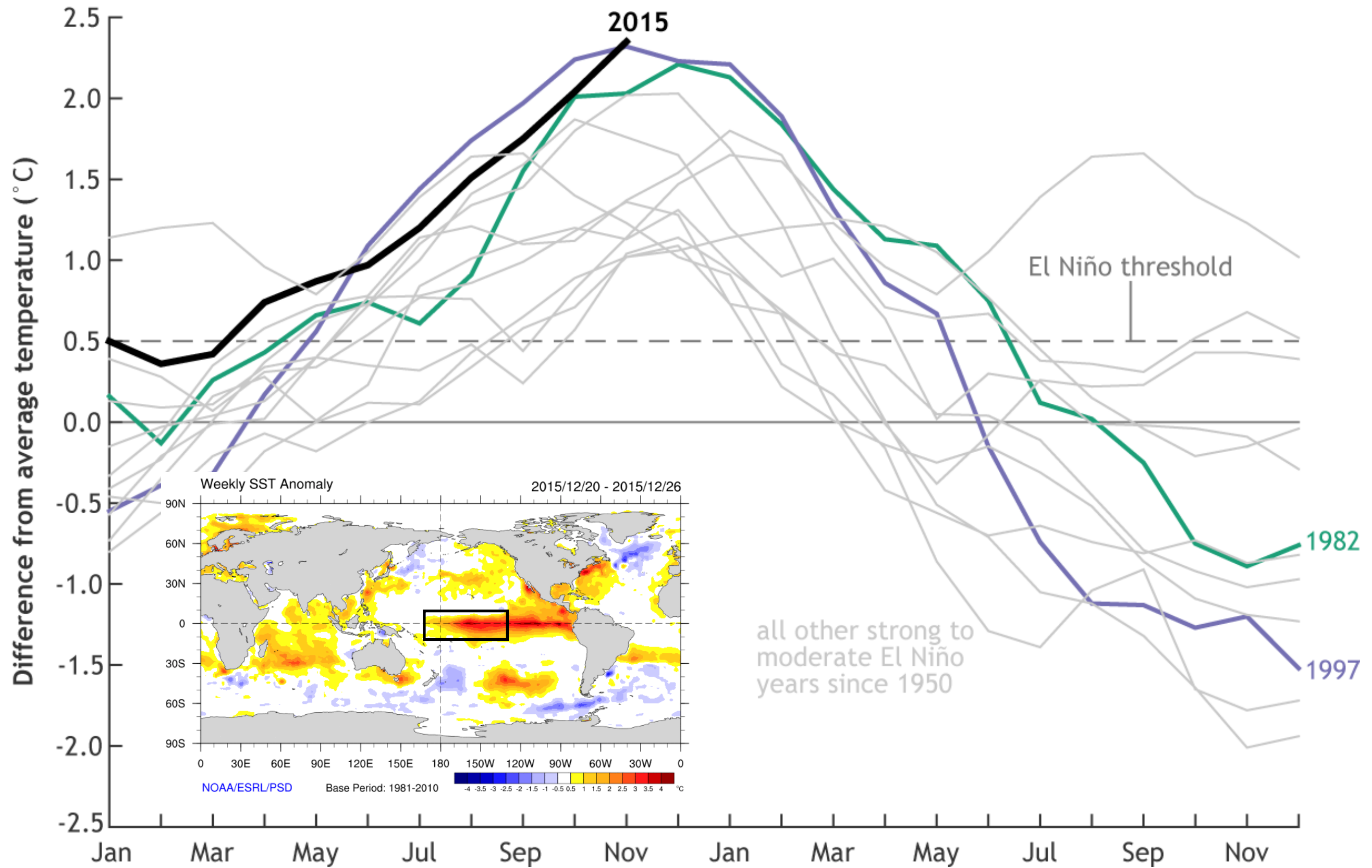
The current event - a big one



the region they call “Nino 3.4”



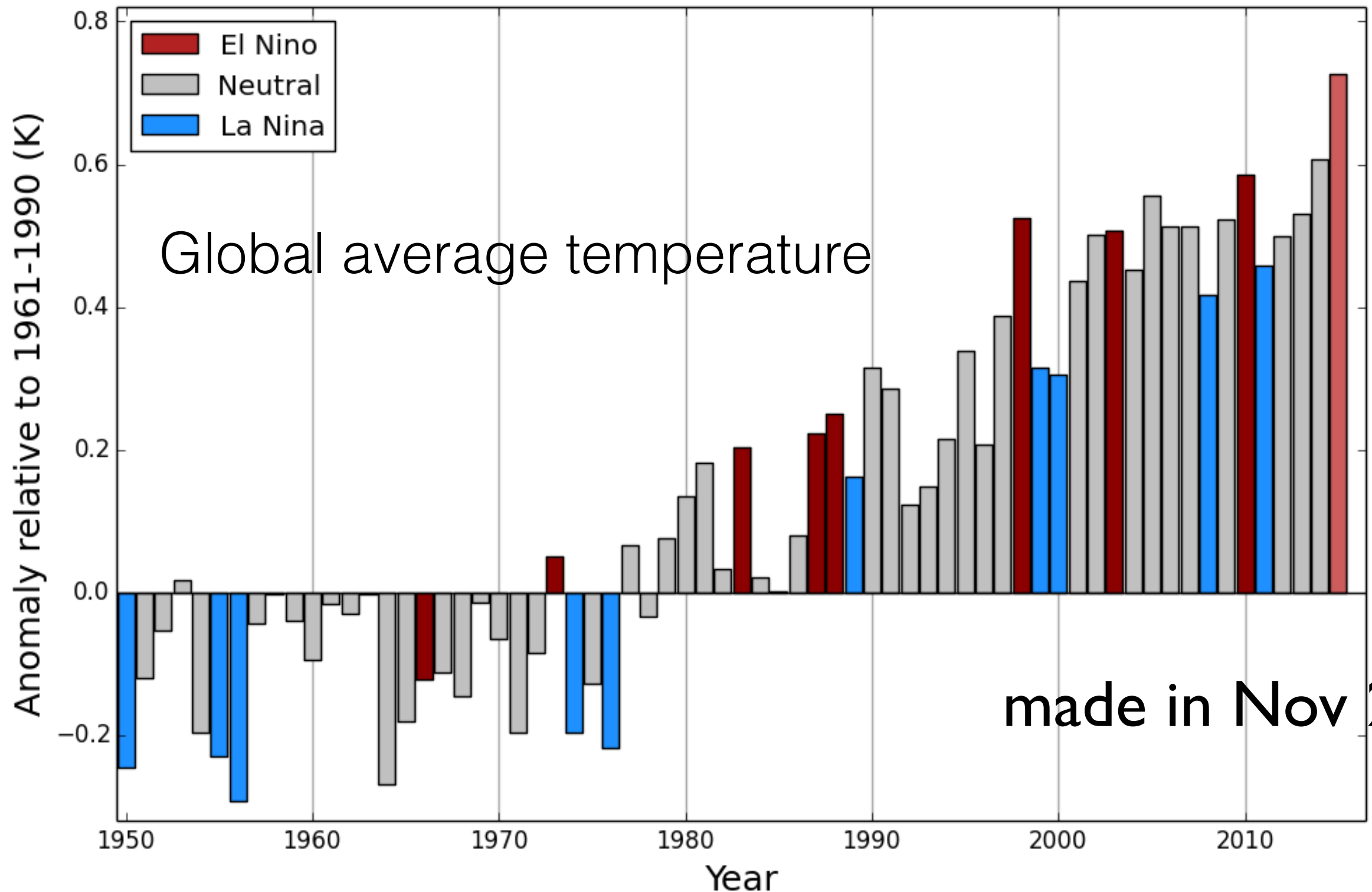
Monthly sea surface temperature Niño 3.4 Index Values



outline

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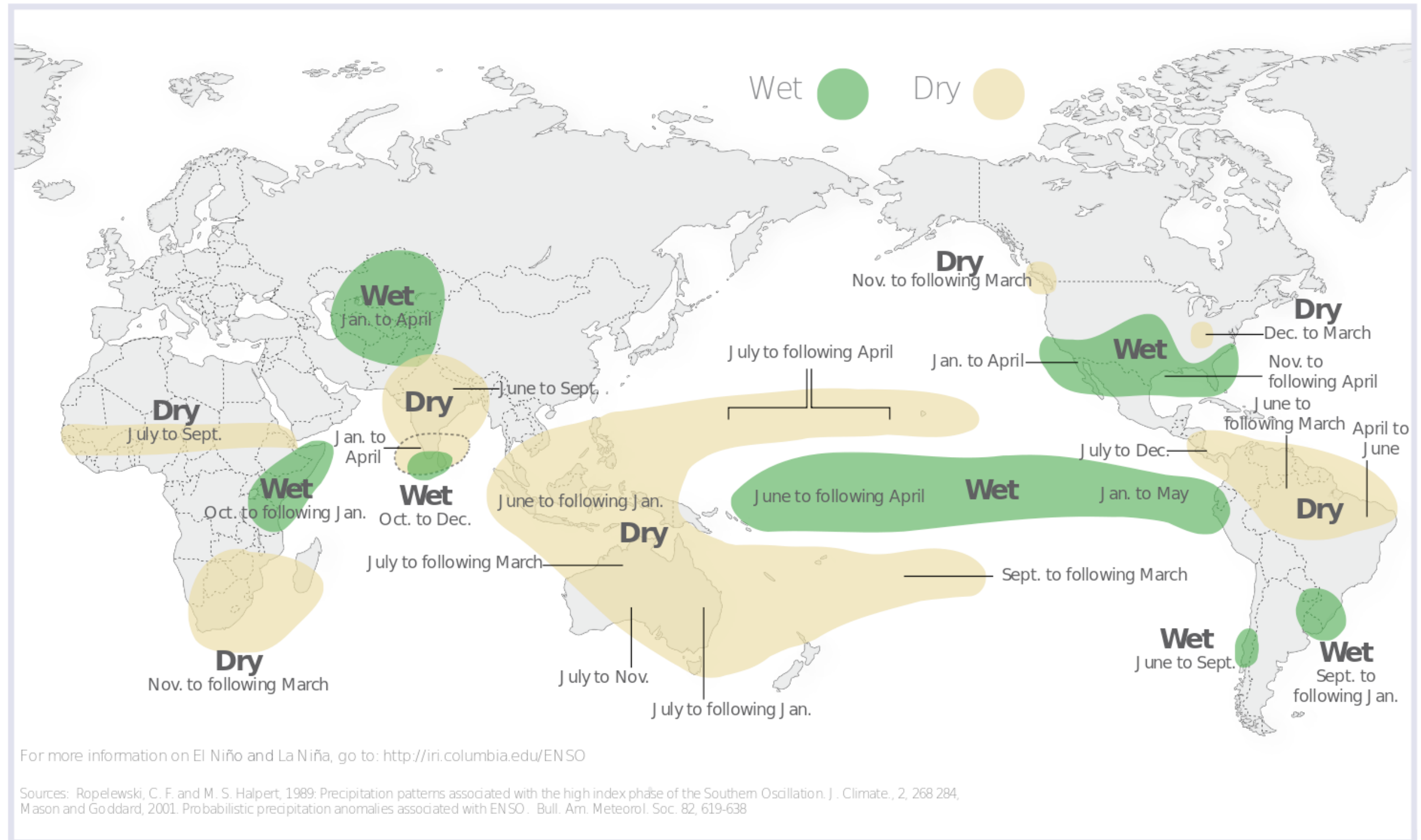
El Niño years are relatively warm (globally) ...as Pacific releases stored heat



made in Nov 2015

El Niño and Rainfall

El Niño conditions in the tropical Pacific are known to shift rainfall patterns in many different parts of the world. Although they vary somewhat from one El Niño to the next, the strongest shifts remain fairly consistent in the regions and seasons shown on the map below.



teleconnections

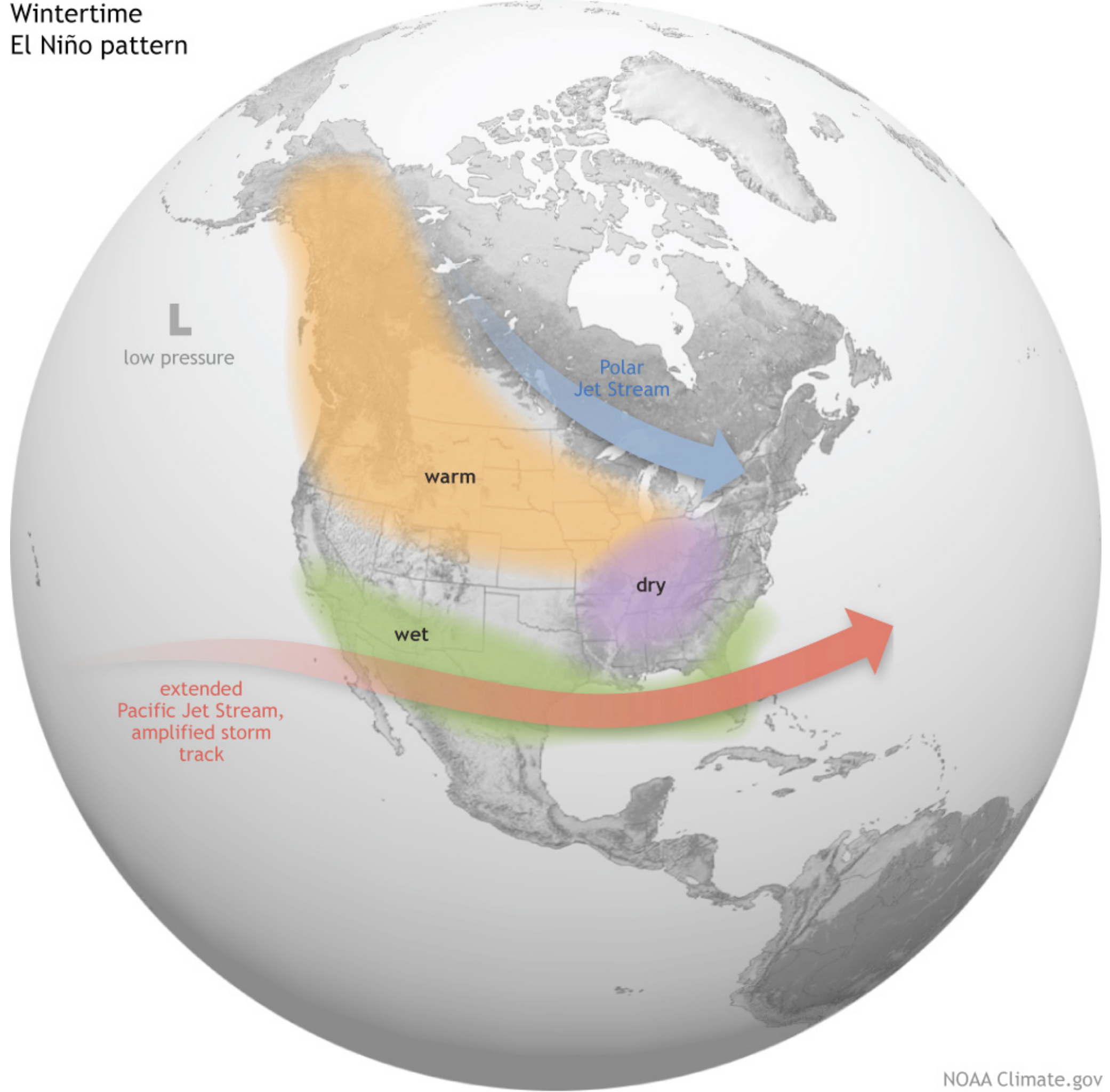


Wildfire season in Indonesia

GHG release,
respiratory
disease



Wintertime
El Niño pattern



El Niño and Wisconsin: winter

El Niño and Wisconsin: winter

- for 6 strong El Niño event since 1950...
(57/58, 65/66, 72/73, 82/83, 91/92, 97/98)

El Niño and Wisconsin: winter

- for 6 strong El Niño event since 1950...
(57/58, 65/66, 72/73, 82/83, 91/92, 97/98)
- temperature
 - composite: DJF +1° warmer, precip normal
 - but 1982-83 and 1997-98: warmer

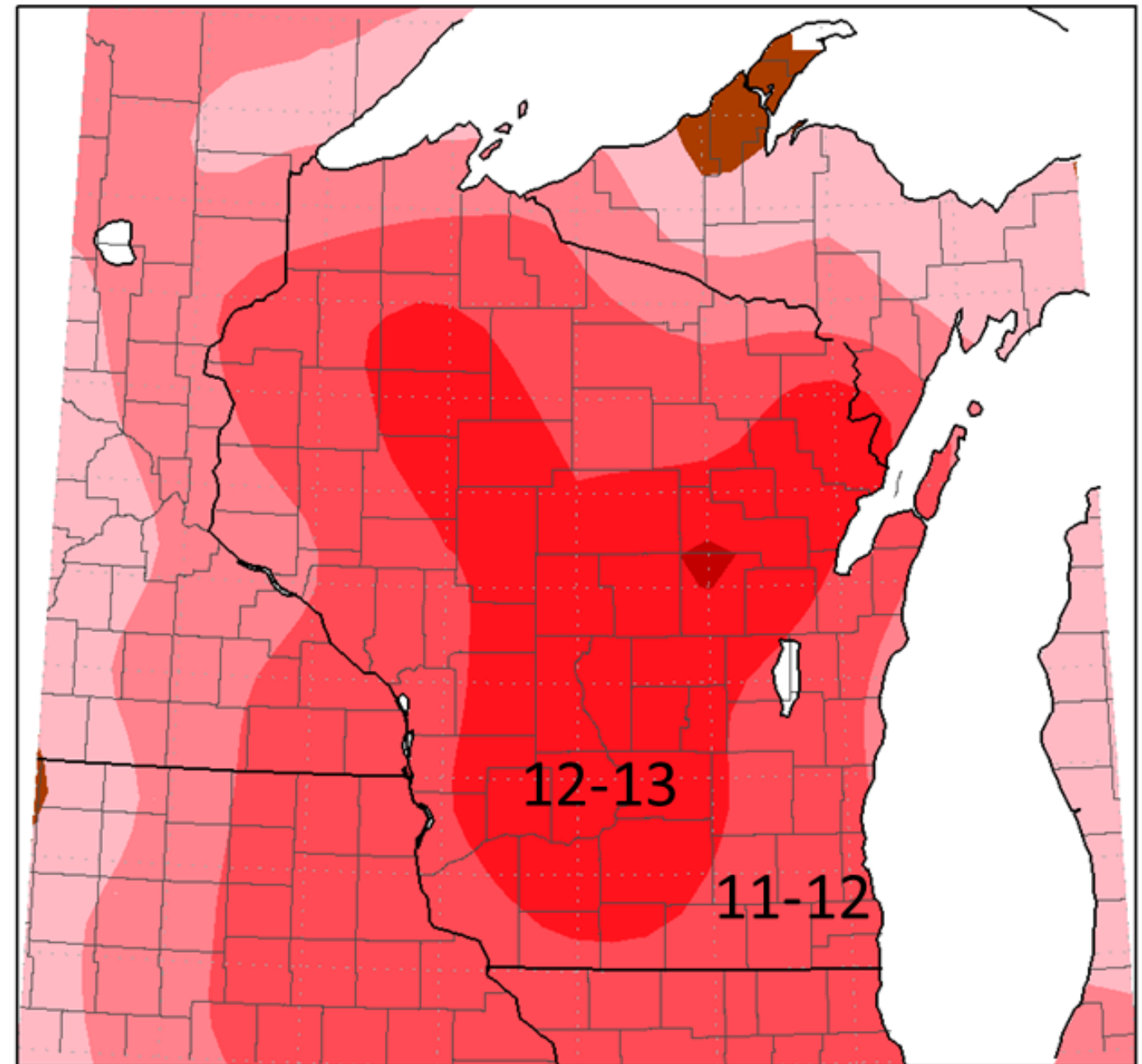
El Niño and Wisconsin: winter

- for 6 strong El Niño event since 1950...
(57/58, 65/66, 72/73, 82/83, 91/92, 97/98)
- temperature
 - composite: DJF +1° warmer, precip normal
 - but 1982-83 and 1997-98: warmer
- precipitation: mixed among 7 events

Average Temperature (°F): Departure from Mean
December 1, 2015 to December 31, 2015

Unofficially: warmest
December on record in
Milwaukee, 2nd in Madison

'97-'98 event had
normal fall, then warm
winter



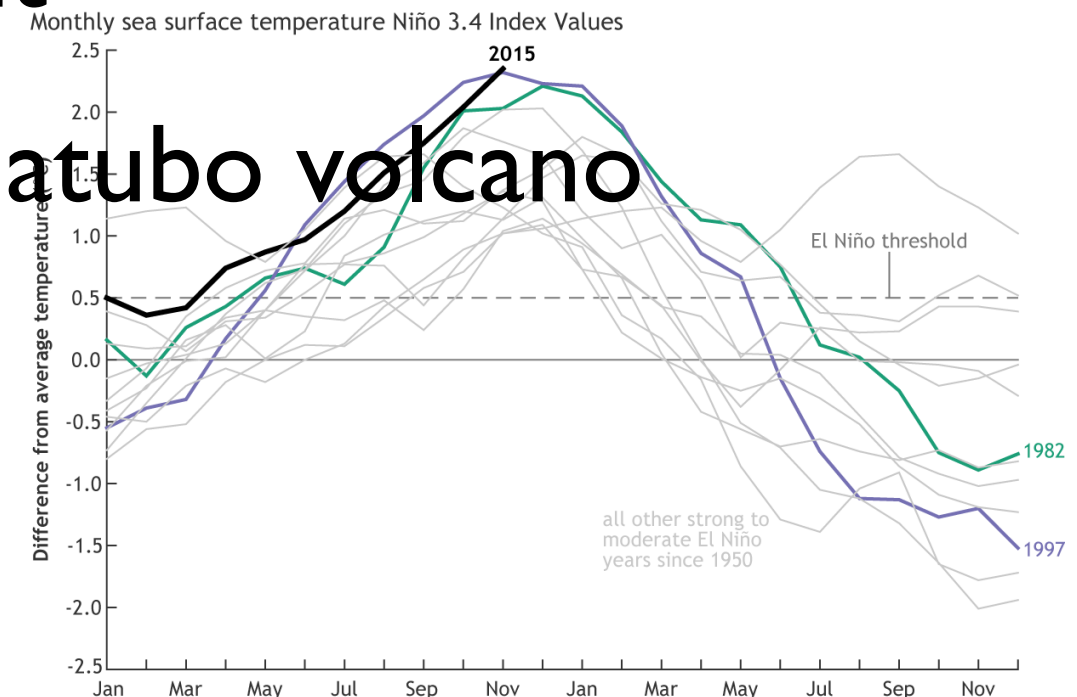
Mean period is 1981-2010.



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/1/2016 6:39:10 PM CST

El Niño and Wisconsin: summer

- for 6 strong El Niño event since 1950...
(57/58, 65/66, 72/73, 82/83, 91/92, 97/98)
- temperature & precip
- JJA: no pattern apparent
- 1992 was cold - Mt Pinatubo volcano
- crop yields: no pattern



El Niño and Wisconsin: spring

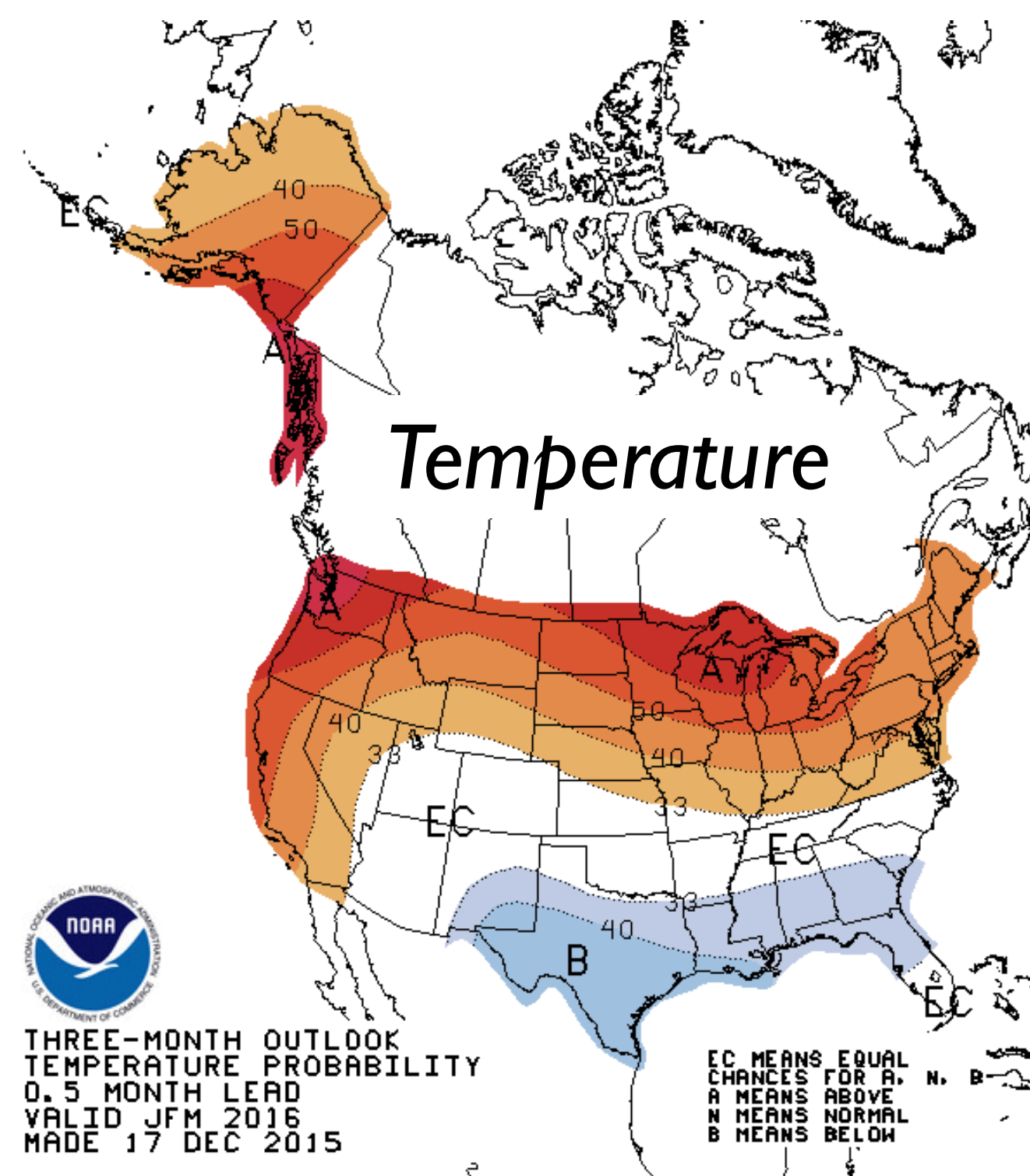
- for 6 strong El Niño event since 1950...
(57/58, 65/66, 72/73, 82/83, 91/92, 97/98)
- temperature: cooler 0.5 to 1°
- precipitation: “enhanced” (thanks)

outline

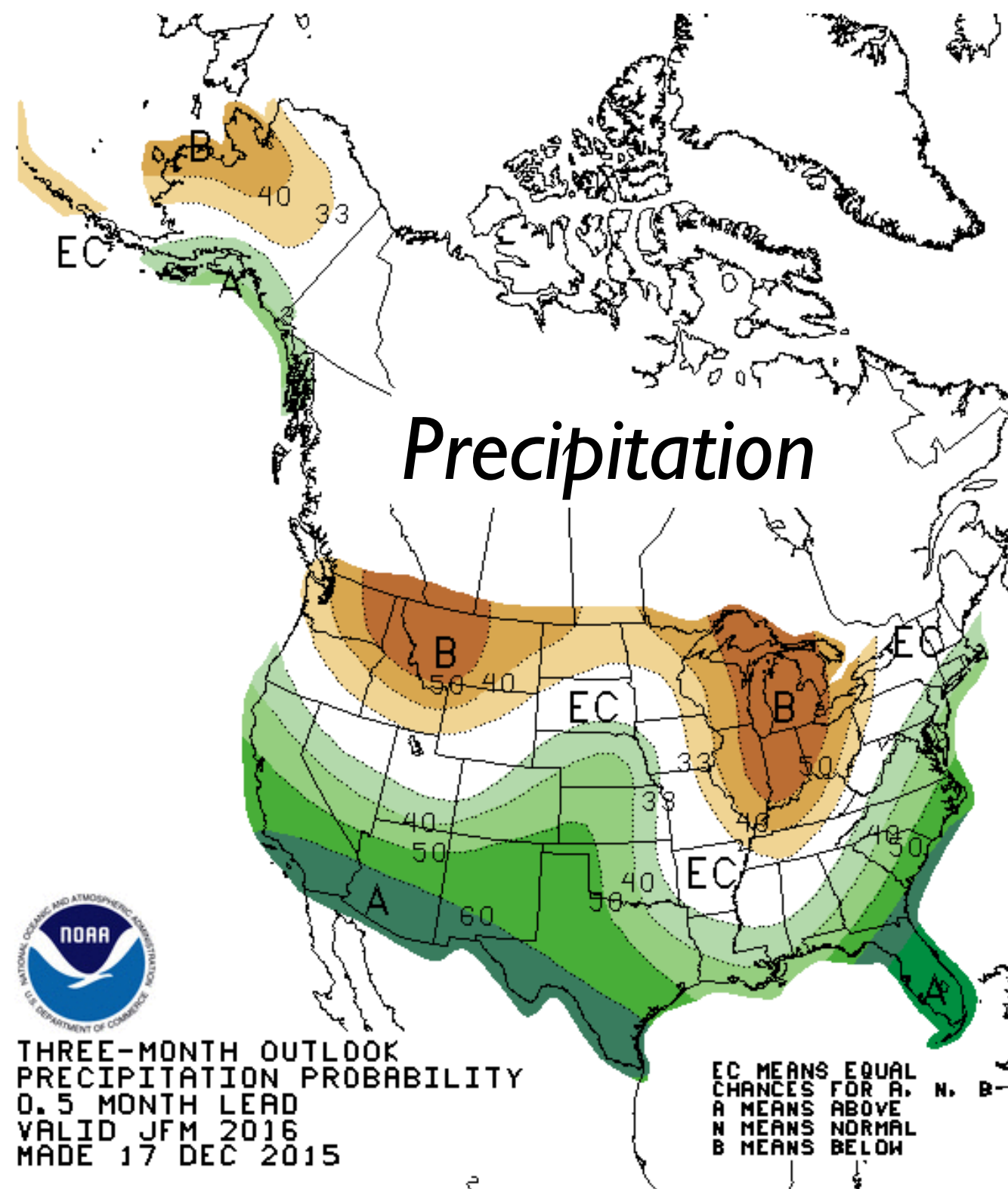
- what is it
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Jan-Feb-Mar

Temperature



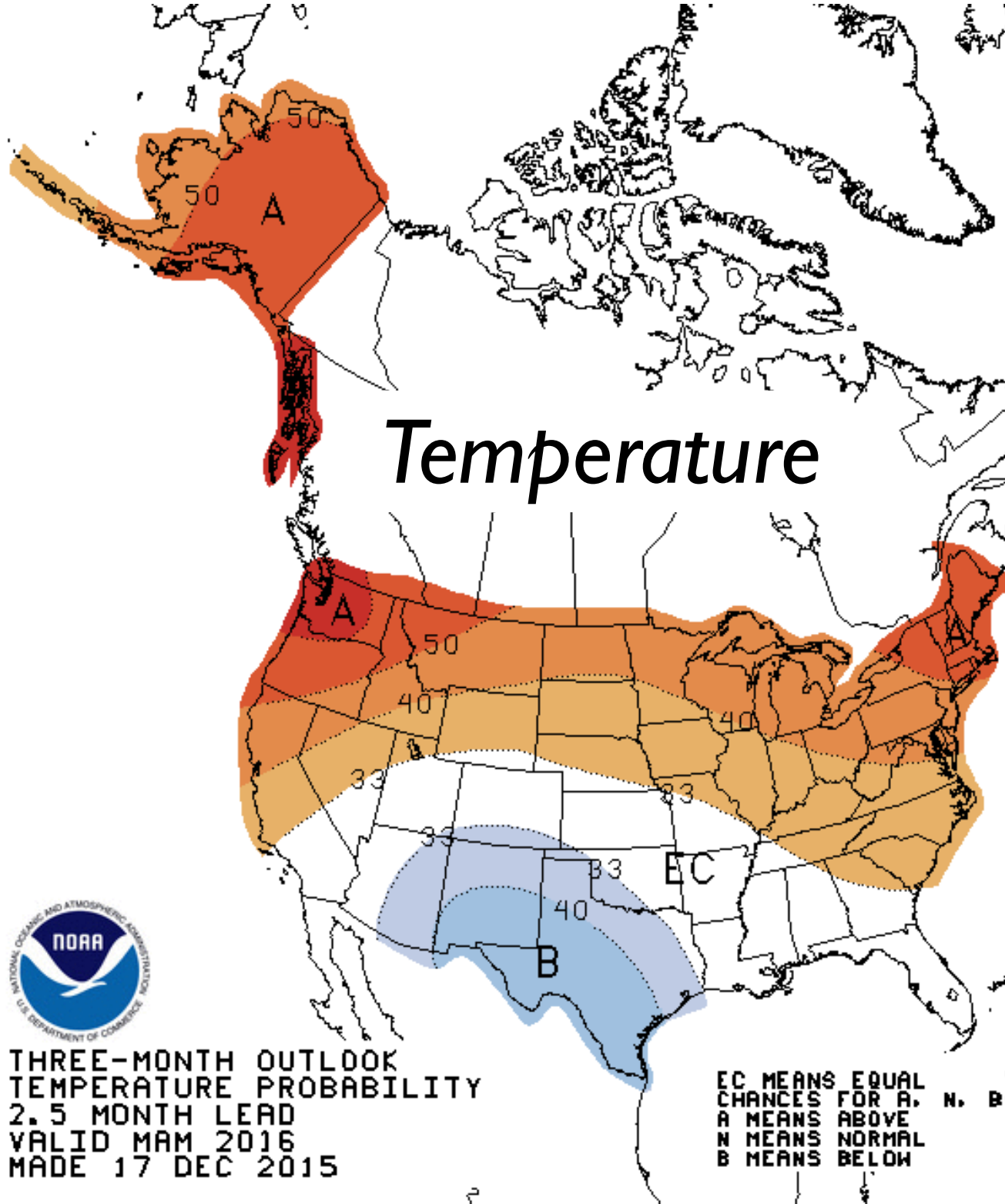
Precipitation



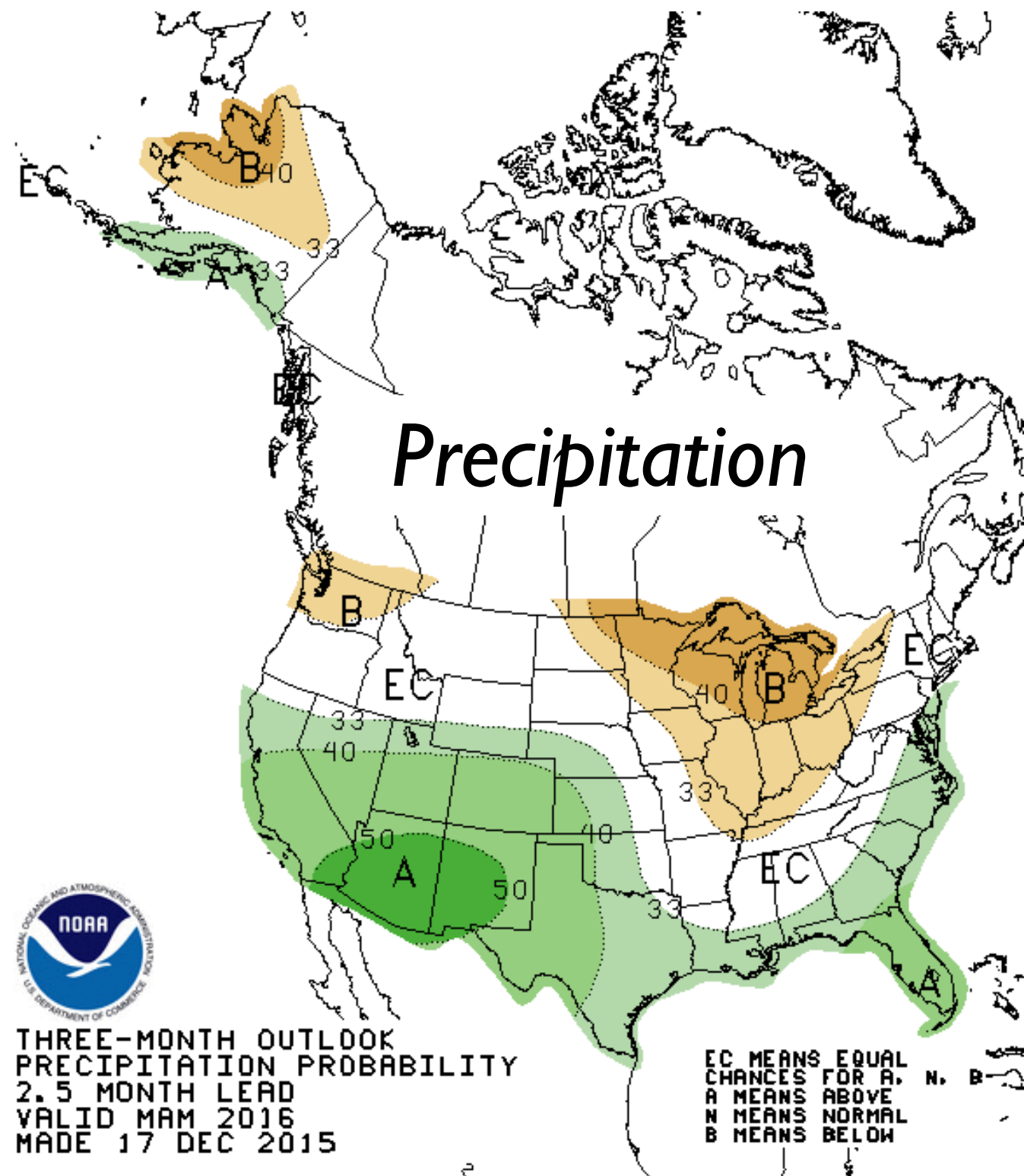
search: "seasonal outlook"

Mar-Apr-May

Temperature



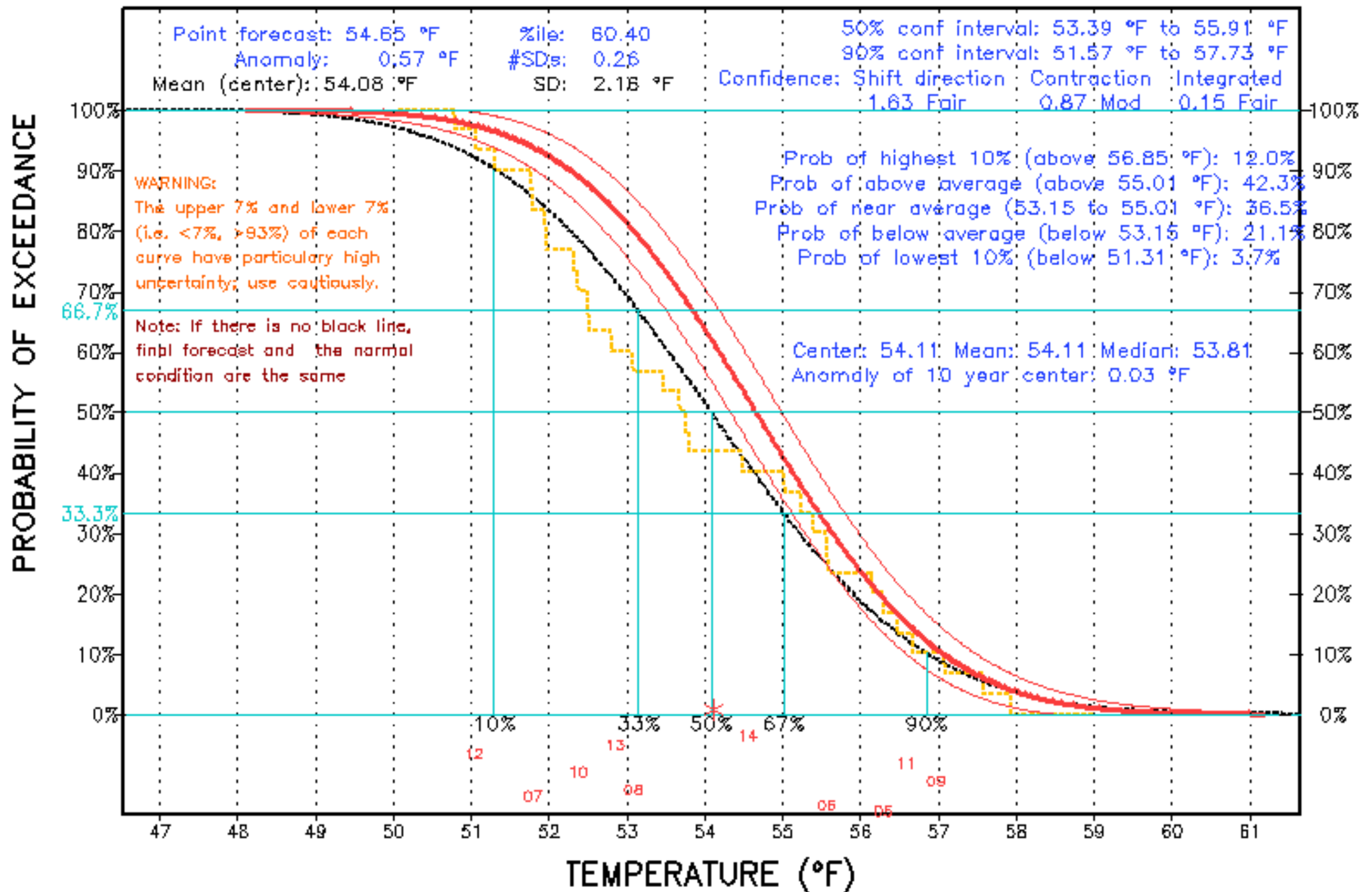
Precipitation



MEAN TEMPERATURE OUTLOOK FOR AMJ 2016

3.5 MONTH LEAD OUTLOOK – MADE Dec 17 2015

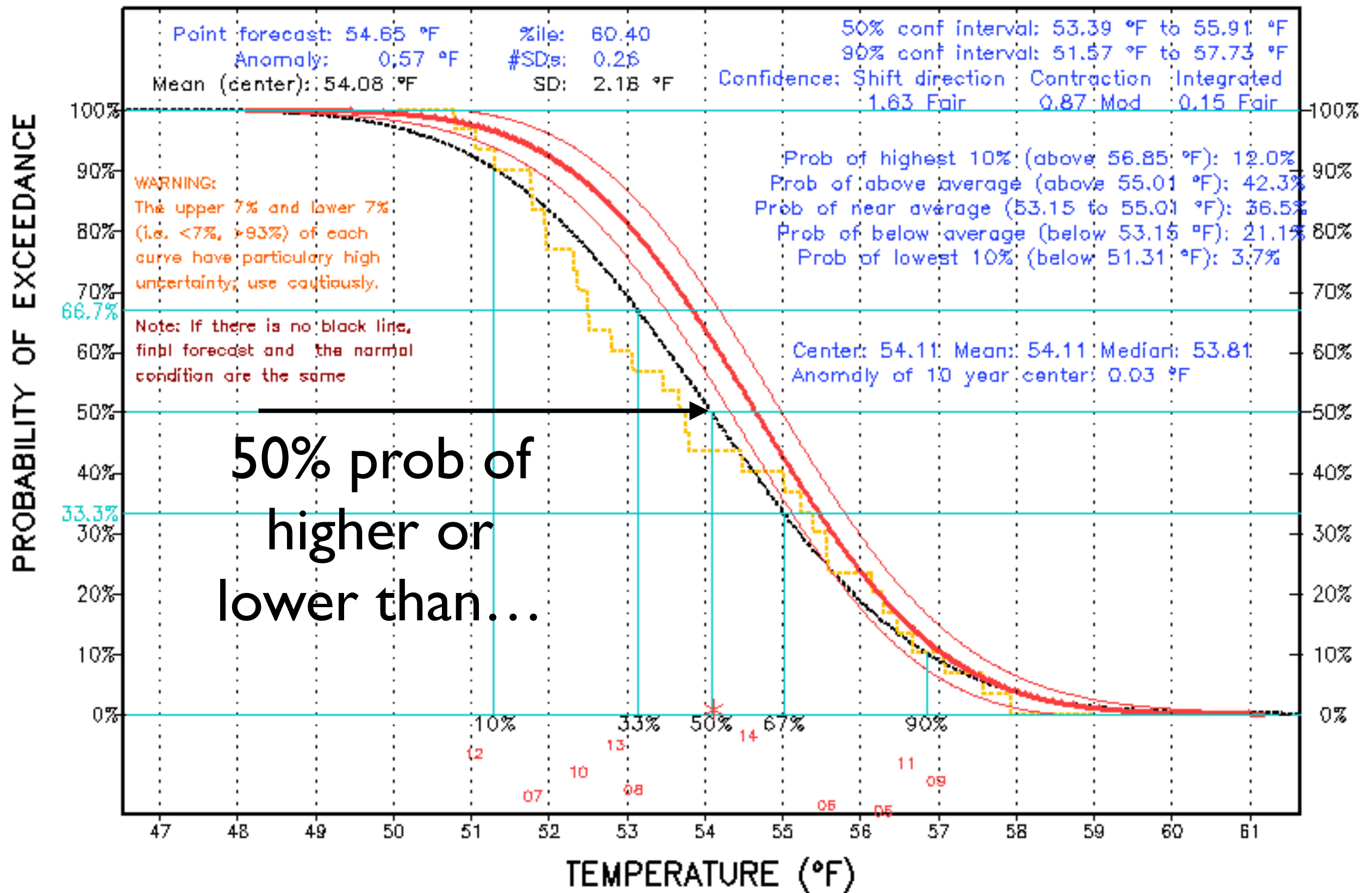
Climate Division 26 (Northern Wisconsin)



MEAN TEMPERATURE OUTLOOK FOR AMJ 2016

3.5 MONTH LEAD OUTLOOK – MADE Dec 17 2015

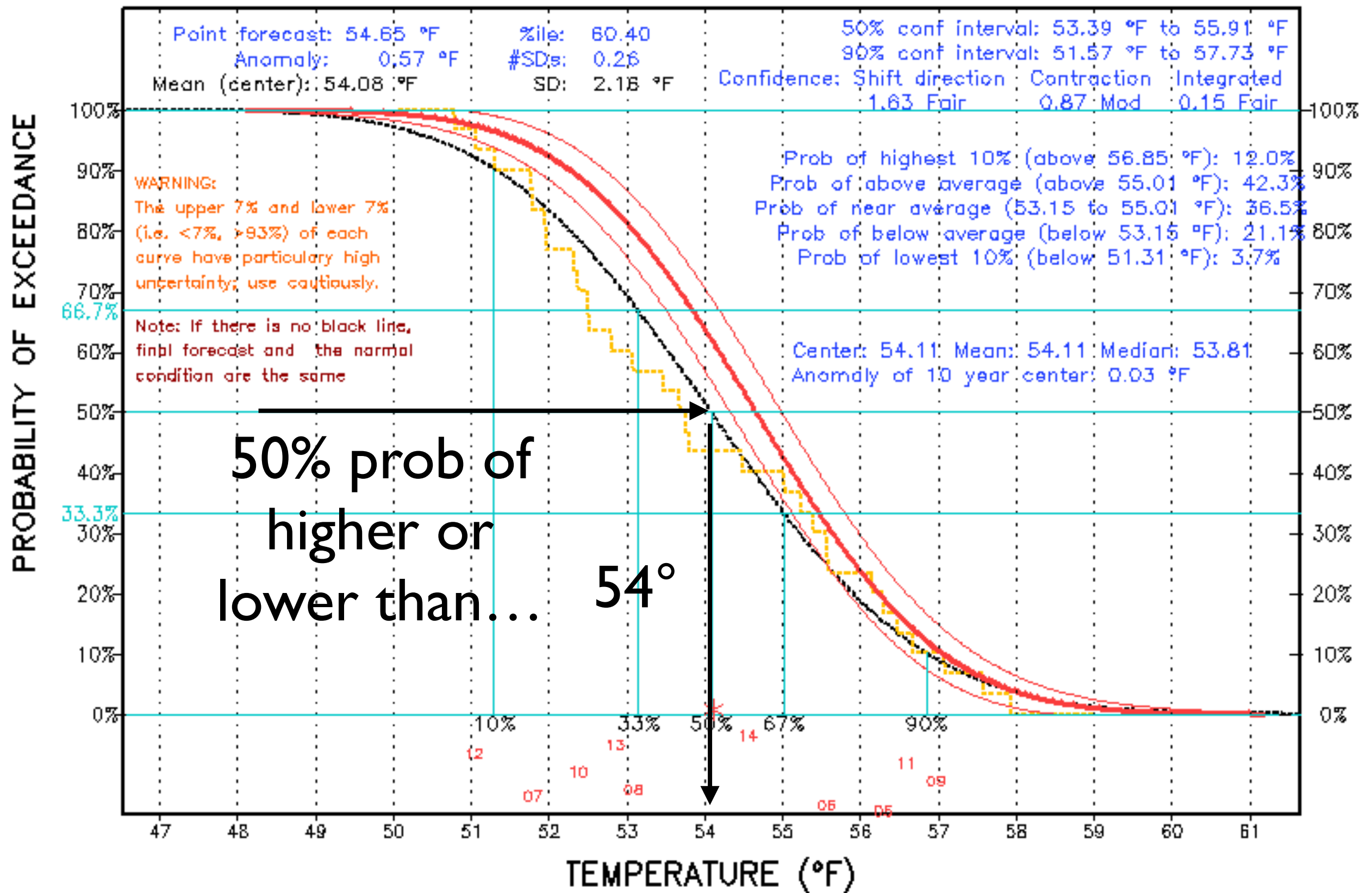
Climate Division 26 (Northern Wisconsin)



MEAN TEMPERATURE OUTLOOK FOR AMJ 2016

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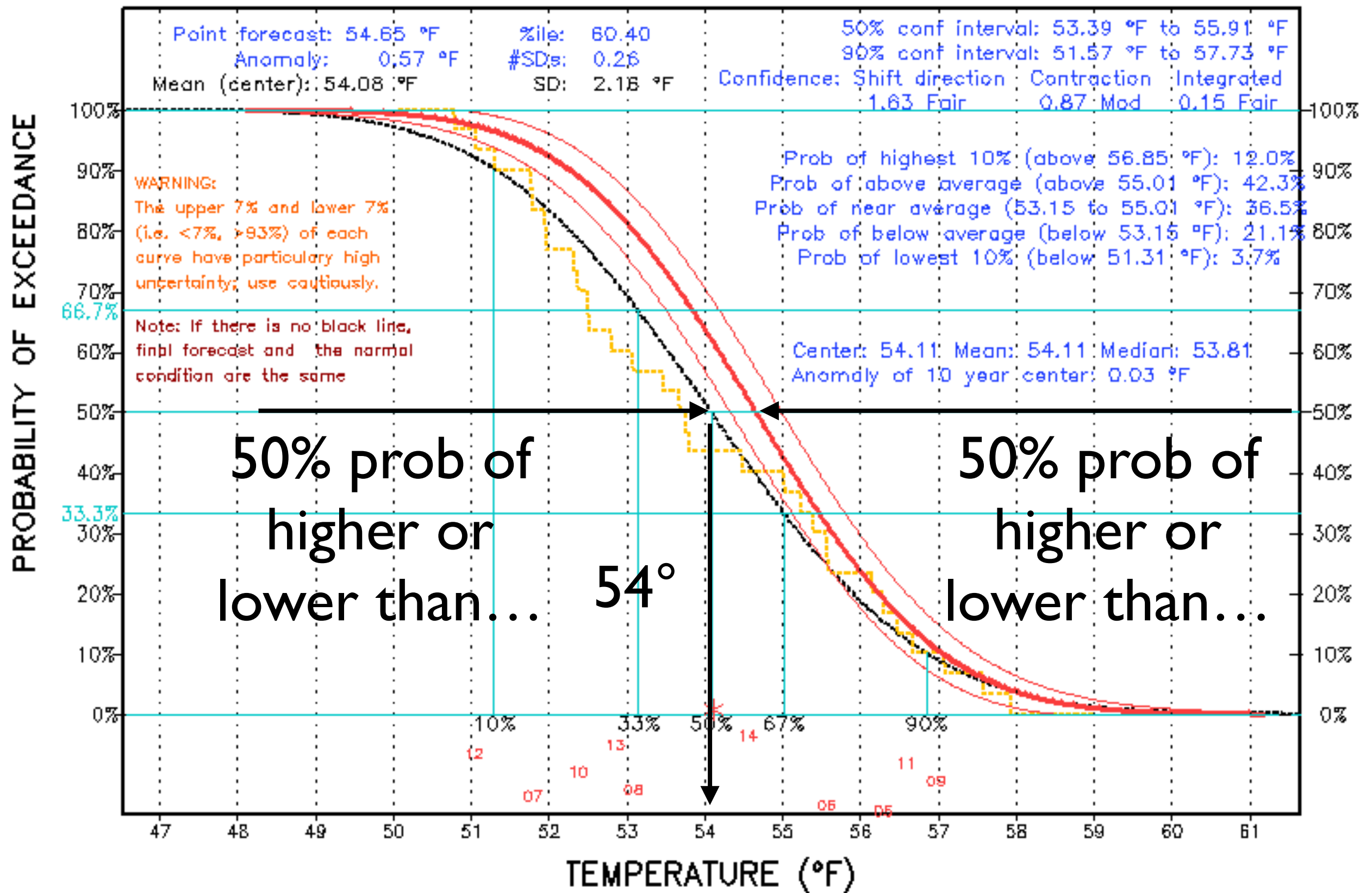
Climate Division 26 (Northern Wisconsin)



MEAN TEMPERATURE OUTLOOK FOR AMJ 2016

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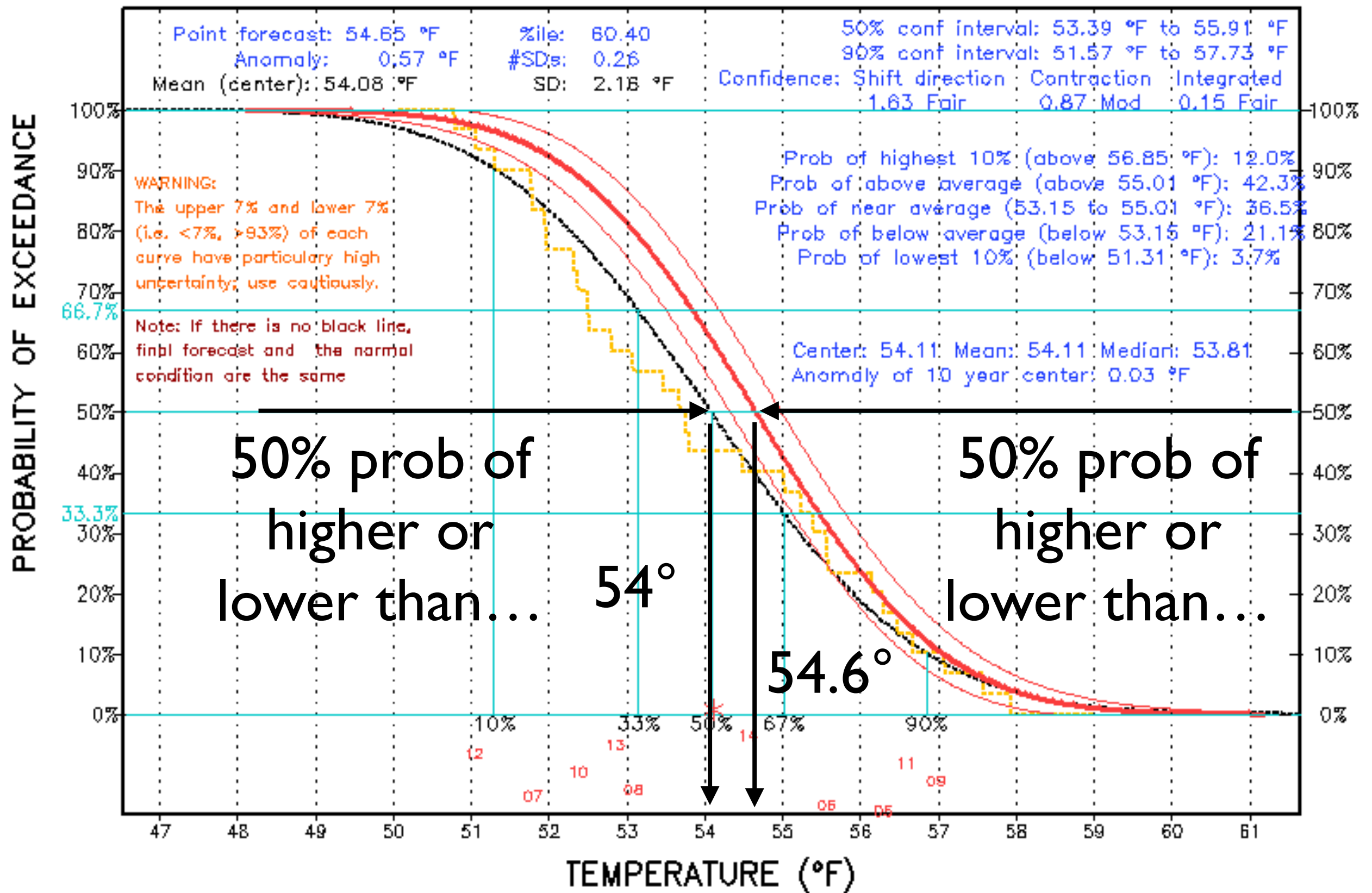
Climate Division 26 (Northern Wisconsin)



MEAN TEMPERATURE OUTLOOK FOR AMJ 2016

3.5 MONTH LEAD OUTLOOK – MADE Dec 17 2015

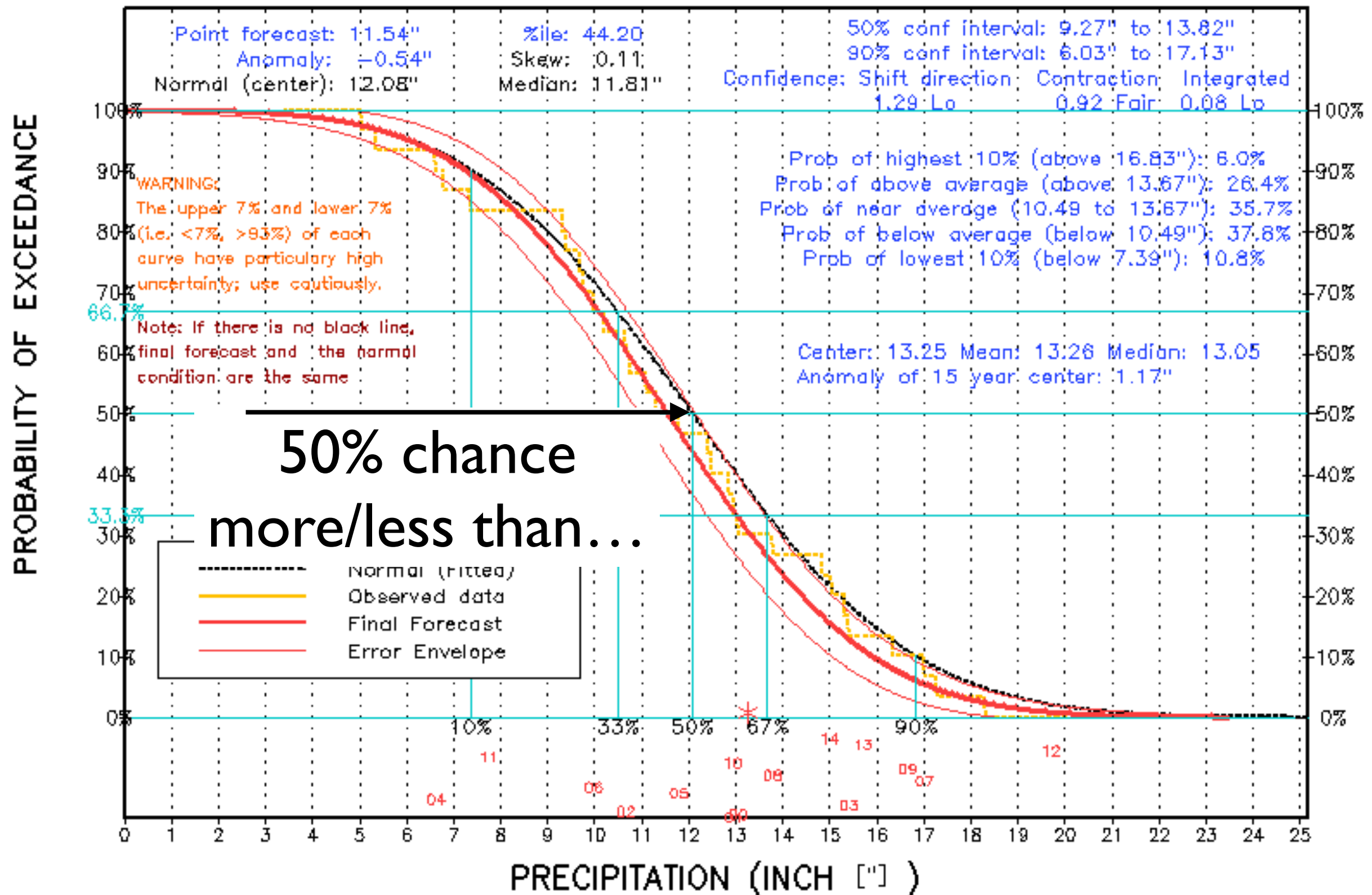
Climate Division 26 (Northern Wisconsin)



PRECIPITATION OUTLOOK FOR AMJ 2016

3.5 MONTH LEAD OUTLOOK – MADE Dec 17 2015

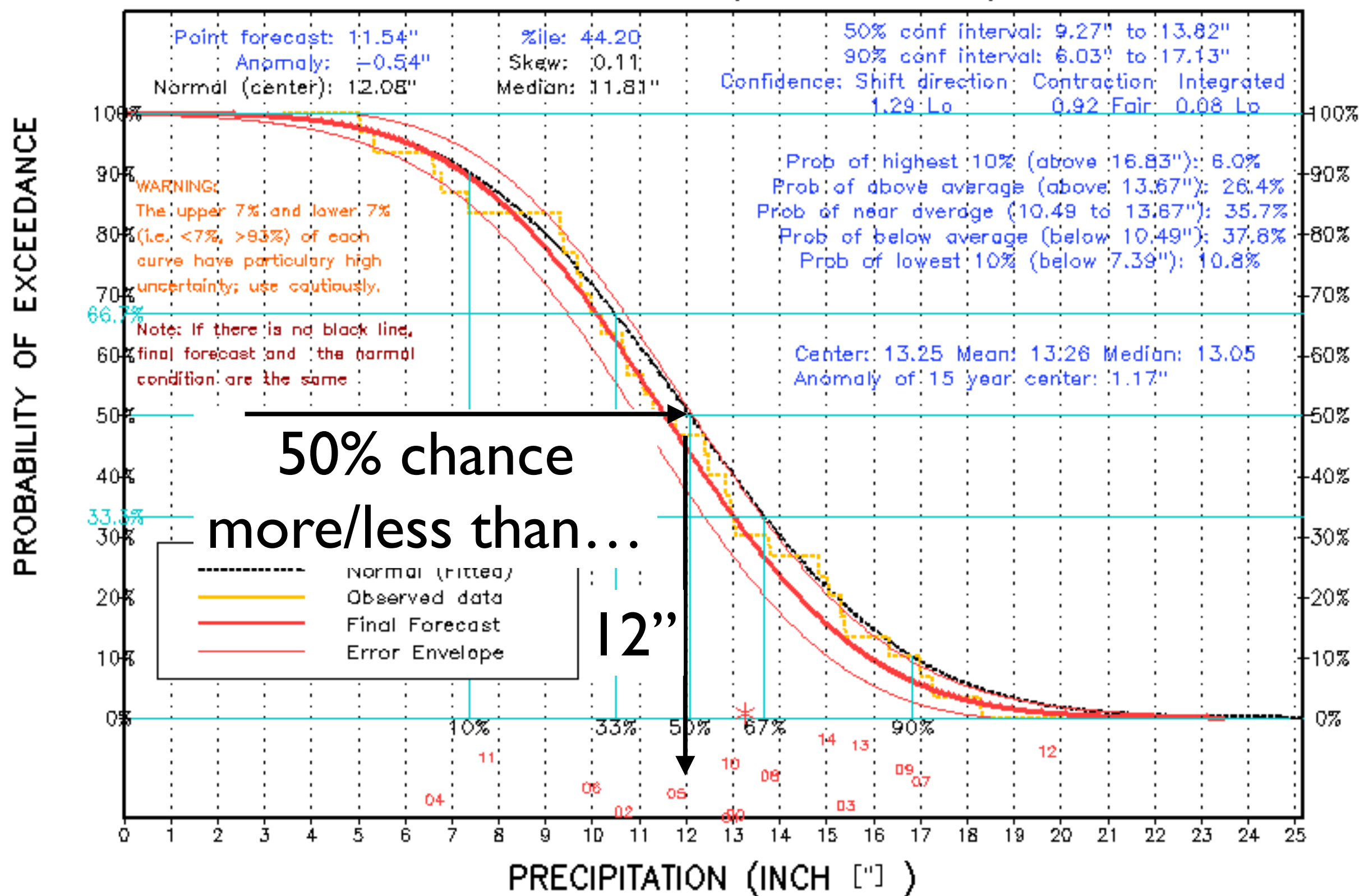
Climate Division 25 (Northern Illinois)



PRECIPITATION OUTLOOK FOR AMJ 2016

3.5 MONTH LEAD OUTLOOK – MADE Dec 17 2015

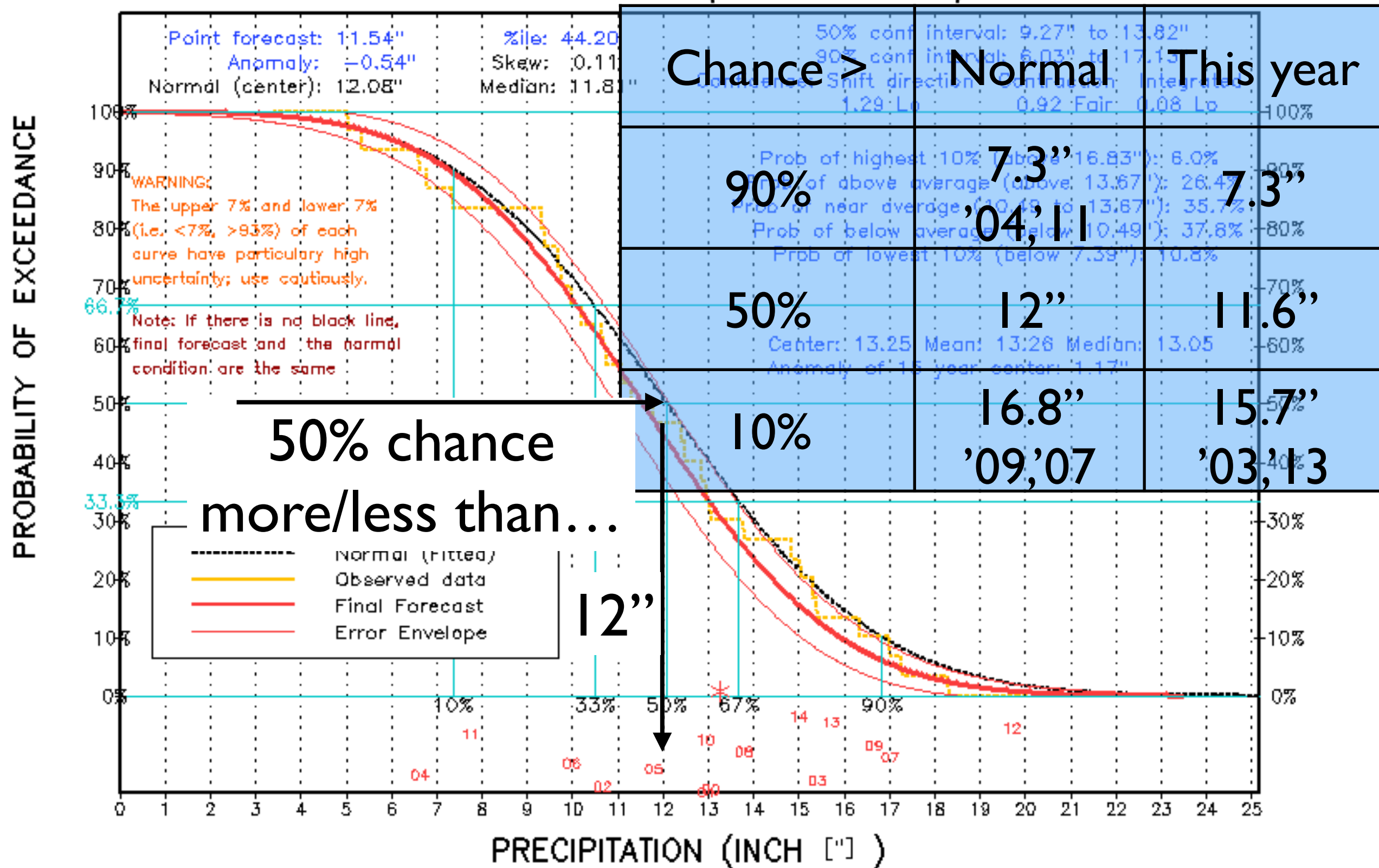
Climate Division 25 (Northern Illinois)



PRECIPITATION OUTLOOK FOR AMJ 2016

3.5 MONTH LEAD OUTLOOK – MADE Dec 17 2015

Climate Division 25 (Northern Illinois)



what it means for Wisconsin agriculture...

- outlooks do not imply anything outside of usual range (but there is always possibility)
- systems are adapted to this
- no apparent connection to commodity prices globally (World Bank)

but maybe...

- more overwintering pests, earlier start
- good planting season - warm, not wet
- minimum low temperature stress on livestock
- ice cover on cranberry tougher
- alfalfa winterkill?

in conclusion...

- in midst of historic El Niño event
- serious local challenges around world
- record warm December (ENSO + AO + climate change)
- human-caused climate change already tilting the odds to warmth, El Niño adds a bit
- winners and losers