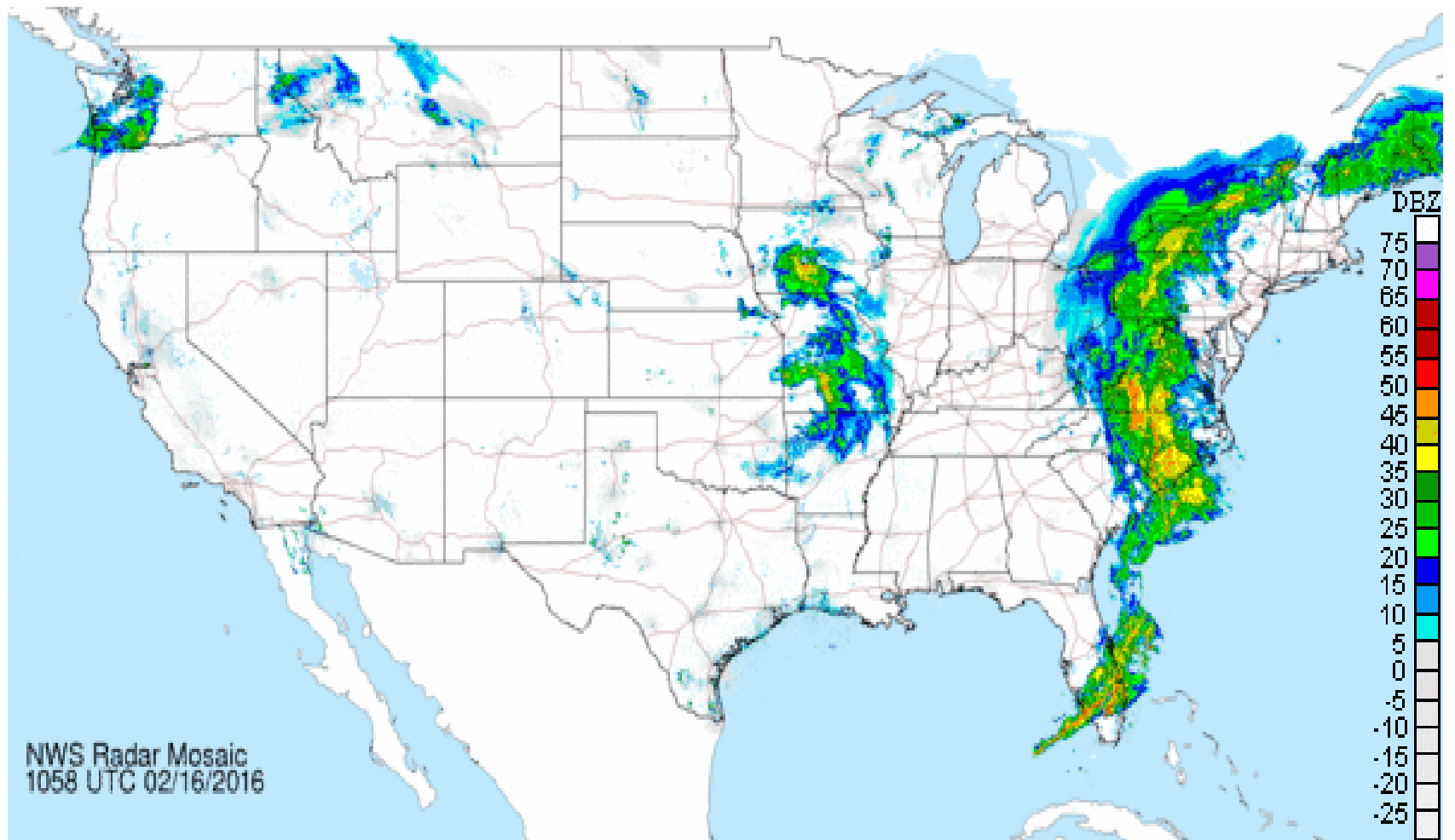


# **El Niño and other Weather Related Issues**

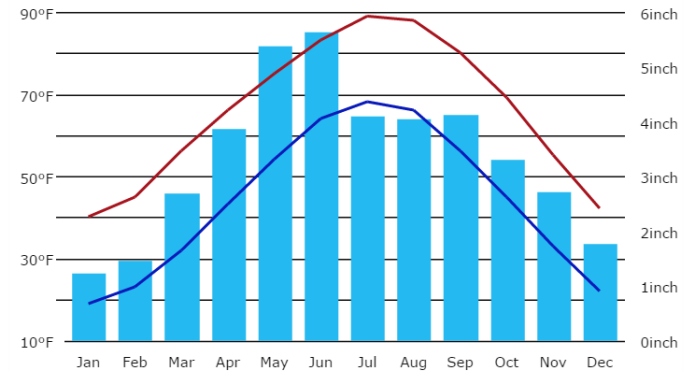


**Elwynn Taylor**  
**Iowa State University**  
**[setaylor@iastate.edu](mailto:setaylor@iastate.edu)**

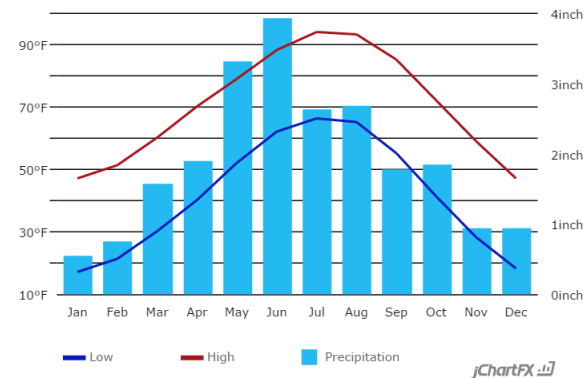


## Locations have typical seasonal patterns

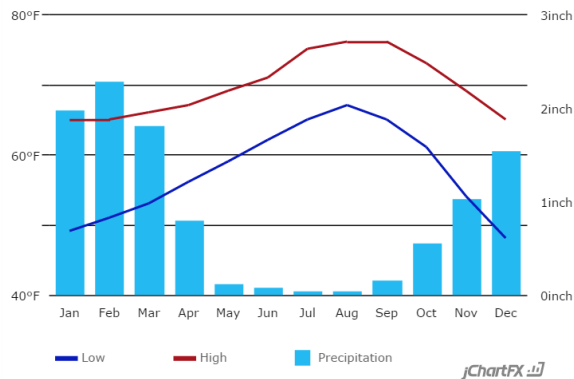
Climograph Ottawa



Climograph Ashland

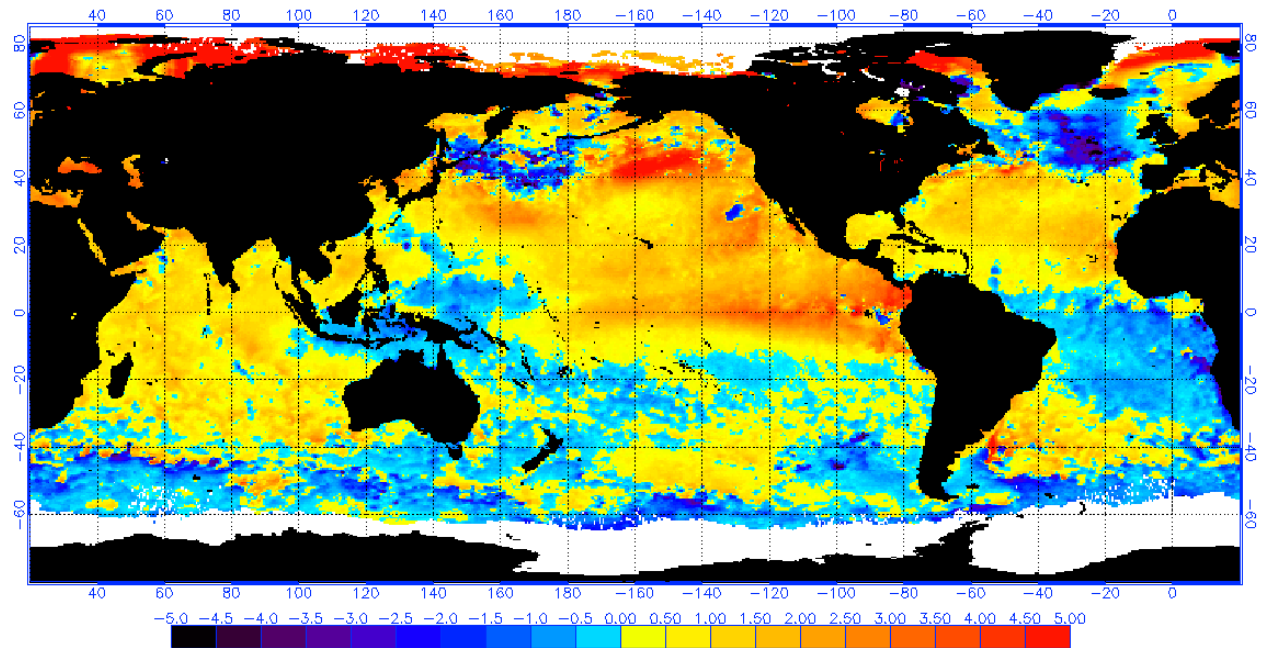


Climograph San Diego



**yourweatherservice.com**

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 8/20/2015  
(white regions indicate sea-ice)



**Another Year of Wild Weather for Crops  
(Too Wet, Too Dry, even Ideal)**

**In the Midwest, light is a factor  
about 1 yr in 7**

**Temperature is always a factor:  
frost, heat stress, growing degree days**

**October 2009**

**El Niño**

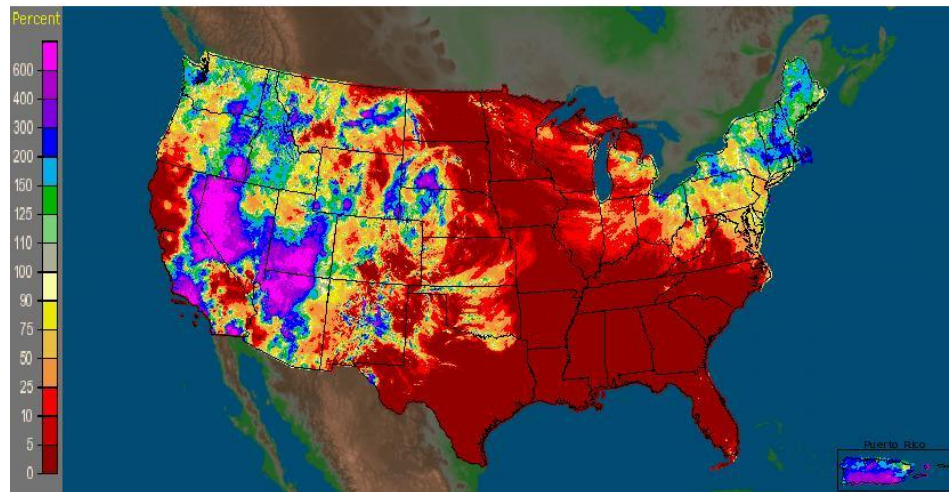
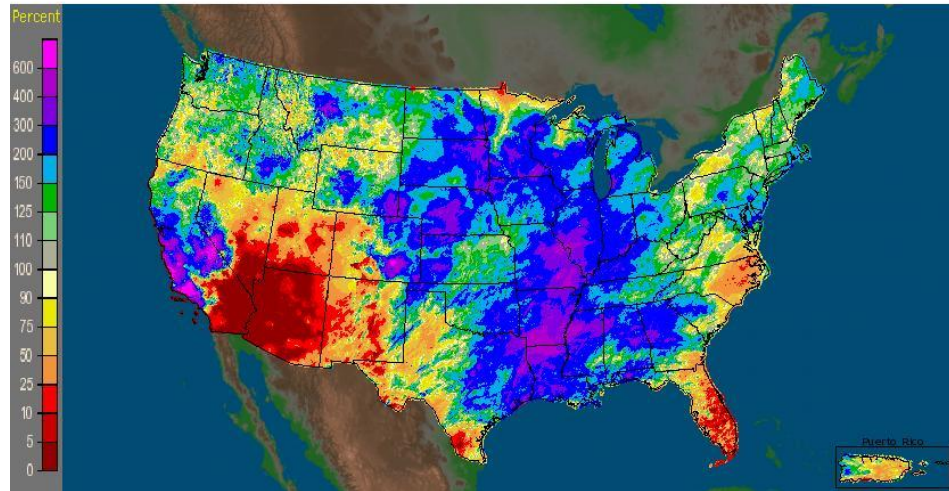
**To**

**La Niña**

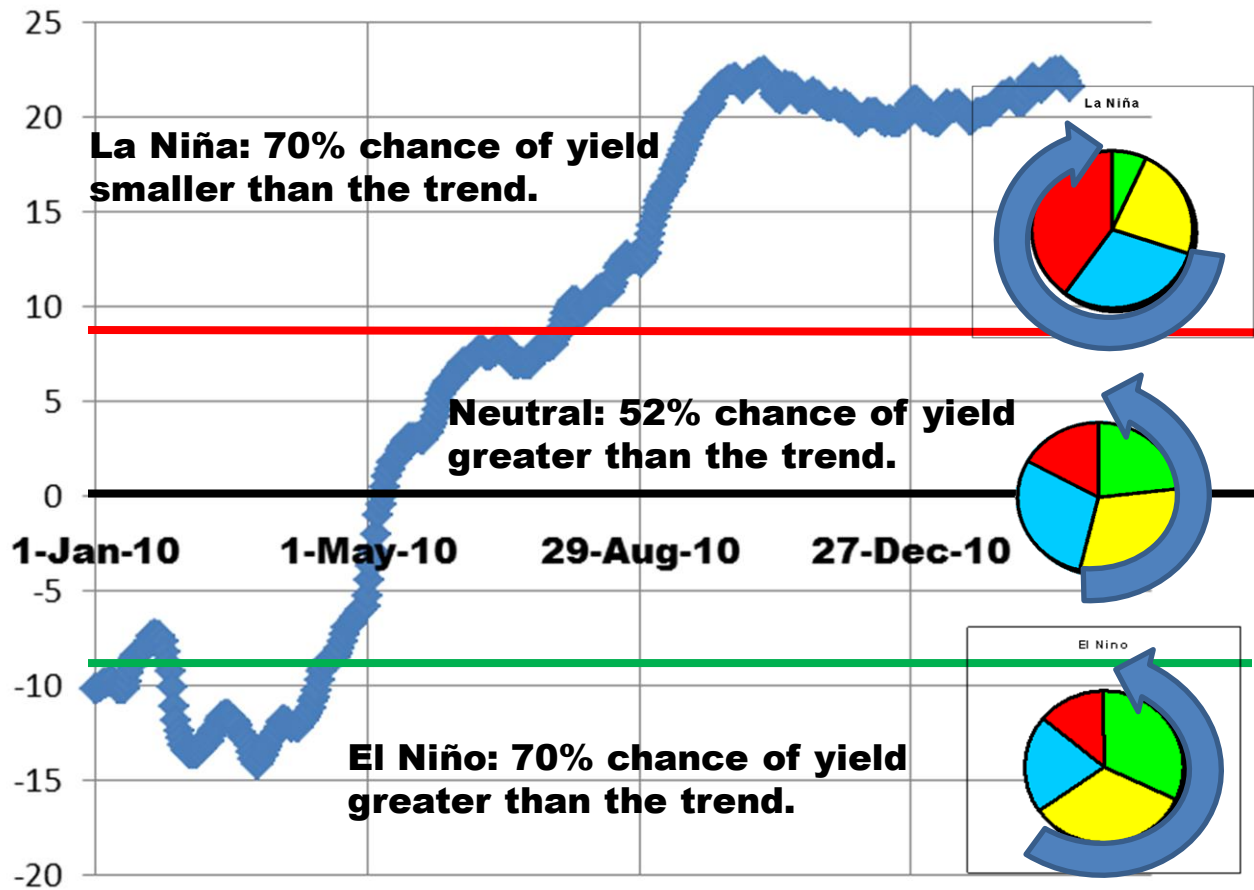
**October 2010  
to 2012**

•

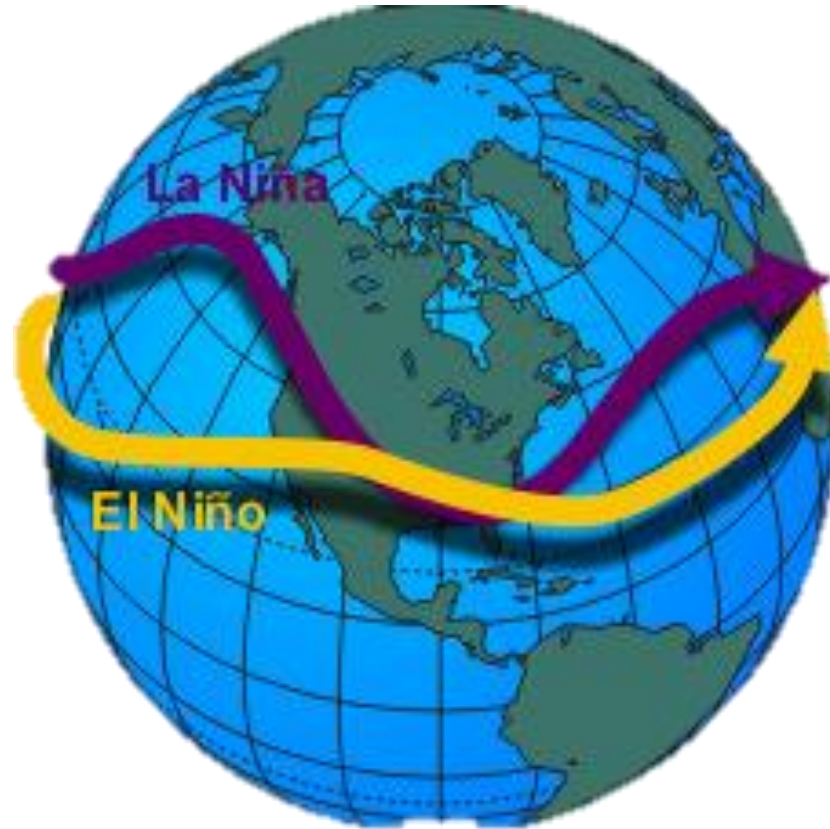
CONUS + Puerto Rico: October, 2009 Monthly Percent of Normal Precipitation  
Valid at 11/1/2009 1200 UTC- Created 5/31/10 9:23 UTC



## SOI 1 Jan 2010 - 7 Mar 2011

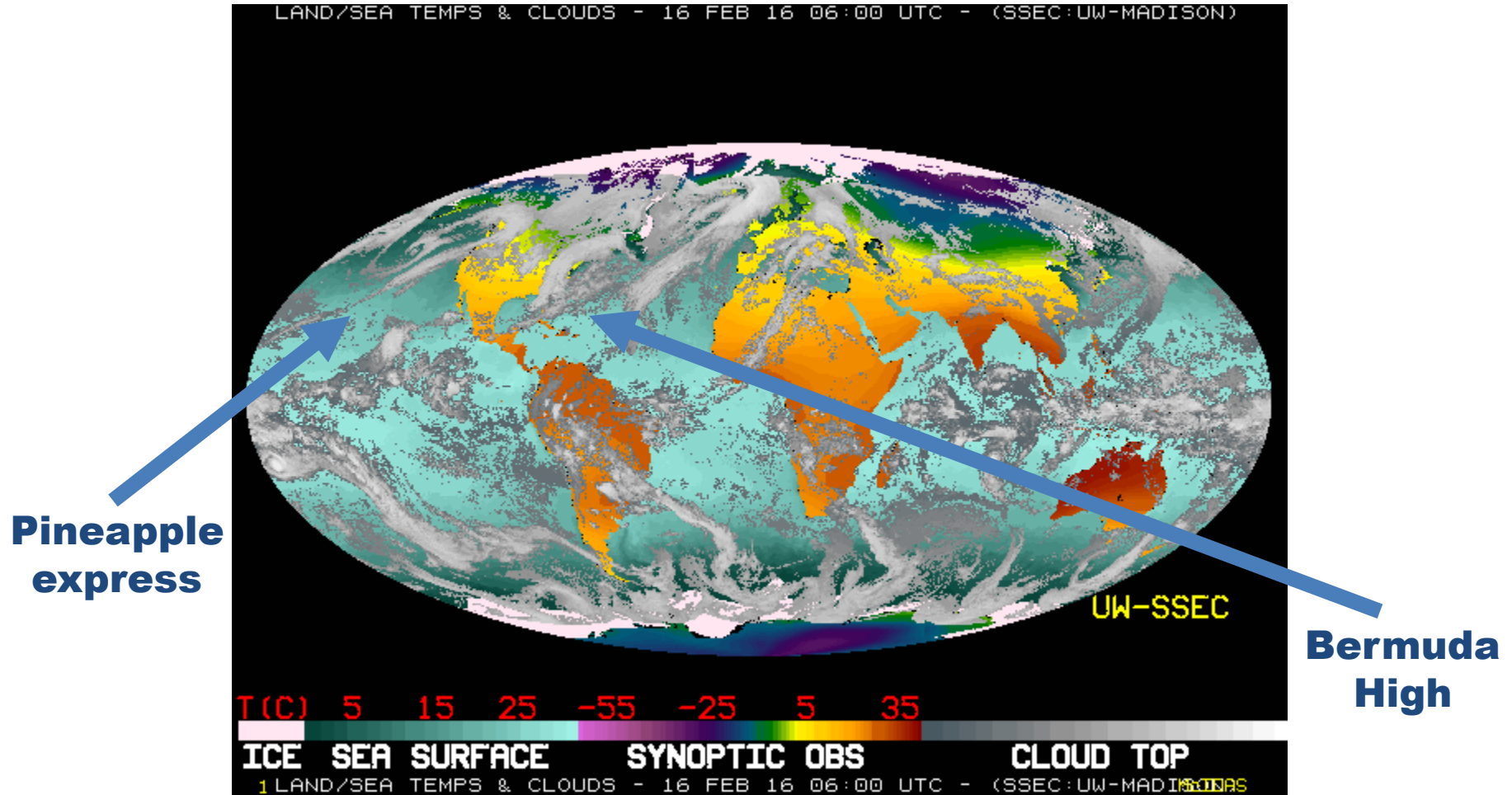


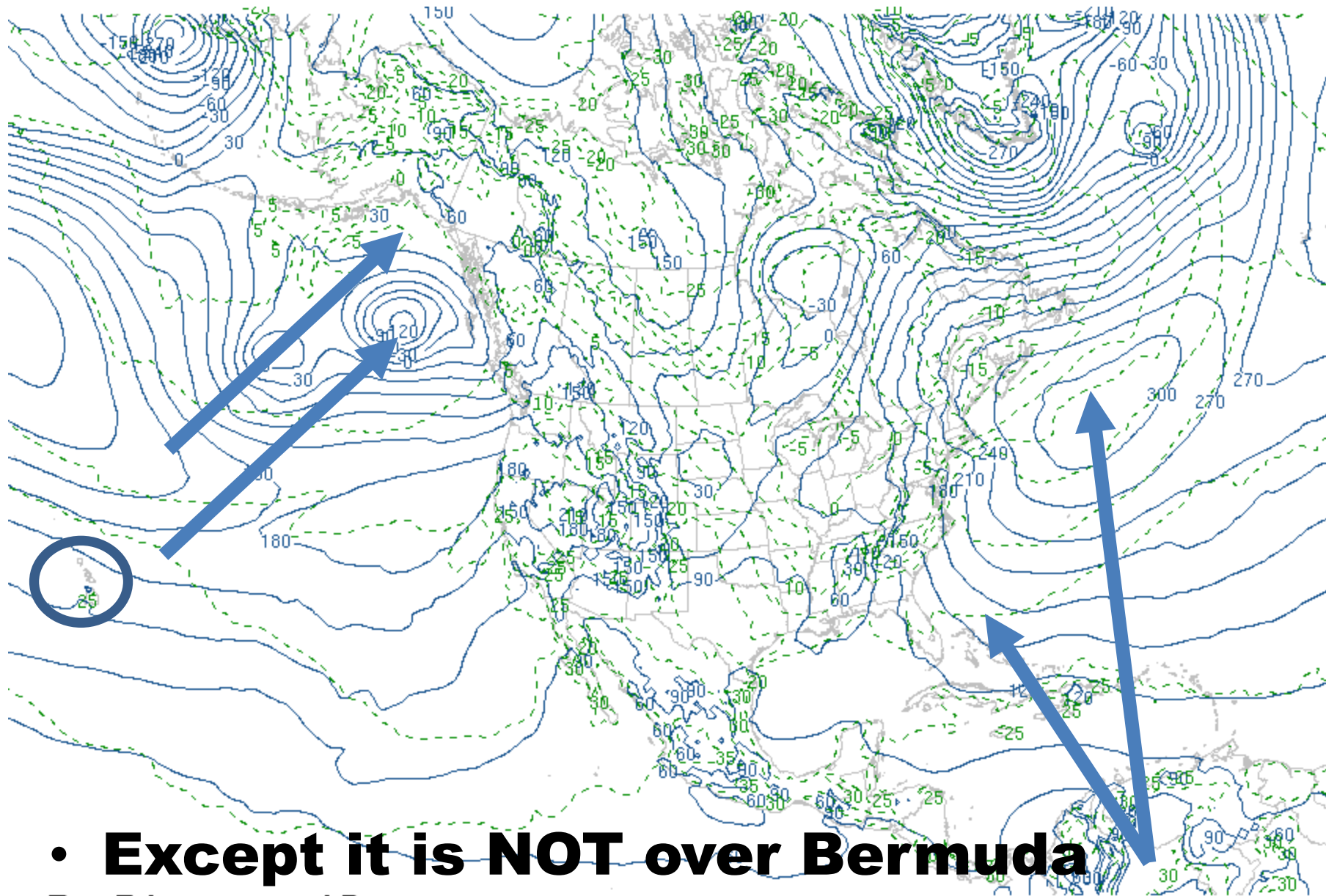
## La Niña : Extremes





# The Sea Controls the Weather



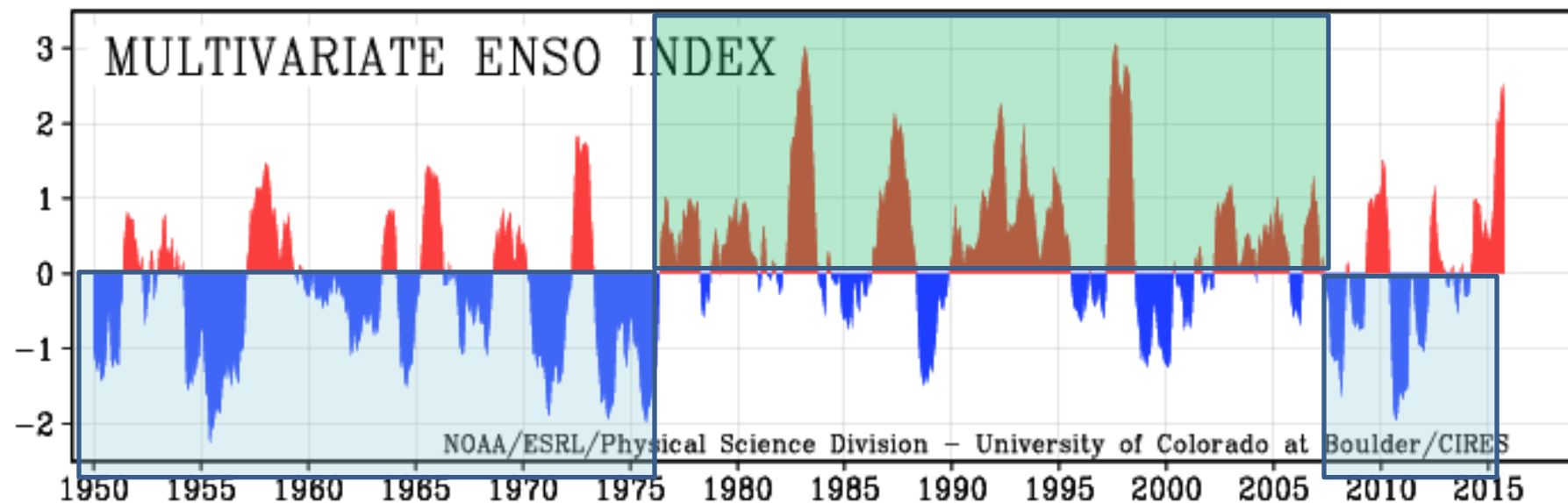


• **Except it is NOT over Bermuda**

00Z 16 Feb 2016 1000 hPa

University of Wyoming

Standardized Departure



El Nino



La Niña



**High risk**

**Moderate**



**High**

**Beyond**





U.S. DEPARTMENT OF COMMERCE, NATIONAL WEATHER SERVICE  
EASTERN NORTH PACIFIC HURRICANE TRACKING CHART

Preliminary

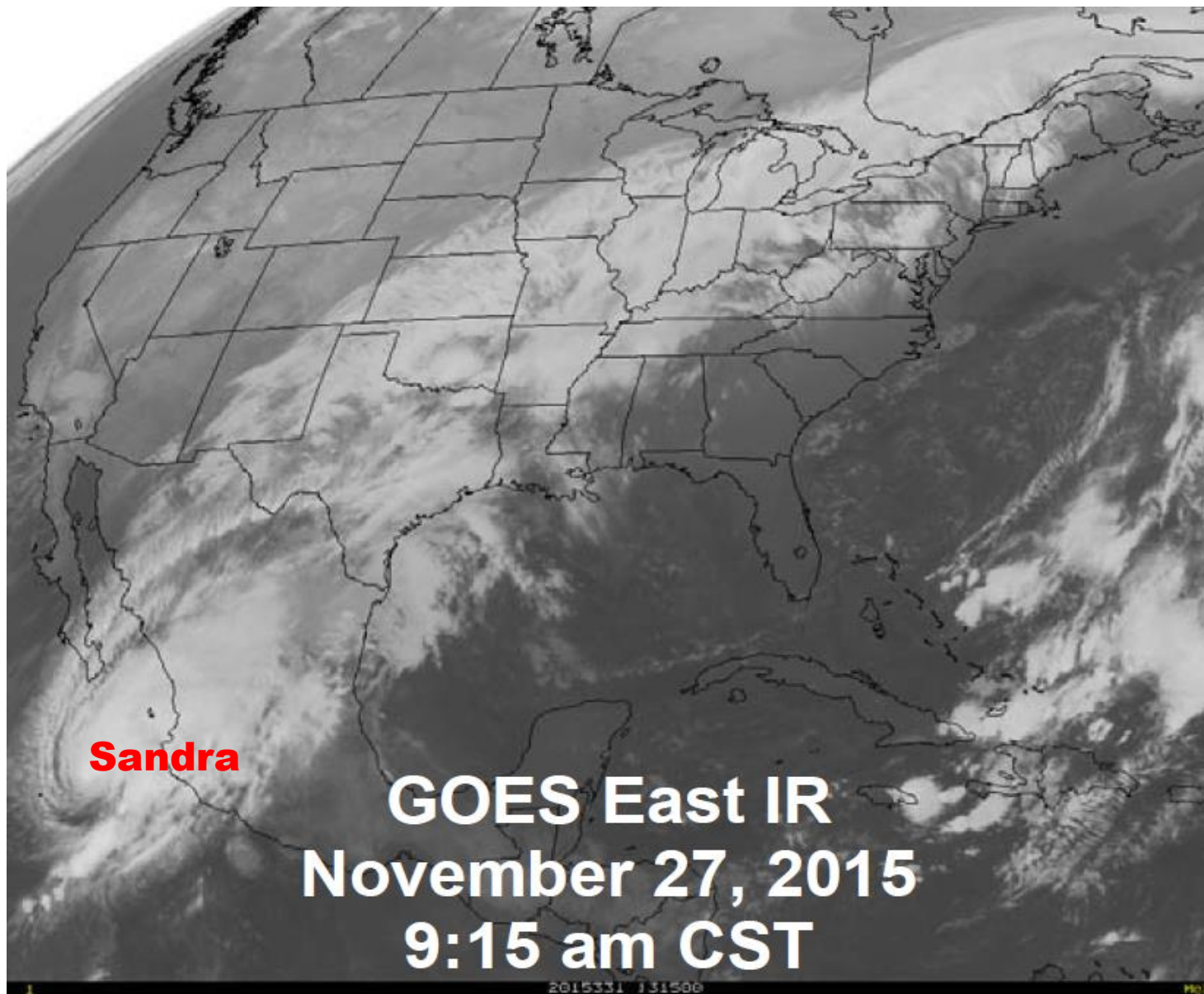
2016

NUMBER	NAME	DATE
1	JOE	SEP 19-20
2	JOE	SEP 21-22
3	JOE	SEP 23-24
4	JOE	SEP 25-26
5	JOE	SEP 27-28
6	JOE	SEP 29-30
7	JOE	SEP 31-OCT 1
8	JOE	OCT 2-3
9	JOE	OCT 4-5
10	JOE	OCT 6-7
11	JOE	OCT 8-9
12	JOE	OCT 10-11
13	JOE	OCT 12-13
14	JOE	OCT 14-15
15	JOE	OCT 16-17
16	JOE	OCT 18-19
17	JOE	OCT 20-21
18	JOE	OCT 22-23
19	JOE	OCT 24-25
20	JOE	OCT 26-27
21	JOE	OCT 28-29
22	JOE	OCT 30-31
23	JOE	NOV 1-2
24	JOE	NOV 3-4
25	JOE	NOV 5-6
26	JOE	NOV 7-8
27	JOE	NOV 9-10
28	JOE	NOV 11-12
29	JOE	NOV 13-14
30	JOE	NOV 15-16
31	JOE	NOV 17-18
32	JOE	NOV 19-20
33	JOE	NOV 21-22
34	JOE	NOV 23-24
35	JOE	NOV 25-26
36	JOE	NOV 27-28
37	JOE	NOV 29-30
38	JOE	DEC 1-2
39	JOE	DEC 3-4
40	JOE	DEC 5-6
41	JOE	DEC 7-8
42	JOE	DEC 9-10
43	JOE	DEC 11-12
44	JOE	DEC 13-14
45	JOE	DEC 15-16
46	JOE	DEC 17-18
47	JOE	DEC 19-20
48	JOE	DEC 21-22
49	JOE	DEC 23-24
50	JOE	DEC 25-26
51	JOE	DEC 27-28
52	JOE	DEC 29-30
53	JOE	DEC 31

Post Storm Analysis in progress

Legend:  
 - Tropical Depression  
 - Tropical Storm  
 - Hurricane  
 - Post Storm Analysis in progress  
 - Tropical Depression  
 - Tropical Storm  
 - Hurricane  
 - Post Storm Analysis in progress

NEUTRALIZATION PROJECTIONS  
 100% 100% 100% 100%  
 100% 100% 100% 100%

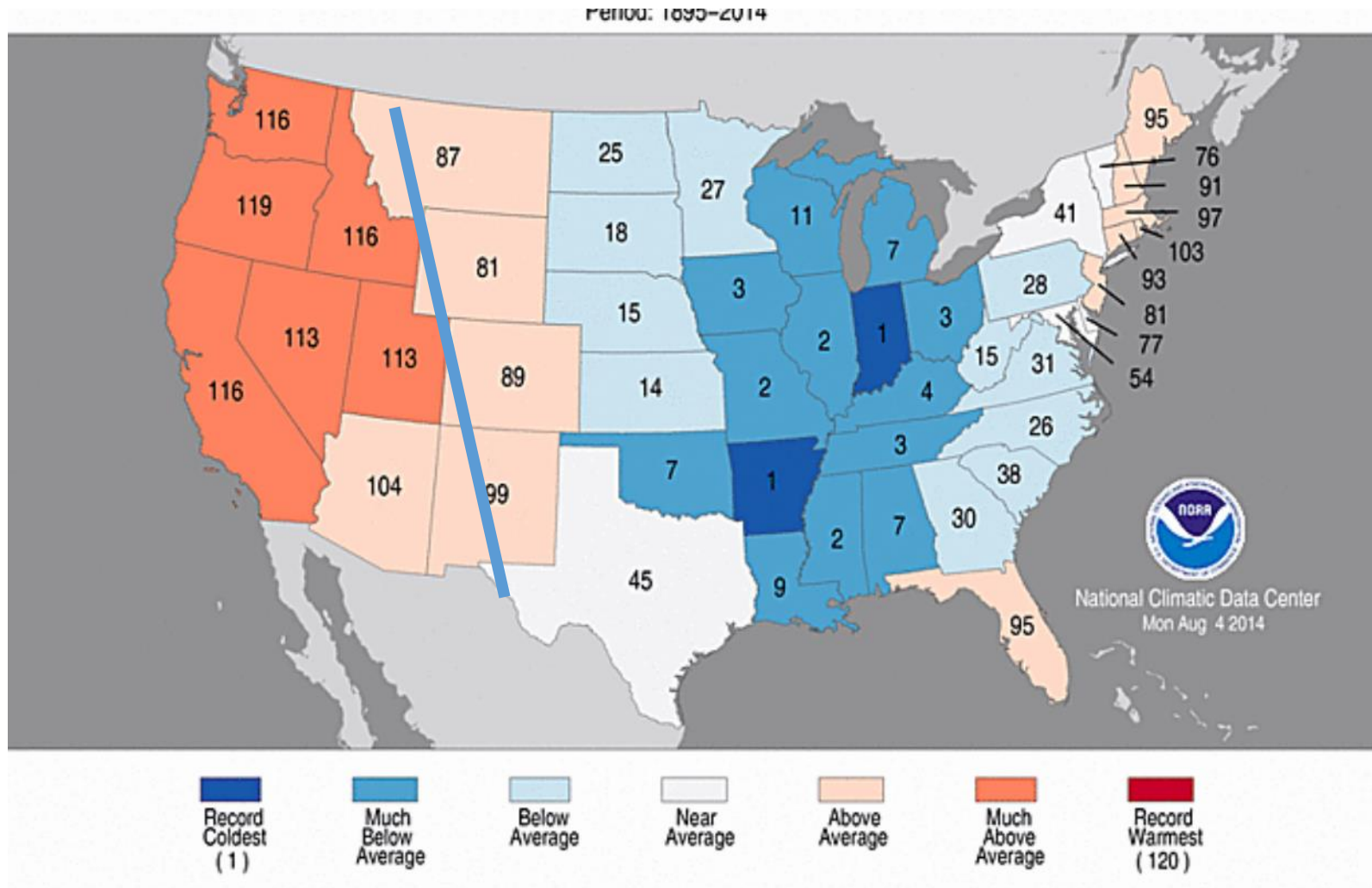


**Sandra**

**GOES East IR**  
**November 27, 2015**  
**9:15 am CST**

2015331 131500

**Often a bad weather year for Corn (Midwest)  
is a good weather year for NW Wheat**  
**a: Continental Divide effect**  
**b: El Nino/La Nina impact**





**AZ wet** WA dry **13/14**

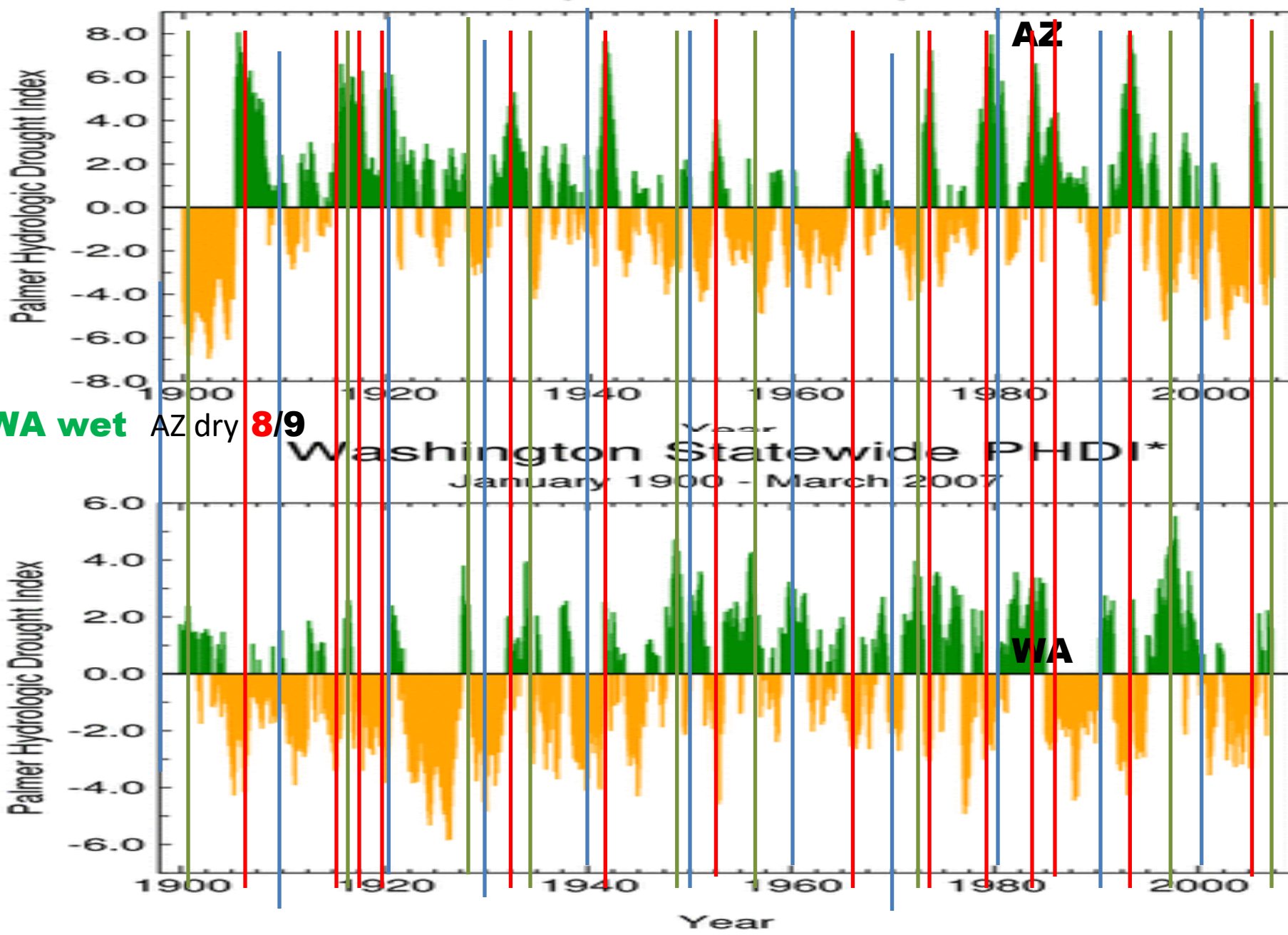
# Arizona Statewide PHDI\*

January 1900 - February 2007

**WA wet** AZ dry **8/9**

# Washington Statewide PHDI\*

January 1900 - March 2007

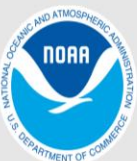
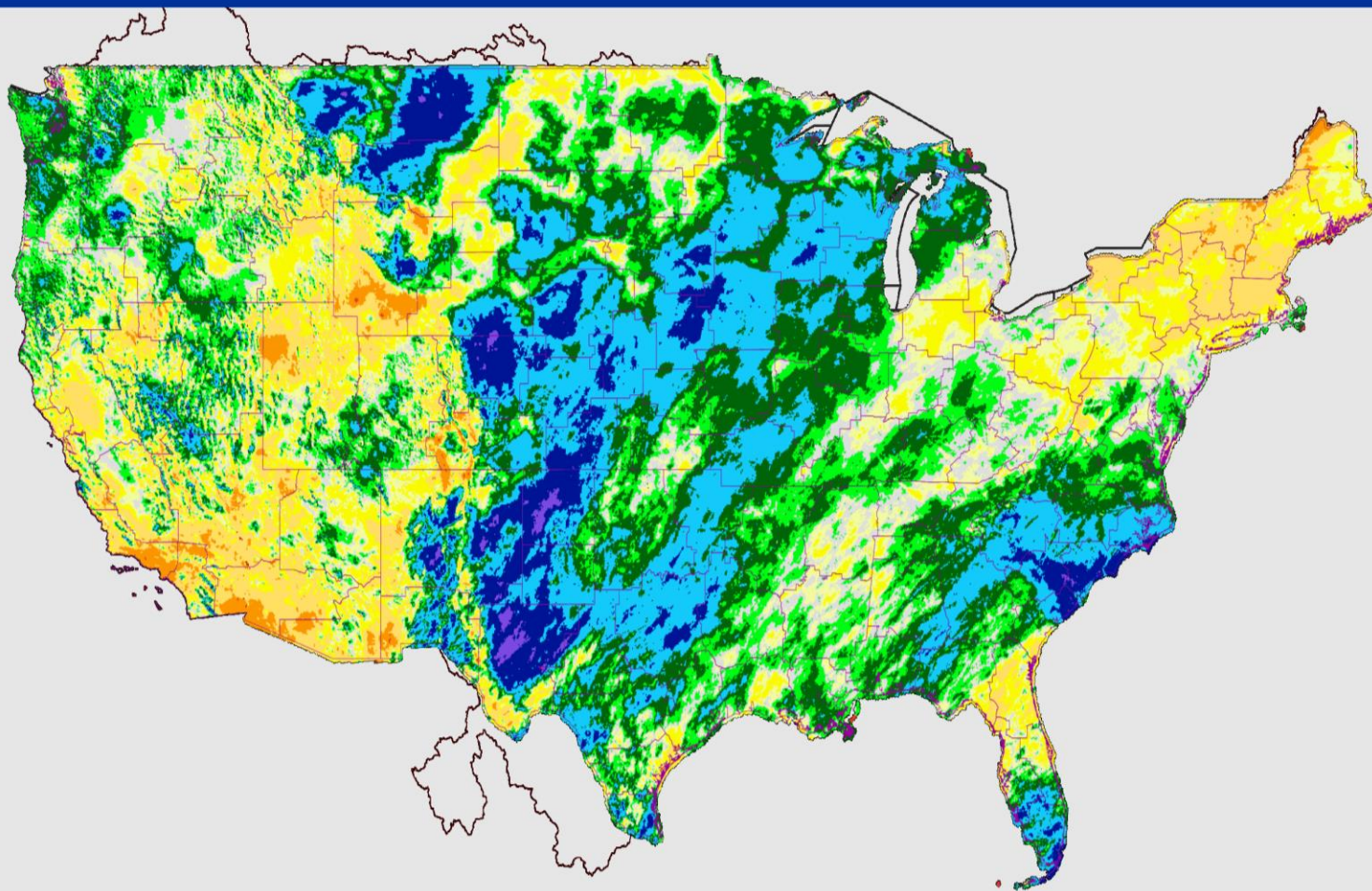




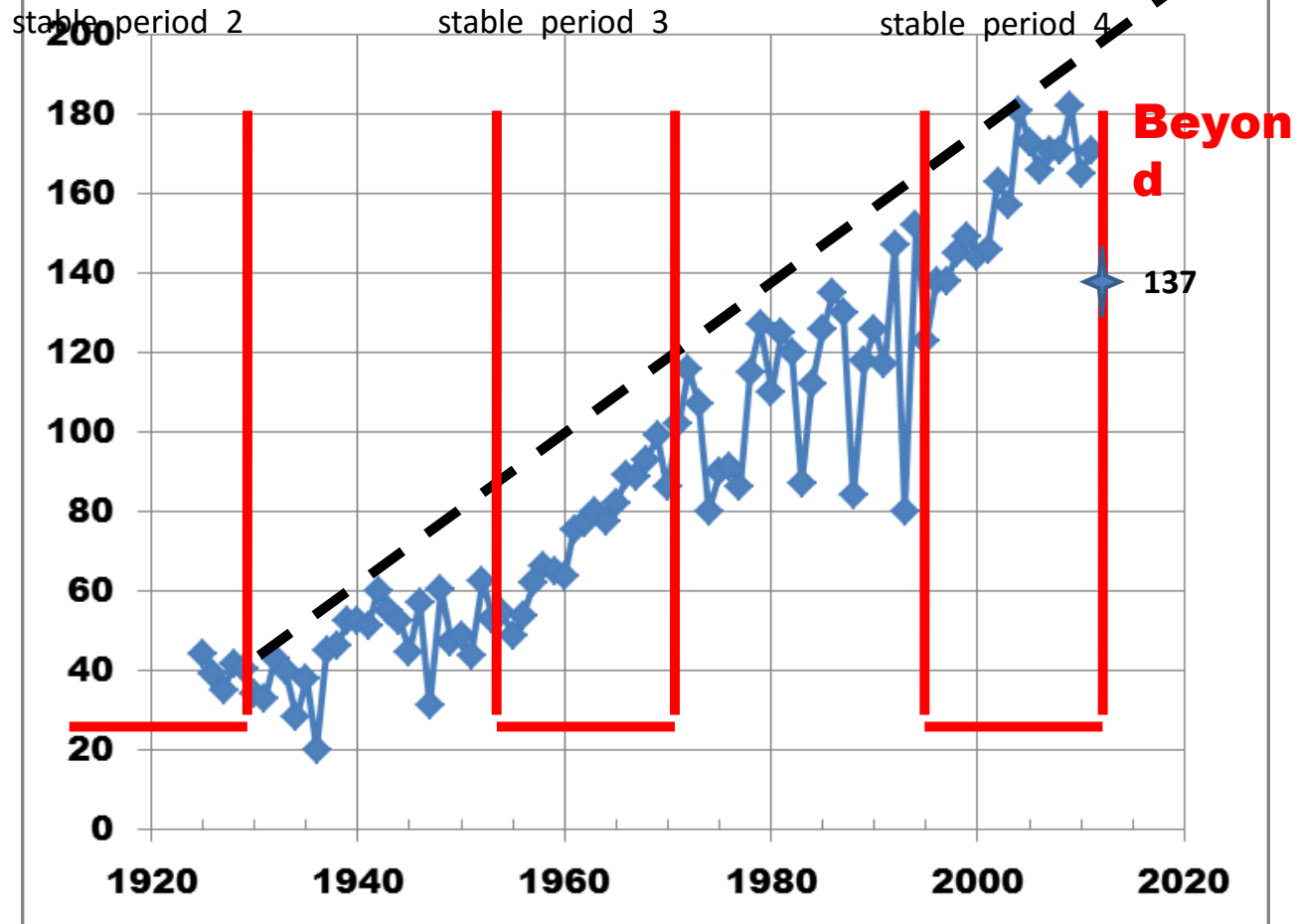
# February 15, 2016 Water Year to Date (Oct. 1) Percent Precipitation

Created on: February 15, 2016 - 19:38 UTC

Valid on: February 15, 2016 12:00 UTC

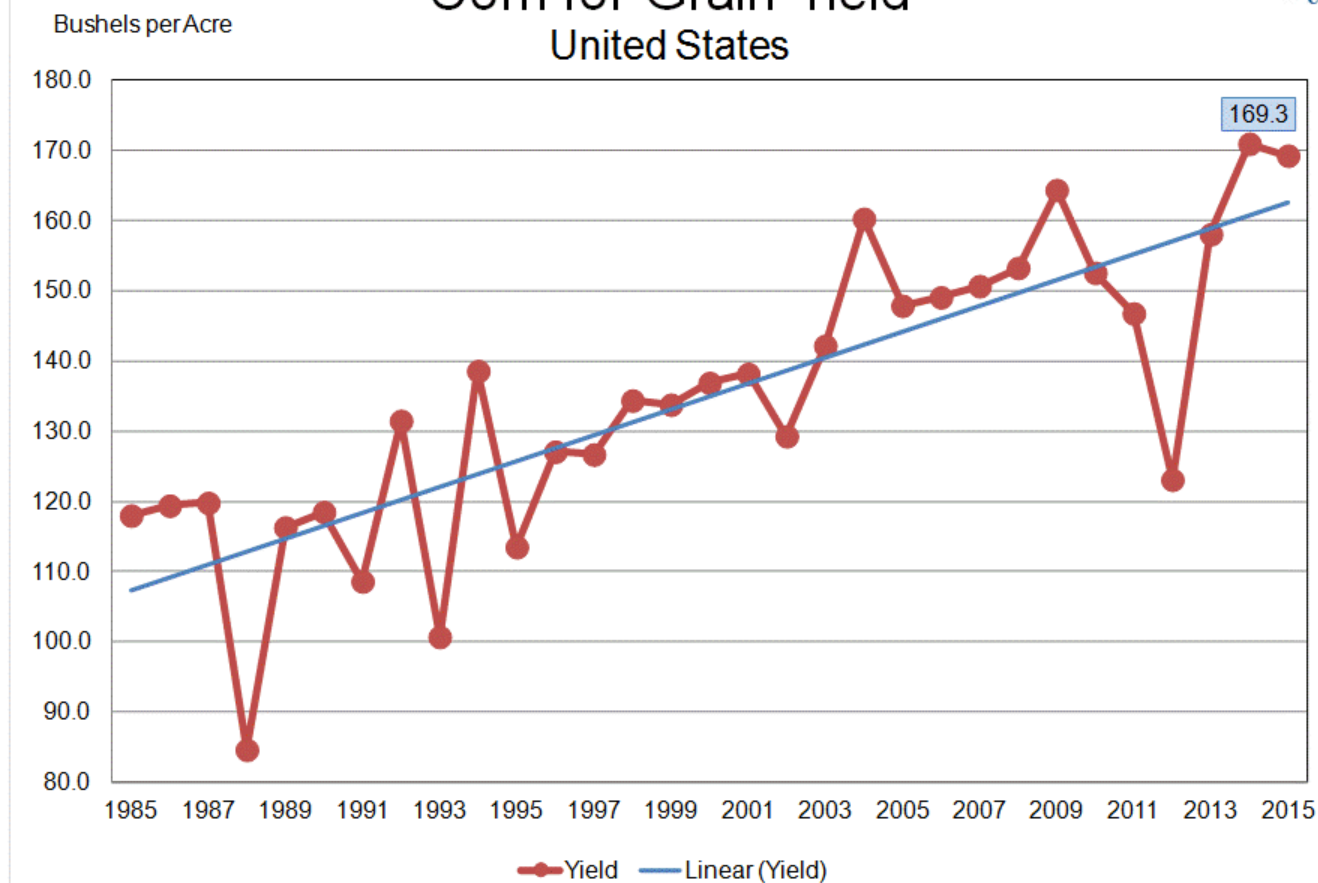


# Iowa Corn Yield 1925-2011





## Corn for Grain Yield United States

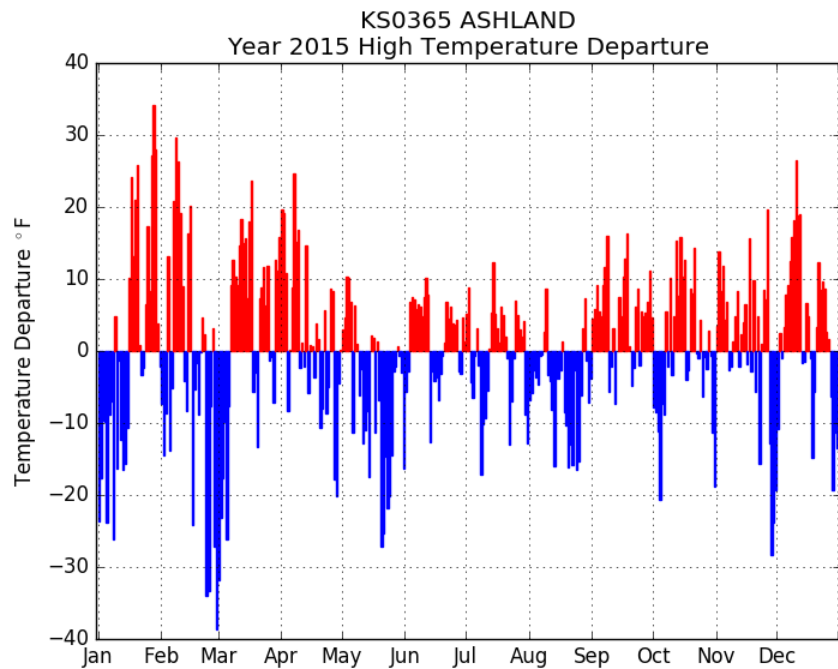


USDA-NASS  
11-10-15

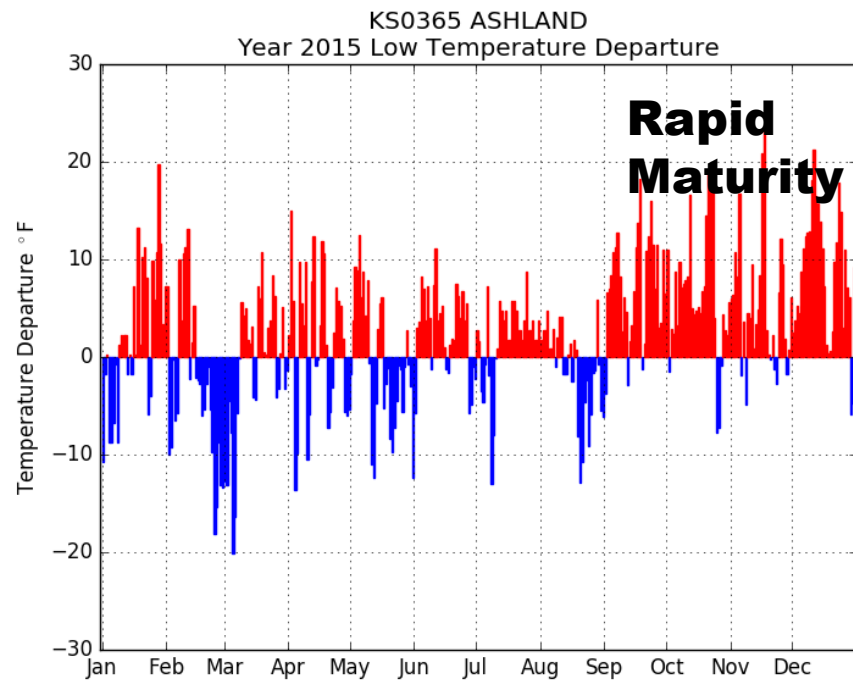
Year 2010 High Temperature Departure

Month	High Temperature Departure (°F)
Jan	-10
Feb	-25
Mar	-15
Apr	-5
May	5
Jun	15
Jul	25
Aug	35
Sep	45
Oct	55
Nov	65
Dec	75

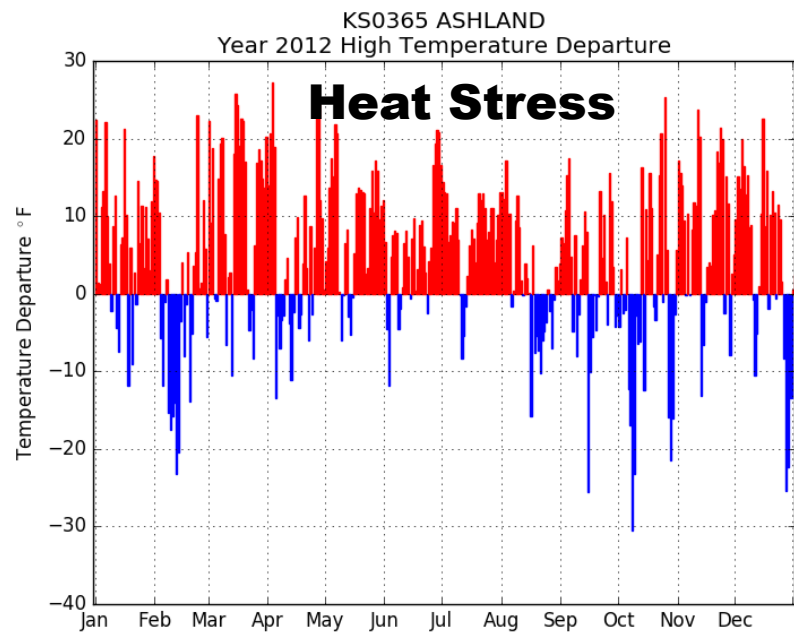
Plot Generated at 15 Feb 2016 9:11 PM in 0.90s



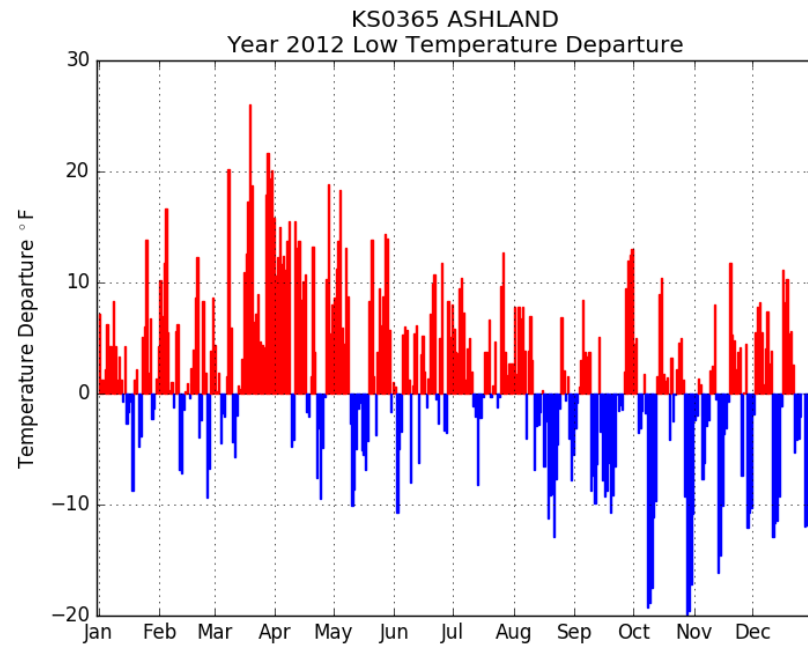
Plot Generated at 15 Feb 2016 9:13 PM in 3.92s



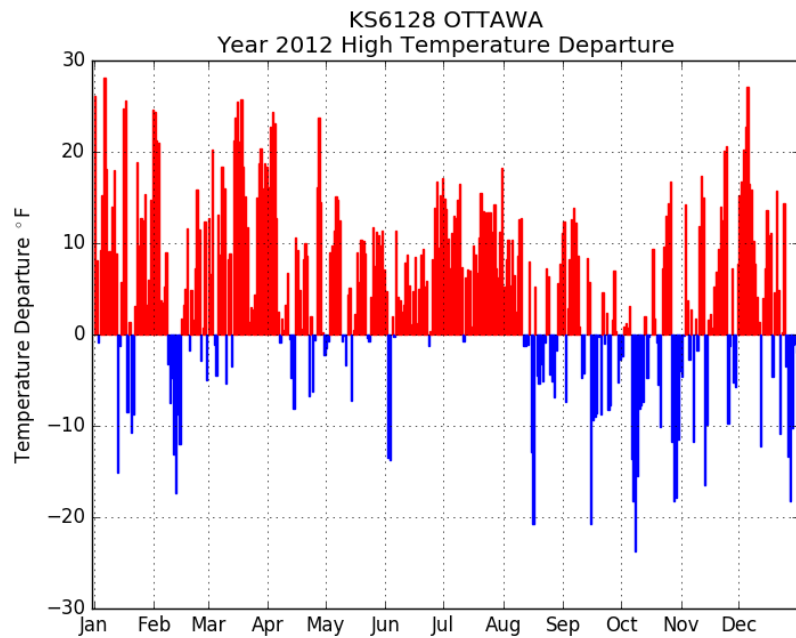
Plot G



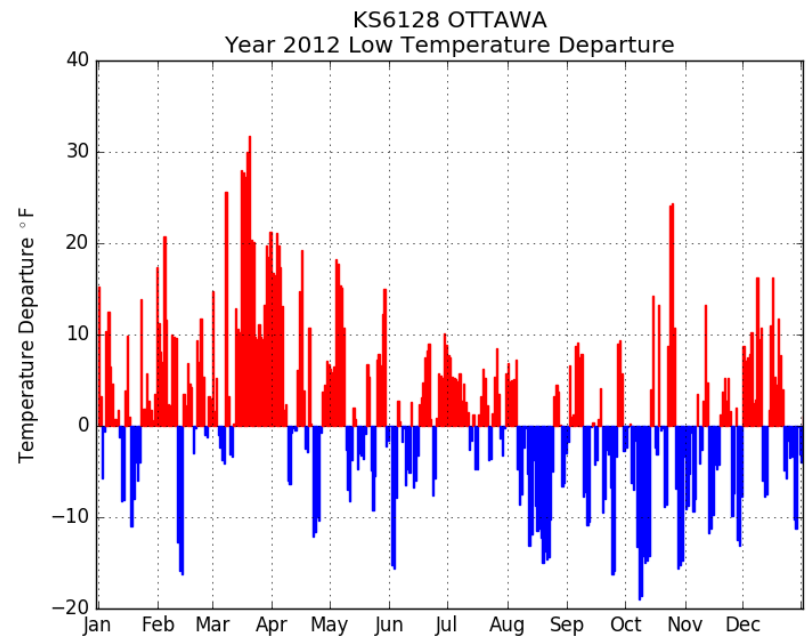
Plot Generated at 15 Feb 2016 9:19 PM in 1.19s



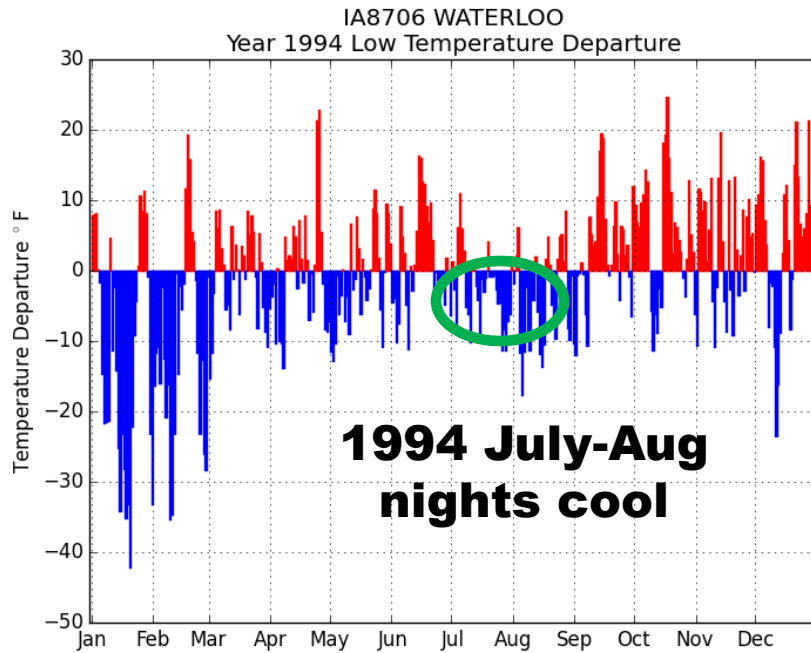
Plot Generated at 15 Feb 2016 9:18 PM in 2.12s



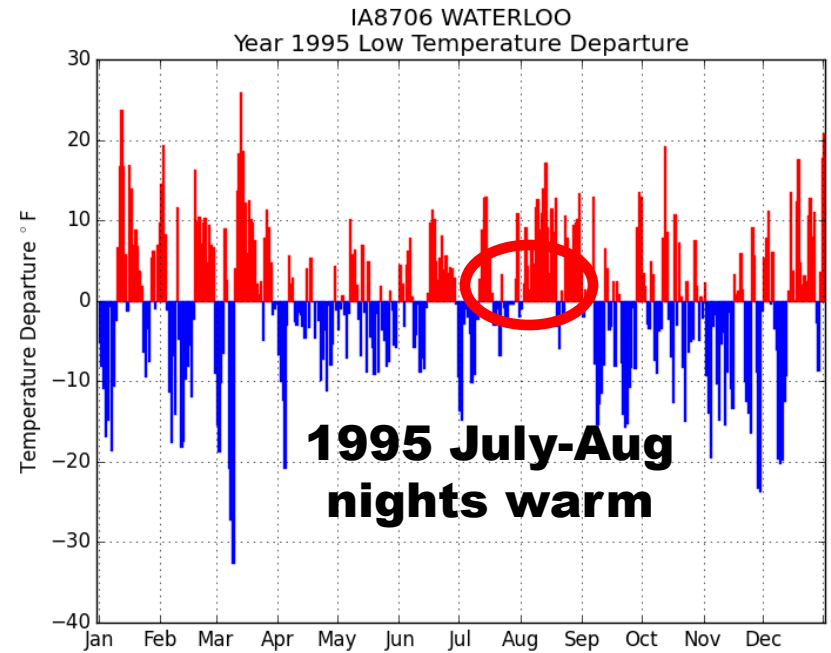
Plot Generated at 15 Feb 2016 9:24 PM in 0.93s



Plot Generated at 15 Feb 2016 9:25 PM in 1.31s



Plot Generated at 20 Jan 2016 8:34 PM in 1.27s



lot Generated at 20 Jan 2016 8:37 PM in 1.01s

- **1994 record high corn yield**
- **1995 almost as bad as a drought**

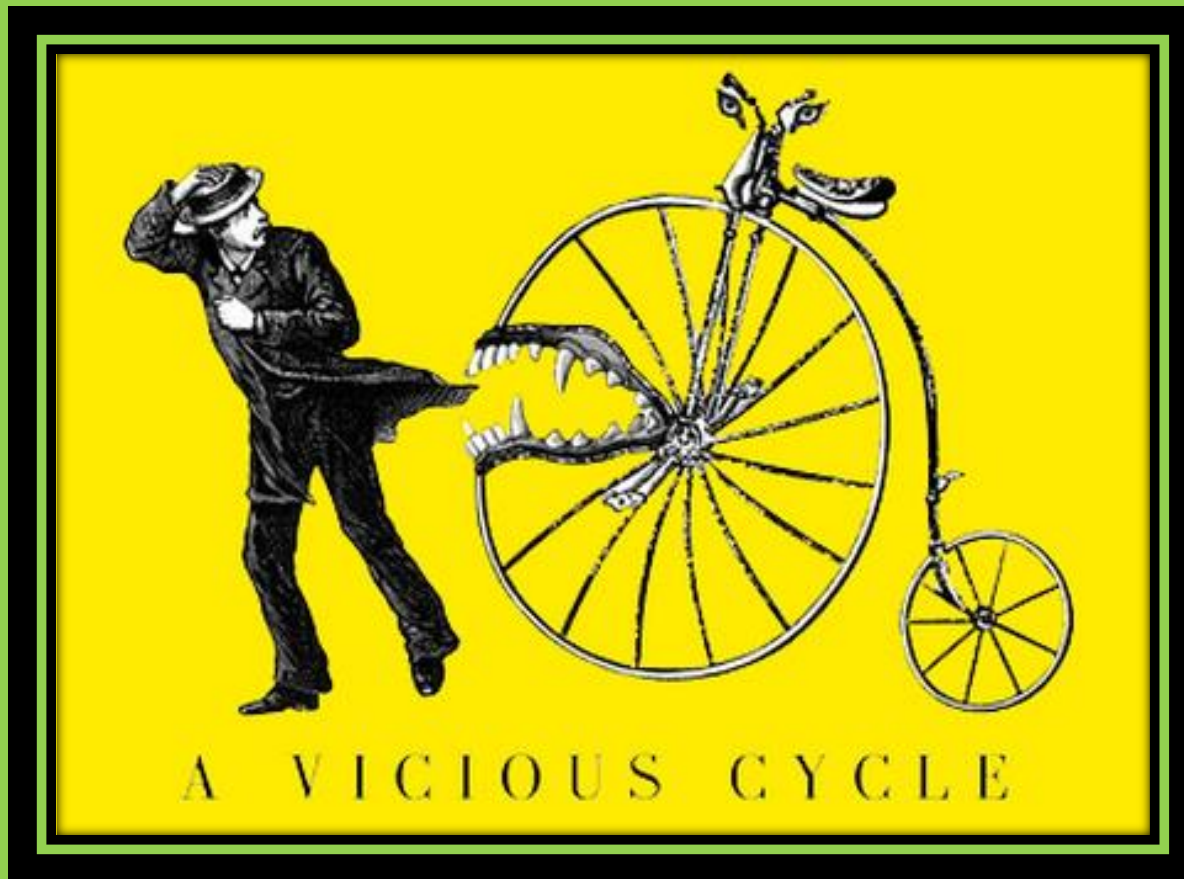
<http://mesonet.agron.iastate.edu/agweather/>

Automated Data Plotting



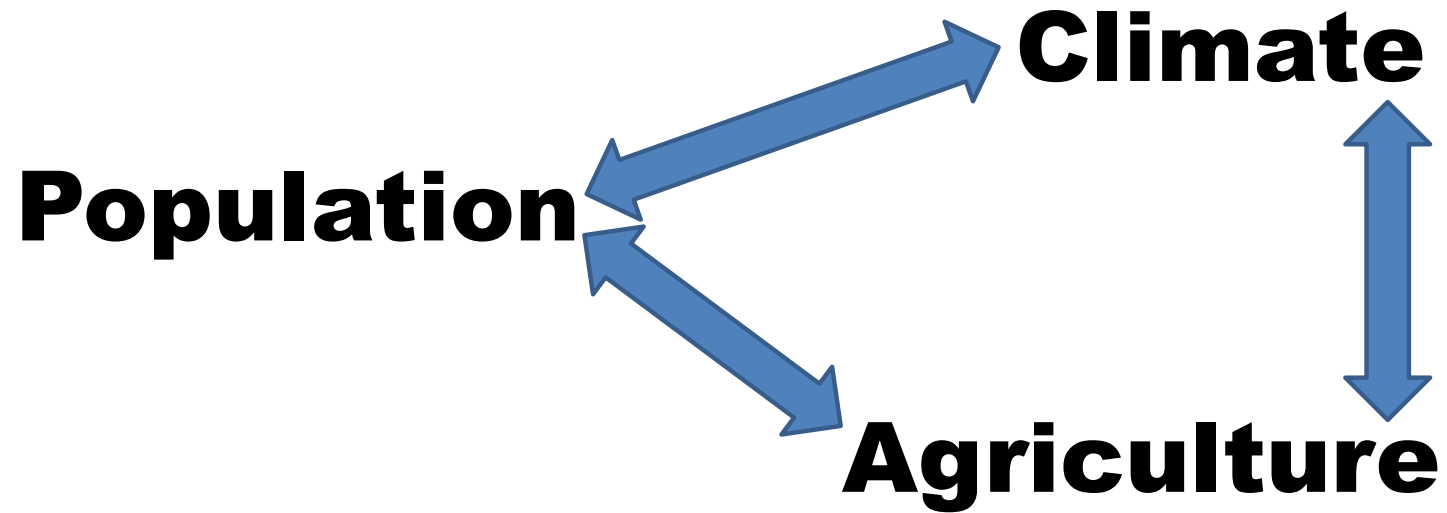
# Weather

- The Vicious Cycle --- breaking it will take us ALL





# **The VICIOUS CYCLE**

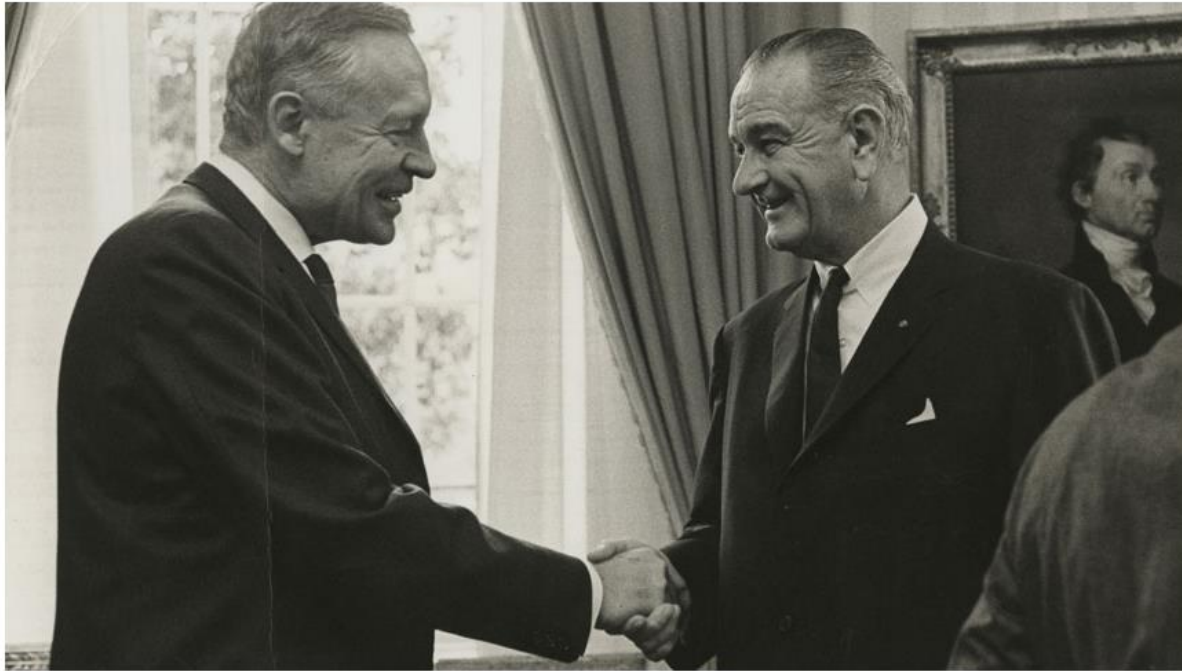


**Who will BREAK the CYCLE ?**

50  
*Years*

The image is a commemorative graphic for a 50th anniversary. It features a large, stylized number '50' in a thick orange font. The '0' is replaced by a realistic image of the Earth, showing the Americas and surrounding oceans and clouds. Below the '50', the word 'Years' is written in a grey, elegant script font. The entire graphic is set against a white background, which is itself centered on a solid green background.

## A 50th anniversary few remember: LBJ's warning on carbon dioxide



Fifty years ago this this month President Johnson's science advisors delivered the first warning about rising greenhouse gas emissions to a sitting president. On Feb. 8, he warned Congress about altering the atmosphere with carbon emissions. Above, climate scientist Roger Revelle shakes hands with Johnson in the Oval Office. Photo courtesy Roger Revelle Papers, Special Collections & Archives, University of California, San Diego.

**Feb. 2, 2015**

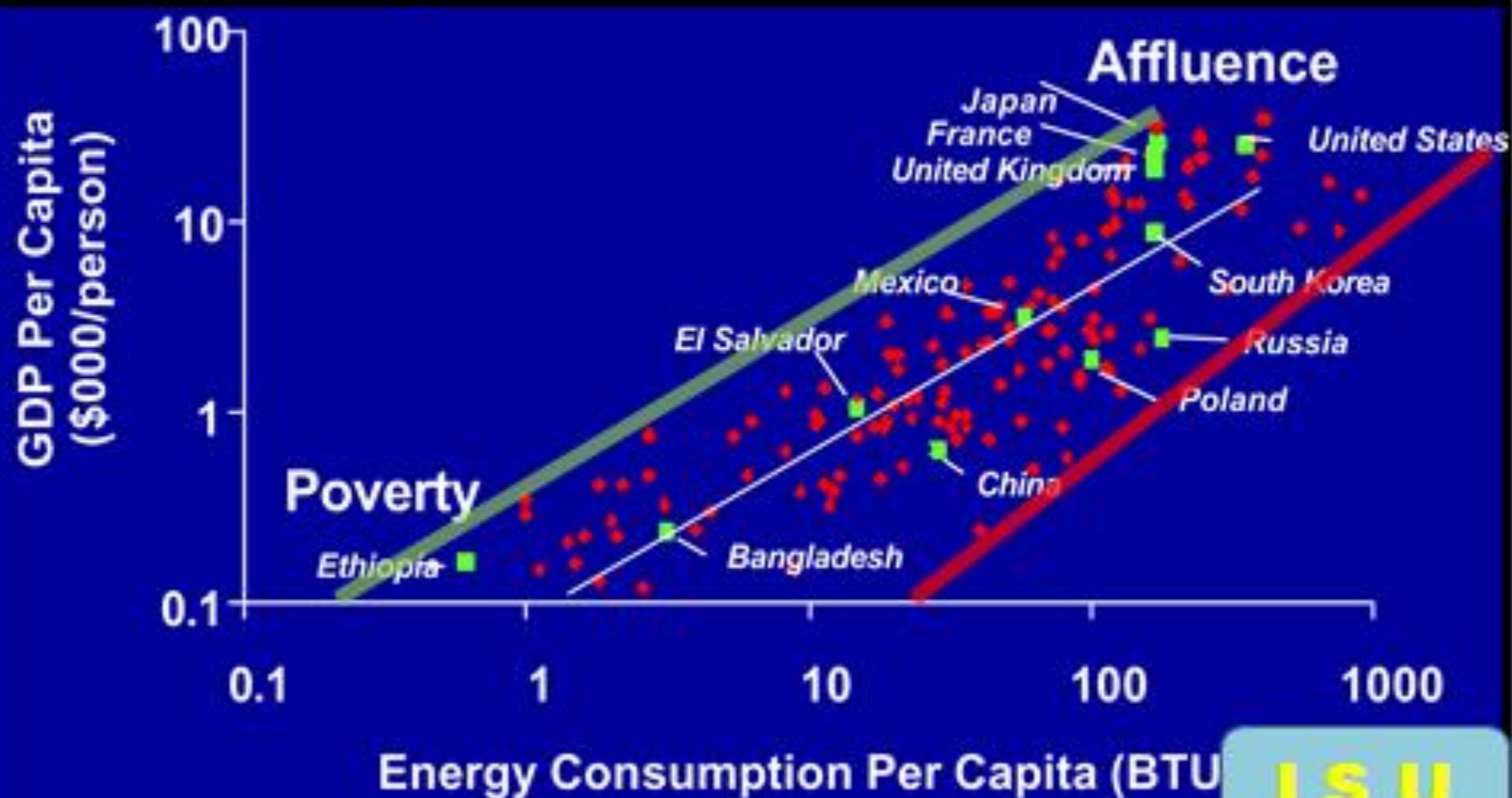
**Fifty years ago this month President Johnson voiced concern over invisible fossil fuel emissions in a special message to Congress. It was the first time a U.S. president warned the nation about our carbon habit.**

# • Feb 8<sup>th</sup> special session of congress

**This generation has altered the composition of the atmosphere on a global scale through radioactive materials and a steady increase in carbon dioxide from the burning of fossil fuels.**

**- President Lyndon B. Johnson, 1965**

## Global Energy Demand Rises When Income Rises



Source: Energy Information Administration, International Energy Annual 1998 Tables E1, B1, B2; Mike Chinn, 3/1/100. Gross Domestic Product per capita is for 1997 in 1990 dollars. Energy Consumption per capita is 1997.



# END



**Elwynn Taylor**  
**Iowa State University**  
**Climatologist**

# AZfeb2016Taylor

The changing climate: Precipitation change in 48 States per 100 yrs.  
The tools to manage risk: information, insurance...



