MANAGING DROUGHT

IN THE SOUTHERN PLAINS

January 12, 2012

Webinar Series Goals

- To improve communication among agencies and organizations in the Southern Plains who are being affected by the historic and exceptional drought
- To provide information on available resources and assistance to help monitor and manage drought
- To understand the impacts of drought in this region *from the perspective of those who are tasked with managing it*
- To document impacts that will help improve the weekly U.S. Drought Monitor assessment and our understanding of how drought impacts evolve and decay

Webinar Format

- 2nd and 4th Thursdays of each month at 11:00 a.m. Central Time
- Overview of regional drought conditions and outlook for next several weeks to months
  - led by the Drought Monitor authors
- Discussion Topic
  - Alternating between an impact type (wildfire, agriculture) and a resource (monitoring tools, assistance programs)
- Comments & Updates from State Climatologists
- Open-ended time for questions and comments
- Total Time Commitment: 45 minutes for presentations, as much time as needed for discussion
- Past webinars, summaries, and Federal/State Assistance links posted on the U.S. Drought Monitor, http://www.drought.gov in the Southern Plains Region. Webinars posted on Youtube: http://www.youtube.com/user/SCIPP01

Texas

John Nielsen-Gammon, State Climatologist

Oklahoma 2011: A Year of Extremes

Gary McManus
Associate State Climatologist
Oklahoma Climatological Survey

FEMA Declared Disasters (2000-Sep. 2011)

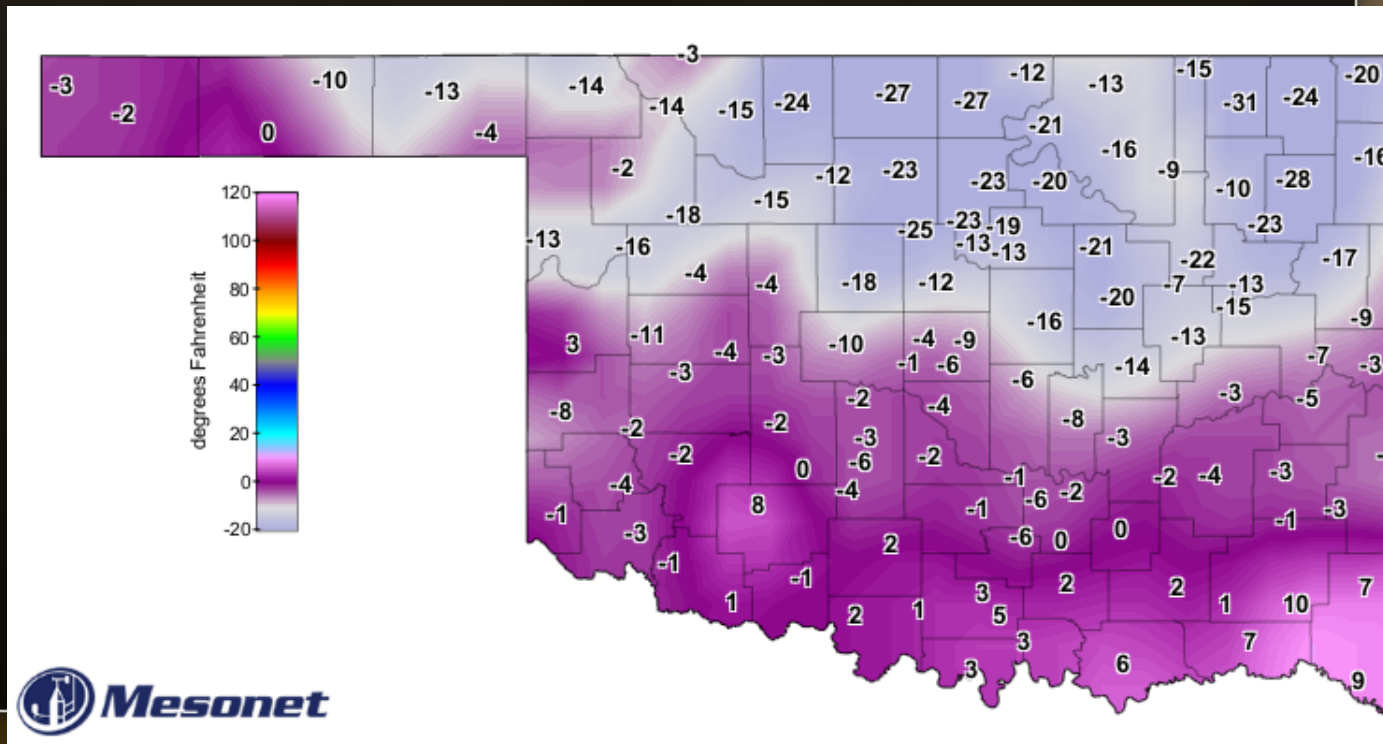
State	Disaster Declarations
Oklahoma	32
Missouri	25
Kansas	24
New York	24
Kentucky	23
Nebraska	22
Alabama	21
Florida	21
Tennessee	21
Arkansas	20

Snowstorms

- January 29-31: Blizzard, 21” in NE
- February 8-9: 27” of snow at Spavinaw
  - New all-time state record 24-hour snowfall
  - Just broken in late-March 2009 with 26”!!
- December Panhandle blizzard: drifts of 10’

February 10: Record Cold

- Lowest temperature ever recorded in Oklahoma
  - -31 degrees from Nowata Mesonet site
  - Previous record was -27 degrees!!



Tornadoes

- Second most on record – 118
  - 145 in 1999 is #1
- 50 tornadoes in April, new record
  - Old record, 40 from 1957
- 14 deaths, most since 1999 (42)
- 10 November tornadoes (second highest)
  - Record, 1958's 12
  - Nov. 7 EF-4, strongest Nov. tornado on record

- May 24: EF-5 tornado near El Reno
  - El Reno Mesonet site recorded 151 mph wind
  - Highest Oklahoma surface wind ever recorded (by anemometer)

- Largest hailstone in Oklahoma history
  - 6” in diameter
  - May 23rd near Gotebo

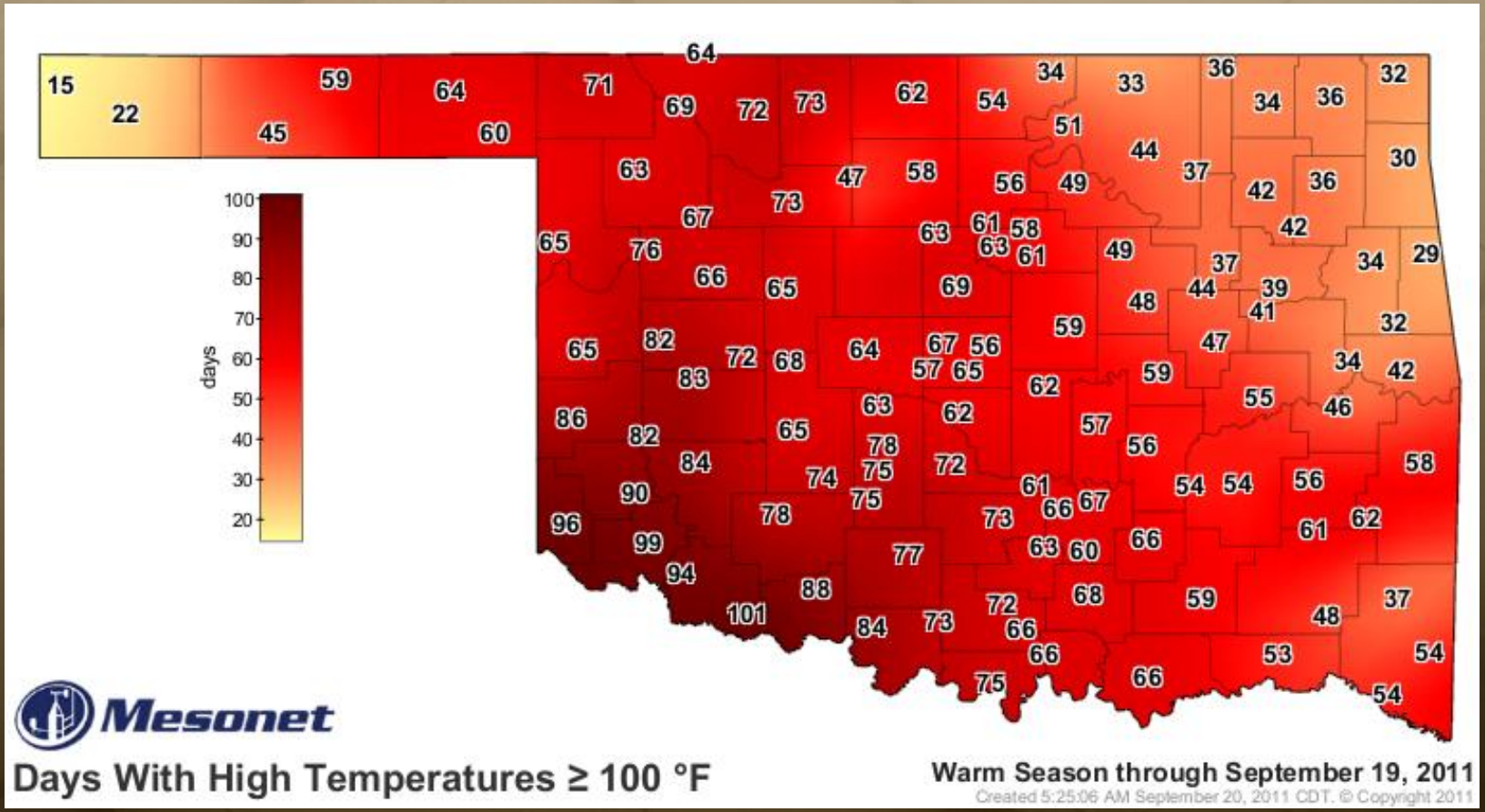
Hottest month on record for any state (1895-2011)

State	Month/Year	Statewide Avg. Temp.
Oklahoma	**July 2011**	**89.3**
Oklahoma	July 1954	88.1
Texas	August 2011	88.1
Oklahoma	July 1980	87.4
Oklahoma	July 1934	87.3

Hottest summer on record for any state (1895-2011)

State	Year	Statewide Avg. Temp.
Oklahoma	2011	86.8
Texas	2011	86.7
Oklahoma	1934	85.2
Louisiana	2011	84.8
Oklahoma	1936	84.4
Oklahoma	1980	84.3
Louisiana	1998	84.3
Texas	1980	84.3
Texas	1998	84.3
Oklahoma	1954	84.2
Texas	1934	84.2

Days above 100° record SMASHED!



Previous record: 86 days (Hollis 1956)

- Drought began October 2010
- Relief for eastern OK in April/May 2011
- Peaked in September
  - 93% of state covered by D3-D4 drought
- Driest water year (Oct 2010-Sep 2011) on record for west
- 2011 was 11th driest on record
- $1.6-2.0 billion in agricultural damage
- Great relief October-December
  - 12th wettest November
  - 9th wettest November-December

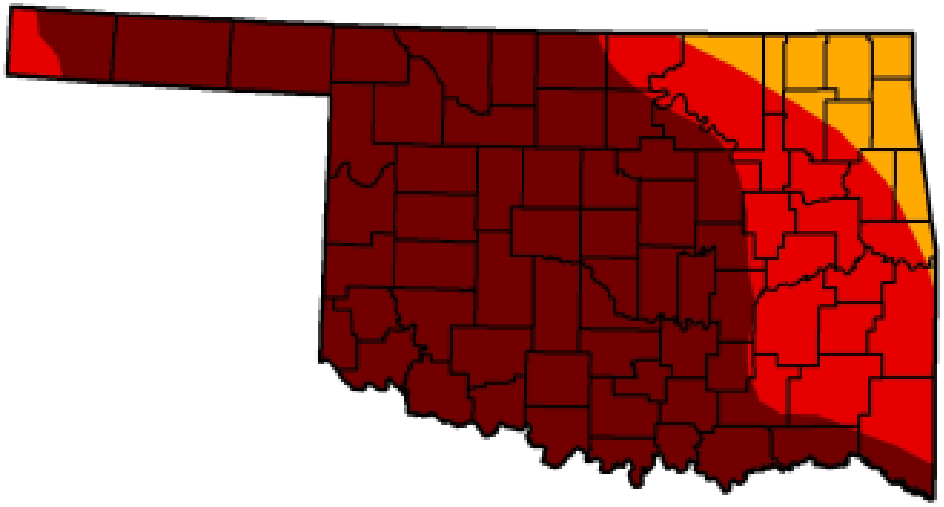
U.S. Drought Monitor

September 13, 2011
Valid 7 a.m. EST

Oklahoma

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	100.00	92.59	68.93
Last Week (09/06/2011 map)	0.00	100.00	100.00	100.00	85.44	69.15
3 Months Ago (06/14/2011 map)	22.11	77.89	57.87	41.76	33.53	10.32
Start of Calendar Year (12/28/2010 map)	13.82	86.18	47.90	1.50	0.00	0.00
Start of Water Year (09/28/2010 map)	66.28	33.72	4.21	0.00	0.00	0.00
One Year Ago (09/07/2010 map)	42.33	57.67	35.75	0.00	0.00	0.00



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

USDA National Drought Mitigation Center

Released Thursday, September 15, 2011
Mark Svoboda, NDMC

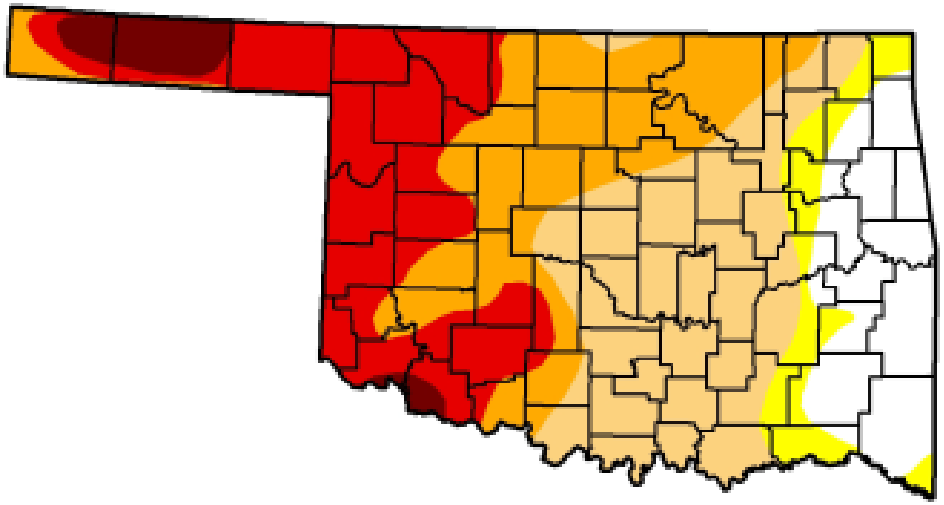
U.S. Drought Monitor

January 3, 2012
Valid 7 a.m. EST

Oklahoma

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	14.83	85.17	78.76	50.55	27.48	3.78
Last Week (12/27/2011 map)	14.83	85.17	78.76	50.55	27.48	3.33
3 Months Ago (10/04/2011 map)	0.00	100.00	100.00	100.00	78.97	69.82
Start of Calendar Year (12/27/2011 map)	14.83	85.17	78.76	50.55	27.48	3.33
Start of Water Year (09/27/2011 map)	0.00	100.00	100.00	100.00	78.97	66.42
One Year Ago (12/28/2010 map)	13.82	86.18	47.90	1.50	0.00	0.00



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http://droughtmonitor.unl.edu

Released Thursday, January 5, 2012
Brad Rippey, U.S. Department of Agriculture

Don’t forget earthquakes!

Thanks!

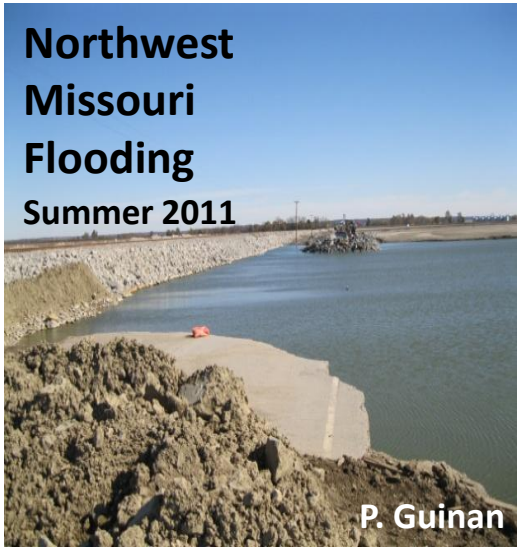
gmcmanus@mesonet.org
(405) 325-2253

Kansas

Mary Knapp, State Climatologist

Missouri

Pat Guinan, State Climatologist



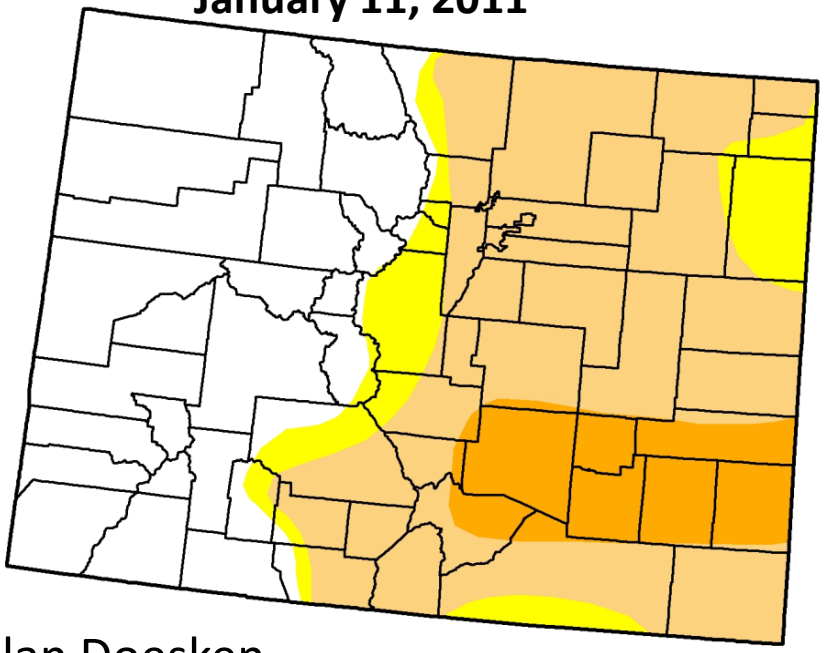
Heat Wave & Drought
Summer 2011

Colorado

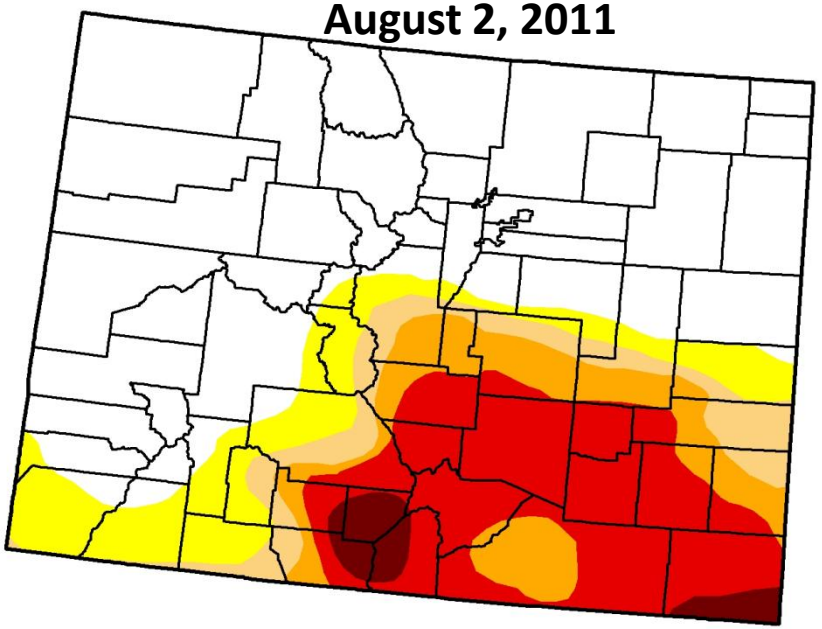
Nolan Doesken, State Climatologist

Recent Evolution of Drought Conditions in Colorado

January 11, 2011

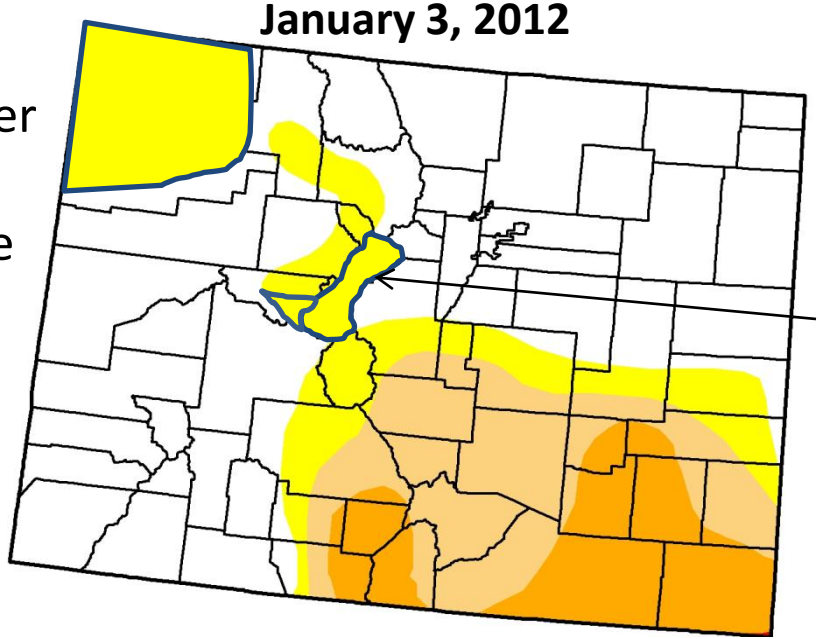


August 2, 2011



Nolan Doesken
State Climatologist
Colorado Climate Center
Dept. of Atmospheric Science, Colorado State University

January 3, 2012



Blue outline is January 10, 2012 D0 addition

Regional Drought Monitor Update

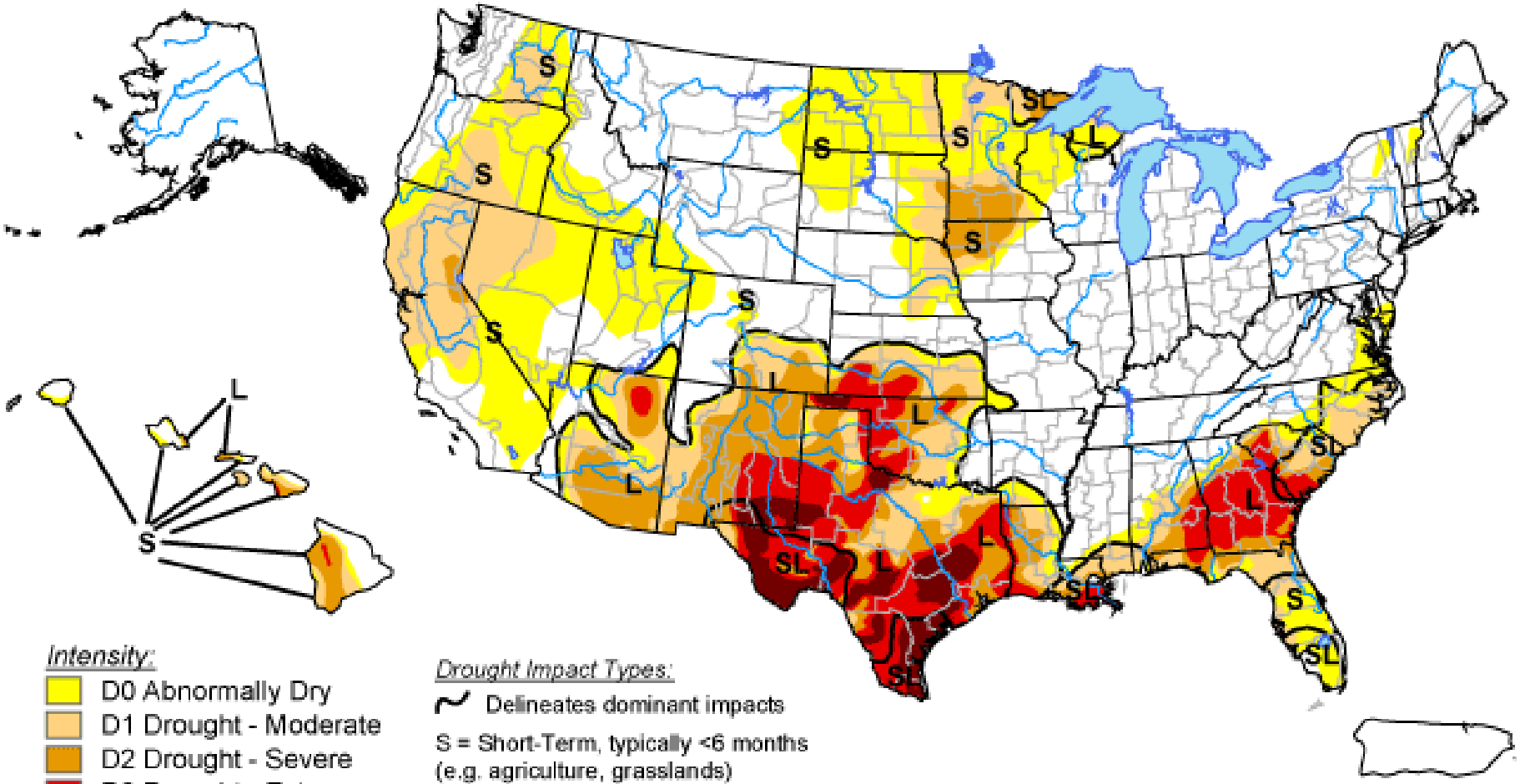
Mark Svoboda, Climatologist
Monitoring Program Area Leader

National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln

SCIPP/NIDIS Drought Webinar Series, January 12, 2012

U.S. Drought Monitor

January 10, 2012
Valid 7 a.m. EST



Intensity:
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

Delineates dominant impacts

S = Short-Term, typically <6 months (e.g. agriculture, grasslands)

L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Released Thursday, January 12, 2012

Author: Laura Edwards, WRCC, South Dakota State University

http://droughtmonitor.unl.edu/

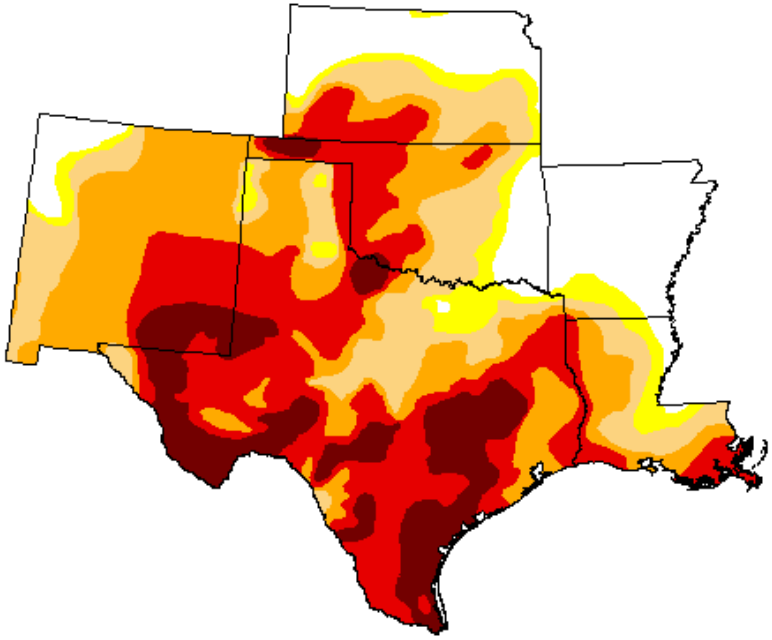
U.S. Drought Monitor

January 10, 2012
Valid 7 a.m. EST

South Central United States

Drought Conditions (Percent Area)

	None	D0 - D4	D1 - D4	D2 - D4	D3 - D4	D4
Current	16.93	83.07	76.75	60.46	36.80	12.37
Last Week (1/3/2012)	16.73	83.68	78.40	61.85	39.00	15.63
3 Months Ago (10/11/2011)	3.77	96.23	90.33	81.05	66.45	45.61
1 Year Ago (1/11/2011)	13.87	86.13	57.08	20.21	7.74	0.00



Intensity:

- D0 - Abnormally Dry
- D1 - Drought Moderate
- D2 - Drought Severe
- D3 - Drought Extreme
- D4 - Drought Exceptional

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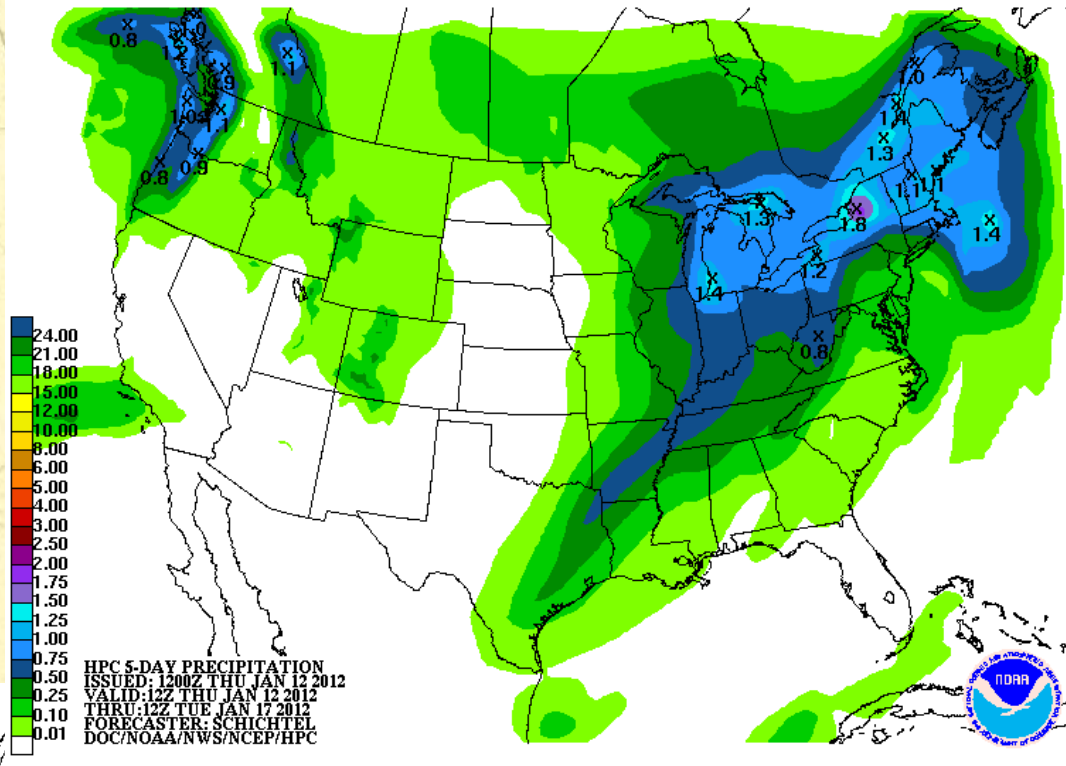
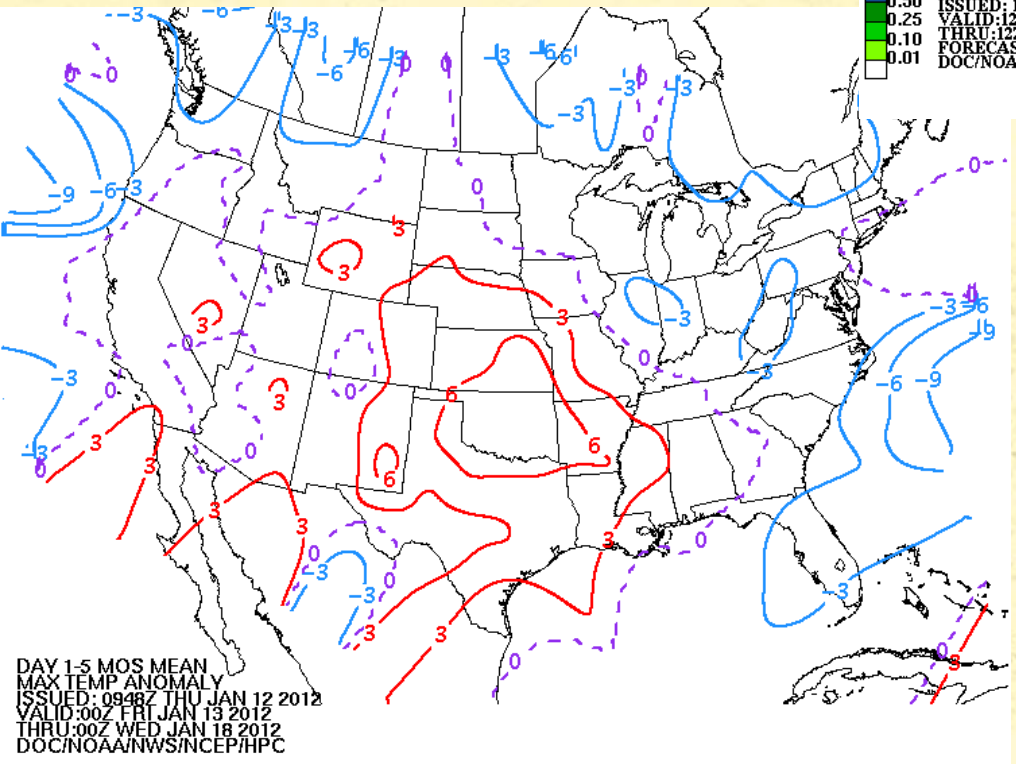
http://droughtmonitor.unl.edu

Released Thursday, January 12, 2012

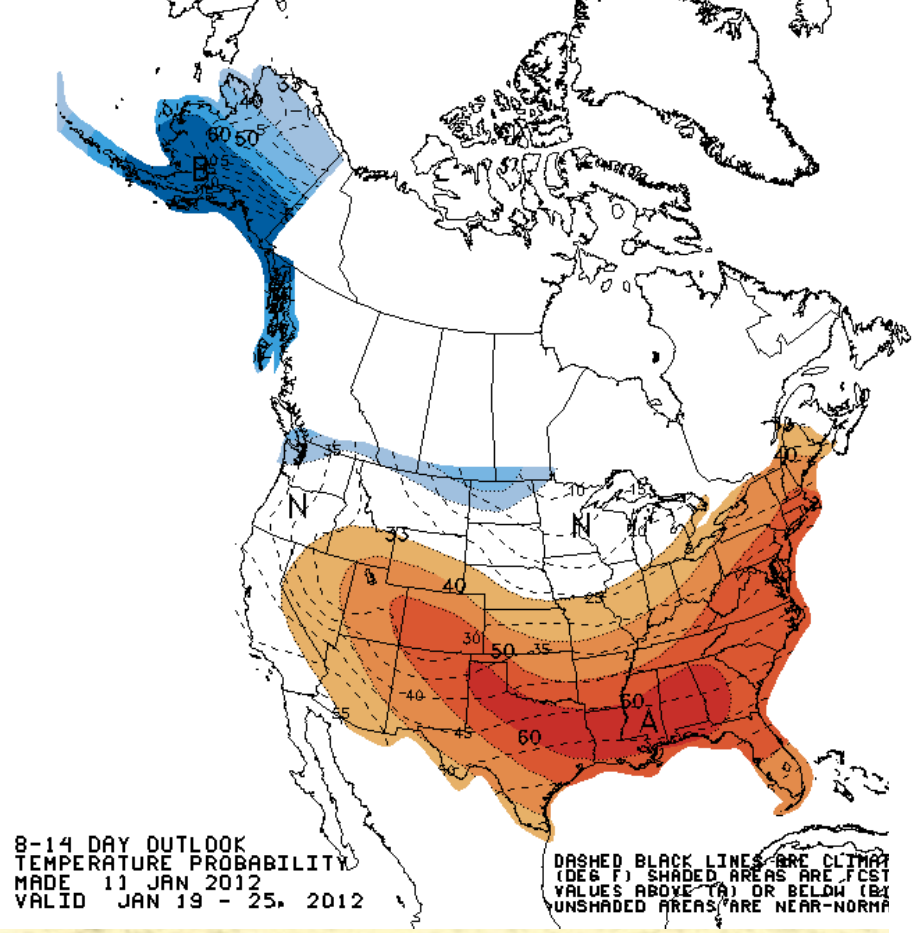
Laura Edwards, Western Regional Climate Center and South Dakota State University

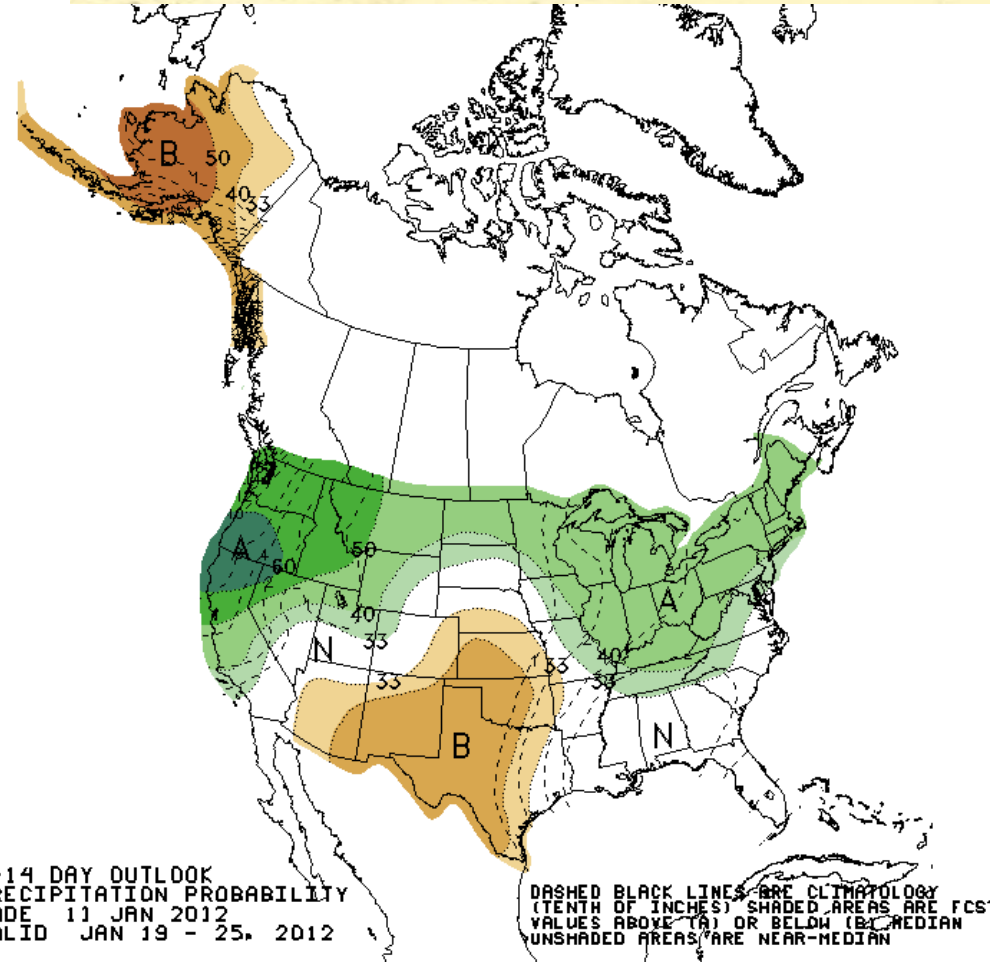
HPC 5-Day Outlook

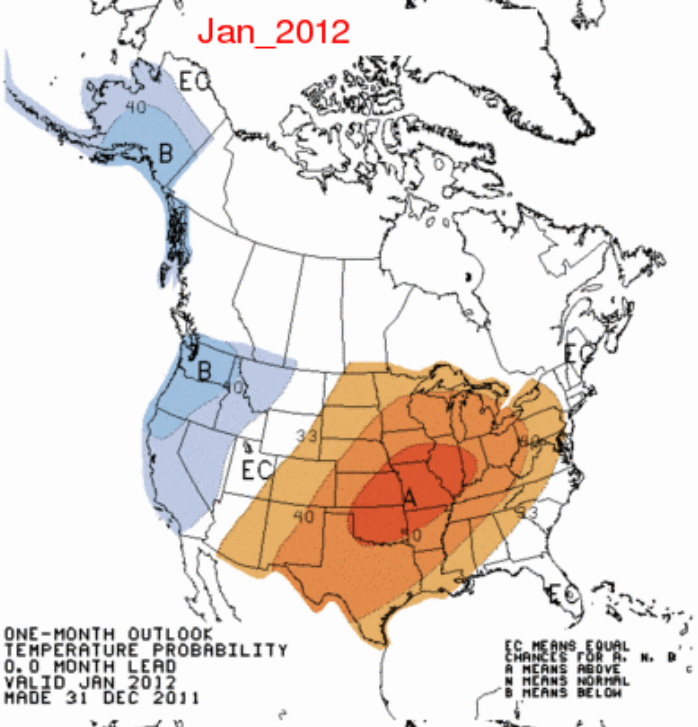


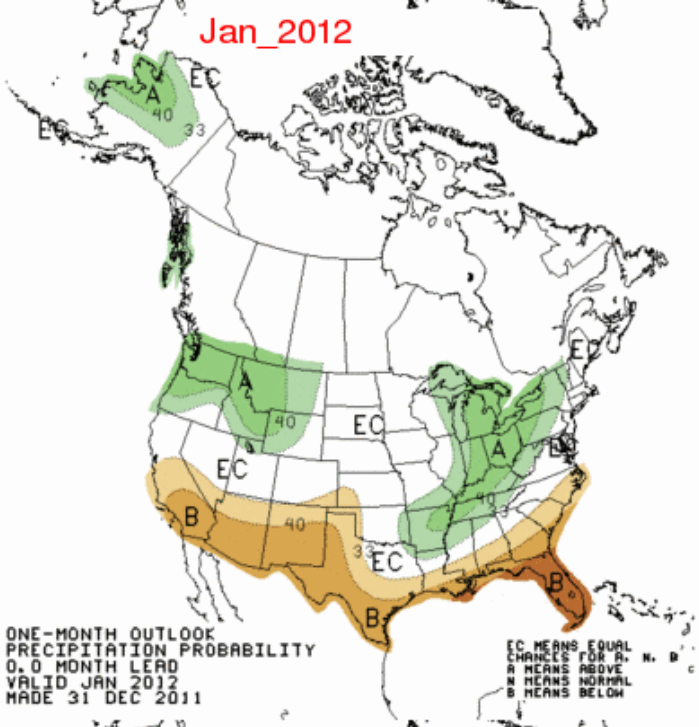


CPC 8-14-Day Outlooks






Jan_2012
ONE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.0 MONTH LEAD
VALID JAN 2012
MADE 31 DEC 2011
EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW


Jan_2012
ONE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.0 MONTH LEAD
VALID JAN 2012
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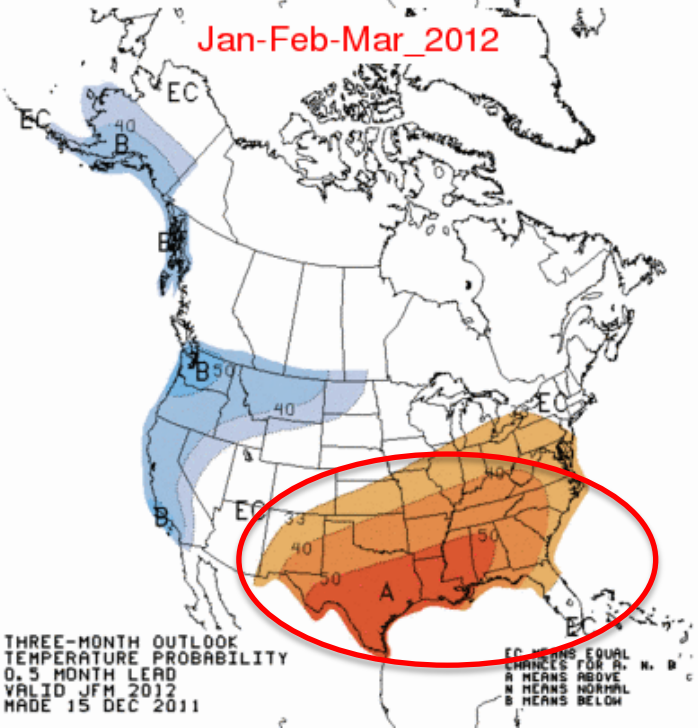
Jan-Feb-Mar_2012
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID JFM 2012
MADE 15 DEC 2011
EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
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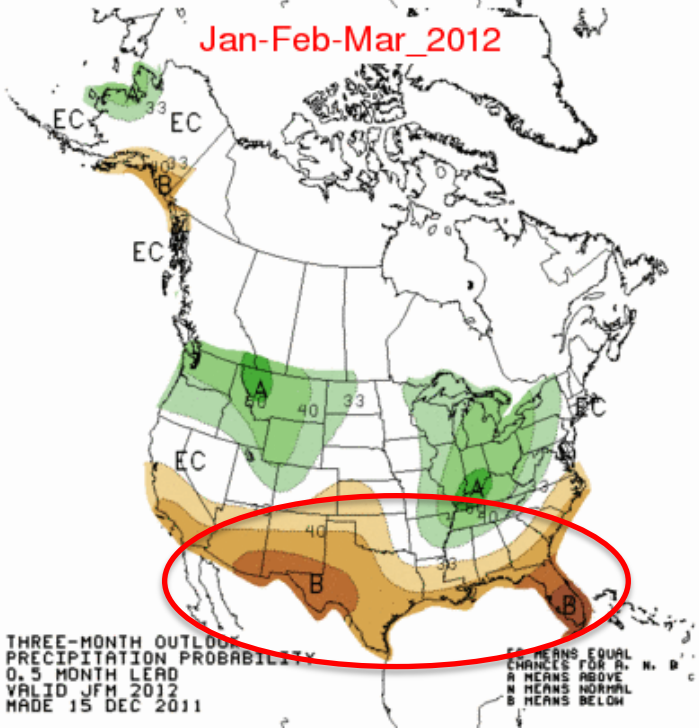
B MEANS BELOW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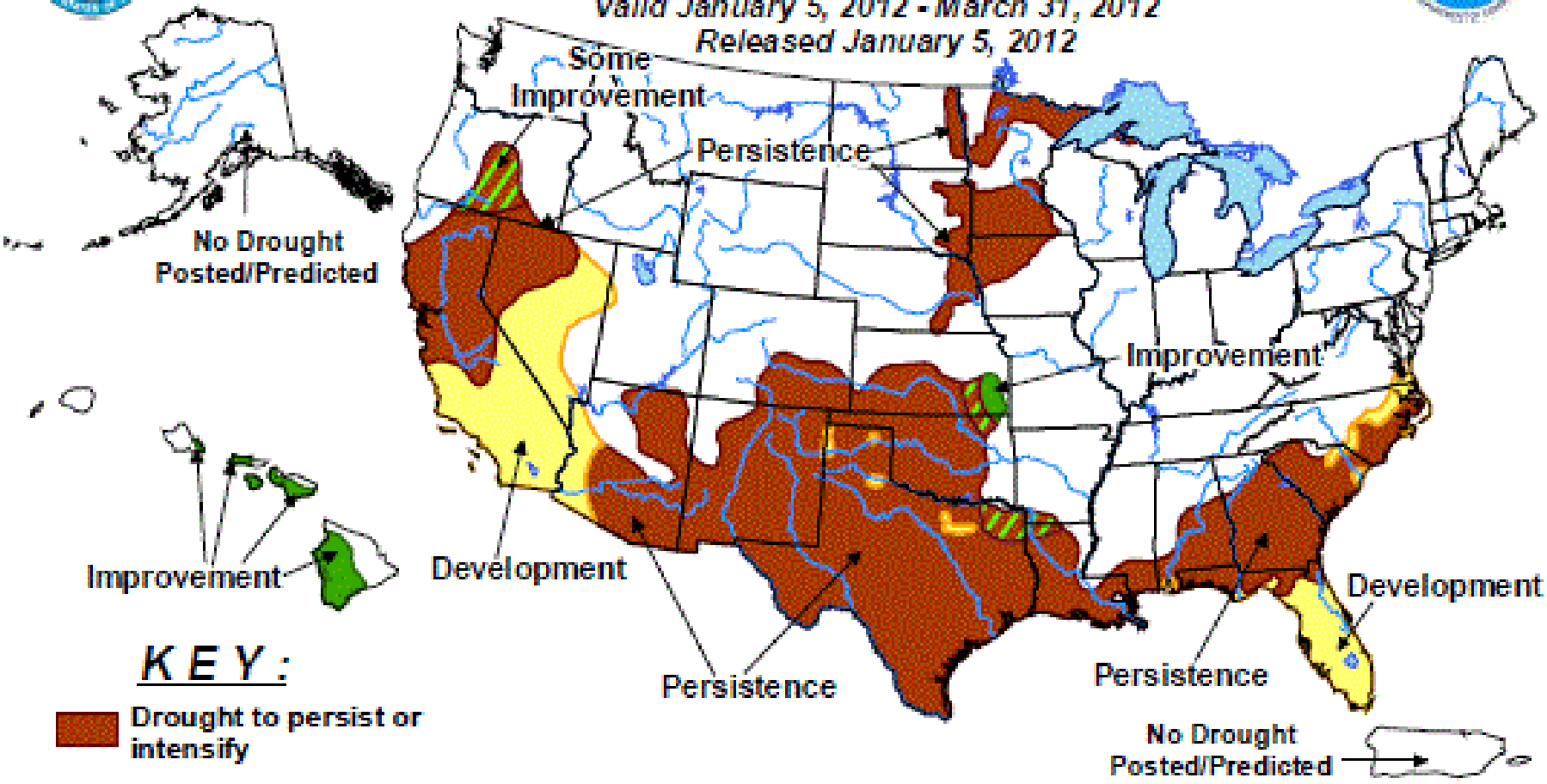
B MEANS BELOW

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid January 5, 2012 - March 31, 2012

Released January 5, 2012



K E Y :

- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events – such as individual storms – cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green Improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Featured USDM Product

Did you know…..

The NIDIS Portal is structured to answer the oft-asked drought related questions of:

1) “What’s the current situation?”;

2) “What are the impacts and where are they being felt?”; and

3) “Will it get better or worse?”

National Integrated Drought Information System

U.S. Drought Portal

www.drought.gov

Contact Us | Log In | Text-Only

Search:

HOME | WHAT IS NIDIS? | CURRENT DROUGHT | FORECASTING | IMPACTS | PLANNING | EDUCATION | RESEARCH | RECOVERY | REPORTS

Area Drought Information

Select State... Go

Select Region... Go

Maps & Tools

- Map & Data Viewer - **new!**
- Geodata Portal
- Drought Monitor Graphics
- CRN Soil Data

Events & Announcements

- ACF Climate Outlook Forum and Pilot Review Meeting 2011
- Engaging Preparedness Communities Webinar, Dec 13th 1-2 PM EST
- 36th Annual Climate Diagnostics and Prediction Workshop
- Navajo Drought Declaration Reaffirmation June2011
- 2011 Southern US Drought Impacts and Assessment Workshop
- May 23, 2011 Southern Drought Briefing

View Archive | Portal Release Notes

Regional Drought Webinars

- Managing Drought in the Southern Plains
- ACF Briefing Presentation - November 15th, 2011
- Colorado - weekly, 12PM EDT
- South Central Drought Briefing - November 10th, 11 AM CDT

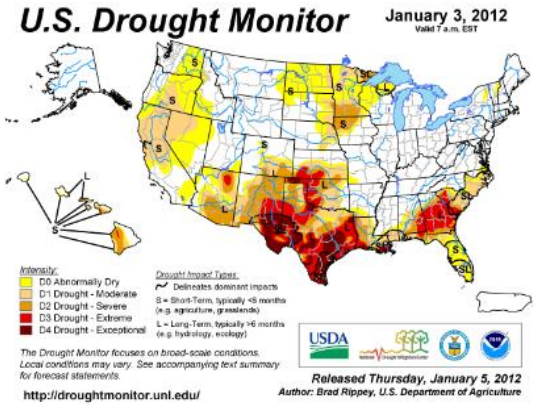
Drought In The News

- US Drought Drives Up Food Prices
- Scene From A Drought | Surprising Science
- WABE: Current drought conditions projected to worsen Public Broadcasting Atlanta
- Rainfall won't likely change drought conditions | kxan.com
- 15 counties in Oklahoma, 1 in Arkansas eligible for disaster aid for damage from drought, heat | The Republic
- Insurance News - At 1.8 billion, drought crop losses continue to grow - The Hutchinson News, Kan.

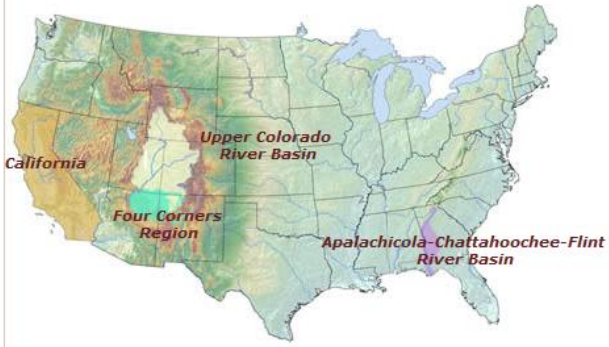
RSS

Featured Products

Where are Drought Conditions Now? | How is the Drought Affecting Me? | Will the Drought Continue?

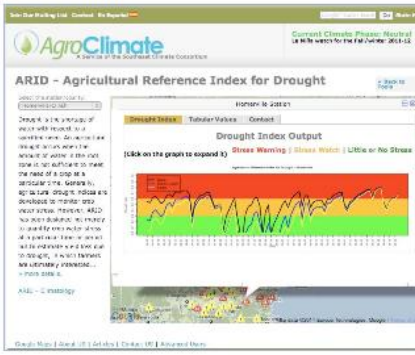


Regional Drought Early Warning Systems (DEWS)



(Click on an area to view the Drought Early Warning System - DEWS)

NIDIS Feature



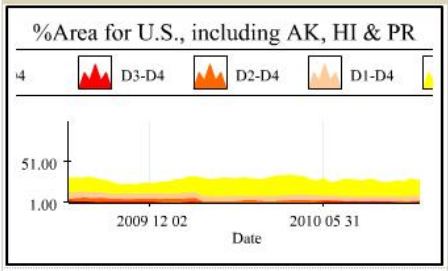
Fall 2011 Drought Research Special Issue

Drought Information Statements

Click on a highlighted area to view the current NWS Drought Information Statement or Click Here to select from a list

View larger map

Drought Monitor Time Series



Drought Classifications | Larger View

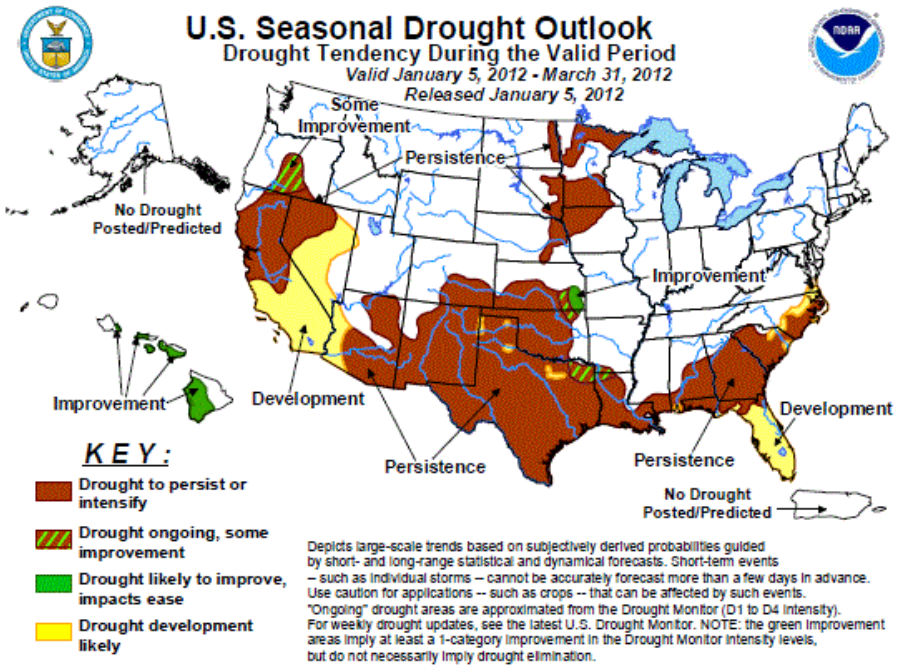
This Section Includes

- Forecasting Home
- Temperature and Precipitation
- Soil Moisture
- Hydrology
- Wildfire
- Improved Drought Prediction

Forecasting Home

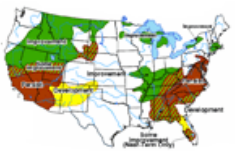
Forecasting is a developing component of the drought management issue. New products will be added to this web site as they become operational.

** New - View the interactive version of the US Drought Outlook

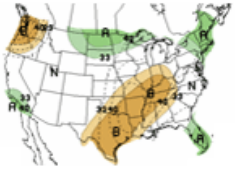


This Section Includes

Seasonal Temperature and Precipitation

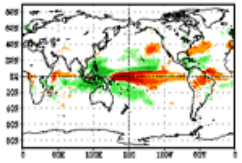


The Climate Prediction Center's (CPC) Seasonal Drought Outlook is issued twice a month. The Outlook predicts whether drought will emerge, stay the same or get better in the next three months.

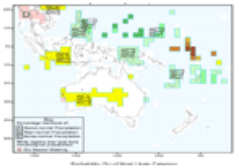


CPC offers many other predictions on its homepage, including whether precipitation and temperature are likely to be above or below normal. Forecasts show numerous intervals up to 15 months into the future.

A graphical interface for the CPC temperature and precipitation outlooks is also available.

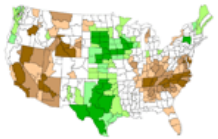


CPC's official seasonal outlooks incorporate a set of dynamic models showing monthly and seasonal outlooks for temperature, precipitation, atmospheric circulation, and sea surface temperatures, including El Niño/La Niña status. Outlooks up to six months are available.

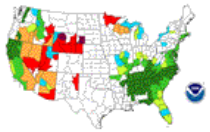


The International Research Institute for Climate and Society at Columbia University offers Seasonal Climate Forecasts for Africa, Asia, Australia, Europe, the Middle East, the Pacific Islands, South America, and the entire globe.

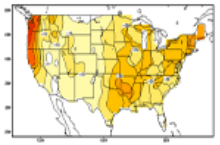
Soil Moisture



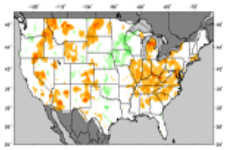
The Climate Prediction Center produces a four-month Palmer Drought Severity Index outlook as tabular data for each climate division. The Palmer index assesses total moisture by using temperature and precipitation to compute water supply and demand and soil moisture. It is considered most relevant for non-irrigated cropland and primarily reflects long-term drought.



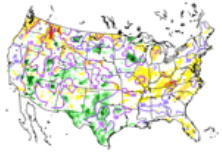
The Palmer drought model features the capability to compute the amount of precipitation that would be required to end a drought or reduce (ameliorate) a drought's severity. Maps of the precipitation needed, and the probability of receiving it based on historical records, are available from the National Climatic Data Center.



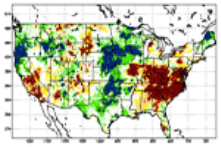
One- and two-week forecasts of soil moisture anomalies, (that is, the difference between seasonal normal and current), based on the Global Forecast System (GFS) model are available. The monthly and seasonal forecasts of soil moisture anomalies produced by the Constructed Analog on Soil Moisture (CAS) model are also available.



The Experimental Surface Water Monitor, from the University of Washington, provides analyses of soil moisture, snow water equivalent and other water-related variables.



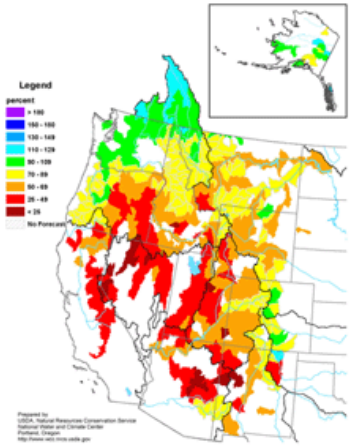
Experimental Soil Moisture Forecasts, up to six months, are available at Princeton University's Drought Monitoring and Forecasting project web site. These forecasts are based on a statistical design called the Extended Stream-flow Prediction (ESP) and a dynamic seasonal model called the Climate Forecast System (CFS).



NOAA and NASA are collaborating on the Land Data Assimilation Systems (LDAS) experimental drought monitor to provide soil-moisture maps derived from near real-time estimates.

This Section Includes

Hydrology



The Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture provides data and information for the western United States, including:

1) Stream-flow forecasts for the first five months of each year, based on mountain snowpack.

2) Data and stream-flow outlooks by state and river basins, incorporating snow-pack and precipitation data.

3) Forecasts reflecting snowpack, stream-flow and reservoir storage. *Please note: For some states the river basin reports may be generated and kept by state officials rather than the NRCS.*

4) NRCS also provides experimental daily water supply forecasts

The National Weather Service's Advanced Hydrologic Prediction Service (AHPS) monitors and reports on river flood conditions and on low river water levels for the United States. The short- and long-term forecasts are also available. The long-term forecasts for low levels are available under local forecast points. Look for a tab below hydrograph under Additional Information and the link, How low could the river get?

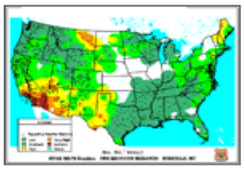
Water supply forecasts and water resource outlooks from NOAA River Forecast Centers are provided by basin in general and for specific points using an interactive map. Forecasts are generally made only for basins with potentially significant amounts of snow melt. In addition to the forecast, point-specific information also includes climatology.

The Climate Impacts Group at the University of Washington produces hydrological and soil moisture monitoring and forecast maps for the western United States.

This Section Includes

Wildfire

The National Weather Service provides local fire weather forecasts, including issuing fire weather watches and red flag warnings. These forecasts are based on variables such as wind, relative humidity, stability, lightning, precipitation and fuel dryness. These forecasts are on the National Fire Weather Web page.



The Wildland Fire Assessment System (WFAS) is currently based on weather observations taken at fire weather stations throughout the U.S. and entered into the Weather Information Management System (WIMS). National Fire Danger Rating System (NFDRS) calculations are done at the National Computer Center at Kansas City (NCC-KC). The fuel model, index, and fire danger levels are set by local managers. National WFAS maps are produced from fire danger levels.

The Predictive Services Unit at the National Interagency Coordination Center and the Geographic Area Coordination Center provides current wildland fire information and a number of outlook products, including the 7-Day Significant Fire Potential Outlook, and daily, monthly and seasonal forecasts and trends. Both National and Geographic Area products can be accessed from the National Interagency Coordination Center (NICC).

The USFS's Remote Sensing Applications Center generates regional maps for the US fire managers using the active fire locations from the Moderate Resolution Imaging Spectro-radiometer (MODIS) Rapid Response System. Maps cover the conterminous United States, Alaska, and Canada.

The Web Fire Mapper at the University of Maryland provides access to current and archived fire locations detected by the Moderate Resolution Imaging Spectro-radiometer (MODIS) Rapid Response System. Other fire related information is also available on this web site.

Contact Information:

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National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln

SCIPP/NIDIS Drought Webinar Series, January 12, 2012

INTERPRETING CPC OUTLOOKS

Dennis Todey
South Dakota State Climatologist
American Association of State Climatologists

What is Normal (Average)?

- A tool helpful when comparing conditions to the long term
- A 30-year average
- Updated every 10 years
- There are normals for:
  - Days, months and years
  - Temperature, rainfall, snowfall, and more!

September Rainfall: OKC

1971	**4.25”**	1976	**1.53”**	1981	**1.48”**	1986	**9.54”**	1991	**11.85”**	1996	**5.88”**
1972	**2.05”**	1977	**1.21”**	1982	**2.86”**	1987	**4.58”**	1992	**2.92”**	1997	**1.38”**
1973	**8.00”**	1978	**0.96”**	1983	**0.90”**	1988	**5.19”**	1993	**7.17”**	1998	**4.39”**
1974	**6.24”**	1979	**0.72”**	1984	**1.02”**	1989	**4.51”**	1994	**2.15”**	1999	**4.88”**
1975	**1.92”**	1980	**2.21”**	1985	**4.59”**	1990	**7.35”**	1995	**6.05”**	2000	**1.73”**

The average of all these numbers is 3.98”

– the normal September rainfall at Oklahoma City.

The 1st Dirty Secret of Normals:

Normals only tell you the *average* for a particular month, day or year.

They don’t tell you anything about natural variability!

All Normals Work the Same Way

- Oklahoma City's …
  - Average September Rainfall: 3.98"
  - Average September Temperature: 73.2 degrees
  - Average September 26th High: 81 degrees
  - Average "First Freeze of Fall": November 4

- *All of these are based on 30 numbers recorded between 1971-2000!*

Normal vs. “supposed to”

- A normal is just an average!
- It doesn’t mean “supposed to”
- It’s not “supposed to” rain 3.98” at OKC in September
- It doesn’t “usually” rain 3.98” at OKC in September
- It has *never* rained exactly 3.98” at OKC during *any* September dating back to 1896

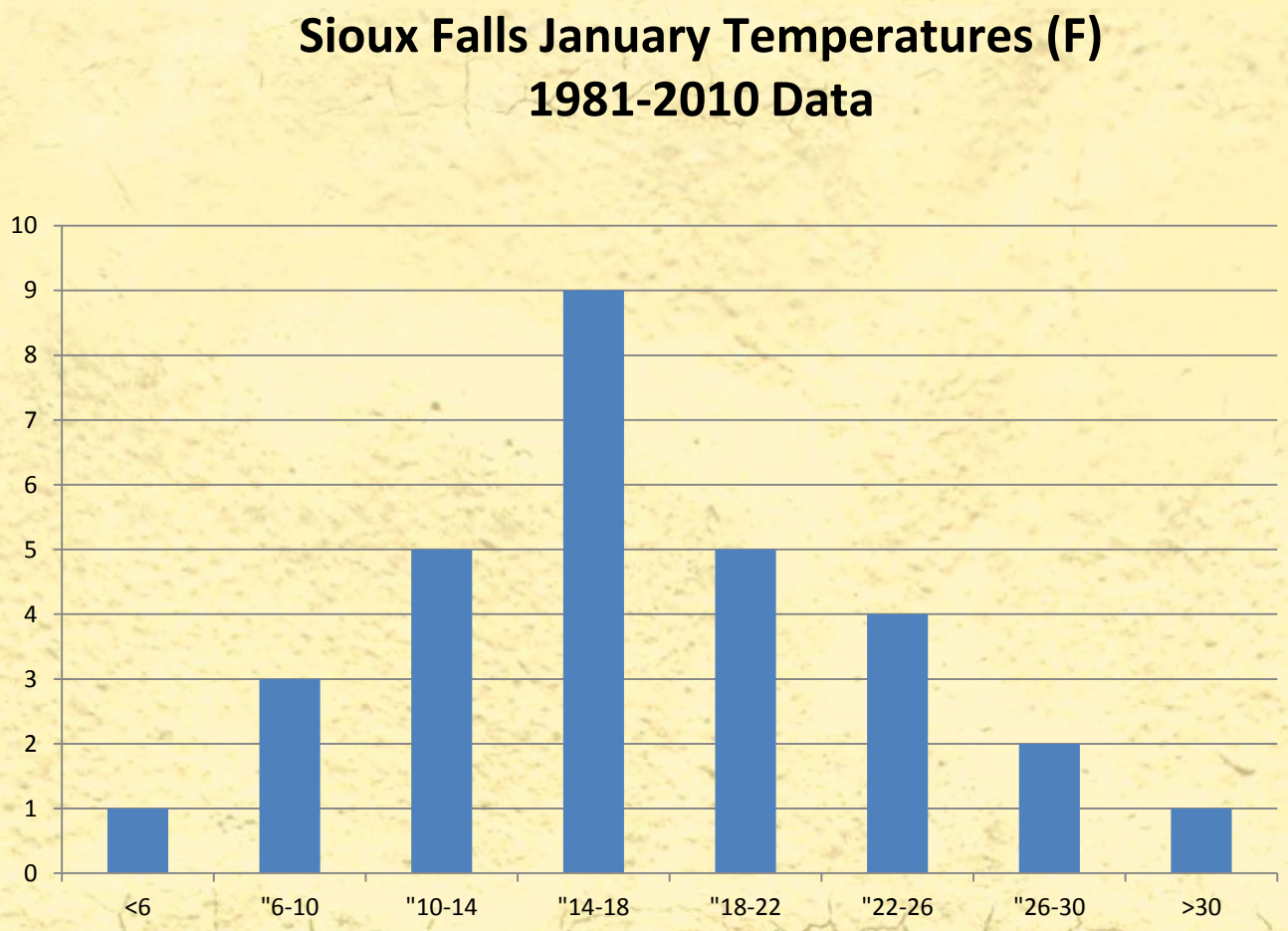
The 2nd Dirty Secret of Normals:

For rainfall, most months are below-normal!

So, what's my point?

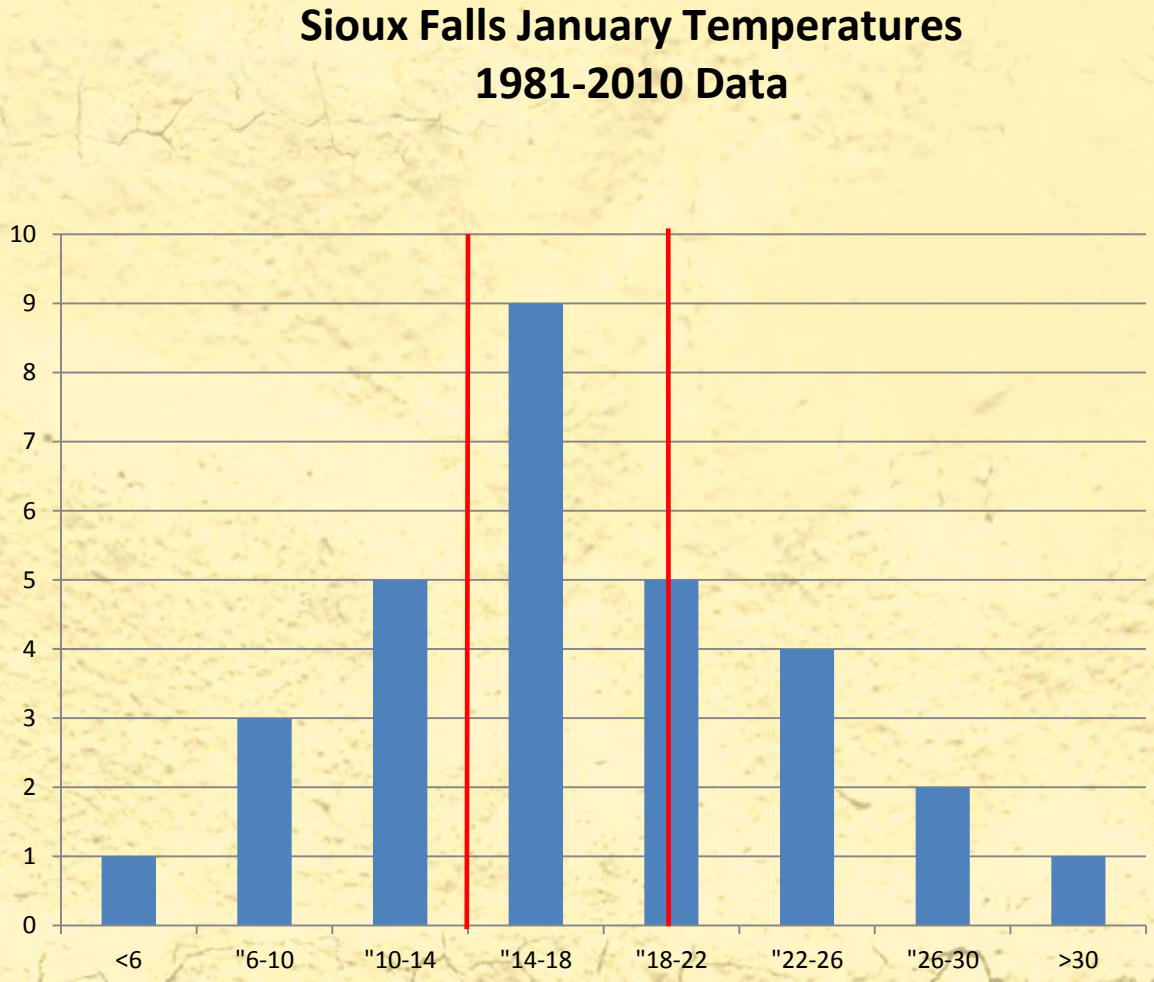
- In Oklahoma, and in much of the U.S., climate values are *highly variable*.
- Large variability makes "supposed to", "usually" and even the word "about" pretty meaningless on a month-to-month basis.
- However, for *longer-term* rainfall (seasonal, annual, and beyond), departures from "normal" mean more.
- Need to understand variability and interpretation within CPC Outlooks

Example


Sioux Falls January Temperatures (F)
1981-2010 Data
10
9
8
7
6
5
4
3
2
1
0
<6
"6-10
"10-14
"14-18
"18-22
"22-26
"26-30
>30

Example con't

Percentiles
33rd – 14 F
67th – 19.1 F



Example con't

Percentiles
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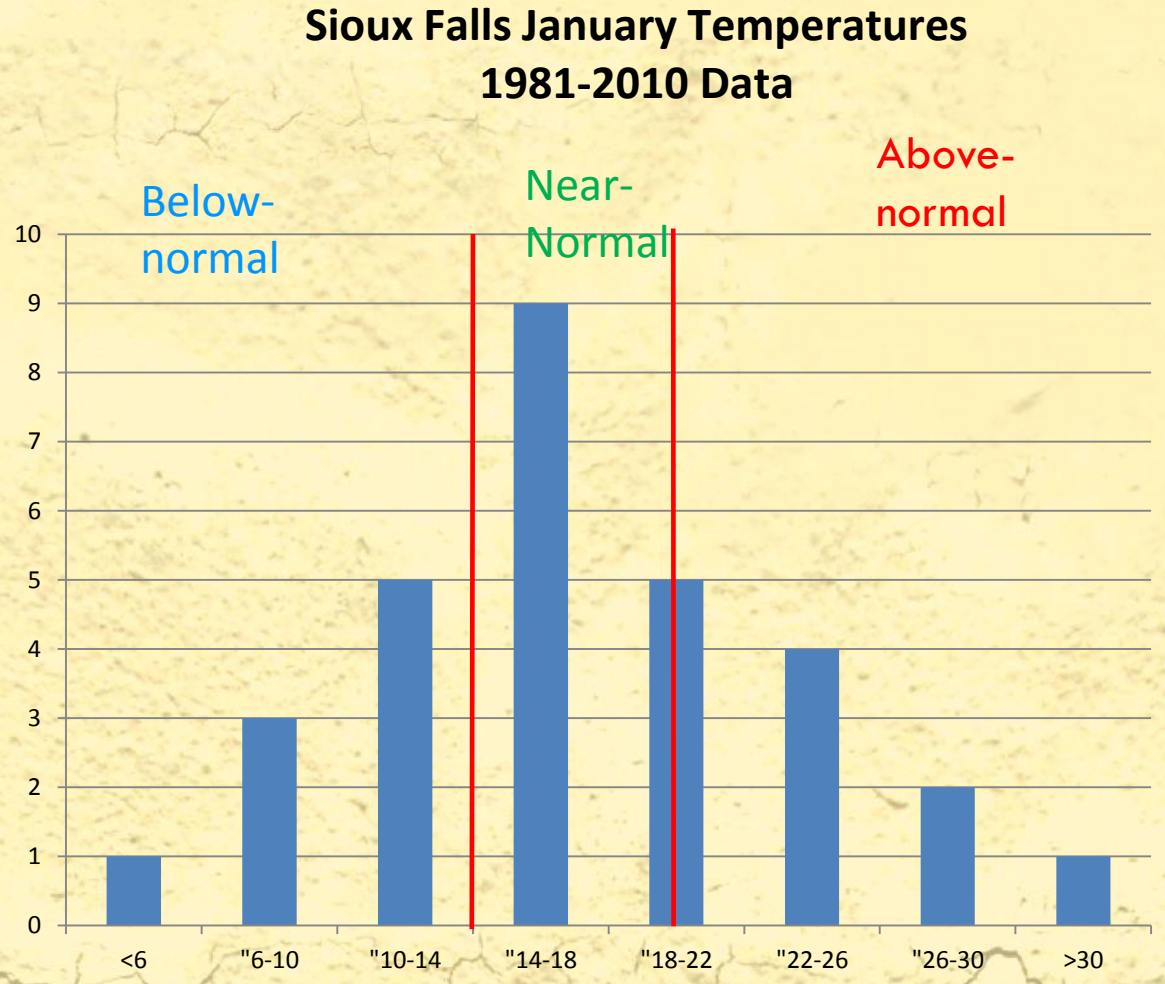
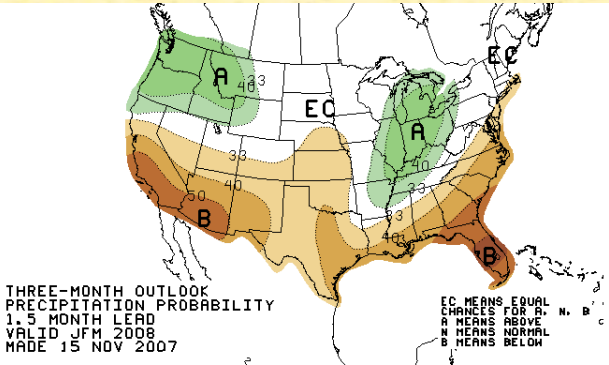


Interpreting Seasonal Outlooks

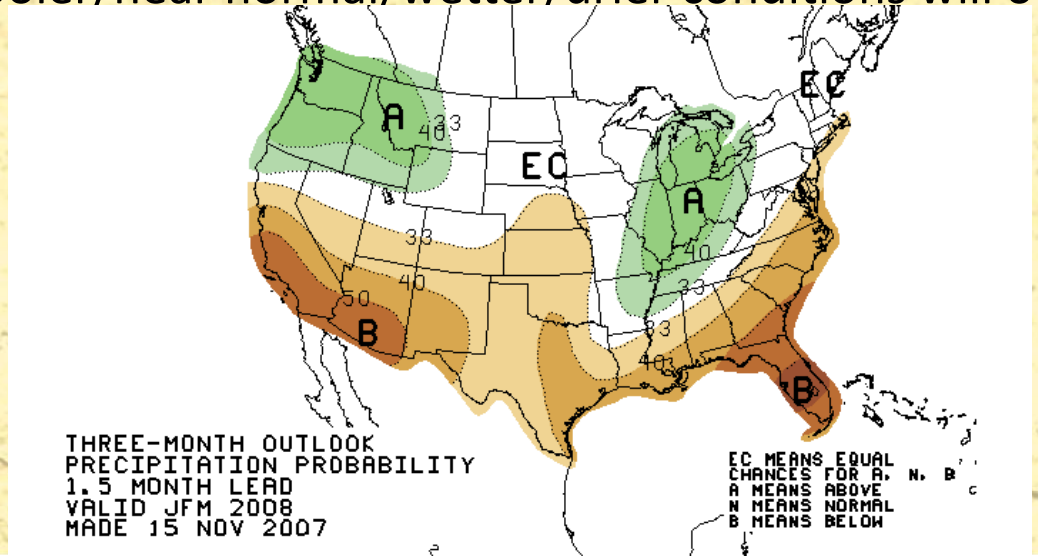
- A=Above, B=Below, N=Near Normal, EC=Equal Chances
- EC indicates a 33.3% chance of conditions falling into one of the three categories (above, near normal, or below)
- A (B) indicates that the forecaster thinks that conditions will be above (below) normal
  - Does not forecast how much above normal
- Any contours show an increased *confidence* in the forecast trend

	Above	Near Normal	Below
Equal Chances	33.3	33.3	33.3
40% Above	40.0	33.3	26.7
50% Below	16.7	33.3	50.0



Seasonal Outlooks

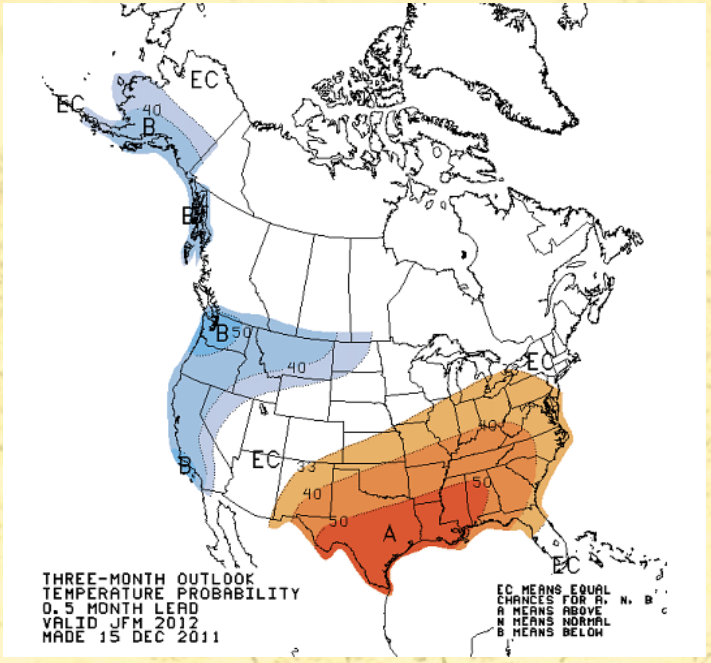
- From the Climate Prediction Center: http://www.cpc.noaa.gov/
- Three Month (seasonal) and One Month outlooks
- Forecast is actually how *confident* they are about general tendencies (above, below, or near normal)
  - The darker the shading, the more confident the forecaster is that warmer/cooler/near normal/wetter/drier conditions will occur

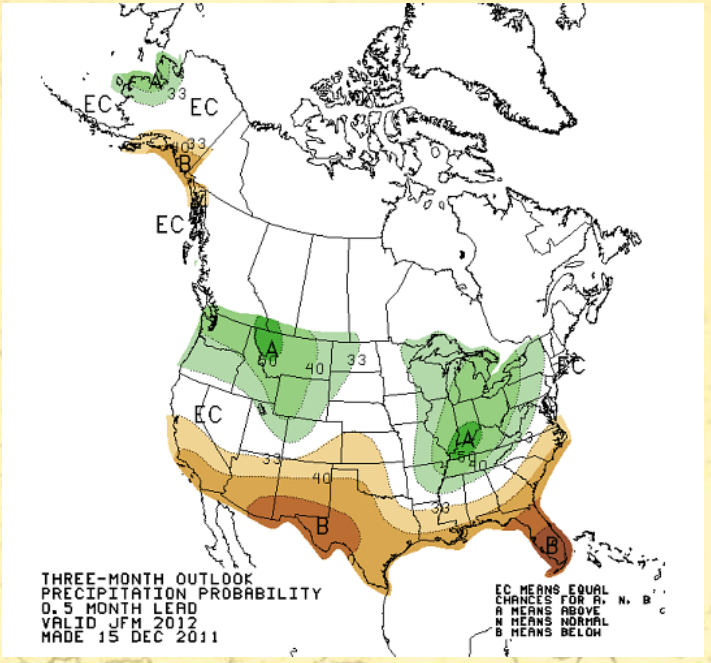


How are CPC Seasonal Outlooks Created?

Jon Gottschalck

Head of Forecast Operations
NOAA – Climate Prediction Center





Presentation Outline

1. Seasonal forecast launch schedule and process

2. Seasonal forecast basis and tools

3. Seasonal forecast challenges

4. Seasonal forecast skill

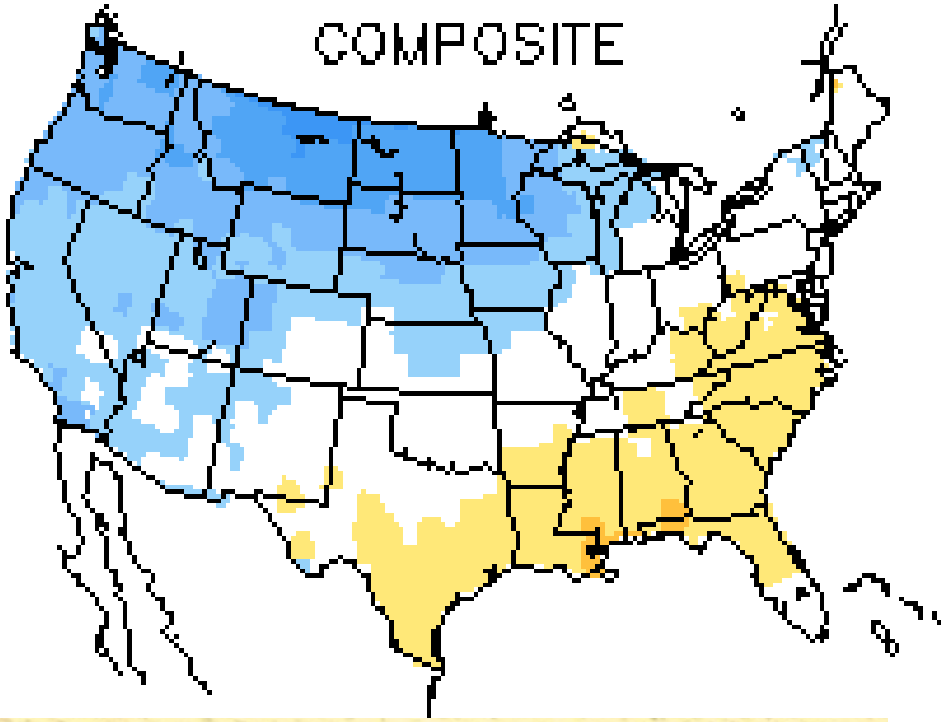
Seasonal Forecast Schedule and Leads

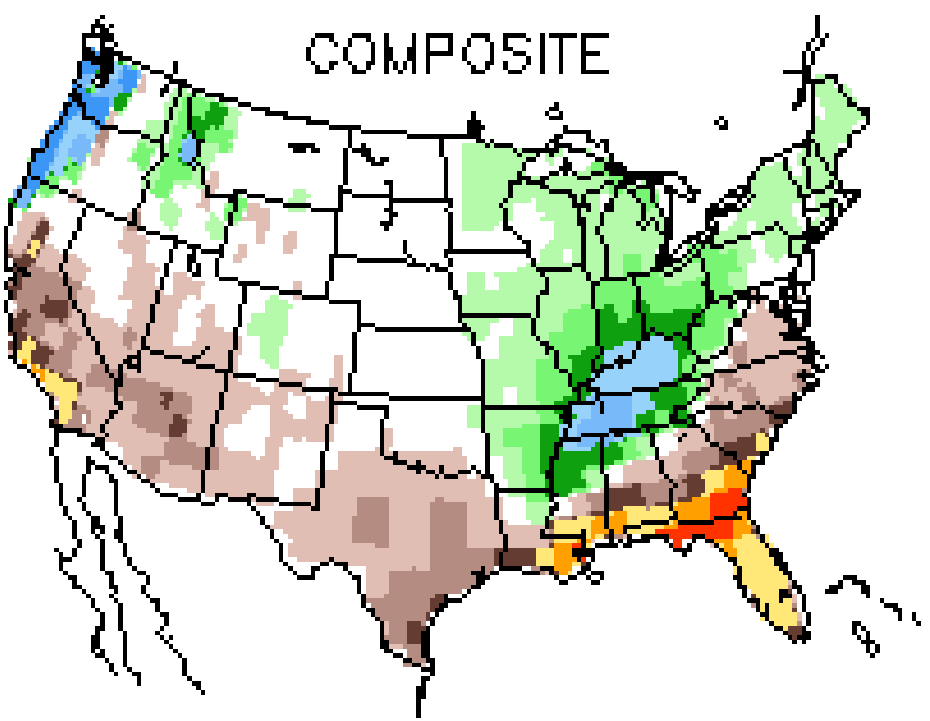
- Seasonal outlooks are prepared for average temperature and total accumulated precipitation
- Monthly, near mid-month CPC prepares a set of 13 outlooks for 3-month “seasons” for lead times ranging from ½ month, 1 ½ months, …, 12 ½ months
- Released always on the third Thursday of the month
- Conference calls on preceding Friday and Tuesday with partners

Seasonal Forecast Basis

- Natural climate variability that organizes weather on seasonal time scales → El Nino-Southern Oscillation (ENSO)
- Statistical forecast tools using various methods and data
- Long term trends
- Dynamical weather/climate forecast models
- Soil moisture, ocean temperatures and snow cover

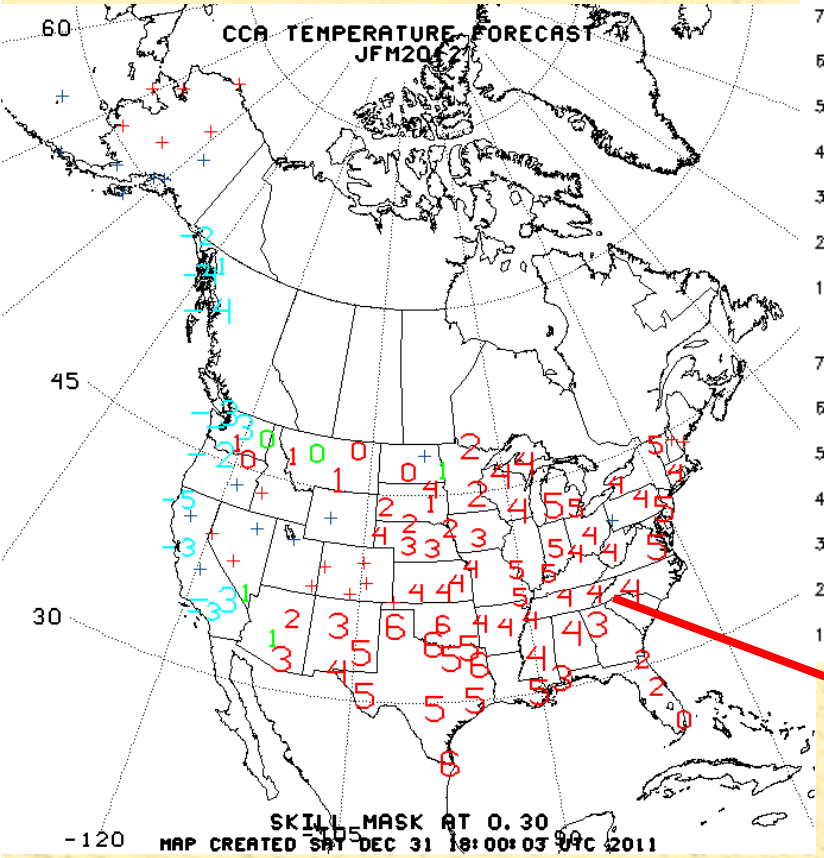
La Nina Composites



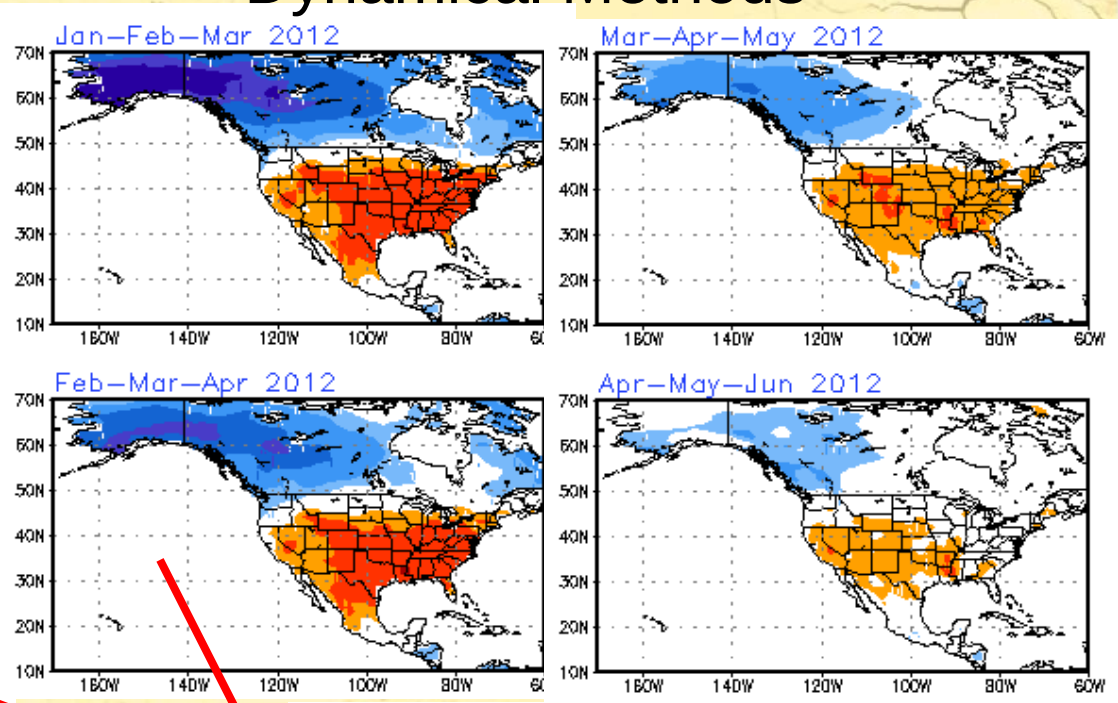


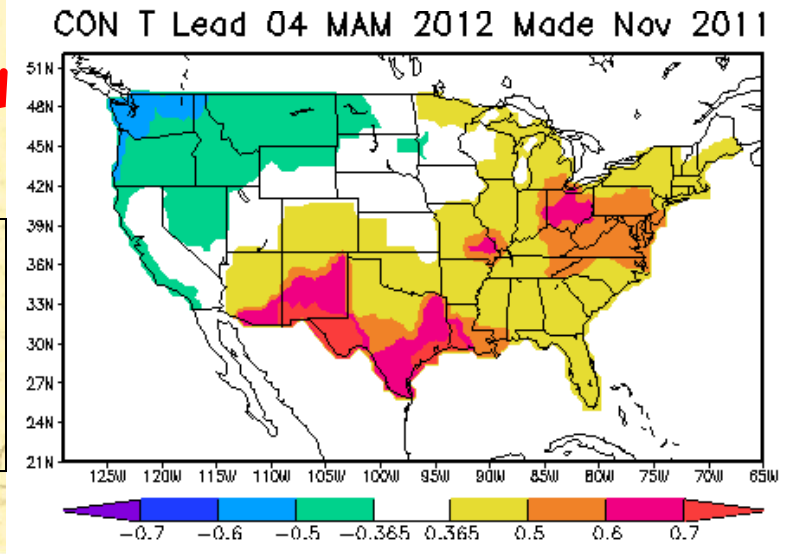
Some Forecast Tools

Statistical Methods



Dynamical Methods



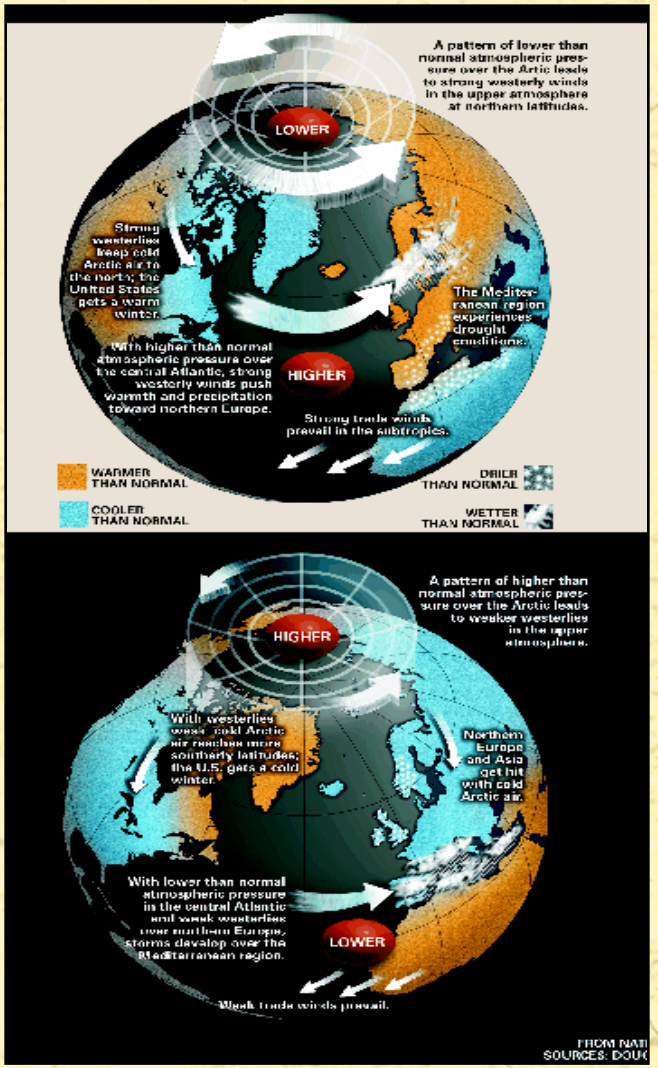


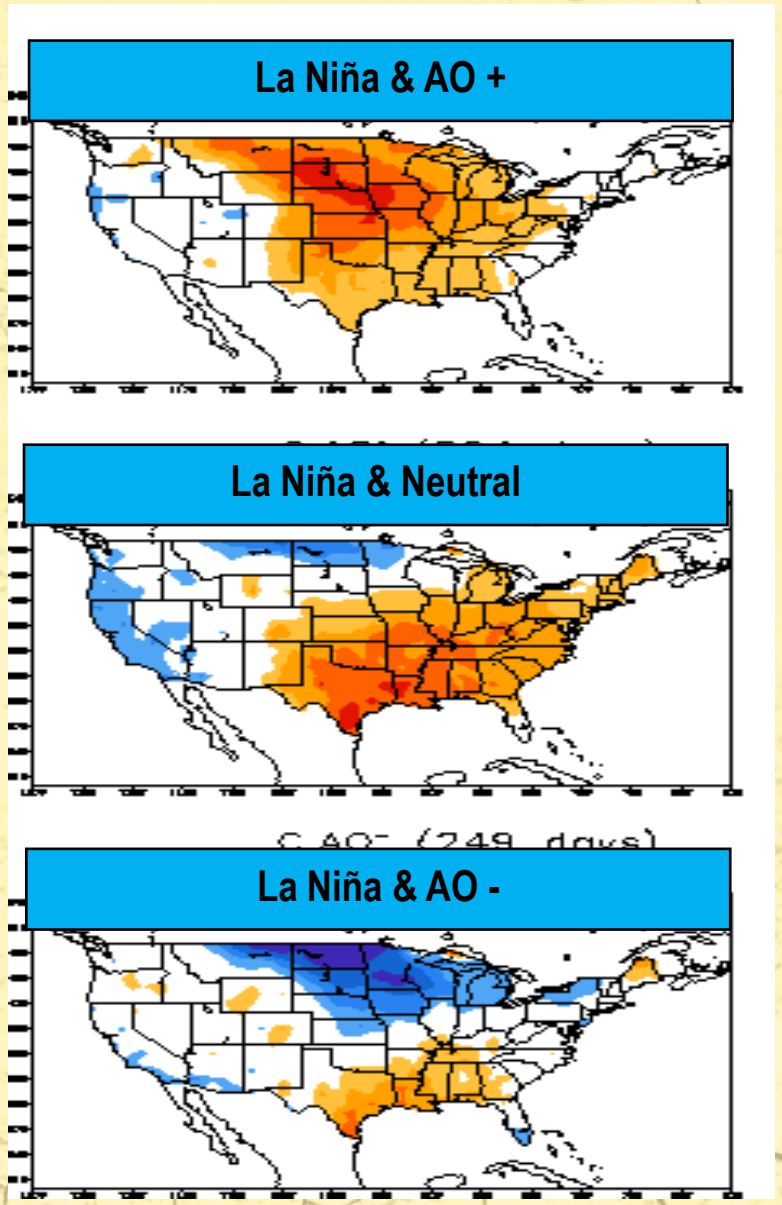
- **A skill weighted objective combination of forecast tools**
- **Serves as a first guess to the forecaster**

Challenges

There are other forms of variability that are not predictable at seasonal periods

Arctic Oscillation (AO): Modulates the circulation pattern over the high latitudes

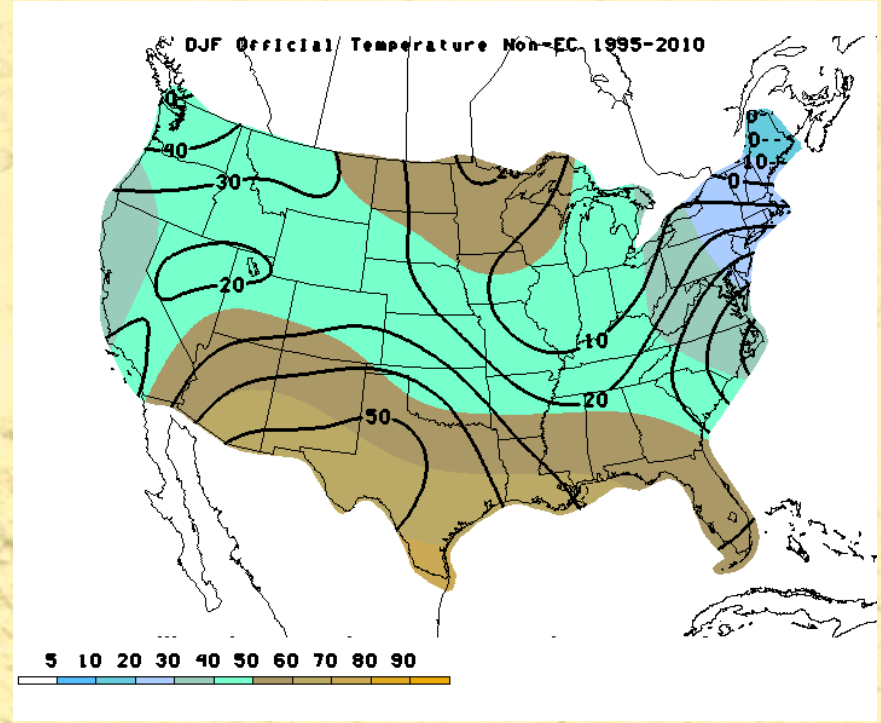




Verification

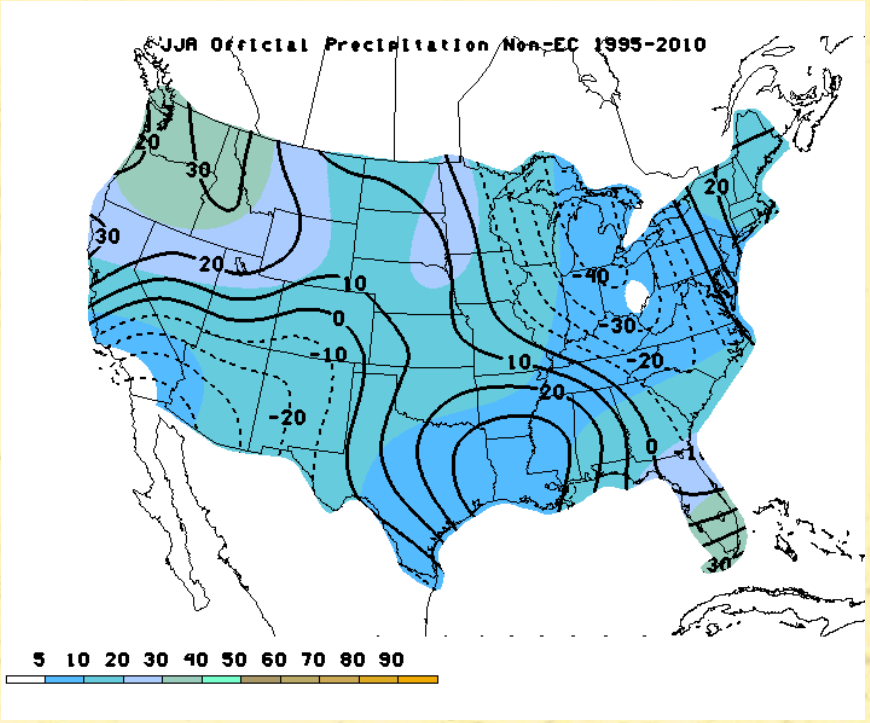
Winter months

TEMPERATURE



Summer months

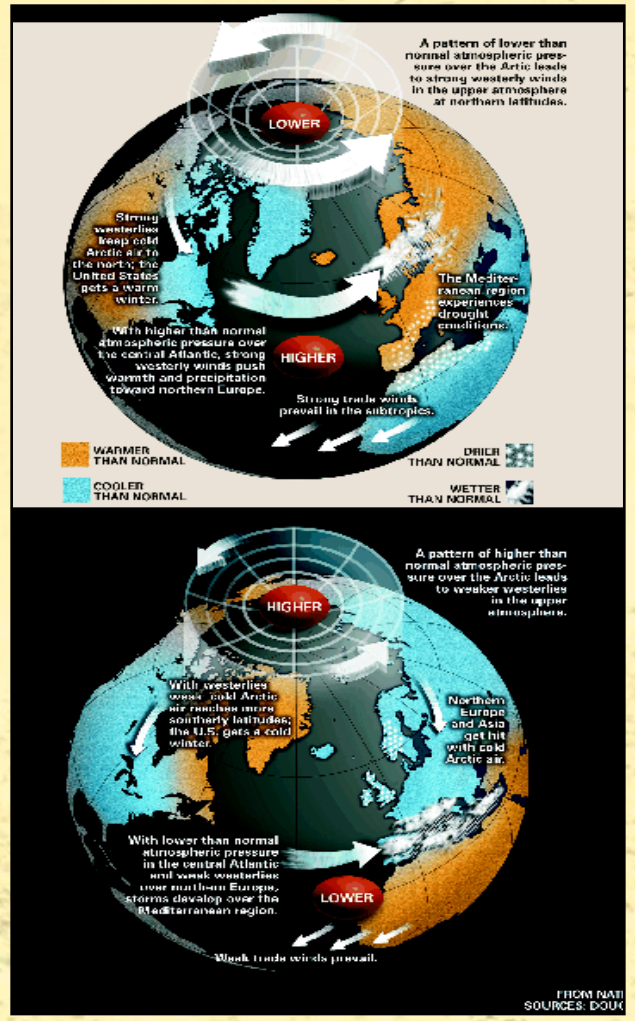
PRECIPITATION



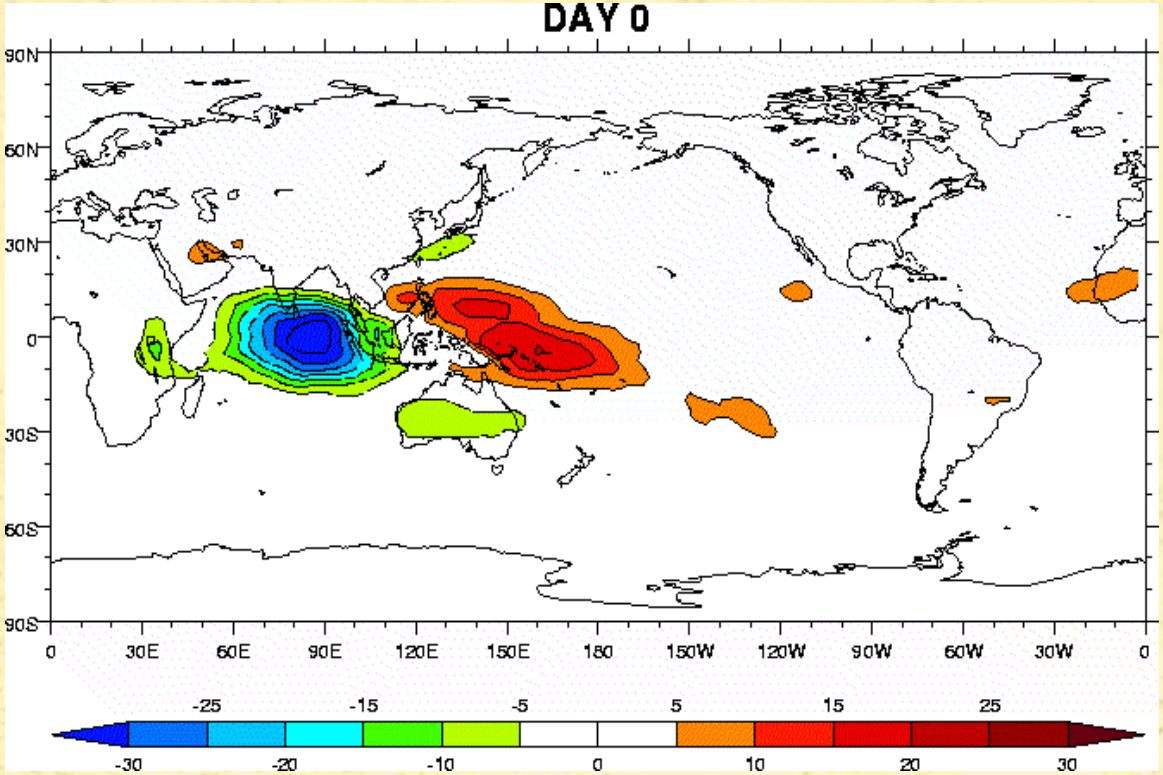
Shading: Forecast coverage (number of times a forecast was made)
Contours: Skill scores over the period from 1995-2010

Challenges

There are other forms of variability that are not predictable at seasonal periods



Arctic Oscillation (AO): Modulates the circulation pattern over the high latitudes



Madden-Julian Oscillation (MJO): The MJO is an intraseasonal disturbance originating in the Tropics that sometimes can result in changes in the mid-latitude circulation

Thank You

Send comments and questions to:
Jon.Gottschalck@noaa.gov

Using Seasonal Outlooks

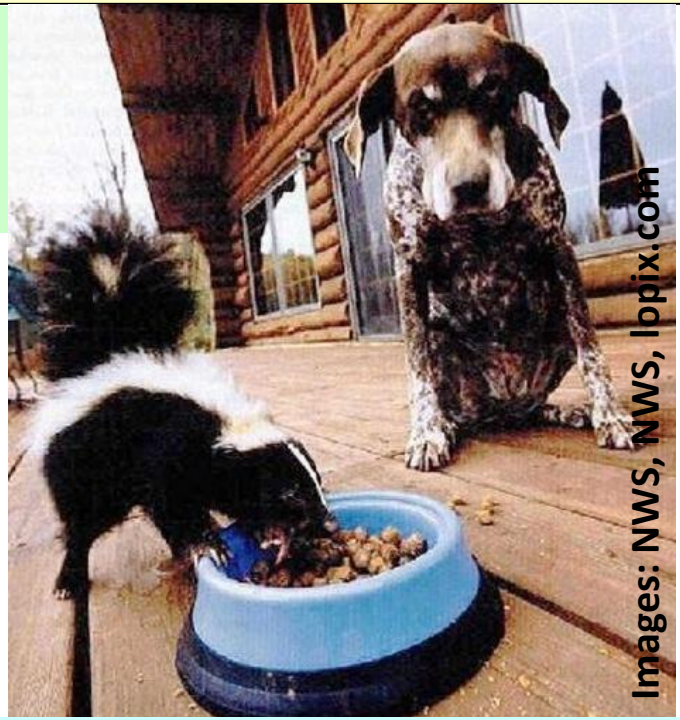
Holly C. Hartmann, University of Arizona
hollyoregon@juno.com

How good are the seasonal outlooks?

Outlook skill varies by location, seasonal coverage, and lead time.
Many metrics measure skill: POD, FAR, Brier Score, RPSS, Reliability, Discrimination, etc.
Develop user knowledge so they can connect information with their management wisdom.

Forecast Evaluation Tool

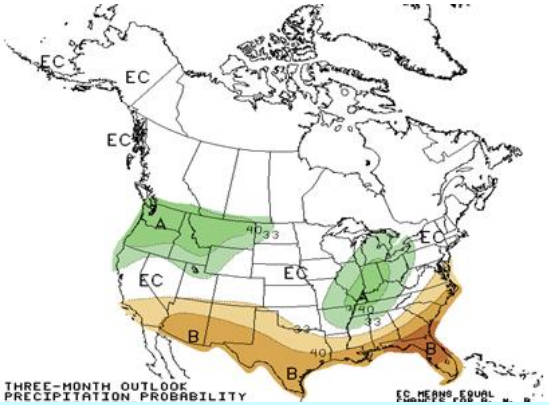
URL: fet.hwr.arizona.edu/ForecastEvaluationTool/
Tutorials, archive, skill, recent & historical observations.



Weather Conditions for:
Eugene, Mahlon Sweet Field, OR (KEUG)
Elev: 364 ft; Latitude: 44.13333; Longitude: -123.21444

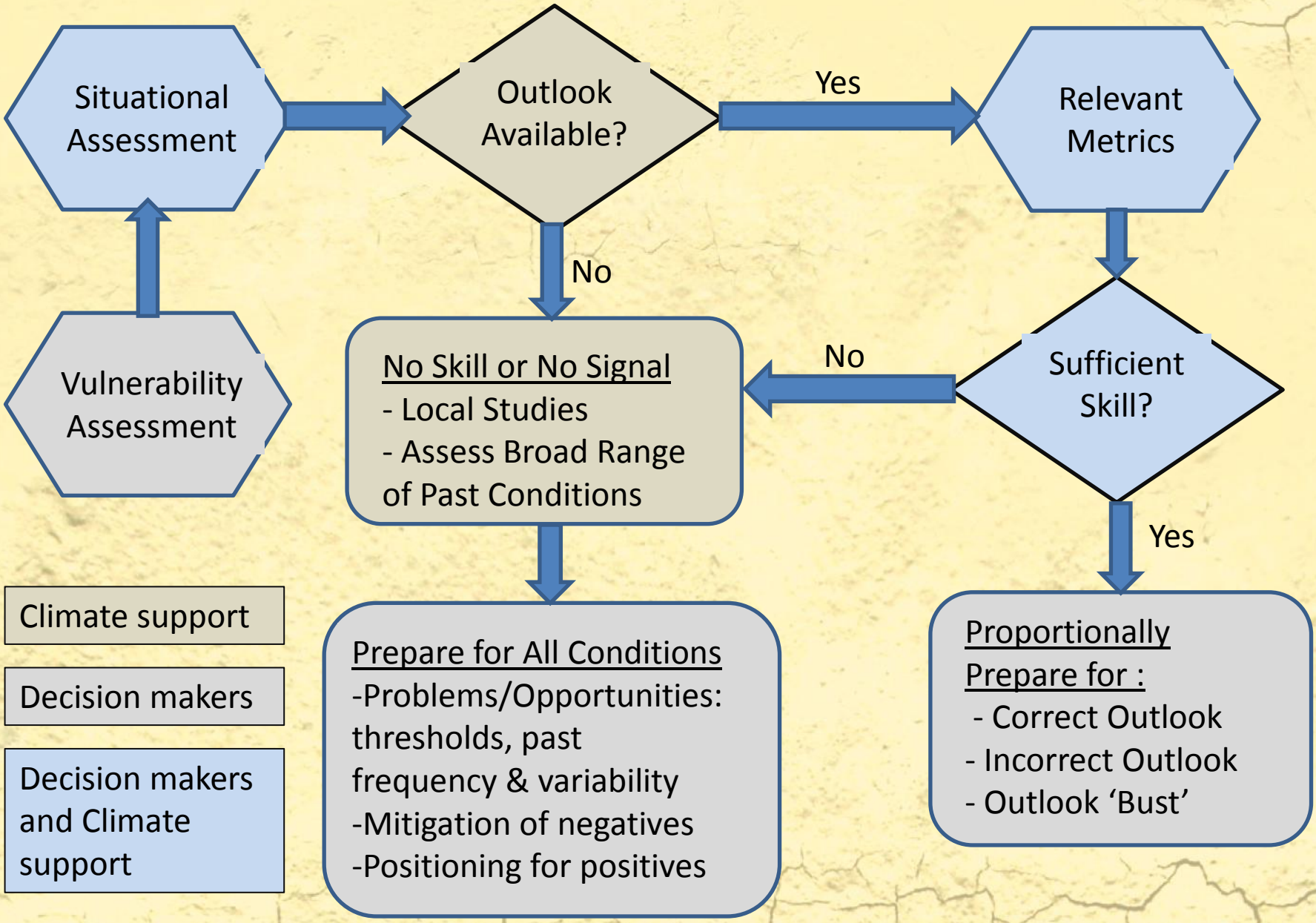
Current time: Fri, 10 Dec 7:27 am (PST)
Most Recent Observation: Fri, 10 Dec 6:54 am (PST)

Time (PST)	Temp. (f)	Dew Point (f)	Relative Humidity (%)	Wind Direction	Wind Speed (mph)	Visibility (miles)	WX	Clouds	Sea Level Pressure (mb)	Altimeter Setting (inches)	Station Pressure (inches)	Precip 1 hou (inches)
10 Dec 6:54 am	47	44	90	S	15	10.00		SCT028 BKN044 OVC060	1016.9	30.03	29.646	0.06
10 Dec 5:54 am	46	43	89	SSE	7	7.00	RA	FEW027 BKN036 OVC050	1016.4	30.01	29.626	0.08
10 Dec 4:54 am	46	43	89	SSE	8	10.00	-RA	FEW033 BKN040 OVC060	1016.6	30.02	29.636	0.01



Data << Information << Knowledge << Wisdom

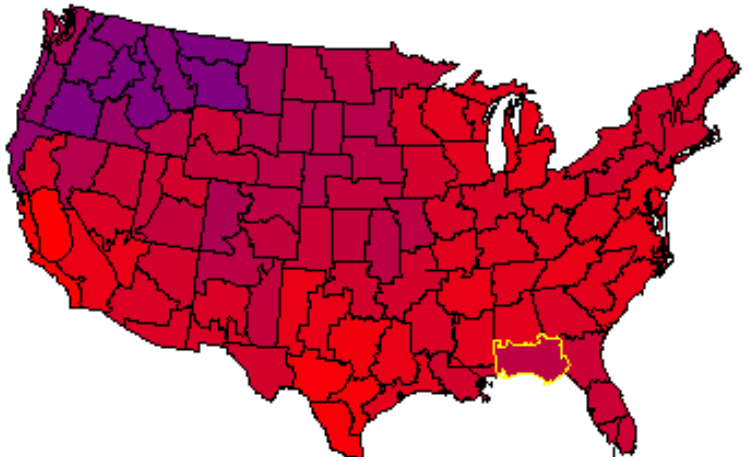
Flow Chart for Using Outlooks



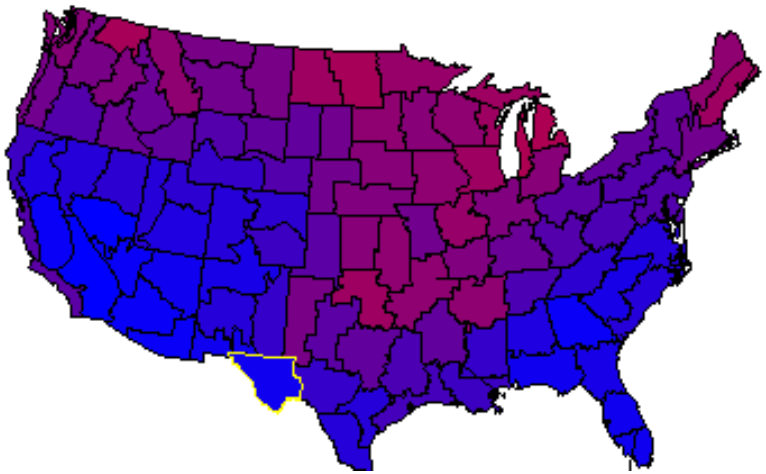
Frequency of Forecasts

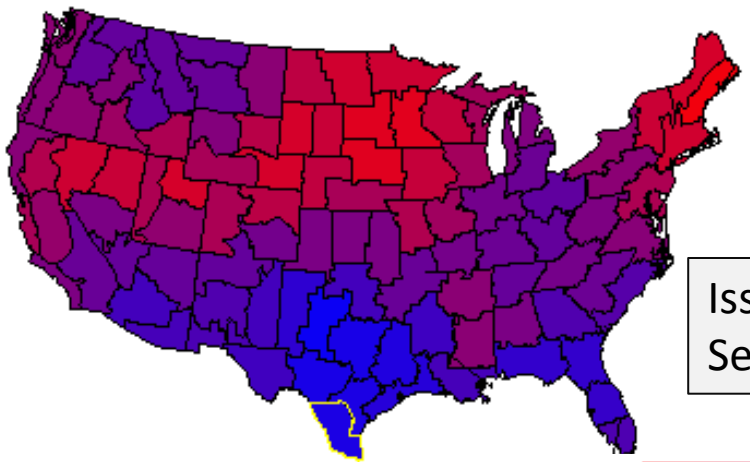
Precipitation

Temperature

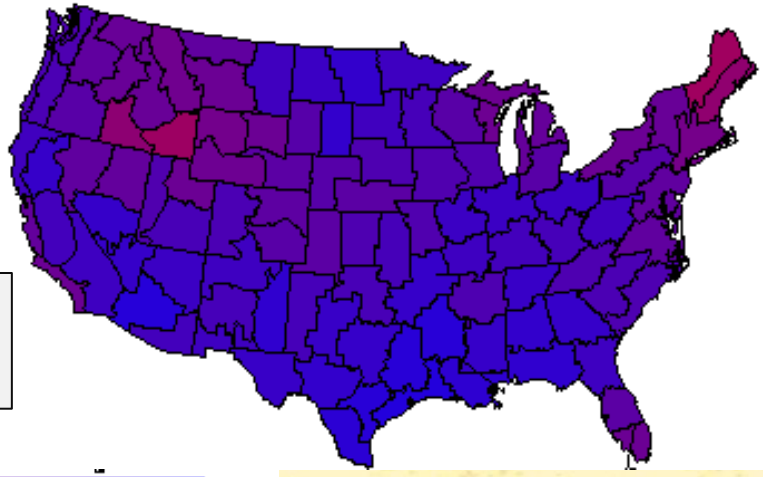


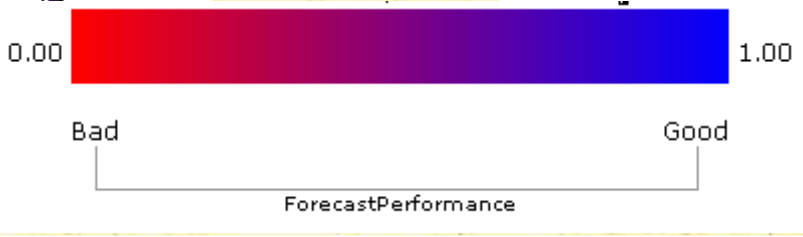
Issued: A,M
Season: JJA





Issued: S,O,N
Seasons: DJF, FMA



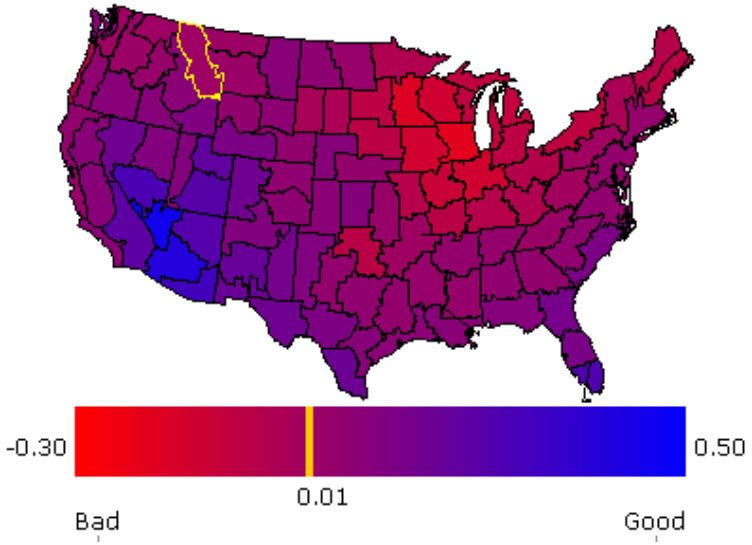


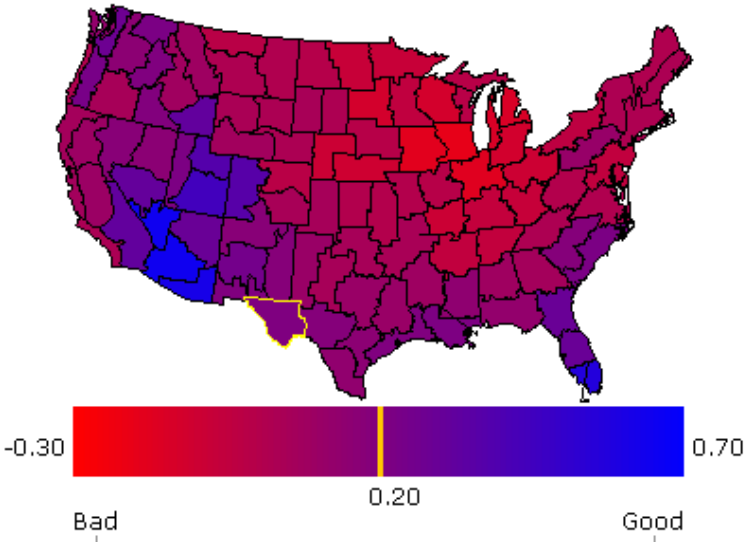
Brier Skill Score: relative to using equal chances

Unseasonably Warm

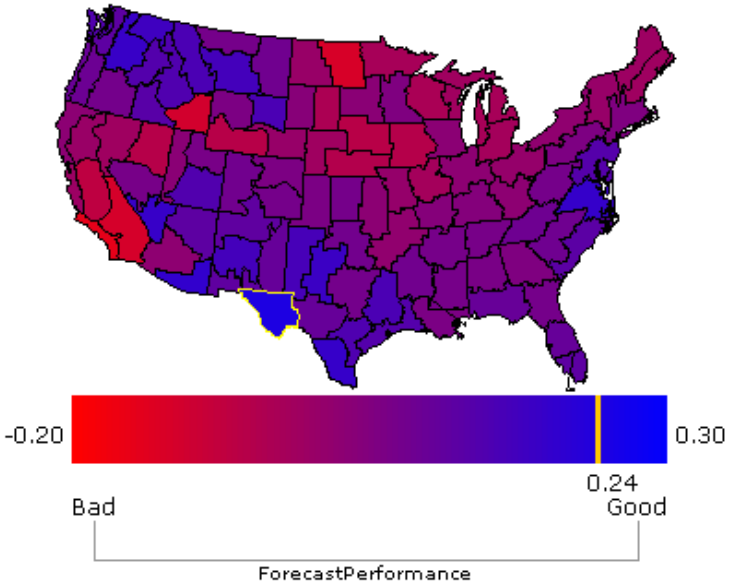
Unseasonably Cool

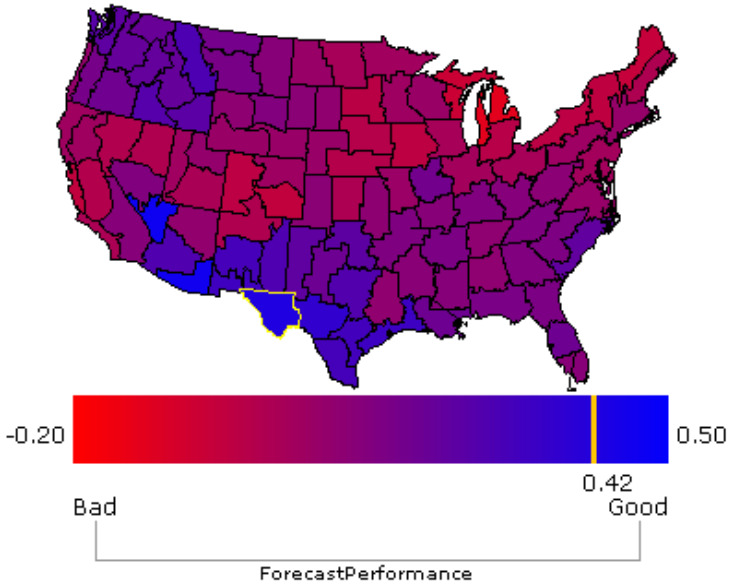
Issued: A,M
Season: JJA





Issued: S,O,N
Seasons: DJF, FMA



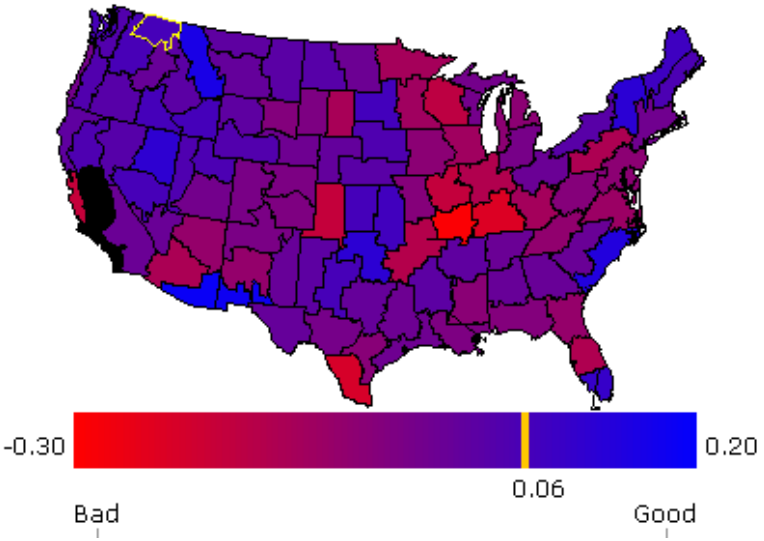


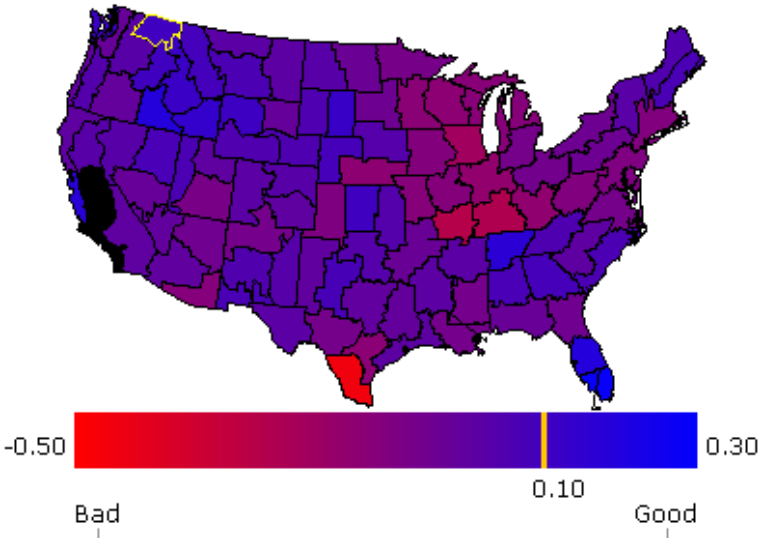
Brier Skill Score: relative to using equal chances

Unseasonably Wet

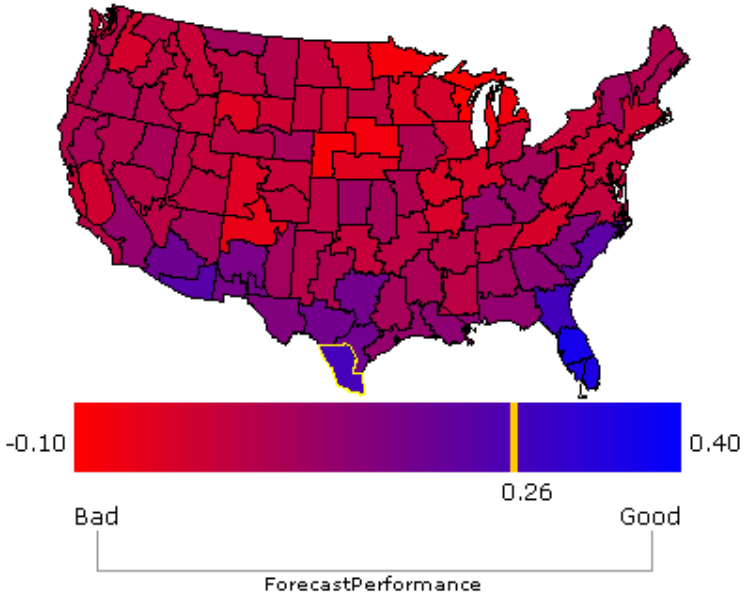
Unseasonably Dry

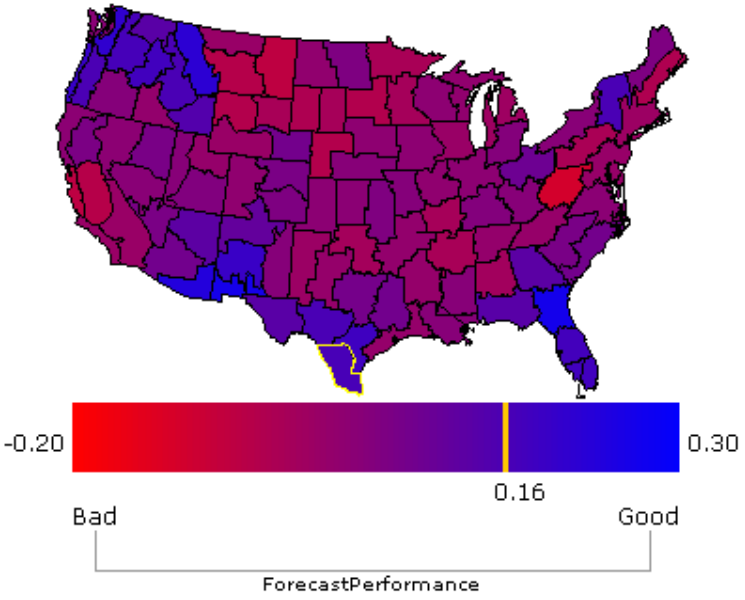
Issued: A,M
Season: JJA





Issued: S,O,N
Seasons: DJF, FMA

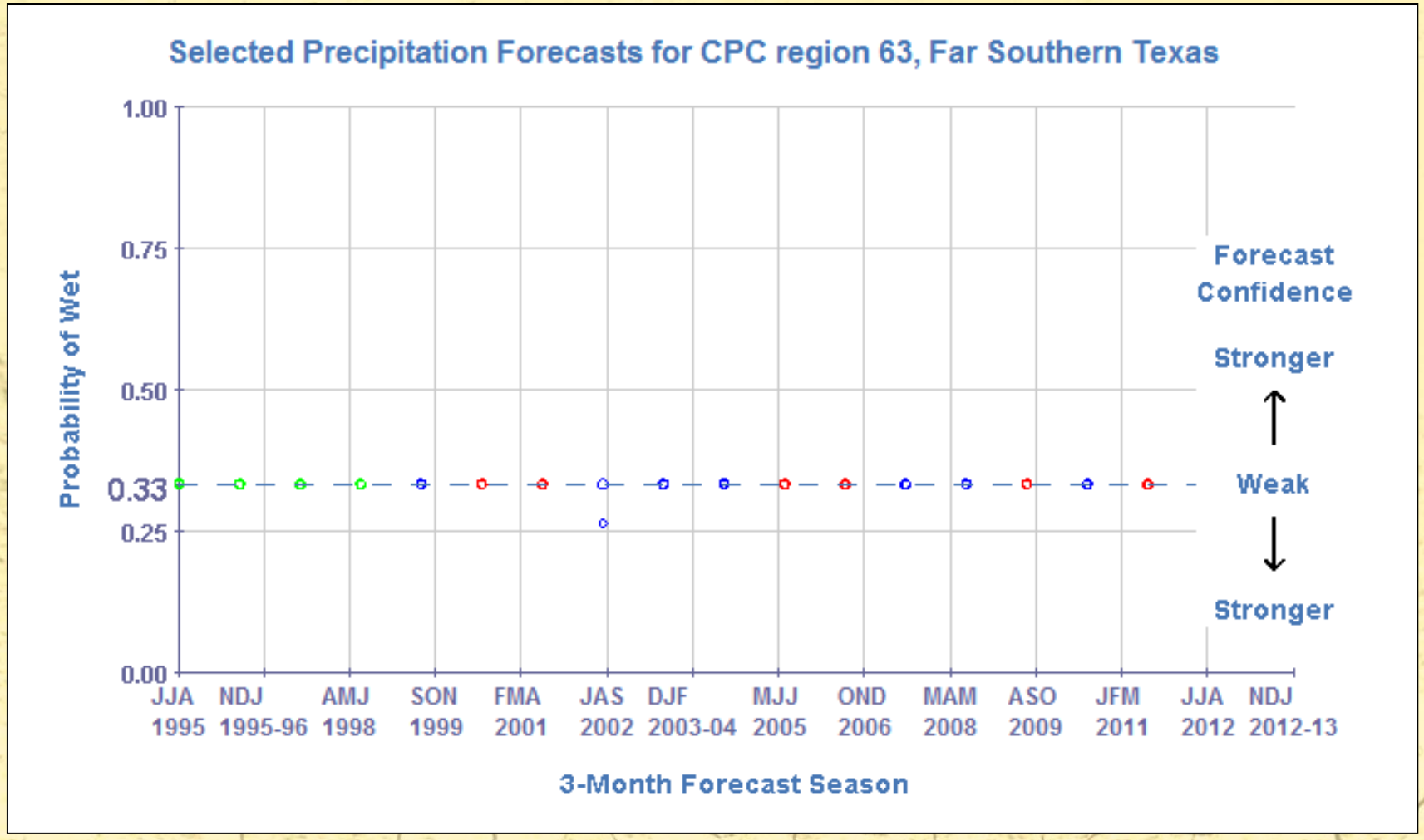




Behind the Skill Scores: the Forecast & Observation Record

Categories: Wet Neutral Dry No Observations Yet

Bubbles: Smallest o = Shortest Lead Time (1 month) Largest ◯ = Longest Lead Time (13 months)



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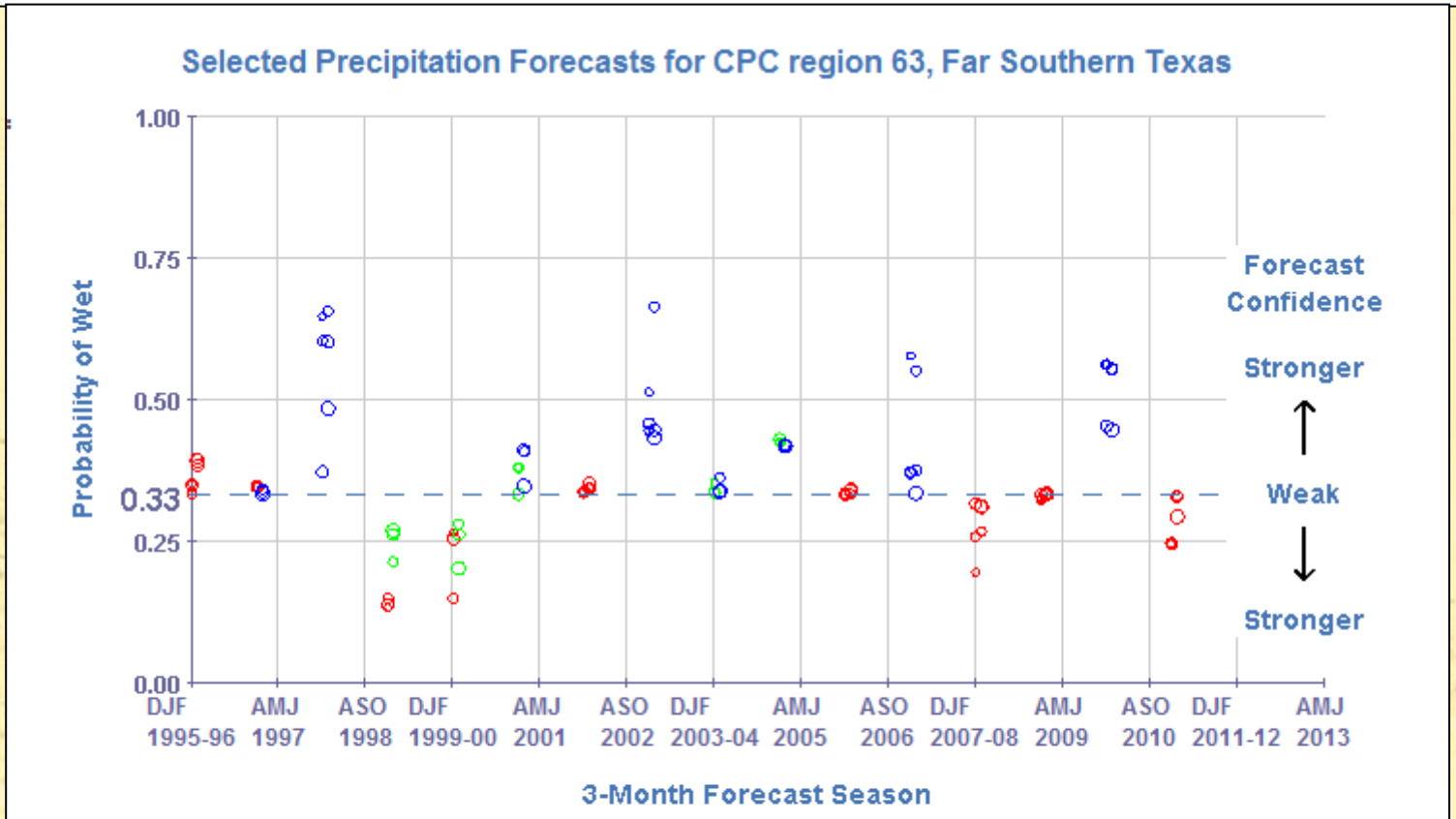
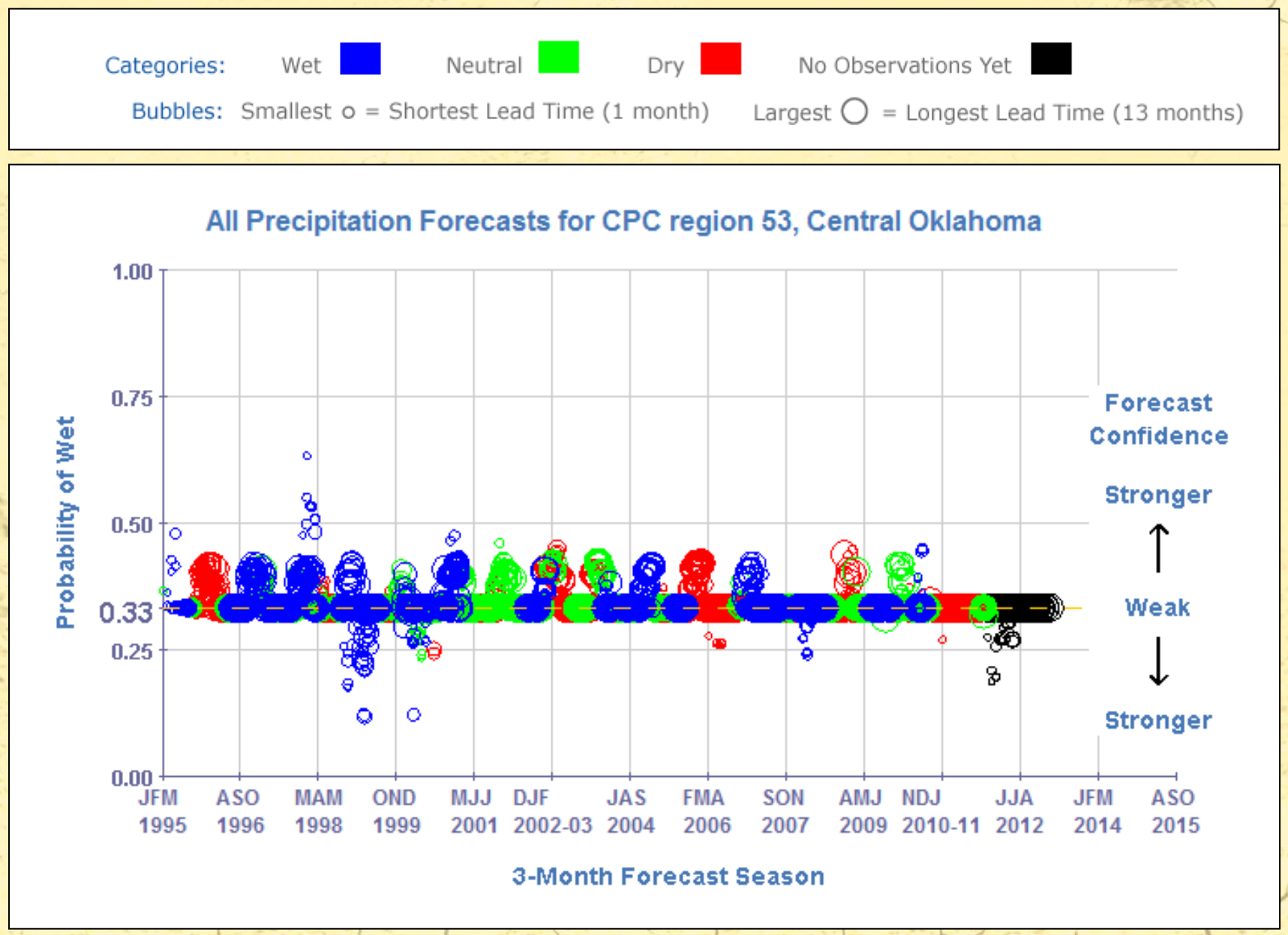


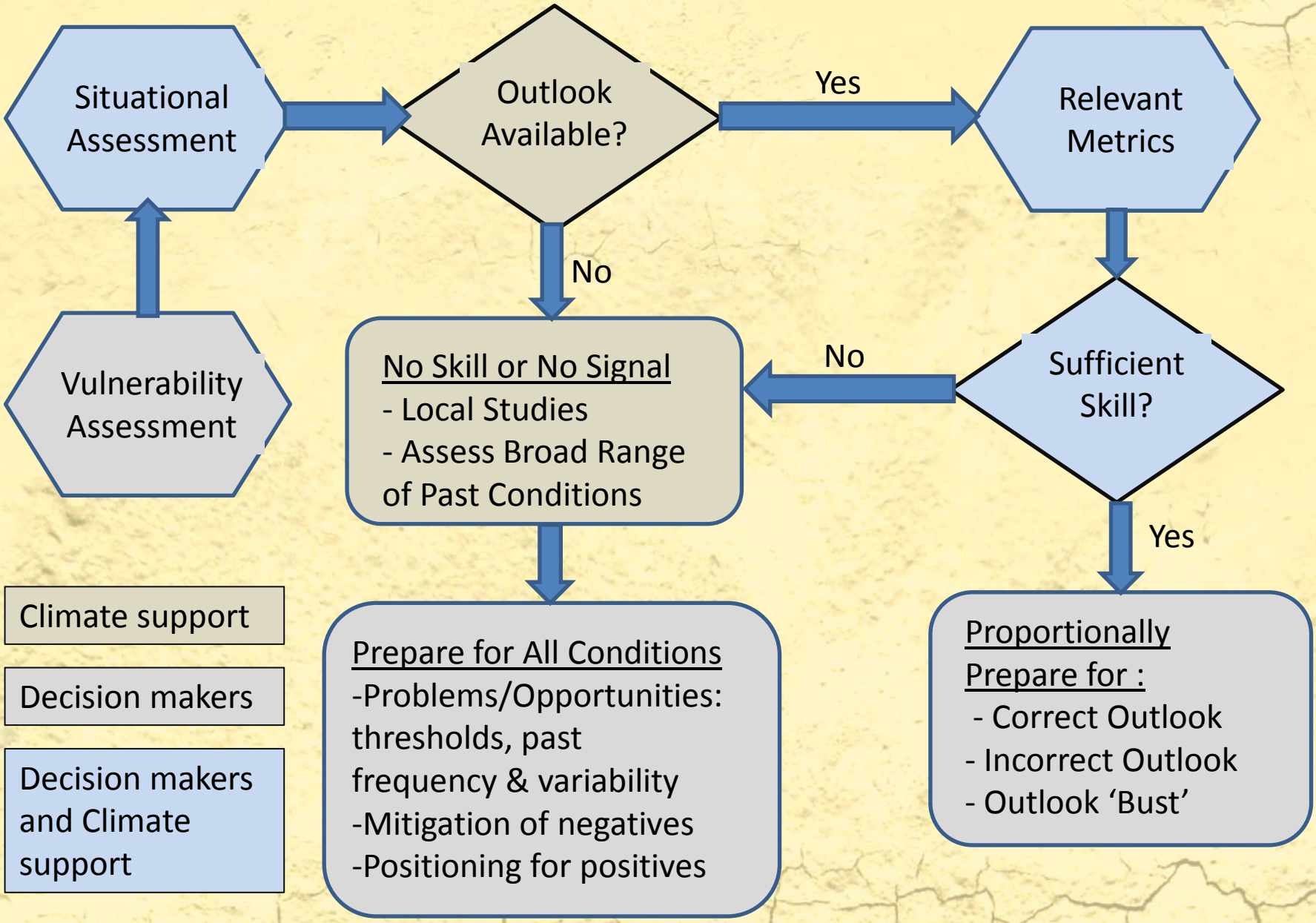
3 Click on column header to sort, click again to reverse-sort, or control-click to secondary sort
Click on table row to compare forecast and observation maps

Issue Month	Target Season	Lead Time	Probability of Wet	Probability of Neutral	Probability of Dry
September 2002	JFM 2003	4 Months	0.432	0.333	0.235
October 2002	JFM 2003	3 Months	0.446	0.334	0.220
November 2002	JFM 2003	2 Months	0.664	0.235	0.101

Behind the Skill Scores: the Forecast & Observation Record



Flow Chart for Using Outlooks



Historical Analysis and Analogs

1 Which Climate Variable are you interested in?

Precipitation ○ 1 Month ◉ **3 Month (Seasonal)**

Temperature ○ 1 Month ○ **3 Month (Seasonal)**

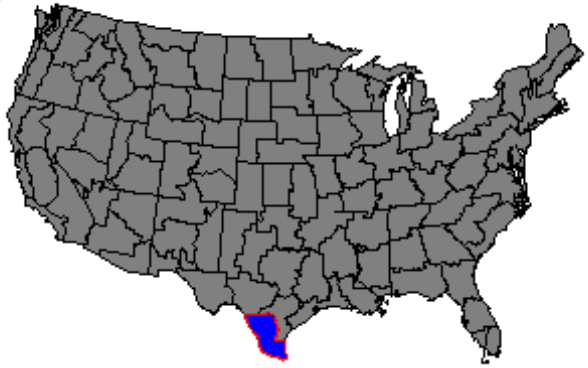
How many months of the recent past do you want to see?

12 **24**

How many months into the future do you want to see?

12 24

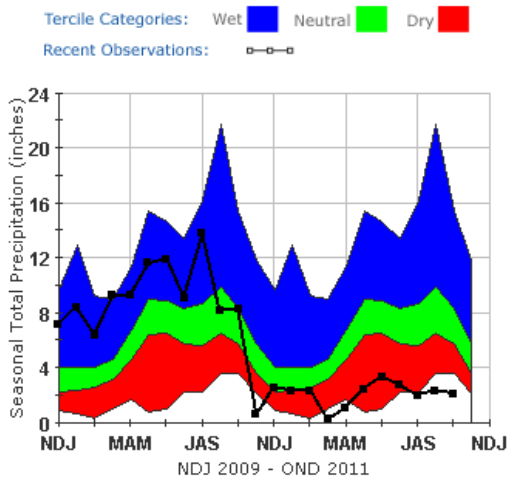
2 Choose (Click) target area on the map.



Historic Conditions

Precipitation / Far Southern Texas (63)

This plot shows 3 month (seasonal) **Precipitation** for the last **24 Months** compared to the historic tercile categories from 1971-2000.



Analogs: Examples of Possible Futures

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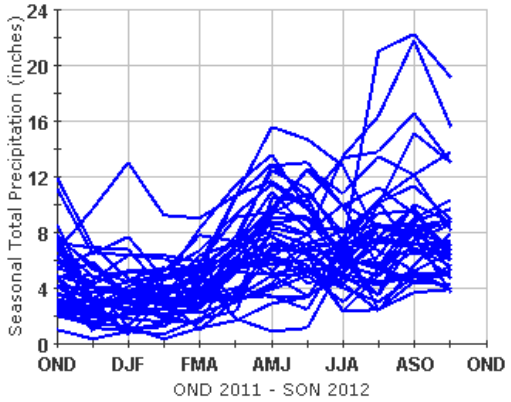

Current Season: **OND 2011**

4 Probability of Exceedance Graph

To view graph:
Use the slider below to select the season from the chart above. Select a season by moving shaded area and clicking on it.

O N D J F M A M J J A S O N

3 Analog Selector

Select/deselect a year by clicking on it.

Select All Clear All

1961	1971	1981	1991
1962	1972	1982	1992
1963	1973	1983	1993
1964	1974	1984	1994
1965	1975	1985	1995
1966	1976	1986	1996
1967	1977	1987	1997
1968	1978	1988	1998
1969	1979	1989	1999
1970	1980	1990	2000

Patterns

El Nino Only
La Nina Only
Neither El Nino nor La Nina
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Mid Pacific Decadal Oscillations
Low Pacific Decadal Oscillations

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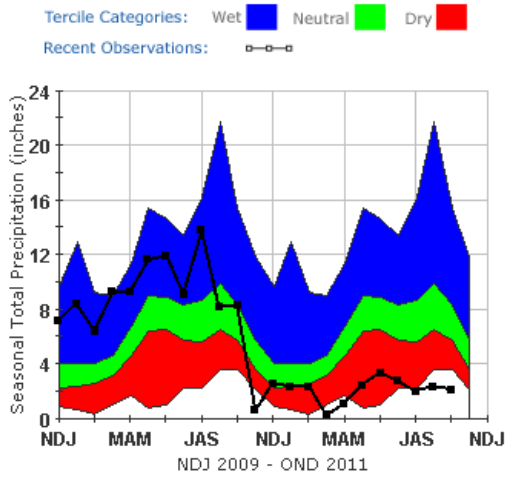

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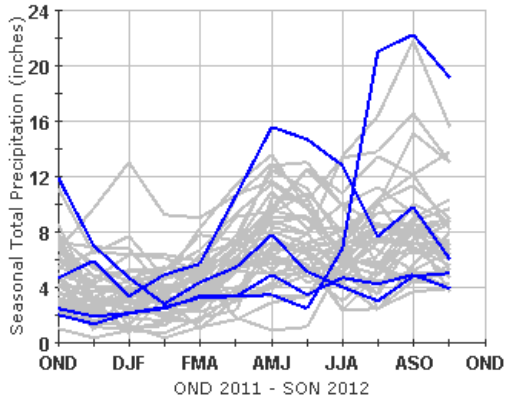

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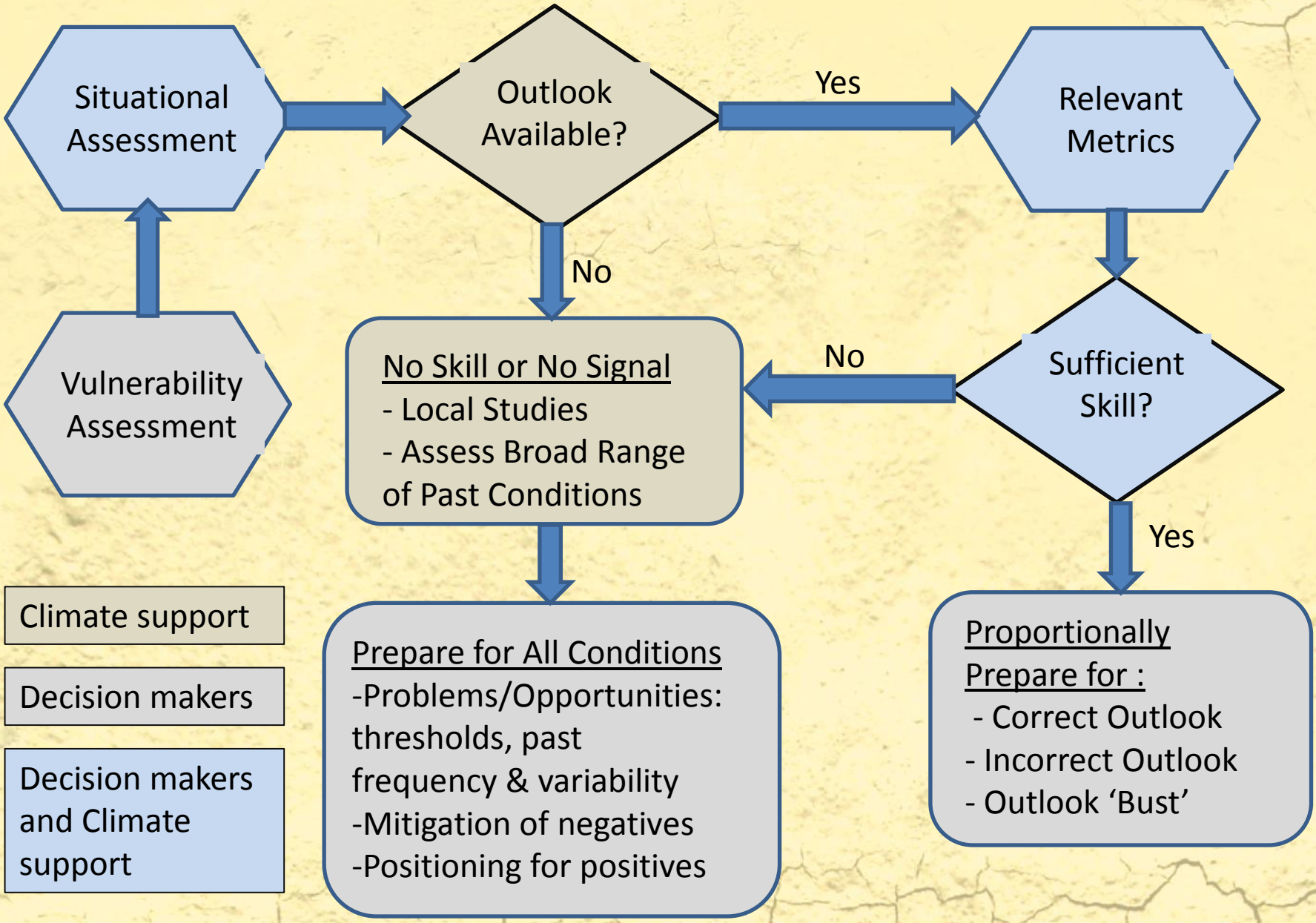

Resources

- U.S. Drought Portal
  - http://www.drought.gov
- Past webinars, summaries, and Federal/State Assistance
  - http://www.drought.gov/portal/server.pt/community/southern_plains
- Drought Impact Reporter
  - http://droughtreporter.unl.edu/
- State Climatologists
  - http://www.stateclimate.org/
- National Drought Mitigation Center
  - http://drought.unl.edu/
- Southern Climate Impacts Planning Program (SCIPP)
  - http://www.southernclimate.org/
  - Youtube: http://www.youtube.com/user/SCIPP01
- Climate Assessment for the Southwest (CLIMAS)
  - http://www.climas.arizona.edu/

We are now on facebook!
Southern Climate Impacts Planning Program

Is drought properly classified in your region? If not, let us know!

- Drought Impact Reporter
- Contact your State Climatologist
- E-mail the DM Authors: droughtmonitor@unl.edu