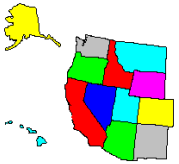


Western Regional Climate Center

Much Ado About Nothing:

Whither U.S. Drought ?

Kelly Redmond

Western Regional Climate Center

Desert Research Institute

Reno Nevada

36th Annual Climate Diagnostics and Prediction Workshop

Fort Worth, Texas October 3-6, 2011

I love talking about nothing. It is the only thing I know anything about.

Oscar Wilde

Drought: "Too many nice days." - Reid Bryson

Your National Weather Service forecast

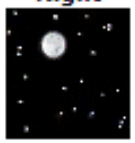
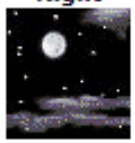
Fort Worth TX

Enter Your "City, ST" or zip code [ ] Go BOOKMARK

NWS Dallas/Fort Worth, TX
Point Forecast: Fort Worth TX
32.75°N 97.31°W (Elev. 525 ft)

Mobile Weather Information | En Español
Last Update: 2:51 am CDT Oct 2, 2011
Forecast Valid: 12pm CDT Oct 2, 2011-6pm CDT Oct 8, 2011

Forecast at a Glance

This Afternoon	Tonight	Monday	Monday Night	Tuesday	Tuesday Night	Wednesday	Wednesday Night	Thursday
								
Sunny	Clear	Sunny	Clear	Sunny	Mostly Clear	Sunny	Partly Cloudy	Partly Sunny
Hi 84 °F	Lo 55 °F	Hi 87 °F	Lo 55 °F	Hi 87 °F	Lo 58 °F	Hi 87 °F	Lo 63 °F	Hi 87 °F

Detailed 7-day Forecast

This Afternoon: Sunny, with a high near 84. Southeast wind between 5 and 10 mph.

Tonight: Clear, with a low around 55. Southeast wind around 5 mph.

Monday: Sunny, with a high near 87. South southeast wind between 5 and 10 mph.

Monday Night: Clear, with a low around 55. South southeast wind around 5 mph.

Tuesday: Sunny, with a high near 87. Calm wind becoming south southeast between 5 and 10 mph.

Current Conditions [Move Down]

view Yesterday's Weather

Fort Worth, Meacham International Airport
Lat: 32.83 Lon: -97.35 Elev: 687
Last Update on Oct 2, 10:53 am CDT

Fair

70 °F (21 °C)

Humidity:	37 %
Wind Speed:	SE 10 MPH
Barometer:	30.25" (1023.8 mb)
Dewpoint:	42 °F (6 °C)
Visibility:	10.00 mi.
More Local Wx:	3 Day History:

Even nothing is alive with something ... The virtual particle cornucopia.

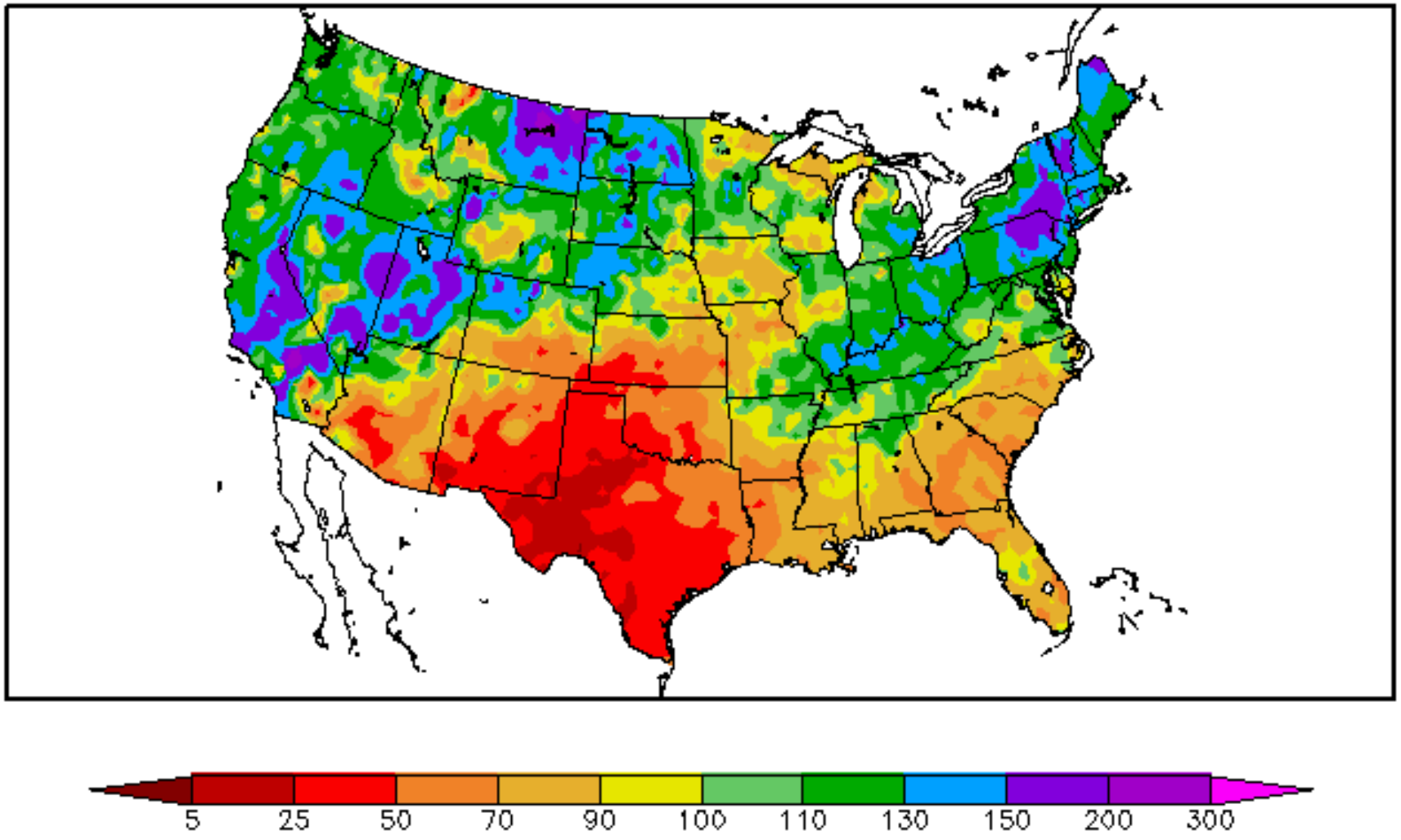
Hubble Deep Field Detail

Seinfeld

visit seinfeld.com

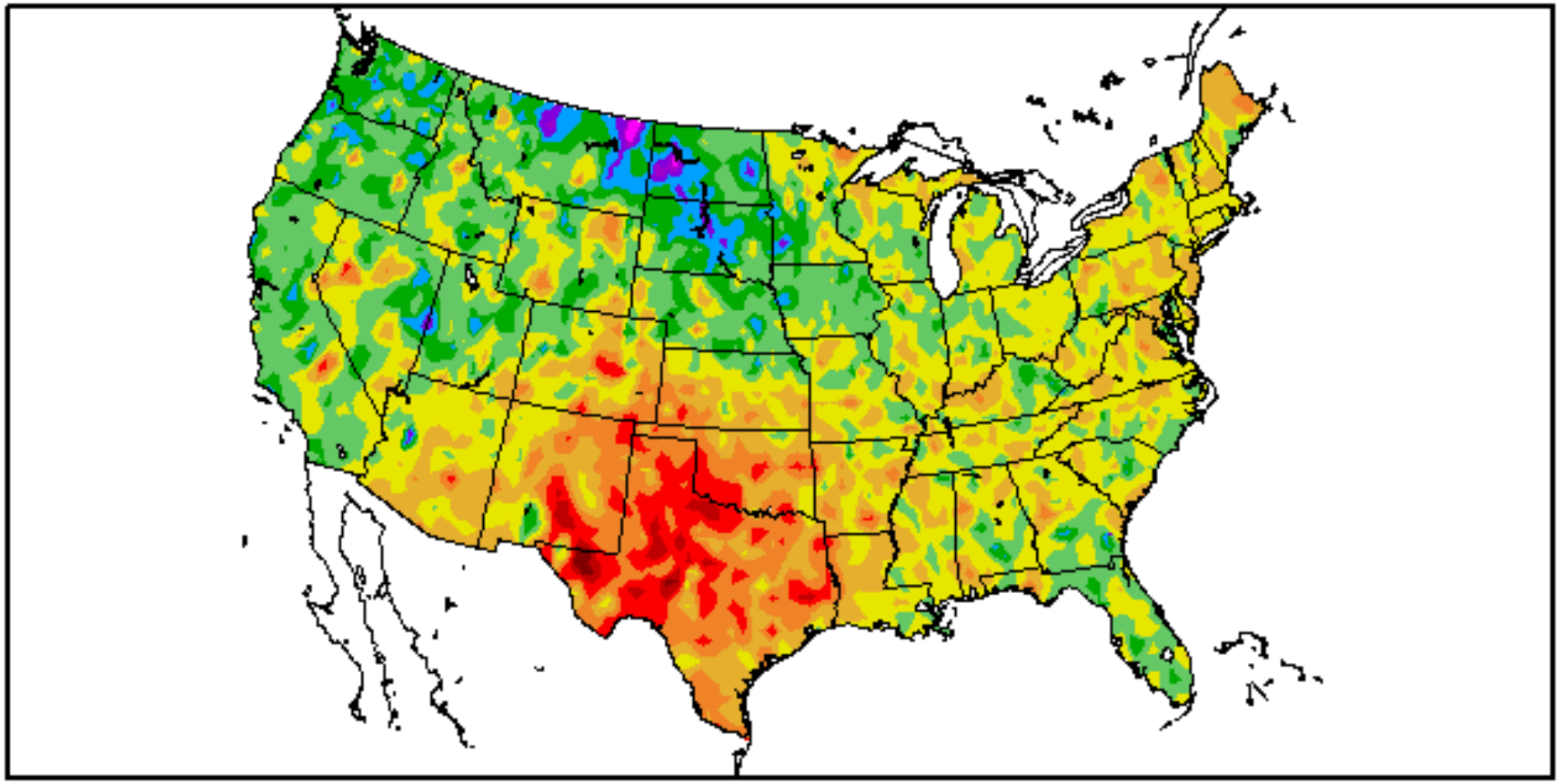
Precipitation
Percent of Ave
2010 Oct 1 thru
2011 Sep 30
USA, via HPRCC

Holiday Greetings: Happy New Water Year !!!



Mean Temp
Dep from Ave
2010 Oct 01 thru
2011 Sep 30
USA, Via HPRCC

Departure from Normal Temperature (F)
10/1/2010 – 9/30/2011

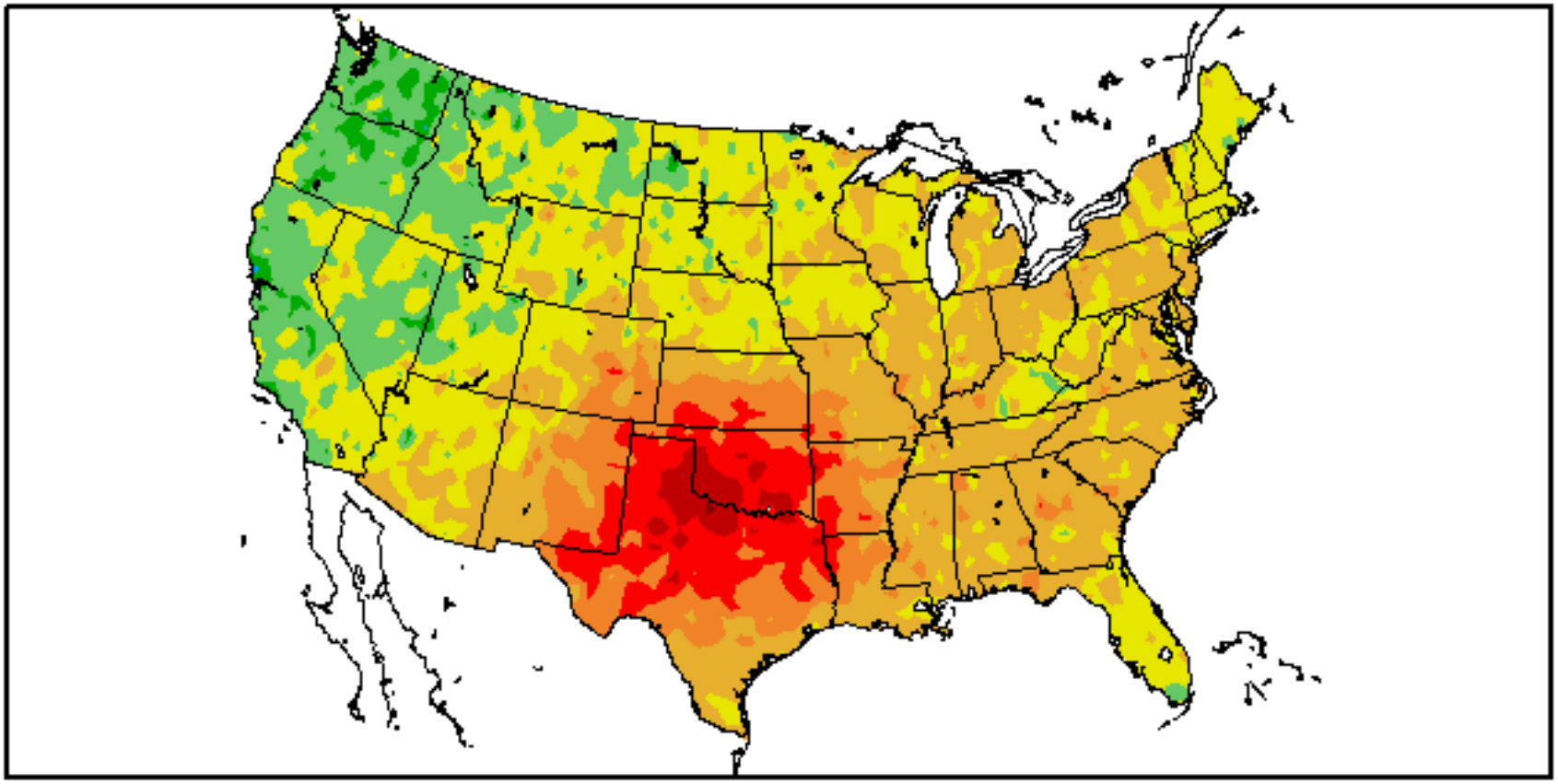


Generated 10/1/2011 at HPRCC using provisional data.

Regional Climate Centers

Mean Temp
Dep from Ave
2011 Jun 01 thru
2011 Aug 31
USA, Via HPRCC

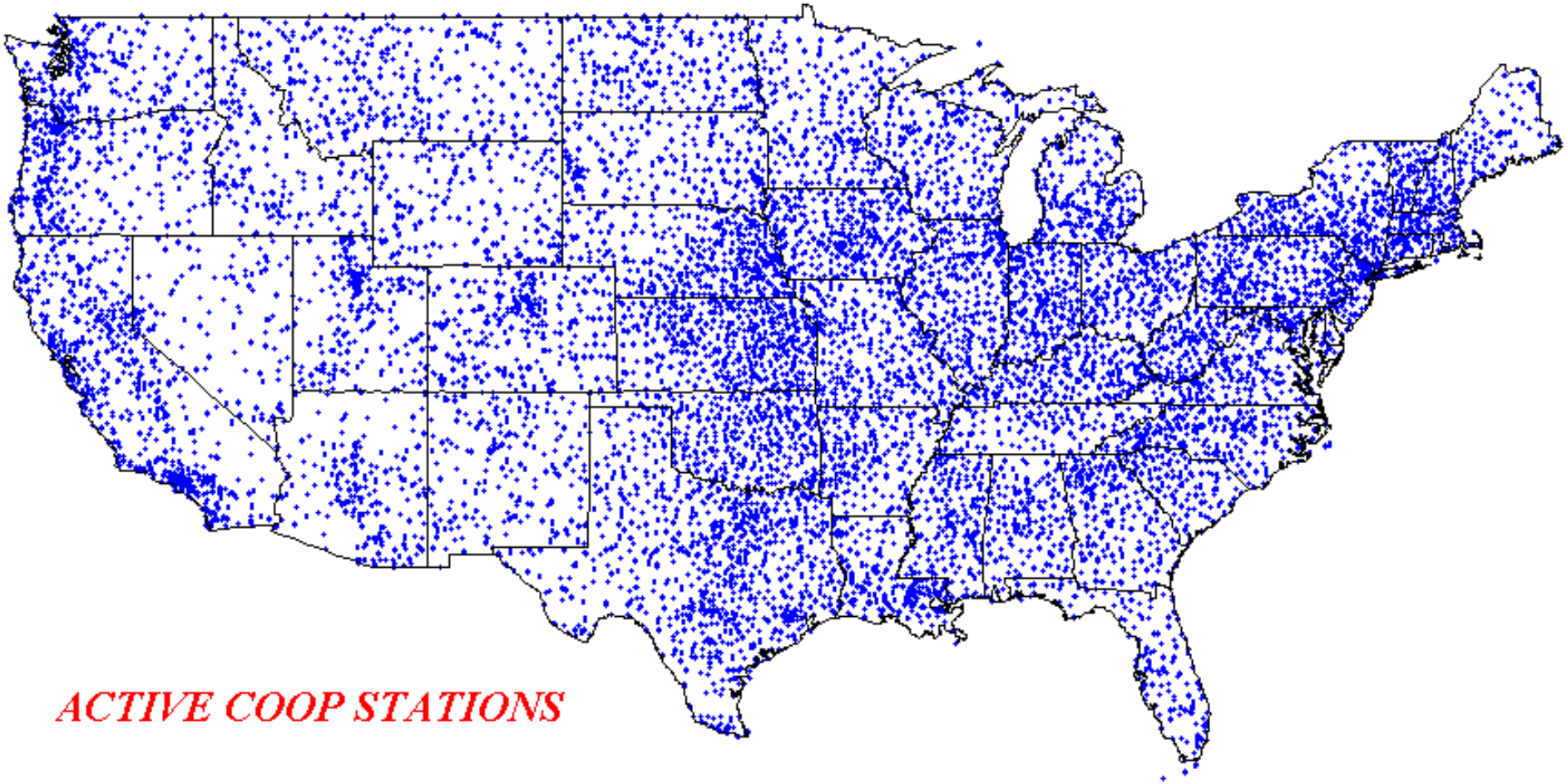
Departure from Normal Temperature (F)
6/1/2011 – 8/31/2011



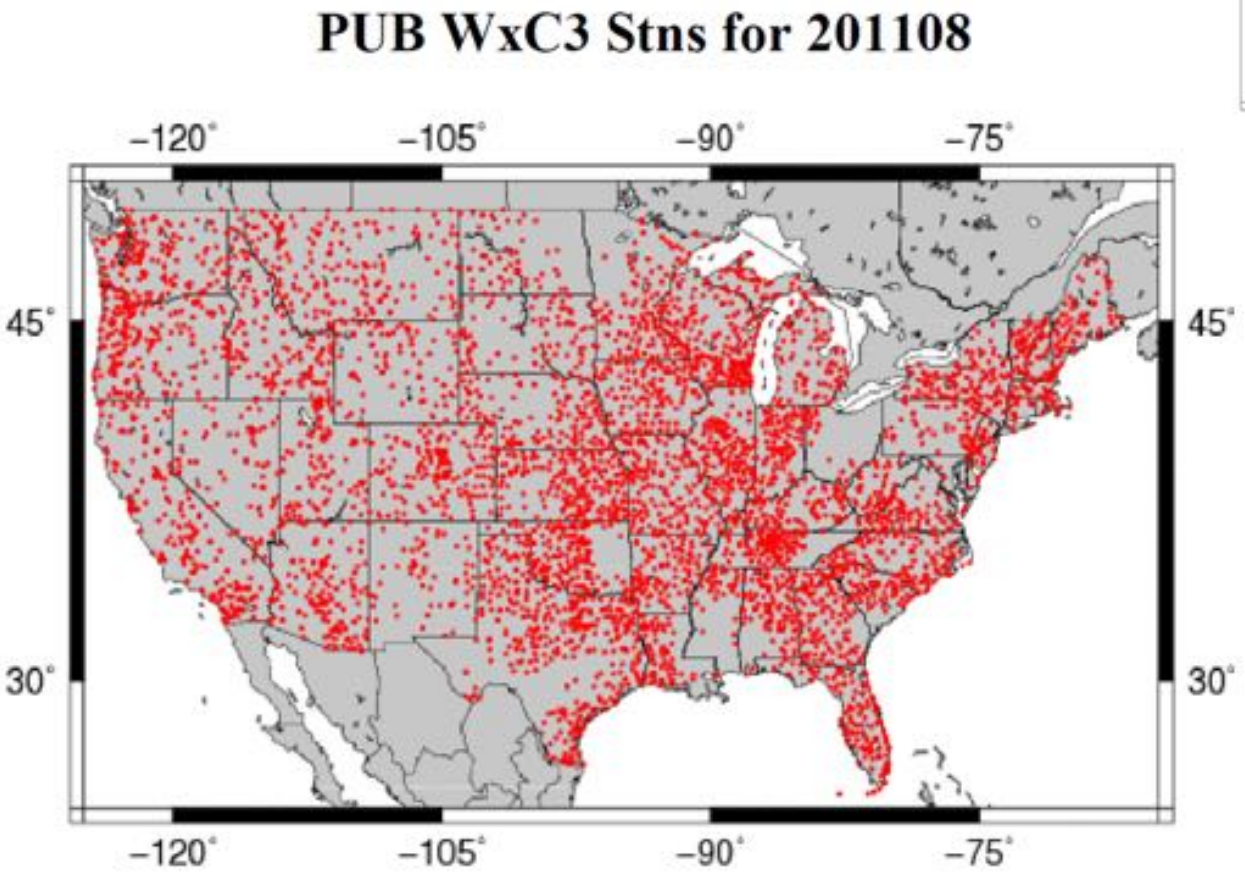
−10 −8 −6 −4 −2 0 2 4 6 8 10

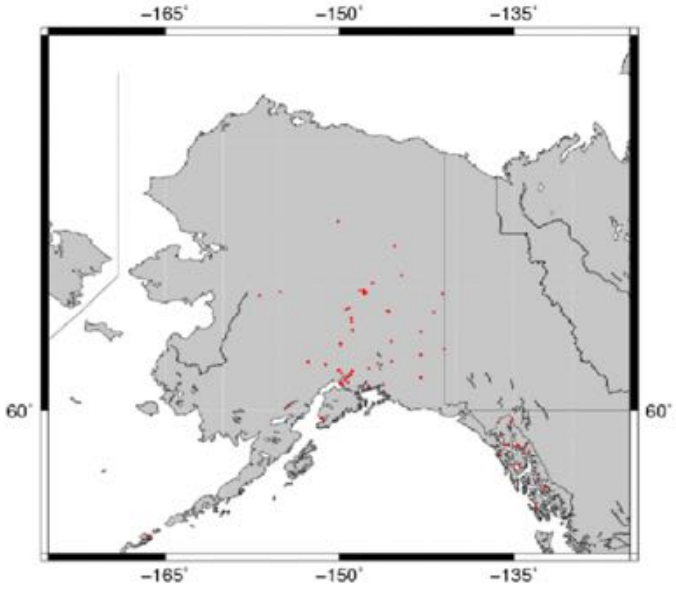
Generated 9/11/2011 at HPRCC using provisional data.

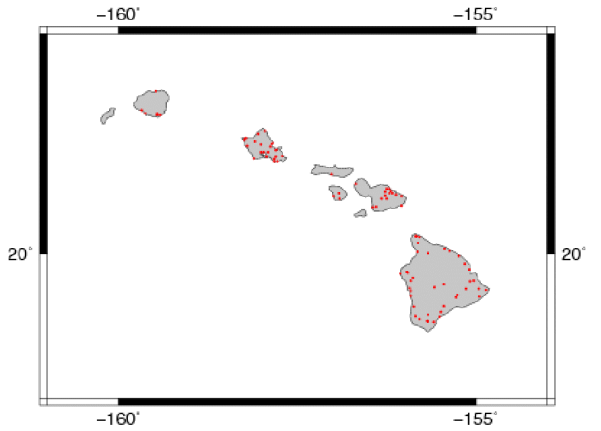
Regional Climate Centers

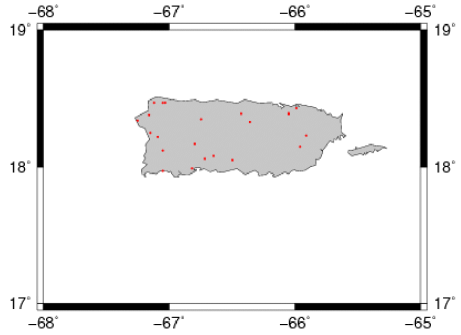

ACTIVE COOP STATIONS

August 2011. NOAA WeatherCoder III. Web entry of manual observations. 4108 stations (53.8%) routed thru WRCC daily. Joint NCDC-NWS activity, goal 80% end FY12. Also 519 IV-ROCS. Needed for ACIS maps (AK 70 of 130. Approx 31 ASOS stns.)
Start of pathway to national distribution.
"Paperless" NOAA Cooperative Network.





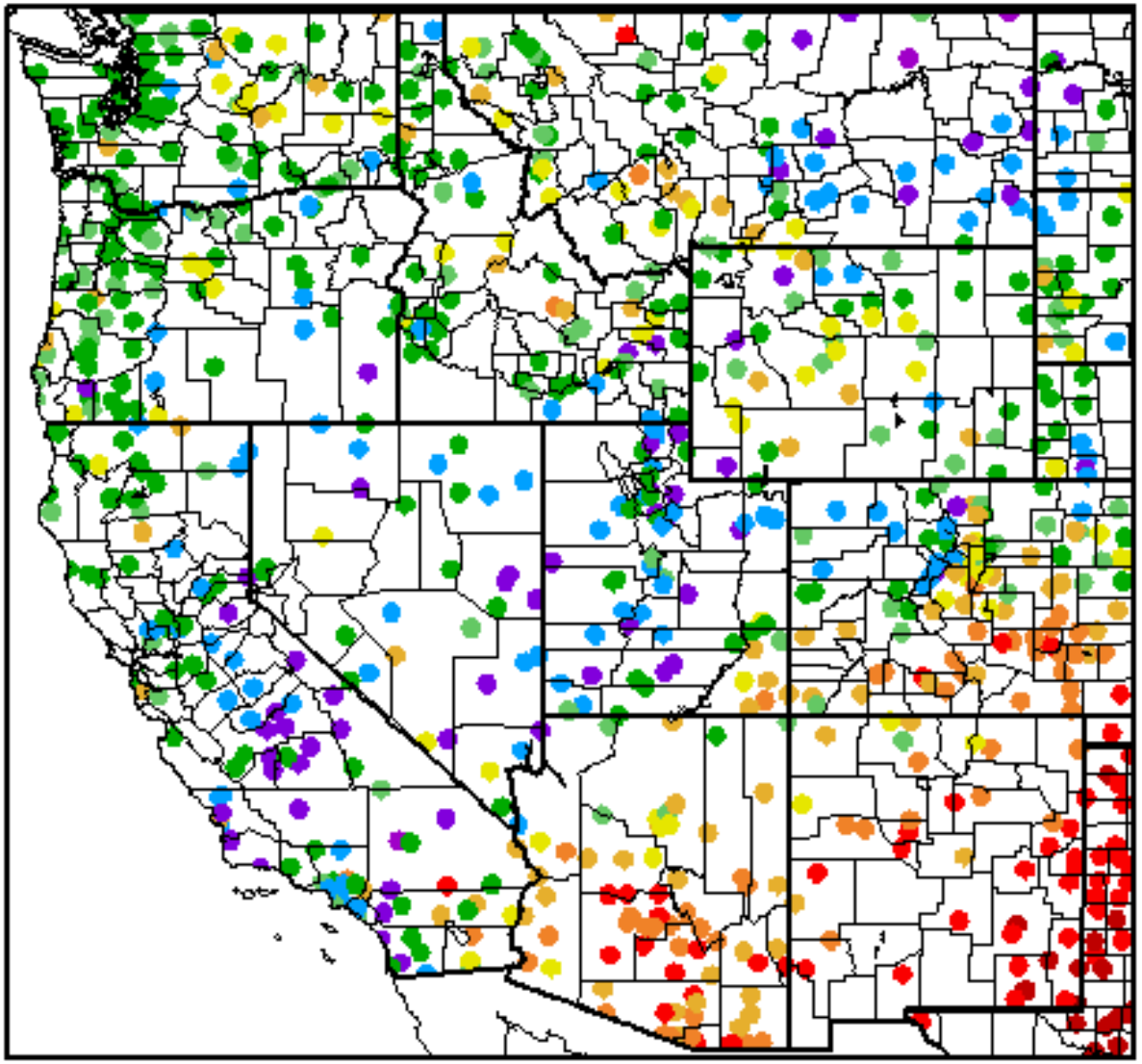




Stations Ingested by ACIS

Applied Climate Information System

Percent of Normal Precipitation (%)
10/1/2010 – 9/30/2011

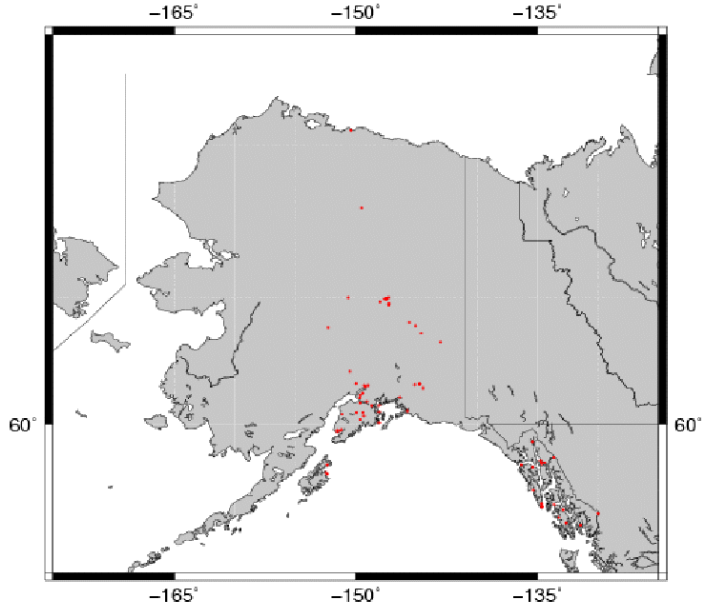


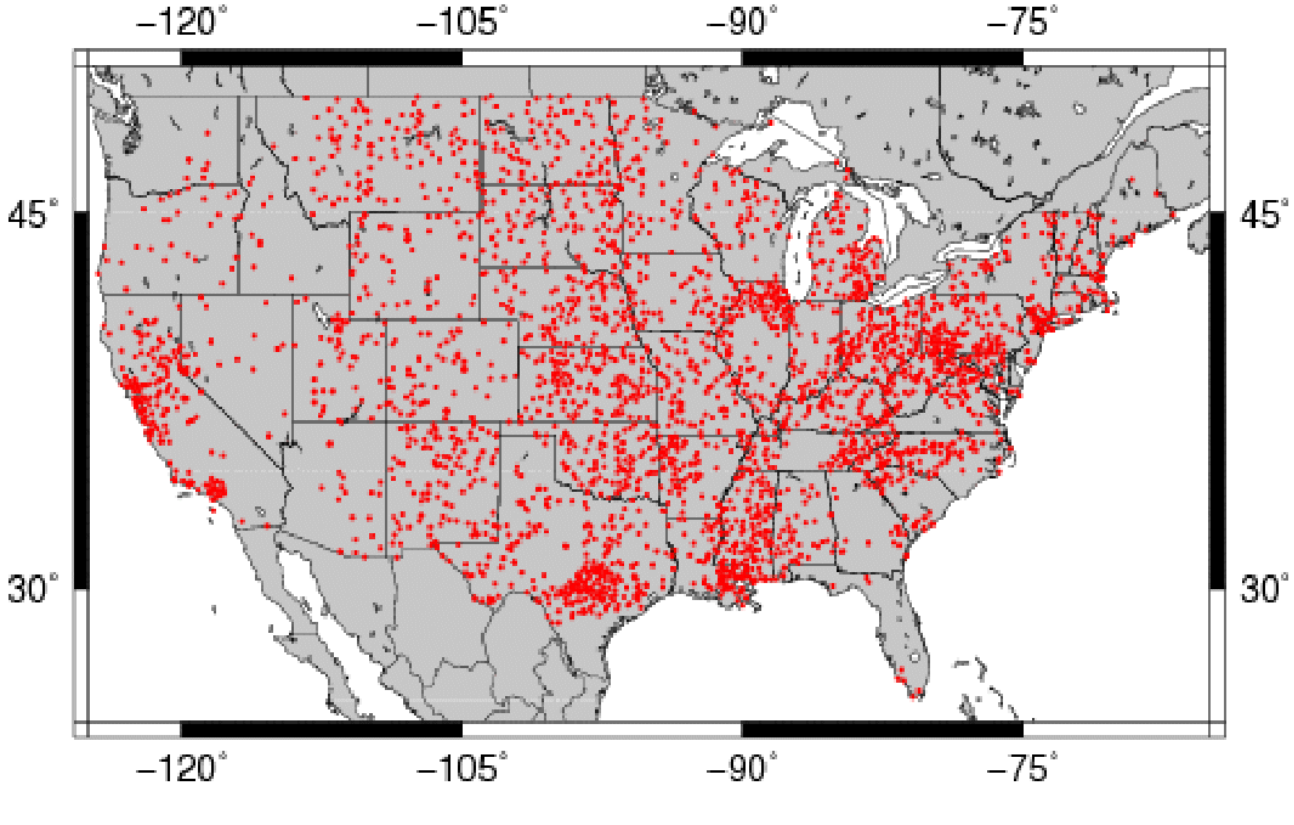
Generated 10/1/2011 at HPRCC using provisional data.

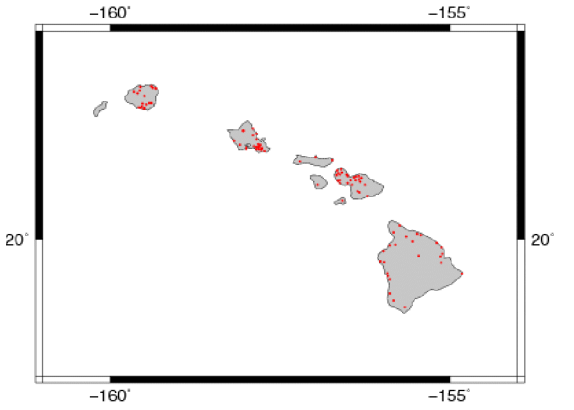
Regional Climate Centers

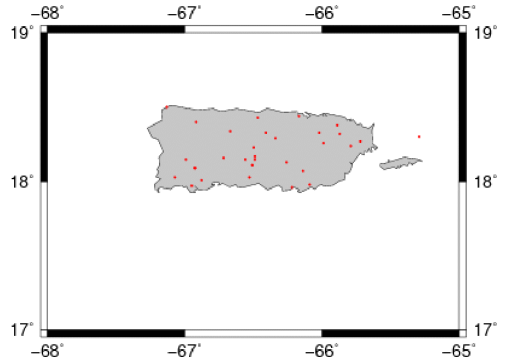
August 2011. NOAA WeatherCoder III.
Web entry of manual observations.

Stations yet to convert.









US Climate Reference Network

USCRN Overview

The **U.S. Climate Reference Network (USCRN)** consists of 114 stations developed, deployed, managed, and maintained by the National Oceanic and Atmospheric Administration (NOAA) in the continental United States for the express purpose of detecting the national signal of climate change. The vision of the USCRN program is to maintain a sustainable high-quality climate observation network that 50 years from now can with the highest degree of confidence answer the question: How has the climate of the nation changed over the past 50 years? These stations were designed with climate science in mind.

Three independent measurements of temperature and precipitation are made at each station, insuring continuity of record and maintenance of well-calibrated and highly accurate observations. The stations are placed in pristine environments expected to be free of development for many decades. Stations are monitored and maintained to high standards, and are calibrated on an annual basis. In addition to temperature and precipitation, these stations also measure solar radiation, surface skin temperature, and surface winds, and are being expanded to include triplicate measurements of soil moisture and soil temperature at five depths, as well as atmospheric relative humidity. Experimental stations have been located in Alaska since 2002 and Hawaii since 2005, providing network experience in polar and tropical regions. Deployment of a complete 29 station USCRN network into Alaska began in 2009. This project is managed by NOAA's National Climatic Data Center and operated in partnership with NOAA's Atmospheric Turbulence and Diffusion Division.

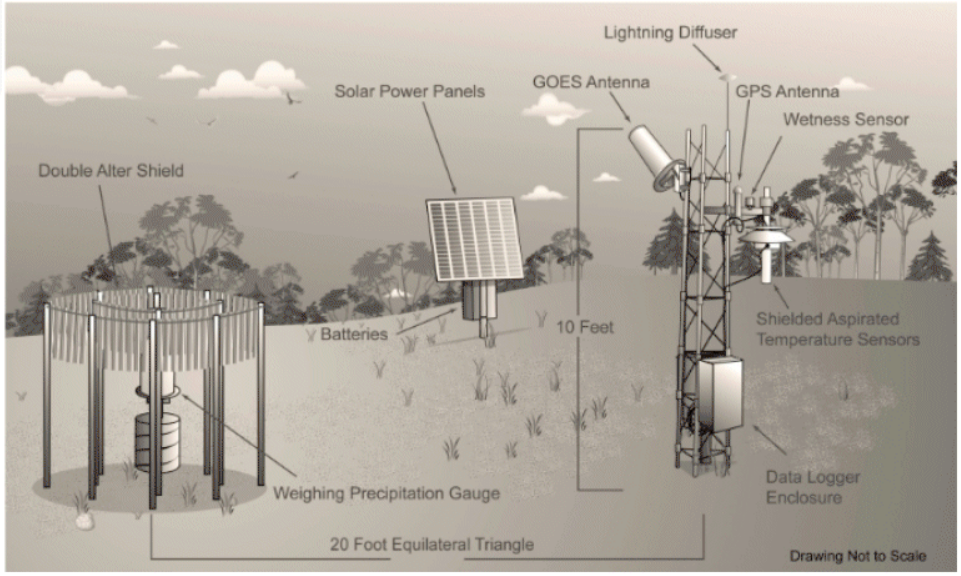
USRCRN
United States REGIONAL Climate Reference Network
Click here for USRCRN

USRCRN

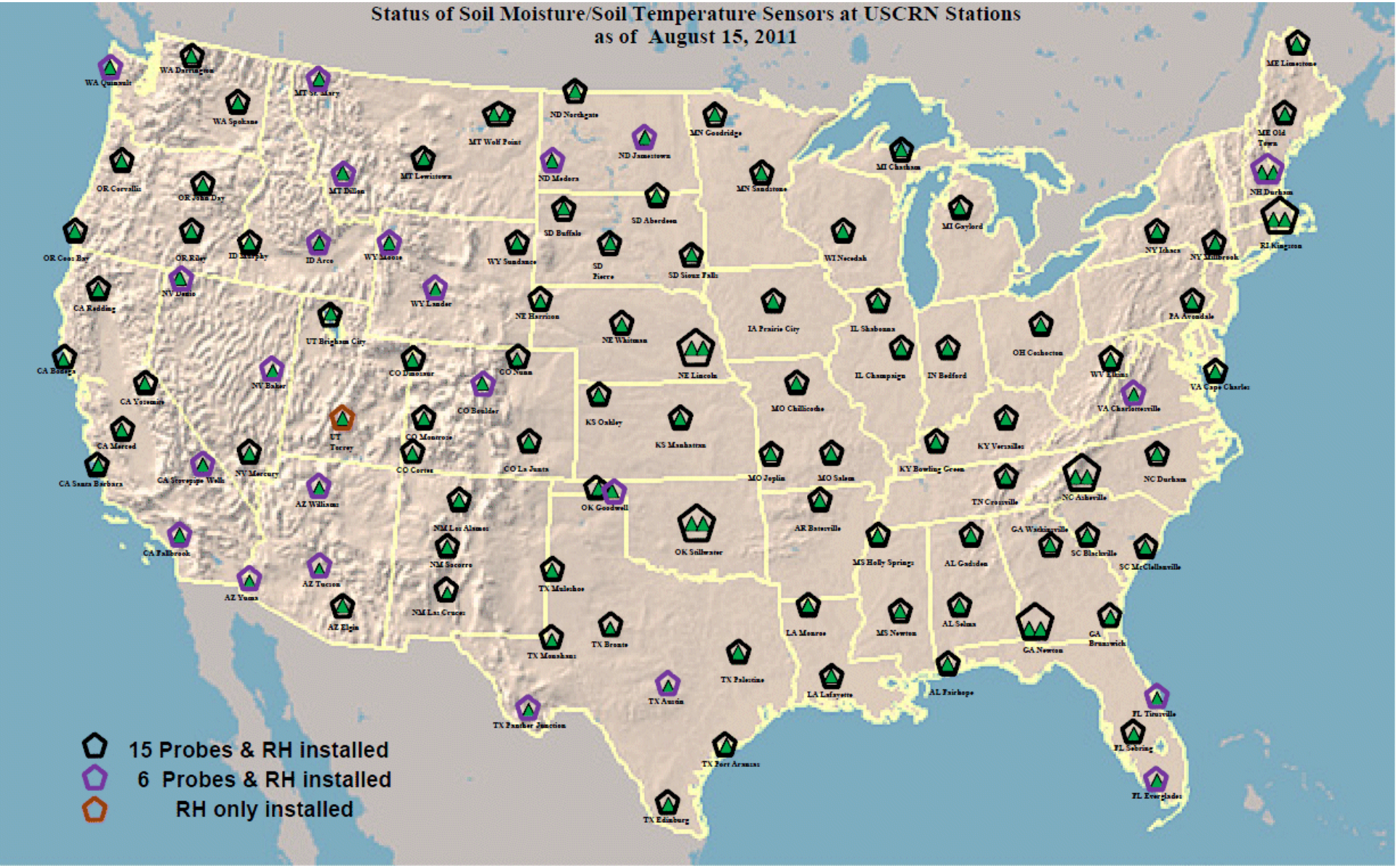
USRCRN Overview

A new network of stations called the **U.S. Regional Climate Reference Network (USRCRN)** is now being deployed by NOAA. These stations maintain the same level of climate science quality measurements as the national-scale U.S. Climate Reference Network (USCRN), but are spaced more closely, and focus solely on temperature and precipitation.

Beginning with a pilot project in the Southwest, USRCRN stations will be deployed at a 130 km spatial resolution to provide for the detection of regional climate change signals. Following completion of the pilot project, the long-term vision is deployment in each of the nine NOAA climate regions of the United States at a 130 km spatial resolution that will allow the detection of regional climate change signals. As with the USCRN, USRCRN stations have triple redundancy and are placed in pristine environments. About 538 locations in the United States will have either a USRCRN or USCRN station at the end of deployment for this project. This project is managed by NOAA???s National Climatic Data Center in partnership with the Office of Science and Technology in NOAA's National Weather Service and NOAA's Atmospheric Turbulence and Diffusion Division.

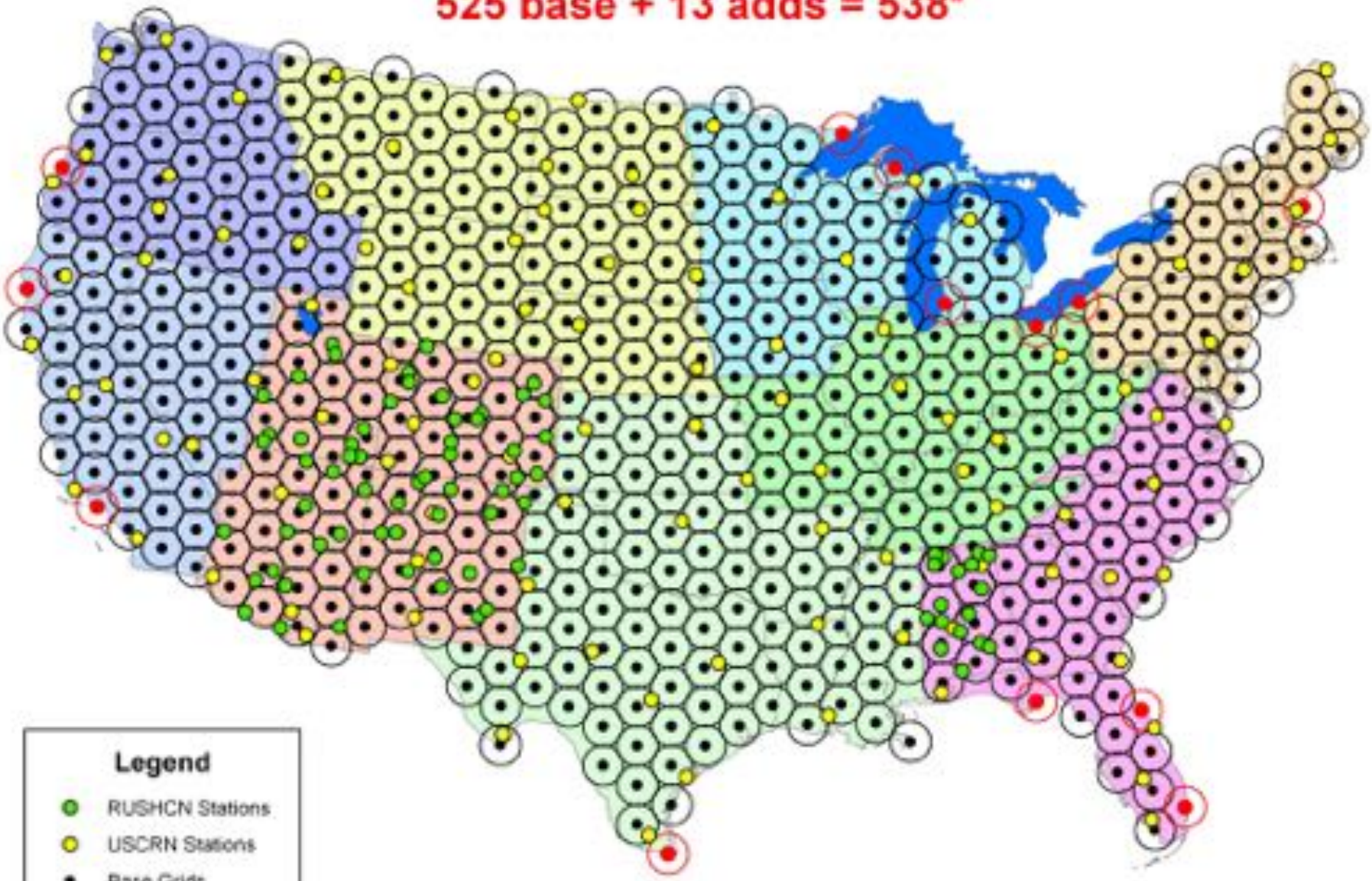


US CRN Climate Reference Network . Status 2011 August 15

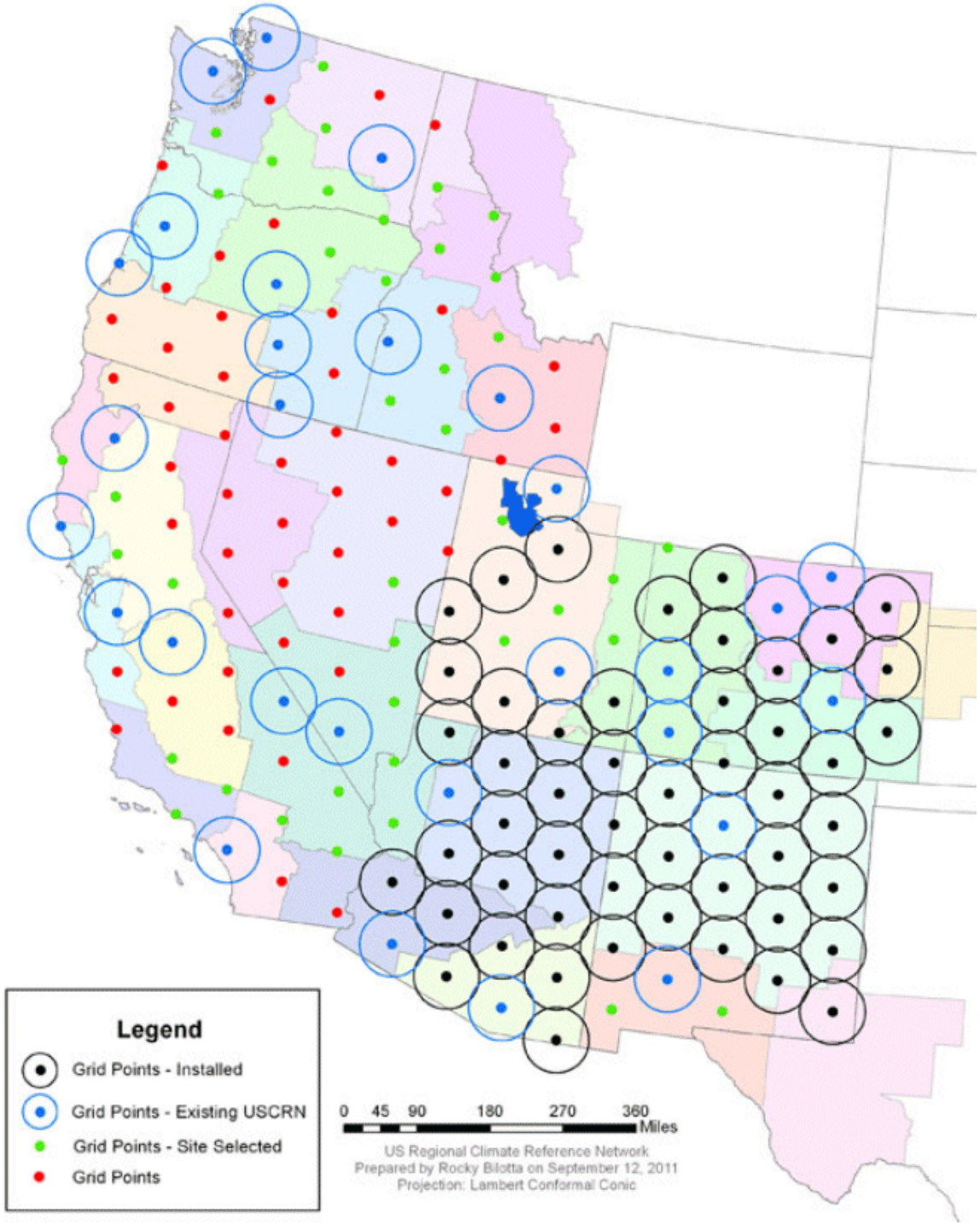


NCDC

Recommendation for
Conterminous United States
525 base + 13 adds = 538*



* Pending SW Adjustments

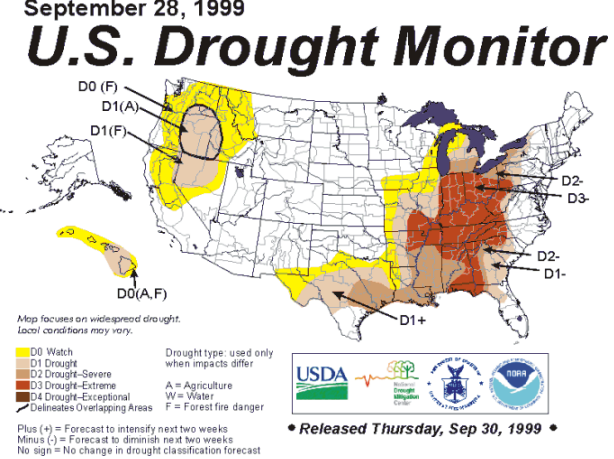


Status of US RCRN

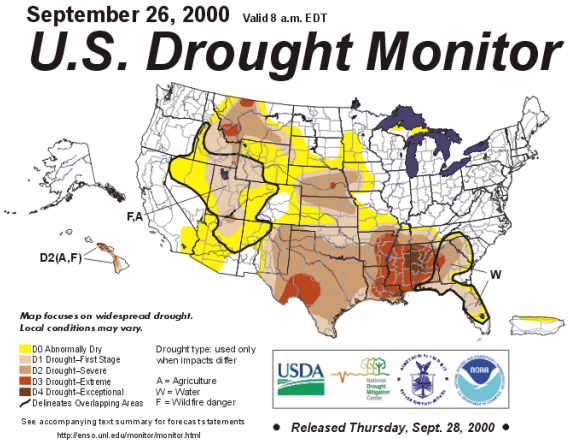
Regional Climate Reference Network

Surveys and Installations

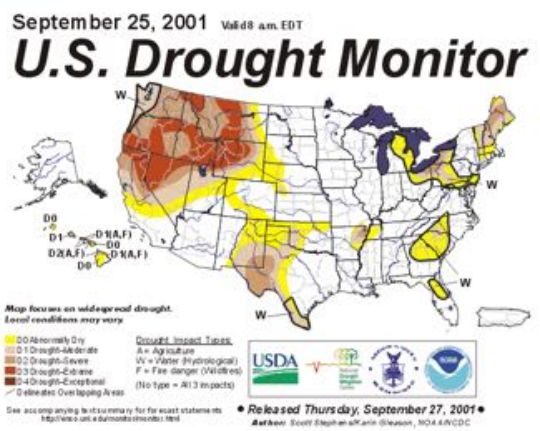
2011 September 12



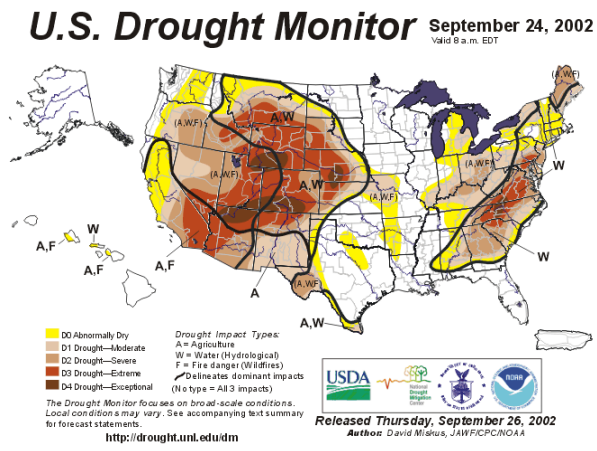
Sep 28, 1999



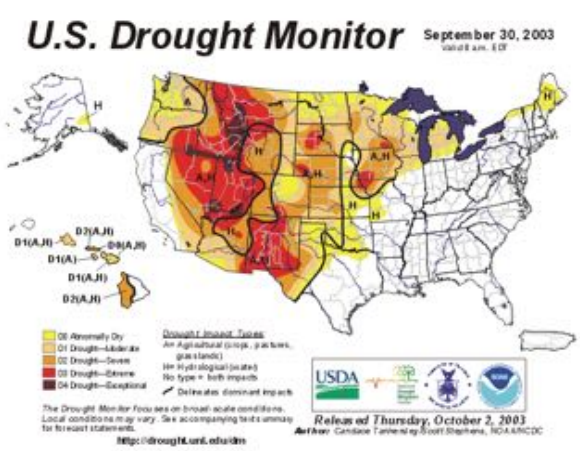
Sep 26, 2000



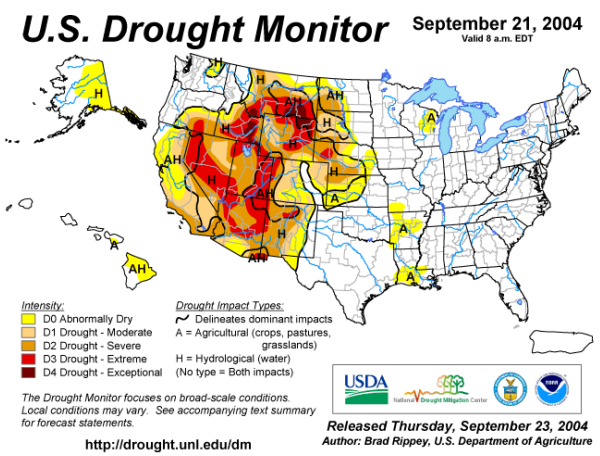
Sep 25, 2001



Sep 24, 2002



Sep 30, 2003



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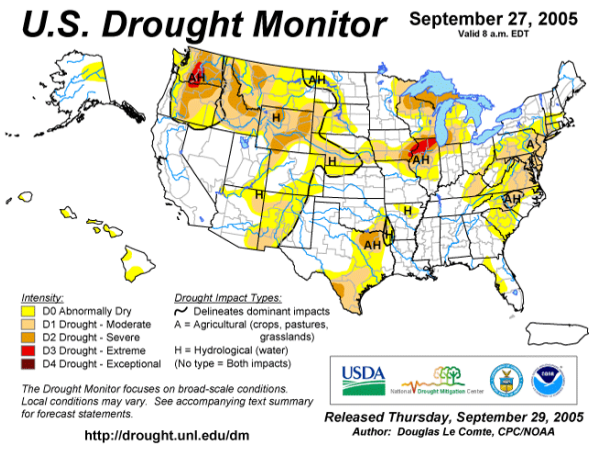

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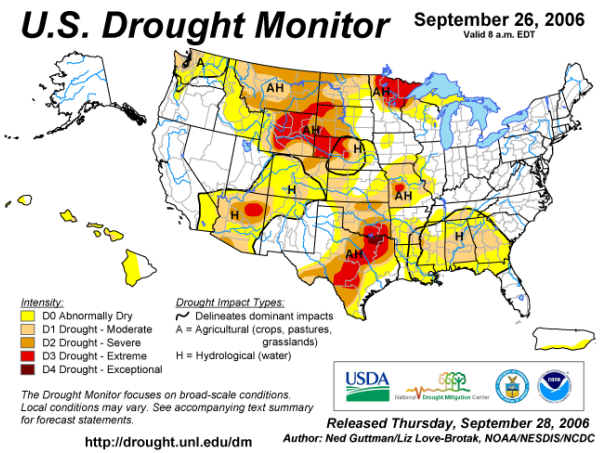

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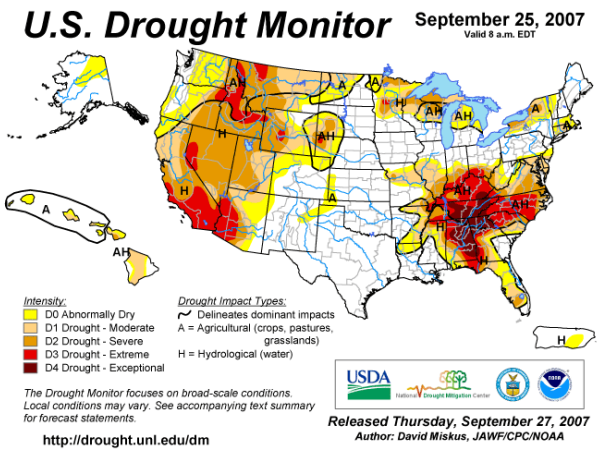

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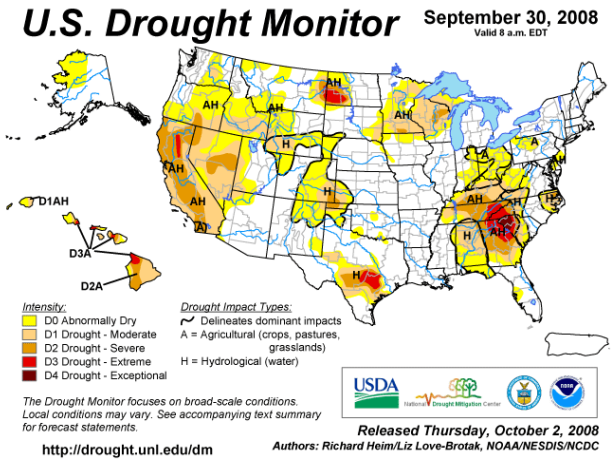

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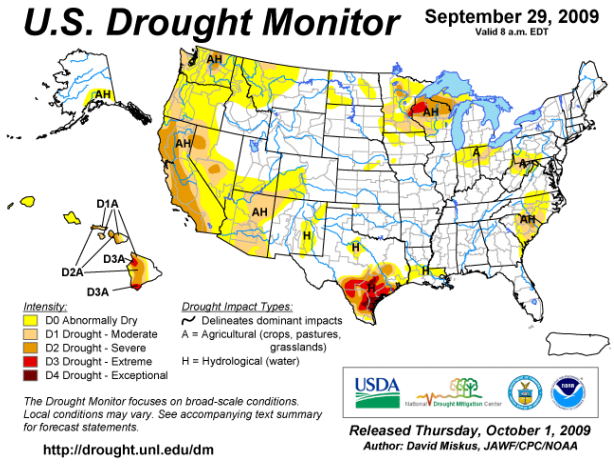
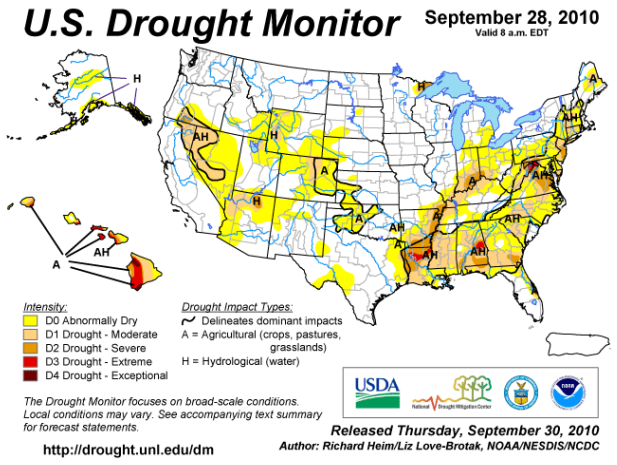
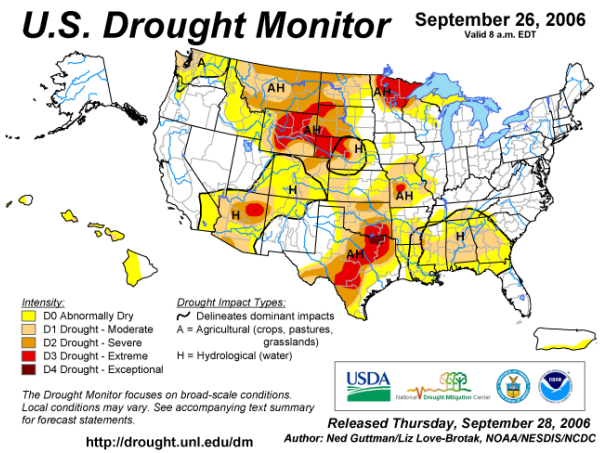


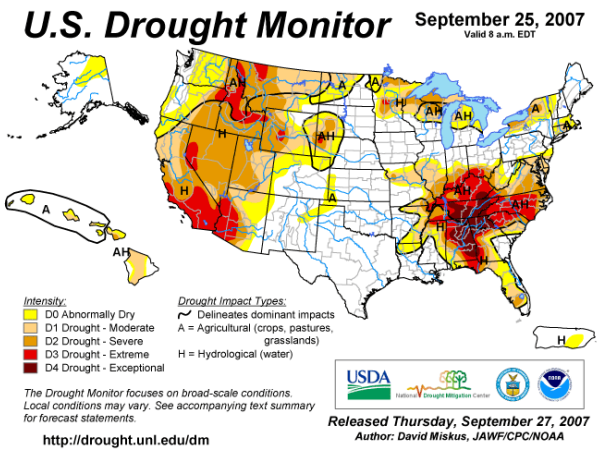
Sep 29, 2009



Sep 28, 2010



Sep 26, 2006



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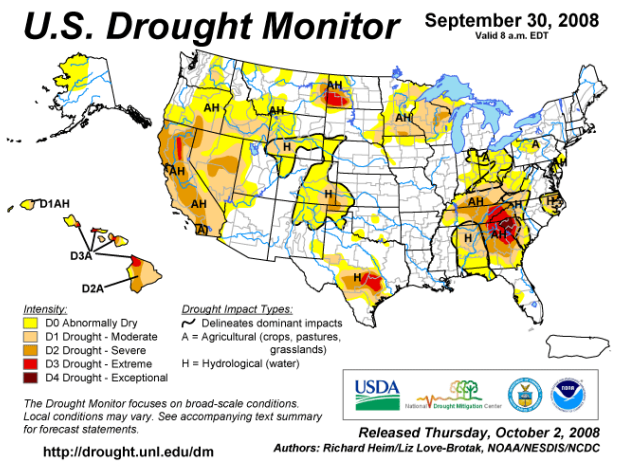

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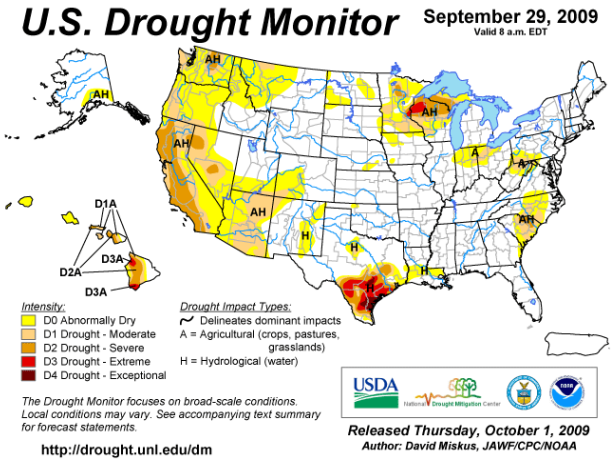

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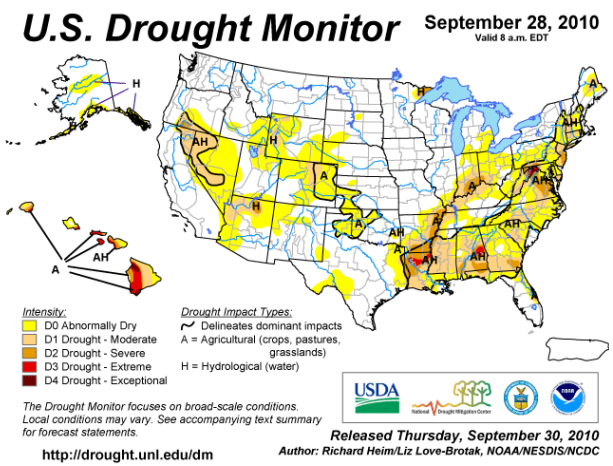

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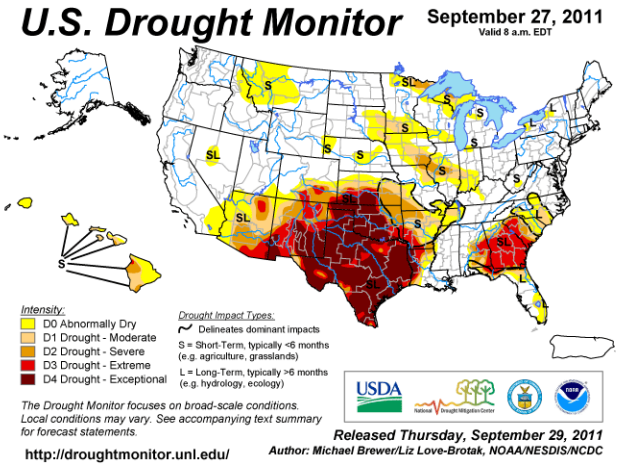


Sep 27, 2011

The Drought Monitor

Initiated because of a 1999 drought in Washington DC area. (Yes, true!)

The Drought Monitor is both a process and a product.

An extended weekly email discussion, about 300 potential voices.

A weekly (USDM) or monthly (NADM) product (spatial depiction).

A rich, vibrant, interesting, varied, intelligent (mostly) conversation.

A great source of discussions, ideas, needs, tools, issues, problems.

A farmers market of real world, practical and intellectual challenges.

Drought (usually) develops slowly. We should never be taken by surprise.

Do impacts corroborate physical indicators? The red-faced test.

Do physical indicators presage impact appearance? Looking for trouble.

Drought is defined by its impacts. No impacts - no drought.

The Drought Monitor (continued)

Ownership is by everybody and by nobody. An important characteristic.
Contributions from variety of federal and state agencies, individuals.

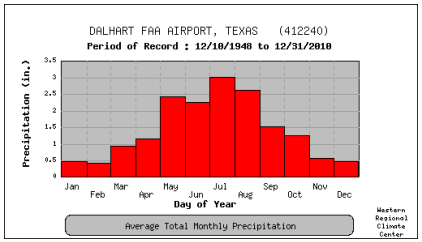
Basis for increasing number of resource allocation decisions.

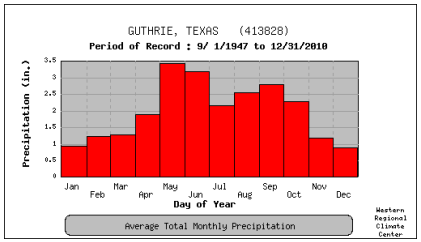
Not the definitive word on basin, state, sectoral scales. Many ongoing activities with much greater sophistication and very long histories.

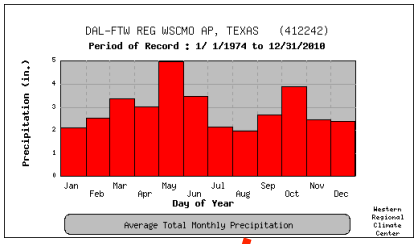
Drought involves complex responses to geophysical drivers.
DM limitations: Time scales, spatial scales, map depiction, lags, more.

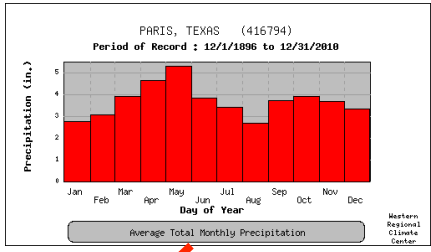
USDM - Works well inside one country.
NADM - Fosters international collaboration. Common issues.
World - More diversity, new issues, potentially a good, practical approach.

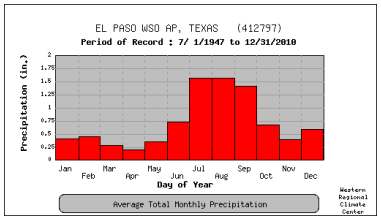
A combined social and physical endeavor with real-world grounding.

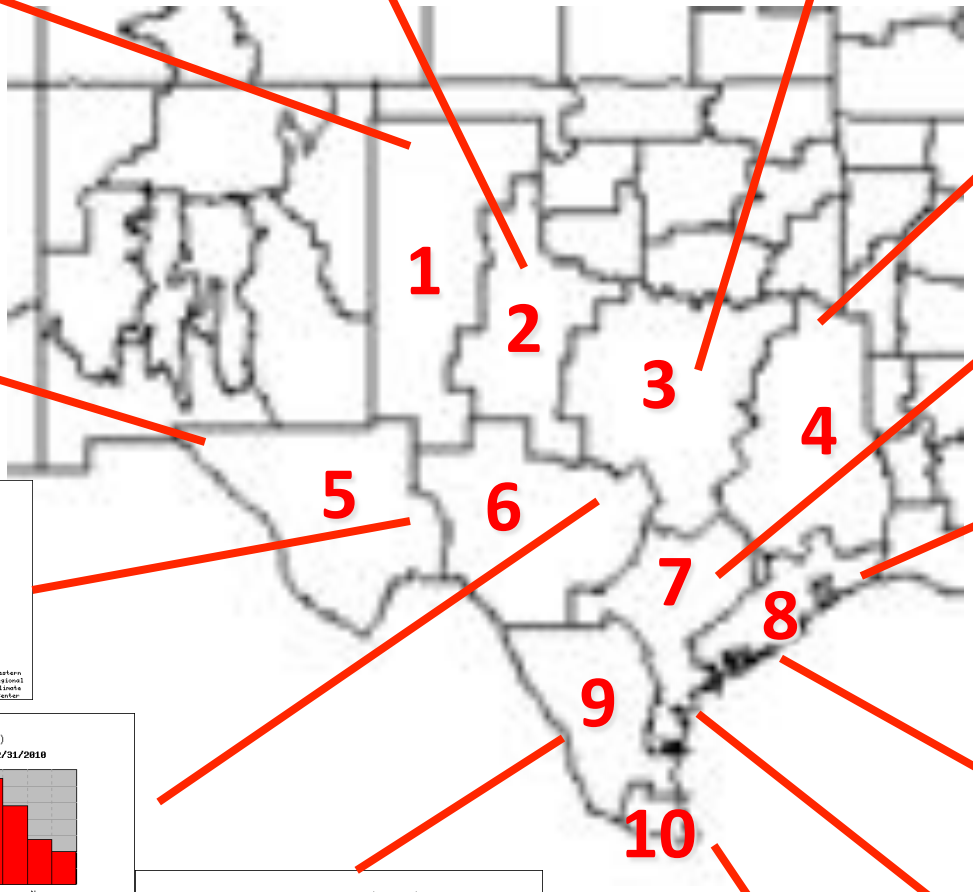

DALHART FAA AIRPORT, TEXAS (412240)
Period of Record : 12/10/1948 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center


GUTHRIE, TEXAS (413828)
Period of Record : 9/ 1/1947 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center


DAL-FTW REG WSCMO AP, TEXAS (412242)
Period of Record : 1/ 1/1974 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center


PARIS, TEXAS (416794)
Period of Record : 12/1/1896 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center


EL PASO WSO AP, TEXAS (412797)
Period of Record : 7/ 1/1947 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center


1
2
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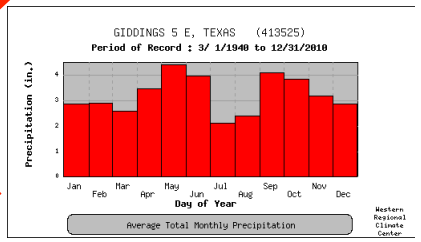
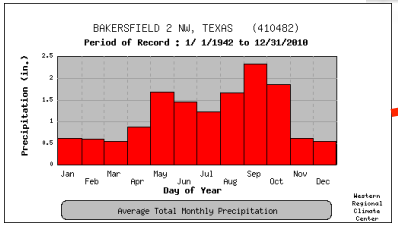
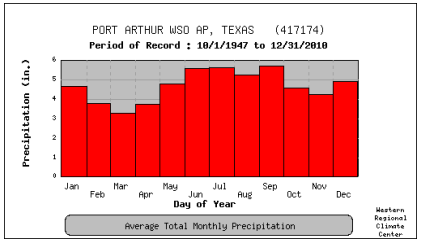
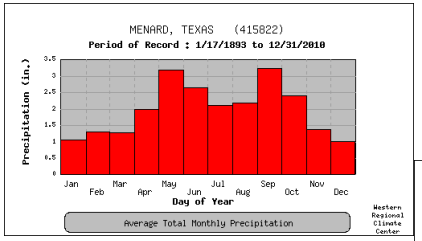
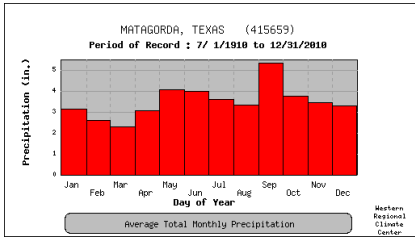
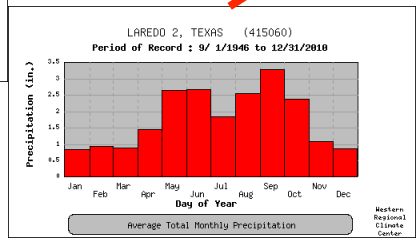

GIDDINGS 5 E, TEXAS (413525)
Period of Record : 3/ 1/1940 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center

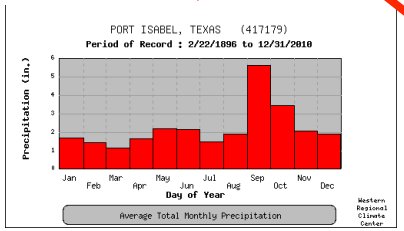

BAKERSFIELD 2 NW, TEXAS (410482)
Period of Record : 1/ 1/1942 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center

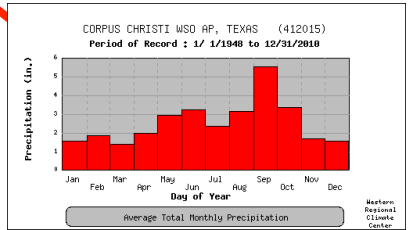

PORT ARTHUR WSO AP, TEXAS (417174)
Period of Record : 10/1/1947 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center


MENARD, TEXAS (415822)
Period of Record : 1/17/1893 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center

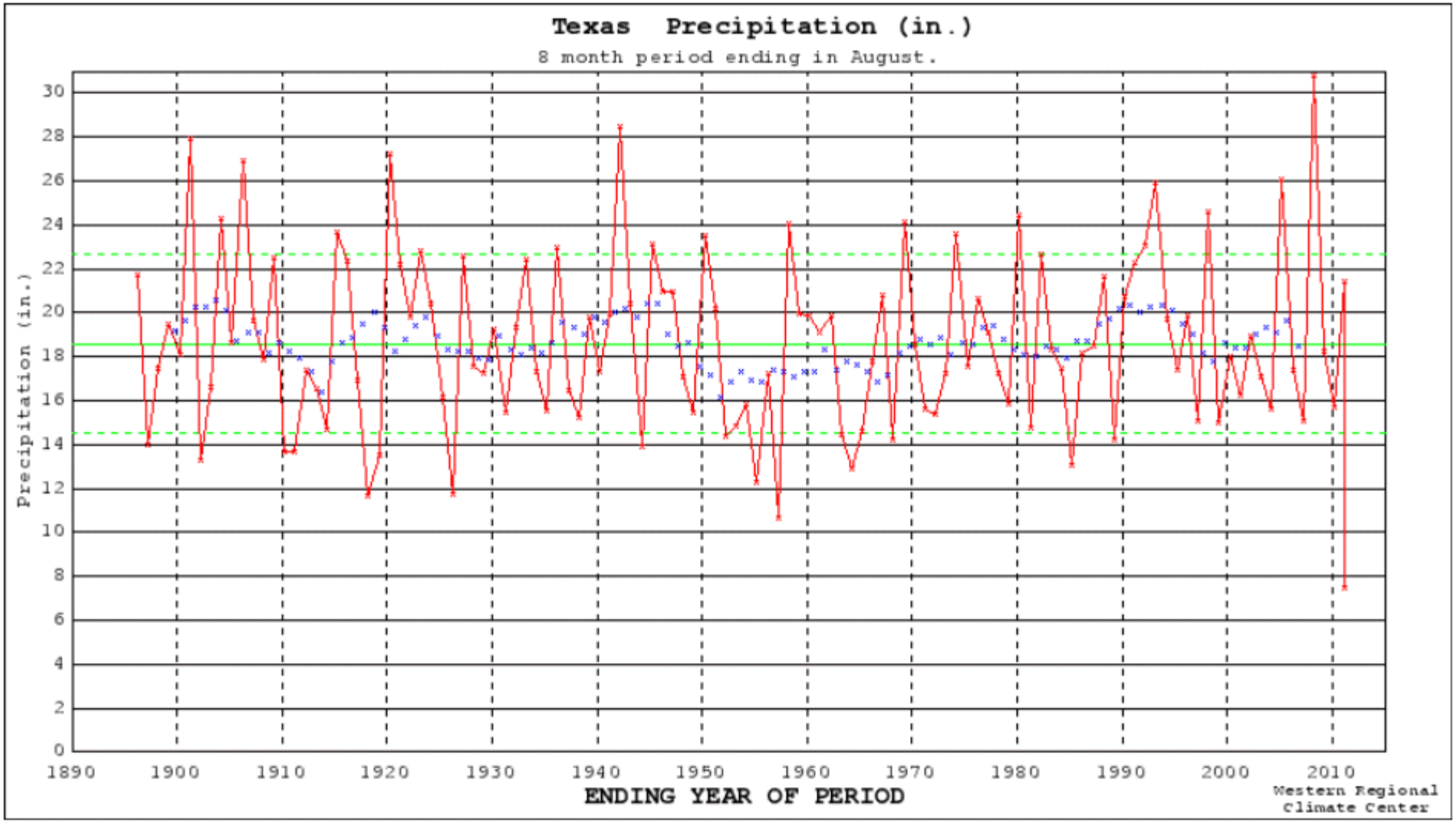

MATAGORDA, TEXAS (415659)
Period of Record : 7/ 1/1910 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center


LAREDO 2, TEXAS (415060)
Period of Record : 9/ 1/1946 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center


PORT ISABEL, TEXAS (417179)
Period of Record : 2/22/1896 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center

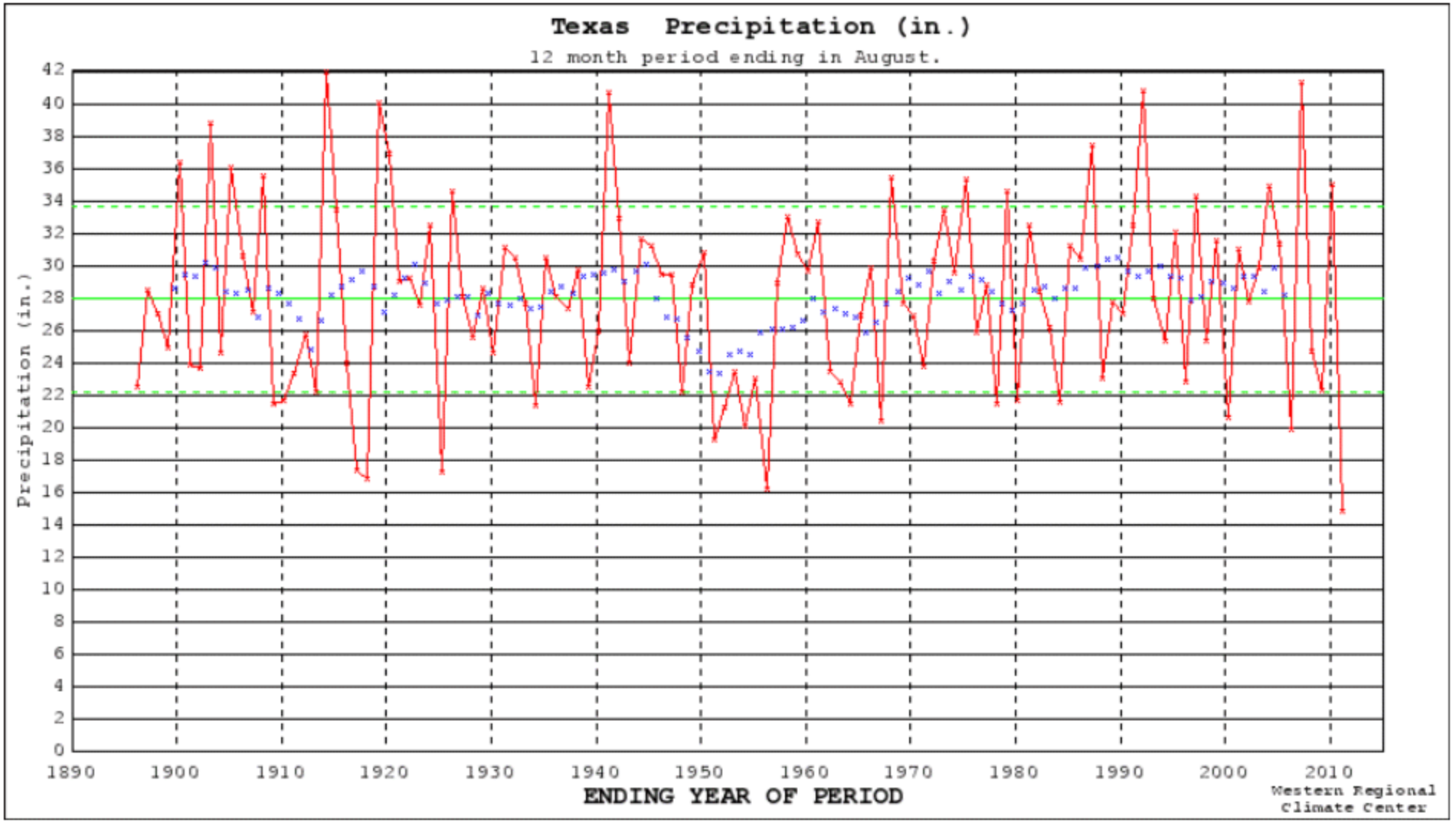

CORPUS CHRISTI WSO AP, TEXAS (412015)
Period of Record : 1/ 1/1948 to 12/31/2010
Precipitation (in.)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Day of Year
Average Total Monthly Precipitation
Western Regional Climate Center

Texas Statewide Precipitation (Jan-Aug, 1895-2011). NCDC Div Data.



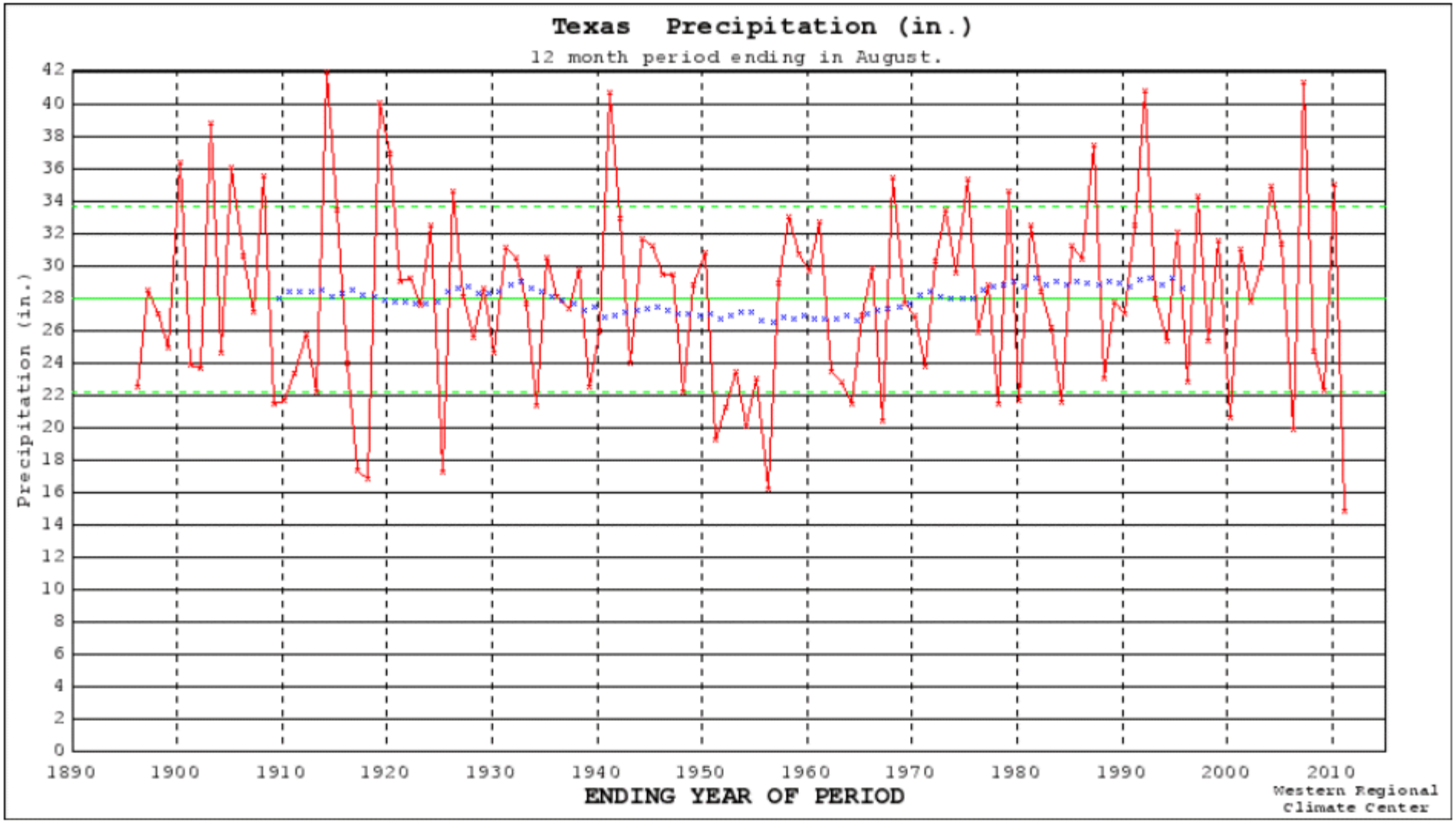
red - 8 month period
blue - 10 year running mean
green - average (solid), ± sigma (dashed)

Texas Statewide Precipitation (Sep-Aug, 1895-2011). NCDC Div Data. 10-yr filter.



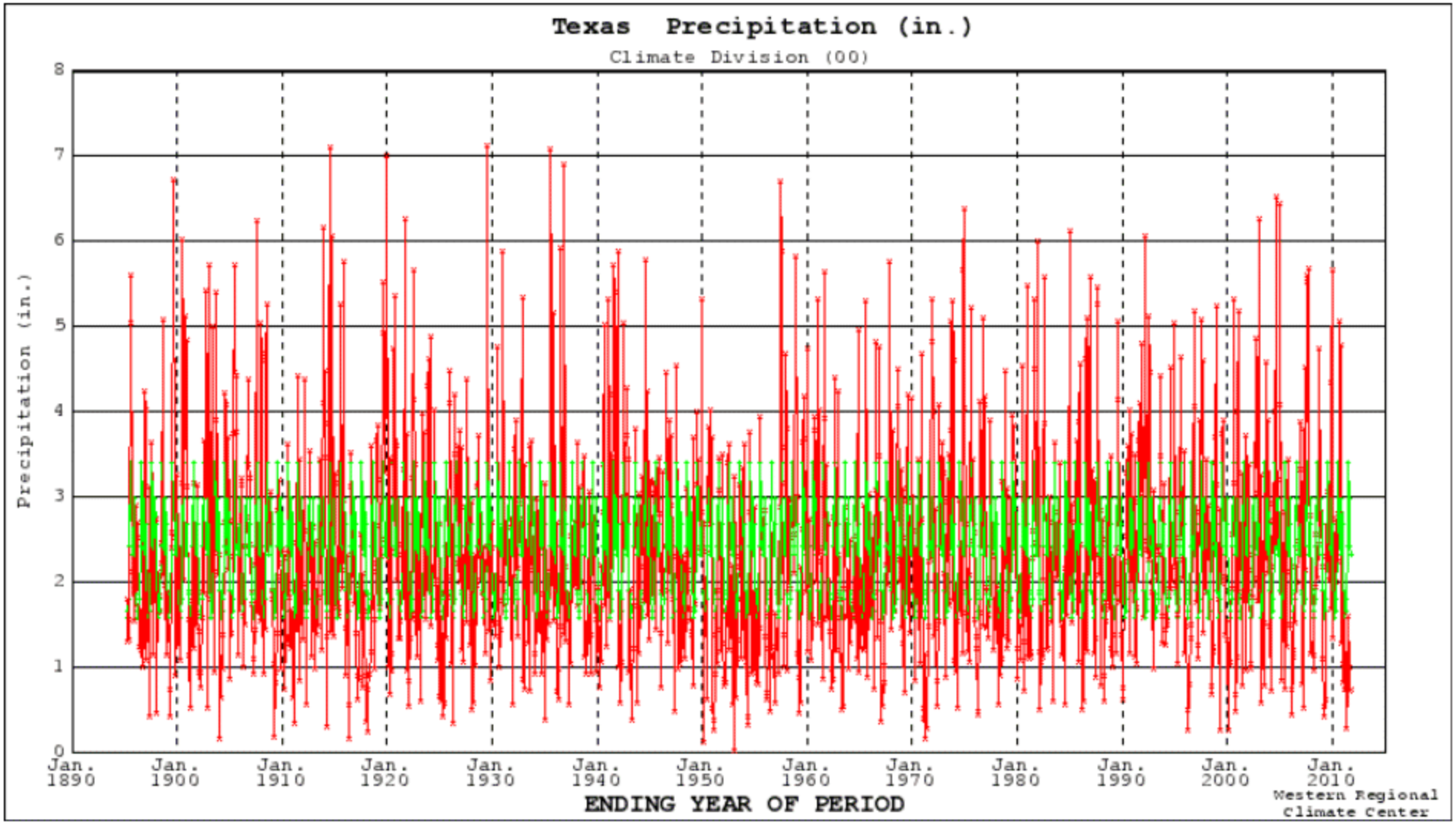
red - 12 month period
blue - 10 year running mean
green - average (solid), ± sigma (dashed)

Texas Statewide Precipitation (Jan-Aug, 1895-2011). NCDC Div Data. 30-yr filter.



red - 12 month period
blue - 30 year running mean
green - average (solid), ± sigma (dashed)

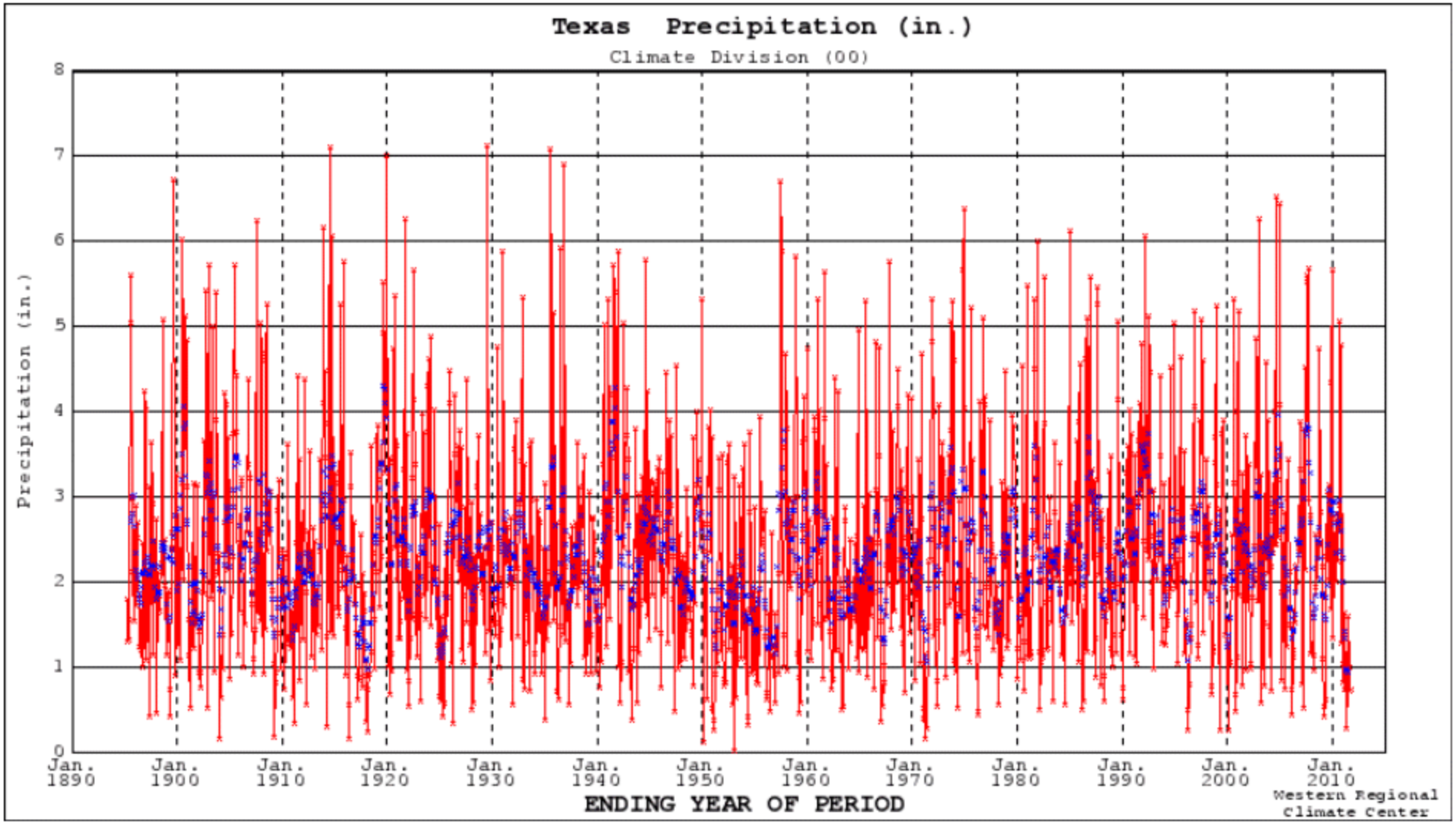
Texas Statewide Precipitation, Monthly, Jan 1895 thru Aug 2011. NCDC Div Data.



red - monthly data value

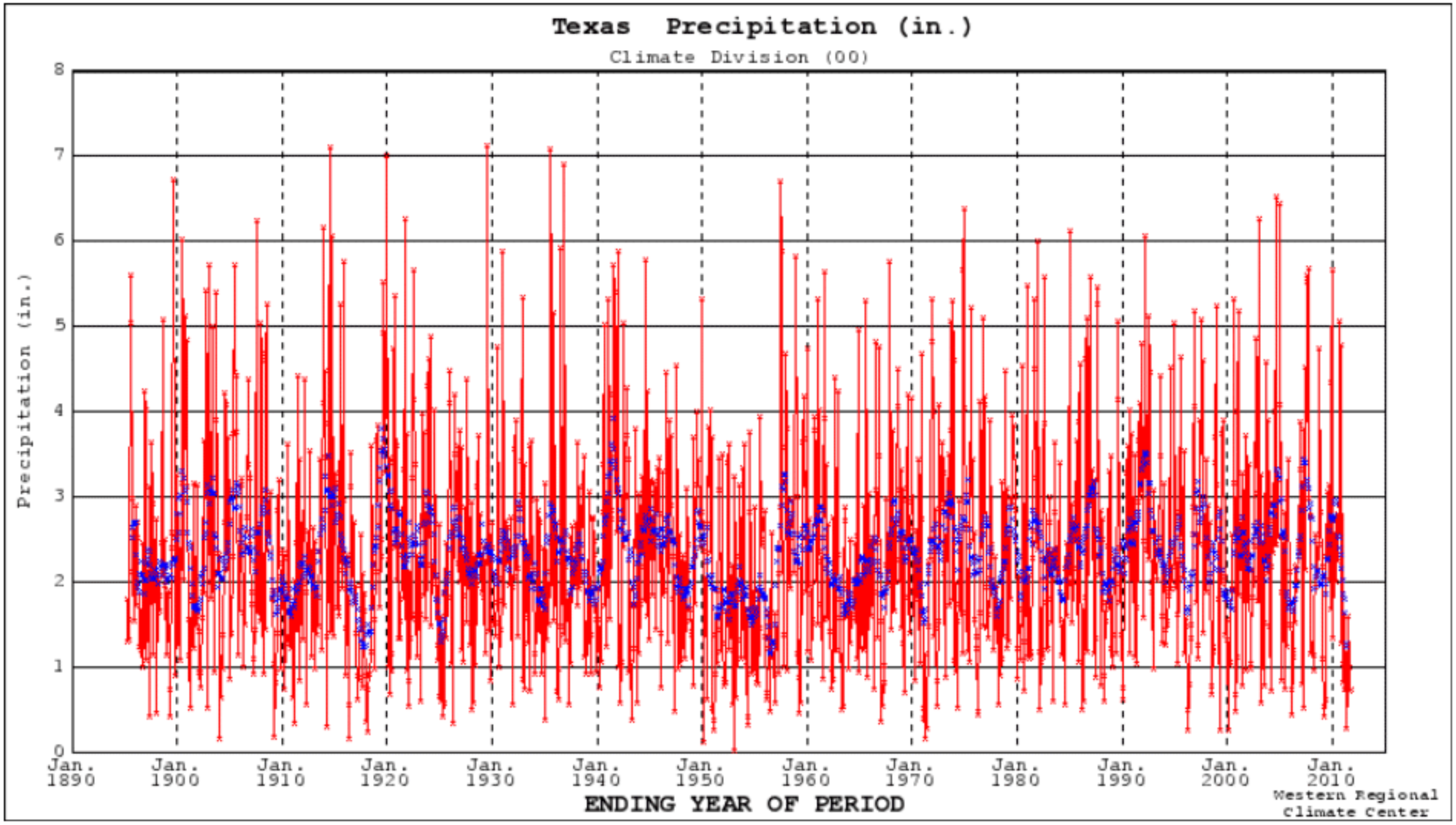
green - average monthly value

Texas Statewide Precipitation, Monthly, Jan 1895 thru Aug 2011. 8-mo mean.



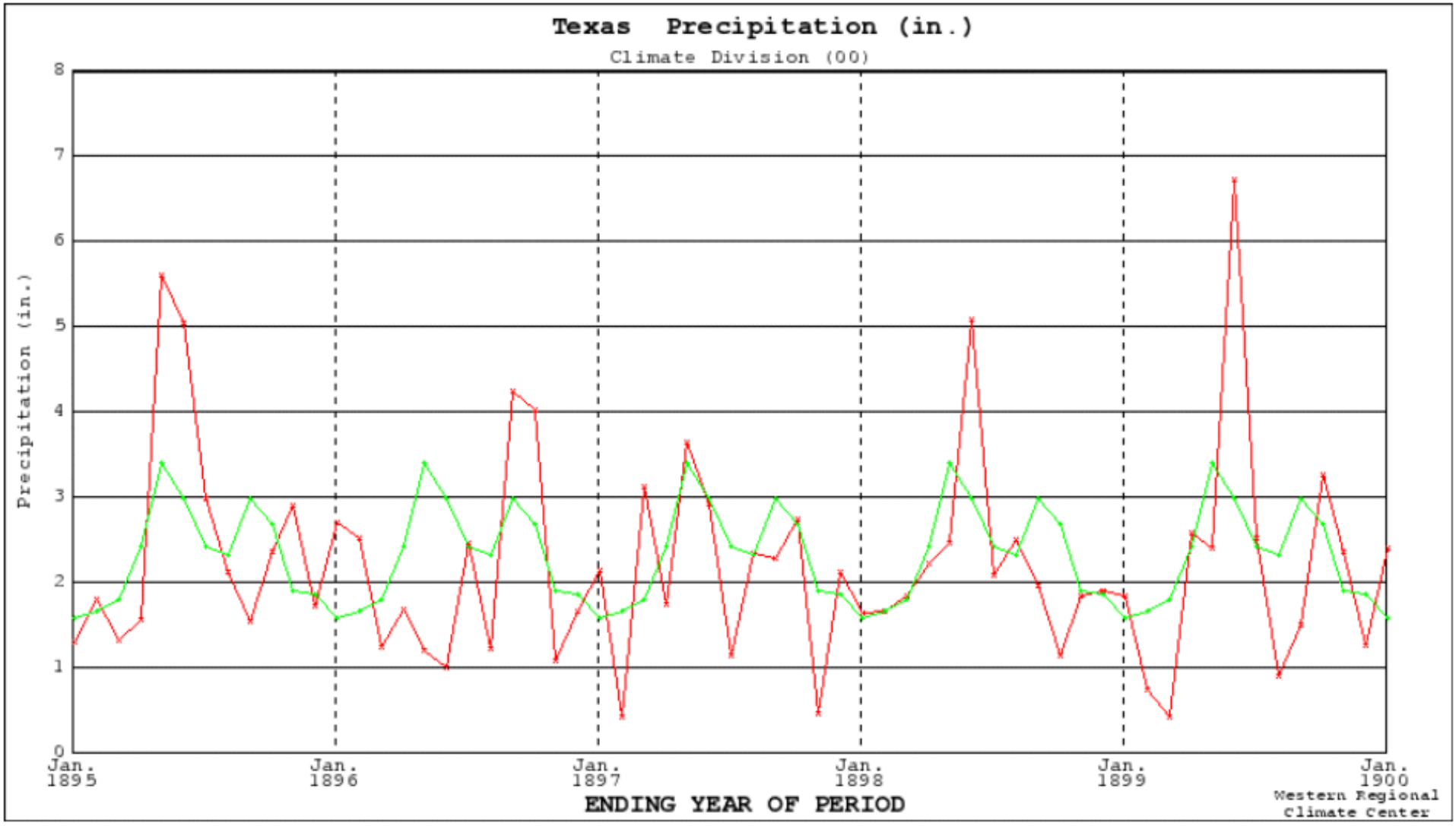
red - monthly data value
blue - 8 month running mean

Texas Statewide Precipitation, Monthly, Jan 1895 thru Aug 2011. 12-mo mean.



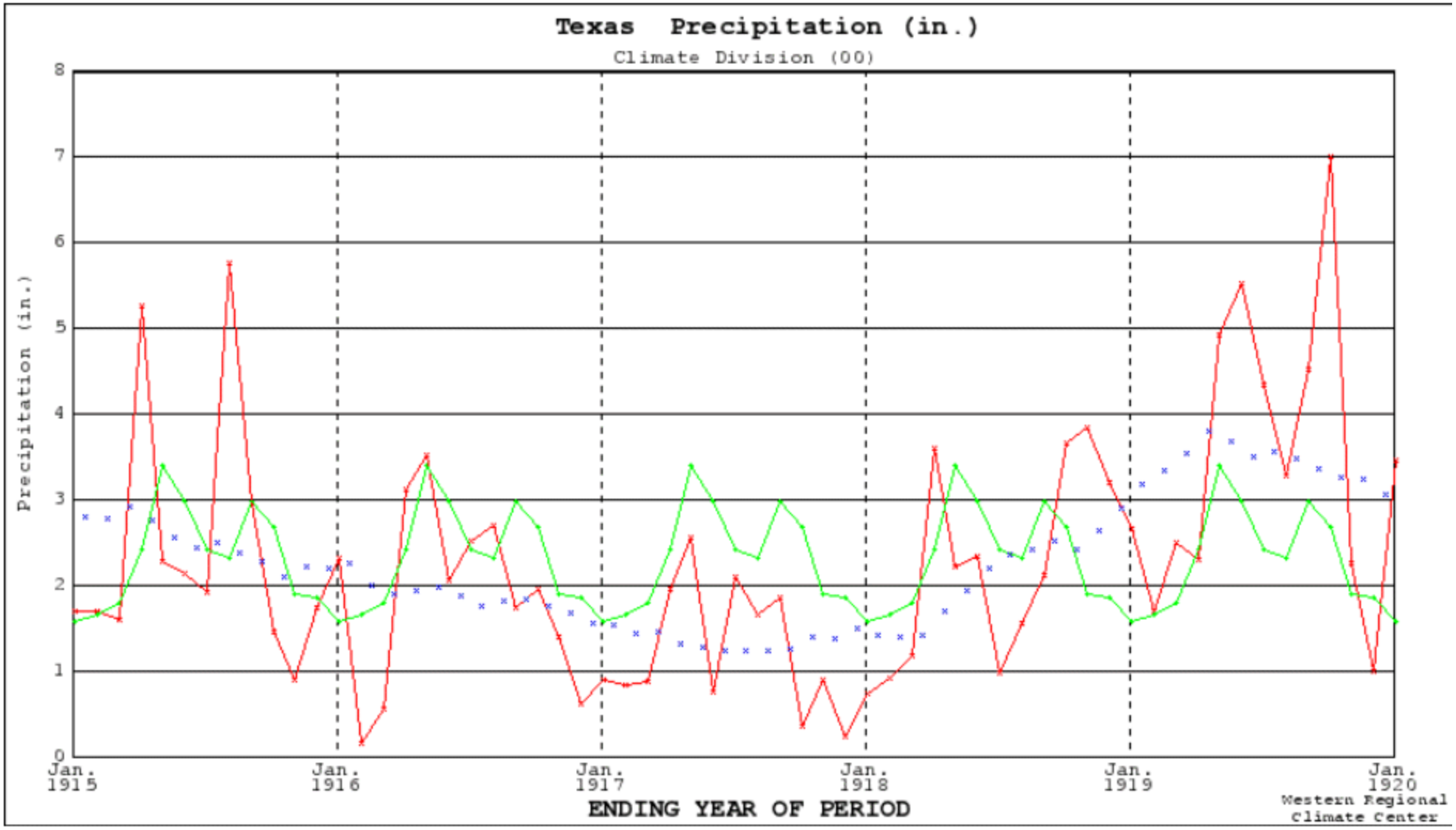
red - monthly data value
blue - 12 month running mean

Texas Statewide Precipitation, Monthly, Jan 1895 thru Jan 1900. NCDC Div Data.



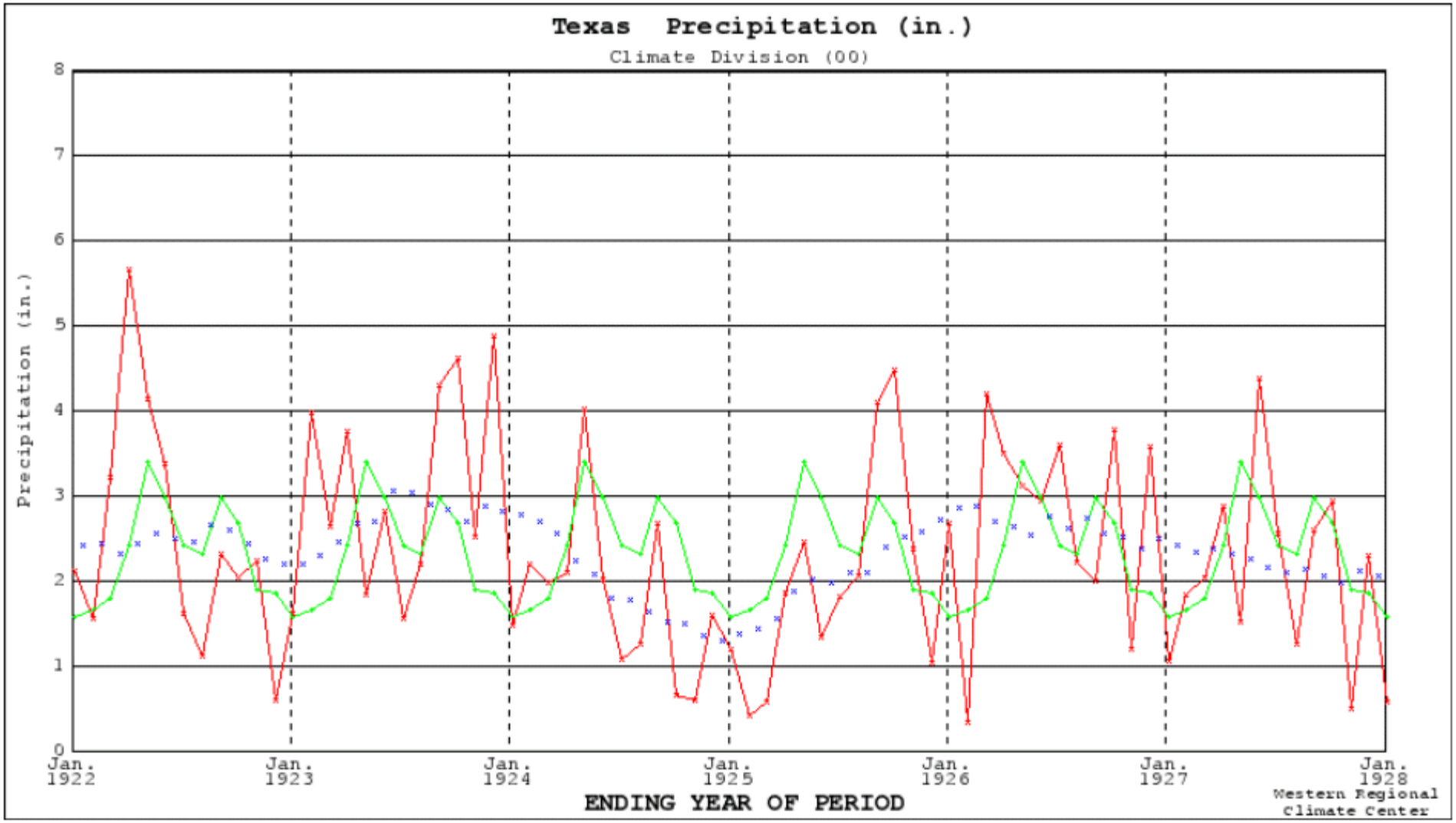
red - monthly data value
green - average monthly value

Texas Statewide Precipitation, Monthly, Jan 1915 thru Jan 1920. NCDC Div Data.



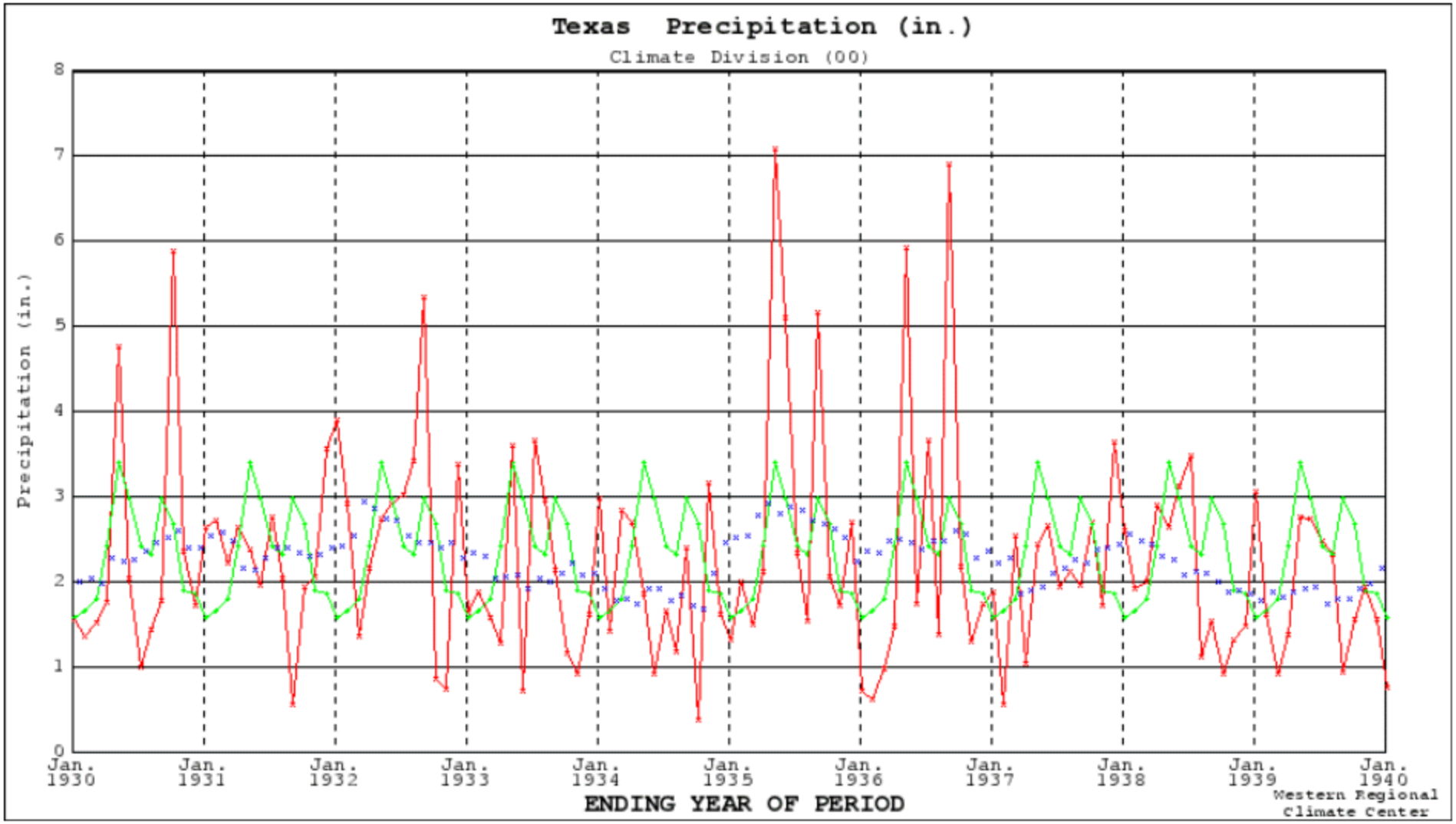
red - monthly data value
blue - 12 month running mean
green - average monthly value

Texas Statewide Precipitation, Monthly, Jan 1922 thru Jan 1928. NCDC Div Data.



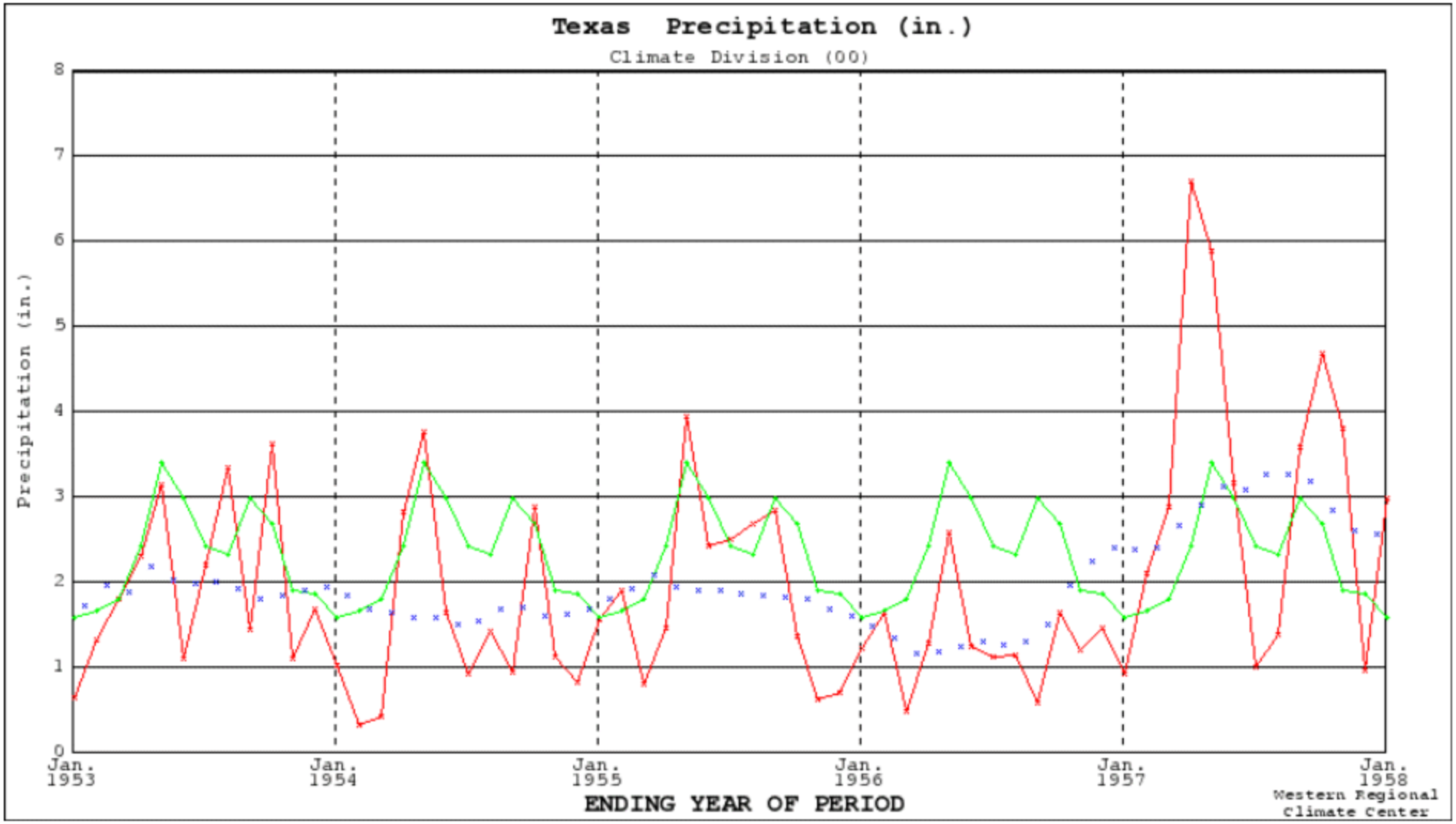
red - monthly data value
blue - 12 month running mean
green - average monthly value

Texas Statewide Precipitation, Monthly, Jan 1930 thru Jan 1940. NCDC Div Data.



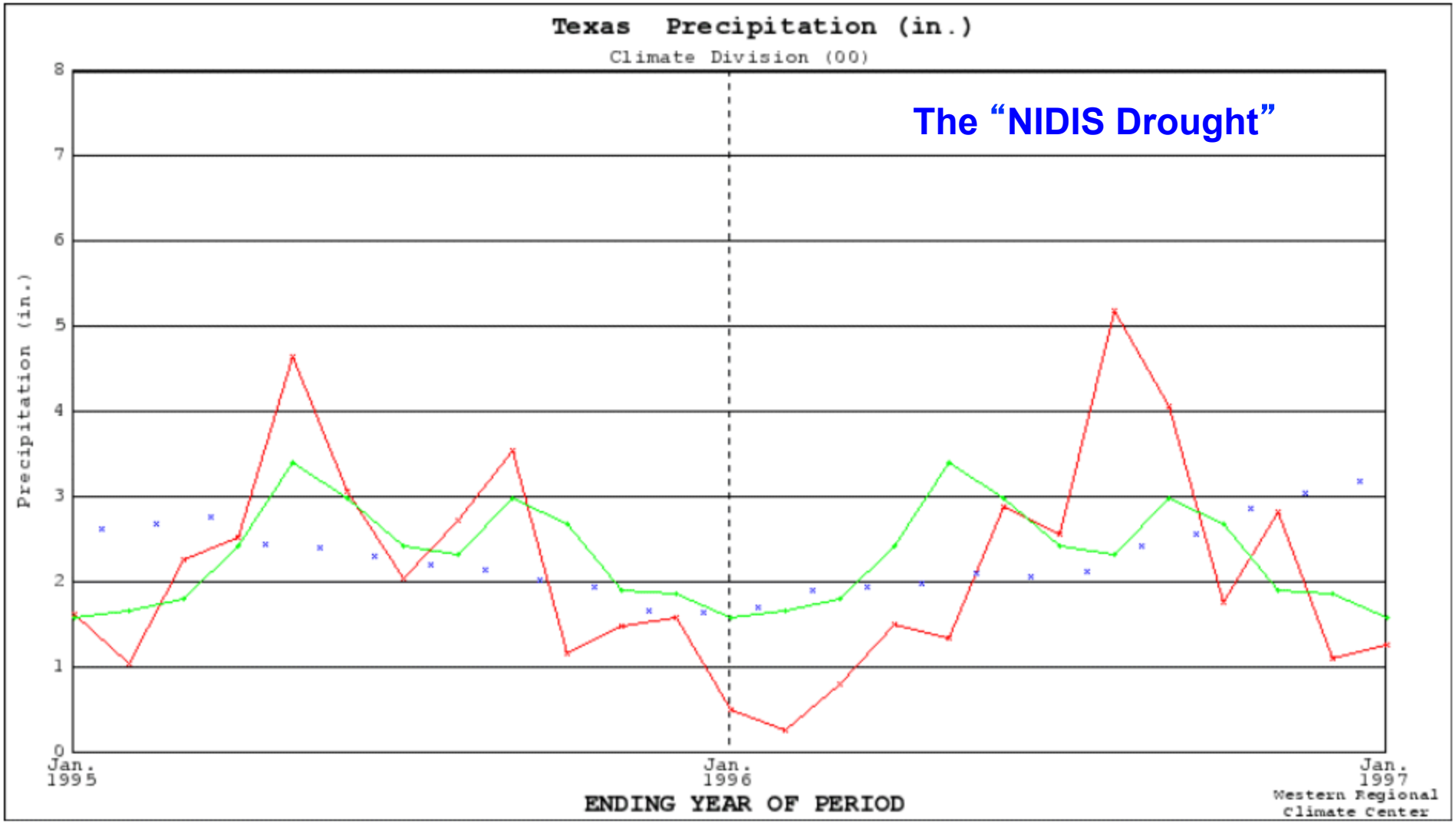
red - monthly data value
blue - 12 month running mean
green - average monthly value

Texas Statewide Precipitation, Monthly, Jan 1952 thru Jan 1958. NCDC Div Data.



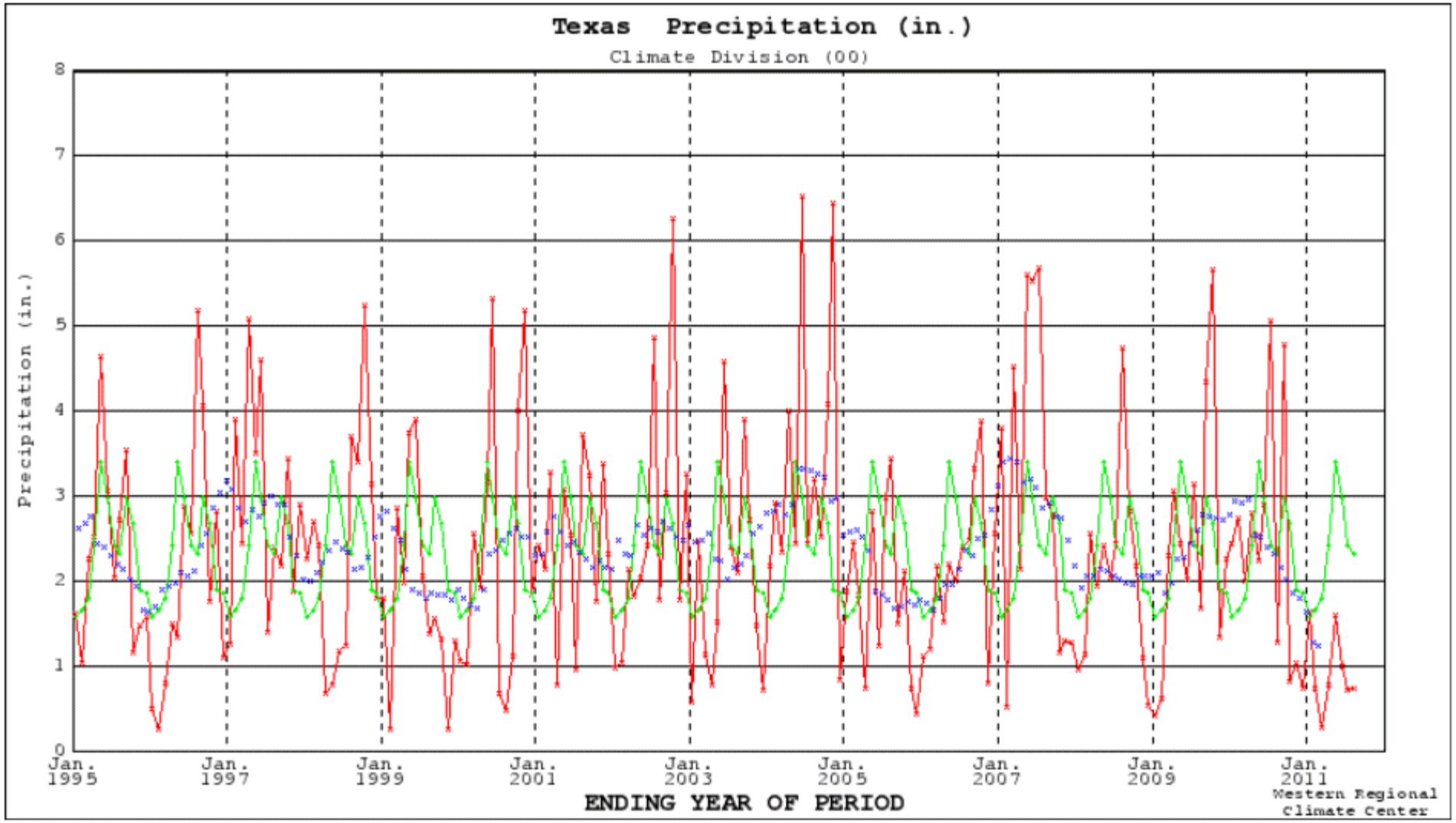
red - monthly data value
blue - 12 month running mean
green - average monthly value

Texas Statewide Precipitation, Monthly, Jan 1995 thru Jan 1997. NCDC Div Data.



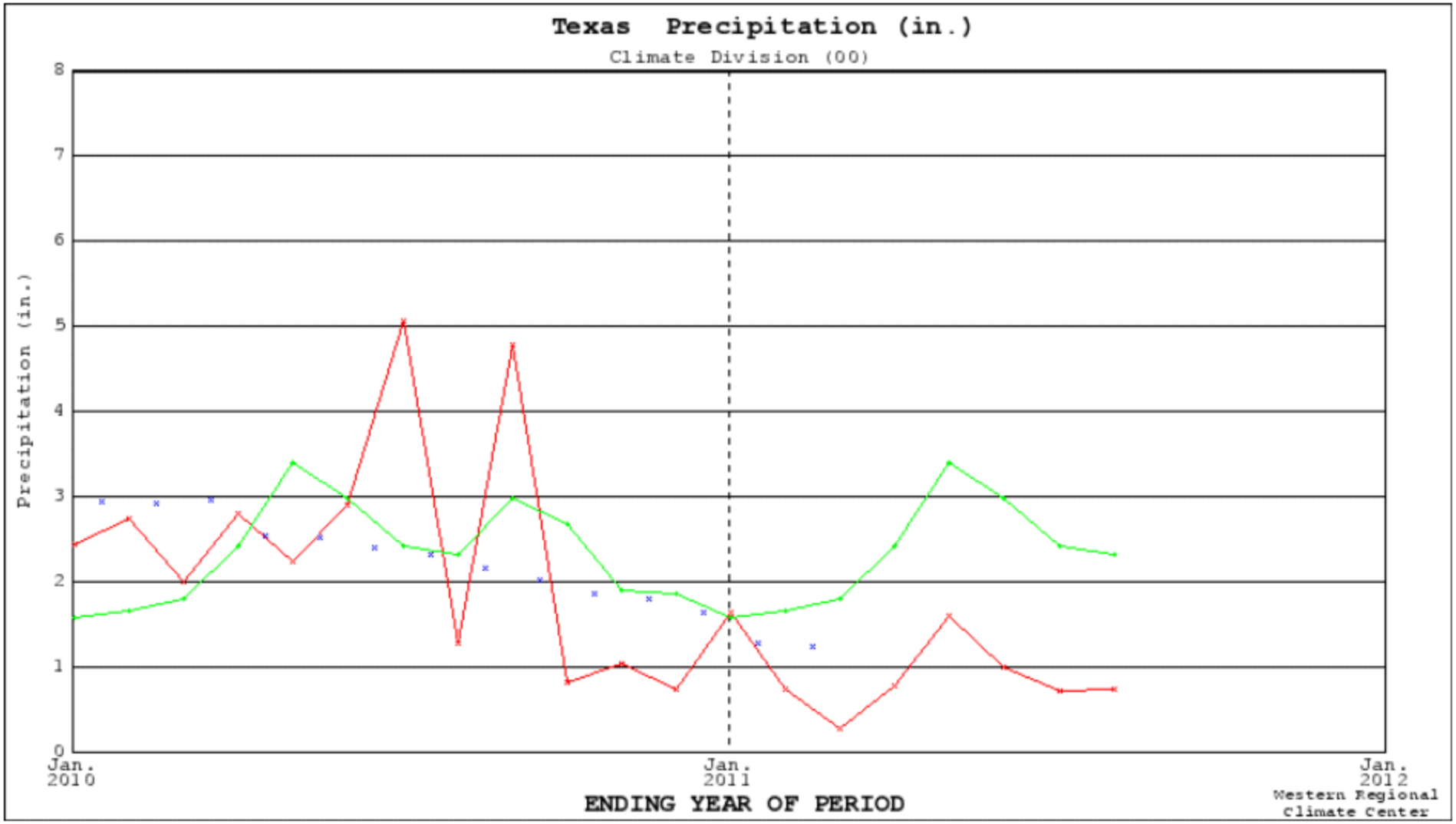
red - monthly data value
blue - 12 month running mean
green - average monthly value

Texas Statewide Precipitation, Monthly, Jan 1995 thru Aug 2011. The NIDIS Era.



red - monthly data value
blue - 12 month running mean
green - average monthly value

Texas Statewide Precipitation, Monthly, Jan 2010 thru Aug 2011. NCDC Div Data.



red - monthly data value
blue - 12 month running mean
green - average monthly value

Standardized Precipitation Index

[What is the Standardized Precipition Index? (SPI)]

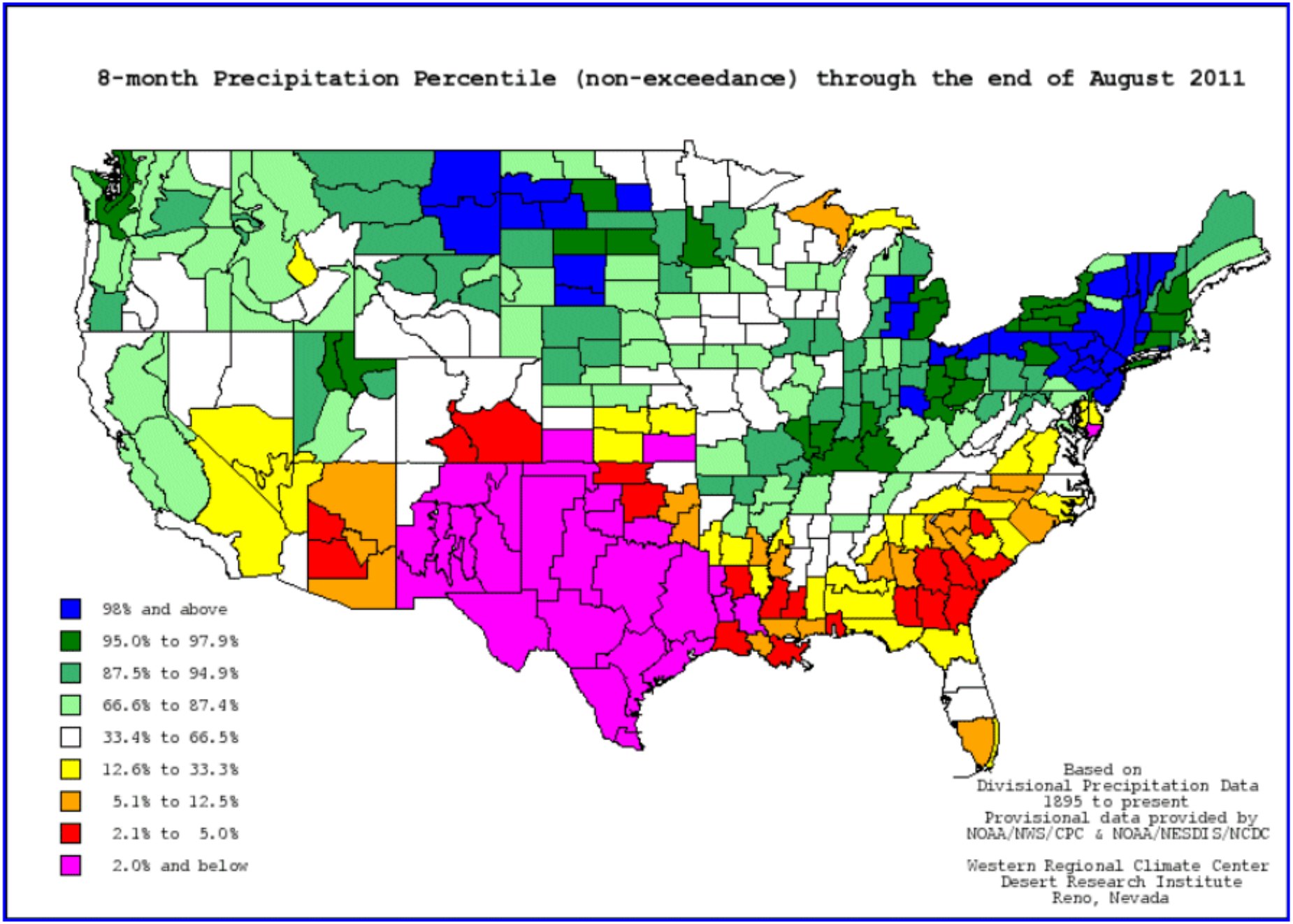
Select the SPI product (from the left column) and the time scale heading (from the top row.) Click on the intersecting box to display the product mapped for the U.S. Climate divisions. To obtain details for a climate division click on the desired climate division for any one of the U.S. maps.
NOTE: The following links were designed for a 1024x768 display. Other display settings may require horizontal scrolling.

Time Scale in Months Through the End of August 2011																			
	1	2	3	4	5	6	7	8	9	10	11	12	15	18	24	30	36	48	60	72
Accumulated Precipitation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Accum. Pcpn. dep. from Normal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Percentage of Average	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Precipitation Percentile	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standardized Pcpn. Index	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ Product available. Product not available. ...back to Home Page.

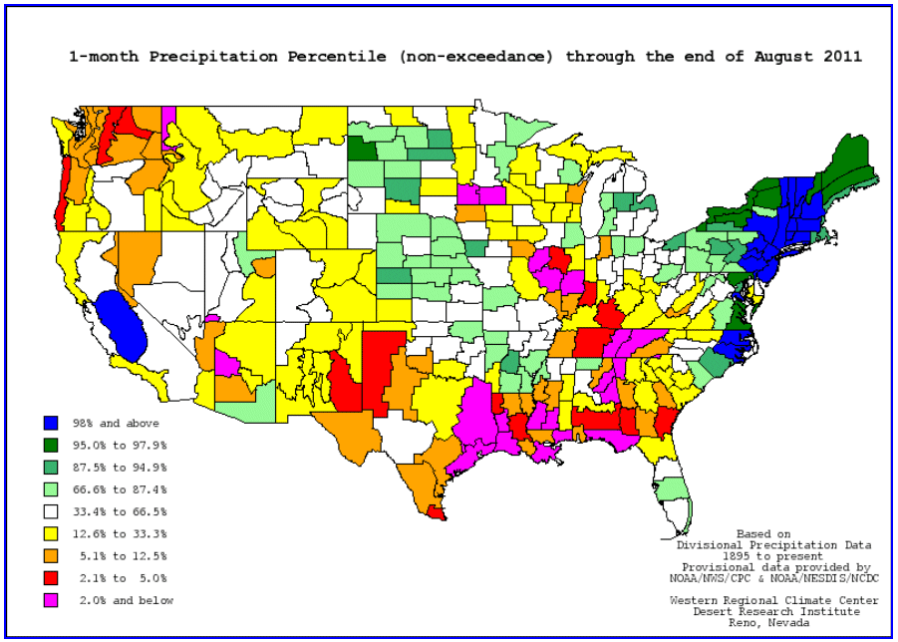
For more drought information: National Drought Mitigation Center
Western Regional Climate Center, wrcc@dri.edu

8-month Percentile

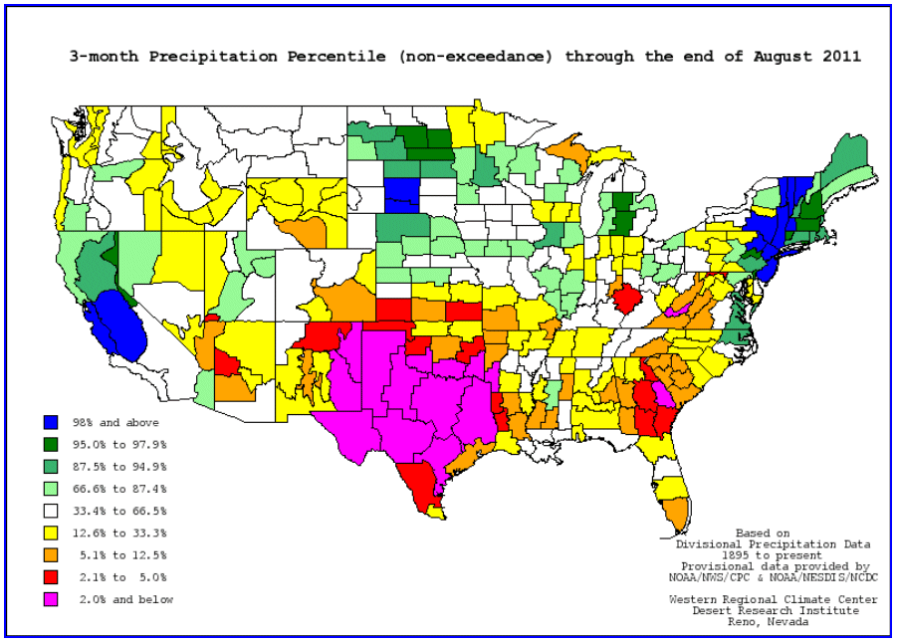


Clicking on a division gives a time scale history for the division.

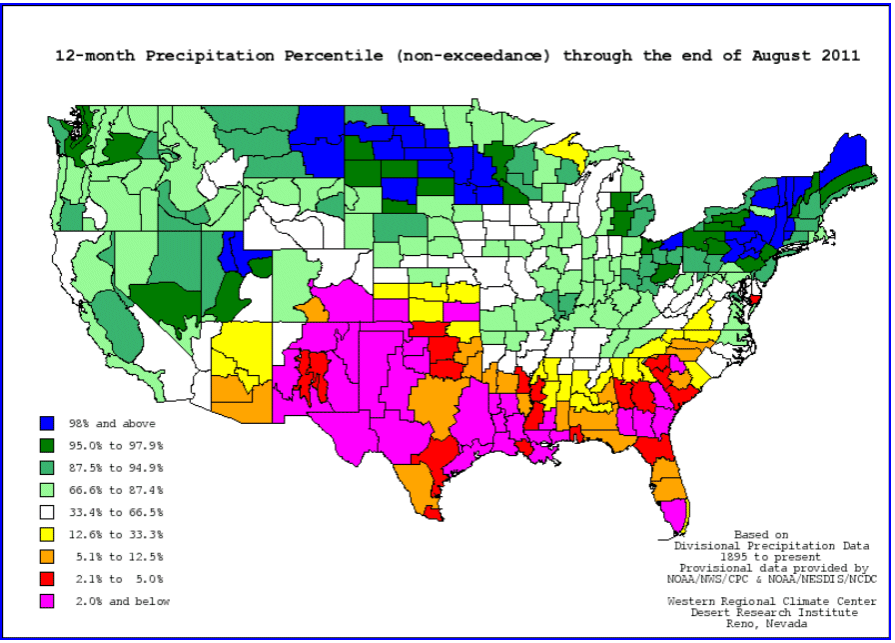
SPI 01-Month Scale



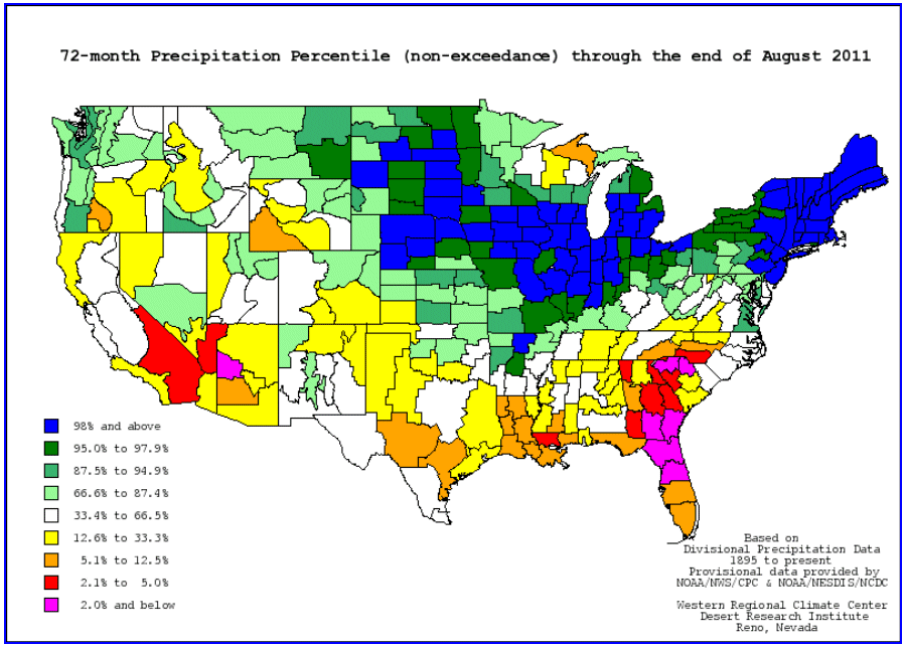
SPI 03-Month Scale



SPI 12-Month Scale

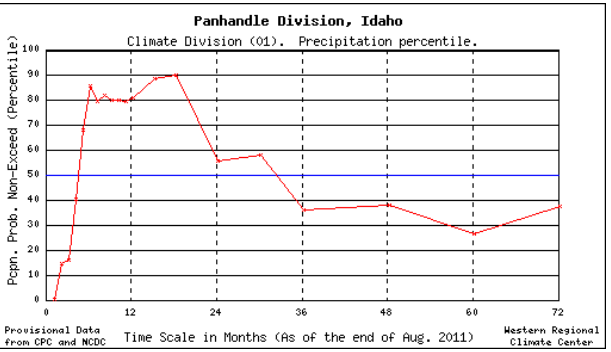


SPI 72-Month Scale

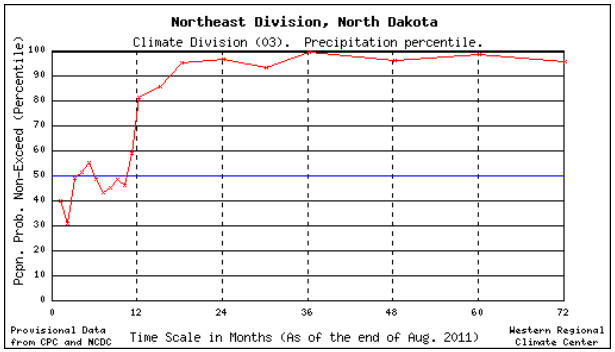


SPI History 0 to 72 months (expressed as percentiles)

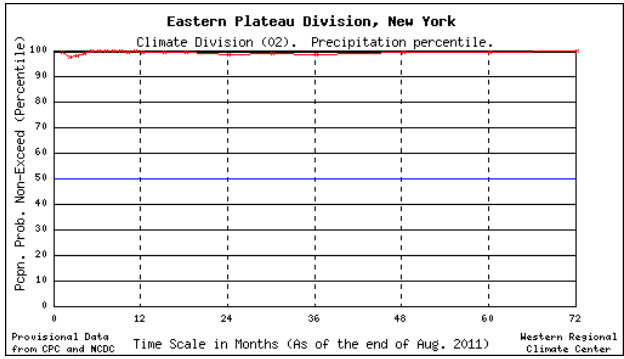
Northern Idaho



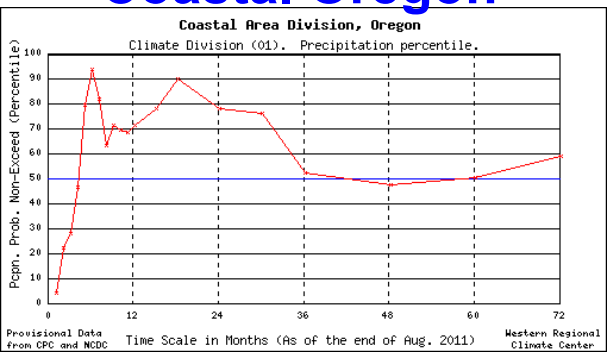
Northeast North Dakota



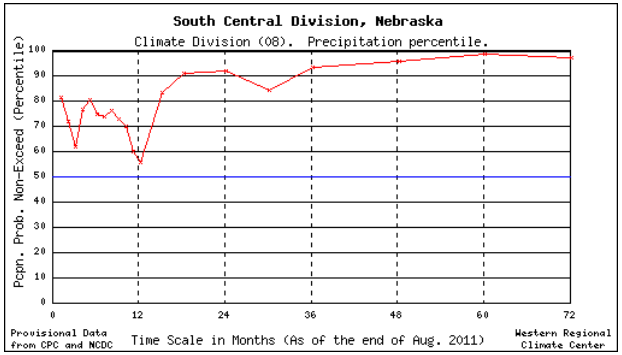
Central New York



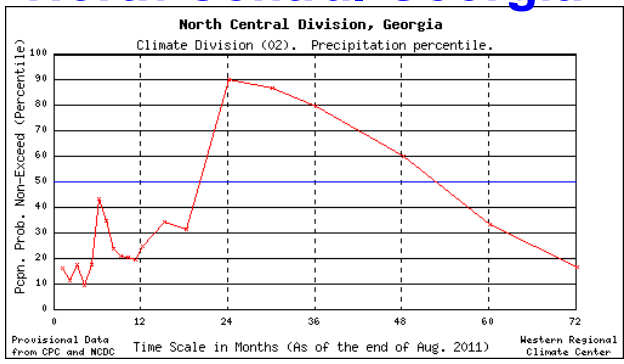
Coastal Oregon



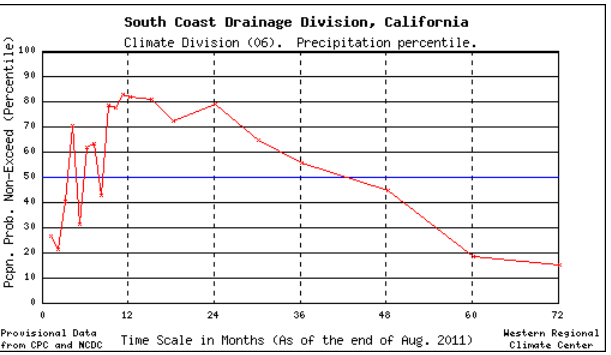
Central Nebraska



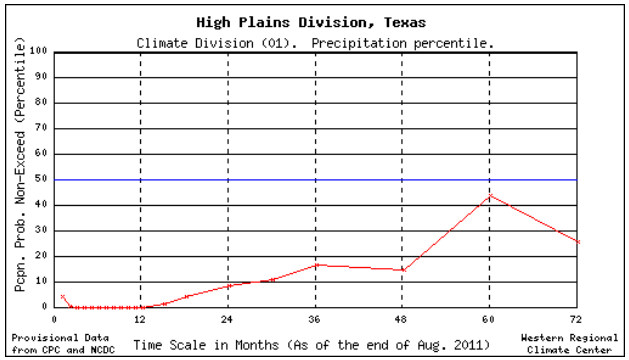
North Central Georgia



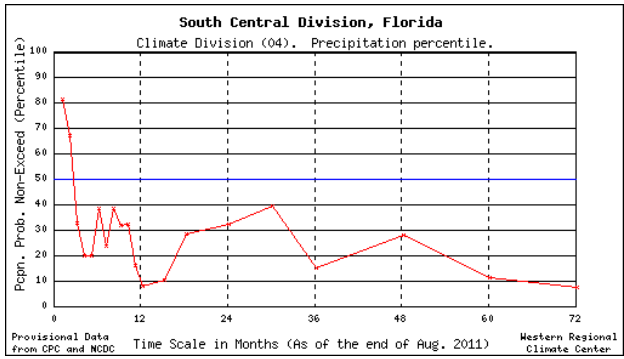
South Coast California



Northwest Texas



Southern Florida



0 12 24 36 48 60 72 mo 0 12 24 36 48 60 72 0 12 24 36 48 60 72

A Dilemma

These line graphs are the original motivation for the Standardized Precipitation Index.

Questions:

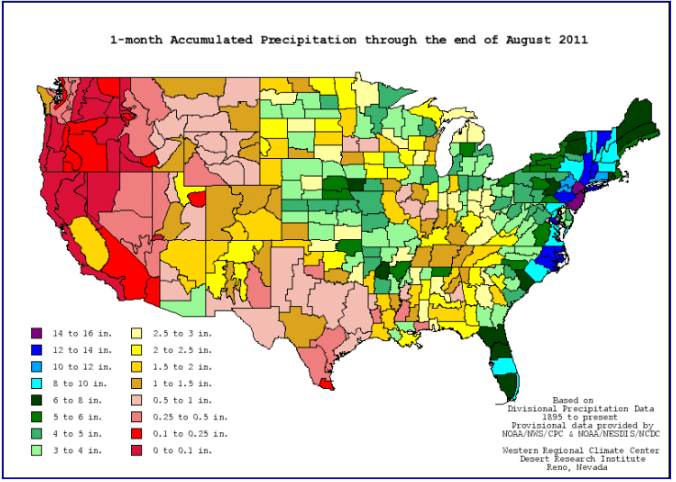
Is there any "best" way to characterize these graphs ?

What is the best way to visualize "fields" of such histories ?

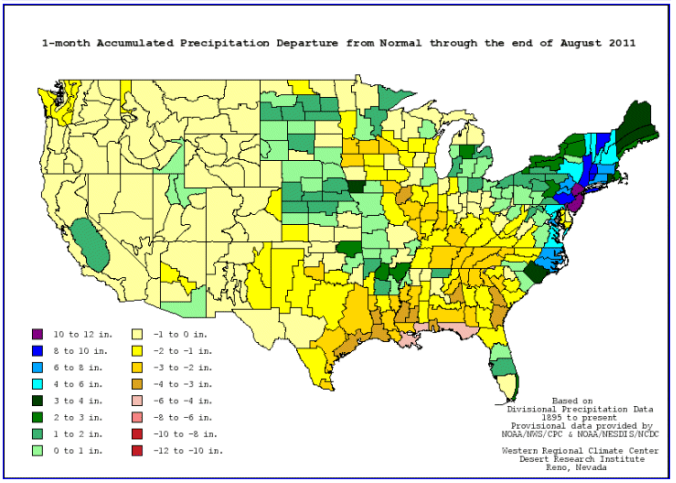
How to make better use of such spatial-temporal information.

The Five SPI "Quantities"

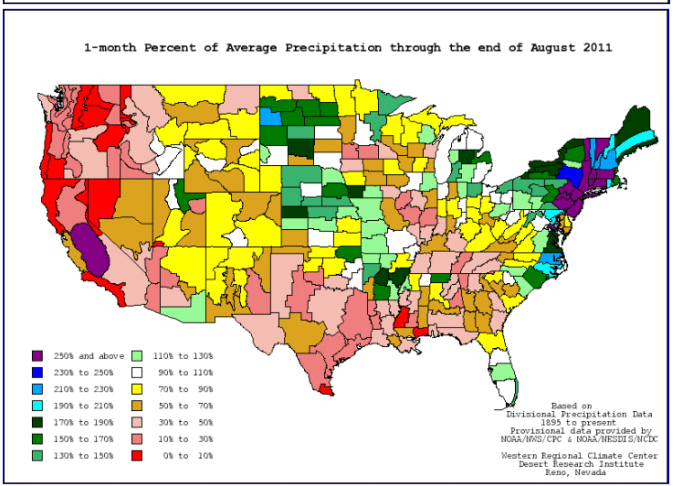
Accumulation



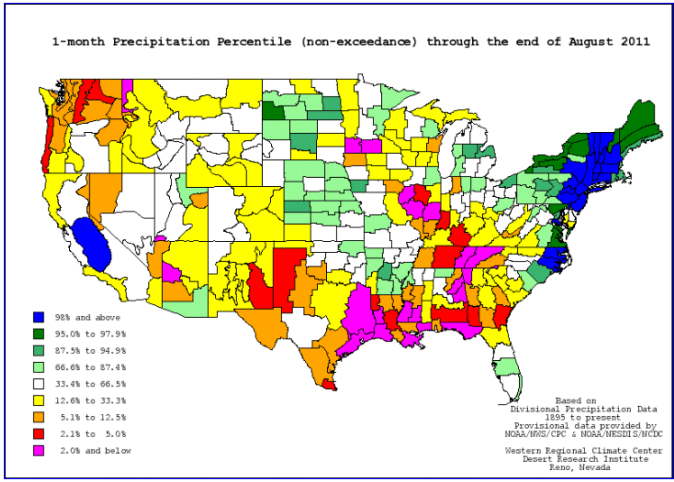
Accumulated Departure



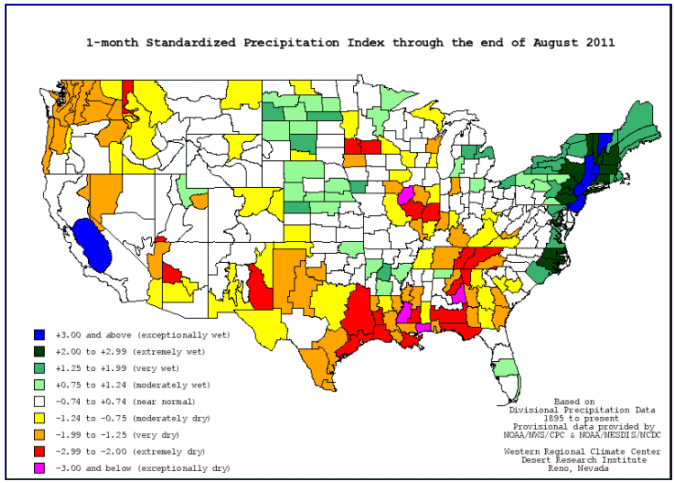
Accumulated Percentage Of Average



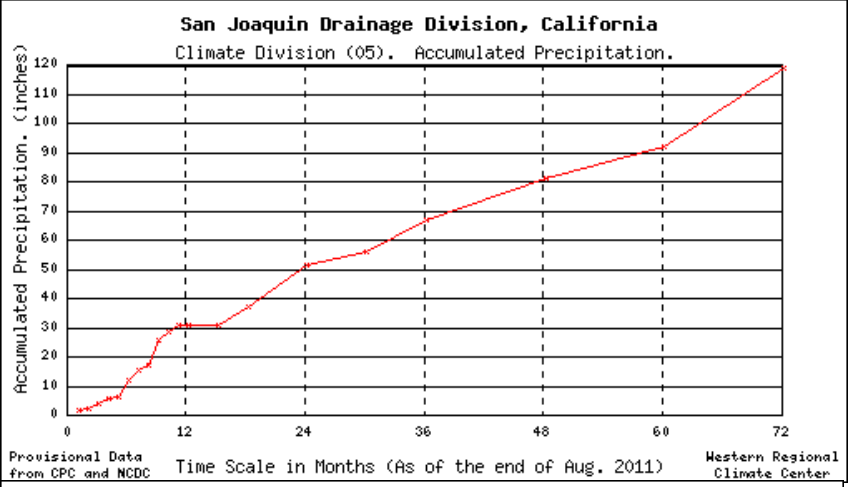
Accumulated Percentile



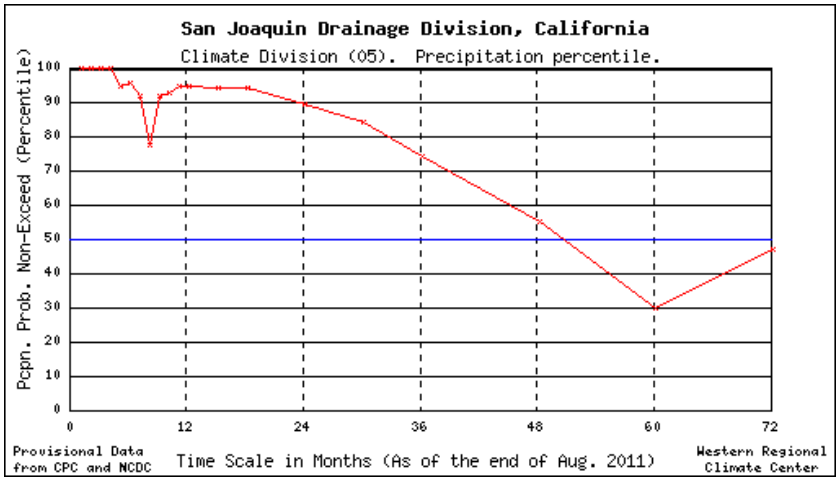
Standardized Precipitation Index



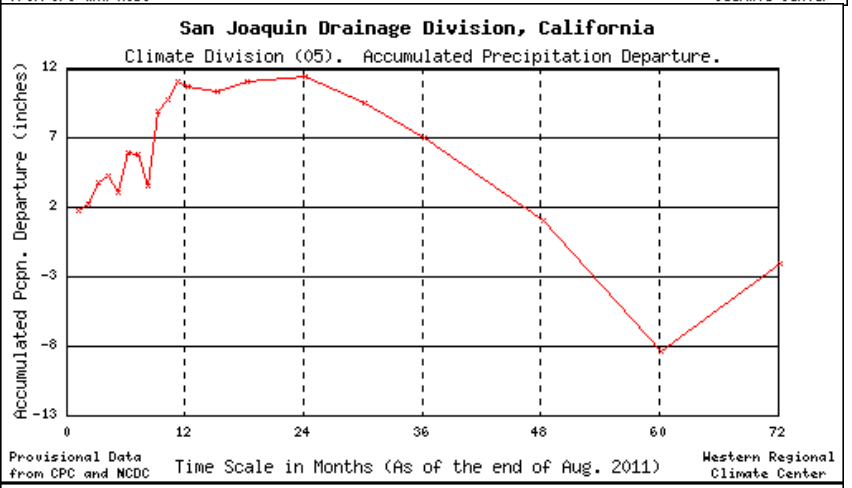
San Juaquin Valley



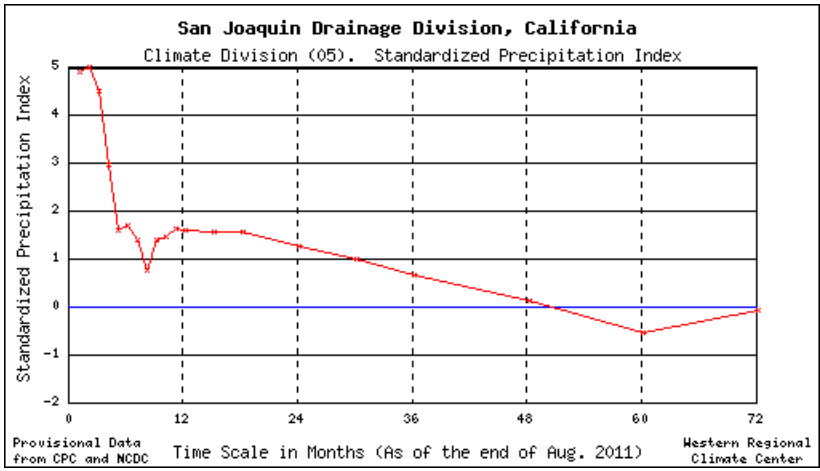
Accum Precip



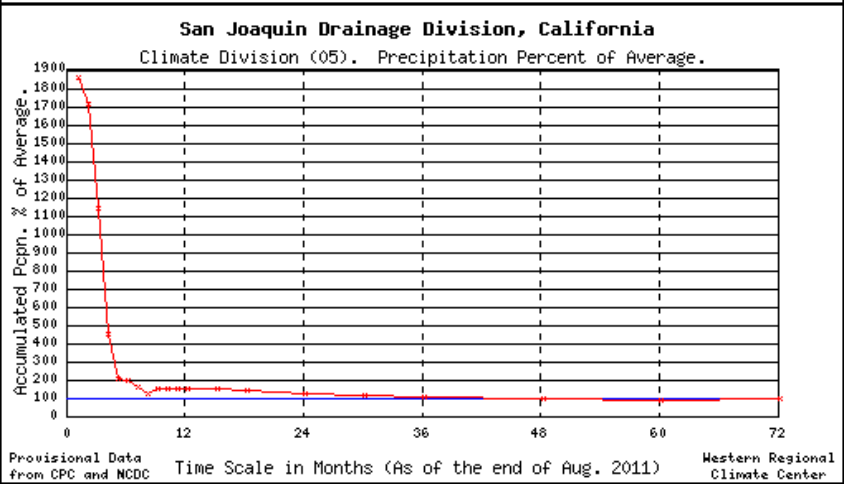
Accum Percentile



Accum Departure



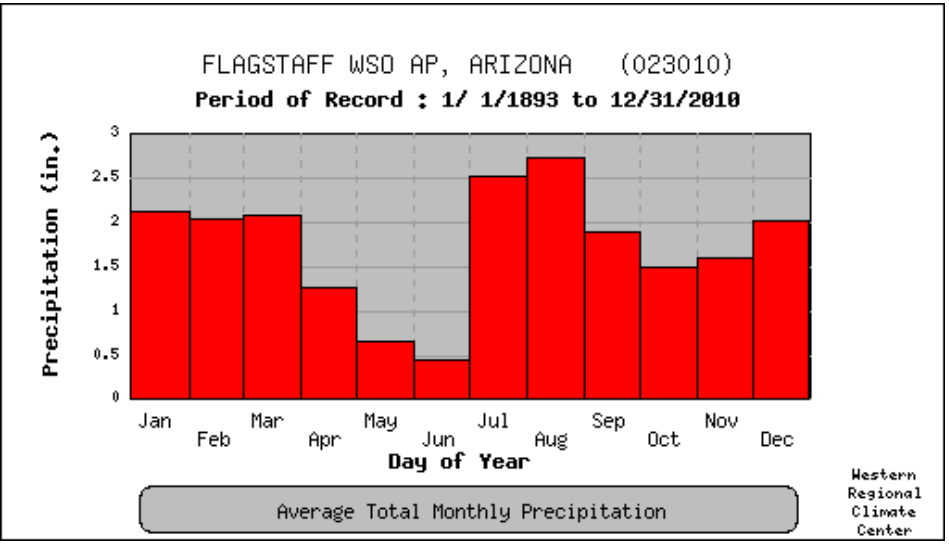
SPI



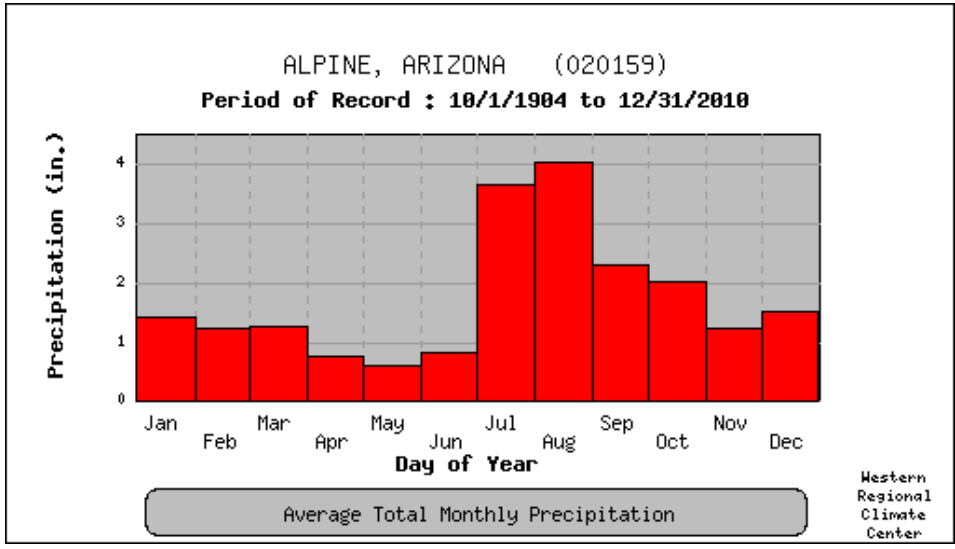
Accum Percentage

The Annual Cycle of Precipitation

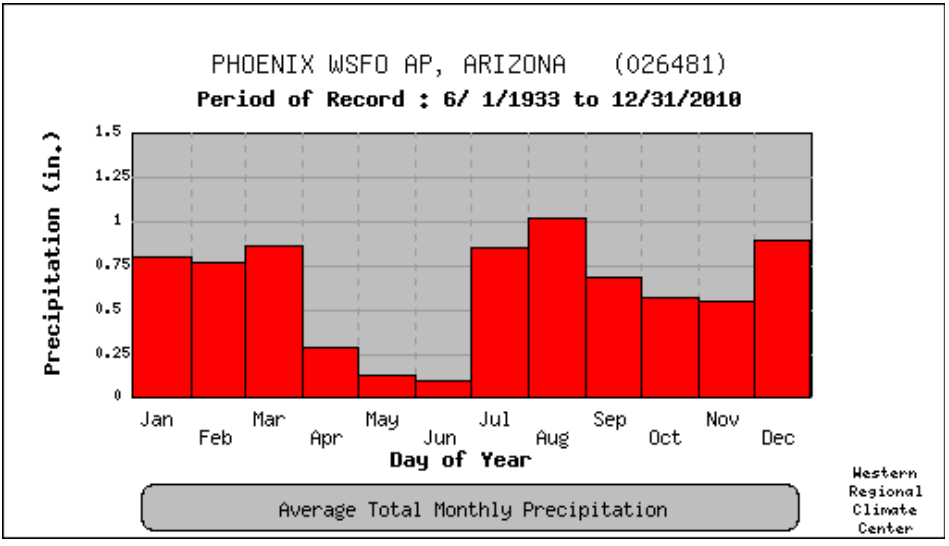
Flagstaff NWS



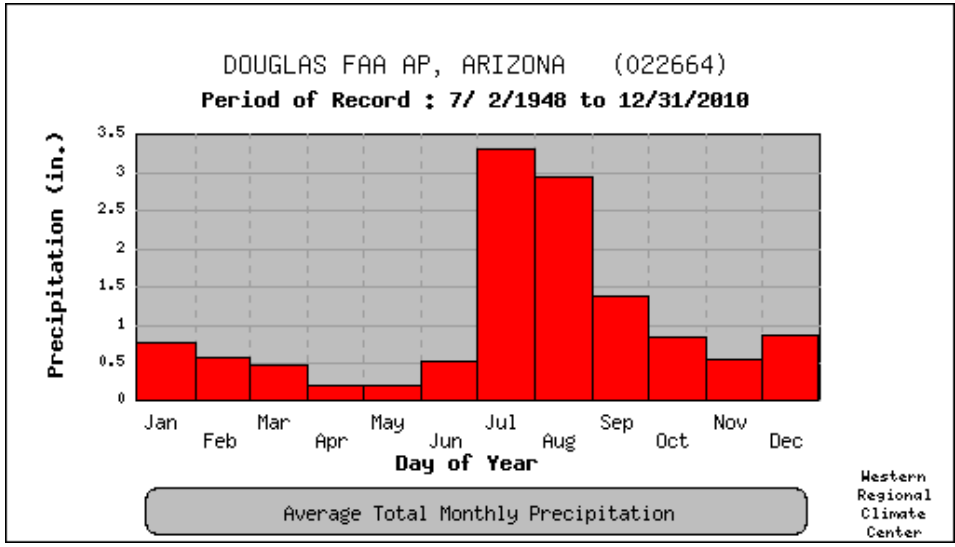
Alpine

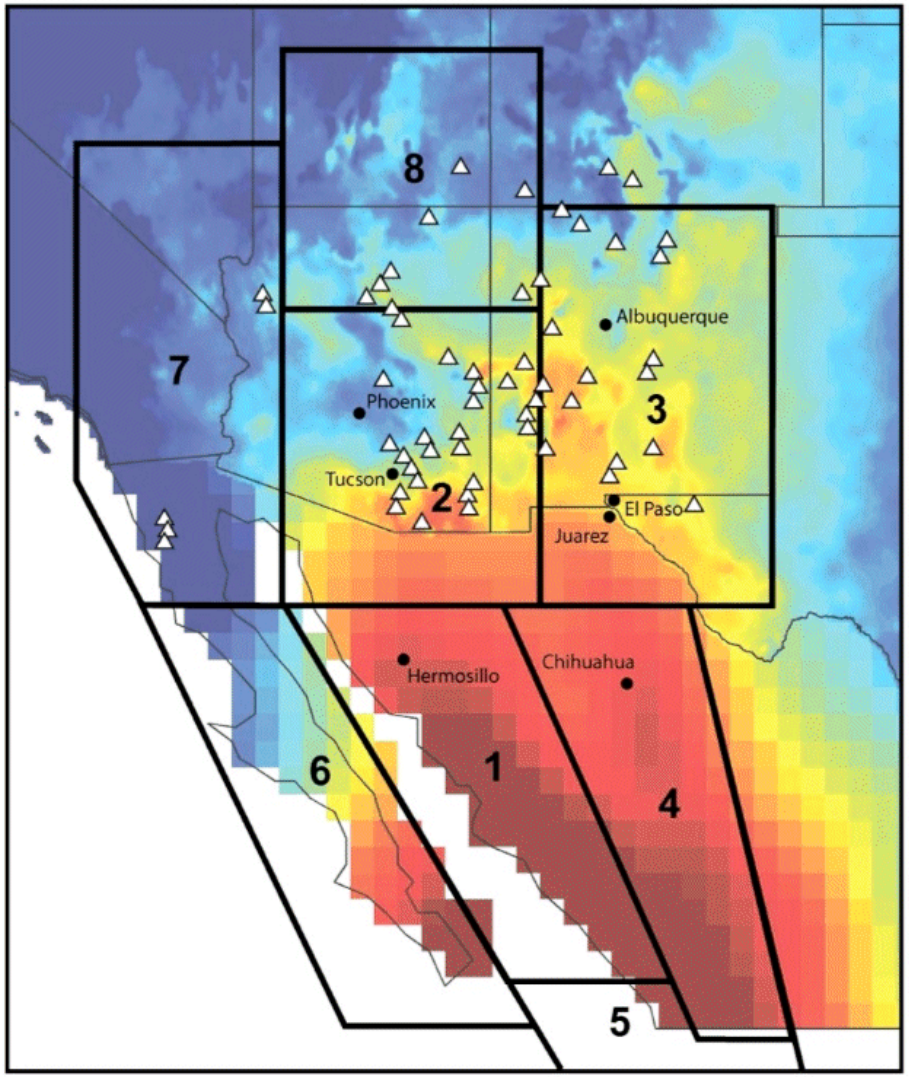


Phoenix



Douglas





2 NAM Sub-Regions Tree-Ring Sites

JAS Fraction of Annual Precipitation

20 30 40 50 60 70%

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A new monsoon precipitation reconstruction for the Arizona-Sonora region

- NAME Region 2*

  *Regions based on PC-type analysis

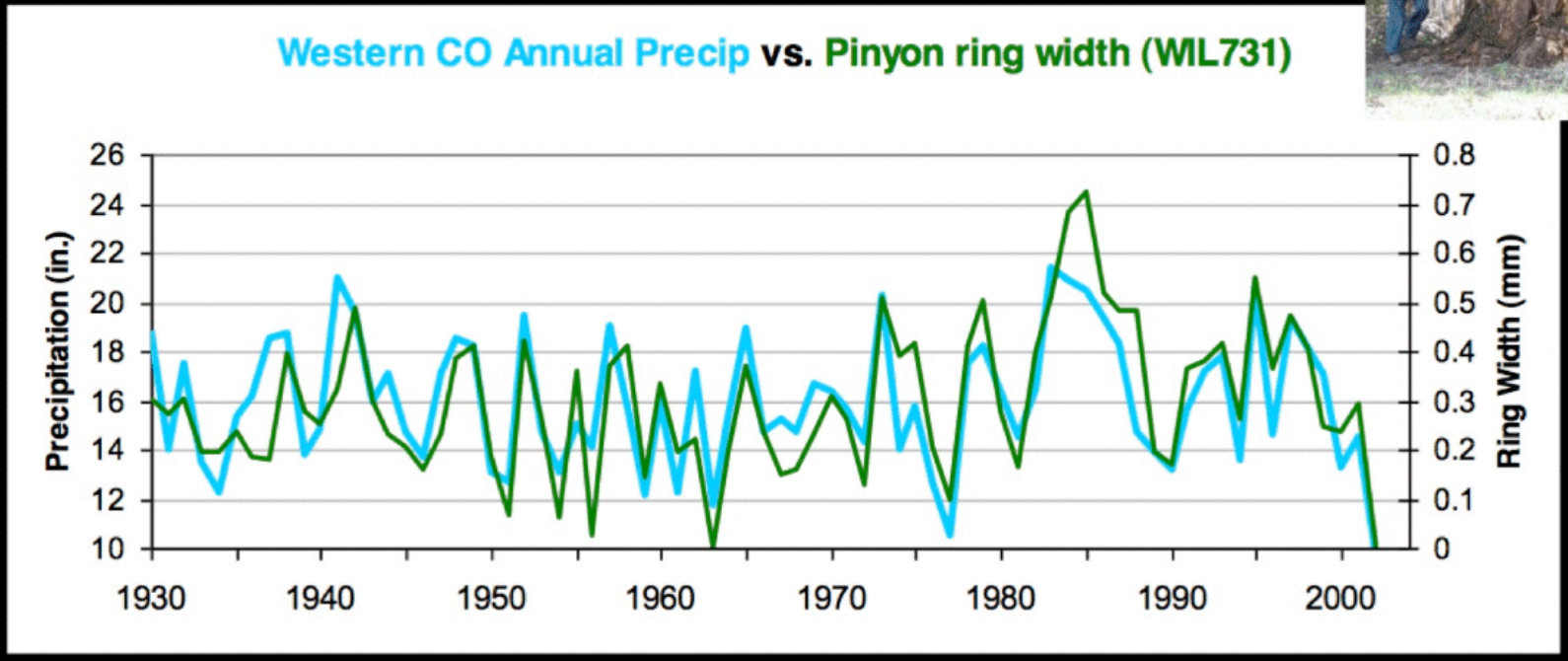
  (Comrie and Glenn 1998)

  (Gutzler 2004)

- Vose and Heim 0.5˚ Precip Data (unpublished, 1896-2008)
- Jun-Aug 3 month SPI
- Oct-Apr 7 month SPI
- 45 EW/LW chronologies
- Principal Components Regression

Griffin et al. (in prep.)

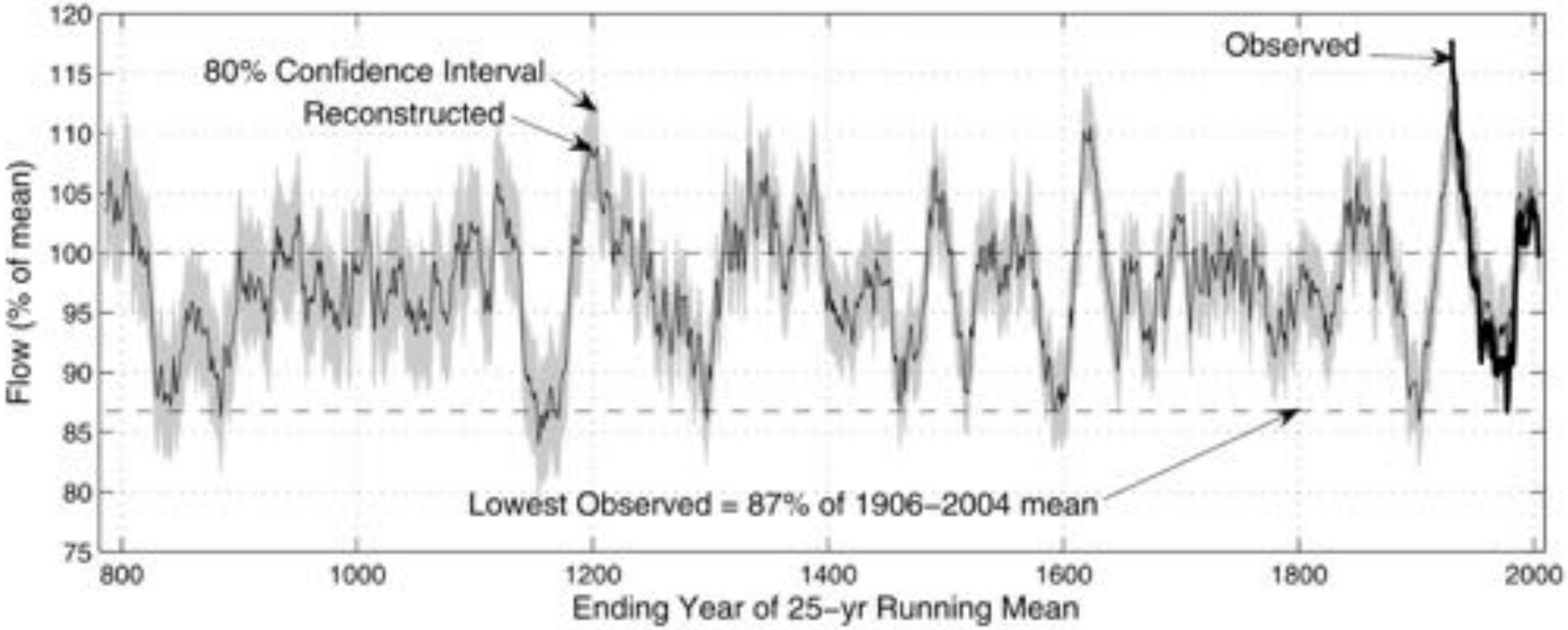
Moisture-stressed trees closely track variations in precipitation



Ring widths from a single tree near Grand Junction, CO are plotted with annual precipitation in western Colorado. The correlation between the two is 78% (r = 0.78).

Ctsy Dan Griffin, UofA

1,244 Year Tree-Ring Reconstruction of Colorado River Flow at Lee's Ferry (Meko et al. 2007)



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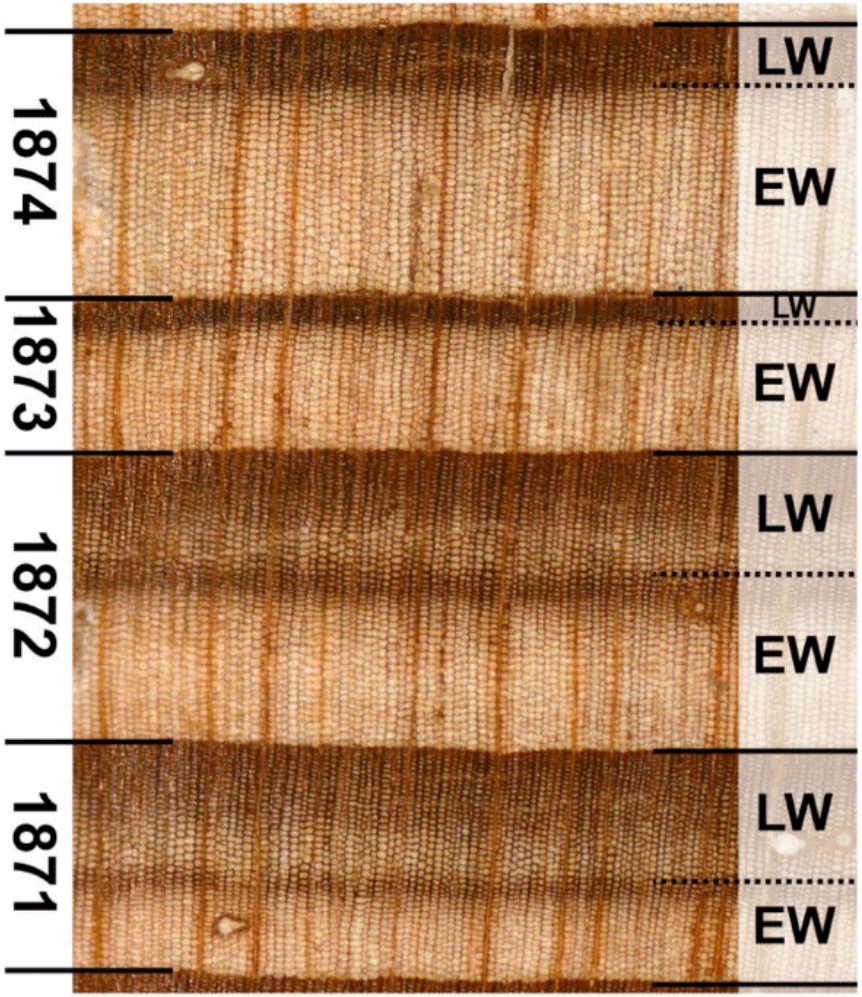
Earlywood & Latewood



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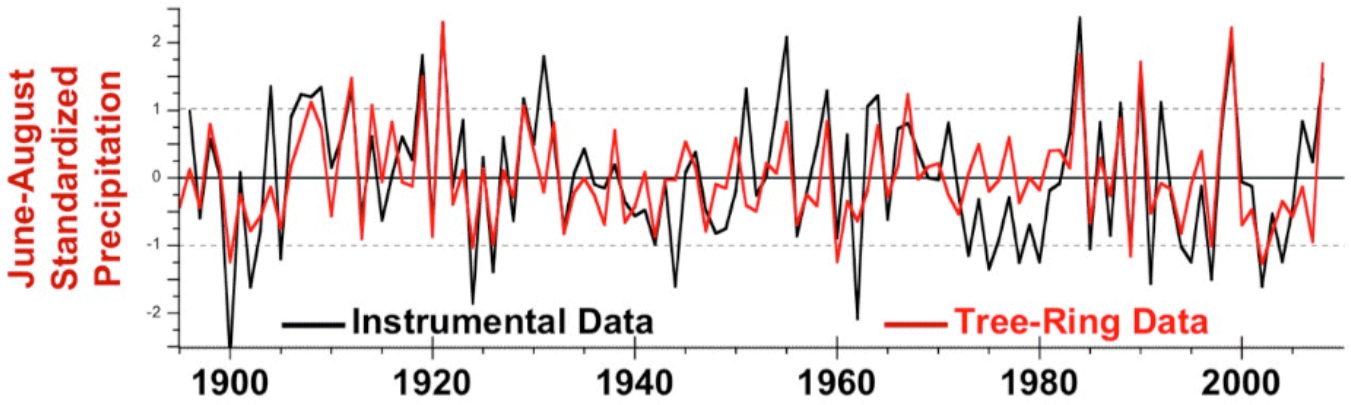
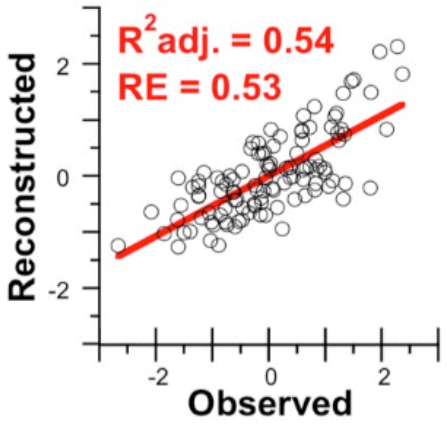
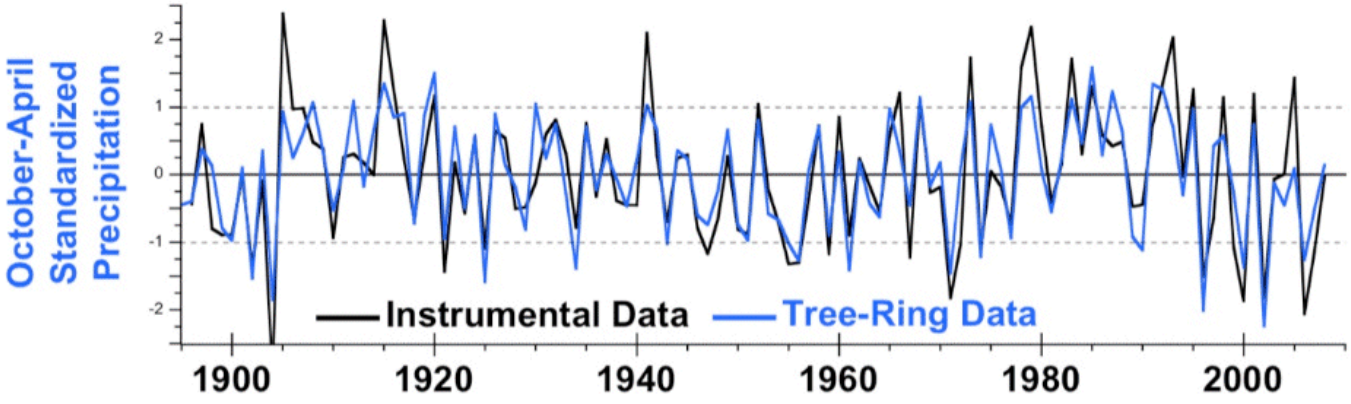
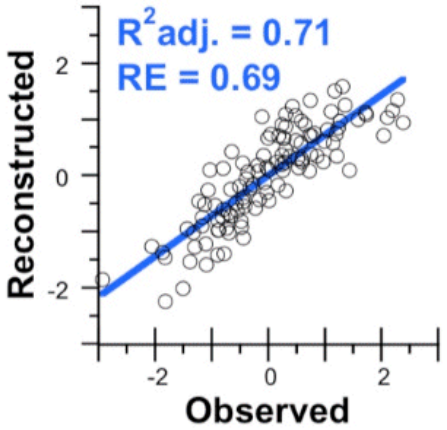
NAME Region 2 SPI Reconstructions





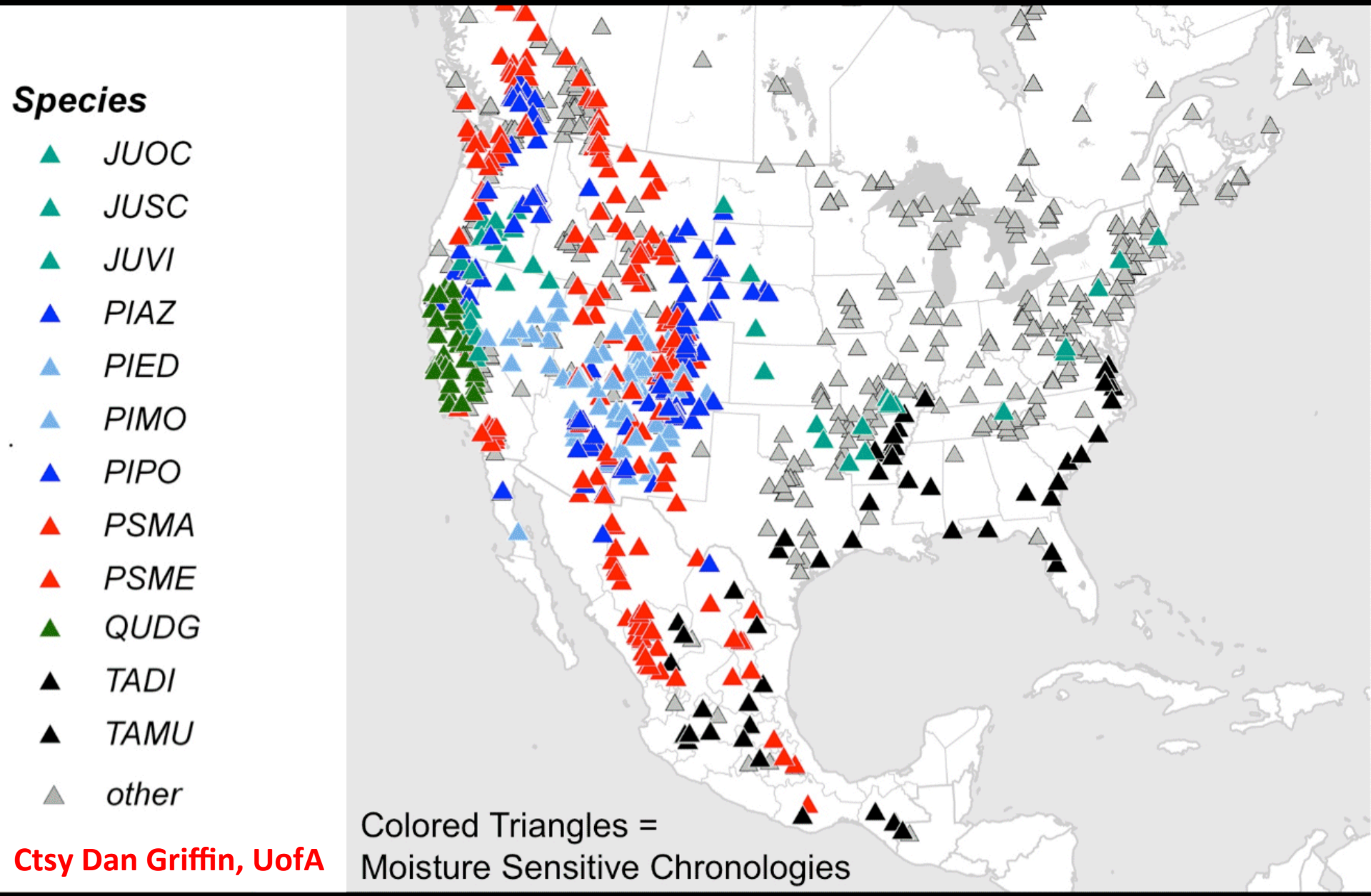




Ctsy Dan Griffin, UofA

Griffin et al. (in prep.)

North American Tree-Ring Chronologies > 200 years long



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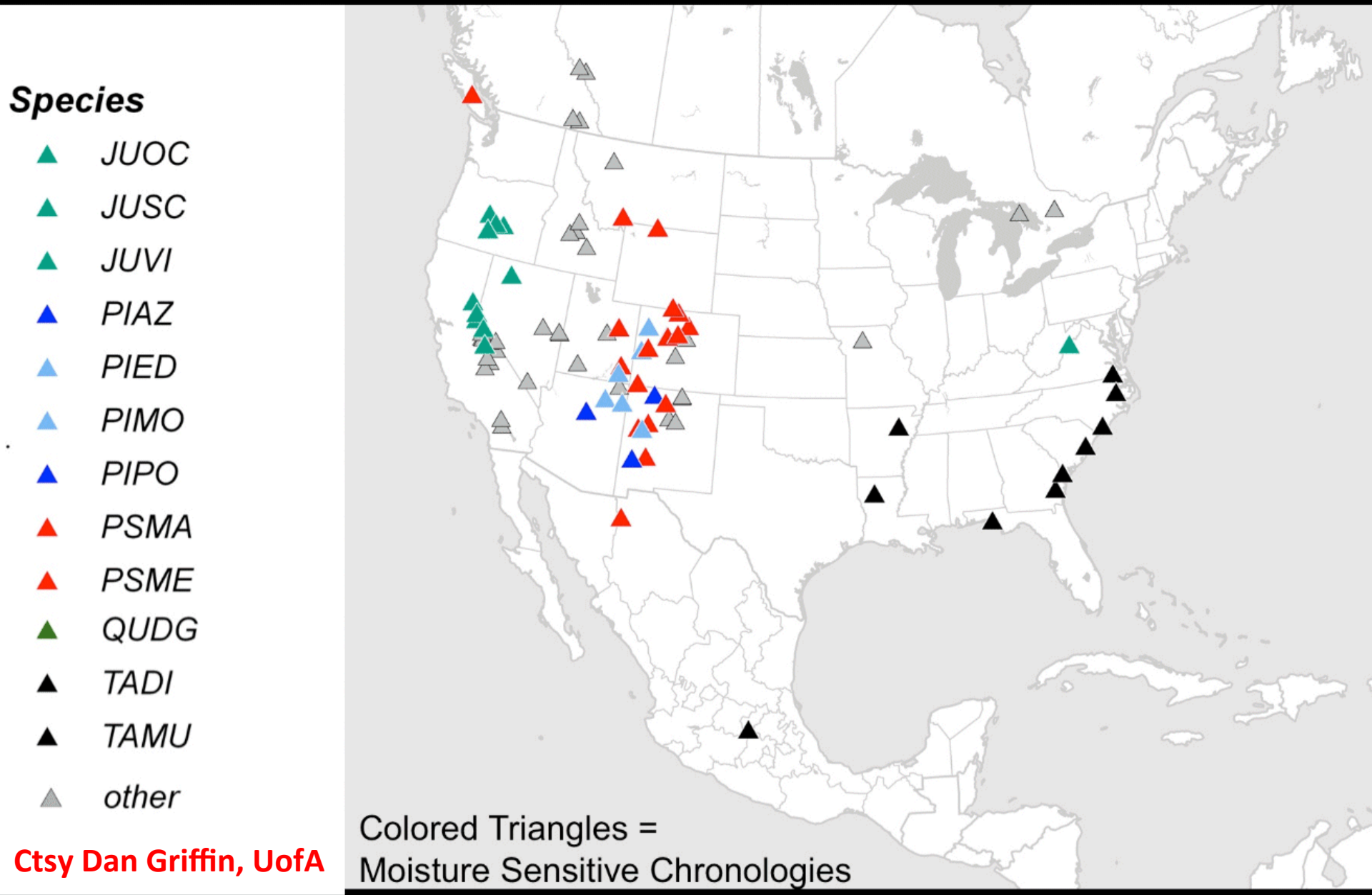
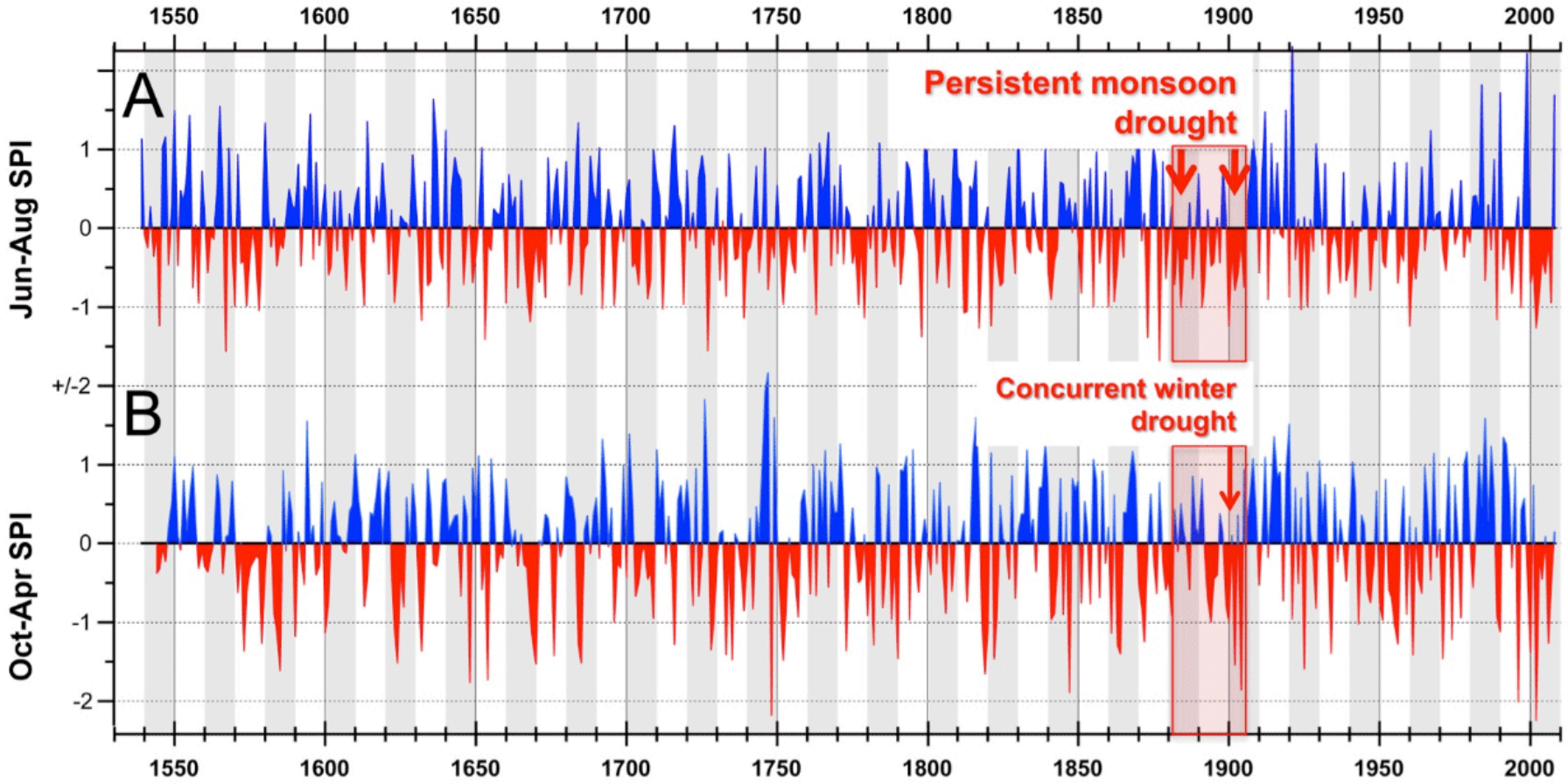
North American Tree-Ring Chronologies > 1000 years long



Ctsy Dan Griffin, UofA

NAME Region 2 SPI Reconstructions: 1539-2008
Seasonality of Drought

Griffin et al. (in prep.)



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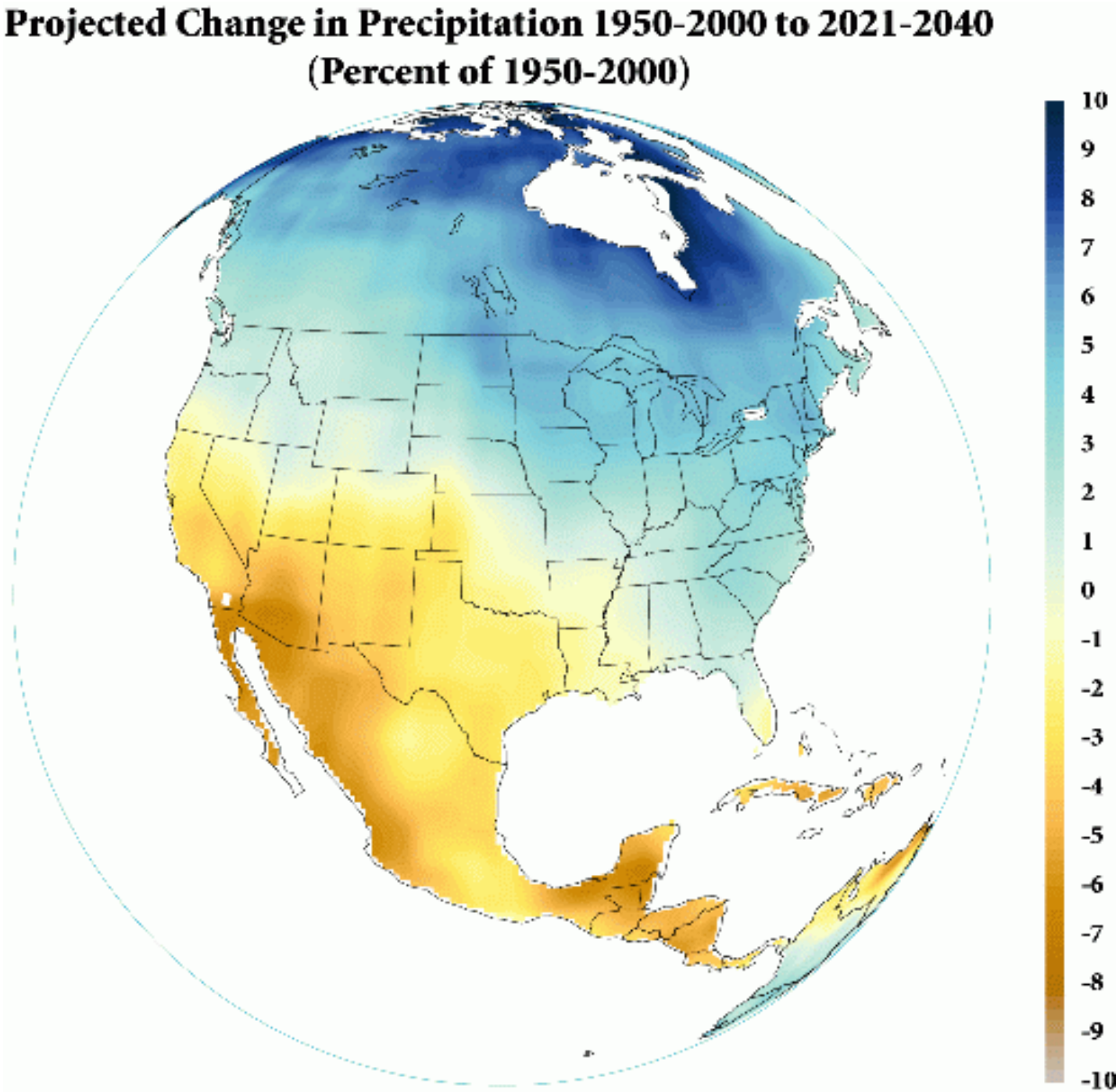


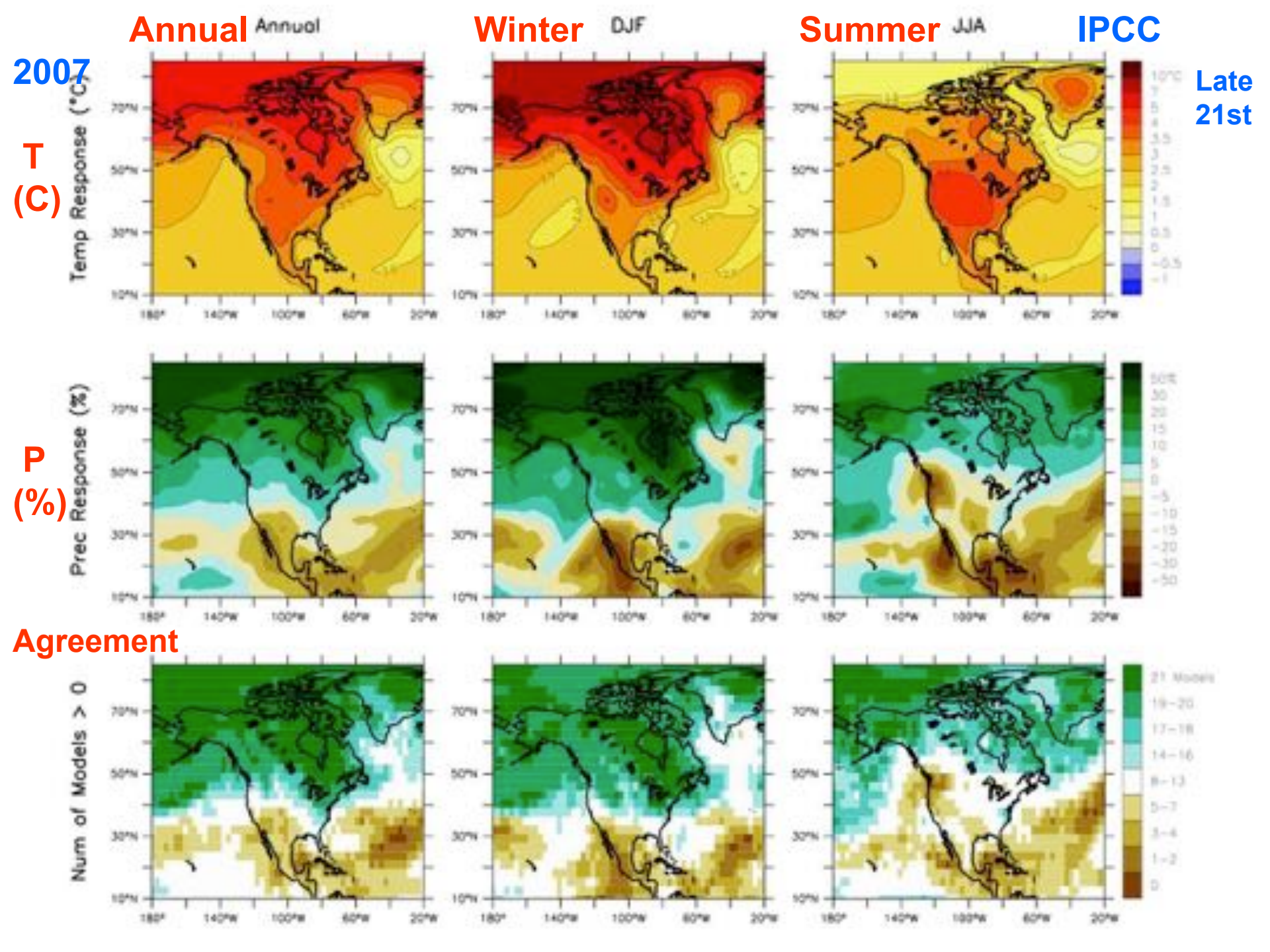
Average of 19 climate models. 2007.

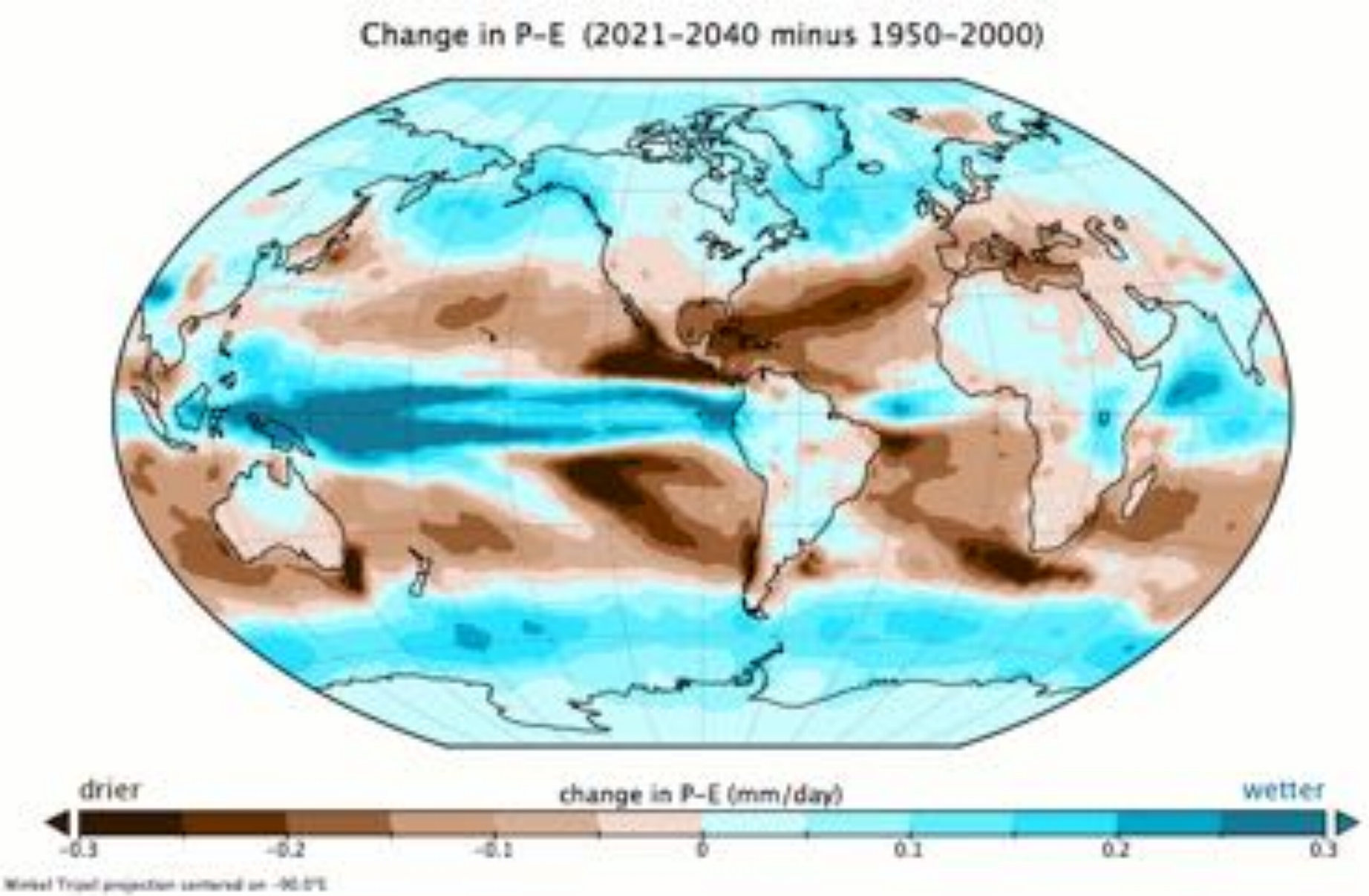
20 years centered 20 years from now

Figure by Gabriel Vecchi.

www.ldeo.columbia.edu/res/div/ocp/drought/science.shtml

R. Seager, M.F. Ting, I.M. Held, Y. Kushnir, J. Lu, G. Vecchi, H.-P. Huang, N. Harnik, A. Leetmaa, N.-C. Lau, C. Li, J. Velez, N. Naik, 2007. Model Projections of an Imminent Transition to a More Arid Climate in Southwestern North America. *Science*, DOI: 10.1126/science.1139601

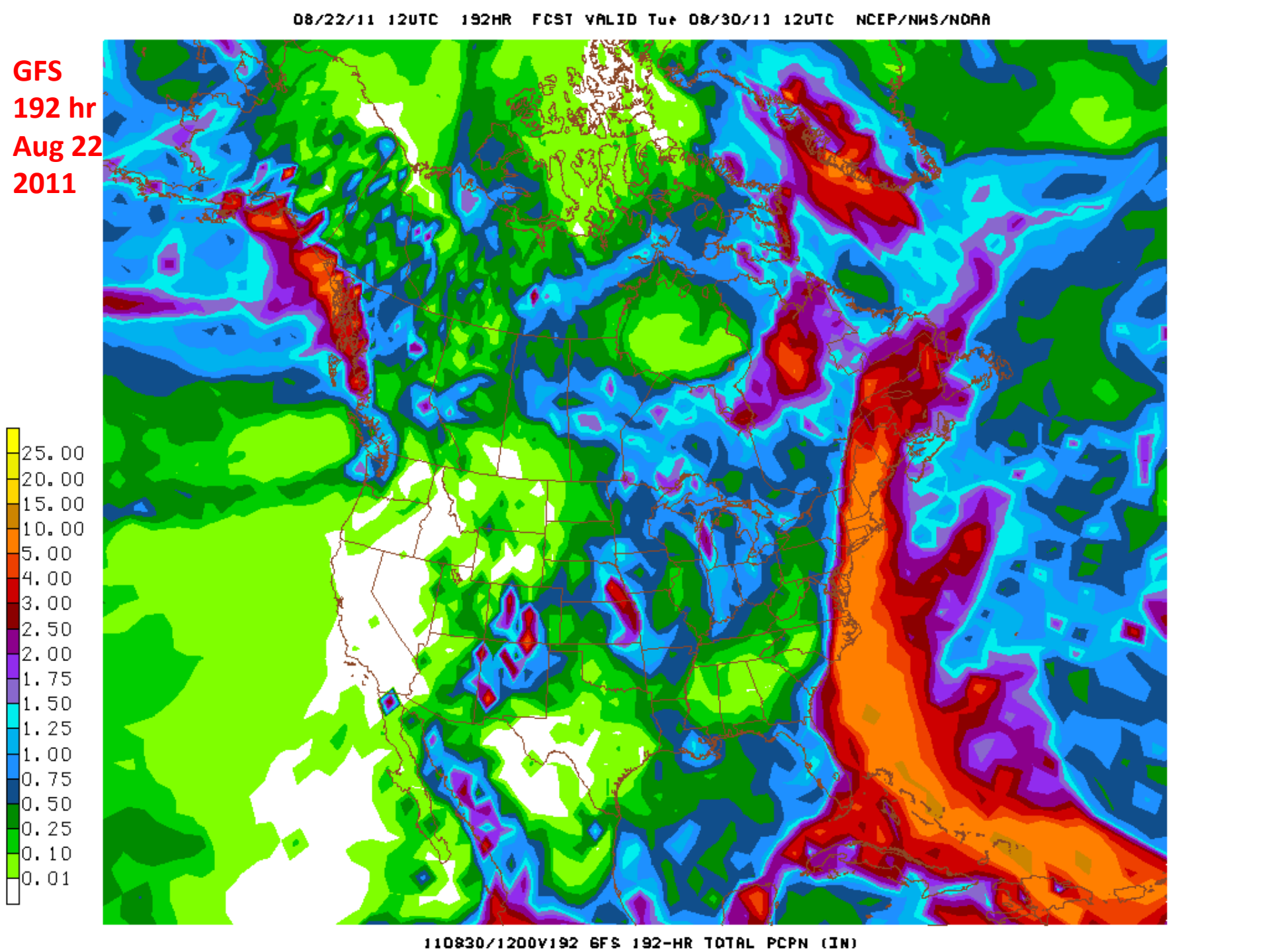

Annual
Annual
Winter
DJF
Summer
JJA
IPCC
2007
Late 21st
T (C)
P (%)
Agreement
Temp Response (°C)
Prec Response (%)
Num of Models > 0

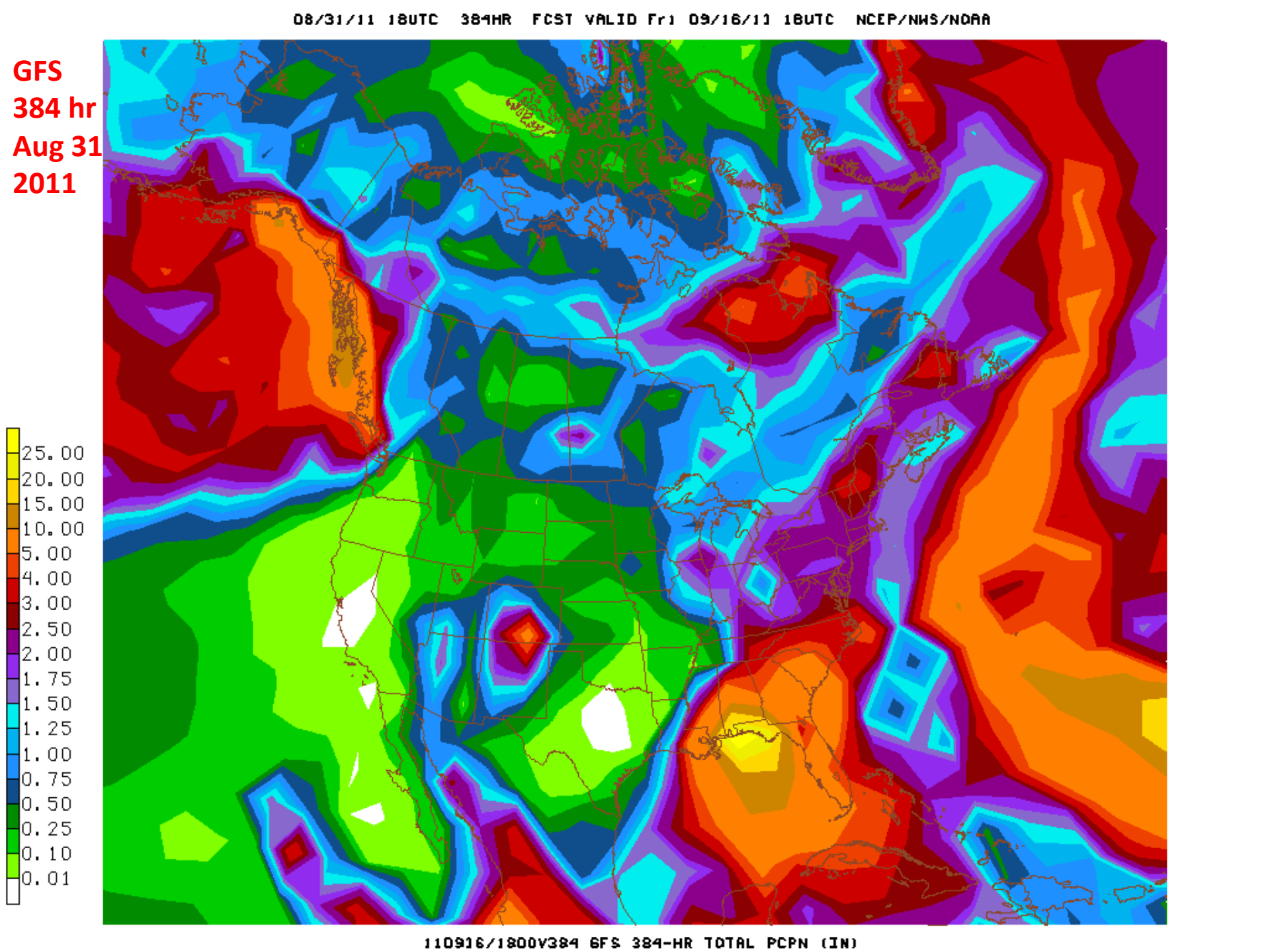


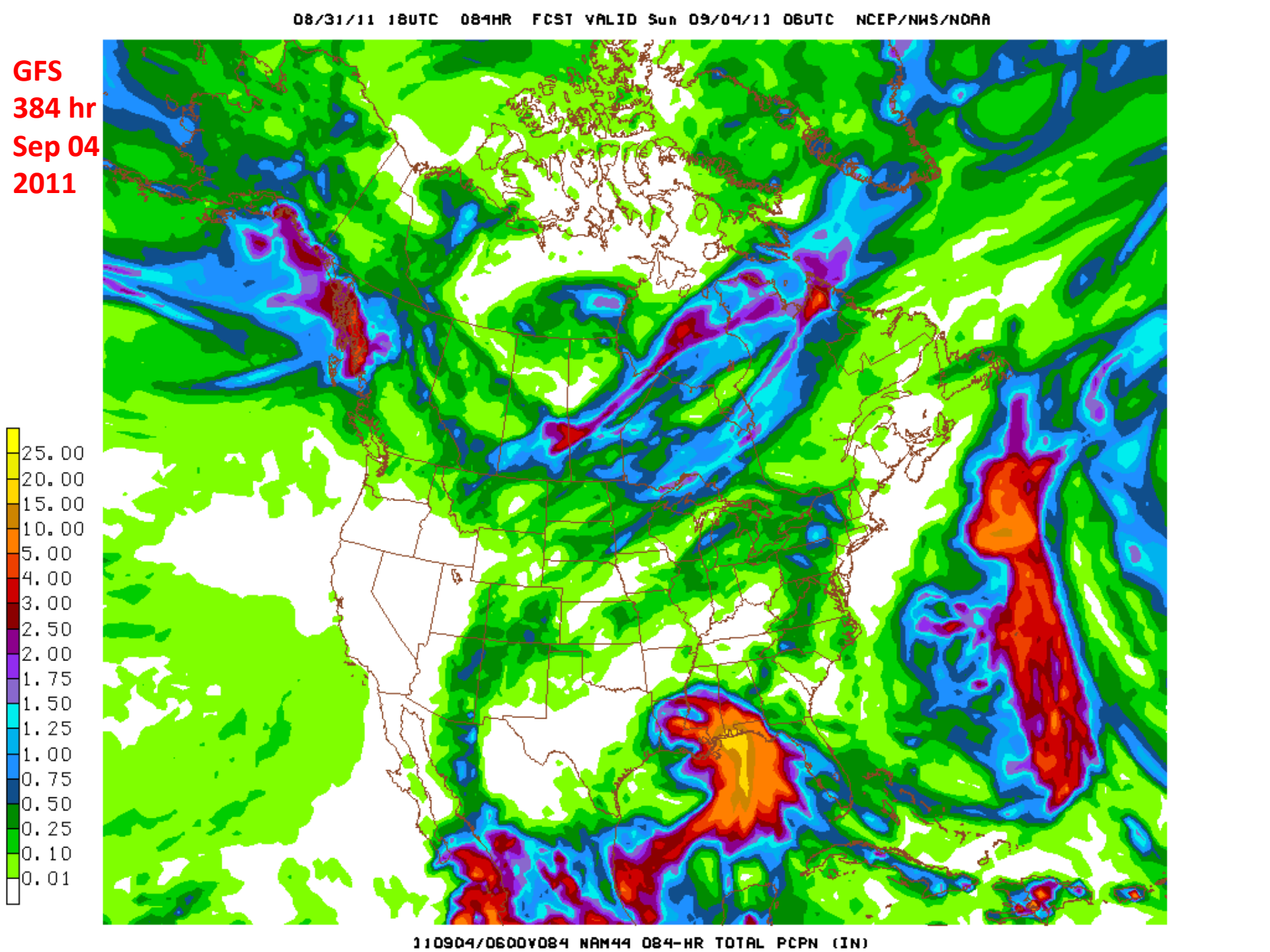
Seager et al, 2007. Average of 19 climate models. Figure by Naomi Naik.

www.ldeo.columbia.edu/res/div/ocp/drought/science.shtml

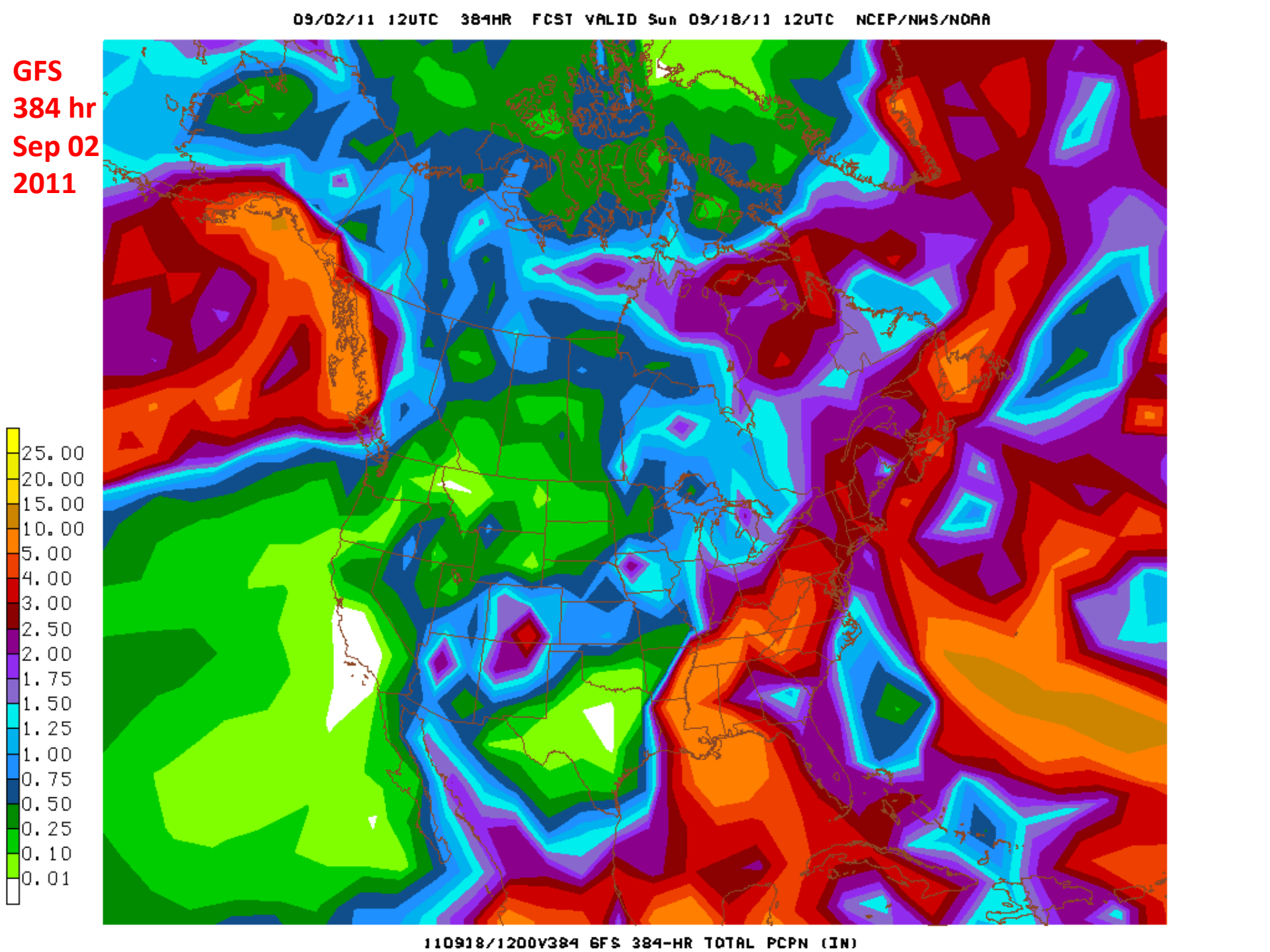

DO NOT ENTER
ENTRANCE ONLY


08/22/11 12UTC 192HR FCST VALID Tue 08/30/11 12UTC NCEP/NWS/NOAA
GFS
192 hr
Aug 22
2011
25.00
20.00
15.00
10.00
5.00
4.00
3.00
2.50
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.10
0.01
110830/1200V192 GFS 192-HR TOTAL PCPN (IN)

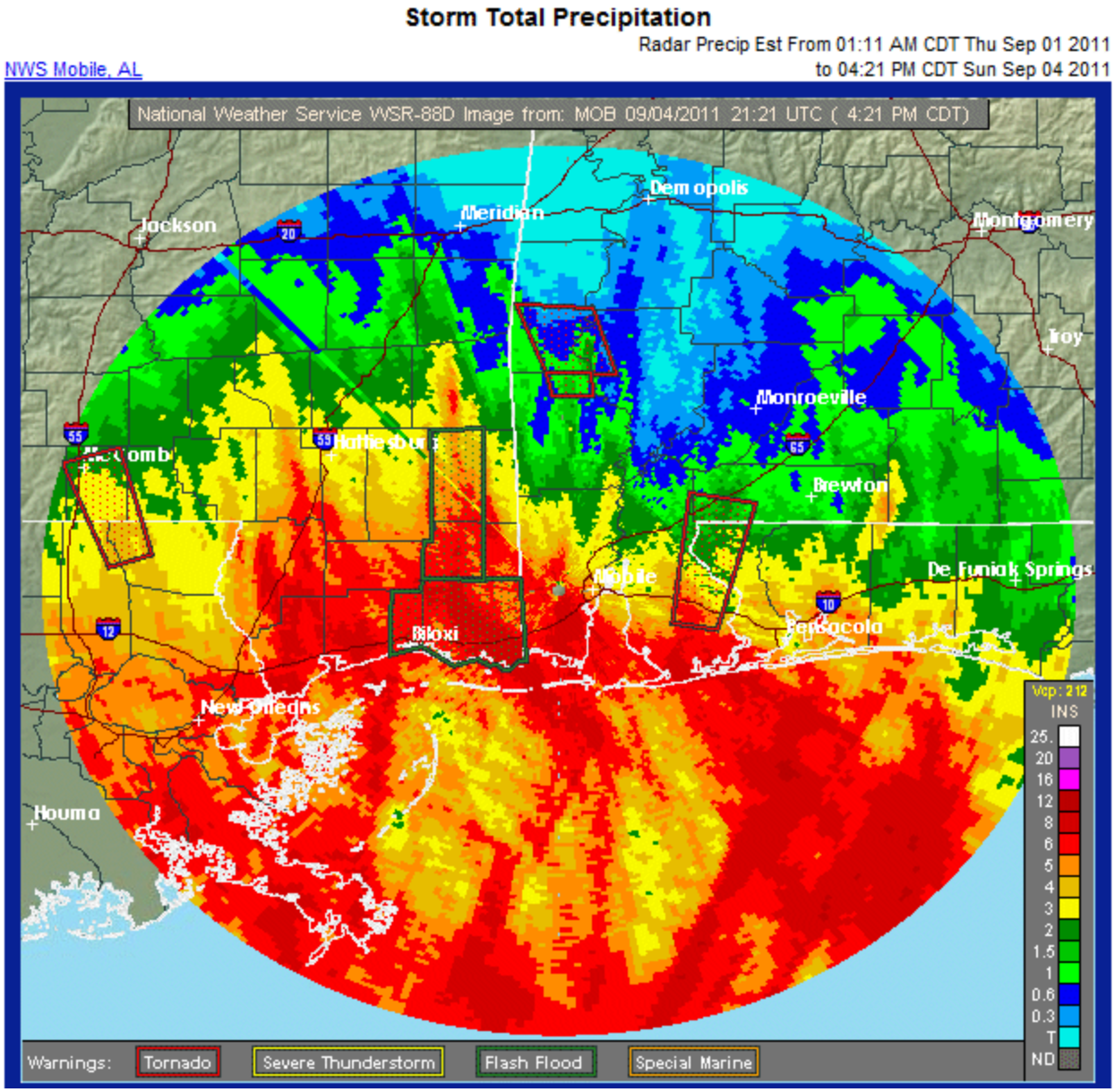

08/31/11 18UTC 384HR FCST VALID Fri 09/16/11 18UTC NCEP/NWS/NOAA
GFS
384 hr
Aug 31
2011
25.00
20.00
15.00
10.00
5.00
4.00
3.00
2.50
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.10
0.01
110916/1800V384 GFS 384-HR TOTAL PCPN (IN)


08/31/11 18UTC 084HR FCST VALID Sun 09/04/11 06UTC NCEP/NWS/NOAA
GFS
384 hr
Sep 04
2011
25.00
20.00
15.00
10.00
5.00
4.00
3.00
2.50
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.10
0.01
110904/0600V084 NAM44 084-HR TOTAL PCPN (IN)

Continued continuation of persistent persistence


09/02/11 12UTC 384HR FCST VALID Sun 09/18/11 12UTC NCEP/NWS/NOAA
GFS
384 hr
Sep 02
2011
25.00
20.00
15.00
10.00
5.00
4.00
3.00
2.50
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.10
0.01
110918/1200V384 GFS 384-HR TOTAL PCPN (IN)

Radar Precipitation
2011 Sep 01
111 am CDT
Thru
2011 Sep 04
421 pm



Select Year: 1936 Select Month: 7

Submit

Choose Year/Month, press Submit and then choose product below

Climate Product Options

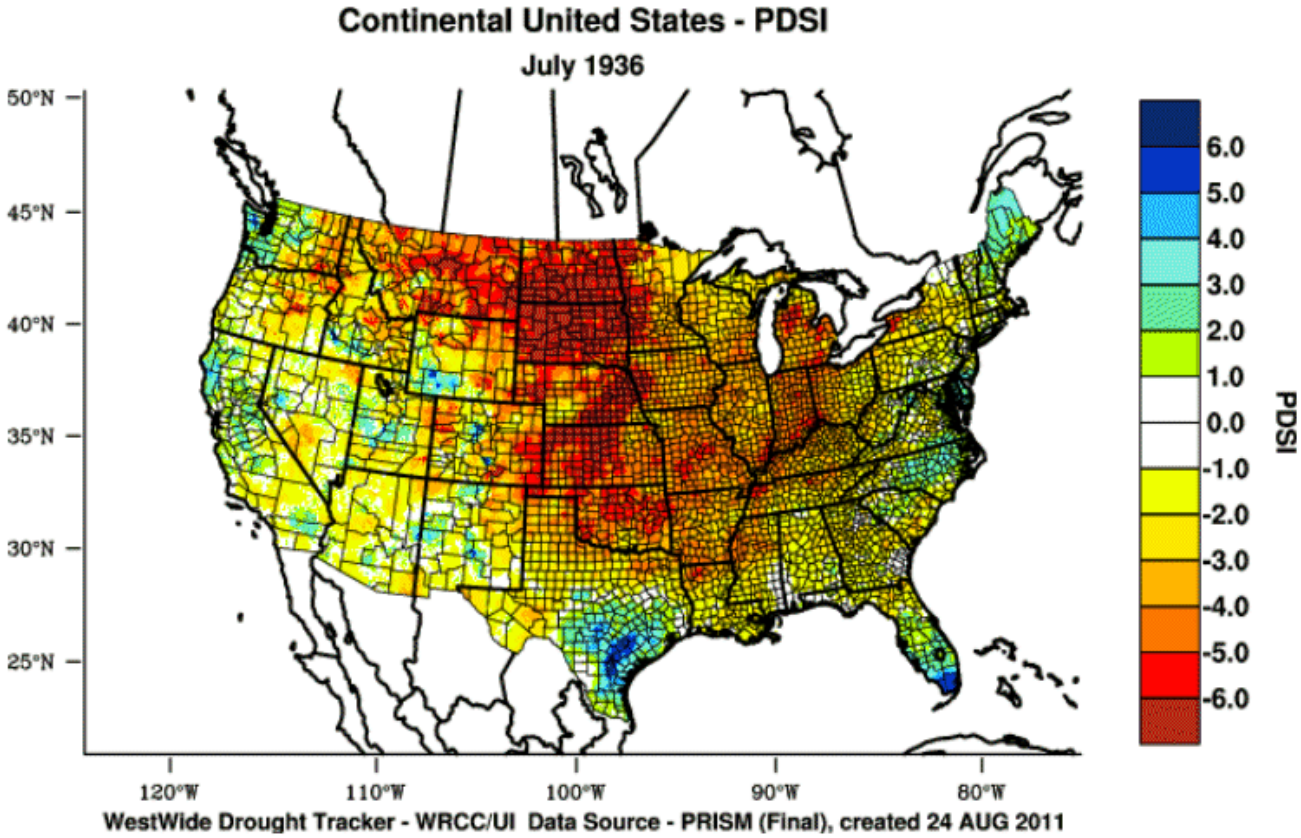
Expand All | Contract All

- Variable
  - Drought Index
    - Palmer Index
      - PDSI
      - Palmer Z-Index
      - Self-Calibrated PDSI
    - SPI
  - Hydrological
    - Snow Water Equivalent
      - Anomaly
      - Percentile
    - Soil Moisture
      - Anomaly
      - Percentile
  - Climate
    - Temperature
      - Anomaly
      - Percentile
    - Precipitation
      - Anomaly
      - Percentile
- Dataset
- Region

Extension of WestWide Drought Tracker

Currently viewing images using the PRISM dataset.

Displaying image from /images/ARCHIVE/pdsi/193607_us_cl.png



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Select Year: 1934 Select Month: 7

Submit

Choose Year/Month, press Submit and then choose product below

Climate Product Options

Expand All | Contract All

- Variable
  - Drought Index
    - Palmer Index
      - PDSI
      - Palmer Z-Index
      - Self-Calibrated PDSI
    - SPI
  - Hydrological
    - Snow Water Equivalent
      - Anomaly
      - Percentile
    - Soil Moisture
      - Anomaly
      - Percentile
  - Climate
    - Temperature
      - Anomaly
      - Percentile
    - Precipitation
      - Anomaly
      - Percentile
- Dataset
- Region

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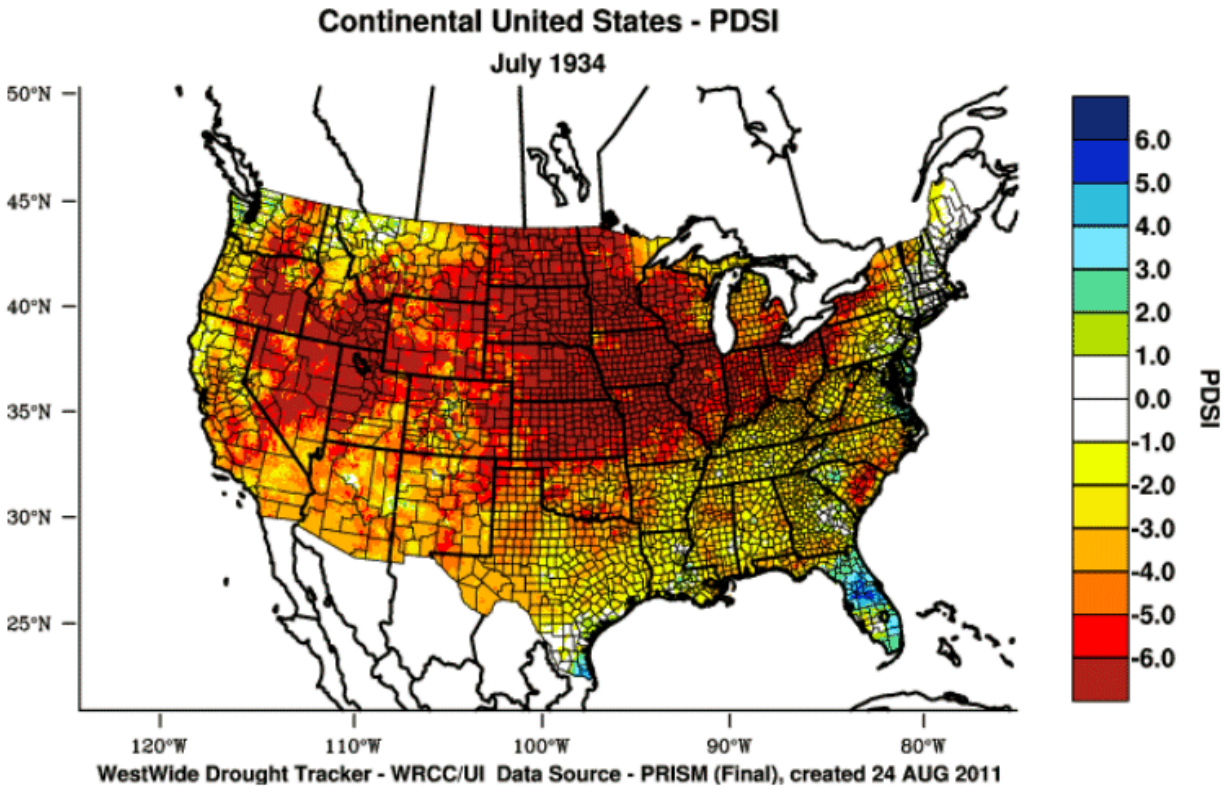
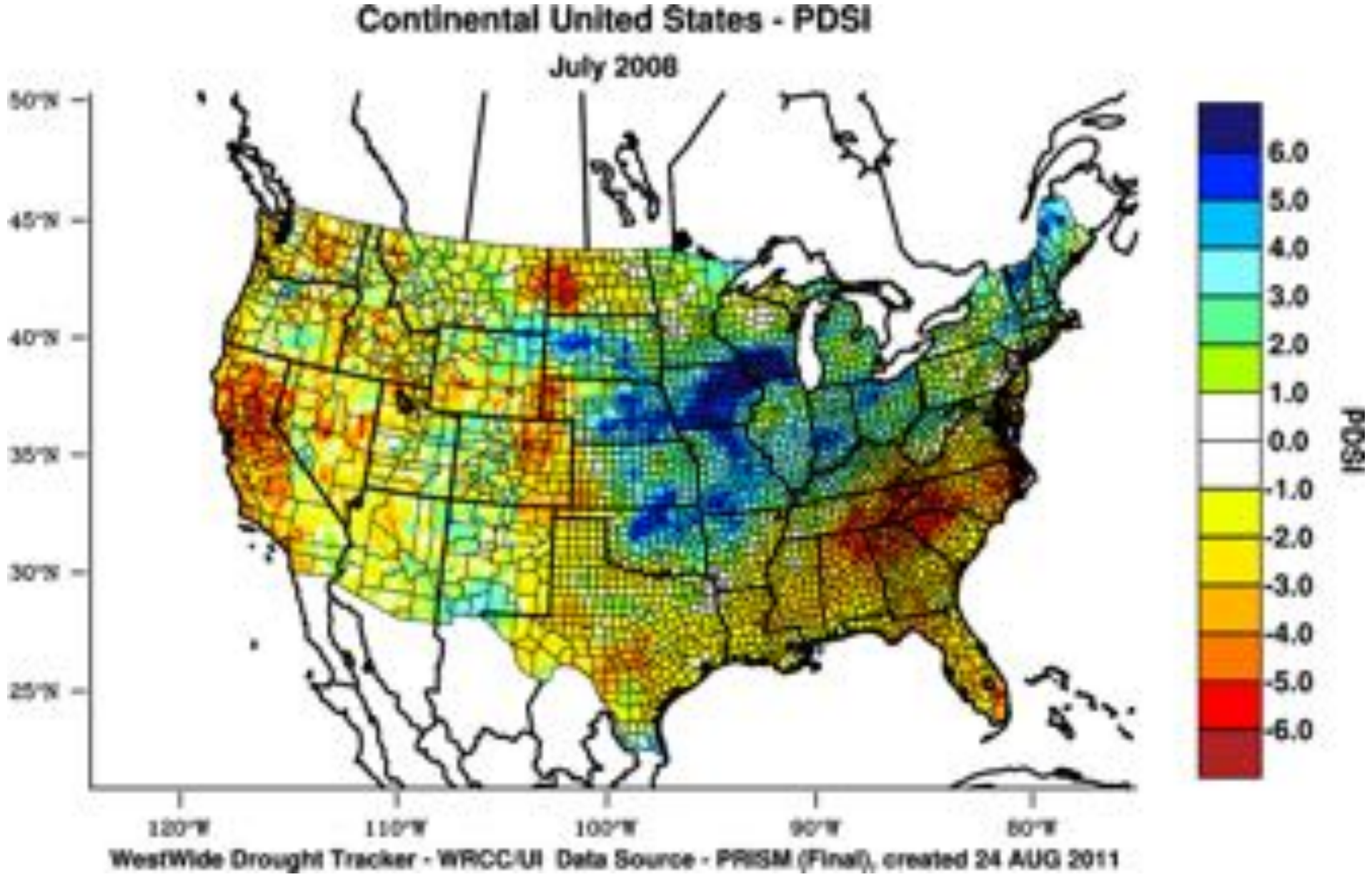
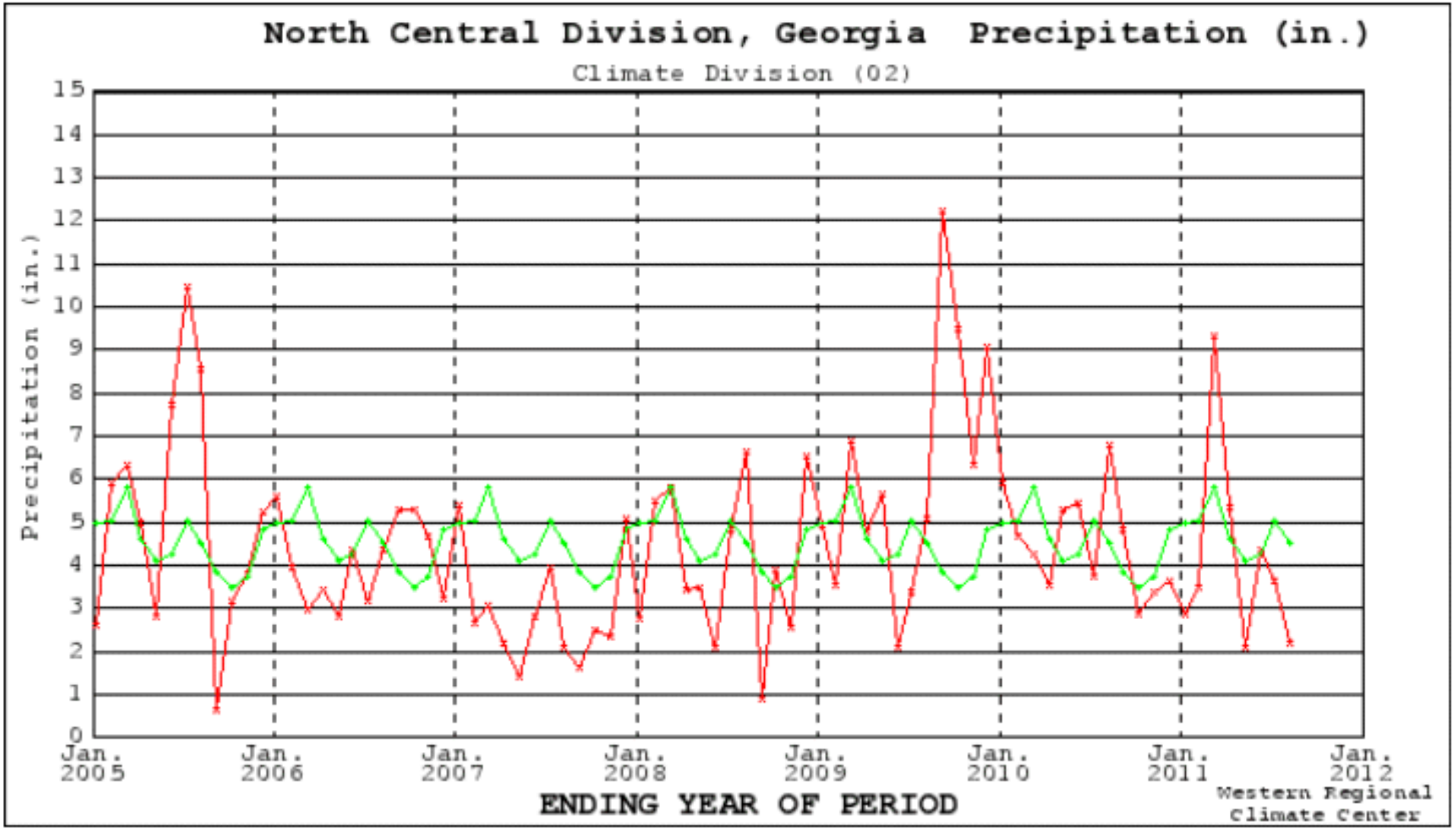


 Download PRISM dataset

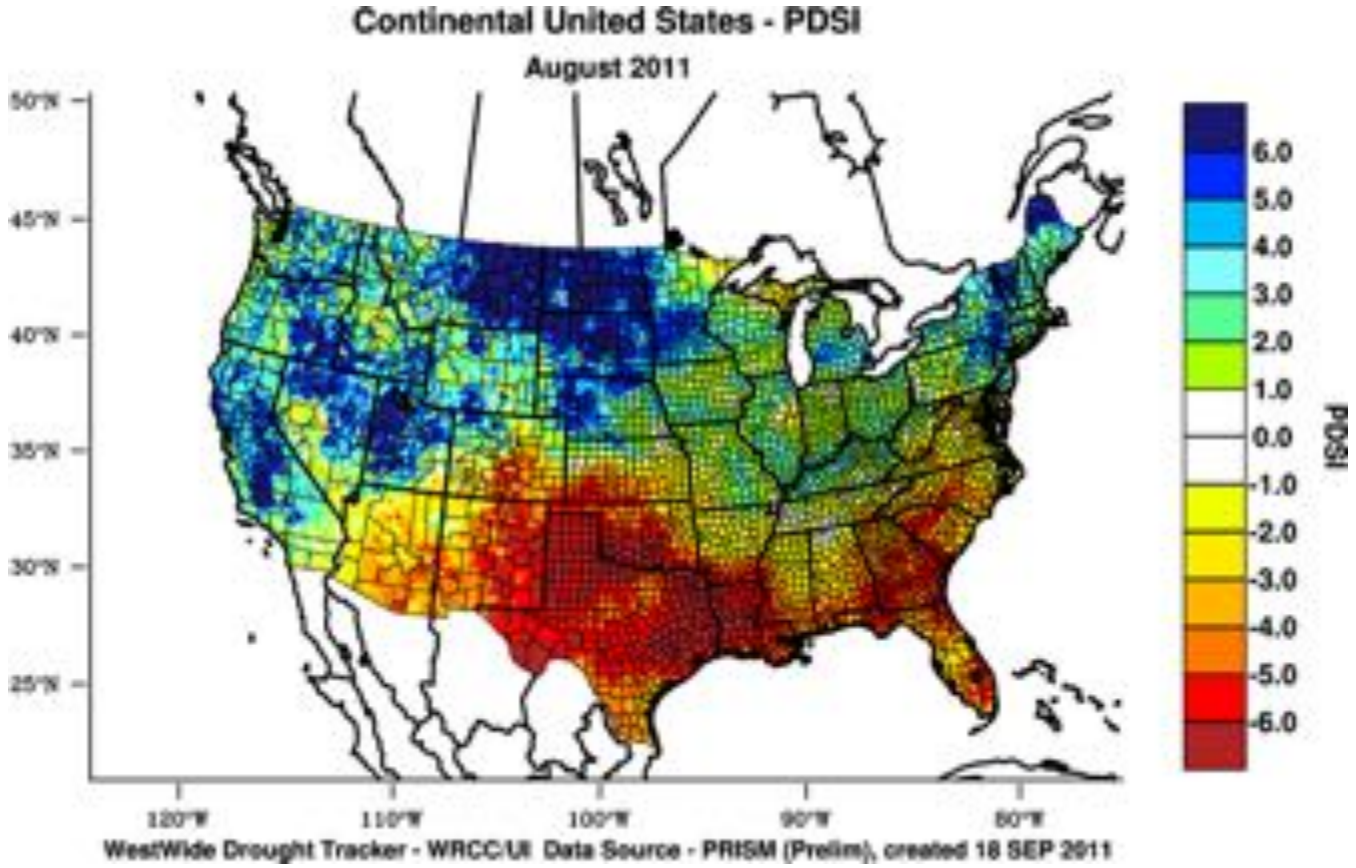
Download Data

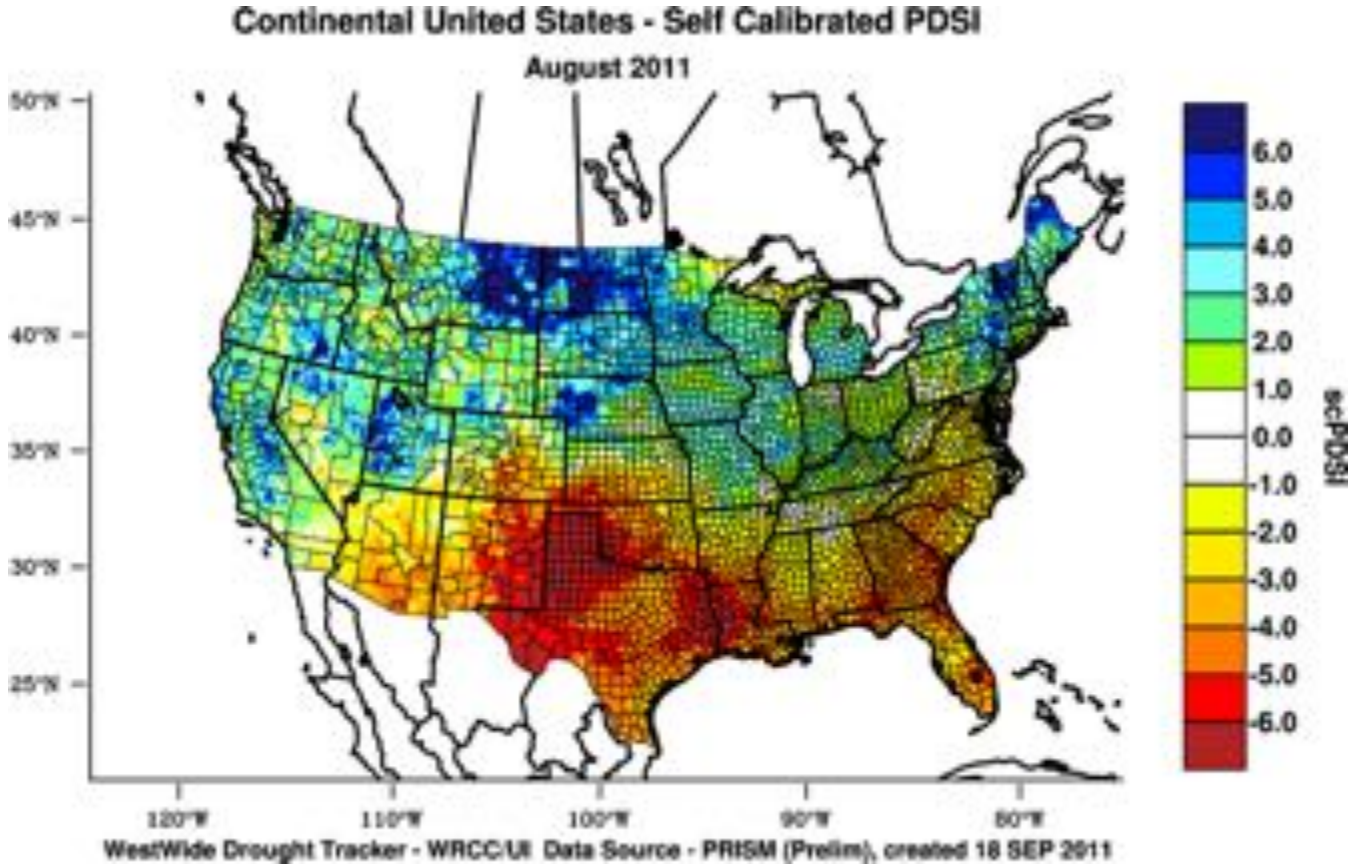

Continental United States - PDSI
July 2008
50°N
45°N
40°N
35°N
30°N
25°N
120°W
110°W
100°W
90°W
80°W
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
PDSI
WestWide Drought Tracker - WRCC/UI Data Source - PRISM (Final), created 24 AUG 2011



red - monthly data value

green - average monthly value


Continental United States - PDSI
August 2011
50°N
45°N
40°N
35°N
30°N
25°N
120°W
110°W
100°W
90°W
80°W
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
PDSI
WestWide Drought Tracker - WRCC/UI Data Source - PRISM (Prelim), created 18 SEP 2011


Continental United States - Self Calibrated PDSI
August 2011
50°N
45°N
40°N
35°N
30°N
25°N
120°W
110°W
100°W
90°W
80°W
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
scPDSI
WestWide Drought Tracker - WRCC/UI Data Source - PRISM (Prelim), created 18 SEP 2011

Relation between Duration Scale and Spatial Scale of Drought

Abundant evidence of long-lasting paleo-droughts

What kind of physical phenomena could produce these ?

What kind of "communication" between winter and summer ?
Different climate relationships and teleconnections

Can regional patterns of departure from present climate
remain in place for decades or centuries ??

The answer affects many of the ways in which we view drought.

Disclaimer

“Nothing’s gonna change my world.”

Concluding comments

We've made a lot of progress
- Drought Monitor has spurred a lot of activities
  - Monitoring
  - Physical understanding -- steady, but a long way to go
  - Social sciences components -- much more attention

Granularity and resolution of monitoring and prediction
- Especially in mountains, much runoff is from small source regions

Need continued and increased attention to entire water budget
- Supply side AND demand side (human and natural)

Role of a few big individual events
- Especially in more southerly regions
  - Occurrence or non-occurrence of Atmospheric Rivers

Need much better understanding of multi-year and decadal variability
- A lot to be learned from paleoclimate studies

Role of differential seasonal contributions to long-term droughts

Nothing is too wonderful to be true.

Michael Faraday