Oklahoma Update

Red River Valley Association
81st Annual Convention
February 22-24, 2006

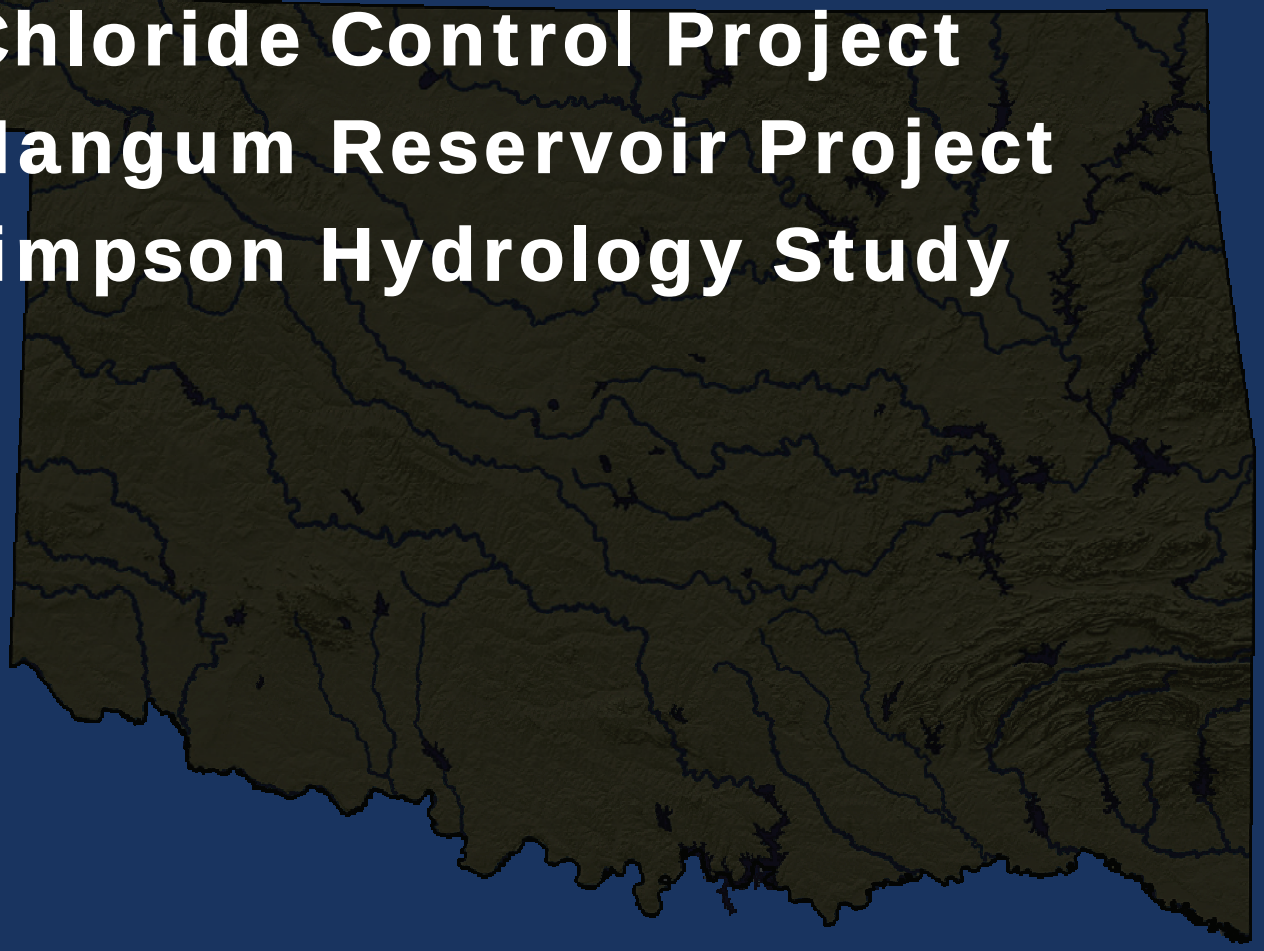
Mike Mathis, Chief
Planning & Management

State of Oklahoma
OWRB
Water Resources Board
the water agency

Ongoing OWRB Water Supply Studies & Programs

Southern Oklahoma

- **Red River Chloride Control Project**
- **Proposed Mangum Reservoir Project**
- **Arbuckle-Simpson Hydrology Study**



Ongoing OWRB Water Supply Studies & Programs

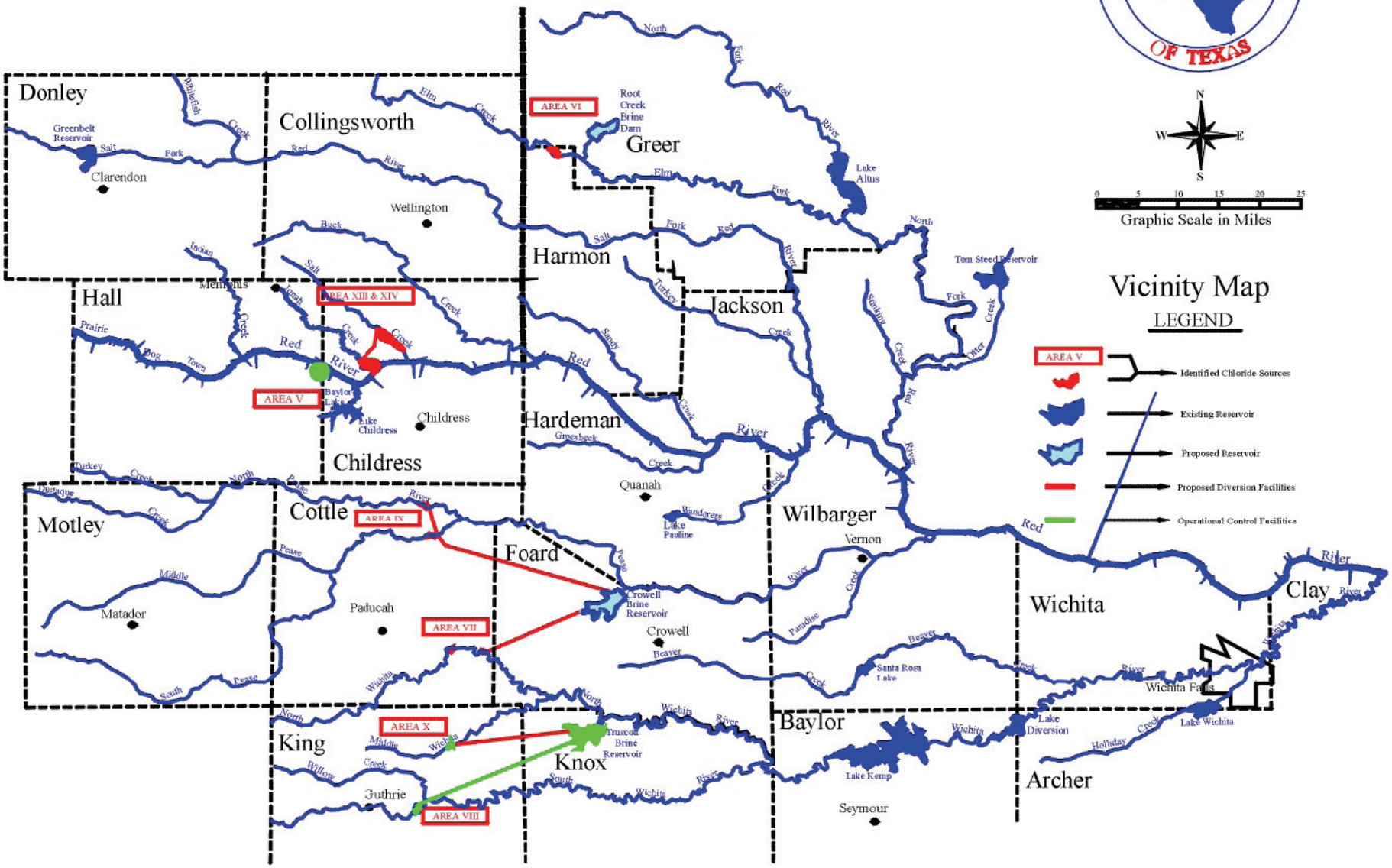
Southern Oklahoma

Red River Chloride Control Project

- Purpose is to augment water supplies in southwestern Oklahoma, including Lugert-Altus Irrigation District
- The project would control (dispose of) the estimated 510 tons of chlorides per day that currently flow past the Carl gage on the Elm Fork
- Plan is to construct a 115-acre detention reservoir to collect diverted brine water; Elm Fork River would be diverted around this reservoir and brine would be pumped from detention reservoir to a permanent storage reservoir on Fish Creek
- Project would remove about 80 percent (420 tons) of the estimated chloride load

Red River Basin Chloride Control Project

Oklahoma & Texas



Ongoing OWRB Water Supply Studies & Programs

Southern Oklahoma

Red River Chloride Control Project

- Proposed focused evaluation of Elm Fork Area VI by U.S. Army Corps of Engineers:
  - Support/request by Gov. Henry
  - Corps was appropriated $375,000 in FY-06 to initiate evaluation of Area VI
  - Corps / OWRB cooperating on water quantity / quality data collection plan

Ongoing OWRB Water Supply Studies & Programs

Southern Oklahoma

Proposed Mangum Reservoir Project

- Recent Studies:
  - Foundation conditions appear to be favorable
  - Geology and karst conditions in the uppermost part of the reservoir, near Commissioner Bend of Salt Fork Red River, will impose limits on the dam elevation, size, and capacity
  - If construction at the conservation pool level of 1550 feet is justified, additional data will be needed to characterize foundation conditions and estimate cost of dam and facilities
  - If additional storage is needed (conservation pool level above 1550 feet), then further study should focus on hydrogeology and water loss from Salt Fork at Commissioner Bend

Proposed Mangum Damsites and Alternatives

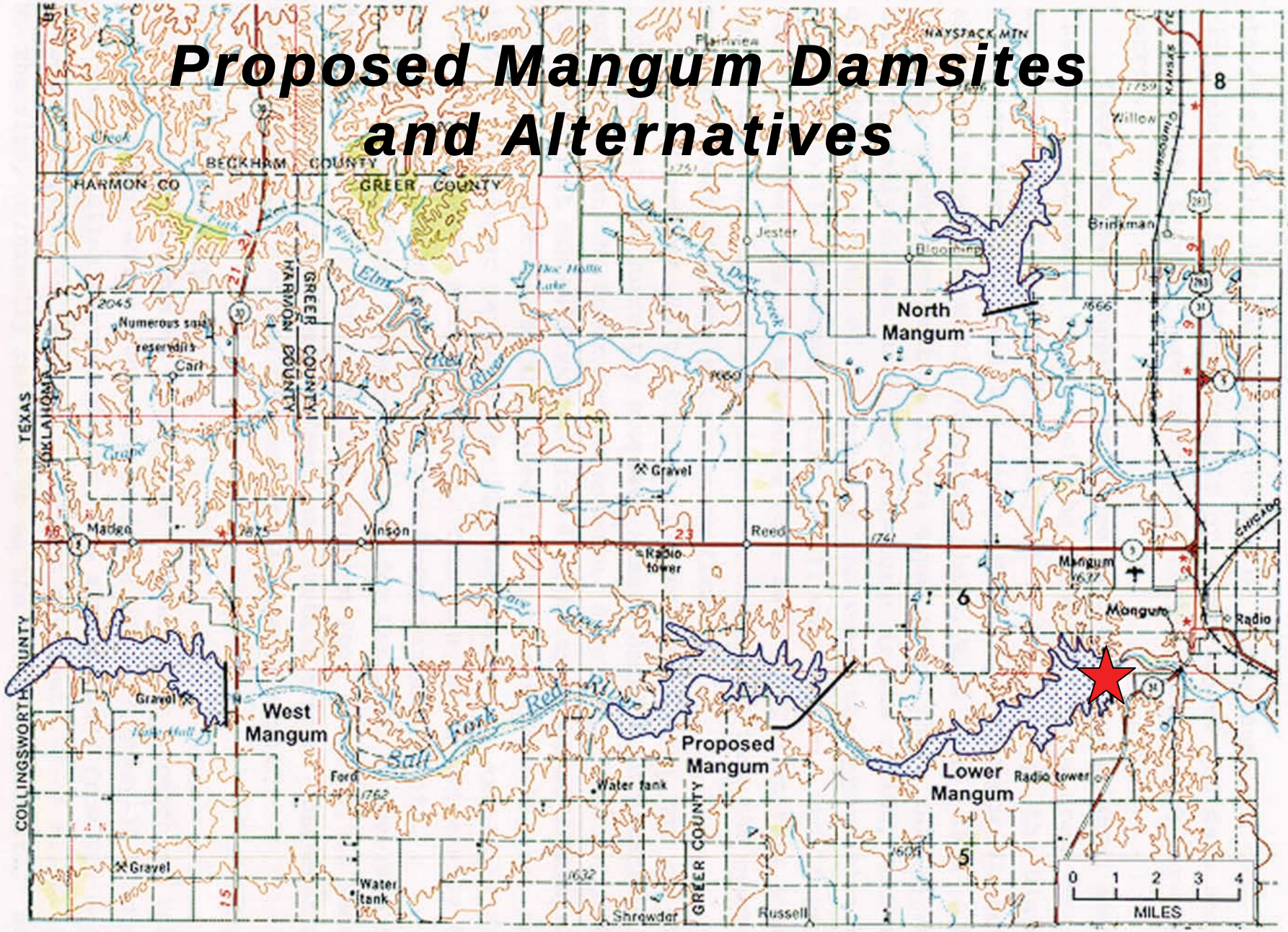


Figure 8. Map of Mangum area showing location of proposed Mangum Damsite and three alternative damsites. Base map is the U.S. Geological Survey, 1:250,000-scale topographic map for the Lawton and Clinton 1x2-degree quadrangles.

Ongoing OWRB Water Supply Studies & Programs

Southern Oklahoma

Proposed Mangum Reservoir Project

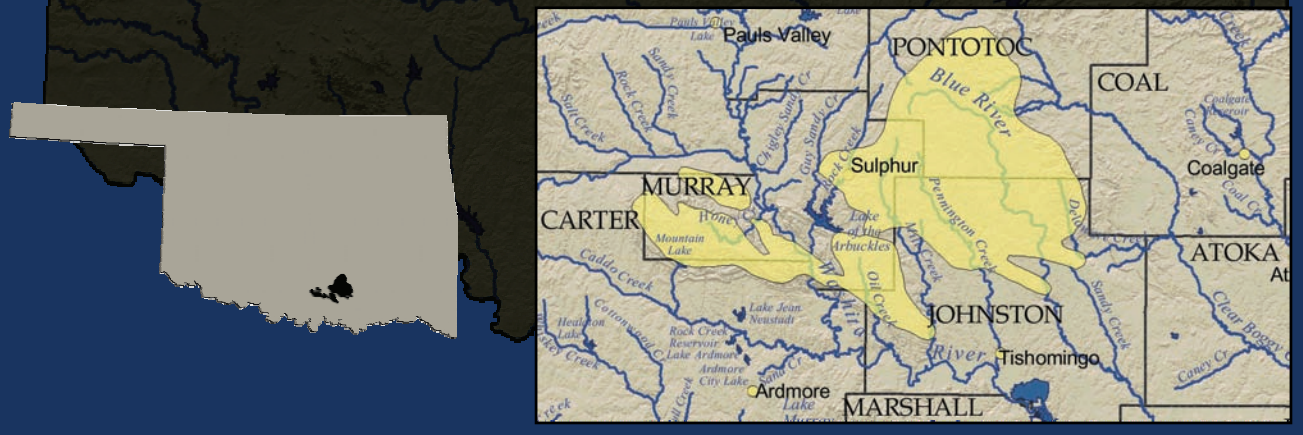
- Potential alternate water supply for Lugert-Altus Irrigation District
- Proposed damsite 2 miles southwest of Mangum:
  - Estimated storage = 26,000 ac-ft (11 MGD yield)
  - Estimated surface area = 1,800 acres
- Phase VI of project to continue geotechnical investigations funded in FY-06 COE budget

Ongoing OWRB Water Supply Studies & Programs

Southern Oklahoma

Arbuckle-Simpson Hydrology Study

- Comprehensive multi-year study to characterize the aquifer region's geology and hydrology:
  - $5.7 million cost-share (OWRB/Bureau of Reclamation)
- Identify future management options that protect area springs/streams



Ongoing OWRB Water Supply Studies & Programs

Southern Oklahoma

Arbuckle-Simpson Hydrology Study

- Current Activities/Results:
  - Stream water/groundwater monitoring (data collection):
    - Stream flow habitat
    - Utilize NEXRAD data to link surface/groundwater models
  - Preliminary groundwater flow modeling (USGS):
    - Early results of age-dating tests reveal Vendome Well water is 10,000 to as maybe as much as 30,000 years old
  - Deep well drilling project (to 1,820 feet)
  - Tree ring analysis to reconstruct hydrologic record

Major OWRB Initiatives for 2006

- **Statewide Water Development Revolving Fund Recapitalization**
- **State Water Plan**

Major OWRB Initiatives for 2006

Statewide Water Development Revolving Fund Recapitalization (Water/Wastewater Project Financing)

- Oklahoma has a $5.4 billion water/wastewater infrastructure financing need over next 20 years:
  - OWRB Statewide Financial Assistance Program (FAP) Revolving Fund is rapidly dwindling
- Potential funding through Gross Production Tax
- $25 million included in Gov. Henry's FY-07 budget

State Financial Assistance Program:

- Original Investment(s) = $39 million
- Total loans/grants = 1,501 for $1.4 billion
- Estimated savings = $450 million

Major OWRB Initiatives for 2006

State Water Plan

- Oklahoma requires an effective and comprehensive plan to meet future water supply challenges:
  - Address population growth
  - Reduce vulnerability to drought
  - Satisfy competing water interests
  - Balance economic development and the environment
  - Address future water/wastewater infrastructure costs
- $2.5 million included in Gov. Henry's FY-07 budget
- Potential funding through Gross Production Tax
- Utilize OWRB's Financial Assistance Program for infrastructure development

OK Comprehensive Water Plan:

- Original plan created in 1980; last updated in 1995
- 10-year updates mandated by State Legislature

OWRB
Drought Monitoring Duties

- Chair agency of the Water Availability and Outlook Committee (WAOC) of the Oklahoma Drought Management Team
- Water Availability & Outlook Committee:
  - permanent working group;
  - directs efforts to monitor current water availability and moisture conditions and provide near-future estimates of water supply;
  - monitors water/moisture-related conditions and/or problems;
  - as drought conditions deteriorate, convenes regular meetings to assess drought trends and projections; and
  - provides information relevant to impending or ongoing drought in Oklahoma to the State Drought Coordinator, Drought Team, public, and media.

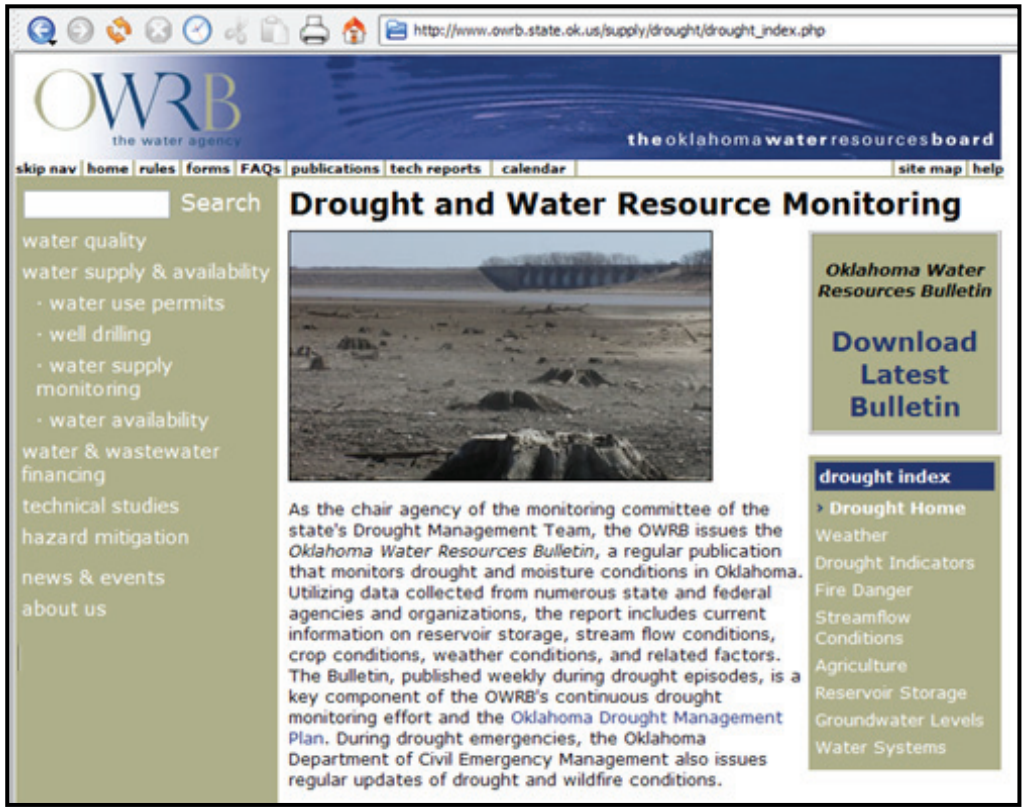
OWRB's
Drought Monitoring Partners

Oklahoma Department of Civil Emergency Management
State Drought Coordinator

- Oklahoma Climatological Survey (Mesonet)
- Oklahoma Department of Agriculture (Forestry Services)
- Oklahoma Department of Environmental Quality
- Oklahoma Conservation Commission
- Oklahoma Department of Wildlife Conservation
- OSU Cooperative Extension Service
- Oklahoma Rural Water Association
- Oklahoma Municipal League

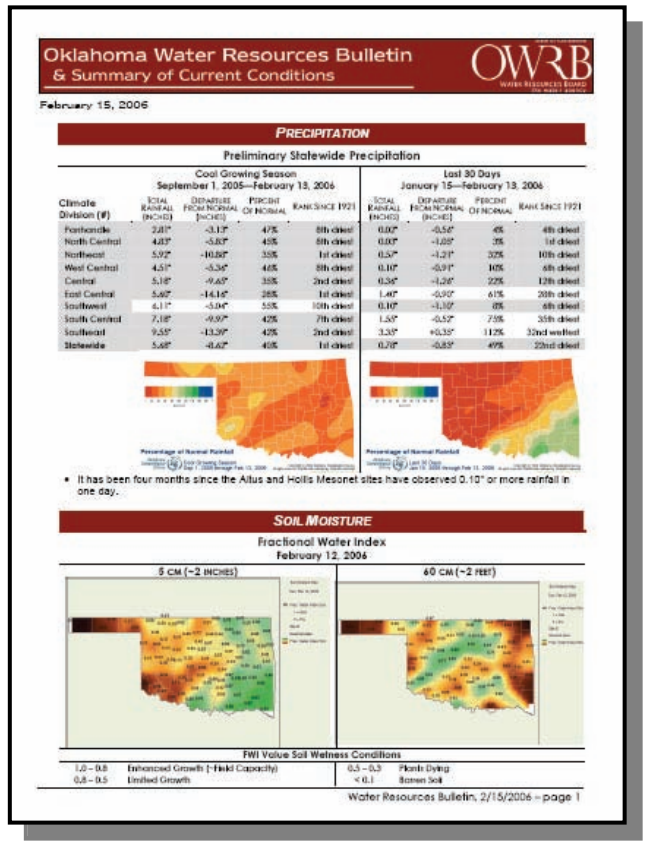
- National Weather Service
- U.S. Army Corps of Engineers
- Bureau of Reclamation
- U.S. Geological Survey
- Natural Resources Conservation Service

Drought Monitoring Resources



OWRB Web Site:

www.owrb.state.ok.us



Oklahoma
Drought/Moisture Conditions

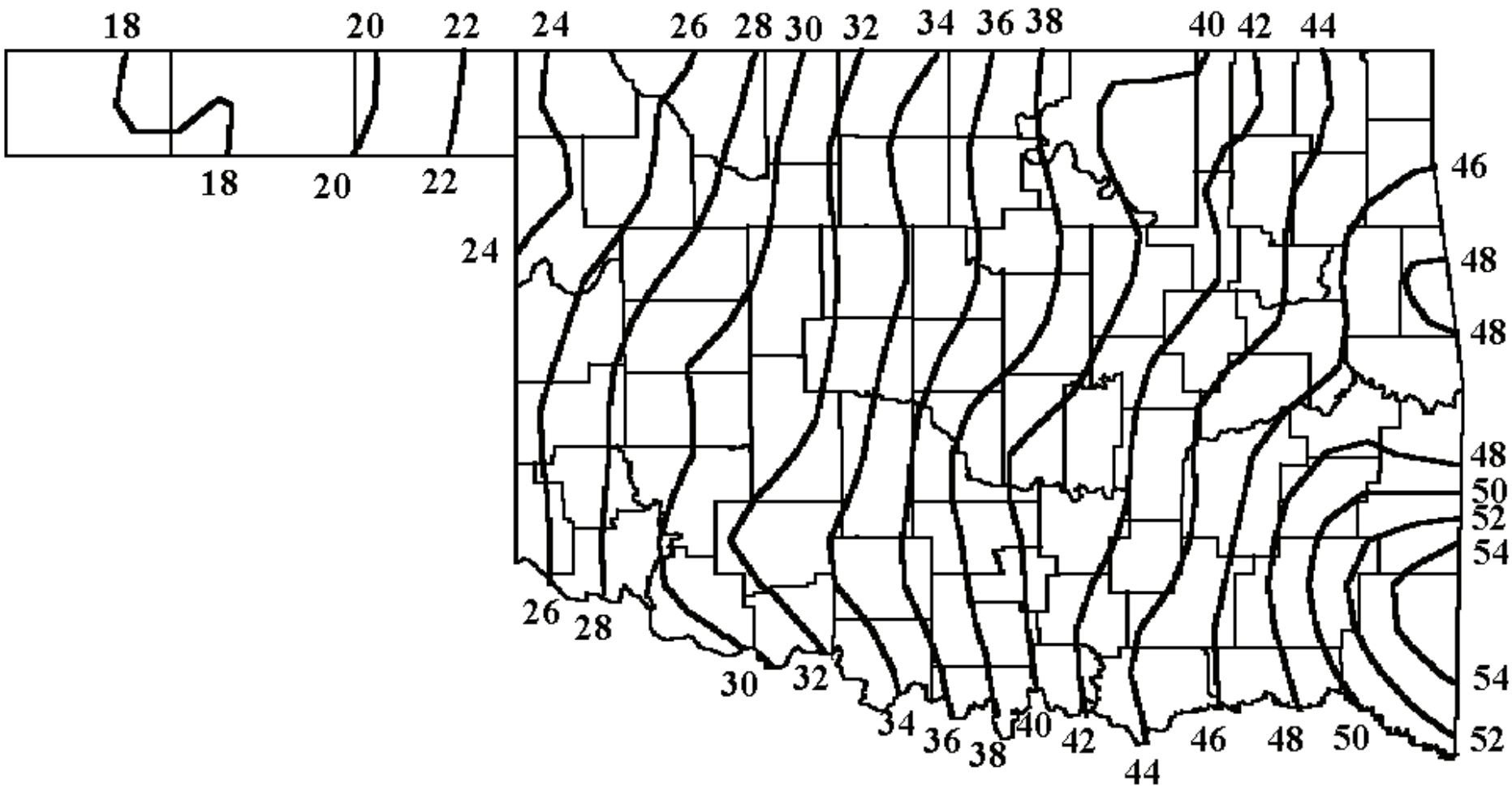
Notes of Interest:

- The drought across southeast Oklahoma has intensified and has begun to creep northwestward.
- Dry conditions and strong winds sparked large wildfires throughout much of the state:
  - Since November 1, a total of 1,863 fires have burned 437,195 acres in Oklahoma
    - Current resources:
      - » Heavy Air Tankers - 1
      - » Single Engine Air Tankers - 4
      - » Air Tactical Planes - 5
      - » National Guard Helicopters - 4
      - » Lead Planes - 1
      - » Engines - 100
      - » Bulldozers - 59
      - » Personnel - 367

Normal Annual Precipitation

State of Oklahoma

1971-2000



Precipitation Rank by Time-Scale

State of Oklahoma

Periods Ending February 9th

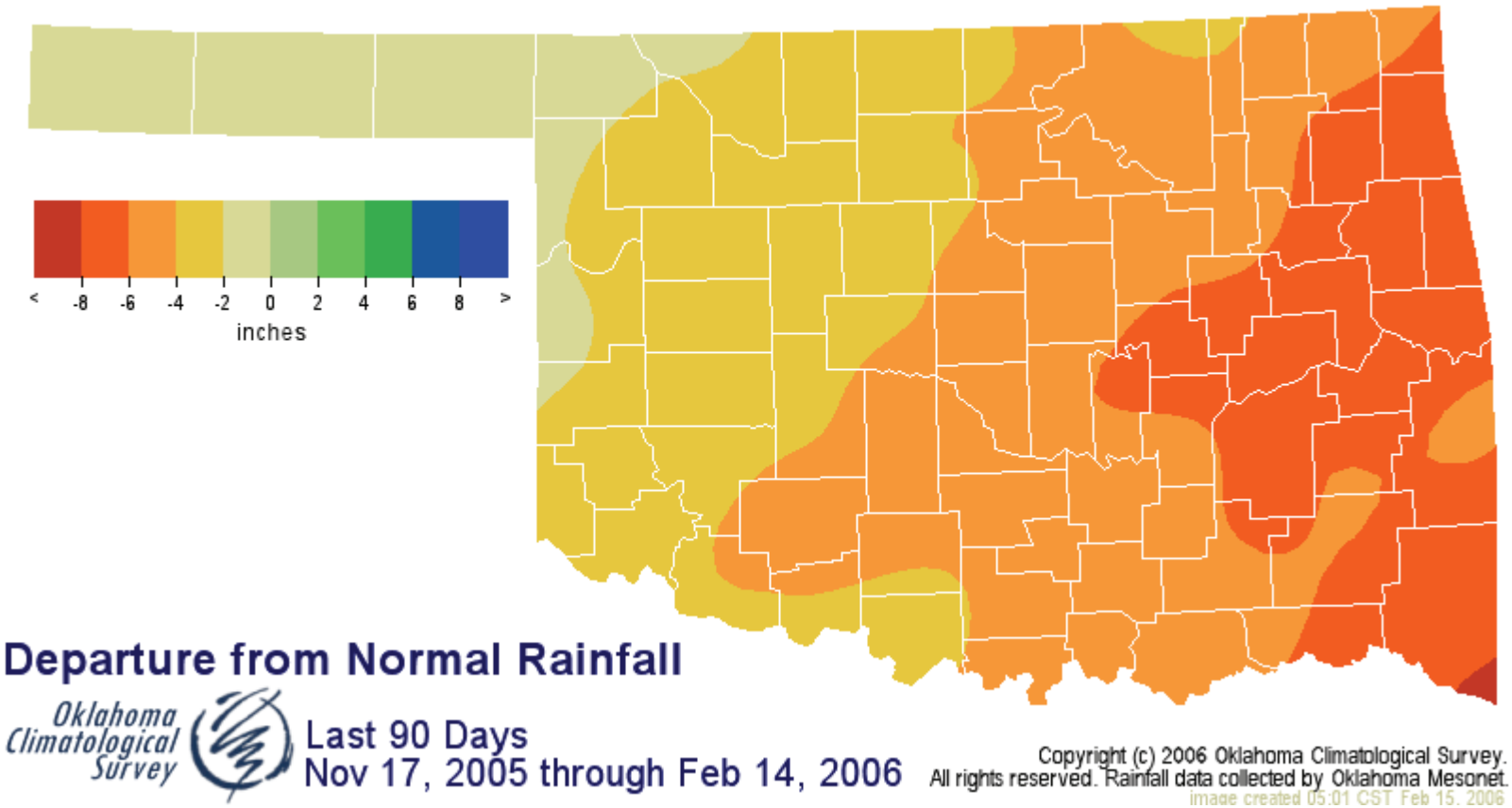
OK Region	Rank by Time Scale: For Periods Ending February 9th						
	30-Day	60-Day	90-Day	120-Day	180-Day	365-Day	Two-Year
1-Panhandle	13th	8th	8th	11th	18th	20th	57th
2-N. Central	11th	6th	2nd	5th	25th	14th	43rd
3-Northeast	21st	10th	1st	2nd	9th	4th	21st
4-W. Central	10th	9th	2nd	1st	40th	23rd	65th
5-Central	16th	3rd	1st	1st	20th	11th	26th
6-E. Central	28th	6th	1st	1st	3rd	1st	12th
7-Southwest	8th	5th	1st	1st	25th	12th	42nd
8-S. Central	34th	14th	2nd	2nd	13th	6th	21st
9-Southeast	55th	13th	1st	1st	2nd	1st	1st
OK-Statewide	26th	4th	1st	1st	8th	3rd	24th

Historical Rank: Among five driest.
Historical Rank: 6th through 10th driest.
Historical Rank: Among driest quarter.

Description: Cells show the historical rank of recent precipitation on seven time scales. Values are compared to analogous periods ending Feb. 9th. There are 85 such periods in the modern climate history (since 1921).

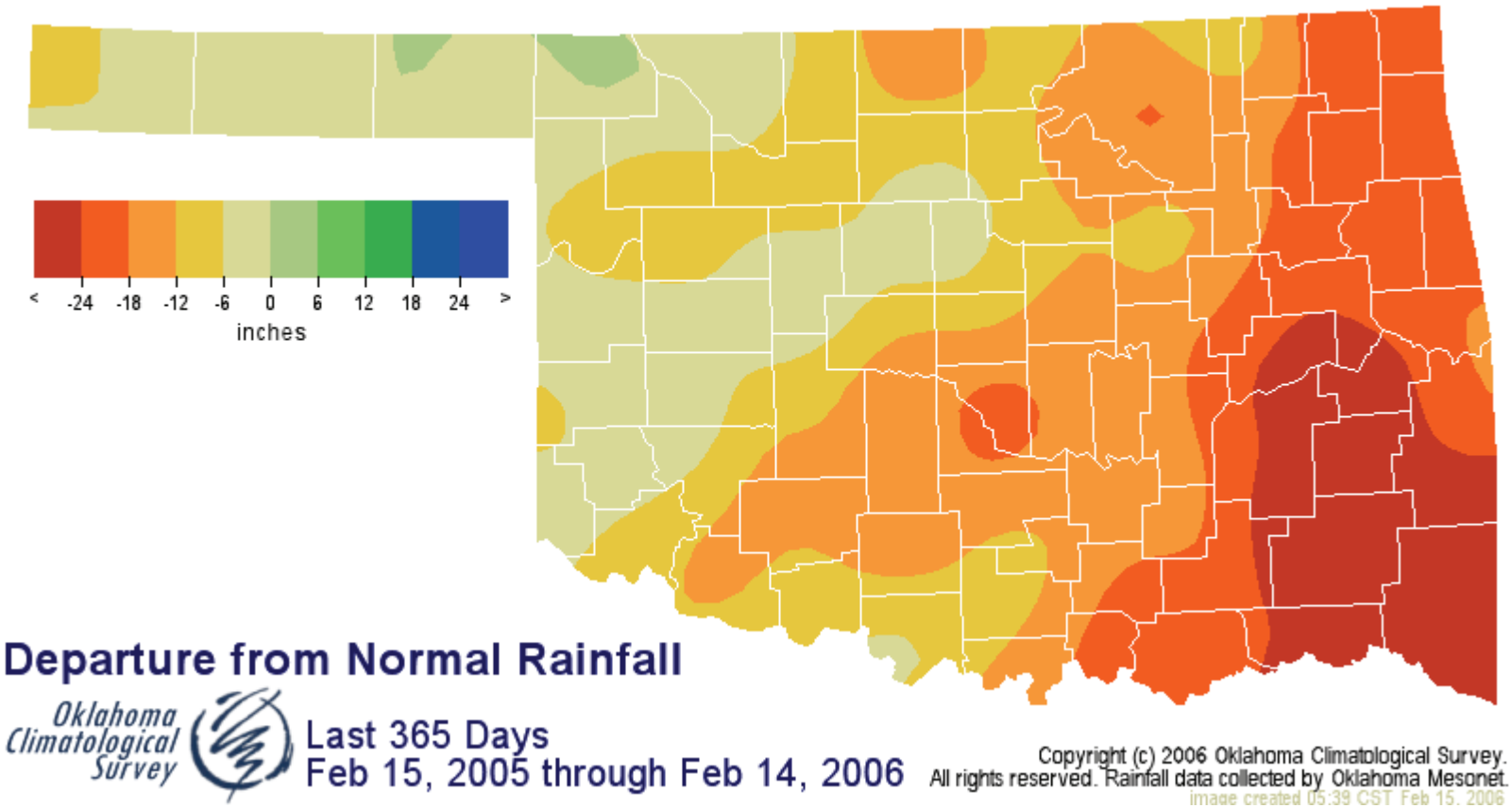
Departure from Normal Rainfall

Last 90 Days

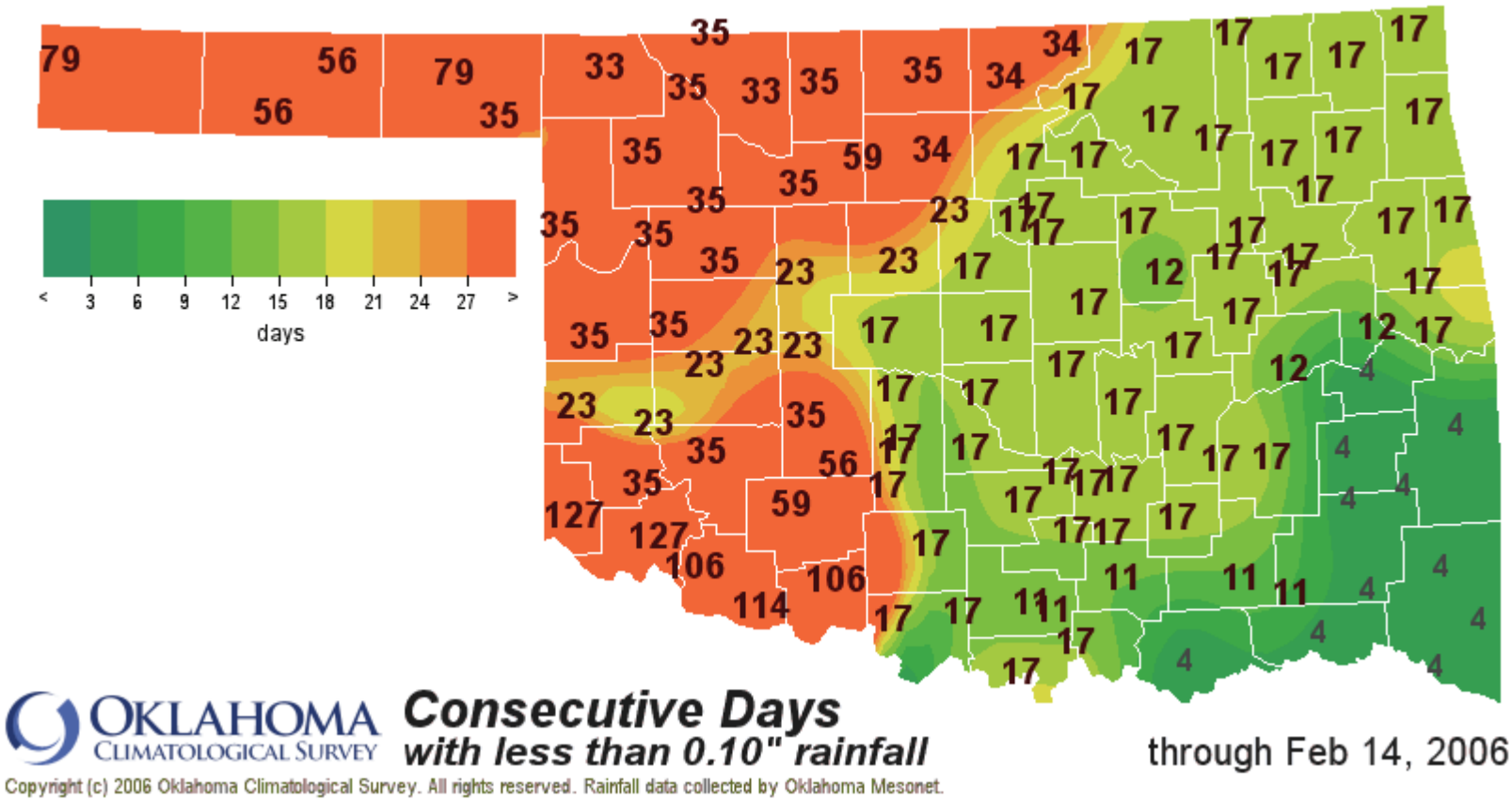


Departure from Normal Rainfall

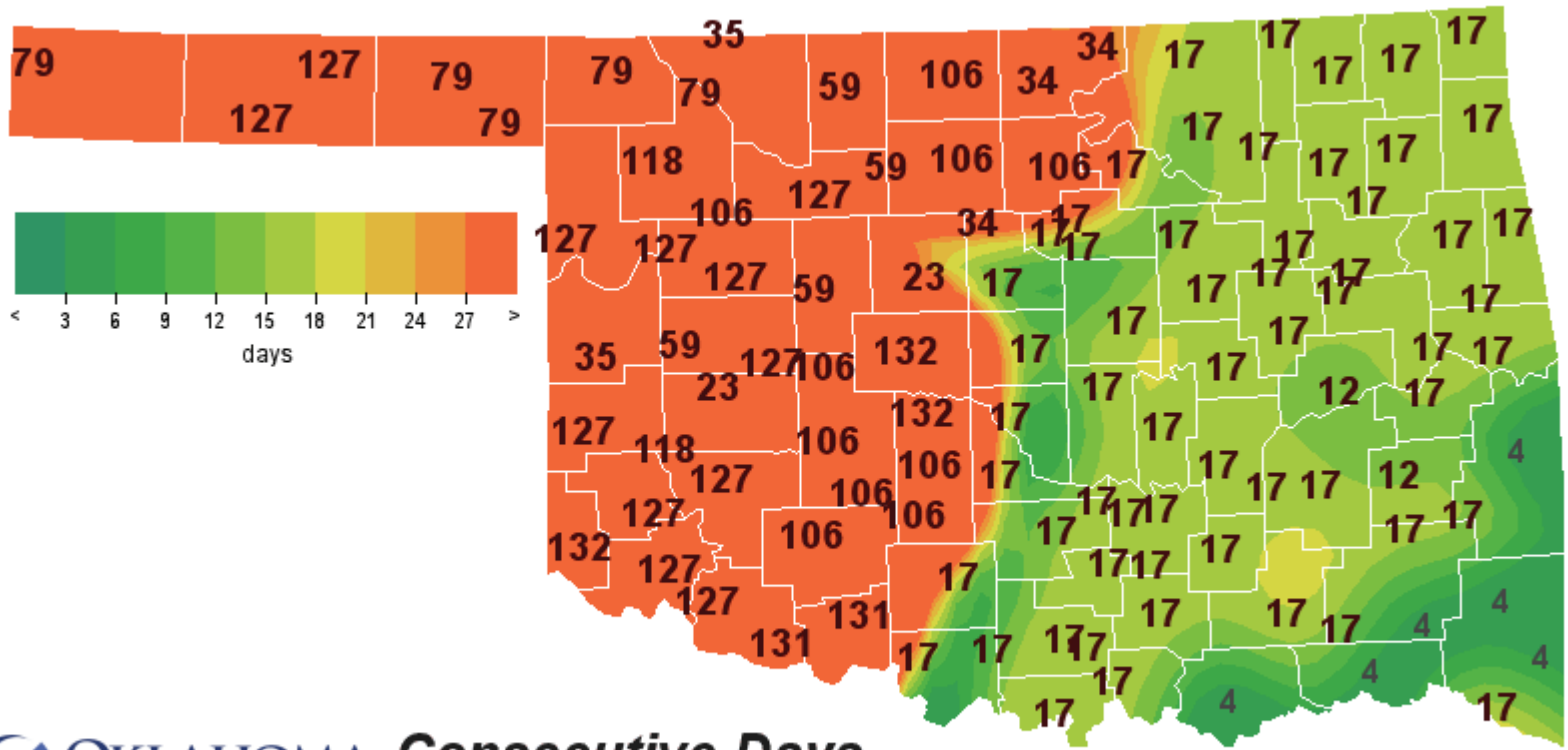
Last 365 Days



Consecutive Days
With Less Than 0.10” Rainfall



Consecutive Days With Less Than 0.25” Rainfall



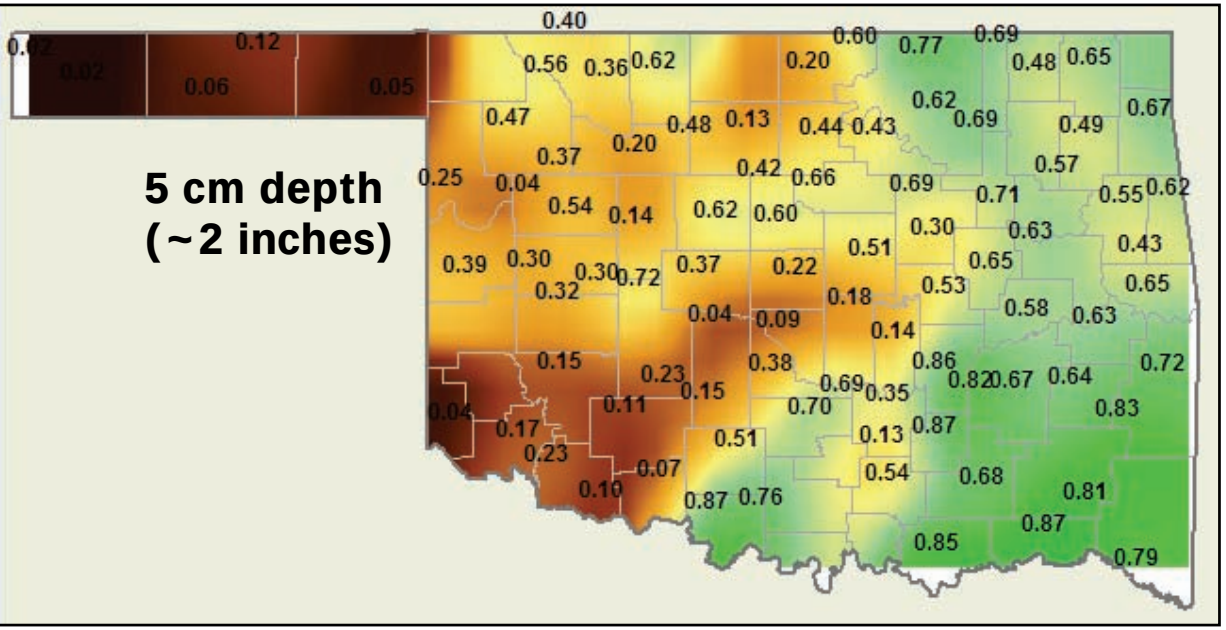
OKLAHOMA CLIMATOLOGICAL SURVEY

Consecutive Days
with less than 0.25" rainfall

through Feb 14, 2006

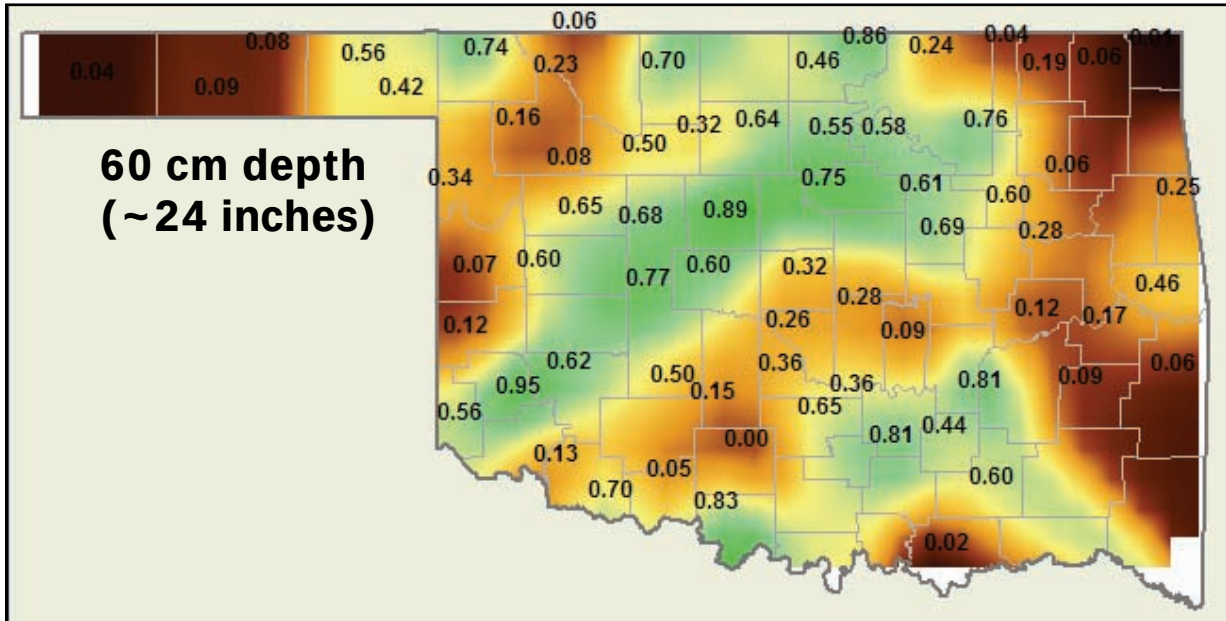
Copyright (c) 2006 Oklahoma Climatological Survey. All rights reserved. Rainfall data collected by Oklahoma Mesonet.

Current Soil Moisture (OCS)



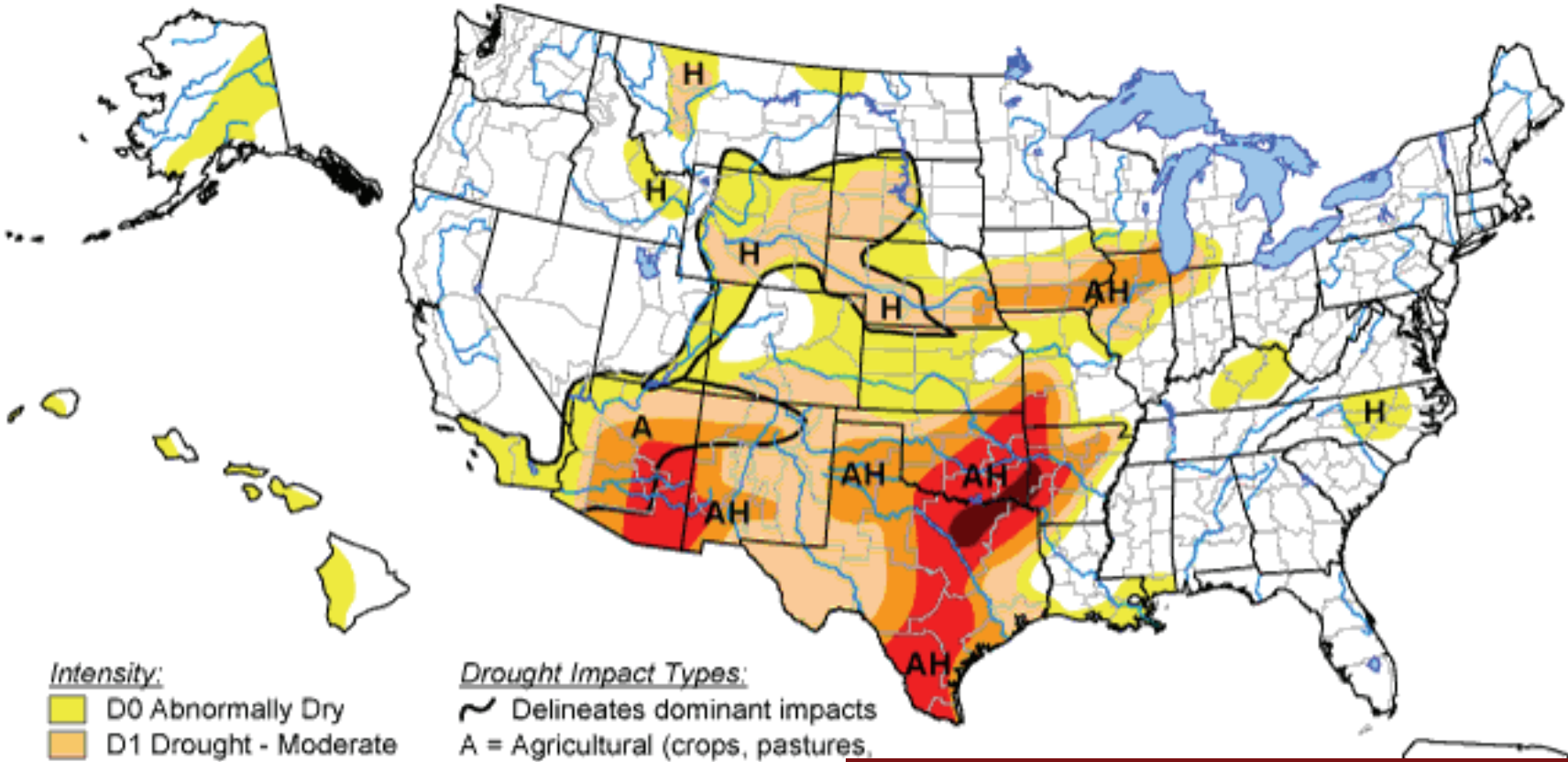
Category Description	
Category 4	Moist/wet
Category 3	Adequate
Category 2	Limited
Category 1	Dry

February 14, 2006



U.S. Drought Monitor

February 14, 2006
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
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

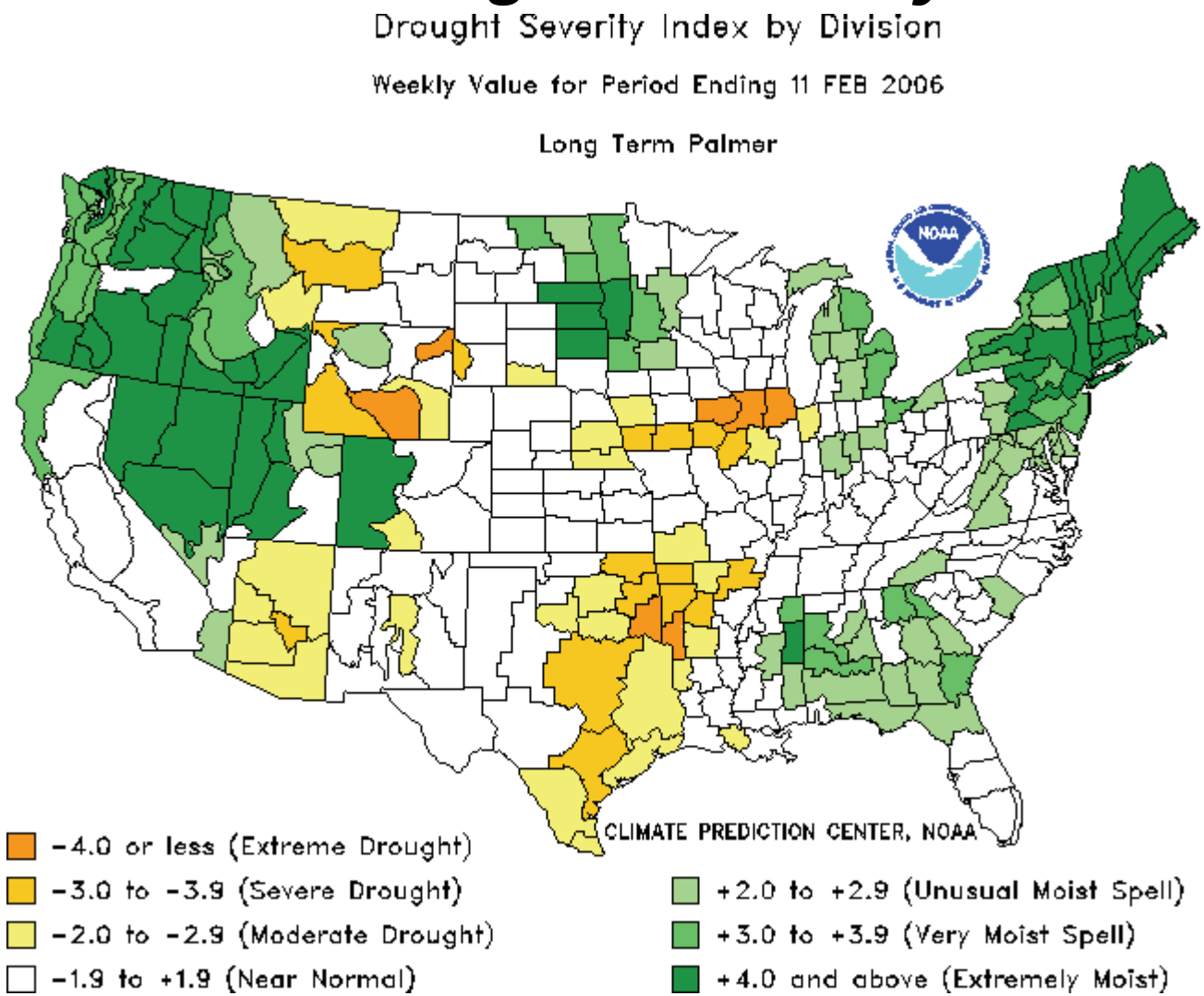
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

U.S. Drought Monitor:

- a service maintained by the University of Nebraska (Lincoln);
- utilizes numerous state and federal weather-related sources;
- Oklahoma: “abnormally dry” to “extreme drought” conditions

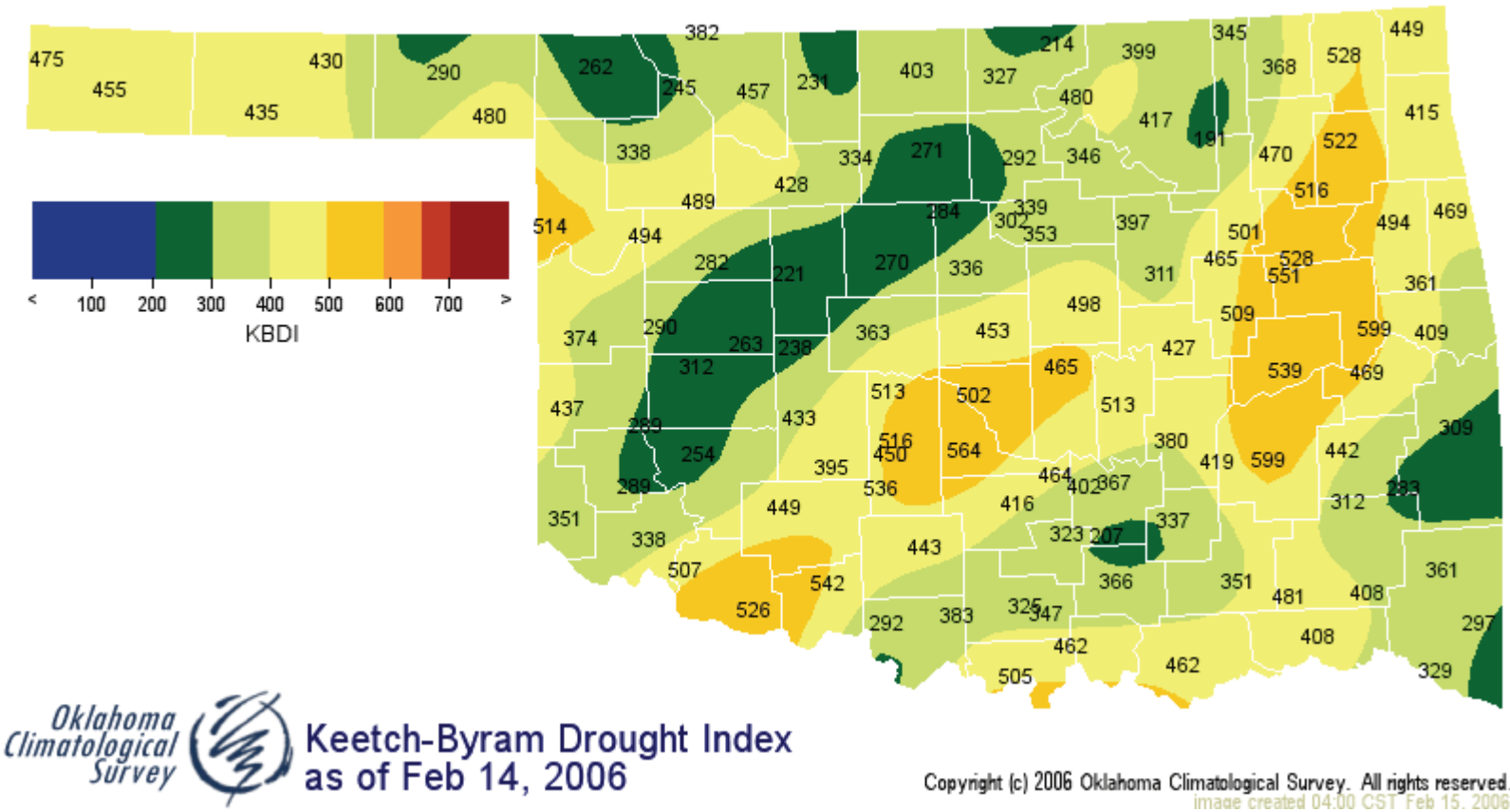
Palmer Drought Severity Index



<u>As of February 11, 2006</u>:

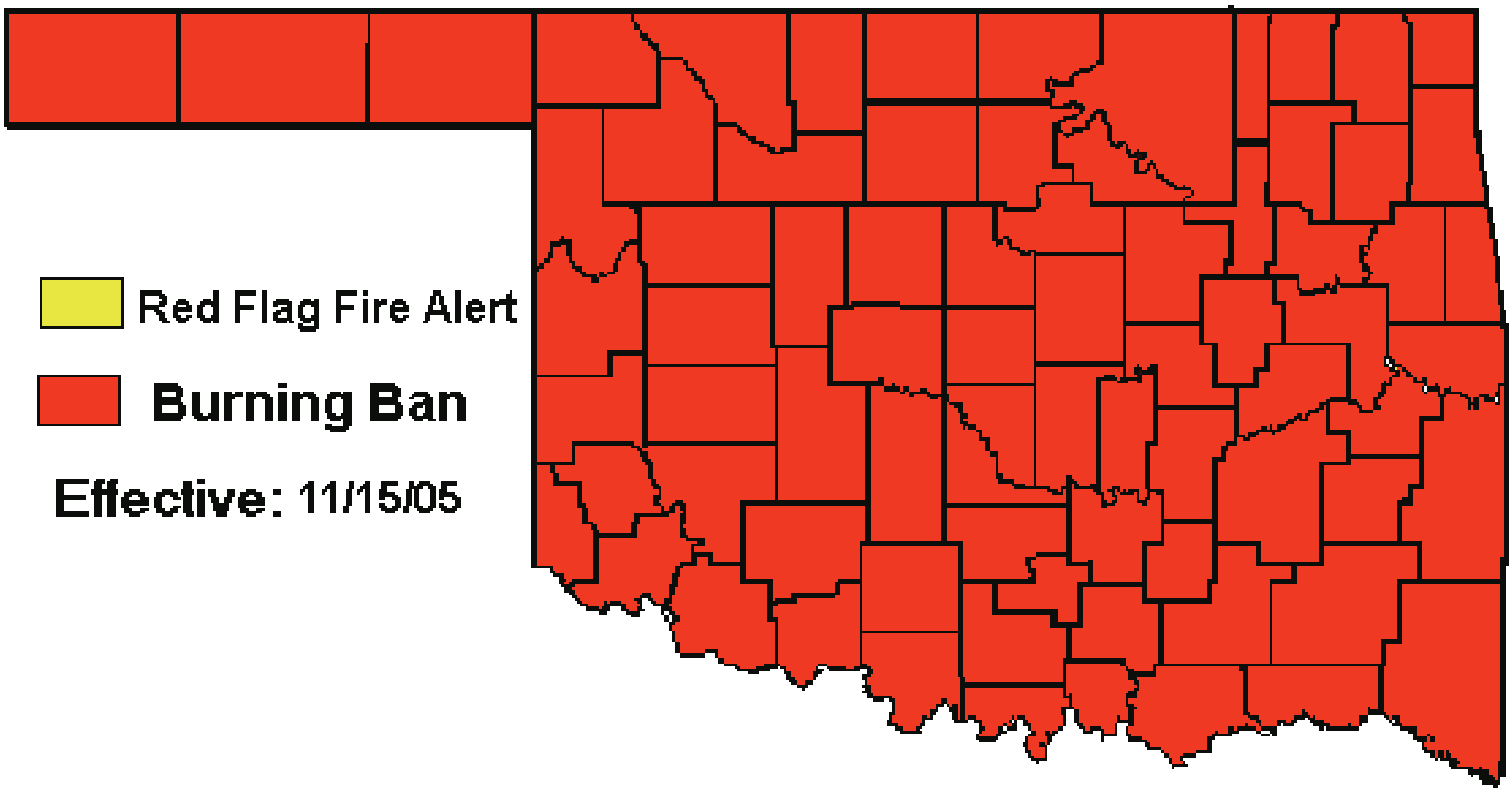
- All 9 state climate divisions are experiencing drought conditions

Keetch-Byram Drought Index



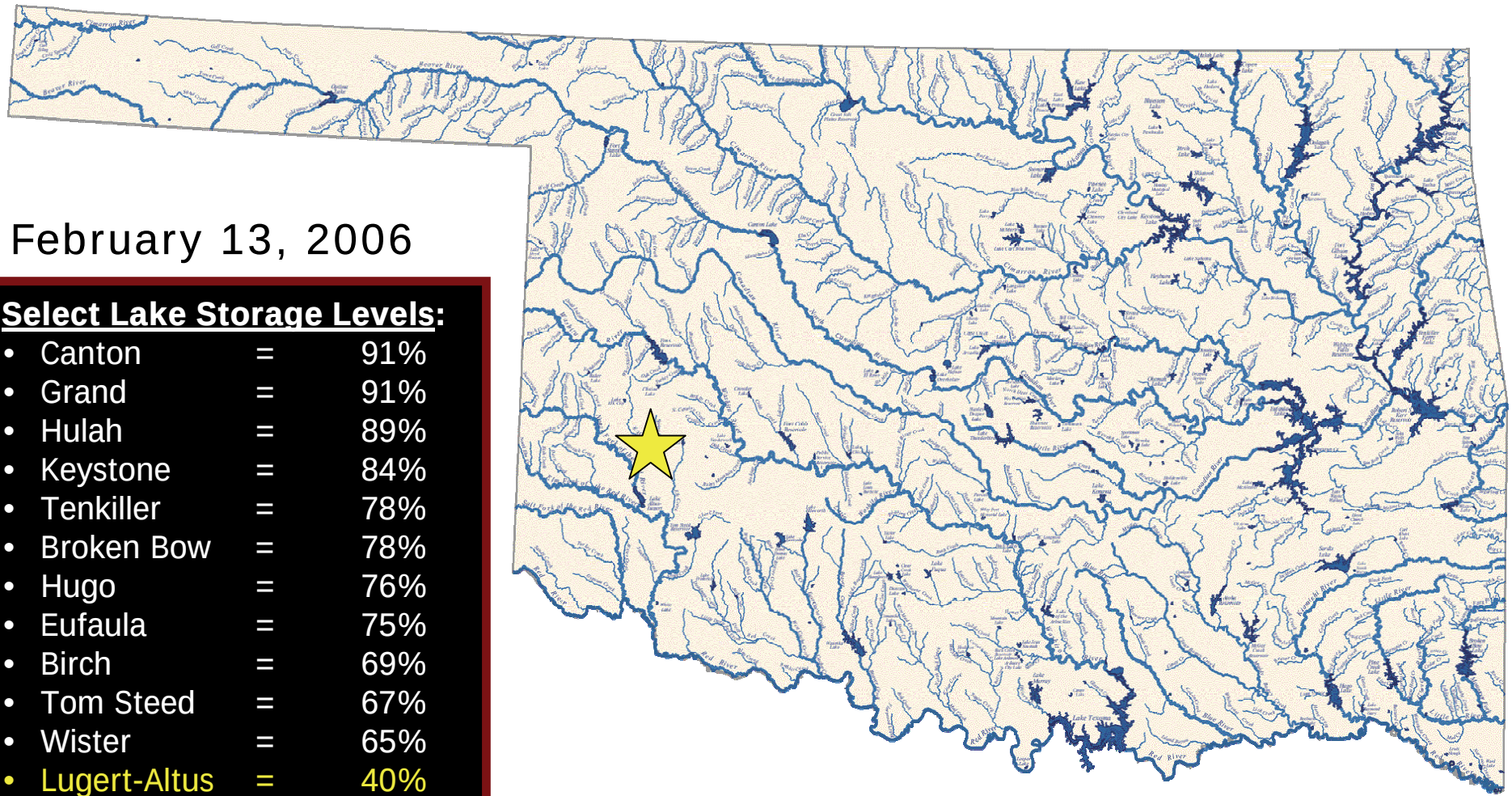
- Drought-related fire conditions remain of concern throughout much of Oklahoma.

Fire Situation / Threat



- On November 15, 2005 Governor Henry issued a Ban on Outdoor Burning for all counties in Oklahoma .

Reservoir Storage in Major State Lakes

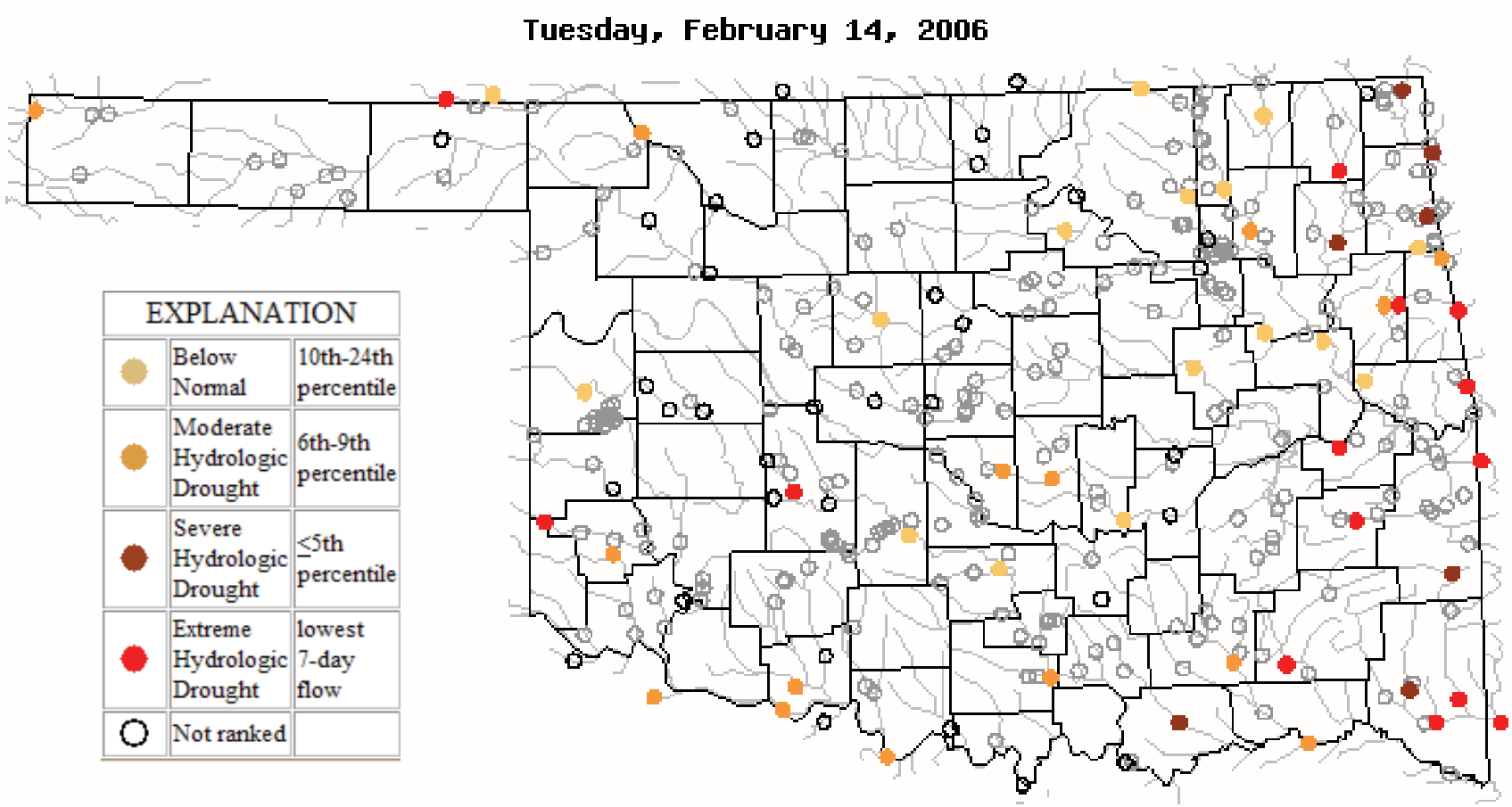


February 13, 2006

Select Lake Storage Levels:

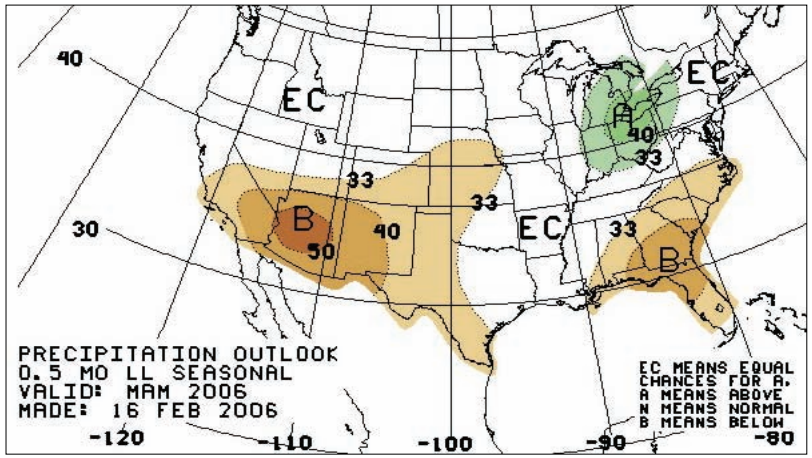
- Canton = 91%
- Grand = 91%
- Hulah = 89%
- Keystone = 84%
- Tenkiller = 78%
- Broken Bow = 78%
- Hugo = 76%
- Eufaula = 75%
- Birch = 69%
- Tom Steed = 67%
- Wister = 65%
- Lugert-Altus = 40%

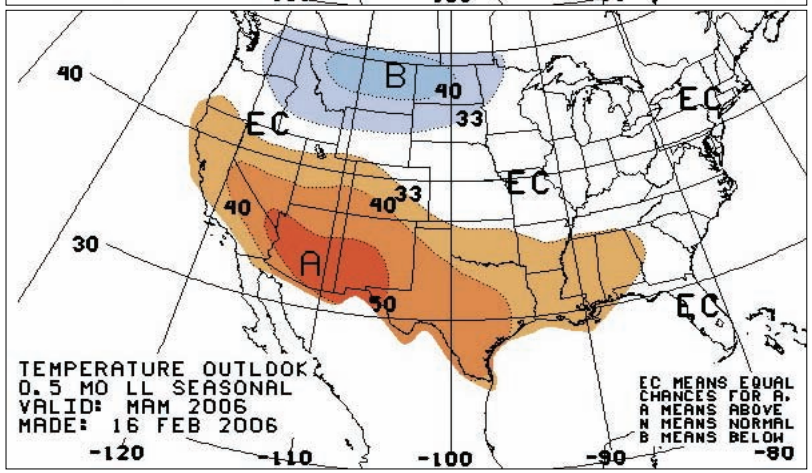
Streamflow Conditions

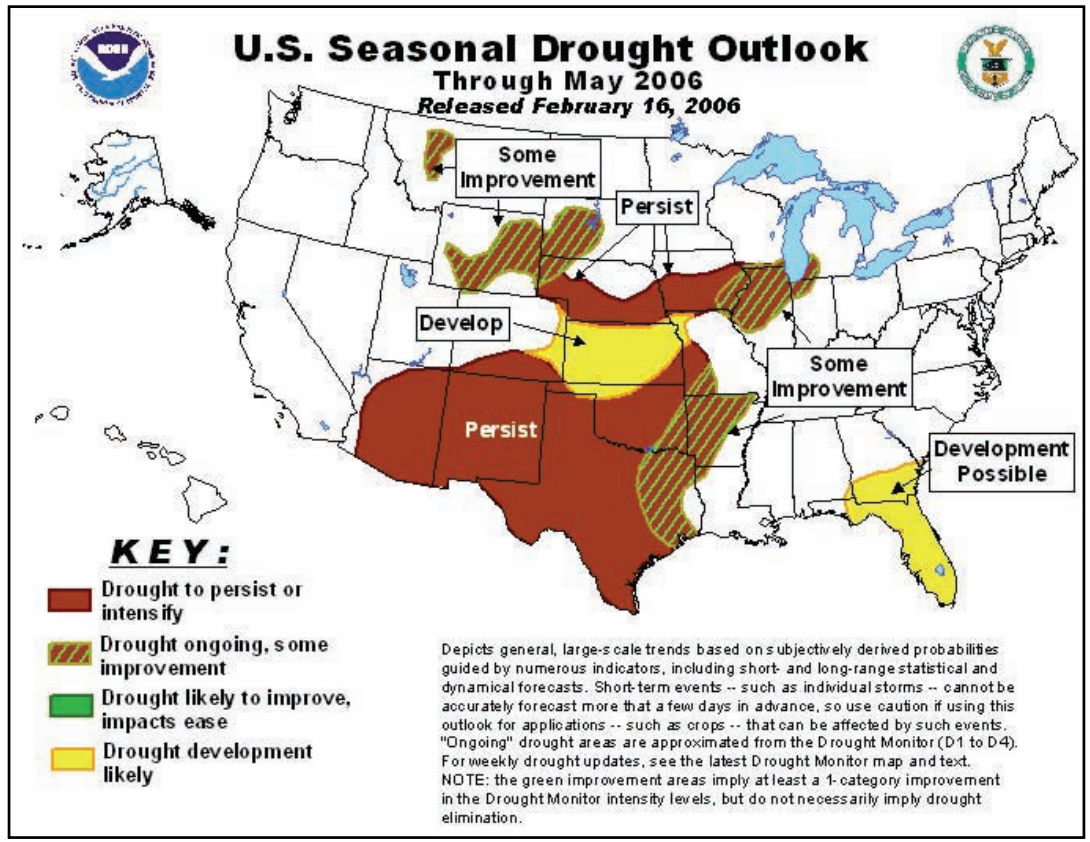


- Streamflows are generally below normal; low flows <u>in southern, central, and eastern Oklahoma</u> are of particular concern.

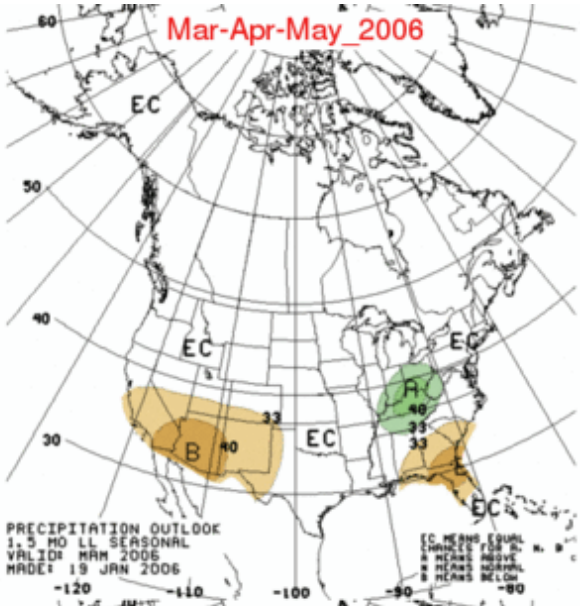
Spring Outlook

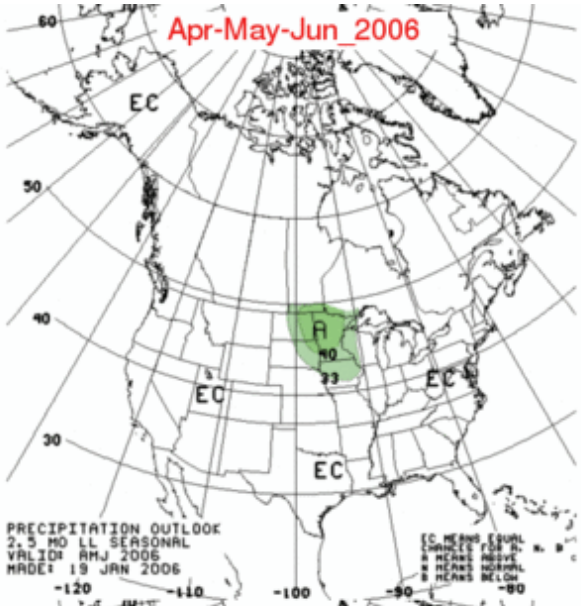


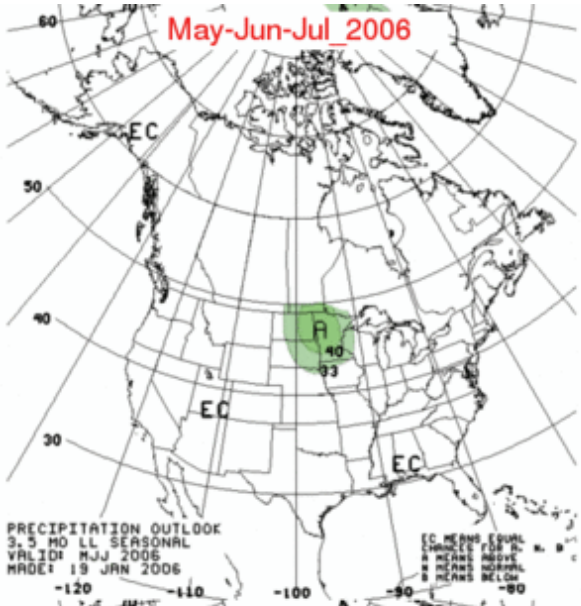


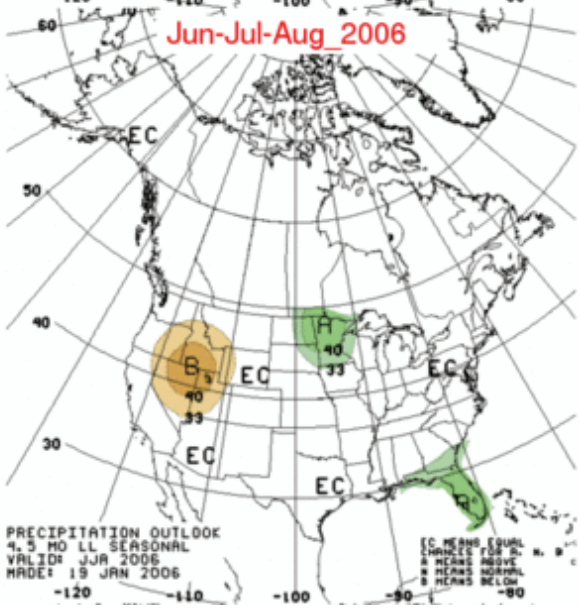


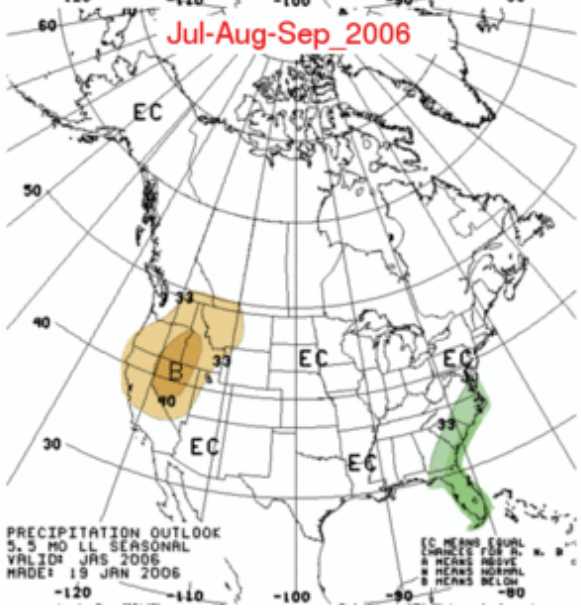
Long-Term Precipitation Forecast

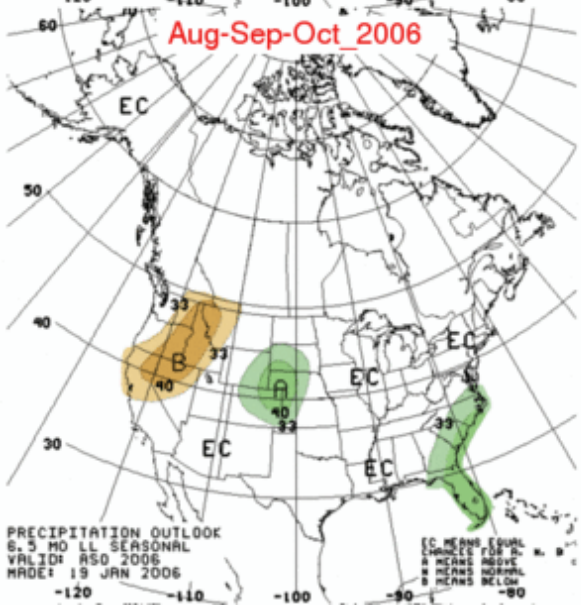




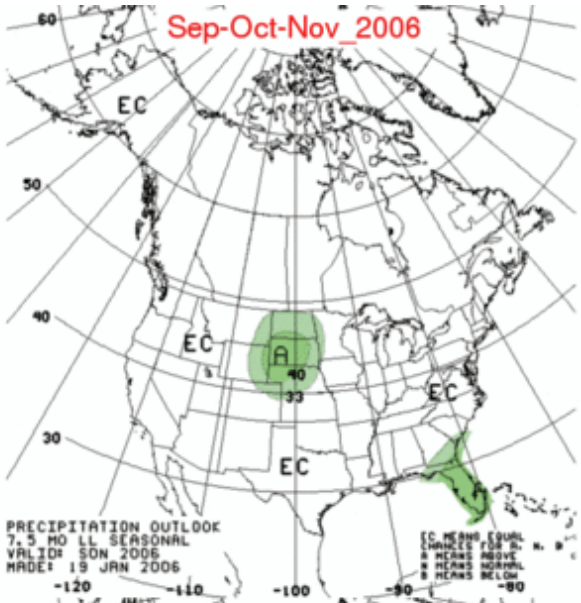


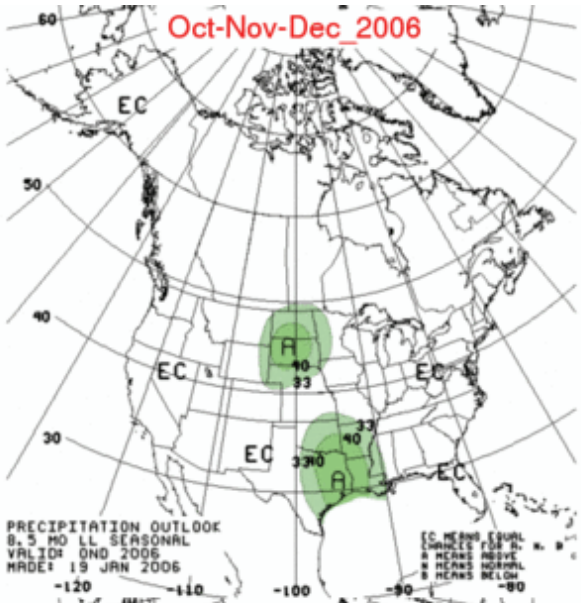


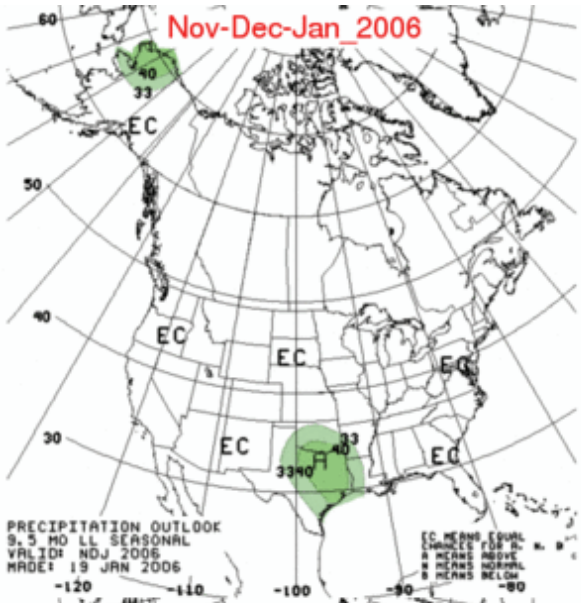


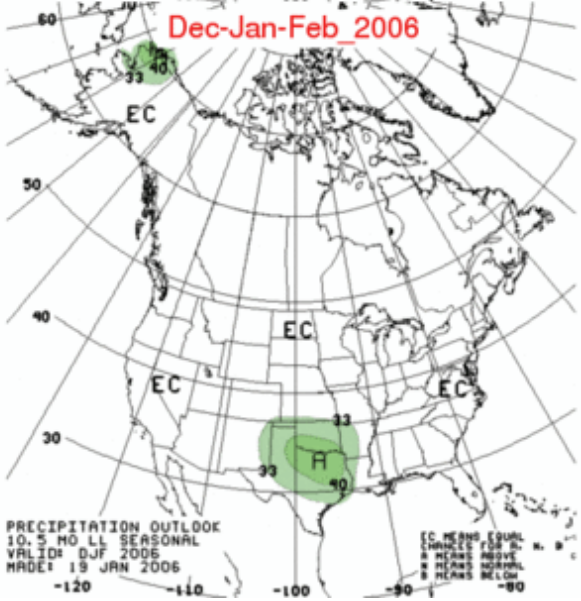


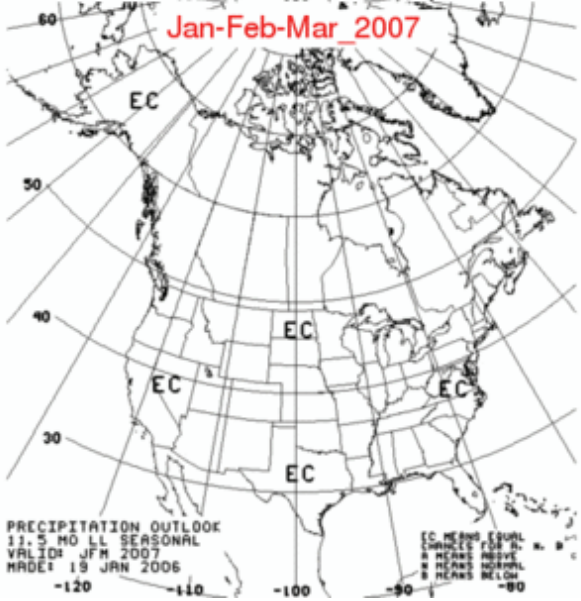
Long-Term Precipitation Forecast

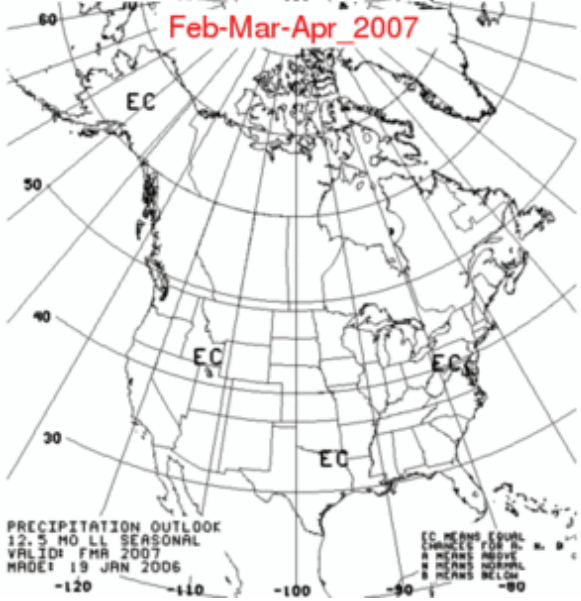




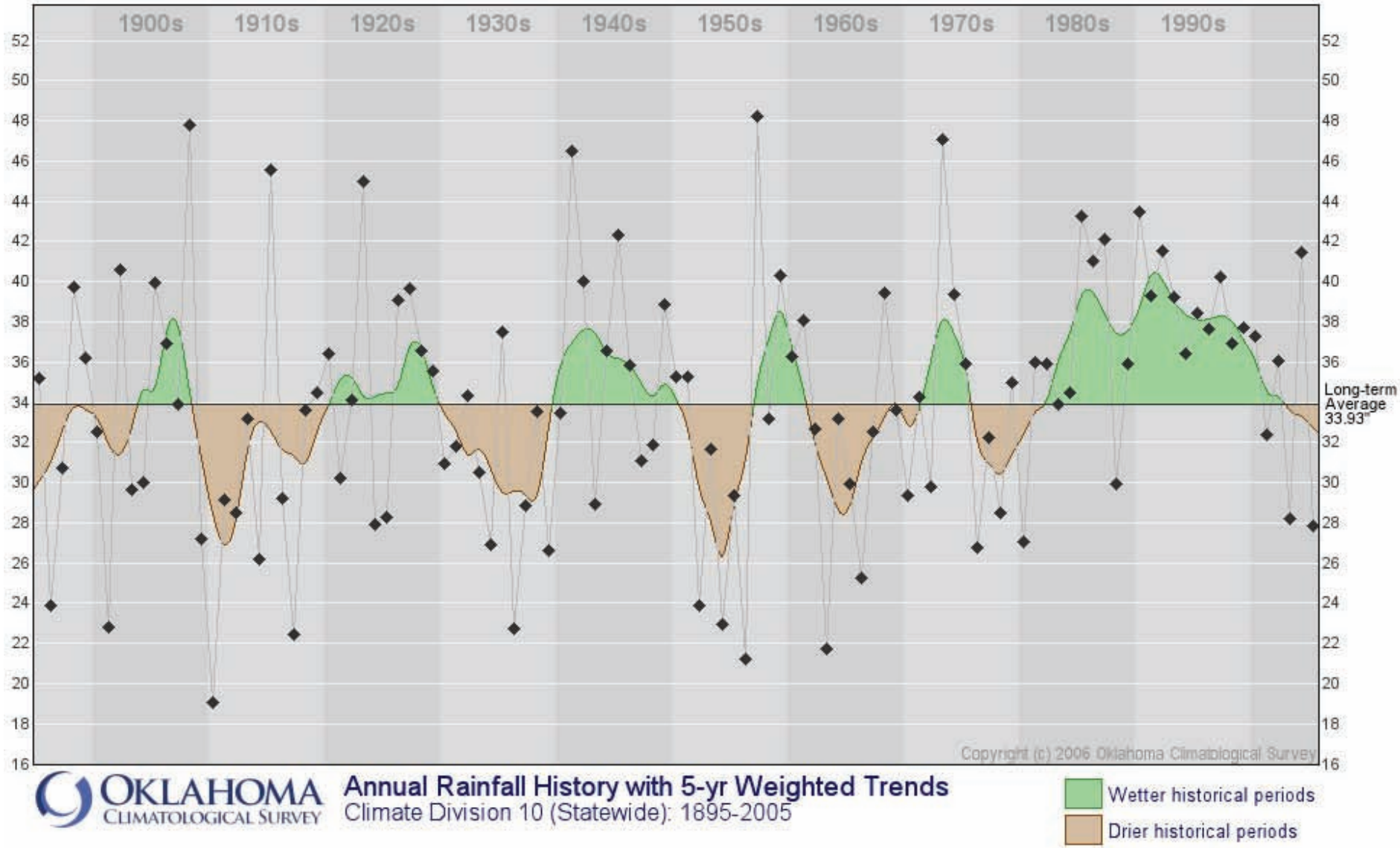


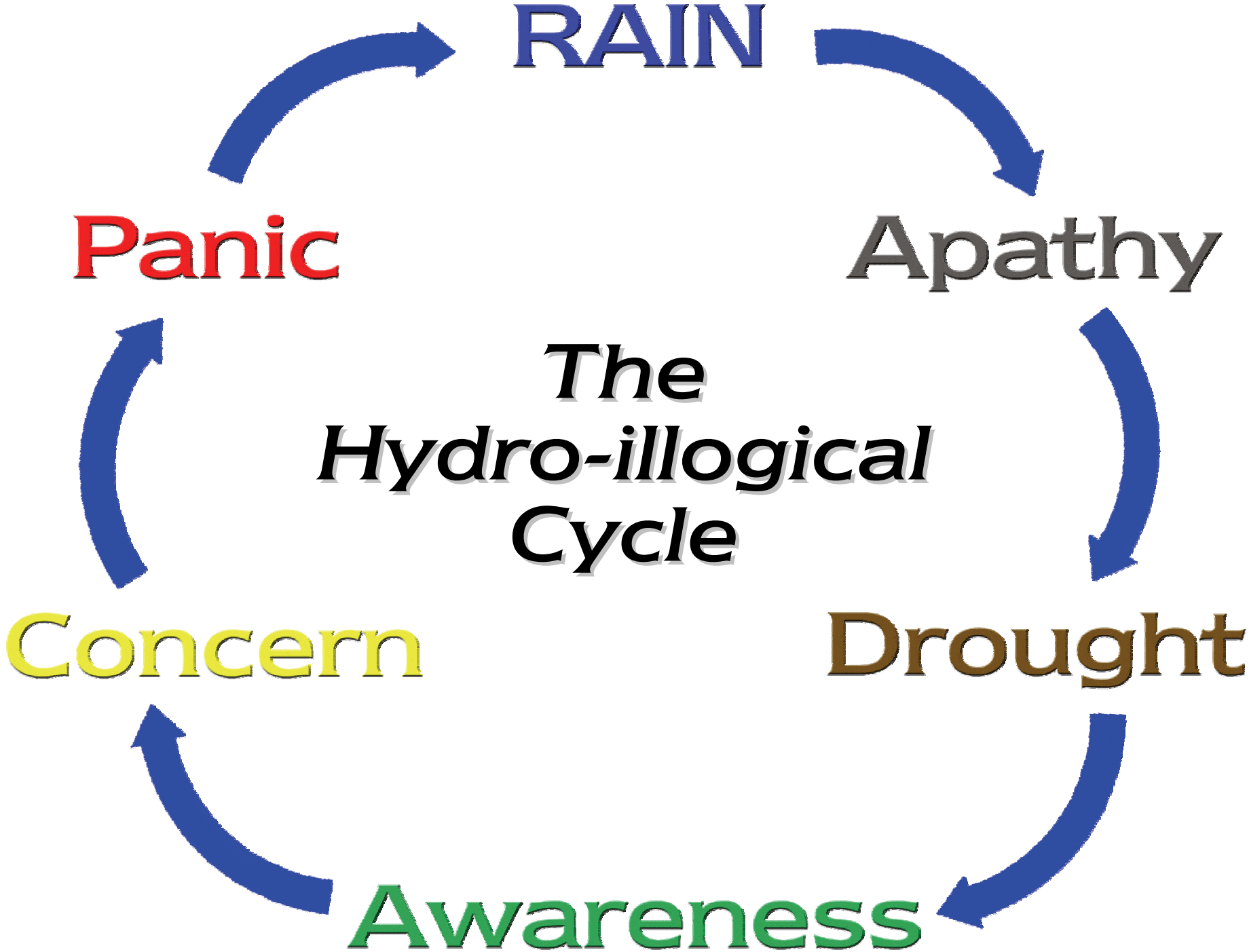






Oklahoma Annual Rainfall History
(1895-2005)




RAIN
Apathy
Drought
Awareness
Concern
Panic
The Hydro-illogical Cycle

OWRB

the water agency

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