



State of Rhode Island and Providence Plantations

Water Resources Board

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To: Public Drinking Water Protection Committee
Through: Juan Mariscal, P.E., General Manager
From: Beverly O'Keefe, Supervising Planner
Date: March 30, 2006
Subject: Drought Update: Current Water Conditions

BACKGROUND: Pursuant to State Guide Plan Element 724: The Rhode Island Drought Management Plan, the Water Resources Board is required to assess water conditions monthly. Staff has assembled climate information from a variety of sources to monitor the potential for drought conditions in Rhode Island which is summarized below:

Data Source	Date	Report Summary
NOAA NWS Taunton MA Climate Report	30 Mar 06	Month to date precip + 0.57" -3.56 " departure from normal
USGS Surface Water Runoff Report	Feb 2006	RI – Above Normal
Scituate Reservoir	30 Mar 06	285.09 FEET (103.3 % of Capacity)
USGS Groundwater Level Summary	Feb. 2006	Most of RI – Normal South County- Above Normal
USGS RI Groundwater Level Detail Well Report	Feb. 2006	6 High Water Level Wells
NOAA NWS Drought Severity Index: Palmer	25 Mar 06	Near Normal
NOAA NWS Crop Moisture Index	25 Mar 06	Slightly Dry/Favorably Moist
NOAA NWS Drought Monitor Seasonal Assessment	21 Mar 06	Abnormally Dry
NOAA NCDA Statewide Precipitation Ranks	Feb 06	Near Normal

Rhode Island experienced a decrease in the amount of precipitation during March 2006 with month to date rainfall recorded at - 0.57 inches. Normal rainfall for March is 4.13 inches which has resulted in a very dry month (departure from normal is -3.56 inches). An updated Rhode Island county precipitation report will be provided at the committee meeting (www.erh.noaa.gov/box/fcsta/BOSCLIPVD.html).

The **USGS Water Conditions Statement** is summarized in three tables (Surface Water Runoff, Ground-water Level Conditions, and Summary of Rhode Island Ground-Water Levels) embedded in this memorandum.

Surface-water flows at the end of February 2006 were above normal (highest 25 percent of flows for February) for Massachusetts and Rhode Island rivers. No new maximum or minimum monthly mean discharge values for February were recorded at any stream-gaging stations in Massachusetts and Rhode Island

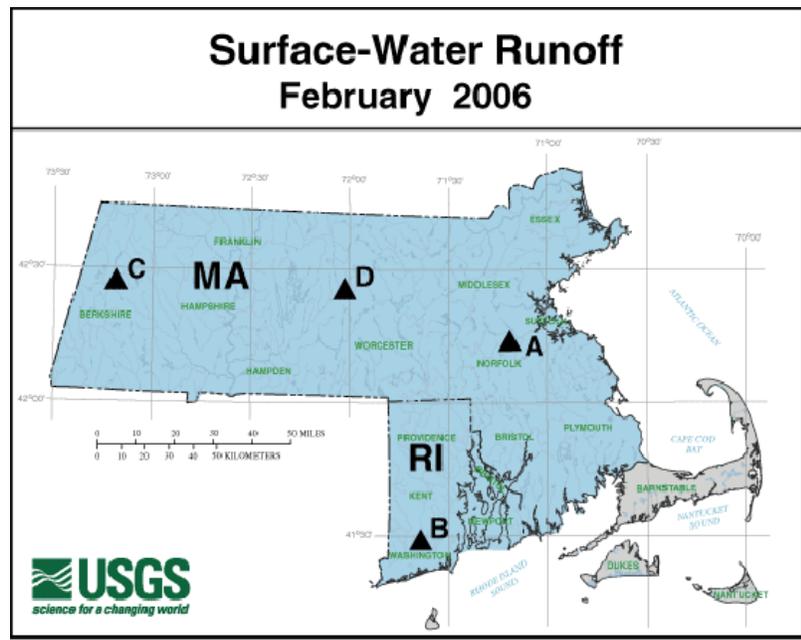
Ground-water levels at the end of February 2006 were above normal (highest 25 percent of levels for February) in southern Rhode Island (including Block Island). Ground-water levels were normal (between the highest and lowest 25 percent of levels for February) in central and northern Rhode Island. Please refer to the February Ground-Water Conditions map for

individual well conditions and other information. Six wells in Rhode Island set new record high levels for the month of February. No other wells set new record high or low records for the month of February. The readings on Burrillville well 395 have been adjusted with the well showing normal levels at this time.

Borden Brook/Cobble Mountain, Quabbin, and Scituate (Rhode Island) Reservoirs were 93-, 100-, and 104-percent full, respectively, at the end of February. In comparison, these reservoirs were 95-, 101-, and 104-percent full, respectively, at the end of January.

The NOAA National Weather Service (NWS) Drought Severity Index for the period ending February 2006 shows extremely moist conditions for the region (Table 4). The Crop Moisture Index for the same time period shows wet conditions (Table 5). The RI Precipitation Report will be distributed at the Committee meeting.

Table 1: Surface Water Runoff



COMPARISON WITH MONTHLY NORMAL RANGE

- ABOVE NORMAL – within the highest 25 percent of record for this month**
- NORMAL RANGE**
- BELOW NORMAL – within the lowest 25 percent of record for this month**
- NO STREAM DATA**
- INDEX STREAM GAGE AND IDENTIFIER LETTER**

NOTE: Additional sites from those shown are used to determine ranges

Table 2: Ground Water-Level Conditions

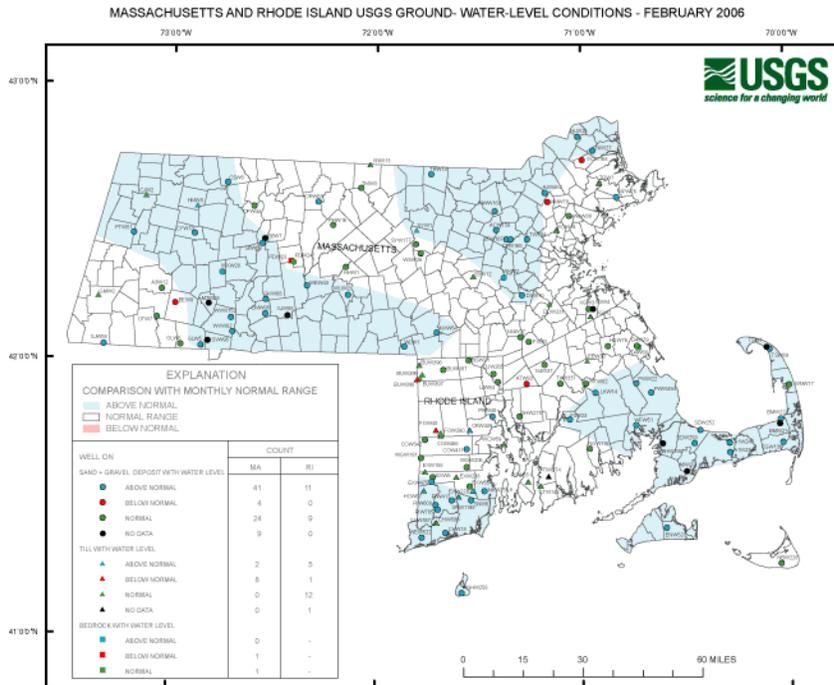


TABLE 3: SUMMARY OF GROUND-WATER LEVELS February 2006 PROVISIONAL
 (NOTE: Wells with * also available in real-time at top of Ground-Water Data page;
 OWc, monthly measured value used in high ground-water level estimation report,
 USGS Open-File Report 80-1205.)

WELL	L	START	NET CHANGE		DEPARTURE	WATER LEVEL	
	T	YEAR	IN MONTH	IN ONE	FROM	BELOW LAND-	
	O	OF	YEAR		MONTHLY	SURFACE	
	P	RECORD			MEDIAN	DATUM	
	O	O			(FEET)	(FEET)	DAY
RHODE ISLAND							
BURRILLVILLE 187	TS	1968	- 0.40	+ 0.21	+ 0.38	14.45	23
BURRILLVILLE 395	UT	1992	+ 3.96	+ 0.09	+ 0.39	6.06	28
BURRILLVILLE 396	VT	1992	- 0.19	- 0.17	- 0.01	5.07	28
BURRILLVILLE 397	HT	1992	- 3.48	- 0.34	+ 1.48	12.58	28
BURRILLVILLE 398	HT	1992	- 2.36	- 2.02	- 1.70	9.41	28
CHARLESTOWN 18	FS	1946	+ 0.09	+ 1.03	+ 2.84	14.24	> 21
CHARLESTOWN 586	VT	1992	- 0.50	+ 0.13	+ 0.03	3.57	28
CHARLESTOWN 587	ST	1992	- 2.82	- 0.61	- 0.33	7.47	28
COVENTRY 342	VS	1991	- 1.24	- 0.22	+ 0.39	7.76	24
COVENTRY 411	SS	1961	- 0.04	+ 0.82	+ 1.47	19.80	24
COVENTRY 466	VT	1992	- 0.13	-----	- 0.10	2.72	24
CRANSTON CITY 439	ST	1992	- 1.21	- 0.94	+ 2.62	9.58	24
CUMBERLAND 265	SS	1946	- 1.04	- 0.95	- 0.15	12.01	23
EXETER 6	VS	1948	- 0.80	- 0.02	+ 0.19	4.89	24
EXETER 158	ST	1991	- 0.98	- 0.08	+ 0.40	5.90	24
EXETER 238	FT	1991	- 0.32	+ 0.19	+ 0.01	11.55	22
EXETER 278	HT	1991	- 1.88	+ 1.01	+ 2.57	8.13	22
EXETER 475	VS	1981	- 0.27	+ 0.60	+ 1.11	12.62	24
EXETER 554	SS	1988	- 0.27	-----	+ 0.55	8.96	22
FOSTER 40	HT	1991	- 1.47	- 0.02	- 0.93	4.14	24
FOSTER 290	HT	1992	- 0.55	- 0.11	+ 0.75	4.68	24

HOPKINTON 67	ST 1991	-	0.79	+	1.18	+	3.11	12.15	>	24
LINCOLN 84	VS 1946	-	0.97	-	0.55	+	0.11	4.72		23
LITTLE COMPTON 142	ST 1992	-	4.54	-	4.50	+	0.10	12.06		27
NEW SHOREHAM 258	UT 1991	-	0.26	+	0.12	+	0.66	10.74		26
NORTH KINGSTOWN 255	VS 1954	-	0.36	+	0.54	+	1.46	6.64		21
NORTH SMITHFIELD 21	TS 1947	-	0.99	-	0.47	-	0.27	7.03		23
PORTSMOUTH 551	HT 1992	-	5.32	-	5.18	+	1.14	33.25		28
PROVIDENCE 48	TS 1944	+	0.05	+	0.53	+	3.10	3.38	>	21
RICHMOND 417	VS 1976	-	0.24	+	0.14	+	0.54	5.82		22
RICHMOND 600*	TS 1977	+	0.01	+	1.02	+	1.30	32.07	>	24
RICHMOND 785	FS 1989	+	1.03		-----	+	4.24	20.23	>	24
SOUTH KINGSTOWN 6	VS 1955	-	0.24	+	0.88	+	1.74	9.73		22
SOUTH KINGSTOWN 1198	FS 1988	-	0.24	+	0.85	+	1.66	6.35	>	22
TIVERTON 274	TT 1990		-----		-----		-----			
WARWICK 59	ST 1991	-	0.24	+	0.11	-	0.01	4.69		21
WESTERLY 522	FS 1969	-	0.22		-----	+	0.53	11.05		21
WEST GREENWICH 181	US 1969	-	1.03	-	0.55	+	0.05	15.25		24
WEST GREENWICH 206	ST 1991	-	0.19	+	0.05	-	0.04	3.88		22

 >> SET NEW HIGH OR EQUALED HIGHEST RECORDED WATER LEVEL FOR PERIOD OF RECORD
 > SET NEW HIGH OR EQUALED HIGHEST RECORDED WATER LEVEL FOR END OF NOVEMBER
 << SET NEW LOW OR EQUALED LOWEST RECORDED WATER LEVEL FOR PERIOD OF RECORD
 < SET NEW LOW OR EQUALED LOWEST RECORDED WATER LEVEL FOR END OF NOVEMBER
 ----- - DATA NOT AVAILABLE

TOPOGRAPHIC (TOPO) SETTING: F=FLAT, G=FLOOD PLAIN, H=HILLTOP, S=HILLSIDE,
 T=TERRACE, U=UNDULATING, V=VALLEY, W=UPLAND DRAW

Table LITHOLOGY (LITHO): G=GRAVEL, R=ROCK, S=SAND, T=TILL

Table 4: Drought Severity Index

Drought Severity Index by Division

Weekly Value for Period Ending 25 MAR 2006

Long Term Palmer

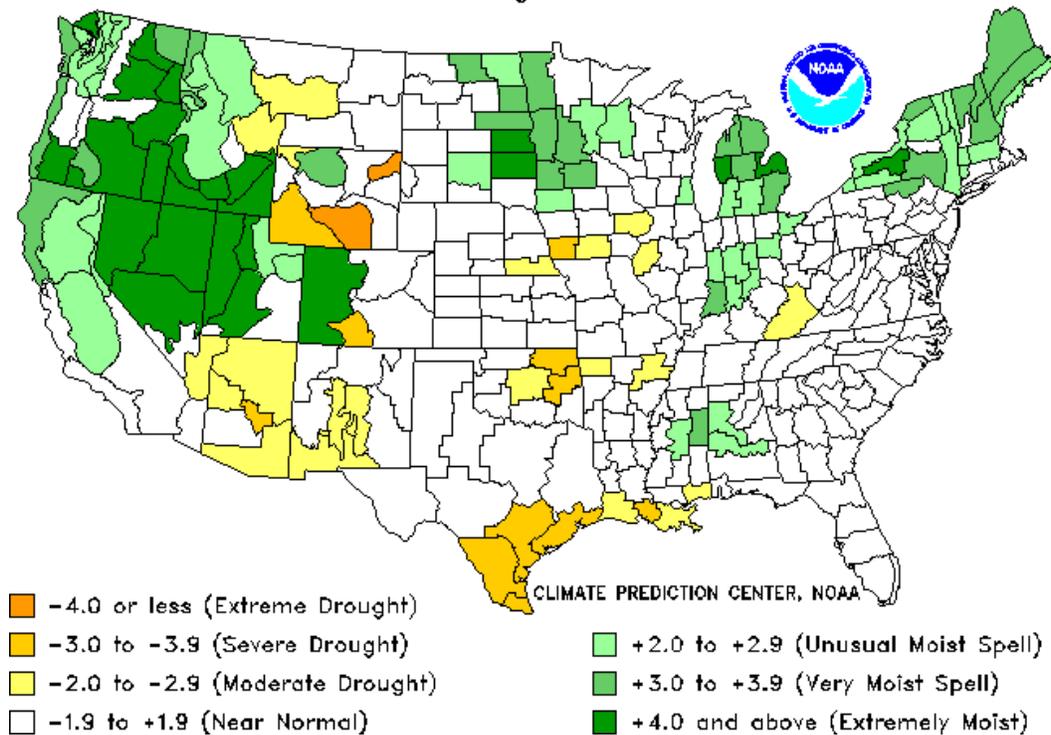


Table 5: Crop Moisture Index

Crop Moisture Index by Division

Weekly Value for Period Ending 25 MAR 2006

Short Term Need vs. Available Water in 5 Ft Profile

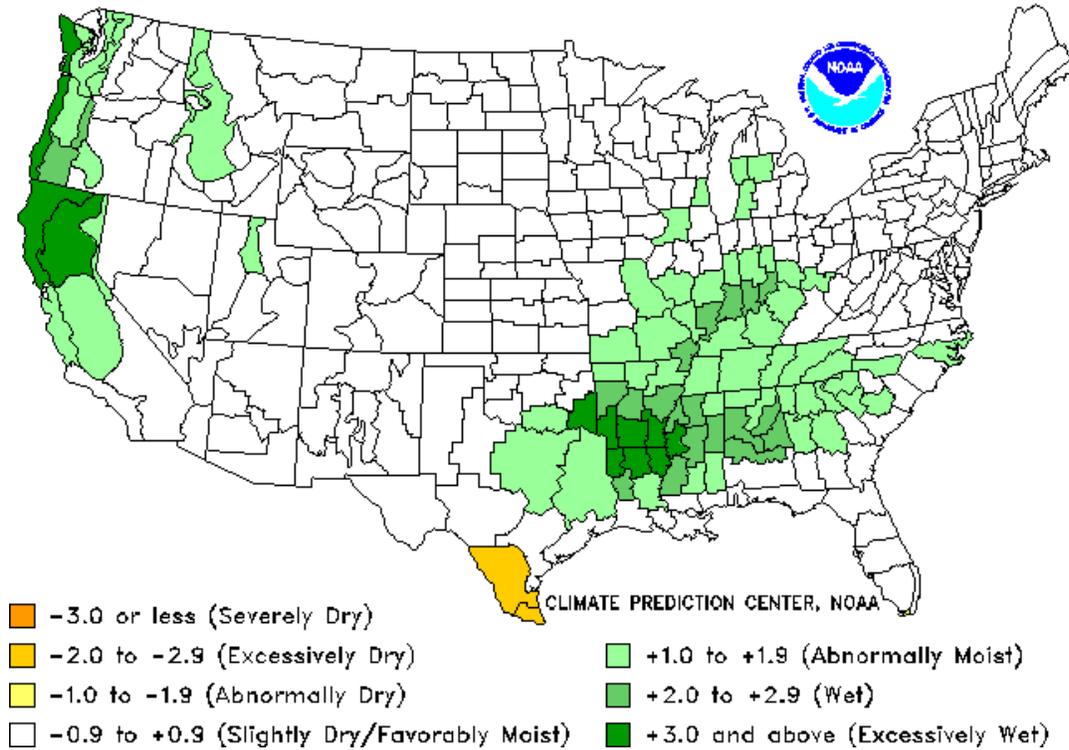
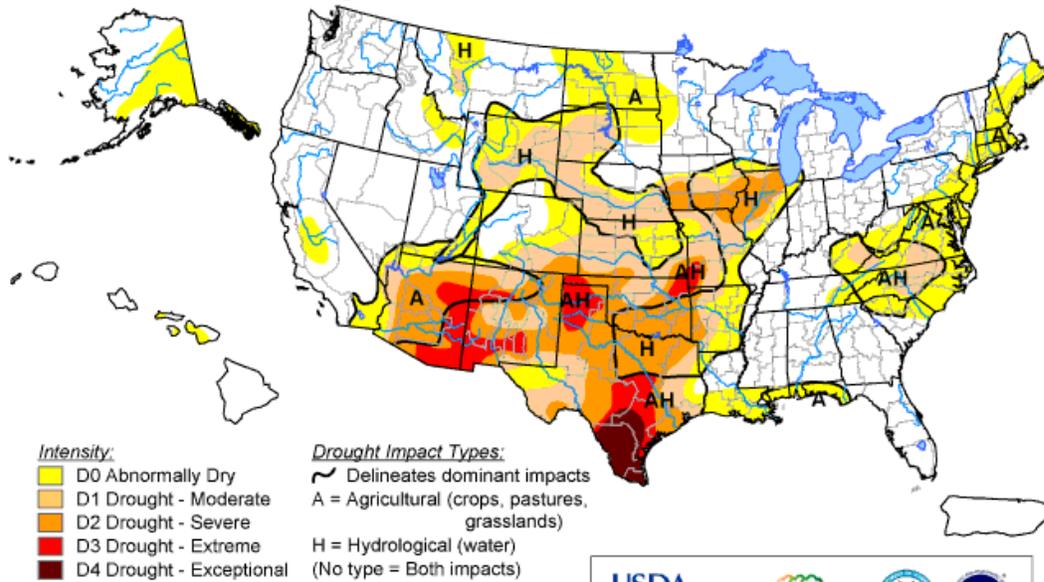


Table 6: US Drought Monitor

U.S. Drought Monitor

March 21, 2006
Valid 7 a.m. EST



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

<http://drought.unl.edu/dm>

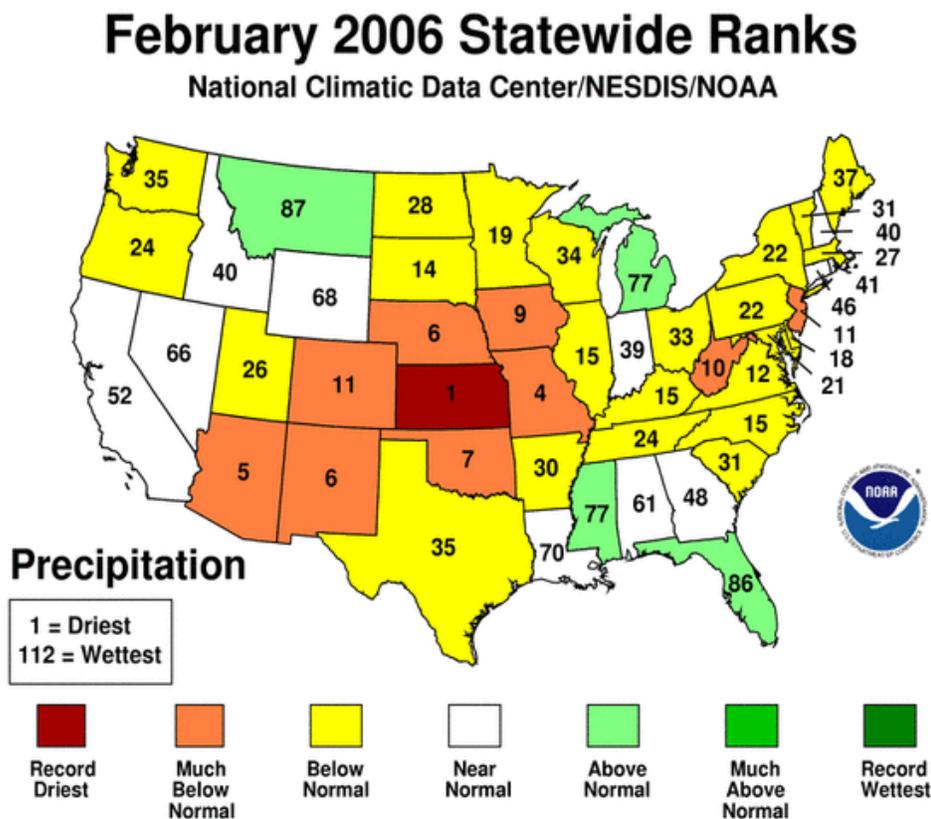


Released Thursday, March 23, 2006
Author: R. Heim/L. Love-Brotak, NOAA/NESDIS/NCDC

Latest National Seasonal Assessment - An extremely dry winter has resulted in the development of moderate to extreme (D1-D3) drought across much of Arizona and New Mexico, as well as extreme southern Colorado. The drought was record breaking in some areas, such as Phoenix where no measurable rainfall was observed for 143 consecutive days. The dry, warm weather resulted in little if any snowpack across in the mountains. However, an early March storm brought relief to parts of the region and generated the first significant precipitation in several months. Additional drought relief is expected during the first few weeks of the outlook period. Despite the short term relief, the dry season is just around the corner and the region will not receive enough rain and snow to make up for the record dryness. Therefore, temporary short term relief will be followed by drought persistence. Over the southern Plains, extremely dry, warm conditions over the past six months have resulted in the development of severe to exceptional (D2-D4) drought. Further north, the drought is less severe over areas such as Kansas and Nebraska. During the final weeks of March, some relief is expected as storm systems bring welcome moisture to the region. However, there are indications that the spring will be dry and warm. As a result, the drought is expected to persist, with possible further expansion into eastern Colorado. Over the western Corn Belt, some drought relief is possible over the next few months, while drought development is possible across the Southeast and Mid-Atlantic. Drought is already underway in North Carolina and parts of Virginia.

Tables 6 and 7 present national seasonal assessment and state rankings based on precipitation. The Drought Monitor (Table 6) focuses on broad scale conditions, and portrays Rhode Island experiencing an abnormally dry intensity through March 23, 2006. On the other hand, the NOAA NCDA Statewide Precipitation Ranking reveals Rhode Island in a “near normal” ranking.

Table 7: NOAA NCDA Statewide Precipitation Ranks



DISCUSSION

Water conditions for Rhode Island have remained normal through February 2006 with a notable decrease in precipitation during March 2006 (0.57 inches of precipitation recorded as of March 29, 2006, down 3.41 inches for March). Water

conditions will be closely monitored over the next month. The Drought Steering Committee will be convened in April to review conditions and monitoring responsibilities.

RECOMMENDATIONS : Information only.

Additional Information on Water Conditions:

NOAA NWS Climate Report <http://www.erh.noaa.gov/box/fcsts/BOSESFBOX.html>

NOAA Drought Severity Index by Division

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif

Crop Moisture Index by Division

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/cmi.gif

U.S. Regional Drought Watch, Climate of February 2006

<http://www.ncdc.noaa.gov/oa/climate/research/2006/feb/drought-regional-overview.html>