



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: February 21, 2007
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	Jan. 2007	Below normal precipitation in northwest, northeast, central west and eastern regions
USGS Surface Water Runoff Report	Jan. 2007	Normal
Scituate Reservoir	Feb. 21, 2007	101.5% of Capacity
USGS Groundwater Level Summary	Jan. 2007	Normal
USGS RI Groundwater Level Detail Well Report	Jan. 2007	No new high or low levels reported
NOAA NWS Drought Severity Index: Palmer	17 Feb. 2007	Very Moist
NOAA NWS Crop Moisture Index	17 Feb. 2007	Abnormally Moist
NOAA NWS Drought Monitor Seasonal Assessment	13 Feb. 2007	Normal
NOAA Seasonal Drought Outlook (through April 2007)	18 Jan. 2007	Normal

Rhode Island month to date rainfall for February 2007 was 1.84 inches, -0.61 below normal. The NOAA National Weather Service Preliminary Precipitation Report reveals deficit precipitation in the northwest, northeast, central west and eastern regions of Rhode Island.

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 January 2007 were generally normal (between highest and lowest 25 percent of flows for January) for most of Rhode Island. Flows were above normal in the Pawcatuck River Basin in southern Rhode Island.. Ground-water levels were generally above normal (highest 25 percent of levels for January) in southern Rhode Island. Ground-water levels were generally normal (between highest and lowest 25 percent of levels for January) for the rest of Rhode Island.

Surface-Water Runoff January 2007

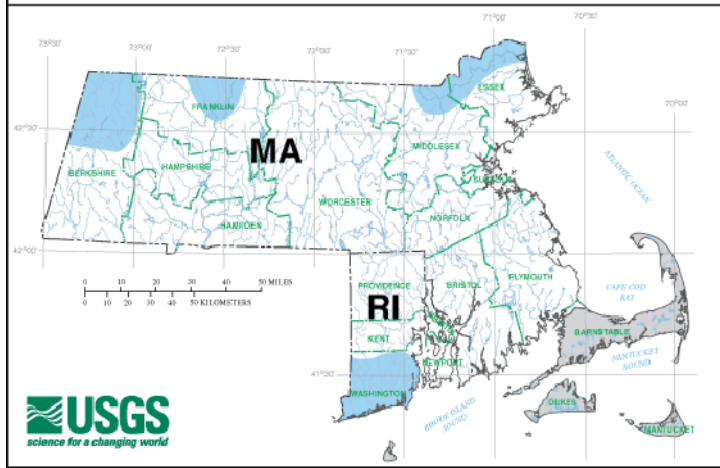


Table 1: Surface Water Runoff

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 these shown are used to determine ranges

MASSACHUSETTS AND RHODE ISLAND USGS GROUND-WATER-LEVEL CONDITIONS - JANUARY 2007

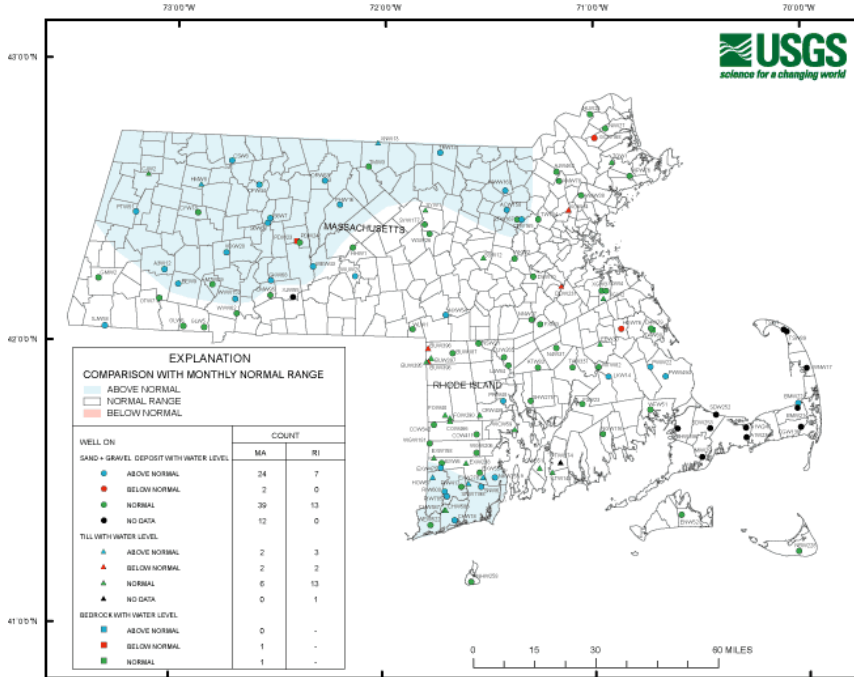


Table 2: Ground Water-Level Conditions

Borden Brook/Cobble Mountain, Quabbin and Scituate Reservoirs were 91-, 97-, and 104-percent full, respectively, at the end of January. In comparison, Borden Brook/Cobble Mountain, Quabbin, and Scituate Reservoirs were 94-, 96- and 107-percent full, respectively, at the end of December.

TABLE 3: SUMMARY OF GROUND-WATER LEVELS **January** **2007** 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 T I O T P H O O	START YEAR OF RECORD	NET CHANGE		DEPARTURE FROM MONTHLY MEDIAN	WATER LEVEL		
			IN MONTH (FEET)	IN ONE YEAR (FEET)		BELOW LAND- SURFACE DATUM (OWc) (FEET)	DAY	
RHODE ISLAND								
BURRILLVILLE 187	TS	1968	+ 0.04	- 0.91	- 0.14	14.96	24	
BURRILLVILLE 395	UT	1992	+ 0.70	+ 3.57	- 0.14	6.45	26	
BURRILLVILLE 396	VT	1992	+ 0.07	- 1.07	- 0.87	5.95	25	
BURRILLVILLE 397	HT	1992	+ 6.52	- 5.58	- 0.57	14.68	26	
BURRILLVILLE 398	HT	1992	+ 0.00	- 0.96	- 0.96	8.01	26	
CHARLESTOWN 18	FS	1946	+ 0.99	- 1.48	+ 2.03	15.81	25	
CHARLESTOWN 586	VT	1992	- 1.20	- 0.55	+ 0.03	3.62	25	
CHARLESTOWN 587	ST	1992	- 0.31	- 1.74	+ 0.54	6.39	25	
COVENTRY 342	VS	1991	+ 0.40	- 1.44	+ 0.11	7.96	24	
COVENTRY 411	SS	1961	- 0.44	- 1.26	+ 0.41	21.02	25	
COVENTRY 466	VT	1992	-----	- 0.21	- 0.16	2.80	25	
CRANSTON CITY 439	ST	1992	-----	- 3.56	- 1.31	11.93	25	
CUMBERLAND 265	SS	1946	+ 0.33	- 0.39	+ 0.57	11.36	24	
EXETER 6	VS	1948	+ 0.24	- 0.85	+ 0.66	4.94	24	
EXETER 158	ST	1991	+ 0.74	- 1.19	+ 0.23	6.11	24	
EXETER 238	FT	1991	+ 0.20	- 0.47	+ 0.10	11.70	25	
EXETER 278	HT	1991	+ 1.79	- 2.95	+ 2.54	9.20	24	
EXETER 475	VS	1981	+ 0.36	- 0.88	+ 0.65	13.23	24	
EXETER 554	SS	1988	+ 0.31	- 0.62	+ 0.00	9.31	24	
FOSTER 40	HT	1991	+ 0.31	- 1.67	- 0.64	4.34	24	
FOSTER 290	HT	1992	-----	- 1.19	- 0.01	5.32	25	
HOPKINTON 67	ST	1991	+ 1.94	- 1.56	+ 2.54	12.92	24	
LINCOLN 84	VS	1946	+ 0.41	- 0.92	+ 0.46	4.67	24	
LITTLE COMPTON 142	ST	1992	+ 2.72	- 2.94	- 0.36	10.46	26	
NEW SHOREHAM 258	UT	1991	+ 0.15	- 0.75	+ 0.32	11.23	27	
NORTH KINGSTOWN 255	VS	1954	+ 0.81	- 0.44	+ 1.45	6.72	25	
NORTH SMITHFIELD 21	TS	1947	+ 0.27	- 1.05	+ 0.22	7.09	24	
PORTSMOUTH 551	HT	1992	- 2.65	- 4.26	+ 1.72	32.19	29	
PROVIDENCE 48	TS	1944	- 0.17	- 0.49	+ 2.55	3.92	22	
RICHMOND 417	VS	1976	+ 0.33	- 0.49	+ 0.27	6.07	25	
RICHMOND 600*	TS	1977	+ 0.38	- 0.88	+ 0.74	32.96	24	
RICHMOND 785	FS	1989	+ 0.83	- 0.51	+ 2.89	21.77	25	
SOUTH KINGSTOWN 6	VS	1955	+ 0.78	- 0.98	+ 1.35	10.47	25	
SOUTH KINGSTOWN 1198	FS	1988	+ 0.66	- 0.73	+ 0.49	6.84	24	
TIVERTON 274	TT	1990	-----	-----	-----	-----		
WARWICK 59	ST	1991	+ 0.39	- 0.15	+ 0.22	4.60	22	
WESTERLY 522	FS	1969	+ 0.63	- 0.61	+ 0.26	11.44	25	
WEST GREENWICH 181	US	1969	+ 0.33	- 0.76	+ 0.24	14.98	24	
WEST GREENWICH 206	ST	1991	+ 0.17	- 0.26	+ 0.06	3.95	25	

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

The NOAA National Weather Service (NWS) Drought Severity Index for the period ending February 17, 2007 shows very moist conditions for the region (Table 4). The Crop Moisture Index for the same time period shows wet conditions (Table 5).

Table 4: Drought Severity Index

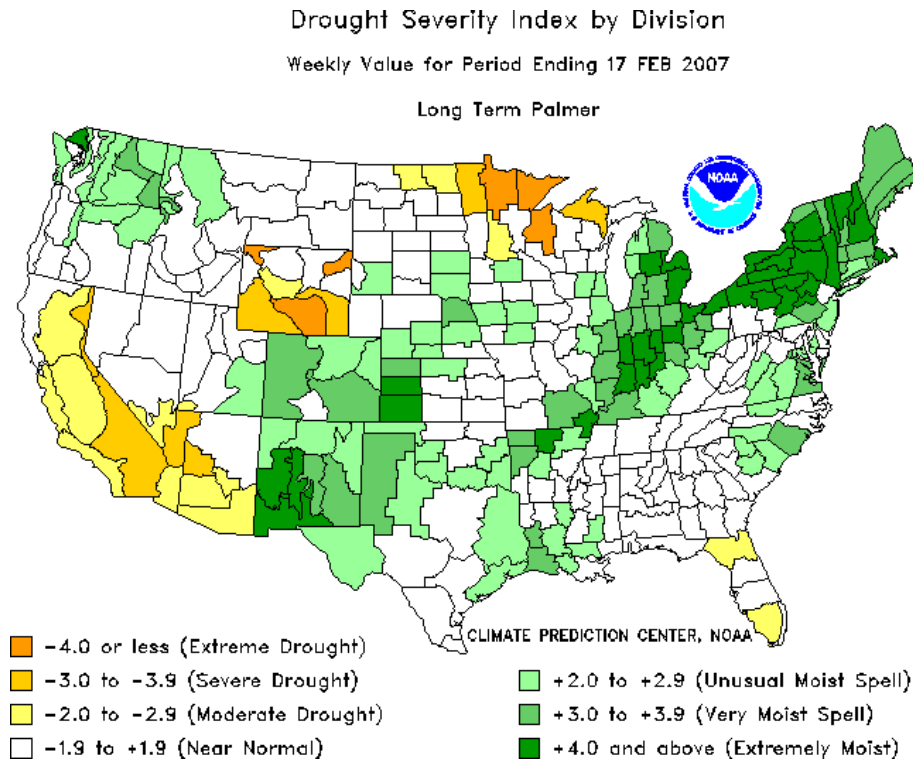


Table 5: Crop Moisture Index

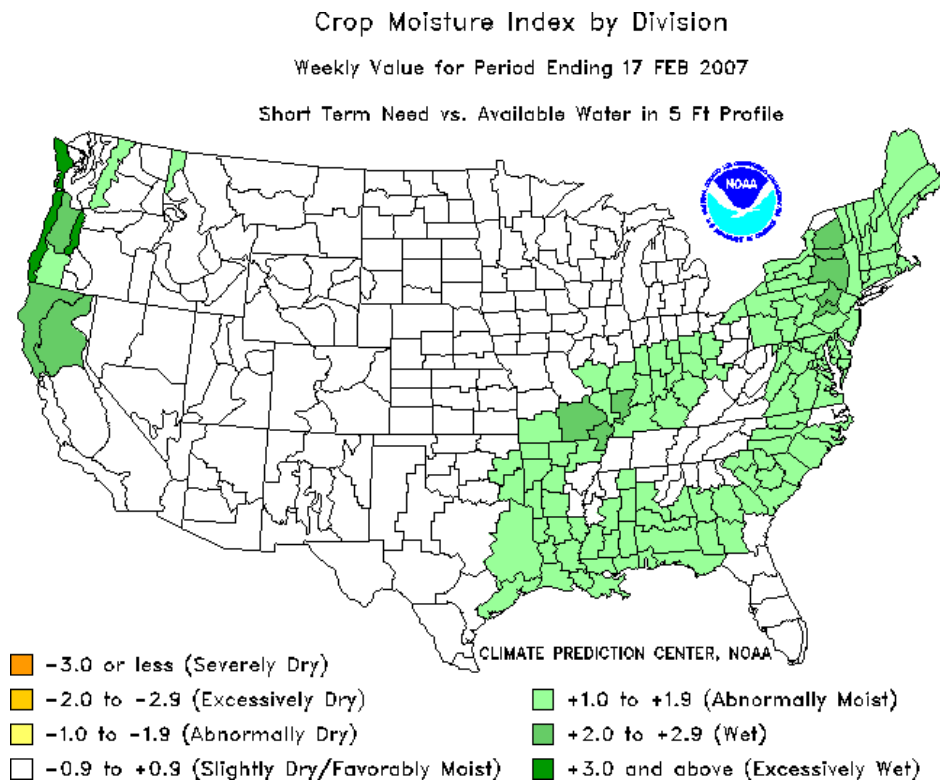
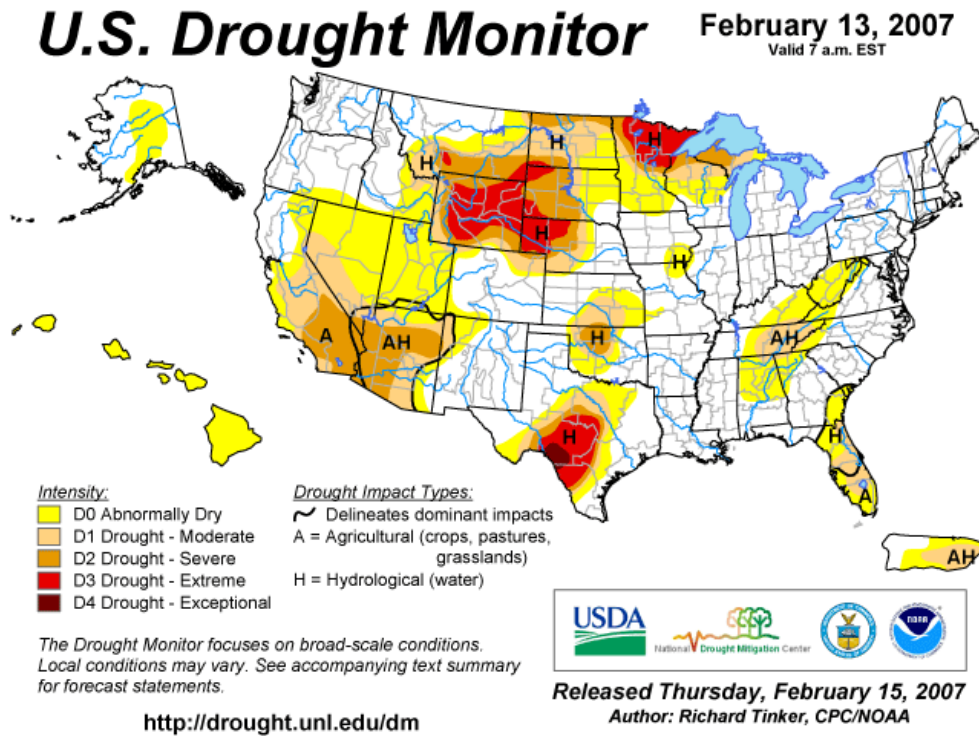
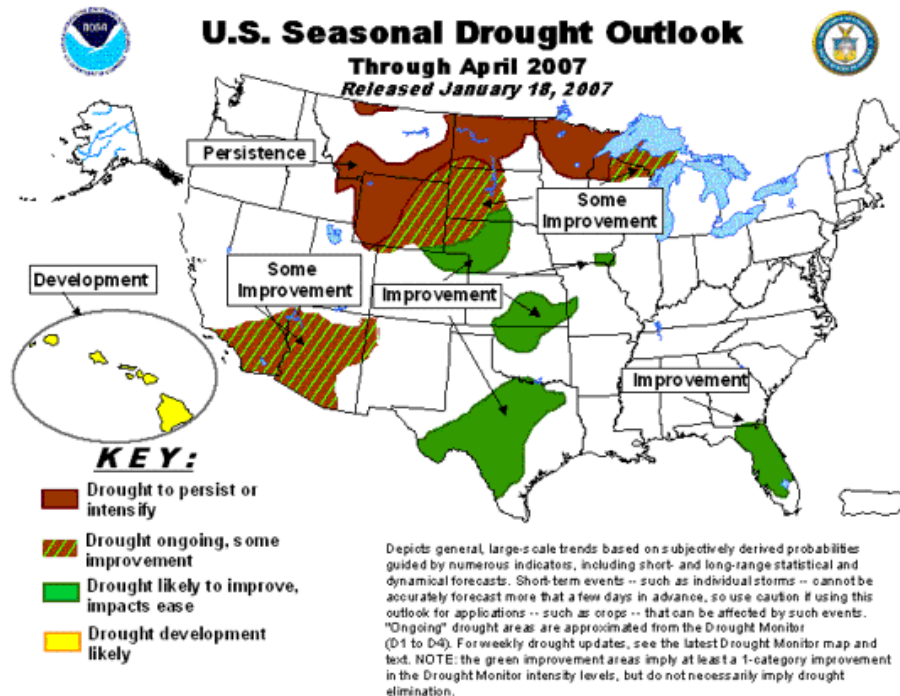


Table 6: US Drought Monitor



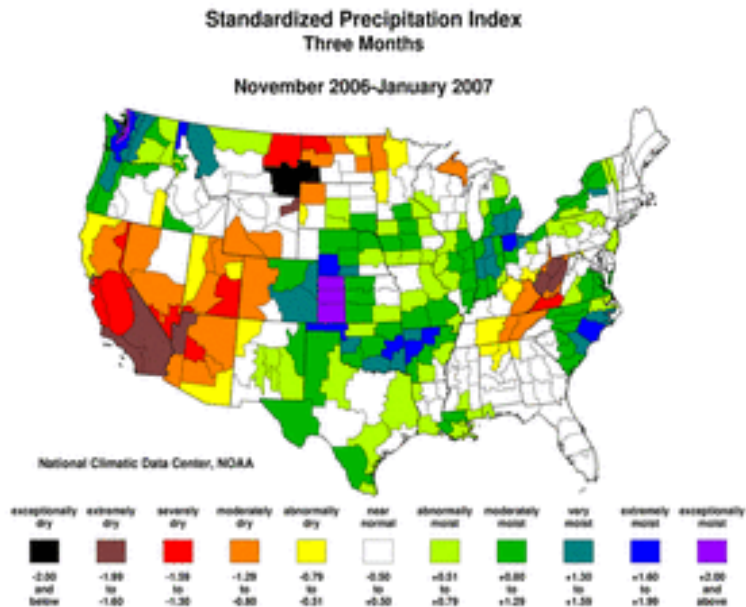
Tables 6 and 7 present national seasonal assessment and state rankings based on precipitation. The Drought Monitor (Table 6) focuses on broad scale conditions, and portrays Rhode Island experiencing a normal intensity through February 13, 2007. The NOAA Seasonal Drought Outlook through April 2007 projects “normal” conditions for Rhode Island.

Table 7: NOAA Seasonal Drought Outlook



Current Standardized Precipitation Index

The Standardized Precipitation Index (SPI) is a way of [measuring drought](#) that is different from the Palmer drought index (PDI). Like the PDI, this index is negative for drought, and positive for wet conditions. But the SPI is a probability index that considers only precipitation, while Palmer's indices are water balance indices that consider water supply (precipitation), demand (evapotranspiration) and loss (runoff). On this map, the red shading denotes dry conditions while the green shading indicates wet conditions.



DISCUSSION

Water conditions will continue to be closely monitored over the next month by the Water Resources Board staff. Consideration should be given to convening a preliminary spring meeting of the Drought Steering Committee to review conditions prior to the summer months.

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

NOAA Drought Information Center

<http://www.drought.noaa.gov/>

U. S. Geological Survey – MA & RI

<http://ma.water.usgs.gov/>

