



**State of Rhode Island and Providence Plantations  
Water Resources Board**

Justice William E. Powers Building, Third Floor  
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Providence, RI 02908  
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Date: January 4, 2008

To: Robert Griffith, Ph.D., Chair, Water Resources Protection & Use Committee  
WRP&U Committee Members

Through: Juan Mariscal, P.E.  
General Manager

From: Beverly O'Keefe, M.A.  
Supervising Planner

Re: Drought Management Plan Program – Current Conditions

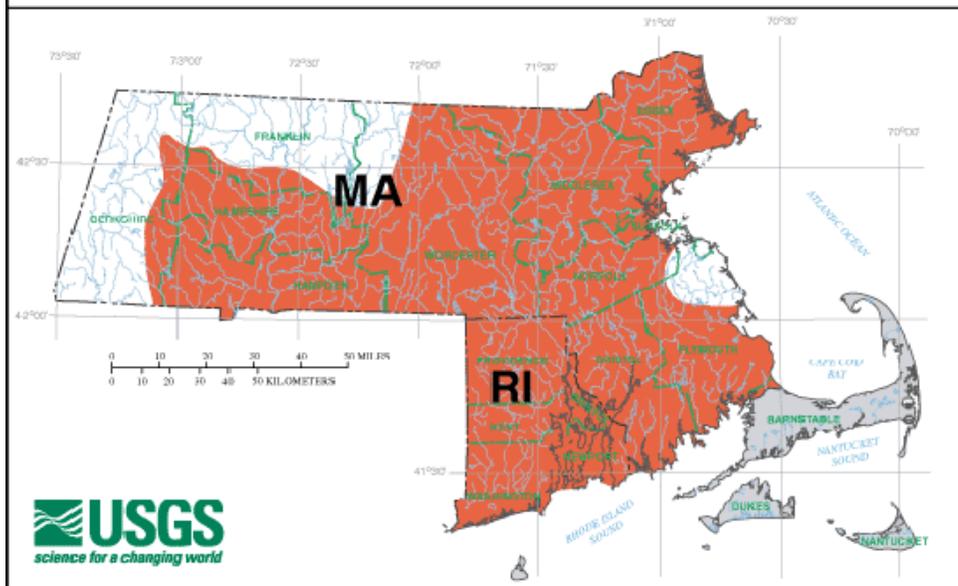
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BACKGROUND: Pursuant to State Guide Plan Element 724: The Rhode Island Drought Management Plan, the Water Resources Board is required to assess water conditions monthly. Staff has assembled climate information from a variety of sources to monitor the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

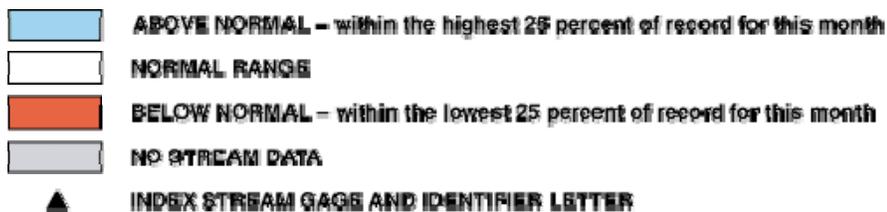
<b>Data Source</b>	<b>Date</b>	<b>Report Summary</b>
NOAA NWS Taunton MA Climate Report	Jan 4, 2008	0.27" received thru Jan. 4 2008, T.F. Green Airport; -0.15" below normal for January
USGS Surface Water Runoff Report	Nov 2007	Below normal
Scituate Reservoir	Jan. 4 2008	66.8% of Capacity
USGS Groundwater Level Summary	Nov 2007	Below normal
USGS RI Groundwater Level Well Report	Nov 2007	New historical low ground water levels– Exeter well 475. Eight dry till aquifer wells & 8 new record ground water levels (342, 475, 67, 258, 21, 417, 600, 785, 1198, & 59)
NWS Drought Severity Index: Palmer	29 Dec 2007	Near Normal
NOAA NWS Crop Moisture Index	29 Dec 2007	Wet
NOAA NWS Northeast Drought Monitor Seasonal Assessment	1 Jan 2008	Abnormally dry
NOAA Seasonal Drought Outlook (through March 2008)	3 Jan 2008	Near Normal
NOAA Standard Precipitation Index – Six Months	Nov 2007	Moderately dry conditions

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 November 2007 were generally below normal (lowest 25 percent of flows for November) in Rhode Island.

## Surface-Water Runoff December 2007



### COMPARISON WITH MONTHLY NORMAL RANGE



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

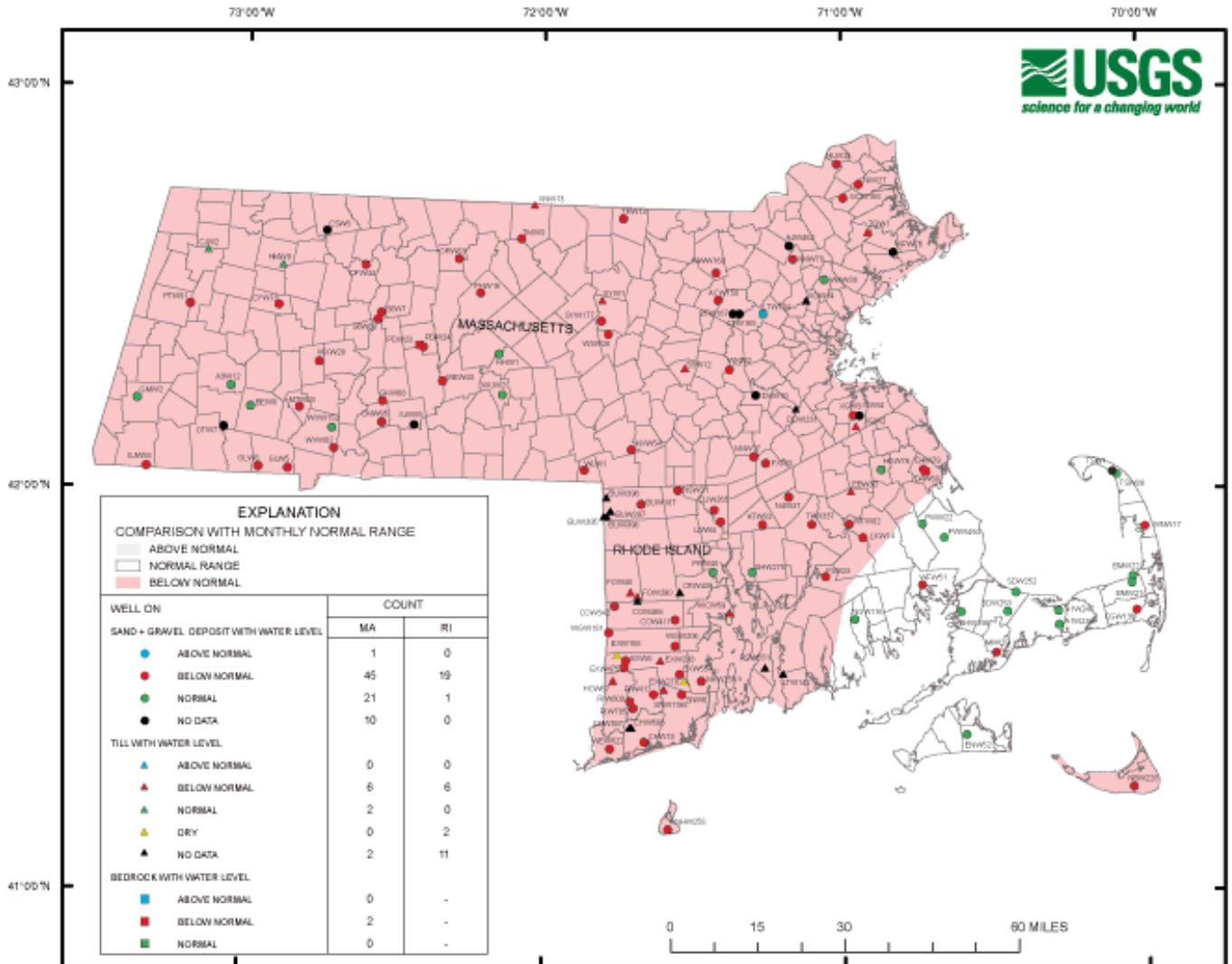
Ground-water levels were generally below normal (lowest 25 percent of levels for November) in Rhode Island, including Block Island. A new historical record-low ground-water level was measured in the Exeter 475 well in Rhode Island (lowest since measurements started in 1981). New record-low ground-water levels for the month of November were measured in eight wells in Rhode Island

Eight Rhode Island wells that are installed in till aquifers, were measured and determined to be dry: Burrillville 397 and 398, Charlestown 587, Cranston City 439, Exeter 158, Exeter 278, Foster 290, and Portsmouth 551. These wells may go dry during extended periods of below-normal ground-water-level conditions. This assessment is based on the evaluation of 117 wells with 10 or more years of record.

Borden Brook/Cobble Mountain, Quabbin and Scituate Reservoirs were 72-, 88-, and 66-percent full, respectively, at the end of November. In comparison, Borden Brook/Cobble Mountain, Quabbin, and Scituate Reservoirs were 73-, 89- and 71-percent full, respectively, at the end of October. The average reservoir level for December is 276.09 feet.

Table 2: Ground Water-Level Conditions

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



**TABLE 3: SUMMARY OF GROUND-WATER LEVELS December 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 O P H O	START YEAR OF RECORD	NET CHANGE		DEPARTURE FROM MONTHLY MEDIAN	WATER LEVEL BELOW LAND-SURFACE DATUM (OWc)	
			IN MONTH	IN ONE YEAR		(FEET)	DAY
RHODE ISLAND							
BURRILLVILLE 187	TS	1968	+ 0.09	- 2.50	- 2.45	17.50	21
BURRILLVILLE 395	UT	1992	-----	-----	-----	-----	
BURRILLVILLE 396	VT	1992	-----	-----	-----	-----	
BURRILLVILLE 397	HT	1992	-----	-----	-----	-----	
BURRILLVILLE 398	HT	1992	-----	-----	-----	-----	
CHARLESTOWN 18	FS	1946	- 0.04	- 4.35	- 2.77	21.15	21
CHARLESTOWN 586	VT	1992	-----	-----	-----	-----	
CHARLESTOWN 587	ST	1992	-----	-----	-----	-----	
COVENTRY 342	VS	1991	+ 0.22	- 2.24	- 2.65	10.60	< 21
COVENTRY 411	SS	1961	- 0.03	- 2.31	- 1.37	22.89	21
COVENTRY 466	VT	1992	-----	-----	-----	-----	
CRANSTON CITY 439	ST	1992	-----	-----	-----	-----	
CUMBERLAND 265	SS	1946	+ 0.90	- 1.34	- 1.45	13.03	21
EXETER 6	VS	1948	+ 0.05	- 1.64	- 1.14	6.82	21
EXETER 158	ST	1991	-----	-----	-----	DRY	21
EXETER 238	FT	1991	+ 0.06	- 0.26	- 0.50	12.16	21
EXETER 278	HT	1991	-----	-----	-----	DRY	21
EXETER 475	VS	1981	- 0.01	- 3.19	- 1.94	16.78	<< 21
EXETER 554	SS	1988	+ 0.02	- 2.22	- 2.12	11.84	< 21
FOSTER 40	HT	1991	+ 1.46	- 2.00	- 3.03	6.65	21
FOSTER 290	HT	1992	-----	-----	-----	-----	
HOPKINTON 67	ST	1991	- 0.03	- 7.05	- 5.67	21.91	< 21
LINCOLN 84	VS	1946	+ 0.03	- 0.93	- 1.00	6.01	21
LITTLE COMPTON 142	ST	1992	-----	-----	-----	-----	
NEW SHOREHAM 258	UT	1991	- 0.23	- 2.70	- 2.10	14.08	< 22
NORTH KINGSTOWN 255	VS	1954	+ 0.11	- 2.84	- 2.05	10.37	21
NORTH SMITHFIELD 21	TS	1947	+ 0.17	- 2.94	- 2.78	10.30	< 21
PORTSMOUTH 551	HT	1992	-----	-----	-----	-----	
PROVIDENCE 48	TS	1944	+ 0.02	- 0.86	+ 1.72	4.61	17
RICHMOND 417	VS	1976	+ 0.06	- 1.42	- 1.18	7.82	< 21
RICHMOND 600*	TS	1977	- 0.07	- 2.55	- 1.70	35.89	< 21
RICHMOND 785	FS	1989	- 0.37	- 3.94	- 2.28	26.54	< 21
SOUTH KINGSTOWN 6	VS	1955	+ 0.29	- 2.73	- 1.52	13.98	21
SOUTH KINGSTOWN 1198	FS	1988	+ 0.23	- 3.51	- 2.85	11.01	< 21
WARWICK 59	ST	1991	+ 1.58	- 12.41	- 12.47	17.40	< 17
WESTERLY 522	FS	1969	+ 0.49	- 1.45	- 1.61	13.52	21
WEST GREENWICH 181	US	1969	+ 0.25	- 1.17	- 1.33	16.48	21
WEST GREENWICH 206	ST	1991	+ 0.39	- 1.30	- 1.43	5.42	21

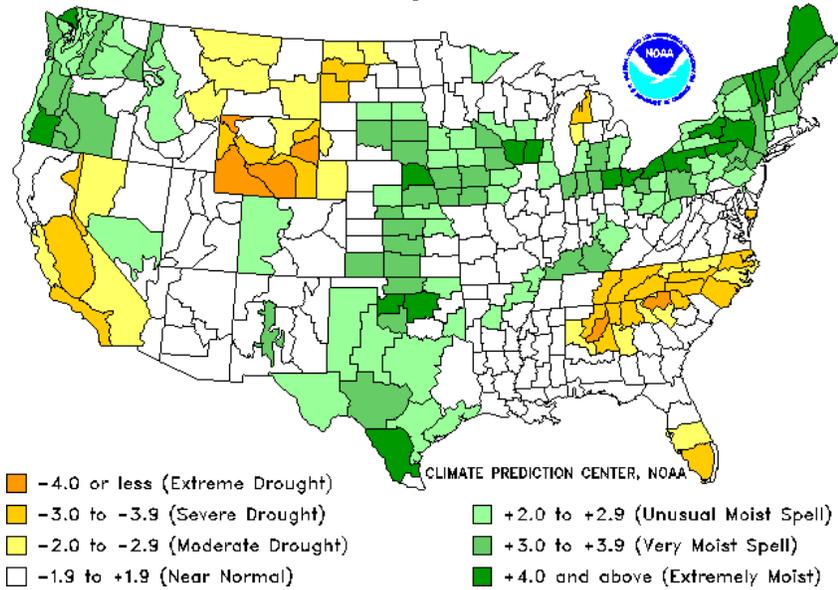
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 >> SET NEW HIGH OR EQUALED HIGHEST RECORDED WATER LEVEL FOR PERIOD OF RECORD  
 > SET NEW HIGH OR EQUALED HIGHEST RECORDED WATER LEVEL FOR END OF SEPTEMBER  
 << SET NEW LOW OR EQUALED LOWEST RECORDED WATER LEVEL FOR PERIOD OF RECORD  
 < SET NEW LOW OR EQUALED LOWEST RECORDED WATER LEVEL FOR END OF SEPTEMBER  
 ----- 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 December 29, 2007 shows normal conditions for the region (Table 4). The Crop Moisture Index for the same time period shows wet conditions (Table 5).

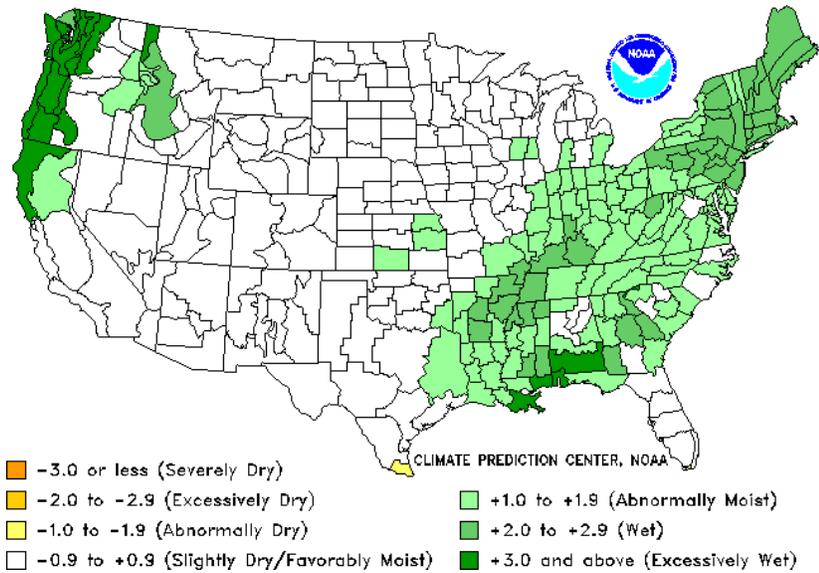
**Table 4: Drought Severity Index**

Drought Severity Index by Division  
 Weekly Value for Period Ending 29 DEC 2007  
 Long Term Palmer



**Table 5: Crop Moisture Index**

Crop Moisture Index by Division  
 Weekly Value for Period Ending 29 DEC 2007  
 Short Term Need vs. Available Water in 5 Ft Profile



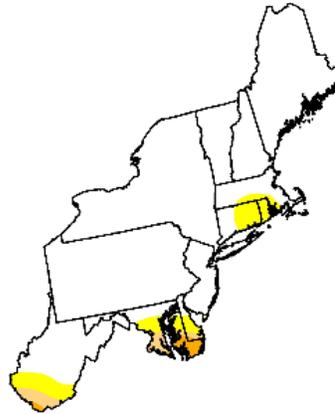
**Table 6: US Drought Monitor**

# U.S. Drought Monitor

## Northeast

January 1, 2008  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	90.5	9.5	3.2	1.1	0.0	0.0
Last Week (12/25/2007 map)	90.5	9.5	3.2	1.1	0.0	0.0
3 Months Ago (10/09/2007 map)	40.3	59.7	26.6	9.1	1.3	0.0
Start of Calendar Year (01/01/2008 map)	90.5	9.5	3.2	1.1	0.0	0.0
Start of Water Year (10/02/2007 map)	51.0	49.0	18.8	7.4	0.3	0.0
One Year Ago (01/02/2007 map)	86.6	13.4	0.0	0.0	0.0	0.0



**Intensity:**

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

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

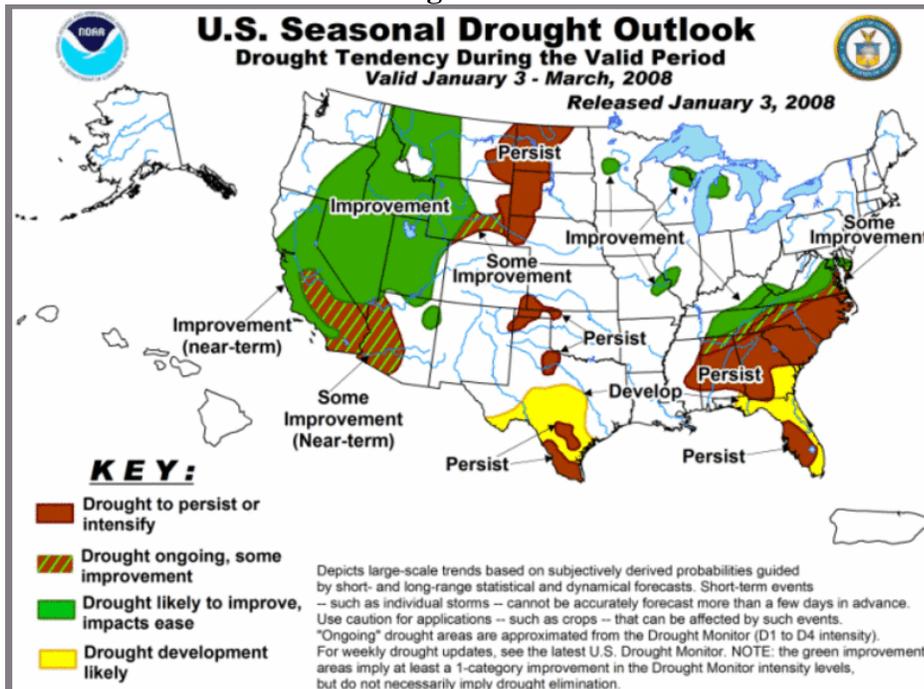
<http://drought.unl.edu/dm>



Released Thursday, January 3, 2008  
Author: Richard Heim, NOAA/NESDIS/NCDC

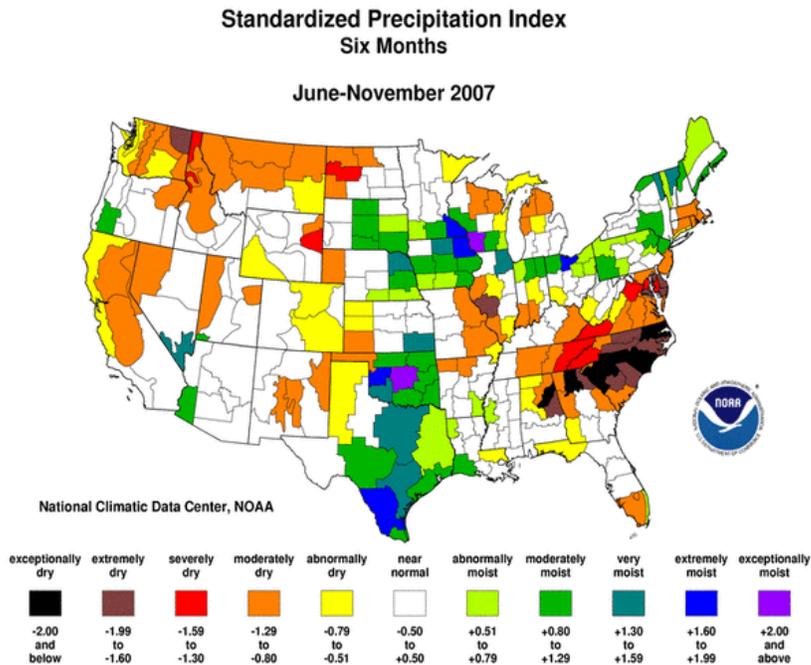
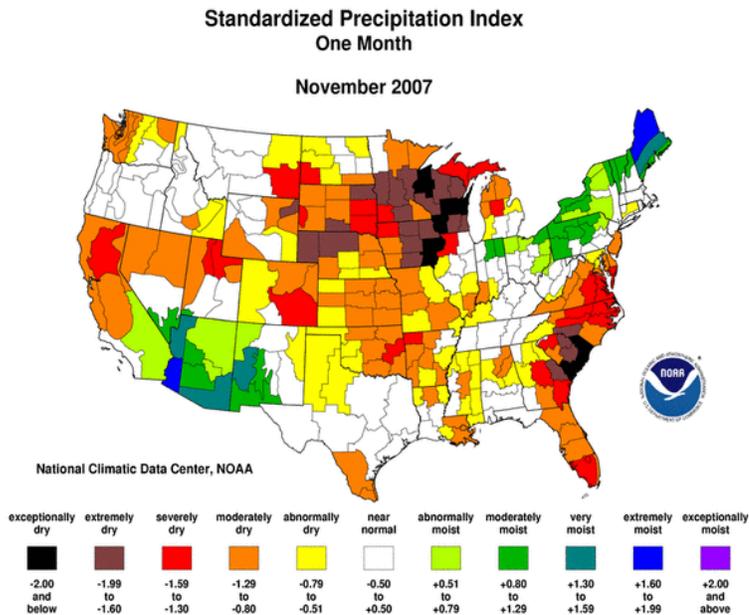
Tables 6 and 7 present national seasonal assessment and state rankings based on precipitation. The Northeast Drought Monitor (Table 6) focuses on regional conditions, and portrays Rhode Island experiencing moderate drought through January 1, 2008. The NOAA Seasonal Drought Outlook through March 2008 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 (evapo-transpiration) and loss (runoff). Six month condition is moderately dry for Rhode Island.



## DISCUSSION

Water conditions will continue to be closely monitored over the next month by the Water Resources Board staff. The Drought Steering Committee met on November 19, 2007 to review current conditions, and recommended remaining in the “drought advisory” phase based on the below normal precipitation for four months. The Drought Steering Committee will meet on January 10, 2008 to review hydrologic conditions.

**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](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](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/>