State of Rhode Island and Providence Plantations
Water Resources Board
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Summary of Current Conditions (Through March 31)

Prepared by WRB Staff
April 11, 2012

This document is intended to provide Drought Steering Committee (DSC) members with background and current conditions information needed to assess and potentially recommend assigning a drought level. WRB staff plan to provide additional current information and web access to real time stream flow and groundwater information. Representatives from US Geological Survey and the National Weather Service have confirmed their attendance. WRB staff acknowledge the US Geological Survey and the National Weather Service with special acknowledgement to Nicole Belk for her dedication and availability.

BACKGROUND

The Rhode Island Drought Management Plan charges the Water Resources Board with water conditions monitoring and coordination of Drought tracking and response activities. The Plan also establishes the DSC which is advisory to the Board. On an ongoing basis, WRB staff work closely with experts, and stakeholders to evaluate conditions. If conditions warrant, WRB staff convene the DSC.

Throughout the fall of 2011 conditions remained well above normal. In January precipitation stayed in the normal range but February and March were well below normal. In fact, RI had its warmest January-March combination on record and its 5th driest January-March combination on record (reported by the National Weather Service from the Northeast Regional Climate Center).

WRB staff began working in mid March to update the DSC list, assemble data and work closely with partners to ensure timely collection of data in anticipation of a meeting. The meeting was set for April 12. If the second half of March was rainy, the focus of the meeting would be organizational. If not, the group may need to recommend a "Drought Advisory." Four major "indices" are used in determining the drought level. When three of the four "triggers" are met a drought phase is declared. However, the time of year can influence the indices and the process. Advisory and Watch levels are declared statewide. The thresholds for the advisory level are shown below:

Major Drought Indices and "Triggers" for Advisory

Precipitation	**Streamflow**	**Groundwater**	**PDI**	**Drought Phase**
2 month cumulative below 65% of normal	3 consecutive months below normal	At least 2 out of 3 months below normal	-2.0 to -2.99	Advisory

SUMMARY OF CURRENT CONDITIONS as of March 31 (Detailed data attached)

Major Indicators

1. Precipitation-Two and three month cumulative deficit is below 65% which **meets the Advisory criteria.**
2. Stream flow-Two months below normal- **does not meet the Advisory criteria**.
3. Groundwater Levels-One month (March) below normal- **does not meet the Advisory criteria**.
4. Palmer Drought Index (PDI) - Near Normal. The weekly maps (3/24 and 4/5) show that the PDI is in the "near normal" range -1.99 - +1.99- **does not meet the Advisory criteria**.

Other Considerations

Precipitation Forecasts- The five day forecast as of April 6 projects dry conditions to continue. The rain predicted is less than 0.10 inches according to the National Weather Service. The 6-10 day and 8-14 day outlook from April 6 are for below normal precipitation http://www.cpc.ncep.noaa.gov/

Water Supply

Water Supply Reservoir Levels- suppliers are reporting that reservoirs are at or above capacity. The current Scituate Reservoir Elevation (feet) 284.81 (103.6 % of Capacity). Groundwater Water Suppliers are reporting normal system operations and static well levels.

Timing/Seasonal Considerations

The downward trends in groundwater and low flows for surface water are of concern for agricultural ecological, and groundwater water supply as we enter a season when these sectors typically require more resources.

Crop Moisture

As of March 31 the weekly crop moisture index was in the -0.9-+0.9 slightly dry/favorably moist category.
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/cmi.gif

Fire Danger- elevated due to dry conditions, level 5 on a 1-5 scale (National Weather Service, Taunton).

US Drought Monitor- This is a weekly map updated every Thursday by the National Drought Mitigation Center. WRB staff worked very closely with NDMC to review the national indicators and develop RI indicators. The US Drought Monitor acknowledges

that it focuses on broad-scale conditions and that local conditions may vary. The April 5, 2012 map shows CT, MA and RI in moderate drought conditions. The national map also classifies the conditions as short term (typically < 6 months) with impacts to agriculture, grasslands.http://droughtmonitor.unl.edu/monitor.html . For more information see http://drought.unl.edu/MonitoringTools/USDroughtMonitor.aspx .

Our Neighbors- Connecticut held their interagency drought workgroup meeting on Tuesday April 3 and will meet again at the end of the month. Massachusetts is planning a meeting on April 13.

RECOMMENDATION CONSIDERATIONS

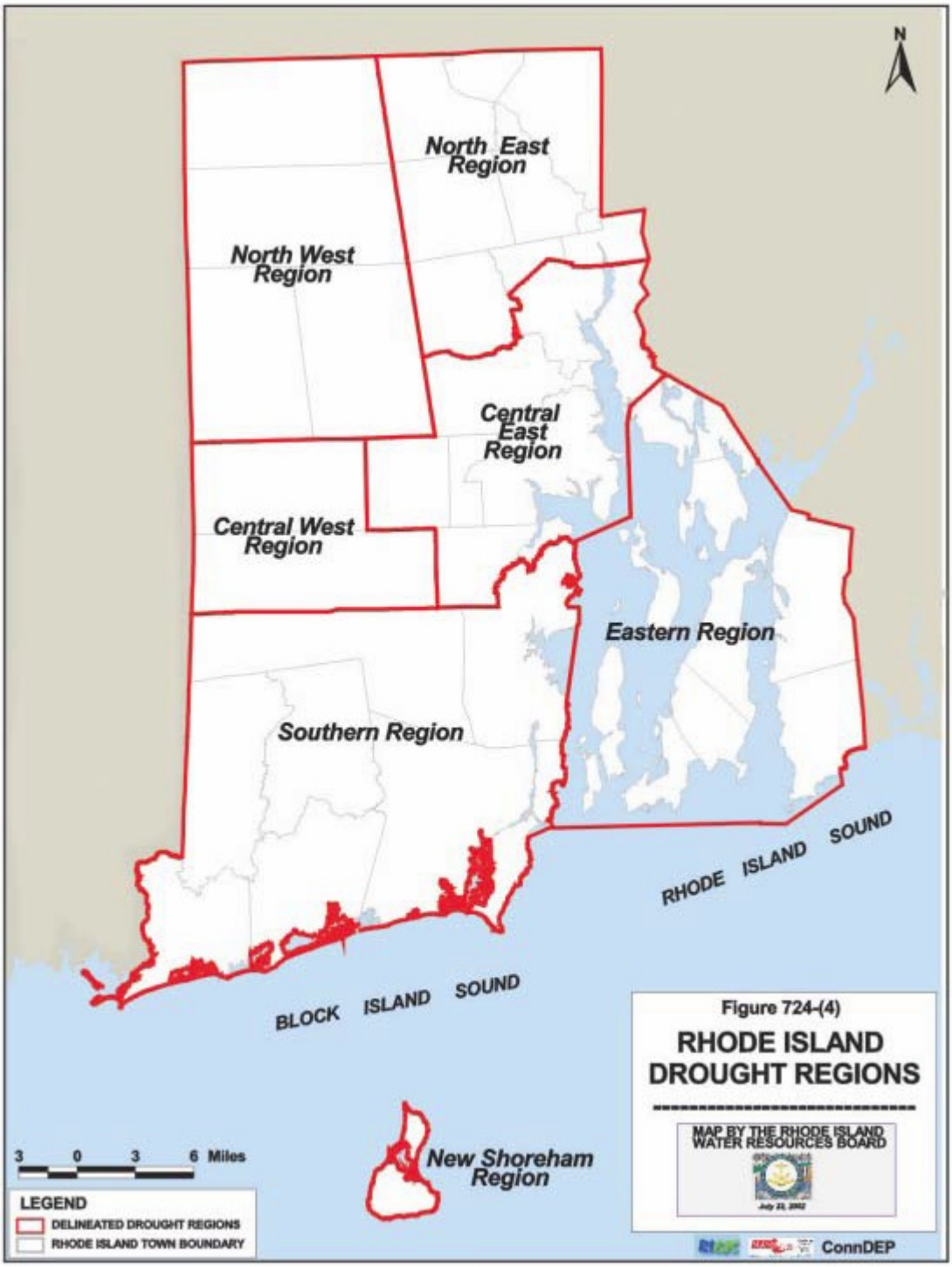
February and March were very dry months indicating emerging drought conditions. The six inch deficit in precipitation is reflected in low streamflows and groundwater levels. The time of year is a concern as we prepare to enter into spring "green up", warmer temperatures, and seasonal peak water usage.

A central consideration is whether this is a short term weather anomaly, a dry spell, or a drought. Only time will tell. As of March 31, one of the four indices for Advisory was met. Another below normal month of precipitation will certainly cause the Advisory triggers to be met. An above normal month could bring recovery. Rainfall data for the first two weeks of April plus the 7-10 day forecast will be necessary for the DSC to make a recommendation.

WRB staff will prepare current information for consideration at the meeting to assist in determining whether an advisory is warranted. The data may be provisional and less complete than what is typically provided

ATTACHMENTS:

RI Drought Regions
Precipitation Data through March 31
Streamflow Data (March Statewide Map and example gage)
Groundwater Data (March Statewide Map)
Palmer Drought Index (A description of the Index and the most current monthly value).


N
North East Region
North West Region
Central East Region
Central West Region
Eastern Region
Southern Region
RHODE ISLAND SOUND
BLOCK ISLAND SOUND
New Shoreham Region
3 0 3 6 Miles
LEGEND
DELINEATED DROUGHT REGIONS
RHODE ISLAND TOWN BOUNDARY
Figure 724-(4)
RHODE ISLAND DROUGHT REGIONS
MAP BY THE RHODE ISLAND WATER RESOURCES BOARD
ConnDEP

Rhode Island Precipitation
National Weather Service Taunton, MA

Preliminary Precipitation Data (inches) by Drought Region
Past 12 months ending March 2012
Includes CoCoRaHS data

RI 1 month March 2012	Rainfall	Departure	Percent	Normal
Northwest	1.69	-3.76	31	5.45
Northeast	1.96	-3.06	39	5.02
Central West	1.75	-3.41	34	5.16
Central East	1.79	-3.22	36	5.01
Eastern	1.87	-3.81	33	5.68
Southern	1.75	-3.86	31	5.61
New Shoreham	1.74	-3.87	31	5.61

RI 2 month Feb-Mar12	Rainfall	Departure	**Percent**	**Normal**
Northwest	2.82	-6.59	**30**	**9.41**
Northeast	2.58	-5.99	**30**	**8.57**
Central West	2.77	-5.99	**32**	**8.76**
Central East	2.84	-5.46	**34**	**8.30**
Eastern	3.11	-6.34	**33**	**9.45**
Southern	3.10	-6.24	**33**	**9.34**
New Shoreham	3.20	-6.14	**34**	**9.34**

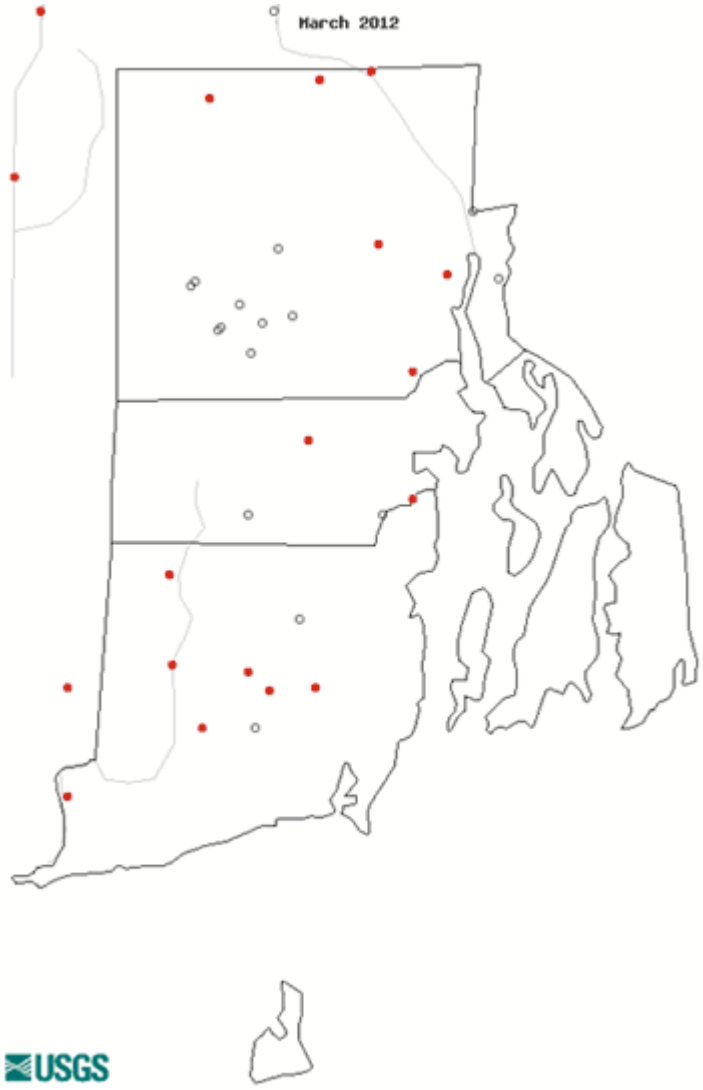
RI 3 month Jan-Mar 12	Rainfall	Departure	Percent	Normal
Northwest	6.25	-7.44	46	13.69
Northeast	6.30	-6.34	50	12.64
Central West	6.66	-6.17	52	12.83
Central East	6.42	-5.74	53	12.16
Eastern	6.98	-6.32	52	13.30
Southern	7.16	-6.16	54	13.32
New Shoreham	7.23	-6.09	54	13.32

RI 6 month Oct 11-Mar 12	Rainfall	Departure	Percent	Normal
Northwest	23.53	-4.73	83	28.26
Northeast	23.20	-3.62	87	26.82
Central West	24.14	-2.49	91	26.63
Central East	23.13	-1.69	93	24.82
Eastern	24.46	-1.42	95	25.88
Southern	24.65	-1.97	93	26.62
New Shoreham	24.97	-1.65	94	26.62

RI 12 month Apr 11-Mar 12	Rainfall	Departure	Percent	Normal
Northwest	57.95	4.25	108	53.70
Northeast	55.97	4.55	109	51.42
Central West	57.39	6.62	113	50.77
Central East	53.91	6.73	114	47.18
Eastern	51.70	3.16	107	48.54
Southern	55.46	4.76	109	50.71
New Shoreham	54.52	3.82	108	50.71

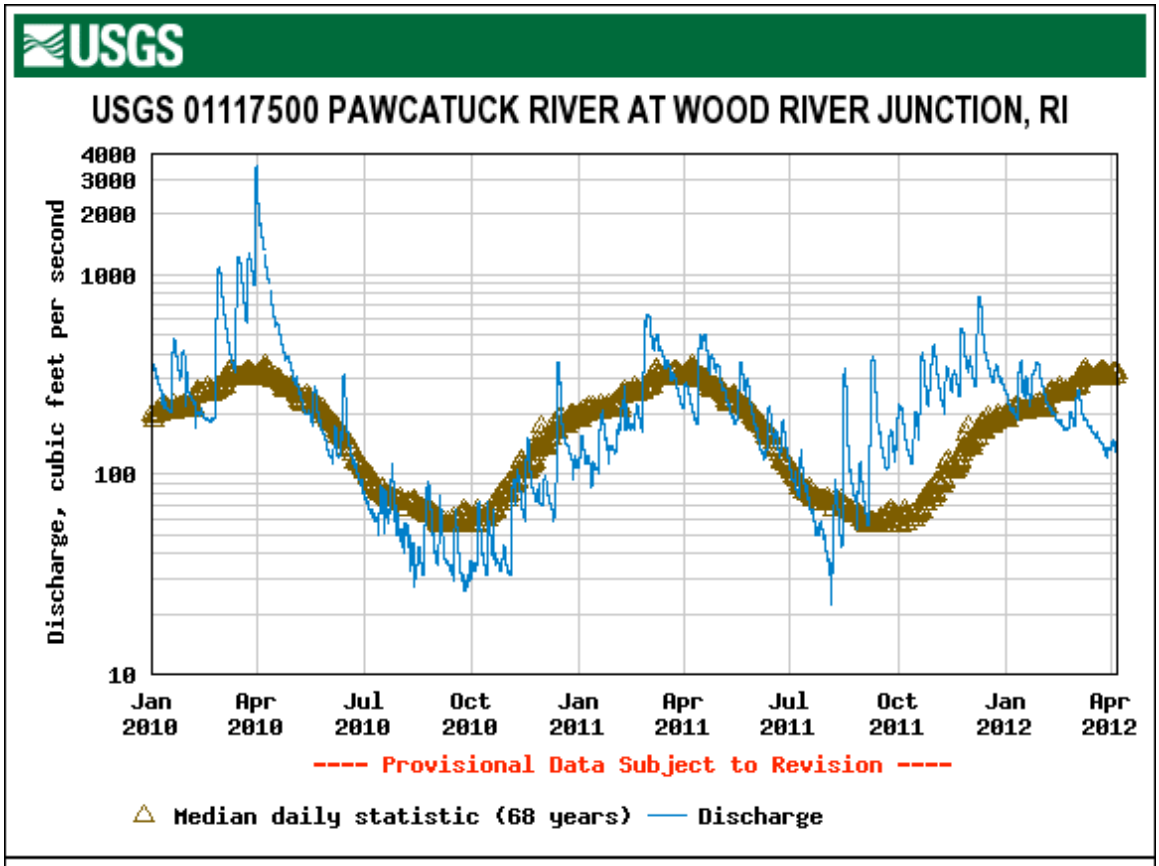
March 2012 Water Conditions
Rhode Island Surface-Water Conditions

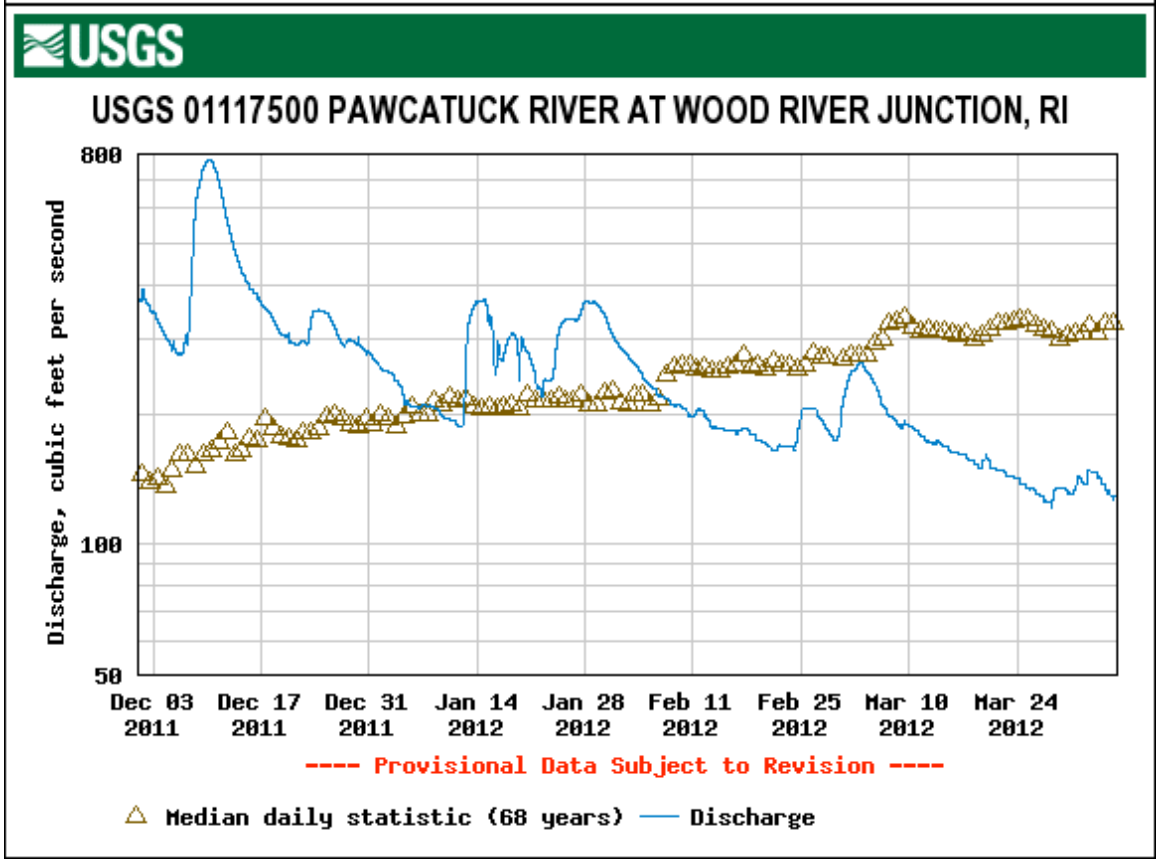
Map of monthly streamflow compared to historical streamflow for the month of the year.



Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

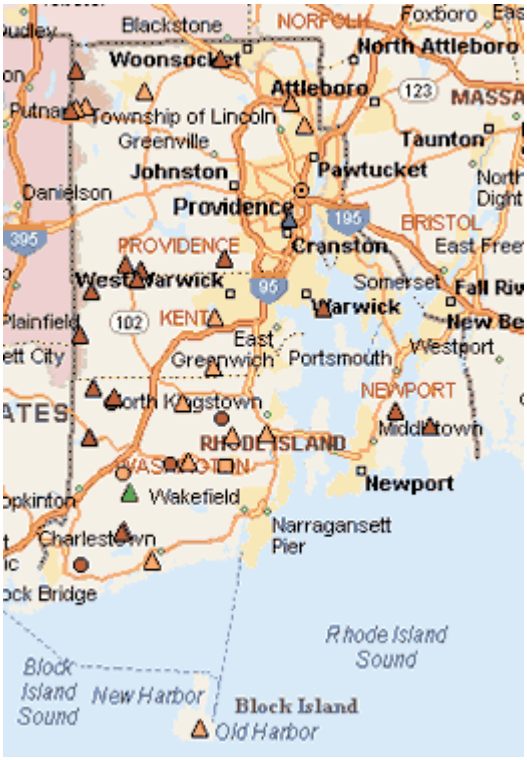
Surface Water Trends and Current Conditions
Selected Data from the Pawcatuck River at Wood River Junction



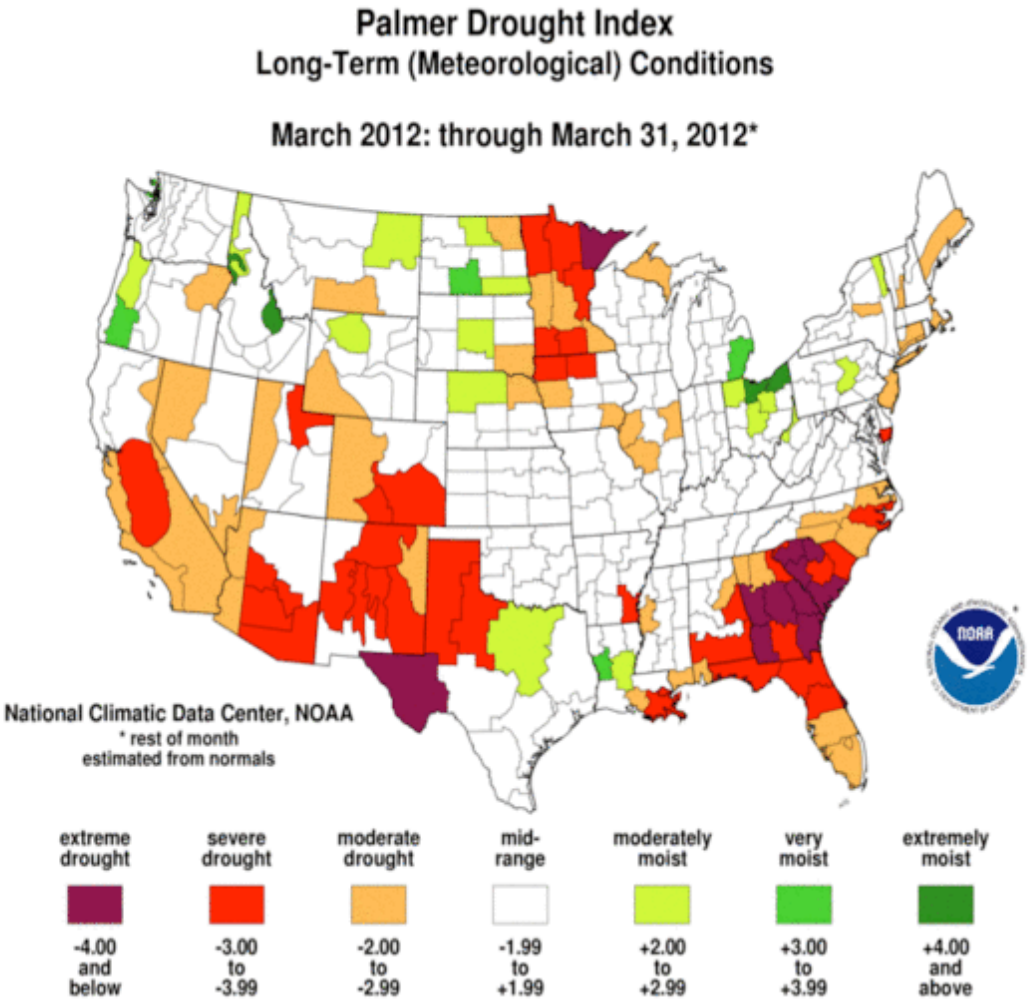


March 2012 Water Conditions

Rhode Island Groundwater Conditions



Explanation - Percentile classes								
								○ Real Time
								□ Continuous
New Low	<10 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	New High	Not Ranked	△ Periodic Measurements



From the National Drought Mitigation Center
http://drought.unl.edu/Planning/Monitoring/ComparisonofIndicesIntro/PDSI.aspx
For additional information see also
http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/palmer.html#drought

Overview: The Palmer is a soil moisture algorithm calibrated for relatively homogeneous regions.

Who uses it: Many U.S. government agencies and states rely on the Palmer to trigger drought relief programs.

Pros: The first comprehensive drought index developed in the United States.

Cons: Palmer values may lag emerging droughts by several months; less well suited for mountainous land or areas of frequent climatic extremes; complex—has an unspecified, built-in time scale that can be misleading.
Developed by: W.C. Palmer, 1965.

Weekly maps: from the Climate Prediction Center
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif