State of Rhode Island and Providence Plantations
Water Resources Board
Justice William E. Powers Building, Third Floor
One Capitol Hill
Providence, RI 02908
(401) 574-8400♦ FAX: (401) 574-8401

To: Public Drinking Water Protection Committee
Through: Juan Mariscal, P.E., General Manager
From: Beverly O'Keefe, Supervising Planner
Date: July 25, 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	Jul 26 2007	2.38" received thru July 26 2007, T.F. Green Airport; -0.13 below normal for July. 2.19" above normal since Jan. 1
USGS Surface Water Runoff Report	June 2007	Normal Range
Scituate Reservoir	July 26, 2007	93.3% of Capacity
USGS Groundwater Level Summary	June 2007	Normal Range
USGS RI Groundwater Level Well Report	June 2007	No new high or low records
NOAA NWS Drought Severity Index: Palmer	21 July 2007	Near Normal
NOAA NWS Crop Moisture Index	21 July 2007	Abnormally Dry
NOAA NWS Drought Monitor Seasonal Assessment	24 July 2007	Near Normal
NOAA Seasonal Drought Outlook (through October 2007)	17 May 2007	Near Normal

Rhode Island month to date rainfall through July 267, 2007 was slightly below normal. The NOAA National Weather Service Preliminary Precipitation Report will be distributed at the committee meeting.

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 June 2007 were generally normal (between highest and lowest 25 percent of flows for June) for river basins in Rhode Island. This assessment is based on monthly flow statistics (30-year period from 1971 to 2000) from 47 near-real-time streamflow-gaging stations with 30 or more years of record. Ground-water levels were generally normal (between highest and lowest 25 percent of levels for June) in Rhode Island.

Borden Brook/Cobble Mountain, Quabbin and Scituate Reservoirs were 90-, 98-, and 101-percent full, respectively, at the end of June. In comparison, Borden Brook/Cobble Mountain, Quabbin, and Scituate Reservoirs were 92-, 100- and 103-percent full, respectively, at the end of May. The Providence Water Supply Board provides reservoir figures for Scituate Reservoir.

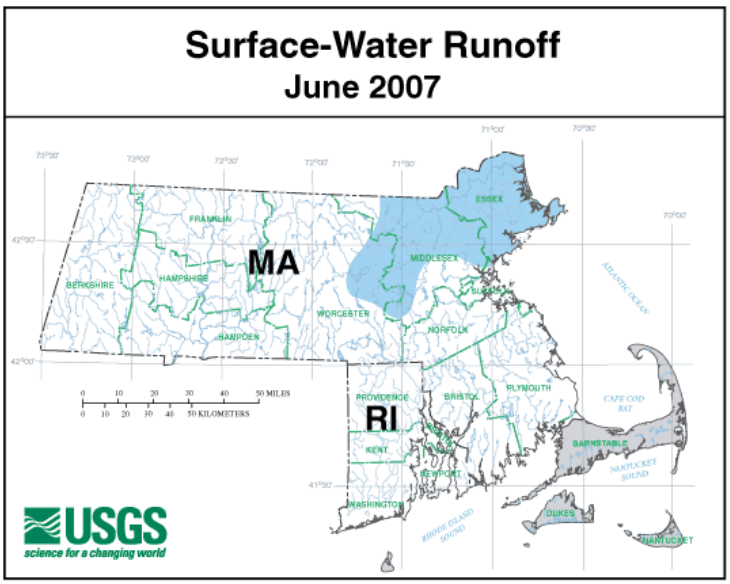


Table 1: Surface Water Runoff

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

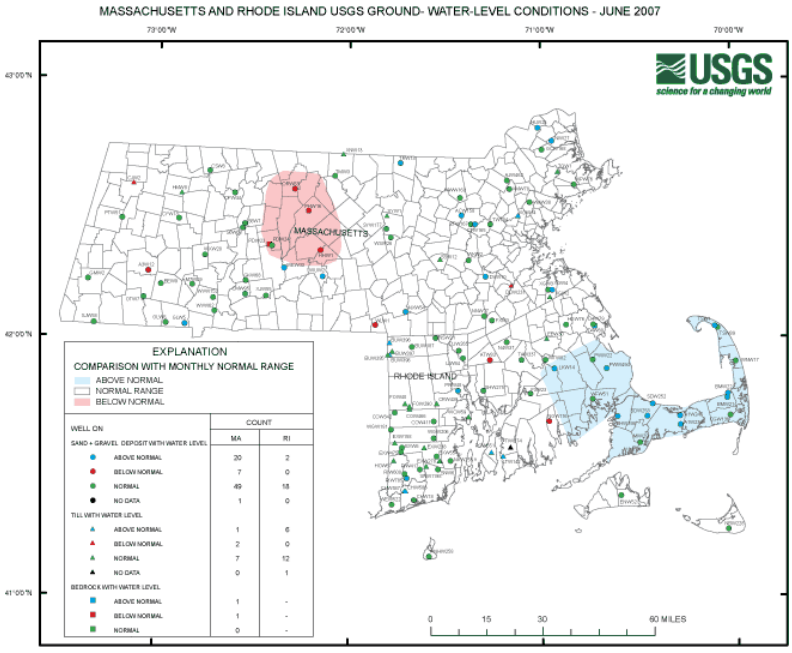


Table 2: Ground Water-Level Conditions

TABLE 3: SUMMARY OF GROUND-WATER LEVELS June 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	LOT	IOT	START YEAR OF RECORD	NET CHANGE IN MONTH (FEET)	NET CHANGE IN ONE YEAR (FEET)	DEPARTURE FROM MONTHLY MEDIAN (FEET)	WATER LEVEL BELOW LAND-SURFACE DATUM (OWc) (FEET)	DAY
RHODE ISLAND								
BURRILLVILLE 187	TS		1968	- 0.71	- 1.23	- 0.08	15.00	29
BURRILLVILLE 395	UT		1992	-----	- 2.91	- 0.09	8.40	29
BURRILLVILLE 396	VT		1992	-----	- 1.80	- 0.83	6.31	29
BURRILLVILLE 397	HT		1992	-----	- 5.30	+ 0.85	16.75	29
BURRILLVILLE 398	HT		1992	-----	- 5.76	- 1.56	10.91	29
CHARLESTOWN 18	FS		1946	- 1.98	- 5.53	+ 0.24	17.15	26
CHARLESTOWN 586	VT		1992	-----	- 0.88	- 0.18	4.17	27
CHARLESTOWN 587	ST		1992	-----	- 3.92	- 0.99	10.28	27
COVENTRY 342	VS		1991	- 1.62	-----	+ 0.04	9.75	29
COVENTRY 411	SS		1961	- 0.92	- 1.67	+ 0.55	20.88	29
COVENTRY 466	VT		1992	-----	- 1.08	- 0.21	3.57	26
CRANSTON CITY 439	ST		1992	-----	- 5.02	- 0.18	15.60	27
CUMBERLAND 265	SS		1946	- 1.33	- 1.30	+ 0.64	12.84	29
EXETER 6	VS		1948	- 1.51	- 1.06	+ 0.03	5.97	29
EXETER 158	ST		1991	- 5.45	- 5.03	- 0.66	12.18	29
EXETER 238	FT		1991	- 1.05	- 1.13	- 0.07	12.50	26
EXETER 278	HT		1991	- 3.93	- 5.48	- 1.27	13.54	26
EXETER 475	VS		1981	- 1.50	- 1.03	+ 0.19	13.89	29
EXETER 554	SS		1988	- 0.33	- 0.50	+ 0.42	9.70	26
FOSTER 40	HT		1991	- 3.43	- 1.50	+ 0.06	6.84	29
FOSTER 290	HT		1992	-----	- 3.52	+ 0.90	7.54	26
HOPKINTON 67	ST		1991	- 3.30	- 3.27	+ 0.46	16.12	29
LINCOLN 84	VS		1946	- 1.64	- 0.88	+ 0.31	4.98	29
LITTLE COMPTON 142	ST		1992	-----	- 6.72	- 1.06	16.80	7/9
NEW SHOREHAM 258	UT		1991	-----	- 1.32	+ 0.23	11.43	25
NORTH KINGSTOWN 255	VS		1954	- 1.48	- 3.18	+ 0.27	8.12	26
NORTH SMITHFIELD 21	TS		1947	- 1.76	- 1.43	+ 0.14	8.29	29
PORTSMOUTH 551	HT		1992	-----	- 14.64	- 3.75	43.22	7/9
PROVIDENCE 48	TS		1944	- 0.42	- 0.84	+ 2.57	3.89	26
RICHMOND 417	VS		1976	- 0.93	- 1.32	- 0.11	6.99	26
RICHMOND 600*	TS		1977	- 0.82	- 2.99	+ 0.11	33.55	29
RICHMOND 785	FS		1989	- 1.06	- 0.24	+ 1.19	21.89	29
SOUTH KINGSTOWN 6	VS		1955	- 1.31	- 1.88	+ 0.05	11.97	26
SOUTH KINGSTOWN 1198	FS		1988	- 1.72	- 2.12	- 0.21	8.68	26
TIVERTON 274	TT		1990	-----	-----	-----	-----	
WARWICK 59	ST		1991	- 2.40	- 3.08	+ 0.17	7.07	26
WESTERLY 522	FS		1969	- 1.02	- 1.73	- 0.09	12.64	26
WEST GREENWICH 181	US		1969	- 0.73	- 1.38	+ 0.15	16.04	29
WEST GREENWICH 206	ST		1991	- 0.88	- 0.89	+ 0.03	4.62	26

>> 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 July 21, 2007 shows normal conditions for the region (Table 4). The Crop Moisture Index for the same time period shows abnormally dry conditions (Table 5).

Table 4: Drought Severity Index

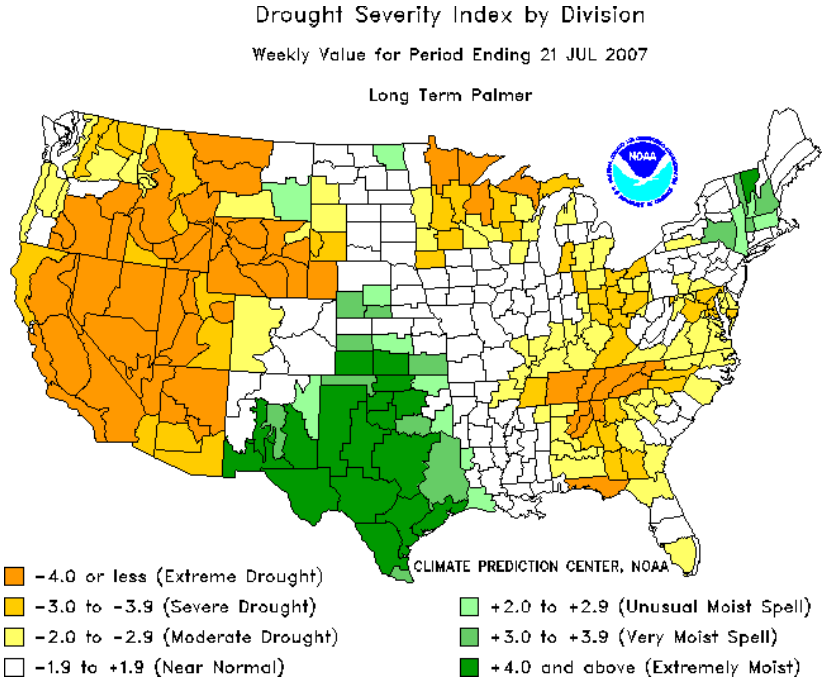


Table 5: Crop Moisture Index

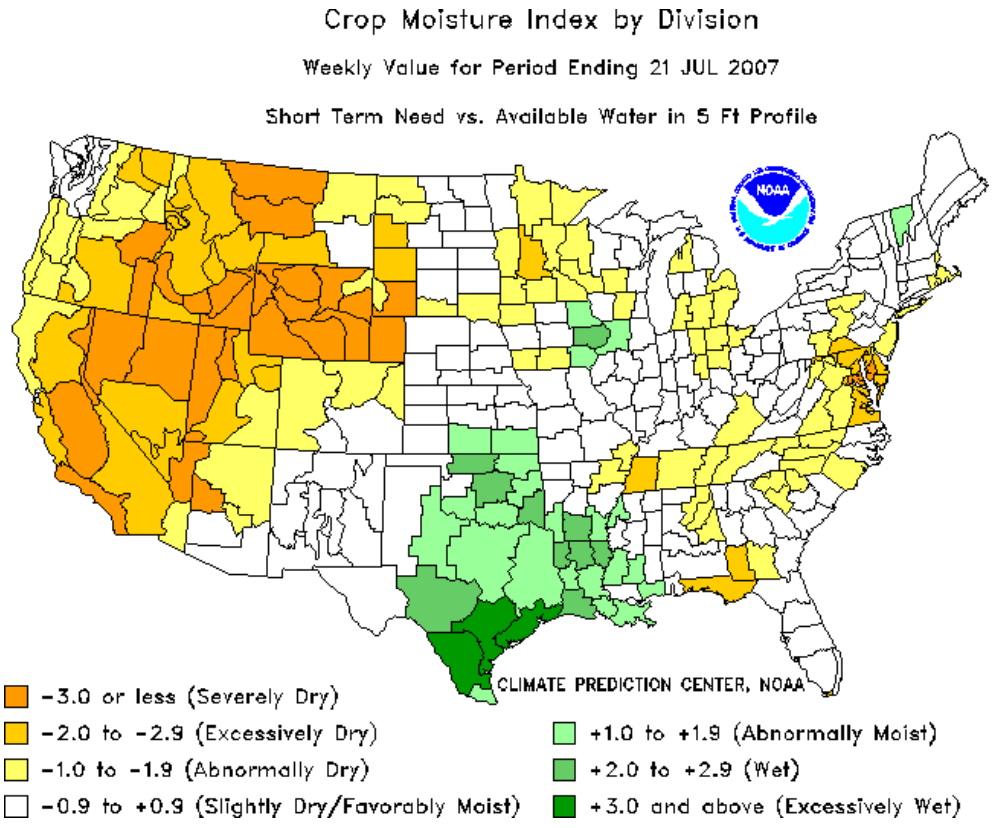
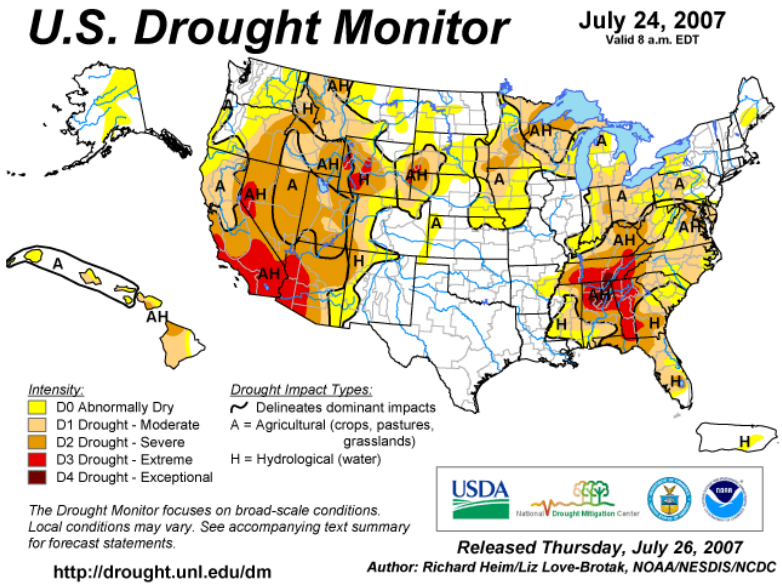
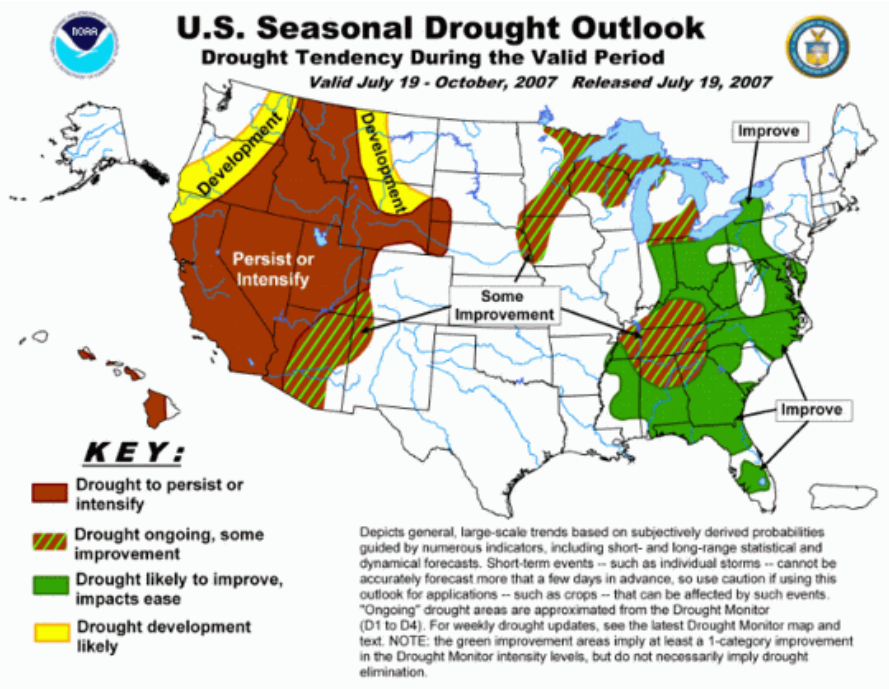


Table 6: US Drought Monitor



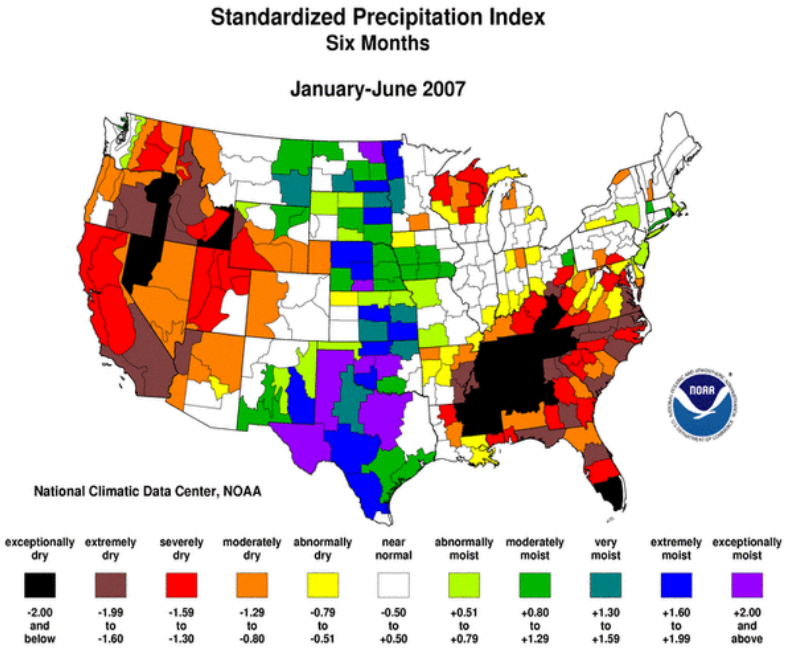
Tables 6 and 7 present national seasonal assessment and state rankings based on precipitation. The Drought Monitor (Table 6) focuses on broad scale conditions, and portrays Rhode Island experiencing a normal intensity through July 24, 2007 The NOAA Seasonal Drought Outlook through October, 2007 projects "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 (evapo-transpiration) 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. The Drought Steering Committee met on April 26, 2007 to review conditions prior to the summer months. At that time a determination was made that weather conditions do not currently warrant the scheduling of a second meeting.

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/

Rhode Island Precipitation
National Weather Service Taunton, MA

Preliminary Precipitation Data (inches) by Drought Region
Past 12 months ending June 2007

RI 1 month Jun 2007	Rainfall	Departure	Percent	Normal
Northwest	3.77	-0.27	93	4.04
Northeast	4.09	0.47	113	3.62
Central West	3.13	-0.88	78	4.01
Central East	3.11	-0.27	92	3.38
Eastern	3.06	-0.62	83	3.68
Southern	2.49	-1.49	63	3.98
New Shoreham	2.49	-1.49	63	3.98

RI 2 month May-Jun 07	Rainfall	Departure	Percent	Normal
Northwest	7.13	-0.91	89	8.04
Northeast	7.93	0.67	109	7.26
Central West	6.03	-2.05	75	8.08
Central East	5.53	-1.51	79	7.04
Eastern	5.46	-2.12	72	7.58
Southern	4.92	-3.20	61	8.12
New Shoreham	4.92	-3.20	61	8.12

RI 3 month Apr-Jun 07	Rainfall	Departure	Percent	Normal
Northwest	16.05	3.52	128	12.53
Northeast	16.09	4.33	137	11.76
Central West	15.01	2.33	118	12.68
Central East	13.45	2.25	120	11.20
Eastern	13.44	1.42	112	12.02
Southern	13.95	1.12	109	12.83
New Shoreham	13.95	1.12	109	12.83

RI 6 month Jan 07- Jun 07	Rainfall	Departure	Percent	Normal
Northwest	28.10	2.11	108	25.99
Northeast	27.80	3.57	115	24.23
Central West	28.67	2.62	110	26.05
Central East	25.77	2.59	111	23.18
Eastern	27.54	2.89	112	24.65
Southern	28.42	2.33	109	26.09
New Shoreham	28.42	2.33	109	26.09

July rainfall through 7/27/07:
Woonsocket ~2 inches, normal = 3.62 inches, 55 % normal
Providence 2.38 inches, normal = 3.17 inches, 75% normal
Newport 2.31 inches, normal =