2007 Parameter Data: Salinity; Salt Pond Coalition and Napatree Point Sites

The distribution and stability of an estuarine ecosystem, such as salt ponds and Little Narragansett Bay, depend on three important physical characteristics of the water: salinity, temperature and circulation. Each affects and is affected by the others. Salinity is the number of grams of dissolved salts present in 1,000 grams of water, so it is usually expressed in parts per thousand (ppt). Freshwater contains few salts (less than 0.5 ppt) which makes it less dense than full ocean strength seawater, which averages 25 to 30 ppt. This difference in density causes salinity to increase with depth, with freshwater remaining at the surface. Water with a salinity of greater than 0.5 ppt but less than 25 ppt is called brackish, meaning a combination of saltwater and freshwater.

Together, salinity, temperature and circulation dictate the physical characteristics of water. The warmer, lighter freshwater flows seaward over a layer of saltier and denser water flowing upstream. The opposing movement of these two flows forms saltwater fronts or gradients that move up and down an embayment in response to the input of freshwater. These fronts are characterized by intensive mixing. A layer separating water of different densities, known as a pycnocline, is formed. This stratification varies within any season depending on rainfall. Stratification is usually highest in the spring as the amount of freshwater in our baysor ponds increases due to melting snow and frequent rain. Stratification is maintained throughout summer due to the warming of surface waters.

In autumn, fresher surface waters cool faster than deeper waters and sink. Vertical mixing of the two water layers occurs rapidly, usually overnight. This mixing moves nutrients up from the bottom, making them available to phytoplankton and other organisms inhabiting upper water levels. This turnover also distributes much-needed dissolved oxygen to deeper waters. During the winter, water temperature and salinity are relatively constant from surface to bottom. (Adapted from the Chesapeake Bay Program website http://www.chesapeakebay.net/physicalcharacteristics.aspx?menuitem=14657)

Results reported here are from samples collected during the monthly water collections, and then analyzed in the URI Watershed Watch laboratory. URI Watershed Watch staff used both LaMotte salinity kits and two refractometers, with the average value rounded to whole numbers reported. Additional salinity data may be available for Narrow River and some other estuarine sites monitored by the volunteers in the field using LaMotte kits.

Monitoring Locations	**2007 Data**						
	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	**MEAN**
Salt Pond Coalition Sites	**- - (g/l or ppt) - -**						
Green Hill - In Pond 0.5 m	24	27	25	28	30	29	**27**
Green Hill - In Pond 1.5 m	24	28	30	32	28	27	**28**
Green Hill - Indigo Pt	22	27	22	26	29	26	**25**
Green Hill - Sea Lea	26	31	31	33	33	31	**31**
Green Hill - Teal Rd	0	29	23	27	25	38	**24**
Little Maschaug Pond	9	9	11	12	14	14	**11**
Ninigret Pond - Crawford Dock	31	32	31	30	32	31	**31**
Ninigret Pond - Stumpy Pt 0.5 m	-	33	26	28	31	30	**29**
Ninigret Pond - Stumpy Pt 1.5 m	-	36	32	29	29	32	**32**
Ninigret Pond - Vigna's Dock	29	34	25	27	30	30	**29**
Ninigret Pond - Western Basin 0.5 m	32	32	31	34	30	32	**32**
Ninigret Pond - Western Basin 1.5 m	31	-	31	34	33	28	**31**
Pt Judith Pond - Champlin's Cove	-	35	33	32	32	33	**33**
Pt Judith Pond - Gardiner Island 0.5 m	-	36	33	30	32	30	**32**
Pt Judith Pond - Gardiner Island 1.5 m	-	32	-	30	33	34	**32**
Pt Judith Pond - Ram Point 0.5 m	19	31	16	25	24	33	**25**
Pt Judith Pond - Ram Point 1.5 m	-	32	-	25	23	-	**27**

2007 Parameter Data: Salinity; Salt Pond Coalition and Napatree Point Sites

Monitoring Locations	2007 Data						
	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	**MEAN**
Salt Pond Coalition Sites	**- - (g/l or ppt) - -**						
Quonnie Pond - Harmonic Cove Channel 0.5 m	33	36	35	35	32	34	**34**
Quonnie Pond - Harmonic Cove Channel 0.5 m	34	35	30	34	33	34	**33**
Quonnie Pond - Harmonic Cove	33	36	32	37	32	34	**34**
Quonnie Pond - Harmonic Cove Buoy 0.5 m	35	35	35	35	33	35	**34**
Quonnie Pond - Harmonic Cove Buoy 1.5 m	34	35	36	33	36	35	**35**
Quonnie Pond - Judge's Rock 0.5 m	34	36	32	33	32	36	**34**
Quonnie Pond - Judge's Rock 1.5 m	34	35	34	35	36	31	**34**
Quonnie Pond - Mud Cove	33	34	35	34	34	33	**34**
Quonnie Pond - N. of Bill's Is. 0.5 m	34	36	33	33	33	33	**34**
Quonnie Pond - N. of Bill's Is. 1.5 m	36	35	35	34	33	33	**34**
Quonnie Pond - Shady Harbor Brk	33	35	31	35	33	34	**33**
Quonnie Pond - Yacht Basin	33	34	34	29	34	29	**32**
Saugatucket River - Caleb's Dock	-	2	2	-	3	-	**2**
Winnapaug Pond - Aquaculture	-	-	32	31	31	31	**31**
Winnapaug Pond - Breachway	33	32	33	35	33	32	**33**
Winnapaug Pond - Golf Course Cove	30	34	34	32	31	32	**32**
Winnapaug Pond - SWest Corner	-	-	32	32	32	33	**32**
	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	**MEAN**
Watch Hill Conservancy Sites	**- - (g/l or ppt) - -**						
Napatree Point - Bayside	-	-	34	31	32	32	**33**
Napatree Point - Oceanside	-	-	32	32	34	34	**33**