Group Seeks Permits for Maintenance
Dredge of Charlestown Breachway

Obligation to maintain and protect restoration success

The Town of Charlestown is seeking permits to perform a maintenance dredge on the sedimentation basin installed in the Charlestown Breachway six years ago. The basin was part of the nationally recognized South Shore Restoration Project that paired breachway dredging with eelgrass restoration. The function of the basin is to catch sand washing in from ocean storms before it reaches the inner channel and eelgrass beds.

The project was funded with money from NOAA through the Army Corps of Engineers. As part of the deal the State of Rhode Island signed a contract to maintain and protect restoration success for ten years. The Town of Charlestown is seeking permits to dredge the basin after the initial ten years. The state is responsible for dredging the basin until the end of its maintenance obligation in 2014. The Town of Charlestown is taking over the maintenance role.

Oyster Restoration Moves Ahead

Plans to build an experimental oyster reef in Ninigret Pond are moving ahead. The Nature Conservancy, with the participation of SPC, has secured grant funding from the NOAA Community Restoration Fund to build a 1/10th acre reef between ten and twenty inches thick.

The project is modeled on a successful project in the Chesapeake Bay that was constructed in 2004. That project installed shell-based reef of two thicknesses and then compared both along with an adjacent area where no artificial reef was present.

Upon inspection in 2007, and again in 2009, the researchers found that the reef had a vibrant oyster population. Density on the high-relief reef was fourfold greater than on the low-relief reef.

The Ninigret project is a small-scale trial of the high-relief concept. Shell will be attached to the foundation in a manner that will allow the shell pieces to break down and provide a substrate for oysters to attach. The project is modeled on the Chesapeake Bay project that was successful. SPC is working with The Nature Conservancy, and the State of Rhode Island. There will be a public dedication event on April 23, the Tidal Page’s 25th birthday.

Janet Coit Nominated to Head Rhode Island DEM

We are happy to report that Janet Coit, the director of the RI chapter of The Nature Conservancy, has been nominated for the position of Director, Department of Environmental Management by governor-elect Lincoln Chafee. Janet has been a supporter of SPC for many years and through her work with TNC has come to know the salt ponds well. We look forward to working with Janet and wish her well as she takes over the reins of this important state agency.
Message From Our President

As another year is winding down, I report to you a very active and successful time in the life of Salt Ponds Coalition. Our success and progress is the result of a dedicated group of volunteers and donors all working together.

This season wrapped up the twenty-fifth year of our water quality monitoring. We have gone from a dedicated group collecting water samples, to a trained group testing the whole gamut of physical, biological and chemical factors, which affect the ponds’ health. We now have our results available to all through Elise Torello’s computer mapping. Dr. Ted Callender has completed several important analyses to identify how some of the measured factors interact within the ecosystem. He has produced several white paper reports which are posted on the website, indicating the pathways that contaminants enter and react within the system. The report on the interaction of ammonium on the nitrogen budget within the ponds is included in this issue. In conjunction with the runoff inputs of nutrients into the ponds, Dr. Anne Veeger and her student Jessica Donohue are monitoring nutrient content of the ground water within the Quonochontaug aquifer, adjacent to the salt ponds.

On the advocacy front, Salt Ponds Coalition continues to participate in an ad hoc group working to address drainage, septic issues and nutrient loading. In addition, I am working on a team with the Town Salt Pond Commission, Corps of Engineers, R.I.C.R.M.C. and URI professionals to secure permits and support for maintaining the Charlestown Breachway. As you may recall, the Corp of Engineers dredged the channel in 2003, and the state has failed to maintain its settlement basin, which is now full, thus allowing the channel to fill. Much more information on this effort will come in the next issue of Tidal Page.

The Board of Directors is pleased to announce that Dr. Marshall Mugge will serve as Treasurer, replacing George Hill, who has served for many years. We welcome Marshall and thank George for his many years of service. Happily, George will remain on the board and continue as a pond watcher. We also wish to thank Johnny Crandall for donating and preparing shellfish and chowder for both our pizza event and Pond Watcher celebration.

We certainly couldn’t do this work without our talented Executive Director and Board of Directors. Our Board is a truly amazing and diverse group that pools their talents to work toward our goal of protecting our salt pond resources. We are grateful for the financial support from both individuals and organizations to make us financially able to continue.

Membership renewals will be sent in January, but I encourage anyone who wishes to make an end-of-the-year contribution to do so.

Thanks to all and have a healthy and happy holiday season.

Art Ganz

Salt Ponds Coalition
The Salt Ponds Coalition stands up for the health and sustainable use of the southern Rhode Island salt ponds. SPC is the only organization whose sole charter is to monitor and protect these unique resources.

www.saltpondscoalition.org
Email: info@saltpondscoalition.org
Mailing address
PO Box 875
Charlestown, RI 02813

Board of Directors
Art Ganz
President
Edward Callender
Vice President & Chair Environmental Committee
Marshall Mugge
Treasurer
Nancy Zabel
Secretary
David Bailey
Sarah Dodd
Barbara Engel
Jack Frost
Sharon Frost
George Hill
Martha Hosp
Roy Jeffrey
William Lester
Leo Mainelli
Dick Sartor
Elise Torello

Executive Director
Mark Bullinger
Tidal Page Editorial and Layout
Mark Bullinger
Scallop Numbers Large Enough for Small Harvest

The salt ponds produced a small treasure this year. When the scallop season opened on the first Saturday of November, there were enough bay scallops to be found in the ponds to provide a fantastic meal or two to those willing to turn off the football and get out on the water to look for them.

Scallops were once prevalent in the ponds, but declining water quality, loss of eelgrass beds and a killing brown tide back in the 80s devastated the populations. Since then many people and organizations have worked hard to restore habitat and scallop stocks. The population is still low by historic standards, but there are enough to find a couple of meals worth if you know where to look.

Prior to December 1st harvesting is restricted to dip netting, which is done from a small boat using a view box and a long-handled net. The scalloper drifts along peering through the glass-bottom viewer and once one of these aquatic jewels is spotted, the trick is to get your net in position fast enough to scoop it up. Easy in concept, but a lot harder when the November wind is blowing your craft along at a smart clip. Once December comes you can snorkel for them, but be warned, you will want a thick wet suit!

Searching for this elusive bivalve is addictive and a lot like hunting Easter eggs. You will see a lot of seaweed, barnacle encrusted rocks and old shells drift by and then all of a sudden, right there before you, is this beautiful, round, three dimensional fluted form sitting on the pond bottom - yours for the taking if you are fast enough. Knowing that each one represents a mouthful of the sweetest most sublime shellfish you will ever taste makes the thrill that much greater.

Scallops are not distributed evenly around the ponds, so the successful scalloper will have to do some sleuthing to find them. One effective way is to keep an eye on hard surfaces where the big gulls drop shellfish to break the shells. If you see scallop shells mixed in, stake the spot out at low tide and see if you can spot where the gulls are fishing. Binoculars are helpful and this being Rhode Island you might want to bring coffee and donuts for the stakeout, too.

Scallops only live a couple of seasons and by the time they are the size of those pictured above, they have spawned and will soon die. The younger crop will winterover and happily there are quite a few spread around the ponds. Juvenile scallops are preyed upon by many predators and they are sensitive to a variety of water conditions that could develop between now and next fall, so who knows if there will be a good crop in 2011.

What a thrill it is to know these fascinating and delicious creatures inhabit our ponds. And what a good reason they give us to maintain the quality of the pond waters, so that one day there will again be thousands of these lovely creatures to reward the lone hunter as well as small-scale commercial harvesters who would supply restaurants and seafood markets with these local gems.
Recycling of Ammonium and Phosphate in Bottom Waters of Quonochontaug Pond

Edward Callender  
Vice-President and Chair, Environmental Committee  
November 2010

Introduction

In the past, scientists and municipal officials in Rhode Island have focused on nitrate inputs to southern Rhode Island coastal lagoons, locally known as salt ponds. In fact, most of the water quality section of the Special Area Management Plan for Rhode Island Salt Ponds Region (CRMC, 1999) talks about nitrate inputs to the ponds and fertilization of algae. More recently, ecological studies of coastal marine waters have shown that both nitrate and ammonium are utilized by marine plankton and algae. In fact, ammonium is the preferred species of dissolved inorganic nitrogen (nitrite, nitrate, and ammonium) due to the fact that it is energetically favored to form amino acids in organic matter while nitrate first has to be reduced. In experimental lagoon ecosystems (mesocosms) set up to mimic the coastal salt ponds in Rhode Island, fertilization experiments confirmed that aquatic plant growth responds dramatically to dissolved nitrogen additions or to dissolved nitrogen when combined with phosphorus. (Data from the University of Rhode Island Graduate School of Oceanography.)

The main sources of nitrate to RI coastal salt ponds are inputs from the atmosphere, watershed (surface water), and groundwater. Lawn and garden fertilizer and pet waste contribute some nitrogen to the salt ponds, but human waste from septic systems is by far the dominant source of nitrate for the five larger ponds (Pt. Judith, Green Hill, Ninigret, Quonochontaug, and Winnapauq) in the salt pond region (Nixon et al., 1982). In fact, residential septic systems represented between 60% (Ninigret) and 90% (Green Hill) of the nitrate inputs to groundwater, the overwhelming largest source of nitrogen to the ponds (Ernst, 1996). However, there was essentially no mention of ammonium inputs to the salt ponds. In groundwater, ammonium is adsorbed onto soil particles and does not move with the water. In surface water, ammonium concentrations are only 10% of the dissolved inorganic nitrogen (DIN) in streams and brooks (Linda Green, personal communication). Maybe some pet waste and swan/geese feces contribute ammonium to the water column, but the main source of ammonium in these salt ponds appears to be remineralization of particulate organic matter in the water column and benthic sediment.

Study Site

The pond chosen for assessing the summer nitrogen dynamics study was Quonochontaug Pond. Quonnie Pond is 4.5 km long and has an average width of 0.5 km. The average depth is about 4 m in the trough that runs from the eastern basin along the southern part of the pond to the Weekapaug Yacht Club Basin. Essentially Quonnie Pond is divided into an Eastern Basin that receives water from a permanent breachway to the ocean (Block Island Sound); and two western basins that are progressively removed from the breachway and have a relatively long water residence time. Waters in the eastern basin are replenished daily by flows from Block Island Sound. On the other hand, waters in the western and extreme western basins have water residence times of up to several days.

The best way to understand the general circulation of Quonnie Pond is to envision a deep-sided bathtub with straight sides that merge with a shallow shelf at the top. Well-oxygenated seawater comes into the pond through the breachway during a flood tide. This ocean water mixes with a minor amount of freshwater from the eastern shore and the mass of brackish water moves along the channel through the narrows and spreads into the western and extreme western basins. Before the tide starts to ebb, some of this fairly well-oxygenated brackish water moves into the shallow northern waters of the western and extreme western basins. However, the amount of this water is less than the volume of the shallow water column, which is only partially replenished by the fairly well-oxygenated brackish water. The result is that the shallow northern areas of the western and extreme western basins receive a limited amount of oxygenated ocean water on any given flood tidal cycle. Thus the origin of up to several days of water residence time for the shallow waters in the western and extreme western basins.

Two localities in Quonochontaug Pond were used to conduct this study from early June to late September, 2010. The Judge’s Rock station (JR), located in the middle of the extreme western basin of Quonnie Pond averages about 3 meters of water depth. Due to the longer water residence time (see the above discussion of pond circulation), this station represented a prime locality where bottom water was in contact with bottom sediment for protracted periods of time when the water column was stratified.

The East Bay Yacht Club station (EBYC) in the eastern basin was chosen to represent an area where bottom water was essentially replenished daily with well-oxygenated seawater transported from Block Island Sound through the Quonnie Pond breachway. As we will see later, this often was the case but not always. The depth of water at the EBYC station just exceeded 3 meters.

Temperature and Dissolved-Oxygen Distributions

Temperature and percent dissolved oxygen saturation in surface and bottom
Army Corps of Engineers Studying Transport of Sand Along South Shore of Rhode Island

Elise Torello

An extensive study is currently under way that is of great importance to the southern RI coast and salt ponds. The U.S. Army Corps of Engineers in partnership with the Rhode Island Coastal Resources Management Council is conducting a study known as the Rhode Island Regional Sediment Management (RSM) Program. Now in its second year, the RSM project has been funded by Congress with $750,000 for FY11 with plans for funding to continue at this level for at least another year. These funds are being used to collect wave and tide data, and locate and quantify sediment sources and sinks, determine sediment transport characteristics, perform historical analysis of southern RI shoreline changes, and begin modeling of sediment transport. The goal of the project is to better understand how sediment moves along the RI shoreline, from Watch Hill to Point Judith, in order to develop a sediment budget and management plan.

Why is this important? Anyone who uses a boat to get into and out of our RI salt ponds has experienced the problem of sediment building up in the breachways and in the ponds. Coastal erosion is also a major problem along the south coast of RI despite repeated efforts to replenish sand and hold back the ocean. Sea level rise will only exacerbate these problems, putting shoreline structures, barrier beaches, and our salt ponds further at risk. Having a more complete understanding of the forces at work and behavior of the sediment will lead to better informed decisions of how to manage these issues.

The modeling of sediment transport along the coast will require a great deal of data, and collection of these data is already taking place off shore, near shore, and in our salt ponds. In fall of 2009, a buoy was deployed about 10 miles southeast of Block Island in about 150 feet of water. The data generated by the buoy are available real time at http://cdip.ucsd.edu/; the station ID is 154. In addition, three yellow, lighted, bottom-mounted Acoustic Doppler Current Profiler (ADCP) buoys were deployed within two miles of shore between Watch Hill and Point Judith in about 30-35 feet of water. These buoys measure wave height and currents, and soon these data should be available real-time on the web as well. Within the salt ponds, 12 gauges (total) were deployed to measure tidal ranges close to and away from the inlets. A meteorology station was installed at East Beach to collect weather data for the study area. University of Rhode Island researchers are working on compiling existing beach profile data to analyze shoreline changes over time using Geographic Information Systems (GIS). Detailed topographic and bathymetric data of the southern RI shoreline and ponds has been collected using Light Detection and Ranging (LIDAR).

Data collection will continue for one year—the buoys will be removed at the end of the summer in 2011. Soon, a web site detailing the project and providing access to the project data will be available—we will publish the link in Tidal Pages and on our web site as soon as it is available.

Ultimately, these data will be used in a RSM Plan. The plan will include refining the analysis of sediment basin and flood shoal growth in the ponds and locating the optimal placement of dredge material. In addition, the possibility of reconfiguring jetties outside of Ninigret, Quonochontaug, and Winnapaug Ponds to deflect sediment around the breachways may be considered. If continued funding in future years allows, potential further research includes: analysis of the impact of sea level rise; location of sources of offshore beach fill sediment; location of offshore sediment sinks (where is the eroded sand going?); flushing/water quality studies in the salt ponds using particle tracking models; updated return period storm analysis (100 year storms, etc); and analysis of storm specific erosion impacts.

It will be very interesting to watch the RSM project move forward and view the very important results—we will keep you updated in the Tidal Page.

Watch for our Special Report on the Breachways in the next Tidal Page.
The Rhode Island salt ponds and 2010 SPC sampling stations
Clockwise from top left: John Crandall donated the raw bar, Jack frost tended the other bar, guests enjoyed the woodsy outdoors on the deck; Vic Divorak and Joe Picano sample the oysters; Sue Lester, Tom Dodd and Dave Bailey visit; guests gathered in the atrium; past and present samplers in attendance; Pam and Art Ganz receive certificate (as did all other samplers).
water from both stations were measured weekly over the summer of 2010. The temperature distribution at the JR station (Figure 1) had several dates where the temperature difference between surface and bottom waters was 1.5 degrees Centigrade or more. On those dates (6/25, 7/09, 8/06, 9/02) when this temperature difference occurred, there was a substantial depletion in dissolved oxygen saturation. Figure 2 shows the distribution of percent dissolved oxygen deficits (surface water minus bottom water % dissolved oxygen saturation) for both the JR and the EBYC stations. For example, if the surface water is 90% saturated with dissolved oxygen and the bottom water is 40% saturated with dissolved oxygen, the dissolved-oxygen deficit is 50%. It is clear that many times during the sampling period, the difference in dissolved oxygen saturation between surface and bottom waters was substantial: 50 to 80 %. The average difference for the study period was 38 % dissolved oxygen saturation for the JR station and 21% for the EBYC station. It appears that the residence time of water at the two stations has a strong influence on the dissolved oxygen in bottom water: longer water residence time (JR station) and more dissolved-oxygen depletion in bottom water.

Relationship between Dissolved Oxygen Deficits and Ammonium Increases in Bottom Water

In Figure 3, the % dissolved oxygen deficit, %DOSat surface water - %DOSat bottom water, is regressed against the ammonium increase in bottom water (bottom water ammonium concentration (uG/L) – surface water ammonium concentration (uG/L)) for the Judge’s Rock (JR) and East Basin Yacht Club (EBYC) stations in Quonnie Pond. In the few instances that there was more ammonium in surface water than bottom water, the data from these dates were converted to 0 uG/L. Since the differences were less than 10% of the average ammonium analyses and the variance of the ammonium analyses fell within this range of analytical reproducibility, this conversion seems justified. For both the Judge’s Rock station and the East Basin Yacht Club station, there were three data points that plotted 0 uG/L ammonium increase (see Figure 3). In addition, there were three sampling times at the East Basin Yacht Club station where the dissolved oxygen deficit was either zero or very close to zero.

Correlation analysis applied to the data points in Figure 3 indicate that there is a fair relationship between oxygen depletion in bottom water and ammonium increase at the Judge’s Rock station (Rsquared = 0.32). At the East Basin Yacht Club station, this relationship was not as good (Rsquared = 0.1). The difference in the goodness of fit between the two regressions is probably due to the fact that bottom water at the EBYC station is significantly more oxygenated than the bottom water at the JR station (i.e., this station receives much more oxygenated seawater from Block Island Sound through the breachway). In addition, bottom water at the JR station sits in contact with benthic sediment for longer periods of time than does bottom water at the EBYC station.

The major premise of this report is that ammonia increases in bottom water from the five major salt ponds in coastal southern Rhode Island are caused by the decay of organic matter in surficial pond sediment and the resultant advective and diffusive flux of ammonium across the sediment-water interface into the bottom water. A similar plot to figure 3 for data (30 data points) from the five major coastal salt ponds sampled in 2007, 2008, and 2009 shows that the goodness of fit for this regression (Rsquared = 0.32) is essentially the same as that for the JR station in the present study. The JR data for the 2010 ammonium recycling study suggest that there may be a relationship between ammonium increases in bottom water and dissolved-oxygen deficit in bottom water. Since there is always some dissolved oxygen in the bottom water of Quonnie Pond, aerobic respiration is the prominent pathway whereby deposited organic matter is remineralized within surface sediments and ammonium is released to the overlying bottom water. Such a relationship may be the result of degradation of organic matter in the upper few centimeters of bottom sediment. During this process, dissolved oxygen is consumed as ammonium is released during the suboxic breakdown of sedimentary organic matter. From the data in Figure 3, it is apparent that this process is more likely to occur at the JR station than at the EBYC station. Longer water-residence times at the JR station are the main reason why this is so; bottom water is in contact with benthic sediment for a substantial period of time whereas at the EBYC station bottom-water is replenished daily by influx of well-oxygenated seawater from Block Island Sound. In fact, the bottom water dissolved-oxygen deficit at the JR station is double that, on the average, of the deficit at the EBYC station.

However, benthic flux may not be the only process that causes the enrichment of ammonium in bottom waters of the coastal salt ponds. There may be one or more processes in the bottom-water column of the ponds that can also result in ammonium enrichment. One major process in the water column that creates ammonium at the expense of particulate organic matter is ammonification. Ammonification is the mineralization of the amino acids in organic matter (urine, feces, dead organisms, etc.) by heterotrophic bacteria to release ammonia and energy. We can envision this as the conversion of organic nitrogen to ammonium. Analysis of data collected in this study shows that particulate organic nitrogen in bottom waters of Quonnie Pond is significantly enriched over that in surface waters; generally by a factor of 1.9 for JR and 1.7 for EBYC. Obviously, there appears to be abundant organic nitrogen to support this ammonification process. In a study of a coastal lagoon in the Gulf of Mexico, it has been shown that ammonifi-
cation of organic nitrogen was high. Ammonium showed a negative correlation with dissolved oxygen. As we can see from Figure 3, the lower the % dissolved oxygen deficit (the greater the dissolved oxygen content of bottom water), the smaller the increase of ammonium in bottom water.

Another process that can result in the production of ammonium in the water column is dissimilatory nitrate reduction to ammonium (DNRA). This process is not well understood. DNRA is favored in reducing environments. This is the conversion of nitrate back to ammonia. There is always some dissolved oxygen in the bottom waters of Quonnie Pond. Thus, oxidizing conditions (some hypoxic conditions) always exist in the bottom waters of Quonnie Pond. In addition, the reduction of nitrate concentrations in Quonnie Pond bottom waters (surface – bottom water) is so small as to make the production of ammonium in bottom water infinitesimal.

Relationship between Dissolved Oxygen Deficits and Phosphate Increases in Bottom Water

As noted in the introduction, results from experimental lagoon ecosystems set up to mimic the coastal salt ponds in Rhode Island indicated that aquatic plant growth responded dramatically to dissolved nitrogen additions or to dissolved nitrogen when combined with dissolved phosphorus. Thus, it is interesting to test whether the bottom- water increase in dissolved phosphate correlated with the dissolved oxygen deficit in the same bottom water.

Figure 4 is a plot of the percent dissolved oxygen deficit in bottom water versus the phosphate increase in bottom water. For both the Judge’s Rock (JR) and East Basin Yacht Club (EBYC) stations, there is a moderately good correlation between the two variables (JR Rsquared=0.53, EBYC Rsquared=0.44)). There were two dates when there was no difference between surface and bottom water dissolved phosphate concentrations at the JR station and three dates when this was the case for dissolved phosphate at the EBYC station. This correlation suggests that as dissolved oxygen declines in bottom water, dissolved phosphate increases. The correlation between dissolved oxygen and dissolved phosphate also suggests that much of the phosphate comes from benthic sediment efflux across the sediment-water interface. Over the years, there have been many studies of phosphorus cycling between bottom sediment and overlying water, both in freshwater and marine systems.

Chemical extraction of oxidized benthic sediment has revealed a direct relationship between iron oxyhydroxide and phosphate. That is, dissolved phosphate has a strong affinity to adsorb onto iron oxyhydroxide. Quonnie Pond bottom sediments are composed mostly of black, sulfide smelling, fine-grained muds. The black color and the sulfide smell are due to the presence of sulfate in the brackish water of the pond. In the absence of oxygen, the sulfate is reduced to sulfide, thus resulting in the black color (iron sulfide) and the sulfide smell. Where there is dissolved oxygen in the pond water (bottom water) adjacent to the sediment, a thin layer of brown-colored sediment exists. Also, when one brings up an anchor from the sediment, it is possible to see this coloration on the surface of the sediment.

Based on the moderately good regression between bottom water dissolved-oxygen deficit and bottom water dissolved phosphate increase (Figure 4), and the presence of a thin iron-oxyhydroxide layer at the surface of anoxic bottom sediment, it seems probable that a benthic flux across the sediment-water interface is the main process that is responsible for the relationship seen in Figure 4. Similar data from Chesapeake Bay sediments shows that as the bottom water dissolved oxygen declines, the benthic phosphate flux increases.

Management Implications and Future Studies

Aquatic scientists and municipal of-

---

continued on page 10
benthic flux of these nutrients across the sediment-water interface, then it would be prudent to assess the magnitude of these benthic fluxes so that a meaningful nitrogen and phosphorus balance can be constructed. So the follow up to the above study is to measure the benthic fluxes of these nutrients. While the above studies and analyses of their data show that benthic flux of ammonium and phosphate may be an important process that feeds the fertilization and growth of algae in the salt ponds, it was not possible to quantify the magnitude of these benthic fluxes.

References


Special thanks to the Weekapaug Foundation for Conservation, which provided funding for year one of this study. Thanks to The Rhode Island Rivers Council for providing grant funding for additional studies next summer. Also, special thanks to Linda Green of URI Watershed Watch for the nutrient analyses and Casey Tremper, a URI Coastal Fellow, who collaborated with the author on this study.

Glossary
Advective- Physical transport of chemical species.
Diffusion- Movement of chemical species along a concentration gradient.
Dissimilatory- Describes a chemical process involving the production of an inorganic compound or element from an organic one.
Flux- The rate of flow of fluid and its chemical species.
Iron Oxyhydroxide- A chemical form of oxidized iron that resembles “rust”.
R-Squared- Correlation coefficient that is a measure of linear association between two variables. A correlation coefficient of +1 indicates that the two variables are perfectly related in a positive linear sense.

Figure 1
Distribution of Surface and Bottom Water Temperatures versus Time at the Quonochontaug Pond

Figure 2
Distribution of Percent Dissolved Oxygen Deficit (Surface - Bottom) versus Time at the Quonochontaug Pond Judge’s Rock and East Basin Yacht Club Ammonium Recycling Stations, 2010
Welcome Marshall Mugge

Marshall Mugge, PhD, has joined the board of Salt Ponds Coalition and will serve as treasurer for the organization, replacing George Hill in that post. Marshall recently retired to the Westerly area after a career in nuclear physics. Marshall’s specialty was in devising experiments utilizing giant particle accelerators to study the nature of exotic particles and matter itself. Marshall worked with several high-profile laboratories including Lawrence Livermore National Laboratory in CA. We are very pleased to have Marshall’s scientific mind on board to help steer SPC. We are quite sure that after helping to unlock the secrets of the universe, Marshall will find our humble books pretty straightforward. We sure are thankful for his help!

Oyster restoration  (continued from page 1)

be collected from raw bars and local seafood processors and will be allowed to age outside so all organic material has time to decompose and wash away.

Next summer the reef will be installed and TNC divers will visit the site periodically to monitor the recruitment of oysters. “We used to be brood stock limited,” says Chris Littlefield of TNC, “but now we’re substrate limited.” Millions of oysters in four aquaculture farms now populate the pond, and although they are raised in wire cages, they still release billions of larvae each year. These larvae prefer to attach to calcium-rich shell, so the hope is by creating thick reefs we can help wild stocks gain a foothold in the pond. If the experiment is successful, additional funding will be sought to expand the technique in Ninigret as well as other ponds.

Oysters used to be plentiful in the ponds and they helped keep them clean by constantly filtering the water. Over-fishing, hurricanes, and disease mostly wiped out the oysters during the 20th century. The reef project will nicely complement ongoing efforts to repopulate the ponds with disease-resistant hybrids.
Please Help Us Help the Ponds

2010 memberships expire at the end of December. Please use this form to renew for 2011 and ask your friends and neighbors to become members, too.

- An SPC membership for the 2011 season helps fund protection of the ponds.
- With your membership, you will receive future issues of the Tidal Page.
- Donations are tax deductible and can help reduce the tax you owe.

Please make checks payable to Salt Ponds Coalition. Memberships run from January through December.

Please enroll the individual/family at right at the following membership level:

☐ $40+ Standard 2011 Membership
☐ $75+ Select Level
☐ $250+ Steward Level
☐ $500+ Patron Level
☐ $________ Donation to the Aukerman Scholarship Fund

Name: ____________________________
Permanent Address
Town __________________________ State _______________ Zip _______________
Summer Address
Town __________________________ State _______________ Zip _______________
Email __________________________
Phone __________________________

☐ Please find enclosed my gift of $_____________
☐ I would like to sponsor a testing station for $600

Please consider a gift to SPC. Your donations to our 501(c)(3) organization are tax deductible.

Abby Aukerman Scholarship Fund

Please help us fund this worthwhile scholarship, which helps support a deserving undergraduate student in marine studies at URI. If you would like to make a contribution to the scholarship fund, please use the form above.

Salt Ponds Coalition
P.O. Box 875
Charlestown, RI 02813
401-322-3068

We appreciate your continued generous support!