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#### IMPACTS OF SALINITY AND NUTRIENT STRESS TO RUPPIA MARITIMA AND ZOSTERA MARINA: A MESOCOSM EXPERIMENT

Healthy seagrass beds were once found throughout the shallow areas of Narragansett Bay, R.I. but have disappeared due to infilling, pollution and disease. In Greenwich Bay, a highly developed embayment within Narragansett Bay, *Ruppia maritima* has colonized an area on the northern shore once dominated by *Zostera marina*. This area is sandy, which may allow groundwater seepage. *Ruppia* is extremely salinity tolerant, and may also be more nutrient tolerant than *Zostera*. We ran a preliminary six week mesocosm experiment at two salinity (20 and 30 ppt) and 4 nutrient (0, 5, 10, and 30  $\mu$ M inorganic N) levels to test their tolerance. The treatments were renewed daily to simulate tidal flushing and the exposure water was dosed with 15N for the first week of the experiment. At the end of the experiment, the plants were weighed and measured, and dried for later isotopic analysis. Of the two species, *Ruppia* had significant structural responses to both nutrients and salinity. With increasing nutrient levels, there was a slight decline in root weight, and a decrease in the total number of shoots. *Ruppia* also had an increase in the number of blades per shoot, which was more apparent at 30 ppt. Average *Ruppia* blade length decreased with increasing nutrients and this decrease was more evident at 30 ppt. *Ruppia* epiphyte cover was greater at 30 ppt than 20 ppt. *Zostera* showed no significant structural differences due to either salinity or nutrients. For both species, there were no differences in shoot or root/rhizome weights in any treatment, nor were there differences in isotopic results due to salinity. For both species,  $\delta^{15}N$  in the tissue increased with increasing nutrient levels. For *Zostera*, %N also increased in the root and rhizomes. Another mesocosm experiment is planned for this summer, using a slightly lower salinity and a wider range of nutrient concentrations to determine *Zostera's* tolerance to nutrient and salinity stress and to confirm the *Ruppia* results.