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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 μ M inorganic N) levels to test their tolerance. The treatments were renewed daily to simulate tidal flushing and the exposure water was dosed with ^{15}N 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, $\delta^{15}\text{N}$ 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.