CAUDLE, K.L.[1], BROWN, C.A.[2], AND KALDY, J.E.[2]. 1. Department of Biological Sciences, Fort Hays State University, Hays, KS, 2. US EPA WED Pacific Coastal Ecology Branch, Newport, OR. Comparing photophysiology of seagrasses in the Pacific Northwest: potential implications for species interactions

Physiological tolerances are a primary control on species interactions mediated through production and growth. We examined how the physiology of native eelgrass (*Zostera marina* L.) and introduced Japanese eelgrass (*Z. japonica* Aschers. & Graeb) responded to temperature in order to predict field interactions. Individual shoots of *Z. marina* and *Z. japonica* were collected from local populations in Yaquina Bay, Newport, OR. Photosynthesis (P) and dark respiration (R_d) were measured using oxygen flux methods at 10, 20, and 30 °C following a 5-10 minute acclimation period. *Z. japonica* P increased with temperature, while *Z. marina* P at 30 °C was significantly lower than *Z. japonica*. At 20 °C both species had similar P rates. R_d rates for both species increased with increased temperature. Although R_d was similar at 10 °C, *Z. japonica* R_d was significantly lower than *Z. marina* at both 20 and 30 °C. Differences observed in photosynthesis at these high water temperatures may be due to heat sensitive oxygen evolving proteins. The ratio of P:R may be related to plant fitness, with higher P:R indicating an advantage with respect to carbohydrate availability. At 10°C and 30 °C the differences in P:R between *Z. japonica and Z. marina* were not statistically significant. However at 20 °C *Z. marina* had a significantly higher P:R than *Z. japonica*. Differences in photosynthetic temperature response between *Z. japonica* and *Z. marina* suggest a mechanism to explain observed zonation patterns and provide insight on how estuarine plant communities may respond to increased water temperatures.