

## **JUNCUS ROEMERIANUS EXHIBITS STRESS RESPONSE TO ELEVATED SALT MARSH SOIL SALINITY**

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Southeastern US coastal salt marshes are experiencing increased salinity and inundation due to sea-level rise and resultant salt marsh die-off along creek and coastal edges. *Juncus roemerianus*, dominant in the Big Bend region of Florida, tolerates high levels of salt within its tissues. Defenses to increased salinity include 1) production of the enzyme proline, an osmoregulator to protect against cellular damage from increased salt ion levels and 2) increased stomatal densities to allow for greater capacity for water transpiration. To what degree *J. roemerianus* utilizes these defenses, and whether sea-level rise may be creating conditions that exceed this capacity, is unknown.

To quantify *J. roemerianus* stress and to provide a predictive measure of possible salt marsh die-off, 12 creek systems on the Florida Gulf coast were intensively sampled from May-June 2019. We measured morphological (stomatal density), physiological (proline, water content, lignin, and ion levels), and growth characteristics (above- and below-ground biomass and stem height and density) of *J. roemerianus*, and sampled soil for salinity, texture, and nutrients in 6 plots within each creek (plots were at three distances from the creek mouth to the inland and positioned at both the creek bank and 40 m into the marsh interior).

Creek systems varied in soil salinities, yet generally showed elevated salinity towards the creek mouth. Surprisingly, biomass production was not significantly affected by distance along the creek reach. However, proline levels, stem density, and stem water content increased significantly with soil salinity, demonstrating a link between plant stress and elevated salinity. This study is the first to quantify salinity-related stress in *J. roemerianus* along the Florida Gulf coast, suggesting that though productivity declines are difficult to measure, these indicators can signal potential pre-die-off conditions in stressed salt marshes.

**PRESENTER BIO:** Ms. Verhulst is a Ph.D. student at the University of Florida in the Environmental Horticulture department. She has over 5 years of experience as an environmental consultant managing numerous wetland mitigation and restoration projects throughout Florida and Georgia before obtaining her M.S. in Biology and now working towards her Ph.D.