Climate change and extreme weather impacts on salt marsh plants

Autumn Oczkowski, Cathleen Wigand, Erin Markham, Alana Hanson, Earl Davey, Roxanne Johnson

Regional assessments of climate change impacts on New England demonstrate a clear rise in rainfall over the past century. The number of extreme precipitation events (i.e., two or more inches of rain falling during a 48-hour period) has also increased over the past few decades. As part of a larger effort to examine the interacting hydrologic effects of increasing rainfall, extreme storms, and sea level rise on salt marsh plants (*Spartina patens* and *Typha latifolia*), we conducted mesocosm experiments to consider how efficiently nitrogen (N) in the rain is being retained by seagrass and cattails at various positions in the marsh. By adding a nitrogen stable isotope tracer to the rainfall treatments (ambient, extreme, drought), we quantified the N allocation and retention for plants receiving different pulses of rain at different positions in the salt marsh. Our hypothesis is that the vegetation will be less effective at retaining N delivered via extreme rains as there is less time for N uptake and transformation. We provide preliminary evidence for how the nitrogen balance of salt marshes will respond to the effects of sea-level rise and rainier weather associated with climate change.