

Preliminary results from a mesocosm marsh experiment with treatments simulating three tidal flooding and precipitation conditions

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Our goal was to observe and quantify the effects of low, medium and high tidal flooding regimes and various precipitation conditions on both *Spartina alterniflora* and *Typha angustifolia* in greenhouse mesocosms. The experiment was maintained for 4 months. Each of 3 tanks (600L) had simulated seawater tidal rise and fall over two cycles daily; each tank contained pots on shelves at 3 heights; tanks received freshwater input which simulated either drought, ambient rain or storm conditions. The drought tank received no freshwater, the storm tank received freshwater biweekly which increased the tank water level by 10cm, and the ambient rain tank received freshwater daily which increased the tank water level by 3.25mm. Each tank contained pots of soil composed of sieved peat, compost and sand at ratios of 2:1:0.125. Half the pots were planted with *Spartina* (n=3) and the other half with *Typha* (n=3).

Here we present data for porewater sulfides, salinity and pH and preliminary soil respiration in both the *Spartina* and *Typha* pots. No sulfides were found in the porewater throughout the experiment. A two-way ANOVA was used to test for precipitation and tidal flooding effects as well as precipitation X flooding interactions on the porewater salinity and pH for each plant species. The main effect of precipitation on *Spartina* was significant for porewater salinity and porewater pH. The tidal flooding effect on porewater pH in *Spartina* pots was significant, but there was no flooding effect on porewater salinity. The main effects of precipitation and tidal flooding and their interaction on *Typha* porewater were significant. The drought tank under low flooding conditions showed lower pH and higher salinity than the other two treatment tanks; this could have an effect on plant vitality. Changes in pH and salinity are important to understand in order to model effects of sea level rise and climate change on marsh grass.