Study of Salt Marsh Restoration Success in Dodge Paddock and Beal Preserve Salt Marsh, Stonington, CT
Nicole Deck, Marine Biology Program
Dr. Gail Hartnett [Faculty Mentor]
Department of Biology and Environmental Science
University of New Haven, West Haven, CT 06516

Abstract:
Data was collected to track the growth rates of both mature and newly planted Spartina alterniflora and Spartina patens to study the effectiveness of a salt marsh restoration project. Measurements were recorded in Dodge Paddock and Beal Preserve Salt Marsh, the restoration site, and Barn Island Salt Marsh, the control site. The growth for Spartina alterniflora generally increased weekly for both locations and plant types, mature or plug. The growth rate for the mature Spartina alterniflora in Dodge Paddock and Beal Preserve was considerably higher than the mature plants of Barn Island (Figure 1). Additional data collection is needed to clarify the growth rates for Spartina patens in Dodge Paddock and Beal Preserve (Figure 2).

Results:
• Growth rate for DP&BP Spartina alterniflora mature plants generally increases each week and shows considerably faster growth than the mature plants of BI (Figure 1).
• Spatial distribution of the plugs for both Spartina alterniflora and Spartina patens in DP&B show no significant change from week 1-6.
• Sprouting of new plants in DP&B occurred only for Spartina alterniflora starting week 2 and continued to week 6.
• The growth rates for Spartina patens show peaks on week 4, but no clear pattern for either DP&B or BI.

Discussion:
The mature Spartina alterniflora in Dodge Paddock and Beal Preserve were planted as plugs in the late Spring, 2014. After 2 years the growth rate of the mature plants is significantly higher in value than the plugs that were just planted in June 2016. Though, information of the mature plants does not exist previous to this date, it is assumed that the growth rates of those plants as plugs would have been different. It would be interesting to see if 2 years from this Summer’s planting of Spartina alterniflora, if that growth rate would resemble that of the mature plants in Dodge Paddock and Beal Preserve currently (Figure 1).

It is assumed that the growth rates for the newly planted plugs for both Spartina alterniflora and Spartina patens are lower because more energy and nutrients are sourced into building complex root systems rather than growing upwards in height. Further investigation in to the sprouting of Spartina alterniflora in the Dodge Paddock and Beal Preserve Salt Marsh can be taken to determine if the source was shoots sprouting from the newly planted plugs or if seeds from the surrounding area are establishing in the marsh. Additional data can be collected to clarify the growth rates of all the plant types, especially for the plugs of Spartina patens in Dodge Paddock and Beal Preserve where no clear growth pattern was observed.

Conclusion:
The restoration project in the Dodge Paddock and Beal Preserve Salt Marsh is a success story. The restored marsh does not resemble the mature marsh as closely as desired, but further monitoring will show its progress towards functioning as a mature marsh with proper tidal flow, increase plant coverage, and introduction of common salt marsh inhabitants.

Materials and Methods:
• Locations: Dodge Paddock and Beal Preserve Marsh, Stonington, CT and a section of Barn Island, Stonington, CT
• Week 1 6/13/16 – Week 6 7/21/16
• Measured plant height from base to tip of stem in centimeters along predetermined transect lines using a sample area of a $\frac{1}{4}$ m² quadrat.
• Collected height data for Spartina alterniflora and Spartina patens
• Took pictures of each quadrat weekly and analyzed for percent coverage of plants in the software CPe

References: