

An Assessment of Nitrogen Dynamics in Branford, Connecticut Salt Marshes

Author: Lillian Mitsakos, Environmental Science B.S.

Department of Biology and Environmental Science

Mentors: Dr. Jean-Paul Simjouw and Dr. Roman Zajac

Abstract:

Salt marshes are grasslands formed on coastlines that are flooded daily by tides. They provide natural protection from flooding and can affect eutrophication patterns in coastal waters. Salt marshes naturally reduce nutrients such as nitrogen that may impact coastal waters through microbial denitrification. Nutrient pollution that comes from ammonia and nitrate that originates in residential and industrial areas will not be filtered, and the excess nutrient will enter the coastal waters when tide water recedes. The objectives of this study were to assess the differences in nitrate and ammonia concentrations between coastal waters and salt marshes at different points of the tidal cycle, to determine if there is a difference in nitrogen concentrations in tidal pools and creeks at low tide compared to at high tide, and measure concentration in marsh groundwater. Water and core samples were taken in two salt marsh systems in Branford CT to determine the concentrations in surface and groundwater. Though the data was incomplete, there were some trends that were visible. Nitrate concentrations in the marshes were lower than ammonia. The data also suggest that there was more nitrate entering the system in flooding waters than was leaving it during ebb tides. The same trend was seen with ammonia. This suggests that nitrogen is staying in the marshes and building up. More samples throughout more of the tidal cycle and year would need to be taken to see if these trends continue.