Sediment oxygen demand in the Penobscot and Bagaduce estuaries

The measurement of sediment oxygen demand (SOD) is important in understanding how industrial effluent, such as paper mill effluent, can impact microbial communities within sediments. SOD is the demand for oxygen due to the decomposition of OM within the sediments. SOD was measured in Morse Cove on the Penobscot River and Tills Cove on the Bagaduce River, Penobscot, Maine in September and October 2019. SOD was measured three separate times using in situ methods that utilized two SOD chambers placed in the intertidal zone of each site for 24 hr. SOD rates did not significantly differ between sites although Tills Cove showed a higher SOD trend overall. Total organic carbon (TOC) was measured in the upper six cm of each site using loss on ignition (LOI) methods to compare to SOD rates. Morse Cove had higher TOC percentage overall and within the first cm of the sediment. Sediment grain size was identified using sieving methods and a ternary diagram, where Morse Cove was identified as a sand sediment and Tills Cove as a silty sand sediment bottom. SOD and sediment grain size results do not coincide with TOC percent between the two sites, suggesting that there are additional factors involved in this system.

Advisor: Steven Baer