Assessing Carbon and Metal Characteristics of Connecticut River Floodplain Sediments

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Stream bank soils and sediments are zones of active accumulation and cycling of organic carbon and metals, mostly due to the continuous exchange between stream waters and stream banks. As long as these soils and sediments are stable they can present effective sinks for both over relatively long periods of time. However high-intensity hydrological events (such as summer storms) are predicted to become more abundant and severe in the Northeastern United States and resulting increased stream flow can lead to augmented stream bank erosion. Carbon liberated to the streams during such occurrences can become mineralized to CO_2 and act as a greenhouse gas whereas metals can present a threat to aquatic wildlife. In order to assess the amount and characteristics of C and metals in a typical New England floodplain, we performed aqueous soil extracts on two depth soil and sediment profiles of the Connecticut River floodplain. Soils were mixed with double deionized water (ratio 1:5) and placed on a shaker for 24 hours to extract the water soluble, mobile fraction of C and metals. Aqueous soil extract solution was then centrifuged and filtered to separate particulate from dissolved matter. Dissolved organic and inorganic carbon as well as dissolved nitrogen concentrations were determined on all samples with a Shimadzu C analyzer. Characteristics of colored dissolved organic matter was quantified with the Aqualog Fluorescence Spectrometer and metal concentrations were measured with a Perkin Elmer ICP-OES. Results will provide important information on amount, characteristics and origin of organic C in the Connecticut River Floodplain and help to make predictions on C stability during flooding.