

Kory Kirby: Land Resources & Environmental Sciences

Mentor: Tony Hartshorn -- Land Resources & Environmental Sciences

Does greater saturation lead to faster soil carbon accumulation in a restored wetland?

Wetlands provide many ecosystem services. In Bozeman, MT, Story Mill wetland site is being restored and converted into a public park by The Trust for Public Land and The City of Bozeman because of these services. Carbon sequestration via restoration of wetland soils is receiving a lot of interest to mitigate carbon dioxide increases. An initial step in restoring these ecosystem services was the creation of the Bozeman Creek Backwater Slough (BCBS), a side channel constructed by excavating nearly ~6200 yds³ of soil to improve surface water quality by enabling Bozeman Creek to spread over a much greater area during flood events. This excavation has established a time zero for measuring baseline rates of carbon accumulation. My previous research has already answered how much soil carbon was lost due to excavation: I estimated 26%. This research looks to answer if carbon is accumulating at Story Mill, and, if so, at what rate? My hypothesis is that organic matter accumulation rates will be greatest in the most reduced/anaerobic location and organic matter accumulation rates will be lowest in the most oxidized/aerobic location along my sampling transects. I will characterize twelve soil profiles, nine in the BCBS, three outside the slough in which I can compare these results to last year results establishing if carbon is accumulating, and if so how much has accumulated over the course of one year. Though my work will only help quantify how much soil carbon can be sequestered in one part of Montana under these conditions, hopefully I can contribute to the statewide portfolio of Montana solutions to climate change.