Organic C Storage and Cycling As Indicators of Ecological Condition For Military Land Management. (S11-prenger105710-Poster)

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Abstract:

We have evaluated a suite of parameters related to soil organic carbon storage and turnover in upland and wetland areas as a means to evaluate ecosystem integrity, ecological status and trends, and in particular, ecological response to natural and anthropogenic disturbance. In general, the responses of soil microbial populations and plant communities to disturbance are related to soil texture and carbon content and quality. We have attempted to develop cause and effect relationships between environmental changes and soil responses, due both to natural variability and anthropogenic perturbation. These primarily relate to nutrient storage and biogeochemical cycling. Total Carbon (TC) was significantly different among low, moderate, and severely impacted wetlands and among low/moderate and severe impacts in uplands. Soil microbial ectoenzymes generally correlated with TC levels. Microbial biomass carbon (MBC) and dissolved organic carbon, when expressed as percent of TC, were significantly higher in severely impacted sites than low/moderate, while the metabolic quotient (respiration per unit MBC) was significantly lower. The results suggest that fairly simple measures of carbon quality and availability may serve as indicators of soil quality or disturbance, and could be particularly useful for tracking the progress of ecosystem restoration.

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