IMPACTS OF LAND USE AND LAND COVER CHANGES ON SOIL ORGANIC CARBON IN ABERDEEN PROVING GROUND

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Soil Organic Carbon (SOC) exhibits a remarkable capacity to adapt promptly to shifts in land use and land cover (LULC), playing a pivotal role in guiding sustainable land management practices. Additionally, SOC makes a substantial contribution to wetland conservation, emphasizing the necessity for a deeper understanding of SOC dynamics. This study aims to calculate the carbon storage and sequestration over time within the Aberdeen Proving Ground (APG) area in Maryland.

While robust prediction data are readily available for other carbon pools, such as aboveground and belowground biomass, a notable gap exists in estimating SOC, especially in APG. Hence, we meticulously evaluate SOC across diverse LULC types, investigating the repercussions of LULC changes on SOC storage and creating a map of LULC for the future scenario to bridge this critical knowledge gap.

Our methodology is organized around three robust processes that are intended to give a thorough understanding of SOC dynamics and changes in LULC. First, we utilize Google Earth Engine to harness the power of sophisticated satellite picture processing and the deployment of cutting-edge machine learning techniques. This stage enables us to collect precise SOC data and essential insights for our research.

The second step involves an in-depth examination of LULC changes. We meticulously investigate how alterations in LULC impact SOC, and this process allows us to uncover the intricate relationships between land cover transformations and SOC dynamics. The regional assessment of carbon sequestration values under potential future scenarios is the focus of the final step. To accomplish this, we employ the InVEST tool (Ver. 3.13.0), which features a sophisticated carbon storage and sequestration model.

This stage is crucial for predicting how SOC and carbon storage may change in response to shifting environmental circumstances and land use scenarios, offering insightful information for attempts to manage the environment sustainably. These findings hold relevance for future research aimed at conserving blue carbon ecosystems as part of adaptive strategies to mitigate climate change.

PRESENTER BIO: Mojtaba Tahmasebi is a Master of Landscape Architecture student at the University of Florida with a diverse academic background in Architecture, Landscape Architecture, and Urban Planning. His research focuses on blue carbon ecosystems and quantifying various carbon pools to enhance coastal resilience.