B25C-1473 - Spatial and Vertical Patterns of Soil Organic Matter in the Salt Marshes of the Venice Lagoon (Italy)

Tuesday, 14 December 2021

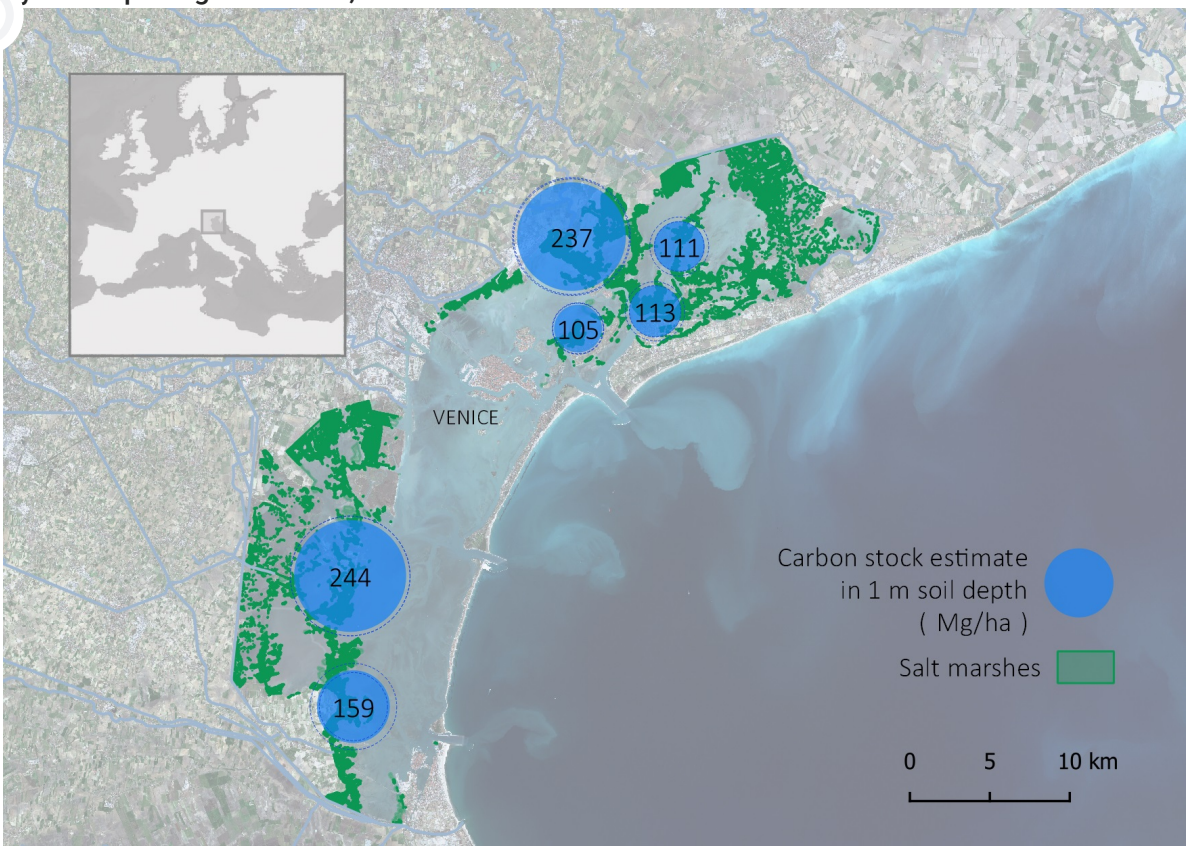
23:00 - 01:00

Convention Center - Poster Hall, D-F

Abstract

Salt marshes are intertidal ecosystems characterized by mostly herbaceous halophytic vegetation and shaped by complex feedbacks between hydrodynamic, morphological, and biological processes. These crucial yet endangered environments are among the most carbon-rich ecosystems on Earth and support a diverse range of ecosystem services, including coastal protection and biodiversity increase. Their primary production coupled with rapid surface accretion results in the ability to sequester and store atmospheric carbon at high rates. Accumulation of organic matter in salt marshes has also a structural role, as it may contribute to vertical accretion necessary for marshes to keep up with relative sea-level rise. A better understanding of the processes regulating soil organic matter (SOM) dynamics in tidal environments is a critical step to predict salt-marsh evolution in the face of climate change and anthropogenic disturbances and to further elucidate carbon sink potential of salt marshes, to the benefit of management and conservation strategies. Toward this goal, we analysed organic matter content in salt-marsh soils of the Venice Lagoon (Italy) from about 40 sediment cores to the depth of 1 m. Vegetation and soil data were collected across elevation and zonation gradients in different areas. Percent organic matter was evaluated using Loss On Ignition (LOI) at 12 depths for each core and carbon stock and accumulation were estimated. We observed that SOM tends to increase when moving away from the marsh edge and to decrease with depth, although sites with higher organic content showed irregular vertical profiles. Estimated carbon stocks were highly variable in different marshes, with higher values in sites affected, either nowadays or in the past, by freshwater inputs. Preliminary results offer insights on spatial and vertical patterns of SOM in salt-marsh soils and suggest that carbon stock in salt-marsh environments can reach considerable values, comparable to those attributed to tropical forests, supporting their carbon sink potential. Differences between measured values at different study sites suggest that SOM accumulation primarily varies depending on organic source and conservation conditions, mostly affected by vegetation, physical and

hydromorphological factors, which are in fact interrelated.



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