Insights: Publications

Climate Change Planning: Soil Carbon Regulating Ecosystem Services and Land Cover Change Analysis to Inform Disclosures for the State of Rhode Island, USA

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The state of Rhode Island (RI) has established its greenhouse gas (GHG) emissions reduction goals, which require rapidly acquired and updatable science-based data to make these goals enforceable and effective. The combination of remote sensing and soil information data can estimate the past and model future GHG emissions because of conversion of “low disturbance” land covers (e.g., evergreen forest, hay/pasture) to “high disturbance” land covers (e.g., low-, medium-, and high-intensity developed land). These modeled future emissions can be used as a predevelopment potential GHG emissions information disclosure. This study demonstrates the rapid assessment of the value of regulating ecosystems services (ES) from soil organic carbon (SOC), soil inorganic carbon (SIC), and total soil carbon (TSC) stocks, based on the concept of the avoided social cost of carbon dioxide (CO2) emissions for RI by soil order and county using remote sensing and information from the State Soil Geographic (STATSGO) and Soil Survey Geographic Database (SSURGO) databases. Classified land cover data for 2001 and 2016 were downloaded from the Multi-Resolution Land Characteristics Consortium (MRLC) website. Obtained results provide accurate and quantitative spatio-temporal information about likely GHG emissions and show their patterns which are often associated with existing urban developments. These remote sensing tools could be used by the state of RI to both understand the nature of land cover change and likely GHG emissions from soil and to institute mandatory or voluntary predevelopment assessments and potential GHG emissions disclosures as a part of a climate mitigation policy.

Related People



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