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ASSESSMENT AND MODELING OF COVARIATES AND FACTORS AFFECTING IRISH PEATLAND PROPERTIES USING MIXED MODELING WITH A FOCUS ON SOIL ORGANIC CARBON

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In the Republic of Ireland, peatlands constitute the largest soil organic carbon (SOC) stock. Recent research suggests that 75% of SOC is stored in an area covering an estimated 20% of the land surface; predominantly in the form of raised bogs in the centre of the country and blanket bogs along the western seaboard. Despite their importance as an economic resource and ecological refuge, a nationwide assessment of the impacts of land disturbance on peatland properties has been lacking thus far. Current research, funded by the Irish Environmental Protection Agency (EPA), addresses this issue with the goal to fill various gaps related to mapping and modeling the distribution of Irish peatland properties. Data from the first nationwide peatland survey forms the basis for this study, in which the influence of different covariates and factors on SOC in peatlands was examined. As a first step, a data exploratory analysis was conducted to assess the major covariates of SOC properties in peatlands. Then, a mixed modeling approach was applied, in order to identify the relevant covariates and factors that are responsible for the differences observed in SOC properties across the country. In addition, model performance to map peatland carbon properties was evaluated. Results of the study will be presented with a focus on discussing the suitability of the mixed model approach to assess the variability in peatland properties and inform climate policy instruments.