Parametrization of empirical models of carbon prediction in the soil of the Caatinga biome

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The construction of prediction models needs surveys of databases, consisting of variables correlated to the phenomenon that one wishes to predict. In the construction of models that aim to predict soil properties, such as carbon content, it is necessary to select factors that have a direct relationship with the formation and modification of this property. Therefore, the objective of this study was to evaluate the parameterization and the influence of parameters related to soil organic carbon in a catchment area in the Caatinga biome. The experiment was conducted in the Basin Representative of Benguê (BRB) located in Northeast of Brazil. A total of 60 soil samples were collected at BRB which has an area of approximately 1,000 km^2. Soil samples were collected in the 0-0.20 m layer to obtain the carbon and clay contents (g.kg-1). The other parameters were obtained through the digital terrain model (SRTM), official Brazilian database and images of the Landsat-TM satellite 8. It was evaluated parameters such as slope (%), aspect (°), reflectance, NDVI and mean annual precipitation (mm). The data were submitted to the Spearman correlation index to evaluate the relative influence of these in the determination of organic carbon contents in the soil. Total organic carbon showed a significant positive correlation with precipitation (0.38). The correlations observed between the bands of the Landsat-8 satellite and the total organic carbon were all significant, except for band 6 - Shortwave Infrared (SWIR) 1. Nevertheless, these correlations indicate an expressive possibility of using the reflectance bands for the construction of the prediction models. No significant correlations were observed for the topographic variables, nor for the NDVI in the latter case. This can be attributed to the complex vegetation dynamics of the biome observed. Therefore, it can be concluded that the significant relative influence observed between the climatic variables and the bands of the Landsat-TM 8 satellite show feasibility in its use for the construction of models of prediction of organic carbon contents in the soil of the Caatinga biome.