PROGRAM

ABSTRACTS

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Prediction of mineral soil fraction through regressions trees and multiple (linear) regressions

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The principal users of soil surveys products are interested to understand how soil properties vary in the space and time. In order to support the decisions makers, the digital soil mapping arises to represent in a quantitative way the spatial variability of soil elements, incorporating pedometric concepts to soil surveys. The goal of the study is the evaluation of two techniques (regression trees, multiple regressions) to predict mineral fraction content (clay, sand), and silt/clay relation index. This index is useful to understand weathering action on soil development, being commonly adopted in soil surveys from tropical landscapes. The study area is a watershed located in Rio de Janeiro (Brazil) under wide variability of landscapes. Terrain attributes are derived from a digital elevation model with 30 m of spatial resolution, to represent landscape co-variables used as an input in predictive models. The selection of the sample sites is based on Latin hypercube algorithm to choose a representative set of one hundred points feasible to access on field. The preliminary results show better performance from Regression Tree models which uses as input up to seven co-variables, while multiple regressions uses approximately a double of input variables, turning the models more complex without gain in precision. Furthermore, better values to adjusted R^2 were obtained with Regression Trees models, corresponding to 0.47, 0.57, and 0.46; to sand, clay, and silt/clay relation, respectively. This is a work in progress. The next step will be to apply soil depth functions through the Spline algorithm to standardize the values to a predefined depth. This procedures will be applied with the aim of improving the above mentioned results, and to allow the generation of 3D maps to the attributes. The products obtained from digital soil mapping approach can enhance soil survey reports, providing easier interpretation to soil management and land use decisions.