

ESTIMATION OF SOIL CARBON STOCK IN COFFEE CROPS IN THE AMAZON BIOME

Introduction

The “Matas de Rondônia” (study area) covers approximately 4.2 million hectares; the soil types are Argissolos (41%), Latossolos (26), Neossolos (17), Cambissolos (10), Plintossolos (4) e Gleissolos (1); and coffee is grown in full sun and monoculture. Producing an estimate of soil organic carbon (SOC) stock in coffee crops may contribute to public policies related to best management practices that increase both carbon sequestration and SOC stocks. The objective of this study was to determine SOC stocks in coffee crops in Matas de Rondônia using geotechnologies.

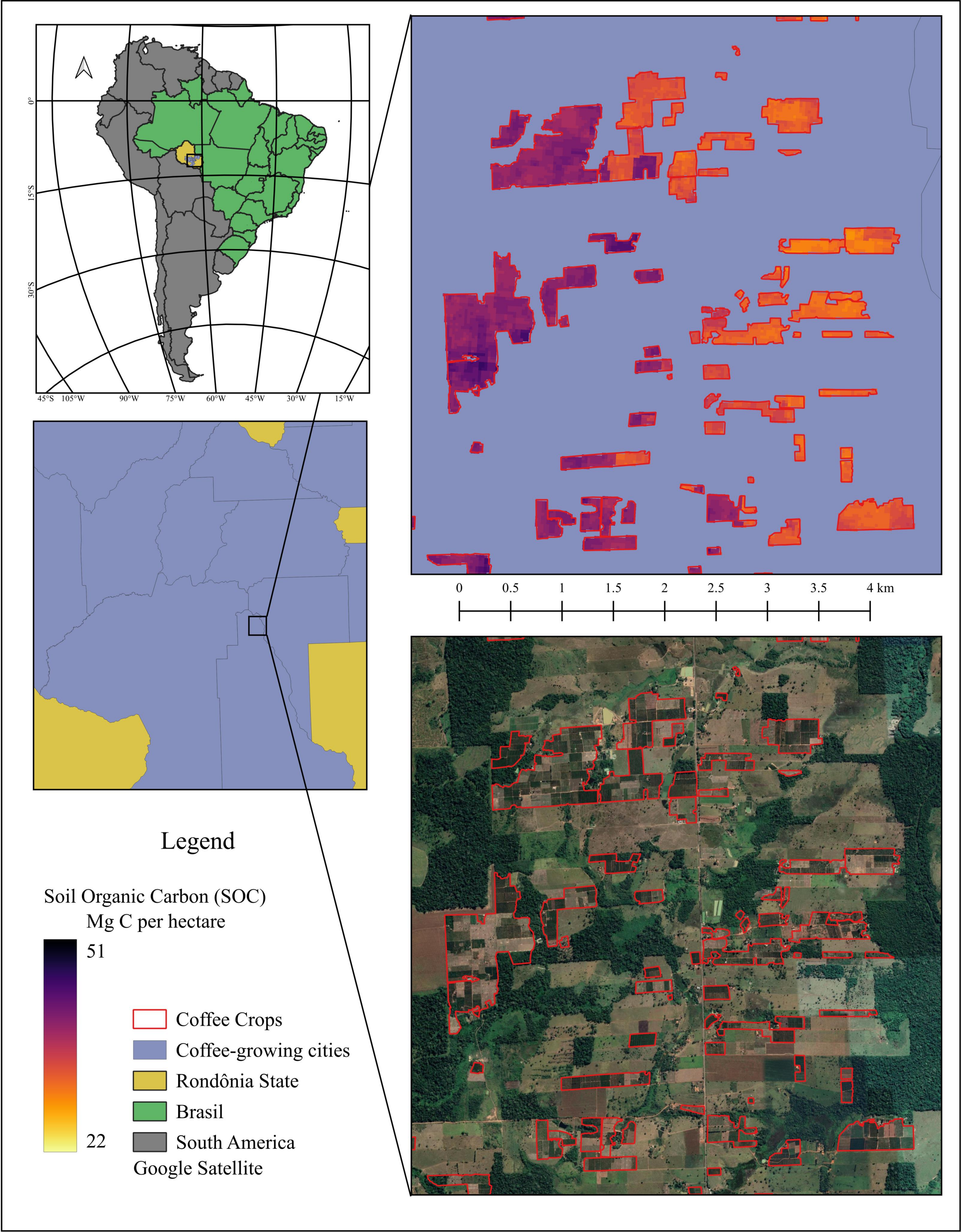
Results and discussion

We estimated 1,145,125 tons of SOC stocked in the 34,447-hectare coffee crop area. The average SOC per hectare was 33.24 tons, and minimum and maximum estimated values were of 22 and 51 tons per hectare, respectively. It is noteworthy that good management practices—such as nitrogen fertilization management, maintaining vegetation between rows, green fertilization, ecological mowing, among others—may reduce emissions and increase CO₂ sequestration in these areas, potentially boosting SOC stocks. Considering that the observed average SOC per hectare was 33.24 tons and the maximum was 51 tons, we estimate that adopting best management practices could hypothetically increase SOC stocks by approximately 611,672 tons in Matas de Rondônia’s coffee-growing areas. In situ SOC surveys are currently in place to validate or refute our estimates.

Conclusions

In this context, the results shown here may strengthen the pursuit of consumer markets which are more demanding with regard to greenhouse gas emission mitigation, as well as promote policies and programs for environmental service payments and certification for low carbon emission system in the Amazon.

Figure 1
“Matas de Rondônia” (study area) and soil organic carbon – SOC (Mg C ha⁻¹) in coffee crops.



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