Bioclimatic processes and vegetation responses under climate change scenarios in the Southern Espinhaço Mountains (Brazil)

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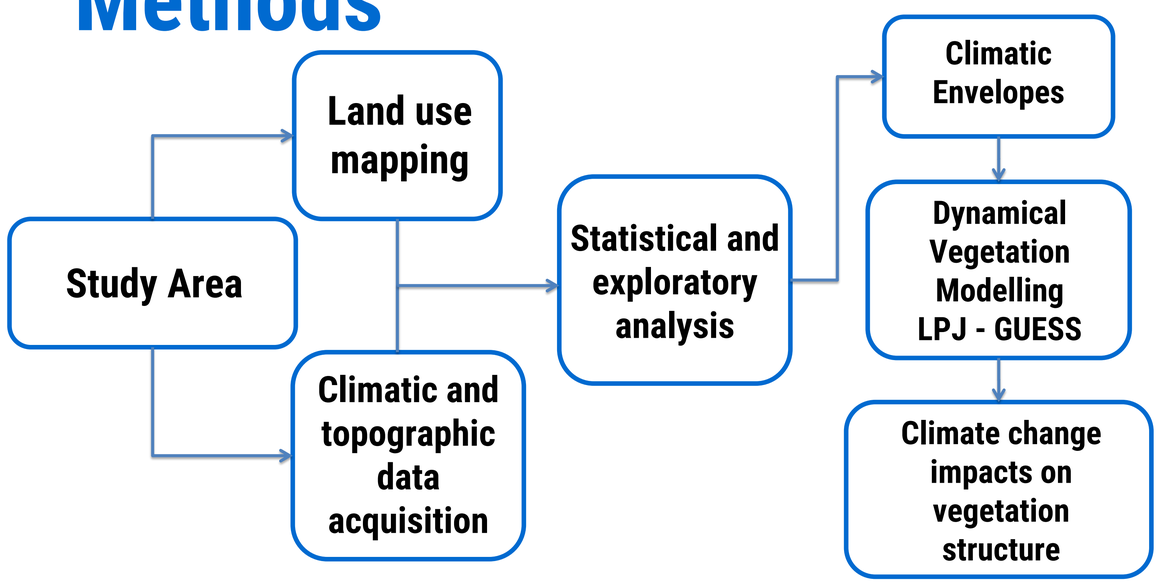
Introduction

Mountainous environments have processes-generating characteristics that influence, directly and indirectly, the functioning and structure of ecosystems. Considering the ecological importance and the complexity of bioclimatic processes in mountainous environments, these regions are particularly threatened by climate change. The Espinhaço Mountain Range, the largest mountainous region in the interior of Brazil, has large topographic variations and a complex and diverse ecosystem structure [1].

Objectives

The general objective of this study is to understand how bioclimatic mechanisms are related to the current distribution of different types of vegetation observed along the southern Espinhaço Mountains, and how these patterns and mechanisms can respond to future scenarios of climate change.

Methods



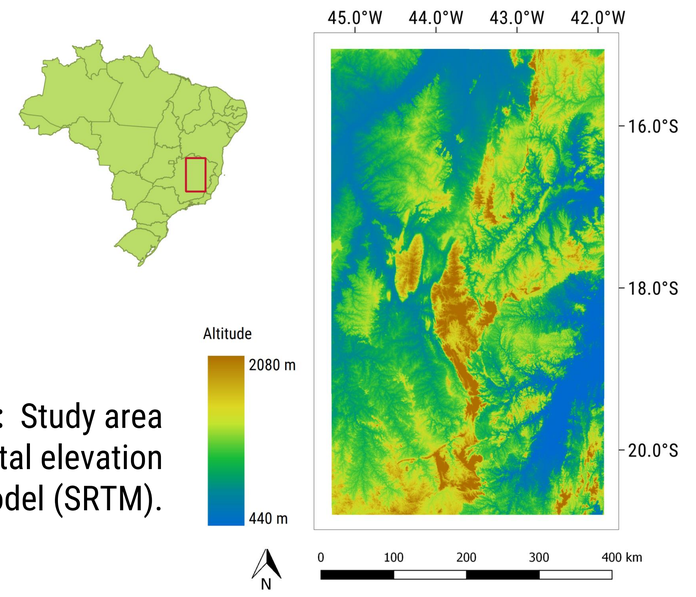


Figure 1: Study area and digital elevation model (SRTM).

Preliminary Results

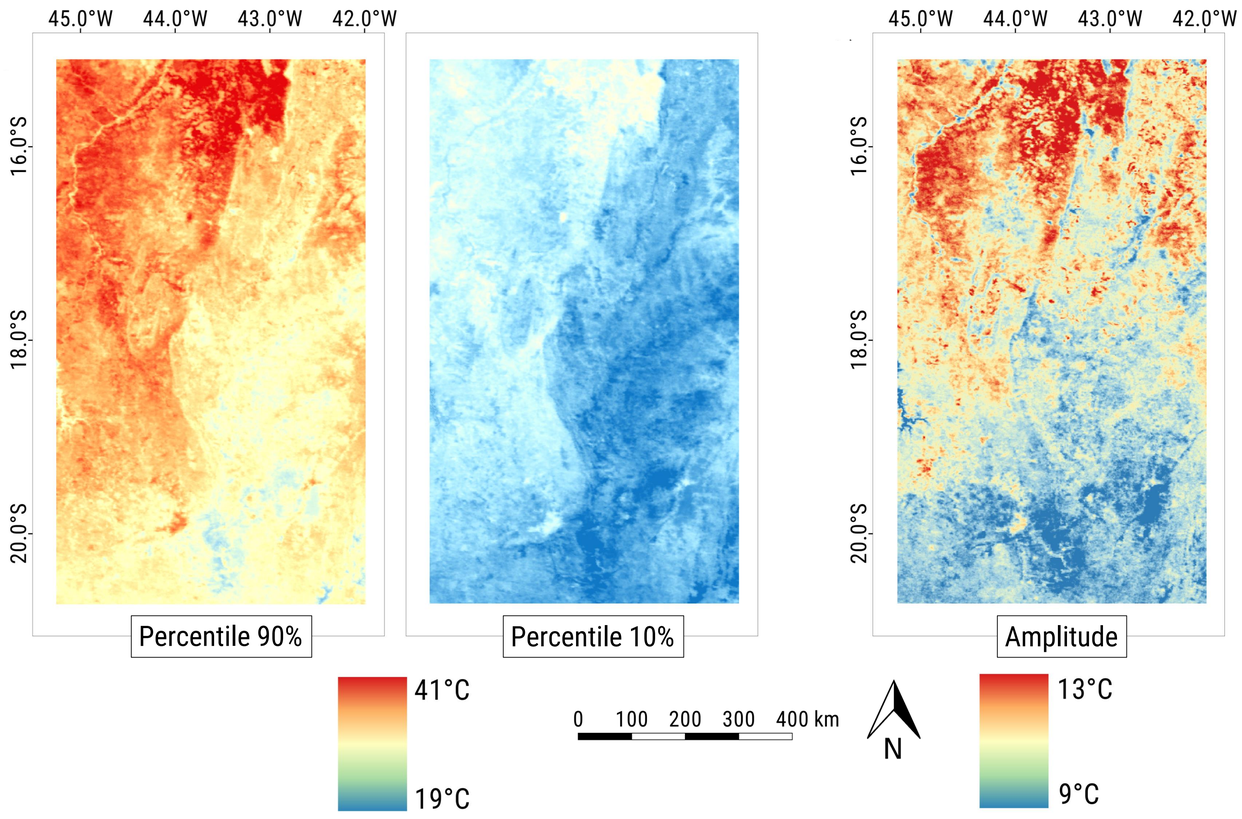


Figure 2: Temperature MODIS MOD11A2 (2000-2016).

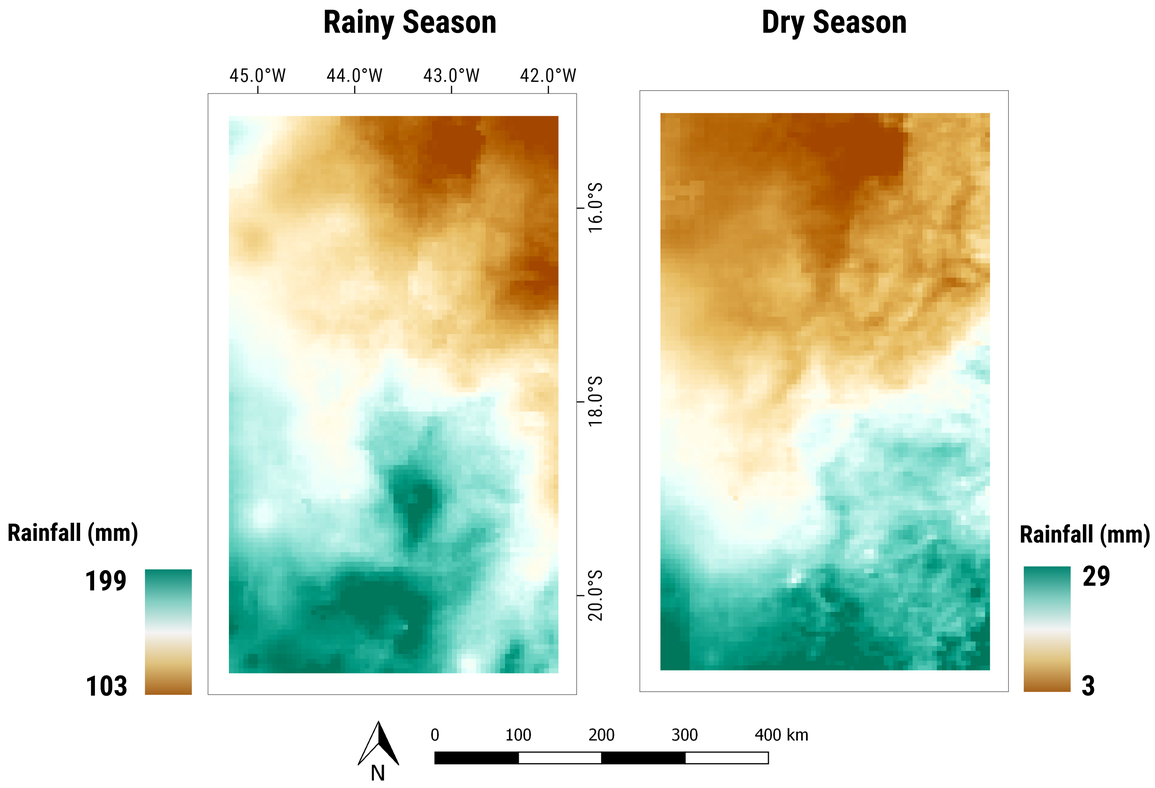


Figure 3: Rainfall seasonal means (CHIRPS 1981-2016).

Preliminary Conclusions

- Precipitation has a pronounced latitudinal pattern
- Influence of the South Atlantic Convergence Zone (SACZ) and the Atlantic Tropical Mass (mTa) on rainfall patterns
- Temperature has a pronounced longitudinal pattern
- Temperature pattern is influenced by mTa (cloud coverage) [2] and adiabatic differential rates of air cooling and heating

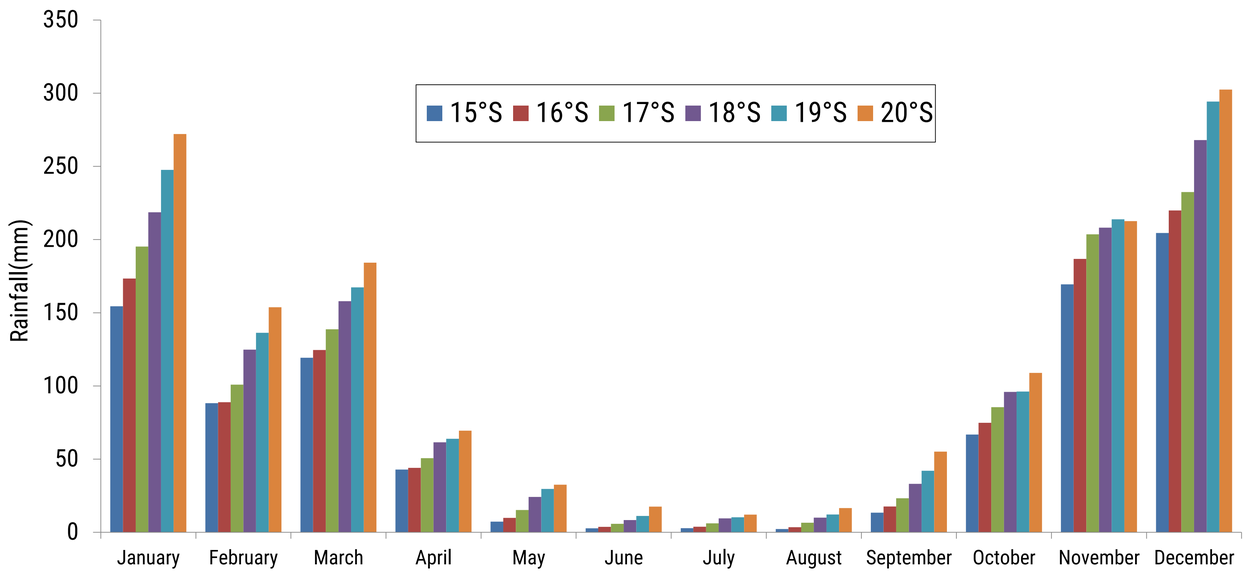


Figure 4: Rainfall latitudinal means (CHIRPS 1981-2016).

Acknowledgments

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