Evaluation of the Evapotranspiration in the São Francisco River basin, Brazil

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INTRODUCTION AND METHODOLOGY

- The use of evapotranspiration (ET) is essential in measuring the water balance of a watershed in order to calculate the water loss due to evaporation.
- ET has been used in water resources, and agricultural management, mostly in Brazil.
- In São Francisco River basin (SFR), the ET monitoring is essential due the regional socio-economic development (water management, agriculture, and energy production).
- Recognizing its significance, the ET monitoring via environmental satellites aids in the investigation of larger regions.
- In this approach, the goal of this effort is to assess the ET pattern in the SFR basin.
- This work made use of ET data from 4th edition of the GLASS Product (0.05° x 0.05° from 1982 to 2018).
- Descriptive statistics were used to assess the ET pattern (mean, standard deviation - SD, and coefficient of variation - CV).

RESULTS

- **Annual Pattern**

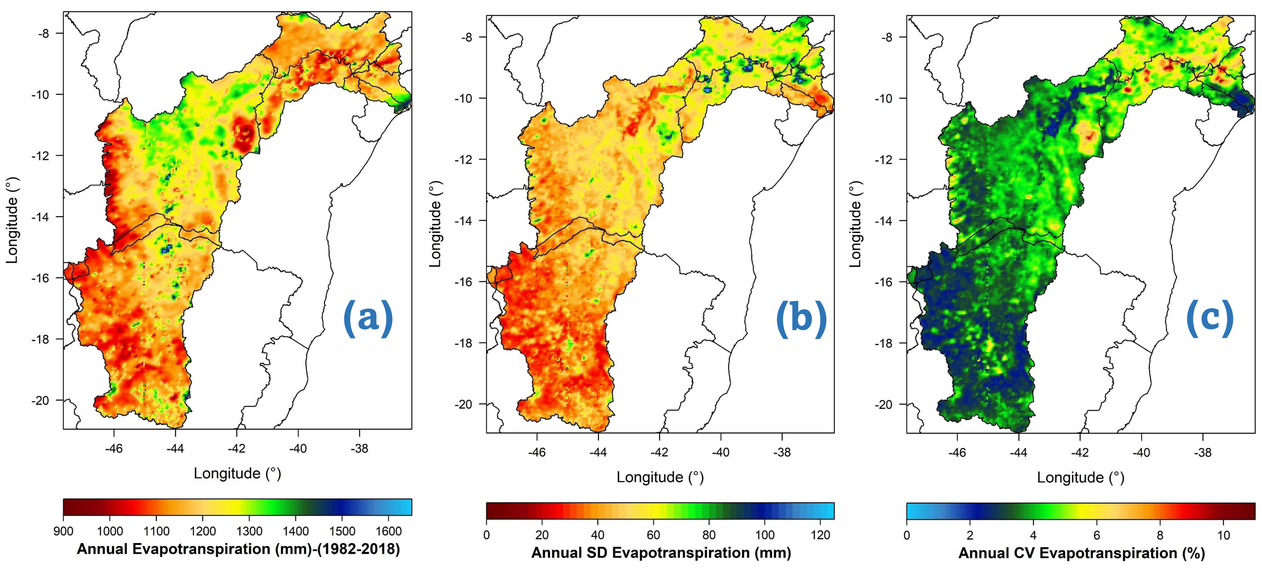

Figure 1 – Annual evapotranspiration maps in the SFR basin (1982 - 2018): (a) mean, (b) Standard Deviation (SD), and (c) Coefficient of Variation (CV).

- **Seasonal Pattern**

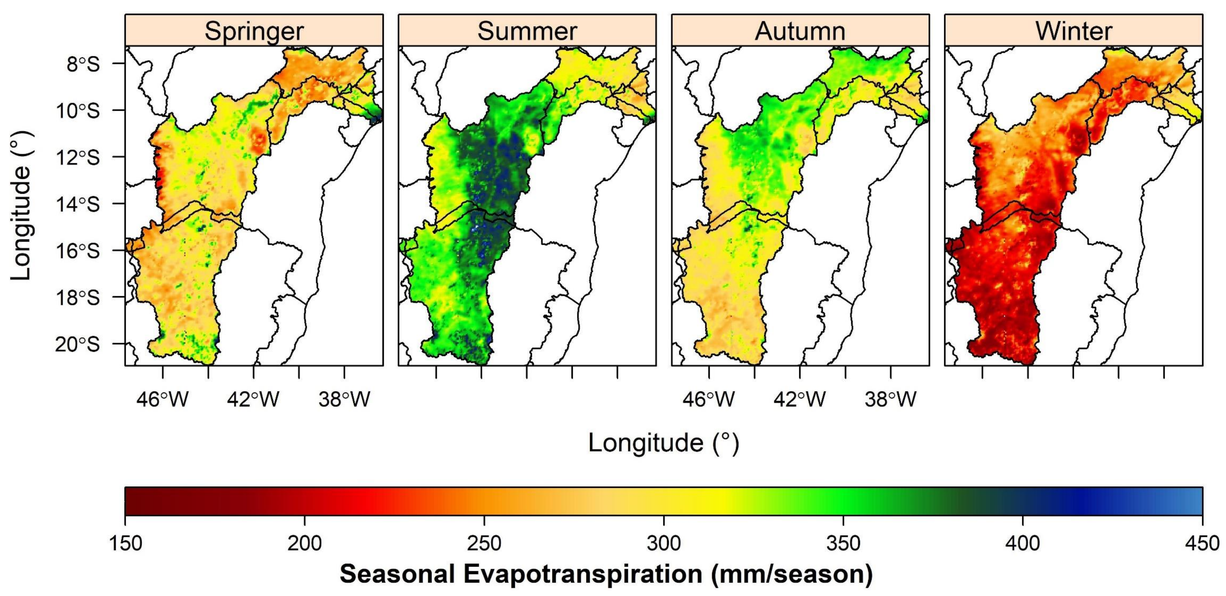

Figure 2 – Seasonal mean evapotranspiration (1982-2018) in the SFR basin.

- In terms of annual mean values, the lowest ET values with values ranging between 800-1100 mm/year and a SD of 5-20 mm/year.
- The highest ET values are detected in the central and northeastern SFR basin, with values > 1300mm/year.
- In the central SFR occur due to several aspects: (a) elevation (< 500 m), (b) vegetation (*Caatinga* biome), (c) greater dam for electricity production (*Sobradinho* Lake), and (d) semi-arid brazilian region.
- In northeastern SFR, the highest ET values occurs due to high evaporative content of SFR and the Atlantic Ocean, as well as the vegetation aspects (Atlantic Forest biome).
- In annual CV terms, the ET data presents low dispersion / variability of data (<10%).
- In seasonal patterns, austral winter (summer) presented the smallest (highest) ET values, with values < 250 mm/season (> 250 mm/season).
- In summer, the rainfall weather systems affects the patterns of bigger and lesser ET indices in SFR basin.

FINAL CONSIDERATIONS

- The preliminary results appointed that the biggest ET values have been proven in the central and northeastern SFR basin region due the local and climatic characteristics.
- The austral winter (summer) exhibited that the smallest (highest) ET values occurred due to rainfall seasonal weather systems in the SFR basin region.