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Effects of ENSO on sugarcane production in Brazil

Megaraptor_Pop_Maestoso

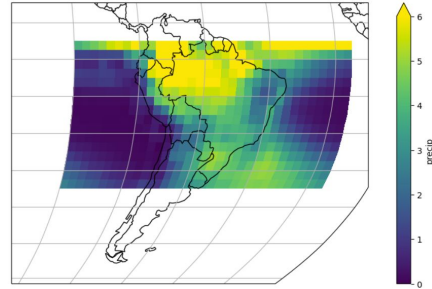


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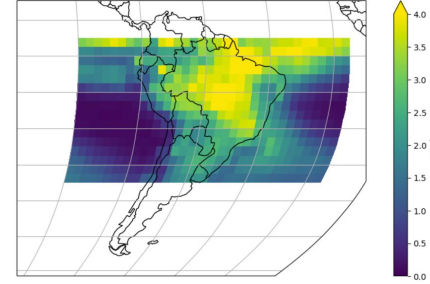
Introduction

- ENSO affects temperature and precipitation around the globe causing extreme weather events affecting food production
- Brazil is world's largest sugarcane producer
- Sugarcane requires specific growing conditions
- What is the effect of ENSO-linked extreme weather events on the production of sugarcane in Brazil?

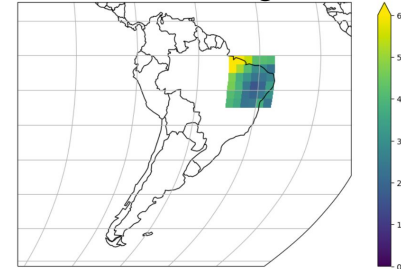
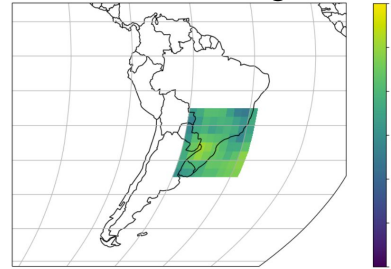
Historical mean rainfall over Brazil



Historical variation of rainfall



Major sugarcane production regions
Southern region Northeast region



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Hypothesis:

ENSO-linked extreme events will affect sugarcane crop production in Brazil

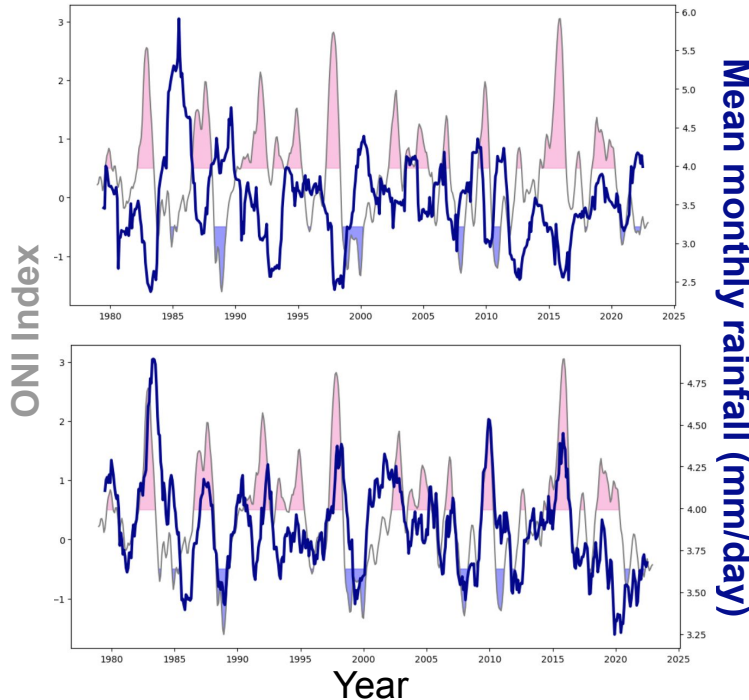
Study period:
1979-2022



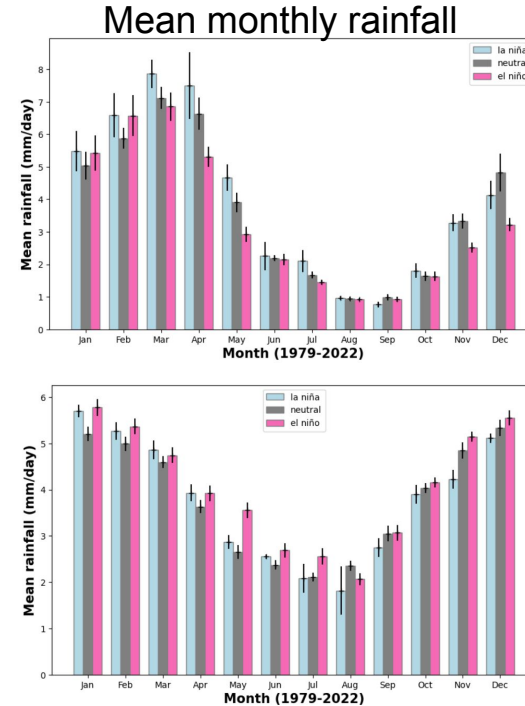
Pattern of rainfall associated with ENSO phases

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North
East:



South:

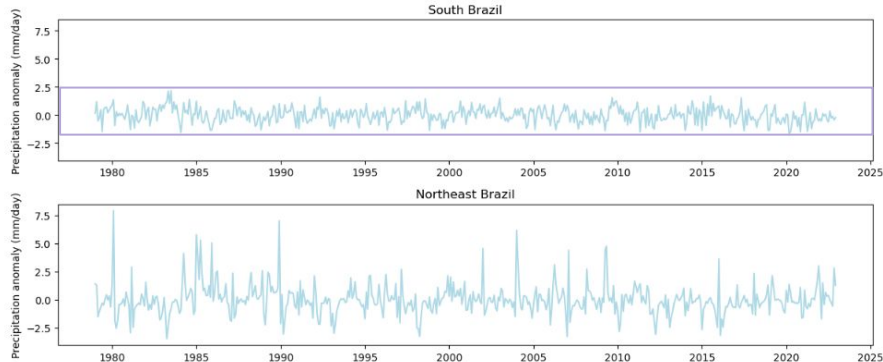


ENSO, Sea Surface Temperature (SST) and rainfall relationships

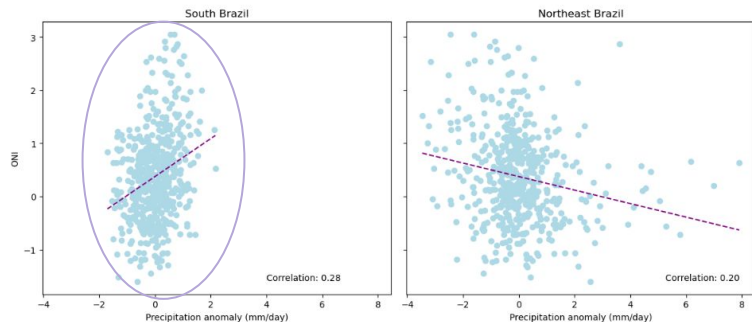
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Precipitation anomaly vs ONI

Precipitation anomaly timeseries

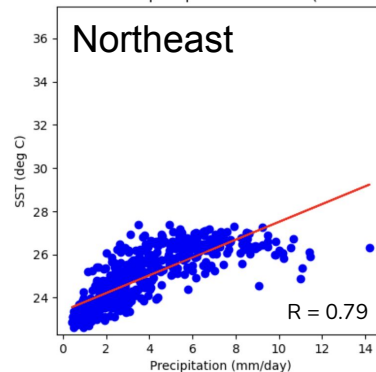


ONI vs Precipitation anomaly

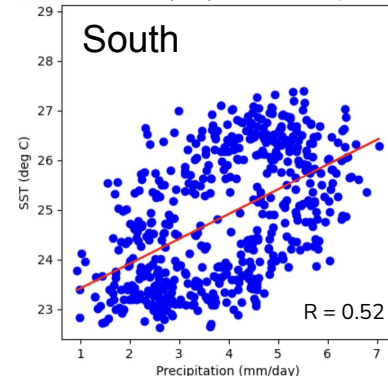


Precipitation vs SST

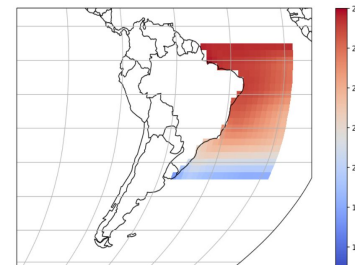
Correlation between precipitation and SST (Northeast region)



Correlation between precipitation and SST (South region)

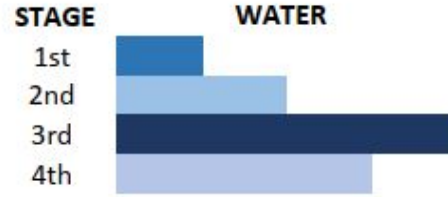
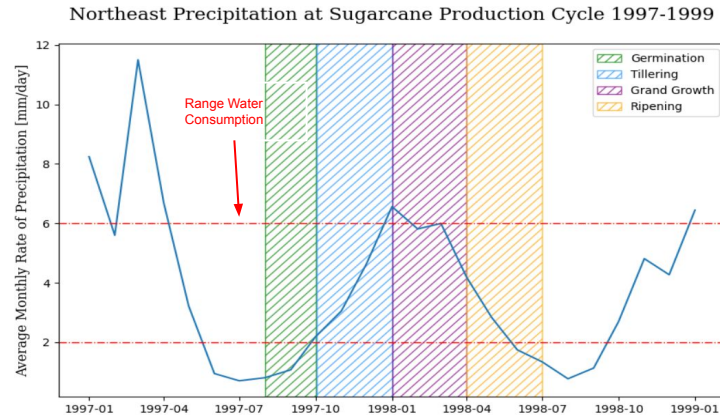
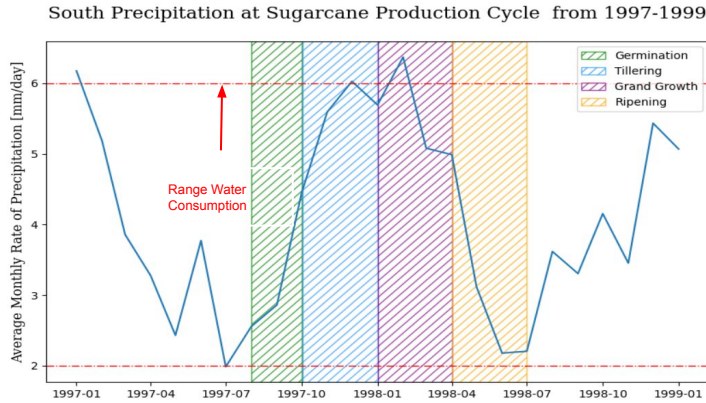


Mean SST Atlantic



Overview of el niño effects on sugarcane production

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Preliminary conclusions:

ENSO affects precipitation in different ways in sugarcane producing regions of Brazil.

Future Work:

Quantify the relationship between ENSO, precipitation, temperature, extreme weather events and sugarcane production, for future climate projections.

