

[Speaker
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Impact of SST variations due to ENSO in rainfall index and possible social impacts in Southern Brazil

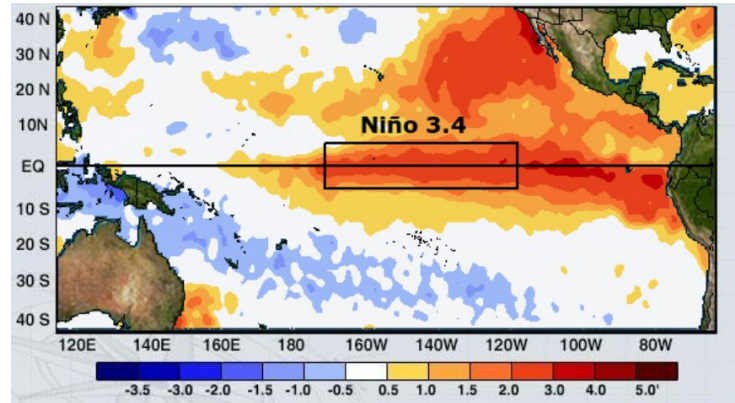
Quilmesaurus_Gwara_Stacatto



El Niño

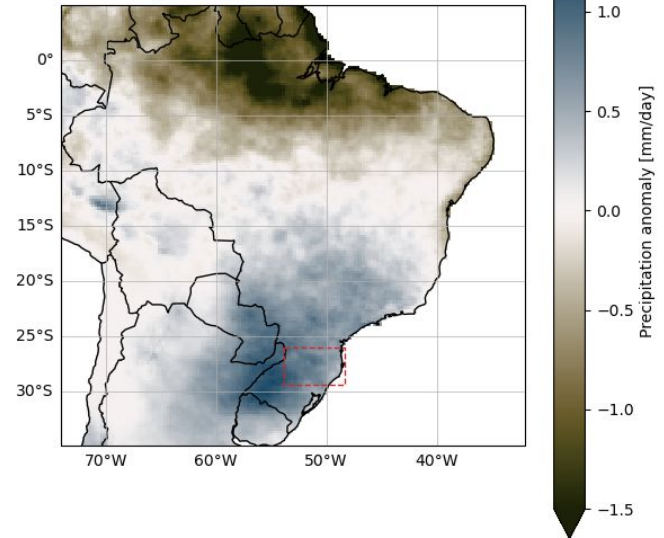
Region 3.4 - SST variations

- Climate Impact: precipitation extremes in Santa Catarina (SC) - Brazil

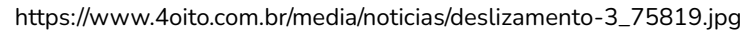


https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.climatempo.com.br%2Fnoticia%2F2015%2F09%2F29%2FEl-nino-analise-da-tsm-7733&psig=AOvVaw2h53_n6GWkg9b02815vRcA&ust=1690636068502000&source=images&cd=vfe&opi=89978449&ved=0CBEQjRxqFwoTCLD996e8sYADFQAAAAAdAAAAABAE

El Niño
CHIRPS daily data from 1982 to 2022



- SC is recurrently affected by mudslides
- Resulting social impact : increase mudslides risks - loss of lives and damage to infrastructure, agricultural lands and housing.



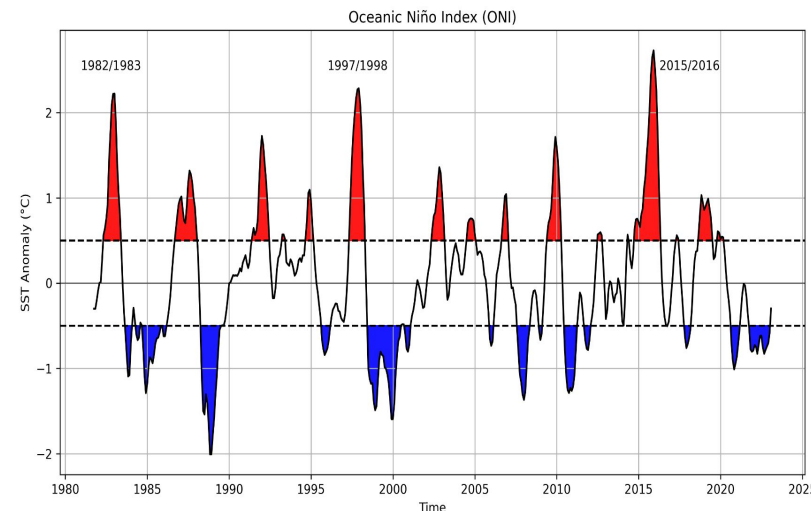
The map displays the Southern Cone of South America, focusing on Brazil, Argentina, and Uruguay. Brazil's states of São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul are highlighted in light yellow. A dashed box labeled 'A' encompasses the southern portion of Rio Grande do Sul, while a solid black box labeled 'B' covers the northern portion of Santa Catarina. Red circles of varying diameters represent population density, with a legend in the bottom right corner defining five size categories: 1.000.000, 2.000.000, 5.000.000, 10.000.000, and 25.000.000. The map also shows neighboring countries Uruguay and Argentina, and the Rio de la Plata water body.

Impact of SST variations due to ENSO in rainfall index and possible social impacts in Southern Brazil



Dataset and Methods

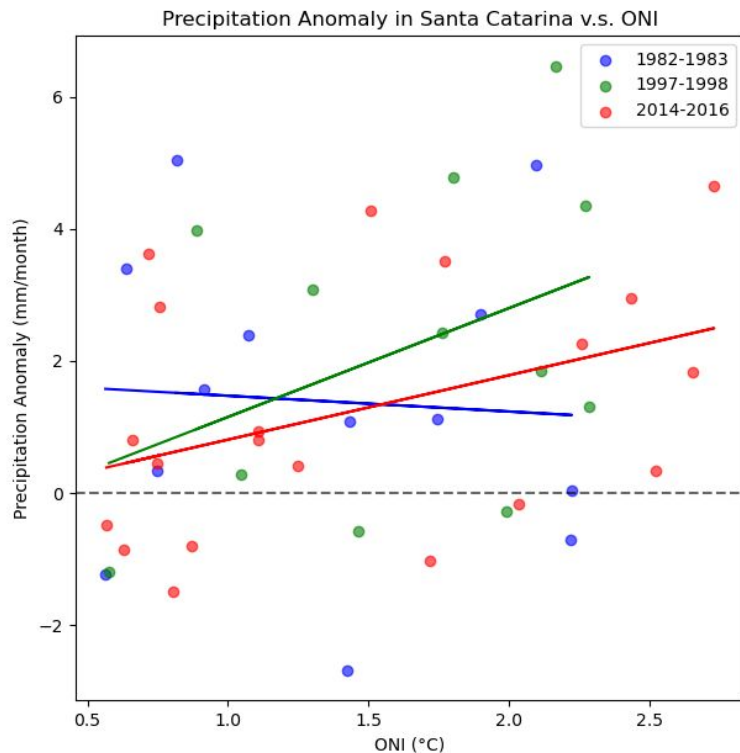
- How we can access that?
 - ONI from NOAA
 - Precipitation rates from CHIRPS
 - CPC available information
- Relationship El Niño x Precipitation:
 - 3 strong El Niño events
- Muslides potential to occur:
 - 3-day cumulative precipitation
 - Precipitation over 50mm



Gouvea *et al.* (2017) doi.org/10.19177/rgsa.v6e32017276-295

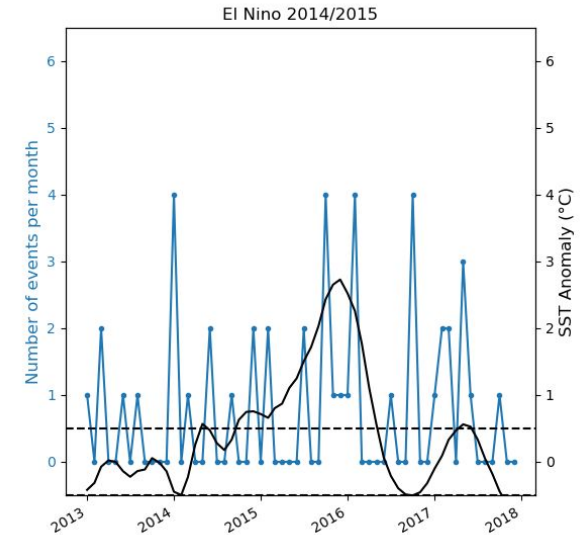
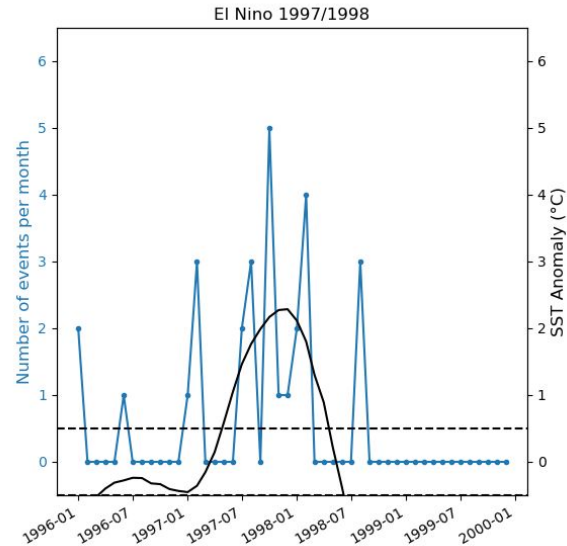
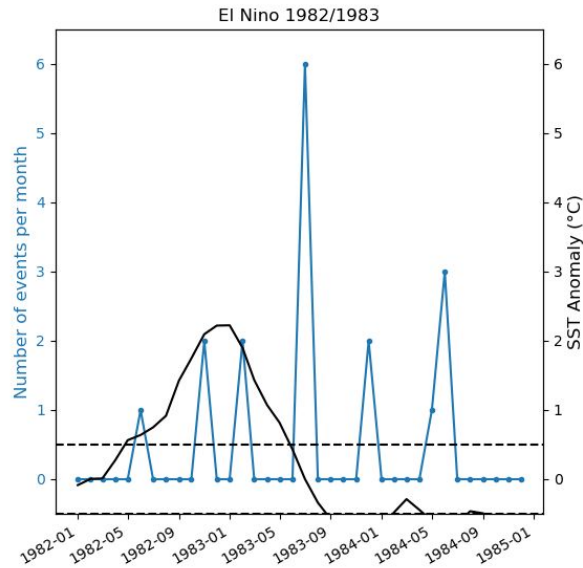


Precipitation distribution



- Overall positive precipitation distribution on El Niño events
- Low correlation coefficients:
 - 1982/1983: -0.14
 - 1997/1998: 0.66
 - 2015/2016: 0.30

Potential Occurrence of Mudslides

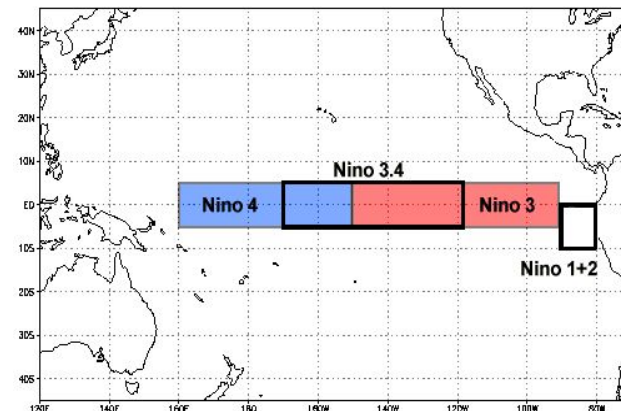


Our findings

- ↑ Precipitation during El Niño
- ↑ Mudslides potential during El Niño

Suggestions

- Delayed precipitation response?
- Influence of other Niño index?
- Use 3-month moving averages for precipitation.



<https://www.gov.br/fundaj/pt-br/destaques/observa-fundaj-itens/observa-fundaj/documentarios-e-estudos-sobre-as-secas/ninoregions.gif>

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THANK YOU!

Quilmesaurus_Gwara_Stacatto



ClimateMatch
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