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The hydroclimate–vegetation relationship in the southwestern Amazon during the last 20 years: an analysis focused on the southwestern region

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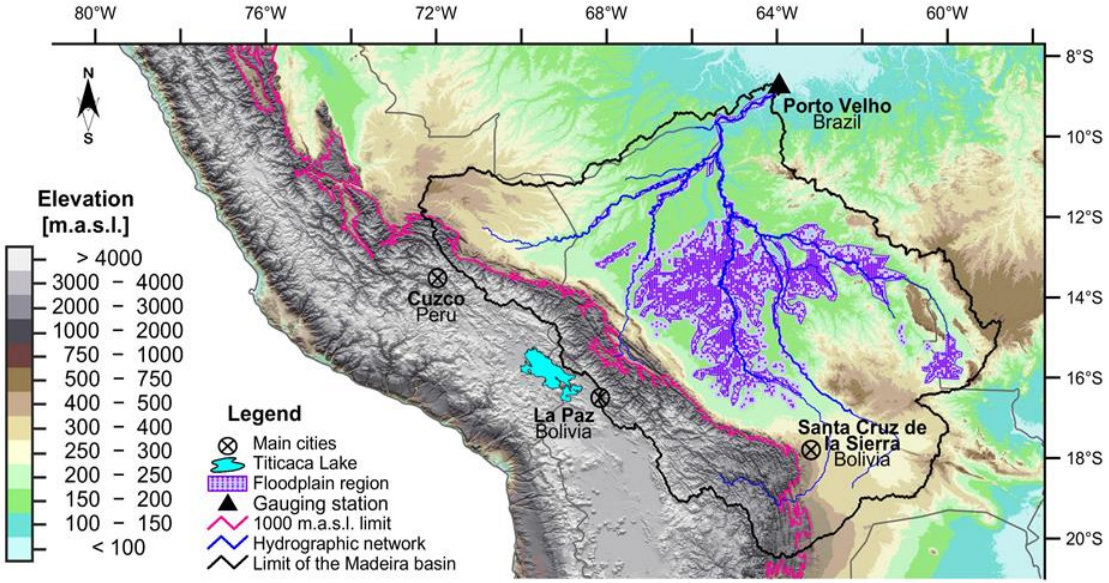
The southwestern Andean-Amazon basin

- Elevation: 100 – 4000 meters
- Region of high spatio–temporal **variability in rainfall regimes**
- Significant **changes in land cover** during the last years
- Forest fires, agriculture, **deforestation**, etc



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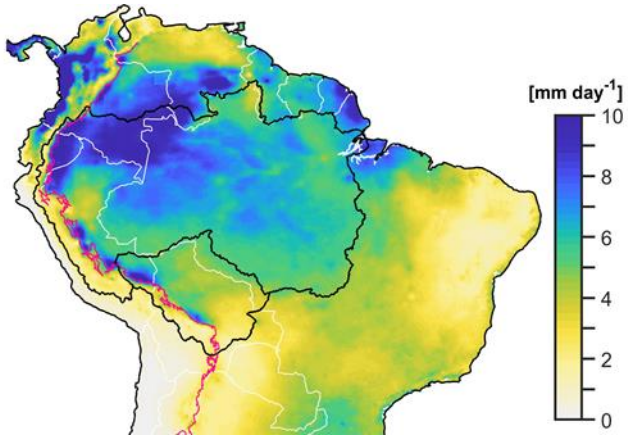
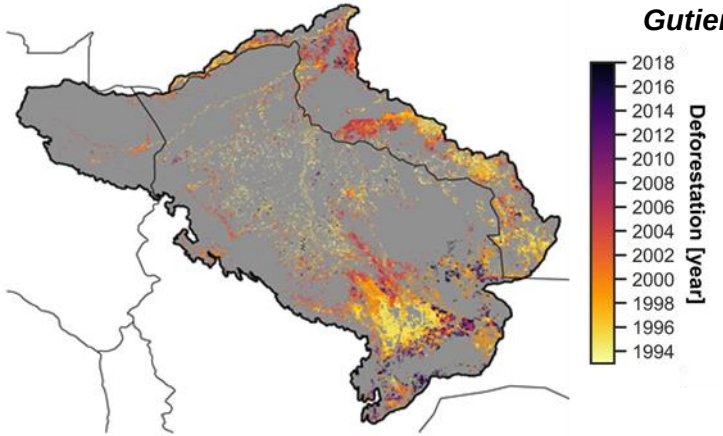
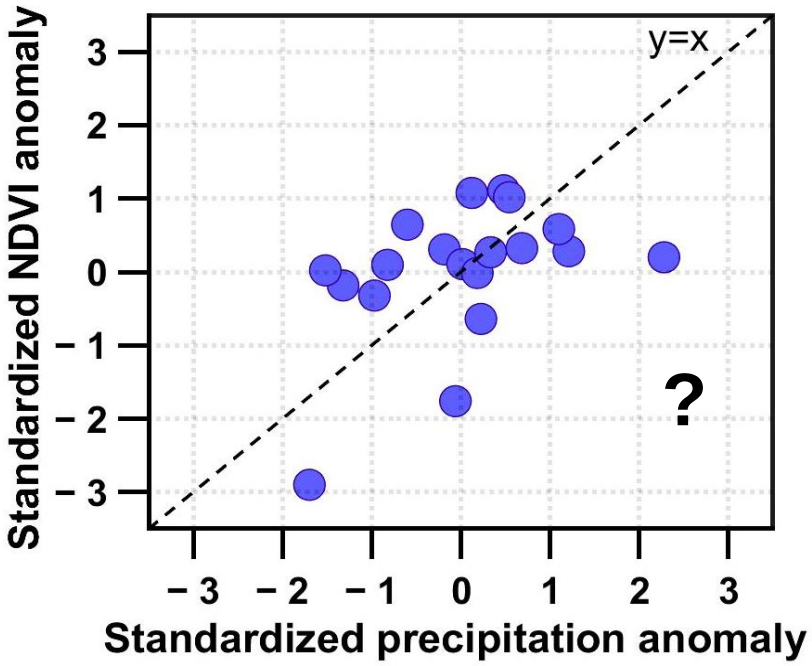


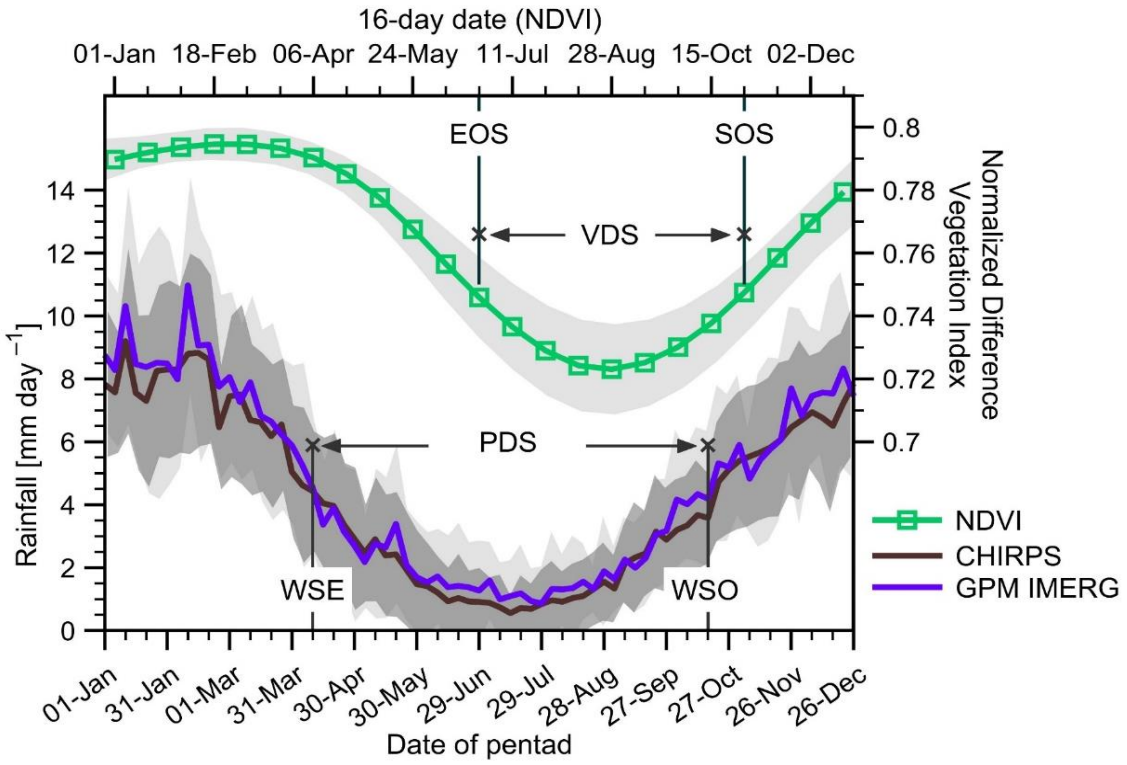


Motivation…

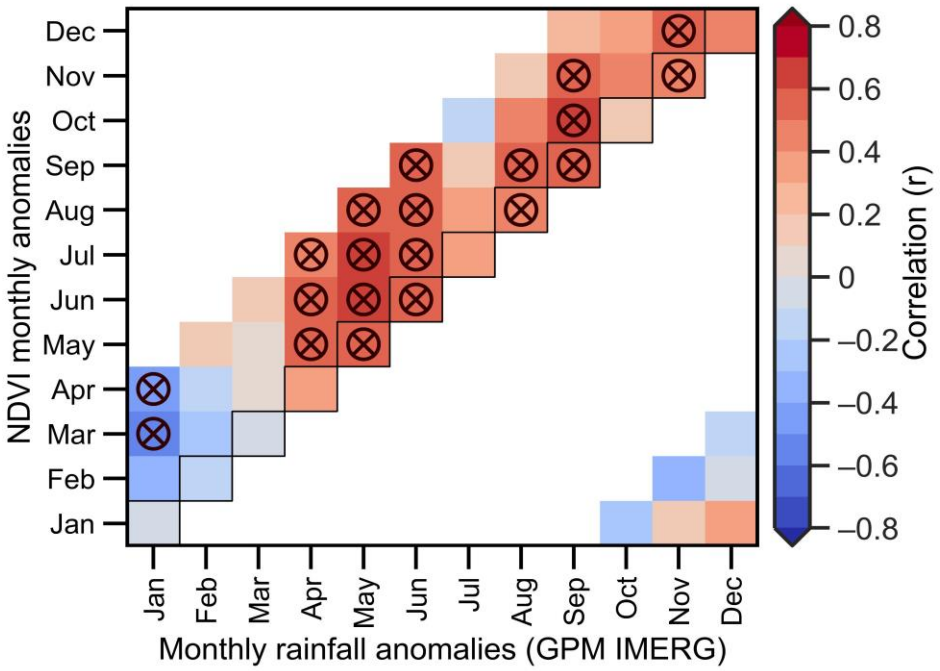
- The hydroclimate-vegetation relationship is not clear
- Amazon forests are energy-limited or water-limited?
- What happens during years of extreme droughts?



Seasonality in rainfall and vegetation



- *WSE: wet season end*
- *WSO: wet season onset*
- *PDS: precipitation dry season*
- *EOS: end of growing season*
- *SOS: start of growing season*
- *VDS: vegetation dry season*



⊗ *significant correlation**

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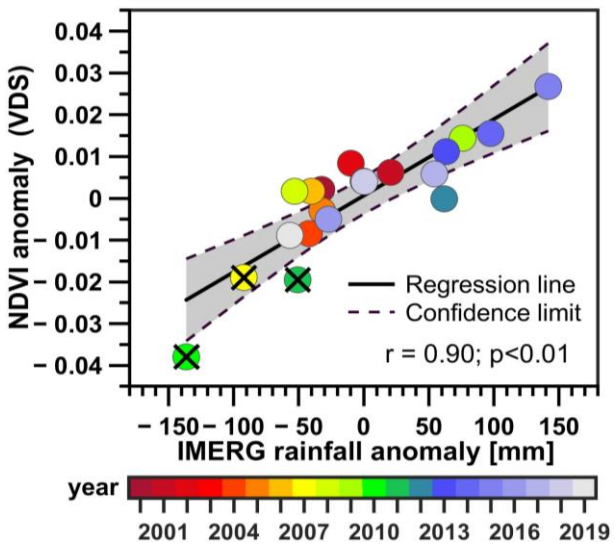
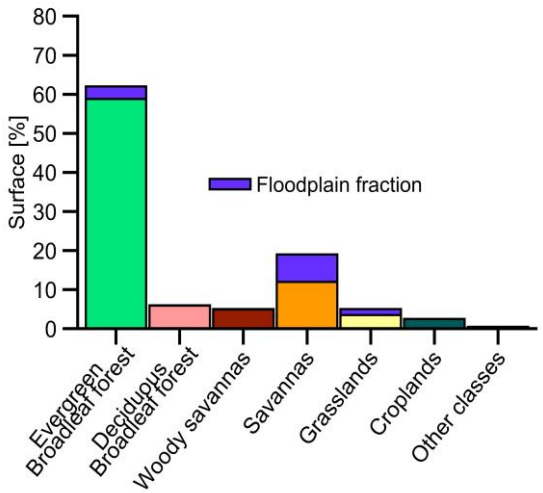
The rainfall and vegetation during the dry season

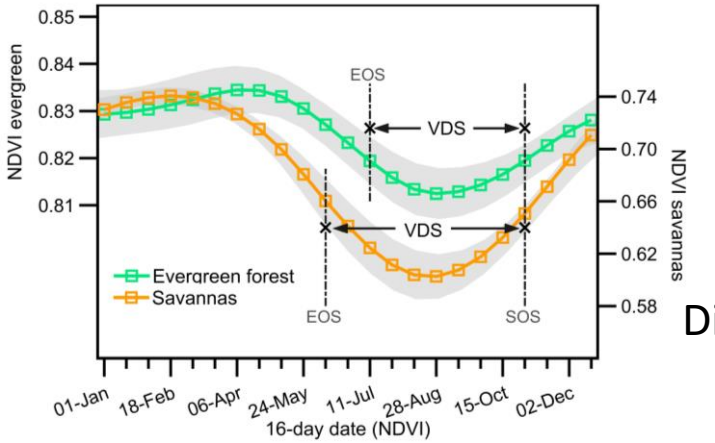


- 2007, 2010 and 2011: years of extreme drought
- Vegetation depends mainly on water availability, particularly during the vegetation dry season (VDS)

Vegetation seasonality in the land cover types

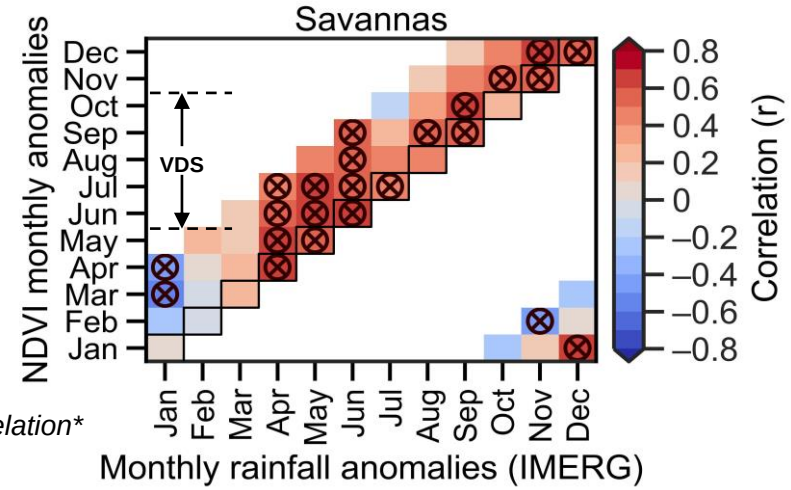


- 62% Evergreen forest
- 20% Savannas



Differences in the Vegetation Dry Season (VDS)

The relationship by land cover types



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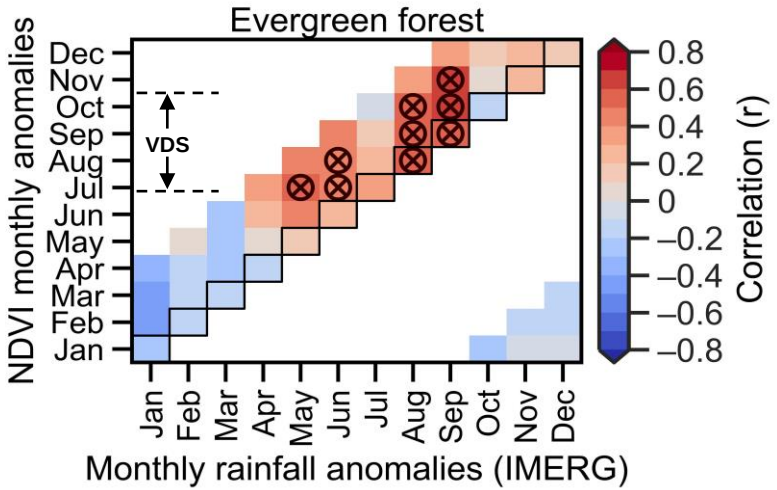
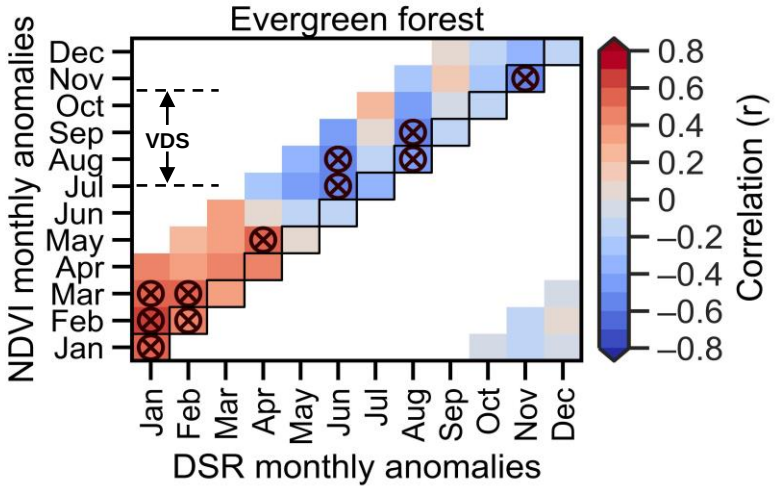
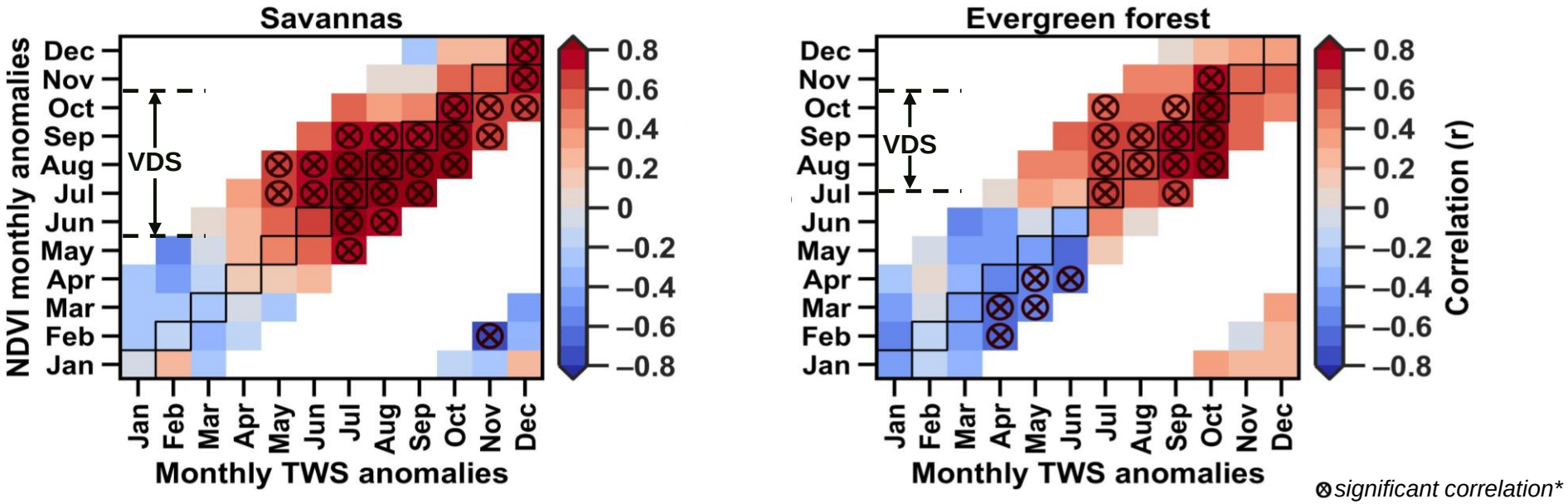


- ❑ **Water–limited during dry season (VDS)**
- ❑ **Energy–limited during wet season**
- ❑ **The vegetation varies from energy– to water–limited throughout the year**

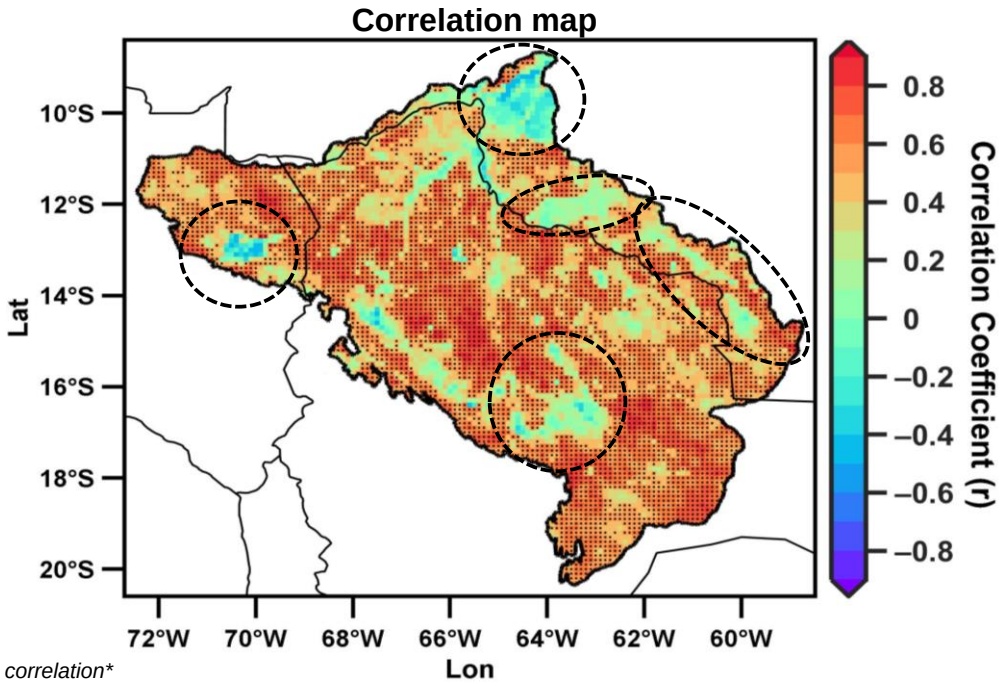


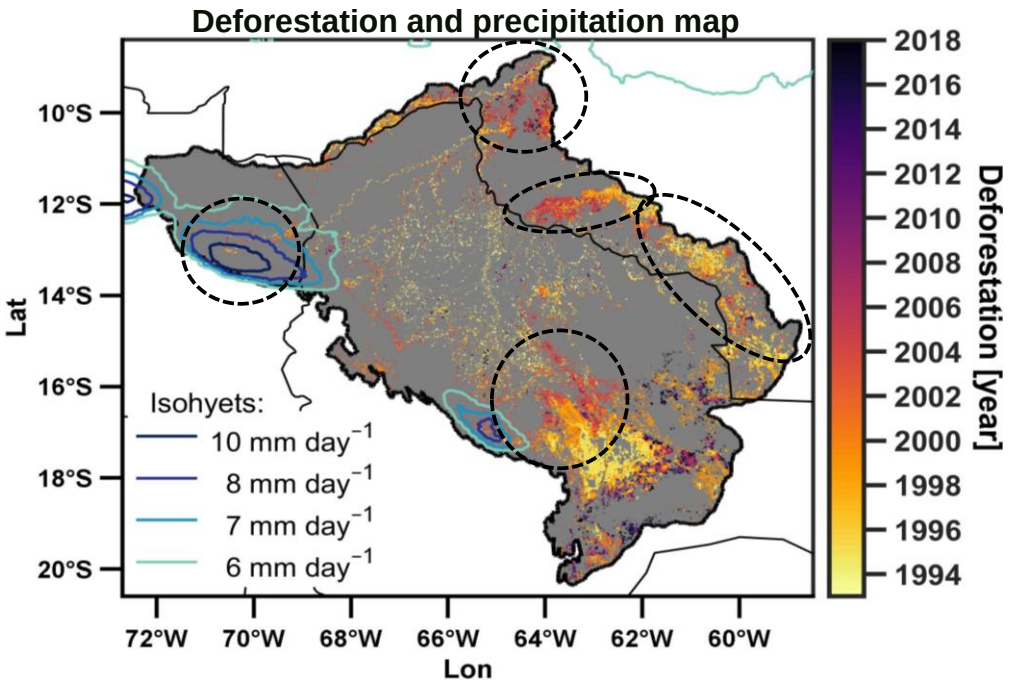
The vegetation and Terrestrial Water storage (TWS)



- ❑ Vegetation is <u>more dependent on the availability of water</u> in the soil during the <u>Vegetation Dry Season</u> (Water-limited)
- ❑ TWS is a better indicator of NDVI variability in evergreen forests

Role of land-cover change in the rainfall–NDVI relationships





* significant correlation*

Specific areas do not show significant hydroclimatic-NDVI correlations during the dry season:

- Very **wet conditions** during most of the year
- Recent **deforested areas**: break the natural response the hydroclimate-vegetation system

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This presentation is a summary of the article " On the Hydroclimate-Vegetation Relationship in the Southwestern Amazon During the 2000–2019 Period "

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Thank you

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