# Impact of extreme precipitation on vegetation cover in Indonesia

Beipiaosaurus_Moonwalk- ID:603 - Regional precipitation variability and extreme events - Dolce

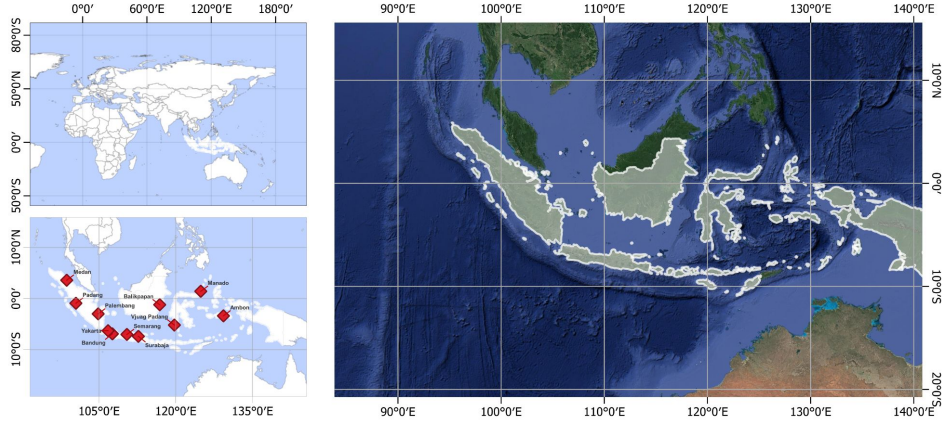
# Introduction

Indonesia is a country very affected by ENSO events

Droughts

Flood

*¿Vegetation?*




- Hypothesis:
  Extre. Pp. ⟶ Vegetation

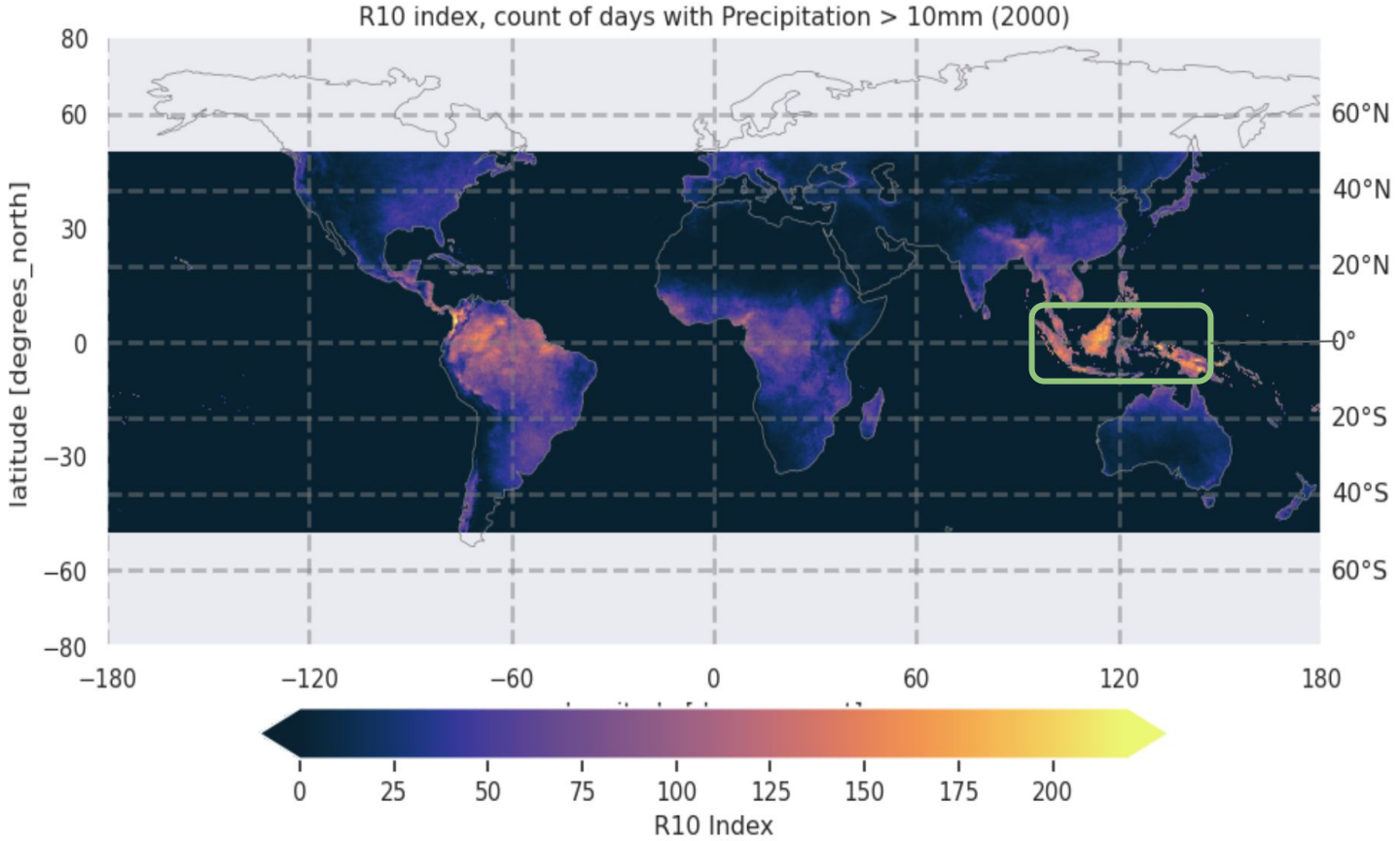
# Data

- Precipitation data
  - CHIRPS v2.0
    - Spatial resolution: **0.25 x 0.25°**
    - Data range: 1981-present
    - Based on satellite & ground observation estimates
- NDVI (Normalized Difference Vegetation Index)
  - NDVI data from NOAA's
    - Spatial resolution: **0.01 x 0.01°**
    - Data range: 1971- present

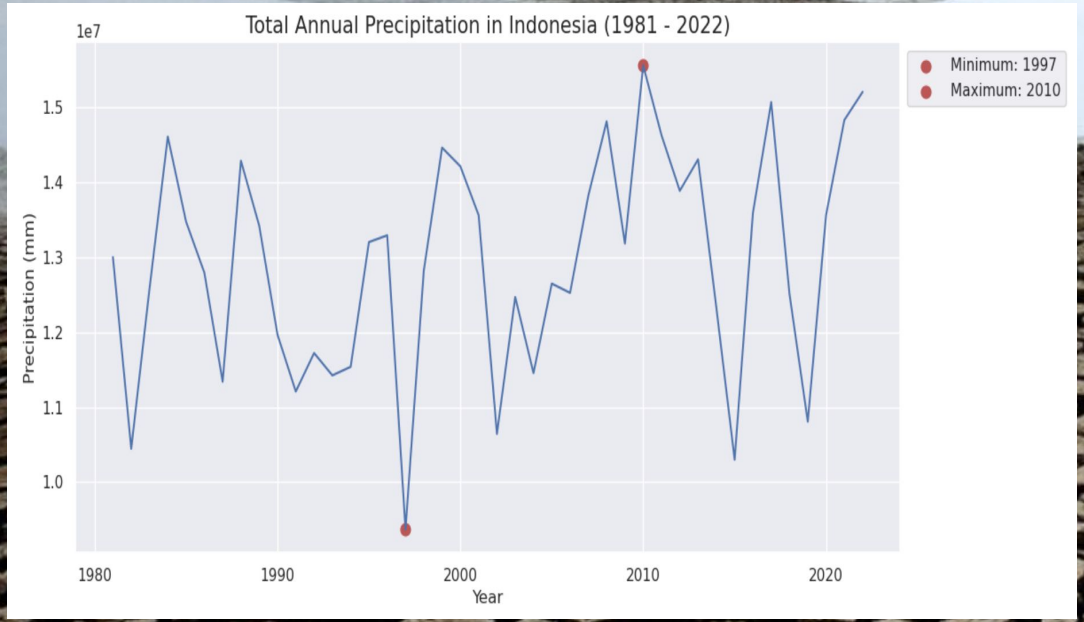
# Methodology

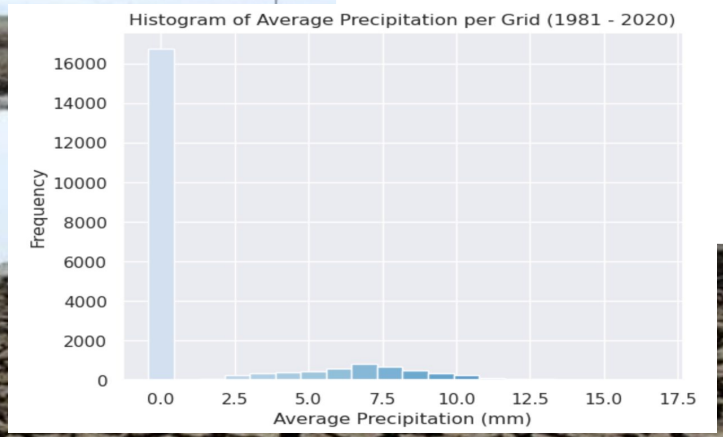
- ETCCDI indices related to precipitation
  - R10 (Days with ≥ 10mm rain)
  - R20 (Days with ≥ 20mm rain)
  - R95p (Rainfall > 95 percentile)
  - R99p (Rainfall > 99 percentile)
- Relationship analysis
  - Pearson correlation

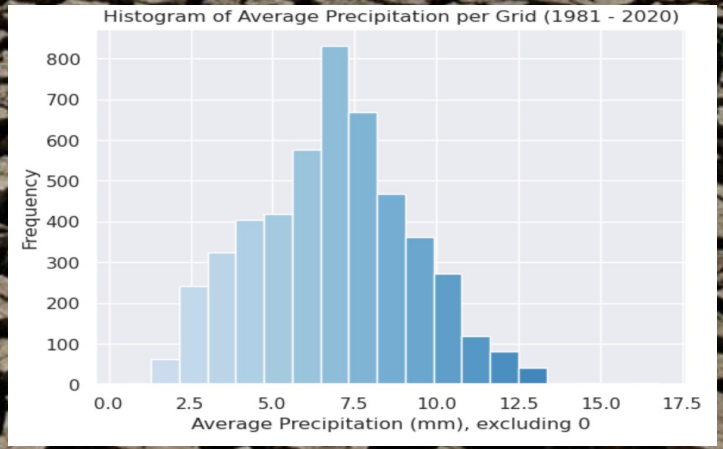
# Why is Indonesia important to study?



# Basic Trends: Indonesia




**Study years**

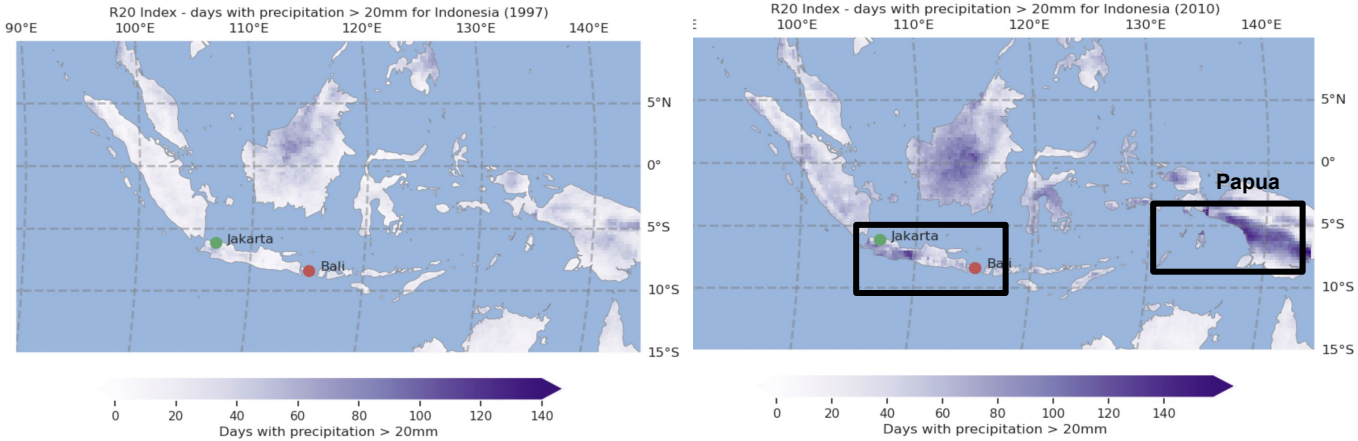
- **1997 (strong El Niño)**
- **2010**

Photo courtesy of Greenpeace Southeast Asia

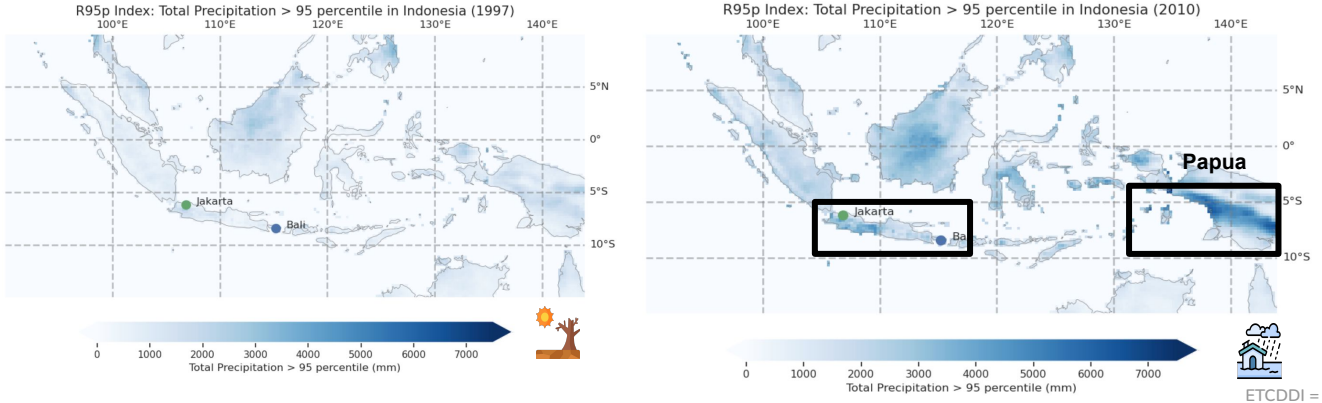
# Precipitation Intensity Indices (ETCCDI)

*[Speaker Zoom video]*

R20




R95p




Indices

**R20** = number of days in a year, when 🌧 > 20mm

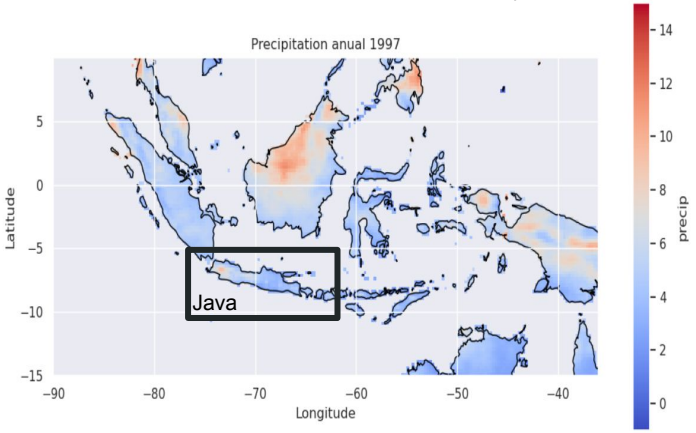
**R95p** = total precipitation in a year where daily rainfall is 🌧 > 95th p

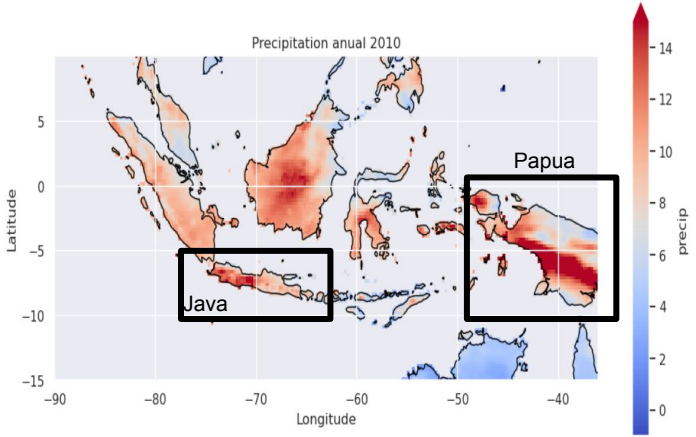
Percentiles (1981-2022)

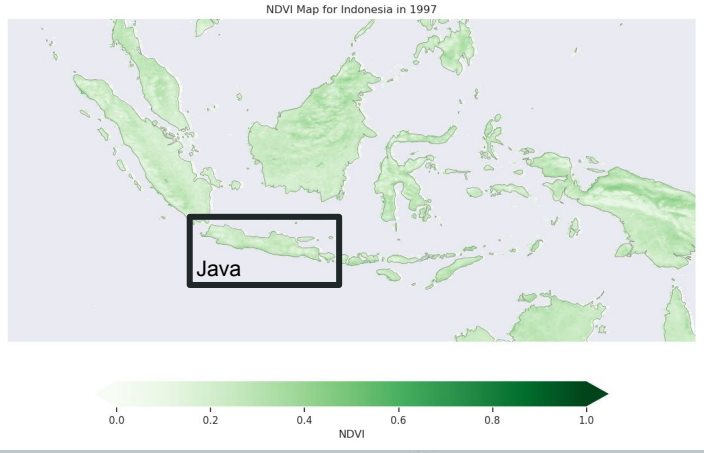
95th **15.87 mm**
99th **18.43 mm**

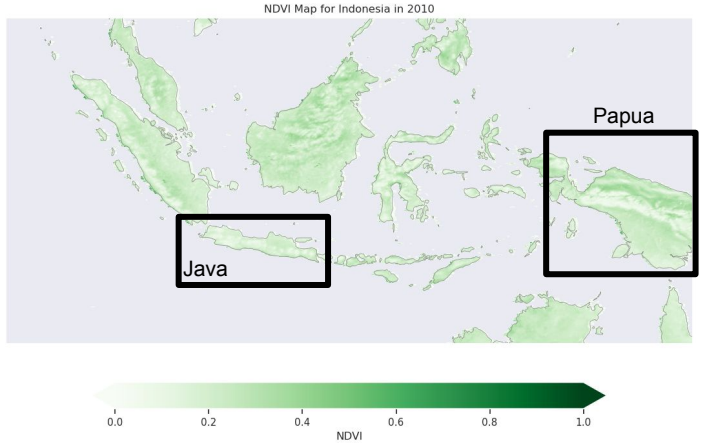
ETCDDI = The Expert Team on Climate Change Detection and Indices

# NDVI and Precipitation

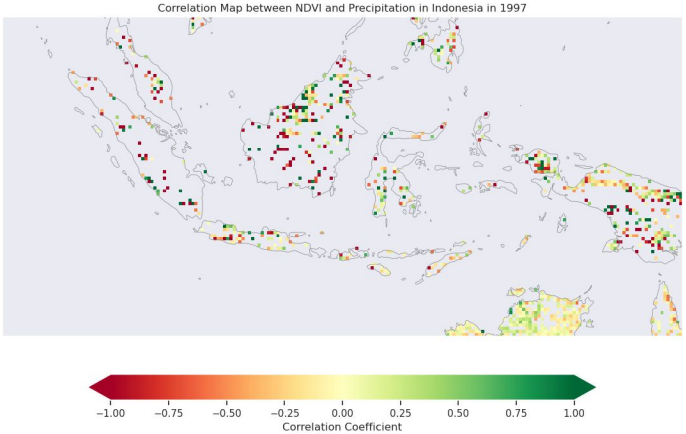


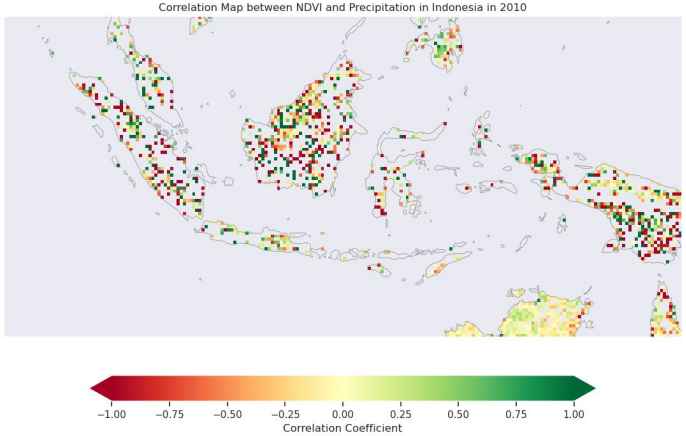



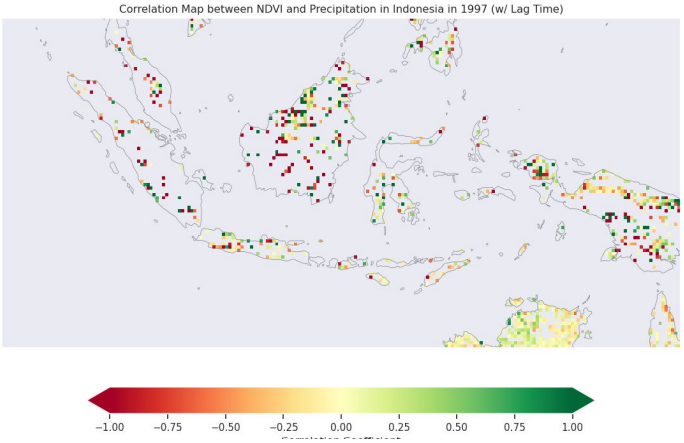



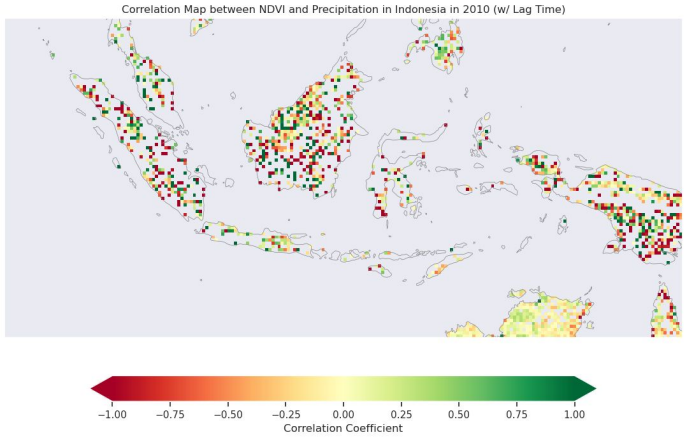



# Correlations between NDVI and Precipitation




<u>Correlation w/o Lag Time</u>

**1997** → More (-) Trend
**2010** → More (-) Trend

<u>Correlation w/ Lag Time</u>

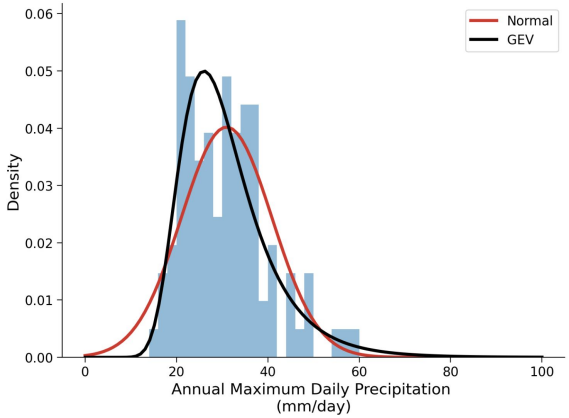
**Lag =** 1 month

**1997** → More (-) Trend
**2010** → More (-) Trend

<u>Overall</u>
no significant trend cluster observed between regions

# Conclusion

- No significant correlation clusters between NDVI & precipitation
  - Consider running spatial autocorrelation to see the clusters
- Future Studies
  - Regional & seasonal trends by island (ex. Java, Sumatra)
  - More robust analyses
    - Extreme value analysis (W2D4 tutorial)
    - More ETCCDI indices, including **temperature**
  - Impact of extreme events on crop production (ex. **coffee**)




*[Speaker Zoom video]*

# THANK YOU :)

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