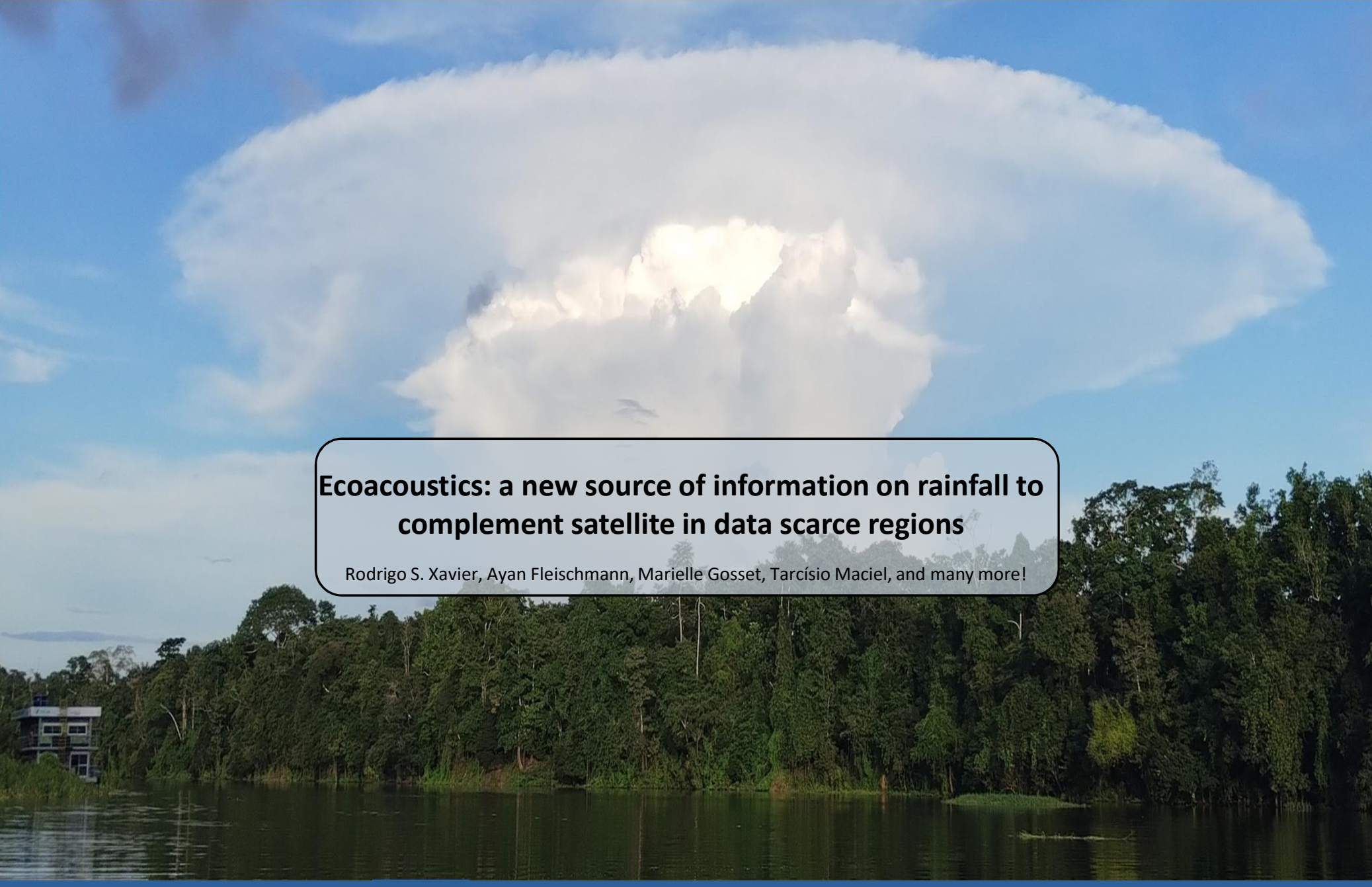


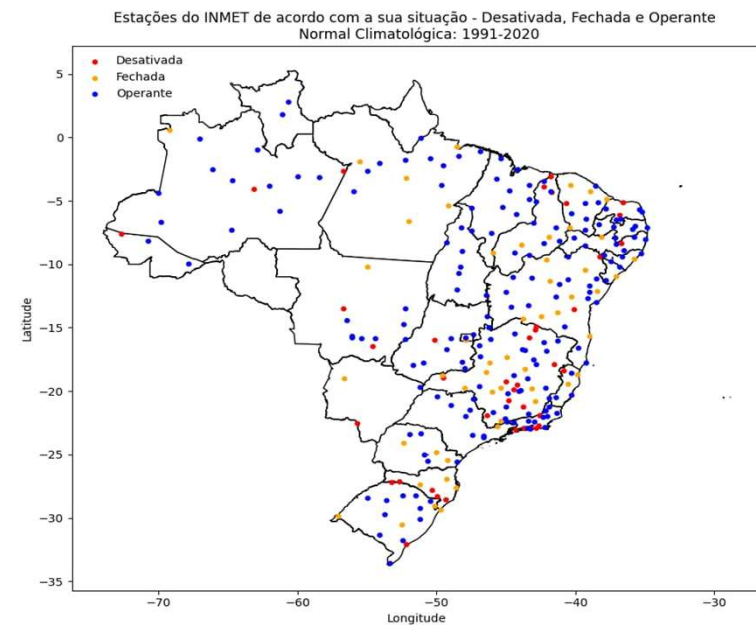
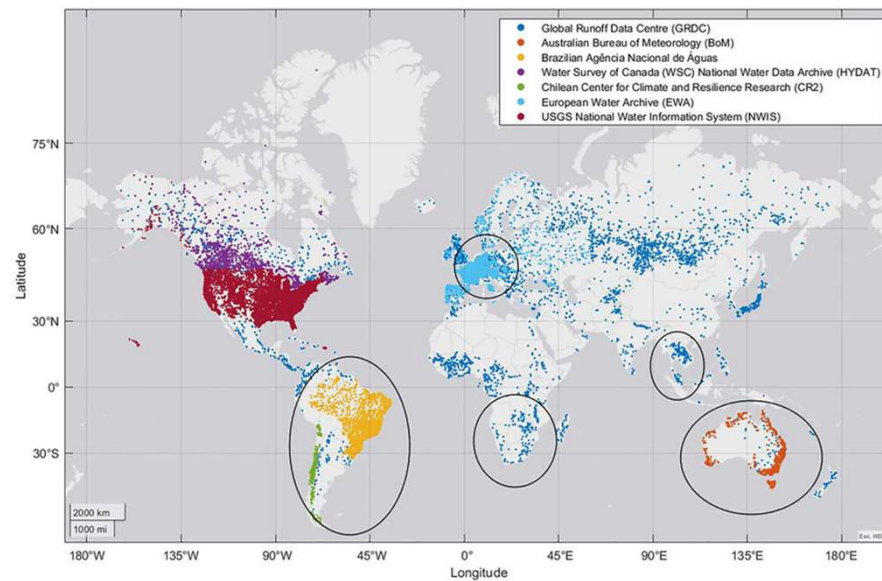


Ecoacoustics: a new source of information on rainfall to complement satellite in data scarce regions

Rodrigo S. Xavier, Ayan Fleischmann, Marielle Gosset, Tarcísio Maciel, and many more!

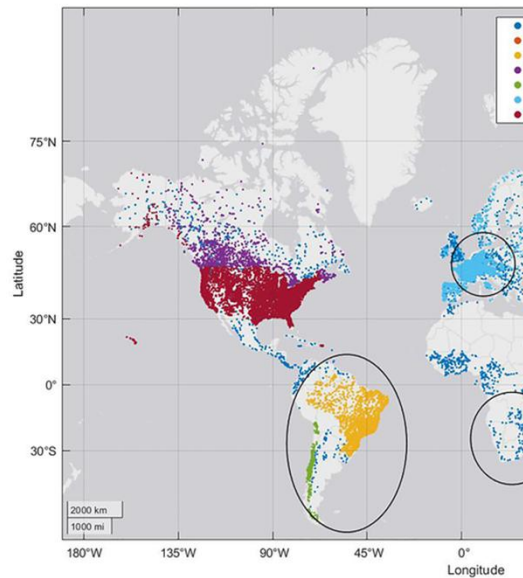
Why?

Lack of data in the global south



Why?

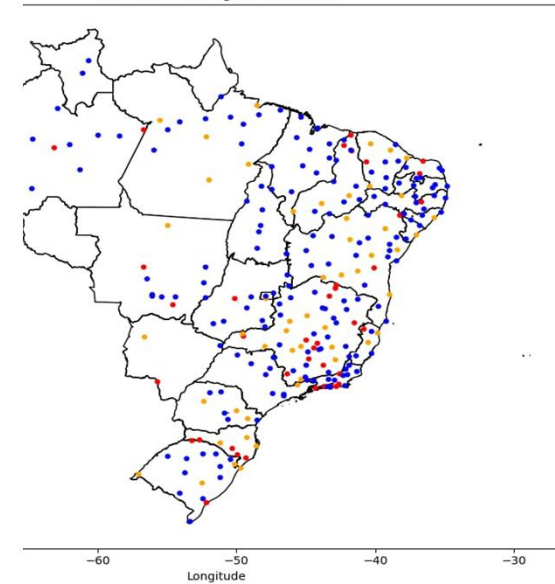
Lack of data in the global south



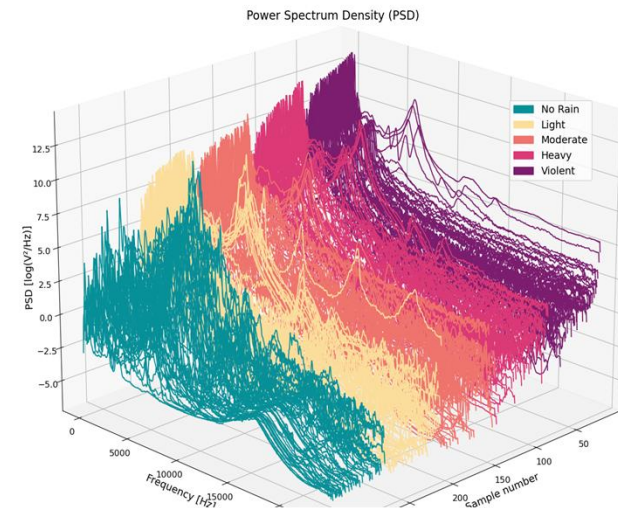
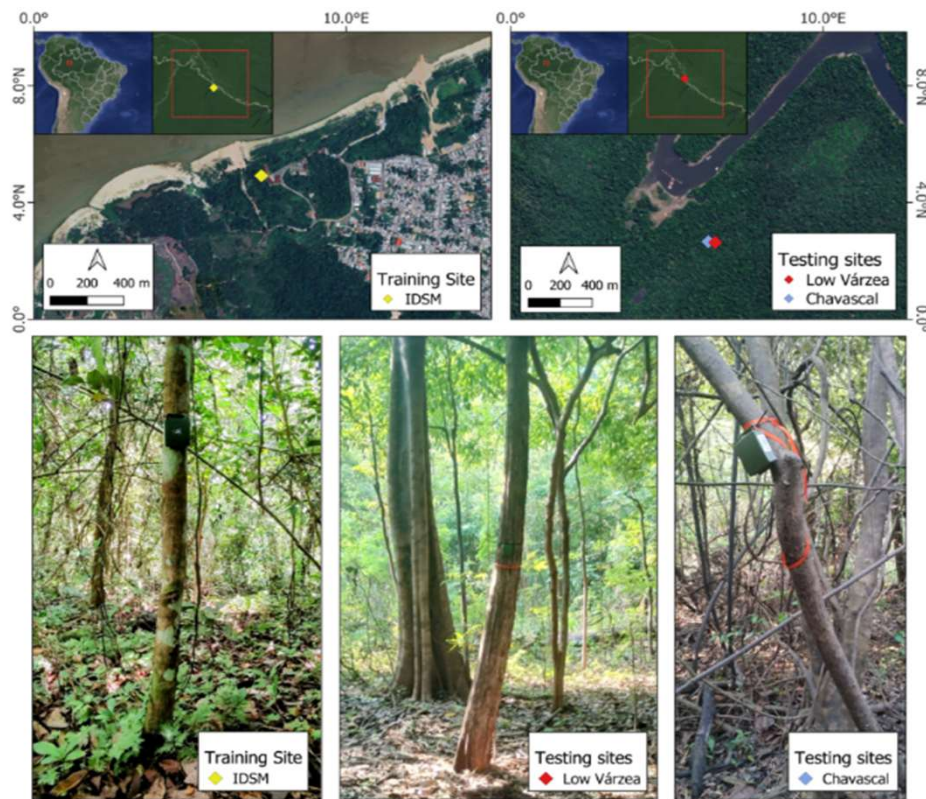
Rainfall data is cool



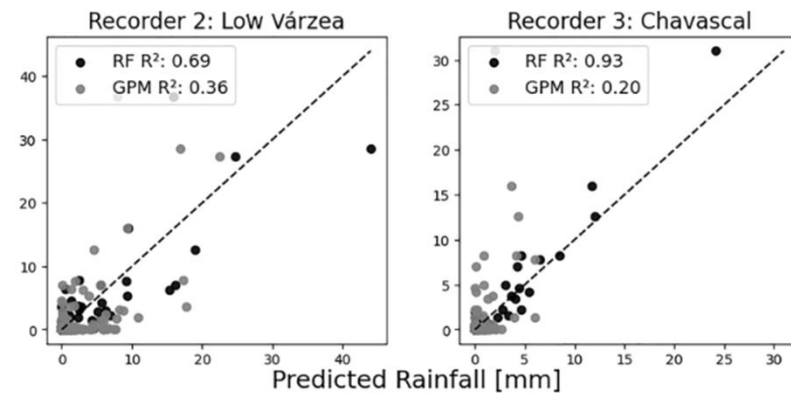
MET de acordo com a sua situação - Desativada, Fechada e Operante
Normal Climatológica: 1991-2020



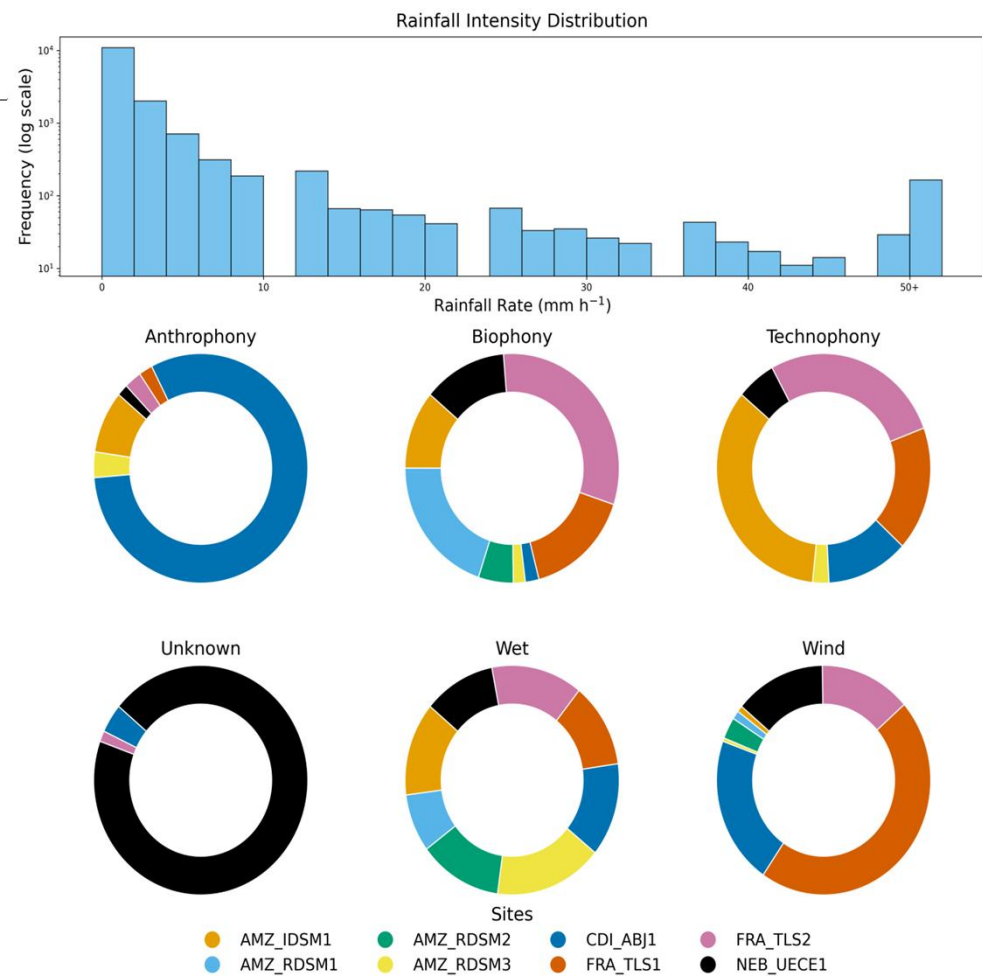
The Mamirauá experiment

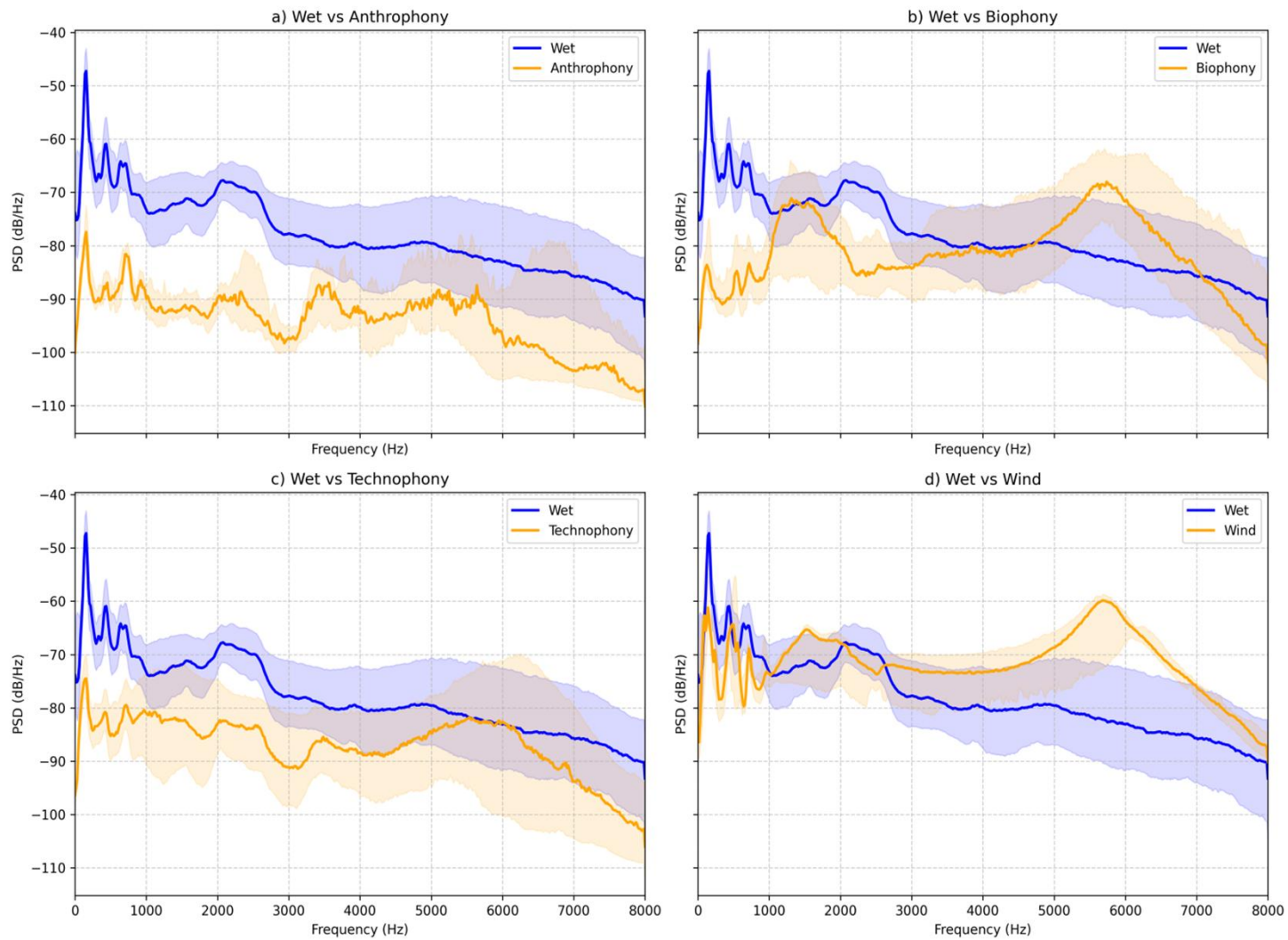


b) Testing sites: regression results for hourly rainfall



A lot of data!





How?

-Current literature:

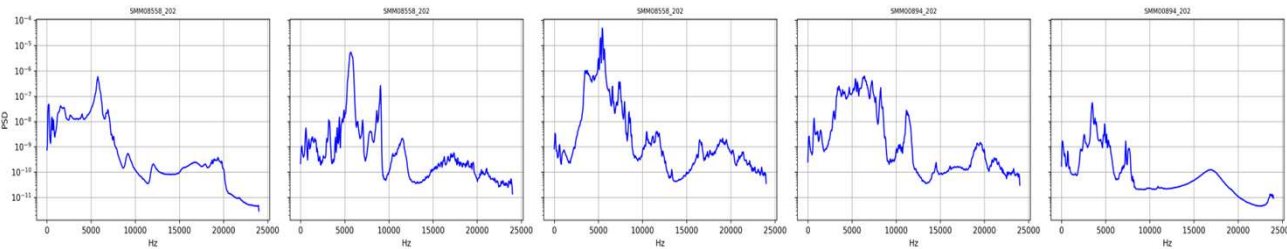
- High focus on neural networks and other deep learning models
- Few experiments outside controlled environments
- We still lack a practical application

-Two ways forward:

- Build more complex models
- Make it simple!
 - Comparing the PSD to a dry baseline

Building a dry baseline

Hour 0



n=1

n=2

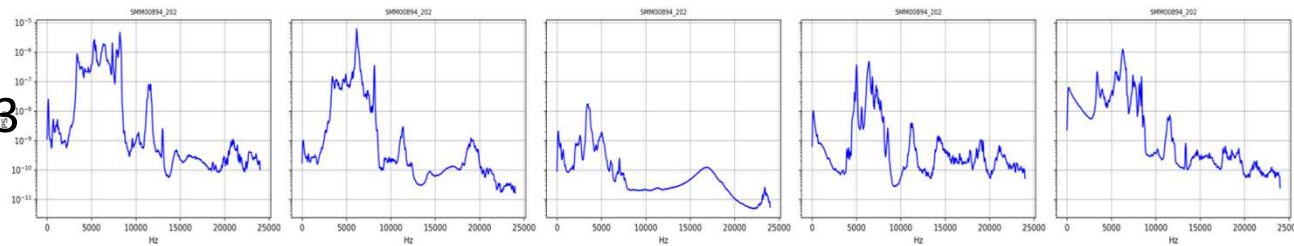
n=3

...

n=100

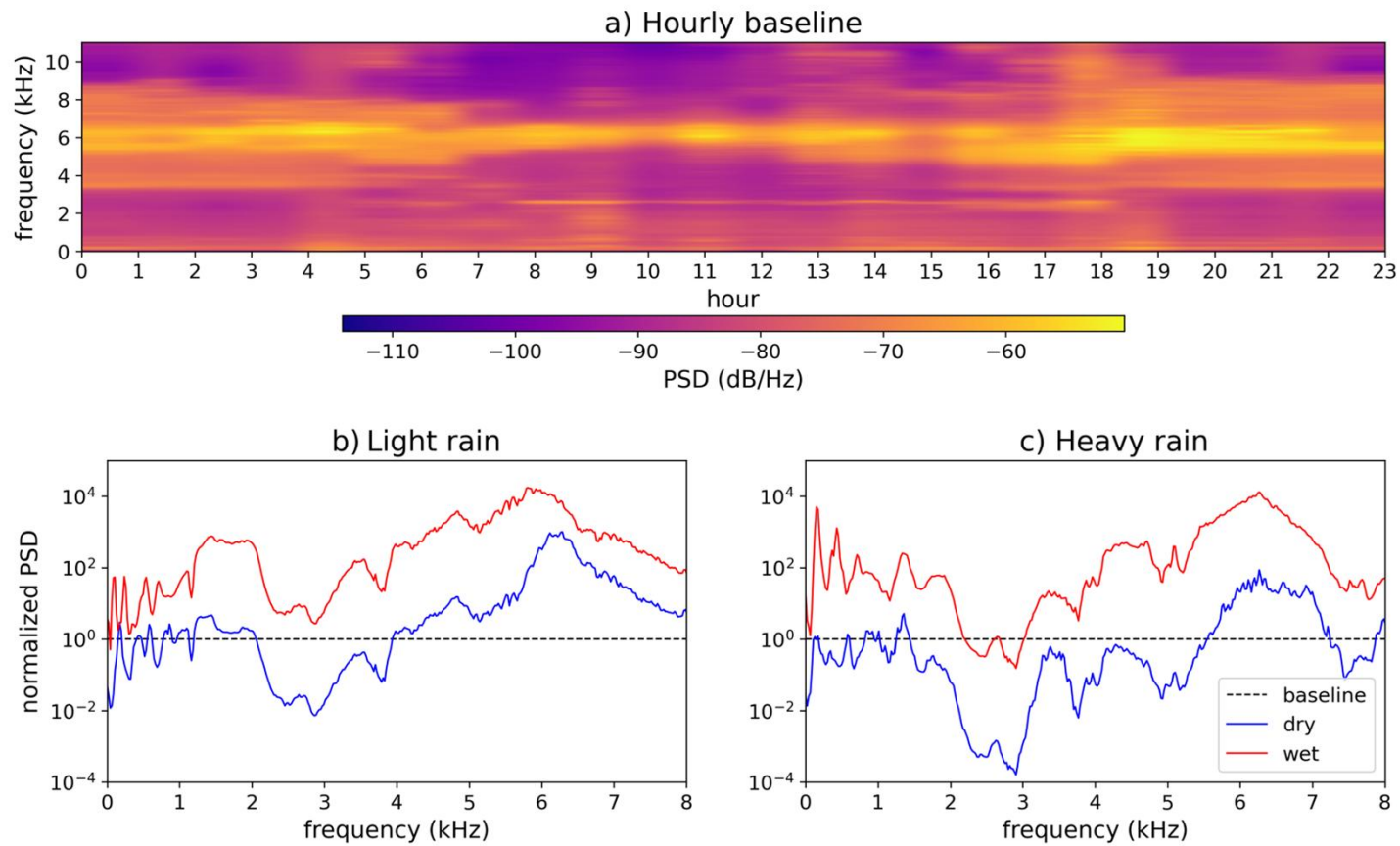
Mean

Hour 23



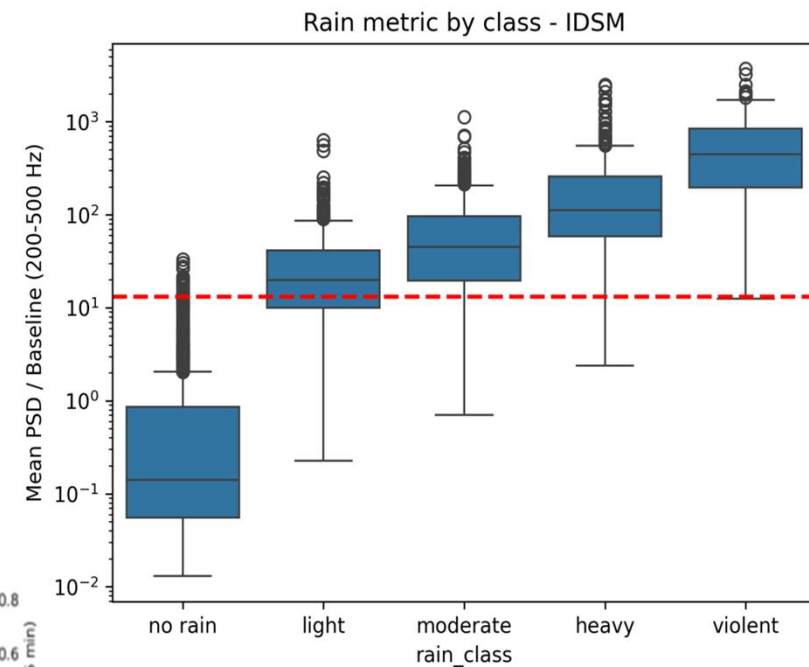
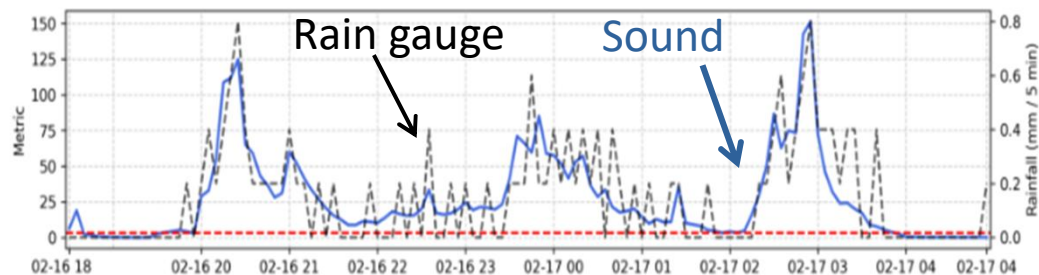
Mean

The dry baseline



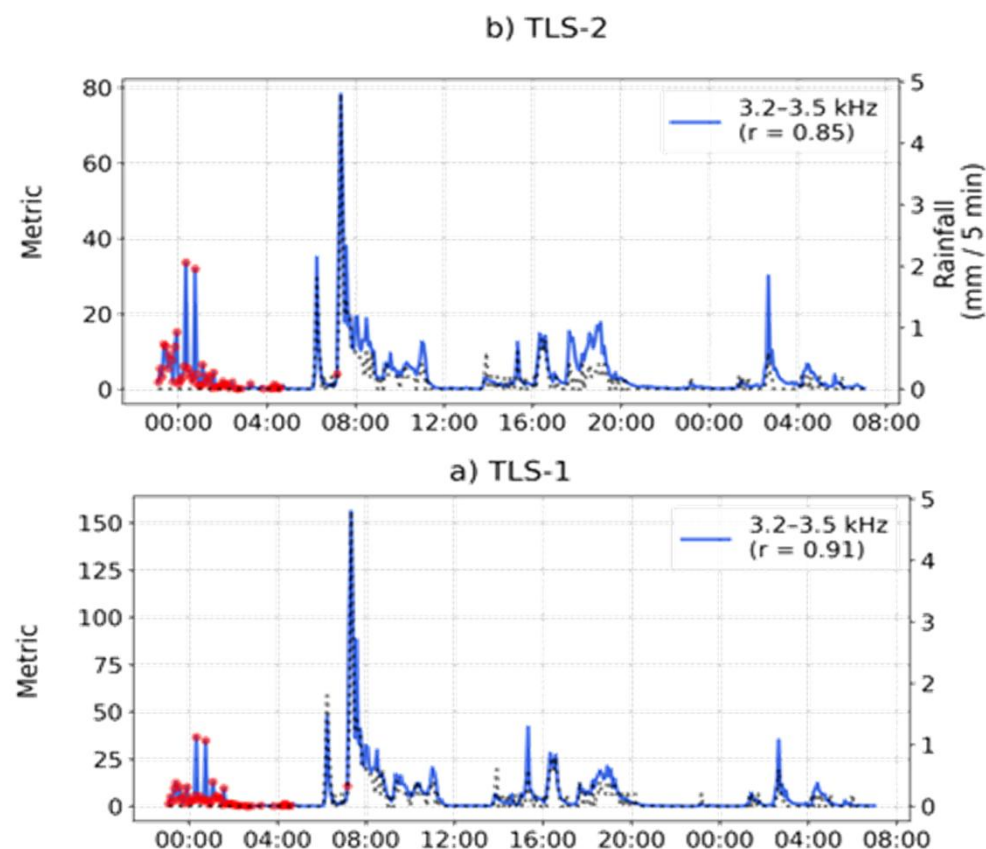
A simple metric for rainfall monitoring

- 1st Step: Build the dry baseline
- 2nd Step: Normalize the PSD in a certain frequency range
- 3rd Step: Integrate the values of the PSD
- 4th Step: If the value crosses the 0.98 percentile, it's classified as wet

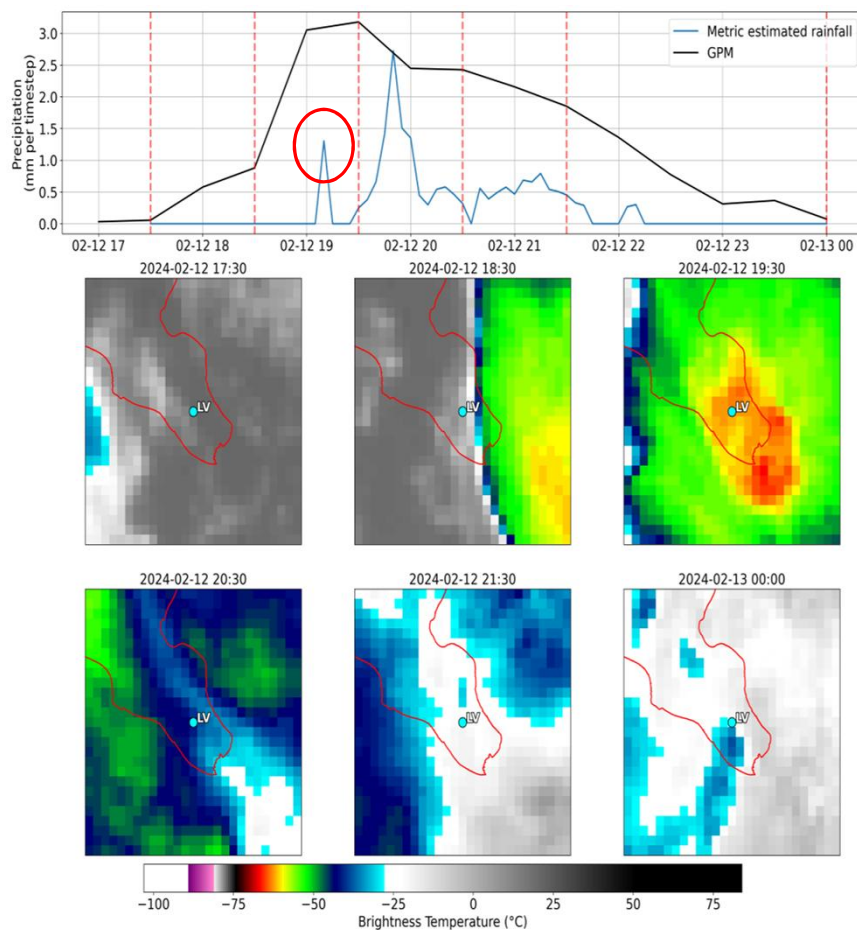


What can we do with this?

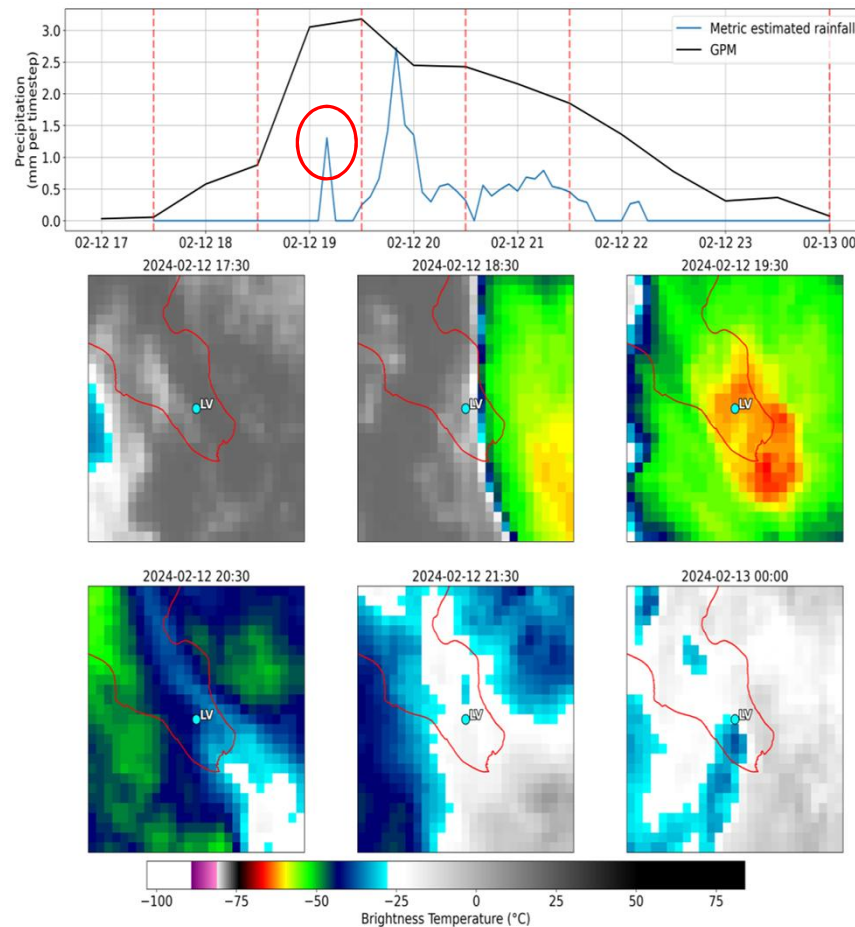
- Correlation does not transfer to rainfall estimation
- Metric values vary depending location
- Wind is a problem
 - no solution yet 😊



Combining acoustic and satellite data?

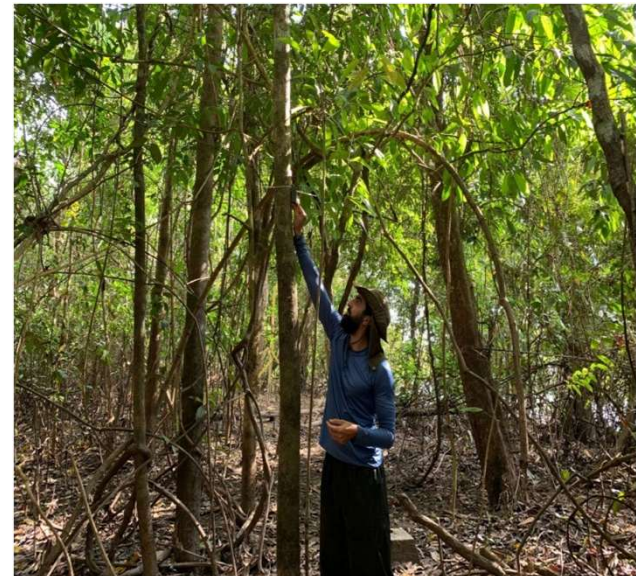


Combining acoustic and satellite data?



- A simple method that doesn't rely on model training
- Tested across several sites in real-world conditions
- Can be used to refine the temporal resolution of satellite data
- Background noise interference still needs to be addressed
- Need for a more autonomous sensor

Thank you!



Special thanks to



Bonus slide

