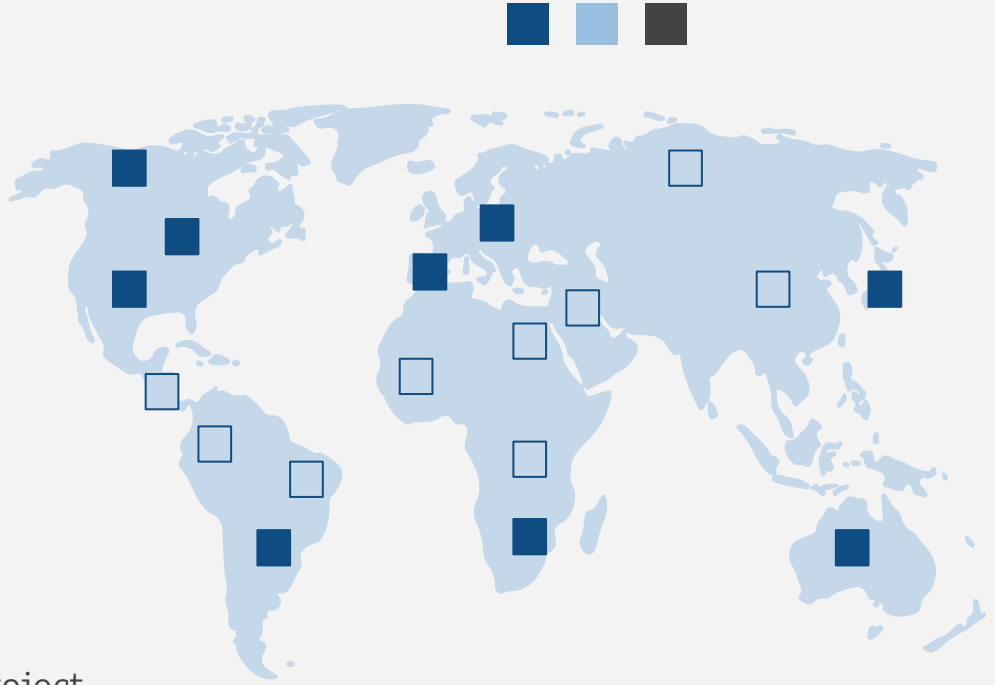
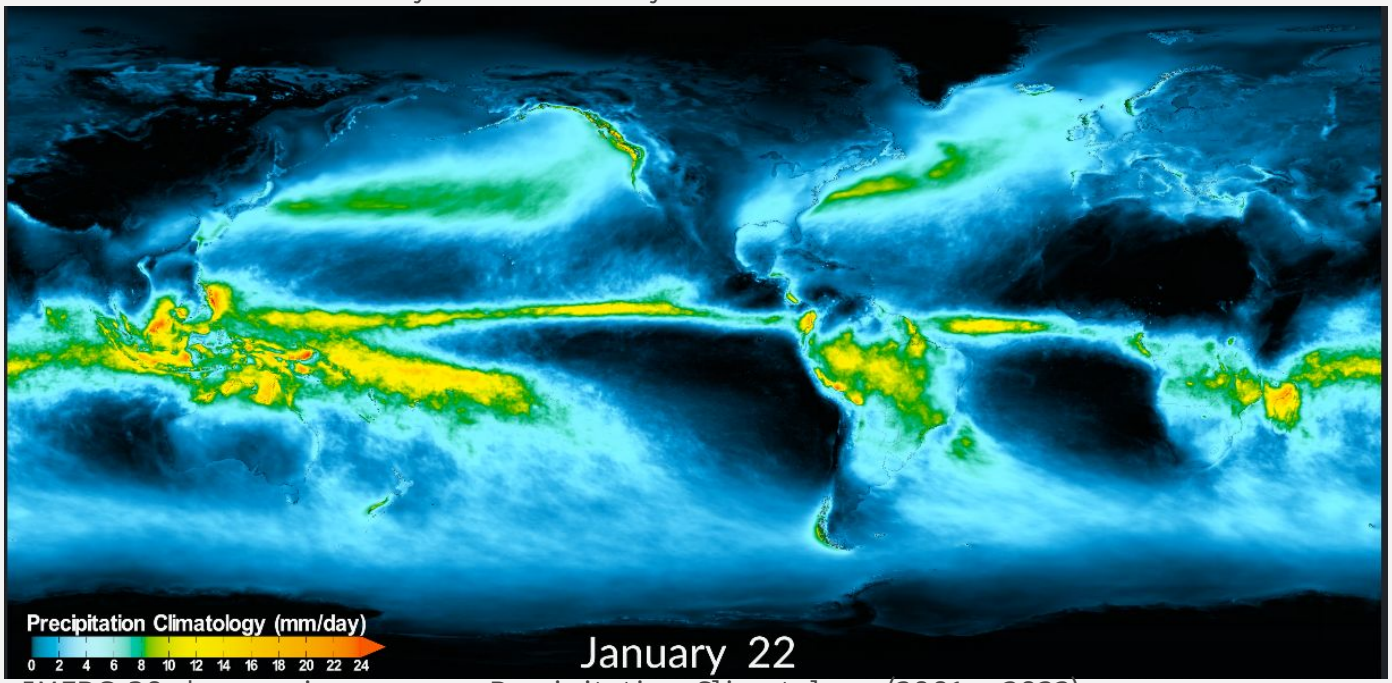
INVESTIGATING PRECIPITATION CLIMATOLOGY OVER AFRICA



GPM mentorship program 2024 capstone project
by **Faith Hunja**
Mentors: **Dr. Jackson Tan, Dr. George Huffman**

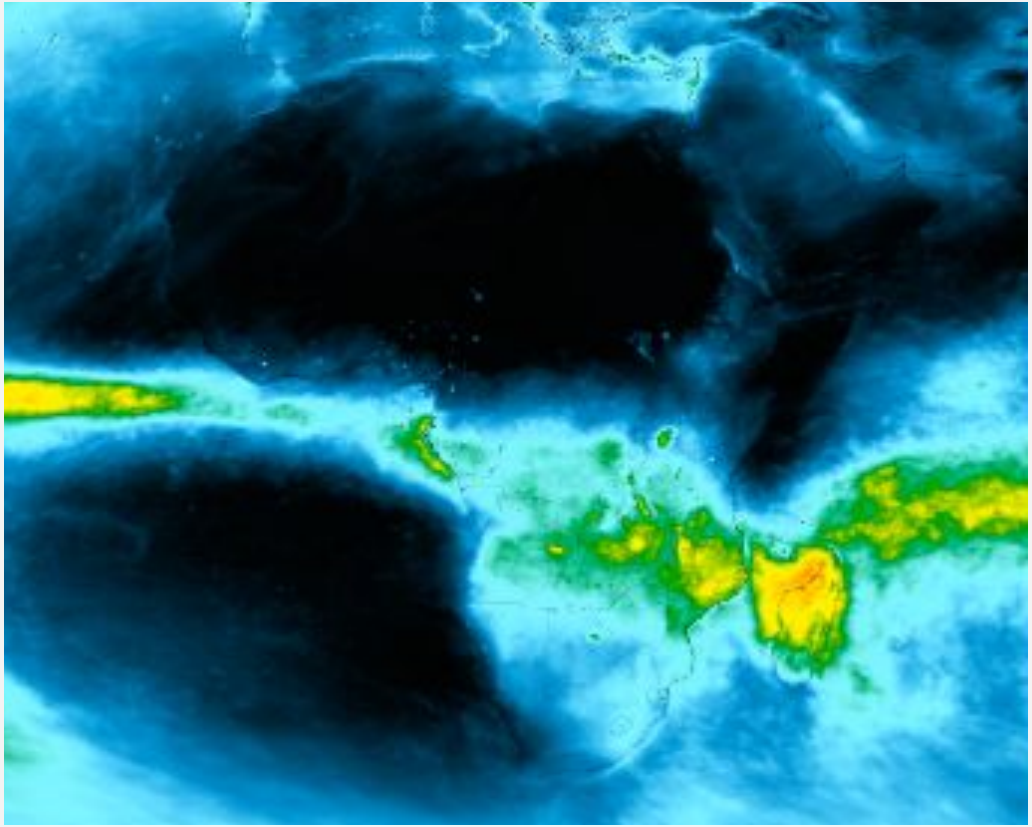
PROBLEM

- IMERG climatology shows spots of high precipitation values which we suspect correspond to inland water bodies and may not be entirely real



IMERG 30 day moving average Precipitation Climatology (2001 - 2022)
Source: https://svs.gsfc.nasa.gov/5254/

PROBLEM



Zoomed in image of Africa

OBJECTIVES

STEPS:

- Compute and plot global grand climatology (IMERG grand climatology netCDF files, 06/2000-05/2023, Final run, V07B)

- Compute and plot monthly climatology - focussing on Africa (IMERG monthly climatology netCDF files, 2001-2022, Final run, V07B)

- Compare high precipitation values with physical features on a map

- Compute and plot GMI monthly climatology (WORK IN PROGRESS!)

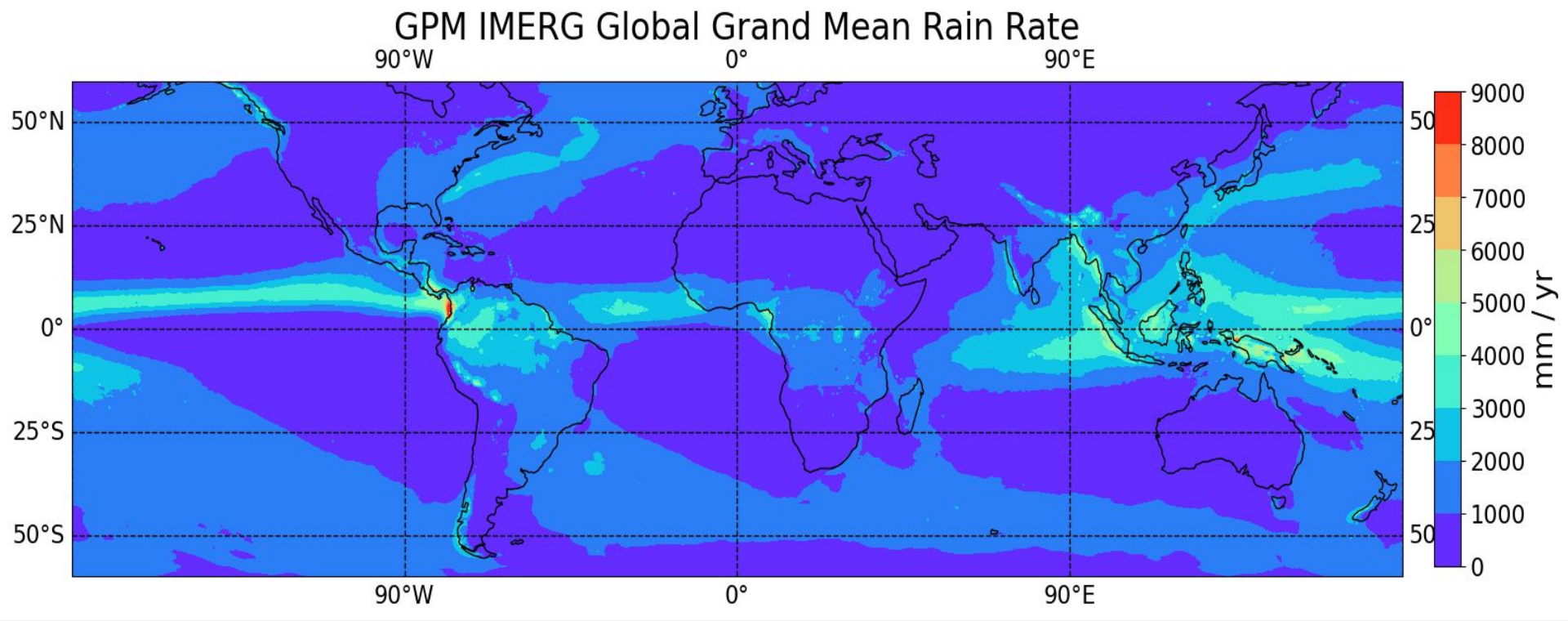
COMPUTATION (using Python):

- Xarray -> open and read dataset

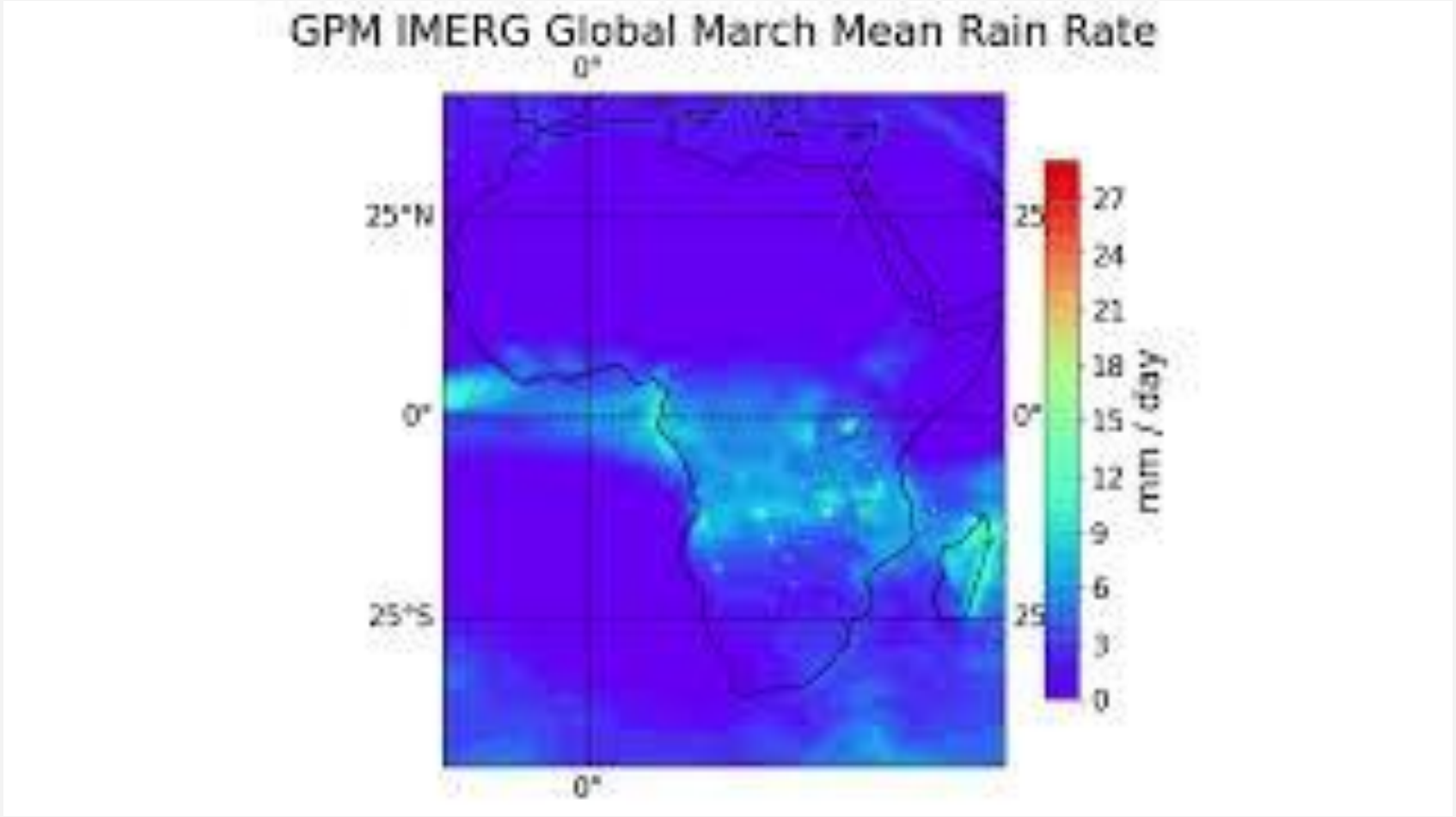
- Numpy -> handling the variables

- Matplotlib and cartopy -> plotting and visualization

IMERG GLOBAL GRAND CLIMATOLOGY



IMERG AFRICA MONTHLY CLIMATOLOGY

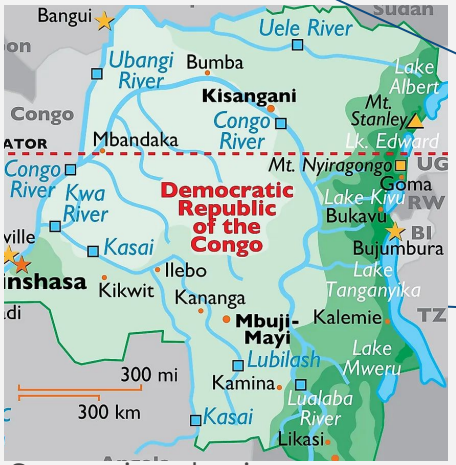


Video animation of IMERG monthly climatology change over Africa. Link: https://youtu.be/3iWKHtUV7tg

JANUARY ANALYSIS

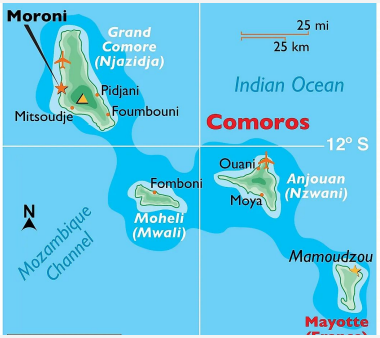
Gulf of Guinea

Source:
https://en.wikipedia.org/wiki/Gulf_of_Guinea



Congo river basin

Source:
https://www.worldatlas.com/maps/democratic-republic-of-the-congo



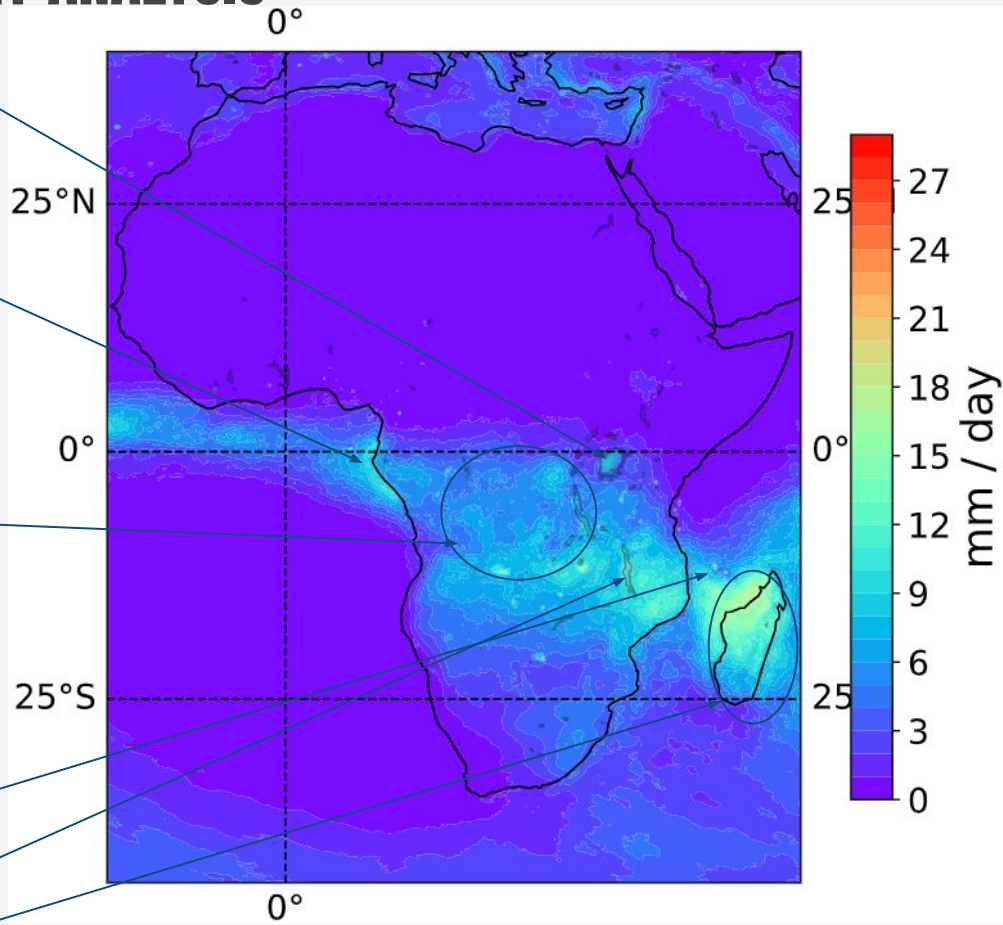
Comoros and Mayotte islands

Source:
https://www.worldatlas.com/maps/comoros

Lake Victoria

Lake Malawi

Madagascar island



JULY ANALYSIS

Ethiopian highlands

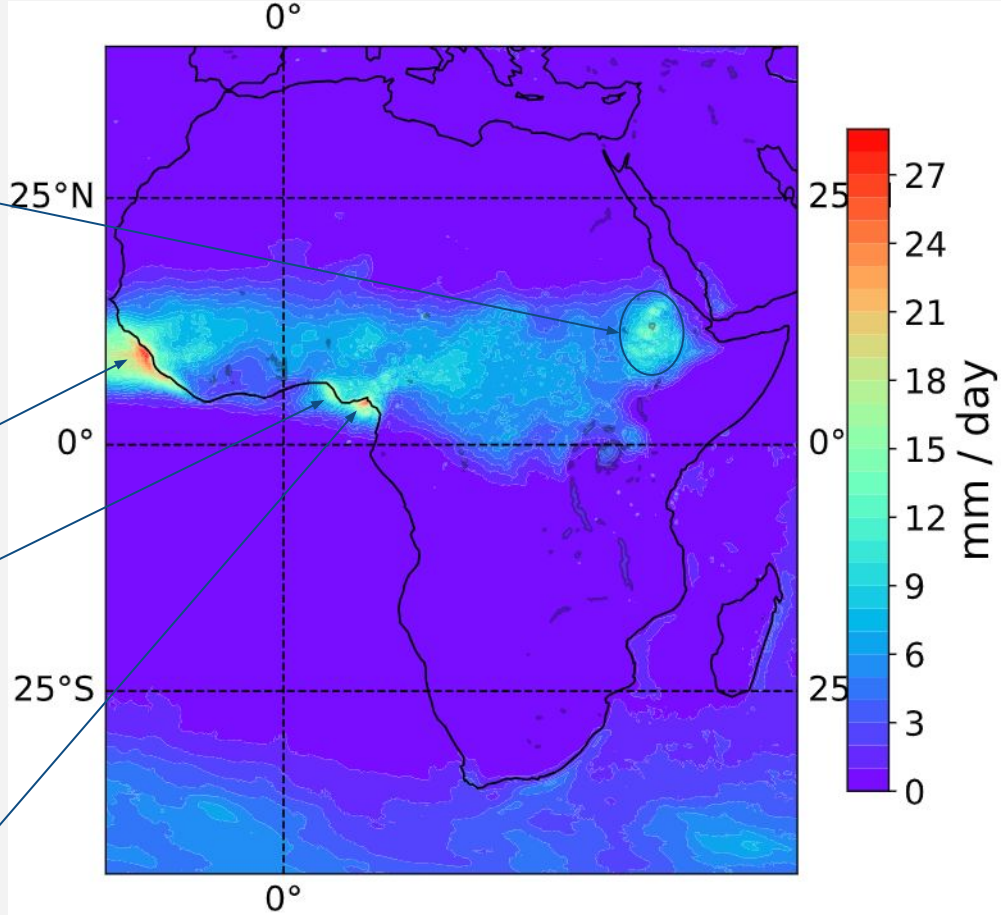
Source: https://www.worldatlas.com/maps/ethiopia

Bissagos archipelago: 88 islands

Source: https://www.worldatlas.com/maps/guinea-bissau

River Niger delta

Bakassi peninsula, Bioko island



OBSERVATIONS AND CONCLUSION

- Most precipitation “hotspots” represent islands, inland lakes and some major river deltas
- Not all lakes have hotspots
- Not all hotspots correspond to lakes or other geographical features
- Further analysis of GMI is required for clarification