

Masters project idea
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Curious cloud lines over the Gulf of Guinea

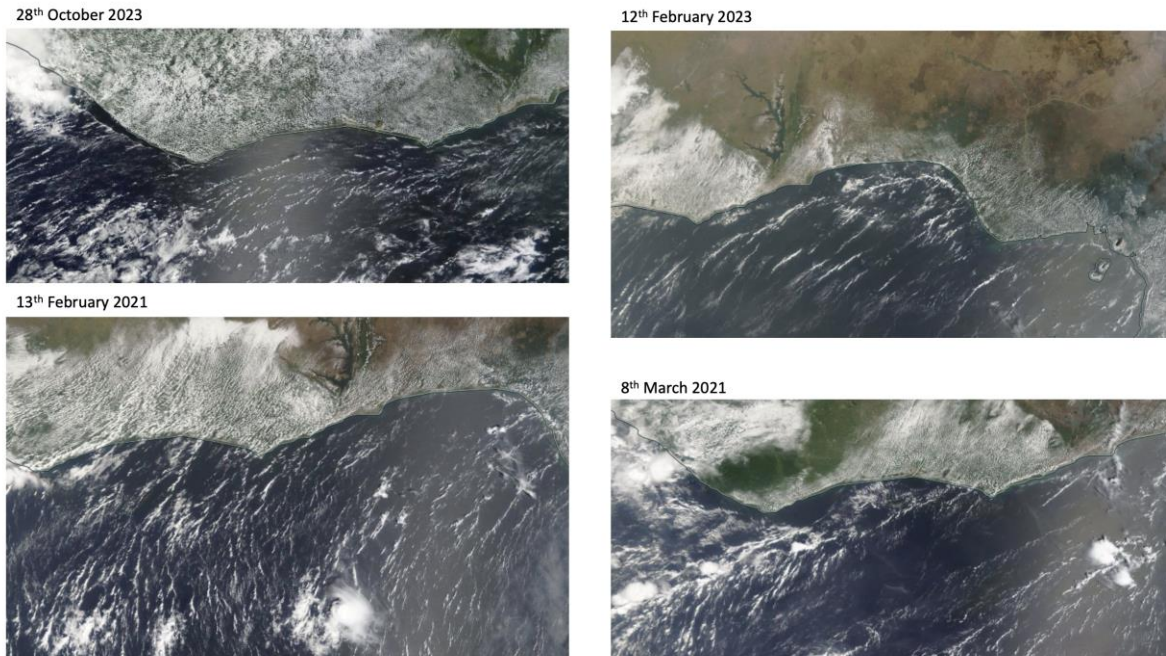


Figure 1 Examples of cloud lines close to the coast in the Gulf of Guinea, taken from the Terra MODIS instrument (<https://worldview.earthdata.nasa.gov>)

Browsing through satellite images of the Guinea Coast, one will frequently come across fascinating cloud lines such as those pictured. In the bottom two images, we see that convection may initiate along the structures. The cause of these cloud lines and associated convection remains unknown.

In this Master's project, you will design a method to detect and categorise these cloud lines from satellite images. By creating a climatology, you will answer questions such as: is there an annual cycle in their occurrence; what time of day are they most commonly seen; how long do they persist; how are they oriented; how often do they precede convection? You will use ERA5 data to investigate the conditions under which they form and under which convection may be initiated. There is also the possibility to model the cloud lines with high-resolution ICON to investigate the processes involved in more detail. The project has lots of flexibility, particularly in the detection method, so you will be able to incorporate your own ideas and interests.