[Speaker Zoom video]

Mangrove land use changes and its impact on climate variables in Indonesia

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Context

[Speaker Zoom video]

Why Mangroves?

- Play a critical role in mitigating climate change.
- Exceptional ability to sequester and store carbon dioxide from the atmosphere.
- Provide coastal protection, biodiversity support.
- Habitat for numerous marine species.

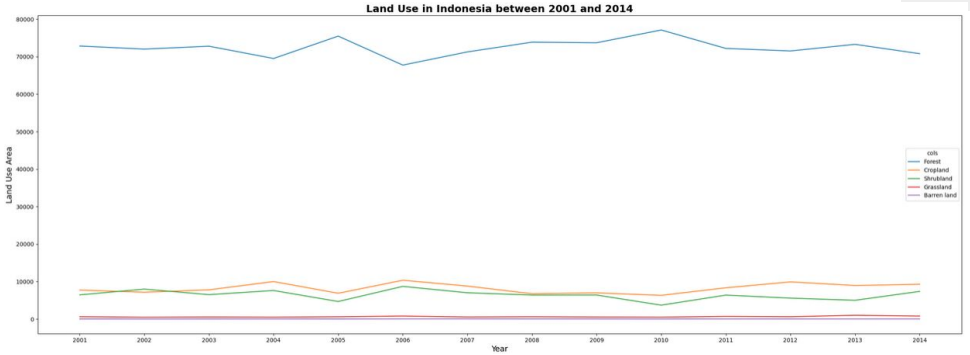
Why Indonesia?

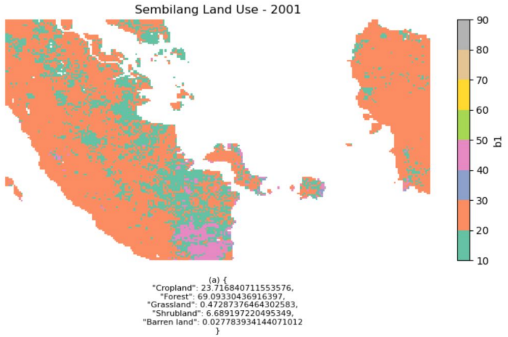
- Home to some of the world's most extensive and diverse mangrove forests.
- Mangroves are vital for the nation's efforts in climate change mitigation and adaptation.
- Threatened by rapid expansion of human activities, including deforestation and development.

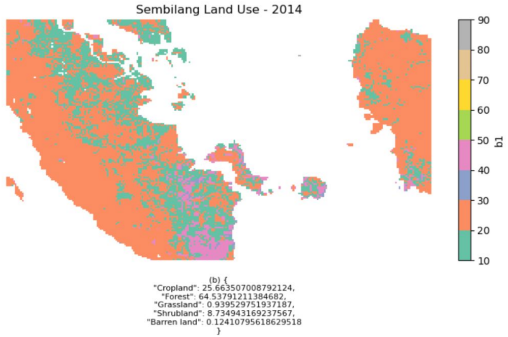
Land Cover Changes

[Speaker Zoom video]

- *There have been reforestation and deforestation periods.*
- *Forest loss has increased land use on croplands and grassland.*

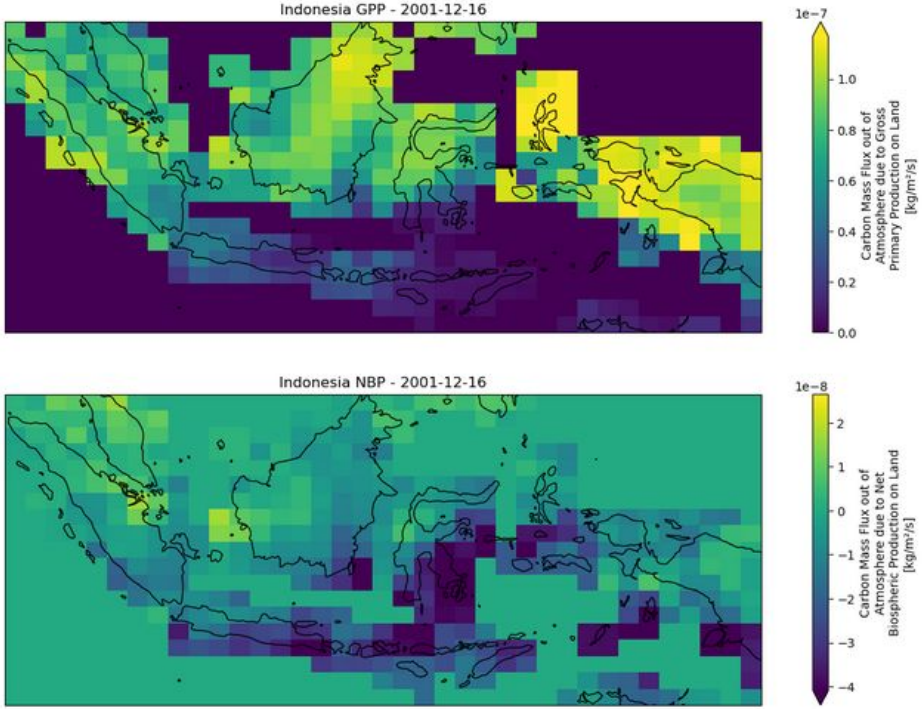


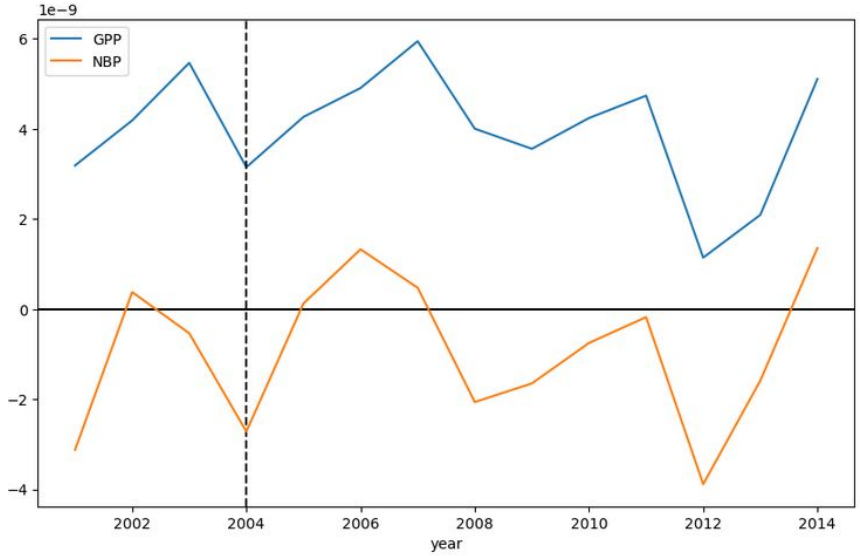




CMIP6 Carbon Mass Flux out of Atmosphere

[Speaker Zoom video]

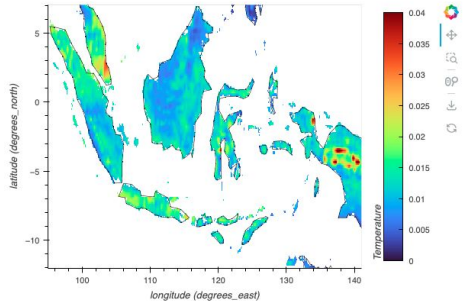


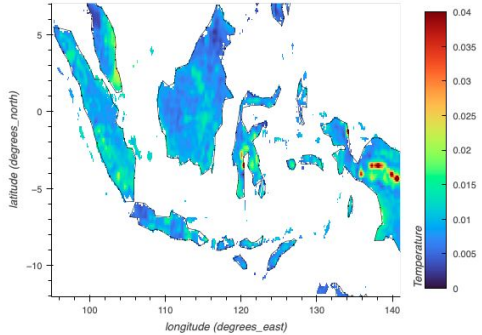


ERA5 - 2001/2014

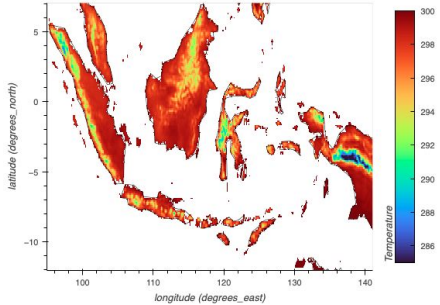
[Speaker Zoom video]

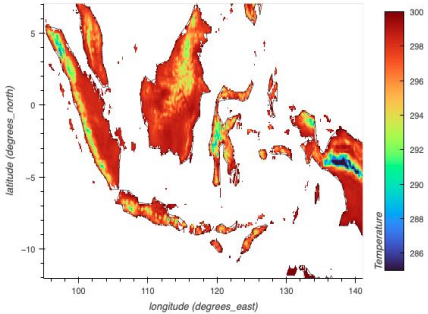
Precipitation





Temperature



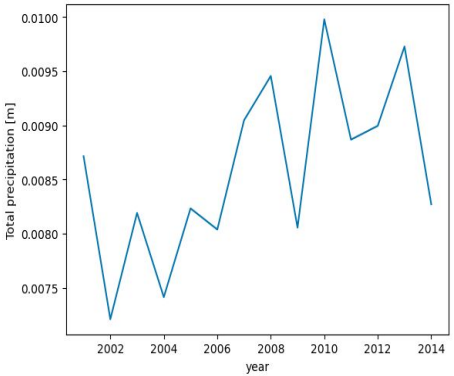


According to the ERA5 dataset, there have not been major changes in the values of temperature and precipitations

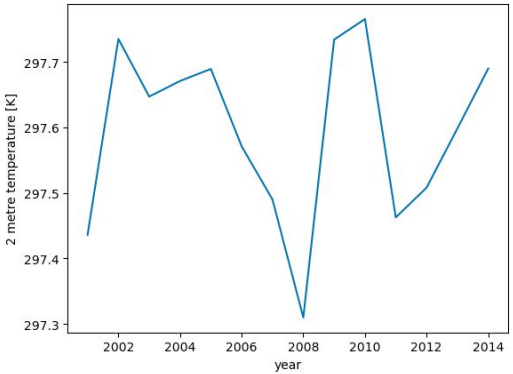
ERA5 - 2001/2014

[Speaker Zoom video]

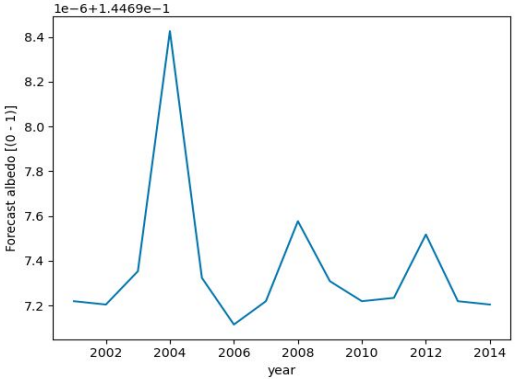
Precipitation



Temperature



Albedo



As you can see, there is a relevant spike in albedo in 2004. We believe this was a consequence of the tsunami that hit Indonesia during the same year

Conclusions

[Speaker Zoom video]

- Literature shows a significant decrease of forest cover. However the data from 2001 to 2014 over the studied datasets shows a decrease of 5%. This could also be due to the efforts of communities in reforesting.

- There is not a clear relation spanning between deforestation, carbon sequestration and several climatic variables that spans across all datasets

- There is a spike in albedo values for both CMIP6 and ERA5 datasets, which supports our hypothesis of an influence of the tsunami over albedo

Future work

[Speaker Zoom video]

- Explore changes in datasets that provide land cover including mangrove ecosystems (or work in segmenting these areas).

- Analyze changes in albedo and carbon sequestration taking into account the reforestation periods that have taken place recently.

- Despite the data does not fully support our hypothesis of albedo impacting other climatic variables, it is possible that a more granular dataset would give a different result.