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Latin America, Caribbean and European Union Network on Research and Innovation

Round table 2 -dialogue between biodiversity and climate change communities

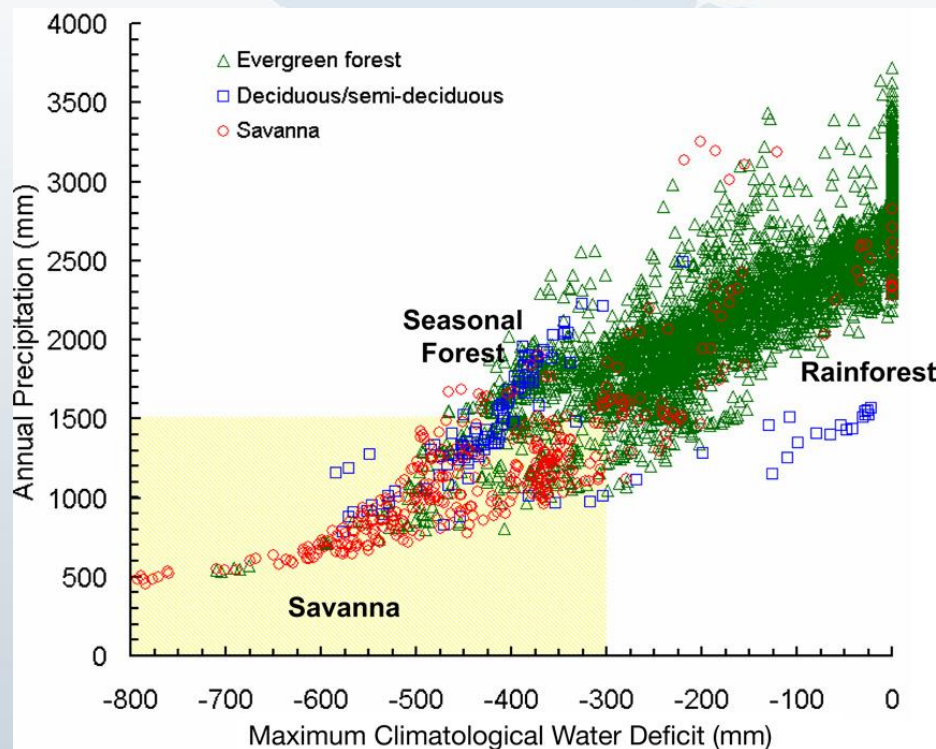
- Marta Llopart
- International Centre for Theoretical Physics (ICTP)/Trieste-IT



- Some studies have shown that **Climate Change** will likely alter the **forests**

e.g. Research carried out by INPE/Brazil shows that a warmer and drier environment for the AMZ region could convert from 30% up to 60% of the Amazon rainforest into a type of dry savanna.

It can happen considering just the climate change induced by increasing green house gases – it does not take LUC into account!!!



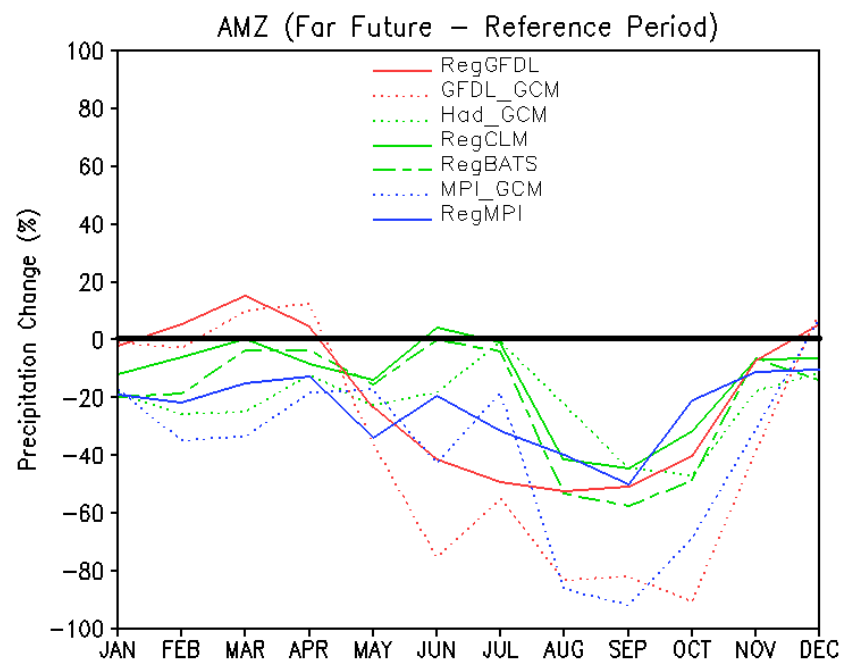
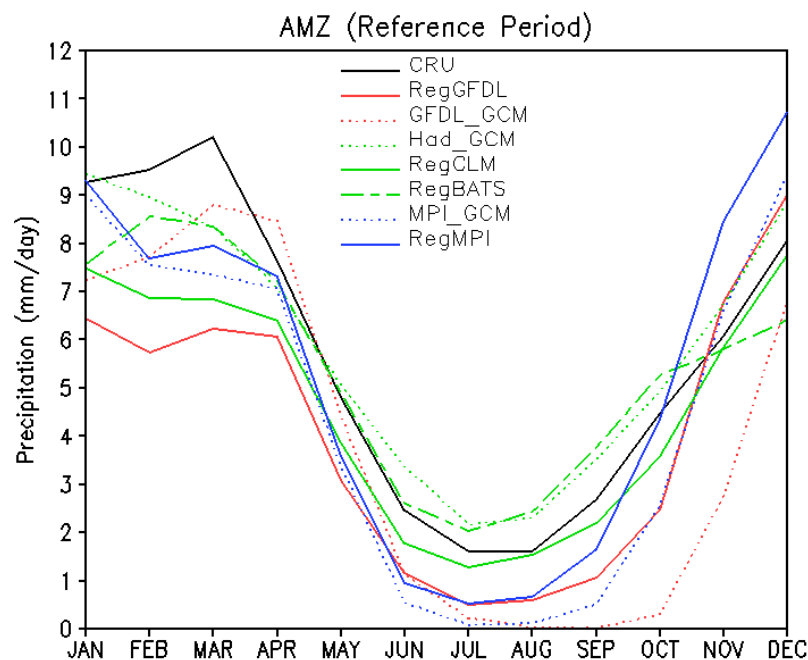
Malhi et al. (2009)

- Each kind of biome needs some minimum of water supply.
- e.g. in this diagram from Malhi et al. (2009) we can see very clearly if the annual precipitation decreases and the maximum water deficit decreases the rainforest could become other **biome type**, like seasonal forest or savanna!

“ We are running a serious risk of losing a large piece of the Amazonian tropical forest. If warming exceeds a few degrees Celsius, the process of ‘savannisation’ may well become irreversible. ”

Carlos Nobre Senior Scientist
INPE - Brazil National Space Research Institute

Annual cycle of observed and simulated precipitation averaged over the AMZ region in the reference period along with the corresponding late 21st century change.



Llopart et al. (2014)

- Model projections show a general decrease of precipitation by the end of the century over the Amazon region

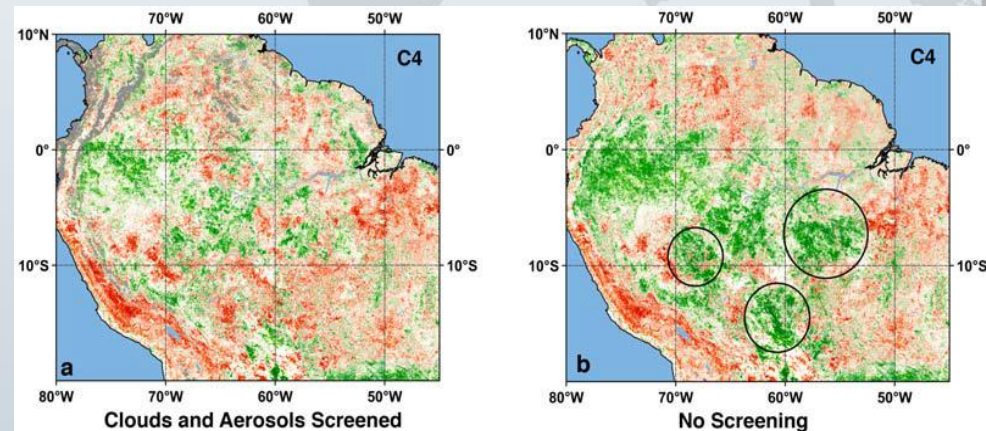
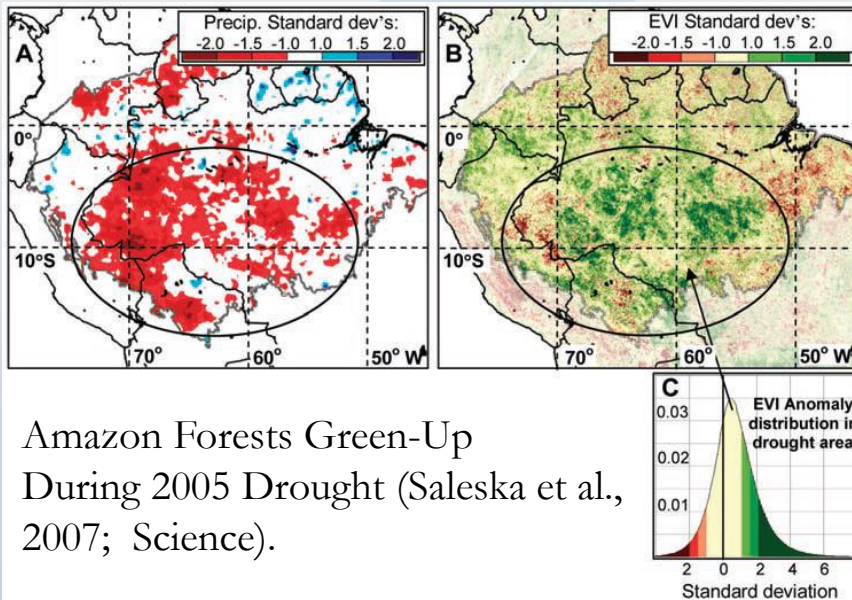


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- ✓ In 2005, large sections of the western Amazon basin experienced the most severe drought in the past 40 yr and one of the most intense of the last hundred years (Marengo et al. 2007)
- ✓ Studies about the AMZ drought in 2005 have shown different conclusions about the behavior of the forest during this period



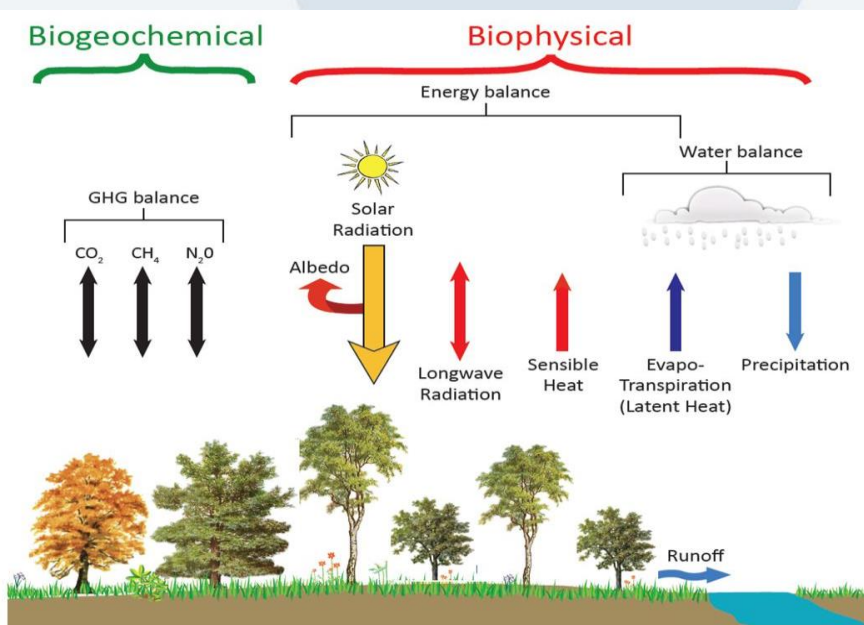
Amazon forests **did not** green-up during the 2005 drought. (Samanta et al. 2010)



- The ecosystems are not inert to climate change!

Biogeochemical

Biophysical



In a changing climate the forest can also change ...

If forests change it will impact on climate – through the **Surface Energy Budget!!!**

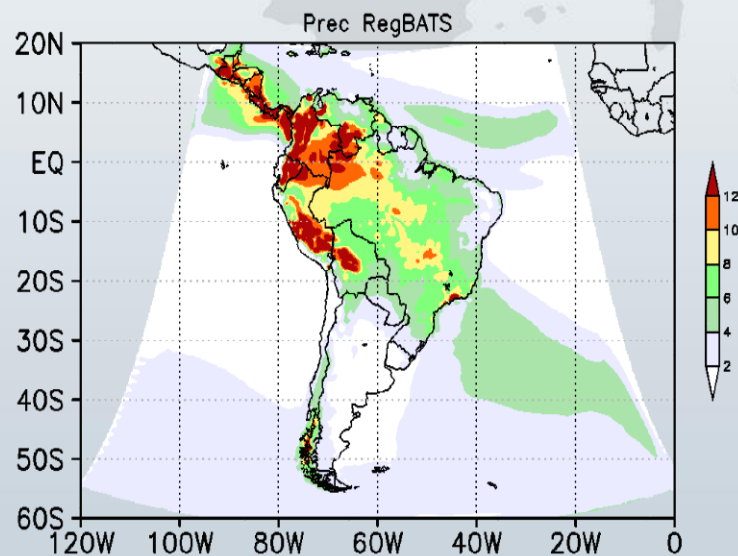
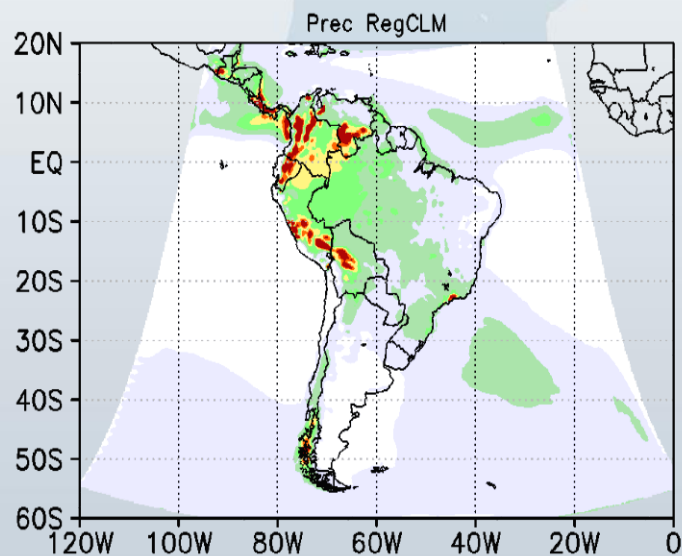
climate and vegetation are in dynamic equilibrium!!

- If climate and vegetation are in dynamical equilibrium would be useful if all the regional climate models -to access climate change over a target area - take into account the dynamic vegetation - climate and vegetation changing all together!
- Some IPCC global models took it into account – not all. About the regional climate models by now, no one is considering it.



There is a dynamic vegetation model coupled with the regional model RegCM- but never tested. Perhaps because there is a lack of experts in ecophysiology/biology/biodiversity working in the group.

- Climate sensitivity to land surface process is very large even without dynamic vegetation
- Different land surface models can impact in regional climate simulated



Llopart (2014)



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– ¡Muchas Gracias!