

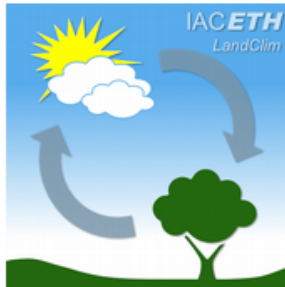
COSMO User Workshop 2013

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group

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Atmospheric and
Climate Science

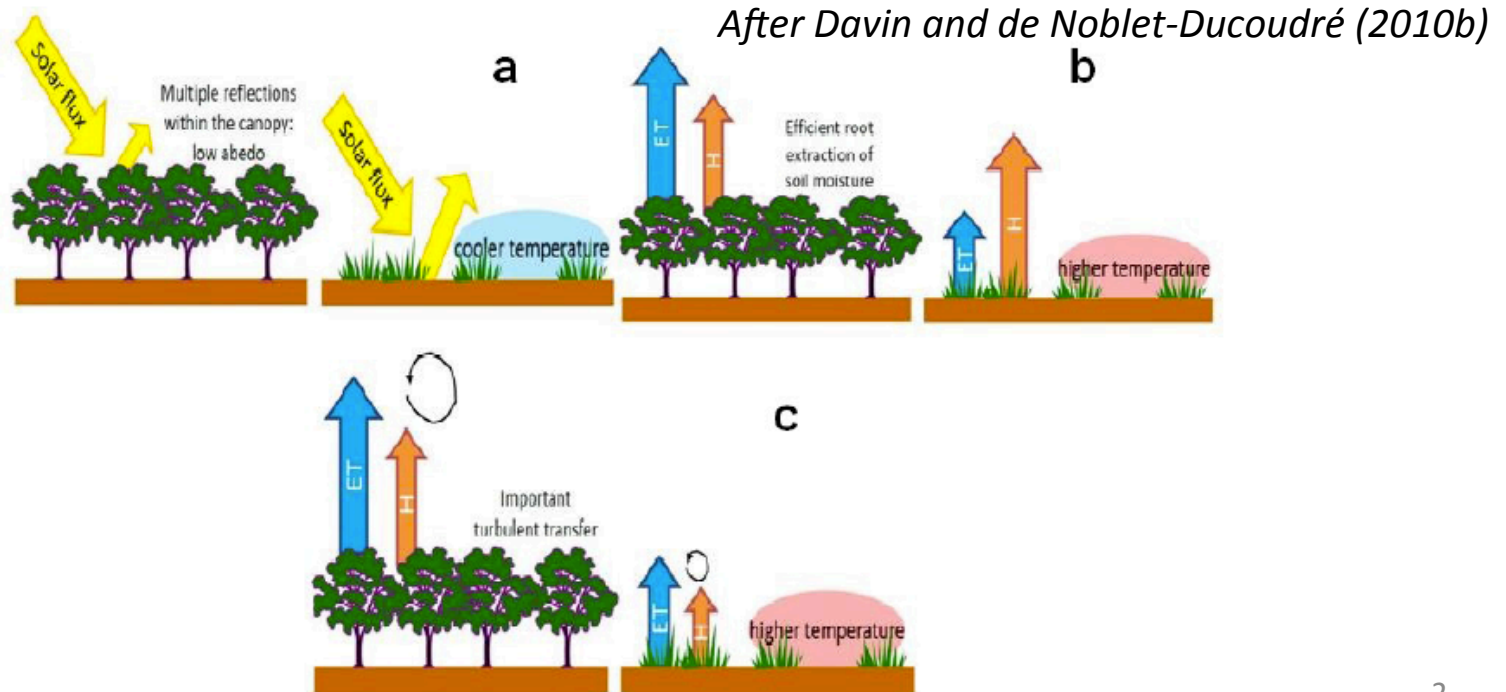
ETH Zürich



IACETH

My research topics

- Land-climate interactions
- Biogeophysical effects of vegetation on climate
- Links between land cover and water cycle

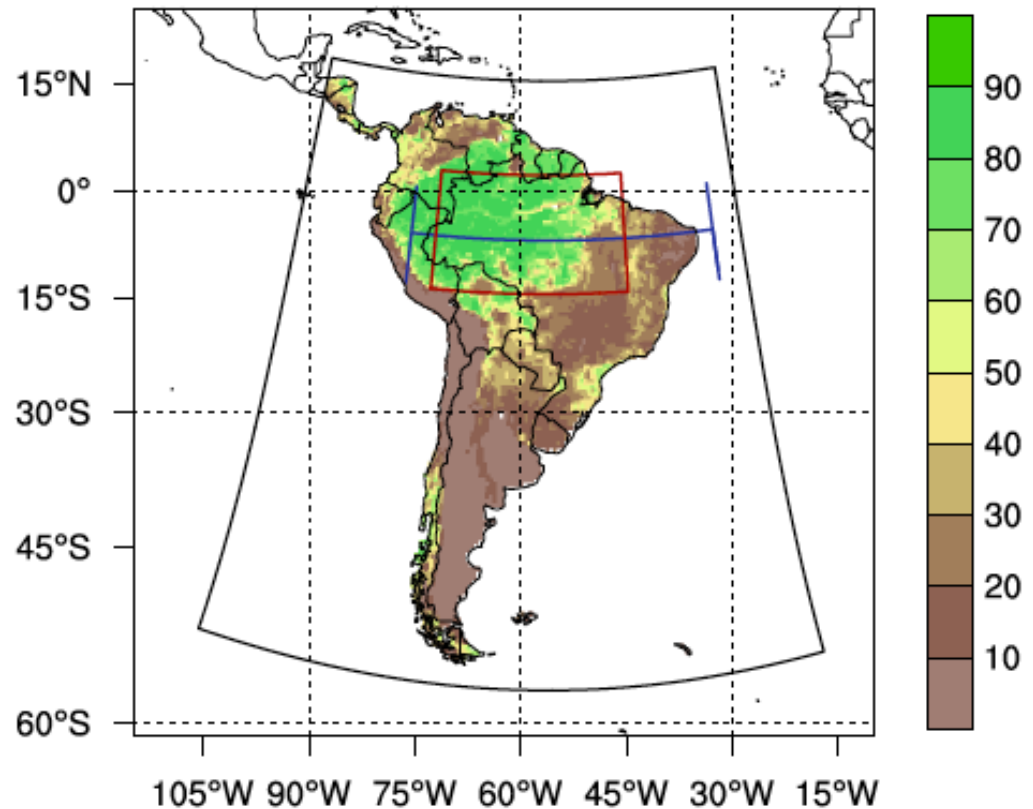


1. Influence of Amazonian deforestation on climate

COSMO version:
COSMO4.8-CLM11,
coupled with the
Community Land
Model 3.5

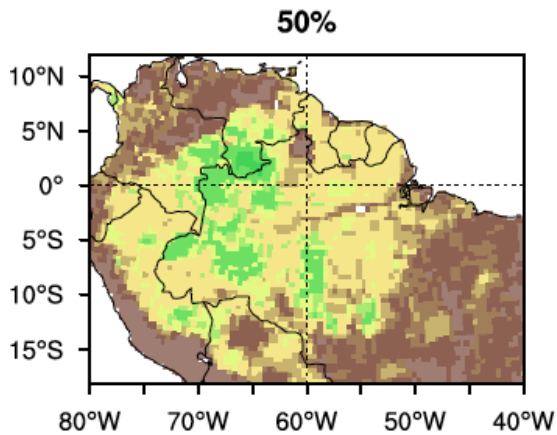
Boundary conditions:
ERA-Interim

Domain: South
America from the
CORDEX project

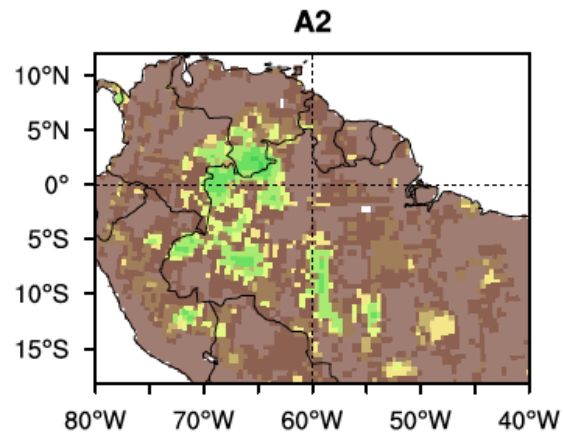


1. Influence of Amazonian deforestation on climate

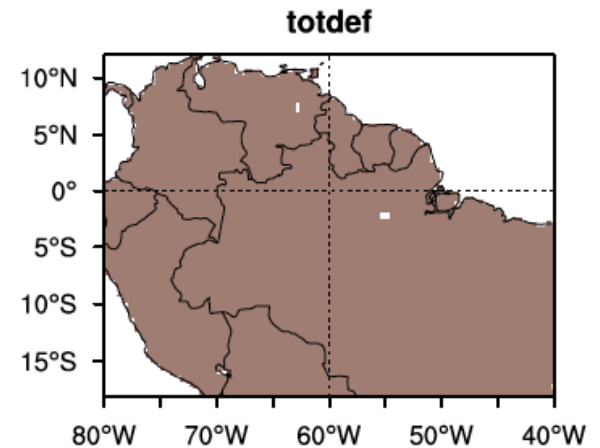
Sensitivity experiments with modified vegetation cover



Intermediate state between
the control and the A2
scenario



A2 scenario for
2100



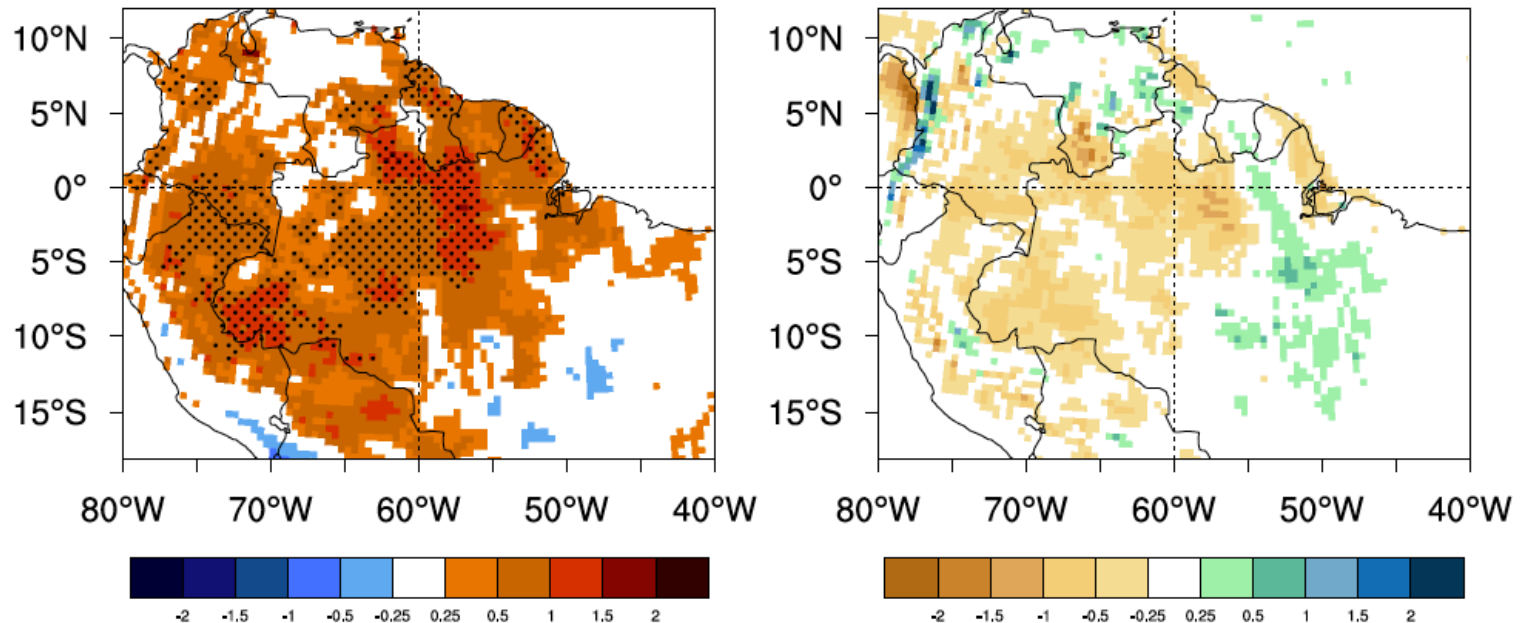
Total deforestation

CO2 concentration unchanged between simulations

1. Influence of Amazonian deforestation on climate

Selected results: A2 Vs control

Lejeune et al, in prep.



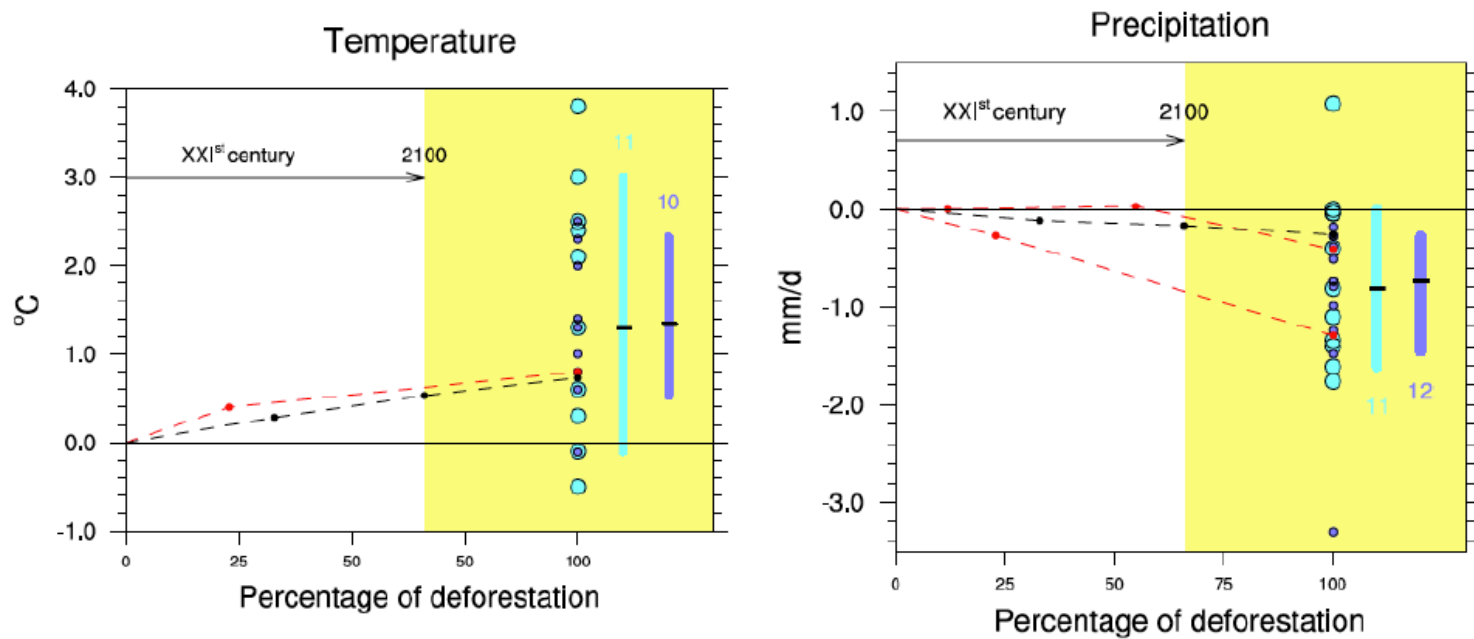
2-meter temperature (°C)

Precipitation (mm/d)

-> Biogeophysical effects: changes in albedo, roughness, evapotranspiration

1. Influence of Amazonian deforestation on climate

Selected results: changes with percentage of deforestation



Legend

- RCM experiments
- This study
- "old" GCM experiments
- "recent" GCM experiments

Lejeune et al, in prep.

2. Comparison of COSMO-CLM and COSMO-CLM² over South America

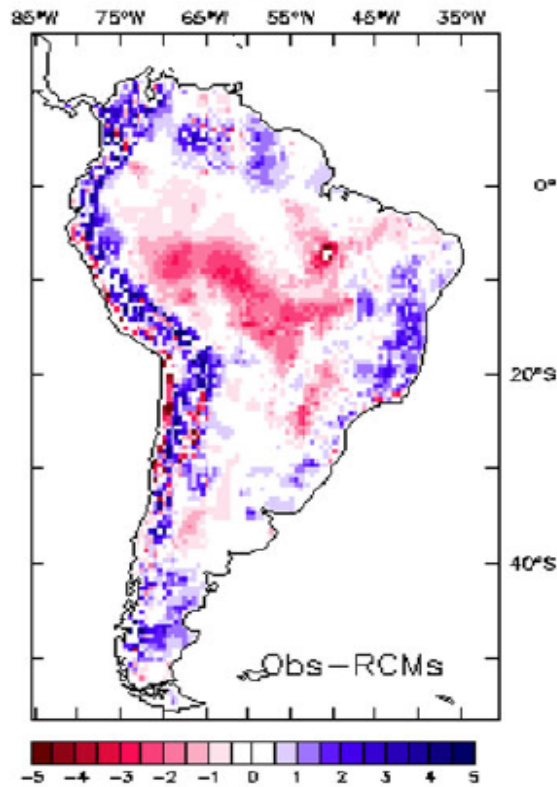
2. Comparison of COSMO-CLM and COSMO-CLM² over South America

In collaboration with Stefan Lange (PIK)

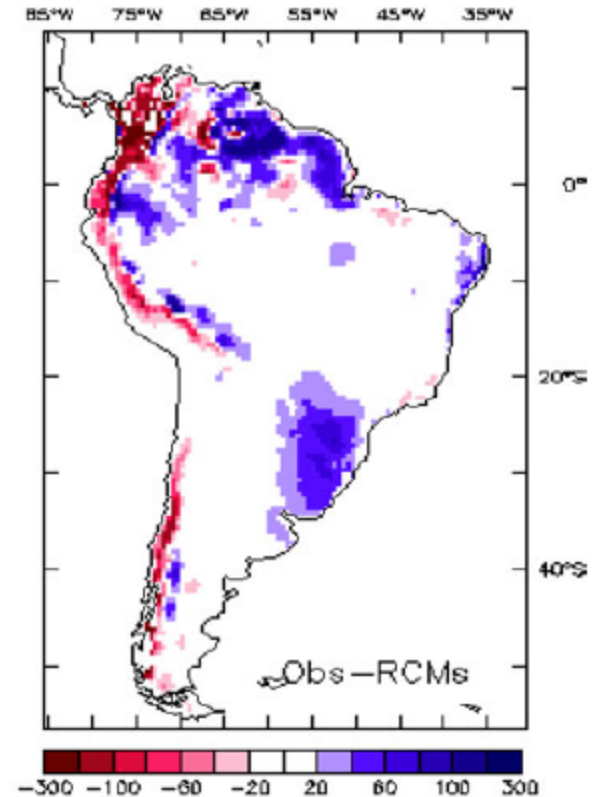
-> Comparison of the performances of
COSMO4.8-CLM11 coupled to the Community Land
Model 3.5
VS. COSMO4.8-CLM19 (default surface model:
TERRA)

Domain: **South America** (CORDEX project)
Boundary conditions: **ERA-Interim**

2. Comparison of COSMO-CLM and COSMO-CLM² over South America



Surface temperature (°C)



Precipitation (mm/month)

CORDEX Project – *Solman et al. (2013)*

3. Further research activities

- Decomposition of continental evaporation fluxes: soil/open water evaporation + vegetation transpiration
 - > tools from the COSMO model
- Land management activities and their influence on the simulated climate
 - > COSMO-CLM²

Thank you for your attention