The experience of developing an Earth System Model in Brazil

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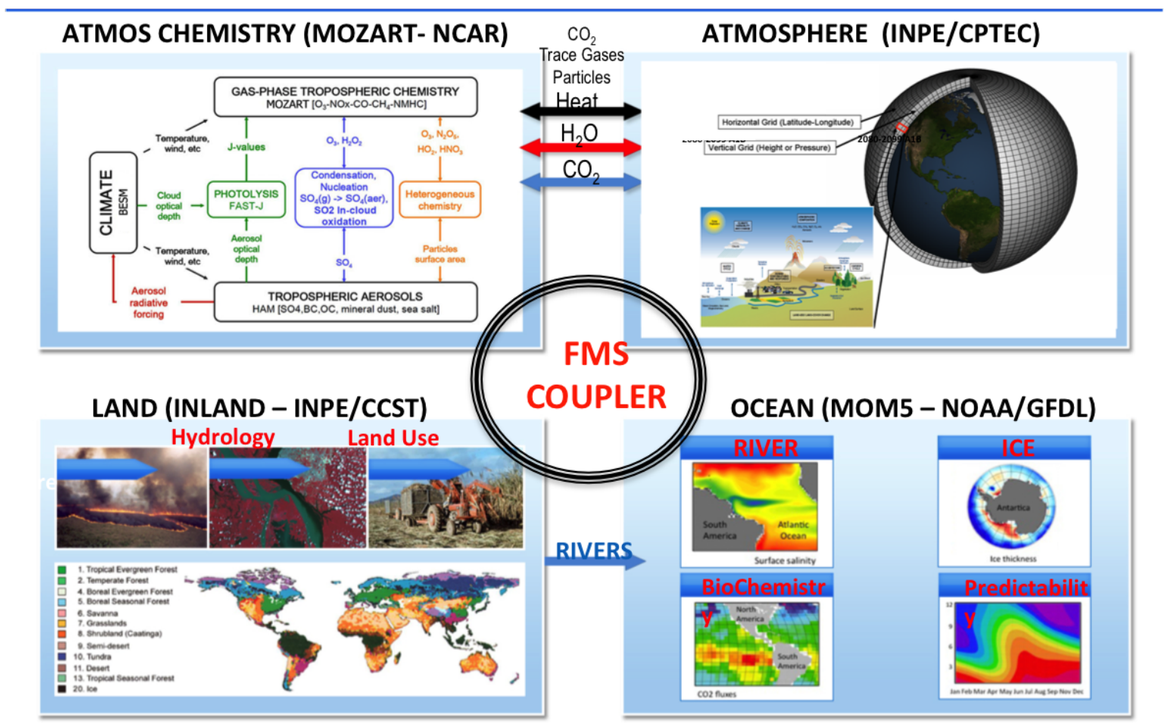
Introduction

The Brazilian Earth System Model, coupled ocean-atmosphere (BESM-OA2.5) is the coupling of the CPTEC/INPE Brazilian Atmospheric Model (BAM) and the GFDL/NOAA Modular Ocean Model (MOM4p1 and MOM5) (Nobre *et al.*, 2013; Capistrano *et al.*, 2016).

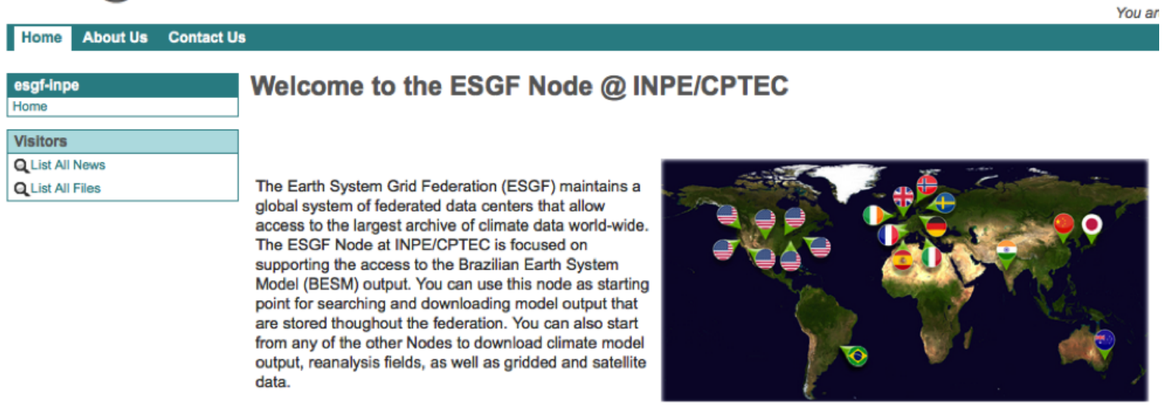
BESM development strategy

1. full use of CPTEC's experience and sub-models
2. collaboration with advanced climate change centers abroad
   - Use GFDL/FMS coupler to add components:
     Dynamic vegetation with carbon cycle;
     Continental hydrology-ocean coupling;
     Ocean carbon cycle;
     Enhanced sea ice and pack ice;
     Atmospheric chemistry.

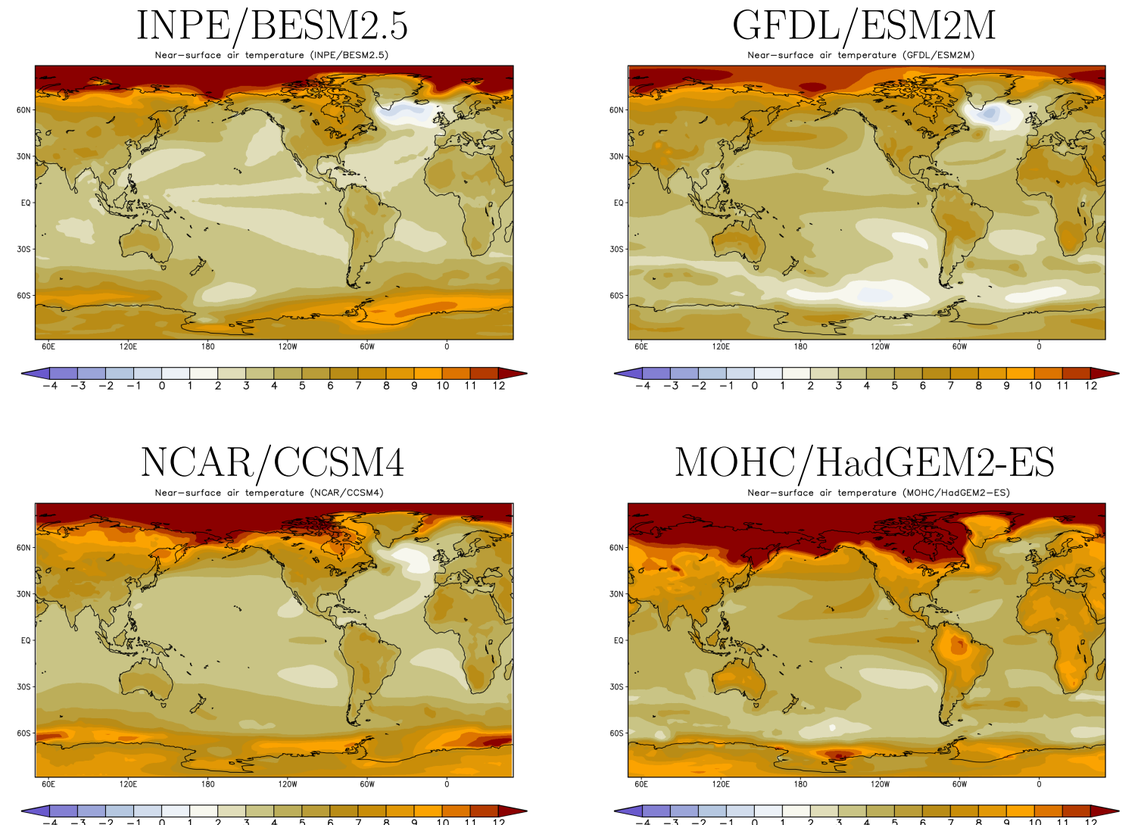
BESM component models

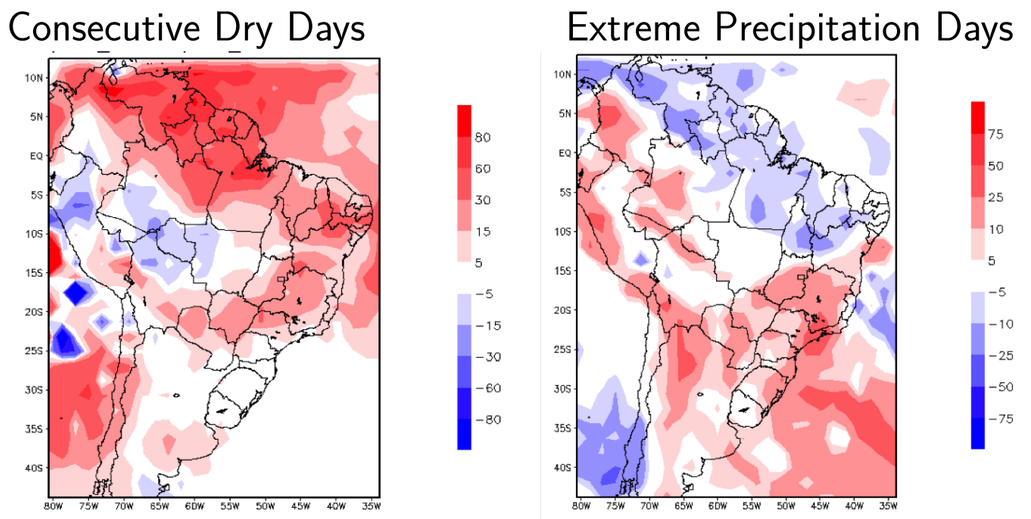


ESGF@INPE/CPTEC



Results





Pesquero *et al.* (2016).

Acknowledgements

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Reference

[1] Nobre, P. *et al.*. **Climate simulation and change in the Brazilian climate model**. *J Clim*, vol. 26(17):6716-6732, 2013.

[2] Capistrano, V. B. *et al.*. **Climate Sensitivity BESM version 2.5**. *To be submitted to Journal of Climate*, 2016.

[3] Pesquero, F. *et al.*. **The equilibrium response of the Brazilian Climate Model - BESM2.5 to 4xCO2 atmospheric concentration forcing**. *Submitted to Theoretical and Applied Climatology*, 2016.