The 2009 rainy season in Eastern amazon as simulated by REGCM4

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THE 2009 RAINY SEASON IN EASTERN AMAZON AS SIMULATED BY REGCM4

Lab. session work by Amazon group # 9
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SIMULATION SET UP:

RegCM4 Domain: 60 Km (80 x 120 X L18) NORMER
Period: 01Jan to 01May 2009
ICBC: EIN15 / OI_WK
Spin-up: 30 days (Jan 2009)
Convective scheme: GFC and MIT
**SENSITIVITY TEST → DSST SCHEME**

RegCM4 with CLM with DSST

RegCM4 with CLM without DSST

**AIM:**
What is the effect of the SST scheme in reproducing surface atmospheric fields and the regional precipitation?

**Model performance analysis:**
Dynamical fields → regional precipitation

Observational data: TRMM, GPCP and GAUGE
MIT
(tpr = total precipitation)

TRMM (mm/day)

GPCP (mm/day)

mit clm_dsst_

TPR

mit clm_nodsst_

Dif.
MIT
(tg = ground temperature)
MIT
(Wind 850 hPa)
MIT
(Zonal circulation cross-section)

Local Walker cell:
Averaged area 5S-1N
Local Hadley cell:
Averaged area 40W-30W
MIT
(Meridional circulation cross-section)

Local Hadley cell:
Averaged area 55W-45W
GFC
(tpr = total precipitation)
GFC
(tg = ground temperature)
GFC
(Wind 850 hPa)
Local Walker cell:
Averaged area 5S-1N

GFC
(Zonal circulation cross-section)
GFC
(Meridional circulation cross-section)

Local Hadley cell:
Averaged area 40W-30W
GFC
(Meridional circulation cross-section)

Local Hadley cell:
Averaged area 55W-45W
Others Seasonal forecast for FMA 2009 (issued in Jan/09)
Some conclusions:

- Over the equatorial Atlantic Ocean, DSST scheme produces SST warmer with MIT than GFC, thereby possible influences on surface wind patterns;

These founds are only for 2009 conditions. So, it is necessary more simulations including another years.
Some conclusions:

- Oceanic rainfall maximum over equatorial Atlantic is slightly well reproduced by MIT and GFC not;

- Over land in Amazon, although GFC has negative bias, it localizes well maximum in central-western and eastern portions; MIT shifts maximum toward south Amazon and Brazil Nordeste;

- The wind patterns predicted by RegCM4 is dynamically consistent with rainfall distribution.

To be done (E. De Souza, Do Carmo & Rosmeri): tuning RegCM4 for Amazon basin...
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Muito obrigado!
Thank you very much!

Adriatic sea (photo taken by De Souza from ICTP guest house), Trieste, Italy, June 2010.