CORDEX Africa Simulation with Convective Parameterization Tests, RegCM3 vs. RegCM4

Tomas Halenka, Michal Belda

tomas.halenka@mff.cuni.cz
Settings

- Domain size: 238x250, 50km, 12 pt buffer zone
- Saharan albedo 0.2 for wavelength <0.7µm and 0.4 for >0.7µm
- Large scale precipitation RegCM alpha
Validation

- CRU land – total area excluding buffer zone (12pt)
- Period 1990-2002, vs. CRU TS2.1
Convection

Tests RegCM3:

- Kuo and Anthes
- Grell (Arakawa and Schubert)
- Grell (Fritsch and Chappell)
- Emanuel, final runs Kuo and Anthes, Grell (Fritsch and Chappell)
Convection

Final runs RegCM3:
• Kuo and Anthes
• Grell (Fritsch and Chappell)
• Emanuel

RegCM4.0
• Grell (Fritsch and Chappell)
All models and CRU 1990-2002
Temperature (°C)
All models and CRU 1990-2002
Precipitation (mm/day)
All models-CRU 1990-2002

Temperature (°C)
All models-CRU 1990-2002
Precipitation (%)
All models-CRU 1990-2002
Precipitation (mm/day)
Validation

- CRU land – total area excluding buffer zone (12pt)
- Period 1990-2002, vs. CRU TS2.1

Time series:
- Africa continent land – 18W-52E, 35S-38N
- ITCZ land – 18W-52E, 15S-15W
CRU land 1989

Temperature (°C)  Precipitation (mm/day)
Africa continent 1989

Temperature (°C)  Precipitation (mm/day)
Temperature – monthly

Africa

Africa - ITCZ
Precipitation – monthly

Africa

Africa - ITCZ
Temperature – monthly

Africa

Africa - ITCZ
Precipitation – monthly

Africa

Africa - ITCZ
Temperature – annual cycle

Africa

Africa - ITCZ
Precipitation – annual cycle

Africa

Africa - ITCZ

MONTH

precipitation (mm/day)
Temperature – annually

Africa

Africa - ITCZ
Precipitation – annually

Africa

Africa - ITCZ
Summary, outlooks, options

• Complete the tests at least till 2006 (CRU TS3.0)
• More tests for RegCM4.0 (RegCM4.1?)
• More detailed statistical analysis (regions, higher statistics)
• Scenarios – ECHAM?, ARPEGE?
Thanks for your attention!