

Description RCM simulations in CLARIS LPB

Model

Short model name	RegCM3
Full model name	Regional Climate Model
Institute	GrEC-USP, Departamento de Ciências Atmosféricas, Unversidade de São Paulo, Brazil (http://www.grec.iag.usp.br/)
Model version	3
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General references	Pal et al. (2007) , BAMS , 88, 1395–1409. da Rocha et al. (2009), JGR , 114, p. D10108, doi:10.1029/2008JD010212

Experimental setup

Name of domain	South America
Size of full grid (lon x lat x vertical)	192 x 202 x 18
Horizontal resolution	50 x 50 km
Type of grid	Rotated Mercator
Lateral Boundary Relaxation number of grid points	12
Nudging (if yes, provide some description spectral, variables, levels)	No
Boundary zone excluded (grid points)	0
Size of post-processed output grid (lon x lat)	192 x 202

ERA-INTERIM

Time period	1989-2008
Source of boundary condition	ERA-Interim
Initial condition	ERA-Interim
Spin up period	Jan-Dec 1989
Internal reference of simulation	

A1B GCM

Time period	1959-1990, 2009-2040, 2069-2100
Source of boundary condition	HadCM3-Q0
Initial condition	HadCM3-Q0
Spin up period	Jan-Dec 1959, Jan-Dec 2009, Jan-Dec 2069 OBS: We sent the spin up periods to the CLARIS Data Base
Internal reference of simulation	

General model description

Process:	Description:	Reference:
Dynamics	Split-explicit integration scheme	Giorgi et al. (1993)
Radiation	Short and longwave radiation processes follows the Community Climate Model 3 (CCM3)	Kiehl et al. (1996)
Cloud fraction	Obtained from explicit cloud scheme and from convective scheme	Pal et al. (2000)
Turbulence	is based on a nonlocal diffusion concept that takes into account countergradient fluxes resulting from large-scale eddies in an unstable, well-mixed atmosphere	Holtslag (1990)
Explicit cloud and precipitation	grid-scale precipitation scheme solves only the prognostic equation for cloud water, which is then directly used in the radiative transfer evaluations.	Pal et al. (2000)
Convection	Grell scheme that considers a single cloud represented by undiluted updraft and downdraft currents	Grell (1993)
Land-surface scheme	BATS (Biosphere- Atmosphere Transfer Scheme) surface-vegetation-atmosphere transfer scheme	Dickinson et al. (1993)
Fluxes over sea	roughness length is function of the wind velocity to account for additional flux induced by boundary layer scale variability.	Zeng et al. (1998)

Details in model description (use or modify as needed)

Land-surface processes

Specification:	Description:	Reference:
Land cover map	Global Land Cover Characterization (GLCC) datasets for the vegetation/landuse data	Loveland et al. (2000).
Soil map	Is specified according to the land cover map	
Orography data	GTOPO30	
No of sub surfaces (tiles)	3	

Overview of files:	vegetation layer, a snow layer, a surface soil layer	
Interactive vegetation	No	
Soil layers for temperature	3 layers: 10 cm thick, or root zone layer, 1-3 m thick, and a third deep soil layer 4.5 m thick (depends of the vegetation)	
Soil layers for humidity	3 layers: 10 cm thick, or root zone layer, 1-3 m thick, and a third deep soil layer 4.5 m thick (depends of the vegetation)	

References

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