# Description RCM simulations in CLARIS LPB

## *Model*

| Short model name | LMDZ |
|---|---|
| Full model name | LMDZ version 4 Configuration South America |
| Institute | IPSL (Institut Pierre-Simon Laplace) |
| Model version | Version 4 |
| Contact person name | Laurent Li |
| Contact person email | li@lmd.jussieu.fr |
| General references | Hourdin et al. 2006; Li 1999 |

## *Experimental setup*

| Name of domain | South America |
|---|---|
| Size of full grid (lon x lat x vertical) | 184 x 180 x 19 |
| Horizontal resolution | Around 0.48 degrees |
| Type of grid | Irregular rectangular latitude-longitude |
| Lateral Boundary Relaxation number of grid points | 32x30 |
| Nudging (if yes, provide some description spectral, variables, levels) | Very week relaxation inside the domain |
| Boundary zone excluded (grid points) | 32x30 |
| Size of post-processed output grid (lon x lat) | 152x150 |

## ERA-INTERIM

| Time period | 1989-01-01 / 2008-12-31 |
|---|---|
| Source of boundary condition | ERA-Interim global 0.75° 4xdaily |
| Initial condition | arbitrary |
| Spin up period | No spin-up |
| Internal reference of simulation | CLARIS/CORDEX/LMDZ-sudam |

## *General model description*

| Process: | Description: | Reference: |
|---|---|---|
| Dynamics | Grid-points Arakawa-C grid | |
| Radiation | 2-band SW, 6-band LW | |
| Cloud fraction | Based on water vapour distribution function | |
| Turbulence | K-diffusion | |
| Explicit cloud | Prognostic cloud water | |

| | | |
|---|---|---|
| **and precipitation** | | |
| **Convection** | Emanuel scheme | |
| **Land-surface scheme** | ORCHIDEE scheme | |
| **Fluxes over sea** | Bulk formula | |

## *Details in model description*

### Land-surface processes

| Specification: | Description: | Reference: |
|---|---|---|
| **Land cover map** | | |
| **Soil map** | | |
| **Orography data** | | |
| **No of sub surfaces (tiles)** | | |
| **Overview of tiles:** | | |
| | | |
| | | |
| | | |
| | | |
| **Energy balance** | | |
| **Interactive vegetation** | | |
| **Soil layers for temperature** | | |
| **Soil layers for humidity** | | |

### Specification of land tiles

| | Open land | Snow on open land | Forest | Snow in forest |
|---|---|---|---|---|
| **Albedo** | | | | |
| **LAI** | | | | |
| **Root depth (m)** | | | | |
| **Momentum roughness** | | | | |

### Description of diagnostic output

Daily variables (16):

| variable | units | description | reference |
|---|---|---|---|
| temp | K | Air temperature at 9 selected pressure levels | ta |
| ovap | kg/kg | Specific humidity at 9 pressure levels | hus |
| geop | m2/s2 | geopotential height at 9 pressure levels | zg |

| vitu | m/s | zonal wind at 9 pressure levels | ua |
|------|-----|--------------------------------|------|
| vitv | m/s | meridional wind at 9 pressure levels | va |
| vitw | ? | vertical wind at 9 pressure levels | wap |
| t2min | K | daily minimum temperature at 2 metres | tasmin |
| t2max | K | daily maximum temperature at 2 metres | tasmax |
| wind10max | m/s | daily maximul wind speed at 10 metres | wssmas |
| topsdn | W/m2 | downward solar radiation at TOA | rsdt |
| topsup | W/m2 | upward solar radiation at TOA | rst, rsdt |
| toplup | W/m2 | upward IR radiation at TOA | rlut |
| solsdn | W/m2 | downward solar radiation at surface | rsds |
| solsup | W/m2 | upward solar radiation at surface | rss, rsds |
| solldn | W/m2 | downward IR at surface | rlds |
| sollup | W/m2 | upward IR at surface | rls, rlds |

8xdaily variables (22)

| | | | |
|------|-------|-----|------|
| t2m | K | 2-meter temperature | tas |
| q2m | kg/kg | 2-meter specific humidity | huss |
| rh2m | - | 2-meter relative humidity | hurs |
| u10m | m/s | 10-m U wind | uas |
| v10m | m/s | 10-m V wind | vas |
| wind10m | m/s | 10-m wind speed | wss |
| rain | mm/s | rainfall rate | |
| snow | mm/s | snowfall rate | |
| evap | mm/s | evaporation | evspsbl |
| bils | W/m2 | total heat flux at surface | |
| sens | W/m2 | surface sensible heat flux | hfss |
| slp | Pa | sea-level pressure | psl |
| psol | Pa | surface pressure | ps |
| prw | kg/m2 | column water vapour content | |
| vimtu | kg/m/s | column integrated U-moisture flux | |
| vimtv | kg/m/s | column integrated V-moisture flux | |
| evapot | mm/s | potential evapotranspiration | evspsblpot |
| runoff | | runoff | mrro |
| drainage | | drainage | |
| snowmass | | surface snow amount | snw |
| bqsb | | soil moisture for the deep layer | |
| gqsb | | soil moisture for the surface layer | |

## *References*