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**REGCM MODEL INFORMATION AND SETUP
(WAMME EXPERIMENTS)**

- The model is the Abdus Salam ICTP regional climate model RegCM. The latest version is described in *Pal et al. 2007*;
- Dynamics: MM5 Hydrostatic (*Grell et al 1994*);
- Radiation: CCM3 (*Kiehl 1996*);
- Large-Scale Clouds & Precipitation: SUBEX (*Pal et al 2000*, *Sundqvist et al. 1989*);
- Cumulus convection: *Grell (1993)* with *Fritsch and Chappell* closure;
- Boundary Layer: *Holtslag (1990)*;
- Tracers/Aerosols: *Qian et al (2001)*;
- Dust (*Zakey et al 2006*) not activated for WAMME experiments;
- Land Surface: BATS (*Dickinson et al 1993*);
- Ocean Fluxes : *Zeng et al (1998)*;
- Model horizontal resolution: 50 km (for WAMME);
- Vertical resolution 18 sigma levels;
- Experiments duration: April-October, 2000,2003,2004,2005 and 2006;
- Spinup: one month removed;
- Domain: 38W-38E , 22S-36N;
- Boundary conditions: NNRP2;
- SST: HadISST;

DATA FILES

REGCM_UAM_topo.nc

REGCM_UAM_2000_may_oct_monthly_2D.nc
REGCM_UAM_2000_may_oct_monthly_3D_plev.nc
REGCM_UAM_2003_may_oct_monthly_2D.nc
REGCM_UAM_2003_may_oct_monthly_3D_plev.nc
REGCM_UAM_2004_may_oct_monthly_2D.nc
REGCM_UAM_2004_may_oct_monthly_3D_plev.nc
REGCM_UAM_2005_may_oct_monthly_2D.nc
REGCM_UAM_2005_may_oct_monthly_3D_plev.nc
REGCM_UAM_2006_may_oct_monthly_2D.nc
REGCM_UAM_2006_may_oct_monthly_3D_plev.nc

REGCM_UAM_2000_may_oct_daily_2D.nc
REGCM_UAM_2000_may_oct_daily_3D_plev.nc
REGCM_UAM_2003_may_oct_daily_2D.nc
REGCM_UAM_2003_may_oct_daily_3D_plev.nc
REGCM_UAM_2004_may_oct_daily_2D.nc
REGCM_UAM_2004_may_oct_daily_3D_plev.nc
REGCM_UAM_2005_may_oct_daily_2D.nc
REGCM_UAM_2005_may_oct_daily_3D_plev.nc
REGCM_UAM_2006_may_oct_daily_2D.nc
REGCM_UAM_2006_may_oct_daily_3D_plev.nc

FILE NAMING CONVENTION

Monthly average files:

        REGCM_UAM_{year}_may_oct_monthly_2D.nc
        REGCM_UAM_{year}_may_oct_monthly_3D_plev.nc

Daily average files:

        REGCM_UAM_{year}_may_oct_daily_2D.nc
        REGCM_UAM_{year}_may_oct_daily_3D_plev.nc

3D VARIABLES

OMEGA:long_name = "Omega"
OMEGA:units = "m/s"

UA:long_name = "Zonal Wind"
UA:units = "m/s"

VA:long_name = "Meridional Wind"
VA:units = "m/s"

TA:long_name = "Temperature"
TA:units = "K"

QD:long_name = "Water Mixing Ratio"
QD:units = "kg/kg"

QC:long_name = "Cloud Mixing Ratio"
QC:units = "kg/kg"

HGT:long_name = "Geopotential Height"
HGT:units = "m"

CL:long_name = "Cloud Fraction"
CL:units = "fraction"

2D VARIABLES

PS:long_name= "Surface Pressure"
PS:units = "hPa"

TGRND:long_name = "Ground Temperature"
TGRND:units = "K"

TSW:long_name = "Total Soil Water"
TSW:units = "mm"

SLP:long_name = "Sea Level Temperatur"
SLP:units = "hPa"

UAS:long_name = "Anemom Zonal Winds"
UAS:units = "m/s"

VAS:long_name = "Anemom Merid Winds"

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VAS:units = "m/s"

TAS:long_name = "Anemom Temp"
TAS:units = "K"

HUSS:long_name = "Anemom Spec Humidity"
HUSS:units = "kg/kg"

SMU:long_name = "Top Layer Soil Moist"
SMU:units = "mm"

SMR:long_name = "Root Lay Soil Moist"
SMR:units = "mm"

RT:long_name = "Total Precipitation"
RT:units = "mm/day"

ETV:long_name = "Evapotranspiration"
ETV:units = "mm/day"

SH:long_name = "Sensible Heat"
SH:units = "W/m2"

LWN:long_name = "Net Longwave"
LWN:units = "W/m2"

SWN:long_name = "Net Solar Absorbed"
SWN:units = "W/m2"

SWI:long_name = "Solar Incident"
SWI:units = "W/m2"

CONPRE:long_name = "Convective Precip"
CONPRE:units = "mm/day"

PSRF:long_name = "Surface Pressure"
PSRF:units = "hPa"

RHA:long_name = "Relative Humidity"
RHA:units = "fraction"
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References

Anthes, R. A., 1977: A cumulus parameterization scheme utilizing a one-dimensional cloud model, Mon. Wea. Rev., 105, 270–286.

Dickinson, R., Henderson-Sellers, A. and Kennedy, P. (1993). Biosphere-Atmosphere Transfer Scheme (BATS) version 1e as coupled to the NCAR Community Climate Model, Technical Report, National Center for Atmospheric Research.

Emanuel, K. A., 1991: A scheme for representing cumulus convection in large-scale models, J. Atmos. Sci., 48(21), 2313–2335. Emanuel, K. A., and M. Zivkovic-Rothman, 1999: Development and evaluation of a convection scheme for use in climate models, J. Atmos. Sci., 56, 1766–1782.

Fritsch, J. M., and C. F. Chappell, 1980: Numerical prediction of convectively driven mesoscale pressure systems.

Grell, G. (1993). Prognostic evaluation of assumptions used by cumulus parameterizations, Monthly Weather Review 121: 764–787.

Grell, G. A., Dudhia, J. and Stauffer, D. R. (1994). A description of the fifth-generation Penn State/NCAR mesoscale model (MM5), Technical Report NCAR/TN-398+STR, National Center for Atmospheric Research.

Holtslag, A., de Bruijn, E. and Pan, H.-L. (1990). A high resolution air mass transformation model for short-range weather forecasting, Monthly Weather Review 118: 1561– 1575.

Kiehl, J., Hack, J., Bonan, G., Boville, B., Breigleb, B., Williamson, D. and Rasch, P. (1996). Description of the ncar community climate model (ccm3), Technical Report NCAR/TN-420+STR, National Center for Atmospheric Research.

Pal, J., Small, E. and Eltahir, E. (2000). Simulation of regional-scale water and energy budgets: Representation of subgrid cloud and precipitation processes within RegCM, Journal of Geophysical Research–Atmospheres 105(D24): 29579–29594.

Pal, J.S., F. Giorgi, X. Bi, N. Elguindi, F. Solmon, X. Gao, S.A. Rauscher, R. Francisco, A. Zakey, J. Winter, M. Ashfaq, F.S. Syed, J.L. Bell, N.S. Diffenbaugh, J. Karmacharya, A. Konaré, D. Martinez, R.P. da Rocha, L.C. Sloan, and A.L. Steiner, 2007: Regional Climate Modeling for the Developing World: The ICTP RegCM3 and RegCNET. *Bull. Amer. Meteor. Soc.*, 88, 1395–1409.

Qian, Y., Giorgi, F. and Huang, Y. (2001). Regional simulation of anthropogenic sulfur over East Asia and its sensitivity to model parameters, Tellus 53: 171–191.

Sundqvist, H., E. Berge, and J. E. Kristjansson, 1989: The effects of domain choice on summer precipitation simulation and sensitivity in a regional climate model, J. Climate, 11, 2698–2712.

Zakey A. S; F. Solmon, F. Giorgi, 2006, Implementation and testing of a desert dust module in a regional Climate model , Atmos. Chem. Phys. 6,4687-4704.

Zeng, X., Zhao, M. and Dickinson, R. E. (1998). Intercomparison of bulk aerodynamic algorithms for the computation of sea surface fluxes using toga coare and tao data, Journal of Climate 11: 2628-2644.