Toby Ault
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RegCM3 brief description

RegCM3 is built off of the original NCAR RegCM models (Dickinson et al., 1989; Giorgi, 1989). It has 16 vertical layers and uses parameterization schemes for the primitive equations from Grell (1994). Topography is taken from the USGS Global Land Cover Characterization and Global 20 Arc-Second Elevation datasets. Reanalysis data (NCEP or ECMWF) can be used to specify boundary conditions.

Solar radiation is computed to account for the effects of atmospheric gasses (O_3, H_2O, CO_2, and O_2) following the NCAR CCM3 approach (Kiehl *et al.*, 1996). Scattering and absorption parameterizations for clouds are used from Slingo (1989). Fractional cloud cover is proportional to the spacing of the horizontal grids, and cloud thickness is proportional to the spacing of RegCM3's 16 vertical layers. One of three methods is used for computing convective precipitation: 1) a modified Kuo scheme (Anthes, 1977)—moisture convergence exceeds a given threshold and the column becomes unstable; 2) a Grell scheme with two options for closure assumptions (Grell, 1993)—clouds are simulated as an updraft and a downdraft; and, 3) the MIT-Emanual scheme (Emanuel, 1991; Emanuel and Zivkovic-Rothman (1999))—Clouds fluxes are assumed to be the result of inhomogenous and chaotic, sub-grid scale processes. Terrain cover is simulated using the Biosphere-Atmosphere Transfer Scheme version 1e (BATS1e) (Dickenson, 1993). In this scheme there are 20 vegetation types, three soil layers, and dust/aerosol calculations for cells dominated by arid land cover. Also, a lake model (Hostetler *et al.*, 1993) can be coupled to the atmosphere. RegCM3 and supporting data files can be downloaded from (http://users.ictp.it/~pubregcm/RegCM3/).

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