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The NASA/GEWEX surface radiation budget dataset

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The surface radiation budget (SRB), consisting of downward and upward components of shortwave (SW) and longwave (LW) radiation is a major component of the energy exchanges between the atmosphere and land/ocean surfaces and thus affects surface temperature fields, fluxes of sensible and latent heat, and every aspect of energy and hydrological cycles. The NASA Global Energy and Water-cycle Experiment (GEWEX) SRB project has now updated and improved a global dataset of surface radiative fluxes on a 1-degree grid for a 23-year period (July 1983 to June 2006). Both SW and LW fluxes were produced with two sets of algorithms: one designated as primary and the other as quality-check. The primary algorithms use a more explicit treatment of surface and atmospheric processes while quality-check algorithms use a more parameterized approach. Cloud and surface properties for input to the algorithms were derived from ISCCP pixel level (DX) data, temperature and humidity profiles from GEOS-4 reanalysis products, and column ozone from a composite of TOMS, TOVS, and assimilated SBUV-2 datasets. Several top-of-atmosphere (TOA) radiation budget parameters were also derived with the primary algorithms. Surface fluxes from all algorithms are extensively validated with ground-based measurements obtained from the Baseline Surface Radiation Network (BSRN), the Global Energy Balance Archive (GEBA), and the World Radiation Data Center (WRDC) archives. This dataset is a major contributor to the GEWEX Radiative Flux Assessment activity.

An overview of the latest version (Release-3.0) of the dataset with global and zonal

statistics of fluxes, inferred cloud radiative forcing, and results of the validation activities will be presented. Time series of SRB parameters at the TOA and surface for global, land, ocean, and tropical area means will be presented along with analysis of flux anomalies related to El Nino/La Nina episodes, phases of North Atlantic Oscillation (NAO), and other interannual phenomena of the period. Results will be summarized to characterize the uncertainties and future plans will be presented to address the deficiencies. The entire dataset is being made available to the worldwide science community by NASA/LaRC Atmospheric Sciences Data Center at: eosweb.larc.nasa.gov/PRODOCS/srb/table_srb.html.