



## Cloud Properties from CERES Edition 4

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The Clouds and Earth's Radiant Energy System (CERES) derives cloud properties using MODerate-resolution Imaging Spectroradiometer (MODIS) data from the Aqua and Terra satellites, as well as from Visible Infrared Imager Radiometer Suite (VIIRS) data from the recently launched National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) satellite. The resultant cloud properties are combined with aerosol and CERES broadband flux data to create a comprehensive cloud and radiation data set for climate study. CERES has produced over 11 years of cloud data from Terra and over 9 years of data from Aqua using the CERES Edition-2 cloud retrieval algorithm. A revised algorithm, Edition 4, has been developed and is now producing significantly enhanced cloud data for climate research. New multispectral retrievals of properties are included along with a multilayer cloud retrieval system. Cloud microphysical properties are reported at three wavelengths, 0.65, 1.24, and 2.1  $\mu\text{m}$  to enable better estimates of the vertical profiles of cloud water content. Additional enhancements include the retrieval of cloud optical properties over snow using the 1.24  $\mu\text{m}$ -channel and retrievals of multi-layered clouds. These and other changes with results from several years of Terra and Aqua data are presented and compared to other datasets, including CALIPSO and CloudSat results. The Edition 4 cloud properties are also compared to the CERES Edition-2 results to elucidate the benefits of the enhancements. Application of Edition 4 algorithms to first look data from VIIRS on NPP are also shown.