

A One-Year Climatology Of Cloud Properties Derived From GOES-8 Over The Southeastern Pacific For PACS

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The overall goal of Pan-American Climate Studies (PACS) program is to extend the scope and improve the skill of operational climate prediction over the Americas. The atmosphere over the southeastern Pacific (SEP) plays an important role in the general circulation, El Nino anomalies, and the weather over North, Central, and South America. Meteorological observations over the SEP are sparse causing large uncertainties in initialized model fields. Although not currently used in assimilations, cloud properties and radiation fields are important components of the weather and climate system and should be faithfully reproduced in models that simulate and predict the atmospheric state from the meso- to global scales. Satellite observations are the only practical means to acquire the necessary parameters over the SEP for model validation and future assimilation. This paper presents the results of an analysis of day and night time 3-hourly multispectral GOES-8 data to derive cloud macrophysical and microphysical properties as well as the radiation budget over the SEP and adjacent continental areas. Monthly mean values for cloud amount, height, phase, effective particle size, optical depth, and liquid/ice water path, shortwave albedo, and top-of-atmosphere longwave flux are derived on a 1.0° latitude-longitude grid for a domain encompassed by 20°N , 40°S , 60°W , and 115°W for the 2000 calendar year. Special attention is given to the periods of April 20 through May 15, and October 17 through November 12 when National Oceanic and Atmospheric Administration research vessels (R/V) were collecting a wide range of meteorological and oceanographic data in the domain. Data from instruments aboard the R/Vs are used to validate the cloud retrievals from GOES-8. These analyses are an important step in the process of developing climatologies of cloud and radiation properties for use in meso- and large-scale models of the circulation in the southeastern Pacific.