

## Global Distributions of Mineral Dust Properties from SeaWiFS and MODIS: From Sources to Sinks

N. CHRISTINA HSU, C. Bettenhausen, and A. Sayer

NASA Goddard Space Flight Center, Greenbelt, MD, USA

The impact of natural and anthropogenic sources of mineral dust has gained increasing attention from scientific communities in recent years. Indeed, these airborne dust particles, once lifted over the source regions, can be transported out of the boundary layer into the free troposphere and can travel thousands of kilometers across the oceans resulting in important biogeochemical impacts on the ecosystem. Due to the relatively short lifetime (a few hours to about a week), the distributions of these mineral dust particles vary extensively in both space and time. Consequently, satellite observations are needed over both source and sink regions for continuous temporal and spatial sampling of aerosol properties.

With the launch of SeaWiFS in 1997, Terra/MODIS in 1999, and Aqua/MODIS in 2002, high quality comprehensive aerosol climatology is becoming feasible for the first time. As a result of these unprecedented satellite data records, studies of the radiative and biogeochemical effects due to dust aerosols are now possible. In this study, we will show the comparisons of satellite retrieved aerosol optical thickness using Deep Blue algorithm with data from AERONET sunphotometers over desert and semi-desert regions as well as vegetated areas. Our results indicate reasonable agreements between these two. These new satellite products will allow scientists to determine quantitatively the aerosol properties near sources using high spatial resolution measurements from SeaWiFS and MODIS-like instruments. The multiyear satellite measurements since 1997 from SeaWiFS will be compared with those retrieved from MODIS and MISR, and will be utilized to investigate the interannual variability of source, pathway, and dust loading associated with the dust outbreaks over the entire globe. Finally, the trends observed over the last decade based upon the SeaWiFS time series in the amounts of tropospheric aerosols due to natural and anthropogenic sources (such as changes in the frequency of dust storms) will be discussed.