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The Application of Regional Aerosol Properties to AVHRR Aerosol Retrieval Algorithms

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Abstract: Assessing the importance of the direct and indirect effect of anthropogenic aerosols on the radiative forcing of climate requires an understanding of the global distribution of aerosol properties and an estimate of what fraction of the total aerosol is from anthropogenic sources. Assembling a global climatology of these aerosol properties will require a combination of in-situ measurements covering a globally representative range of natural and anthropogenically perturbed environments, satellite observations and chemical transport models. We propose to use our unique data set of in-situ aerosol measurements, shipboard sun-photometer measurements and high-resolution AVHRR observations collected on five oceanographic research cruises in the Pacific (RITS-93, RITS-94, ACE-1, and CSP) and Atlantic (ACE-2) Oceans to:

1. develop a regional climatology of marine boundary layer aerosol properties (number size distribution, mass size distribution of individual chemical species, and light extinction) over the oceans,
2. use these regional aerosol properties to develop regional AVHRR aerosol retrieval algorithms, and
3. test these regional aerosol retrievals against simultaneous aerosol in-situ measurements, shipboard optical depth measurements and AVHRR overpasses during the five research cruises.

In addition, as part of the NASA Aerosol Climatology Research Team, we will work with the other Team members to exploit more fully our 10 years of aerosol field data. Our data sets should be particularly useful in testing chemical transport models.

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+ Page updated: 2006-01-18