AVHRR DERIVED AEROSOL OPTICAL THICKNESS DATASETS AT NOAA/NESDIS

BY

LARRY L. STOWE
OFFICE OF RESEARCH AND APPLICATIONS
NOAA/NESDIS
5200 AUTH ROAD
CAMP SPRINGS, MD 20746-4304
301-763-8053
lstowe@nesdis.noaa.gov

PRESENTED AT SECOND GACP SCIENCE TEAM MEETING
NASA/GISS
NEW YORK, NY
SEPTEMBER 29 - OCTOBER 1, 1999

REVIEW OF NOAA/NESDIS AEROSOL OPTICAL THICKNESS DATASETS

DEVELOPED, IMPLEMENTED AND VALIDATED AVHRR SINGLE CHANNEL AOT RETRIEVAL ALGORITHMS OVER OCEANS

Stowe, Ignatov, Singh, 1997: JGR 102, D14

1st gen. alg. uses modified Junge dist. (Nu = 3.5), 1.5-0i, Rsfc = 1.5% biased low by ~ 50% relative to sun-photometer AOT

2nd gen. alg. uses LN dist (r_m = 0.1; F = 2.03), 1.4-0i, Rsfc = 0.2% bias within +/- 10% of sun-photometer, with random error of 0.04.

GLOBAL OCEANIC AOT PRODUCED OPERATIONALLY SINCE 1990

uses cloud mask modified from SST retrieval algorithm

uses: 1st gen. alg. Jan. '90 - Sept. '94; 2nd gen. alg. Aug. '95 - present

mapped on 1 degree latitude/longitude grid

calibration degradation correction applied after Aug. '95

images of most current daily, weekly and monthly mean AOT fields at:

http://psbsgi1.nesdis.noaa.gov:8080/PSB/EPS/EPS.html

access data via: 9-track tape (contact:smccown@ncdc.noaa.gov)

REVIEW OF NOAA/NESDIS AOT DATASETS (CONTINUED)

GLOBAL OCEANIC AOT REPROCESSED FROM JULY ’81 - AUG.’98 (PATMOS - AVHRR PATHFINDER ATMOSPHERE DATASET)

uses cloud mask from CLAVR-1 algorithm (Stowe, Davis, McClain, 1999: JTECH 16)

uses 2nd gen. alg. throughout

mapped on 110 km equal area grid

calibration degradation correction applied July’81 - Aug. ’94

Mar.’96 - Aug.’98 processed without cal. degradation correction

Jan.’95 - present will be reprocessed by end of 1999

PATMOS-1:

twice-daily (day/night) clear/cloud radiance statistics and cloud amount (71 parameters)

access data via: 8mm tape cartridges (contact lstowe@nesdis.noaa.gov)

PATMOS-2:

daily AOT and twice-daily ERB components (26 parameters)

pentad and monthly mean PATMOS-1 and AOT/ERB fields (82 parameters each)

Access data via: ftp://aries.nesdis.noaa.gov and
http://www.saa.noaa.gov (monthly only)

RESEARCH WITH THE PATMOS DATASET AT NOAA/NESDIS

DIRECT AEROSOL RADIATIVE FORCING:

Stowe, L.L., H. Jacobowitz, C. Kondragunta, G. Luo, 1998: Direct Radiative Forcing by Aerosols as Observed from the NOAA/AVHRR Pathfinder Atmosphere (PATMOS) Multi-year Dataset. Proc. AMS Conf. On Sat. Meteor. And Ocean., Paris France, May 25-29, 1998, pp. 154-155.
ftp://orbit-net.nesdis.noaa.gov/pub/crad/rcat/stowe/FORCING

INDIRECT AEROSOL RADIATIVE FORCING:

Wetzel, M.A. and L. L. Stowe, 1999: Satellite-Observed Patterns in Stratus Cloud Microphysics, Aerosol Optical Thickness and Shortwave Radiative Forcing. Jrnl. Geophys. Res., (in press).
(AMS Conf. On Sat. Meteor. & Ocean. Paper available on ftp site above)

RELATIONSHIP BETWEEN ABSORBED SOLAR AND SURFACE TEMPERATURE

Jacobowitz, H. and G. Ohring, 1999: The Relationship Between Global Absorbed Solar Radiation and Global Surface Temperature. Proceedings 10th Conf. Atmos. Rad. Madison, WI

DEVELOPMENT OF AN ALGORITHM TO REMOTELY SENSE AOT OVER LAND

Knapp, K.R. and L.L. Stowe, 1999: An Approach to Deriving an Aerosol Optical Thickness Climatology over Land with AVHRR Data. Abstract for Fall Amer. Geophys. Union Meeting, San Francisco, CA

DEVELOPMENT OF AN AEROSOL CORRECTION ALGORITHM FOR AVHRR/SST

Nalli, N. and L.L. Stowe

EIGHTY SCIENTISTS FROM OTHER GROUPS HAVE ACCESSED THE PATMOS DATASET