Summary of OMCLDRR Optical Centroid Pressure Cloud Climatology

David Haffner
SSAI/NASA-GSFC
Laboratory for Atmospheric Chemistry and Dynamics (Code 614)
david.haffner@ssaihq.com

OMCLDRR version 1.6.0 (Collection 3) was reduced for 2004-2007 at 1x1 degree to generate a monthly climatology of cloud Optical Centroid Pressure (OCP) for use in UV satellite retrieval algorithms.

OCP measurements from the UV rotational Raman scattering cloud pressure algorithm developed by Joiner and Vassilikov give cloud pressures notably higher than those measured by thermal IR techniques due to the effective penetration of UV photons deeper into the could and through overlaying thin cirrus clouds, which thermal IR based cloud pressure retrieval methods have strong senstitivity to.

The method applied to construct the climatology is as follows. All daily orbital L2 data were collected by month for years 2004-2007. OMCLDRR cloud pressures were screened to exclude PixelQuality flags: 0, 1, 2, 4, 7, 14, 15. The TOMS Aerosol Index (AI) from the OMI total ozone product, OMTO3, was used to exclude OMCLDRR retrievals where AI > 2 to avoid including aerosol contaminated data.

High cloud fraction data were selected to capture characteristics of regionally dense, thick clouds at 1x1 degree. The cloud fraction threshold was then relaxed with the resolution maintained at 1x1 degree and the majority of data in the climatology comes from this criterion. Cloud pressures for dry areas, for which no data was gathered in the previous two steps, were filled using information from neighboring pixels by expanding the size of the averaging cell to 5x5 and then 10x10 degrees. Lastly, the climatology was smoothed under a 5x5 window. Table 1 summarizes the scheme used for data selection.

Step	Grid Resolution	RCF
1	1ºx1º	0.7-1.0
2	1ºx1º	0.5-0.7
3	5ºx5º	0.5-0.7
4	10ºx10º	0.5-0.7

Table 1

Areas with no data coverage near the poles during seasons of polar night were filled using the cloud pressure data data from adjacent months.

Related Links:

OMCLDRR flle description:
http://acdb-ext.gsfc.nasa.gov/People/Joiner/OMCLDRR.fs

OMCLDRR data at GES DISC:
http://disc.sci.gsfc.nasa.gov/Aura/data-holdings/OMI/omcldrr_v003.shtml