

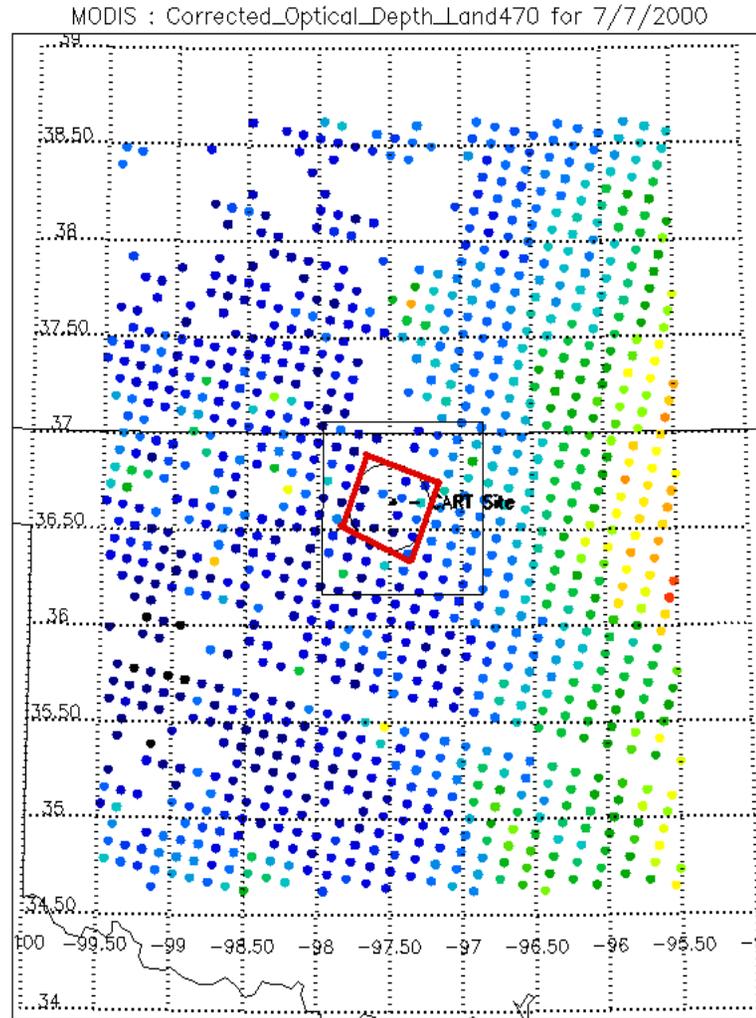
MODIS Aerosol Products Validation Methodology

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- MODIS Aerosol Products cover the earth in image arrays of 10 X 10 Km pixel size.
- Aerosol validation data sets are mostly measurements from ground-based Sunphotometers at individual locations around the world (e.g. AERONET).
- MODIS measures over the entire earth once or twice a day. AERONET measures over individual points several times a day (approximately every 15 minutes).
- Validation correlates the spatial variation of MODIS with the temporal variation of AERONET.

- There are hundreds of validation sites in the MODIS aerosol validation database.
- Figure illustrates a MODIS aerosol product, with the DOE CART Site at center.
- An automatic procedure extracts a 50 x 50 Km box centered on the site.
- Statistics (e.g. Mean, Standard deviation, etc.) of the contents of the subset box are computed.
- These statistics are held in ASCII files for easy porting to spreadsheets.



Sample Granule Matrix of a MODIS Aerosol Product Showing a 50 X 50 Km subset over the DOE SGP CART Site (Oklahoma)

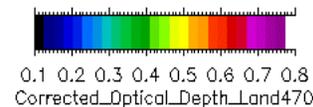
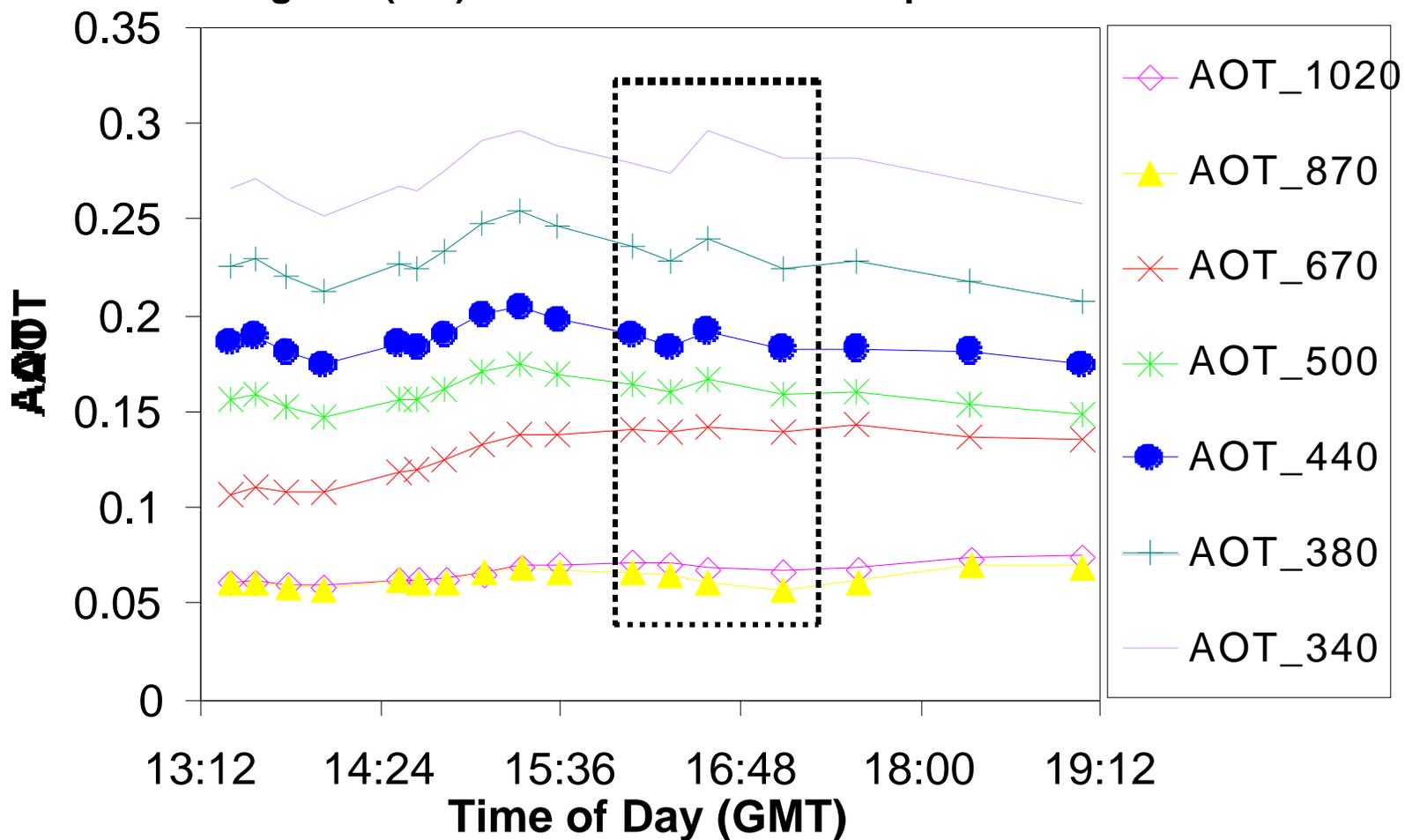


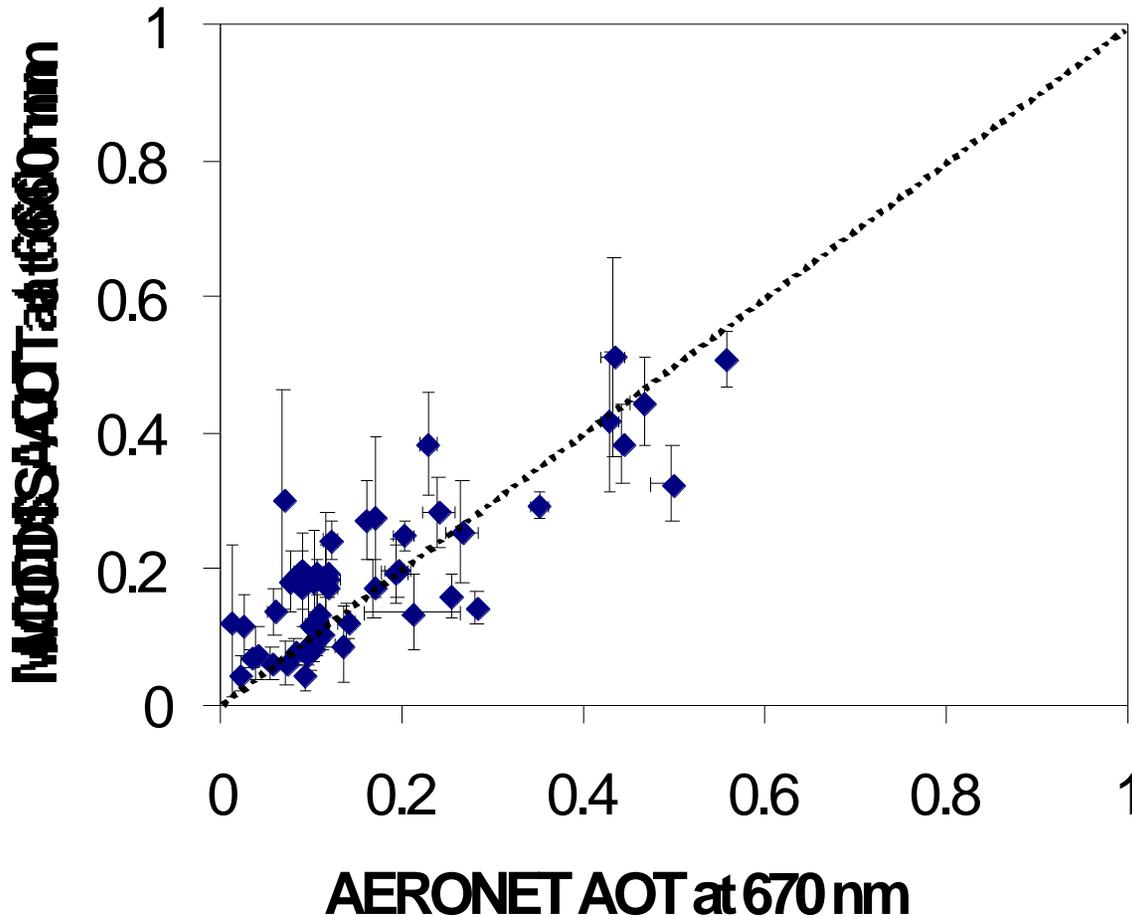
Image provided by Rich Ferrare

- For each validation site that has ground-based sunphotometer (e.g. AERONET) data.
- The automatic procedure identifies the sunphotometer data file corresponding to the site.
- Then it extracts the temporal data points falling within the 1-hour period centered on the time of MODIS (Terra) overpass.
- Statistics (e.g. Mean, Standard deviation, etc.) of the temporal data segment are computed and held in similar ASCII files both separately and in combination with the MODIS statistics.

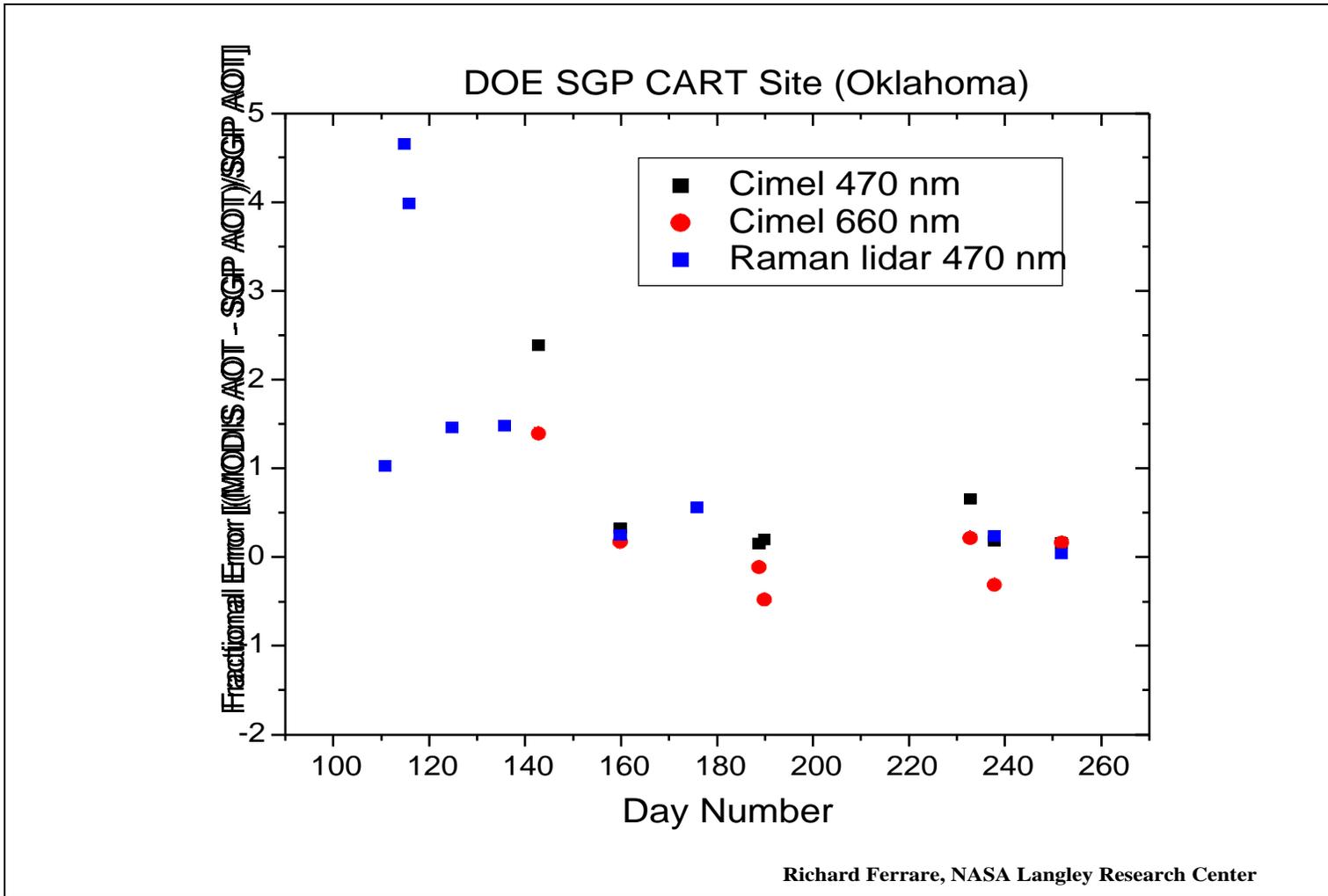
AERONET AOT at Cart Site for 7/7/2000, showing a 1-hour segment (box) centered on the Terra overpass time



Mean AOT over land for Oct 2000



MODIS vs AERONET AOT (Mean with StDev as error bars)
over miscellaneous sites worldwide, from 1 to 15 October 2000



Progressive decrease in AOT error due to improvement in MODIS calibration