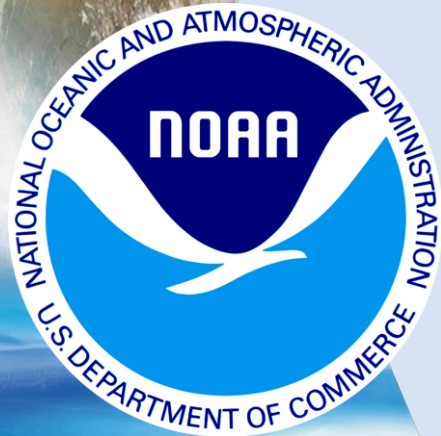


Emerging New Satellite Aerosol Products for Air Quality Monitoring and Forecasting Applications



NOAA
National Satellite and
Information Service

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Lead, Aerosols and Atmospheric Composition
Science Team

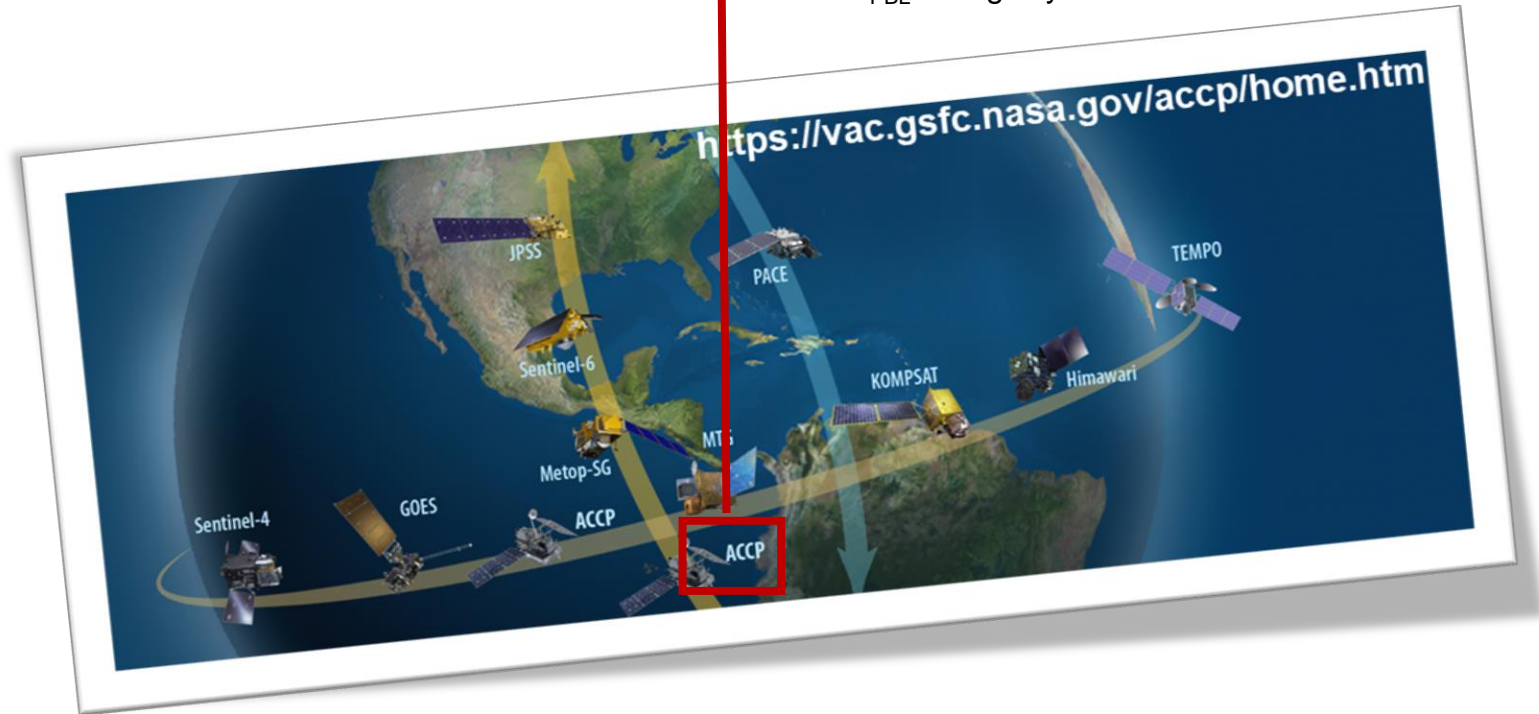
Products and Applications

- NOAA-20 and Suomi NPP trace gas and aerosol products
 - AOD, Aerosol Detection, SO₂, Aerosol Index, NO₂*
- S5P TROPOMI trace gas and aerosol products
 - Aerosol layer height, Aerosol Index, CO, SO₂, NO₂, HCHO, Glyoxal etc.

Key Areas of Applications within NOAA

- Model verification
- Plume rise
- Assimilation
- Near real time distribution of products for operational air quality monitoring

According to the STM, several different aerosol optical and physical properties will be derived from ACCP mission, with aerosol layer height and AOD_{PBL} being key to NOAA needs.



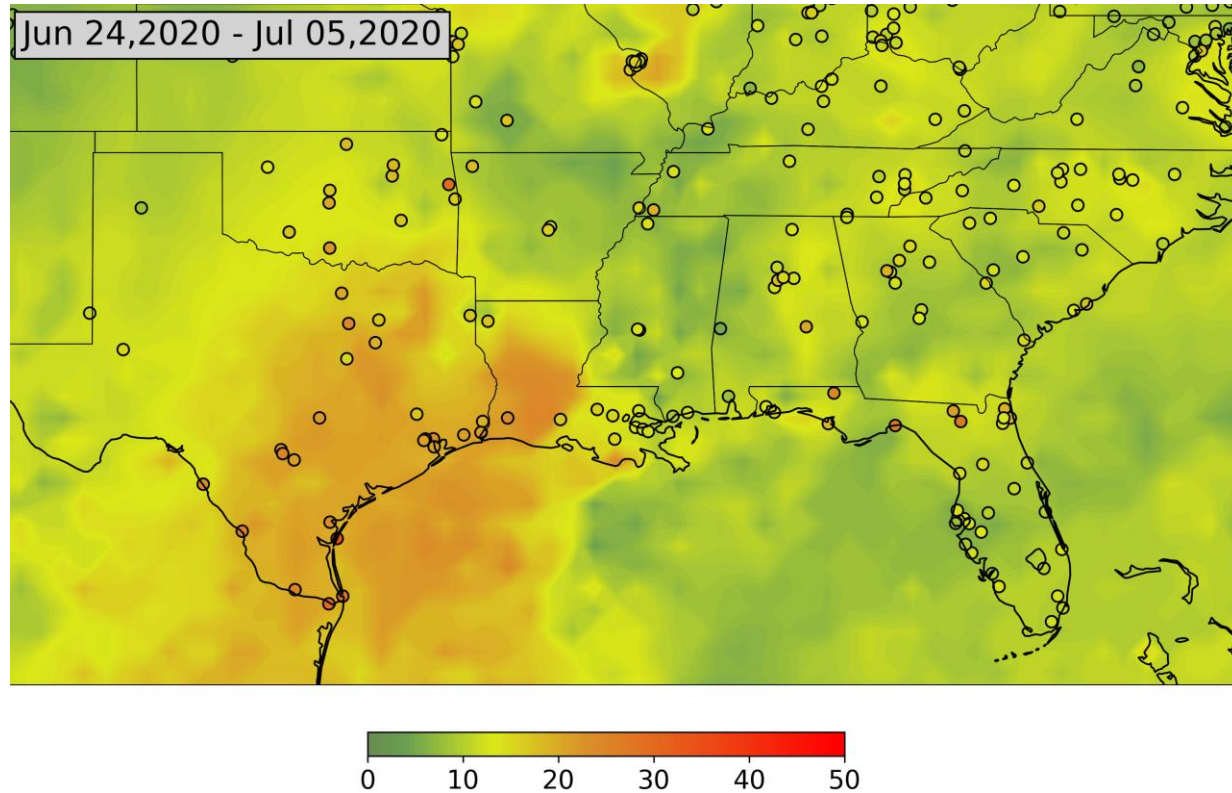
CEOS AC-VC white paper (in preparation) on *Monitoring Surface PM_{2.5}: An International Constellation Approach to Enhancing the Role of Satellite Observations* identifies aerosol layer height, composition, and size as key satellite information needed to accurately monitor speciated PM_{2.5}

*research product

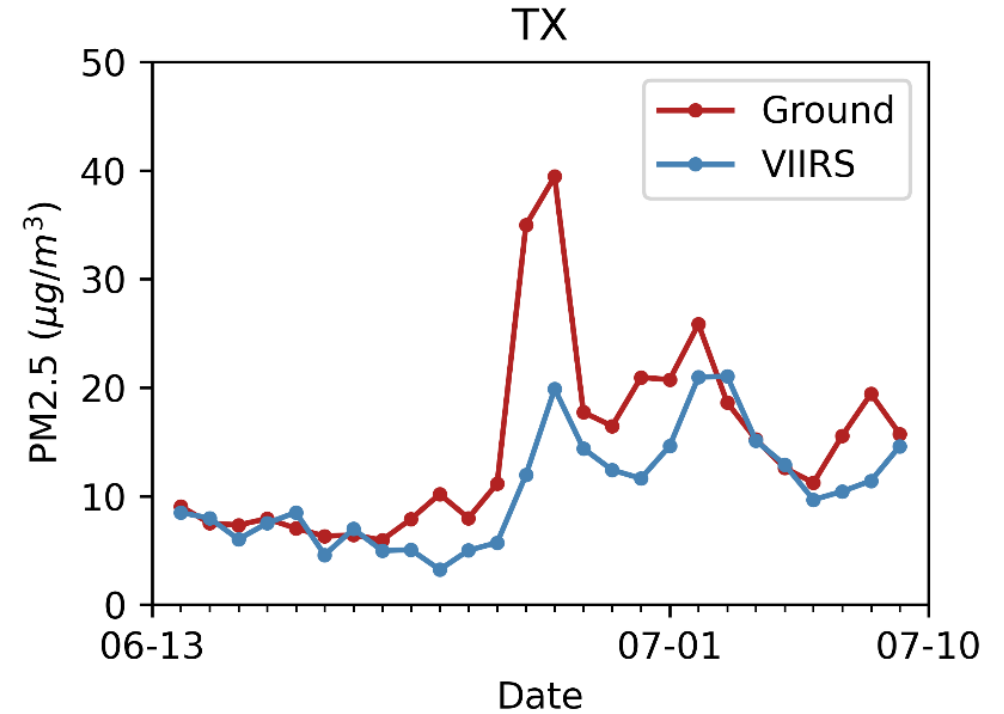


Need for Aerosol Layer Height

June-July 2020 Godzilla dust storm impacting air quality in the US...



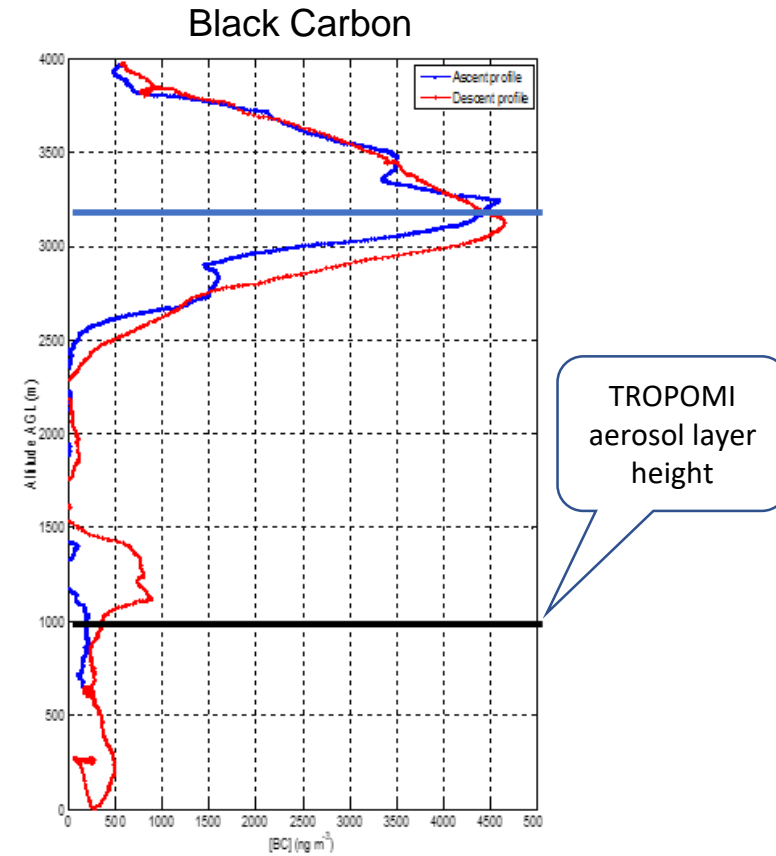
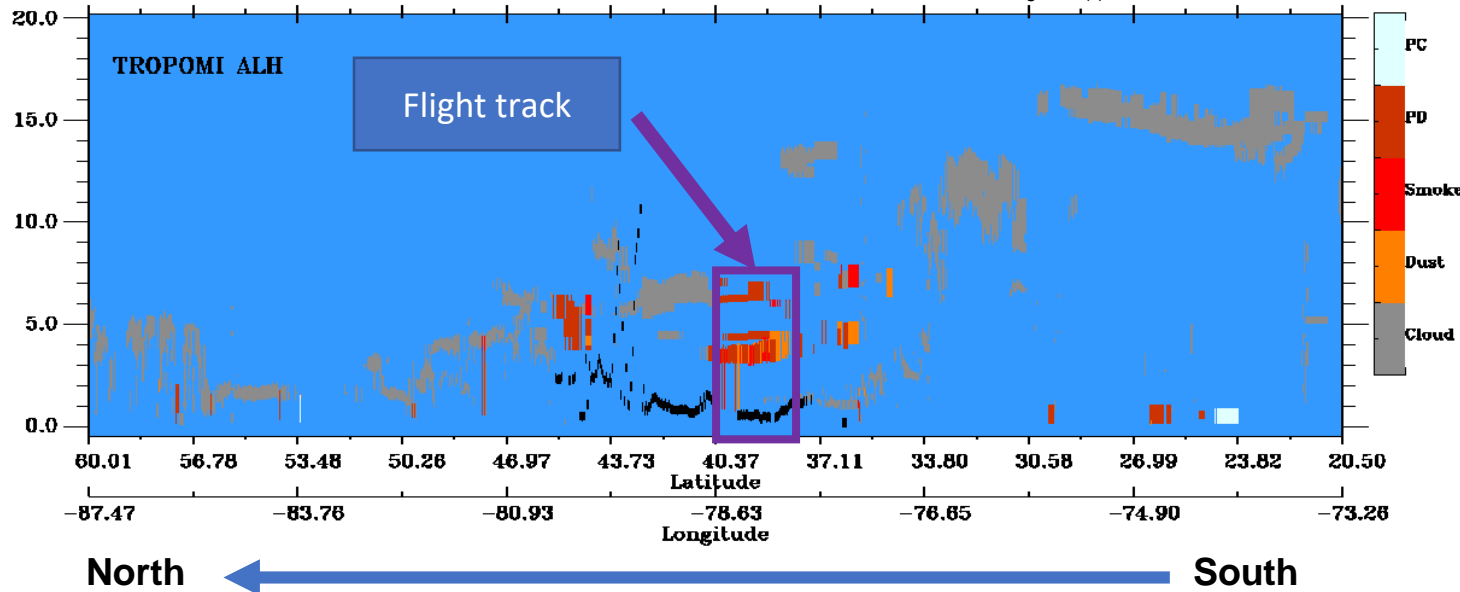
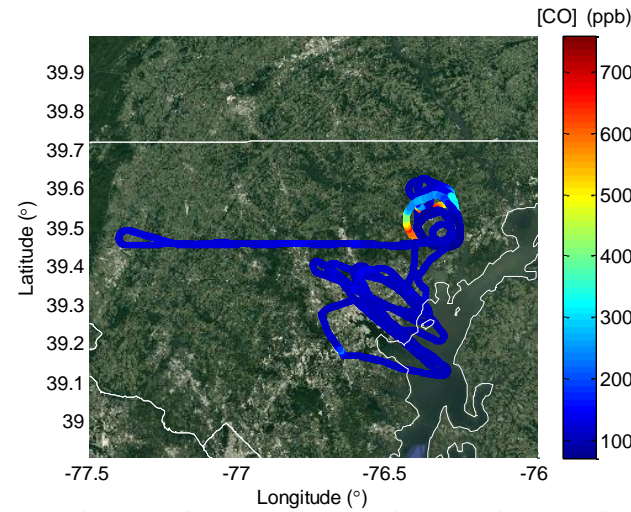
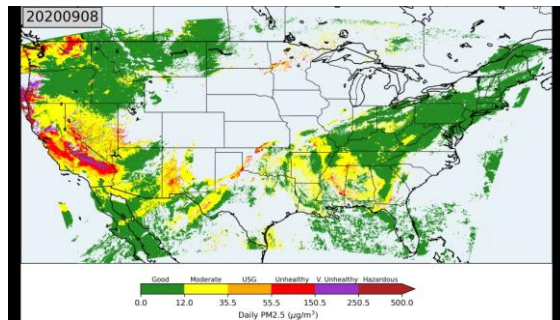
Algorithm to convert VIIRS aerosol optical depth to surface PM2.5 described in *Zhang and Kondragunta, Earth and Space Science, 2021*



Questions

- How much of this PM2.5 is transported dust?
- At what altitude the dust transport happened?
- Did the dust mix into the boundary layer and impact surface PM2.5?

Need for Aerosol Layer Height



Aircraft data from University of Maryland (H. Daley, X. Ren, R. Dickerson)

CALIPSO Vertical Feature Mask data courtesy of NASA/LaRC

NOAA ACCP Data Applications

- ACCP will have better aerosol typing and can serve as a “truth” dataset for JPSS series and GeoXO data.
- ACCP will provide “needed” information for scaling AOD to surface PM2.5
- NESDIS will work with OAR and NWS modelers in support of their assimilation studies

