

Tropospheric Air Quality Working Group Report

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Agenda

- Discussion of objectives
- Seven short talks – main focus on tropospheric ozone
- Discussion of what is needed to improve usefulness of Aura data for air quality purposes

Current Aura Air Quality Activities

- Fishman: OMI – NCEP/GFS SCO; Texas case studies
 - Yang: OMI – MLS with PV mapping
 - Pickering: OMI – MLS (Ziemke) vs. Eta/CMAQ
 - Chatfield: South-Central Calif. Air Quality analysis
 - Kurosu: OMI HCHO and CHO-CHO
 - Levelt: European air quality modeling and assimilations systems
 - Bowman: Use of TES O₃ and CO in Texas AQS
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- Krotkov: Tropospheric SO₂ over highly polluted regions
 - Hoff: Use of SSA from OMI in air quality analysis system
 - Cohen: Use of OMI NO₂ in emission inventory for Calif.
 - Hegarty: Use of Aura data in North American outflow study
 - Allen: Comparisons of Aura data with WRF-Chem simulations over Mid Atlantic

Definition of Air Quality

⇒EPA – health based (boundary layer)

⇒Atmospheric Composition/Satellite Community (lower tropospheric regime; including regional and long-range transport)

Air pollution often travels above boundary layer & impacts surface via subsidence and/or fumigation.

Data Product Intercomparison Issues

- Talks by Fishman, Yang, & Pickering raised issue: How do we compare Aura tropospheric ozone products using residual methods?

⇒ Difficulties arise due to various tropopause definitions. Therefore, standard definition is required. But which one? Compute TCO > 500 mb instead?

- Lack of spatial continuity of cross-track observations (variable pixel size).
- Coarseness of stratospheric column ozone removal.
- Should NASA support more near-real time data processing for mission planning & air quality forecasting?

How well represented is convection in regional/global models?

- Boundary layer venting by convection is a critical process for air quality and long-range transport.
- Can Aura data be used to evaluate convective parameterizations in CTMs?

Vertical Composition Information

- Vertical profile information is critical for assessing transport & air quality (e.g., above boundary layer versus near-surface composition and transport).
- Necessary to understand long-range transport versus *in situ* production of pollution.

Neglected Issues

- We mostly discussed troposphere column ozone.
- But what about aerosols, NO_x , CO, SO_2 , etc.? Topics for next meeting?
- What is/can be Aura's contribution to regional air quality issues? Aura data coupled with surface data (e.g., AIRNow).
- How well does Aura compare with surface observations? More work needed.

Holistic Approach?

- Can Aura data be coupled with *in situ* observations, assimilations, models, etc. to provide a more comprehensive picture of air quality?

European approach? RAQMS approach?

The Future

- The working group only touched the surface of all of the issues related to use of Aura data for air quality. We needed more time.
- Suggest keeping the dialog ongoing through e-mail listserve.