

IDEA-like GOES-R Air Quality Proving Ground data distribution system

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IDEA-like GOES-R air quality proving ground data distribution system

Objectives

- Prepare near-real-time GOES-R air quality data distribution system for air quality community
- Collaborate with GOES-R Air Quality Proving Ground (AQPG) team on user training and preparation for GOES-R air quality data

Techniques

- Collaborate with GOES-R AQPG , build GOES-R proxy dataset – case studies and near-real-time data from model simulation and ABI aerosol retrieval algorithm
- Revise IDEA system to use the GOES-R ABI proxy dataset.
- Develop a new aerosol type component in the system.
- Apply synthetic natural color imagery.
- Air quality index (AQI) map from AOD
- Test the system using proxy dataset. Analyze system ability to handle high data volume from GOES-R.
- Demonstrate the system to the air quality end users. Acquire user feedbacks and improve system further.

Aerosol retrieval algorithm

Objectives

- Test Multi-Angle Implementation of Atmospheric Correction (MAIAC) algorithm performance in geostationary satellite geometry
- Improve the ability of GOES-R aerosol retrieval algorithm over bright surfaces

Techniques

- Use geostationary satellite dataset
 - SEVIRI data
 - Simulated GOES-R proxy data
 - Can apply multichannel aerosol retrieval in the geostationary satellite geometry.
- Two methods will be explored:
 - MAIAC
 - When apply MAIAC on SEVIRI data, use 1.6 μm channel for 2.1 μm channel.
 - Assume 1.6 μm channel is not affected by aerosol, retrieve BRDF (Bidirectional Reflectance Distribution Function) for that channel.
 - Assume 0.6 μm channels have the same BRDF shape as 1.6 μm channel and retrieve BRDF in that channel through time series analysis.
 - Retrieve AOD.
 - Apply modification on surface types where the BRDF shapes are not the same in the three channel
 - Use daily average AOD and TOA reflectance time sequence to retrieve surface BRDF
 - BRDF shapes are not necessarily the same for the three channels
 - Daily average AOD are obtained from MAIAC in good retrieval geometry
 - Retrieve BRDF separately for each channel
- The algorithm will be tested and results will be compared against AERONET retrievals.
- Case studies such as Sahara dust storm and European pollution

Poster: Improved aerosol optical depth retrieval algorithm for current GOES

- ▶ Current GOES only have one visible channel available for aerosol retrieval
- ▶ In the new algorithm, we retrieve surface BRDF using daily average AOD and GOES channel 1 TOA reflectance
- ▶ Three day time series are used for BRDF retrieval
- ▶ Daily average AOD is obtained from MODIS in the eastern US and MAIAC for GOES in the western US
- ▶ The AOD retrieval results are more accurate than GASP and MAIAC for GOES.

