

# AQAST Team Develops Satellite Based Visibility Tool

*By Ben Kaldunski  
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NASA's Air Quality Applied Sciences Team (AQAST) has developed a tool aimed at helping air quality managers measure and predict ground level visibility using satellite data to compliment surface measurements.

The AQAST team led by Brad Pierce, a senior researcher with the National Oceanic and Atmospheric Administration (NOAA), developed a visibility application that uses the MODIS satellite's Aerosol Optical Depth retrievals in combination with IMPROVE data from ground-level monitors.

Comparison with NWS ASOS measurements demonstrates a 64% categorical accuracy for Clear, Moderate, Low and Poor visibility classes. The satellite retrieval shows a high bias when compared to IMPROVE that is attributed to the limit of detection of the MODIS aerosol optical depth retrieval. This bias is corrected for through regression with co-located IMPROVE measurements.

Pierce, who spoke today during AQAST's sixth biannual meeting at Rice University in Houston, said the accuracy of the satellite retrievals was much higher during summer months from June to September. Accuracy suffered during the winter months when visibility is typically very high.

The varying seasonal results correspond to the higher frequency of fires during the summer months, both wildfires and agricultural burning. These events are associated with very poor visibility measurements that MODIS can detect with higher accuracy compared to areas with minimal pollution and high visibility.

Monthly mean visibility retrievals from the MODIS satellite showed relatively high correlations with monthly mean IMPROVE measurements. The MODIS bias is consistent with the satellite's limited detection capabilities for aerosol optical depth, according to Pierce's presentation.

MODIS based visibility retrievals have been generated for 2010-2011 and will be delivered to the EPA's Remote Sensing Information Gateway(RSIG) for use by air quality management to support planning activities for compliance with the federal regional haze rule. The haze rule requires visibility in Class I protected areas to return to natural levels by 2064.

The application of the retrieval to regional haze rule analysis was supported by the AQAST Tiger Team funding. The MODIS visibility algorithm was developed under support from the NOAA [GOER-R Algorithm Working Group](#).

*Pierce's presentation was given on January 15th at AQAST's 6th biannual meeting at Rice University in Houston, Texas. The meeting agenda can be found at this [website](#).*

## Sources and media coverage

**Brad Pierce, NOAA/NESDIS**

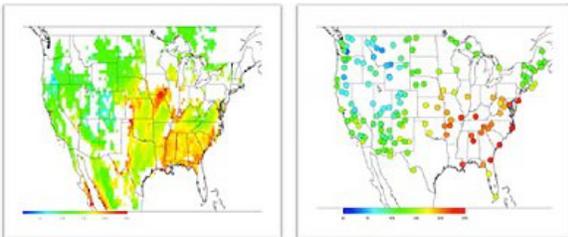
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*These maps compare the visibility retrieval from the MODIS satellite (left) against the IMPROVE data from ground-based monitors (right).*