**Introduction**

As China implemented the national PM2.5 monitoring program in November 2011 and subsequently issued the “Ambient Air Quality Standards” on February 2012, the undertaking of improving the air quality of China has been more promising. However, the process will inevitably encounter various predicaments.

Severe yellow haze hit a vast portion of Central and Eastern China during the second week in June, 2012, as large area in Hubei, Henan, Hunan, Jiangsu, Anhui, Jiangxi, Shandong, Zhejiang provinces and Shanghai city were covered by lingering haze (Figure 1). This massive haze conditions caused considerable inconvenience to people’s daily lives, and more importantly, raised public concern about the haze’s potential influence on public health.

Satellite observations in this case study demonstrate that the haze during quality standards” as from Wuhan Environmental Bureau  to study this haze pollution case in East China, which can provide June, mean concentration from multi sensors (e.g. MODIS and CALIPSO).

**Results**

Figure 2 and Figure 3 show the six case days over the area of study during the time of the Terra and Aqua overpass, respectively. A true color composite of the MODIS Red (645 nm), Green (560 nm), and Blue (459 nm) bands shows clouds in white and ocean in black. Overlaid on these are the MODIS 550 nm AOT from light blue to yellow color scales where yellow shows high AOT values ($\geq 1.2$).

**Objectives**

In this study, we are trying to use satellite remote sensing as a tool to study this haze pollution case in East China, which can provide quick view for emerging air pollution issues over large area.

- Distributions of Aerosol Optical Thickness (AOT) and PM2.5 concentrations are estimated by using latest satellite observations of this severe haze pollution on June, 2012.
- We explore the utility of higher spatial resolution aerosol retrieval from multi sensors (e.g. MODIS and CALIPSO).
- Satellite derived AOT, sites measured hourly PM2.5 and meteorological fields from surface are statistically correlated based on a regression model.

**Results**

The Cloud Aerosol Lider with orthogonal Polarization (CALIOP) on the Cloud Aerosol Lider and Infrared Pathfinder Satellite Observation (CALIPSO) satellite is an active lidar system that can provide vertical distribution of aerosols, although the sampling is limited.

**Figure 4.** It can be seen that CALIPSO observations make it feasible to analyze the vertical profiles including both aerosols (yellow color) and clouds (gray and white colors). This information can be used to parameterize model simulations of aerosol-cloud interactions.

The sampling test taken by the Wuhan Environmental Monitoring Center showed that plant organic carbon content in the particulate matter increased substantially during the air pollution event, indicating that the pollutants largely originate from biomass burning, namely the wheat straw burning. Second, abnormal weather condition in terms of high atmospheric instability caused by temperature inversions and high humidity which blocked the smog diffusion in the air can be another reason for this haze event. The inversion layer, acting as a lid, prevents convection between different air layers and raises the chances of accumulation of pollutants.

**Contact**

Email: sundar@wisc.edu or feng@wisc.edu

---

**Satellite Remote Sensing of Severe Haze Pollution over Eastern China on June, 2012**

Sundar A. Christopher1,2, Nan Feng1, Yangjie Guo3, Song Hong3

1Department of Atmospheric Science, University of Alabama in Huntsville, Huntsville, AL, USA; 2Earth System Science Centre, University of Alabama in Huntsville, Huntsville, AL, USA; 3School of Resource and Environmental Science, Wuhan University, Wuhan, Hubei, China

---

**References**

- Chang, T. et al. (2007). A new approach to estimate aerosol optical depth using MODIS data.
- Tao, H. et al. (2012). A case study of heavy haze pollution in Beijing, China.