

COAA 2020 July Research Highlights

July 1, 2020 - The new coronavirus disease (COVID-19) is an infectious disease, which was first identified in Wuhan China, in December 2019. Given its rapid spread and severity of disease, WHO declared the COVID-19 a pandemic on March 11, 2020. As of July 1st, 2020, the COVID-19 pandemic has sickened more than 11 million people (with 4.7% of them died) in at least 177 countries. Since January 2020, China has taken strict controls including quarantining millions of people and shutting down strategies to prevent further spread of the disease. Wuhan, epicenter of the COVID-19 epidemic outbreak, began a lockdown on January 23 that ultimately lasted for 11 weeks.

Recently, a study published on Science Advances (12 Jun 2020, doi:10.1126/sciadv.abc2992) by NASA's Goddard Space Flight Center (GSFC), Laboratoire des Sciences du Climat et l'Environnement (LSCE) in France, and Royal Netherlands Meteorological Institute (KNMI) reported that China's policy interventions during the COVID-19 outbreak have significant impacts on local environment and economy. Using NO₂ monitoring instruments Ozone Monitoring Instrument (OMI) and the Tropospheric Monitoring Instrument (TROPOMI) onboard NASA and ESA satellites, this study

showed a 48% decrease in a 20-day averaged tropospheric NO₂ vertical column densities before and after 2020 Lunar New Year, which is 20% larger than years prior to 2020 (**Figure 1**). A novel finding of this study is that self-quarantine (e.g., stay at home and work from home) after the announcement of first confirmed infection case by local government has nearly the same impact on NO₂ reduction as lockdown restrictions.

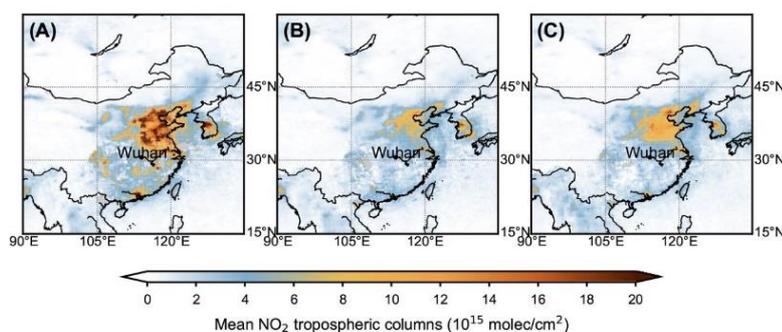


Figure 1 Average OMI tropospheric NO₂ vertical column densities over China in 2020. (A) -20 to -1, (B) 0-19, and (C) 20-39 days relative to the 2020 Lunar New Year. [[AAAS permission license](#)]

This study is leading by Dr. Fei Liu, a research scientist of Universities Space Research Association (USRA) for NASA Goddard Space Flight Center (GSFC). Her major interest is to understand pollutant emissions based on satellite observations of tropospheric composition and their influence on air pollution, atmospheric chemistry and climate. Dr. Liu obtained her B.S. in Geobiology from University of Science and Technology of China, China and her Ph.D. in Atmospheric Sciences from Tsinghua University, China. She is also a member of COAA 2020 board.