



Karen StGermain, Director, Earth Science Division, NASA

Julie Robinson, Deputy Director, Earth Science Division NASA

Jack Kaye, Associate Director for Research, Earth Science Division, NASA

Thomas Wagner, Associate Director for Earth Action, NASA

Dear Directors,

As medical and scientific professional societies engaged in the study of how environmental exposures affect health, we writing with concern about proposed changes in NASA products that we believe will compromise our ability to conduct studies of environmental pollution and health in the future. Specifically, we wish to express our strong encouragement for NASA continuation of the EOS MODIS aerosol processing into the VIIRS timeframe. This is of critical importance to health studies in the United States and around the world because those studies make use of air quality models based on the MAIAC algorithm, due to its high quality and fine resolution. The loss of the Terra and Aqua platforms for MAIAC products makes the extension of the algorithm to VIIRS now and into the future critical. We cannot understate the importance of 1km resolution products to enable 1km resolution models of fine particulate matter (PM<sub>2.5</sub>) for use in these health studies. PM<sub>2.5</sub> has substantial spatial variations at that resolution, meaning that coarser resolutions have substantially more exposure error, reducing their value for health studies and biasing the effect estimates those studies produce. In addition, because so many studies make use of the MAIAC algorithm, a discontinuous change to different, and poorer resolution products would create great analytical difficulties as well as inability to properly assess trends. We emphasize that many studies in the US and elsewhere have made use of MAIAC-derived PM<sub>2.5</sub> estimates for health studies, exposure assessments, risk assessments and projects, and assessment of environmental justice issues that simply cannot be done on a coarser resolution. Additional prominent organizations relying on MAIAC based exposures for health impact assessments include the Global Burden of Disease, World Health Organization, Health Effects Institute, and Air Quality Life Index.

The MAIAC AOD data needs to continue because the US, EU, UK, WHO, and others continue to evaluate whether current air quality standards need to be revised downwards, and it is future concentrations of particles that will provide data at the lower concentration exposures to answer that question. In addition, in low- and middle-income countries there is skepticism about using health studies from wealthier countries to set their standards,

and providing air quality estimates based on MAIAC AOD is critical to enabling such studies. As these countries are just starting to operate new monitoring stations (allowing for better calibration) and developing more health data, future MAIAC AOD will be critical to allow for exposure that matches that health data. This makes the use of the MAIAC algorithm on VIIRS observations extremely important. In a joint workshop<sup>1</sup> co-sponsored by NASA, air quality health experts from around the world emphasized the importance of NASA aerosol data to enable exposure assessment in low and middle income countries.

A large, international health and air quality community relies upon PM<sub>2.5</sub> products produced from NASA aerosol products in general and MAIAC data in particular.

We urge you to please include this in plans going forward.

Sincerely,

International Society of Environmental Epidemiology (ISEE)



International Society of Exposure Science (ISES)





Irina Petrache, MD, ATSF  
President  
American Thoracic Society

Professor Zorana J Andersen  
Environment and Health Committee Chair  
European Respiratory Society

1. Cromar KR, Duncan BN, Bartonova A, Benedict K, Brauer M, Habre R, Hagler GSW, Haynes JA, Khan S, Kilaru V, Liu Y, Pawson S, Peden DB, Quint JK, Rice MB, Sasser EN, Seto E, Stone SL, Thurston GD, Volckens J. Air Pollution Monitoring for Health Research and Patient Care. An Official American Thoracic Society Workshop Report. *Ann Am Thorac Soc*. 2019 Oct;16(10):1207-1214. PMID: 31573344; PMCID: PMC6812167.