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# Observation highlights of the 2010 Russian wildfires: A satellite perspective

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The wildfires that raged in western Russian in July and August 2010 produced thick plumes of carbonaceous smoke aerosols and burning byproducts that were transported over highly populated areas, including the capital city of Moscow. The negative human and economic impacts were severe and extensively covered by the media. Radiosonde data show anomalously high surface temperatures (> 35C) and low relative humidities (< 35%) that resulted from a blocking high-pressure system that prevailed from July to August 2010. The persistence of these anomalous meteorological parameters is not seen in the historic record at all the radiosonde stations in western Russia. We use satellite data from several NASA Earth Observing System (EOS) sensors for a top-down approach to assess the impact of the Russia wildfires on aerosol and chemical composition. CALIPSO data reveal a mixture of smoke and anthropogenic aerosols from local industry extending from the free-troposphere down to the surface. Comparisons of the July/August 2010 satellite record to previous years show that this event is unique. We use the MODIS sensor on Aqua and Terra to show an order of magnitude increase in the fire counts and fire radiative power in the region southeast of Moscow where intense and numerous fires were observed. The Ozone Monitoring Instrument (OMI) sensor on Aura shows an order of magnitude increase in the absorbing aerosol indices over Moscow. OMI tropospheric NO2 column amounts are found to be elevated (> $10\times10^{15}$ molec cm-2) in the vicinity of intensely clustered fires southeast of Moscow, where previous years show no enhancements. Finally, we use the Atmospheric Infrared Sounder (AIRS) total column CO to show a 58% increase, compared to previous summers. Interestingly, the magnitude of the CO is similar to that found over Indonesia during the 2006 El Nino. Both events observed values exceeding $30\times10^{17}$ molec cm-2.