



Long-range transport of Siberian forest fire smoke to Canada's west coast identified by Lidar observations

Kevin Strawbridge (1), Paul Cottle (2), and Ian McKendry (2)

(1) Air Quality Processes Research Section, Environment Canada, Toronto, Ontario, Canada (kevin.strawbridge@ec.gc.ca),

(2) University of British Columbia, Vancouver, British Columbia, Canada

During the summer of 2012, forest fire smoke was detected by two CORALNet lidar systems operated by Environment Canada along Canada's west coast. Based on satellite, model and back trajectory analysis it is thought the smoke originated in Boreal Asia as a result of unusually large amounts of Siberian wildfire activity. The CORALNet lidar systems operate autonomously, measuring the vertical profile of aerosols from near ground to 18 km at a vertical resolution of 3 m and 7.5 m and a temporal resolution of 10 s and 60 s at 1064 nm and 532 nm wavelengths respectively. The lidar also measures the depolarization ratio at 532 nm: and indicator of particle shape. The lidars, located at the University of British Columbia in Vancouver and in the village of Whistler, British Columbia observed an increase in the aerosol backscatter ratio in the free troposphere as the Siberian forest fire smoke was transported across the Pacific Ocean into the region. Of particular importance was the increase in ground level particulate due to the mixing of the smoke into the boundary layer, impacting the air quality in southwestern British Columbia. Lidar depolarization ratios in the boundary layer and the free troposphere were consistent with high concentrations of smoke. Detailed lidar observations will be presented along with supporting satellite, model and ground observations revealing the magnitude of the impact on the region.