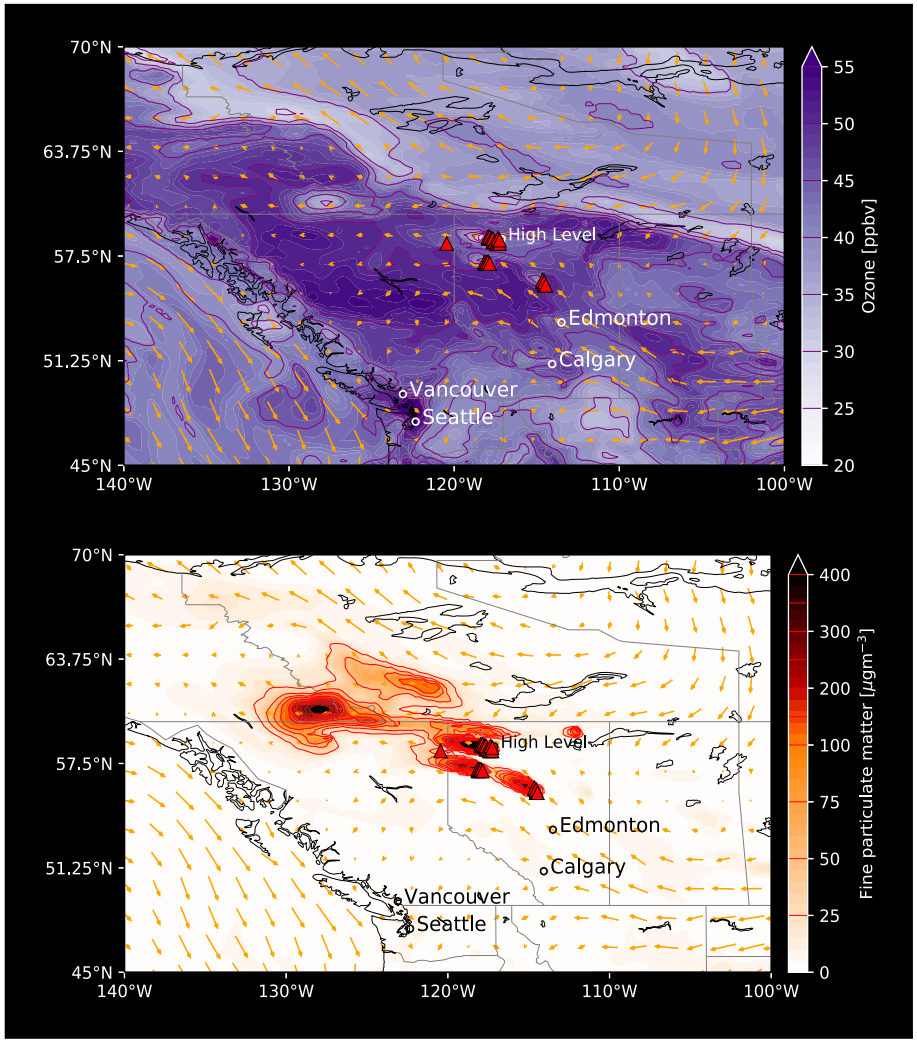
Air Pollution Forecasts Using the NASA GEOS-CF Model: Impacts of the Canadian Wildfires in May & June 2019



During the months of May and June 2019, extremely dry conditions triggered large wildfires in Alberta, Canada. On May 21, the NASA MODIS satellite instrument detected four major active fire areas in the region (red triangles in both figures). Prevailing southeasterly winds (orange arrows) transported the Alberta fire plumes hundreds of miles northwest. Wildfires emit a complex mix of gaseous and aerosol pollutants that spread from the initial source region, potentially impacting communities both near and far. Complex chemical interactions occur within these fire plumes, changing the composition of the plumes as they age. NASA's GEOS Composition Forecast model (GEOS-CF), which includes comprehensive treatment of gas and aerosol phase chemistry, captures these processes, as seen in the above examples of the Alberta, Canada wildfires. Ozone (O_3) is shown in the left image and fine particular matter ($PM_{2.5}$) is shown in the right image.