The equations used to calculate the extinction efficiency, single scatter albedo and asymmetry factor of primary organics, using the optical properties of OC (secondary organics) and pure water droplets and the hygroscopic growth factor of PC (primary organics):

$$Q_{ext_{(RH,r)}}(PC) = \frac{\left[([HGF_{RH}(PC)]^3 - 1) \times Q_{ext_{(r)}}(water)\right] + Q_{ext_{(RH=0,r)}}(OC)}{[HGF_{RH}(PC)]^3}$$

$$SSA_{(RH,r)}(PC) = \frac{\left[([HGF_{RH}(PC)]^3 - 1) \times SSA_{(r)}(water)\right] + SSA_{(RH=0,r)}(OC)}{[HGF_{RH}(PC)]^3}$$

$$ag_{(RH,r)}(PC) = \frac{\left[([HGF_{RH}(PC)]^3 - 1) \times ag_{(r)}(water)\right] + ag_{(RH=0,r)}(OC)}{[HGF_{RH}(PC)]^3}$$
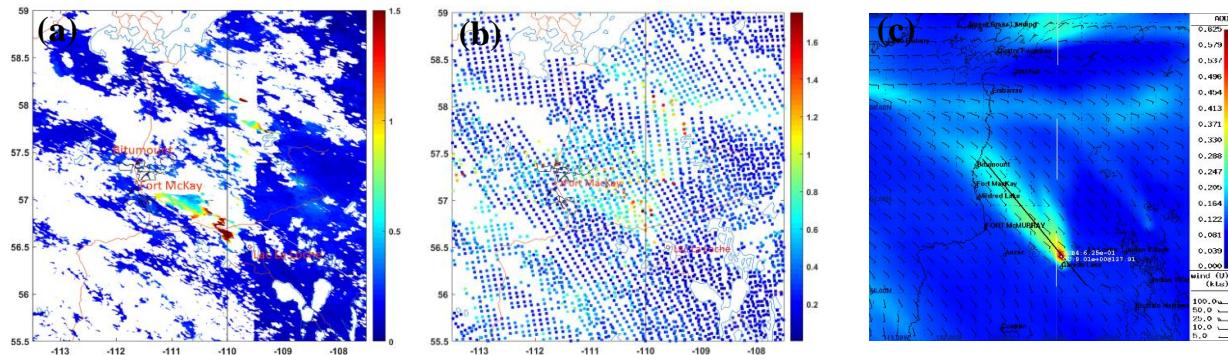
Figure 14: Lac La Loche forest fire, June 25, 2018 (a): MAIAC daily AOD at 550 nm, (b): VIIRS daily AOD at 550 nm and (c): GEM-MACH AOD at 580 nm and horizontal wind bars at 23:00 UTC. The color bar scale on VIIRS and GEM-MACH plots (b and c) show the true maximum values. The maximum AOD value in the MAIAC plot (maximum of 3) was scaled down to illustrate the fire plume. The cross sections in Fig. 15, Fig. 16 and Fig. 17 are plotted along the black line in (c).