



**Figure 2:** Left figure shows a map of the DC-8 flight track on August 7<sup>th</sup>, 2019 for the first set of orthogonal transects through the Williams Flats smoke plume. Colors correspond to the CO<sub>2</sub> mixing ratios from DC-8 measurements. Right figure shows a time series of CO<sub>2</sub>, CO, and BC observations from the DC-8 (panels a-c) that correspond to the transects shown in the left panel and are highlighted by average smoke age. Panel d shows GOES FRP integrated over the same time interval represented by the smoke plume transects and aligned in time with the observations.