**INFLUX: Tower-Based Greenhouse Gas Measurements and Flux Estimates in an Urban Environment**

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Independent verification of anthropogenic greenhouse gas emissions is an emerging need as legislation to regulate greenhouse gas emissions becomes increasingly likely. As part of the INFLUX Project, $CO_2$, $CH_4$ and CO mixing ratios are measured using wavelength-scanned cavity ringdown spectroscopy (Picarro, Inc.) at two towers surrounding Indianapolis, IN, with expansion underway to a network of twelve sensors, including $^{14}CO_2$ flask sampling. Sampling was initiated in October of 2010, and is planned to continue through 2012. We plan to use these data to quantify spatial patterns in greenhouse gas fluxes within and around the urban center at high temporal resolution. We will present preliminary measurements from INFLUX towers as well as simulations of atmospheric greenhouse gas concentrations in the region. We will outline the analytic system being constructed to solve for urban emissions.

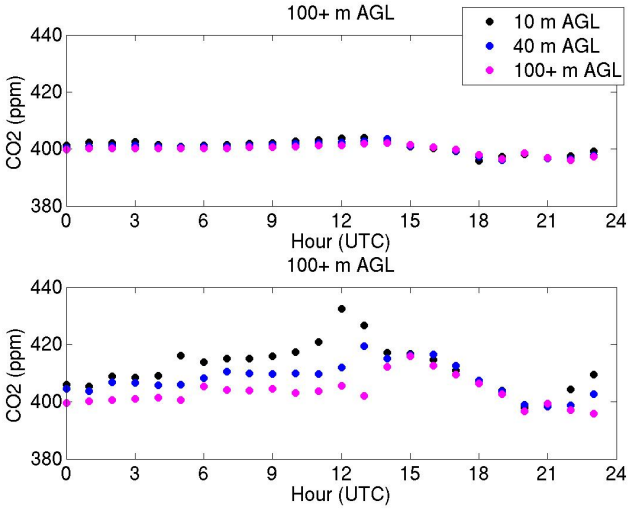


**Figure 1.** $CO_2$ mixing ratios measured at the "Rural" site (top panel) and at the "Urban" site (bottom panel) on 8 November 2010. The wind direction was such that the urban plume was measured at the downwind "Urban" site.

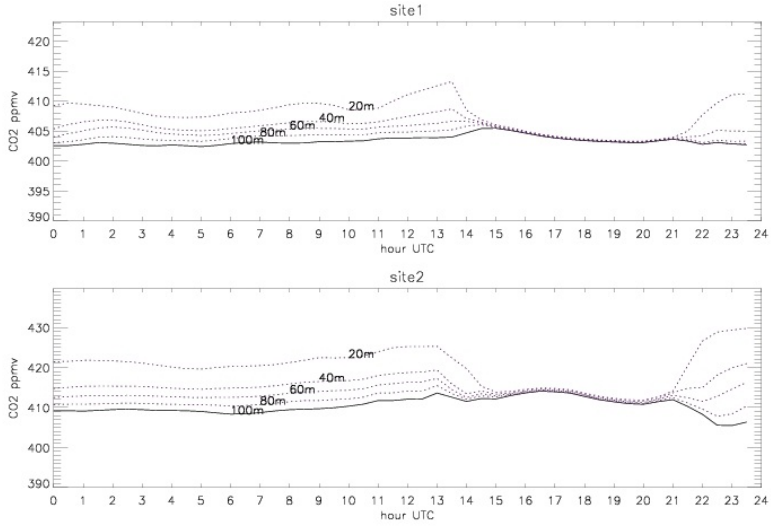


**Figure 2.** Modeled $CO_2$ mixing ratios corresponding to those shown in Figure 1. Although there is more stratification shown at the "Rural" site than was measured, the timing of the mixing and the overall shape of the diurnal cycle agree well with the measurements.