

## Methane Emission Flux from Indianapolis, IN: Identification and Contribution of Sources to the Total Citywide Emission

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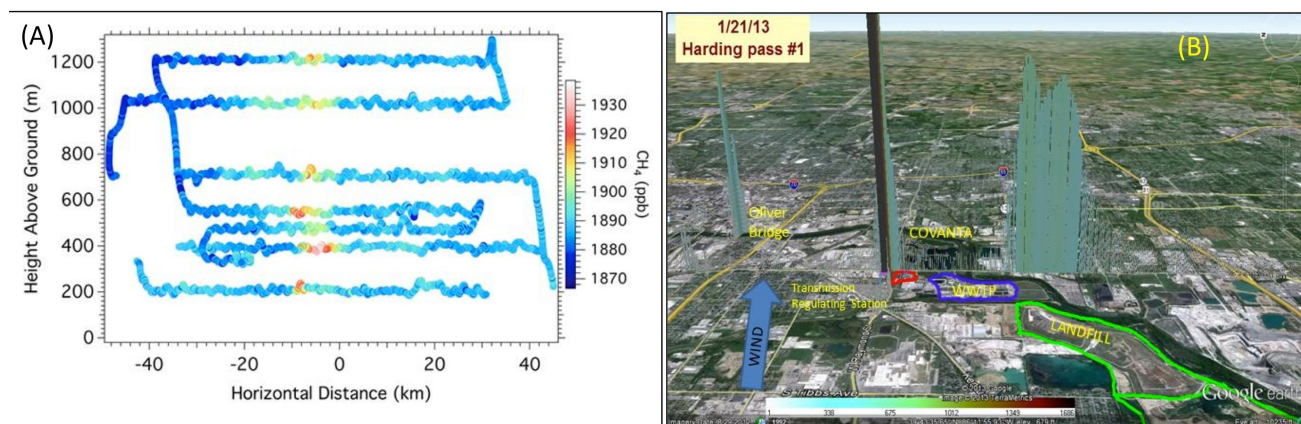
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We report the city-wide methane emission flux from Indianapolis, IN, the location of the INFLUX project, a test case for development of improved urban area-wide emission fluxes. Using an aircraft-based mass balance approach, we determined methane emissions directly downwind from the city. On average, the citywide CH<sub>4</sub> flux determined from several mass-balance flight experiments was 110 moles s<sup>-1</sup>, a factor of ~8 smaller than the South Coast Air Basin, CA, methane emission for 2007 – 2010 (Wennberg et al., 2012). Results from several flight experiments consistently showed elevated CH<sub>4</sub> concentrations at specific coordinates along the horizontal transects downwind of the city (e.g. as shown in Figure 1a). In-flight investigations combined with back trajectories using measured wind directions at the coordinates of the hotspots showed that the CH<sub>4</sub> enhancements were from the southwest side of the city where a landfill and a Transmission Regulating Station (TRS) were located. This aircraft-based finding was supported by results from surface mobile methane measurements within the city (Figure 1b). Using data from several flight experiments, our initial results showed that the landfill-TRS contribute ~30% on average to the total city-wide methane flux. We used our surface mobile measurements to estimate the relative contributions from these two sources, as well as to determine other sources that contribute to the city-wide flux. It appears that most all of the rest of the flux derives from the natural gas distributions system.



**Figure 1.** (A) Methane distribution as a function of altitude and distance along the horizontal transect downwind of the city on June 1, 2011. (B) Observed methane enhancements directly downwind of a landfill and a natural gas transmission regulating station on the southwest side of the city during a surface mobile measurement on January 21, 2013.