Identification of Methane Emissions in an Urban Setting

E. Crosson[1], N. Phillips[2], L. Hutyra[2], J. Turnbull[3], C. Sweeney[3], R. Ackley[4] and S. Tan[1]

[1]Picarro Inc, 3105 Patrick Henry Drive, Santa Clara, CA 94054; 408-891-7168, E-mail: ecrosson@picarro.com
[2]Boston University, Department of Geography/Environment, Center for Energy/Environmental Studies, Boston, MA 02215
[3]Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO 80309
[4]Gas Safety Inc., Southborough, MA 017772

The identification and quantification of greenhouse gas emissions from urban centers are becoming of more interest. Recent measurements indicate that urban emissions are a significant source of methane (CH_4) and in fact may be substantially higher than current inventory estimates. As such, urban emissions could contribute 7-15% to the global anthropogenic budget of methane. Although it is known that the per capita carbon footprint of compact cities such as New York City, Boston, and San Francisco are smaller than sprawling cities such as Houston, the strengths of individual sources within these cities are not well known. Such information is of use to government policy makers because it can be used to incentivize changes in transportation and land use patterns.

In an attempt to identify major methane sources in Boston and Indianapolis, systematic measurements of CH_4 concentrations were made at street level using a vehicle mounted cavity ringdown analyzer. A number of discrete sources were detected at concentration levels in excess of 15 times background levels. Background levels of methane were also measured to be 10% higher than the world-wide average of 1.860 ppm. Measurements of CH_4 concentration levels along with detailed location information will be presented. In addition, chamber flux measurements of discrete sources will also be presented.

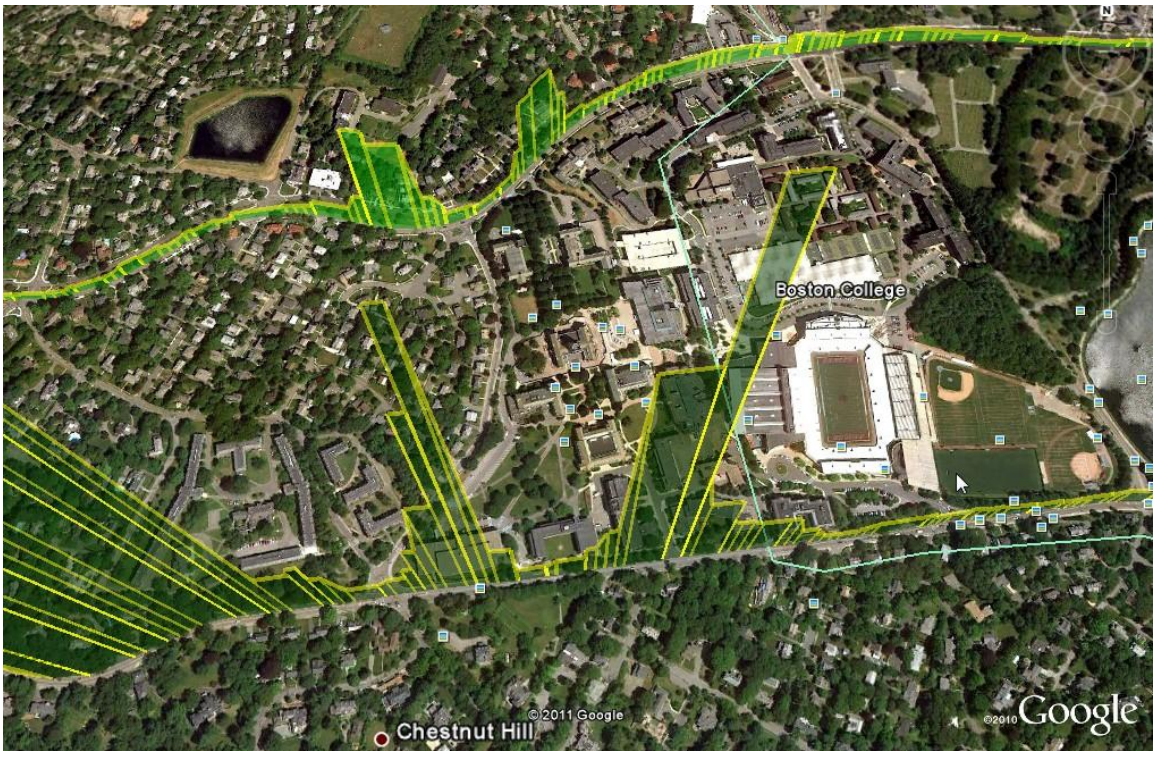

Figure 1. Methane concentration measurements in Boston displayed in Google Earth. Peaks correspond to methane concentrations up to levels five times background levels. These measurements were typical of measurements made throughout the city and surrounding suburbs.