

Ambient Air Quality (B)

Author: Olaguer, Eduardo P.

Source: Environmental Health Insights, 9(s4)

Published By: SAGE Publishing

URL: <https://doi.org/10.1177/EHI.S39424>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Ambient Air Quality (B)

■ Eduardo Olaguer

Program Director for Air Quality Science, Houston
Advanced Research Center, The Woodlands, TX, USA.

Contemporary developments in spectroscopic remote sensing and real time monitoring have opened up new possibilities for the detection and measurement of hazardous air pollutants, especially when environmental justice is at stake. This special issue documents how such developments have been applied in a novel field campaign in the Houston Ship Channel region of Texas known as the Benzene and other Toxics Exposure (BEE-TEX) study. BEE-TEX was first conceived in 2007 as a means to demonstrate the potential of Computer Aided Tomography (CAT) using Differential Optical Absorption Spectroscopy (DOAS), which was previously attempted only once by Laepple et al.¹ in Germany to measure mobile source plumes. However, funding and implementation of BEE-TEX were postponed several times by events beyond the participants' control, a delay which fortuitously enhanced the end result of the campaign, owing to many technical developments between 2007 and the ultimate performance period of the experiment in February 2015. These developments included the marriage of new tools for micro-scale air quality modeling and real-time measurement in a series of papers by Olaguer and various collaborators²⁻⁷, the enhancement of Web technologies to enable real-time data broadcasting (Olaguer, this issue), the development of new Light Emitting Diode (LED) sources for remote sensing applications by Prof. Jochen Stutz and collaborators at UCLA, and the invention of a new *in vitro* technique to measure the response of living human lung cells to ambient air pollution (Vizuete et al., this issue). All these technologies were wed together in what proved to be a much richer experiment than the original one conceived in 2007.

There are three papers in this special issue documenting the design, implementation, and early results of the BEE-TEX study. The first is a general overview by Olaguer, including a discussion of the role of real time data broadcasting and source attribution in the field experiment. Unfortunately, a separate

paper intended to discuss the specifics of the CAT scan implementation was never submitted due to the personal circumstances of the main author, Dr Stutz, so some details of this are provided in the overview. The second paper is a contribution by Aerodyne Research, Inc. (Yacovitch et al.) discussing mobile real-time measurements of various volatile organic compounds, including observed concentrations of 1,3-butadiene routinely exceeding the U.S. Environmental Protection Agency's E-5 lifetime cancer risk level in the Manchester neighborhood of Houston. The third paper is the contribution by Vizuete et al. noted earlier, which discusses the results of the first field trials of the cultured human lung cell exposure technique, including interesting genetic changes accompanying observed pollution events. Together, these three papers demonstrate how air quality monitoring and modeling, and their application to the assessment of human health impacts, may be revolutionized by the latest technologies.

REFERENCES

1. Laepple T, Knab V, Mettendorf K-U, Pundt I. Longpath DOAS tomography on a motorway exhaust gas plume: numerical studies and application to data from the BAB II campaign. *Atmospheric Chemistry and Physics*. 2004;4:1323-42.
2. Olaguer EP. Adjoint model enhanced plume reconstruction from tomographic remote sensing measurements. *Atmospheric Environment*. 2011;45:6980-6.
3. Olaguer EP. The potential near source ozone impacts of upstream oil and gas industry emissions. *Journal of the Air and Waste Management Association*. 2012;62:966-77.
4. Olaguer EP. Near source air quality impacts of large olefin flares. *Journal of the Air and Waste Management Association*. 2012;62:978-88.
5. Olaguer EP. Application of an adjoint neighborhood scale chemistry transport model to the attribution of primary formaldehyde at Lynchburg Ferry during TexAQS II. *Journal of Geophysical Research-Atmospheres*. 2013;118:4936-46.
6. Buzcu-Guven B, Olaguer EP, Herndon SC, Kolb CE, Knighton WB, Cuclis AE. Identification of the source of benzene concentrations at Texas City during SHARP using an adjoint neighborhood scale transport model and a receptor model. *Journal of Geophysical Research-Atmospheres*. 2013;118:8023-31.
7. Olaguer EP, Herndon SC, Buzcu-Guven B, Kolb CE, Brown MJ, Cuclis AE. Attribution of primary formaldehyde and sulfur dioxide at Texas City during SHARP/FLAIR using an adjoint chemistry transport model. *Journal of Geophysical Research-Atmospheres*. 2013;118:11,317-11,326.



Lead Guest Editor **Dr Eduardo Olaguer**

Dr Eduardo Olaguer is Program Director for Air Quality Science at the Houston Advanced Research Center. He completed his PhD at MIT and has previously worked at The Dow Chemical Company and MCNC, a non-profit based in Research Triangle Park, North Carolina. He now works primarily in the development of advanced monitoring and modeling tools for micro-scale and urban air quality. Dr Olaguer is the author or co-author of twenty-five published papers, twenty technical reports, and forty-one conference presentations, and served on the editorial board of *Environmental Science and Pollution Research-International*.



eolaguer@harcresearch.org

<http://www.harc.edu/people/jolaguer>

SUPPLEMENT TITLE: Ambient Air Quality (B)

CITATION: Olaguer. Ambient Air Quality (B). *Environmental Health Insights* 2015:9(S4) 25–26 doi: 10.4137/EHI.S39424

TYPE: Editorial

FUNDING: Author discloses no external funding sources.

COMPETING INTERESTS: Author has disclosed no potential conflicts of interest.

COPYRIGHT: © the authors, publisher and licensee Libertas Academica Limited. This is an open-access article distributed under the terms of the Creative Commons CC-BY-NC3.0 License.

CORRESPONDENCE: eolaguer@harcresearch.org

All editorial decisions were made by the independent academic editor. All authors have provided signed confirmation of their compliance with ethical and legal obligations including (but not limited to) use of any copyrighted material, compliance with ICMJE authorship and competing interests disclosure guidelines.