

Department of Applied Mathematics and Statistics
The Johns Hopkins University

THE FIFTH JOHN C. AND SUSAN S. G. WIERMAN LECTURE

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November 19, 2009
Lecture: 4:00 p.m.
in 111 Mergenthaler Hall
Reception follows
in 304 Whitehead Hall

HOUSTON AIR QUALITY: A SIMULTANEOUS EXAMINATION OF
MULTIPLE POLLUTANTS

ABSTRACT

Houston, the fourth largest city in the nation, is home to one of the world's largest petrochemical industries. Houston also is blessed with a tropical climate and a highly mobile population. These factors lead to the perfect storm in terms of poor air quality and in fact Houston is infamous for its challenges with ambient ozone. In 2005 Mayor Bill White commissioned a task force of area experts to examine the health impact of air quality issues for the Houston population. This task force identified multiple pollutants that create a potential health hazard for the Houston community. Building from this task force report, I will examine Houston air quality from a multi-pollutant perspective. My examination will be derived from the wealth of data collected from the various monitoring networks in the Houston area. A primary focus is on air toxics such as benzene and 1,3butadiene. A multi-pollutant examination requires methodologies that incorporate data from different sources, exhibiting different temporal and spatial scales and non-linear dependence structure. Focusing on levels above thresholds known to impact health, the statistical strategies identify common point sources without relying on the emissions inventory database. Furthermore, we demonstrate that a multi-pollutant examination is key to untangling the health impact story.

Please see the next page for a biography of the speaker.

Katherine Bennett Ensor

Katherine Bennett Ensor received her B.S.E. and M.S. degrees in mathematics from Arkansas State University, and earned her Ph.D. in Statistics from Texas A&M University in 1986. She joined Rice University in 1987 as a member of the newly formed Department of Statistics. Since 1999, she has served as Chair of the department. She is Director of the Rice Center for Computational Finance and Economic Systems and is co-PI on the National Science Foundation grant supporting vertical integration of research and education in the mathematical sciences at Rice. She has held numerous national leadership positions and currently serves on the editorial board of the Journal of the American Statistical Association. She was elected as Fellow of the American Statistical Society in 2001 and received the H. O. Hartley Award, given to outstanding alumni, from the Department of Statistics at Texas A&M in 1996.

Prof. Ensor is an accomplished researcher and educator. Her research interests include stochastic processes exhibiting complex dependence structure, stochastic simulation, risk management, and process modeling and estimation. She works primarily in the application areas of environmental and financial statistics.

She has a long history of research in air quality, focusing on the Houston area. Most recently, she developed and implemented a real-time forecasting system for Houston-area ambient ozone levels. The spatial-temporal forecasting system utilizes the extensive monitoring network data for observed ambient ozone levels as well as pertinent covariates. Through this system, the City of Houston can accurately predict extreme ambient ozone levels two hours in advance as well as identify unusual occurrences of ambient ozone levels.