



## CREAL SEMINAR: FRIDAY 27.6.2008, 9:30 AT CREAL

### Neighborhood and Environmental Factors Associated with Physical Activity During and After Pregnancy

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Physical activity has well-documented health benefits for cardiovascular fitness and weight control. For pregnant women, the American College of Obstetricians and Gynecologists currently recommends 30 minutes of moderate exercise on most, if not all, days; however, very few pregnant women achieve this level of activity. Epidemiologists, policy makers, and city planners are interested in whether characteristics of the physical environment in which women live and work have influence on physical activity levels during pregnancy and in the postpartum period. In this paper we study the associations between physical activity and several factors including personal characteristics, meteorological/air quality variables, and neighborhood characteristics in pregnant women in four counties of North Carolina. We simultaneously analyze six types of physical activity and investigate cross-dependencies between these activity types. Exploratory analysis suggests that the associations are different in different regions. Therefore we use a multivariate regression model with spatially-varying regression coefficients. This model includes a regression parameter for each covariate at each spatial location. For our data with many predictors, some form of dimension reduction is clearly needed. We introduce a Bayesian variable selection procedure to identify subsets of important variables. Our stochastic search algorithm determines the probabilities that each covariate's effect is null, non-null but constant across space, and spatially-varying.

#### FUENTES BIO:

Dr. Montserrat Fuentes is full professor (with tenure) in the Statistics Department at North Carolina State. Dr Fuentes is a fellow of the American Statistical Association (ASA). She holds an associate status in the Marine Earth Atmospheric Sciences Department at NCSU. Dr. Fuentes received her B.S. in Mathematics and also in Music from the University of Valladolid (Spain), and her Ph.D. in Statistics from the University of Chicago (1999). She spent 6 months as a postdoc in the National Center of



Atmospheric Research (NCAR) before joining NC State in 1999. She is a member-elect of the International Statistical Institute, and also a member of the Regional Advisory Board (RAB) for the Eastern North American Region (ENAR) of the International Biometric Society. Dr. Fuentes is a member of the scientific advisory board Board's Integrated Human Exposure Committee of the U.S. Environmental Protection Agency, and the U.S. representative in the Board of Directors of the International Environmetrics Society. She is a member of the Biostatistical Methods and Research Design (BMRD) study section of the National Institutes for Health. She has also worked for the U.S. Department of Justice as an expert witness (Spring 2007), and she is (with - among others - Nino Kuenzli from CREAL) a member of a committee of the National Research Council of the National Academies working on the impact of ozone on mortality. Throughout her professional career, Dr. Fuentes has been active in numerous professional societies, including being chair of the section on Statistics and the Environment (2003) for ENAR, chair of the General Methodology Section (2001, and 2004) of the American Statistical Association (ASA), program chair for the 2002 Southern Regional Council on Statistics (SRCOS) and ASA, serving in the scientific committee for The International Environmetrics Society (TIES) (2004) and in the program committee for the Institute of Mathematical Science-The International Society for Bayesian Analysis (IMS-ISBA) joint conference (2005). She was also chair of the scientific committee for the International Statistical Institute (ISI) Conference on Environmental Statistics and Health (July, 2003). She was the program chair for ENAR 2006. She has been elected for the IMS council (2007-2010).

She received the Abdel El-Shaarawi Young Research's Award in recognition of outstanding contributions to environmetric research (2003). Dr. Fuentes has maintained her own research group, with an average of seven Ph.D. graduate students and two postdocs working on projects sponsored by the National Science Foundation (NSF), the US National Institutes of Health (NIH), the US Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA) and the US Department of Defense (DOD). Dr. Fuentes has developed new statistical methods that she applies to air pollution, weather prediction, hurricane forecasting and environmental health risk assessment problems in collaboration with the air quality modelers and scientists at EPA and NCAR. This work has led to numerous publications in top statistical journals and books, as well as top journals in atmospheric sciences.



