



The University of Chicago
Department of Statistics

STATISTICS COLLOQUIUM SERIES

MONTSERRAT FUENTES

Department of Statistics
North Carolina State University

**Nonparametric Spatial Models for Extremes:
Application to Extreme Temperature Data**

MONDAY, October 3, 2011, at 4:00 PM

133 Eckhart Hall, 5734 S. University Avenue

Refreshments following the seminar in Eckhart 110.

ABSTRACT

Estimating the probability of extreme temperature events is difficult because of limited records across time and the need to extrapolate the distributions of these events, as opposed to just the mean, to locations where observations are not available. Another related issue is the need to characterize the uncertainty in the estimated probability of extreme events at different locations. Although the tools for statistical modeling of univariate extremes are well-developed, extending these tools to model spatial extreme data is an active area of research. In this work, in order to make inference about spatial extreme events, we introduce a new nonparametric model for extremes. We present a Dirichlet-based copula model that is a flexible alternative to parametric copula models such as the normal and t-copula. This presents the most flexible multivariate copula approach in the literature, and allows for nonstationarity in the spatial dependence of the extremes. The proposed modeling approach is fitted using a Bayesian framework that allows us to take into account different sources of uncertainty in the data and models. We apply our methods to annual maximum temperature values in the east-south-central United States.

In collaboration with J. Henry and B. Reich.

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