Richard L. Smith

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and SAMSI

Presenting on:

"Influence of Climate Change on Extreme Weather Events"

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12 noon

(Lunch served at 11:50am)

129 Baker Conference Room

Department of Engineering and Public Policy

Seminar Abstract: The increasing frequency of extreme weather events raises the question of to what extent such events can be attributed to human causes. Within the climate literature, an approach has been developed based on a quantity known as the fraction of attributable risk, or FAR. The essence of this approach is to estimate the probability of the extreme event of interest from parallel runs of climate models under either anthropogenic or natural conditions; the two probabilities are then combined to produce the FAR. However, a number of existing approaches either make questionable assumptions about estimating extreme event probabilites (e.g. inappropriate assumption of the normal distribution) or ignore the differences between climate models and observational data. Here, we propose an approach based on extreme value theory, incorporated into a hierarchical model to account for differences among climate models. A related technique, based on the same modeling approach, leads to quantitative estimates of how the probability of an extreme event will change under future projected climate change. We illustrate the method with examples related to the European heatwave of 2003, the Russian heatwave of 2010, and the Texas/Oklahoma heatwave and drought of 2011. This is joint work with Michael Wehner (Lawrence Berkeley Lab).

Speaker Bio: Richard L. Smith is Mark L. Reed III Distinguished Professor of Statistics and Professor of Biostatistics in the University of North Carolina, Chapel Hill. He is also Director of the Statistical and Applied Mathematical Sciences Institute, a Mathematical Sciences Institute supported by the National Science Foundation. He obtained his PhD from Cornell University and previously held academic positions at Imperial College (London), the University of Surrey (Guildford, England) and Cambridge University. His main research interest is environmental statistics and associated areas of methodological research such as spatial statistics, time series analysis and extreme value theory. He is particularly interested in statistical aspects of climate change research, and in air pollution including its health effects. He is a Fellow of the American Statistical Association and the Institute of Mathematical Statistics, an Elected Member of the International Statistical Institute, and has won the Guy Medal in Silver of the Royal Statistical Society, and the Distinguished Achievement Medal of the Section on Statistics and the Environment, American Statistical Association. In 2004 he was the J. Stuart Hunter Lecturer of The International Environmetrics Society (TIES). He is also a Chartered Statistician of the Royal Statistical Society.

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