

UNIVERSITY OF SYDNEY

SCHOOL OF MATHEMATICS AND STATISTICS

Statistics Seminar

Friday, 4 April 2008, 2.00pm

Carslaw 375

Statistical modelling of Extreme Values: basic theory and applications to analysis of temporal trend in wind storm losses and temperature data

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Abstract

Statistical extreme value theory provides a flexible and theoretically well motivated approach to the study of large losses in insurance. We give a brief review of the modern version of this theory and a "step by step" example of how to use it in large claims insurance. The discussion is based on a detailed investigation of a wind storm insurance problem. A topic of major current interest in extremevalue analysis is the investigation of temporal trends. For example, the potential influence of 'greenhouse' effects may result in severe storms becoming gradually more frequent, or in maximum temperatures gradually increasing, with time. One approach to evaluating these possibilities is to fit, to data, a parametric model for temporal parameter variation, as well as a model describing the marginal distribution of data at any given point in time. In this talk we discuss some parametric trend models and illustrate the methods by application to a dataset on windstorm losses in south of Sweden. We shall also discuss difficulties which might arise in formulating structural trend-models. Motivated by datasets on windstorm severity and maximum temperature, we suggest a nonparametric approach to estimating temporal trends when fitting parametric models to extreme values from a weakly-dependent time series.

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