Title: Ozone concentrations: a robust analysis of multivariate extremes

Speaker: Debbie Dupuis

Abstract

Data on ozone concentrations at four monitoring sites in central Canada are examined. Univariate extreme value methods do not allow for the required inference and multivariate methods exploiting the joint dependence of the data are necessary. Families of multivariate extreme-value copulas with a flexible dependence structure and closed-form cumulative distribution functions have recently been derived. In this talk, we show that maximum likelihood estimates of these parametric models may be obtained numerically and their use can lead to increased efficiency in the estimation of margins. We do not however have any assurance that all data are well modelled by these distributions as (1) the space of multivariate extreme-value copulas is infinite dimensional, (2) data on ozone levels are prone to outliers. The talk addresses the robust methods required for a proper analysis.