DALHOUSIE UNIVERSITY | DEPARTMENT OF MATHEMATICS AND STATISTICS

Date: September 29, 2022

Time: 12:30pm-1:30pm

Presenter: Christian Genest (McGill University)

Title: Bayesian hierarchical modeling of spatial extremes

Abstract: Climate change and global warming have increased the need to assess and forecast environmental risk over large domains and to develop models for the extremes of natural phenomena such as droughts, floods, torrential precipitation, and heat waves. Because catastrophic events are rare and evidence is limited, Bayesian methods are well suited for the areal analysis of their frequency and size. In this talk, a multi-site modeling strategy for extremes will be described in which spatial dependence is captured through a latent Gaussian random field whose behavior is driven by synthetic covariates from climate reconstruction models. It will be seen through two vignettes that the site-to-site information sharing mechanism built into this approach does not only generally improve inference at any location but also allows for smooth interpolation over large, sparse domains.

The first application will concern the quantification of the magnitude of extreme surges on the Atlantic coast of Canada as part of the development of an overland flood protection product by an insurance company. The second illustration will show how coherent estimates of extreme precipitation of several durations based on a Bayesian hierarchical spatial model enhances current methodology for the construction, at monitored and unmonitored locations, of IDF curves commonly used in infrastructure design, flood protection, and urban drainage or water management.

How to connect? Zoom

Meeting ID 896 0007 7950

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Statistics Seminar Series (2022-2023)

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