
Survival Modelling with Environmental Applications

Chair: John Braun (University of British Columbia)

Organizers: John Braun (University of British Columbia) and Douglas Woolford (Wilfred Laurier University)

JAMES STAFFORD, University of Toronto

Accommodating Spatial and Temporal Uncertainty in Wildfire Ignitions.

Historical forest fire records can be temporally and spatially incomplete. Ignition locations may be viewed as both temporally censored (observed ignition time being a right censoring point) and areally censored within the observed fire perimeters. One approach to consider is a MCMC algorithm for making inference on a log-Gaussian Cox process with the exact times and locations being a latent variable sampled at each iteration. Alternatively, a local-EM algorithm could provide a non-parametric fit to the ignition intensity, where the fitted intensity surface maximizes the expectation of the likelihood function taken over the unknown ignition locations. Both approaches have analogies to disease mapping problems, where cases of a given health outcome are aggregated to administrative areas and reporting periods.

YI XIONG, Simon Fraser University

Exploring Forest Fire Duration Times

In attempt to understand how fire duration time is associated with environmental factors together with the fire's location and starting time, we analyze a collection of lightning-caused forest fire records. Two classes of semiparametric survival models are considered to avoid unrealistic model constraints and to capture the natural features of the underlying fire process. The analysis integrates the conventional survival analysis procedures with data smoothing techniques. In particular, we present how to deal with practical challenges arising from forest fire data, such as reporting delay, seasonal effect and spatio-temporal clustering. This is a joint work with John Braun (UBC-O) and Joan Hu (SFU).

THIERRY DUCHESNE, Université Laval

Kernel and Deconvolution Methods of Density Estimation for Interval-Censored Data

In this talk we will compare two nonparametric inference methods for the estimation of a density when the observations are interval-censored. One method is the kernel estimation procedure based on conditional expectations proposed by Braun, Duchesne and Stafford in 2005, while the other method is a new proposal based on deconvolution techniques. We will compare both methods theoretically and numerically under a specific model similar to case-II interval-censoring. The potential applicability of these two methods to forest fire modeling will be discussed.