THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Homogeneity of Variance and Detection of Change-Points in Time Series Analyses: Application to Lake Ice Phenology

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ABSTRACT

We first consider the problem of testing for homogeneity of variance in time series containing records of lake ice freeze-up and break-up dates. Various non-overlapping blocks of a fixed size are tested using non-parametric methods to detect changes in the process spectrum. The methods are based on the Fourier and wavelet spectra which are decompositions of the overall process variance across respective frequencies and scales. Furthermore, we consider the problem of change-point detection in the lake ice phenology series. We apply the cumulative sum of squares test statistic to the discrete wavelet transform of this data to detect change-points associated with various scales.

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