



The impact of large-scale forest disturbance on hydrology in Central British Columbia, Canada

A. Wei (1) and M. Zhang (2)

(1) (adam.wei@ubc.ca) University of British Columbia, Kelowna, Canada, (2) Mingfang Zhang, University of British Columbia, Kelowna, Canada

Influence of forest vegetation on hydrology is seldom examined at large-scale watersheds. Availability of long term hydrological and climatic data from 1953 to 2005, along with large-scale cumulative forest harvesting in the Willow watershed (2860 km²) situated in the central interior of British Columbia, Canada provided us a unique opportunity to study the impact of large-scale forest disturbance on hydrology. Various statistical techniques including time series analysis and nonparametric tests were applied to analyze the impacts of forest harvesting on peak, mean and low flows over annual and other periods (spring, summer and winter). The results showed that forest harvesting in the Willow watershed significantly increased mean and peak flows over annual and spring periods. However, the mean and peak flows in the summer and winter periods were not significantly affected. The impacts of forest harvesting on low flow for all studied periods were either not statistically significant or inconclusive. In addition, we specifically tested the relation between the spring peak flows and timber harvesting with consideration of climate variables by regression model analysis. Our regression analysis further confirmed that spring peak flows were significantly altered by forest harvesting in this large-scale watershed. Our on-going analysis will further provide data on magnitude change of those altered hydrological variables.