

ASSESSING THE IMPACT OF CLIMATE CHANGE ON LANDSCAPE-LEVEL FIRE BEHAVIOR POTENTIAL IN CENTRAL SASKATCHEWAN

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ABSTRACT

Climate change could increase fire weather severity in the western portion of Canada's boreal forest. In this study, we evaluate how climate change could affect future landscape-level fire behavior potential. The study area extends over 135,000 km² and covers the entire southern portion of Saskatchewan's boreal forest. The area characterizes the transition from mixedwood to pure coniferous forest types. Weather data were obtained from historical records to represent actual conditions and from the Canadian Regional Climate Model to simulate future weather. Using the functions within the Canadian Forest Fire Behavior Prediction System, fire weather data, fuel types, and topography were combined to building head-fire intensity maps under a range of climatic conditions (e.g., 90th, 95th, 99th percentile values) and for various periods of the fire season (i.e., spring, summer, and fall). The results from the analysis of present and future fire behavior potential maps confirm on a regional basis the expected increases in landscape flammability and demonstrate quantitatively the range of spatial and temporal variability in wildfire potential under 2×CO₂ and 3×CO₂ climate scenarios, 50 and 100 years from now. Implications for future fire behavior characteristics, fire effects, and suppression effectiveness are discussed.

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