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Contents

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'Remote sensing of burn severity in boreal North America'

Edited by NHF French and ES Kasischke

Using Landsat data to assess fire and burn severity in the North American boreal forest region:

an overview and summary of results

Nancy H. F. French, Eric S. Kasischke, Ronald J. Hall, Karen A. Murphy, David L. Verbyla, Elizabeth E. Hoy and Jennifer L. Allen

International Journal of Wildland Fire 17, 443–462

A review of past assessments and studies presented in this special issue of fire and burn severity assessments is presented. Results from relating and mapping fire/burn severity within the boreal region have been variable. Further research is necessary to achieve large-area application of these methods.

Assessing the differenced Normalized Burn Ratio's ability to map burn severity in the boreal forest and tundra ecosystems of Alaska's national parks

Jennifer L. Allen and Brian Sorbel

International Journal of Wildland Fire 17, 463–475

This paper compared burn severity values derived using Landsat TM/ETM+ data and the differenced Normalized Burn Ratio with field measurements of burn severity obtained from 10 fires that occurred in or near four national park areas in Alaska. Overall, the satellite-derived measurements of severity were strongly correlated with field measurements of severity in both the boreal forest and tundra vegetation types within the study.

Remote sensing of burn severity: experience from western Canada boreal fires

R. J. Hall, J. T. Freeburn, W. J. de Groot, J. M. Pritchard, T. J. Lynham and R. Landry

International Journal of Wildland Fire 17, 476–489

Burn severity measured by the composite burn index (CBI) and differenced Normalized Burn Ratio (dNBR) was evaluated over fires in the western Canadian boreal from the perspectives of modelling, influence of fuel type, and mapping. Results include a non-linear model between CBI and dNBR, how dNBR varies by fuel type, and a new approach for mapping based on field assignment of severity level to CBI.

Evaluating the ability of the differenced Normalized Burn Ratio (dNBR) to predict ecologically significant burn severity in Alaskan boreal forests

Karen A. Murphy, Joel H. Reynolds and John M. Koltun

International Journal of Wildland Fire 17, 490–499

Boreal forest burn severity is strongly tied to the consumption of the organic surface layer. Assessment of a remote sensing protocol for burn severity revealed a poor predictive relationship with on-the-ground severity measures in Alaskan boreal forests and an inability to distinguish ecologically important severity levels.

Evaluating the potential of Landsat TM/ETM+ imagery for assessing fire severity in Alaskan black spruce forests

Elizabeth E. Hoy, Nancy H. F. French, Merritt R. Turetsky, Simon N. Trigg and Eric S. Kasischke

International Journal of Wildland Fire 17, 500–514

We evaluated the potential of different spectroscopic indices and image transformations as a basis for mapping fire severity in Alaskan black spruce forests. In contrast to studies carried out in the conterminous USA, our results suggest that the Normalized Burn Ratio may not be a strong candidate for mapping fire severity in the black spruce forests of the boreal region as measured by the composite burn index.

Evaluation of the composite burn index for assessing fire severity in Alaskan black spruce forests

Eric S. Kasischke, Merritt R. Turetsky, Roger D. Ottmar, Nancy H. F. French, Elizabeth E. Hoy and Evan S. Kane

International Journal of Wildland Fire 17, 515–526

The use of the composite burn index (CBI) to predict important characteristics of fire severity in black spruce ecosystems was evaluated. It was found that the composite burn index had low correlation with most surface measurements that are important in determining how black spruce forests will respond to variations in fire severity.

Seasonal and topographic effects on estimating fire severity from Landsat TM/ETM+ data

David L. Verbyla, Eric S. Kasischke and Elizabeth E. Hoy

International Journal of Wildland Fire 17, 527–534

This study examined the effects of topography, solar elevation, and phenology on remotely sensed fire severity estimates. Fire severity estimates varied substantially depending upon the date of pre-fire and post-fire images used. Because spectral reflectance varies substantially due to seasonal changes in solar elevation and plant phenology, monitoring spatial or temporal trends in fire severity requires extensive field data for calibration and validation of remotely sensed fire severity indices.
