



AMERICAN METEOROLOGICAL SOCIETY

5th Symposium on Fire and Forest Meteorology and the 2nd International Wildland Fire Ecology and Fire Management Congress

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Monday, 17 November 2003

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Fire severity classification: uses and abuses

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Burn severity (also referred to as fire severity) is not a single definition, but rather a concept and its classification is a function of the measured units unique to the system of interest. The systems include: flora and fauna, soil microbiology and hydrologic processes, atmospheric inputs, fire management, and society. Depending on the particular system of interest, the unit of measure changes. For example, in fire management the units of measure include consumption of organic material, flame length, torching index and other indicators of risk and fire behavior. For the atmosphere the units of burn severity include particulates and toxic gasses as a result of smoke and other inputs from fires. For society the number of homes damaged, injuries, and net value changes would be the units of measure. Flora and fauna and soil microbiology and hydrologic processes units of measure would quantify residual ecosystem structure after the fire and then subsequent responses in nutrient cycling, erosion, and species diversity and recovery rates to name a few.

The challenge to burn severity classification is to develop consistent ecological meaningful information that can be readily related to secondary fire effects. Currently, burn severity classification is based on qualitative estimates or include detailed information on individual forest components that are difficult to summarize into one classification system. In addition, forest structure that is measured may have no ecological relation to the secondary fire effect. This paper critically evaluates the use of burn severity classification as it relates to secondary fire effects (erosion, tree mortality, nutrient cycling, vegetation recover) as to their ecological usefulness, ability to quantify and summarize the information.

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