

CHARACTERIZATION OF CANOPY PHYSIOLOGY AT BOREAS WITH SAR

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The Boreal Ecosystem - Atmosphere Study (BOREAS) is a multidisciplinary field and remote sensing study the goal of which is to obtain an improved understanding of the interactions between the boreal forest biome and the atmosphere in order to clarify their roles in global change. The two principal BOREAS field sites, both located within Canada, are located in the southern boreal ecotone, encompassing Prince Albert National Park, Saskatchewan, and in the northern boreal ecotone near Thompson, Manitoba. This paper presents research carried out as part of BOREAS to characterize forest ecophysiological processes as observed by the JPL AIRSAR, SIR-C/X-SAR and the ERS-1 SAR. Automated measurement systems have been installed in three different forest stands within the BOREAS field sites. Two of these stands are in the southern region, one dominated by trembling aspen (*Populus tremuloides*) and the other by black spruce (*Picea mariana*), and one is in the northern region, dominated by black spruce. These stands have each been instrumented with sensors that provide continuous *in situ* monitoring of tree xylem water flux and vegetation tissue and soil temperatures. Since their installation in the autumn of 1993, these sensors have provided a continuous record of vegetation hydrologic activity. Data derived from these sensors are used in concert with SAR imagery to examine the radar response to canopy physiological state as related to such issues as vegetation freeze/thaw state and growing season length. These results are in turn used to examine canopy physiology over larger regions of the BOREAS test sites. Results obtained from the automated measurement systems and SAR imagery will be discussed.

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