

Abstract Submitted
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Considering spatial inhomogeneities in forest canopies RYAN SCOTT, HAWWA FALIH, SARAH SMITH, NASEEM ALI, JULIAAN BOSSUYT, Portland State University, MARC CALAF, University of Utah, RAUL CAL, Portland State University — Forest canopies serve a key role in determining regional climate and modify terrestrial surface roughness. Forests are typically considered large areas of contiguous roughness elements. While forest composition exists in a state of constant flux, human activities impose an ordered arrangement on local canopy structure. In particular, logging and development produce non-homogeneous patterns of canopy patches separated by regular gaps. To quantify the role of these patterns on the canopy sublayer, a series of wind tunnel experiments were performed with a scaled model forest canopy. The model forest was constructed of multiple patches spanning the width of the wind tunnel. Each patch was comprised of model conifers with a total height of 10 cm and cone diameter of 4 cm. Individual trees were realized by an interconnected reticulated foam canopy layer attached to evenly spaced tree trunks. Particle image velocimetry measurements were collected above the canopy and within gaps for both homogeneous and non-homogeneous canopies. From these measurements, the influence of non-homogeneous canopy patterns is quantified by computing relevant mean statistics and flow structures. In addition, the implications for local effects and land management practices will be discussed in presentation.

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