1128-86-260 **Demetrios Gatziolis*** (dgatziolis@fs.fed.us), 620 SW Main Street, Suite 400, Portland, OR 97205. *Voxel-based assessment of sun light in forests.*

The distribution of sunlight and solar energy within forest stands controls many environmental and ecological processes. Its precise spatial assessment, a prerequisite for sound forest management, is challenging owing to solar illumination being a dynamic phenomenon with diurnal and seasonal cycles and also to trees and other vegetation materials exhibiting notoriously complex, difficult-to-describe dimensionality. Rendering into voxel space dense point clouds generated over forested landscapes by using airborne laser scanners has enabled volumetric representations of vegetation. Subsequent ray tracing originating from voxel facets and directed towards selected sets of sun locations within a day or during a longer time period supported the assessment of solar illumination regimes and incident solar energy. Series of adaptations to the ray tracing algorithms helped improve the realism of sunlight distribution calculations while optimizations promoted computation efficiency. Comparisons with field observations of sunlight presence/absence and against in situ measurements of solar energy in a variety of biomes confirmed that this approach is capable of consistently delivering accurate and precise results wherever high-density airborne laser scanning data is available. (Received February 28, 2017)