

**POKHAREL**

**VALIDATION OF DIAMETER INCREMENT MODEL OF THE LAKE STATES VARIANT OF THE FOREST VEGETATION SIMULATOR USING MICHIGAN FOREST INVENTORY AND ANALYSIS DATA**

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The Lake States variant of the Forest Vegetation Simulator (LS-FVS) was developed by using TWIGS (The Woodsman's Ideal Growth Projection System) as the tree growth engine, which is conceptually quite different from growth engines developed elsewhere. The performance of the TWIGS diameter increment model has neither been rigorously tested nor validated uniquely for the Michigan's conditions. In this study model performance was evaluated by analyzing magnitude and direction of diameter increment prediction errors for 30 tree species using geographically extensive, independent data from three successive Forest Inventory and Analysis (FIA) inventories of Michigan. A comparative analysis of model prediction on ten yearly consecutive prediction cycles versus a single ten year prediction cycle showed a small difference in diameter prediction, which is insignificant compared to the overall model prediction error. Re-calibration of the diameter adjustment factor has reduced average bias for 30 tree species from -0.17 inch (-0.43 cm) to -0.06 inch (-0.15 cm) for a 10 year prediction cycle. Validation and re-calibration are continuous processes of model development, which increase model credibility and boost user confidence.

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