Introduction

To answer the post-logging woody residue information needs of land managers, researchers at the University of Montana (UM) have investigated logging utilization of live tree biomass across the 4 state NARA area over the past 3 years. Using sample data from more than 2000 felled trees located within 81 logging sites, the authors are developing manager-friendly information summaries and forecasting tools that predict logging residue volumes and biomass at the state, region, logging site, and tree levels.

State-level Summaries

Logging utilization studies quantify timber volumes cut and delivered to the mill or left as logging residue. They provide valuable insights about the volume removal efficiency of commercial timber harvesting at the state or regional level. Logging utilization studies characterize timber removals and woody residue production by variables such as tree diameter (fig. 1), and logging systems employed (fig. 2).

Biomass Estimator

Logging utilization study results can be used in concert with timber harvest data to estimate residue volumes. When combined with biomass conversion factors and top and lamb data from other sources, analysts can estimate total tree biomass residue. Land managers can use this information to make informed decisions on how to manage residues for bioenergy applications at the stand, landscape, or state level (fig. 3).

Improved Forest Vegetation Simulator (FVS) residue predictions

The Forest Vegetation Simulator (FVS) growth and yield model can predict logging residue volumes and biomass created during timber harvest (fig. 7). FVS users must estimate the number of trees left during logging operations. However, most users have only anecdotal knowledge about how many trees will be left unused. Using logging utilization research results, UM researchers are working with FVS staff to quantify residue volumes and improve the residue prediction capabilities of FVS.

Predicting available woody biomass in forest landing residue piles

Oregon State University (OSU) scientists (Long and Boston 2014) have developed a sampling protocol that estimates woody biomass found in residue piles (fig. 8). UM and OSU scientists have joined forces to link UM's logging utilization research to OSU's residue pile estimation work. OSU and UM researchers will develop correlative models that relate within-pile biomass (derived from OSU pile-based residue estimates) to total forest residue (derived from UM logging residue factors). OSU's research will then be leveraged with BEER's efforts to estimate available biomass feedstocks on any westside site.

References


