

Simulation and Verification of Logistics of Biomass (Woody and Herbaceous) Supply Chains

S. Sokhansanj

Poster

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The Integrated Biomass Supply & Logistics (IBSAL) model is a dynamic (time dependent) model of operations that involve collection, harvest, storage, preprocessing, and transportation of feedstock for use at a biorefinery. The model uses mathematical equations to represent individual unit operations. These unit operations can be assembled by the user to represent the working rate of equipment and queues to represent storage at facilities. The model calculates itemized costs, energy input, and carbon emissions. It estimates resource requirements and operational characteristics of the entire supply infrastructure. Weather plays an important role in biomass management and thus in IBSAL, dictating the moisture content of biomass and whether or not it can be harvested on a given day. The model calculates net biomass yield based on a soil conservation allowance (for residue) and dry matter losses during harvest and storage. This paper outlines the development of the model and provides examples of agricultural and forestry biomass harvest, processing, and logistics.