

## **Monitoring of Moisture and Inorganic Contents of Forest Harvest Residues in Alberta's Boreal Forest for Production of Fuels and Chemicals**

**Mahdi Vaezi**

University of Alberta, Canada, mvaezi@ualberta.ca

**Sonia Ghatora**

University of Alberta, Canada, ghatora@ualberta.ca

**Amit Kumar**

University of Alberta, Canada, Amit.Kumar@ualberta.ca

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**ABSTRACT** In Alberta, the trees are cut in the stand, skidded to the roadside and are delimbed at the roadside. The branches and tops which are generated during delimiting of trees are piled up and burnt to prevent forest fire. These forest residues biomass can be used for production power, fuels and chemicals and substitution of the fossil fuel feedstock. However, high moisture content contributes significantly to the high transportation cost as it increases the bulk density and reduces the calorific value. Inorganic contents present in the forest residues have a detrimental impact on the combustion and gasification, causing slagging and fouling of the furnace walls and heat transfer surfaces. This two year research is aimed at measuring the variation in inorganic and moisture contents of forest harvest residues and development of rigorous analytical models. The models forecasts the inorganic and moisture contents under different combination of climatic variables and helps in determining the optimum time during the year to move the residues from the forest. These experiments are based on monitoring of few forest residue test piles developed in Alberta's boreal forest for this study. According to the results obtained so far, late September is the best time to transport the residues. Currently, we are developing the data-intensive models to correlate moisture and inorganic contents with time, temperature, humidity, and precipitations.

**Keywords:** Biomass, Forest Residues, Bioenergy, Biofuels, Moisture Content, Inorganic Content