VRIMS Annual Forest Inventory Biomass Estimations

To standardize forest stand biomass estimation methods in BC and Canada, the 2017 annual forest inventory biomass estimations are based on the new version VDYP7 that has built-in new functions to calculate aboveground forest biomass using Canadian Forest Service (CFS) volume-to-biomass models. The detailed procedures, models, parameters and documentations are available in the following websites: https://nfi.nfis.org/en/biomass and https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/forestinventory/growth-and-yield-modelling/variable-density-yield-projection-vdyp

The VDYP7 estimates the four components of the biomass: stem wood, stem bark, branches, and foliage (Figure 1). The biomass is defined as oven-dry weight in tonnes per hectare contained in trees at least 1.3 m in height (diameter at breast height (DBH)>0 cm). The stem wood biomass includes merchantable and non-merchantable portions (i.e., bole, stump and top). The stem bark biomass includes bole, stump and top bark; branch biomass includes branches of all sizes, and finally the foliage biomass.
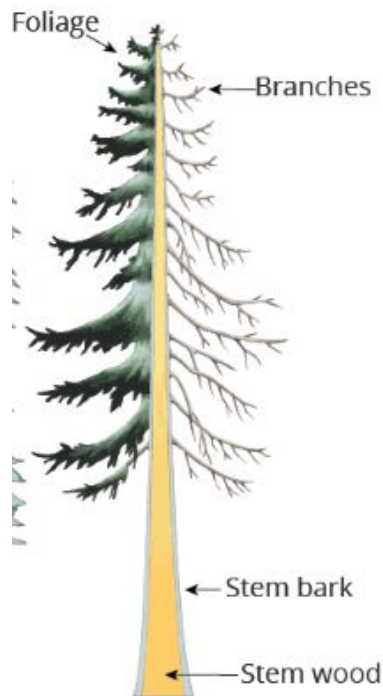
Some preliminary analysis indicates there are some biomass estimation differences between the CFS biomass models and the previous provincial biomass models (MOF). Generally, the total biomass estimates from CFS model are higher than those from the MOF model (??) at the forest region, district, Ecozone, BEC zone and leading species levels. The provincial overall difference is about 19.37%. Among the three forest ecoregions, the coast has a relatively smaller difference (13.15 %), but both the south and north forest regions have significant differences, 20.73% and 21.34%, respectively. The possible factors that caused the differences are due to different model structures, different data stratifications, assumptions, different scale and scope, different volume types, different utilization standards, different modelling approaches, etc. Please note, CFS is currently working to update the biomass equations and the biomass estimations here will be updated when the updated model parameters are finalized.

Figure 1. Components of tree biomass