UNIVERSITY OF ALBERTA

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LTS and crown width measurements

Phil Comeau <pcomeau@ualberta.ca> 31 August 2023 at 09:17
To: Stefan Schreiber <sschreib@ualberta.ca>
Cc: Robert Froese <refroese@ualberta.ca>, "Bokalo, Mike" <mbokalo@ualberta.ca>

Hi Stefan,

Crown radius has been measured since about 1998 in the WESBOGY LTS installations. This was before I was involved in the LTS. However, at about that time measuring crown width or radius became common. I suspect that this addition may have coincided with the addition of crown radius/width measurements to Alberta's protocol for PSP measurements.

Crown radius is measured to the north (CRN) and west (CRW).

Why measure crown radius? -
1) Crown radius/width and crown length are both useful as surrogates for leaf area - when working with small conifers - and can be useful in explaining variation in growth. However, diameter is often a better covariate.
2) Data on crown width could be used in estimating/calculating crown cover.

Issues with measuring crown width
1) takes time
2) unless it is done carefully, and crown perimeters are determined using a clinometer or moosehorn or some other instrument - they are likely to be highly inaccurate (i.e. just looking up and visually estimating crown boundaries is very inaccurate).

In addition, taking only two crown radius measurements, rather than four, gives an incomplete measurement of the extent of a trees crown.

While crown width was significant as a predictor of branch diameter (see Comeau 2021), DBH was a better predictor.

While crown radius data can be analyzed , results are generally consistent with DBH trends.

So, if it is important to reduce measurement costs, then dropping crown radius measurements seems like a good idea to me.

I think that it would, however, be useful to continue measuring Height to Live Crown. HTLC provides useful information on live crown ratio and crown lift. It does not take long to measure this when you are already measuring tree height. However, it is important that the measurement crew follows the protocol: "The base of the live crown is the lowest point on the bole with a relatively complete whorl of live branches. This should identify where the crown breaks up and excludes isolated lower live branches." Note that it is NOT the location of the lowest live branch. By "relatively complete whorl" - I take this to mean that there are branches located around more than half of the circumference of the tree.

But dropping HTLC, if it further saves on costs, would not be a big issue if that is desired. HTLC, crown radius and other specialized measurements could be collected for special projects that have strong reasons for collecting such data. One thought would be to measure HTLC on the four top height trees of each species that are measured in each plot.

I would be happy to discuss this further if you wish.

Phil
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The University of Alberta is located in ᐊᒥᐢᑲᐧᒌᐚᐢᑲᐦᐃᑲᐣ (Amiskwacîwâskahikan) on Treaty 6 lands, the ancestral lands of the Papaschase, and the homeland of the Métis peoples.

2 attachments

Comeau 2021.pdf
924K

Comeau 2021 Frontiers.pdf
4185K