Citation:

Abstract: We combined crossdating with permanent sample plot (PSP) data to assess the precision and accuracy of year-of-death (YOD) estimates obtained by crossdating white spruce and lodgepole pine snags and logs. Crossdating indicated trees died between 1833 and 2006. Comparison of crossdated YOD dates for pairs of samples (n = 121) showed that 90% of YOD estimates were within 10 years of each other. Of 100 trees that died after PSP establishment, 59 YOD dates were within the documented interval of death (IOD). Of the 41 inaccurate dates, 77% of YOD dates preceded the IOD midpoints and error increased with time since death. Regression models increased the accuracy of spruce YOD estimates for trees that had been dead >=17 years, but the corrections were modest (e.g. +5 at 50 years). For pine, the correction models increased accuracy regardless of time since death and corrections were greater than those for spruce (e.g. +4 and +11 at 5 and 50 years, respectively). Precision and accuracy errors resulted from many factors including loss of bark, wood decay, lack of ring formation prior to tree death, and human error. Our results reinforce the need for multiple lines of evidence when reconstructing tree deaths using tree rings. We urge others with access to PSP data to assess the quality of crossdated YOD estimates. Ideally, PSP re-measurements intervals would be short and consistent, facilitating comparisons through time and among genera and locations.

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