

Interactive comment on “Eliminating the “divergence problem” at Alaska’s northern treeline” by M. Wilmking and J. Singh

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The Wilmking and Singh paper provides an important view of variable recent growth trends for white spruce (*Picea glauca*) trees growing along the northern latitudinal tree-line of Alaska. Such sites would be expected to be primarily limited by temperature prior to the recent pronounced overall warming of the late 20th century over much of the globe. This is thus a very valid region for this type of analysis, although the instrumental data is admittedly limited at such northern treeline locations, as it is at many locations from which climatic reconstructions are needed. The analysis of apparent recent divergence of tree growth and temperature trends in some, but not all, of the trees at these sites (i.e. the negative and positive responders) is a worthwhile contribution to the current debate on this topic, making the point that the degree to which divergence

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appears to be present is variable within site, depending upon microsite and other factors (note also that there are many sites without apparent evidence for divergence; Wilson et al. 2007, JGR-Atmospheres). A related, important implication of this study for the generation of dendroclimatic reconstructions is that the screening and removal of certain samples, that for whatever reason do not contribute to the climatic signal of interest, is something that has been long advocated by some in the dendrochronological community (e.g. recently by Esper et al. 2003, Tree-Ring Research ;"this does not mean that one could not improve a chronology by reducing the number of series used if the purpose of removing samples is to enhance a desired signal. The ability to pick and choose which samples to use is an advantage unique to dendroclimatology"). The Wilmking and Singh paper applies this philosophy in a novel way to the divergence problem. While the cause (s) of divergence are still being investigated, it seems likely that temperature-induced drought stress is a factor at many sites. Some cases could, however, arise as artifacts of the standardization process (T. Melvin, Ph.D. thesis), although our recent studies at northern treeline (D'Arrigo et al. unpublished) indicate divergence on interannual time scales even when the trends of both instrumental temperature and proxy data are removed.

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