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Biogeosciences Discussions

Interactive comment on "A meta-analysis on the impacts of partial cutting on forest structure and carbon storage" *by* D. Zhou et al.

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This is a valuable and clearly written analysis of the effects of thinning on forest biomass (DBH, basal area), growth, and carbon storage (aboveground, understory, forest floor, mineral soil) across a wide range of forests. Thinning effects are logically separated into thinning intensity and time since thinning. Findings of the analysis should be useful in addressing a range of ecological and management questions. Table and figures are logically developed and clearly depict results of the analysis.

More objective language concerning the effects of thinning is needed. Reduced aboveground biomass or basal area can be positive or negative, depending on the particular system and values being considered. Thinning can provide significant ecological benefits related to forest health, biodiversity, and susceptibility to wildfire, for example.

These benefits should be part of the discussion in the paper. Terms such as “adverse impacts” (p. 5, line 19) and “significant negative influences” (p. 14, line 12), should be avoided.

Implications of the results for forest carbon storage should also be more objectively described. A true analysis of the carbon impacts of thinning would include the carbon implication for the biomass removed, which can continue to store carbon or be used as an energy source. An unthinned forest may also be more susceptible to wildfire, which can dramatically reduce carbon storage.

Specific comments follow:

Abstract: Note the timeframe of the analysis in describing the results.

Page 5, line 9: Describe how data from different soil depths are treated. If data from 0-5 cm, 0-10 cm, or 0-20 cm is available from a study, can those data be used and, if so, how so for the 0-15 cm depth defined in the analysis?

5, 26: Briefly described “unweighted.”

10, 17: “trees”

Section 4.2: Here and elsewhere, as appropriate, acknowledge that that thinning effects carbon balance in ways other than on site storage (e.g., products and energy).

12, 17: It’s not clear how reduced autotrophic respiration might increase forest floor carbon.

13, 7: “Sustainable” should mean more than the amount of forest biomass in most cases. The baseline assumption appears to be that more forest biomass is always better, regardless of implications for forest health and other values.

Interactive comment on Biogeosciences Discuss., 10, 787, 2013.