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Interactive comment on "Quantifying legacies of clearcut on carbon fluxes and biomass carbon stock in northern temperate forests" *by* W. Wang et al.

W. Wang et al.

weifeng.wang@mcgill.ca

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We have addressed Reviewer 2's comments point by point:

1. Although the authors have done a good job in data collecting, study design, modelling, data analyses and writing, I still have some major concerns about the MS in your discussion section. The one thing is that authors did not compare their results comprehensively with other studies all over the world. E.g. the trajectory analyses of other disturbances such as fire, etc. And other case studies for rainforests or boreal forests.

Author response: We agree that it is valuable to discuss the carbon trajectories for

other forest types. In fact, we have compared our results with other forest types such as boreal forests (e.g., jack pine and black spruce), temperate forests (e.g., Douglas-fir forests in British Columbia, slash pine forests in Florida, white pine forests in Ontario) in the discussion (section 4.1), although we excluded a couple of chronosequence studies that comprise only two age groups.

It is also interesting to discuss the effects of fire on successional trajectories, although our study focuses on harvesting. For example, the simulated LAI change with age is similar with previous fire chronosequence study (Goulden et al., 2011). We have discussed several case studies for fire disturbances in the revision (Section 4.1).

Goulden, M.L. et al., 2011. Patterns of NPP, GPP, respiration, and NEP during boreal forest succession. Glob. Change Biol., 17(2): 855-871

2. Moreover, for a MS to be submitted to a Special Issue "Impacts of extreme climate events and disturbances on carbon dynamics", maybe authors should be focused more on extreme ones not only regularly anthropogenic disturbances(such as clearing, etc.), they should discuss about extreme climate or other events' effect on carbon dynamics and their trajectory. You should add more references about extreme disturbance to make your MS fallen well in the scope of this special issue.

Author response: We have communicated with the guest editors of this special issue regarding the scope of the special issue. "Extreme climate events and disturbances" actually refers to "extreme climate events" and "disturbances", which means that this issue is interested in disturbances in general as well as extreme climate events. We have also briefly discussed the importance of extreme climate events to make the manuscript at the end of the Discussion section (Section 4.3).

3. You should reorganize your objectives to be constant with your results and discussion. One is to evaluate PnET-CN's performance for temperate forests and the other is to study the trajectory variation of carbon dynamics after clearing and their density.

Author response: We first tested the model against field measurements along the chronosequence sites (section 3.1 and 4.3), analyzed the simulated and the hypothesized carbon trajectories (section 3.2 and 4.1), and compared the difference of successional trajectories in carbon fluxes and stocks between two forest types associated with harvest intensity (section 3.2, 3.3 and 4.2). We will emphasize the three objectives in the revision.

4. I suggested that you added a subsection to compare your results with different disturbances as well as with different forest types.

Author response: We have compared our results with different disturbances as well as with different forest types. Please see our response to your comment 1.

Interactive comment on Biogeosciences Discuss., 11, 8789, 2014.