

Interactive  
Comment

***Interactive comment on “Ignoring detailed fast-changing dynamics of land use overestimates regional terrestrial carbon sequestration” by S. Zhao et al.***

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Good suggestion. In fact, selective cutting was considered in our model simulations. Unadventurously, we forget to describe this in the paper. In the revision, we added a paragraph in the method section. In addition, we added a few sentences in the discussion on the impacts of selective cutting.

In the method section, we added:

The land cover change maps did not include selective harvesting activities. Similar to our previous studies (e.g., Liu et al., 2004a), we derived the probability and intensity of selective cutting from FIA databases, and then used to stochastically schedule selec-

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tive harvesting events that were not reflected in the land cover maps. It was assumed in the model that a minimum age of 20 years was required for scheduling a harvesting event in a forest.

In discussion, we added:

Timber harvesting is a dominant disturbance in the region. Our model simulated timber removal agreed well with regional estimate derived from forest inventory (Liu et al., 2004a). Selective cutting is an important forest management practice in the region, and had a significant impact on carbon sequestration. Most of the forests were aggrading young forests in the region and should be carbon sinks. However, we can see carbon sources even in the middle part of the study areas (Fig. 4) where mapped disturbances were very minimal (Fig. 3). This was a result of selective cutting activities that were added on top of the land cover maps according to forest inventory data. The carbon sources caused by selective cutting were irrelevant to the time scales because a selective cutting event can be happen in any forest older than 20 years in the model. The combination of time-scale independent selective cuttings with uneven distribution of clear-cuttings in the region made selective cutting an important factor in shaping the geographic distribution of carbon sequestration and the differences between time scales. Apparently, there is an urgent need for mapping selective cutting activities using remote sensing techniques to improve the quantification of changes in carbon stocks and fluxes at various scales.

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