

Interactive  
Comment

***Interactive comment on* “Changes in carbon  
fluxes and pools induced by cropland expansion  
in South and Southeast Asia in the 20th century”  
by B. Tao et al.**

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This paper addressed a long studied but still very interesting scientific question on effects of land use/cover change on carbon fluxes and pools by using an integrated ecosystem model. Since 1950s South and Southeast Asia have experienced dramatic land use/cover change, where the most significant land conversions include the expansion of croplands by replacing secondary forests. Modeling impacts of land use change on carbon fluxes and dynamics is critical to understanding the associated processes and environmental consequences. I partly agree with some concerns raised by the above referees that only addressing land conversion impact is not innovative. If the

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authors could include land management effects (e.g., nitrogen fertilization mentioned in the text) into the revised version, it would be a good addition to existing literatures in terms of land use impacts analysis. Actually, integrating land use/cover change into process-based modeling is a promising future direction. Process-based analysis of interaction between ecosystem functioning and structure and land use/cover change is much more important than just giving a number of carbon release from land use. In my opinion, this paper was generally well written and the authors' findings are interesting and meaningful to the carbon research community. However, before taking further actions there are some important issues that should be addressed. Some specific comments:

1. As raised by the above 3 reviewers, more detailed information is needed about some data sources in Section 2.3. The authors used averaged climate data to drive model to an equilibrium state, but didn't state the climate data sources. As a spin-up scheme can significantly influence the simulated results, how was it used in this study?
2. The "Method" section mentioned that an agricultural module was specifically developed to simulate impacts of agricultural activities (such as seeding, planting, irrigation, fertilization, tillage, genetic improvement and harvest) and environmental factors on carbon, water and nitrogen cycles in agricultural ecosystems. Were those agricultural activities considered in the simulation in this study?
3. How was MODIS 1 km classification product integrated into the DLEM? What re-sampling methods were used? And
4. Authors should provide more details about the phenology scheme for crops used in the DLEM.

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Interactive comment on Biogeosciences Discuss., 8, 11979, 2011.

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