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Biogeosciences Discussions

Interactive comment on "An assessment of the carbon balance of arctic tundra: comparisons among observations, process models, and atmospheric inversions" *by* A. D. McGuire et al.

Anonymous Referee #1

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General comments:

The manuscript "An assessment of the carbon balance of arctic tundra: . . ." by McGuire et al. is a well written and organized summary of what is known about the regional scale CO2 exchanges between arctic terrestrial ecosystems and the atmosphere. Information from 3 classes of sources – field observations, atmospheric inversion studies, and biogeochemical model simulations – that are used to obtain a history of CO2 exchanges from 1990 to 2010. Since observational constraints for this region are scarce, the independent approaches do not present uniform results. The authors do a very nice job of summarizing this uncertainty, qualifying the conclusions appropriately, and

making reasonable suggestions for further work that would aid in resolving difficulties that contribute to the large ranges of uncertainty.

Specific comments:

p. 15, l. 19. Provide a brief explanation on why the uncertainty increases in recent time. I would expect the reverse.

p. 23, l. 6-7. This statement seems to contradict an earlier statement about the CRU data on p. 22, l. 13.

p. 24, l. 19. Which response are you referring to here? 60% increase, 10-20%increase?

Technical corrections:

p. 8, On line 3 it appears that TCF results are from 2000-2006 but on line 5 2000-2009. Which is correct?

p. 13, l. 17. I presume that the "ecosystems are wintertime sources of CO2"

p. 14, l. 8. Change "the" to that"

p. 16, l. 14. "null balance" seems redundant to me. Why not just "balanced"?

P 25, l. 4. Change "response" to "uptake".

Interactive comment on Biogeosciences Discuss., 9, 4543, 2012.