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## ***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**

Received and published: 23 May 2012

#### 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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

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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 CO<sub>2</sub>”

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”.

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

**BGD**

9, C1409–C1410, 2012

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