Biogeosciences Discuss., 9, C693–C698, 2012
www.biogeosciences-discuss.net/9/C693/2012/


**Biogeosciences Discussions**

# *Interactive comment on* "Environmental factors regulating winter CO<sub>2</sub> flux in snow-covered boreal forest soil, interior Alaska" *by* Y. Kim and Y. Kodama

**Y. Kim**

kimyw@iarc.uaf.edu

Received and published: 17 April 2012

We appreciate Referee #1's invaluable suggestion regarding the estimation of winter CO2 in the snow-covered high-latitude boreal forest soil of interior Alaska. We have presented our findings on the effect of wind pumping when estimating CO2 flux in boreal black spruce forest soil during the seasonally snow-covered period of 2006/7, when the snow depth was at one of its lowest accumulations of the last 80 years. The snow characteristics at our location were much more different than in subalpine and temperate regions (characteristics such as changes in wind speed, accumulative snow depth, soil temperature, soil moisture, and so on).



Here, the yellow highlighting indicates questions from Referee #1; however, highlighting in the manuscript denotes portions corrected and/or changed, based on the underlined responses here and as pointed out by Referee #1.

We have not added Figures S1-S4 in the manuscript without the approval of the Referee #1.

âĂČ

I attached two supplements that one is 'Response on R1' and the other is 'Response on R1 in ext. Would you please see the supplementary files?

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/9/C693/2012/bgd-9-C693-2012-supplement.zip

---

Interactive comment on Biogeosciences Discuss., 9, 1129, 2012.

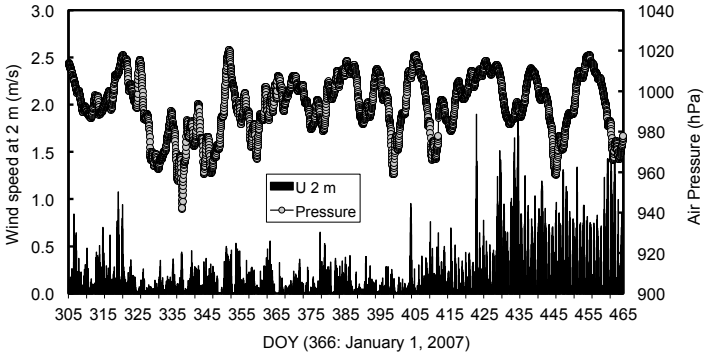


Figure S1. Temporal variations of wind speed at 2 m and air pressure measured by the eddy covariance tower in black spruce forest of interior Alaska during the winter period of 2006-2007.

**Fig. 1.** Temporal variations of wind speed at 2 m and air pressure measured by the eddy covariance tower in black spruce forest of interior Alaska during the winter period of 2006-2007.



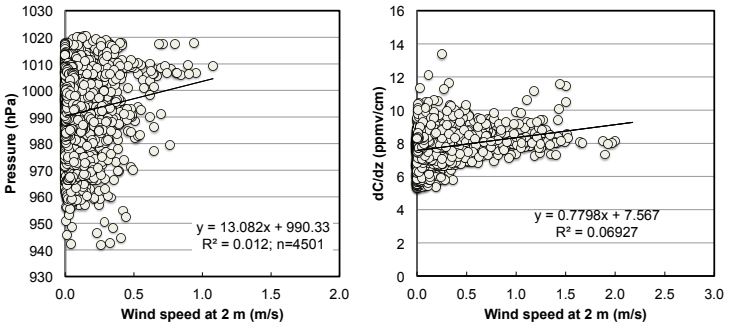


Figure S2. Relationships between a) air pressure and wind speed at 2m, and b) concentration gradients and wind speed.

**Fig. 2.** Relationships between a) air pressure and wind speed at 2m, and b) concentration gradients and wind speed.

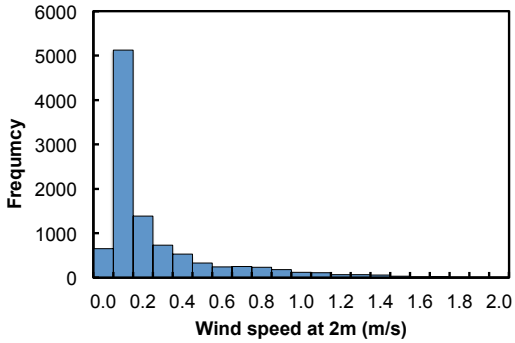


Figure S3. Frequency of wind speed at 2m (m/s) during the winter period of 2006/7.

**Fig. 3.** Frequency of wind speed at 2m (m/s) during the winter period of 2006/7.



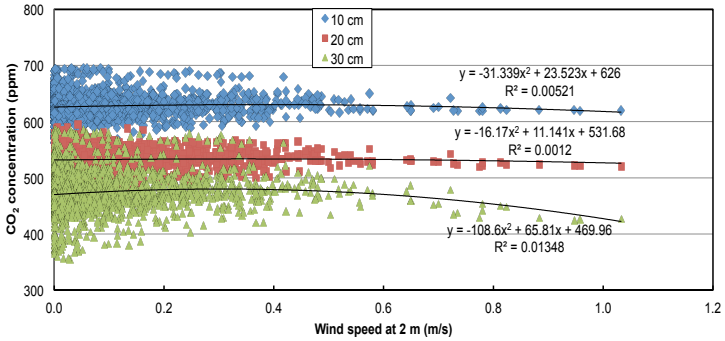


Figure S4. Relationship between $CO_2$ concentration measured at each height in the snowpack and wind speed 2m during the whole winter of 2006/7 with 2nd ploynomial fit equation ($y = cx^2 + bx + a$) as shown by Seok et al. (2009).

**Fig. 4.** Relationship between CO2 concentration measured at each height in the snowpack and wind speed 2m during the whole winter of 2006/7 with 2nd ploynomial fit equation (y = cx2 + bx + a) as shown by Seok