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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Annual variation of methane emissions from forested bogs in West Siberia (2005–2009): a case of high CH_4 and precipitation rate in the summer of 2007" *by* M. Sasakawa et al.

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Comment: Page 27760, Abstract, line 12. What is CASA? Explanation is given further in the text, i.e. in section 2.2, but need to be here as well.

Reply: We have modified the explanation in the abstract as follows; "Estimated seasonal CH4 fluxes based on the ratio of ΔCH4/ΔCO2 and a 3-hourly CO2 flux calculated from a Carnegie–Ames–Stanford Approach (CASA) ecosystem model for the 2005–2009 period exhibited a seasonal variation with a maximum in July at both sites."

Comment: Conclusions summarize and largely repeat what is already written in the preceding sections, only the last sentence formulate a message following this study.

Reply: We have eliminated the repeat part and modified the conclusions as follows; "Methane flux from the forested bog regions around KRS and DEM in West Siberia from 2005 to 2009 showed a maximum in July. Although anomalously high flux was observed in June and July 2007 and August 2009 at KRS, only a small variation in the flux at DEM was observed. These results indicate that the variation in CH4 flux from Siberian wetlands is not uniform in space and time even in times when an increase in CH4 concentration is globally observed. Using VISIT, an ecosystem model in which the dimension of the flooded area is assumed to expand proportionally with the cumulative anomaly in monthly precipitation rate, we confirmed that the anomalously high CH4 flux in the summer of 2007 around KRS resulted from high precipitation rate. Integrated CH4 emissions in a high (low) response case from the forested bogs around KRS (approx. 7.8×104 km2) resulted in 0.54 (0.39), 0.31 (0.34), 0.94 (0.48), 0.44 (0.36), and 0.41 (0.39) Tg CH4 yr-1 for years 2005 to 2009, respectively. Although the emission in 2007 is 2∼3 times greater than those in other years, the anomalous CH4 emission from the targeted area around KRS by itself does not explain all the recently observed variability in the global CH4 concentration growth. No anomalous CH4 emission was observed in 2008 from the forested bog regions. However, West Siberian wetlands would likely play a significant role in influencing global atmospheric CH4 variation since the area of the Siberian wetlands is approximately 17 times that of the targeted area around KRS which is about 1.32×106 km2 (Sohngen et al., 2005)."

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 27759, 2010.