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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Magnitude and seasonality of wetland methane emissions from the Hudson Bay Lowlands (Canada)" *by* C. A. Pickett-Heaps et al.

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General

This is an important contribution and should be published.

The paper quantifies the methane output of a major northern wetland, and addresses the vexed question of the timing of emissions – whether they are dominantly in the warmest time of year, and the relative roles of the shoulder seasons.

Hitherto, estimates of methane emissions from this wetland have been surprisingly low: this work suggests the emissions from the Hudson Bay lowlands are actually signifi-

cantly larger, which is better in accord with wider Arctic studies and global models.

Specific

Page 22421 lower. Justify the comment that fire plumes are a minor source of methane: some isotopic evidence suggests that there is a significant input of 13C heavy methane reaching Europe from Canada.

Page 22423 any model that suggests emissions in early April must have problems! – the ground and the water are frozen. In my experience in muskeg further west, emission bursts from stored methane in ponds under melting ice cover occur in May.

Page 22424 Note that local surface temperatures can be significantly different from meteorological temperatures. Peat hummocks can create and sustain marked micro-climates (nano-climates?) that are much warmer than the surrounding air. This stabilization of temperature of methanogenesis, decoupling from ambient air temperature, could in part account for the discrepancies between model and observations in Fig 4, where the blue line is much steadier than the jagged double-peak red lines.

Summary

A good paper – should be published with minor revision.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 22415, 2010.