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Large methyl halide emissions from south Texas salt marshes
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General comments:

This paper describes results of intermittent in-situ measurements of methyl chloride (CH_3Cl) and methyl bromide (CH_3Br) fluxes from salt marshes in Texas. Measurements were made via static enclosure of areas including salt-marsh vegetation and areas bare of vegetation with collection of head-space gas samples and subsequent laboratory analyses for the methyl halides by GC-MS. Five sets of field measurements were made during the period April 2006 to November 2009.

The methyl bromide and methyl chloride gases have large emissions from natural sources, making them important carriers of halogen into the troposphere and the stratosphere. Terrestrial source magnitudes are still subject to considerable uncertainty. Previous work on terrestrial fluxes indicates that there is considerable spatial and temporal heterogeneity in methyl halide fluxes, not only between different types of ecosystems, but also between the same type of ecosystem but at different global locations. This group has a good publication record of careful field measurements of emissions (and uptake) of these two gases in various ecosystems, and further measurements to help narrow uncertainties on sources of these gases are welcome.

The principal finding from the work reported here is the very high CH_3Cl and CH_3Br fluxes measured from the halophytic plant Batis maritima – orders of magnitude greater than from saltmarsh sites at higher latitudes containing other vascular plants. These findings of large fluxes from lower latitude (subtropical) salt marshes are consistent with higher fluxes reported many years ago from salt marshes in southern California, and, as the authors note here, support the evidence base for large differences in methyl halide emissions between low and high latitude salt marshes that must be taken into account when estimating salt marsh contributions to global emissions of these two gases.

A potential weakness of the work is the fairly small number of field visits and individual flux measurements and the sporadic nature of the visits to field sites over a period of several years. Also, given the relevance of these data to the methyl halide budget ‘story’ (which has been ongoing for many years), I wonder why these data have not been prepared for publication earlier? – the last set of field measurements were undertaken over 4.5 years ago. Overall, however, I believe there are sufficient novel data for warrant publication. The paper is concisely written and the tables and figures of results nicely presented. Conclusions are substantiated by the data, and the wider implications are appropriately set. The scope and international interest of the work is appropriate for publication in Biogeosciences.

Specific comments:

Section 3: It is stated that the temperature inside the enclosures were measured but results are discussed in terms of outside ambient temperature. Would it not be appropriate to examine relationships with the actual temperature experienced within the enclosure?

P9457, L17 and P9458, L16: In the Discussion it is stated that molar ratio between CH_3Cl and CH_3Br emissions is ~15 on average, whilst in section 4.3 it is stated that the molar ratio is roughly 40 during the day and 20 at night. The statements in the two sections do not appear to be consistent with each other.

P9459, L10-13: Two sentences seem to repeat here. The end of the first sentence indicates that the CH_3Cl:CH_3Br molar flux ratio is lower at higher latitude salt marshes, and the next sentence says the same thing. Please reword appropriately.

Technical:

P9459, L12: The in-text citation here should read Blei et al. (2010b).

P9463, L13: The University of Texas MSI contribution number is missing.