**UPDATE 2 (Savanna update) Readme file.**

**February 2015**

The original Akagi et al 2011 paper had 14 Supplementary Tables in an Excel Workbook. This note details the second update to that workbook made in February 2015. The readme file for the first update made in May 2014 is appended below and this current, second update retains the changes made in the first update.

Update 2 consisted of replacing Supplementary Table 1 (Table “S1. Savanna” in the Excel file) with a new savanna Table S1 that includes Savanna fire EF from Table S3 of Stockwell et al., (2015). That paper was part of the FLAME-4 experiment also described in Stockwell et al., (2014).

We also renamed the tabs describing updates at the end of the supplemental tables:

“version 1” worksheet was renamed "changes during ACPD production"

“version 2 ” worksheet was renamed "changes during ACP production"

(those tabs would mostly be of interest to early adopters of early versions of tables)

“version 3” worksheet was renamed "Post Pub. Update 1 May 2014" and it documents adding new tables for temperate forest, extratropical forest, and chaparral

"Post Pub. Update 2 Feb 2015" worksheet was added (after Table S14) and it documents adding the new savanna fire table

Additional details

In this update, in addition to adding the "adjusted FLAME-4 lab EF data" from the Stockwell paper referenced above, we listed the species in order of increasing mass (similar to the May 2014 update); except for CO, CO2, and MCE. We also added more descriptive headers, reformatted the footnotes, etc. Currently, we show the exact mass of the dominant isotope. The user may find it useful to convert to exact mass based on natural abundance as found on NIST webbook, or round off to unit mass.

Before full mass-scan capabilities were implemented, the lab studies measured fewer species and we only used the lab data for species not measured in field. Now the lab-measured species are more extensive and we have discontinued the practice of omitting lab-measured EF when field-measured EF are available. The user can thus readily compare lab and field measured EF and/or ignore data as they chose. Rather than try to design a “one-size-fits-all” averaging scheme that is "perfectly consistent," we supply the data in a form easily manipulated by the user according to their application/preference.

Note that in Akagi et al 2011 we estimated the total NMOC for savanna fires as 24.7 g/kg by simply doubling the compounds that had been measured at that time. Now based on full mass scans a new total EFNMOC for savanna fires is 29.9 g/kg

FLAME-4 produced data for numerous fire types, but for many of the fire-types (e.g. peat, cooking, crop residue), there should be more new data from field campaigns available soon, so we will update those categories after the field campaign data is finalized. For data status meanwhile, it is possible to contact [bob.yokelson@umontana.edu](mailto:bob.yokelson@umontana.edu).

**References:**

Stockwell, C. E., Yokelson, R. J., Kreidenweis, S. M., Robinson, A. L., DeMott, P. J., Sullivan, R. C., Reardon, J., Ryan, K. C., Griffith, D. W. T., and Stevens, L.: Trace gas emissions from combustion of peat, crop residue, domestic biofuels, grasses, and other fuels: configuration and Fourier transform infrared (FTIR) component of the fourth Fire Lab at Missoula Experiment (FLAME-4), Atmos. Chem. Phys., 14, 9727-9754, doi:10.5194/acp-14-9727-2014, 2014.

Stockwell, C. E., Veres, P. R., Williams, J., and Yokelson, R. J.: Characterization of biomass burning emissions from cooking fires, peat, crop residue, and other fuels with high-resolution proton-transfer-reaction time-of-flight mass spectrometry, Atmos. Chem. Phys., 15, 845-865, doi:10.5194/acp-15-845-2015, 2015.

**UPDATE 1 (Temperate Forest and Chaparral update) Readme file**

(duplicate of original readme file)

May 06, 2014 Update Notes

The updates in “Supplementary Tables S1-S14 May 2014 Update.xlsx” include changes to Table S4 (temperate forest) and Table S6 (chaparral) to incorporate recent measurements published in Yokelson et al. (2013) and Akagi et al. (2013). All other tables in this spreadsheet are the same as the original version published in May of 2011 in Atmospheric Chemistry and Physics.

In Table S4, the various types of temperate forest fire emissions measurements are shown in separate columns. The best overall averaging scheme depends on the application and we have implemented a generic solution here. Emission factors (EF) for temperate wildfires are taken as a weighted average of pine-forest understory, organic soil, and coniferous canopy EF (for those species in which no temperate wildfire data was available).The final temperate forest EFs are calculated as the average of pine forest understory, temperate wildfire, and temperate debris EF. This average weights each fire type equally for applications where the fire sub-type is unknown. Updates for this fuel type can be expected after analysis of 2013 field campaigns is completed (SEAC4RS and BBOP).

For temperate forest and chaparral fuel types, final EFs shown in supplementary tables S4 and S6 supersede published EF from Tables 1 and 2 of the original Akagi et al. (2011) compilation published in May 2011 in Atmospheric Chemistry and Physics and also posted on the NCAR site.

Extratropical EFs published in the original published version of Table 1 have also been updated in a separate file. This is because extratropical EFs are computed as a weighted average of boreal and temperate forest emission factors. The new EFs are found in "Extratropical Update May 2014.xlsx".

Note that we have reorganized the compounds in order of increasing mass for all updated tables, which should make locating values for specific species easier. We hope to expand that organizational format to more fire-type categories when recently completed experiments probing these fire-types are published.

References:

Akagi, S. K., Yokelson, R. J., Burling, I. R., Meinardi, S., Simpson, I., Blake, D. R., McMeeking, G. R., Sullivan, A., Lee, T., Kreidenweis, S., Urbanski, S., Reardon, J., Griffith, D. W. T., Johnson, T. J., and Weise, D. R.: Measurements of reactive trace gases and variable O3 formation rates in some South Carolina biomass burning plumes, Atmos. Chem. Phys., 13, 1141-1165, doi:10.5194/acp-13-1141-2013, 2013.

Yokelson, R. J., Burling, I. R., Gilman, J. B., Warneke, C., Stockwell, C. E., de Gouw, J., Akagi, S. K., Urbanski, S. P., Veres, P., Roberts, J. M., Kuster, W. C., Reardon, J., Griffith, D. W. T., Johnson, T. J., Hosseini, S., Miller, J. W., Cocker, D. R., Jung, H., and Weise, D. R.: Coupling field and laboratory measurements to estimate the emission factors of identified and unidentified trace gases for prescribed fires, Atmos. Chem. Phys., 13, 89-116, doi:10.5194/acp-13-89-2013, 2013.