AGAGE and CSIRO Measurements of Recent Global Methane Growth

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Measurements by the Advanced Global Atmospheric Gases Experiment (AGAGE) and the Commonwealth Scientific and Industrial Research Organization (CSIRO) show renewed growth of atmospheric methane from early 2007 to present. This rise follows almost a decade of relatively stable global methane levels and has occurred at all monitoring locations almost simultaneously. A two-dimensional model of atmospheric chemistry and transport is used to optimally estimate the increase in emissions required to produce such a rise. If annually repeating hydroxyl radical concentrations are assumed, we find that emissions rose by similar levels in both hemispheres during 2007. The 2007 global emissions were found to be elevated by approximately 25Tg/yr compared to the 10-year average. Mean emissions during 2008 were estimated to be lower than in 2007, but still higher than the average (by approximately 15Tg/yr), with the Northern hemisphere accounting for most of the 2008 emissions anomaly.

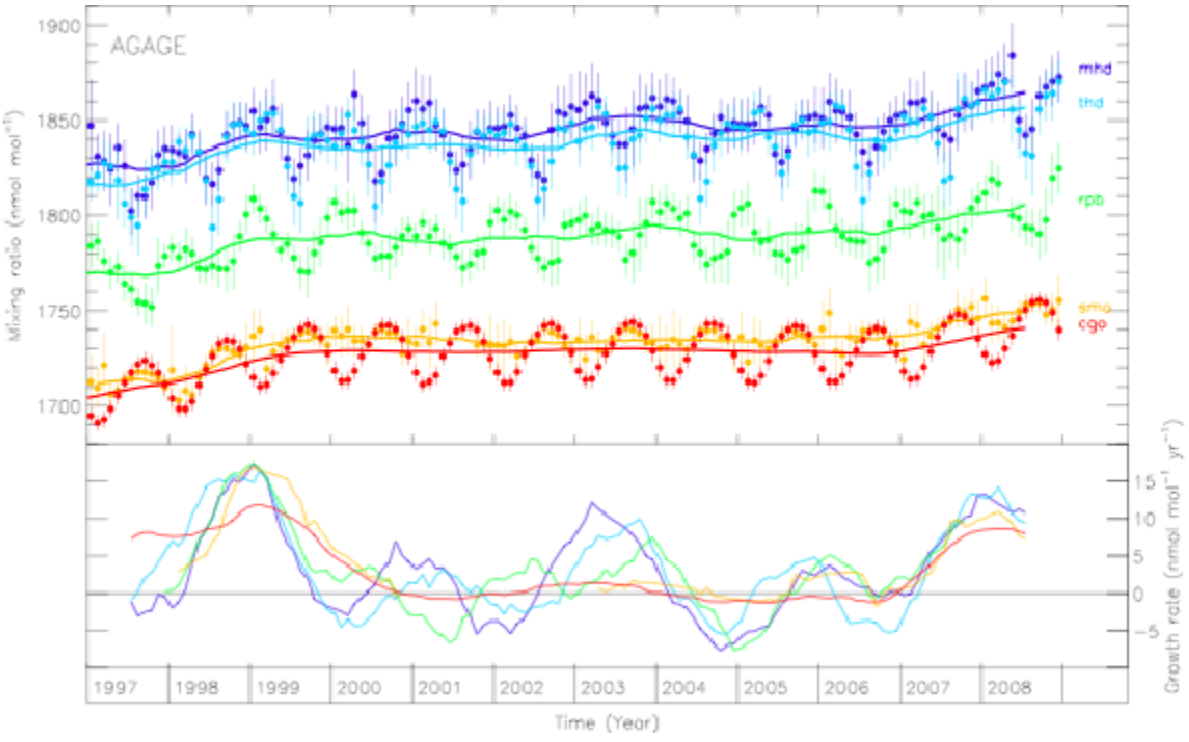

Figure 1. AGAGE monthly baseline methane mole fraction, January 1997 to December 2008 measured at Mace Head, Ireland (mhd), Trinidad Head, California (thd), Ragged Point, Barbados (rbp), Cape Matatula, American Samoa (smo) and Cape Grim, Tasmania (cgo). The thick line in the upper panel shows the annual running mean mole fraction. The lower panel shows the annual average growth rate at each site. Error bars and growth rate are calculated as in Rigby et al. (2008) Renewed Growth of Atmospheric Methane, Geophys. Res. Lett., 35, L22805.