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Further evaluation of wetland emission estimates from the JULES land surface model using SCIAMACHY and GOSAT atmospheric column methane measurements

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The atmospheric concentration of methane began rising again in 2007 after a period of near-zero growth [1,2], with the largest increases observed over polar northern latitudes and the Southern Hemisphere in 2007 and in the tropics since then. The observed inter-annual variability in atmospheric methane concentrations and the associated changes in growth rates have variously been attributed to changes in different methane sources and sinks [2,3].

Wetlands are generally accepted as being the largest, but least well quantified, single natural source of CH_4, with global emission estimates ranging from 142-284 Tg yr^{-1} [3]. The modelling of wetlands and their associated emissions of CH_4 has become the subject of much current interest [4].

We have previously used the HadGEM2 chemistry-climate model to evaluate the wetland emission estimates derived using the UK community land surface model (JULES, the Joint UK Land Earth Simulator) against atmospheric observations of methane, including SCIAMACHY total methane columns [5] up to 2007. We have undertaken a series of new HadGEM2 runs using new JULES emission estimates extended in time to the end of 2012, thereby allowing comparison with both SCIAMACHY and GOSAT atmospheric column methane measurements.

We will describe the results of these runs and the implications for methane wetland emissions.

References

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