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Supplement of

A new model of the global biogeochemical cycle of carbonyl sulfide – Part 2: Use of carbonyl sulfide to constrain gross primary productivity in current vegetation models

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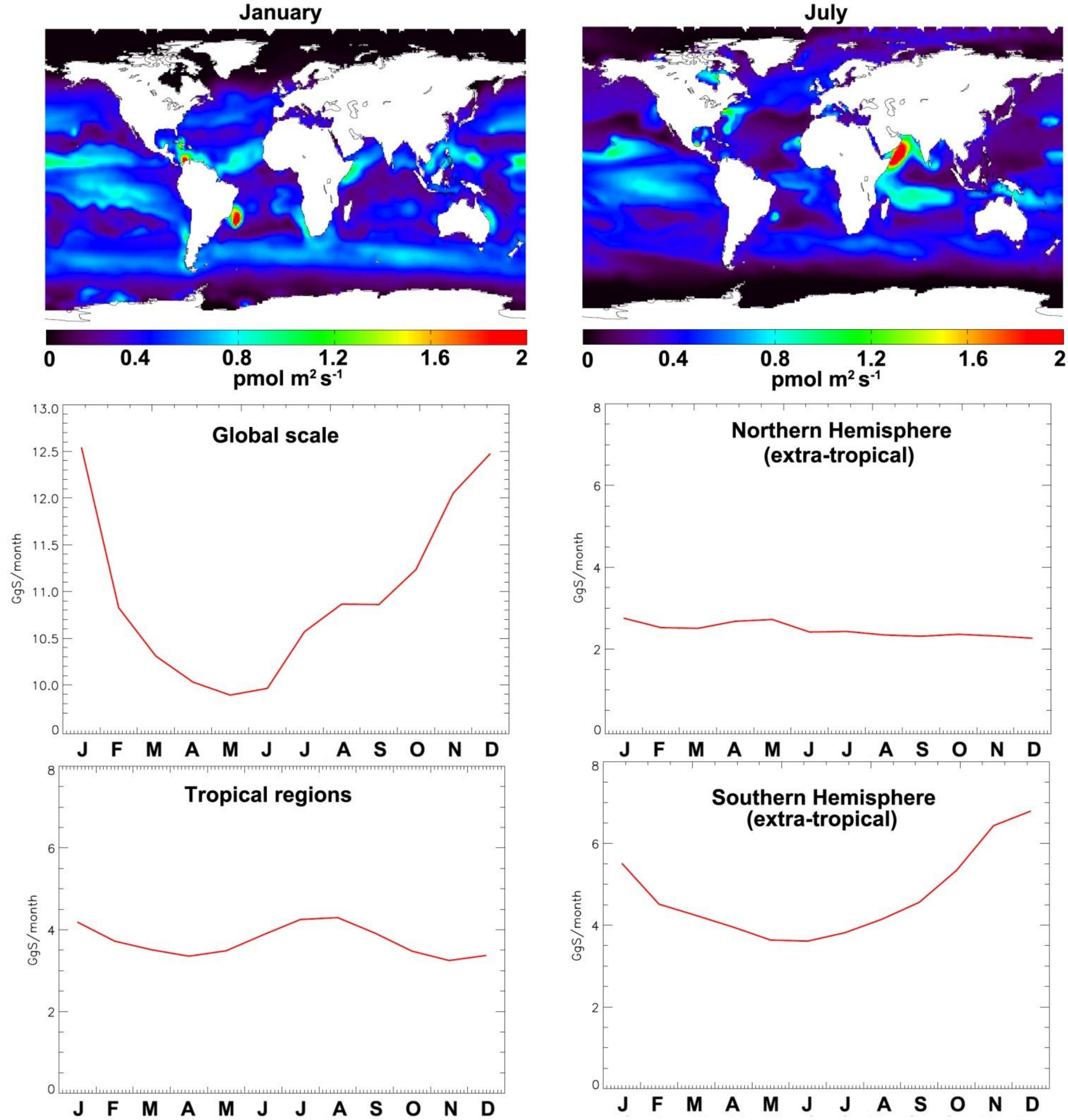

Figure A1: Upper row: annual mean indirect oceanic emissions of OCS from DMS (resulting from the oxidation of DMS in the atmosphere), for January (left column) and July (right column). Second and third rows: monthly means of oceanic indirect emissions of OCS from DMS provided by large latitudinal bands and at the global scale.

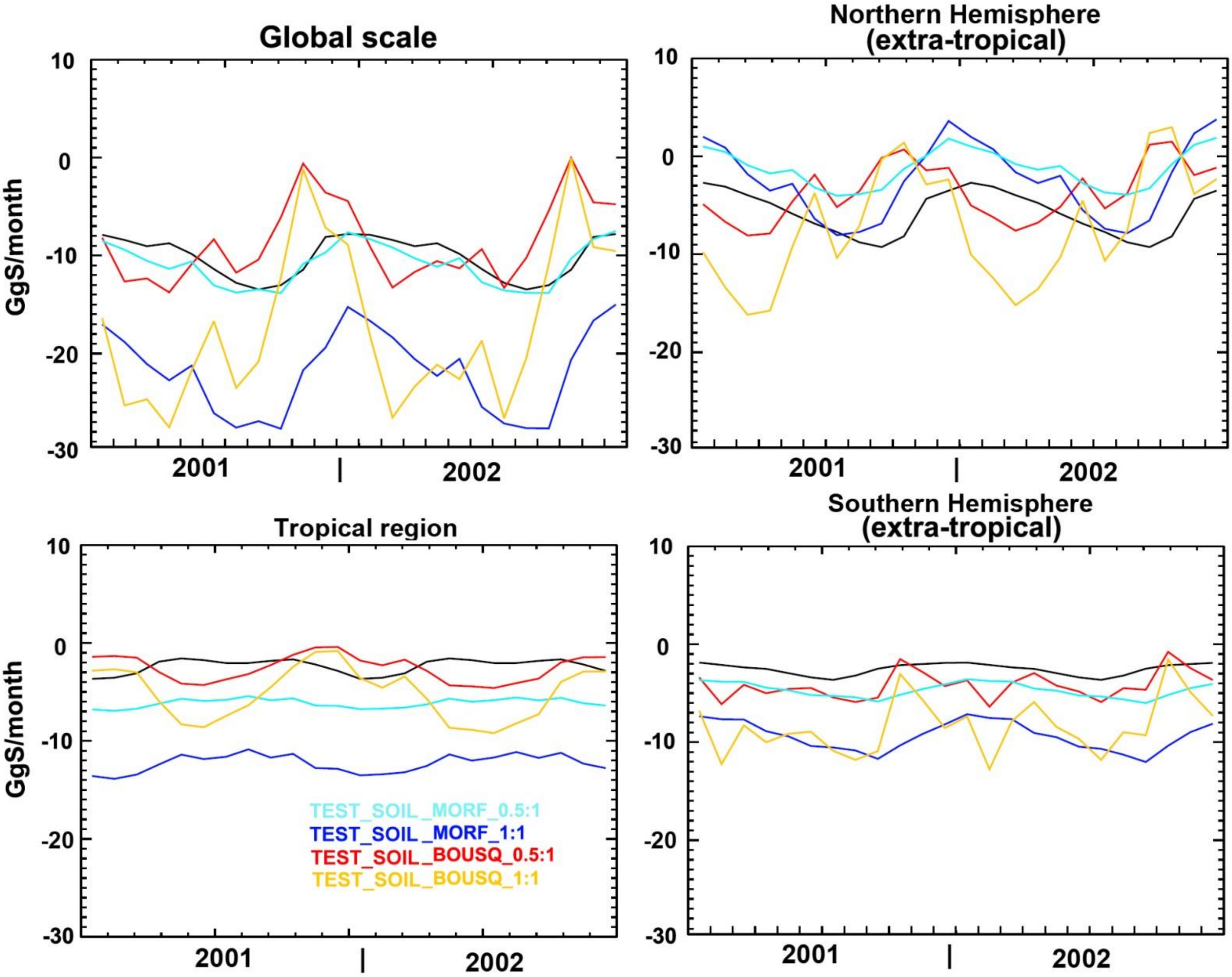

Figure A2: Sensitivity of monthly exchanges of OCS between the atmosphere and the soils (over the period 2001-2002) to the choice of (1) the deposition velocities of H_2 to soils (Morfopoulos et al., 2012 vs. Bousquet et al., 2011), and (2) the ratio between OCS and H_2 deposition velocities (0.5:1 (H. Chen pers. com.) vs. 1:1 (Belviso et al., 2013)). Results are provided for the global scale and by large latitudinal bands. Note that the OCS emissions by anoxic soils were kept unchanged between the simulations, following the mean flux values proposed by Whelan et al. (2013). The Kettle et al. (2002) soil fluxes are shown in black solid line.

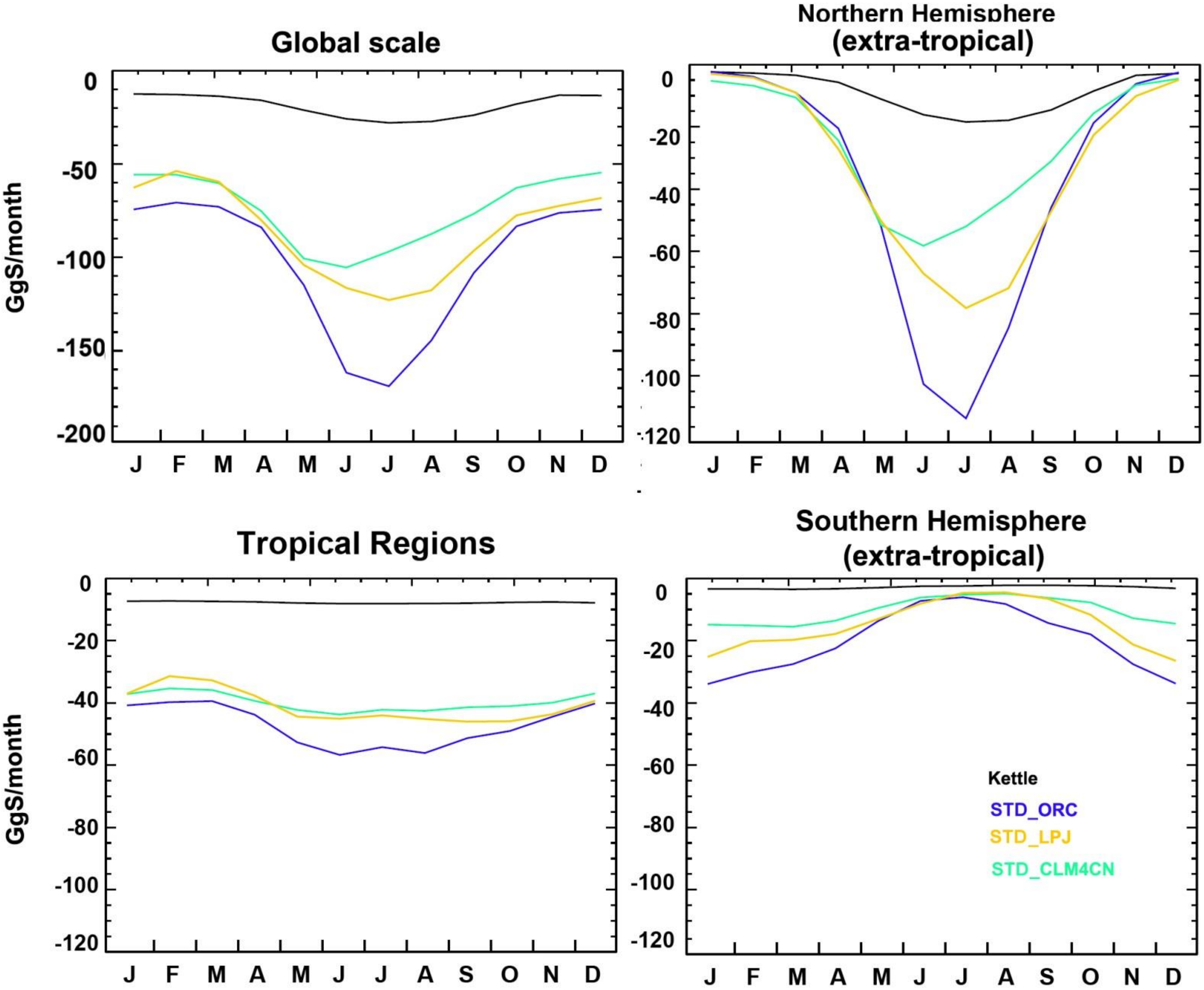

Figure A3: Monthly uptakes of OCS by vegetation (for 2001) deduced from CO_2 gross fluxes (GPP) calculated by three different vegetation models (ORC, LPJ and CLM4CN). Results are provided for the global scale and by large latitudinal bands. The Kettle et al. (2002) vegetation fluxes are shown in black solid line.

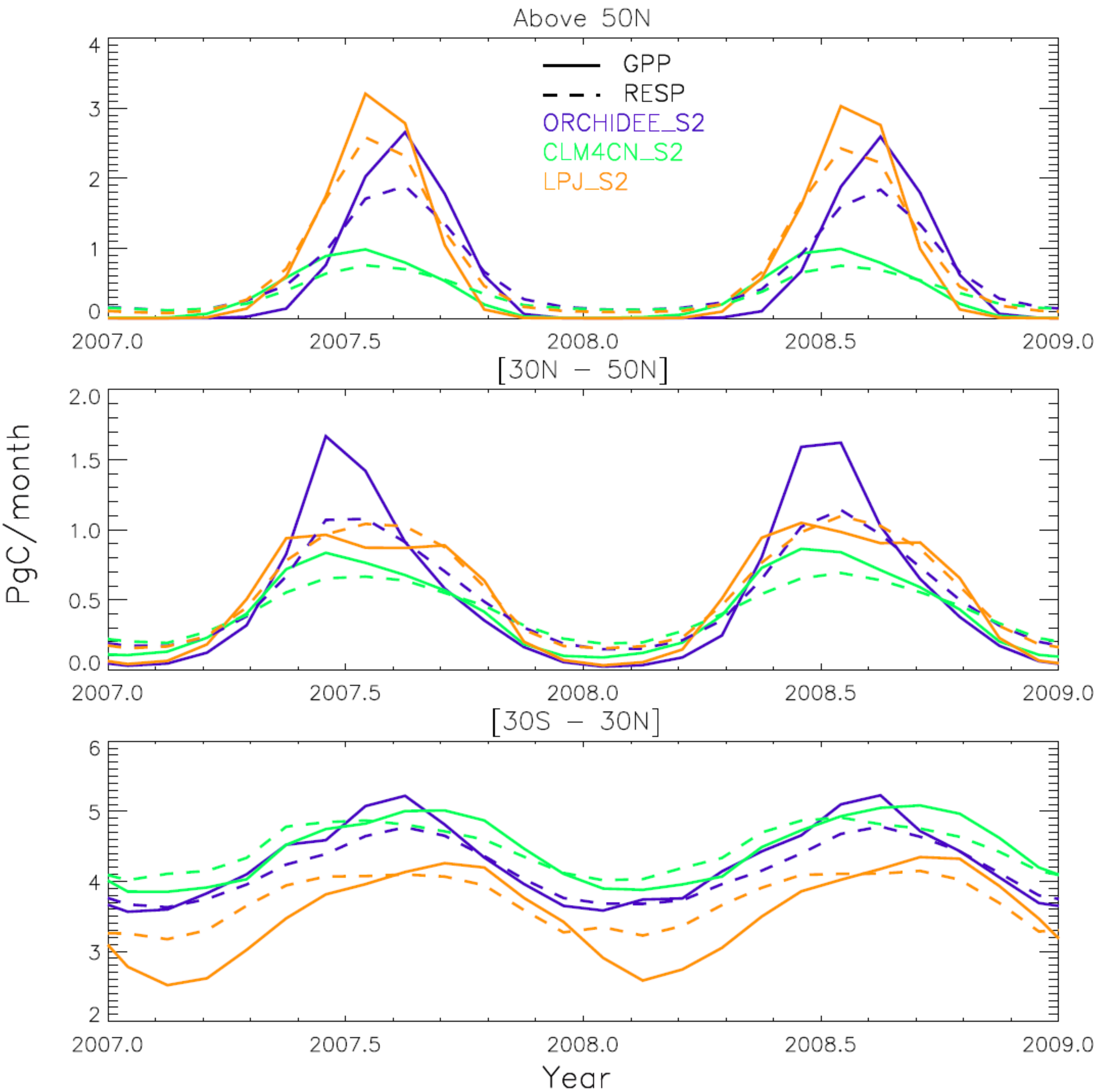

Figure A4: Annual variations of monthly mean GPPs (solid lines) and monthly mean respiration fluxes (dotted lines) simulated by the ORC, CLM4CN and LPJ vegetation models. Data are for the following three latitudinal bands: 50°N-90°N (boreal vegetation, upper panel), 30°N-50°N (vegetation of temperate regions of the northern hemisphere, central panel), and 30°S-30°N (tropical vegetation, lower panel).