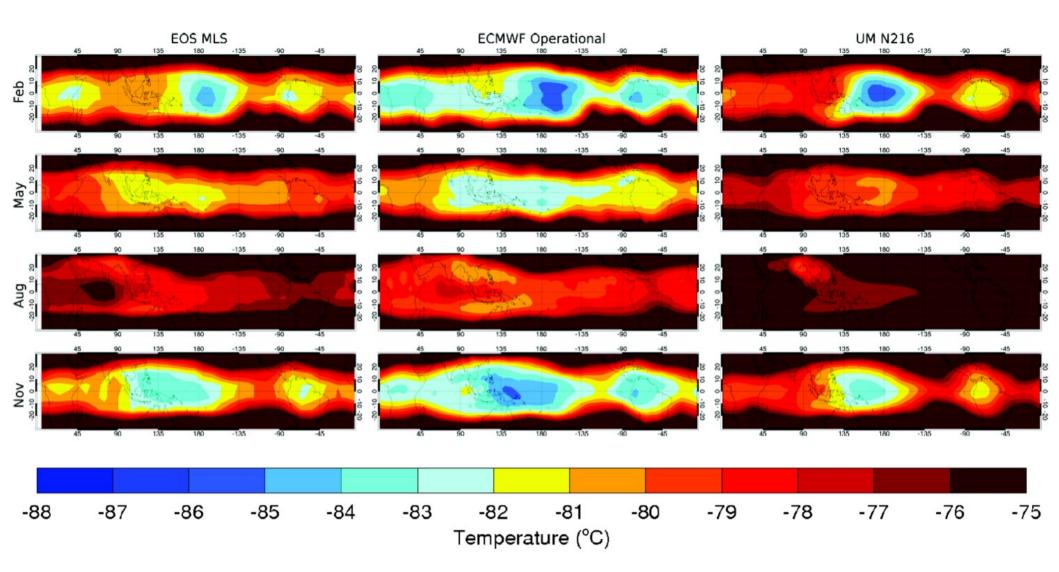


Supplementary Figure 1. Modelled 3-hourly timeseries of convective cloud top heights (black asterisks) and tropical tropopause layer (TTL) diagnostics at a highly convective grid-cell (Borneo) during February. The TTL levels shown are the cold point tropopause (CPT, blue line), the clear sky level of zero radiative heating (Q clear=0, red line) and the lapse rate minimum (LRM, green line). The Q clear=0 has a distinct diurnal cycle whereas the temporal variability of CPT and LRM is irregular. Convection often reaches above the LRM. Above Q clear=0 air will ascent by radiative heating. A stratospheric injection is shown on day 14, a rare instance where convection over-reaches the monthly mean (and the instantaneous) CPT level.



Supplementary Figure 2. Comparison of temperatures at 100 hPa (i.e., near the tropical cold point tropopause) between EOS MLS, ECMWF operational analyses and the UM derived monthly means for February, May, August and November 2005.