

Supplemental material

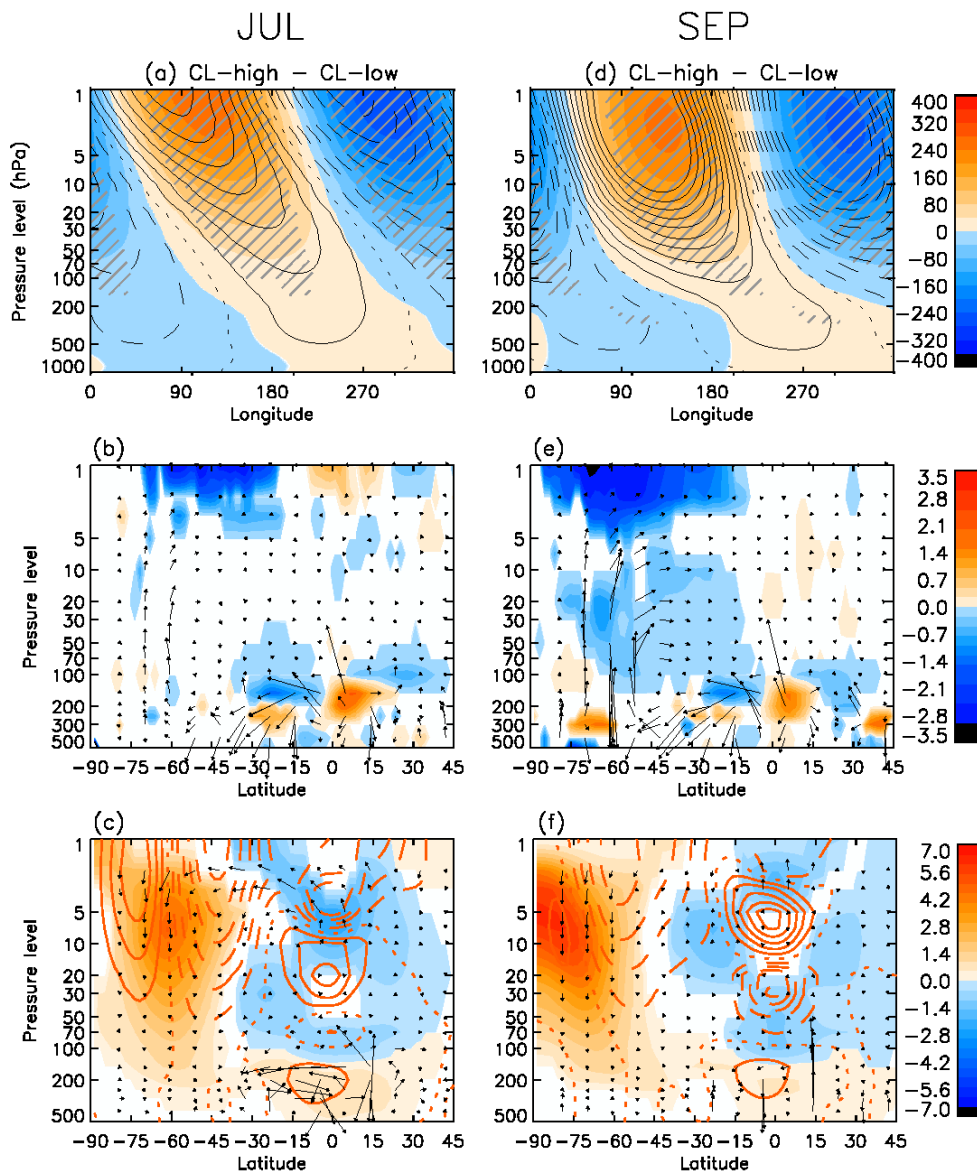


Figure S1: CL-high minus CL-low differences from the MPI-ESM-MR model of (a) the vertical cross section of the longitudinal distribution of wave1 eddy geopotential height anomalies averaged over 50-75N, superimposed on the mean climatology (contour interval is 50m) for July, (b) EP flux vectors (arrows) and EP flux divergence in m/s/d (color shades) and (c) residual circulation (arrows), temperature in K (color shades) and zonal wind (red contours) for July (contour interval is 2.5 m/s). Only significant regions at 95% are shaded. (d), (e) and (f) are equivalent to (a), (b) and (c) but for September.

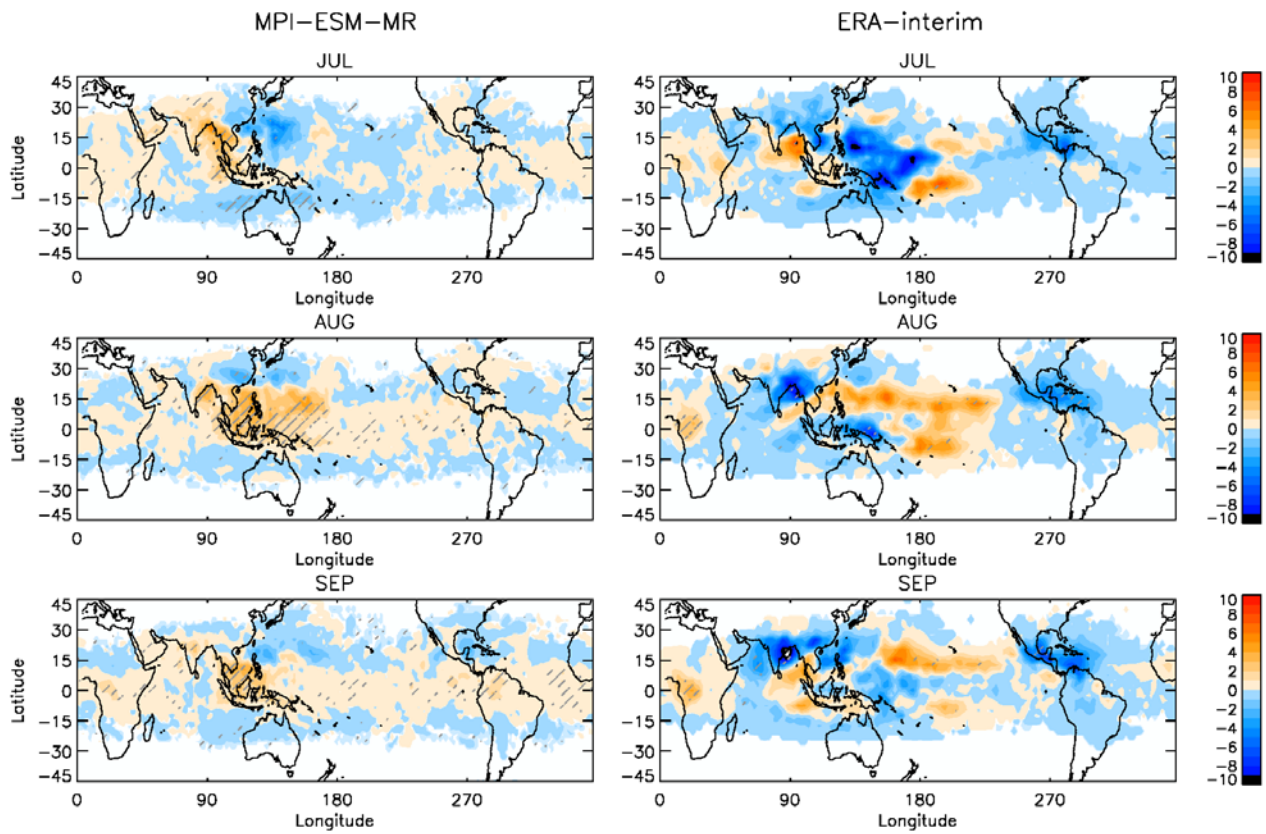


Figure S2: E-QBO minus W-QBO differences for July, August and September cloud area fraction (%) at 100hPa in MPI-EMS-MR (left panel) and in ERA-Interim (Right panel).

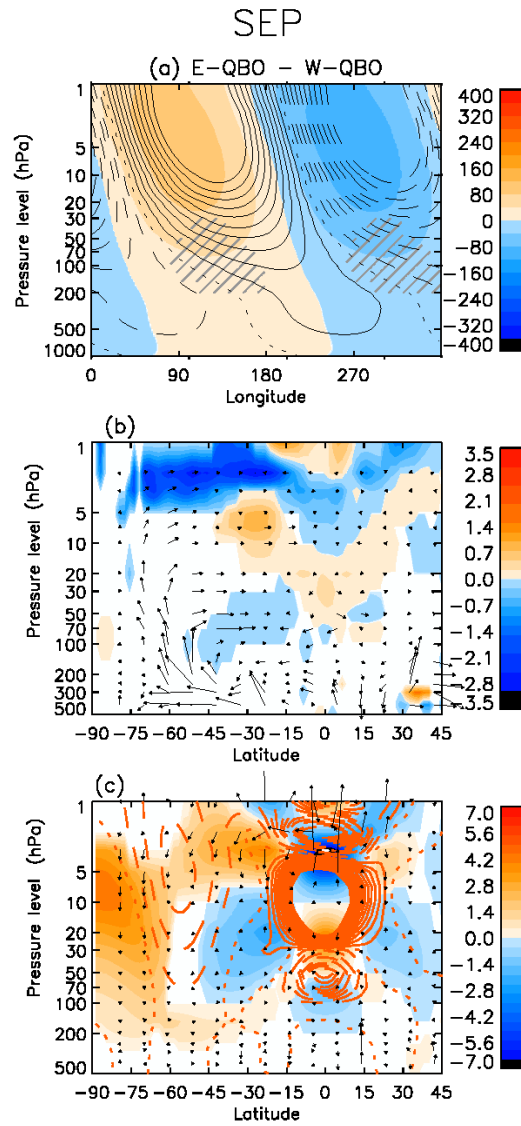


Figure S3: E-QBO minus W-QBO differences from the MPI-ESM-MR model of (a) the vertical cross section of the longitudinal distribution of wave eddy geopotential height anomalies averaged over 50-75N, superimposed on the mean climatology (contour interval is 50m) for September, (b) EP flux vectors (arrows) and EP flux divergence in m/s/d (color shades) and (c) residual circulation (arrows), temperature in K (color shades) and zonal wind (red contours) for September (contour interval is 2.5 m/s). Only significant regions at 95% are shaded.

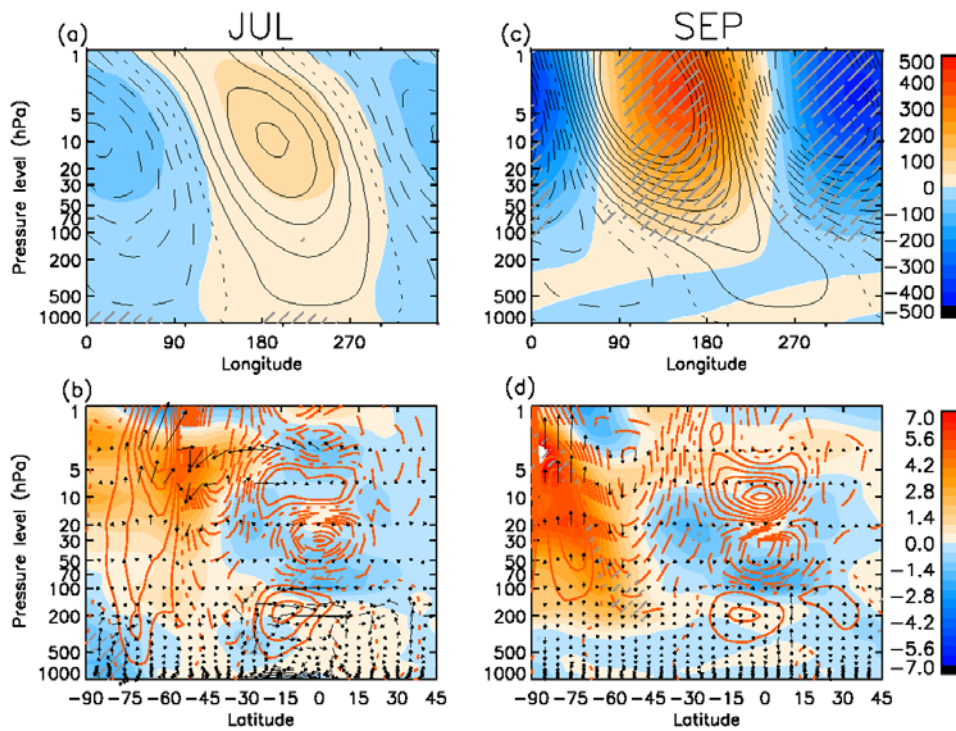


Figure S4: T-low minus T-high differences from ERA-Interim of (a) the vertical cross section of the longitudinal distribution of wave1 eddy geopotential height anomalies averaged over 50-75N, superimposed on the mean climatology (contour interval is 50m) and (b) residual circulation (arrows), temperature in K (color shades) and zonal wind (red contours) for July (contour interval is 2.5 m/s). Only significant regions at 95% are shaded. (c) and (d) are equivalent to (a) and (b) but for September.