# Northern vs. southern hemisphere differences in the stratospheric influence on variability in tropospheric nitrous oxide

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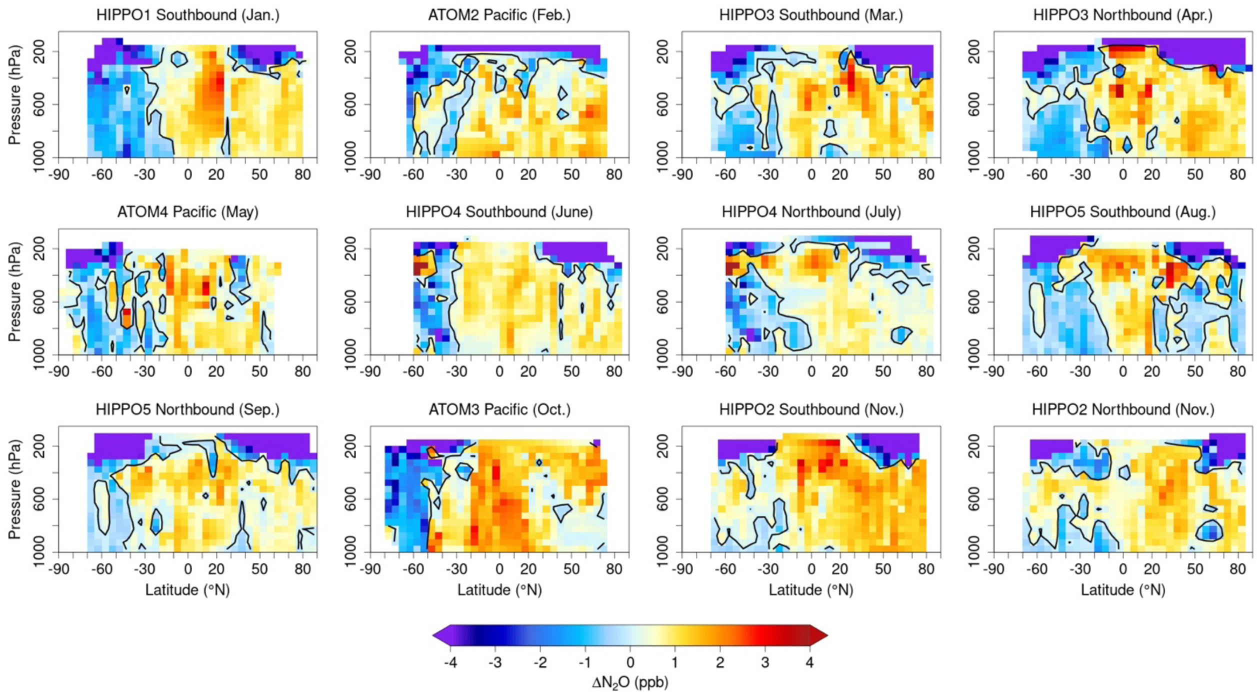
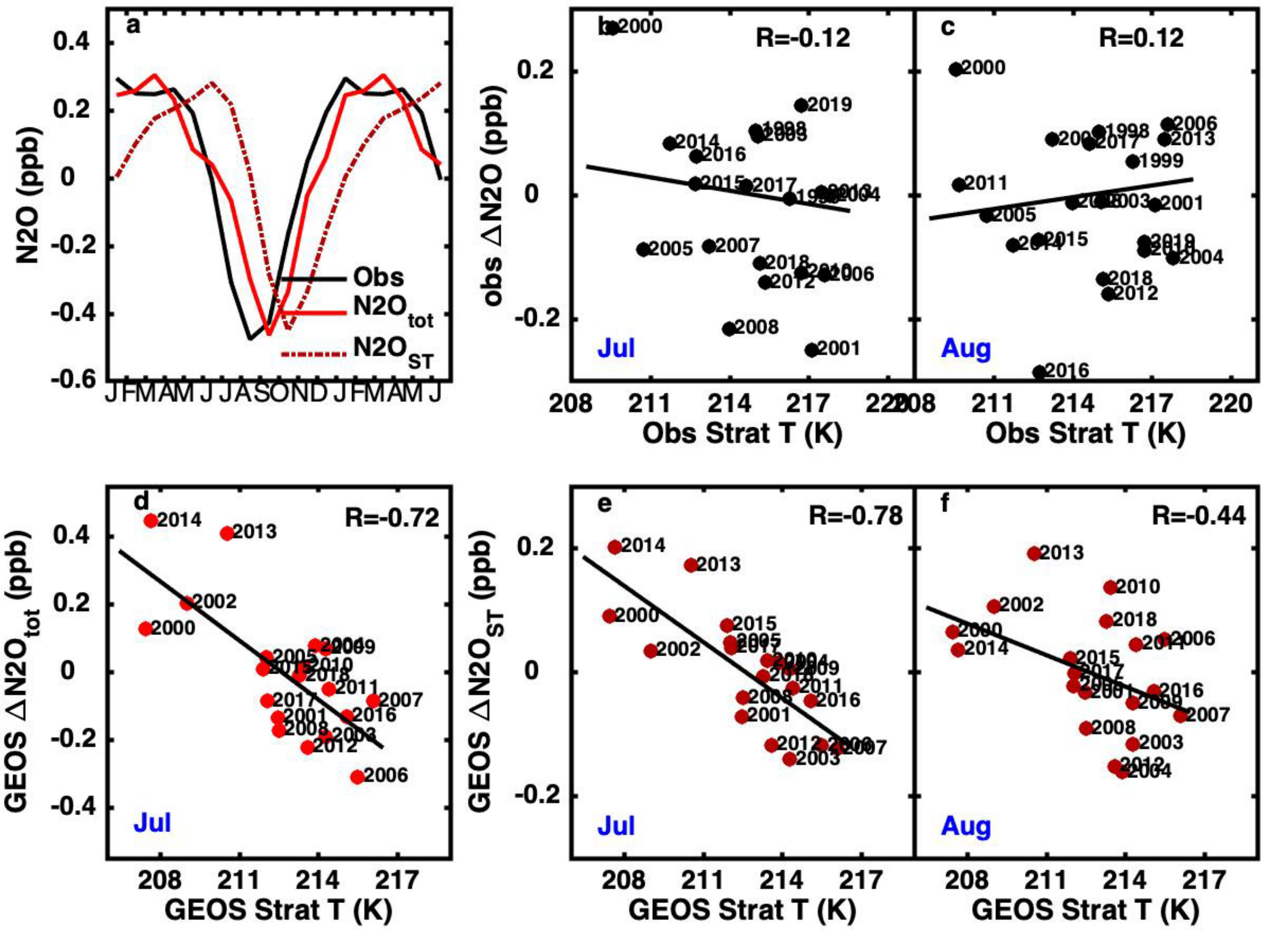
Supplementary Figures S1-S3




**Supplementary Figure S1: Similar to Figure 6 in the main text but including a larger collection of north and southbound HIPPO and ATom transects arranged to form an annual sequence. A deseasonalized fit to the NOAA time series at Mauna Loa has been subtracted from all data.**



**Supplementary Figure S2: a) Mace Head, Ireland (MD) mean seasonal cycle in $N_2O$ for observed $N_2O$ and GEOSCCM total $N_2O$ and $N_2O_{ST}$. NOAA surface $N_2O$ seasonal anomalies in b) July and c) August for data spanning 1997-2020, plotted vs. mean lower stratospheric MERRA-2 temperature at 100 hPa averaged over 60-90°N over the previous winter (January-March). Bottom row shows GEOSCCM seasonal anomalies at MHD spanning 2000-2019 for d) total $N_2O$ in July and $N_2O_{ST}$ in e) July and f) August plotted vs. mean GEOS lower stratospheric temperature at 100 hPa averaged over 60-90°N over the previous winter. $N_2O$ is descending into its seasonal minimum in July and August in the NH.**

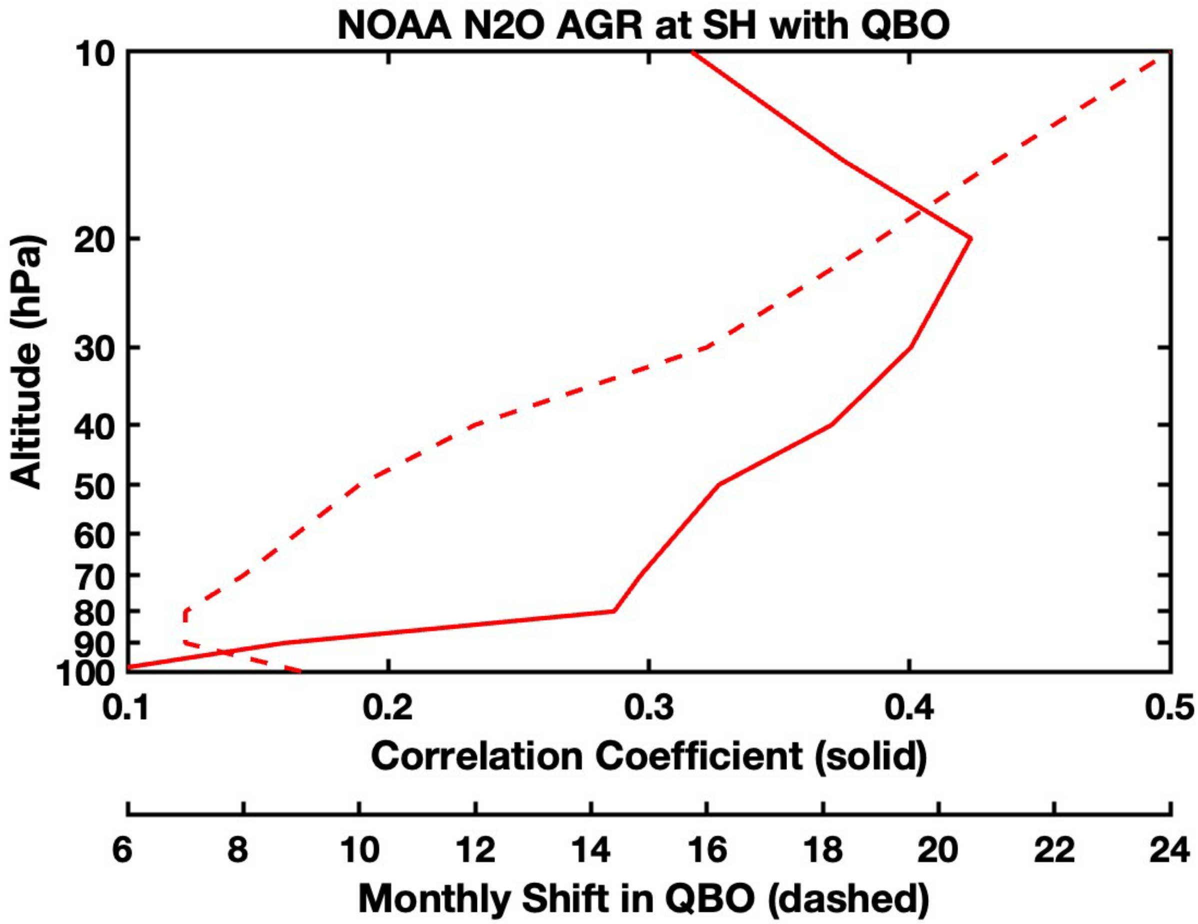



**Figure S3: Southern Hemisphere $N_2O$ atmospheric growth rate (AGR) for NOAA plotted vs. the QBO index ranging from 100 to 10 hPa with the optimal correlation coefficient (solid) and monthly forward shift in the index (dashed).**