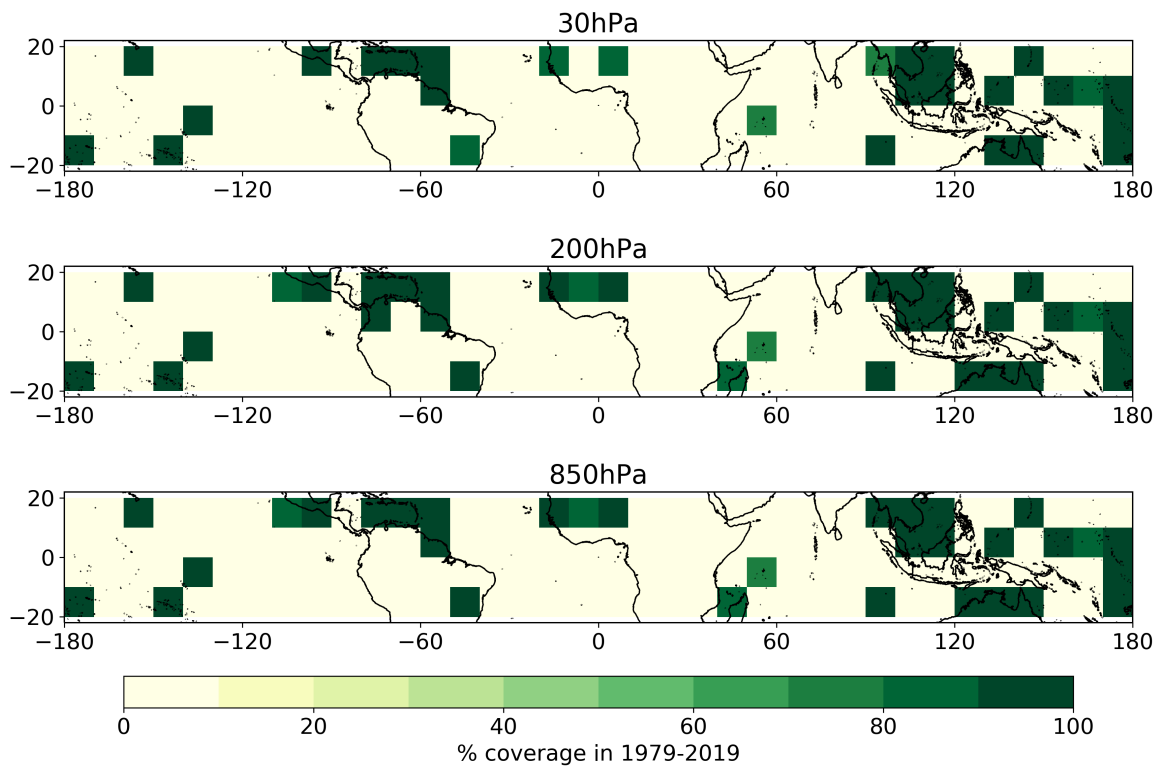
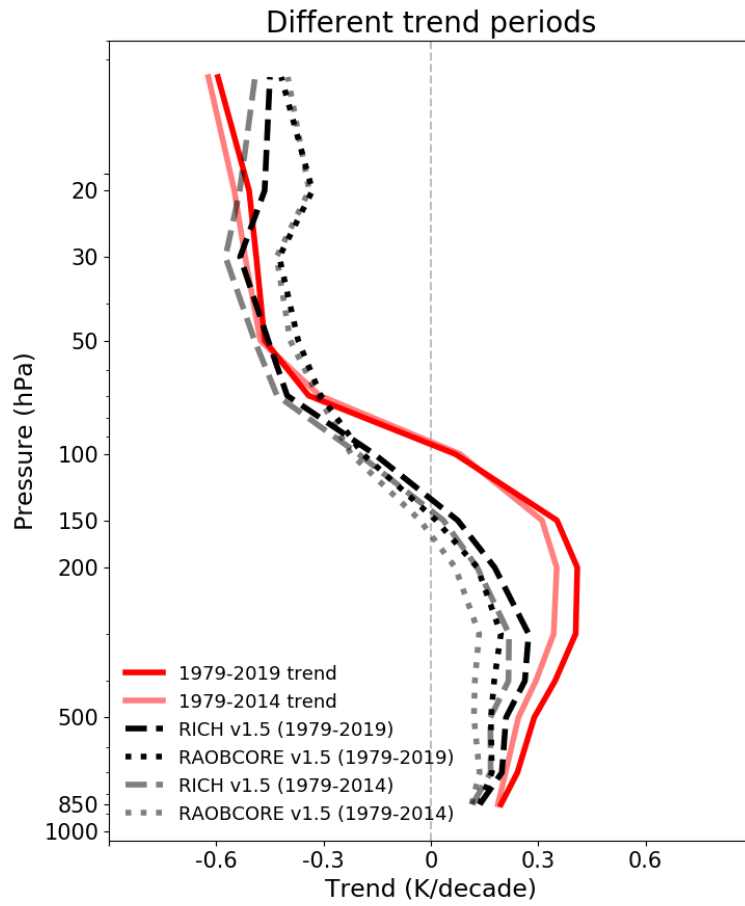


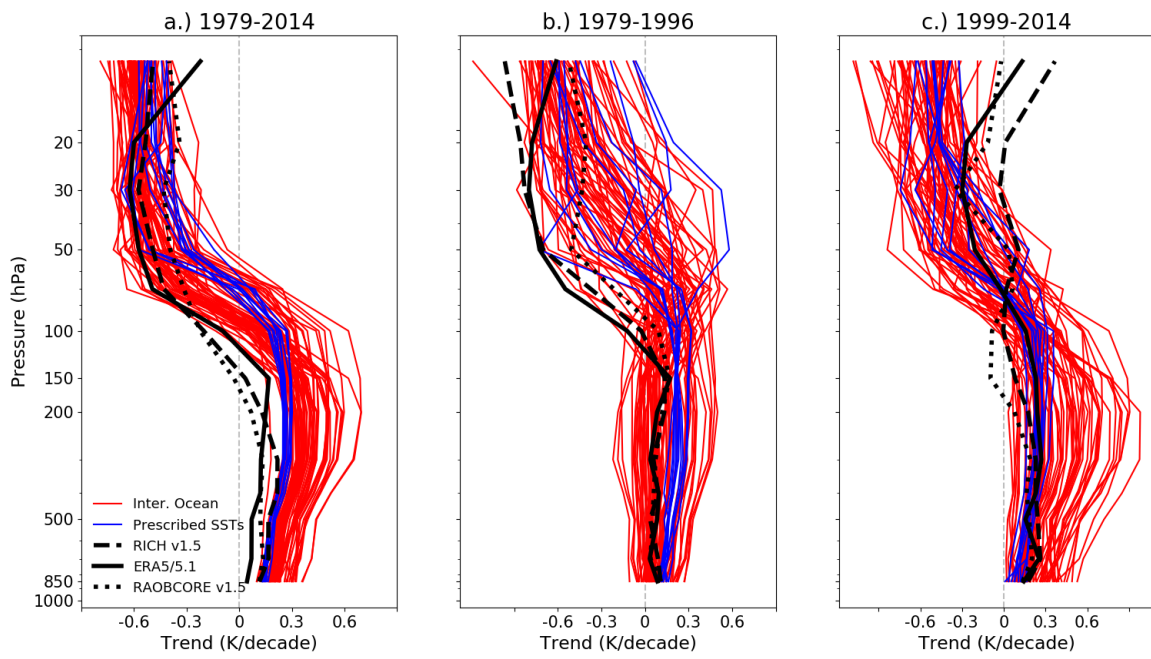
## 1 Supplementary Information



**Figure S1.** Percentage of months between 1979–2019 that RAOBCORE v1.5 data are available in the tropics at 850, 200 and 30 hPa. All months in the years that have more than 3 months of data missing are set to missing.



**Figure S2.** As in Figure ??a but only showing the mean response of the CMIP6 models (reds). The darker lines show the trend calculated from 1979-2019, and the lighted lines show it calculated from 1979-2014 (as in the main body of the paper). CMIP6 historical data end in 2014, so SSP2RCP4.5 data are added to allow for trends to be calculated to 2019. Note we do not currently have the ERA5 data for the latter part of 2019, so it is excluded from this figure.



**Figure S3.** As in Figure ??a but with different trend averaging periods for panel b and c.