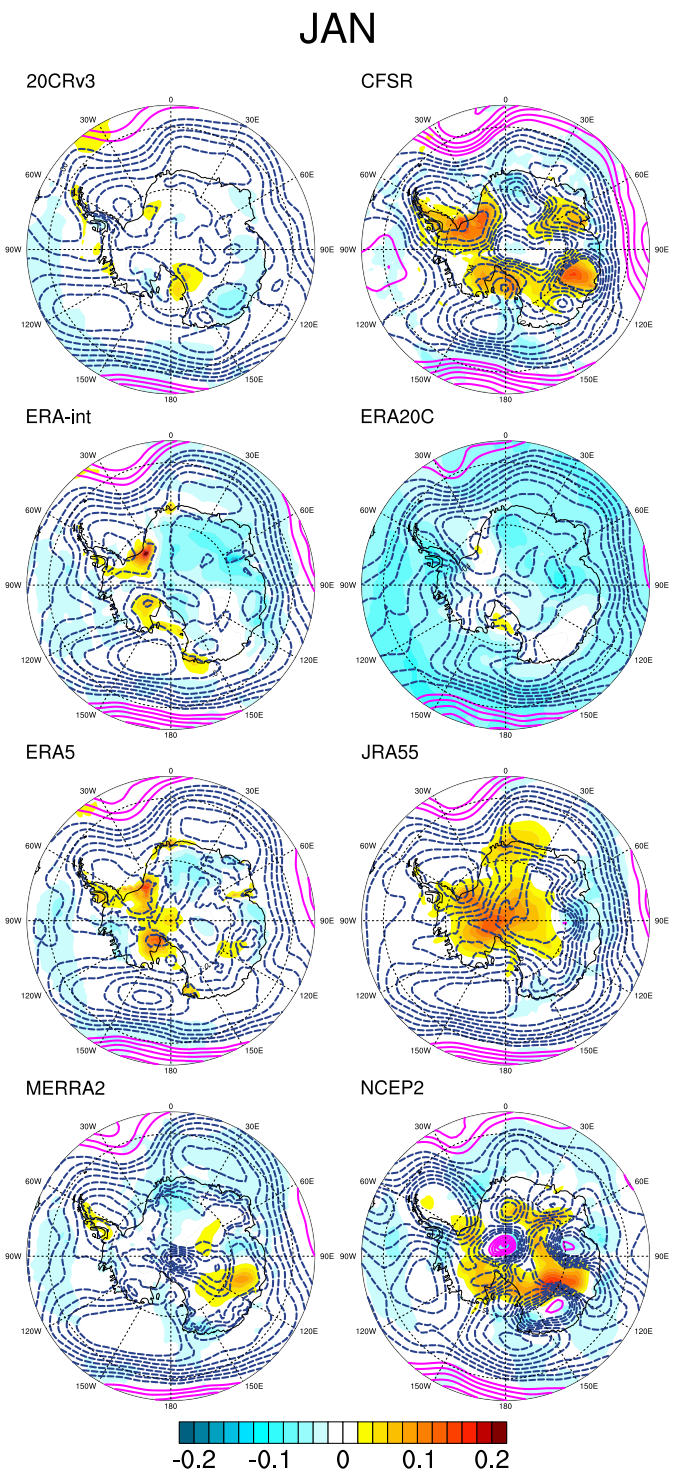

Figure S 1: 1980-2010 trends in January SAT (shading: ºC/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

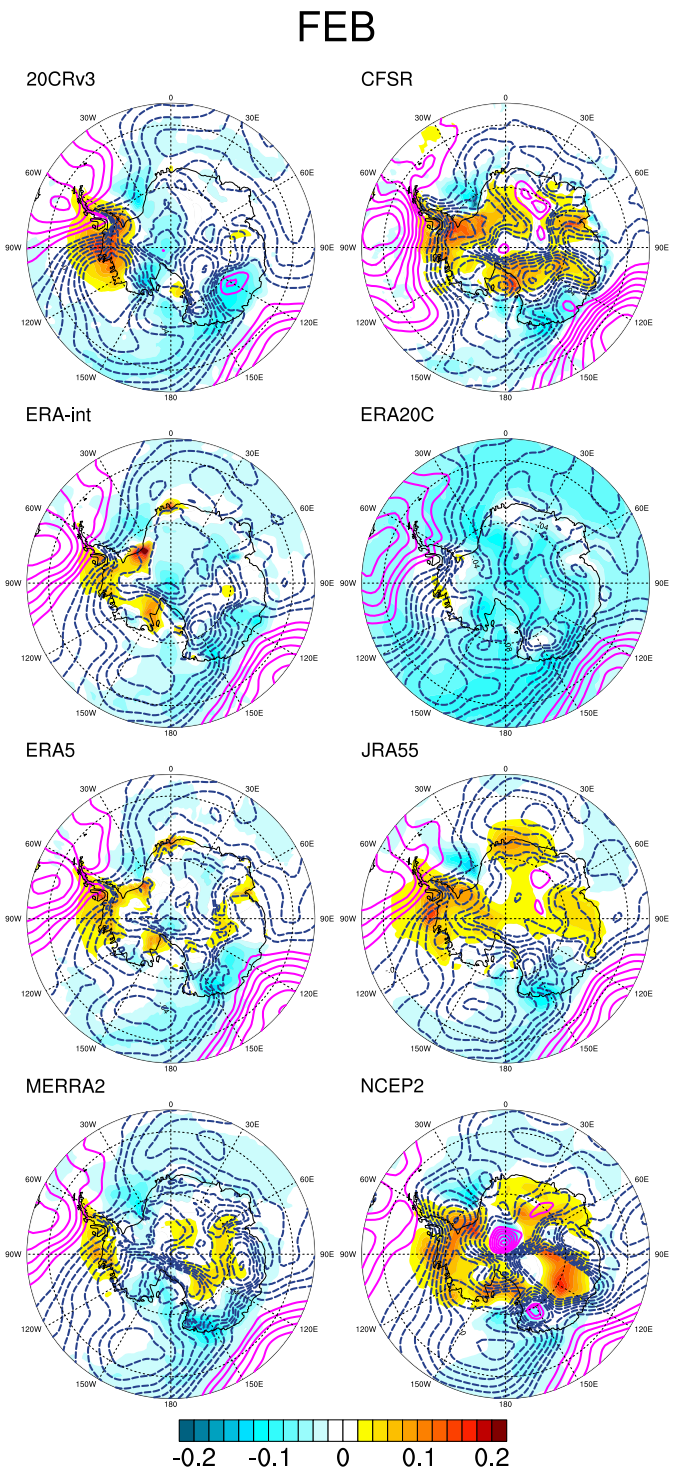

Figure S 2: 1980-2010 trends in February SAT (shading: ºC/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses (refer to Table 1 for details).

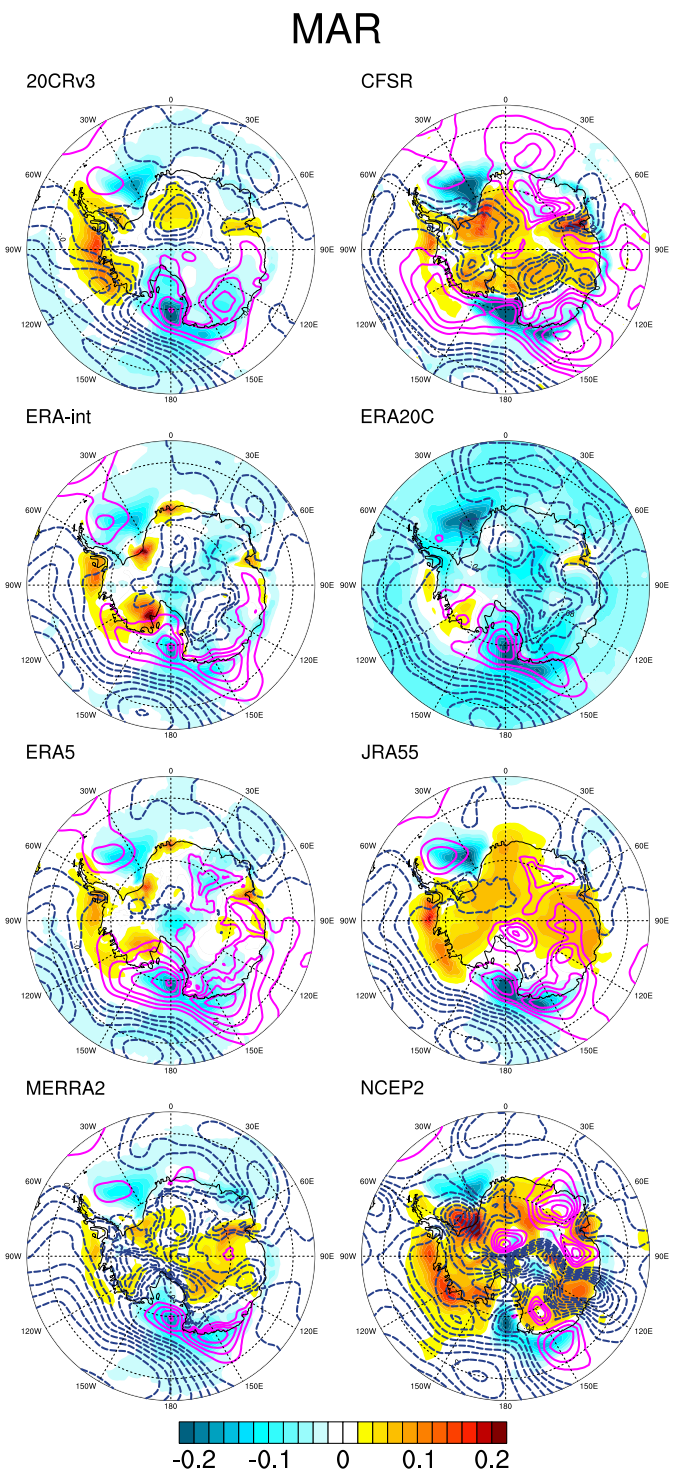

Figure S 3: 1980-2010 trends in March SAT (shading: ^{o}C/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

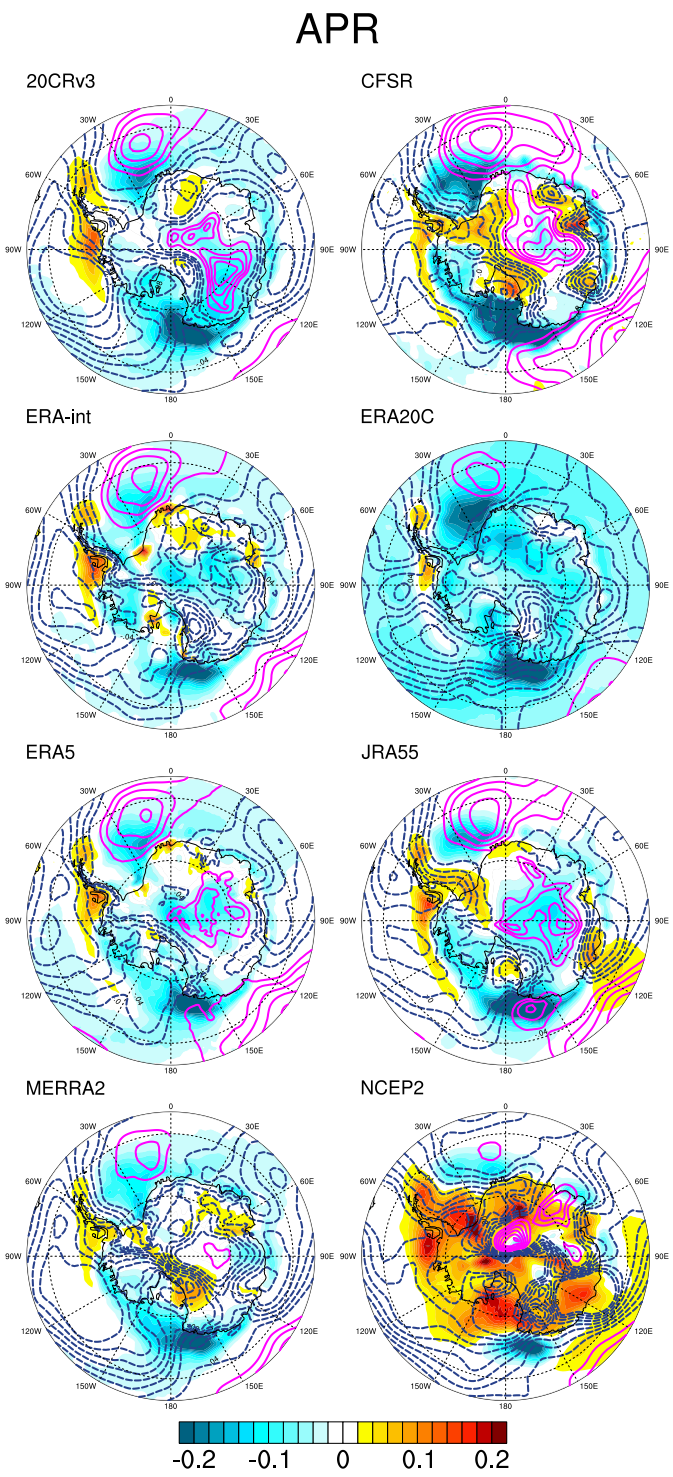

Figure S 4: 1980-2010 trends in April SAT (shading: ºC/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

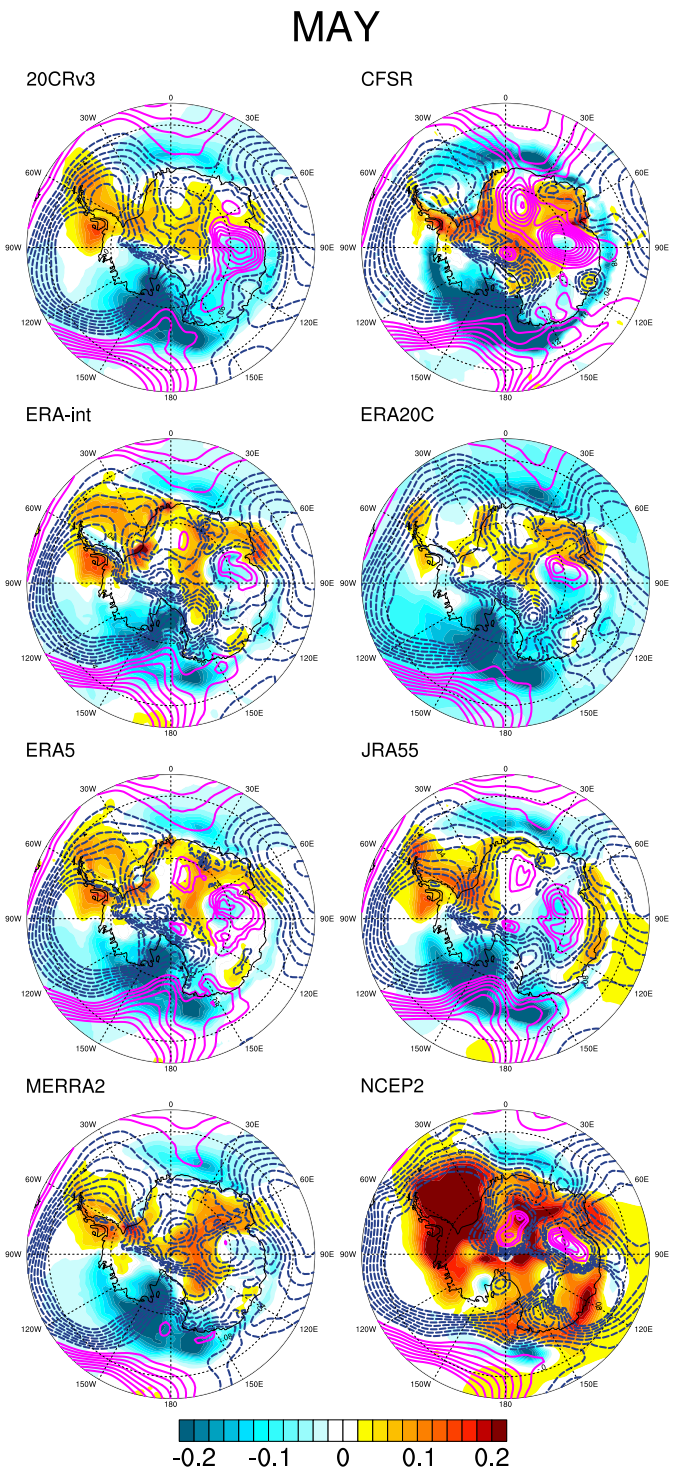

Figure S 5: 1980-2010 trends in May SAT (shading: ºC/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

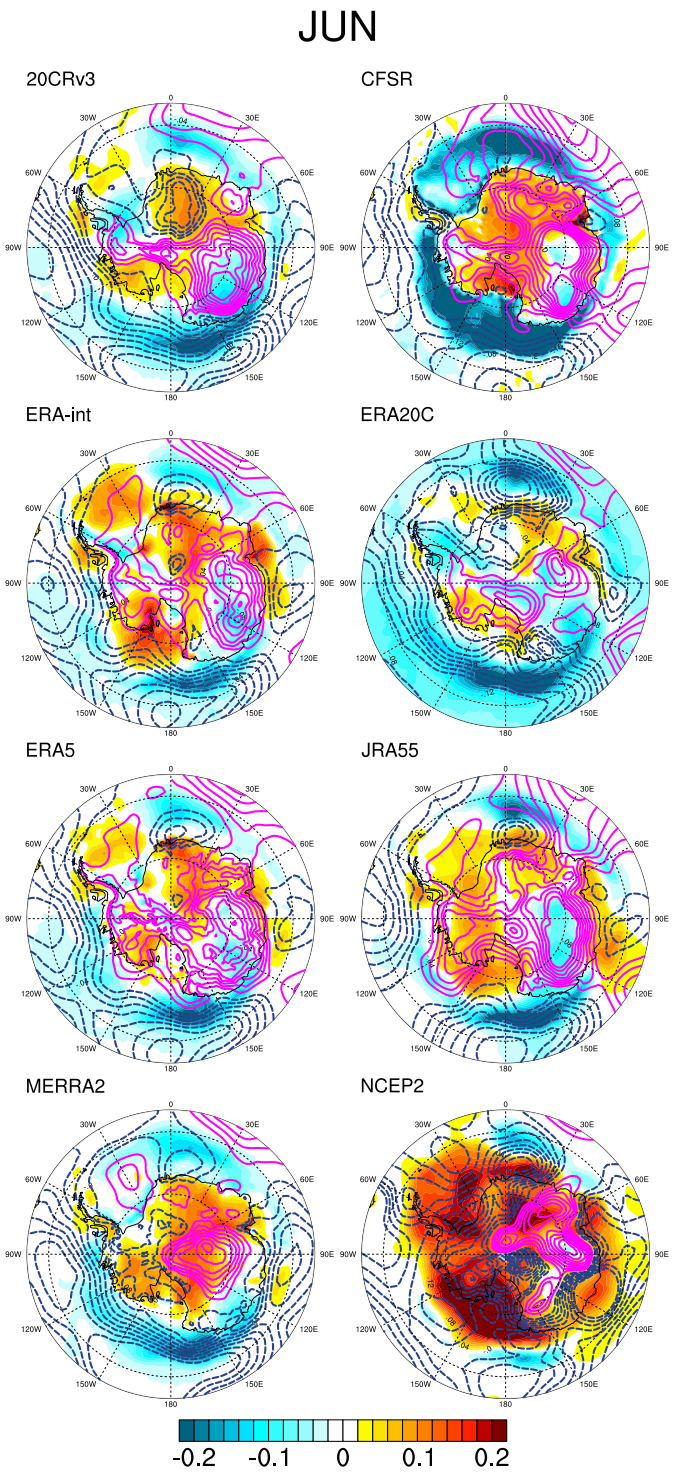

Figure S 6: 1980-2010 trends in June SAT (shading: ºC/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

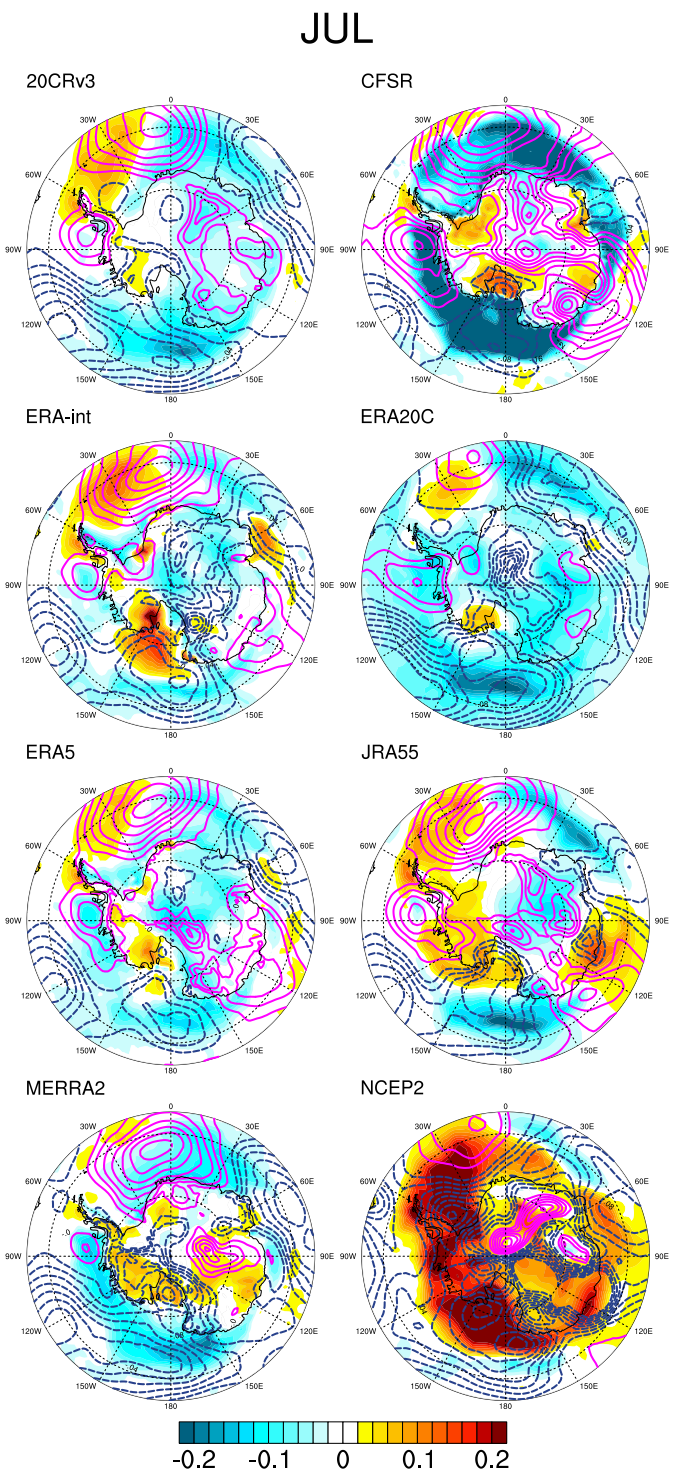

Figure S 7: 1980-2010 trends in July SAT (shading: ^{o}C/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

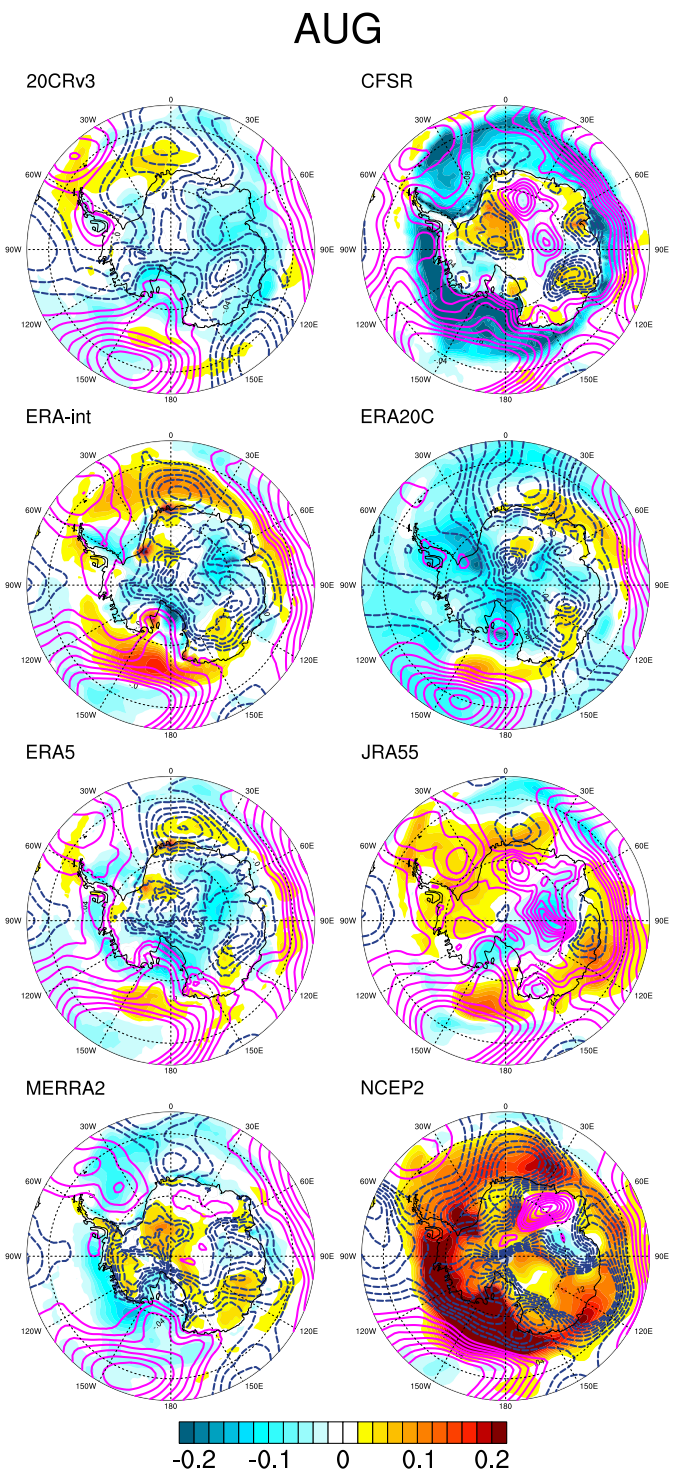

Figure S 8: 1980-2010 trends in August SAT (shading: ^{o}C/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

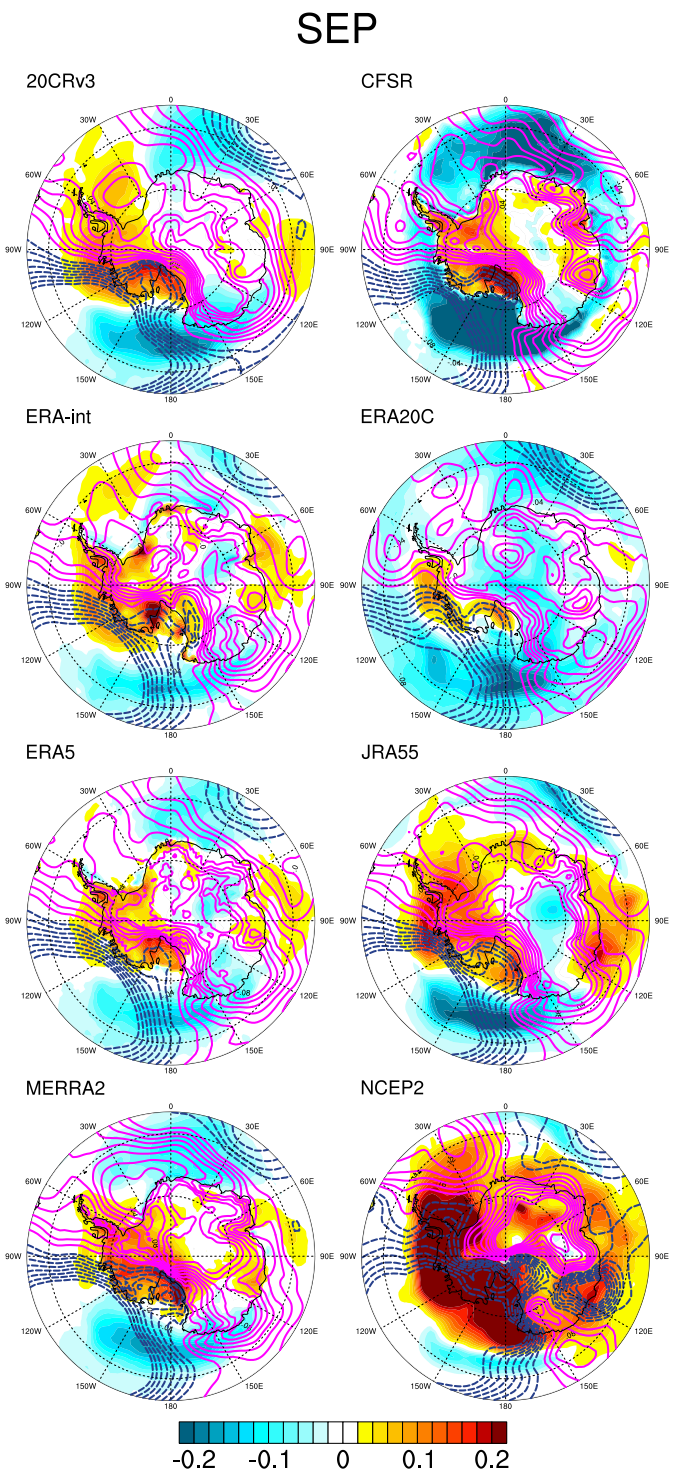

Figure S 9: 1980-2010 trends in September SAT (shading: ºC/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

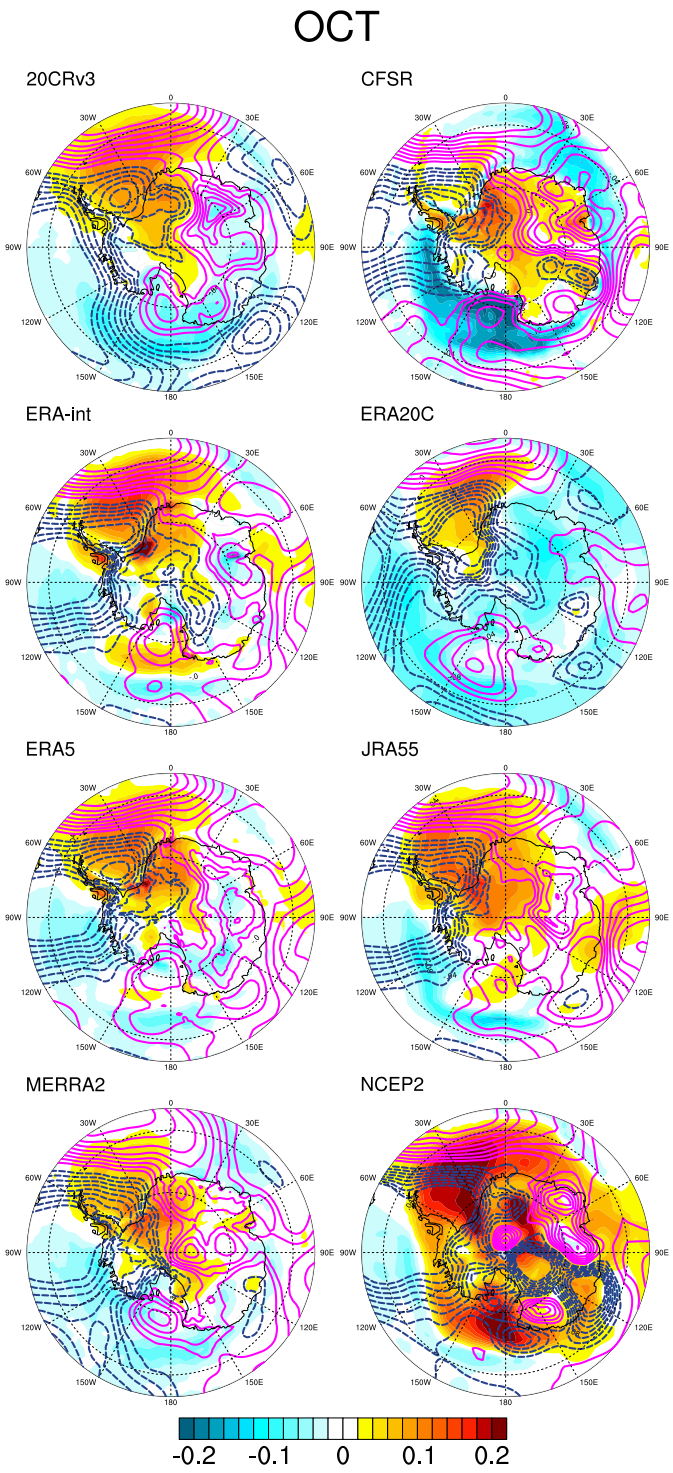

Figure S 10: 1980-2010 trends in October SAT (shading: ºC/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

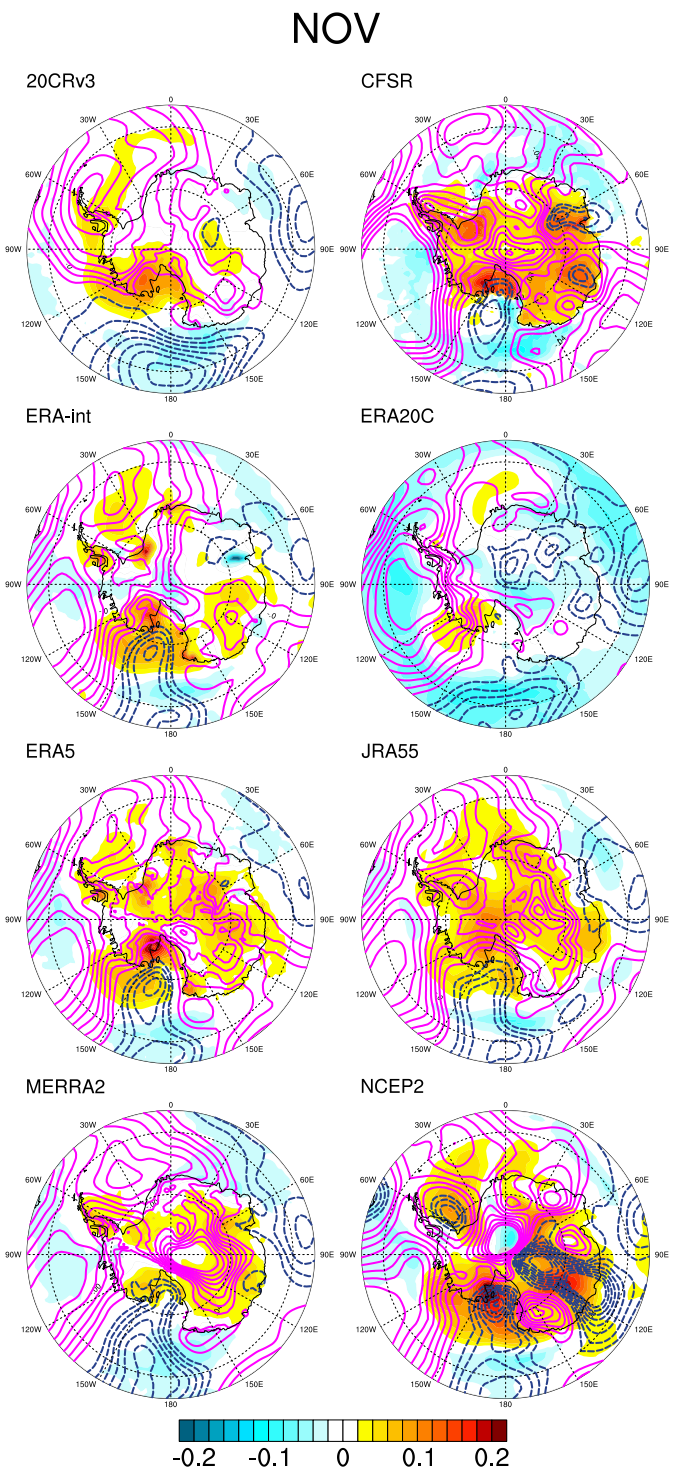

Figure S 11: 1980-2010 trends in November SAT (shading: ^{o}C/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

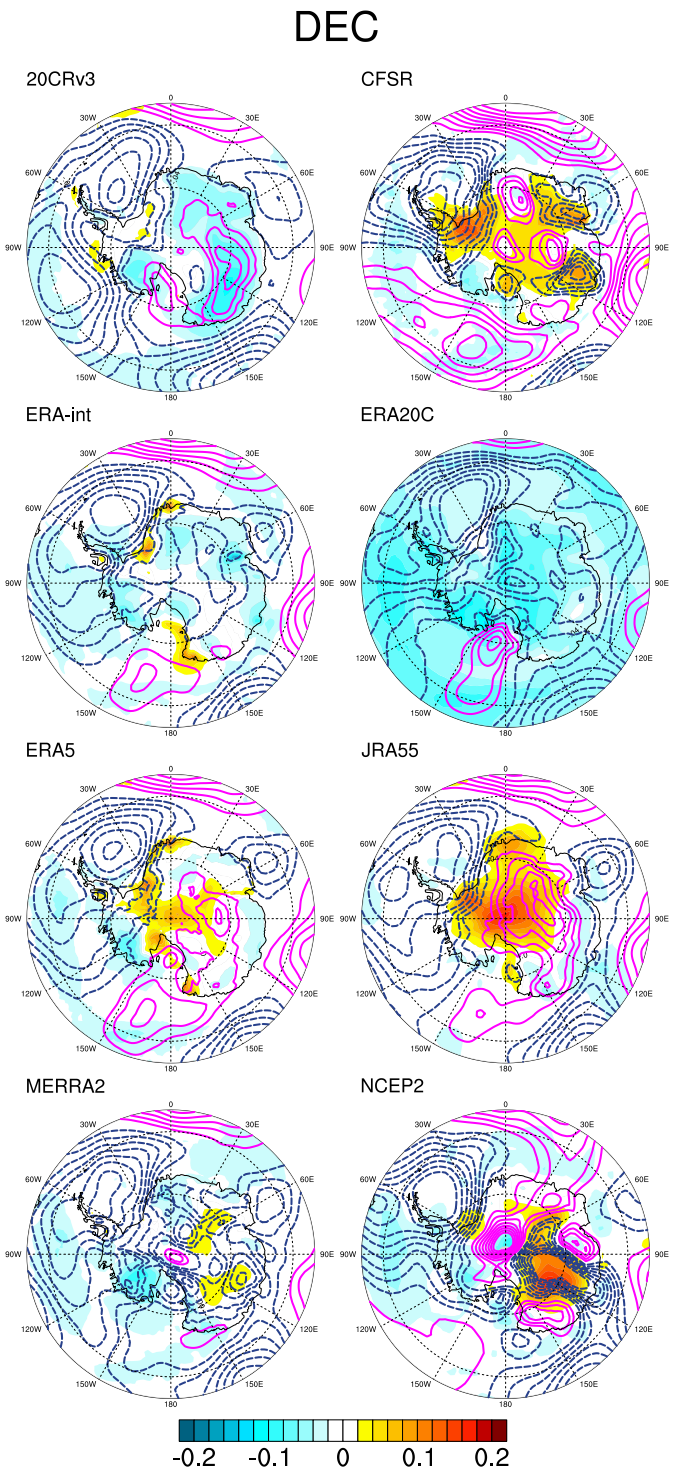

Figure S 12: 1980-2010 trends in December SAT (shading: ºC/year) and MSLP (contour lines: positive trends in blue, negative trends in magenta, with contour spacing = 2.5 Pa/year), for eight individual reanalyses.

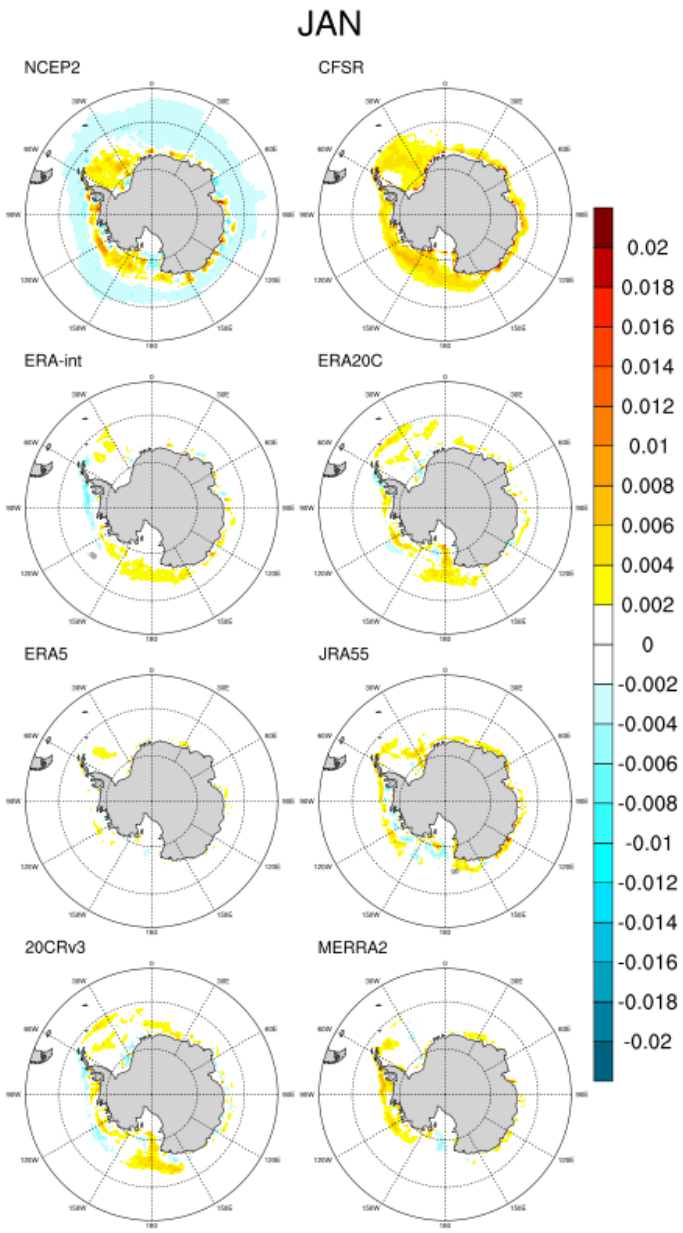

Figure S 13: Difference between January 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

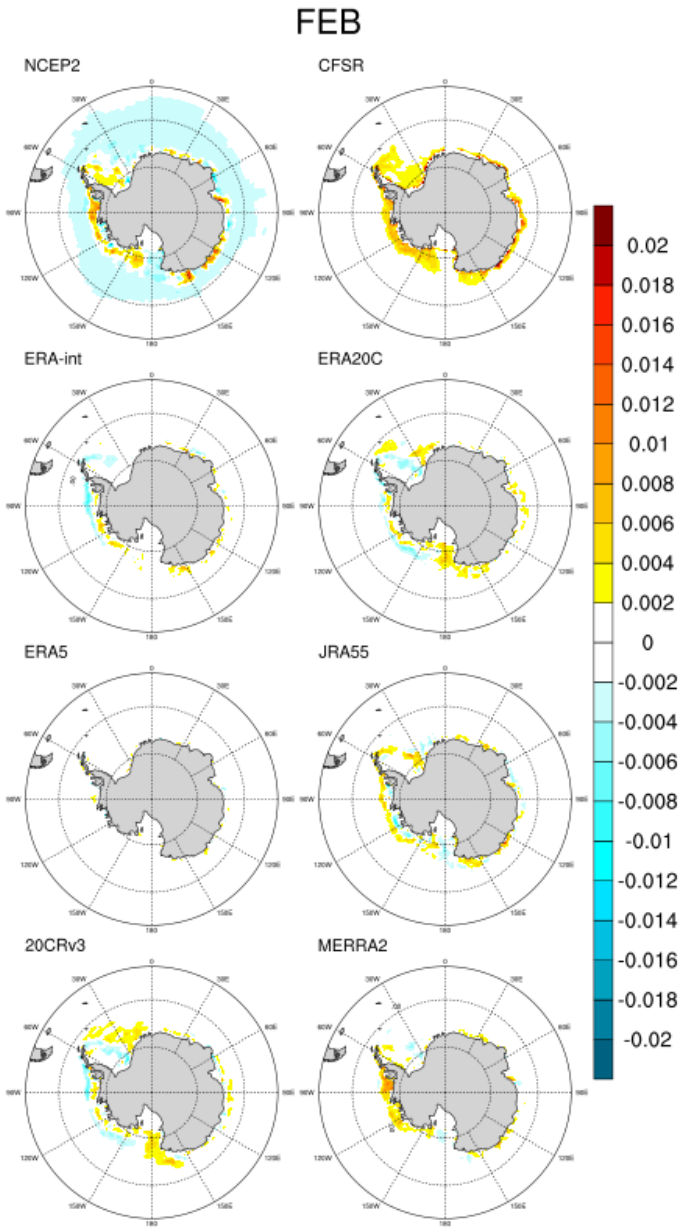

Figure S 14: Difference between February 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

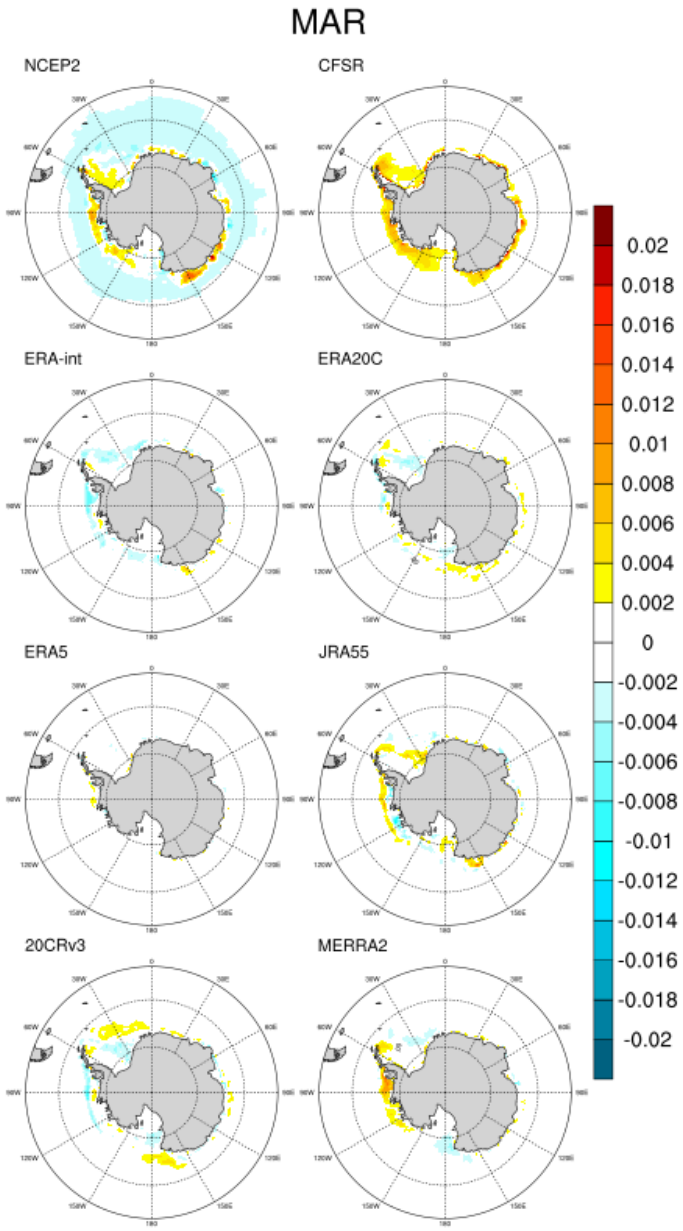

Figure S 15: Difference between March 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

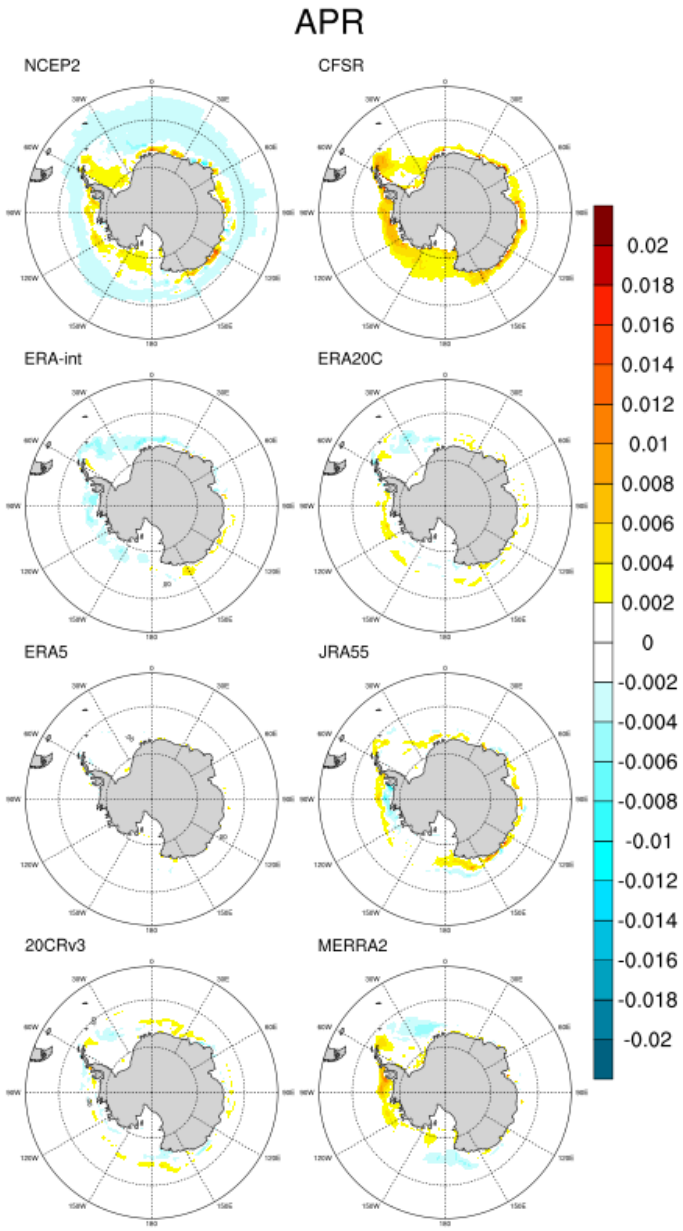

Figure S 16: Difference between April 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

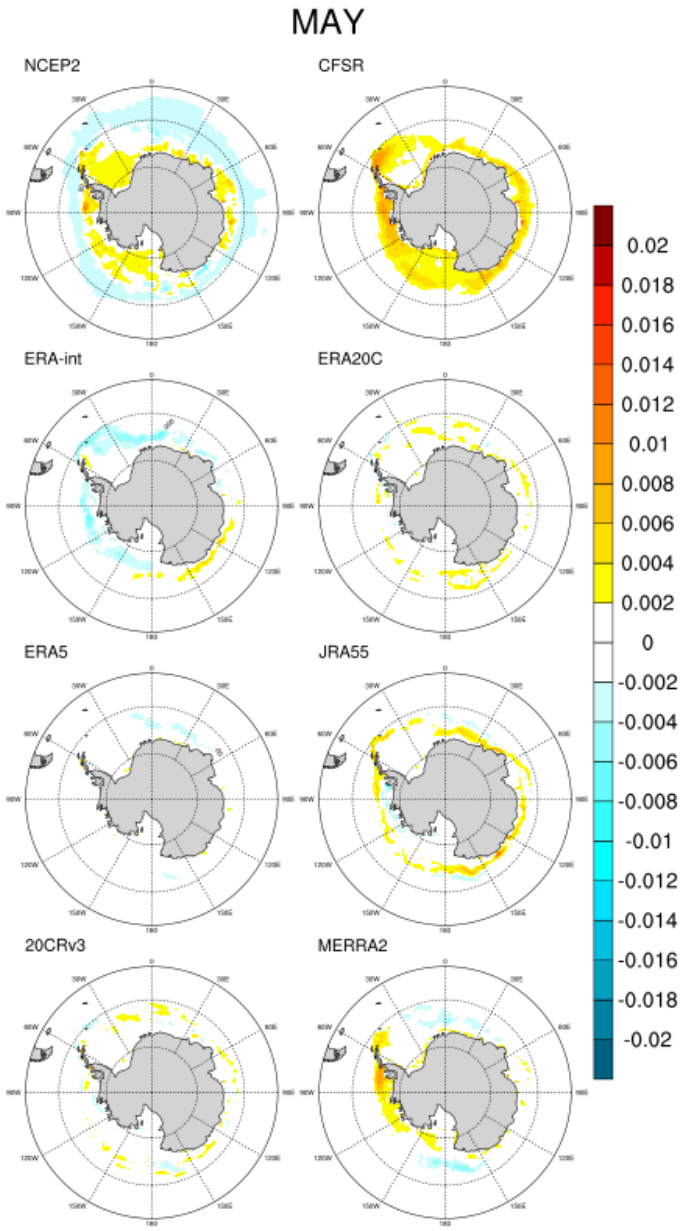

Figure S 17: Difference between May 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

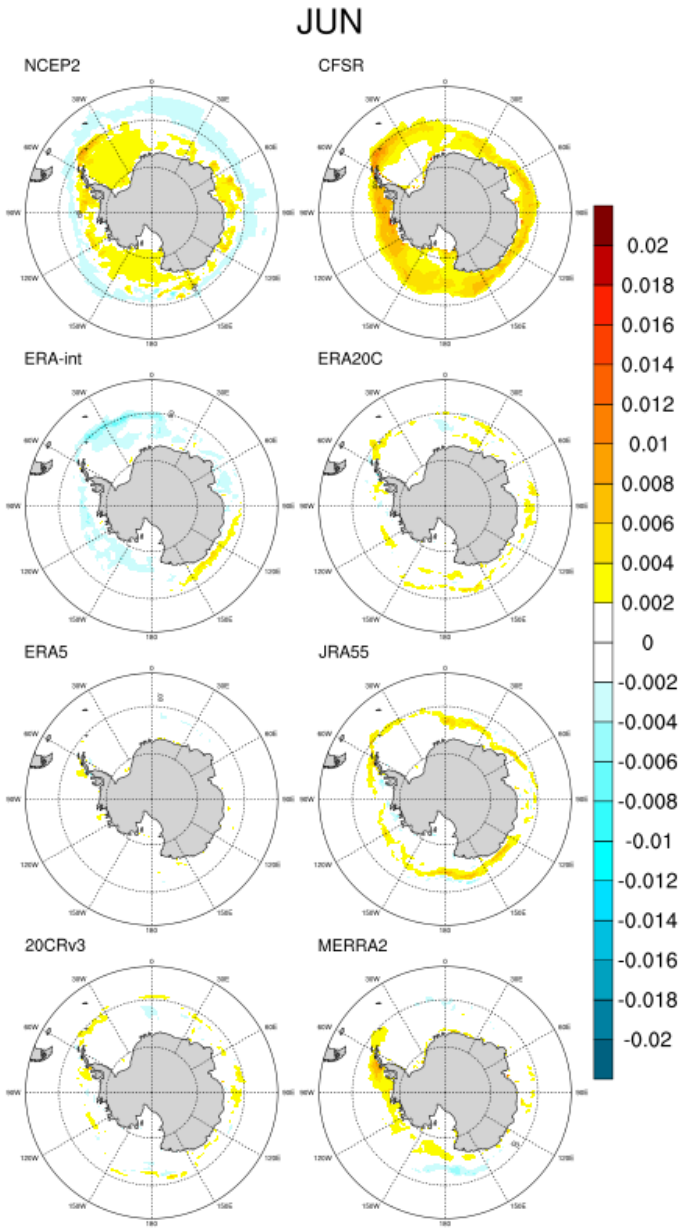

Figure S 18: Difference between June 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

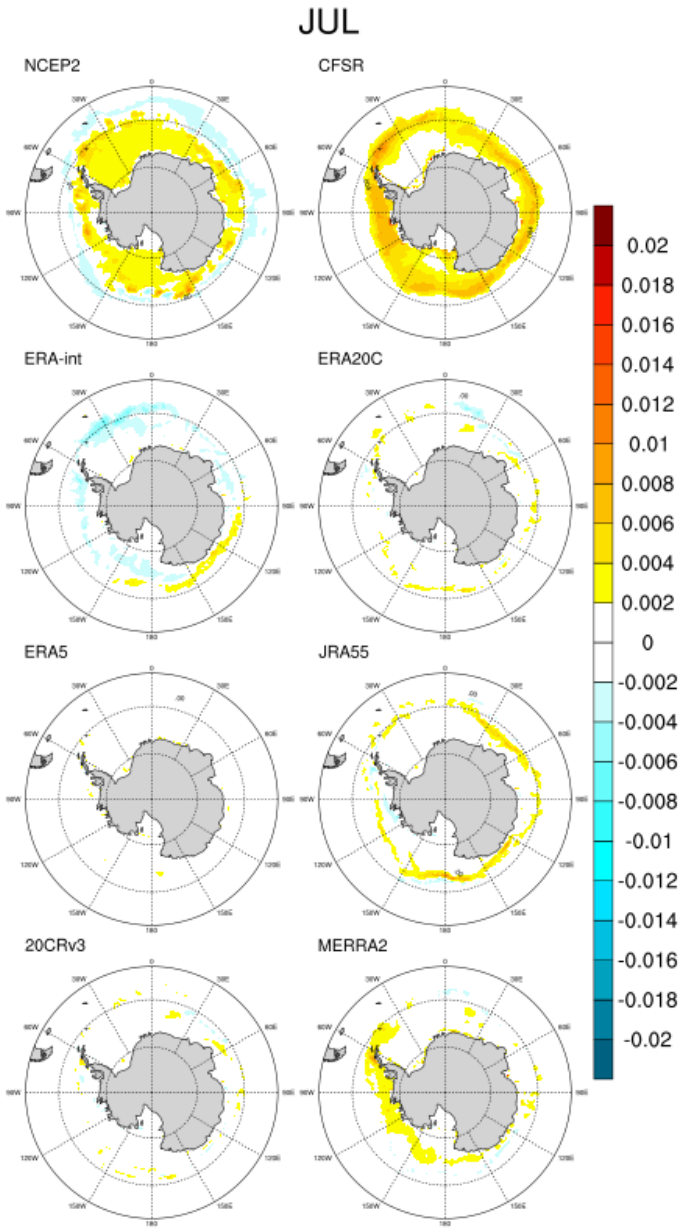

Figure S 19: Difference between July 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

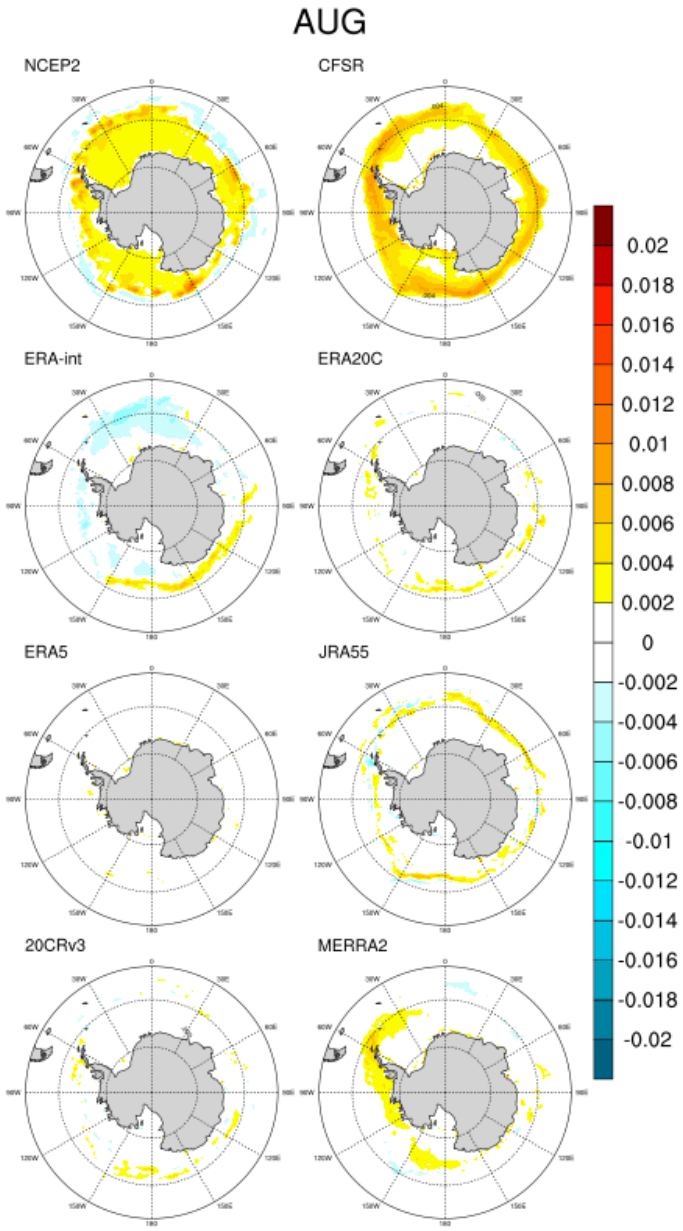

Figure S 20: Difference between August 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

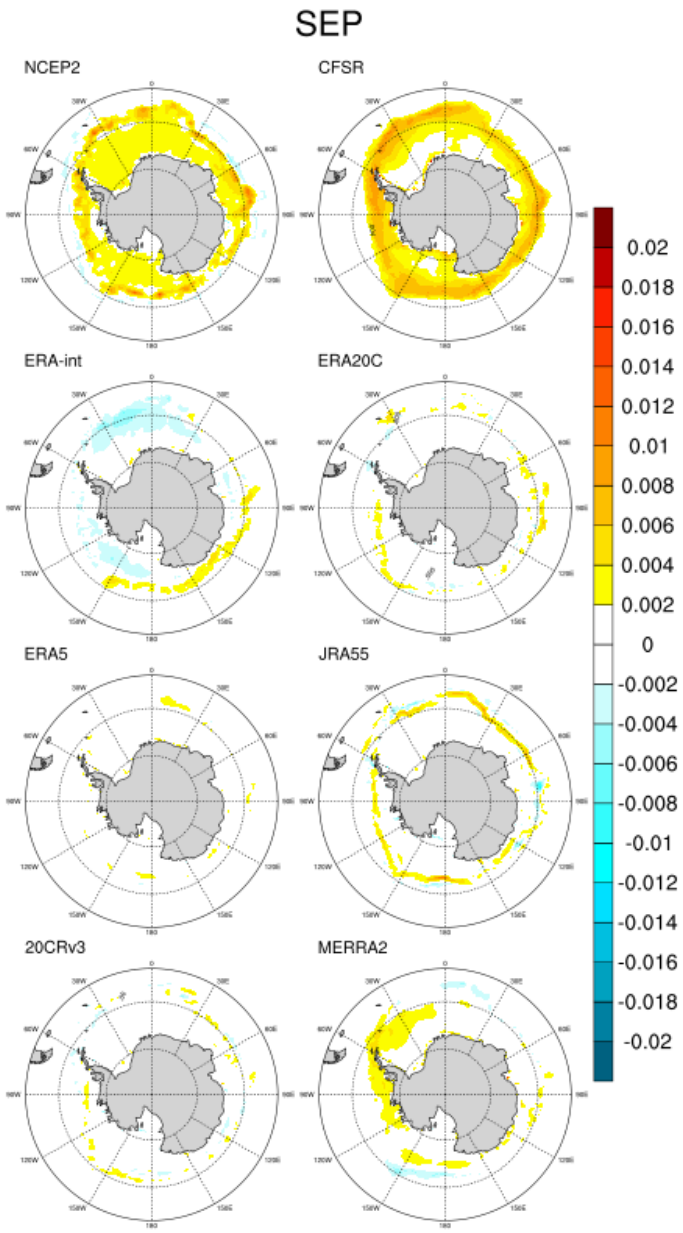

Figure S 21: Difference between September 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

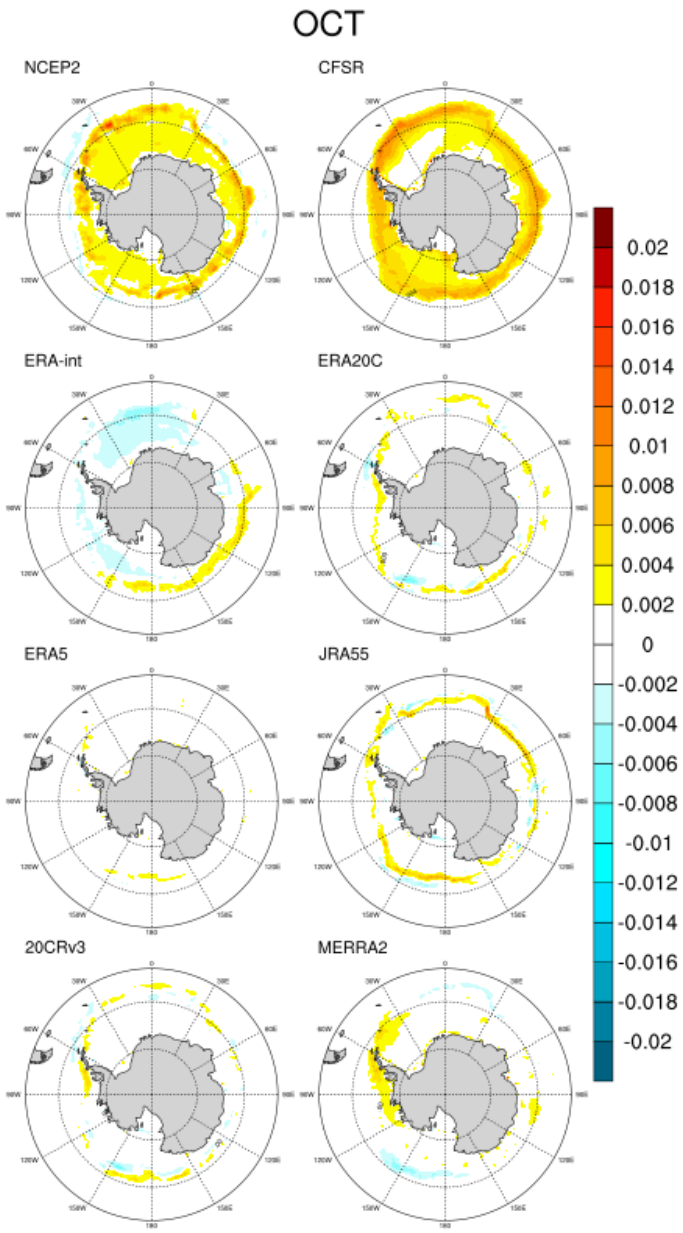

Figure S 22: Difference between October 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

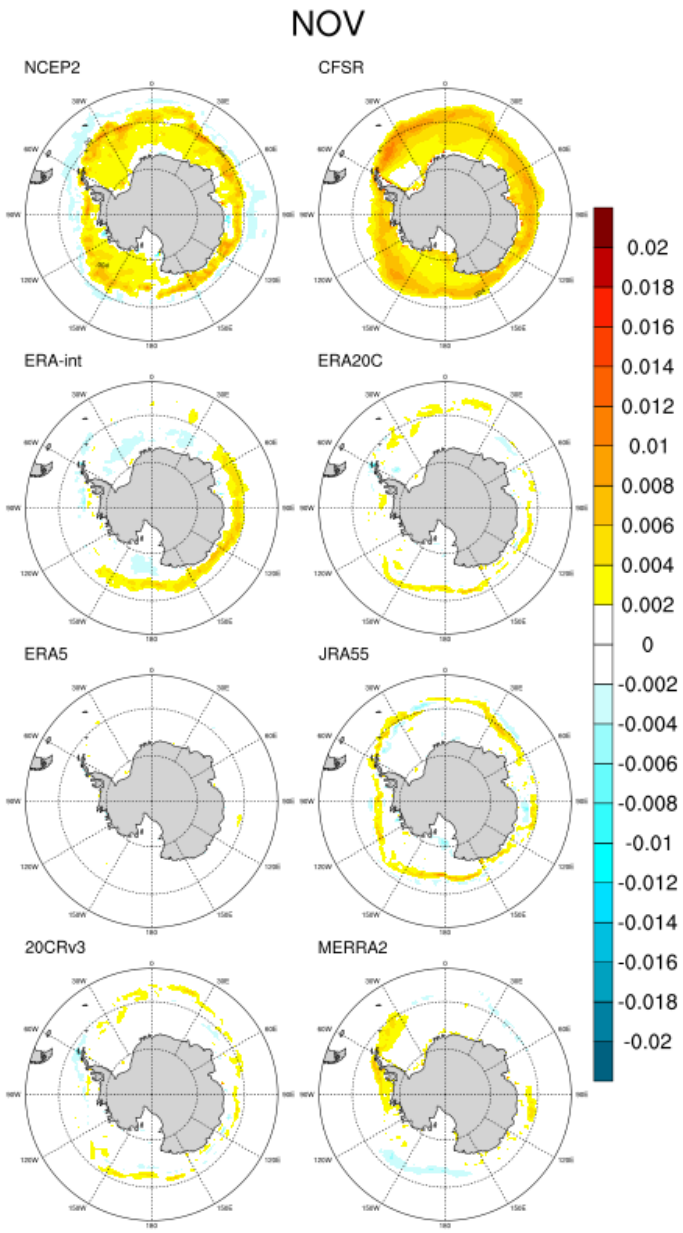

Figure S 23: Difference between November 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

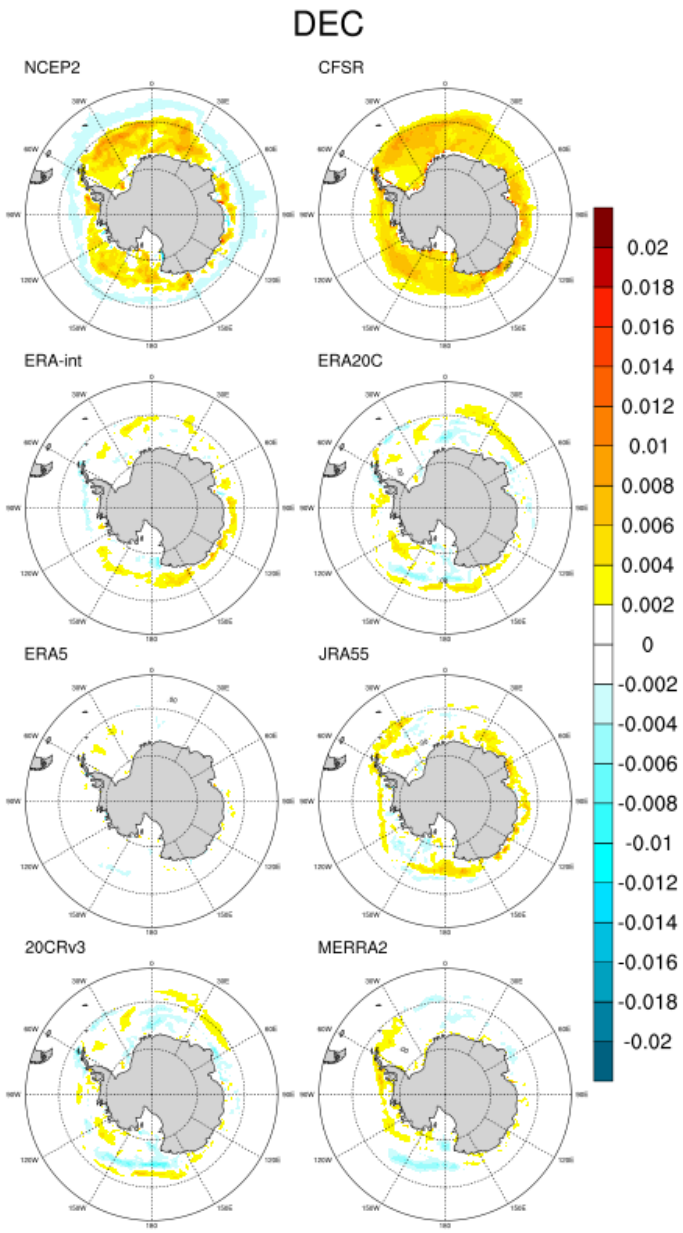

Figure S 24: Difference between December 1980-2010 sea ice concentration trend for each reanalysis, and Goddard-merged passive microwave sea ice concentration trend over the same period.

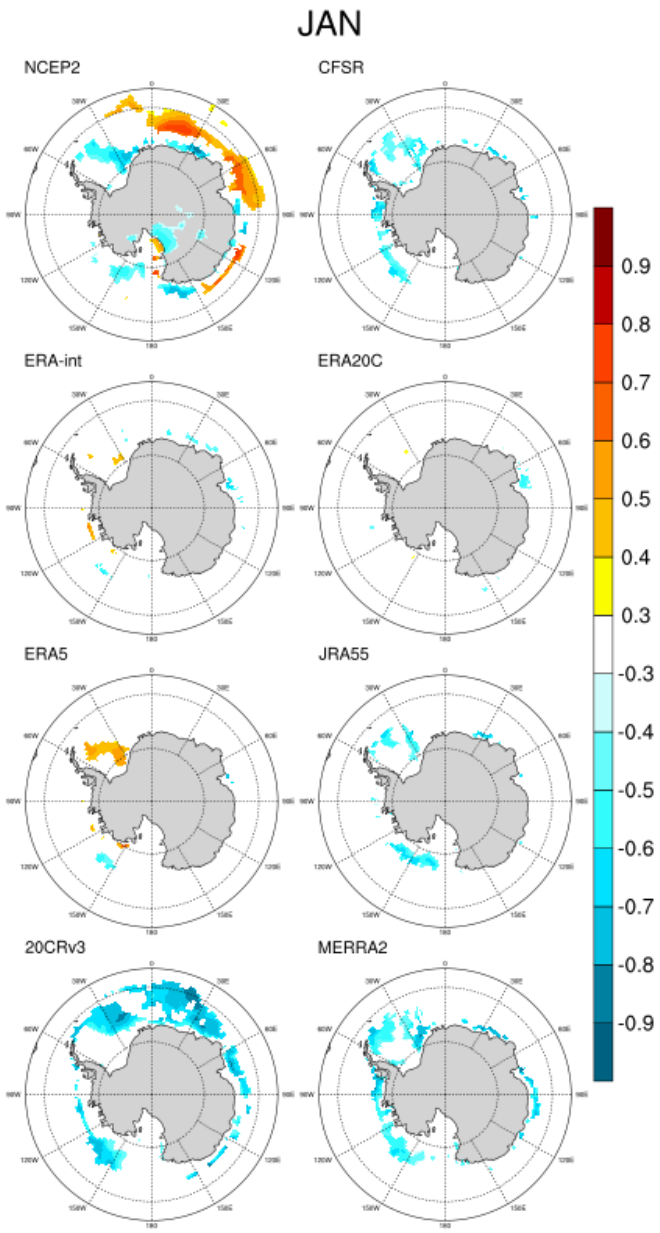

Figure S 25: Correlation coefficient between 1980-2010 January reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

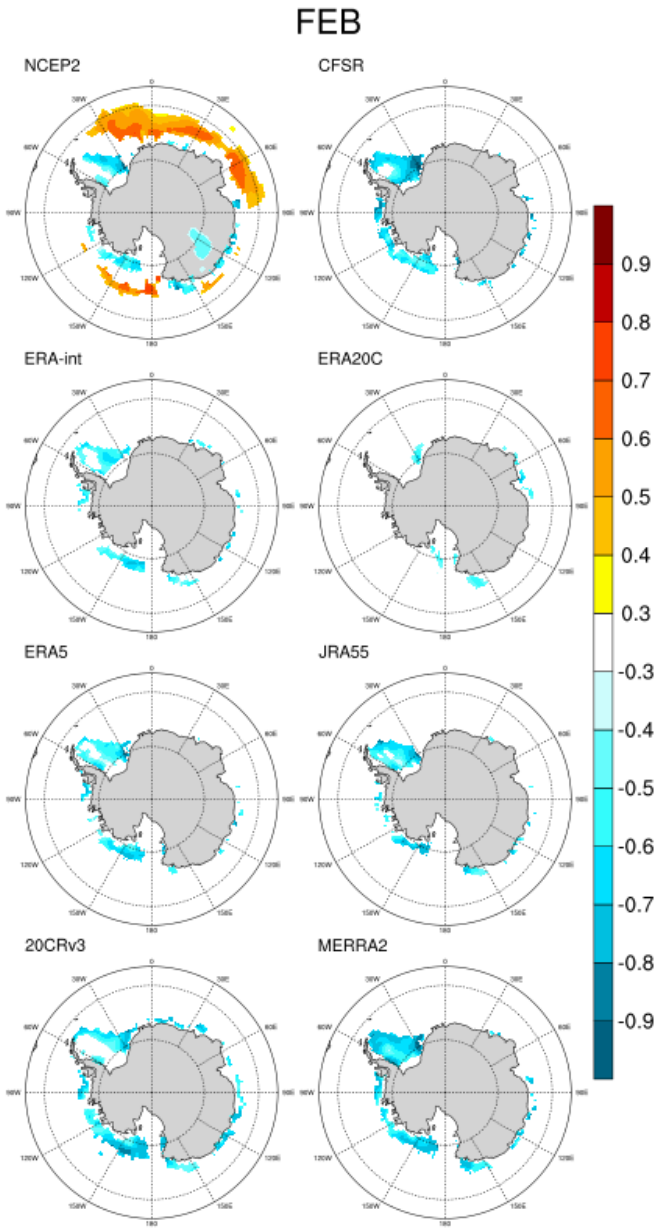

Figure S 26: Correlation coefficient between 1980-2010 February reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

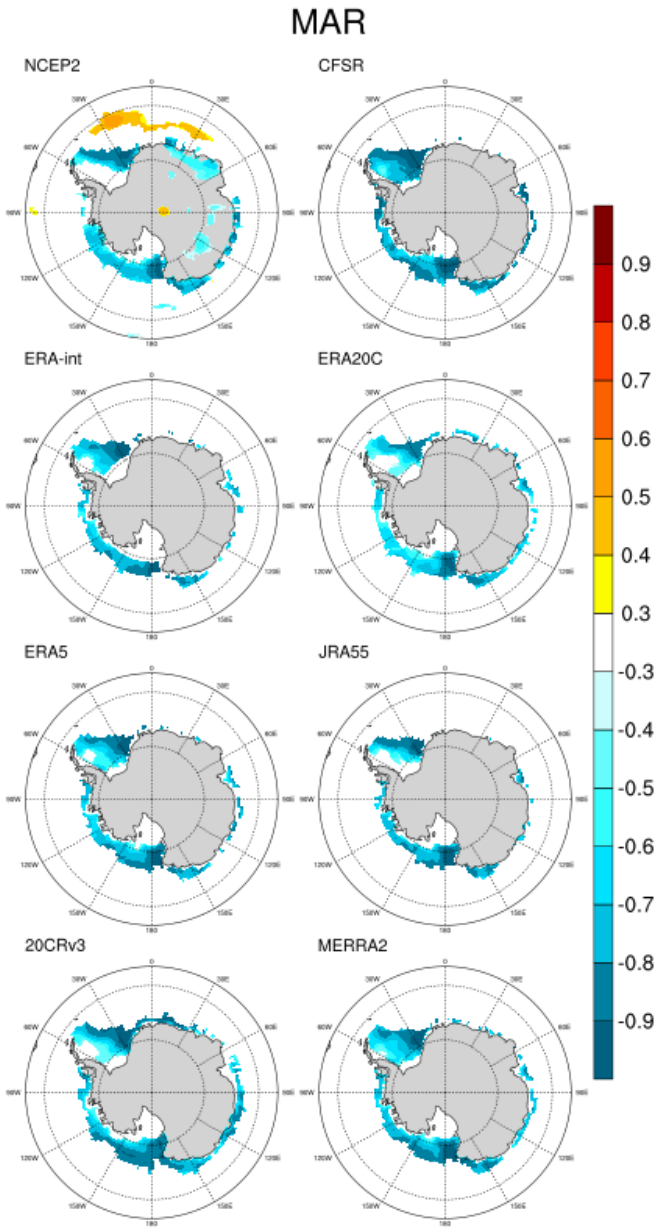

Figure S 27: Correlation coefficient between 1980-2010 March reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

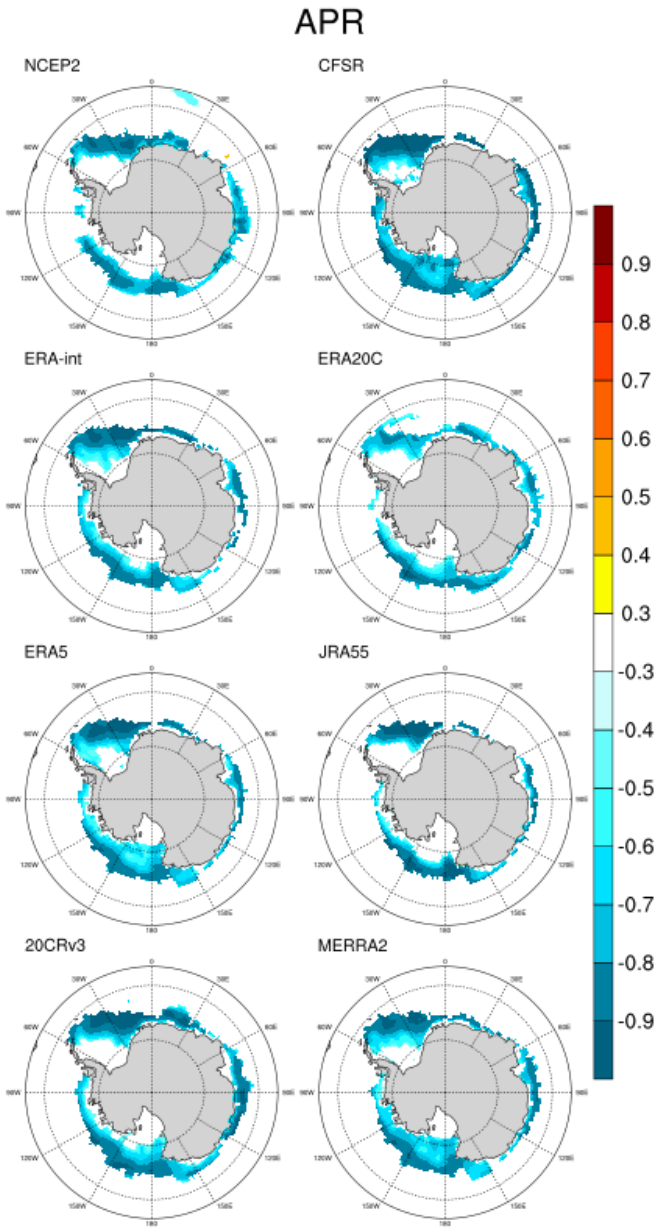

Figure S 28: Correlation coefficient between 1980-2010 April reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

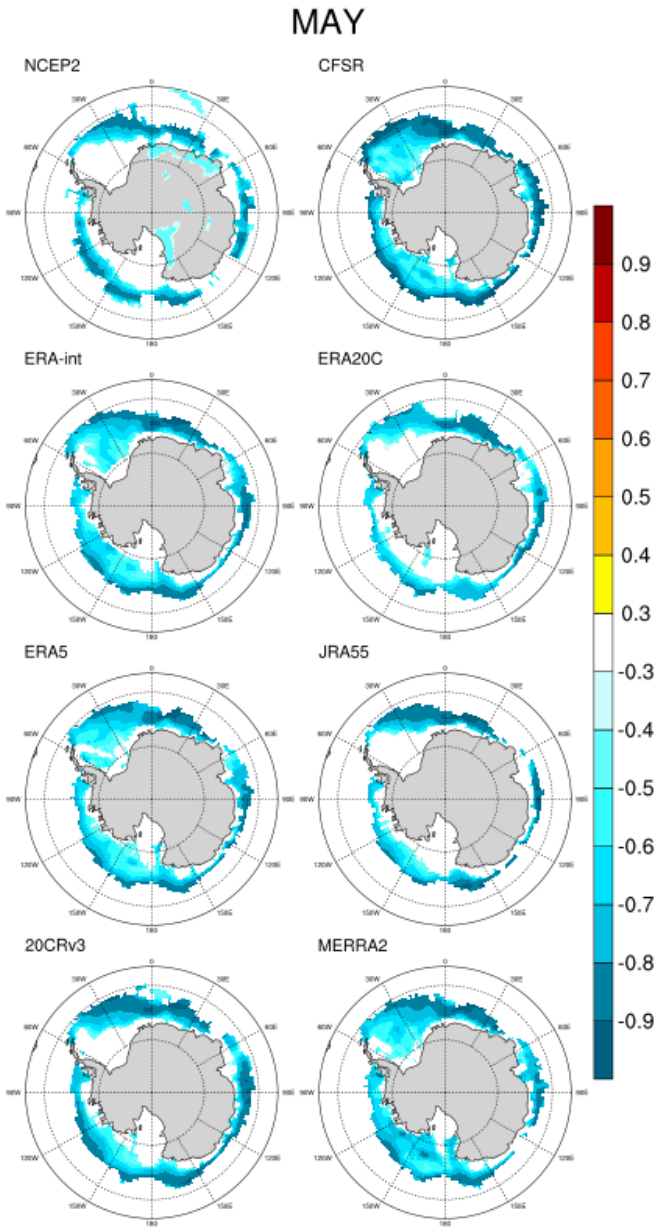

Figure S 29: Correlation coefficient between 1980-2010 May reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

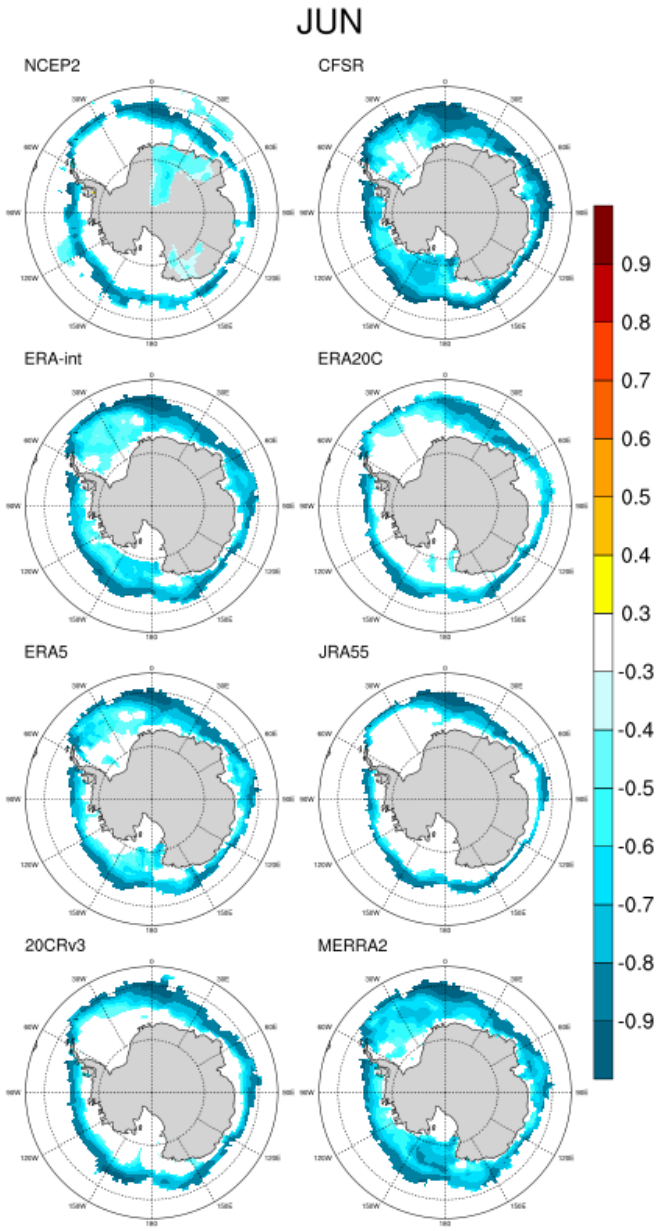

Figure S 30: Correlation coefficient between 1980-2010 June reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

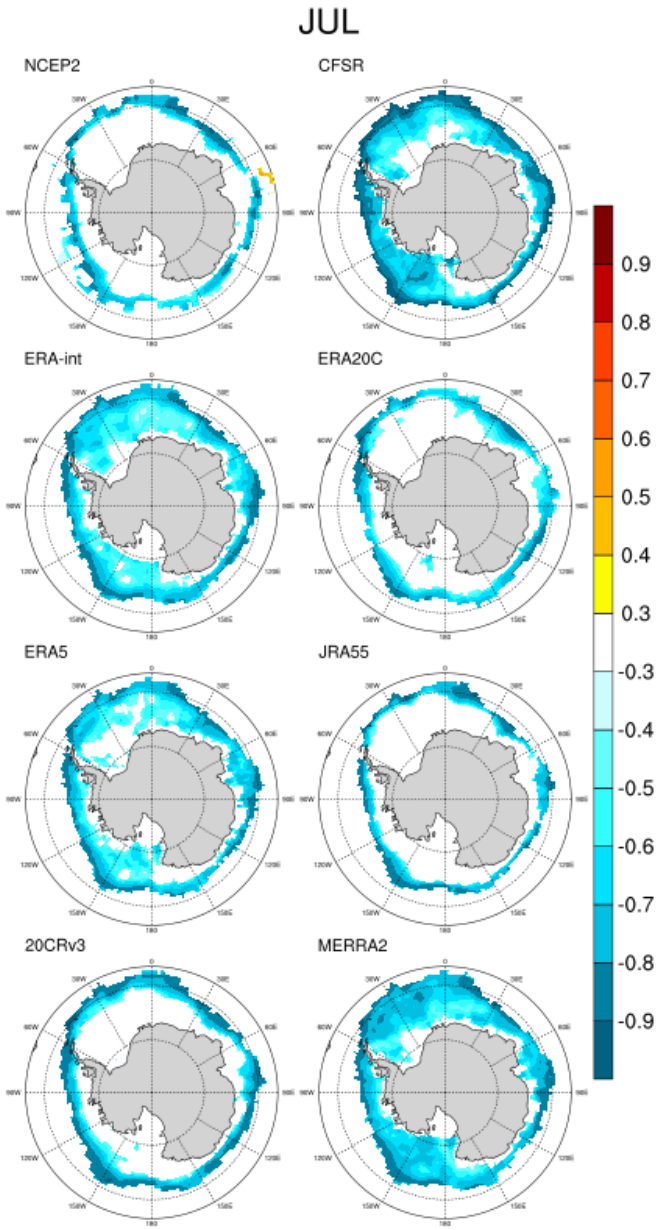

Figure S 31: Correlation coefficient between 1980-2010 July reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

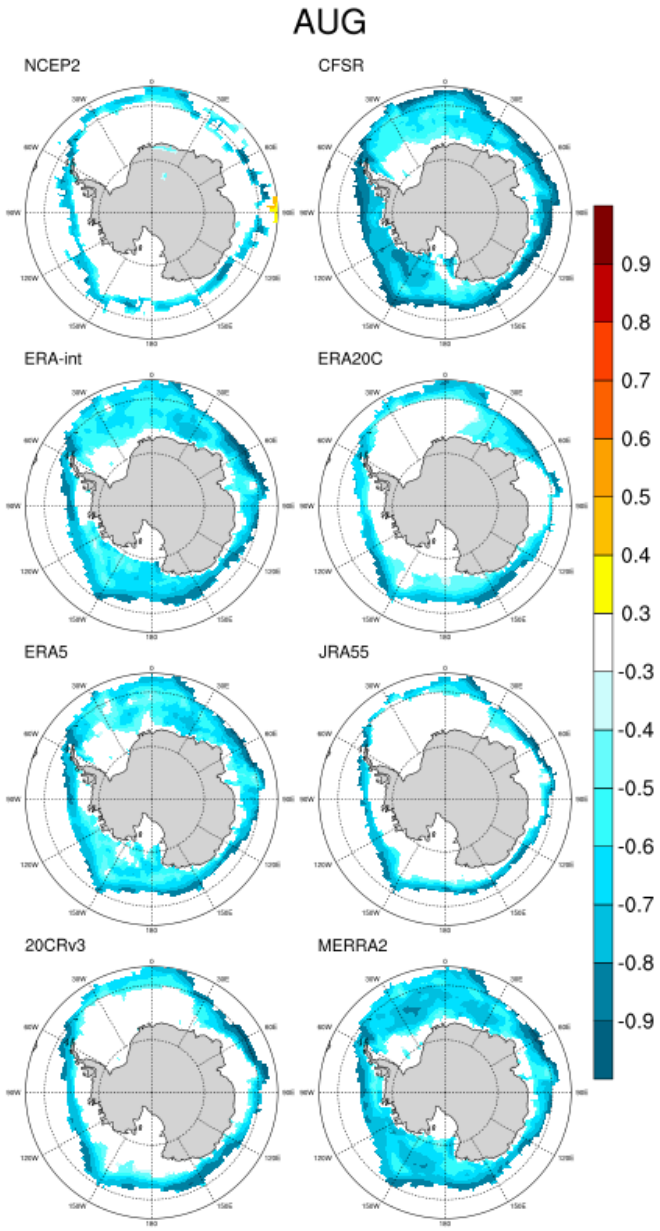

Figure S 32: Correlation coefficient between 1980-2010 August reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

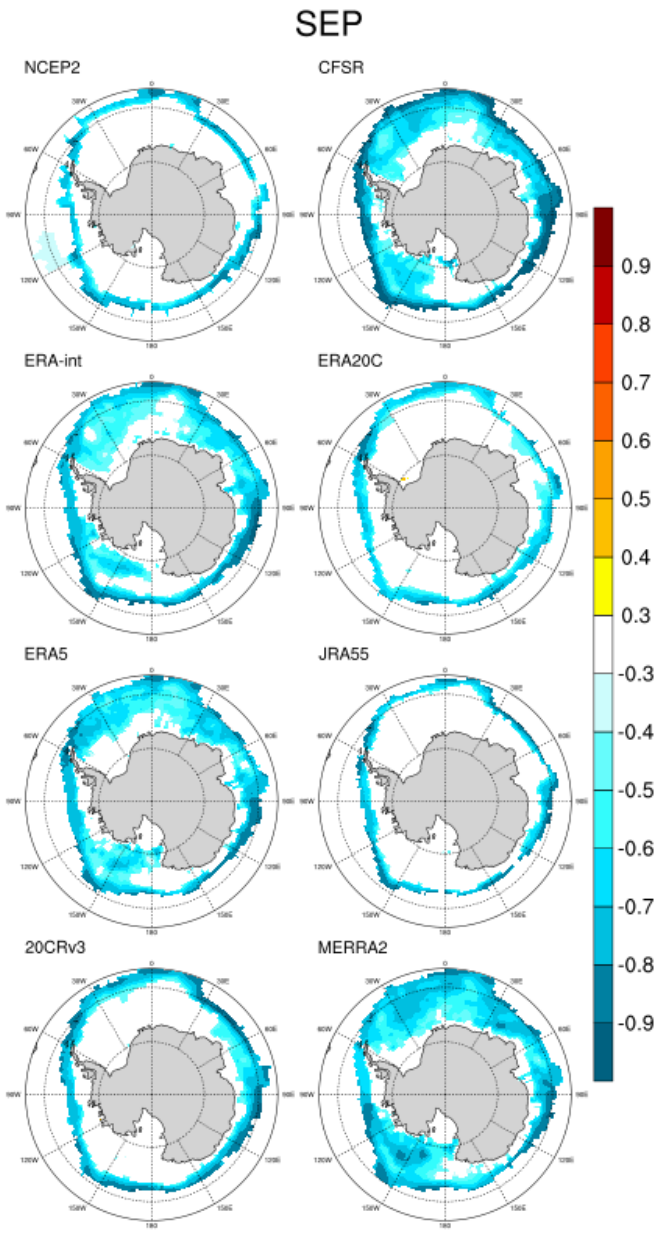

Figure S 33: Correlation coefficient between 1980-2010 September reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

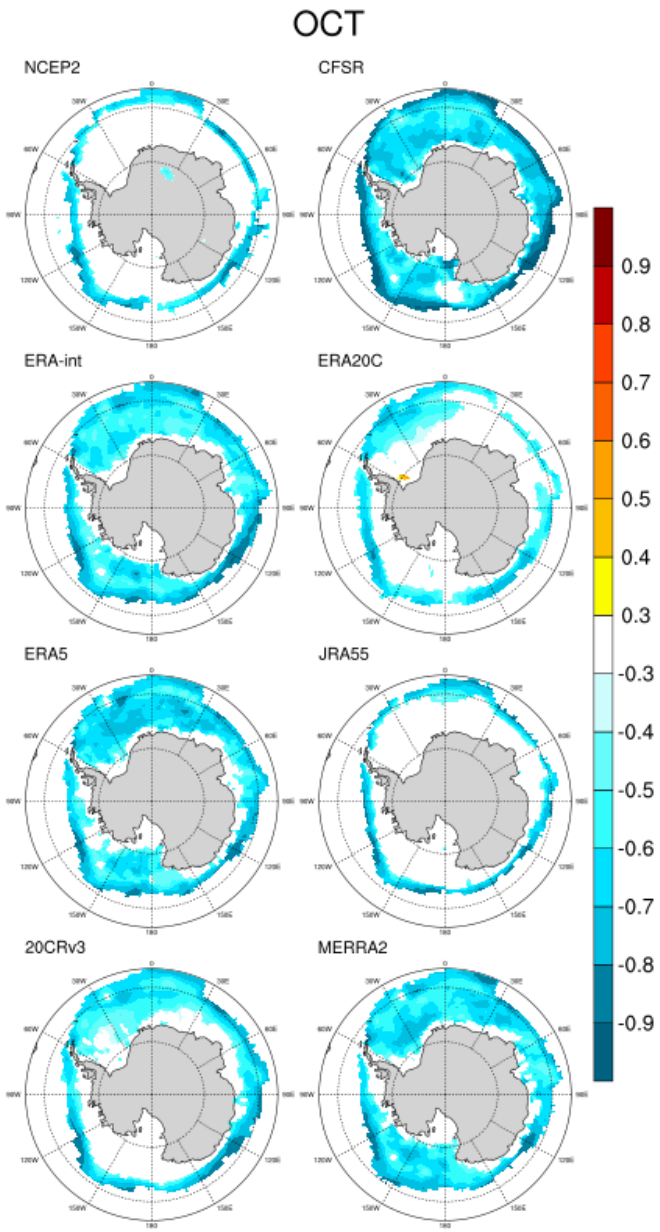

Figure S 34: Correlation coefficient between 1980-2010 October reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

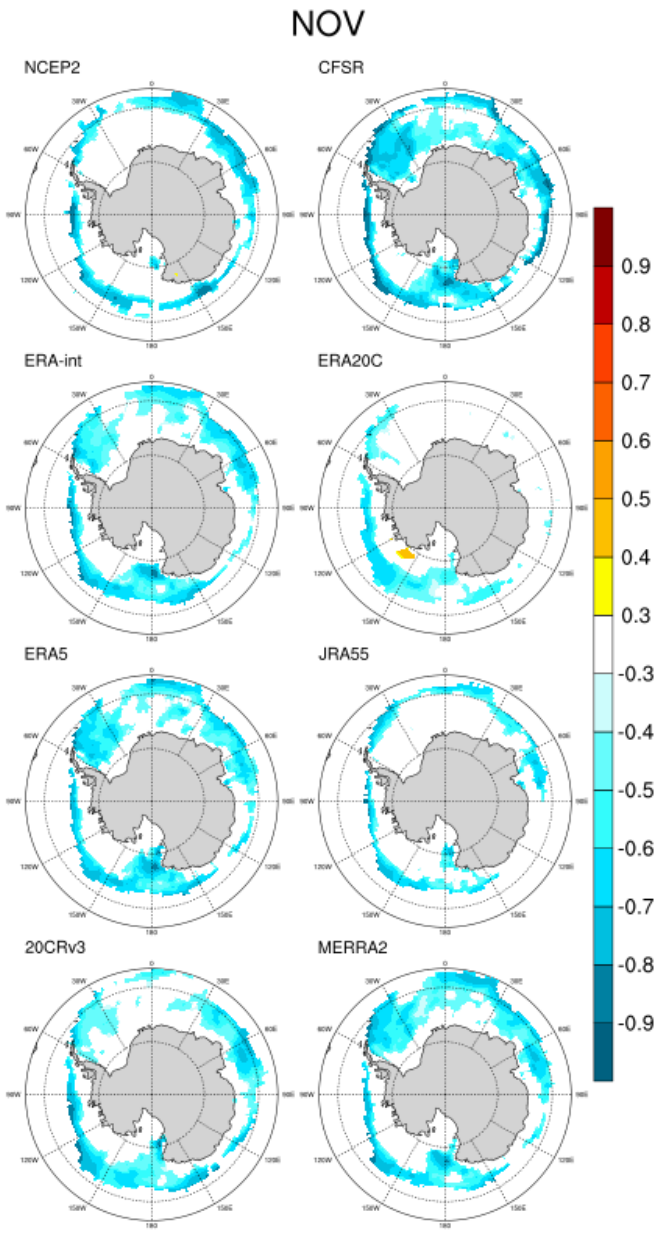

Figure S 35: Correlation coefficient between 1980-2010 November reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.

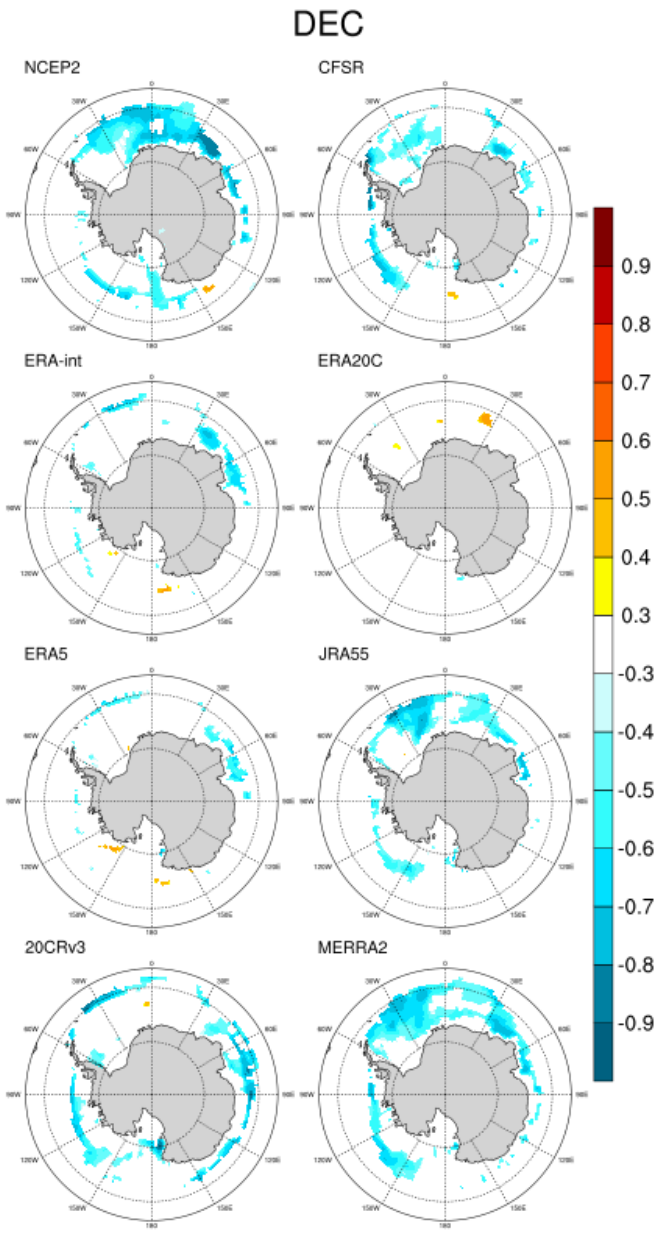

Figure S 36: Correlation coefficient between 1980-2010 December reanalysis SAT and SIC. All data were detrended before correlation; only correlations statistically-significant at the 95% level are plotted.