

1 Figures

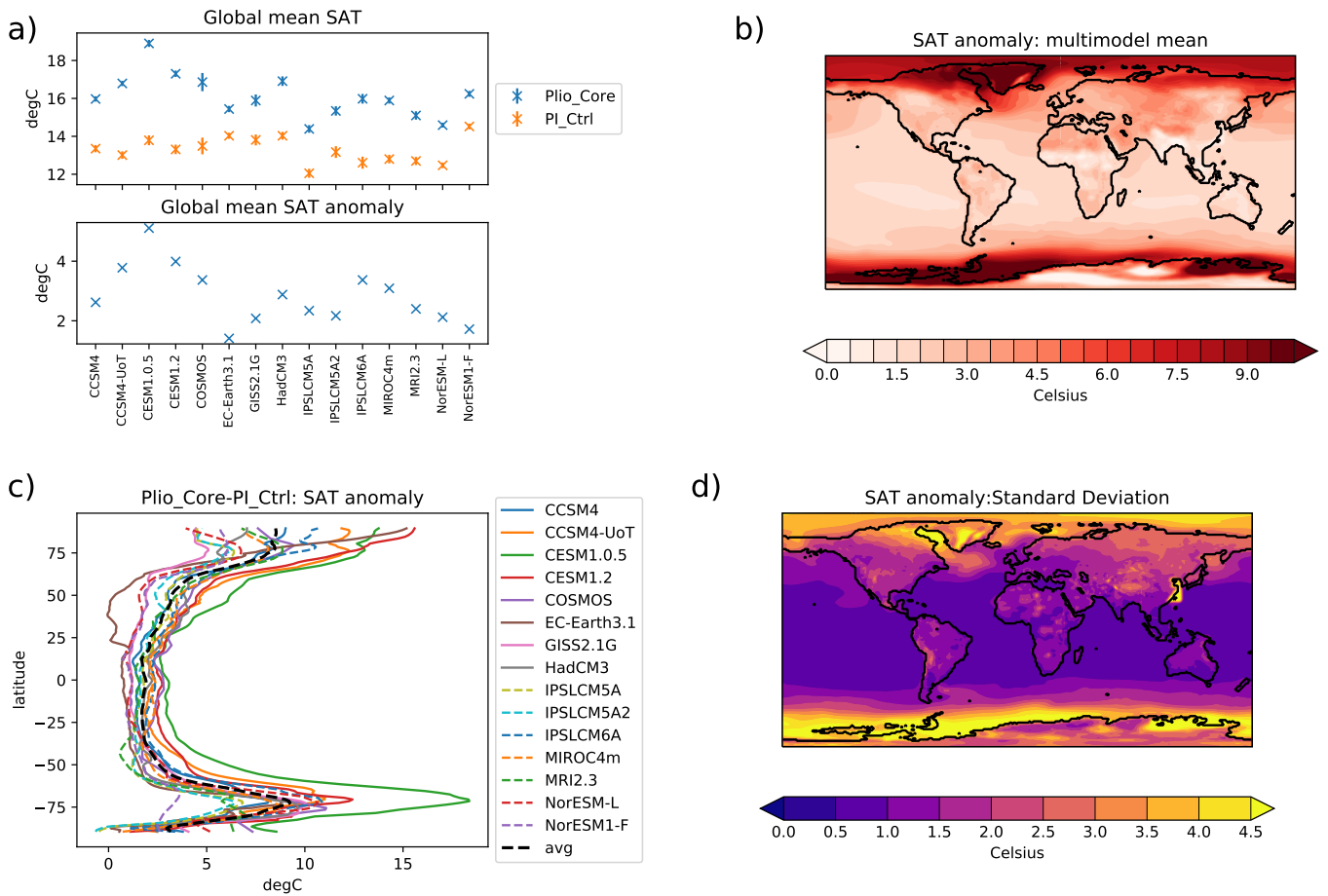


Figure 1: a) Global mean Near Surface Air Temperature [SAT] for the MP and PI from each model [upper panel] and global mean SAT anomaly [lower panel]. b) Multimodel mean SAT Plio_core - PI_Ctrl anomaly. c) Latitudinal mean SAT Plio_core - PI_Ctrl anomaly. d) Intermodel standard deviation for the Plio_core - PI.Ctrl anomaly.

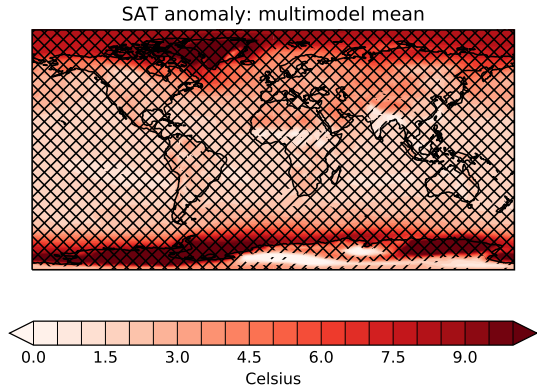


Figure 2: Plio_core - PI_Ctrl SAT multimodel mean anomaly. Gridboxes where at least 12 of the 15 models agree on the sign of the change are marked ‘/’. Gridboxes where the ratio of the multimodel mean SAT change to the PI_Ctrl intermodel standard deviation is greater than 1 are marked ‘\’. Gridboxes where both these conditions are satisfied show a robust signal.

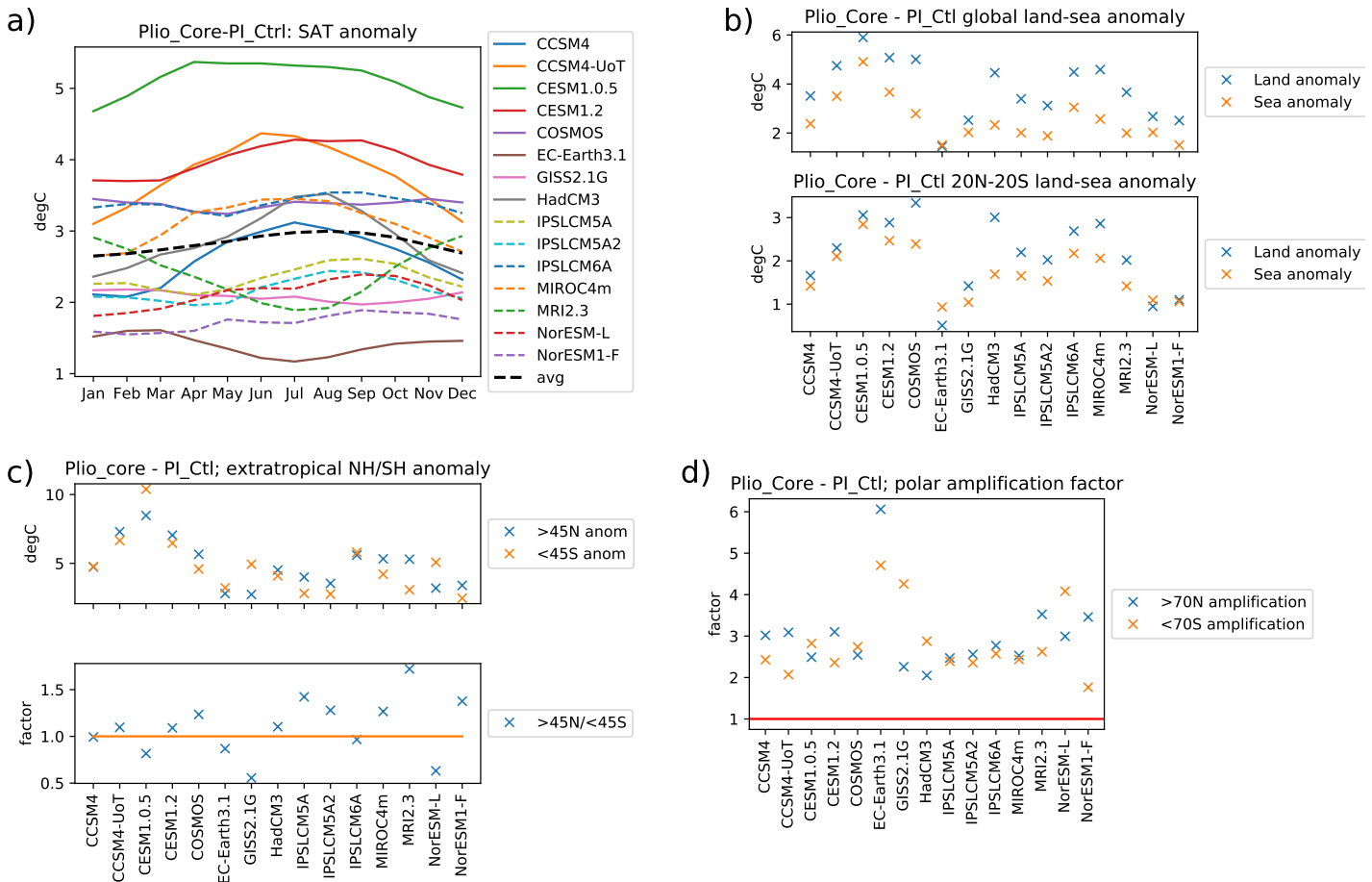


Figure 3: a) Monthly mean Plio_Core - PI_Ctrl SAT anomaly for each model. b) SAT anomaly for land (blue) and sea (orange) from each model averaged over the globe [top panel] and the 20°N-20°S region [lower panel]. c) SAT anomaly for the northern extratropics (blue) and southern extratropics (orange) [top panel] and the ratio between them [lower panel]. d) SAT anomaly poleward of 70° divided by globally averaged SAT anomaly for the NH (blue) and the SH (orange). The red line highlights a ratio of 1 (i.e. no polar amplification).

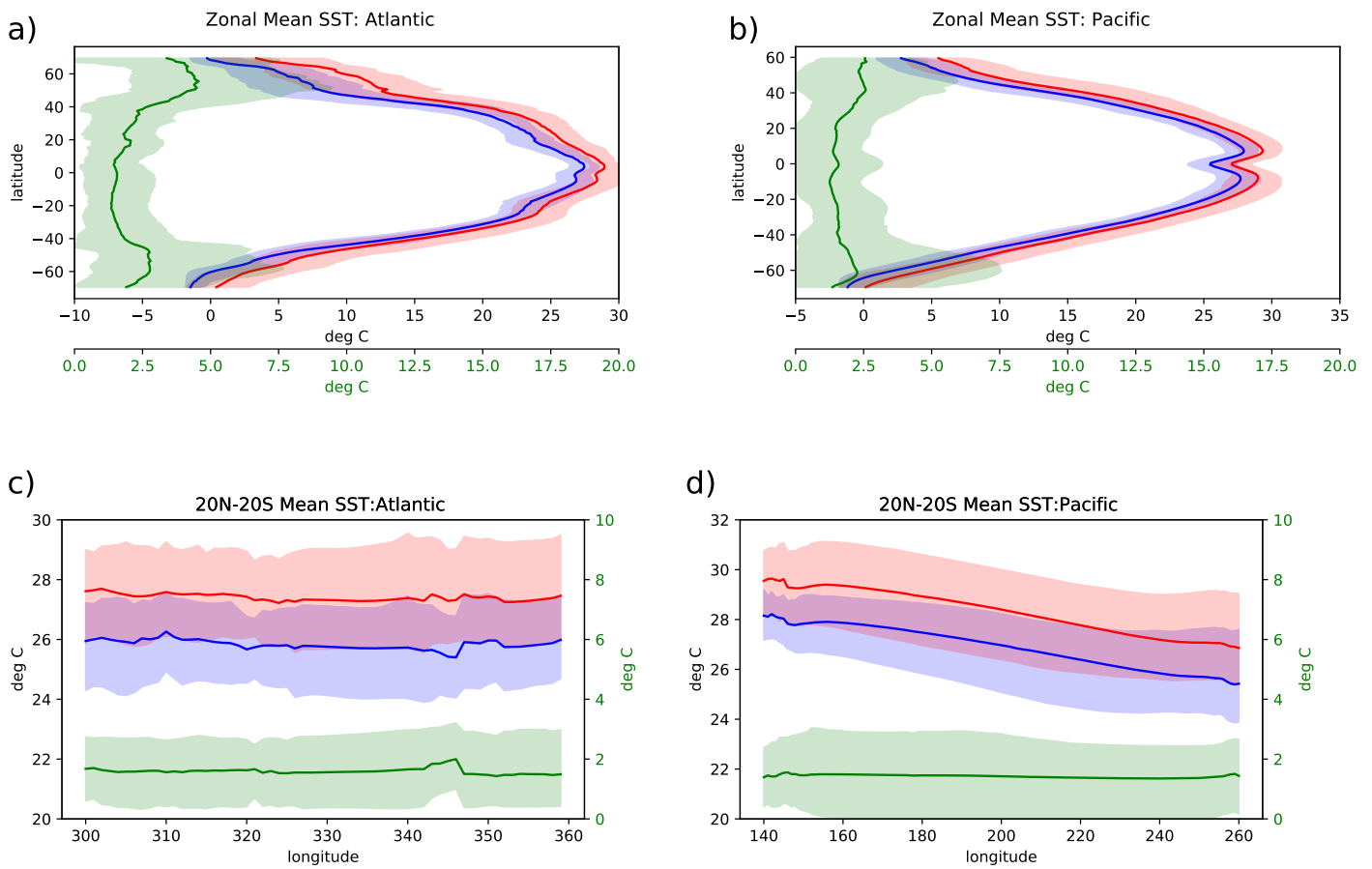


Figure 4: a) and b) show the zonally averaged SST over the Atlantic region (70°W - 0°E) and the Pacific region 150°E - 100°W respectively. c) and d) show the SST averaged between 20°N and 20°S for the Atlantic and Pacific respectively. In all figures blue shows PI_Ctl, red shows Plio_core and green shows the anomaly between them. The solid line shows the multimodel mean, while the shaded area shows the range of modelled values.

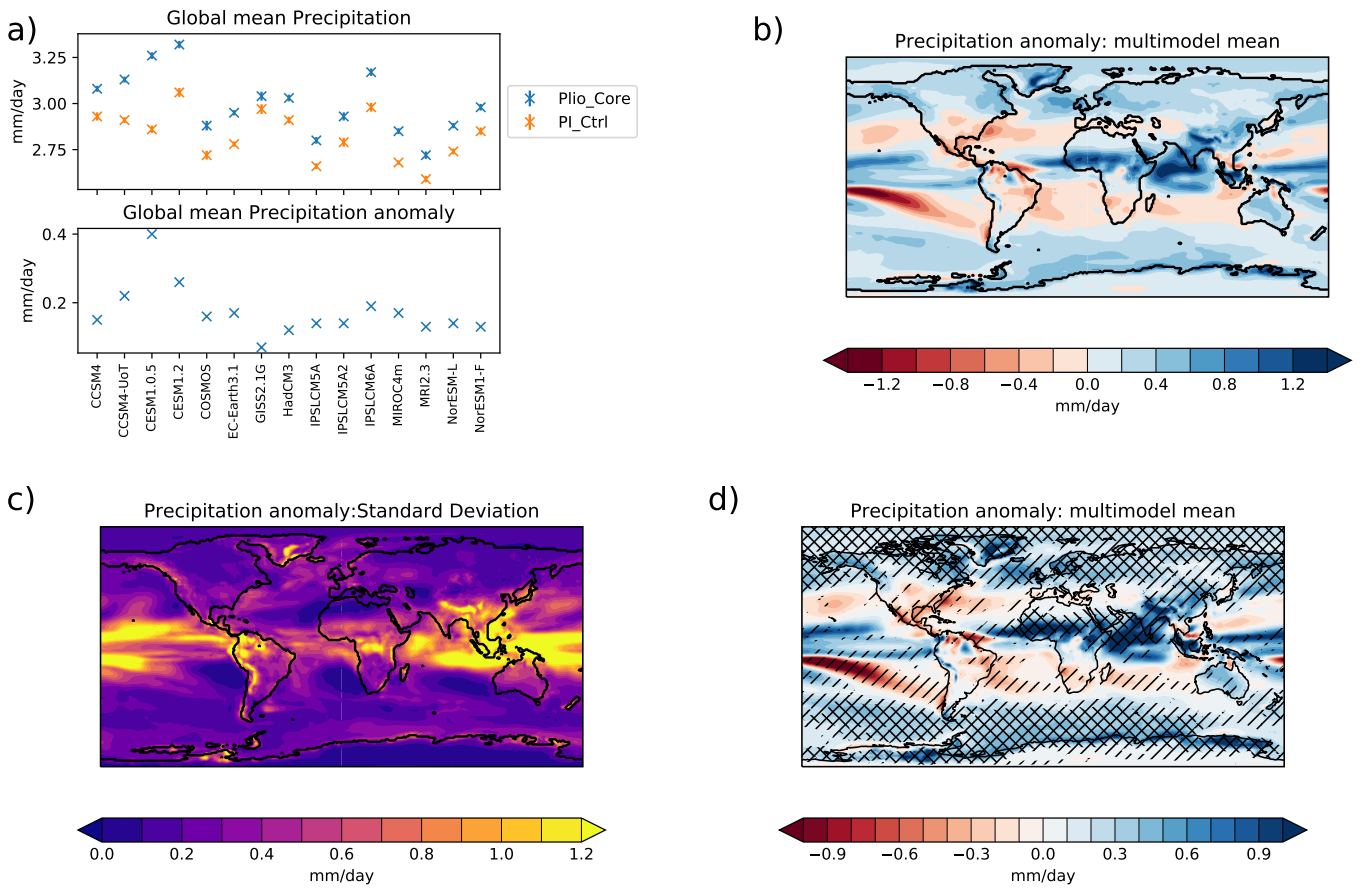


Figure 5: a) Globally averaged precipitation for Plio_core and PI_Ctrl from each model [upper panel] and the anomaly between them [lower panel]. b) Multimodel mean Plio_core - PI_Ctrl precipitation anomaly. c) Standard deviation across the models for the Plio_core - PI_Ctrl Precipitation anomaly. d) Plio_core - PI_Ctrl precipitation anomaly, regions which have at least 12 of the 15 models agreeing on the sign of the change are marked with '/'. Regions which have the ratio of the multimodel mean SAT change to the PI_Ctrl intermodel standard deviation is greater than 1 are marked with '\\'. ' / ' indicates regions where at least 12 of the 15 models agree on the sign of the change. '\\ ' indicates regions where the ratio of the multimodel mean SAT change to the PI_Ctrl intermodel standard deviation is greater than 1.

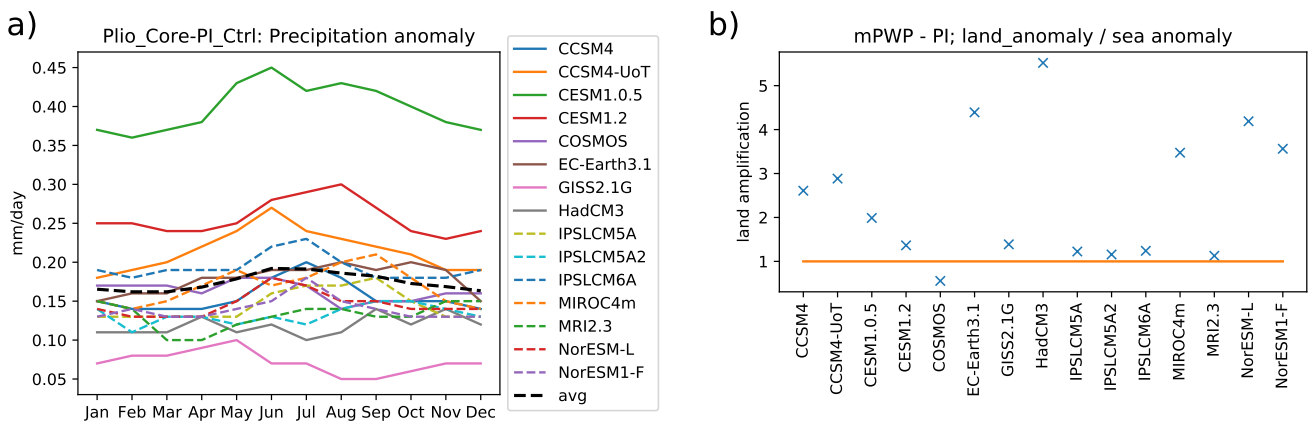


Figure 6: a) shows the globally averaged precipitation anomaly for each model and for each month. b) shows the ratio of the precipitation anomaly over land to the precipitation anomaly over sea (a ratio of 1.0 - where the land precipitation anomaly is the same as the sea precipitation anomaly is shown in orange).

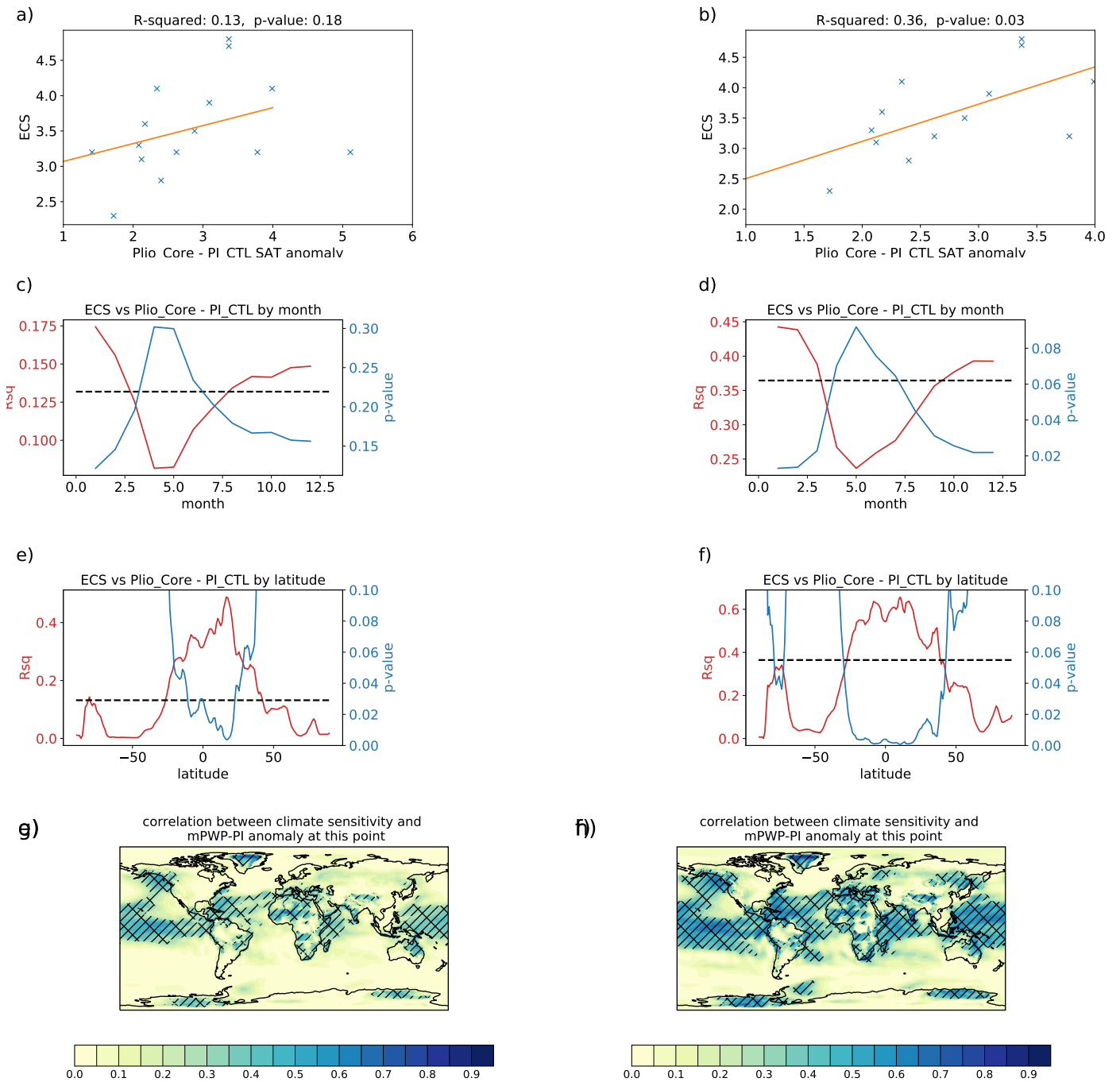


Figure 7: a) and b) the global SAT anomaly for each model vs the published climate sensitivity. c) and d) statistical relationships between the published climate sensitivity and the monthly averaged SAT anomaly across the models. The proportion of climate sensitivity that can be explained by the SAT anomaly in each month (R_{sq}) is shown in red, while the probability that there is no correlation between the climate sensitivity and the SAT anomaly (p) is shown in blue. e) and f) are as c) and d) however climate sensitivity has been correlated with the zonally averaged SAT anomaly. e) and f) colors show the proportion of climate sensitivity across the models that can be explained by the SAT anomaly at any given gridsquare (R_{sq}). Hatching shows a significant relationship (at the 5% confidence level) between SAT anomaly at that gridsquare and climate sensitivity. Subfigures on the left show results for all the models, while subfigures on the right calculate the statistics after excluding the models which show the largest and smallest SAT anomalies.

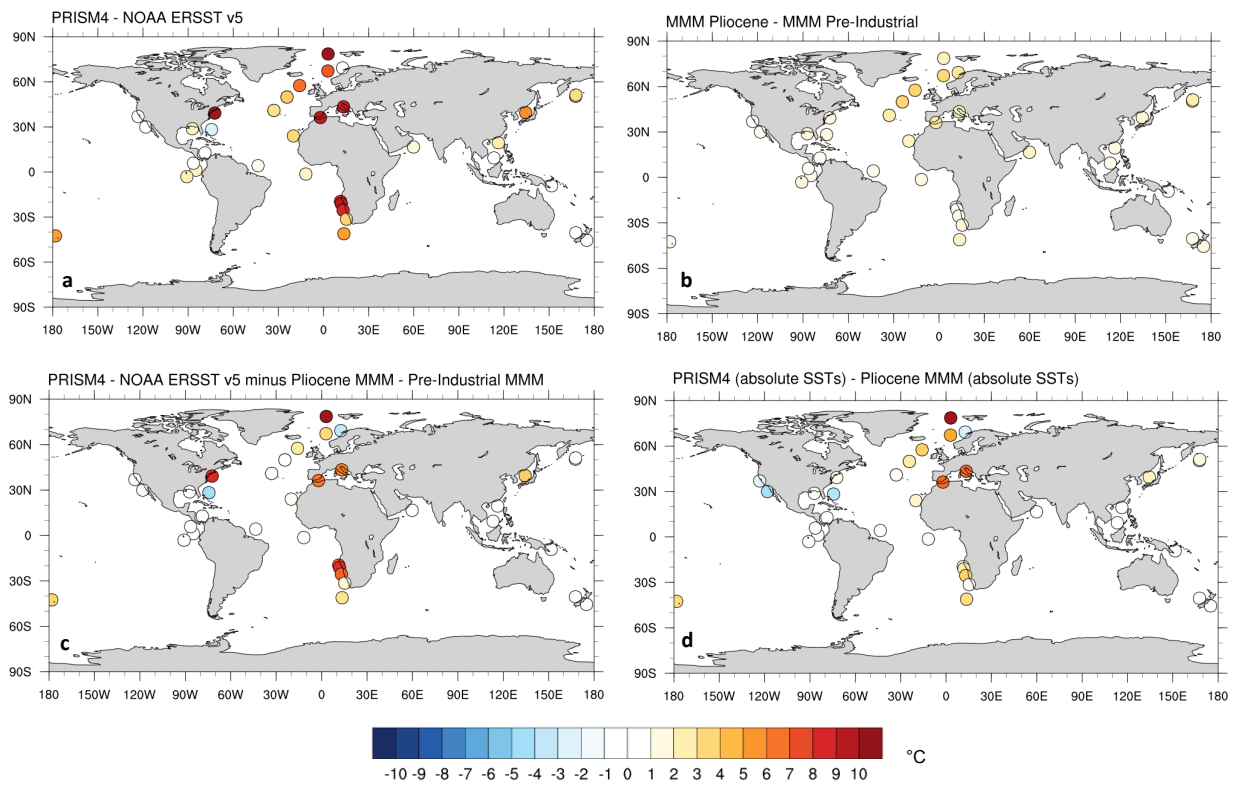


Figure 8: a) PRISM4 - NOAA ERSSTv5 SST anomaly for the datapoints described in section 4. b) multimodel mean Plio_Core - PI_Ctl SST anomaly at the points where data are available. c) The difference between the SST anomaly derived from the models (figure8b) and that obtained from the data (figure 8a). d) the PRISM4 SST data minus the Plio_Core multimodelmean