Signal, noise and skill in sub-seasonal forecasts: the role of teleconnections

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Supplementary Materials

Table S1: *Spatial correlation coefficients between the changes in the forecast skill (Δρ) and changes in the forecast properties ($\Delta\sigma_{EM}^2$, $\Delta\sigma_{ES}^2$, ΔSTN, $\Delta\rho_{perf}$) for T2M in the relaxation experiments.*

	TROP				STRAT			
	$\Delta\sigma_{EM}^2$	$\Delta\sigma_{ES}^2$	ΔSTN	$\Delta\rho_{perf}$	$\Delta\sigma_{EM}^2$	$\Delta\sigma_{ES}^2$	ΔSTN	$\Delta\rho_{perf}$
Weeks 1-2	-0.03	-0.05	0.25	0.42	0.04	-0.09	-0.03	0.01
Weeks 3-4	0.10	-0.06	0.44	0.51	0.29	-0.15	0.16	0.28
Weeks 5-6	0.03	-0.23	0.34	0.36	0.14	0.00	0.08	0.16

Table S2: *Spatial correlation coefficients between the changes in the forecast skill (Δρ) and changes in the forecast properties ($\Delta\sigma_{EM}^2$, $\Delta\sigma_{ES}^2$, ΔSTN, $\Delta\rho_{perf}$) for TP in the relaxation experiments.*

	TROP				STRAT			
	$\Delta\sigma_{EM}^2$	$\Delta\sigma_{ES}^2$	ΔSTN	$\Delta\rho_{perf}$	$\Delta\sigma_{EM}^2$	$\Delta\sigma_{ES}^2$	ΔSTN	$\Delta\rho_{perf}$
Weeks 1-2	0.06	-0.12	0.15	0.13	0.01	-0.03	0.02	0.04
Weeks 3-4	0.26	-0.26	0.33	0.34	0.02	0.02	0.07	0.07
Weeks 5-6	0.33	-0.22	0.39	0.40	0.08	-0.08	0.14	0.15
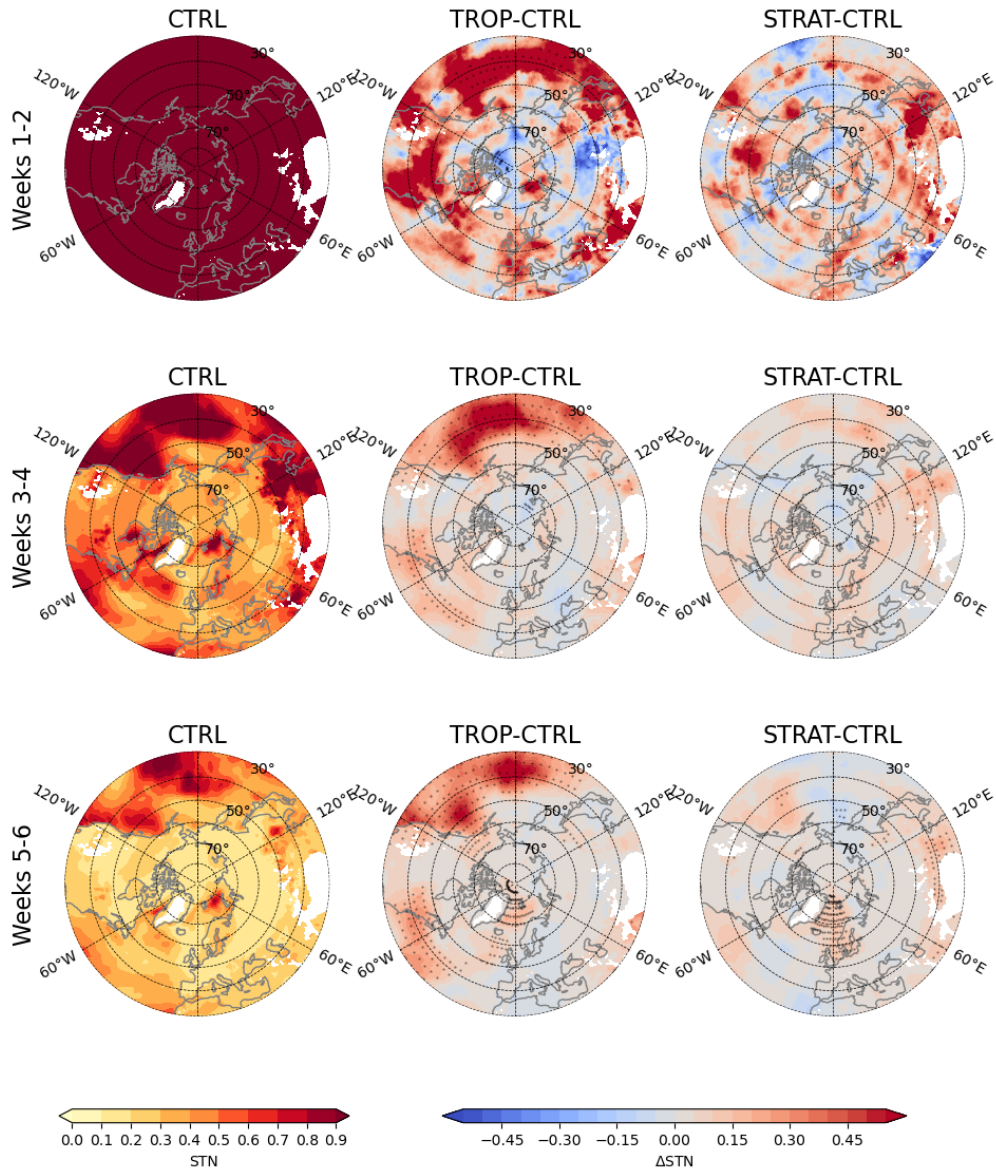
Figure S1: *Signal to noise ratio (STN) for bi-weekly mean T2M anomalies for (left) CTRL; and the differences between ρ in (center) TROP and (right) STRAT experiments with respect to CTRL. Stippling in (center, right) indicates significant differences between CTRL and the respective relaxation experiments.*
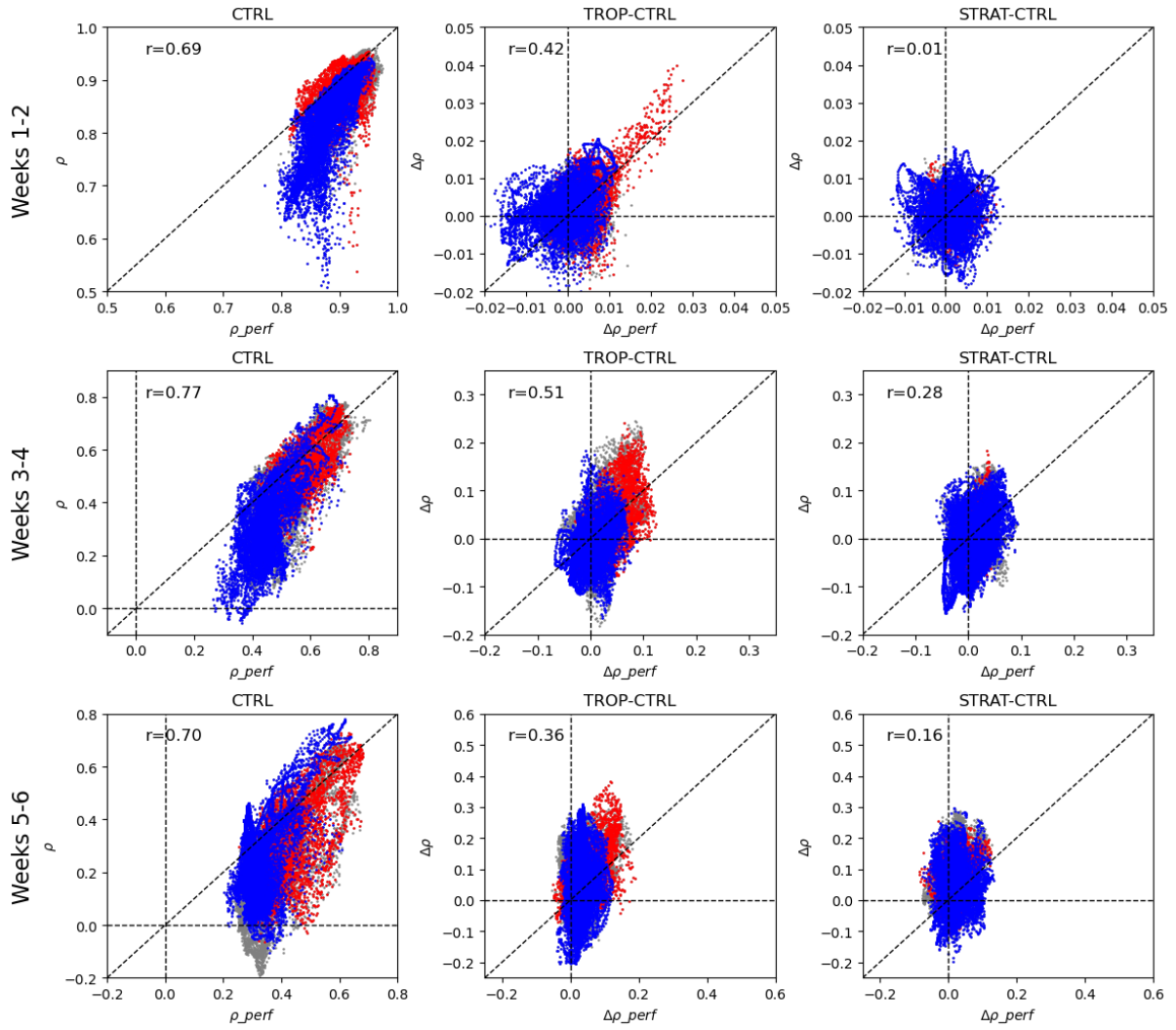
Figure S2: *Scatterplots between ρ and ρ_{perf} for T2M anomalies at each grid point between 30°N and 90°N. 2nd and 3rd columns show differences for ρ and ρ_{perf} between relaxation experiments (TROP and STRAT respectively) and CTRL. r-values show spatial correlation coefficients between ρ and ρ_{perf} fields. Red dots mark grid points south of 40°N, blue dots mark grid points north of 60°N, and grey dots mark grid points between 40°N-60°N.*
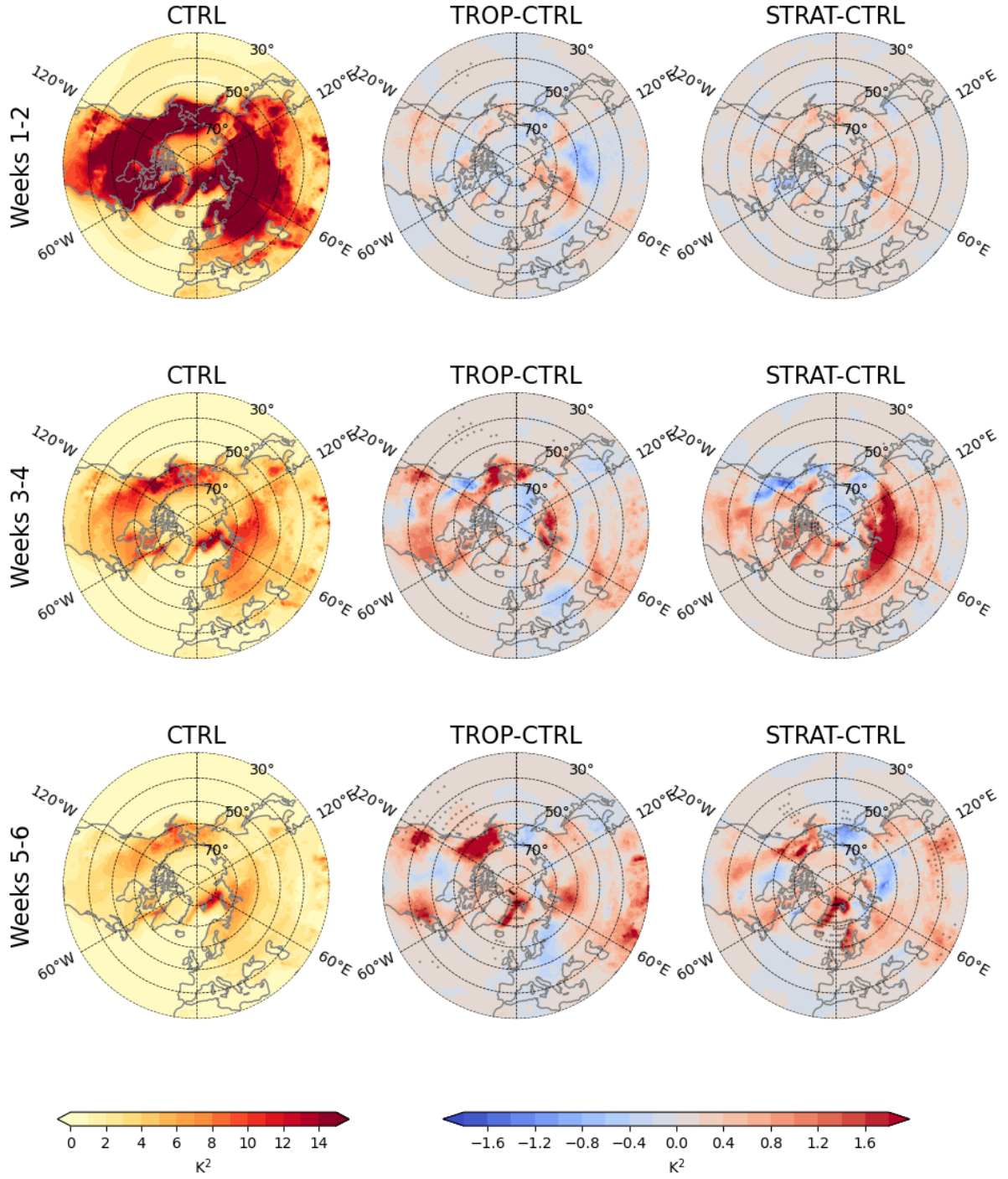
Figure S3: *Variability of ensemble mean (σ^2_{EM}) for bi-weekly mean T2M anomalies for (left) CTRL; and the differences between σ^2_{EM} in (center) TROP and (right) STRAT experiments with respect to CTRL. Stippling in (center, right) indicates significant differences between CTRL and the respective relaxation experiments.*
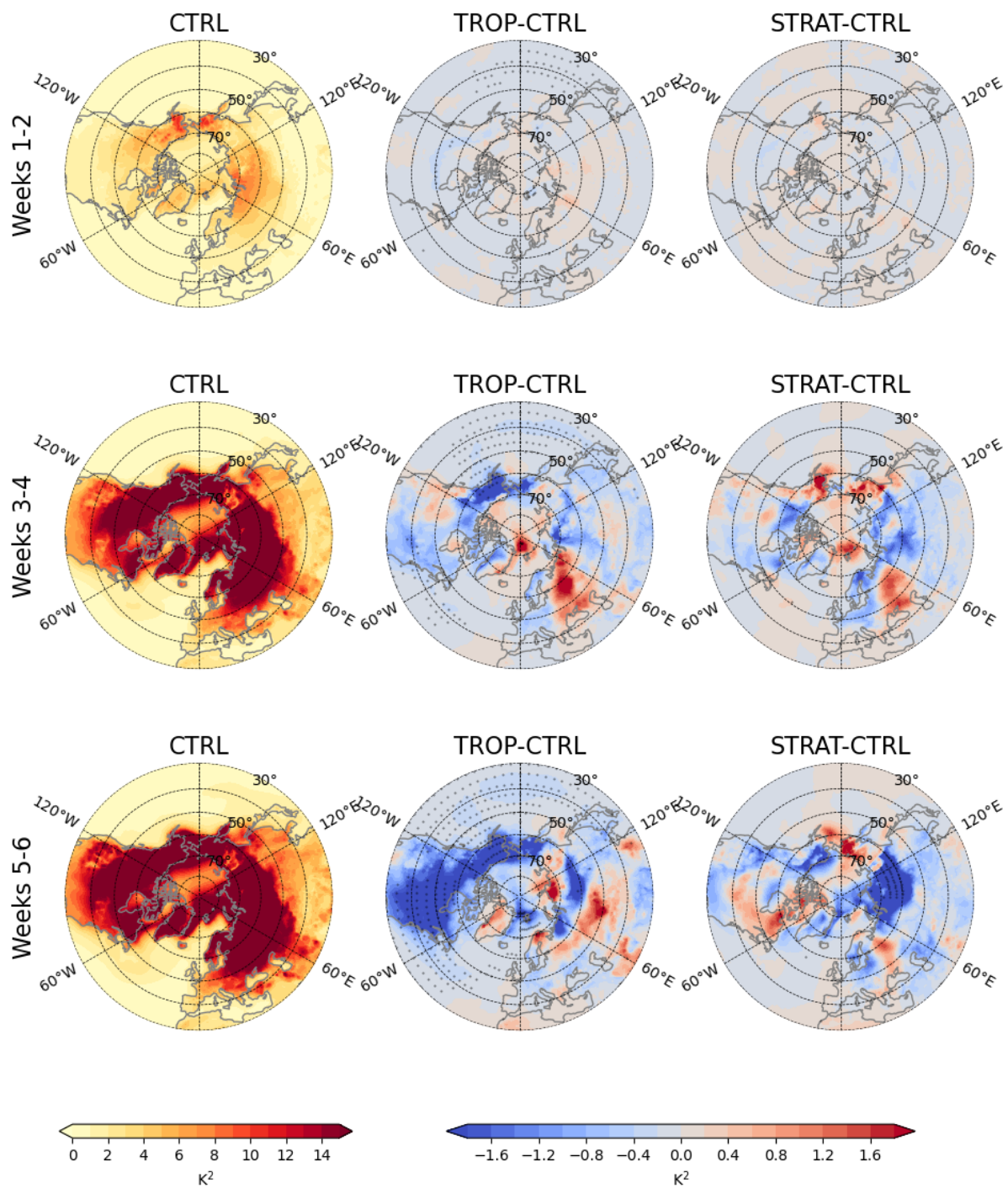
Figure S4: *Ensemble spread (σ_{ES}^2) for bi-weekly mean T2M anomalies for (left) CTRL; and the differences between σ_{ES}^2 in (center) TROP and (right) STRAT experiments with respect to CTRL. Stippling in (center, right) indicates significant differences between CTRL and the respective relaxation experiments.*
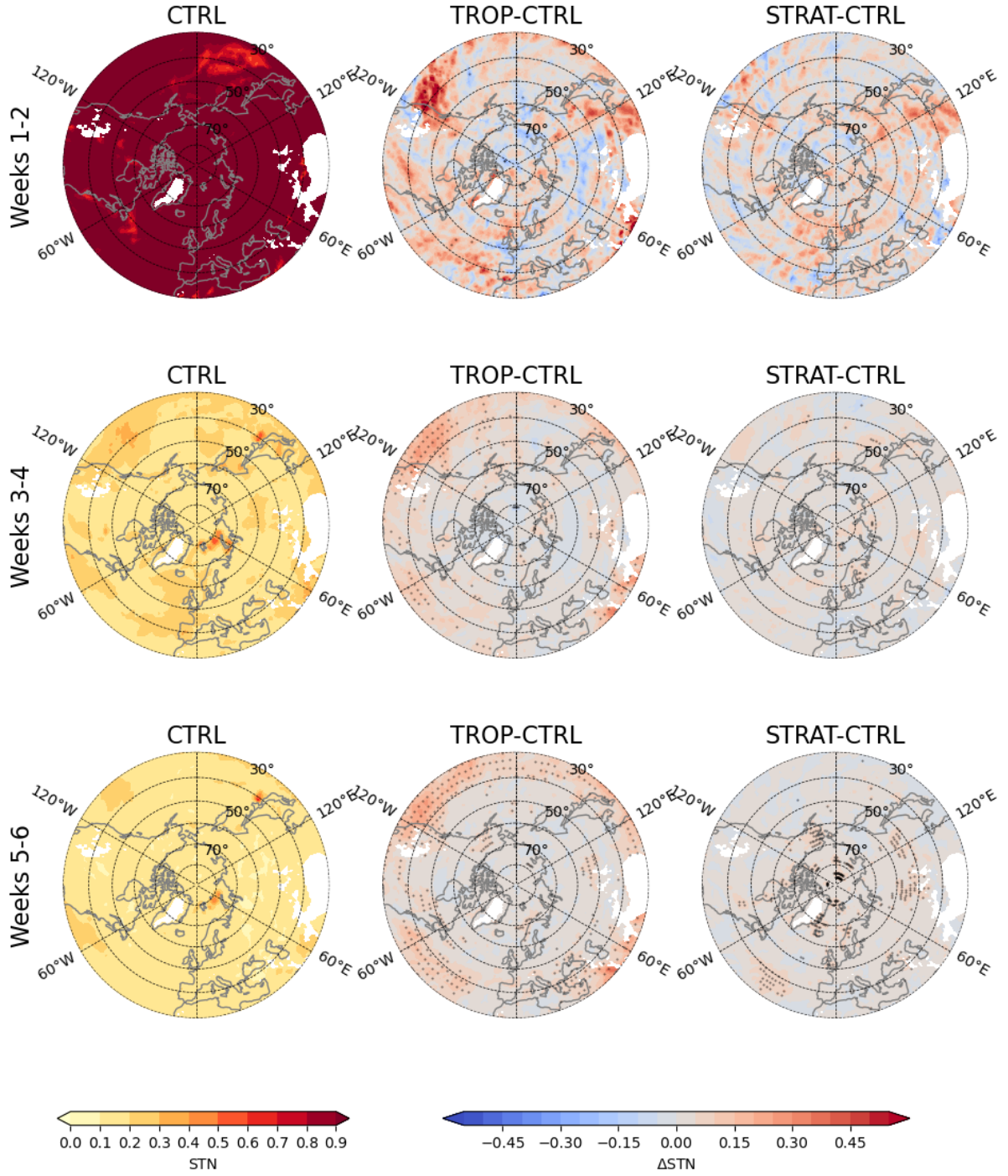
Figure S5: *Signal to noise ratio (STN) for bi-weekly mean TP anomalies for (left) CTRL; and the differences between ρ in (center) TROP and (right) STRAT experiments with respect to CTRL. Stippling in (center, right) indicates significant differences between CTRL and the respective relaxation experiments.*
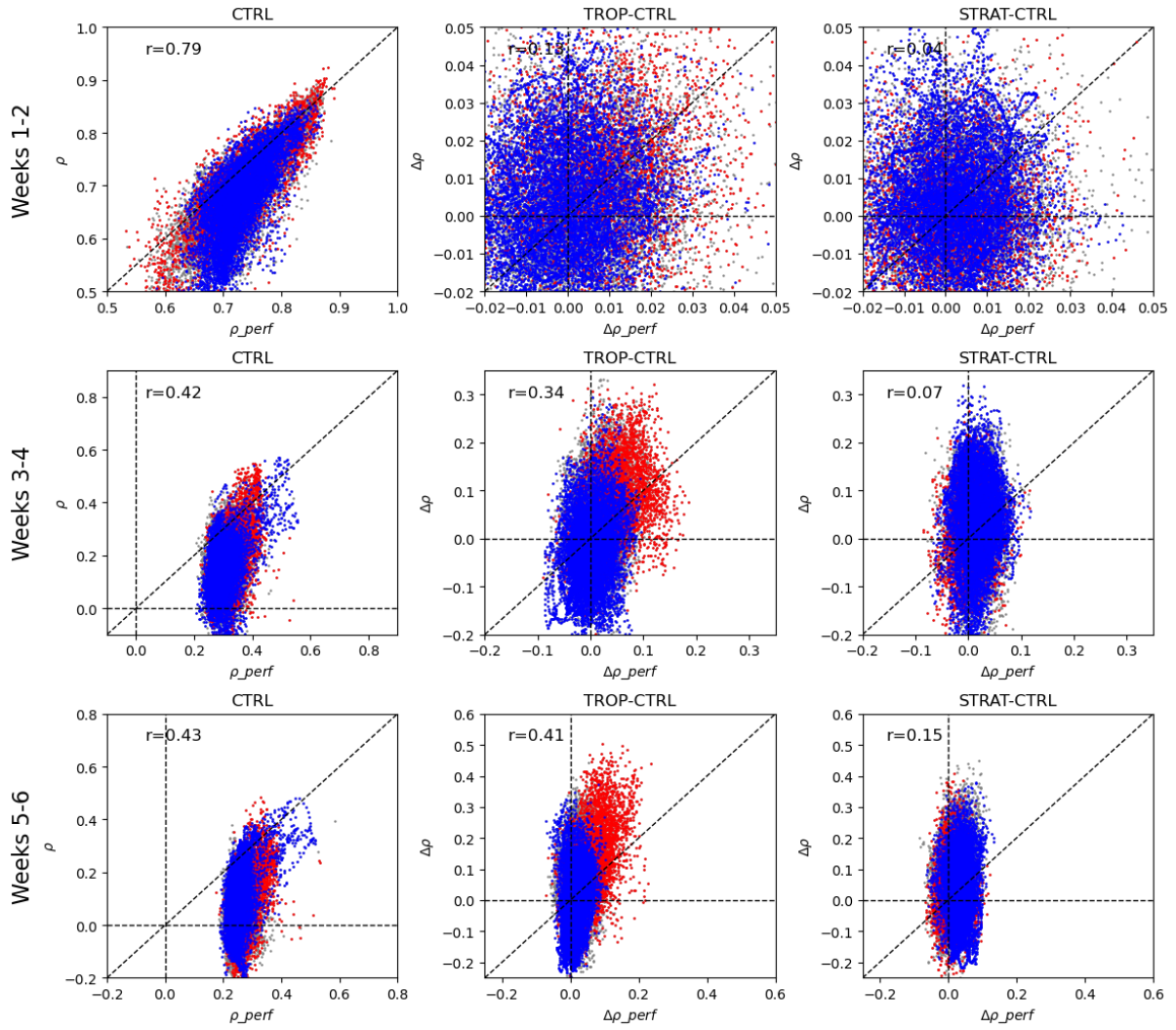
Figure S6: *Scatterplots between ρ and ρ_perf for TP anomalies at each grid point between 30 N and 90 N. 2nd and 3rd columns show differences for ρ and ρ_perf between relaxation experiments (TROP and STRAT respectively) and CTRL. r-values show spatial correlation coefficients between ρ and ρ_perf fields. Red dots mark grid points south of 40 N, blue dots mark grid points north of 60 N, and grey dots mark grid points between 40 N-60 N.*
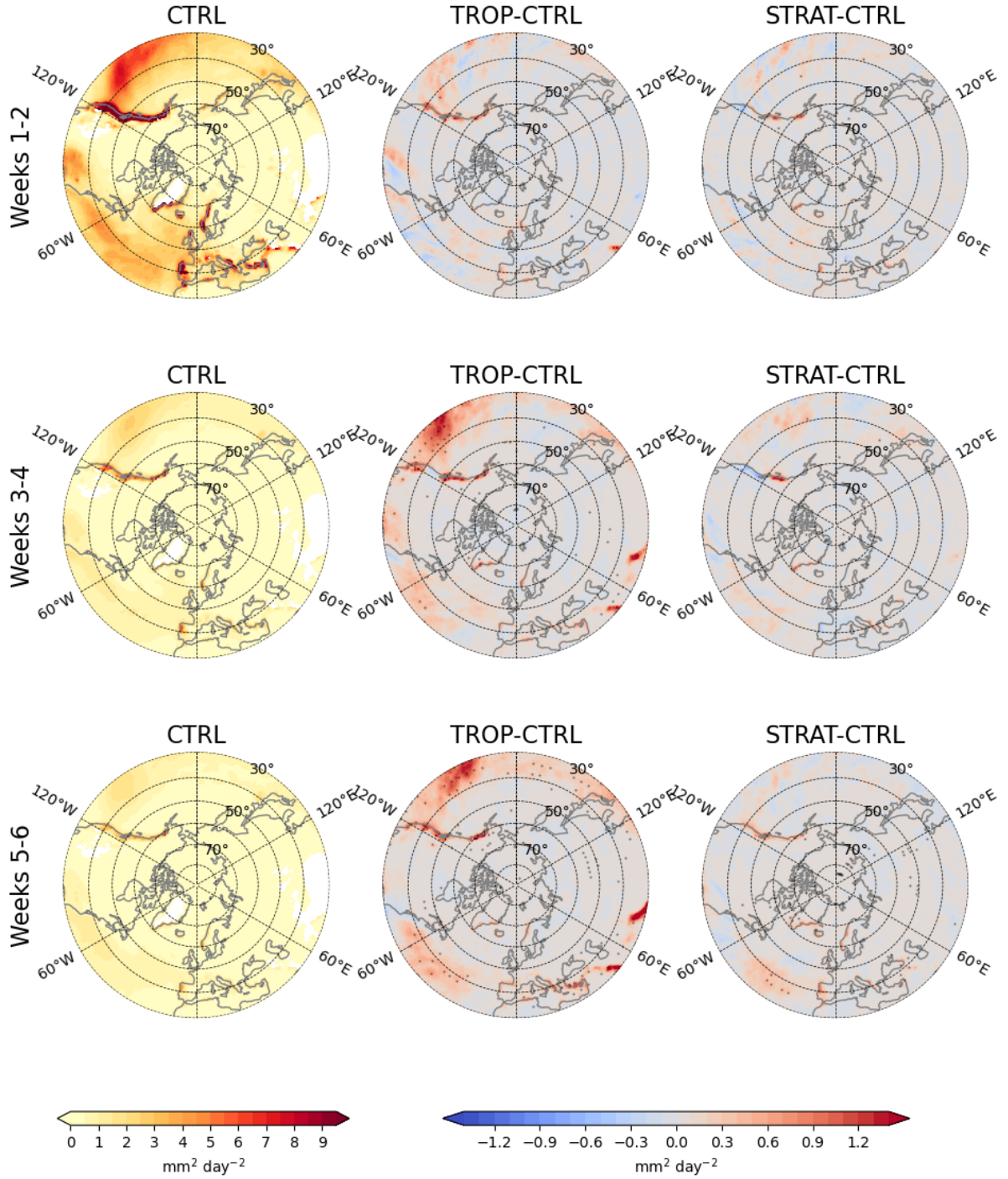
Figure S7: *Variability of ensemble mean (σ_{EM}^2) for bi-weekly mean TP anomalies for (left) CTRL; and the differences between σ_{EM}^2 in (center) TROP and (right) STRAT experiments with respect to CTRL. Stippling in (center, right) indicates significant differences between CTRL and the respective relaxation experiments.*
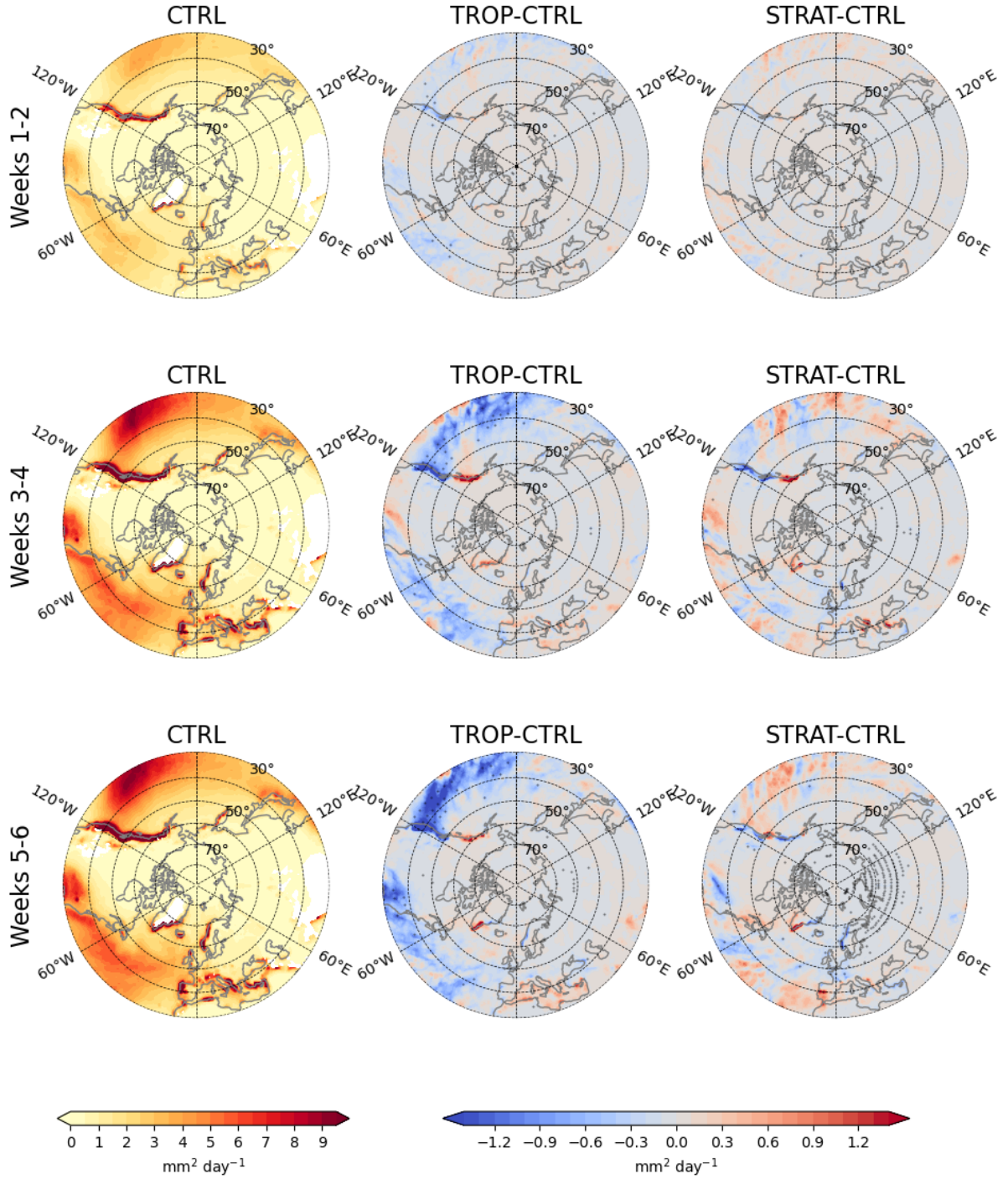
Figure S8: *Ensemble spread (σ_{ES}^2) for bi-weekly mean TP anomalies for (left) CTRL; and the differences between σ_{ES}^2 in (center) TROP and (right) STRAT experiments with respect to CTRL. Stippling in (center, right) indicates significant differences between CTRL and the respective relaxation experiments.*