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2 **Supplementary Information for**

3 **The Role of Baroclinic Activity in Controlling Earth's Albedo in the Present and Future** 4 **Climates**

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8 **This PDF file includes:**

9 Figs. S1 to S3

10 Tables S1 to S2

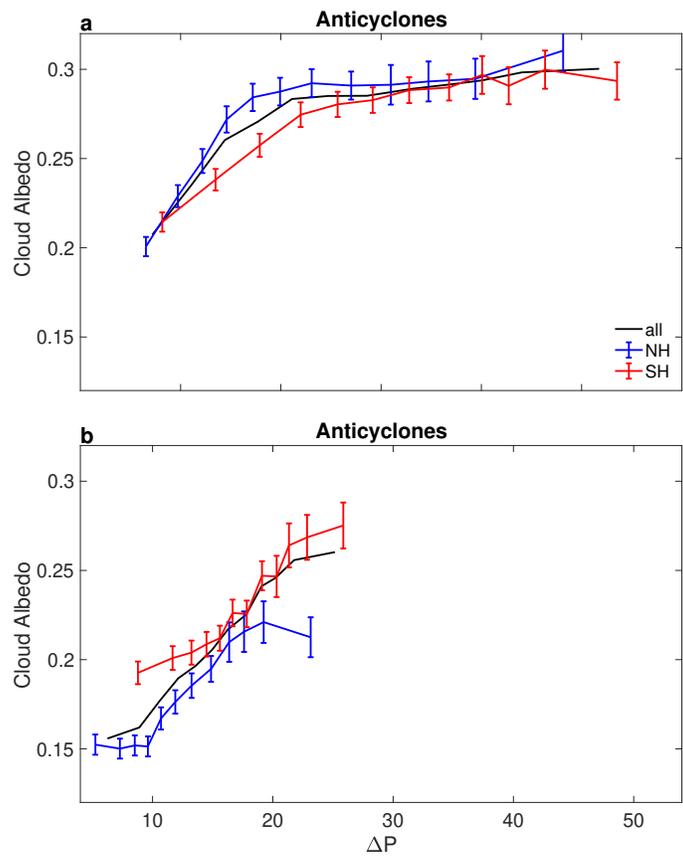


Fig. S1. As Fig. 3a,b but for a composite box of ± 560 in the meridional and ± 600 in the zonal.

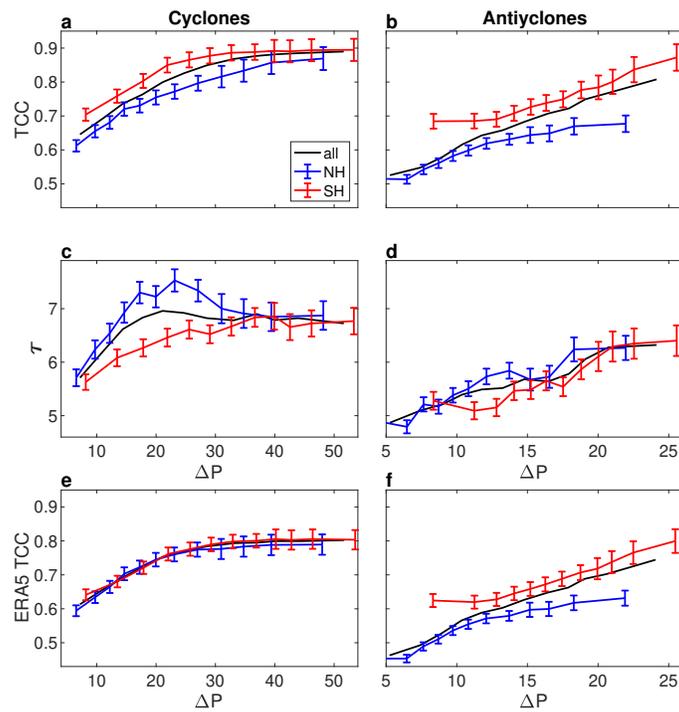


Fig. S2. Composite mean CERES total cloud cover (TCC, a,b), and optical thickness (τ , c,d) and ERA5 TCC (e,f) as a function of cyclone (a,c,e) and anticyclone (b,d,f) intensity (hPa surface anomaly). Each point represents the mean of the 10, 20, 30, 40, 50, 60, 70, 85, 80, 90, and 95 percentiles for all storms (black), and for the NH and SH (blue and red, respectively). Cyclone and anticyclone tracks are based on ERA5 data (as described in Materials and Methods). Error-bars are defined as one SD from the mean value. Composite average area is as defined in the Materials and Methods section.

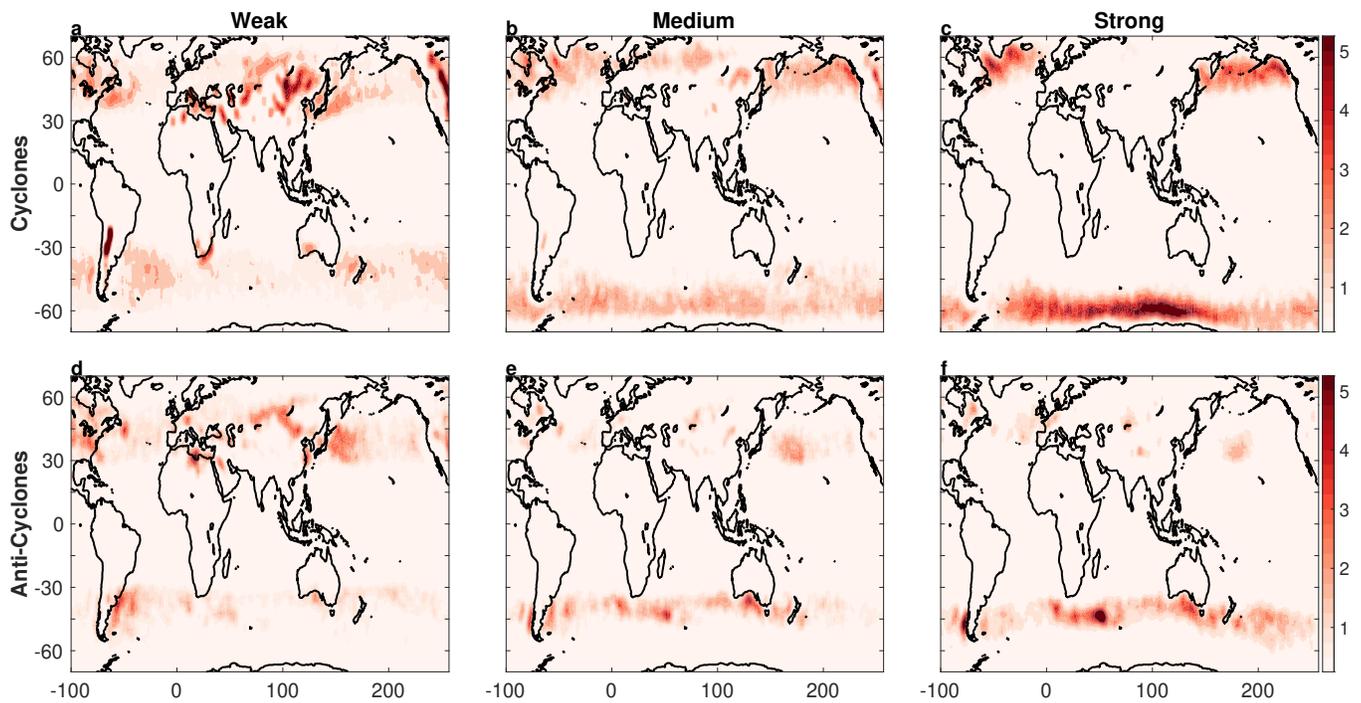


Fig. S3. Cyclone and anticyclone (a-c and d-f, respectively) density of maximum intensity position (tracks/°²) for weak (a,d) Medium (b,e) and strong (c,f) eddies. The position of the cyclone was chosen as their position at maximum intensity. Storm track data is taken from ERA5 between the years 1980-2019.

Table S1. Parameter values for the functions in Eq. 2. The values were found by fitting to the cyclone and anticyclone cloud albedo-strength curves (Fig. 3a,b).

Function	a	b	c
1. σ	0.28	0.10	-3.0
2. λ	0.065	0.93	

Table S2. The 13 Coupled Model Intercomparison Project 6 (CMIP6) models that were used in Fig .4. In all models, the high emissions Shared Socioeconomic Pathway 5-8.5 (SSP5-8.5) scenario is used.

	Model Name	Horizontal resolution (longitude ° × latitude °)
1	ACCESS-CM2	1.9°×1.3°
2	BCC-CSM2-MR	1.1°×1.1°
3	CMCC-CM2-SR5	0.9° × 1.25°
4	EC-Earth3	0.7°×0.7°
5	IPSL-CM6A-LR	2.5°×1.27°
6	KIOST-ESM	1.9°×1.9°
7	MIROC6	1.4°×1.4°
8	MPI-ESM1-2-HR	0.9°×0.9°
9	MPI-ESM1-2-LR	1.9°×1.9°
10	MRI-ESM2-0	1.1°×1.1°
11	NESM3	1.9°×1.9°
12	NorESM2-LM	2.5°×1.9°
13	NorESM2-MM	0.94° × 1.25°