Supporting Information for:

A comparison of the atmospheric response to the Weddell Sea Polynya in AGCMs of varying resolutions.

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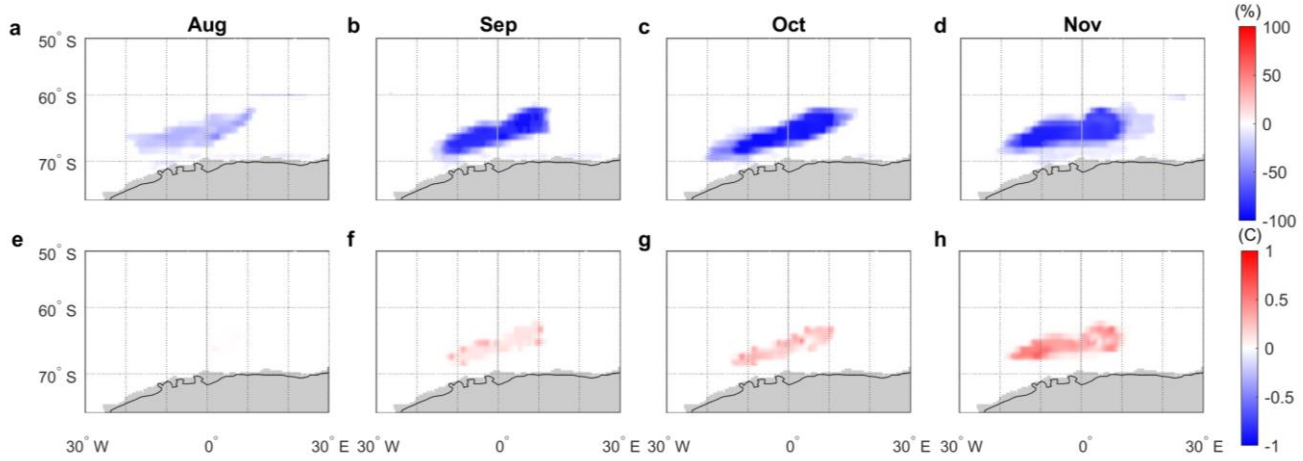

Figure S1: Difference between Sea ice concentration boundary conditions with and without the polynya (ocean- atmosphere boundary layer forcing) for (a) August, (b) September, (c) October, (d) November. (e-h) as (a-d) but for sea surface temperature.

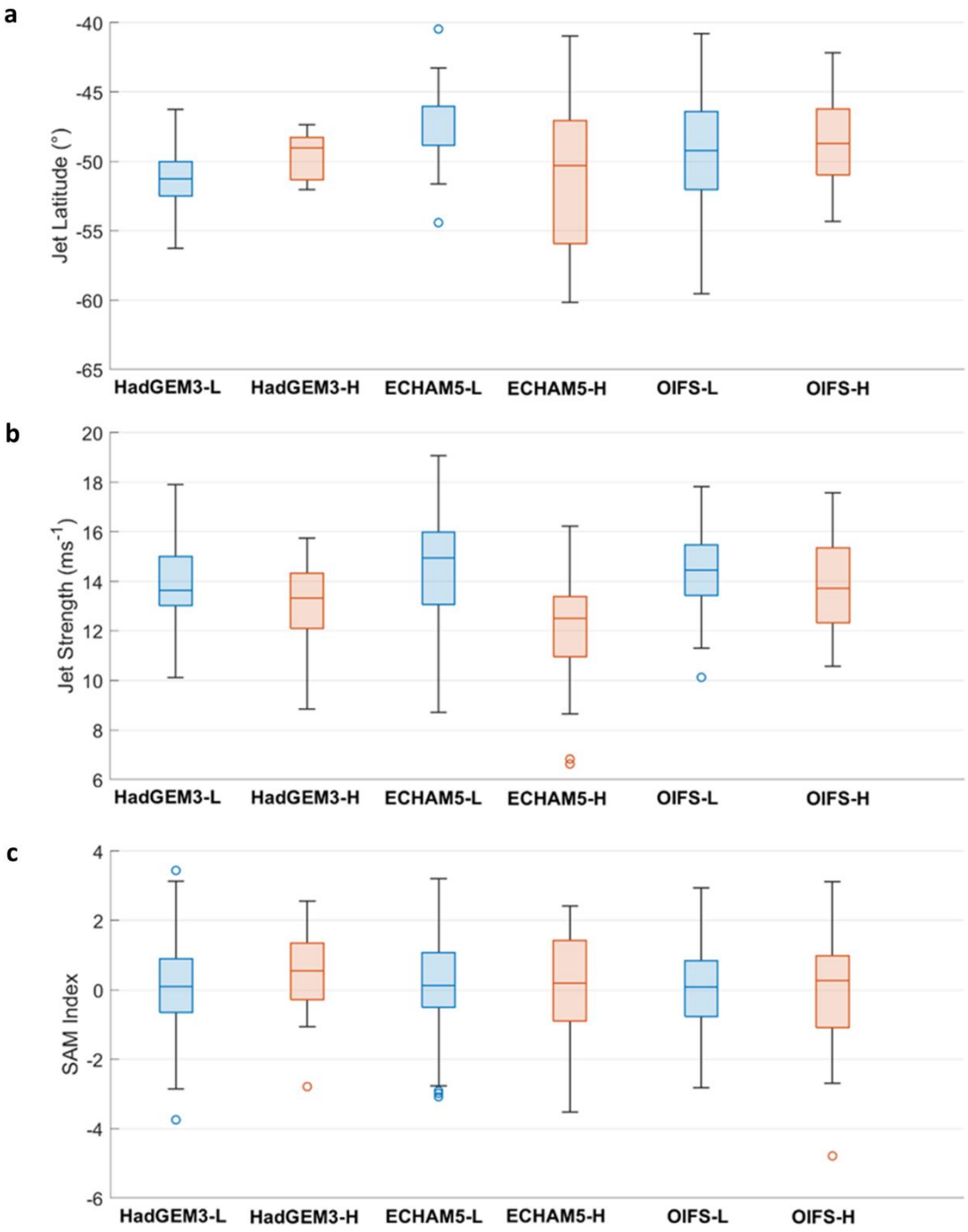

Figure S2: (a) Boxplots of jet latitude for the ensemble spread of each model at +/- 1 standard deviation, with black lines denoting the 95th percentile. Blue/red demote the low/high resolution versions. Dots are anomalies outside of the 95th percentile. (b) as a for jet strength. (c) as a for the SAM Index.

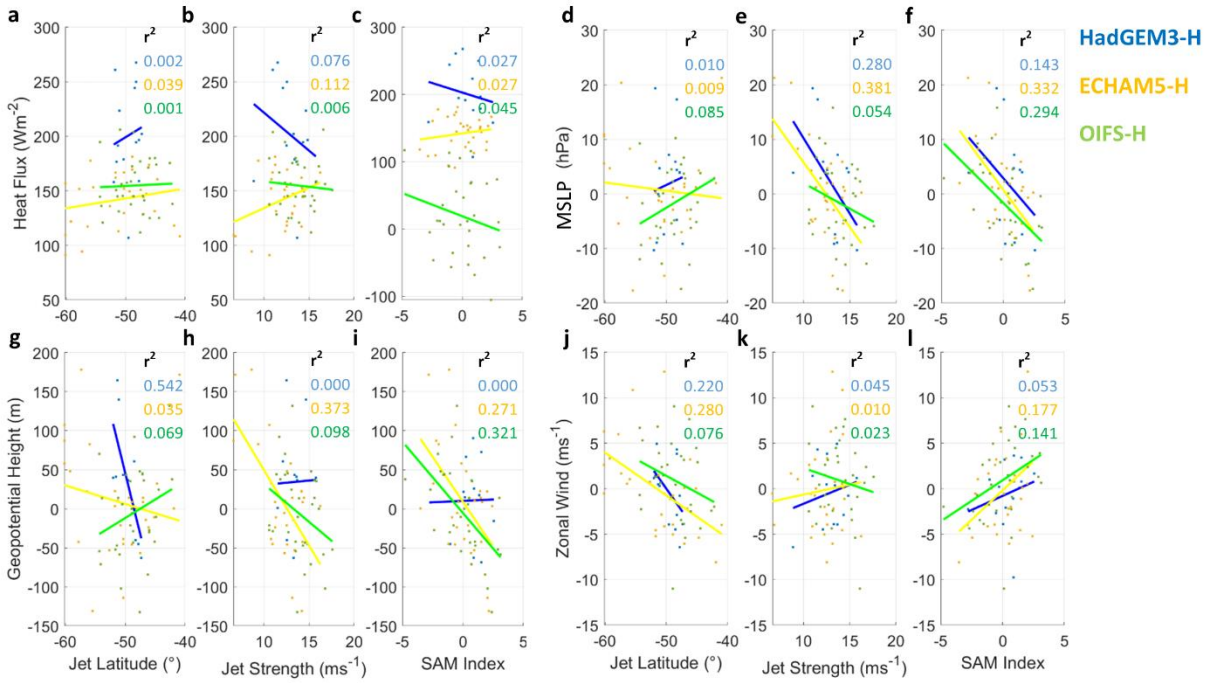

Figure S3: Heat flux response to the WSP (averaged over 10° E – 10° W, 63° S – 68° S; red box in Fig. 1) against jet latitude (a) jet strength (b), and SAM index (c) for the high-resolution versions of the models. Blue for HadGEM3-H, yellow for ECHAM5-H and green for OIFS-H. Each dot represents each ensemble member for September. (d-f) as (a-c) but for MSLP, (g-I) as (a-c) but for geopotential height at 850 hPa, and (j-l) as (a-c) but for zonal wind at 850 hPa.

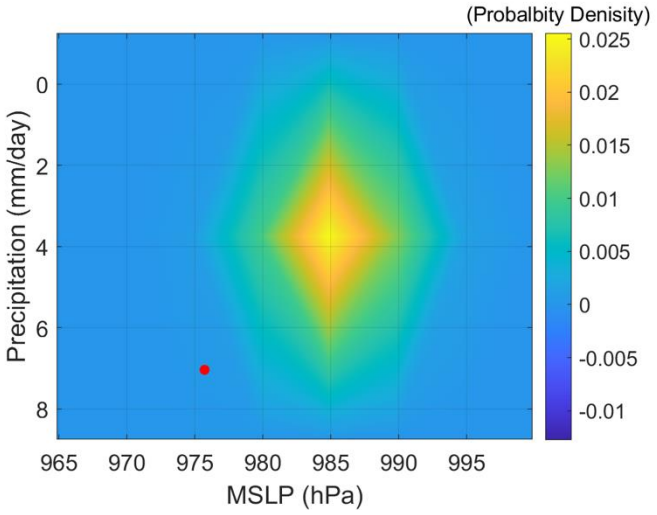

Figure S4: Probability density function of September ERA5 MSLP and total precipitation. The red dot is the polynya conditions for September 1974.