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Supplement of

Minimal influence of future Arctic sea ice loss on North Atlantic jet stream morphology

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Minimal influence of future Arctic sea ice loss on North Atlantic jet stream morphology- Supplementary Information

Table S1: Summary of jet latitude statistics

Model	Jet latitude μ (°)		Jet latitude p(t-test)	Jet latitude daily σ (°)		Jet latitude interannual σ (°)		Jet latitude skew		Jet latitude p(K-S)
	Present-day	Future		Present-day	Future	Present-day	Future	Present-day	Future	
AWI-CM-1-1-MR	46.9 ± 0.10	46.3 ± 0.10	0.22	9.5	9.5	2.5	2.9	0.4	0.4	0.18
CanESM5	49.7 ± 0.07	48.8 ± 0.07	0.036	7.1	7.0	2.6	2.4	0.1	0.3	0.043
FGOALS-f3-L	47.7 ± 0.08	46.7 ± 0.09	0.049	7.8	8.1	2.2	2.4	0.3	0.4	0.03
HadGEM3-GC31-MM	48.3 ± 0.06	47.7 ± 0.06	0.043	9.8	10.4	2.8	3.0	0.1	0.2	0.0059
IPSL-CM6A-LR	46.3 ± 0.09	46.1 ± 0.08	0.64	12.2	11.0	3.7	3.0	0.3	0.4	0.062
MIROC6	46.4 ± 0.12	46.2 ± 0.13	0.74	11.5	11.9	3.1	3.3	0.2	0.3	1.00

Table S2: Summary of jet speed statistics

Model	Jet speed μ (ms^{-1})		Jet speed p(t-test)	Jet speed daily σ (ms^{-1})		Jet speed interannual σ (ms^{-1})		Jet speed skew		Jet speed p(K-S)
	Present-day	Future		Present-day	Future	Present-day	Future	Present-day	Future	
AWI-CM-1-1-MR	13.1 ± 0.03	13.0 ± 0.03	0.55	2.6	2.6	0.7	0.7	0.1	0.1	0.98
CanESM5	13.9 ± 0.02	13.9 ± 0.02	0.73	2.2	2.1	0.6	0.6	0.05	0.05	1.00
FGOALS-f3-L	13.6 ± 0.03	13.5 ± 0.03	0.57	2.4	2.5	0.7	0.7	-0.02	0.05	1.00
HadGEM3-GC31-MM	12.7 ± 0.02	12.6 ± 0.02	0.16	2.6	2.7	0.8	0.7	0.1	0.1	0.80
IPSL-CM6A-LR	12.8 ± 0.02	13.0 ± 0.02	0.19	3.3	3.0	0.9	0.9	0.2	0.1	0.85
MIROC6	12.0 ± 0.03	11.9 ± 0.03	0.38	2.9	3.0	0.8	0.8	0.2	0.2	0.70

Table S3: Summary of jet mass statistics

Model	Jet mass μ (x10^{13} ms^{-1})		Jet mass p(t-test)	Jet mass daily σ (x 10^{13} ms^{-1})		Jet mass interannual σ (x 10^{13} ms^{-1})		Jet mass skew		Jet mass p(K-S)
	Present-day	Future		Present-day	Future	Present-day	Future	Present-day	Future	
AWI-CM-1-1-MR	8.6 ± 0.04	8.3 ± 0.04	0.26	3.6	3.5	1.3	1.3	-0.01	-0.03	0.82
CanESM5	10.9 ± 0.04	10.5 ± 0.04	0.25	3.9	3.7	1.4	1.4	-0.3	-0.2	0.83
FGOALS-f3-L	9.8 ± 0.04	9.6 ± 0.04	0.21	3.6	3.7	1.3	1.3	-0.2	-0.1	0.85
HadGEM3-GC31-MM	8.2 ± 0.02	7.8 ± 0.02	0.01	3.5	3.5	1.3	1.2	-0.05	-0.02	0.12
IPSL-CM6A-LR	8.0 ± 0.03	8.1 ± 0.03	0.94	4.0	3.8	1.5	1.5	0.1	0.06	0.99
MIROC6	7.0 ± 0.04	6.8 ± 0.04	0.21	3.4	3.3	1.1	1.2	0.04	0.2	0.83

Table S4: Summary of jet area statistics

Model	Jet area μ (x10^{12} m^2)		Jet area p(t-test)	Jet area daily σ (x 10^{12} m^2)		Jet area interannual σ (x 10^{12} m^2)		Jet area skew		Jet area p(K-S)
	Present-day	Future		Present-day	Future	Present-day	Future	Present-day	Future	
AWI-CM-1-1-MR	6.3 ± 0.02	6.1 ± 0.02	0.22	2.3	2.2	0.9	0.8	-0.3	-0.3	0.49
CanESM5	7.6 ± 0.02	7.4 ± 0.02	0.17	2.3	2.2	0.9	0.9	-0.5	-0.4	0.65
FGOALS-f3-L	7.0 ± 0.02	6.8 ± 0.02	0.11	2.2	2.2	0.8	0.8	-0.5	-0.4	0.44
HadGEM3-GC31-MM	6.2 ± 0.01	5.9 ± 0.01	0.004	2.3	2.3	0.9	0.8	-0.3	-0.3	0.06
IPSL-CM6A-LR	5.9 ± 0.02	5.8 ± 0.02	0.96	2.6	2.4	0.9	0.9	-0.2	-0.2	0.88
MIROC6	5.5 ± 0.02	5.3 ± 0.02	0.18	2.3	2.3	0.8	0.9	-0.2	-0.1	0.65

Table S5: Summary of jet tilt statistics

Model	Jet tilt μ (°)		Jet tilt p(t-test)	Jet tilt daily σ (°)		Jet tilt interannual σ (°)		Jet tilt skew		Jet tilt p(K-S)
	Present-day	Future		Present-day	Future	Present-day	Future	Present-day	Future	
AWI-CM-1-1-MR	6.2 ± 0.11	6.2 ± 0.10	0.84	10.1	9.8	2.5	2.4	-0.3	-0.3	1.00
CanESM5	9.0 ± 0.09	8.2 ± 0.09	0.052	8.7	8.8	2.4	2.2	-0.2	-0.3	0.26
FGOALS-f3-L	4.0 ± 0.10	4.0 ± 0.10	0.86	9.3	9.6	2.3	2.6	-0.05	-0.04	1.00

HadGEM3-GC31-MM	7.4 ± 0.06	7.0 ± 0.06	0.095	9.6	9.7	2.4	2.5	-0.3	-0.3	0.30
IPSL-CM6A-LR	6.4 ± 0.08	6.2 ± 0.08	0.51	10.3	10.1	2.7	2.4	-0.4	-0.3	0.97
MIROC6	6.1 ± 0.10	5.9 ± 0.10	0.64	9.8	9.5	2.4	2.3	-0.3	-0.05	0.90

Table S6: Summary of number of jet objects for each model

Model	Zero jet days (%)		One jet days (%)		2 jet days (%)	
	Present-day	Future	Present-day	Future	Present-day	Future
AWI-CM-1-1-MR	2.3	2.4	94.8	94.7	2.8	2.8
CanESM5	0.8	0.7	96.5	95.6	2.7	3.6
FGOALS-f3-L	1.5	1.7	97.0	96.2	1.5	2.0
HadGEM3-GC31-MM	2.5	2.8	94.5	93.8	3.0	3.4
IPSL-CM6A-LR	3.9	3.0	91.7	93.0	4.4	3.9
MIROC6	3.9	4.4	93.3	91.9	2.8	3.7

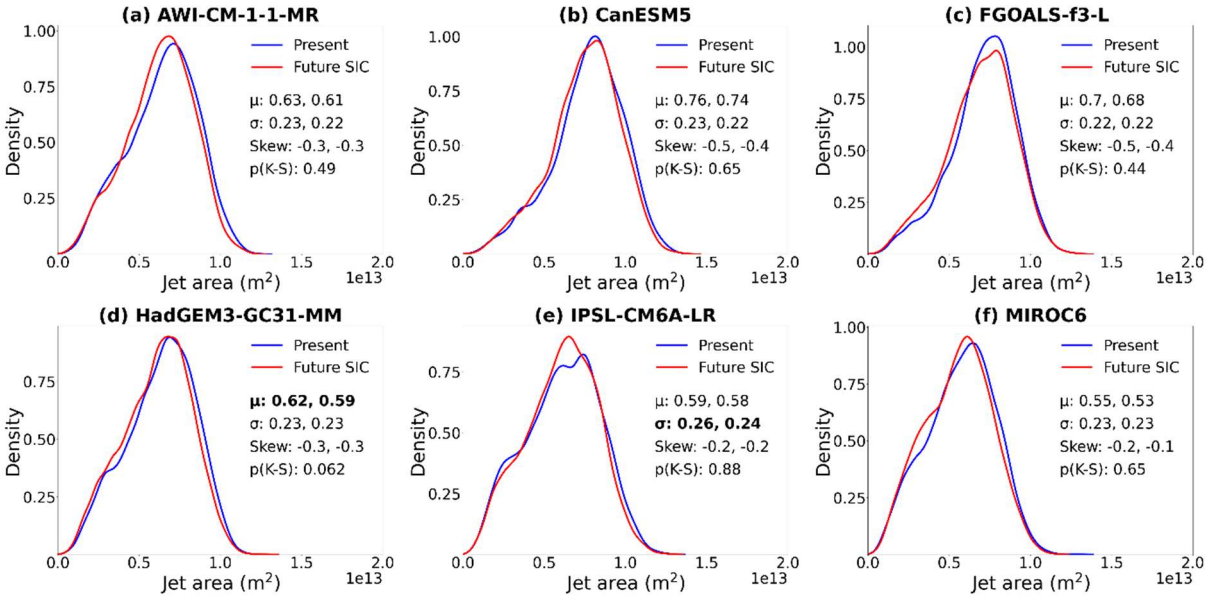

Figure S1: Distributions of daily jet area in winter for simulations forced by present-day (blue) and future (red) SIC. Data are for the largest mass jet object on each day and distributions have been fitted with a kernel density estimate. Ensemble mean (μ), standard deviation (σ), skewness and K-S test p-value for the distributions are shown in the legend. Ensemble mean and standard deviation have been scaled by a factor of $1x10^{13}$ for clarity Means are bold where the difference between present-day and future simulations is statistically significant based on a t-test at the 95% confidence level. Standard deviations are bold where the difference between time periods is greater than for random sampling.

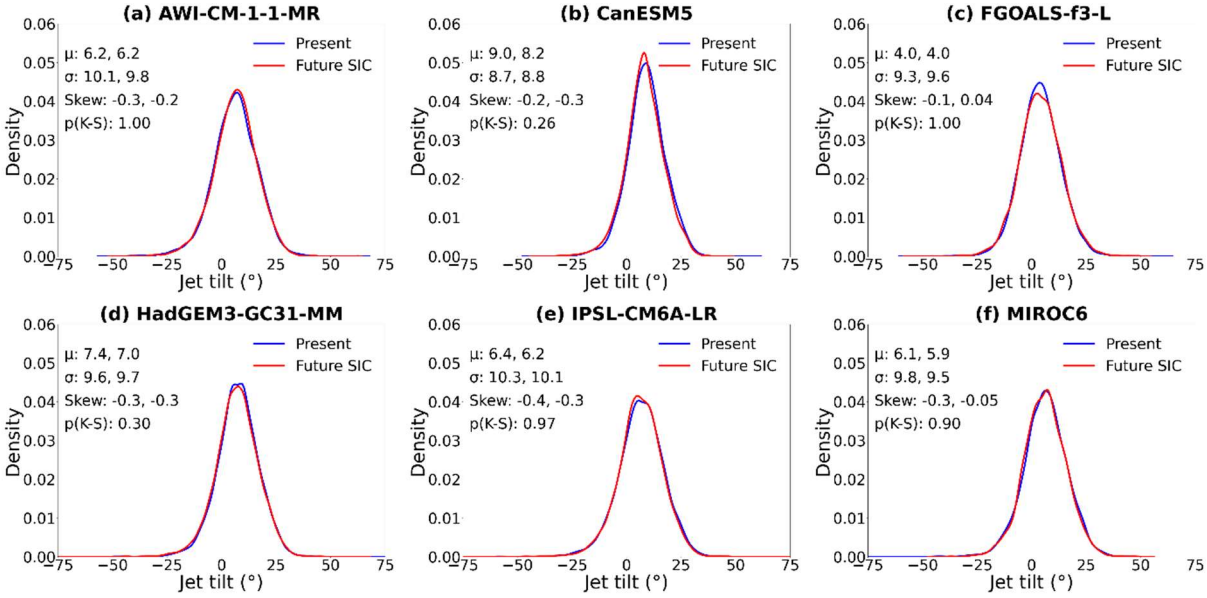

Figure S2: Distributions of daily jet tilt in winter for simulations forced by present-day (blue) and future (red) SIC. Data are for the largest mass jet object on each day and distributions have been fitted with a kernel density estimate. Ensemble mean (μ), standard deviation (σ), skewness and K-S test p-value for the distributions are shown in the legend.

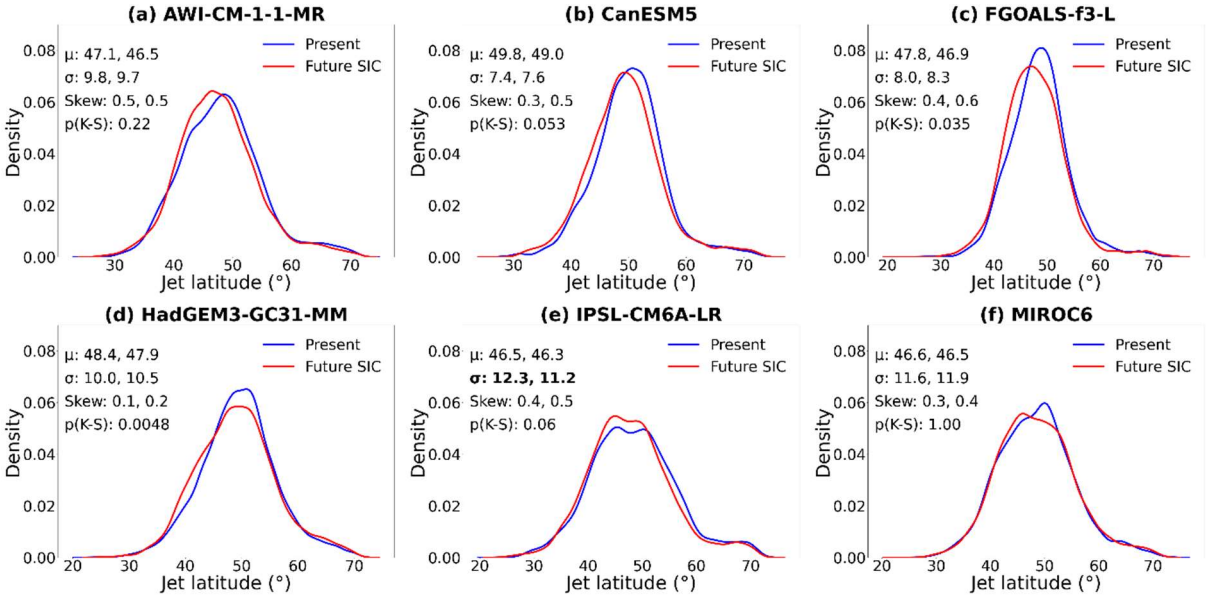

Figure S3: Distributions of daily jet latitude in winter for simulations forced by present-day and future SIC. The simulations are present-day SIC (blue line) and future SIC (red line). Data are for the largest mass object on each day and the second largest mass object for days with more than one jet object. Distributions have been fitted with a kernel density estimate. Ensemble mean (μ), standard deviation (σ) and skewness are shown. Standard deviations are bold where the difference between time periods is greater than for random sampling.

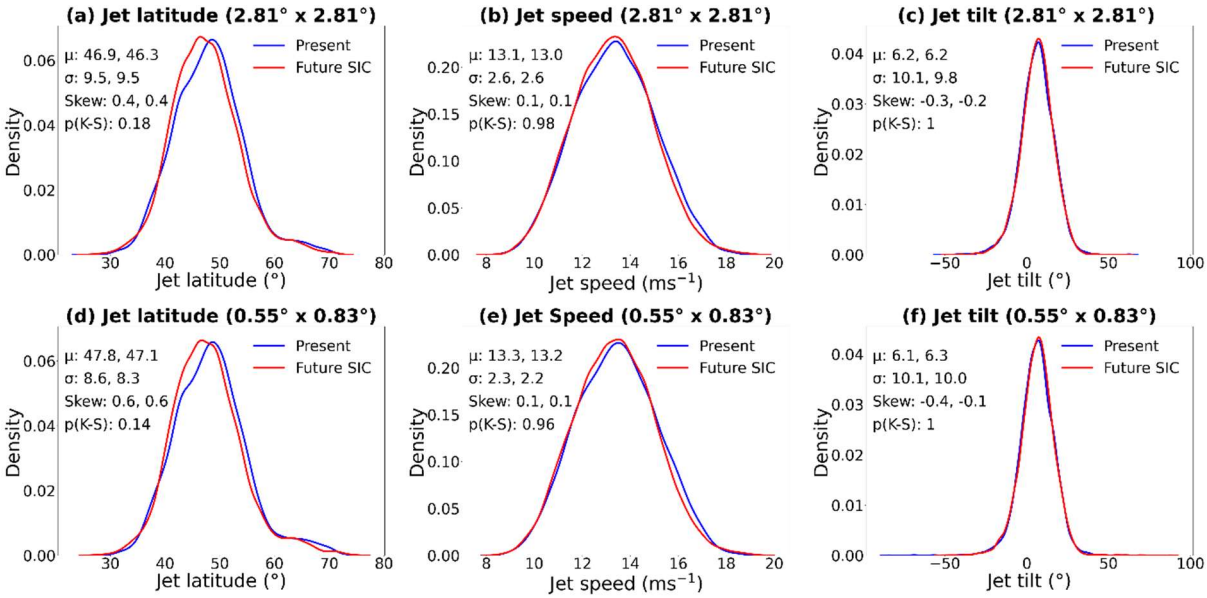

Figure S4: Distribution of jet diagnostics in winter for simulations forced by present-day and future SIC for AWI-CM-1-1-MR at 2.81° x 2.81° resolution (a)-(c) and 0.55° x 0.83° resolution (d)-(e). The simulations are present-day SIC (blue line) and future SIC (red line). Data are for the largest mass object on each day. Distributions have been fitted with a kernel density estimate. Ensemble mean (μ), standard deviation (σ) and skewness are shown.