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Supplement of

Past and future of the Arctic sea ice in High-Resolution Model Intercomparison Project (HighResMIP) climate models

Julia Selivanova et al.

Correspondence to: Julia Selivanova (julia.selivanova@cmcc.it)

Supplementary

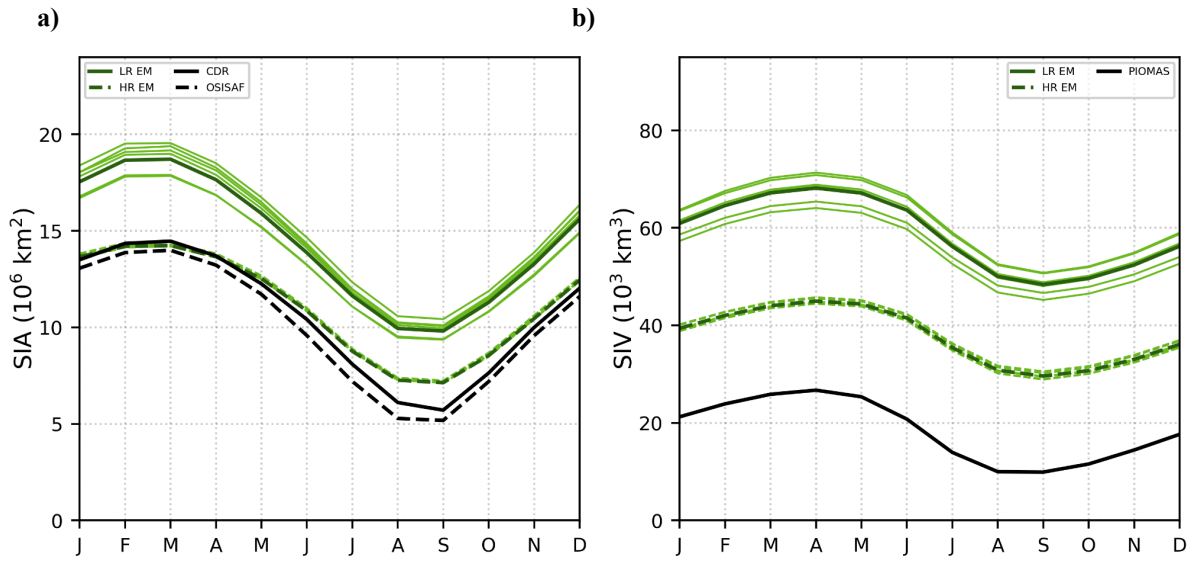

Figure S1. The 1979-2014 seasonal cycle in SIA (a) and SIV (b) from ECMWF LR and HR ensemble means against CDR and OSISAF for SIA and PIOMAS for SIV. Thin lines represent six ensemble members for LR and HR configurations.

a)

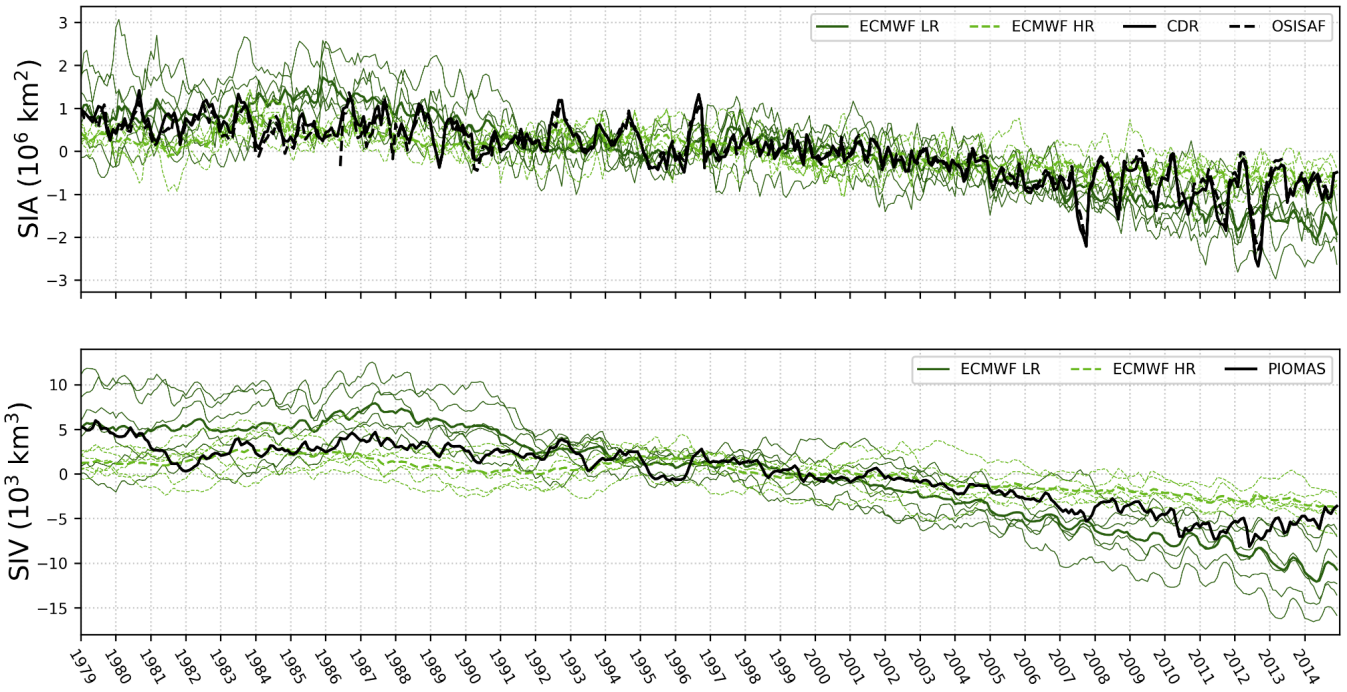

Figure S2: Monthly anomalies of SIA (a) and SIV (b) over 1979-2014 from ECMWF LR and HR ensemble members and reference products.

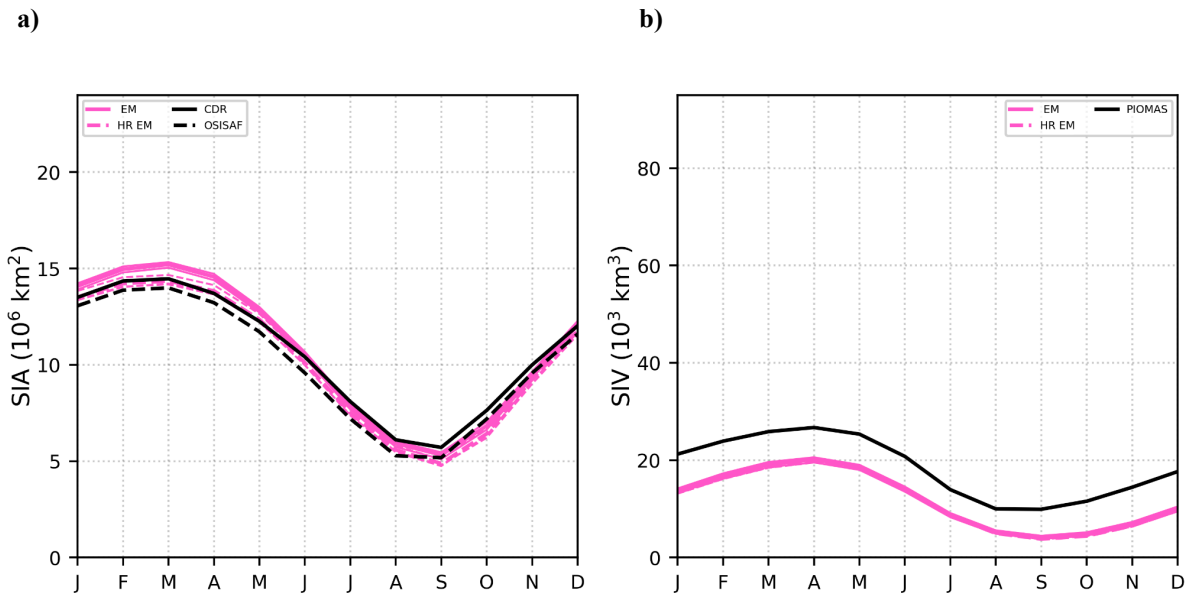

Figure S3. The 1979-2014 seasonal cycle in SIA (a) and SIV (b) from CNRM LR and HR ensemble means against CDR and OSISAF for SIA and PIOMAS for SIV. Thin lines represent three ensemble members for LR and HR configurations.

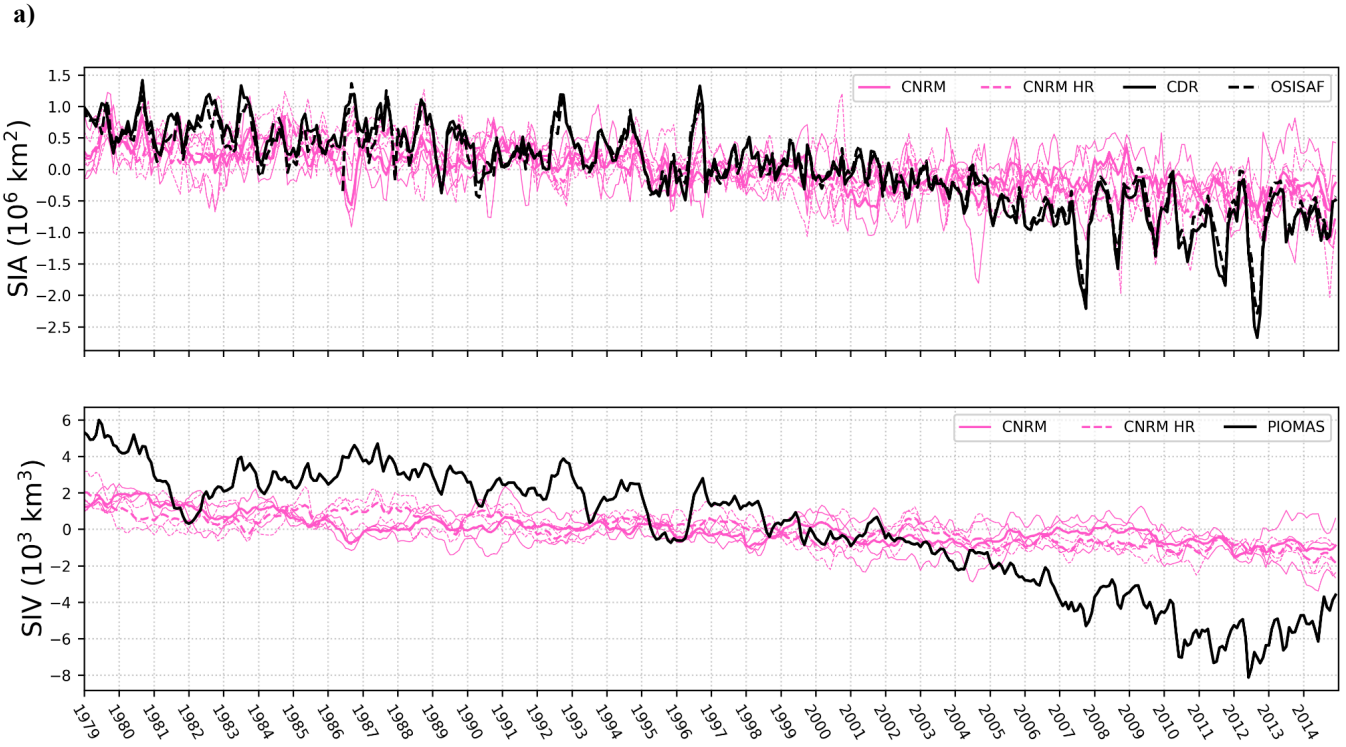

Figure S4: Monthly anomalies of SIA (a) and SIV (b) over 1979-2014 from CNRM LR and HR ensemble members and reference products.

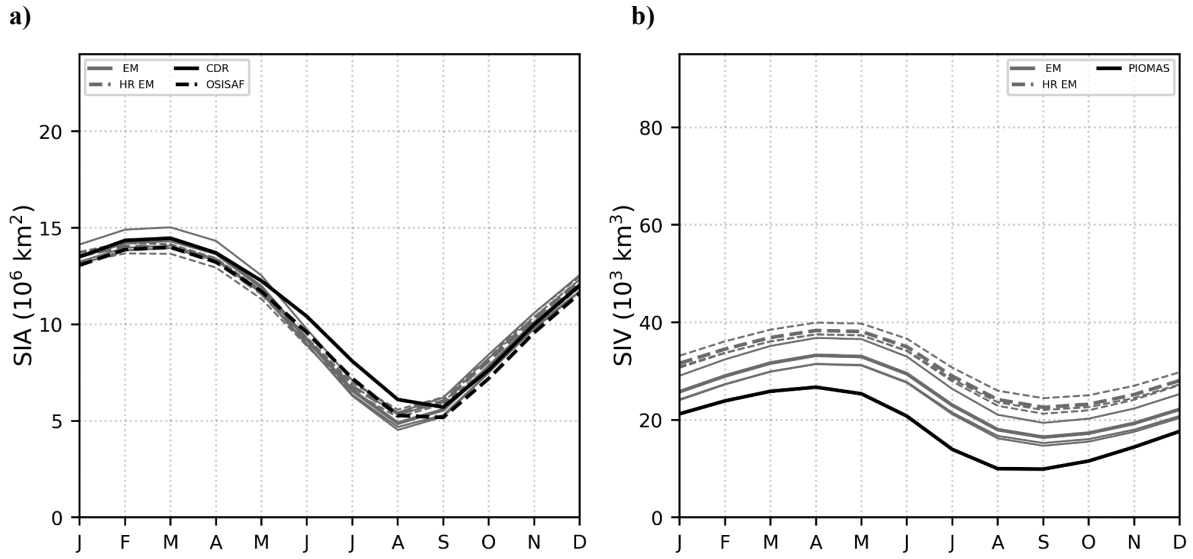

Figure S5. The 1979-2014 seasonal cycle in SIA (a) and SIV (b) from EC-Earth3P LR and HR ensemble means against CDR and OSISAF for SIA and PIOMAS for SIV. Thin lines represent three ensemble members for LR and HR configurations.

a)

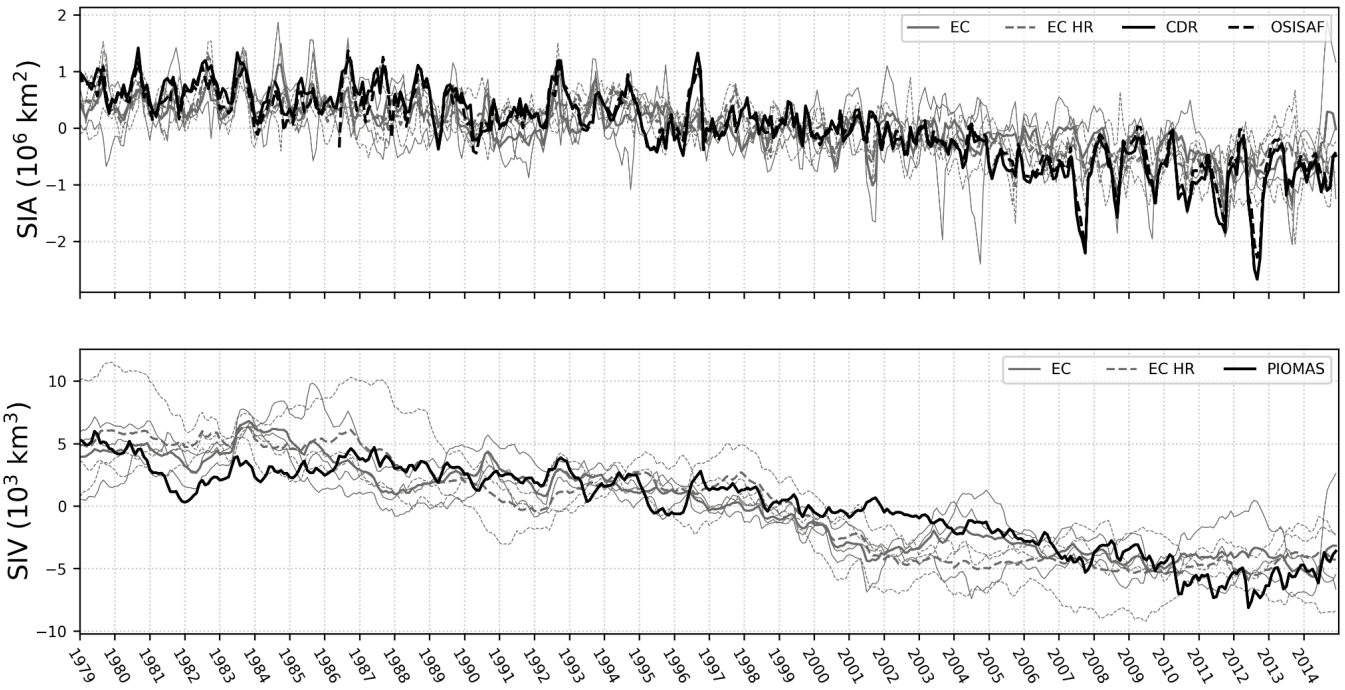

Figure S6: Monthly anomalies of SIA (a) and SIV (b) over 1979-2014 from EC-Earth3P LR and HR ensemble members and reference products.

Table S1. Linear trend in SIA and SIV and their standard deviations for ensemble members of ECMWF LR and HR simulations for 1979-2014.

	1979-2014 SIA trend (10^3 km^2/yr)	1979-2014 SIV trend (km^3/yr)
ECMWF-IFR LR1	-72.08 ± 16.9	-423.86 ± 68.3
ECMWF-IFR LR2	-44.68 ± 13.5	-238.32 ± 82.8
ECMWF-IFR LR3	-134.19 ± 14	-801.13 ± 65.3
ECMWF-IFR LR4	-92.77 ± 12	-666.2 ± 34.3
ECMWF-IFR LR5	-40.13 ± 8.8	-608.42± 64.6
ECMWF-IFR LR6	-94.85 ± 11.5	-225.26 ± 63
ECMWF-IFR LR Ens	**-80.3 ± 9.1**	**-493.85 ± 49.2**
ECMWF-IFR HR1	-36.66 ± 7.6	-157.49 ± 34.4
ECMWF-IFR HR2	-40.78 ± 8.9	-209.46 ± 50.9
ECMWF-IFR HR3	-36.92 ± 8.1	-260.7 ± 58.7
ECMWF-IFR HR4	-32.45 ± 6.2	-157.08 ± 47.4
ECMWF-IFR HR5	-31.95 ± 13.7	-88.3 ± 61.8
ECMWF-IFR HR6	-11.29 ± 8.7	-32.03 ± 49.1
ECMWF-IFR HR Ens	**-31.81 ± 5**	**-150.85 ± 22.8**

Table S2. Linear trend in SIA and SIV and their standard deviations for ensemble members of CNRM LR and HR simulations for 1979-2014.

	1979-2014 SIA trend (10^3 km^2/yr)	1979-2014 SIV trend (km^3/yr)
CNRM LR 1	-29.83 ± 8.9	-61.89 ± 23.6
CNRM LR 2	-16.29 ± 8.9	-53.95 ± 22.1
CNRM LR 3	-14.19 ± 9.6	-56.77 ± 24.2
CNRM LR Ens	**-20.1 ± 4.4**	**-57.54 ± 12.3**
CNRM HR1	-15.94 ± 7.9	-35.58 ± 15.9
CNRM HR2	-36.1 ± 7.2	-70 ± 19
CNRM HR3	-39.94 ± 6.3	-94.53 ± 13.6
CNRM HR Ens	**-30.67 ± 4**	**-66.7 ± 10.1**

Table S3. Linear trend in SIA and SIV and their standard deviations for ensemble members of EC-Earth3P LR and HR simulations for 1979-2014.

	1979-2014 SIA trend (10^3 km^2/yr)	1979-2014 SIV trend (km^3/yr)
EC-Earth3P LR 1	-34.2 ± 9.47	-322.28 ± 31.8
EC-Earth3P LR 2	-40.31 ± 7.8	-394.77 ± 58.4
EC-Earth3P LR 3	-19.87 ± 9.7	-224.19 ± 55.3
EC-Earth3P LR ens	**-31.46 ± 4.4**	**-313.77 ± 31.3**
EC-Earth3P HR 1	-40.13 ± 8.8	-460.47 ± 97.5
EC-Earth3P HR 2	-19.25 ± 6.9	-211.62 ± 59.7
EC-Earth3P HR 3	-50.26 ± 8.5	-427.92 ± 43.3
EC-Earth3P HR ens	**-36.55 ± 4.9**	**-366.67 ± 41.1**