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Supporting Information for

Warm Arctic, increased winter sea-ice growth?

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Introduction

This document contains some supporting tables summarizing the CryoSat-2/PIOMAS comparisons, and figures providing further context to the analysis presented in the primary manuscript.

	October AO	April AO	October WA	April WA	October EA	April EA
AWI	**0.83** / 0.17 m	0.52 / 0.54 m	0.55 / 0.36 m	**0.81** / 0.42 m	0.67 / 0.17 m	0.72 / 0.40 m
CPOM	0.66 / 0.20 m	0.72 / 0.18 m	0.43 / 0.42 m	**0.83** / 0.24 m	**0.91** / 0.60 m	0.59 / 0.16 m
GSFC	0.42 / 0.38 m	0.74 / 0.19 m	0.20 / 0.59 m	**0.81** / 0.25 m	**0.94** / 0.07 m	0.53 / 0.12 m

Table S1: Correlation coefficient (left) and root mean squared difference (right) between the regional winter thickness (October and April) from three CryoSat-2 products and PIOMAS over the five year period 2011-2015. Bold values are significant at the 90% level. Regions given in Figure 1 and S1.

	AO	WA	EA
AWI	0.65 / 0.46 m	-0.40 / 0.48 m	0.76 / 0.54 m
CPOM	-0.11 / 0.36 m	-0.39 / 0.25 m	0.80 / 0.49 m
GSFC	-0.22 / 0.17 m	0.25 / 0.22 m	0.72 / 0.18 m

Table S2: Correlation coefficient (left) and root mean squared difference (right) between the regional winter thickness growth (April - October) from three CryoSat-2 thickness products and PIOMAS over the four year period 2012-2015. No correlations were found to be significant at the 90% confidence level.

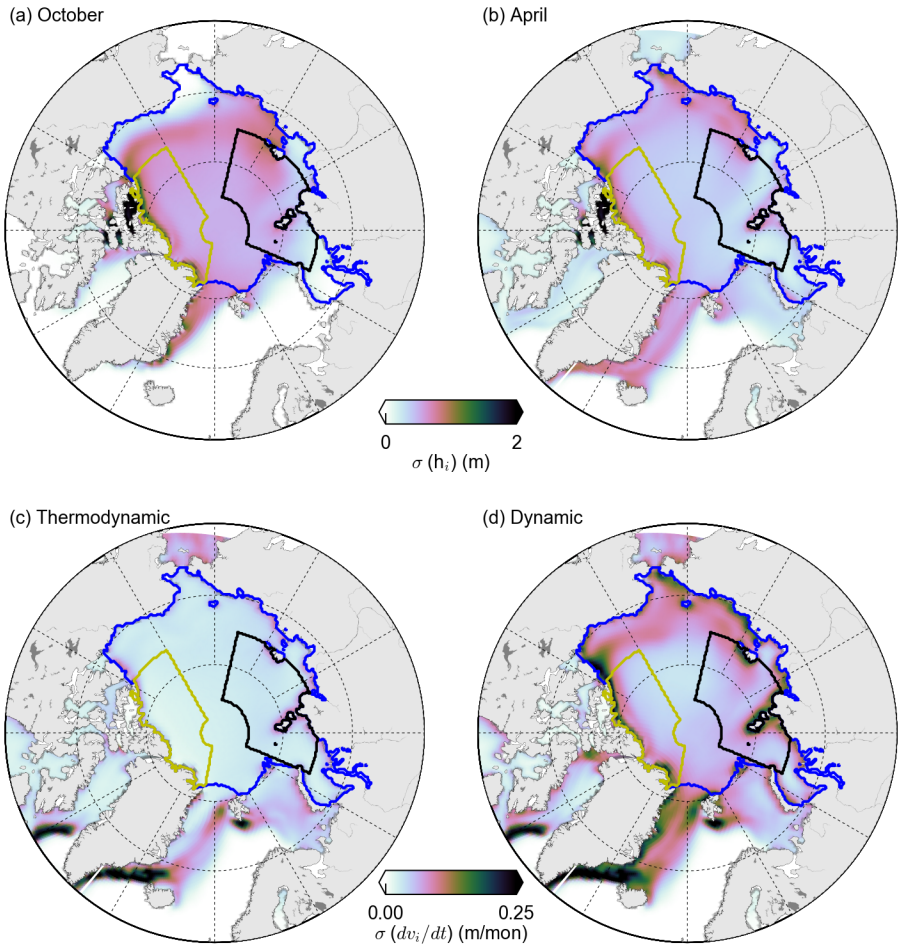

Figure S1: As in Figure 1 but for the standard deviation instead of the mean value across the 40 ensemble members and years (2006-2020).

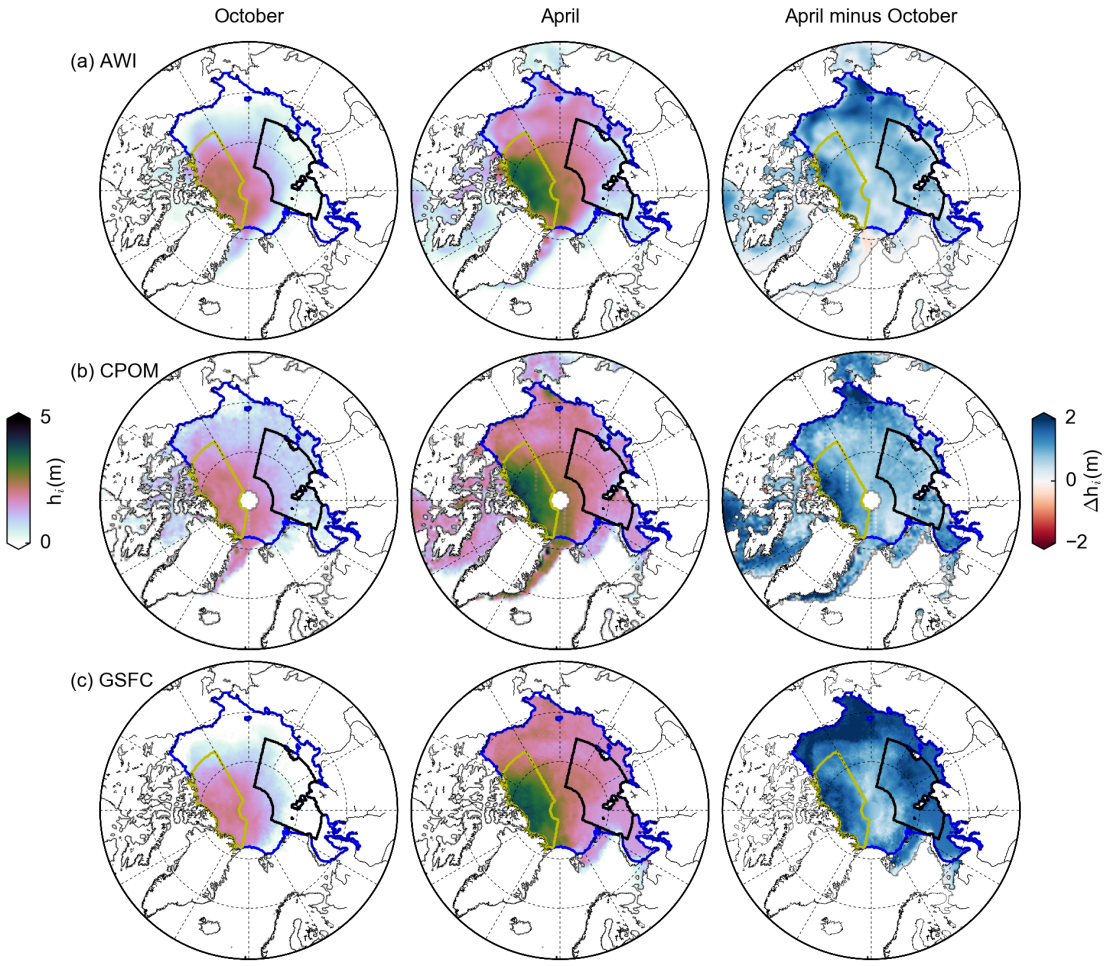

Figure S2: Mean 2011-2015 October (left), April (middle) and April minus October (right) Arctic sea ice thickness derived from CryoSat-2 observations from AWI ($_{top}$), CPOM (middle) and NASA GSFC (bottom).

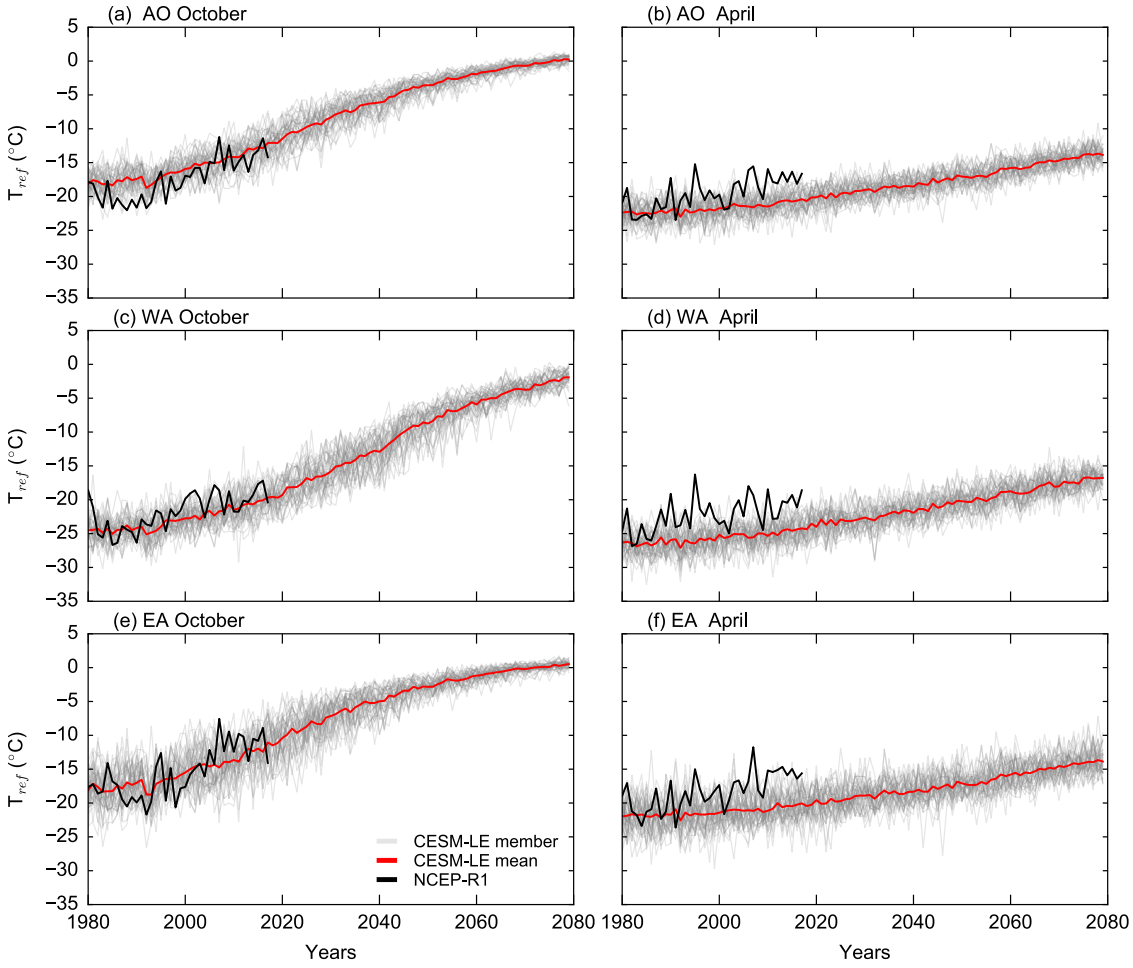

Figure S3: October (left) and April (right) 2 m air temperature averaged across the three study regions given in Figure 1/S1 with the CESM-LE (ensemble values in grey, ensemble mean in red) and NCEP-R1 (black). AO: Arctic Ocean, WA: Western Arctic, EA: Eastern Arctic.

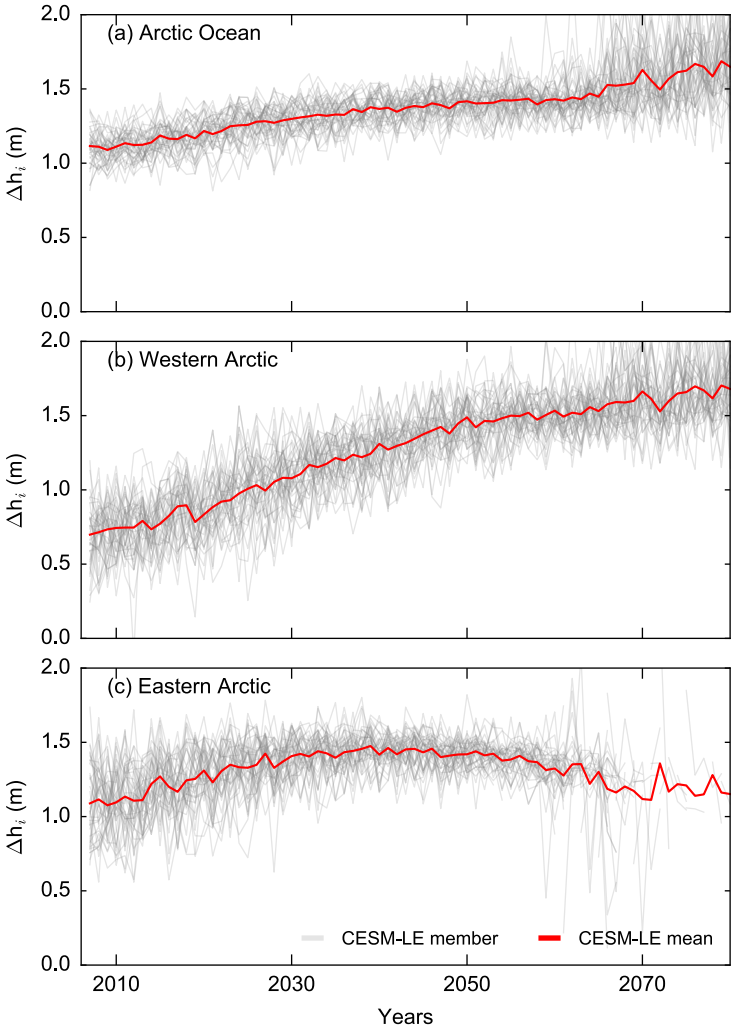

Figure S4: As in Figure 3 but only including grid-cells with an annual October ice concentration above 15% in the regional means.

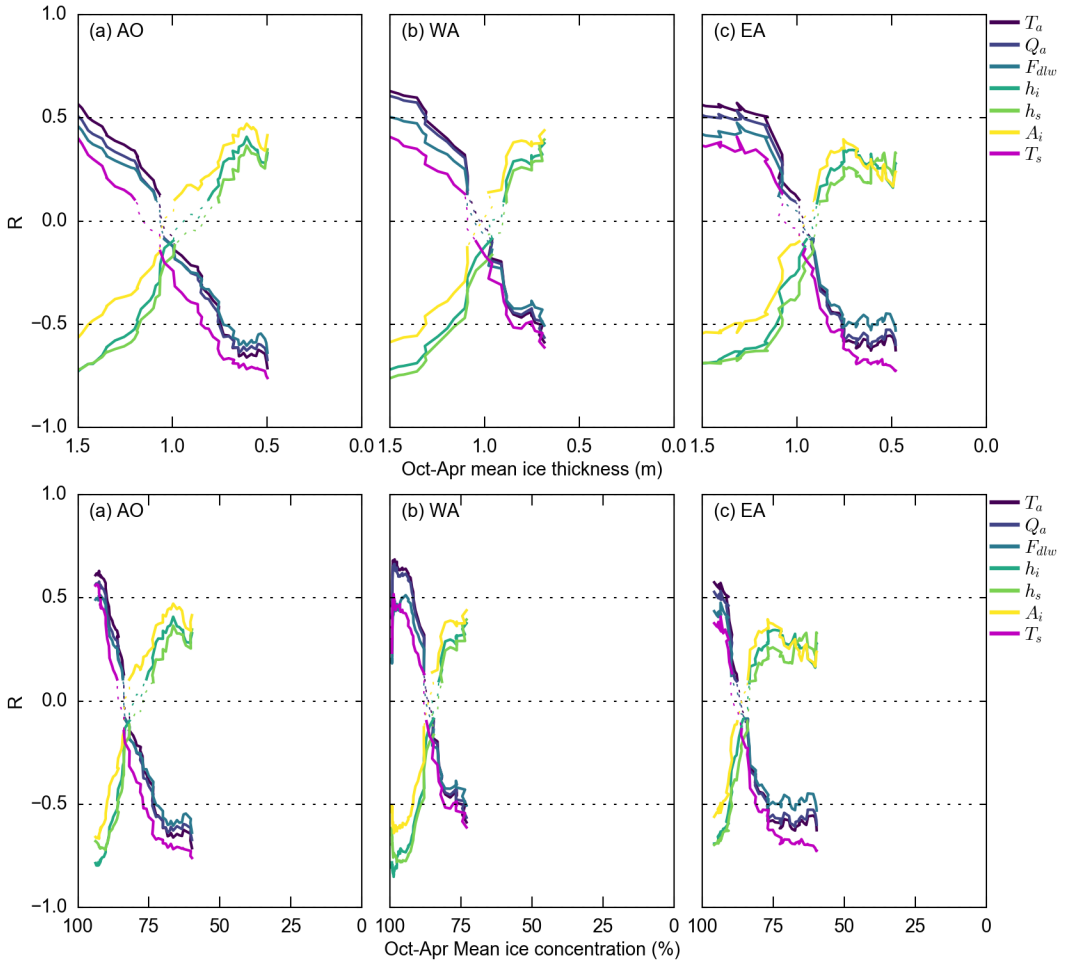

Figure S5: As in Figure 5 but plotted as a function of the mean winter (October to April) thickness (top) and concentration (bottom).