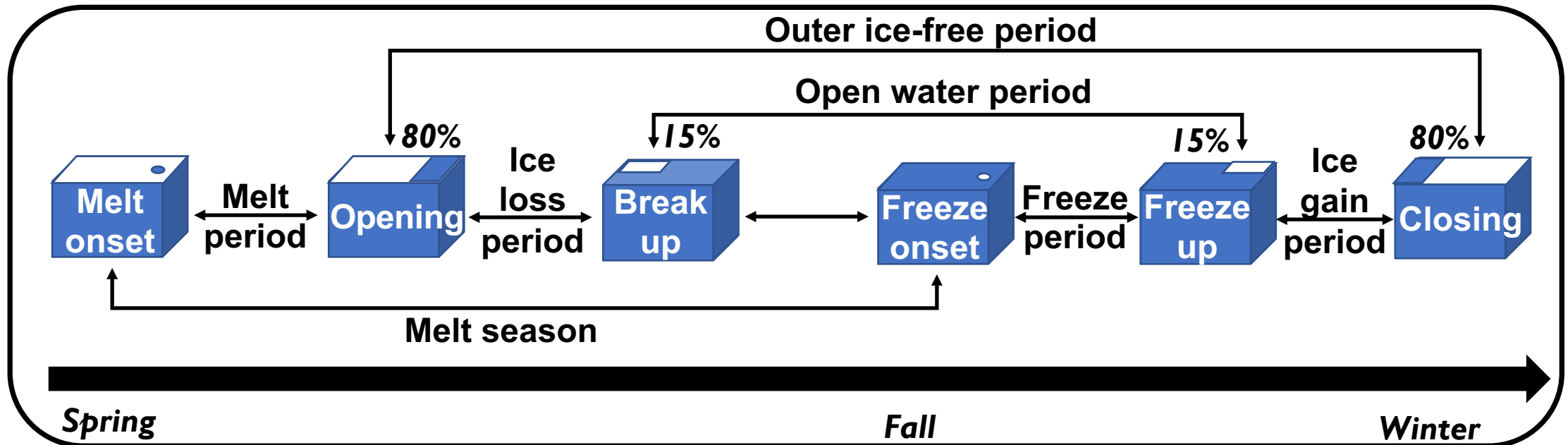


Seasonal transitions of Arctic sea ice over the satellite era in CMIP6 models

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Objective: Identify biases in seasonal transitions and their effects on sea ice area and thickness in CMIP6 models



Smith, A., Jahn, A., and Wang, M.: Seasonal transition dates can reveal biases in Arctic sea ice simulations, *The Cryosphere Discuss.*, <https://doi.org/10.5194/tc-2020-81>, in review, 2020.



Key finding #1: Differences in seasonal transition dates between models are unlikely due to internal variability alone

Smith et al., 2020

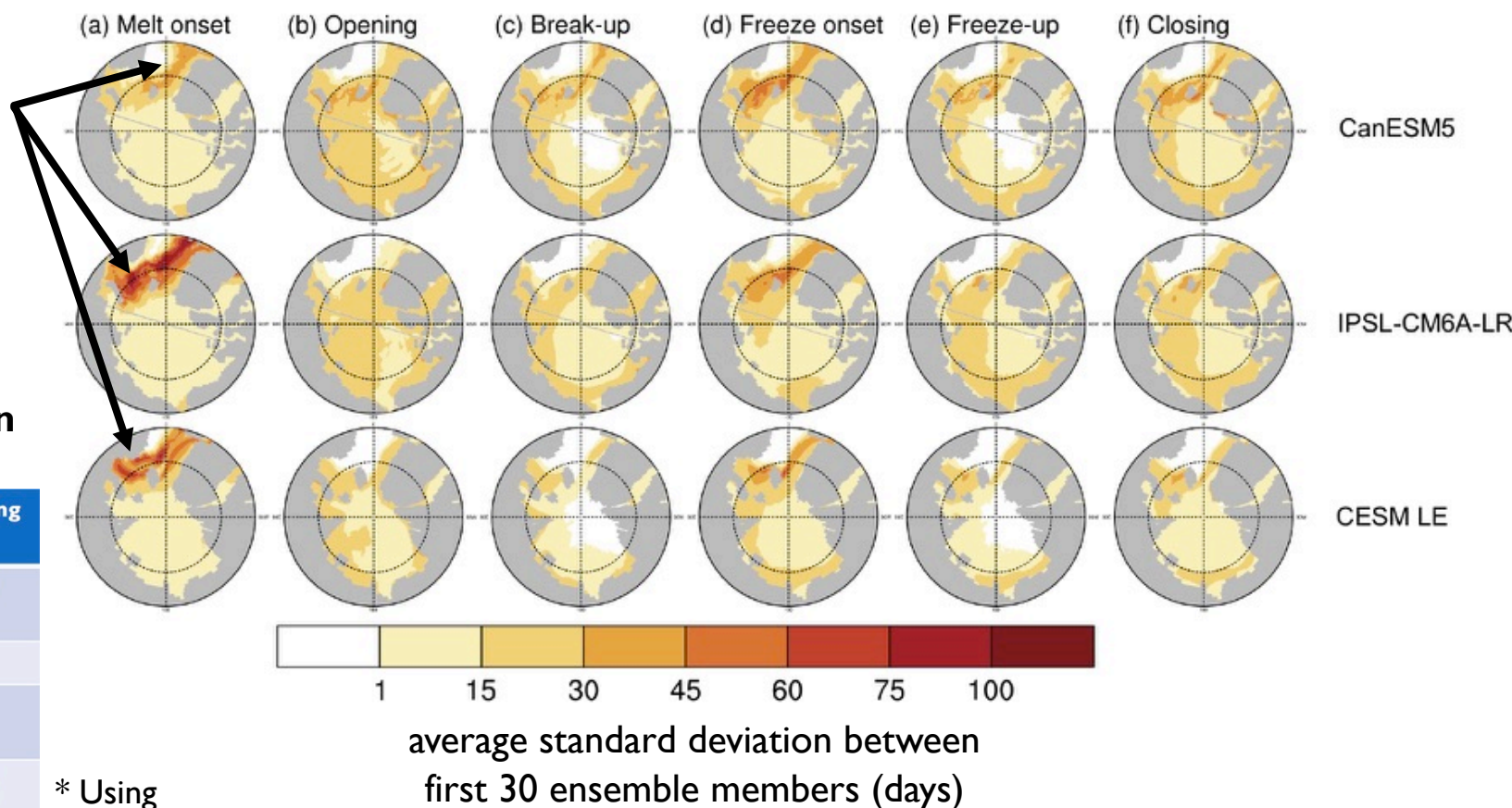
The largest impacts of internal variability are seen in the inflow regions of melt and freeze onset dates, but all metrics show pan-Arctic model spreads exceeding the internal variability.



Model spreads in median seasonal transition dates 1979-2014 (days)

	Melt onset	Break-up	Opening	Freeze onset	Freeze-up	Closing
All-model spread	33	17	13	35	21	32
CanESM5 spread*	5	4	4	6	5	9
IPSL-CM6A-LR spread*	6	8	5	10	9	14
CESM LE spread*	3	4	5	6	5	5

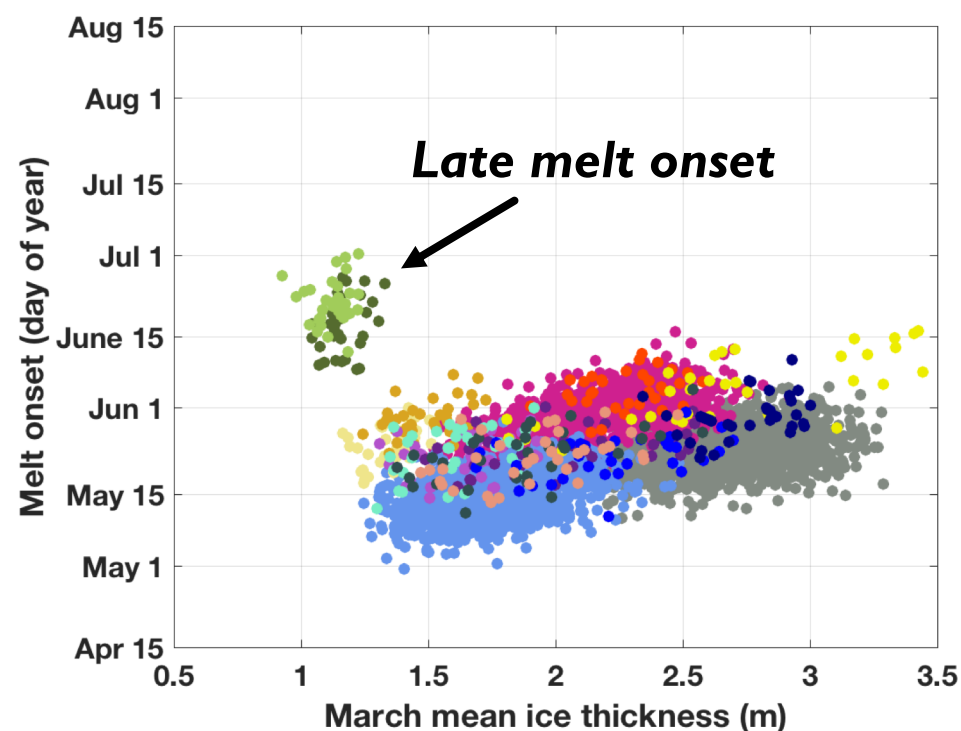
* Using first 30 ensemble members



Key finding #2: Biases in seasonal transitions can compensate for other unrealistic aspects of simulated sea ice

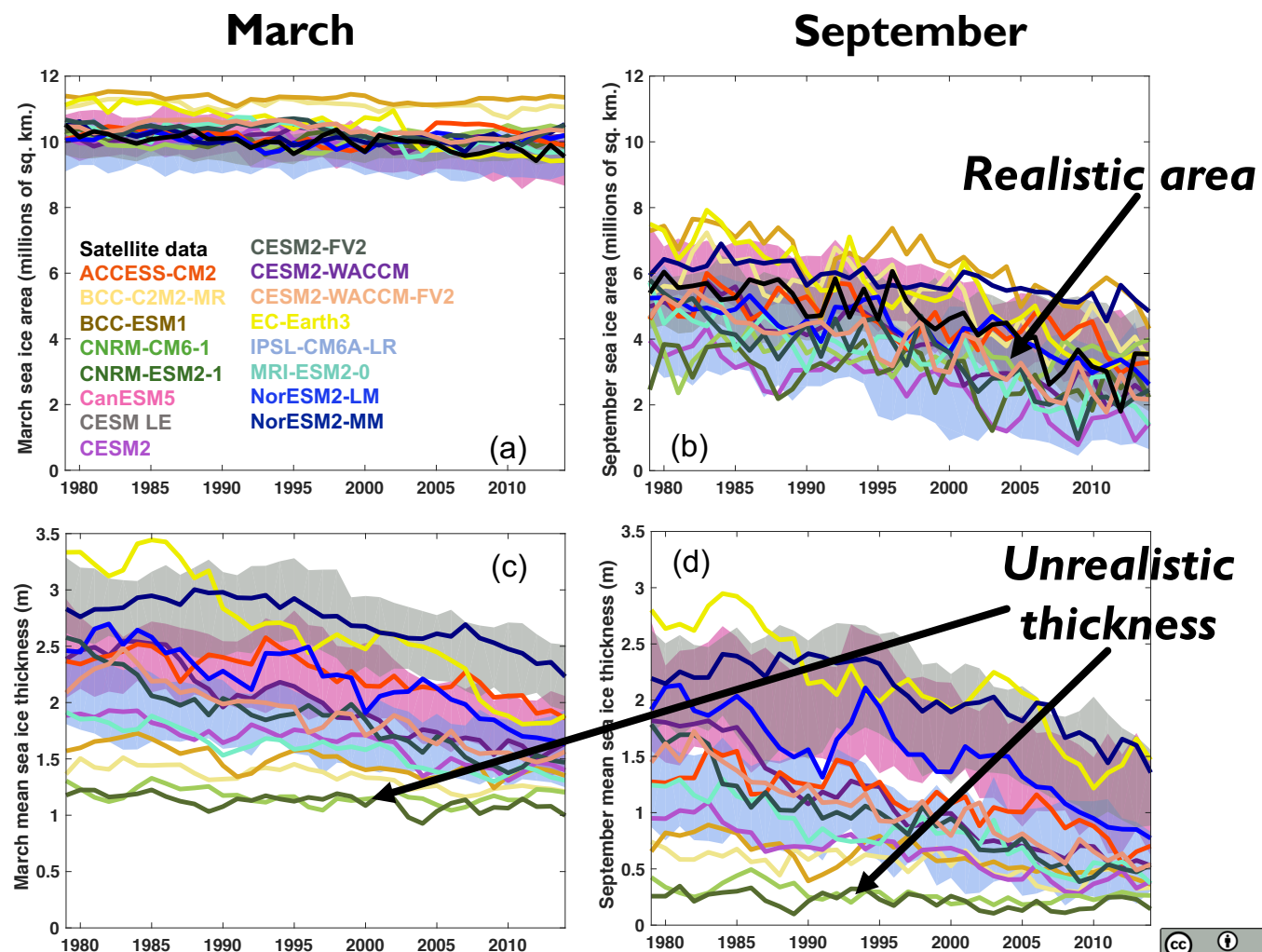
Smith et al., 2020

Late melt onset retains thin ice that would otherwise disappear. **→** CNRM models produce realistic September ice coverage for the wrong reasons.



Area

Mean thickness

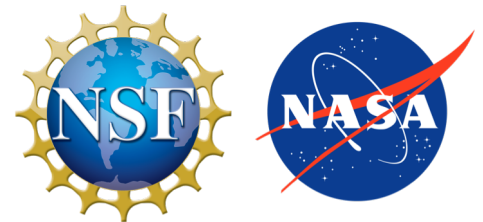


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