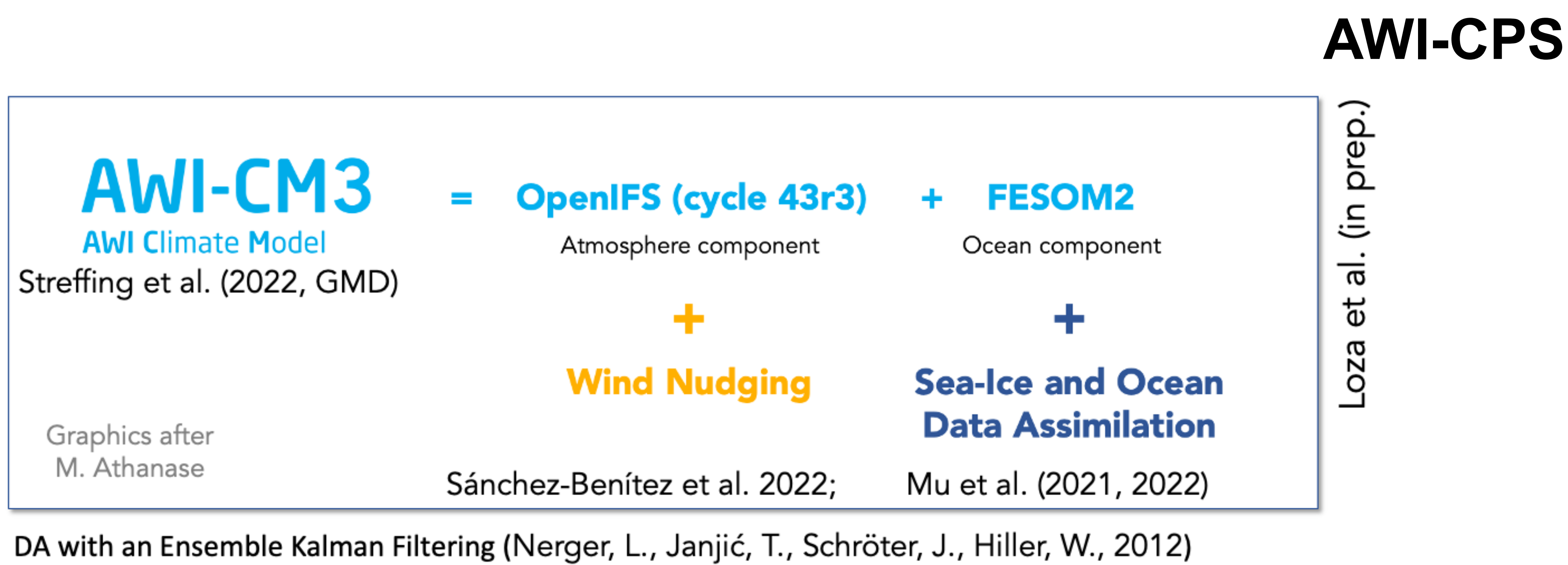




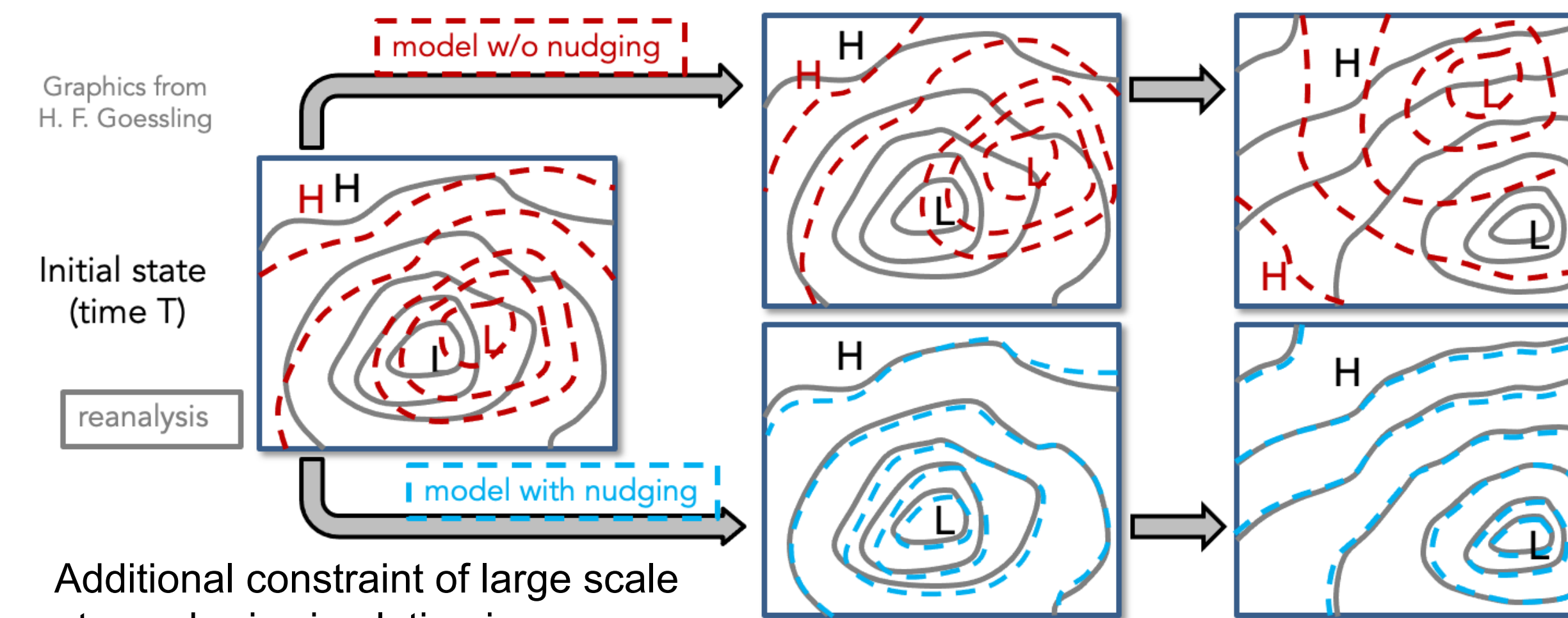
# Improving daily-to-seasonal sea ice forecasts of the AWI coupled prediction system with sea-ice and ocean data assimilation and large-scale wind nudging

Svetlana N. Loza, Marylou Athanase, Longjiang Mu, Jan Streffing, Antonio Sánchez-Benítez, Miguel Andrés-Martínez, Lars Nerger, Tido Semmler, Dmitry Sidorenko and Helge F. Goessling



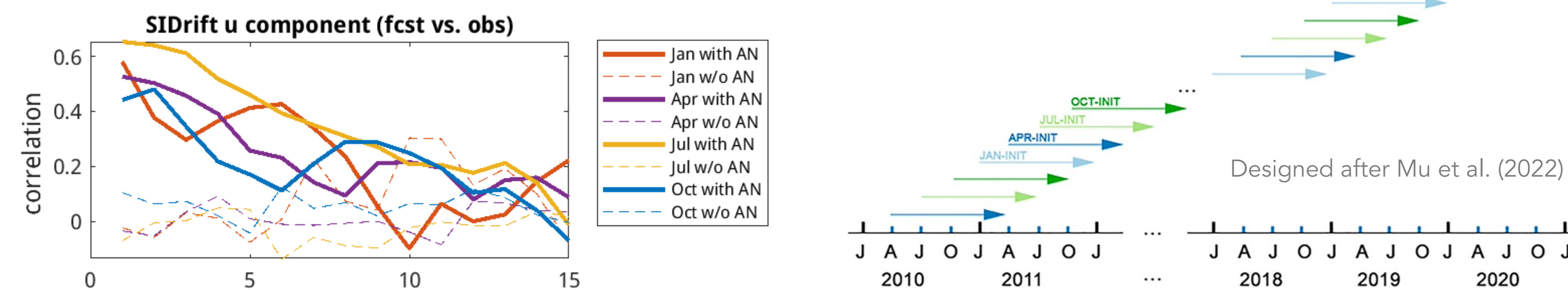
## Nudging ERA5 large scale wind reanalyses

The quasi-random atmospheric states within an ensemble forecast lead to a fast divergence of the predicted ocean and sea-ice states.



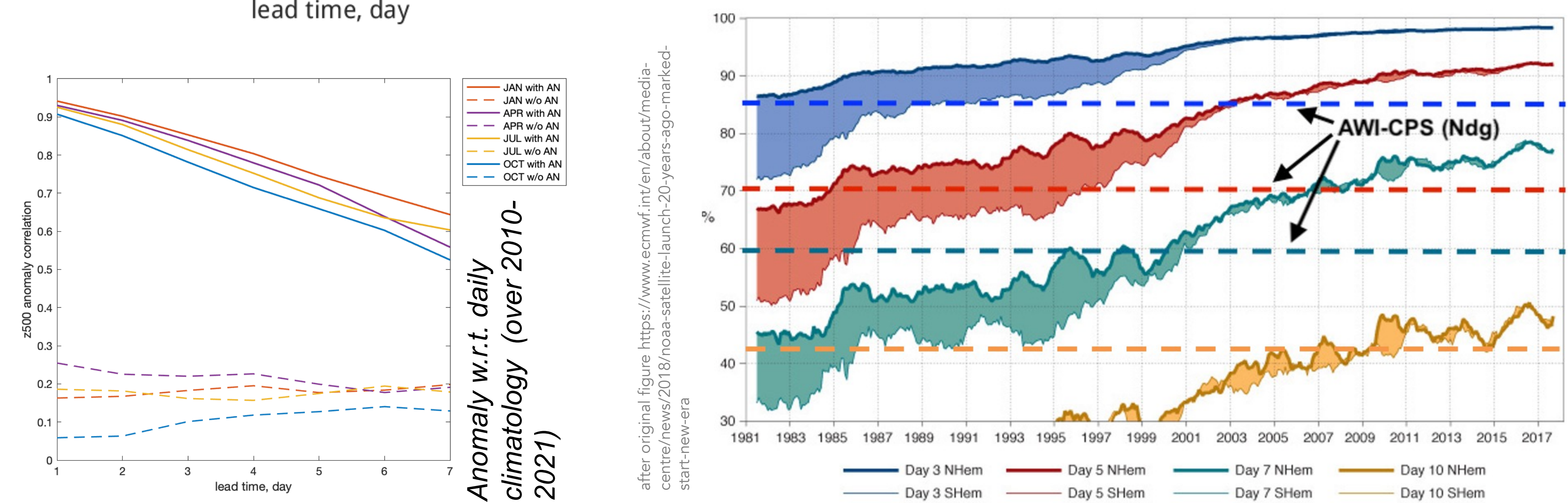
The AWI-CPS with and without atmospheric large scale circulation nudging (AN) runs with daily ocean and sea-ice data assimilation (DA) given 30 ensemble members spanning 2002 – 2023 to provide an optimal sea-ice, ocean and atmosphere state for Long Forecast initialisations.

## Improved weather forecast



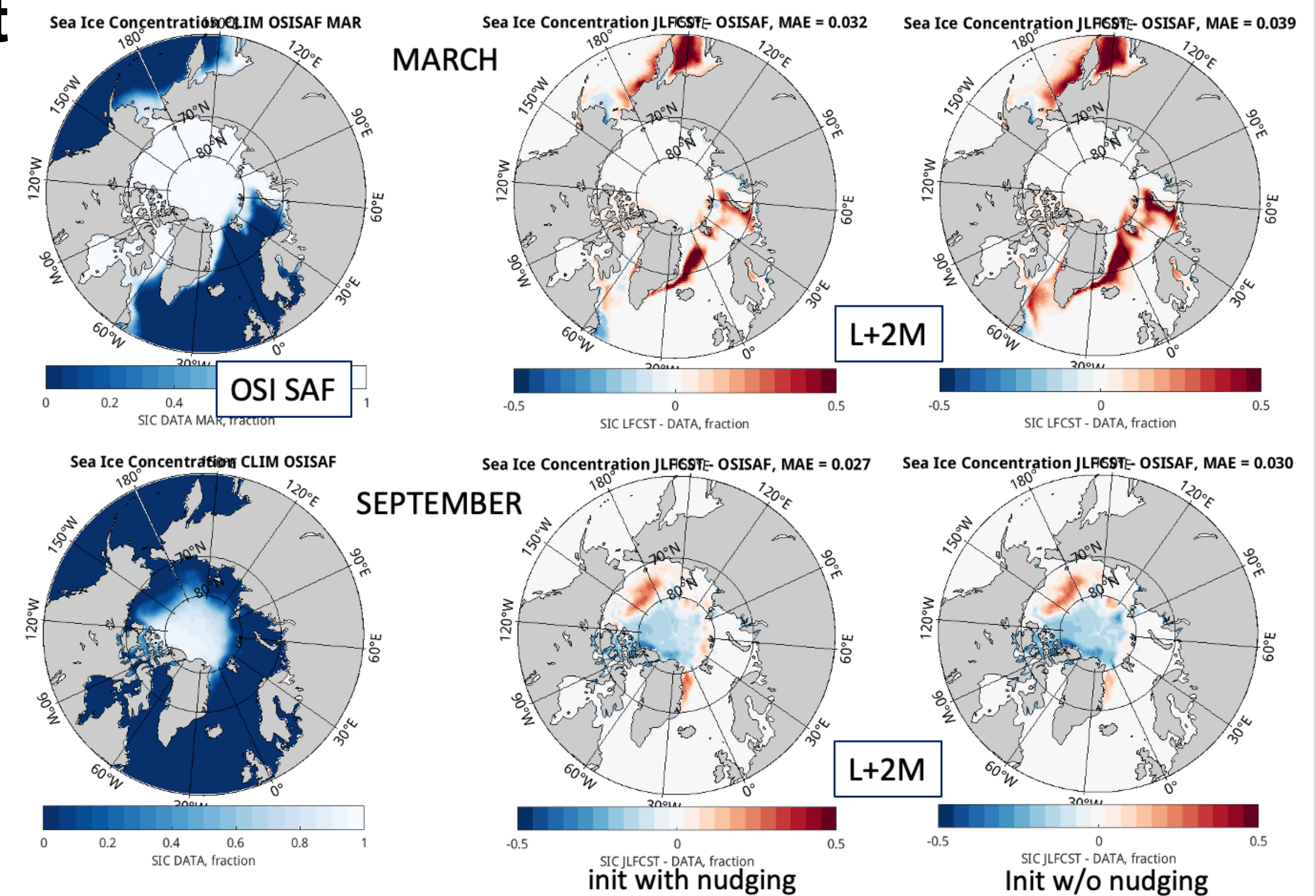
We performed and evaluated a series of Long (day-to-season) Forecasts initialised in January, April, July and October over the 2010 – NRT.

Weather forecast skills compared to ECMWF forecast score based on anomaly correlation for z500hPa

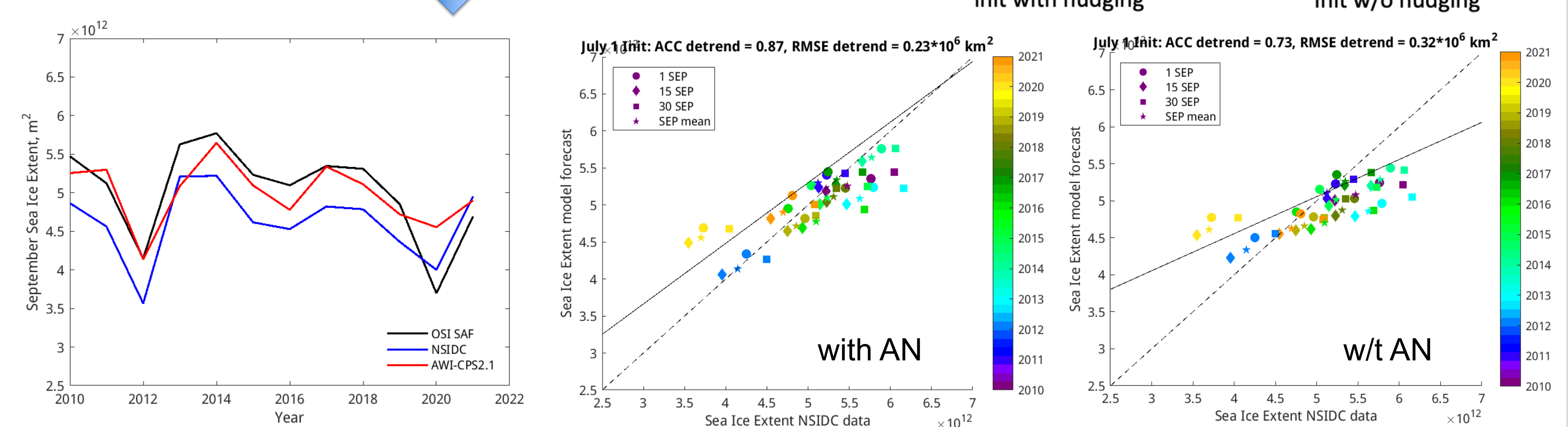


## Seasonal forecast

Predicted Arctic Sea Ice Concentration (SIC) against the product from the Ocean and Sea Ice Satellite Application Facility (OSI SAF) climatology



The seasonal forecast of September Arctic Sea Ice extent (initialised on 1 July) vs. OSI SAF and National Snow and Ice Data Centre (NSIDC) products



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