AWI-CM3 hands-on-course:

Part 1 Introduction

Jan Streffing 08.09.2022

Goals of the day

1) Install esm_tools
2) Install awicm3-v3.1
3) Run a default simulation
4) Modify namelists and run a simulation

} Hands-on

5) Learn how to contribute
6) Learn about visualization
7) Learn about documentation & support

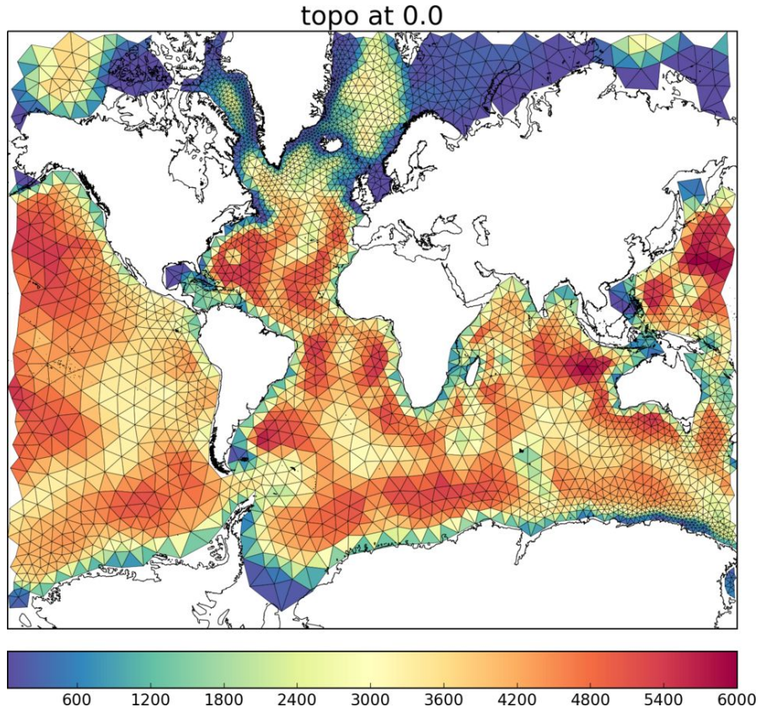
} Hands-off

Introduction

Major participating models for CMIP6:

ACCESS-CM2, **AWI-CM1-MR, AWI-ESM1-LR**, BCC-SM2-MR, CAMS, CanESM5, CAS-ESM2-0, CESM2, CIESM, CMCC-CM2-SR5, CNRM-CM6-1-HR, E3SM-1-1, EC-Earth3, FGOALS-f3-L, FIO-ESM-2-0, GISS-E2-1-G, HadGEM3MM, ICON-ESM-LR, IITM-ESM, INM5, IPSL-CM6A-LR, KIOST-ESM, MCMUA1, MIROC6, MPI-ESM1-2-HR, MRI-ESM2-0, NESM3, NOAA-GFDL, NorESM2-MM, SNU, TaiESM1

	Practical resolutions:
AWI-CM1	FESOM1: 120-10 km ECHAM6: 200-100 km



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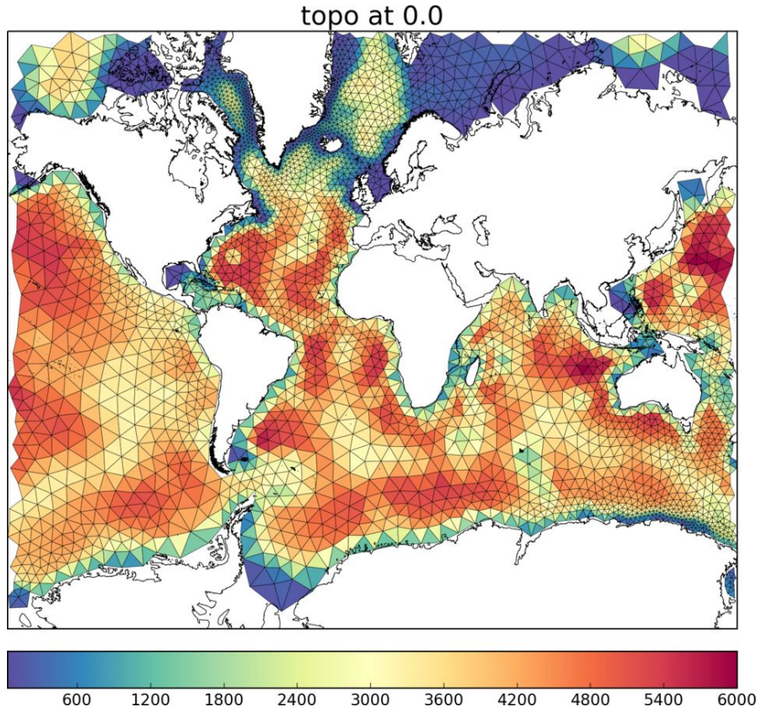

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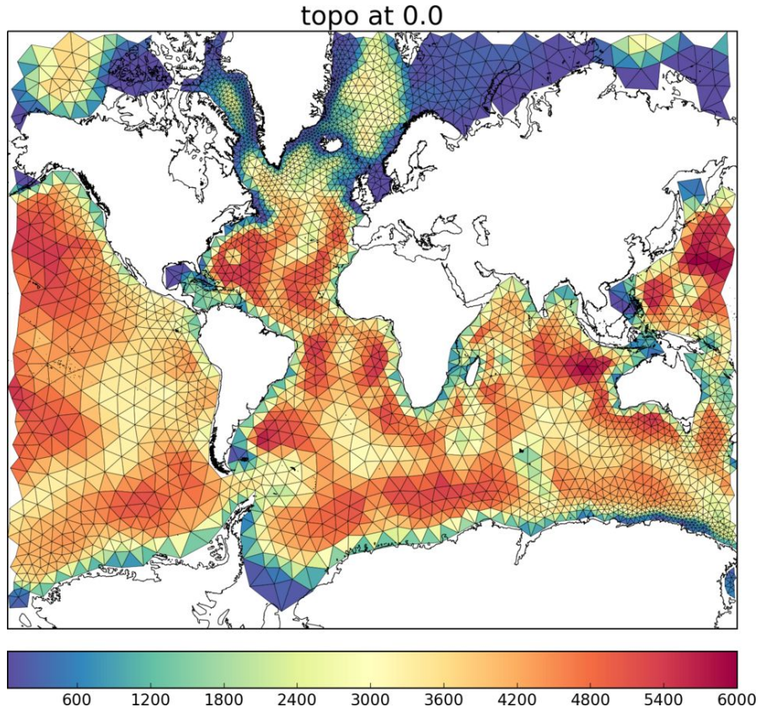
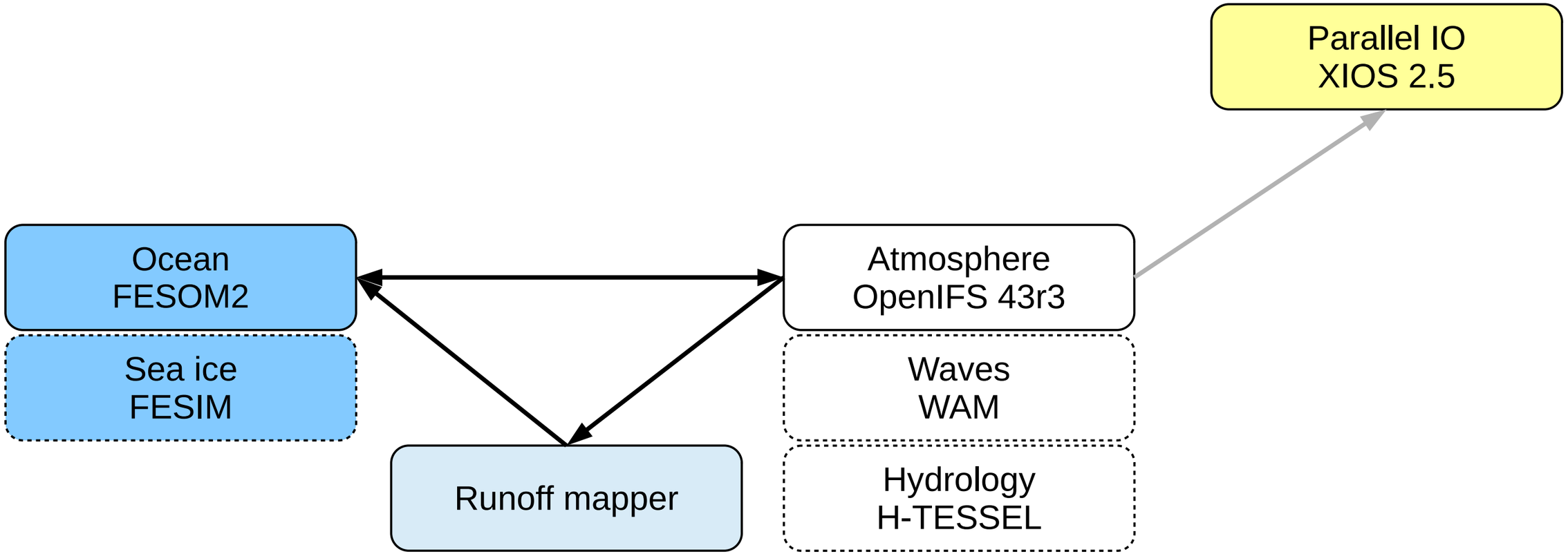
AWI-CM2	FESOM2: 120-1 km ECHAM6: 200-100 km
AWI-CM3	FESOM2: 120-1 km OpenIFS: 120-9km

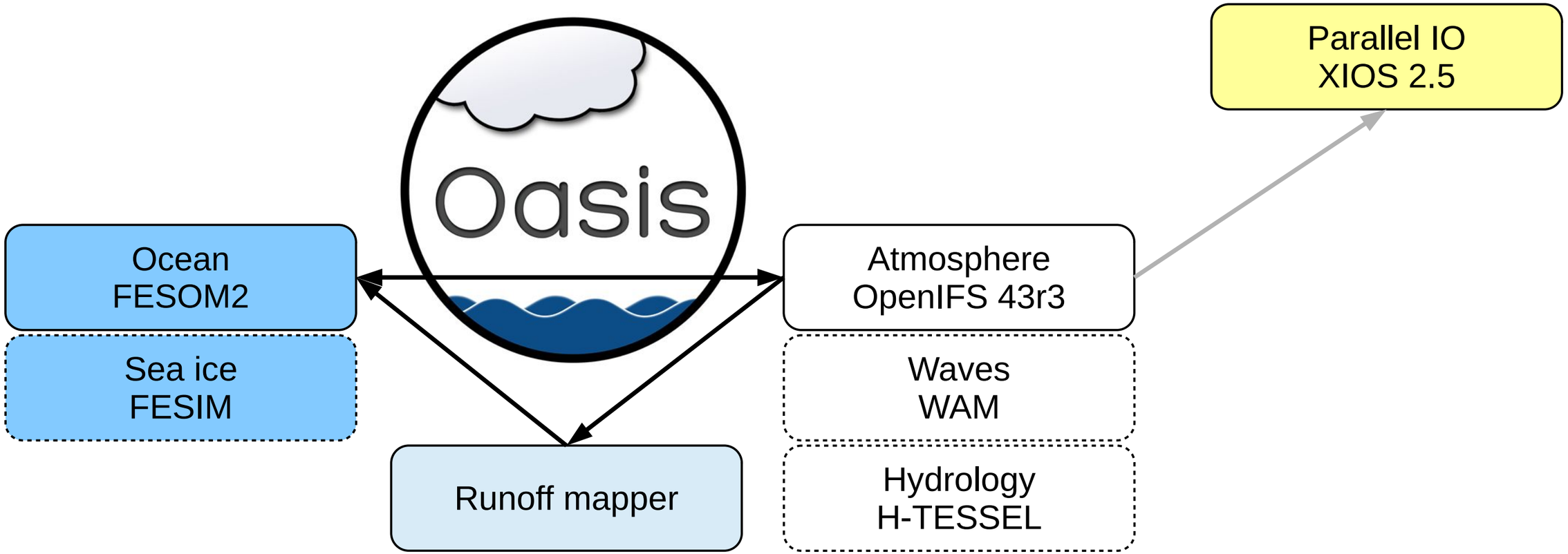


Introduction Coupling schematic



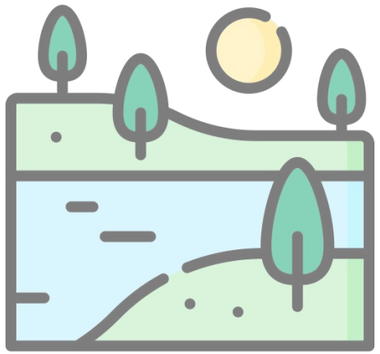
Introduction Coupling schematic

Oasis: Interpolation library by CERFACS & Los Alamos Labratory

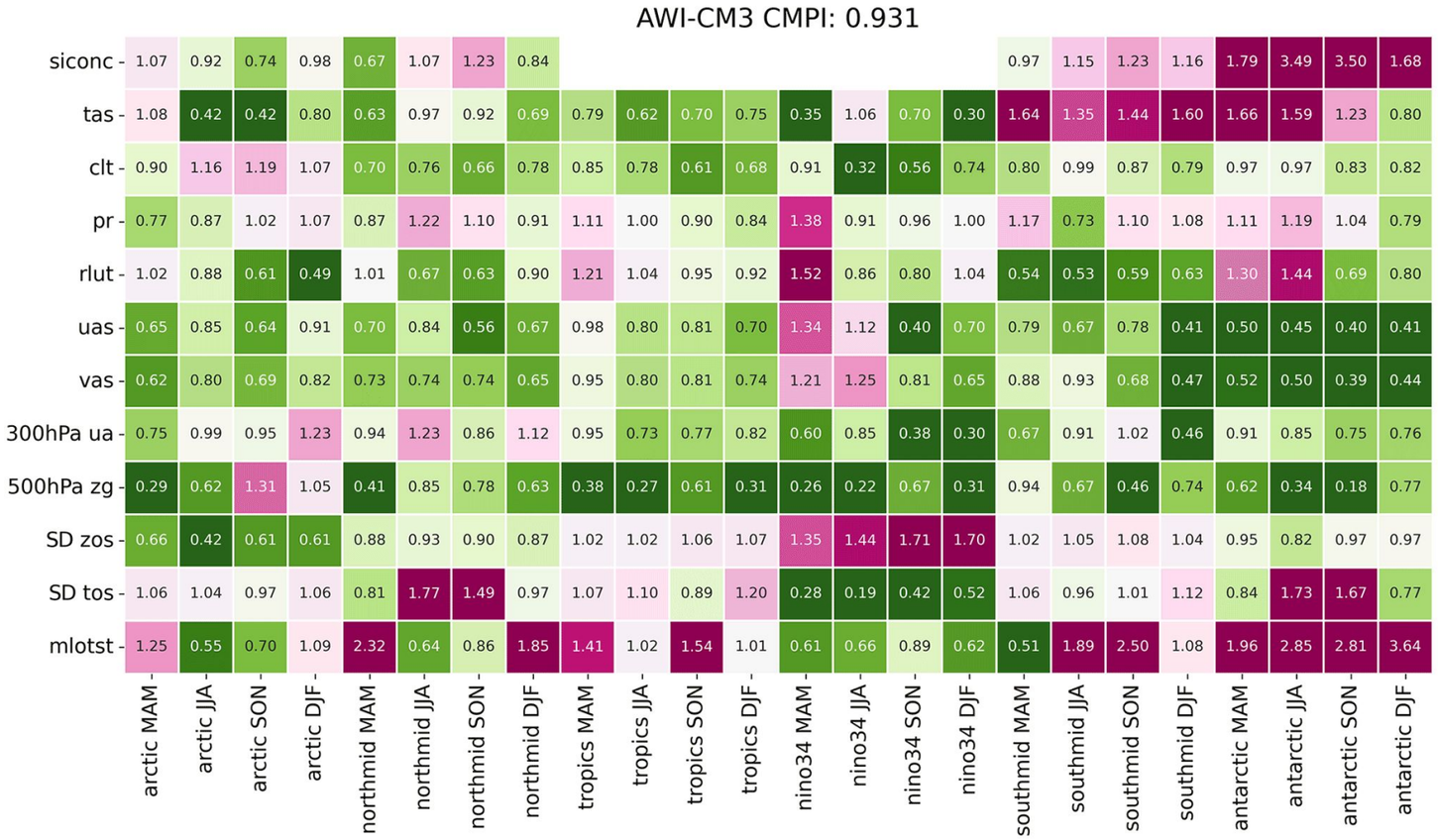


Introduction Basic coupling

Computed in FESOM2	Computed in OpenIFS	Computed in Runoff-mapper
Sea surface temperature	Zonal wind stress, ocean	River runoff
Sea ice surface temperature	Meridional wind stress, ocean	
Sea ice concentration	Zonal wind stress, sea ice	
Sea ice thickness	Meridional wind stress, sea ice	
Snow thickness	Non-solar heat flux ocean	
	Solar heat flux	
	Total heat flux sea ice	
	Liquid precipitation	
	Solid precipitation	
	Evaporation	
	Sublimation	
	Precipitation - evaporation - soil moisture	



Introduction v3.0 performance



Green = better than CMIP6 average
Magenta = worse than CMIP6 average
Number = Factor by how much

https://github.com/JanStreffing/cmpi-tool/

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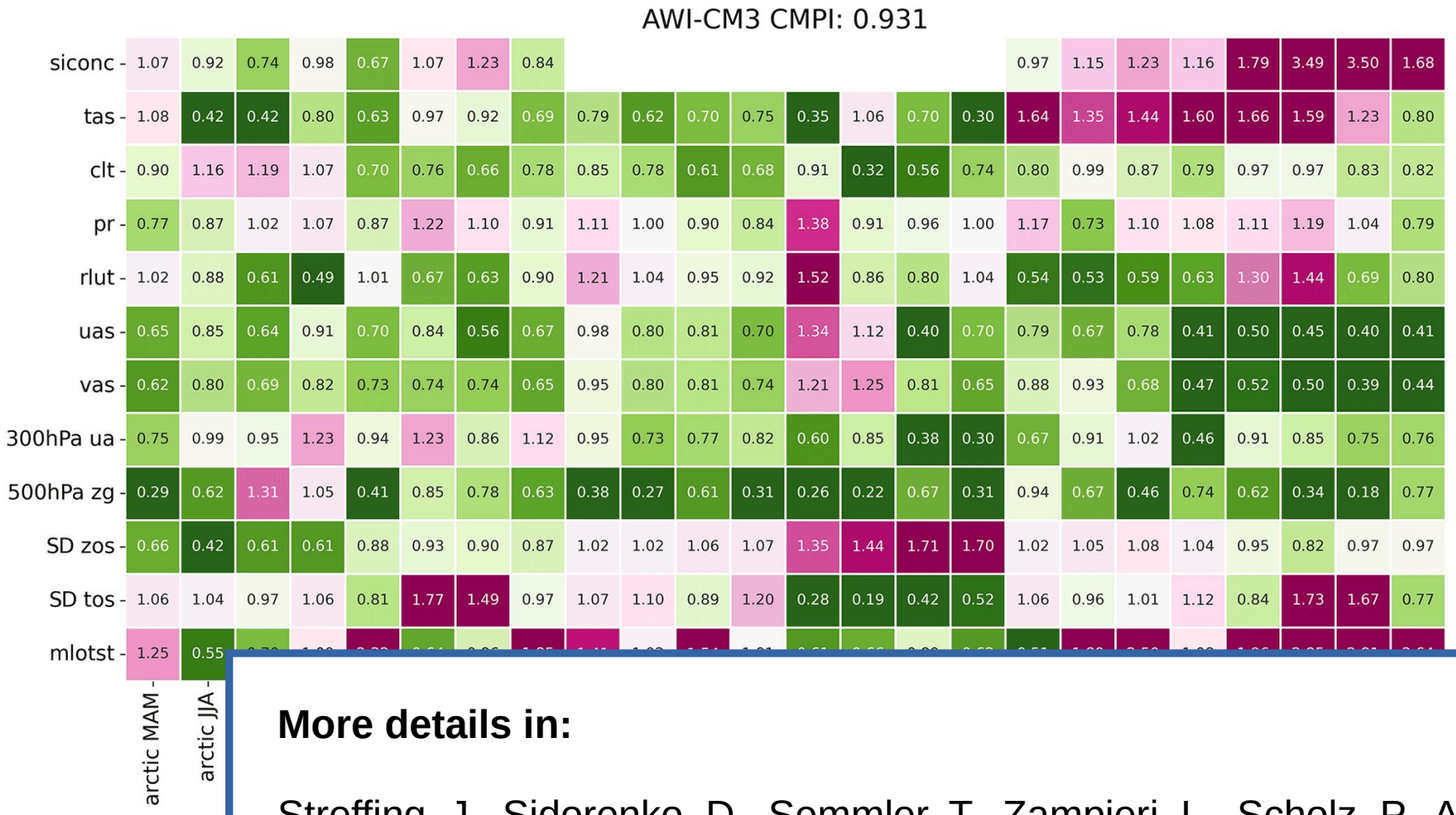

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More details in:

Streffing, J., Sidorenko, D., Semmler, T., Zampieri, L., Scholz, P., Andres-Martinez, M., … Jung, T. (2022). AWI-CM3 coupled climate model: description and evaluation experiments for a prototype post-CMIP6 model. Geoscientific Model Development, 15 (16), 6399–6427. Retrieved from https://gmd.copernicus.org/articles/15/6399/2022/ doi: 10.5194/gmd-15-6399-2022

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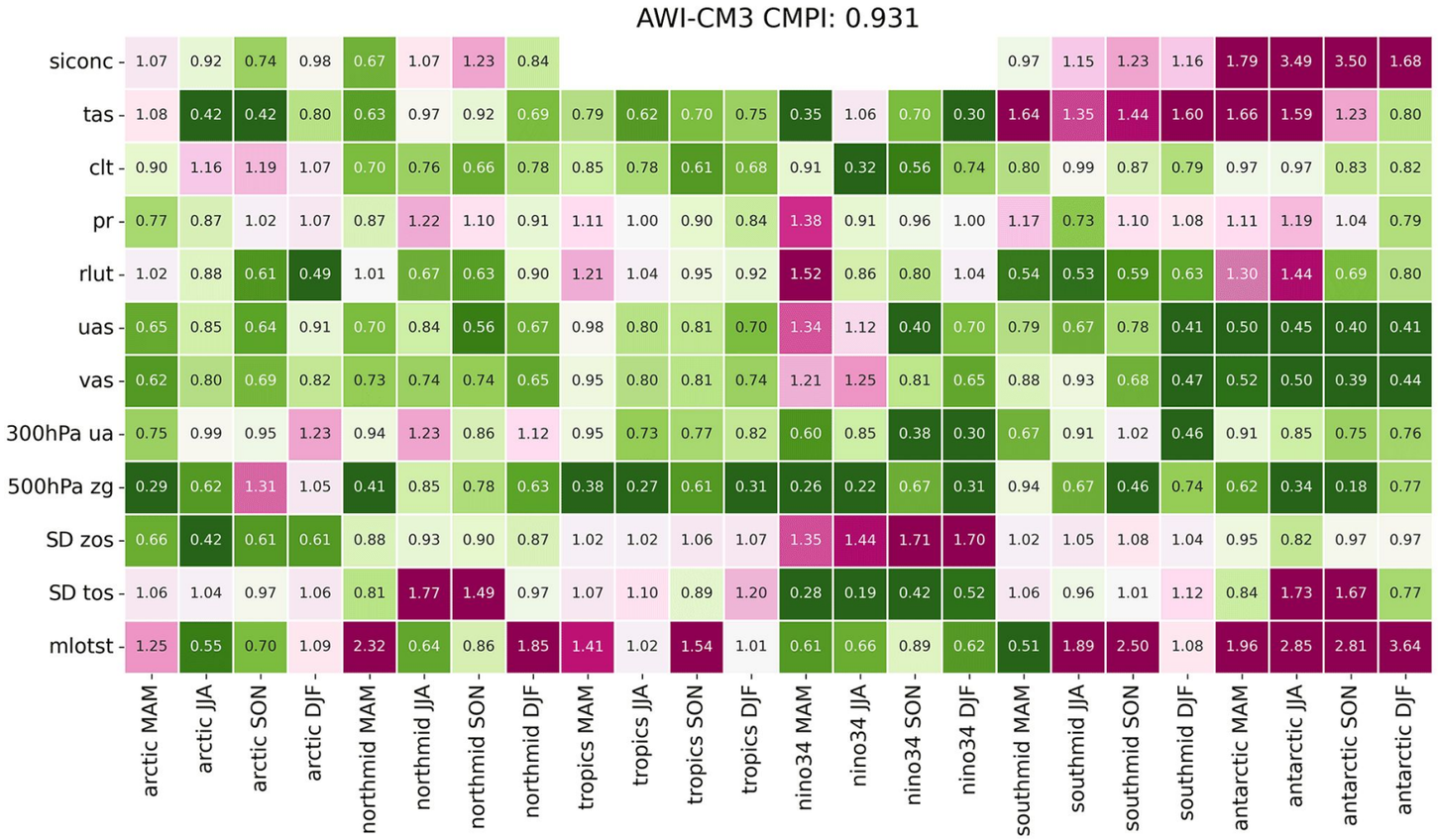

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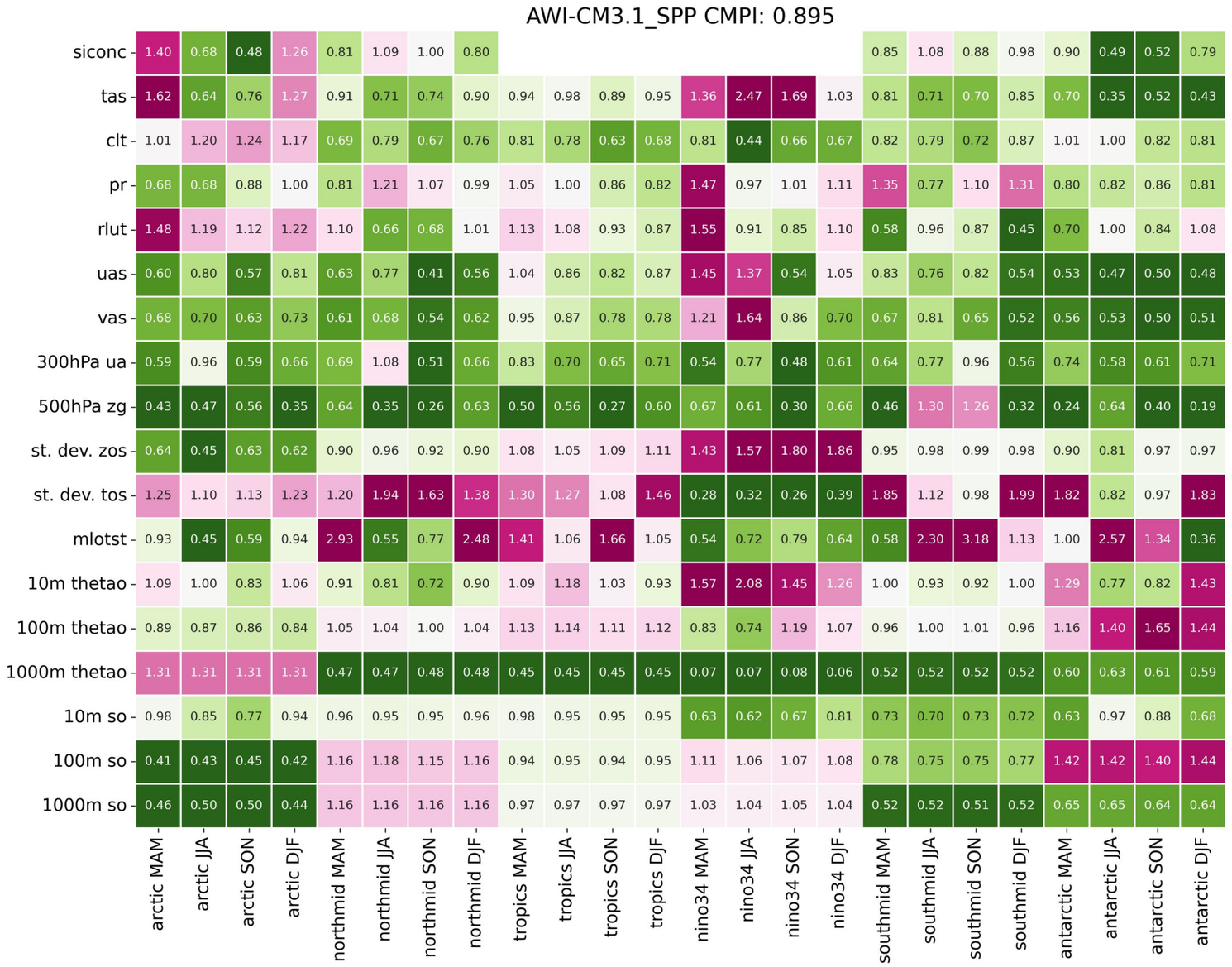
Introduction v3.1 performance



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Introduction Longterm plan