

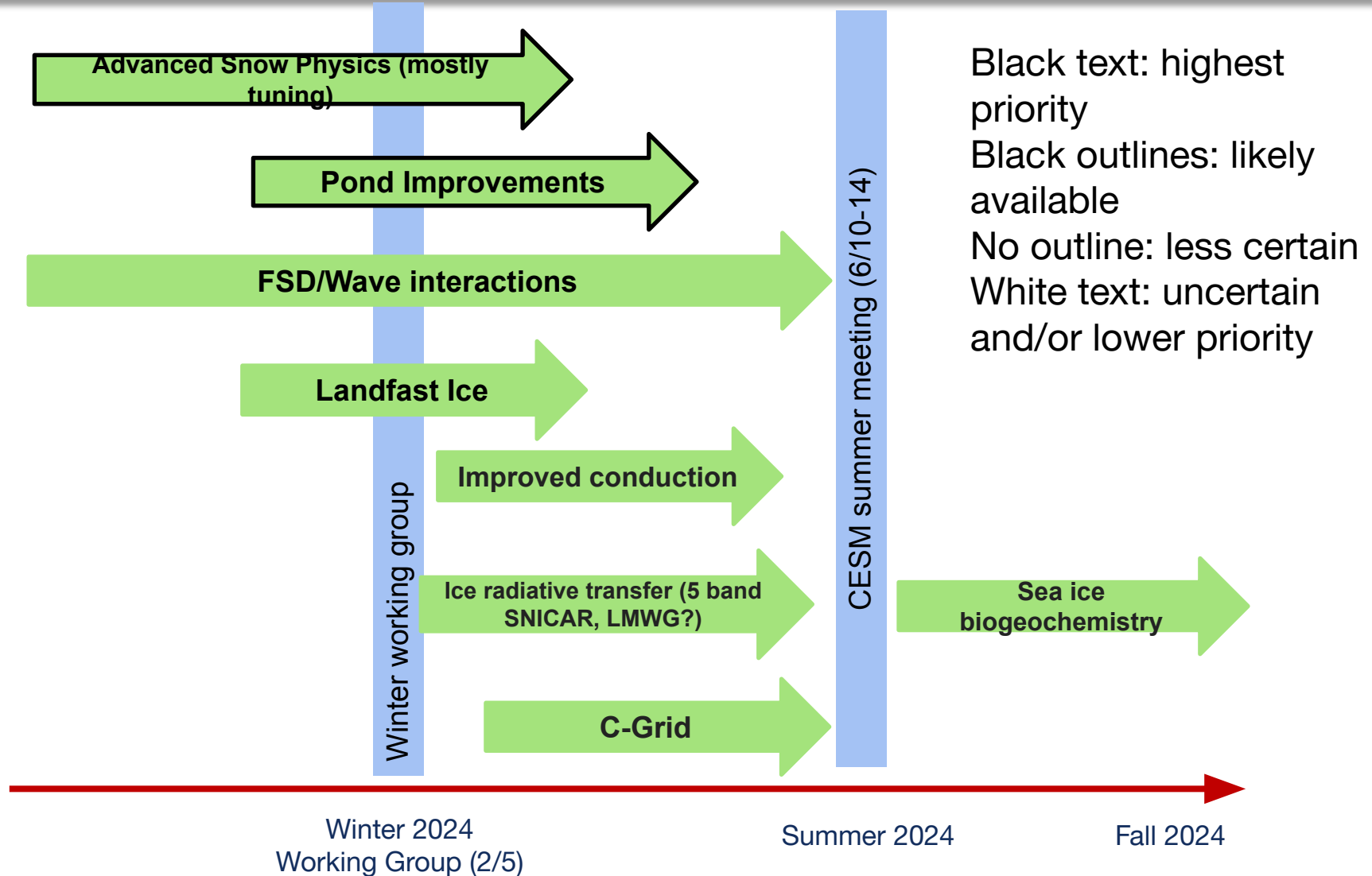


Polar Biases in the CESM3 Development Simulations

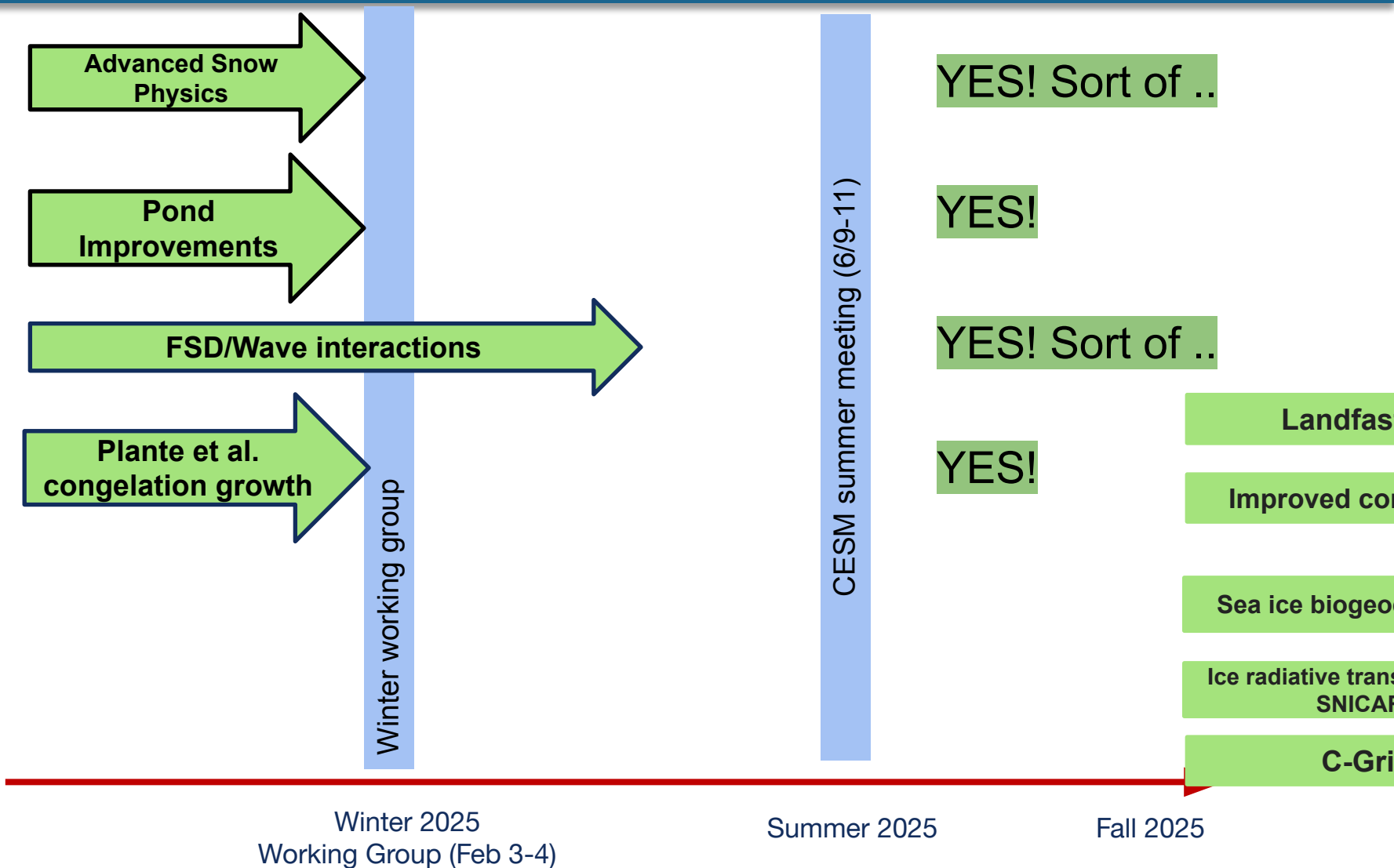
David Bailey, Alice DuVivier, Marika Holland

Jun 10, 2025

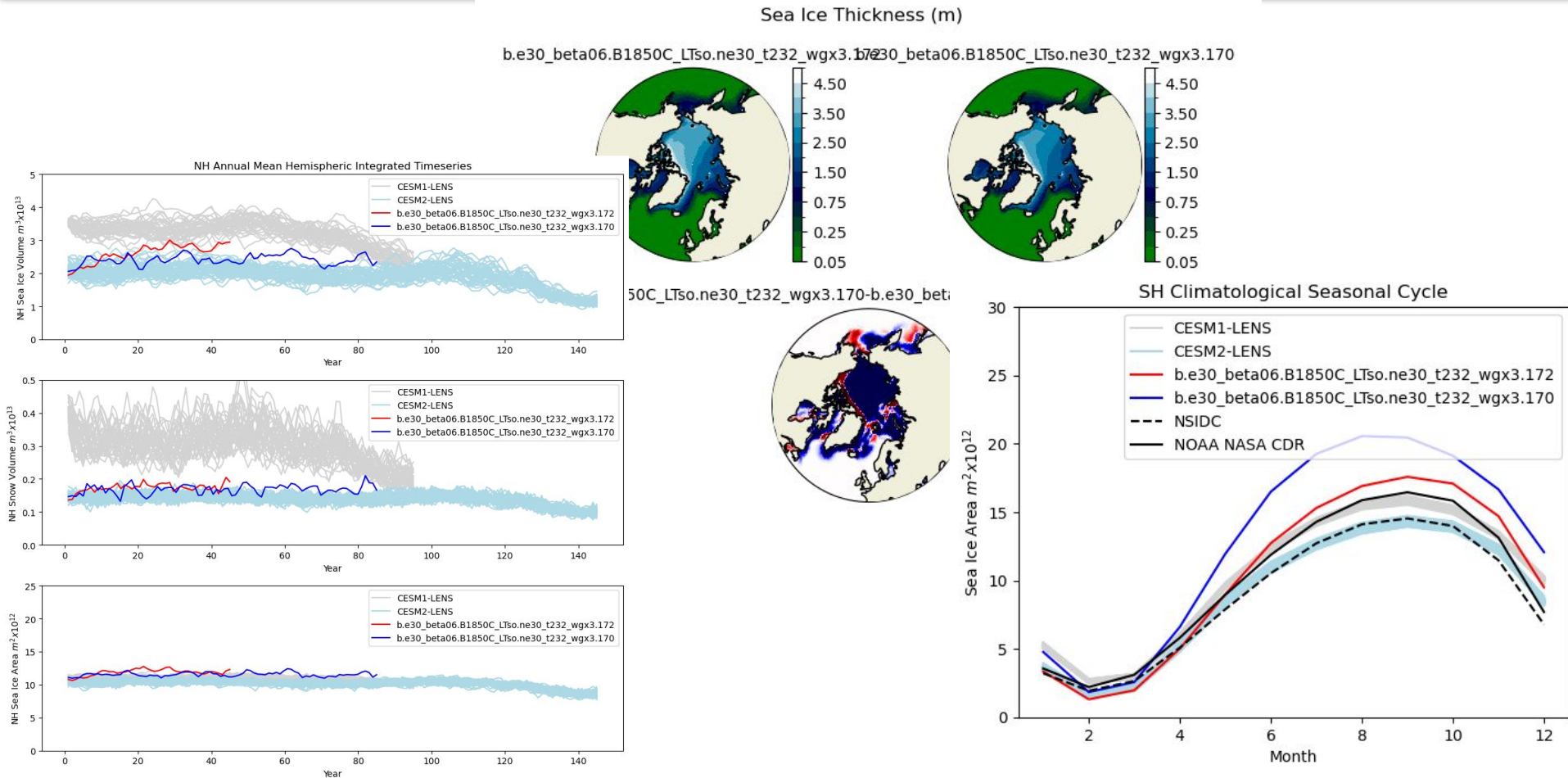
PCWG Sea Ice Plans



PCWG Sea Ice Updated Plans

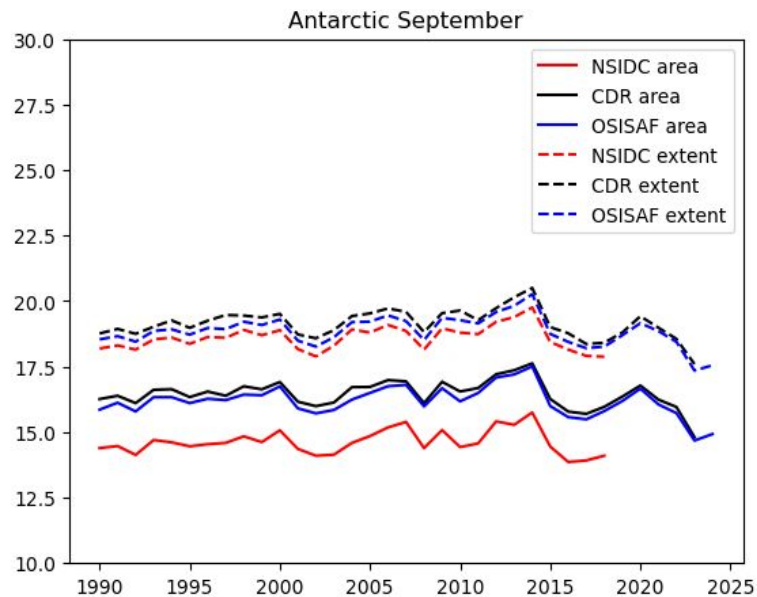
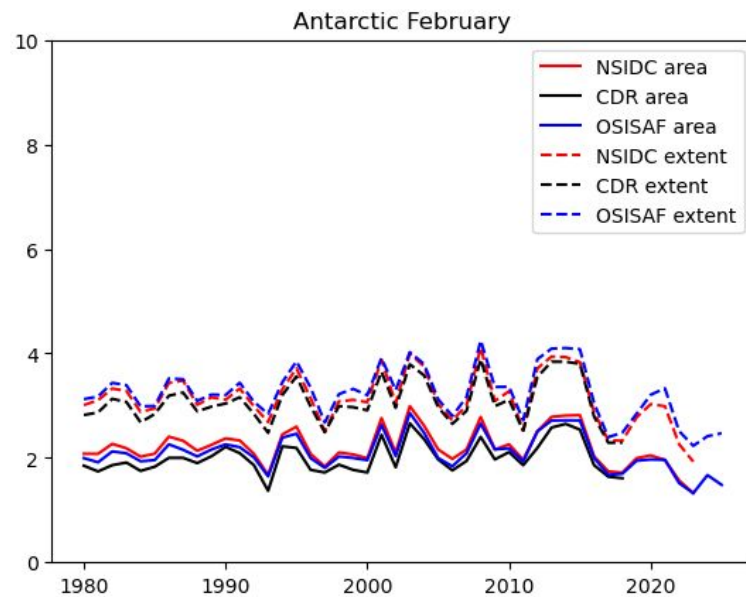
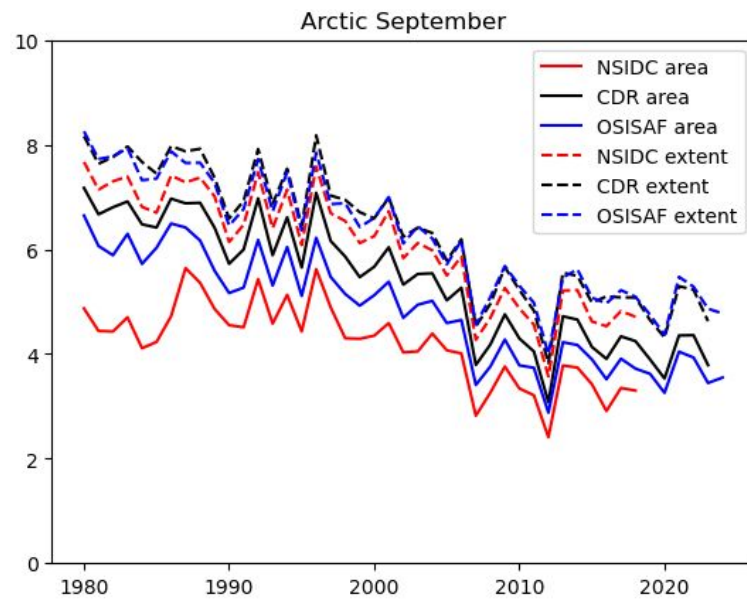
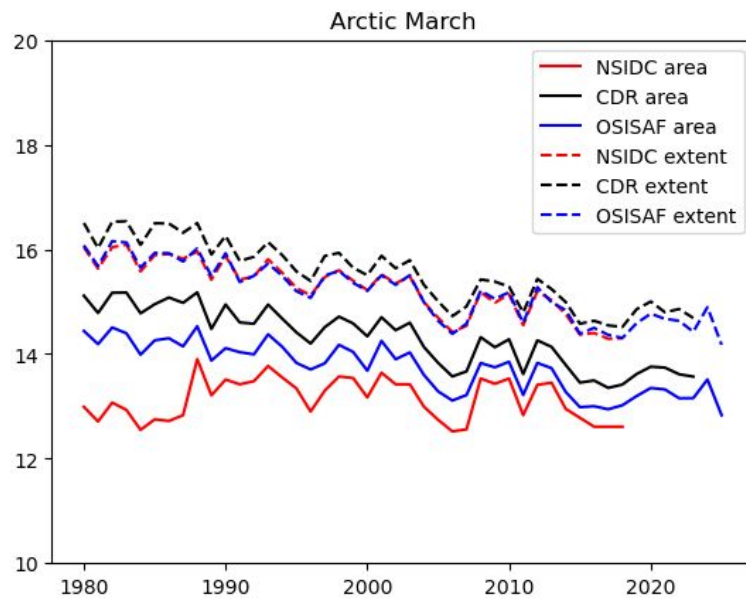


CUPiD: Sea Ice Key Metrics Notebooks

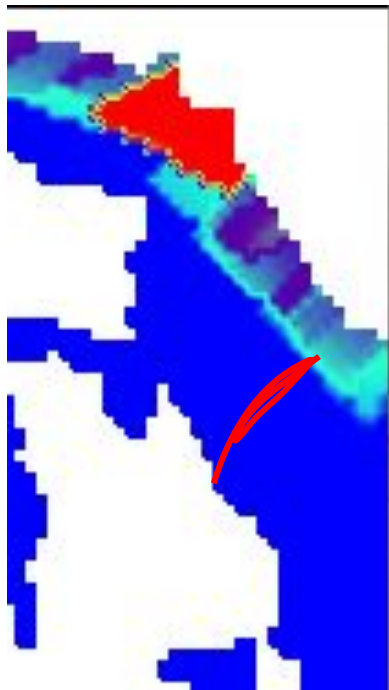
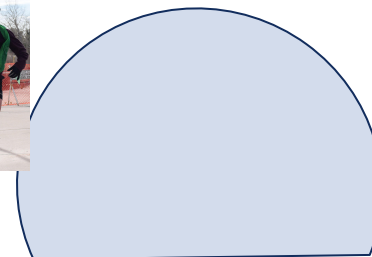
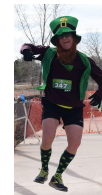


https://webext.cgd.ucar.edu/BLT1850/b.e30_beta06.B1850C_LTso.ne30_t232_wgx3.172/ice/b.e30_beta06.B1850C_LTso.ne30_t232_wgx3.172-b.e30_beta06.B1850C_LTso.ne30_t232_wgx3.170/infrastructure/index.html

CUPiD: Passive Microwave Sea Ice Products



Coupled Model Biases: Labrador Sea

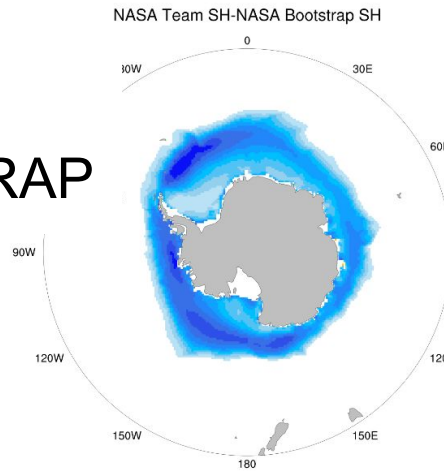


Experiments

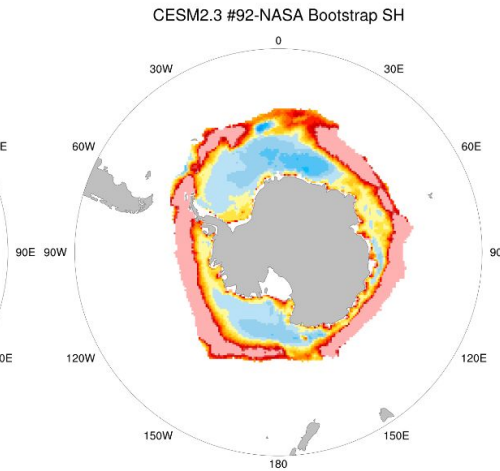
- Reduce precipitation: Latent heat flux, topographic changes, ...
- Reduce flux over Labrador Sea: Restoring, reduction factors, ...
- Reduce lateral and vertical mixing: Bodner, KPP / ePBL, ...

Coupled Model Biases: Southern Ocean Sea Ice

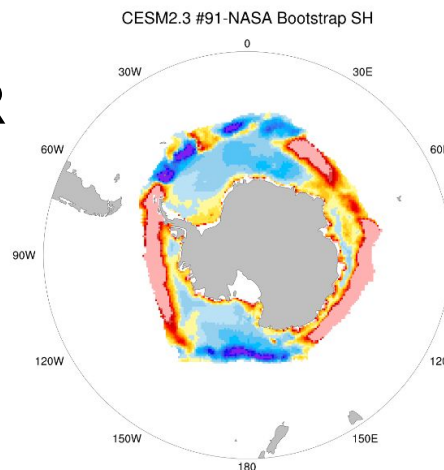
NASA TEAM -
NASA BOOTSTRAP



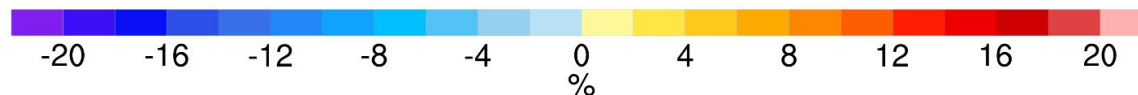
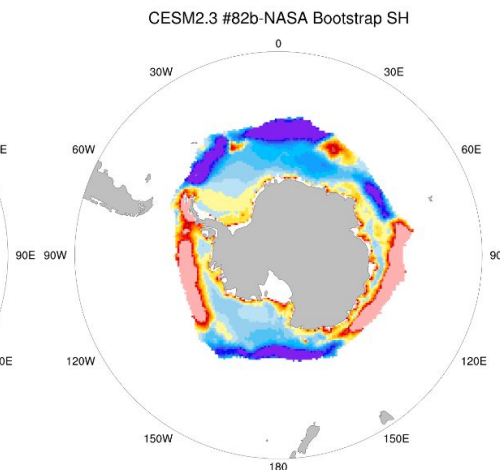
HYCOM1



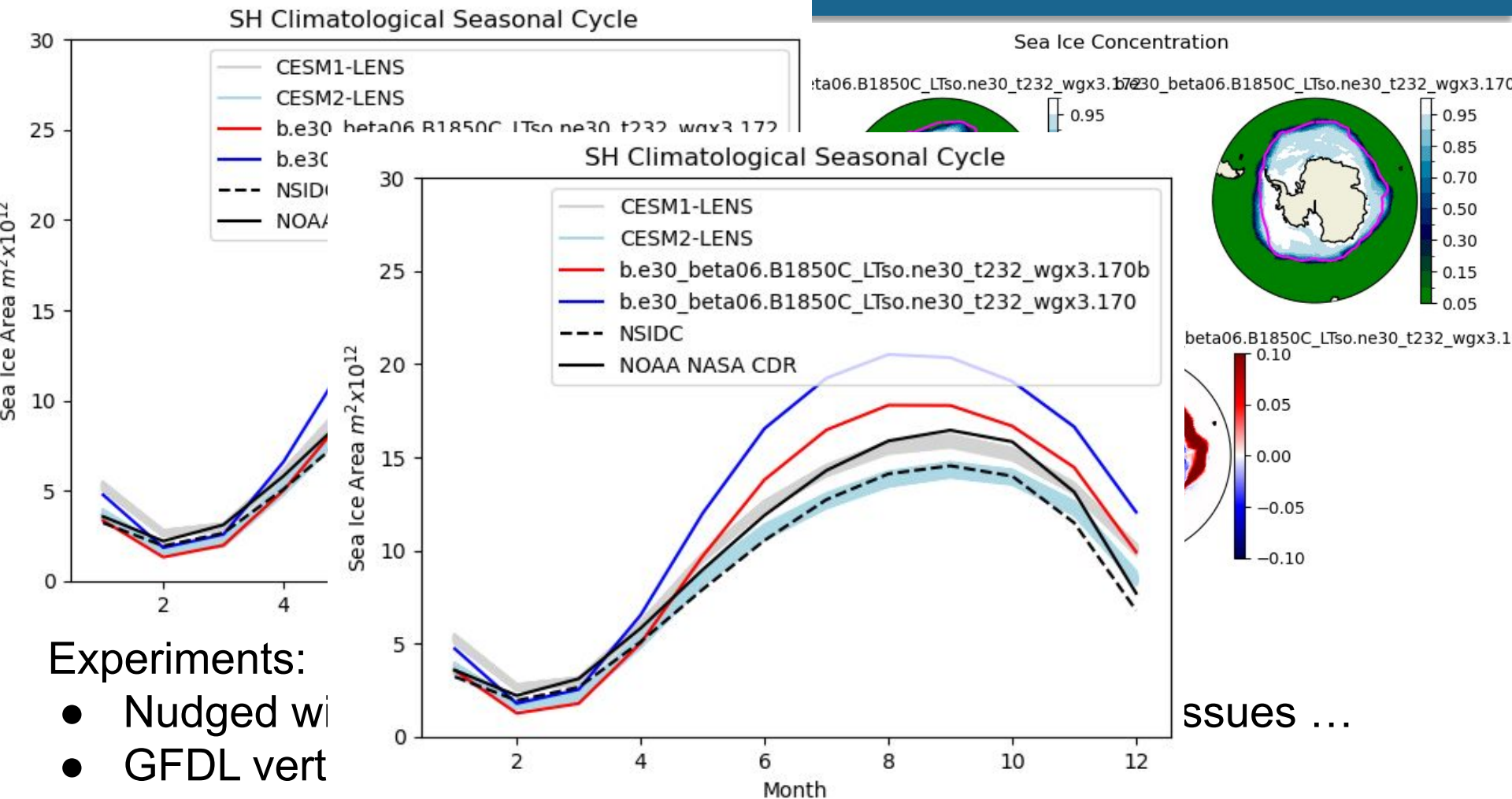
ZSTAR



CESM2ish



Coupled Model Biases: Southern Ocean Sea Ice



Experiments:

- Nudged with
- GFDL vertical
- Wave-ice interaction. Does decrease the ice extent somewhat
- Gent-McWilliams coefficient: in progress (170b)

Coupled Model Biases: Summary

- New physics: congelation growth changes, snow redistribution, sea level ponds, wave-ice fracturing (floe size distribution)
- Using NASA NOAA CDR extent as a metric
- various experiments to alleviate the polar biases
- As Dave L said, the Lab Sea is a show stopper
- Is the SH sea ice a show stopper?