# MOM6 Arctic 12 km domain

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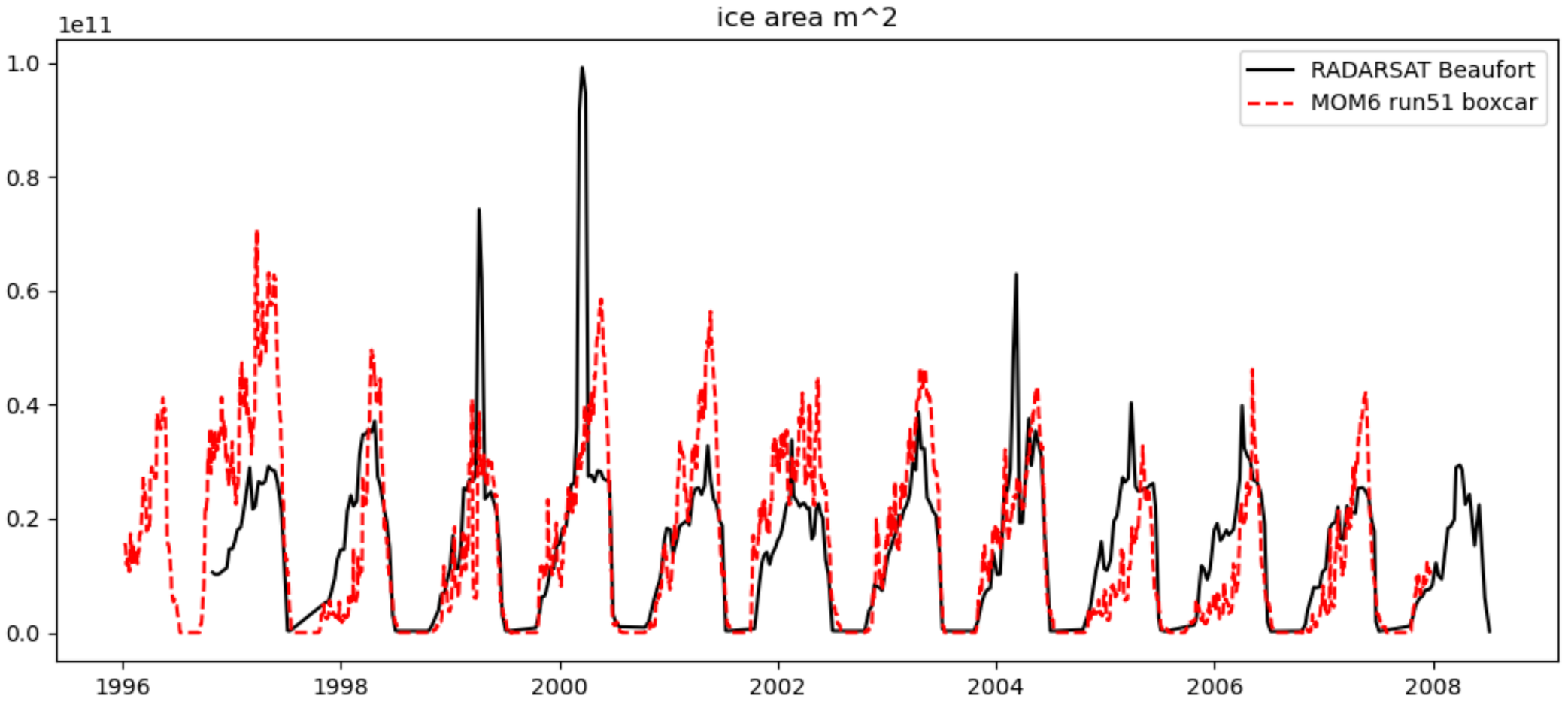
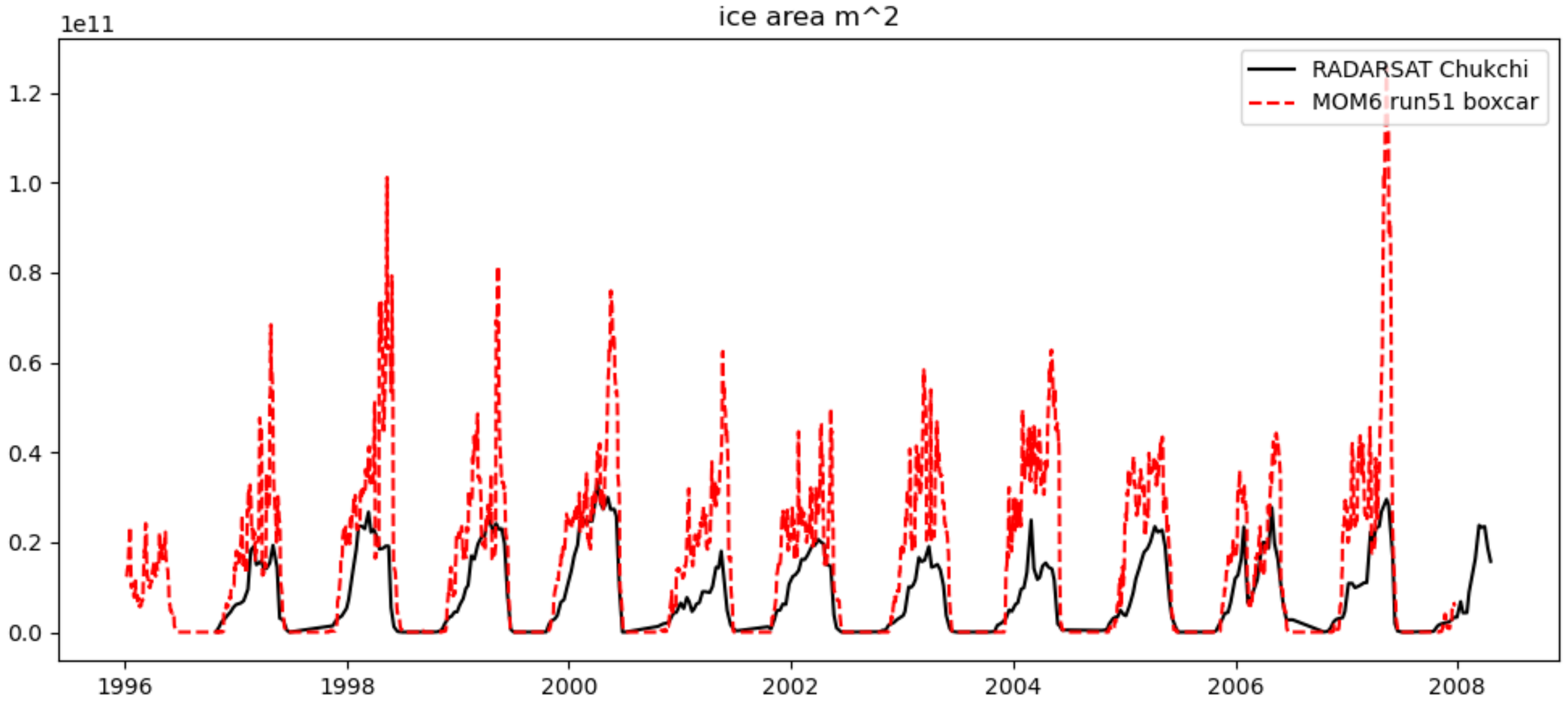
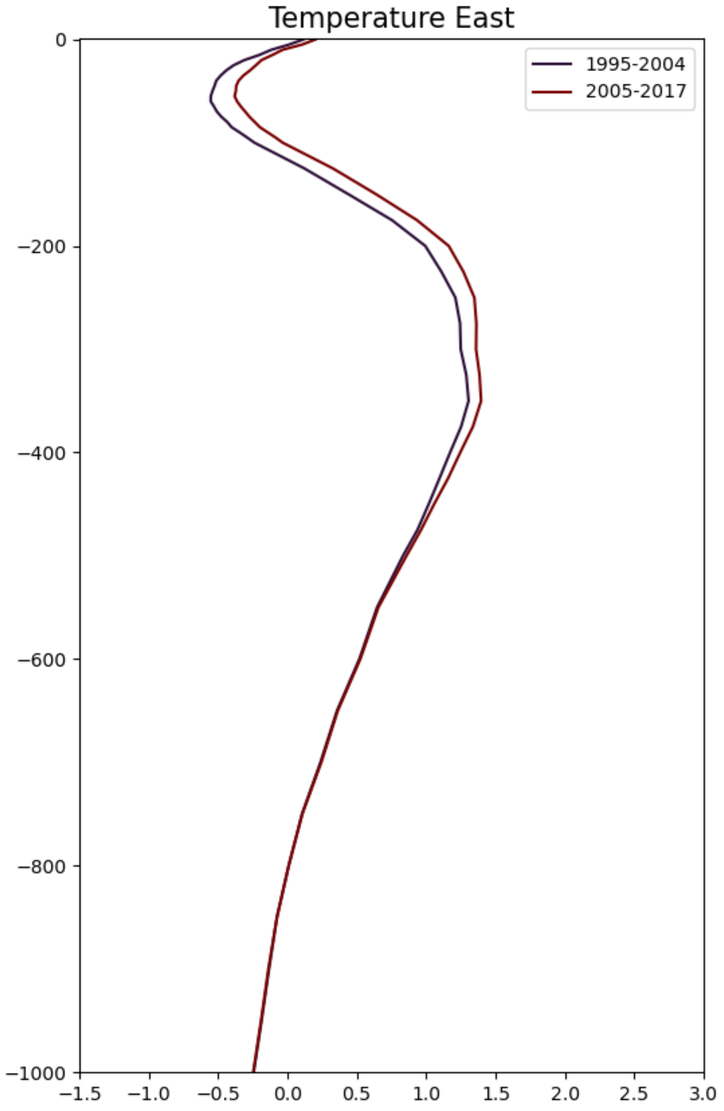
# Pan-Arctic domain

- MOM6 ocean, SIS2 ice, Icepack ridging
- JRA55-do atmospheric forcing
- A combined GLOFAS-Hill river runoff
- COBALT BGC tracers
- A landfast ice parameterization (Dupont, 2022)
- Ten sea-ice categories
- Open boundary conditions from GLORYS
- 75 vertical z-star levels in ocean
- Focus on the years 1993-2019

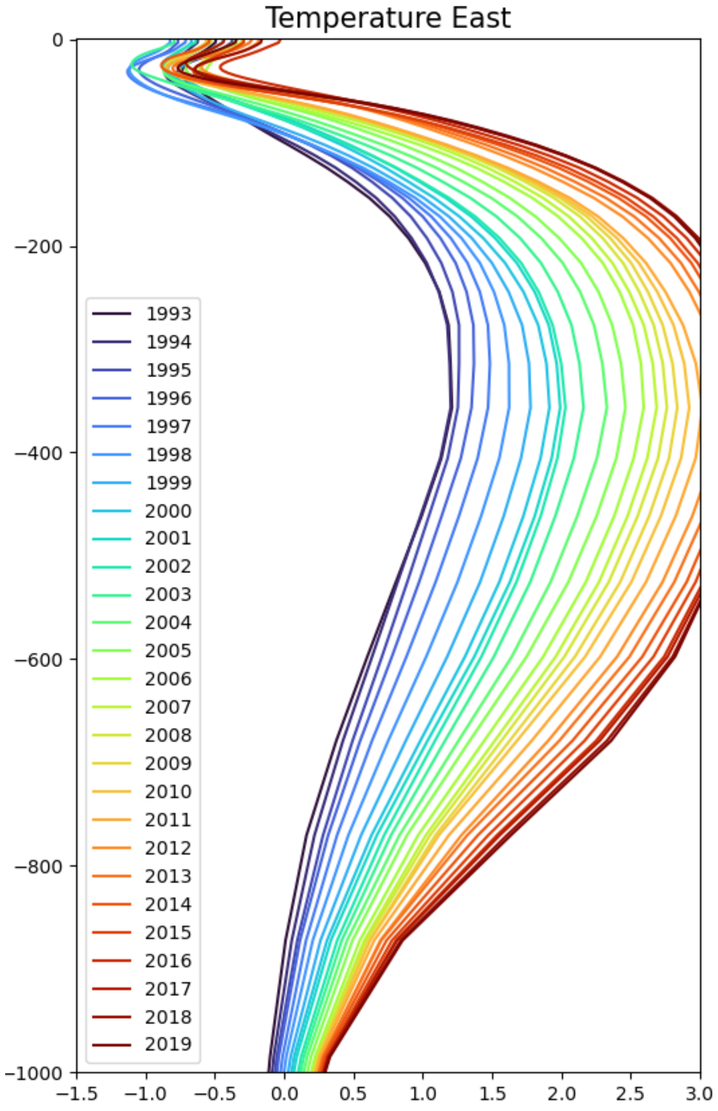

ice area m^2
1e11
1.0
0.8
0.6
0.4
0.2
0.0
1996
1998
2000
2002
2004
2006
2008
RADARSAT Beaufort
MOM6 run51 boxcar


ice area m^2
1e11
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1996
1998
2000
2002
2004
2006
2008
RADARSAT Chukchi
MOM6 run51 boxcar

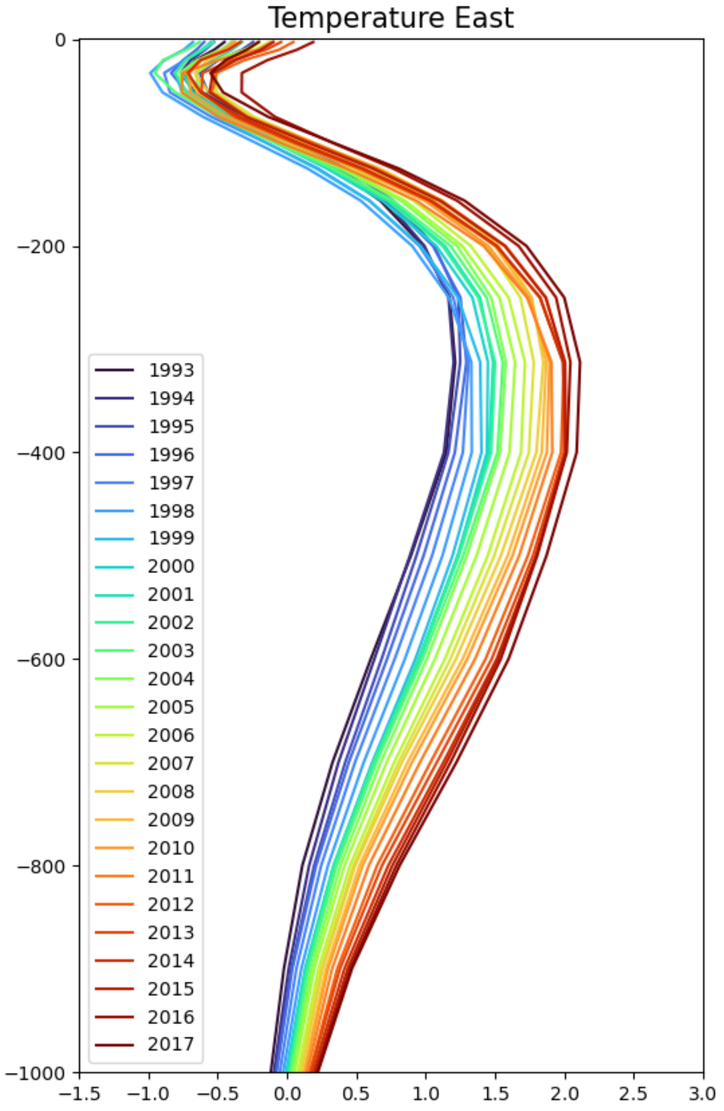
WOA (0.25°;



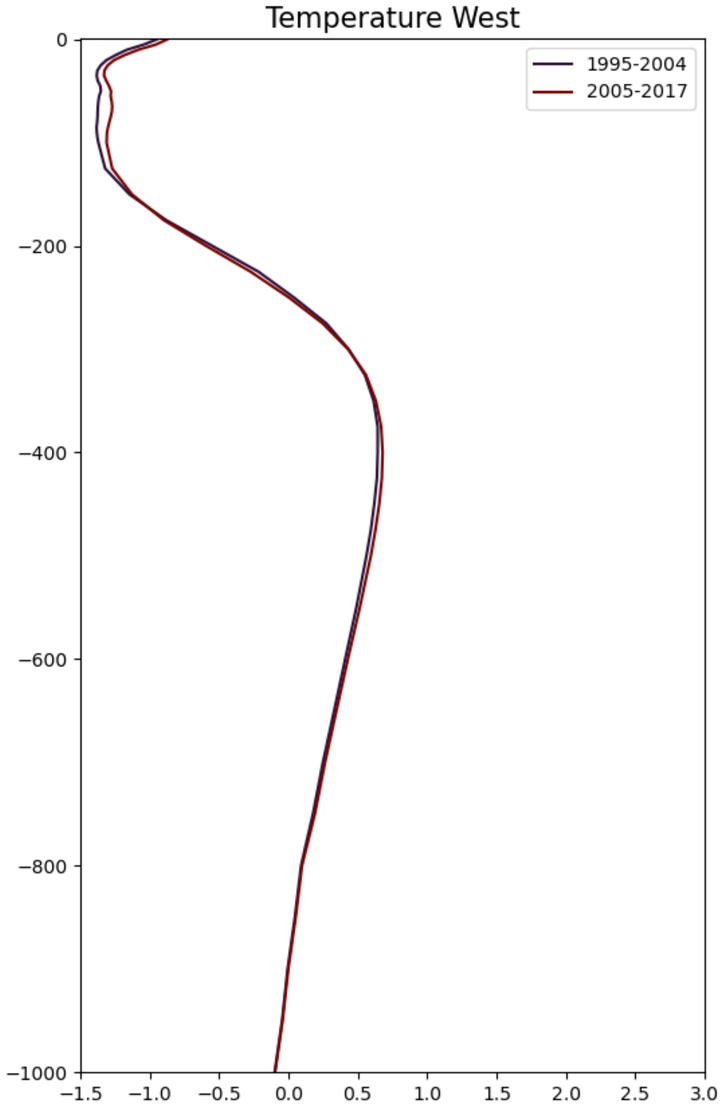

Arctic MOM6 run27



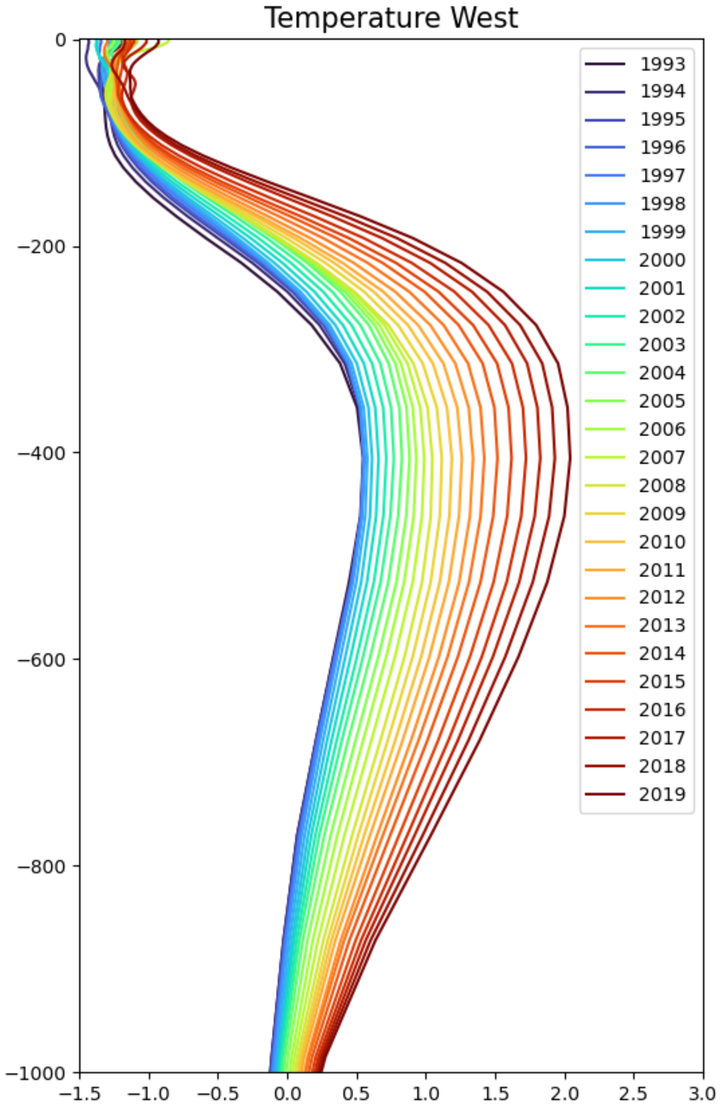

Arctic MOM6 run51



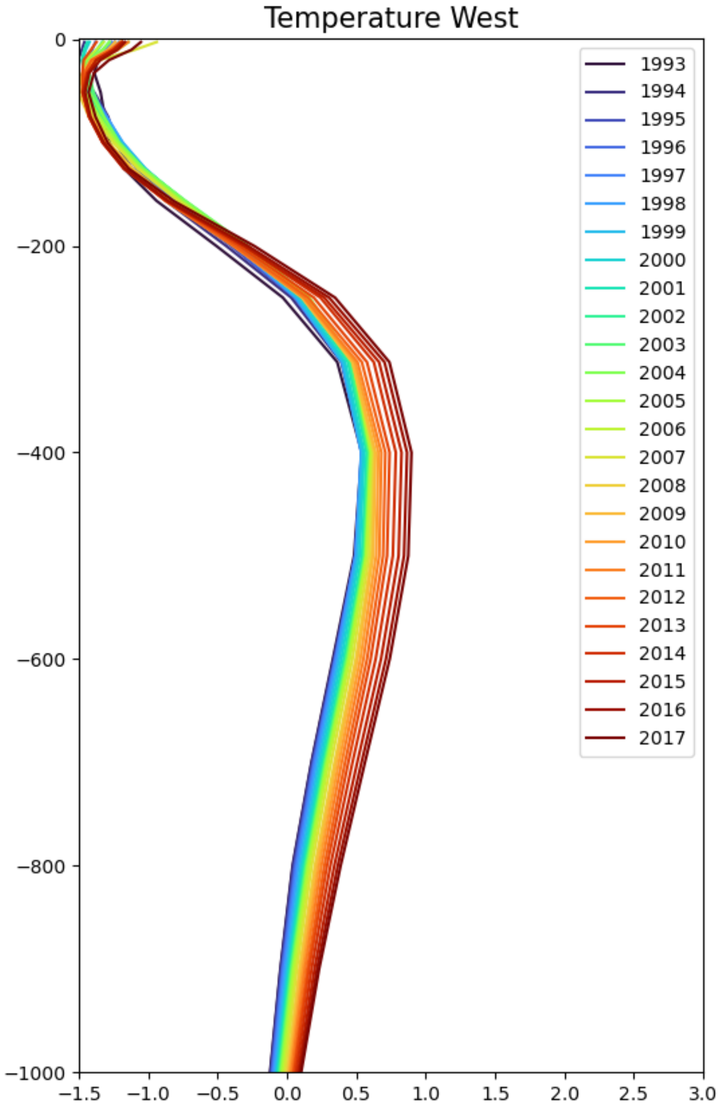
WOA (0.25$^o$;




Arctic MOM6 run27

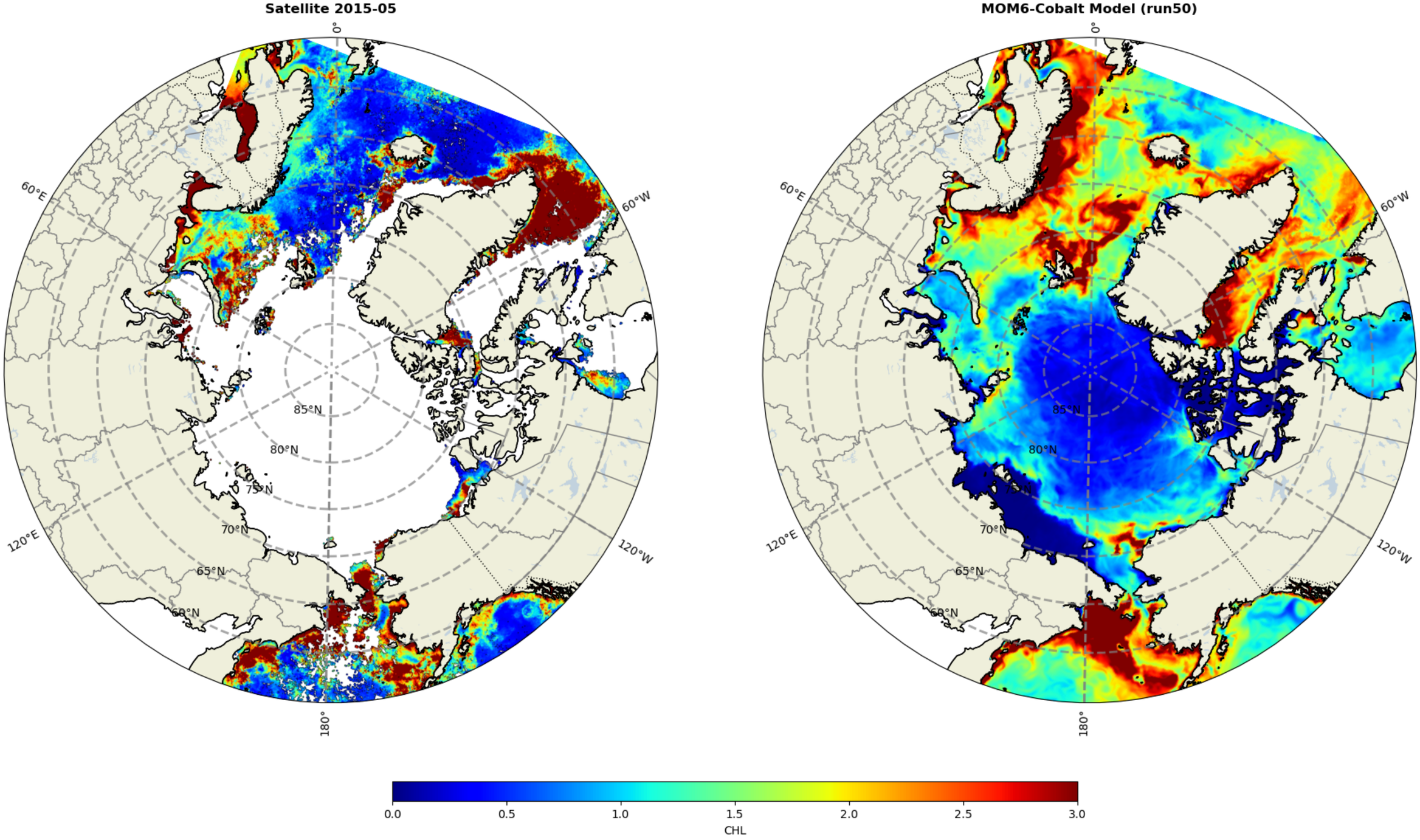



Arctic MOM6 run51



# Reducing biases

- A better runoff product, merging Hill's runoff with GLOFAS
- An equation of state that is valid for the full temperature and salinity range
- Turning off the bottom boundary layer
- Turning on sea surface salinity nudging
- Clean up the code to get back perfect restarts and reproducibility across processor counts
- Turning on and adjusting the mixed-layer restratification options, trying both Fox-Kemper (2008) and Bodner (2023)


Satellite 2015-05
MOM6-Cobalt Model (run50)
0°
60°E
60°W
120°E
120°W
180°
85°N
80°N
75°N
70°N
65°N
60°N
0.0
0.5
1.0
1.5
2.0
2.5
3.0
CHL

# Future plans

- Investigate the landfast ice behavior in the model, comparing to the Chukchi and Beaufort products from UAF, as well as looking at specific outbreak events.
- Continue to investigate the model biases and attempt to reduce them, with more of a focus on the BGC model.
- Write a paper describing these runs, following in the footsteps of Ross et al. (2023)
- Bring in more features from Icepack.
- Try a different ice-ocean driver (CIOD).
- The Arctic ocean surface salt bias could be due to how brine is introduced at the ocean surface when ice is formed. Adding a brine plume parameterization is being considered.