

The algorithm implemented for using the SOWISC12to60E2r4 T,S as an initial condition for the SOWISC12to30E3r3 grid are as follows:

- 1) Extract temperature and salinity from 20221116.CRYO1950.ne30pg2\_SOWISC12to60E2r4.N2Dependent.submeso.chrysalis.0701-01-01.nc
- 2) Interpolate horizontally from the SOWISC12to60E2r4 grid to a global 0.1x0.1 degree latitude-longitude grid. This intermediate grid was used to avoid using the unstructured grid in the following step.
- 3) Using ferret, extrapolate new fields horizontally using a 4-point smoother so that all grid points have a finite value. This is done so that reasonable values for T,S exist in areas where the new and old MPAS grids have discrepancies about the location of the coastline.
- 4) Using ferret, linearly interpolate in the vertical from the old 60 level grid to the 80 levels used in the new grid.
- 5) Interpolate the resulting T,S from the 0.1x0.1 grid to the SOWISC12to30E3r3 grid.
- 6) Append the new T,S fields onto a copy of the original SOWISC12to30E3r3 initial condition after renaming the original temperature and salinity arrays. NOTE: the original initial condition is from **before** the short spinup performed in compass, so the ocean is at rest.
- 7) Spin up the new initial condition for a month, starting with a small timestep and strong Rayleigh damping, then increase the timestep and reduce the damping as stability allows. Unlike in compass, this is done in an E3SM G-case. The initial condition for sea ice is ice-free. The run was continued successfully for 2 more months with no damping and the desired 10 minute timestep, so the 1 month restart file was deemed satisfactory for using as a possible initial condition for the SOWISC12to30E3r3 production runs.