Uncovering the reasons for differing low-frequency AMOC behavior in ocean reanalysis products used to initialize decadal predictions

AMOC variability has been invoked as a significant driver for ocean heat content change in the subpolar North Atlantic. One of the important outcomes of the various analyses of the CMIP5 suite of decadal prediction experiments was the development of mechanistic understandings of the role of low-frequency AMOC variability in preconditioning the ocean state for the skillful prediction of upper ocean heat content (e.g. Yeager et al. 2012; Robson et al. 2012; Msadek et al. 2014). However, the low-frequency variability of AMOC in the ocean state estimates used for initialization of these models is dramatically different.

A recent effort at NCAR has been initiated to compare the low-frequency AMOC estimates across the range of the ocean reanalysis products that were used in the CMIP5 decadal predictions. Initial investigation of five different ocean state estimates suggests that there is *no consensus* on the sign of the AMOC trend since the 1980's. Since most ocean reanalysis products assimilate observed temperature and salinity, we wish to understand whether there are dominant low-frequency temperature and salinity trends in the North Atlantic that may drive AMOC variability in these ocean reanalysis; and relatedly, whether differing trends in temperature and salinity among reanalysis products could be responsible for the disparity in estimates of low-frequency AMOC behavior.