**Klower et al.**

This study explores variability and predictability in the Atlantic Meridional Overturning Circulation (AMOC) on decadal and longer time scales. Since observations of AMOC are short, Klower et al. rely on variations in the North Atlantic Oscillation (NAO) to reconstruct AMOC variability from 1900 to 2010. According to ocean general circulation models, high NAO phases increase convection in the Labrador Sea and strengthen AMOC.

Klower et al. apply observational surface heat flux anomalies associated with the NAO to the Kiel Climate Model. They find that this model has “some skill” at simulating observed North Atlantic SST’s, with the leading mode of variability showing SST anomalies similar to those observed during a positive NAO. They find strong decadal AMOC variability, along with a decline in modeled AMOC during 1920-1970 and a subsequent increase. Models show North Atlantic SST leads AMOC by 10 years, roughly corresponding to a positive NAO, which increases subpolar ocean convection, enhances surface heat loss, and accelerates AMOC. They also find that AMOC leads SST by 21 years, consistent with slow AMOC forcing of SST’s, with a spatial pattern that resembles that of the Atlantic Multidecadal Oscillation (AMO). They conclude that AMOC “filters” NAO forcing, enhancing low-frequency variability and changing SST. Since SST is more difficult to simulate in models than AMOC, Klower et al. thus use modeled AMOC to hindcast and forecast N Atlantic SST anomalies (with some key limitations), and find this 21-year AMOC forcing is well correlated with observed N Atlantic SST. They use this AMOC signal to predict that the AMO will remain positive until the end of their forecast in 2031. Despite limitations in observations and models, this paper provides evidence that AMOC, the NAO, AMO, and sea surface temperatures are intricately linked, which may make future changes in these modes predictable.

**Chylek et al.**

Like Klower et al., this paper uses models to assess the future impacts of climate modes. Chylek et al. note that models disagree on both the amounts of past warming and future warming. They apply a statistical regression model to historical/projected global temperatures from 42 CMIP5 climate models. They perform multiple regression analyses using solar radiation, volcanoes, ENSO, the AMO, the PDO, and greenhouse gases/aerosols as explanatory variables, and find that greenhouse gases/aerosols, solar variability, and the AMO account for over 95% of global temperature variance. Chylek et al. justify the importance of the AMO with its link to AMOC (as shown in Klower et al.). Using their model including GHG/aerosols, solar radiation, and AMO variability, they accurately reconstruct past temperature rise of 0.95°C. Extrapolated into the future assuming an RCP4.5 scenario, this regression model projects less than 2°C of warming between 1900 and 2100, which agrees with the CMIP5 models that do not incorporate aerosol-cloud interactions; other CMIP5 models anticipate higher (~3°C) warming. In this scenario, their model suggests that the AMO’s contribution will increase approximately twofold after 2050, as CO2 output declines.

This paper illustrates the importance of the AMO to climate projections, but with some key caveats. Most importantly, all models were assumed to follow radiative forcing in the RCP4.5 scenario, which strongly underestimates our current trajectory (RCP8.5+); therefore, radiative forcing may mask any additional feedbacks from AMO variability. In addition, the AMO itself may change with radiative forcing, making its future importance to warming more difficult to predict than Chylek et al. conclude.