Minutes of WBCWG sub group 'Small scale (Ocean-frontal scale) Air-Sea Interaction'

Justin Small held a teleconference with Kathie Kelly and LuAnne Thompson on April 25th. Later Roger Samelson, Nick Bond and Meghan Cronin also provided written input on their work on this subject. Here is a summary arising from these communications.

Small and Kelly and Thompson have mutual interests in the role of the Gulf Stream in modifying storm tracks, both of individual storms, and the storm track 'envelope'. In particular, what is the relationship between the near surface variance of v' (synoptic filtered meridional wind), and the storm track at higher levels (e.g. 850 mb or 250 mb)? It appears that the surface storm track closely follows the Gulf Stream (both in the QuikSCAT analysis of Kelly et al, and in a Regional Climate Model simulation by Small).

The physics of interest include the role of the large surface heat fluxes in possibly fueling storms (sensible heat affecting the boundary layer/thermal gradient vs latent heating affecting the deeper troposphere and storm growth.) There is some interesting stuff relating upper level PV anomalies with lower level thermal gradients (as discussed by Hoskins et al) that was done by Reed and collaborators and more recently Businger.

The Kelly group propose to look at WRF simulations with their student Jimmy. Small will continue to analyse his model data to diagnose the link between surface storm track and the deeper, classic storm track.

The priority of the Samelson group (Roger, Eric Skyllingstad, one student) is to look carefully at the NAM model (previously Eta, now WRF) and compare fluxes, etc, with Kathie Kellys results. They are in the process of regridding the model output so that they can make these comparisons directly. They plan to look at the coupled boundary layer problem and possibly the storm track problem.

Bond and Cronin will soon begin examining the sensitivity of the atmosphere to SST variations in the region of the Kuroshio extension. The initial focus here will be on storms in fall, in particular those transitioning from tropical to extratropical in character. These events appear to be a source of considerable error/uncertainty in present-day NWP models, not just regionally but as far downstream as North America. We plan to use high-resolution NWP experiments as a means of studying these storms and their sensitivity to the underlying ocean.