This review is by Owen Cooper, a co-Editor for ACPD/ACP and the editor of this manuscript. Two anonymous referees have provided very thorough and insightful reviews of this paper and I thank them for the obvious time and effort they put into their write-ups. In addition to the concerns raised by the referees I list below some additional points and concerns that need to be addressed during the manuscript revision.

Some references need to be checked:
1) Wotawa and Trainer, 2000, addresses just biomass burning smoke transport but it is used as a reference for STE.
2) Polvani and Esler, 2007, deals with idealized cyclone transport and does not specifically address STE over the western North Atlantic. Given the context of the Introduction, this reference should be removed.
3) Cammas et al., 2008, discussed intrusions of tropospheric air into the stratosphere but I didn't find any mention of stratospheric intrusions impacting the lower troposphere of eastern North America or the Atlantic.
4) Owen et al. 2006 do not discuss decreasing cyclone activity in summertime compared to other seasons.
5) Parrish et al 2000 did not discuss the PCF. The concept of the PCF was introduced by Cooper et al., 2001 and expanded in Cooper et al 2002a.

page 23214 line 19
When discussing the decrease in summertime cyclone activity do you mean intensity, frequency, or just a shift to the north?

page 23218 line 3
Should this be 2004-2006?

page 23219 line 2
While the PCF can consist of air that descends from the mid-troposphere to the boundary layer, it can also just refer to the low level boundary layer flow behind a cold front that doesn't necessarily descend.

page 23222 line 5
A reference is needed for the O3/CO slopes from ICARTT 2004.

page 23223
DJF3 has a low centered over NY State. Region 1 is mostly ahead of where the WCB should be located, so I am not convinced that this region experiences WCB transport. This is probably why very few trajectories show ascent.

page 23224 line 15-20
Similar to the comments of one of the referees regarding skew-T's, I recommend you use the coastal skew-T plots to infer the atmospheric structure over the water. Then take a

typical sea surface temperature and allow it to ascend along wet adiabats (assuming the sea surface air parcel is saturated) to see how high it would rise. Does this agree with the cloud top heights that you can estimate from GOES IR images and the skew-T, or model temperature profiles? Also, how high does a polluted air parcel need to be lofted before it has a significant impact on the 681 hPa TES retrieval?

page 23224 line 20-21
Here you say descending but in Figure 9 you say ascending.

page 23228 line 8-10
Here you talk about CO accumulating in the stratosphere, but are these particular retrievals actually in the stratosphere? Please compare these retrievals to PV plots to determine if they are above or below the tropopause. It would also be helpful to plot ozone vs. CO for these cases and look at the scatter plot distribution. Does the distribution look similar to the stratospheric samples in Figure 6c [Cooper et al., 2005] which shows ozone versus CO from all Northern Hemisphere MOZAIC flights above 1 km during February 2004?

Cooper, O. R., et al. (2005), Direct transport of midlatitude stratospheric ozone into the lower troposphere and marine boundary layer of the tropical Pacific Ocean, J. Geophys. Res., 110, D23310, doi:10.1029/2005JD005783.

page 23228 line 10-14
Arctic haze is primarily a lower tropospheric phenomenon, so your trajectories that show transport to the upper troposphere of the Arctic are not likely tapping this pollution source A good paper on Arctic residence times is:
Title: Characteristics of atmospheric transport into the Arctic troposphere
Author(s): Stohl A
Source: JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES Volume: 111 Issue: D11 Article Number: D11306 Published: JUN 9 2006

page 23230 line 1
Do you mean northeastward rather than northeasterly?

page 23230
Here a boundary at 50 N is discussed, but to my eye it looks more like 45 N.

page 23230
Sea breezes are offered as a possible lofting mechanism, but are typical sea breezes strong enough to loft pollutants to 681 hPa? Please find references that describe observations (not model results) of such deep transport.

page 23230
What is the mechanism to reduce the O3/CO slope in Region 3?
Please see Real et al. (2008), ACP, 8, 7737-7754.

page 23232 line 1-2
What causes ascent in northerly flow behind a cold front? Do satellite images show convective cloud?

page 23232
I am confused how convection over the central US influences CO and O3 over the Atlantic at the exact same time. Please provide additional explanation.

page 23234
In the summary it would be helpful to compare the average summer and winter export patterns to your previous springtime results. Of the 3 seasons the greatest O3 export is in summer at around 35 N which is an important result to convey.

Your average summertime results should be compared to the recent modeling results of:

Fang, Y., A. M. Fiore, L. W. Horowitz, A. Gnanadesikan, H. Levy, Y. Hu, and A. G. Russell (2009), Estimating the contribution of strong daily export events to total pollutant export from the United States in summer, J. Geophys. Res., 114, D23302, doi:10.1029/2008JD010946, 4 December 2009

Figure 3 4 and 11
the numbers on the color scale are too small, please enlarge

Fig 4
We don't need to know the stratospheric ozone mixing ratios in detail for this study. Please change the color scale to increments of 5 ppbv that focuses on the range of tropospheric values.

Figure 5
Please overlay the location of the TES retrievals, add a coastal outline map and increase the contrast of the image.

Figure 7 and 9
Please increase the size of the skew-T by at least a factor of two.

Figure 16 17 and 20
Please increase the size of each panel