

Overall, this paper has been improved by the revisions. The paper still contains grammatical mistakes and should be read through carefully and edited. The language should be toned down in some cases to be less definitive and more suggestive. The main conclusion is still that seasonal variations in wind patterns change the organic aerosol concentration. There is some discussion of decreasing particles from fossil fuel emissions. There is a small section on the contribution of marine aerosol, which is not complete, and the discussion of CCN at the end is still overreaching.

### **General Comments:**

The OC/EC description has been improved, and Table 2 helps a lot in explaining the ratios measured in different sources. Based on Table 2, the split at OC/EC higher or lower than 2 may not be the best indicator (i.e. the first line with fossil fuel combustion has OC/EC of 4.0, 4.1, and 1.1). The authors could point out this range and then state that their values are much larger in the summer and still greater than the cutoff in the winter to spring, as shown.

The part about the lower WSOC/OC ratio in the summer suggesting an ocean-derived source of organic carbon is still speculation. It is fine to include this paragraph with these references, but there is no concrete evidence here. This just says that other studies have measured OC in ocean-derived aerosol. Additionally, there is a wind-speed threshold required to produce breaking waves that in turn produce primary marine aerosol. The “low speed easterly winds” mentioned should include an actual wind speed and a reference to the speed needed for breaking waves, if the authors keep this discussion. The most that could be inferred from this data set, not including any correlations to sea salt, would be that air masses that originate over the ocean have lower concentrations of OC and are mixing and decreasing the total OC.

The authors need to include references if they are going to state that OC particles “majorly scatter” solar radiation to the same degree that sulfate or other salts do. At the very least, this should be rephrased to state that EC scatters less than OC and that EC is more absorbing. That is well known, whereas the scattering efficiency of OC alone is not.

The original comment on the “Atmospheric Implications” was not fully addressed. Figure 5 with one correlation between CCN and WSOC is not enough to show that “water-soluble organic matter also plays an important role in CCN formation.” At the very least, this needs to be rephrased to state the uncertainty. There are many more factors that contribute to CCN activation, so a single correlation (and not showing the possible correlations between WSOC and salts or particle size, etc.) is not enough. Figure 5 does not show a direct link, and the new text is not enough.

### **Specific Comments:**

Figure 2: The new figure is much better, but it still runs into the problem of 12 years of data overlapping in the same plot. The back trajectories show the general trends, and the fire data is interesting. Could both of those be colored by the year? Here, it is unclear if one year had a lot of fires and others had none or if there are always fires in the same area. Using a color bar for the years would be also useful since the back trajectories don’t

perfectly overlap. The MODIS data also stops at 80E – mention that in the caption to be clear.

Line 248: Add numbers to the ratios to describe “higher” and “lower”, especially since the higher and lower ratios are indicative of different sources.

Line 338: Why would there have been higher ocean-derived OC emissions during 2007-2008? There is no evidence presented here supporting a one-year difference in marine aerosol emissions. This should be removed.

### **Technical Corrections:**

These are examples of technical corrections in the abstract only. The whole paper should be checked for grammatical errors and corrected.

Line 32: Remove “that”

Line 35: Add “a” after “found”

Line 36: Change to: “that the concentration of biomass-burning-derived carbonaceous aerosols has increased”

Line 37: Change “are” to “has”

Line 40: Change “source” to “sources”

Line 41: Add “a” after “found”

Lines 42-44: This is unclear.

More examples of technical corrections:

Line 54: Remove “invisible”

Line 57: Remove “hence”

Line 59: This implies that EC is volatile - rephrase

Line 60: Change “while” to “and”

Line 61: Add “, which” after “BC)”

Line 63: Change “some” to “a” and remove “so called”

Line 67: Remove “about”; change “are” to “is”

Line 83: Change “exist” to “existing”

Line 91: Change to “dominating”

Line 96: Change “increased” to “increase in”

Line 119: Change “is” to “are”

Line 181: Fix “the air masses are stronger to transport”

Line 184: Add “and” before “mostly”

Line 226: Change to “EC particles are primary and predominately come”

Line 375: Add “and” before “thus”