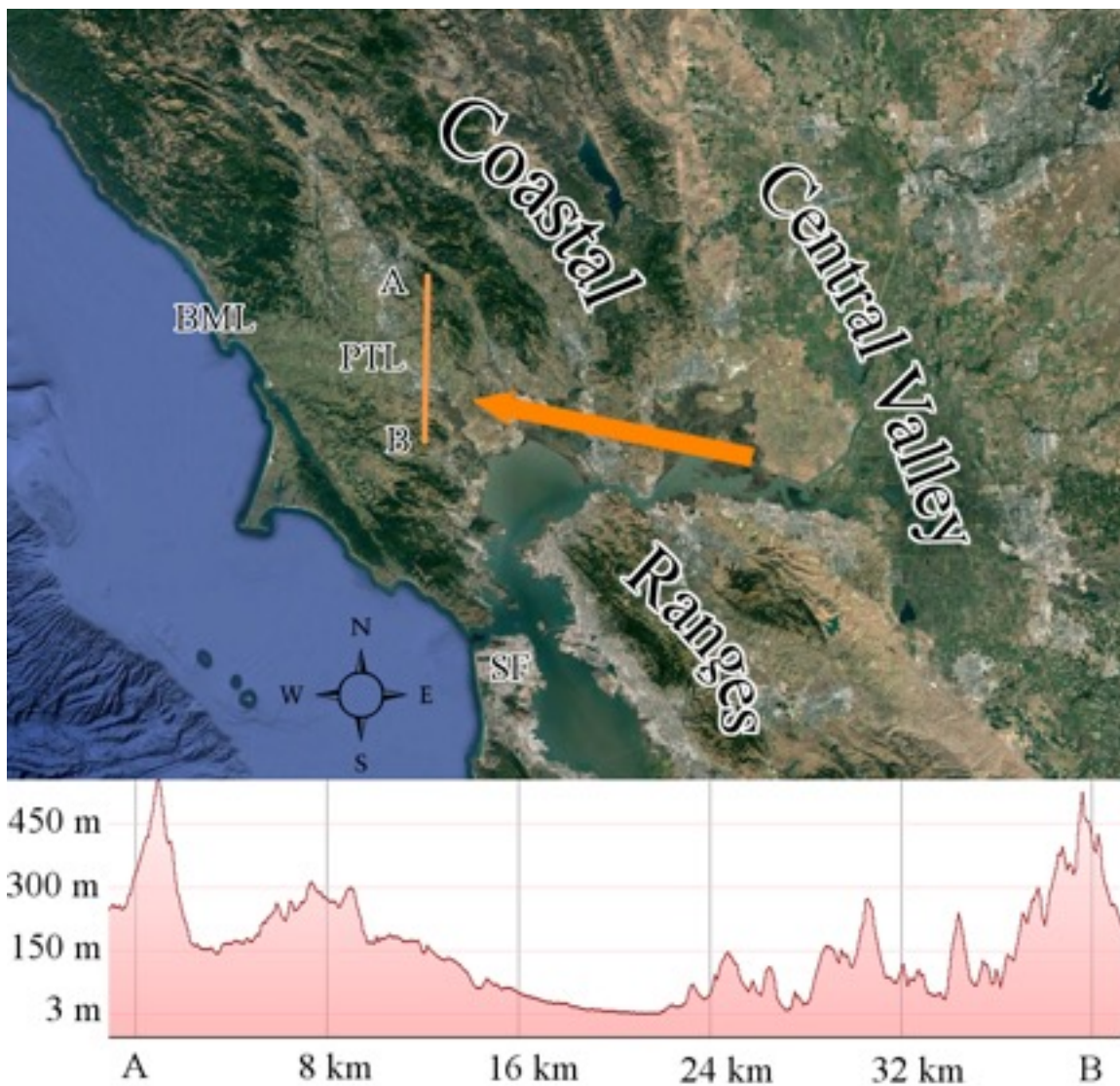


We would like to thank the reviewer for their valuable comments. We have reworked the paper to address the relevant issues where necessary. The reviewer comments are written in plain text, our response and changes to the manuscript in bold.

Specific comments:

1. Although the authors have provided a brief introduction for the phenomenon of PGF and also referenced in a previous paper (Neiman et al., 2006), it would be nice if they could also provide a map. The map may show the terrain of the Northern California region (and the prominent gap), the site location, and a diagram of the PGF to help the readers to understand the PGF without reading the reference.

Added new figure 1, which is a map of the study site, relevant geographical features in CA and the Petaluma Gap Flow.



2. This paper used many acronyms and abbreviations. I would suggest including a table with abbreviations for efficient reading.

Included an additional table (Table 4) to with a list of acronyms and abbreviations.

3. Related to the comment above, please choose a different abbreviation for marine aerosol than the “SSA” (sea salt aerosol?), because “SSA” can also represent Single Scattering Albedo in the aerosol and cloud community.

Changed all references of SSA to SS in text and in figures.

4. Section 2.3: Specify the size range for the APS. What are the typical RH values in the sampling line? Does the RH sufficiently low such that the size measurements were not affected?

Specified size range for the APS (page 4 line 19). Also added a discussion of the RH within the sampling line and how much that would have affected size distributions (page 4, lines 22-27).

5. Section 2.5: I was confused about whether the CCN measurements were conducted for super-saturation scan or diameter scan. Please specify.

Section 2.5 refers to “Size-resolved cloud condensation nuclei concentrations”, states that the CCN counter was coupled with SMPS, and refers to several papers (Petters et al., 2009; Petters and Kreidenweis 2007) that were seminal in establishing size-resolved (diameter scanning) CCN measurement methods. We are unsure if we can make it more clear to the reader, but perhaps this is an issue of terminology. We added a parenthetical note that the reader may be familiar with this technique under the name “diameter scan” to page 4, line 36.

6. Section 3.2, Page 6 Line 25: Say explicitly what correction is needed for the aethalometer. Correction for back scattering?

Reworked sentence to make clear that the correction required is for back-scattering (page 6, line 32).

7. Section 4.2: Report the “all-study mean” values, and the percentage differences of mean values between the PGF and CTL periods.

Done as requested. See page 10, lines 5-8.

8. Fig. 2: Do the colors in the wind rose plots represent the binned wind speed, as stated in the legend, or a relative probability, as stated in the caption? Also, use SI unit m s^{-1} instead of kts?

The caption of Fig. 2 has been changed to more accurately describe that the colored petals of the wind represent the relative distributions of wind speed from the given direction. The units on the wind rose petals and colorbars have been changed from kts to m s^{-1} . Note that this changes the colorbar values slightly compared to the previous version.

9. Fig.2 vs. Fig. 4: Fig. 4 shows that the mean value of APS particle number concentration was about one order of magnitude lower during the PGF than that during the CTL (2.4 cm^{-3} vs 14.9 cm^{-3} , as mentioned in Page 10, Line 27). However, their median values were very similar, as shown in Fig. 2a. Please provide some explanation.

Figure 2 displays the max/min/median and upper/lower quartiles of hourly APS integrated number concentration. This is a different quantity than that displayed in Fig. 4, which is the PGF/CTL

composite APS size distribution displayed as $d\log N/d\log D_p$ or $d\log N/d\log D_p$. It is likely that the two quantities are drawn from different probability densities. We acknowledge that the label in Fig. 2 and in section 4.2 where the integrated quantity is referred to as “APS” is confusing. Therefore, we have changed page X, lines Y-Y to introduce the symbol n^{APS} and define it. We have also changed the corresponding label in Figure 2.

10. Section 4.4: I found the normalization of ratios not intuitive. Add an equation in the main text, or in an appendix.

Unmodified peak ratios are dependent upon which peak is in the denominator. We utilized a normalization scheme employed by Cahill et al., (2012). The scheme is discussed further in the text at page 12, line 2.

11. Section 4.4: Any explanation for the association between high OC:soot ratio and high abundance of amines-type particles (Fig. 8a)? Do the OC ions usually nitrogen containing for the CLT cases?

Amines contain chemical chains of OC, so it is not surprising that the measured particles had a high OC/EC ratio. A further explanation has been added to the text at page 12, line 25.

12. Fig. 10: I found this figure is confusing and less informative. As the values have been mentioned in the text, this figure can be eliminated. The corresponding method section (section 3.5) could be significantly shortened.

This figure has been redacted and the corresponding methods section revised (page 9, line 10).

Technical comments:

1. Page 5, Line 2: Please check the symbol (κ ?).
2. Page 7, Line 20: missing “.” after “radiative effects”
3. Page 7 Line 24: Extra “.” after “particle aging”

Fixed formatting issues in manuscript.