

Author response to reviewer and public comments for Brief Communication: Differences between Sundowner and Santa Ana wind regimes in the Santa Ynez Mountains, California” by Benjamin J. Hatchett et al.

Responses to reviewer comments are given in **bold**

New or changed text is given in *italics* (***bold italics*** for emphasis where noted)

Interactive Comments from Anonymous Reviewer #1

Overview: This brief manuscript presents evidence that Santa Barbara’s “Sundowners” are dynamically distinct from Southern California’s Santa Ana winds. The figures and text are clear and concise, and I have only very minor comments the authors should address before I recommend publication.

We appreciate the reviewer taking the time to provide constructive suggestions and positive feedback regarding our paper.

Page 1

1. l. 28: ‘low relative humidity result’ should be ‘low relative humidity results’

Change made, thank you:

“low relative humidity *results*”

Page 3

2. l. 1-13: I think the criteria for Sundowner-only, Sundowner+SAW, and SAW-only could be explained a bit more clearly. In particular, it’s not clear as written, how many days are in the Sundowner-only regime (I think it’s 71 but this could be spelled out more plainly). Also, I’m curious why the definition of SAW was top 2% for SAW-only and less stringent for Sundowner+SAW – did any top 2% SAWs overlap with Sundowner days?

We agree that a clearer explanation will help the reader. We will alter the text in the revised manuscript to more explicitly state the criteria and number of days and exactly how many days were identified.

With respect to the last question, a very small number of day (less than 10) overlapped, and this is why we opted to weaken our constraint in order to increase our sample size. We will alter the revised text to be more clear about this choice. Upon completion of these revisions, I will post them as a follow-up comment.

3. l. 16: The ‘peak seasons’ of April-May and December-January do not seem to be consistent with what is shown in the figures (Mar-Jun and Nov-Feb in both Figs 2 and 3).

Thank you for pointing this out. We have changed the text to correctly represent the respective seasons:

“Sundowner (March-June) and Santa Ana (November-February) regimes”

4. l. 19: Were the long-term means calculated on a seasonal, monthly, or daily basis (or some other method?)

We used daily values which were averaged over the season for the long-term means, and have added this to the description:

“...1981-2010 long-term seasonal means calculated from daily output...”

5. l. 23: I believe a reference for the August-Roche-Magnus approximation is appropriate.

Correct, we have added a reference and apologize for the oversight:

“Lawrence, M.G.: The Relationship between relative humidity and the dewpoint temperature in moist air: A simple conversion and applications. Bull. Amer. Meteor. Soc., 86, 225–233, <https://doi.org/10.1175/BAMS-86-2-225>, 2005.”

Page 4

6. l. 6: ‘potential Sundowner events’ – why is the word ‘potential’ used here? Are these CDFs for Sundowners as defined by your index?

Good point, these CDFs were produced using Sundowners as defined by the temperature ramp index and thus the word is not necessary. We removed “potential” from the text.

7. l. 7: I believe this refers to Fig. 2b (not 3b)

Thank you for pointing this out. Change has been made:

“...stronger (Figure 2b)...”

Page 5

8. l. 5: ‘west MSLP gradients’ should read ‘west MSLP gradient’

Thank you for pointing this out. Change has been made:

“...MSLP gradient exists...”

9. Figure 2: Are these CDFs for Sundowner-only days during each season, Sun-

downer+SAW days for each season, or SAW (winter) days and Sundowner (Spring) days. The caption of (a) indicates the latter, but the legend at the bottom says winter/spring Sundowner days. Please clarify. Also, begin (b) with 'As in (a) except...'

Figure 2 is for strong (top 0.5%) Sundowner days in all cases. We have changed the caption to more clearly represent how the figures were generated and to link the caption with the figure legend (bold italics for emphasis):

“Distributions are created from either all hours (*All Days*) or for the five hours following each identified possible top 0.5% Sundowner event (*Sundowner Days*) during the respective peak seasons (see Figure 1d-f).”

Change made for the last point, thank you:

“(b) *As in (a) except for wind speed*”