In this study, the authors investigated the long-term trend of deposition of N and S using state-of-the-art regional CMAQ model. Model evaluations for the deposition as well as concentration for specific air pollutants are reasonable. The conclusions are not surprising that the depositions in the US are declining from 2002 to 2107, with contributions of reduced nitrogen increasing and oxidized nitrogen decreasing, which are consistent with several previous studies. In general, this study was well designed and fit into the journal. The authors need to make efforts to improve the reading flow for the manuscript, as well as to improve their quality of figures and tables.

Change the hyphen "—" to minus "–" through the whole manuscript.

Abstract:

Line 11-13 "few assess dry deposition, incorporate a measurement-model fusion approach to improve wet deposition estimates, or focus on changes within specific US climate regions." This was exactly what was covered in my two previous studies (Zhang et al., 2018, 2019) which was cited by the authors as well. I suggest the authors refine their motivation or novelty for this study. Also, read the latest paper by Tan et al. (2020) and distinguish the novelty between this study with previous one.

Reference:

Tan, J., Fu, J. S. and Seinfeld, J. H.: Ammonia emission abatement does not fully control reduced forms of nitrogen deposition, Proc. Natl. Acad. Sci. U. S. A., 117(18), 9771–9775, doi:10.1073/pnas.1920068117, 2020.

Line 16—17: Reading from section 2.1, the authors state that the STAGE option was performing similar results as M3dry. So I did not see the point/novelty for the authors to add this statement in the abstract. Also abbreviation for "STAGE" is not necessary since it was not referred again in the abstract.

Line 22: Explain "TNO_3"

Line 22-23: Is this sentence used to explain the model evaluation of wet deposition, or concentration?

Line 27: Will the "increased precipitation" increase both the reduced and oxidized N deposition as well?

Line 29-30: This is an interesting finding. Can the author provide explanations why this happens?

Line 30: change to "The average annual total N"?

Introduction:

Line 69: define "TNO_3" and "NH_X"

Line 76: “TDEP” to “TDep”

Line 97: Please reorganize this sentence. The Hemisphere CMAQ was used to provide BCs for the 12 km CMAQ only, but not used for the data analysis in this study.

Line 101: “STAGE” was already defined.

Methods

Section 2.2: Why the authors explain why the criteria for NTN and CASTNET differ with each, “at least 60% annual coverage” for NTN, and “75% annual coverage” for CASTNET?

Results and Discussions

Line 161: define “ECODEP”

Line 167: Please provide figure/table for this statement “although the EQUATES precipitation is still biased low on average relative to PRISM.”

Line 219-224: Please show a plot/table for this conclusion. Also, discuss the NH_4 first and then NO_3 and SO_4, following the flow of earlier discussions in the same paragraph.

Line 206: “The 16-year total NH_4”: is this the 16 year total or 16 year annual average? The same applies to the NO_3 and SO_4.

Line 234-line 245: I suggest the authors to follow the order of “NH_4, TNO_3, $SO2$, and SO_4” when discussing the model performances of the concentration.

Line 287: define NAAQS here instead of in line 293.

Line 302: “—0.19-0.31 kg-N/ha/yr)”: Is the 0.31 positive or negative trend?

Figures & Tables

Figure 1: “Site locations of the 200” Reading from the figure, I believe the authors mean “the 263” NADP locations instead of 200 since they have “black-bordered white circles” vs. “black circles”?

Figure 2: “black circles”—I think the authors meant the 200 “black-bordered white circles”? In the legend, there are lines associated with the rectangle and diamond, while there are none in the Taylor plot.

Table 2: Put Table 2 in Landscape orientation, which will make the table look much better. The same as Table 3.

Figure 9: change to “throughout the nine climate regions and CONUS”. Also change “United States” in the bottom bar to “CONUS”;

Fig. 9(b) Missing the percentage contribution for the year 2002 in “West”, “Southwest”, and also for the year 2017 in “West”
Fig. 9(b) Missing the percentage contribution for the year 2017 in “West”, “Northwest”, “Northern Rockies”, and “Southwest”;

Figure 10: Be consistent for the usage of “CONUS” and “United States”