Main revisions and response to reviewers' comments

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Title: High-resolution regional emission inventory contributes to the evaluation of policy effectiveness: A case study in Jiangsu province, China

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We thank very much for the valuable comments and suggestions from the editor, which help us improve our manuscript. The comments were carefully considered and revisions have been made in response to suggestions. Following are our point-by-point responses to the comments and corresponding revisions. **Please note that the line numbers mentioned following refer to the clean version of the revised manuscript.**

Editor:

Thank you very much for the careful revision of your manuscript. There is a number of additional improvements that need to be made before this is accepted for publication in ACP. Please perform all the following changes and resubmit a revised version with track changes.

Thank you for choosing ACP for the publication of your research. The editor.

Note that pages and lines refer to the track changes document:

Page 2 line 53 between 2015 and 2017, and of NOx…

Page 7, line 226: 'The framework included six first-level categories this study': please correct something is missing there

Page 10, line 302: remove greatly

Page 11, line 357: replace 'finer categories' by 'second-level sources' and in the next line replace 'coarse source categories' by 'first level source categories'

Page 11, line 359: release during filling

Page 13, line 433: Four months representing the four seasons

Page 15, lines 505-506: 'and the anthropogenic emission variation (VEMIS)'

Page 17, line 583: elevate

Page 19, line 659: than for northern cities

Page 21, line 742: a broad area of Jiangsu was identified…

Page 23, line 889: the official statistics were much lower than ours (remove smaller)

Page 25, line 971: replace 'greatly' by 'significantly'

Page 26, line 1001: thus, they were further discussed together

Page 29, line 1093: as shown in Table S8

Page 30, line 1138: explain to what you refer as 'unfavorable meteorological conditions'. Is it temperature, precipitation, wind direction, wind speed?

Page 30, lines 1148: replace 'involved' by 'considered'

Page 30, line 1149: replace 'complicated' by 'complex'

Page 31, lines 1173- 1177: I suggest rephrasing as follows: ' As shown in Figure 11, in the baseline simulation that accounted for the interannual changes of both anthropogenic emissions and meteorology, the provincial-level PM2.5 concentration (geographical mean) was calculated to decrease …. in 2017-2019.

Page 32, line 1283: role in

Page 33: line 1315: such demonstrations were …

Page 34, line 1337: remove 'finally'

Response and revisions:

We appreciate the editor's careful review and comments, and all the suggested revisions/corrections have been made accordingly. In particular, we would like to make some more explanations on the following two comments.

Q1: *Page 11, line 357: replace 'finer categories' by 'second-level sources' and in the next line replace 'coarse source categories' by 'first level source categories'.*

Response and revisions:

In the guidelines of national emission inventory, there are missing source profiles in third-level or fourth-level categories, and information for coarser categories (second-level or third-level) was commonly used. Through field measurements and literature investigations, we supplement some of the missing profiles and make it possible to differentiate the finer categories. Therefore, we keep the original text in the manuscript.

Q2: *Page 30, line 1138: explain to what you refer as 'unfavorable meteorological conditions'. Is it temperature, precipitation, wind direction, wind speed?*

Response and revisions:

As shown in Table S2 in the supplement, both observation and simulation indicated the reduced wind speed after 2017, which could partly explain the rebound of $PM_{2.5}$ concentrations. We have added the information as "…, attributed possibly to the unfavorable meteorological conditions that were more likely to exacerbate air pollution (e.g., the reduced wind speed as shown in Table S2) for recent years" **in lines 823-825 in the revised manuscript**.