

Interactive comment on “Development of a high-resolution emission inventory and its evaluation through air quality modeling for Jiangsu Province, China” by Yaduan Zhou et al.

Anonymous Referee #1

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General comments: This paper presents the development of a provincial (Jiangsu) emission inventory, which can reduce the uncertainty in previous national level emission inventory and improve capability of air quality forecasting in Jiangsu province. The manuscript is well organized and written. Comprehensive evaluations were conducted, including comparisons with other inventories, with satellite data and with measurements of air pollutants. Another highlight of this manuscript is the inclusion of modeling results and sensitivity analysis of PM_{2.5} and O₃ formation in Nanjing, which provides some implications of emission control strategies. The presentation of this newly developed high resolution emission inventory is suitable for being published in ACP. I only have some minor comments.

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Specific comments:

Page 3, line 51-52: change “Issued in 2013, for example, the National Air Pollution Prevention Action Plan required” to “For example, the National Air Pollution Prevention Action Plan issued in 2013 required”

Page 9, line 232: The sentence “For other sources, the temporal distributions in Shanghai investigated by Li et al. (2011).” is not complete.

Page 11, line 284-285: D3 also includes some areas of Anhui, Zhejiang and Shanghai, but the provincial inventory was developed for Jiangsu. How were emissions in D3 treated for provincial inventory case? Please clarify.

Page 16, line 436-437: This implication might be questionable since the difference might be mainly driven by different methods (including different data sources) used in developments of emissions.

Sect. 3.3 shows the comparisons of pollutants from typical sources, how about pollutants from all sources? As shown in Figure 3, these typical sources account for significant but not entire amounts of the selected pollutants. The spatial distributions of total pollutants may substantially differ.

Page 19, line 514: NO_x emissions in Jiangsu are only 65% higher than those of Shanghai. Given the large areas of Jiangsu, NO_x emissions in south Jiangsu areas are comparable to those in Shanghai, and south Jiangsu is very close to Shanghai. It is hard to say local source in south Jiangsu is dominant. Is “those of Shanghai and Zhejiang Shanghai” a typo? Please correct it.

Sect. 4.2: Provincial emission inventory was developed but the innermost domain was only configured with focus on south Jiangsu. However, the newly developed emission in north Jiangsu might have impacts on the air quality simulations in south Jiangsu (as shown in Figure S6, some sources are from north). Besides, the evaluations using surface measurements were only shown in Nanjing, how about in other cities, particularly

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in north Jiangsu?

Page 23, line 641-642: How were VOCs mapped to VOCs species? Were the same species profile applied for three emission inventories? Please clarify.

Figure S5: the wind vectors and colors are difficult to read, please make clearer plots.

Page 26, line 716-721: Please clarify the starting time in Figure S6. Are surface winds plotted in figure S5? Wind directions vary at different heights (for example, blue red and green lines show different directions), so it cannot imply the inconsistency with WRF results. The trajectories include vertical information, but the WRF winds are horizontal winds.

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