

A review like this one is much needed. This topic is relevant to ACP. The methods are largely sound. I have listed below items that have caught my attention.

Methodology

-I could not find what kind of search methods were used to find the studies reviewed in this paper. For example, key words used; publication or study time periods within which the search were conducted; scope of the search, i.e. peer-reviewed journal papers only, or reports and conference papers included as well.

-I agree with the previous reviewer that some papers were mentioned but not discussed. It would be nice to state clearly what kind of studies will be discussed.

-In addition to the data in the references suggested by Dr. Feng, some studies conducted in Quebec and Ontario (Toronto and Windsor) Canada may be worth consideration.

-The title of this paper is “spatial and temporal trends” of atmospheric mercury. The authors may want to condense some summaries thus make room for more comparative reviews, for example, temporal trends at different time scales (i.e. diurnal, seasonal, and inter-annual). Furthermore, some discussion on the percentage of the studies reviewed that had one kind of trend (hypothetically summer high winter low) and the reasons of those observations, and the percentage of the studies that had another kind of trend (hypothetically summer low winter high) and the reasons. Identification of similarity and heterogeneity in the published findings will strengthen this paper. Moreover, there are other aspects of the network including the study design, instrumentation (continuous vs. integrated, detection limits), whether other pollutants and meteorological data were collected at the same site.

- The authors mentioned in several occasions that the atmospheric modeling sector will benefit greatly from a well designed and well functioned global monitoring network. However, such a network serves the scientific community in other aspects as well. Firstly, the relation between emission trend and regional/global concentration levels reveals source-receptor relationships. This kind of information will help policy making. Above all, the dataset from a comprehensive network would provide with us valuable information of the mechanisms and parameters that control the transport, transformation and removal of atmospheric Hg. For instance, formation rate of Hg(p) in urban environment with fresh (manmade) particles could be different from that with aged particles or sea salt particles. In my opinion, our modeling tools are far from being great to represent those processes due to knowledge gaps.

Editorial suggestions

-I too feel that the readability could be improved, by avoiding run-on sentences and long paragraphs (sometimes more than 2 pages), and rephrasing a few awkward sentences.

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- Some of the references seem pasted in from another report without a proofreading. For example, page 1291, lines 11-14, had a 2002a but no 2002b to be found. Also see L29-32 on the same page, and pg 1295, 1300. Some references should be recorded (e.g. pg 1290. 1294, 1296, 1298. 1299).

-Abstract. It is a bit hard to follow. Suggest reorganize by objective, methods, major findings and recommendations.

-Instruction. It is a mixture of introduction, an overview of the current status of monitoring networks, some detailed review of monitoring studies leading to the need of better networks to refine and validate models, and objective. I would suggest the following structure: introduction, the need of better networks to advance sciences, aid policy making, and help model improvement and validation, objective, methods of literature search and discussion. Move the overview of current status of monitoring networks to Results and discussion.