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# ***Interactive comment on “An objective determination of optimal site locations for detecting expected trends in upper-air temperature and total column ozone” by K. Kreher et al.***

## **Anonymous Referee #1**

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### General comments:

This paper describes (1) about determination of measurement uncertainty criteria of the upper air sounding observation with considering the uncertainty from the sampling errors using CFSSR data and (2) about the method to determine the observation sites for 21st century tropospheric temperature, stratospheric temperature, and ozone. About (1), the new point of this paper is (i) using the latest reanalysis data with the raised model top and (ii) analyzing up to the higher level (1hPa) than the referred paper.

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About (2), it is very example to determine the historical observation sites objectively while the selection criteria should be discussed further because of the requirements for the other field. Totally, this paper is very informative for the observation network design.

Minor comments:

Introduction)

1. In the line 23 in page 1620, the paper refers GRUAN website for its network. But the web site may become obsolete in the future. So that, the current GRUAN network should be displayed explicitly in this paper. How about showing them in figure 1?

In section 2)

2. In the line 11 in page 1621, please show the referred paper used NCEP-NCAR reanalysis data since there are several reanalysis data currently and the characteristics are different. So that it should be shown explicitly.

3. In the line 16 in page 1622, please show the point selection strategy (as a sample and selected randomly) as shown in the caption of the figure. This information is important and should be stated in the main part of the paper.

4. About the figure 3, these sampling scenarios should be summarized in a different table. And, since the referred paper mentioned that “made at least twice daily, at least once every two or three days”, why are not there scenarios as “noon and midnight for every 2/4/7 days”?

5. In the line 11-12 in page 1623, although it mentioned the criteria (0.2K) is not different for the other points / levels, it is better showing one (or two) other point sample (figure) in the other (lower) latitudes. It is hardly understood that one high latitude point situation can represent the globe.

In section 3)

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6. Around the line 5 in 1628, what AMSU data is used? Just TB? How do you deal with the cloud contamination?

7. In the line 28 in page 1628, it mentioned about GUAN network but no information was provided. Please mention it and it is better to show GUAN sites.

In section 4)

8. Why table 3 and 4 is so different? Please note any idea about it.

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Interactive comment on Atmos. Chem. Phys. Discuss., 15, 1617, 2015.

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