

Interactive comment on “Detecting seasonal and long-term vertical displacement in the North China Plain using GRACE and GPS” by Linsong Wang et al.

Anonymous Referee #2

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General Comments:

This manuscript investigated the seasonal displacements of surface loadings in the NCP area using GRACE and GPS. The consistency between GPS and GRACE was quantitatively evaluated by removing GRACE-derived seasonal displacement from GPS observed detrended height time series. The rate of GRACE-derived TWS loss in the NCP was estimated and the land subsidence in the central and eastern of NCP was discussed. Generally the topic of manuscript is interesting and the writing is clear. However, in my opinion there are several important issues need to be addressed before publication.

Major points:

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1. Recently lots of publications regarded on the estimation of TWS variation in the NCP, such as Huang et al. (2015), Feng et al. (2013), Moiwo et al. (2013), Tang et al. (2013) (listed in the manuscript) and some other references (e.g. Su et al., 2011). These studies should be included in the discussion to compare the depletion in TWS in the NCP.

2. Results and discussion should be presented separately, since some result sections (e.g. section 3) include discussion parts (e.g. lines 308-326, lines 356-359). I would suggest moving the relevant parts to section 5 for discussion.

3. There are some grammatical errors in the paper, meanwhile some sentences are not well written (e.g., lines 301-302, lines 335-338, lines 422-424, line 448). Please check it carefully throughout the manuscript.

Specific Comments:

1. Page 1, line 15: please remove “We employ” from the sentence.
2. Page 1, lines 17 and 19: please give the full name of “NCP” and “WRMS”, since it first appeared in the paper.
3. Line 367: should be “equations (2) and (3)”.
4. Line 369: » “was presented. . .”
5. Line 388: » “under- or overestimation. . .”
6. Line 449: » “before and after removing. . .”
7. Line 488: “two periods” » “two sub-periods”

References:

Su, X. L., J. S. Ping, and Q. X. Ye (2011), Terrestrial water variations in the North China Plain revealed by the GRACE mission, *Sci. China Earth Sci.*, 54 (12), 1965–1970, doi:10.1007/s11430-011-4280-4.

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