

## ***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 #1**

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In this manuscript, the authors present the time series variation of vertical displacement in North China Plain using GPS and GRACE data. Also, they analyzed the impact of Terrestrial Water Storage loss on vertical displacement. Generally, the manuscript is written clearly and illustrates some interesting results about the long-term variation of vertical displacement in North China Plain from 2003 to 2013 and discussion about the impact factors of vertical displacement like TWS loss. However, the manuscript suffers some deficiencies that need to be discussed before publishing of the manuscript. The major points that need to be added are provided below.

1) Surface vertical displacement and estimation of water storage variation using GRACE data were presented in many researches during recent years and the method-

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ology are more or less the same. However, there is little discussion in validation of the result. In this study, is there any field measurement data of groundwater level for validation of the water storage loss in NCP?

2) In part 5.2, GPS trend changes of water storage are different in two periods (2004-2009 and 2010- 2013), especially the long-term trend rate is different in different areas from 2010 to 2013. Are there any field measurement data of groundwater levels or groundwater use in different areas can support this result? In my opinion, the manuscript would be more improved if some groundwater data can be combined into this research.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/hess-2016-552/hess-2016-552-RC1-supplement.pdf>

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