Interactive comment on "Detection of Land Subsidence due to Excessive Groundwater Use Varying with Different Land Cover Types in Quetta valley, Pakistan Using ESA-Sentinel Satellite Data" *by* Waqas Ahmad et al.

Anonymous Referee #3

Received and published: 20 August 2017

General comments

The manuscript presents a detection of land subsidence in different land cover types in Quetta valley, Pakistan based on ESA Sentinel satellite data. The analysis is helpful to explain the impact of human activities (excessive groundwater use) on land subsidence. However, there are still some important issues that need further explanation.

Specific comments

1. The authors attempt to analysis land subsidence due to excessive groundwater

use in order to address the impact of excessive groundwater use on land subsidence. However, the whole manuscript only presents the land subsidence in different land cover types rather than exploitation of groundwater. And there is also no quantitative relationship between different land cover types and the groundwater use. It is the main research topic and should be clearly explained.

2. The errors of the Sentinel-1 InSAR data for detection land subsidence and the comparison with other data should be presented.

3. Why the author used the SRTM 3 arc seconds DEM rather than SRTM 1 arc seconds DEM, which is more accuracy and also free.

4. The author applied the Amplitude Dispersion Index (ADI) filter to exclude the low-accuracy pixels. Why the threshold value of 0.25 of the ADI index is selected? Which low-accuracy pixels are exclude need to be presented in a spatial distribution map together with the high-accuracy pixels? The ratio of low and high accuracy pixels, the precision corresponding to different thresholds?

5. Why is the Ordinary Kriging method applied to obtain the map of land subsidence rather than other interpolation methods?

6. There are twenty eight pairs of the Sentinel-1 SAR images in the study area. Why the eight dates in Figure 5 and Figure 6 is selected to analysis?

7. The subsidence at urban area shows not so significantly greater than that of the seasonal vegetation or barren land in Figure 7. Are there significant differences between the land subsidence in four land cover types in statistics?

8. The acquisition time of the ESA Sentinel-2 data used to the detection of land cover classes should be presented. The original image should be mapped. The precision of the detection of land cover types also need to presented.

Technical corrections

1. The right parentheses is absence in the title of Figure 5.

2. Page 4 line 24, the Celsius degree should be revised.

3. The resolution of figures need to be improved.

C3