

Monitoring Land Surface Displacement over Xuzhou (China) in 2015-2018 through PCA-based Correction Applied to SAR Interferometry

Yu Chen, Kun Tan, Shiyong Yan, Kefei Zhang, Hairong Zhang, Xiaoyang Liu, Huaizhan Li, Yaqin Sun

Section 1. Displacement rate map derived from initial InSAR time series

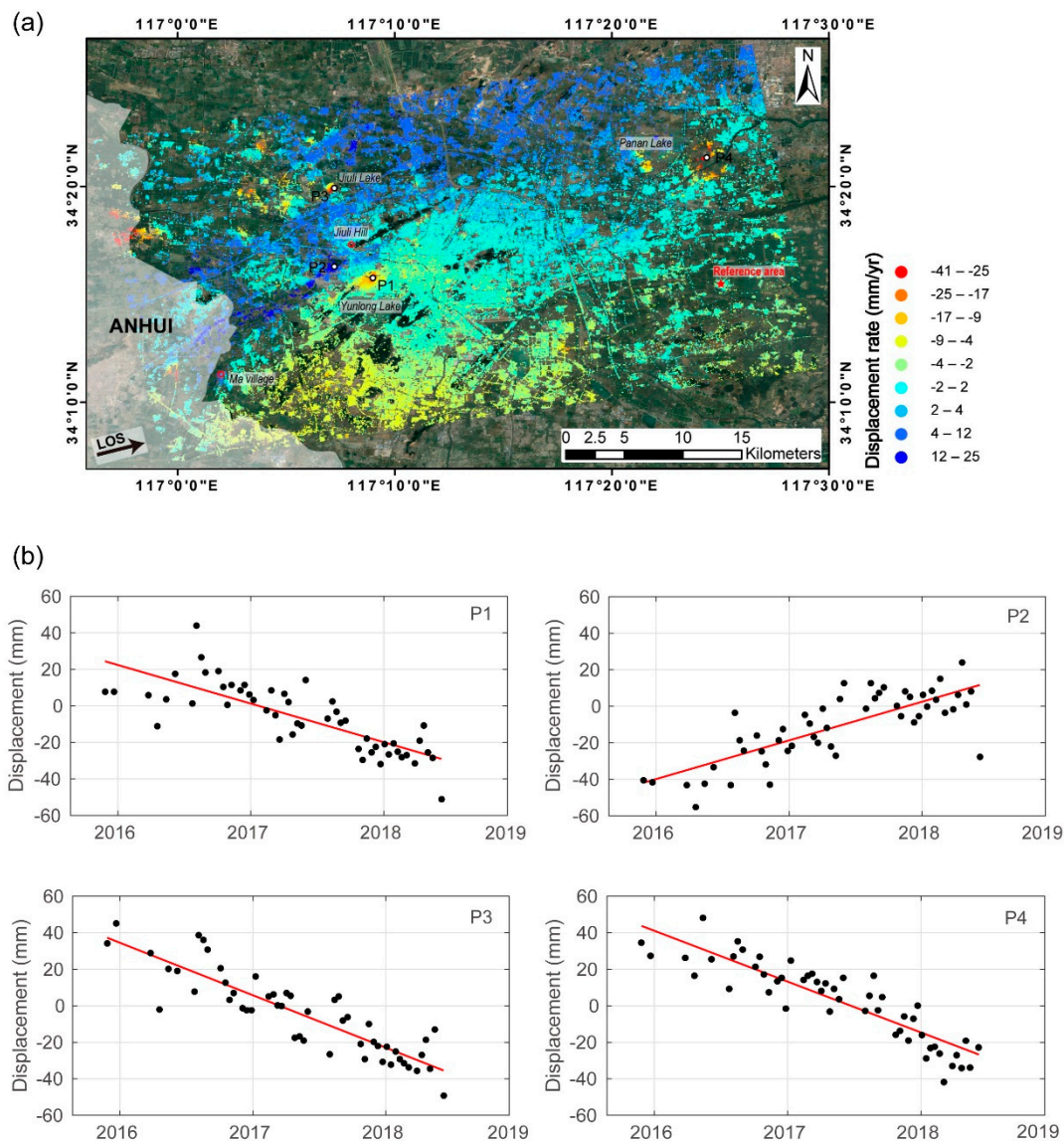


Figure S1. (a) Displacement rate map derived from initial InSAR time series for the entire study area during the period from November 2015 to June 2018. Positive values represent decreases in earth-satellite distance, while negative values represent increases in earth-satellite distance. Location of P1–P4 are indicated by black circles. Filled red star indicates the location of the reference area. The map conventions are the same as in Figure 4. (b) Displacement time series of points P1–P4. The red lines indicate the linear fits.

As shown in Figure S1a, long-wavelength artifacts are visible in the displacement rate map derived from the initial InSAR time series. Apart from the long-wavelength artifacts, there are several local displacement patterns located in the west and the northeast of the study area, which is consistent with the spatial pattern of PC2 in Figure 4b. The displacement time series of four representative points P1-P4 are plotted in Figure S1b. They all show linear time-dependent temporal behaviors that are similar to the temporal function of PC2 (Figure 4b V2). The large deviations of the time series for P1 – P4 (Figure S1b) indicate the significance of the artifacts. According to the above analysis, we conclude that the signal in the PC2 is mostly related to the land surface displacement affecting the study area. It is the main component used to estimate the LTDM. Furthermore, the comparison between the displacement rate map derived from the initial InSAR time series (Figure S1a) and that derived from the InSAR time series corrected by strategy 2 (Figure S1b) can further strengthen the effectiveness of the proposed correction method.

Section 2. The enlarged scatter plots in Figure 4.

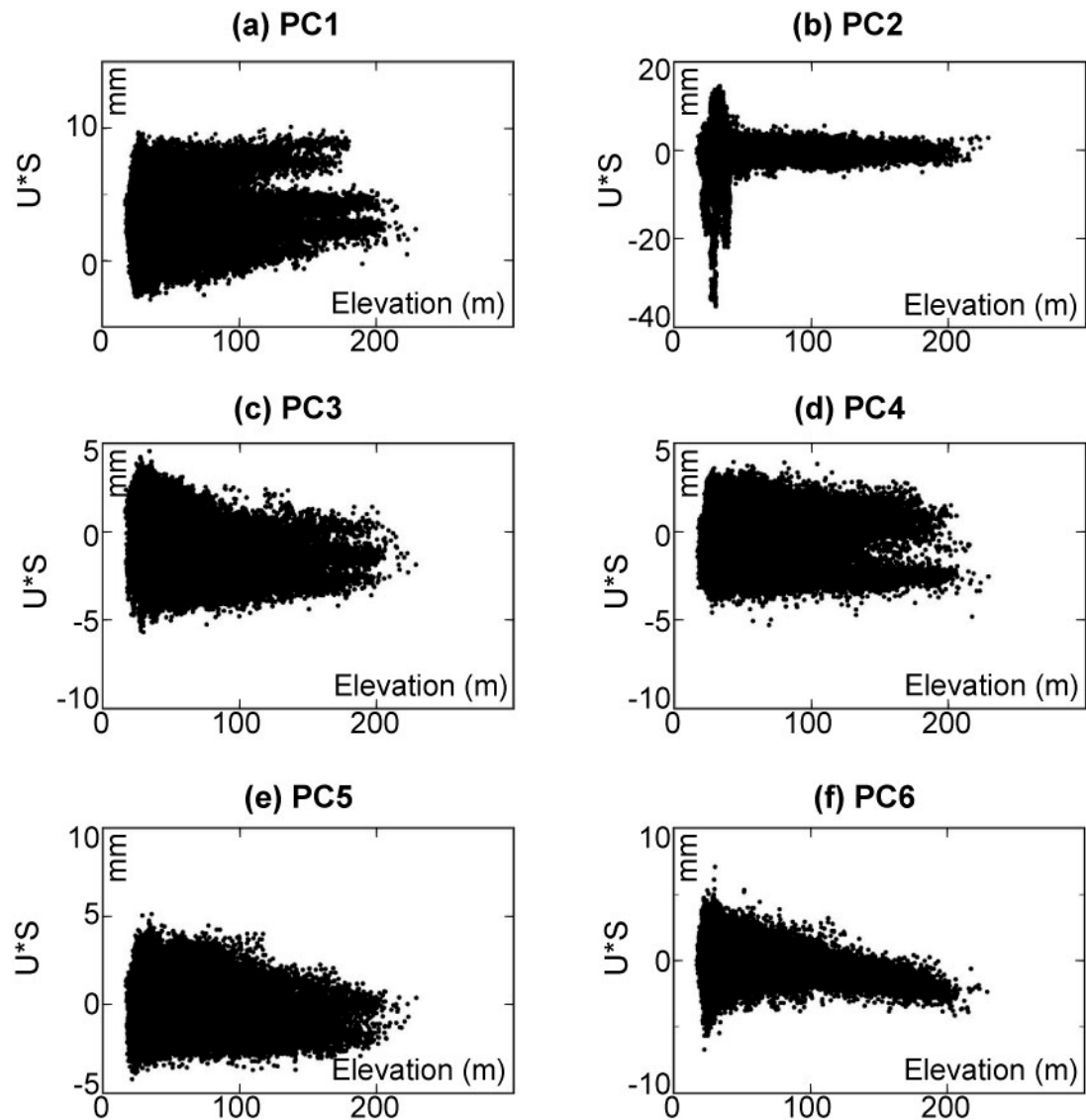


Figure S2. Correlations between the PCs and the elevation