Observation and Research Station of Groundwater and Land Subsidence in Beijing-Tianjin-Hebei Plain, MNR
Base of the State Key Laboratory of Urban Environmental Process and Digital Modeling
Key Laboratory of mechanism, prevention and mitigation of land subsidence, MOE
Beijing Laboratory of Water Resources Security
Capital Normal University

2021 DRAGON SYMPOSIUM
Dragon 4 Final Results and Dragon 5 First Year Reporting
19–23 July 2021 | ONLINE EVENT

Dragon 4 ID.32248
Dragon 5 ID.58897

Impact of ecological water compensation on urban safety along Yongding River (Beijing section)

Background & Study area

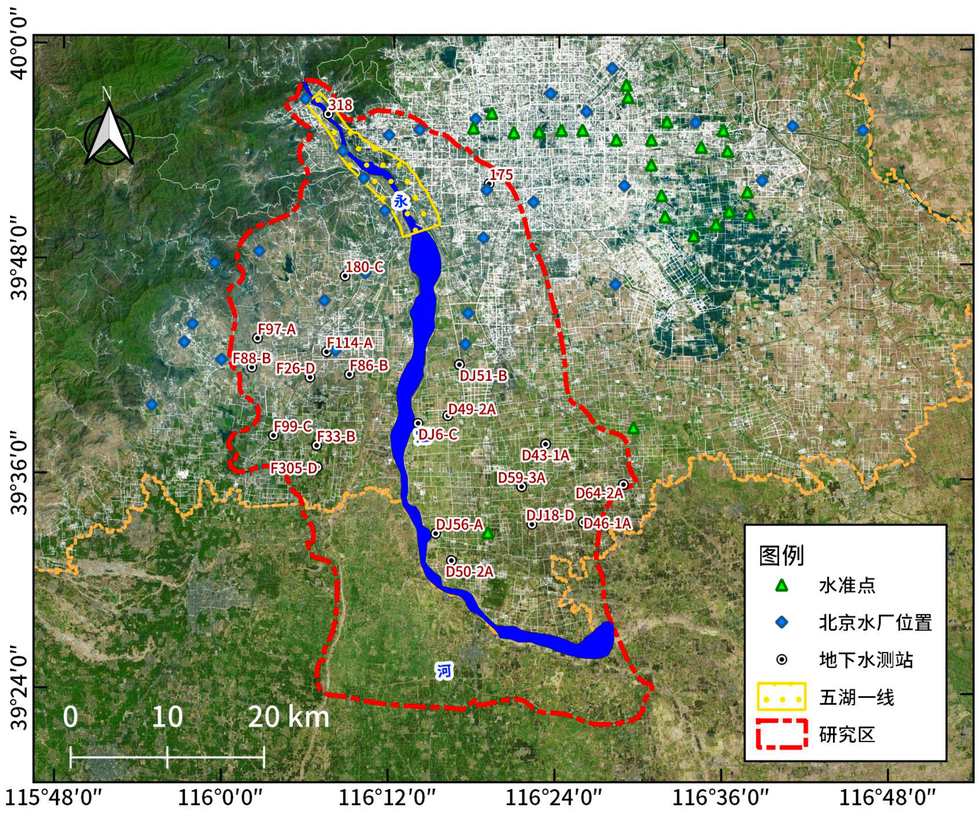

Fig. 1 The impact range of ecological water compensation of Yongding River (Beijing section)

Data sets and methods

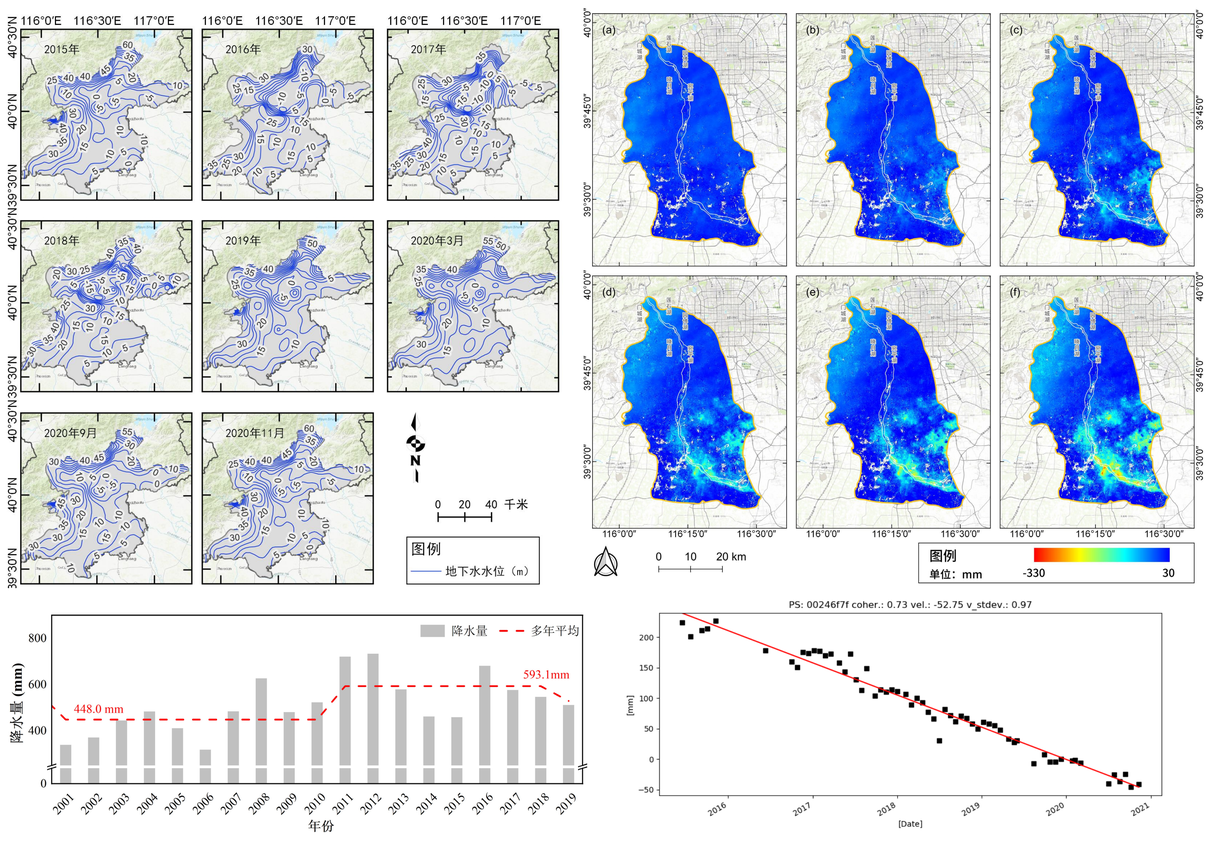

Fig. 2 Data used in this study(groundwater, displacement, precipitation, time series of deformation)

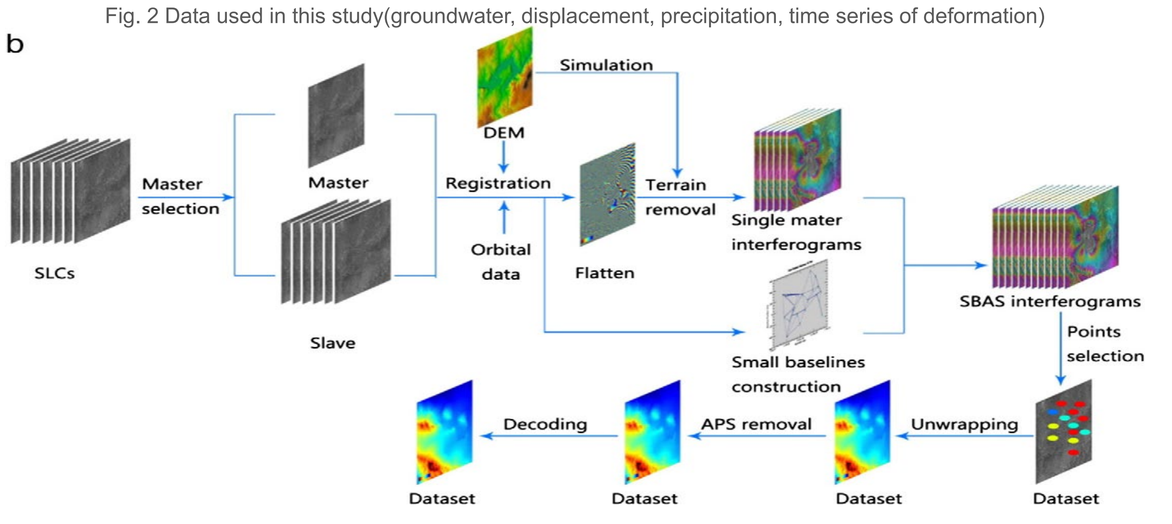

Fig. 3 The technique flowcharts of InSAR processing .

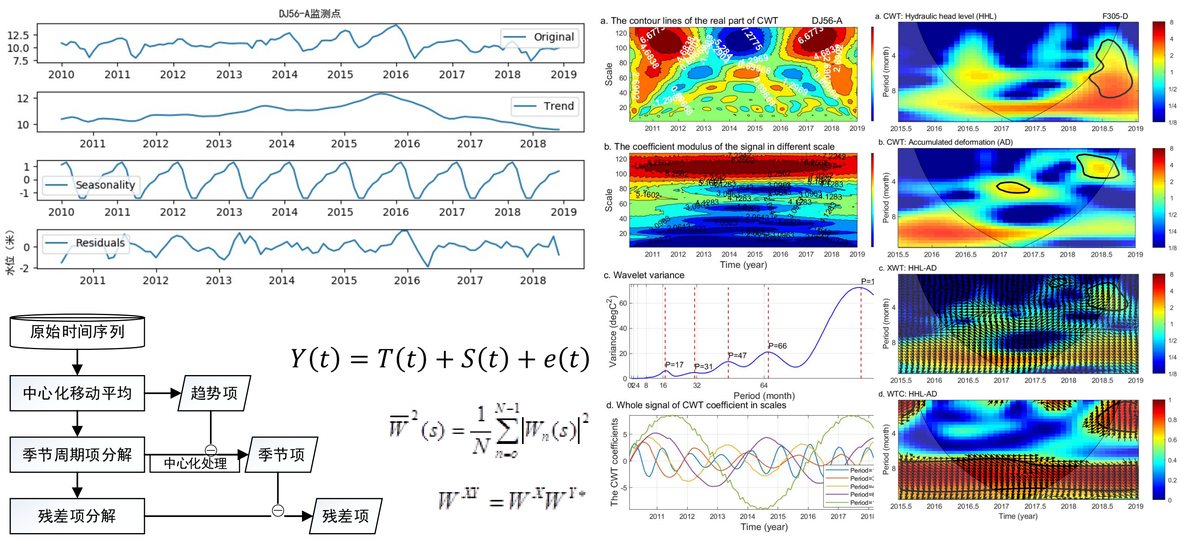

Fig. 4 Other methods used in this study(such as STL, wavelet analysis, spatial analysis, etc)

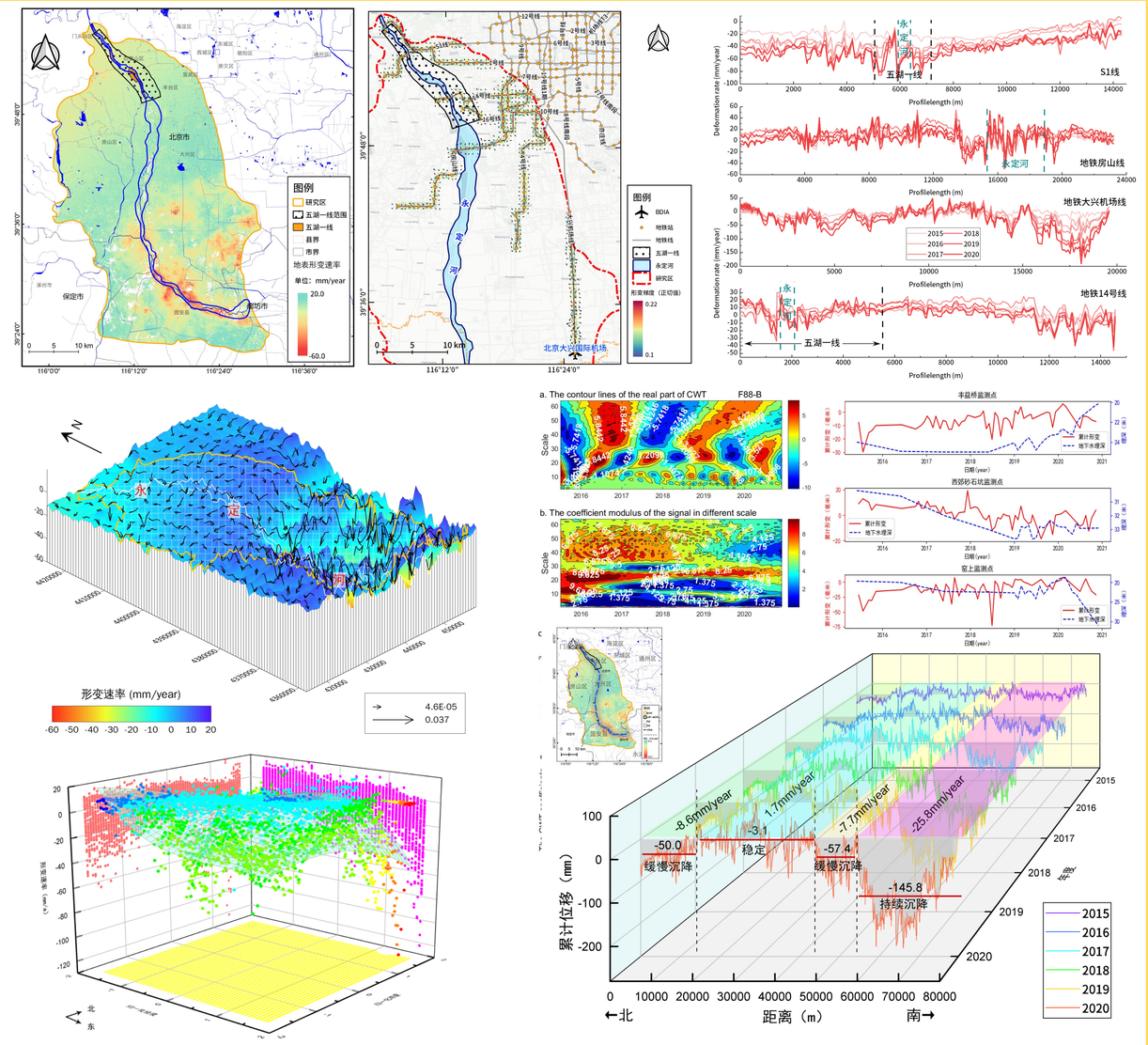

Fig. 5 Main results from the analysis (deformation rate, subway line buffer area, deformation along subway lines, gradient of deformation rate, time domain characteristics by wavelet analysis, time series analysis, surface deformation trend field, annual deformation profiles along Yongding River)

Discussion

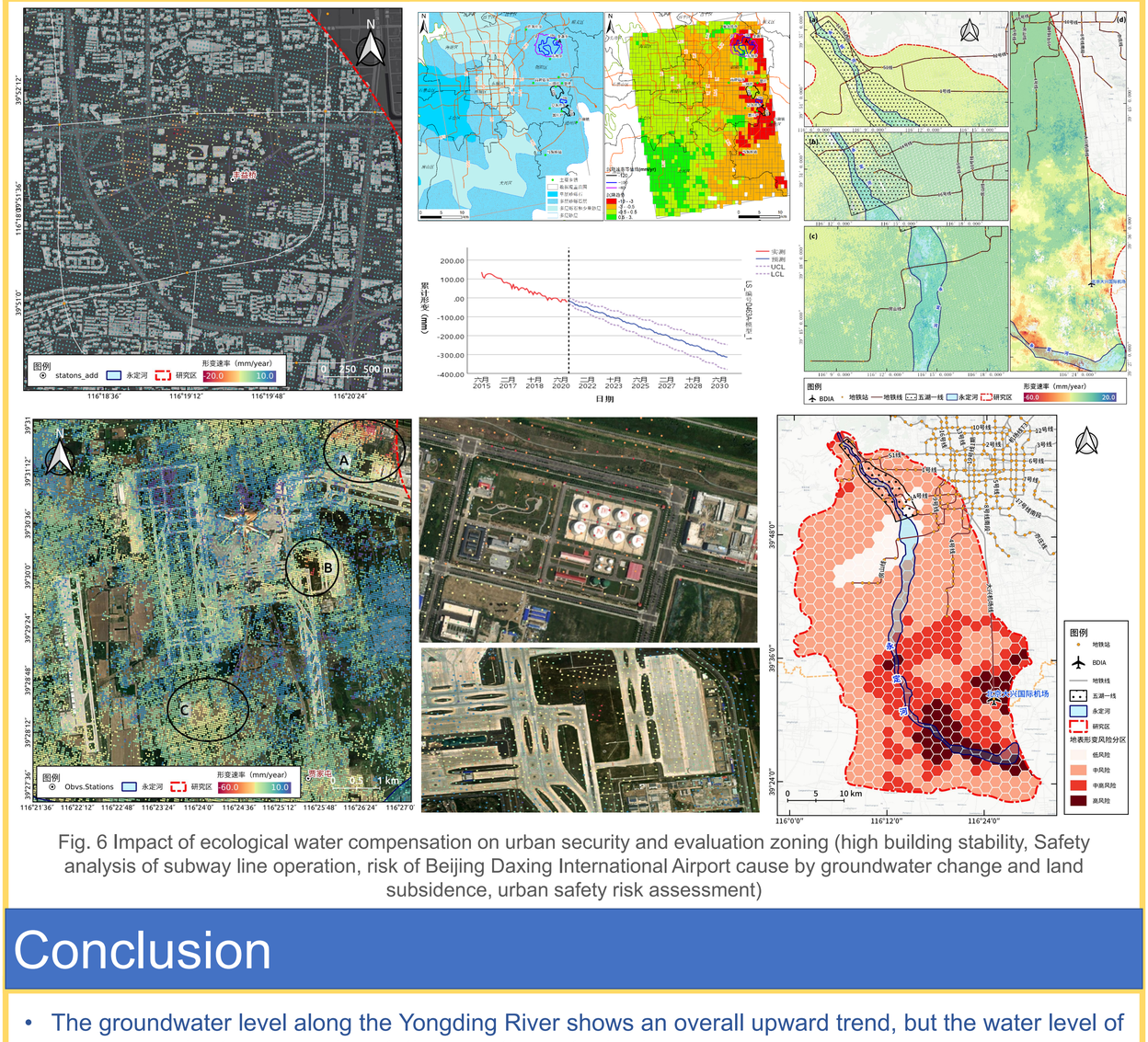

Fig. 6 Impact of ecological water compensation on urban security and evaluation zoning (high building stability, Safety analysis of subway line operation, risk of Beijing Daxing International Airport cause by groundwater change and land subsidence, urban safety risk assessment)

Conclusion

- The groundwater level along the Yongding River shows an overall upward trend, but the water level of some groundwater measuring stations continues to decline;
- The ecological water supply plays a positive role in the control of surface deformation in the upper reaches of the Beijing section of the Yongding River;
- The affected area in the lower reaches of the Yongding River in Beijing is close to Beijing Daxing International Airport, which requires close attention;
- At present, the water replenishing project of Yongding River has not caused obvious influence on the ground deformation, but the rising groundwater level and the differential land subsidence in some areas will pose great risks to the safety of coastal cities in the future.

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Mingliang Gao, Huili Gong*, Xiaojuan Li, Yinghai Ke, Beibei Chen, Mi Chen, Chaofan Zhou, Min Shi, Mingyuan Lv*
Jun 2021 (Corresponding author: cnugml@cnu.edu.cn; 4039@cnu.edu.cn)