

Supporting Information for

Groundwater Depletion in the West Liaohe River Basin, China and Its Implications Revealed by GRACE and In Situ Measurements

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Table S1. The background of the plain region of the West Liaohe River Basin (WLRB) based on the statistics from Li [1], Gao [2], and the Inner Mongolia Autonomous Region Bureau (<http://www.nmgjt.gov.cn>). Precipitation results were calculated based on the gridded precipitation products from the China Meteorological Data Service Center (CMDC) (<http://data.cma.cn/>). The Palmer Drought Severity Index (PDSI) on a 2.5° grid was used to quantify the dry or wet conditions in the WLRB (<https://www.esrl.noaa.gov/psd/data/>). The drought classification ranges from -1 to -2 correspond to abnormally dry, -2 to -3 moderate drought, -3 to -4 severe drought, -4 to -5 extreme drought, and <-5 exceptional drought. Populations are in millions; groundwater irrigation areas are in km²; crop yield is in ×10⁴ tons; precipitation is in mm.

	Population	Groundwater irrigation area	Crop yield	Precipitation	PDSI
1950s	0.95	--	42.93	430	1.03
1960s	1.48	1347	76.56	399	-0.36
1970s	2.05	1097	92.20	389	-0.68
1980s	2.41	1813	140.34	374	-1.59
1990s	2.86	3406	307.30	426	-0.52
2000s	3.10	5641	383.32	323	-3.59 (drought)

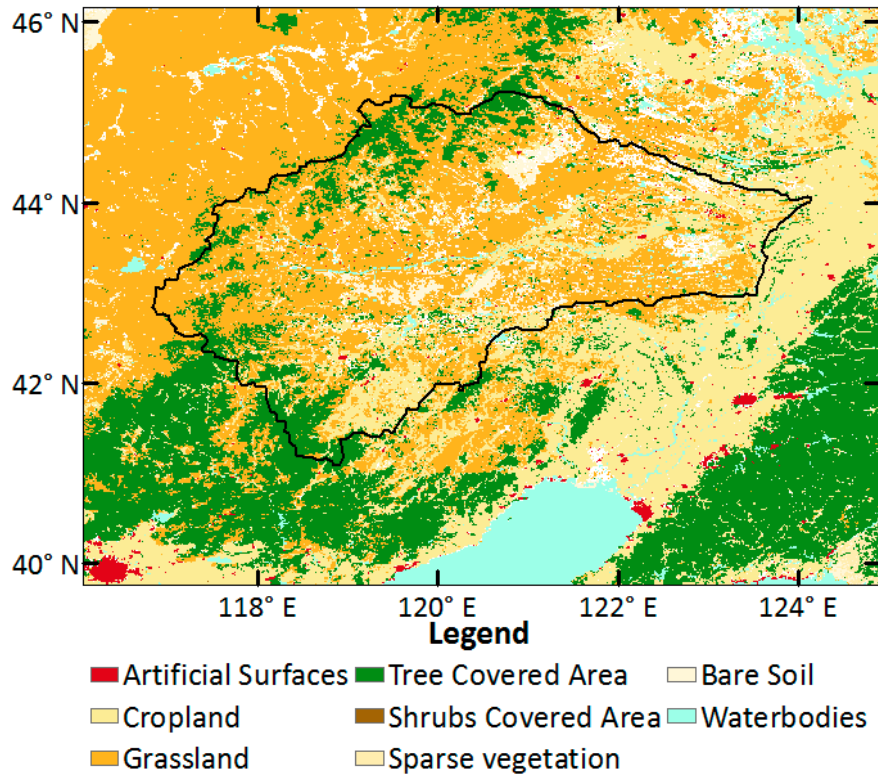


Figure S1. Land cover map of the WLRB based on the Global Land Cover SHARE (GLC-SHARE) database published by the Food and Agriculture Organization of the United Nations (FAO) (<http://www.glcn.org/>).

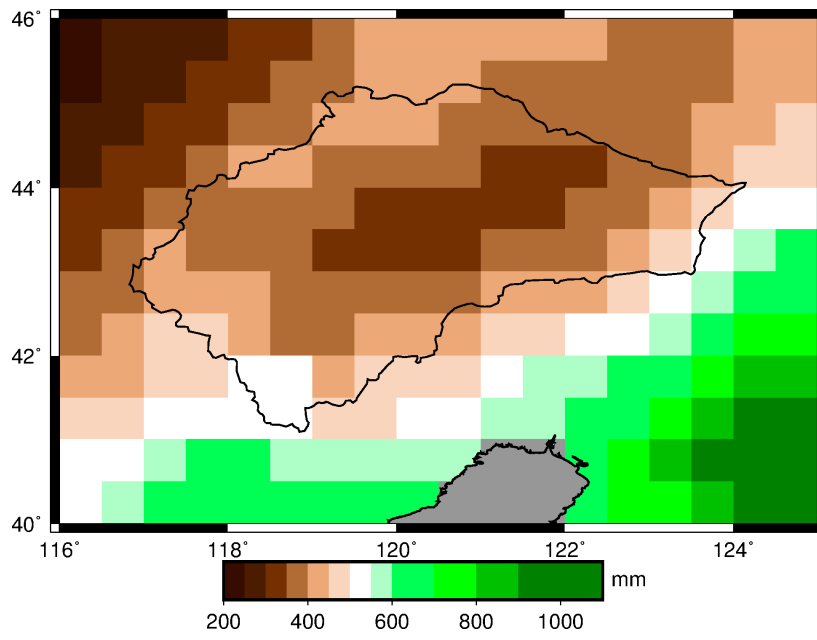


Figure S2. Spatial pattern of mean annual precipitation from 1961 to 2015 in the WLRB based on the gridded precipitation products from the CMDC (<http://data.cma.cn/>).

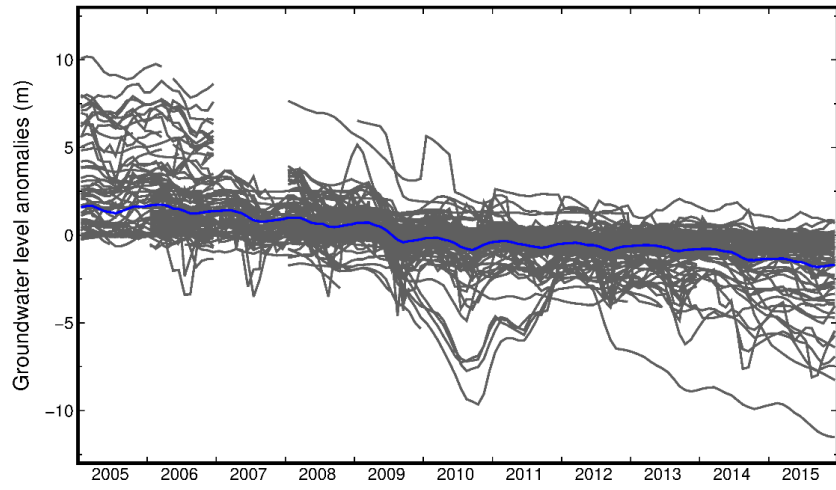


Figure S3. Groundwater level anomalies (gray lines) from a total of 122 monitoring wells and the mean groundwater level anomalies (blue line) in the WLRB from 2005 to 2015.

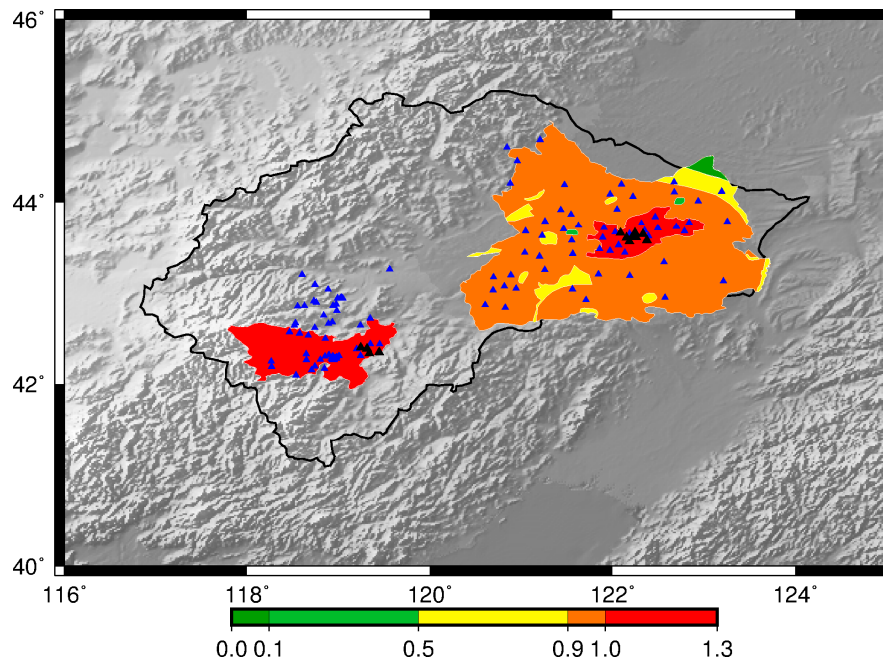


Figure S4. Coefficients of groundwater exploitation (the ratio of the actual amount of groundwater extraction to the allowable amount of groundwater exploitation) in the WLRB modified from Gao [3]. The black triangles represent observation wells maintained by the China Institute of Geological Environment Monitoring (CIGEM), which are all located in groundwater overdraft regions. The blue triangles represent observation wells maintained by the Hydrological Bureau of Inner Mongolia (HBIM) in the WLRB.

References:

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