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## Urban dry island effect and its potential underlying mechanisms in the Yangtze River Delta urban agglomeration, China

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Land use/cover change (LUCC) affects regional climate change not only through its direct changes of land surface properties, but also through its further modifications of land-atmosphere interactions including the surface energy budget, water cycle and carbon cycle. Urban land expansion as a typical case of LUCC, has been widely discussed about its effects on regional climate, notably on temperature and known for urban heat island (UHI). Another important climate variable atmospheric humidity is also seriously affected by LUCC but has not earned as much attention as temperature. We examined atmospheric humidity changes by a series of indicators in the Yangtze River Delta urban agglomeration of China during 1965-2017, and found obvious urban dry land (UDI) effect in the urban cores, as characterized by decreased humidity and increased vapor pressure deficit. Furthermore, we found similar spatial patterns of humidity changes with urban land expansion process and strong correlations of humidity changes with evapotranspiration and leaf area index changes, indicating that LUCC affects regional climate through an ecohydrological way. We suggest that the UDI effect should be paid more attention in future urban planning and landscape design and more quantitative estimations of urban expansion effect on regional and global drying trends are needed.