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Plain Language Summary: This study aimed to answer the question: what are the dominant factors affecting the variations of reference evapotranspiration (RET) in the Pearl River Delta of China? Our results indicated that the land use change-induced shifts in surface albedo were responsible for RET variations. Besides, the roles of climatic factors varied across sub-regions. The changes in sunshine duration and wind speed were the two dominant factors in decreasing RET in Guangzhou and Zengcheng, whereas the variations of temperature and relative humidity were responsible for RET increase in Taishan, Zhongshan and Shenzhen, respectively.

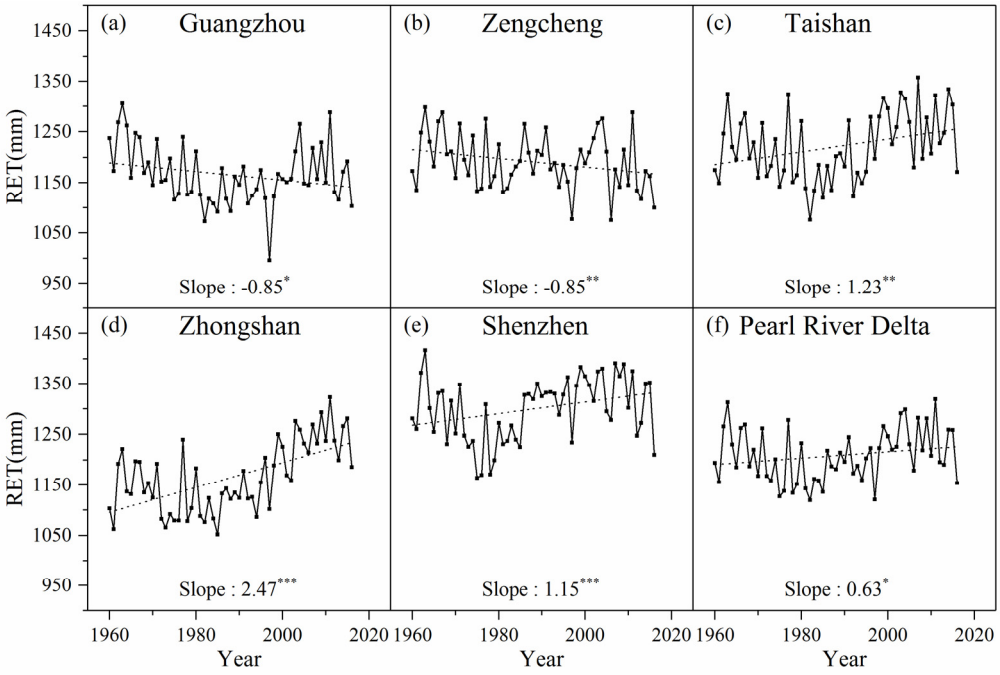

Fig. 1 The trends and variations of RET in the Pearl River Delta of China during 1960-2016. "*", "**" and "***" represent $p<0.1$, $p<0.05$ and $p<0.01$, respectively. The slope unit of RET is $mm \cdot yr^{-1}$.

- The increase of surface albedo due to the conversion of woodland to grassland decreased RET remarkably.
- The decrease of net radiation due to the declined sunshine duration and the weakening of energy exchange due to the decreased net radiation were the two dominant factors in reducing RET in Guangzhou and Zengcheng.
- The increase of vapor pressure deficit due to changes in daily maximum and minimum temperatures as well as daily relative humidity were responsible for RET increase in Taishan, Zhongshan and Shenzhen.