

# COMPARISON OF EVAPOTRANSPIRATION BETWEEN CROPLANDS AND FOREST LANDS IN A HUMID SUBTROPICAL REGION

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There is currently a general consensus that forested lands lose more water through evapotranspiration (ET) than croplands, particularly in semi-arid and arid regions. However, several studies have reported that forest lands may ET at certain tree ages and under specific management practices in the humid subtropical region. Using remote sensing data from MODIS (Moderate Resolution Imaging Spectroradiometer) with an 8-day and 500m spatial resolution, I conducted a comparative analysis of ET rates between croplands and forest lands in the humid subtropical region of the Yazoo River basin (YRB), Mississippi, USA, over a 21-year period from 2001 to 2021. Annual ET trends for croplands and forest lands were determined using Mann-Kendall statistics ( $\tau$ ), while annual differences between the two were assessed with the Kolmogorov-Smirnov test. The results show that there was a significant increasing trend in ET for croplands over the past 21 years, based on the Mann-Kendall test, but no such trend was observed for forest lands. The study further reveals that the differences in ET between croplands and forest lands were highly significant (at  $\alpha = 0.05$ ) over the most recent 11 years, from 2011 to 2021, with ET rates in croplands exceeding those in forest lands. I attribute this finding to the greater availability of water for ET in croplands due to intensive groundwater pumping for crop irrigation in the YRB. This new perspective challenges our traditional understanding of how forests and crops influence ET in the humid subtropical region.

PRESENTER BIO: Dr. Ouyang is a research hydrologist with more than 30 years of research experience in vadose zone, surface water and groundwater hydrology and water quality.