CONTRIBUTION OF STREAMS TO GROUNDWATER RESOURCE IN THE MISSISSIPPI EMBAYMENT OVER THE PAST 100 YEARS

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Water resource sustainability due to increasing water demand under the changing climate is a critical concern worldwide. Many regions of the world, including north Africa, Middle East, south and central Asia, north China, north America, and Australia, are now experiencing water resource depletion and/or shortage. Among them, Mississippi Embayment (ME) of USA is one of the fastest groundwater depletion regions in the world. Mississippi Embayment encompasses Missouri, Illinois, Kentucky, Arkansas, Tennessee, Mississippi, Alabama, and Louisiana and is a key region for crop productions in midsouth USA. To maximize crop yields, some cropland areas of the ME with groundwater irrigation has increased 92% since 1998 and resulted in a significant depletion of groundwater resources. Currently, long term interactions between streams and groundwaters in the ME are basically unknown. Using the US Geological Survey's Mississippi Embayment Regional Aquifer Study (MERAS) model, we estimated the contribution of major streams to groundwater resources in the ME over the past 100 years from 1915 to 2014. The temporal interaction trends between the streams and the groundwaters in the ME were also estimated using the Mann Kendell statistics. Our study provides a useful reference to water resource managers and farmers in the ME and around the world when developing their groundwater supply strategies.

PRESENTER BIO: Dr. Ouyang is a research hydrologist. Over the past 30 years, his working experience has spanned the spectrum from basic to applied research in water resources, hydrology, soil physics, and environmental sciences. He has published more than 150 refereed journal articles with 80 articles as the first or sole author.