Coupling Monitoring and Modeling to improve understanding of water availability in the Mississippi River Alluvial Plain.

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The Mississippi Alluvial Plain (MAP) is one of the most important agricultural regions in the United States. Crop productivity relies on groundwater irrigation from the Mississippi River Valley alluvial (MRVA) aquifer - an aquifer system that is poorly understood in terms of water-level response to pumping, sources of recharge and the water budget components. Withdrawals from the MRVA aquifer have resulted in substantial declines in groundwater-levels and reductions in stream baseflow, and a realization that continued rates of withdrawal may not be sustainable to maintain the aquifer as a source for irrigation in the region. As water resources become increasingly strained not only in the MAP but in other areas of the U.S. such as the Central Valley and the High Plains, the development of reliable water-availability estimates are needed for resource managers to make informed water-use management decisions. To address this need in the MAP, the U.S. Geological Survey (USGS) has initiated a regional water-availability project to improve the characterization of the MRVA aquifer system. The USGS plans to collect data that supplement or add to past data-collection efforts with several goals that include identifying the water-budget components, characterizing groundwater-surface water interactions using geophysical techniques, and improving estimates of water use throughout the study area. Activities in the investigation will couple monitoring of the water resources with modeling to provide stakeholders with the necessary information to better manage the water resources of the Mississippi Alluvial Plain.