Reconstructing hydrologic conditions in the Mississippi River Basin during the Last Interglacial

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Existing hydrologic records in midcontinent North America for the Last Interglacial (LIG; MIS 5e), when climate was warmer than today, is incomplete and controversial. To address this, we reconstructed and compared vegetation and hydrology in Mississippi River (MR) Basin during the LIG and Holocene using leaf wax carbon ($\delta^{13}C_{wax}$) and hydrogen (δD_{wax}) isotopic compositions preserved in marine sediment core (ODP 625B) from northeastern Gulf of Mexico (GoM). Leaf wax chain-length distributions indicate increased grasslands during the LIG than the Holocene, while δD_{wax} suggests slightly higher contribution of moisture from the GoM during the LIG. To provide more informed interpretations about vegetation and water changes, we performed a spatial analysis to estimate the magnitude of $\delta^{13}C_{wax}$ and δD_{wax} variations in the MR Basin with changes in vegetation and moisture source contributions. The model data estimates the extent of vegetation and/or source moisture changes with the observed shifts in leaf wax distributions and isotopes during the LIG in sedimentary records, and contributes to improving leaf wax isotopes from marine sediments toward more quantitative paleoenvironment proxies.