PALEOHYDROLOGICAL CHANGES IN SOUTHEASTERN CHINA FROM 13.1 TO 2.5 KA BASED ON A MULTI-PROXY PEAT RECORD

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Investigating the hydrological changes in the East Asian monsoon regions of China during the Holocene could provide important insights into the mechanism and future variability of the East Asian summer monsoon (EASM) rainfall. However, existing studies have revealed large inconsistencies in the spatiotemporal pattern of the hydrological changes in East China, probably due to different climatic sensitivities of various proxies, the uncertainties of sedimentary chronologies and unevenness of proxy record distributions. Thus, multi-proxy records with precise dating are needed, especially in southeastern China which is one of the key places to determine the spatiotemporal pattern with few hydrological records available. In this study, hopanoid flux, humification degree, the concentration of total organic carbon (TOC) and the atomic ratio between total organic carbon and total nitrogen (C/N) of organic matter were applied on Shuizhuyang (SZY) peat cores retrieved from southeastern China to reconstruct the paleohydrological changes spanning from 13.1 to 2.5 ka. Results of these proxies reveal a moderately dry period during 13.1-11.6 ka, followed by an interval of increasing aridity from 11.6 to 8.6 ka. The Holocene optimum (referred here as an effective moisture maximum) occurred at 8.6-4.4 ka before the climate became drier from 4.4 to 2.5 ka. The hydrological changes in SZY during the Holocene with a mid-Holocene Holocene optimum are consistent with the regional climate records in southeastern China. Such an overall arid-wet-arid pattern in Southeast China during the Holocene closely tracked the variations in the west-to-east sea surface temperature (SST) gradient in tropical Pacific. We preliminarily concluded the ENSO state and the western Pacific subtropical high (WPSH) position associated with variations in the thermal state of the tropical Pacific were primarily responsible for the hydrological changes in Southeast China during the Holocene. Our study added new evidence to the spatiotemporal pattern of hydrological changes in eastern China during the Holocene.