The Asian Summer Monsoons (ASM) represent the main source of precipitation in China and East Asia with about one third of the world population and a region of widespread civilizations. Identifying the temporal and spatial patterns (pathways) of these monsoonal events during the Late Holocene to today has been a matter of debate amongst the scientific community. Here we show that the distribution patterns of the cosmogenic isotope $^{10}\text{Be}$ and oceanic $^{127}\text{I}$ in the topsoil across China exhibit imprints of the main ASM pathways. Our results indicate the monsoon pathway pattern persisted for several millennia or more and suggest a strong bond between $^{10}\text{Be}$ and water vapor transport patterns. Our data also reveal a $^{127}\text{I}$ distribution pattern controlled by the ASM pathways, rather than proximity to the sea or bedrock weathering. The persistent pathway of the ASM during the late Holocene, together with higher than average global soil iodine concentration, may have further strengthened the development of civilizations in this region of the world through reduction of iodine deficiency related diseases.