Temperature and stable isotope records from the Timor Sea revealed repeated incursions of Indian Ocean thermocline water mass during HEs 3–6 related to slowdown of global thermohaline circulation coincided with increased precipitation reflecting southward migration of the Intertropical Convergence Zone (ITCZ). Today, this region is influenced by various ocean–atmosphere interactions including the seasonal migration of the ITCZ, changing intensity of SE Asian and Australian monsoonal systems and variable occurrence of El Niño-Southern Oscillation (ENSO) events. Slowdown or even collapsed of the thermohaline circulation during HEs resulted in major cooling at mid latitudes in the North Atlantic, reduced precipitation in high-latitude East Asia and southward displacement of the ITCZ. Stalagmite records from Liang Luar Cave in Flores, Indonesia, show that the Australian-Indonesian southern hemisphere summer monsoon precipitation increased during Younger Dryas cooling event, when Atlantic meridional overturning circulation was relatively weak and the ITCZ shifted southwards.