

Tropical Pacific Hydrologic Changes during the Holocene from Lipid D/H Ratios on Remote Islands

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Tropical rainfall patterns control the subsistence lifestyle of more than a billion people. Yet their natural variability prior to the late 20th century is poorly known, as is their link with extra-tropical climate. Using compound-specific hydrogen isotope analyses in lake sediments from islands across the tropical Pacific Ocean we show that for most of the last millennium the band of heavy precipitation known as the Intertropical Convergence Zone (ITCZ) was located south of its 20th century position, by as much as 500 km during the Little Ice Age (1400-1850 A.D.). A colder Northern Hemisphere at that time, perhaps the result of lower solar irradiance, may have caused the southward displacement of the ITCZ. If so, a small change in the planet's radiation budget can have a profound impact on both tropical rainfall and extra-tropical temperatures.