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A 50,000-year high-resolution stalagmite record from Northern Turkey

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Our current knowledge of continental climate variability in Turkey relies almost entirely on lake records, some of which even extend back to the Last Glacial Maximum. A further source of information on late Pleistocene and Holocene climate variability are speleothems, which can be found in caves throughout Turkey. A 170 cm long stalagmite (So-1) from Sofular Cave in north-western Turkey represents a continuous record of the last 50.6 kyr BP. A total of 3420 oxygen and carbon isotope measurements and more than 60 U-series dates allow us to construct a highly resolved and precisely dated time series of climate and environmental variability in the western Black Sea region. Carbon isotopes vary between -11.5 and 6.2 permil (VPDB) and are interpreted to be primarily driven by precipitation-controlled changes in vegetation and soil productivity. The So-1 δ^{13}C-profile indicates that precipitation was generally lower between 50.6 and 11.5 kyr BP and considerably higher during the Holocene. Well-known climatic events, such as the Dansgaard-Oeschger (D-O) cycles 1 to 13, Younger Dryas (YD) and Bolling-Allerod (BA), are clearly evident in the So-1 δ^{13}C time series. Periods of enhanced rainfall in north-western Turkey are associated with warm periods over the North Atlantic region. Both the timing and duration of D-O interstadials in the So-1 δ^{13}C time series is in excellent agreement with the absolutely dated Hulu Cave record from China. The So-1 δ^{18}O -profile shows a very different pattern. From 50.6 to 14.5 kyr BP δ^{18}O values vary between -13.9 and -11.4 permil (VPDB) around a mean value of -12.8 permil (VPDB). D-O interstadials are charac-

terized by more positive δ^{18}O values due to increasing temperatures. δ^{18}O values then rise continuously from -12.8 to -8.3 permil (VPDB) between 14.5 and 8.5 kyr BP. This rise in δ^{18}O is also evident in marine cores from the western Black Sea, indicating that the observed 4.5 permil increase in δ^{18}O in the So-1 time series is primarily caused by a change in δ^{18}O of Black Sea surface waters.