A high-resolution peat record from NW Iran reveals several episodes of enhanced atmospheric dust during the last 14000 years

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West Asia, which extends from Iran and the Arabian Peninsula to eastern Mediterranean Sea, is one of the most climatically dynamic regions in the northern hemisphere. The interactions between the mid-latitude Westerlies, the Siberian Anticyclone (SA) and the Indian Ocean Summer Monsoon (IOSM) control precipitation and atmospheric dust content across West Asia. There is mounting evidence that rise and fall of some of the earliest human societies in the "Fertile Crescent" may be related to periods of abrupt climate change during the Holocene. Nevertheless, high-resolution records of climate variability are scarce from this region and the existing archives are, in part, contradictory; while pollen and planktonic abundances from lakes in central and east Turkey and western Iran suggest dry conditions during the early-middle Holocene, geochemical data indicate relatively wet conditions prevailed during this interval. In order to address these discrepancies and study the interplay between major synoptic regimes in West Asia, we propose a multi-proxy approach to reconstruct changes in moisture and atmospheric dust at interannual to decadal time-scales during the last glacial termination and the Holocene using peat records. X-ray florescent analyses of conservative lithogenic elements (e.g., Al, Zr, Ti) in a 772-cm peat core from Neor mire in NW Iran reveal periods of elevated dust input to this region since 14272 ± 372 cal yr B.P. The intensity patterns of redox-sensitive elements (e.g., Fe, K, Rb, Zn, Cu, Co, and V) are similar to refractory metals, which indicate an aeolian source for these elements. In addition, significant correlations between the intensity of potentially mobile elements, such as K and Rb, and Ti (K/Ti R²=0.85, Rb/Ti R²=0.95) confirm that ombrotrophic condition were sustained throughout the record. At least seven major episodes of enhanced dust deposition can be identified that may be related to southward expansion of the SA accompanied by weaker Westerlies. In contrast, stronger Westerlies and diminished IOSM may also explain delivery of dust to the region during these intervals, as evidenced by similar modern events. High-resolution radio carbon dating, discrete analyses of organic biomarkers, trace elements and stable, radiogenic isotopes, and high resolution 500µm intervals (approximately at seasonal level) XRF scanning in additional peat cores from NW Iran are underway to further investigate abrupt climate change in West Asia and its potential influence on human civilizations.