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Mineral magnetic study of lacustrine sediments from Pumoyum Co Lake, southern Tibet, over the last 19 ka and paleoenvironmental significance

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The Tibetan Plateau plays an important role in controlling Northern Hemisphere atmospheric circulation and affects global climate. Therefore, high-resolution paleoclimatic records from this region are essential for understanding the coupling between local and global climate. We conducted systematic environmental magnetic studies on lacustrine sediments that date since the last deglaciation ($\sim$19 ka) from Pumoyum Co Lake, southern Tibet. From paleoenvironmental and magnetic property data, the studied sequence can be divided into three major units. Unit 1 spans the Holocene when the environment was oxic, in which an upward increasing trend is observed in the concentration of magnetic minerals. This trend can be interpreted as an increasing transportation of magnetic minerals from the catchment into the lake due to increased post-glacial melt-water flow. In contrast, both units 2 and 3 contain evidence of reducing environment. Fine-grained greigite dominates the bulk magnetic properties of unit 3, while both magnetite and greigite coexist in unit 2. The enhanced magnetic signal in unit 2 is mainly due to the increased precipitation which results in more detrital magnetic mineral rushed into the lake. Our results suggest that the climate of southern Tibet is teleconnected to high-latitude Northern Hemisphere climate variations. Although different mechanisms dominate the magnetic assemblage and associated magnetic properties in different units, environmental magnetic studies have considerable potential to provide important insights into paleoclimate variations in this region.