



Reconstructed Holocene climatic variability and paleoseismicity from paleolake sediments in the Spiti valley, India.

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We report the results of ongoing investigations of Mane paleolake sediments (named after the village, where the landslide occurred) from the Spiti valley that were deposited by the landslide damming of the Spiti River during the early Holocene. The preliminary study of the lake sediments reveals the presence of four different lithologies: (1) finely laminated detrital sediments constituted of couplets comprising dark (quartz dominated) and light colored (calcite dominated) sublaminae, which dominate the section, (2) non-laminated sediments mainly consisting of homogeneous clay, (3) sand layers (4) gravel layers that are mainly occurring at ca. 10m, 22m, and 30m in the 41m outcrop. Abrupt changes in lithologies, sedimentary structures, and facies point to dynamic and rapidly changing environmental conditions during the early Holocene. Based on geomorphological mapping, correlation of several sediment sequences and lithological changes indicates deepwater conditions, sediment laden underflows and periods of relative shallower lake level conditions.

In addition to the climate variability, neotectonic activity has also left clear imprints on the Mane paleolake sediments. Seismites such as fault grading stratigraphy, ball and pillow structures, contorted laminations, injection structure and diapiric flame intrusions are identified at two intervals within the lake sediments indicating the process of fluidization and liquefaction of lake sediments that can be linked to past seismic activity in the region. Also the trends of the normal faults found within the lake sediments shows near parallelism with the trends of Kaurik – Chango fault suggesting Holocene reactivation of the Kaurik – Chango fault that is located to the close vicinity of lake sediments.