2004 Fall Meeting
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HR: 16:15h
AN: **T34B-02 INVITED**
TI: Evidence for Repeated Megafloods Down the Tsangpo River Gorge, Southeastern Tibet
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AB: Lacustrine terraces record the extent of at least four glacially dammed lakes immediately upstream of the Tsangpo River gorge at the eastern syntaxis of the Himalaya. Field work in 2002 and subsequent GIS analyses constrained the extent of two of the lakes, a younger 240-m-deep lake and an older, 680-m-deep lake. Radiocarbon dating of wood and charcoal yielded ages of 8860$\pm$40 and 9870$\pm$50 ^{14}C yr B.P. for the higher set of lake terraces, and 1220$\pm$40 and 1660$\pm$40 ^{14}C yr B.P. for sediments from the lower terraces. Field work in 2004 revealed evidence for both a younger

shallower lake and an older deeper lake. The 680-m-deep paleolake discovered in 2002 covered almost 2850 km^{2} and contained an estimated 835 km^{3} of water; the 240-m-deep paleolake contained an estimated 81 km^{3} of water. These two dated paleolakes correlate with the timing of glacial advances due to monsoon strengthening indicated by glacial advances at Chomolongma (Mount Everest). In addition, preliminary ^{10}Be dating of ridge-crest boulders from a sequence of moraines about 50 km NE of the Tsangpo gorge indicates a series of at least three glacial advances, the youngest of which appears to be the same age as the 680-m-deep paleolake. Two earlier Pleistocene glacial advances were larger and may correlate with the deeper lake discovered in 2004. Catastrophic failure of the glacial dams that impounded the two dated paleolakes would have released outburst floods down the gorge of the Tsangpo River with estimated peak discharges of up to 1 to 5 x106 m^{3} s^{-1}. The erosive potential represented by the unit stream power calculated for the head of the gorge during such a catastrophic lake breakout indicates that post-glacial megafloods down the Tsangpo River were likely among the most erosive events in recent Earth history. Our evidence for previously unrecognized glacially dammed lakes at Namche Barwa show that monsoon-driven valley glacier advances dammed even the largest Himalayan rivers, and repeatedly created unstable glacier-dammed lakes that generated floods likely unparalleled in the recent history of the Himalaya. Hence, such immense outburst floods may well have played an important role not only in carving the deepest valley on Earth, but also, more generally, in the development of the spectacular topography across the Himalaya and other high, glaciated ranges.

DE: 1815 Erosion and sedimentation
DE: 1824 Geomorphology (1625)
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SC: Tectonophysics [T]
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