Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08759, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08759
EGU General Assembly 2008

Glacier lakes changes in the southeast tibetan plateau in the past thirty years

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Glacier lakes on the Tibetan Plateau play an important role in the local climate and hydrology. A recent study shows that the Tibetan glaciers have retreated dramatically over the past couple decades under the condition of global warming, which implies much melting ice from the glaciers supplied to the glacier lakes. However, there is little knowledge about the glacier lake changes in the Tibetan plateau. In this paper, we analyzed 493 glacier lake variations in the basin of Parlang Zangbo River in the southeast Tibetan plateau. Based on the aerial photos, satellite images, topographic maps and the derived digital elevation model (DEM), we measured the glacier lake areas in 1970, 1990 and 2000, respectively. The results show 215 of the 493 glacier lakes expanded, while the other 278 shrank. The total area of the 493 glacier lakes decreased slightly from 80.79km^2 in 1970 to79.33km^2 in 1990. But in the period 1990-2000, the total area increased by 7.23km^2. Of the 493 glacier lakes, 32 disappeared and 75 came into being in just thirty years, suggesting the glacier lakes in the southeast Tibetan plateau are unstable and response to climate change in a complex way.