# Sensitivity of glaciers in the Himalayas and the Tibetan Plateau to global warming

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We show the relation between annual precipitation and sensitivity of glaciers in the Qilian Mountains, the Tanggula Mountains, and the Nepal and Bhutan Himalayas to 1 deg C warming by means of mass balance model. The estimated glacier sensitivity shows that glaciers in the Himalayas and the Tibetan Plateau is more sensitive than those in other areas, and the difference between the sensitivity to warming in these regions and that in other areas becomes large with the increase in annual precipitation. Summer snowfall provides the most of the mass input of glacier in the Himalayas and Tibetan Plateau, and high surface albedo kept by summer snowfall restrains ablation of glacier in these regions. Warming in the Himalayas and Tibetan Plateau can cause significant albedo reduction. Therefore, glaciers in the Himalayas and the Tibetan Plateau are more sensitive than those in the area where glacier accumulation depends mainly on snowfall in winter. Most previous studies of glacier sensitivity, however, did not touch on this albedo reduction in summer, and they would underestimate the glacier sensitivity in the Himalayas and the Tibetan Plateau.