



Variation trend of snow in the Kamikochi-Azusa catchment of the Japanese Alps

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The Japanese Alps experience exceptionally heavy snowfall, extreme even by global standards, and in spring and summer the melting snow becomes a valuable water resource. The snow effectively acts as a natural dam when it accumulates in watersheds during winter. However, there have been no observations of the amount of snow in high-altitude regions of Japan. Therefore, we cannot discuss the effect of global warming on the change in the amount of snow in these regions based on direct observation data. We were, however, able to obtain climatic and hydrologic data for high-altitude sites in the Japanese Alps, and discuss the variations in these conditions in the Kamikochi-Azusa catchment (altitude 1490 m–3190 m) of the Japanese Alps over a 68-year period using these observed data. No long-term trends are observed in the annual mean, maximum, or minimum temperatures at Taisho-ike from 1945 to 2012; the total annual precipitation shows a statistically significant decreasing trend. The annual total snowfall at Taisho-ike from 1969 to 2012 shows a statistically significant increasing trend. The annual total runoff of the Kamikochi-Azusa catchment from 1945 to 2012 shows a statistically significant increasing trend, as does the snowmelt runoff to the river (which occurs from May to July). We can thus conclude that the annual snowfall in the Kamikochi-Azusa catchment has increased in recent years.