

Extreme Low Temperature in the Snow Covered Season at Kamikochi

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Meteorological element, especially temperature is an essential factor for many field studies. It is more important in mountain regions than lowlands because of complex terrain which makes spatial temperature variation complicated. So we have been conducted high-resolution weather observation since 2011 in Kamikochi-Yari-Hotaka Region, Central Japan Alps, to reveal vertical distribution of air temperature. The result of this observation showed that cold air pools formation occurs frequently and extreme low temperature appears occasionally in wintertime at Kamikochi. In this study, condition and cause of extreme cold events were discussed particularly associated with snow cover. The number of days that minimum temperature became lower than -18°C (defined as “extreme low temperature” in this study) occupied 10 percent during snow covered seasons. The most coldest cases, which were below -23°C minimum temperature only appeared within 3 days after latest snowfall events. Strong cold air pools also occurred intensively within 1.5 to 3 days. These may be why cooling effects of new snow such as snow-albedo feedback persist in few days, though these effects were lost with time passes and snow melts. Almost all cold air pools were nocturnal ones which formed and collapsed within one night, and positive relationship between duration and intensity was shown for these cases. However, there were few cases of persistent cold air pools that lasted for several days. These ones formed only in specific synoptic weather condition that was connected with advective temperature inversion.

Keywords: Cold Air pool, Snow Cover, Alpine Area