

Daily adjustment for the wind-induced precipitation undercatch of daily gridded precipitation in Japan

*増田 南波¹、谷田貝 亜紀代¹、上口 賢治²、田中 賢治³

*Minami Masuda¹, Akiyo Yatagai¹, Kenji Kamiguchi², Kenji Tanaka³

1. 弘前大学大学院理工学研究科、2. 気象庁、3. 京都大学防災研究所

1. Graduate School of Science and Technology, Hirosaki University, 2. Japan Meteorological Agency, 3. Disaster Prevention Research Institute, Kyoto University

The Japan Sea side of northern Japan is known as one of the regions with the heaviest snowfall in the world. Snowfall is important for water resources, but can sometimes causes locally significant disasters. Because of this, accurate measurement of precipitation amounts is required, especially in wintertime. Gauge-based precipitation data are generally considered to be more reliable than remote sensing observations; however this includes wind-induced precipitation undercatch biases, especially for solid precipitation.

The purpose of this study is to obtain the best adjustment method for wind-induced precipitation undercatch of high-resolution daily precipitation data, APHRO_JP (Kamiguchi et al., 2010) which is based on precipitation data from an array-based in-situ observation network called Automated Meteorological Data Acquisition System (AMeDAS). We devised an adjustment that uses both AMeDAS and Dynamical Regional Downscaling Using the JRA-55 Reanalysis (DSJRA-55) (Kayaba et al., 2016) wind speeds, because 30% of AMeDAS stations observe precipitation without wind speed. We applied a correction equation proposed by Yoshida (1959). To decide the parameters, we applied rain/snow judgement (Yasutomi et al., 2003). To validate the adjusted precipitation, river inflows from dams' catchments are compared with the difference between precipitation and evapotranspiration at several dams' catchments in northern Japan in the data (2009 –2011). This adjustment method yielded an increase of annual precipitation of 7% and wintertime (DJF) precipitation of 13% in the 4-year average over northern Japan, although adjustment using only AMeDAS wind underestimated precipitation compared with unadjusted precipitation because of a decrease in interpolated stations. Using this adjustment, the bias in hydrological balance was reduced from 28% to 14%.

キーワード：風による捕捉損失、降雪量、APHRO_JP

Keywords: wind-induced precipitation undercatch, solid precipitation, APHRO_JP