



Soil water dynamics and evapotranspiration in alpine ecosystems in the NE of Qinghai-Tibet Plateau, China

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Interactions between surface energy flux, evapotranspiration and soil water were poorly understood in the alpine ecosystems in the Qinghai-Tibet Plateau, which is a sensitive and vulnerable region to global climate change. For the first time, we continuously measured surface energy flux and soil water content (SWC) and estimated ET using Bowen ratio energy balance method in the Qinghai Lake watershed, located in the northeast of Qinghai-Tibet Plateau between 2012 and 2013. The three ecosystems were Kobresia meadow (KMd.), *Potentilla fruticosa* shrub (PFSH.) and *Achnatherum splendens* steppe (ASSt.). Results indicated that there was a good negative correlation between ecosystem Bowen ratios and SWC in the growing season for the three ecosystems. Annual ET at KMd. and PFSH. was 16% and 3% less than local annual precipitation, while that at ASSt. was 26% larger than annual precipitation. Average annual ET was 507.9, 493.2 and 413.7 mm at PFSH., KMd. and ASSt., respectively. Fluctuations of daily ET at alpine ecosystems were primarily controlled by solar radiation, especially in the growing season, whereas, at ASSt. where precipitation and SWC was limited, ET was also controlled by water supply.