



Abstract

On 7-8 August 1978, severe floods and debris flows, induced by heavy precipitation with embedded thunderstorms, occurred on both north and south sides of the Swiss Alps. On the north side, northeastern Switzerland and the Rhine was affected, on the south side, mainly an area near Lago Maggiore. The associated synoptic weather patterns and dynamics are analysed using the Twentieth Century Reanalysis (20CRv2c) dataset, and in addition using the NCEP/NCAR, ERA-20C and CERA-20C reanalyses. Responsible for the heavy precipitation was an upglide process of warm moist air from the south over and across the Alps. These dynamics were related to a 'Vb-type' lee surface low, a quasi-stationary front over the Alps, and marked upper-level ascent of air downstream of a 'digging trough'. The atmospheric features are well represented in the 20CRv2c dataset, with restrictions regarding the orographic modulation of the moisture flow and intensity of precipitation, for instance. Differences to the three other reanalyses products, two with finer resolution, are overall small.