



## **Variability and trends of fog and low stratus over the Swiss Plateau: The role of circulation types**

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The occurrence of a continuous layer of fog and low stratus (FLS hereafter) is a dominant climatological phenomenon on the Swiss plateau during the winter season. Scherrer and Appenzeller (2014) introduced an FLS proxy based on sunshine duration for the period 1901-2012. They found pronounced interannual to decadal variability in the FLS series. Here, we use the FLS series (updated until 2015) to analyse the link between FLS and circulation types for the years 1957-2015. Ten automatic weather type classifications (WTCs) developed in COST733 and operationally computed at MeteoSwiss are considered. We show that WTCs based on “sea level pressure” (GWT) are able to better distinguish days with and without FLS than those based on “geopotential height at 500 hPa”. It also proves beneficial to rely on a higher number of weather classes (e.g. 26 or 27 instead of only 9, 10 or 11). Using the 26-member GWT-classification based on sea level pressure, four (eight) weather classes can be identified that comprise already 59 (85) percent of all days with FLS. The occurrence of the four weather classes most related to FLS shows a decline in the period 1957-2015 ( $p=0.05$ ). The days with FLS show a similar decline in this period. In addition a clear seasonal cycle can be seen in the probability of occurrence of FLS within the identified weather classes most related to FLS. In summary, our results indicate that the interannual variability and trends of days with FLS is in the first order determined by the occurrence frequency of circulation types most related to FLS.

Reference: Scherrer, S. C., and C. Appenzeller, 2014: Fog and low stratus over the Swiss Plateau - a climatological study, *Int J Clim*, 34(3), 678-686, doi:10.1002/joc.3714.