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Seasonality analysis of hydrological characteristics and flash flood events in Greece

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The seasonality of flash flood occurrence is strongly connected to the climate forcing mechanisms of each region. Hydrological characteristics such as precipitation and stream flow depict the regional climate mechanisms. Comparison of daily and mean monthly seasonality of selected precipitation and runoff characteristics reveals valuable information within the context of flood occurrence. The present study presents the preliminary findings of the seasonality analysis of flash flood events that occurred in Greece during the 1925 - 2007 period in combination with a seasonality analysis of their hydrological characteristics. A two level approach at national (Greece) and regional (Crete Island) level was followed, using a total of 206 flood events. Twenty two of these flood events enriched the European Flash Flood database, which is being developed in the HYDRATE project. The analysis of hydrological characteristics through seasonality indices was based on a dataset of 83 monthly and daily precipitation stations and additionally 22 monthly and 15 daily flow stations. Analysis concludes that on the island of Crete, the flood event-based seasonality coincides with the seasonality of the daily precipitation maxima during December and January. The seasonality of the 3 largest long term daily precipitation maxima indicates that 50% of the maximum precipitation events occur during and the November –December – January (NDJ) period. The event based seasonality analysis for Greece indicated that 57% of the events occur during the NDJ period. The annual maximum daily precipitation is lagging behind by approximately one month to the maximum annual stream flows for Crete. This is due to the snow melting process, the low soil percolation rates of winter period and the high baseflow of the local karstic aquifers that contribute to the maximum flows. The results will be compared with six different hydrometeorological regions within Europe in the frame of HYDRATE project, in order to examine the regional seasonality patterns of flash flood occurrence.