

Changing structure of European precipitation: longer wet periods leading to stronger extremes

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We present the recently developed analysis of the changes in the structure of precipitation, quantified through the duration and intensity of periods of the consecutive days with significant precipitation or wet spells. We show that during the last 60 years the character of precipitation over Europe has changed: precipitation events have become longer over most of Europe by about 15-20%. From 1990 to 2009 wet spells lasting longer than 2 days contributed as much as 65-70% to the total number of annual precipitation events compared to about 50% in the period 1950-1960. Becoming longer, wet periods over Europe are now characterized by more abundant precipitation. Heavy and extreme precipitation events during the last two decades have become much more frequently associated with longer wet spells and also become more intense in comparison with 1950s and 1960s when extreme rainfalls were predominantly connected with relatively short wet periods. The changes in the distribution of temporal characteristics of precipitation towards longer events and higher intensities should have a significant impact on the terrestrial hydrologic cycle including subsurface hydrodynamics and surface runoff (e.g., European flooding).