



Changes in the timing of droughts in Europe

Yannis Markonis (1), Oldrich Rakovec (2), Rohini Kumar (2), Petr Máca (1), and Martin Hanel (1)

(1) Czech University of Life Sciences Prague, Water Resources and Environmental Modeling, Prague, Czech Republic, (2) Helmholtz Centre for Environmental Research, Department Computational Hydrosystems, Leipzig, Germany

Drought is a natural hazard with adverse socioeconomic consequences that is expected to be influenced by climatic changes. However it is difficult to assess the current changes, due to the long evolution of the phenomenon, its multi-variate characteristics and its spatiotemporal heterogeneity in genesis, propagation and recovery. Here we overcome these issues by using a rather long hydrological simulation (250 years) of mesoscale Hydrologic Model (mHM) and a dimensionality-reduction method for classification (Self-Organizing Maps; SOMs). Our results demonstrate a significant increase in the vegetation period droughts (April-Aug), also known as heat wave flash droughts. Interestingly, the droughts of the last decades appear to propagate from meteorological droughts to both soil moisture and hydrological droughts, which was not so evident in the past.