EMS Annual Meeting Abstracts
Vol. 13, EMS2016-435, 2016
16th EMS / 11th ECAC

Verification of subseasonal forecasts of drought indices

Christoph Spirig (1), Jonas Bhend (1), Samuel Monhart (1,2,3), and Mark Liniger (1)

(1) MeteoSwiss, Analysis and Forecasting, Zurich, Switzerland (christoph.spirig@meteoswiss.ch), (2) Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Birmensdorf, Switzerland, (3) ETH Zurich, Institute for Atmospheric and Climate Science, Zurich, Switzerland

Droughts severely impact various sectors including agriculture, hydrology, health or energy. Skillful systems for early recognition of droughts would therefore be highly beneficial for a broad range of applications, and – considering projected changes in occurrence of droughts due to climate change – can be part of effective adaptation measures. We investigated the capabilities of ECMWF's current extended range forecast system (IFS cycle 41r2) for predicting the Standardized Precipitation Evapotranspiration Index (SPEI) at various stations in Switzerland. The SPEI represents an interesting model case as its definition reflecting the cumulative water balance over different time periods allows an assessment of predictability for systems exhibiting different degrees of inherent memory. The memory effect alone yields predictive skill for SPEI forecasts based on climatological precipitation and temperature forecasts, with skill proportional to the chosen SPEI time period. Using the 20 years of hindcasts available, we verified SPEI forecasts at selected sites in Switzerland in comparison to such climatological SPEI forecasts. We found predictive skill for SPEI over the full forecast range of 6 weeks despite marginal or missing skill in precipitation forecasts beyond week two. Analyzing skill for dry and wet anomalies separately revealed that the overall skill originated from higher skill for dry conditions, whereas forecasts for wet anomalies are similar or worse than the reference forecast based on climatological values.