

Sequential correction of ensemble regional weather predictions for forecasting reference evapotranspiration

Anna Pelosi (1), Hanoi Medina Gonzalez (2), Paolo Villani (3), Guido D'Urso (4), and Giovanni Battista Chirico (5)

(1) CUGRI, University of Salerno, Fisciano (SA), Italy (apelosi@unisa.it), (2) Agrarian University of Havana, La Habana, Cuba, (3) Department of Civil Engineering, University of Salerno, Fisciano (SA), Italy, (4) Department of Agriculture, University of Naples Federico II, Portici (NA), Italy, (5) Department of Agriculture, University of Naples Federico II, Portici (NA), Italy (giovannibattista.chirico@unina.it)

This study explores the performance of an adaptive procedure for correcting the ensemble numerical weather outputs applied to the probabilistic forecast of reference evapotranspiration (ETo). This procedure is proposed as an effective forecast correction method when the available dataset is not large enough for the calibration of statistical batch procedures. The numerical weather prediction outputs are those provided by COSMO-LEPS, an ensemble-based Limited Area Model, with 16 members and 7.5 km spatial resolution, with forecast lead-time up to 5 days. ETo forecasts are computed according to the FAO Penman–Monteith (FAO-PM) equation, which requires data of five weather variables: air temperature, relative humidity, solar radiation and wind speed. The performance of the proposed procedure is evaluated at eighteen monitoring stations, located in Campania region (Southern Italy), with two alternative strategies: i) correction applied to the raw ensemble forecasts of the five weather variables prior applying the FAO-PM equation; ii) correction applied to the ensemble output of the ETo forecasts obtained with FAO-PM equation after using the raw ensemble weather forecasts as input. In both cases the suggested post-processing procedure was able to significantly increase the accuracy and reduce the uncertainty of the ETo forecasts.