EMS Annual Meeting Abstracts
Vol. 16, EMS2019-565, 2019

Development and evaluation of a climate service supporting water reservoir management at seasonal time-scale

Juan Carlos Sánchez-Perrino (1), Marta Domínguez-Alonso (1), Luis Miguel Barranco (2), Carmen Mirta Dimas-Suárez (2), Samuel Viana-Jiménez (1), Ernesto Rodríguez-Camino (1), Beatriz Navascués-Fernández-Vitorio (1), and Esteban Rodríguez-Guisado (1)

(1) AEMET, Spain (jsanchezp@aemet.es), (2) CEDEX, Spain (Luis.M.Barranco@cedex.es)

This poster describes an extension of a previous work for supporting water reservoir management using seasonal climate predictions which uses a web-based tool (S-ClimWaRe). This climate service was originally organized into two main components allowing both exploration of existing hydrological variability and provision of reservoir inflow and precipitation seasonal probabilistic forecasts, complemented by information of probabilistic forecasts skill. The seasonal forecasting part was exclusively based on a statistical forecasting system and was developed only for the extended winter NDJFM period. The new extension is based on a combination and weighting of downscaled ensemble members from Copernicus (C3S) seasonal forecasting systems. Here we describe the results of driving two alternative hydrological models with these advanced seasonal forecasts: SIMPA hydrological model, and offline SURFEX land surface model used by the HARMONIE climate model. SIMPA model, calibrated and tuned with observations of inflow reservoirs, is the reference hydrological model used to routinely provide an estimation of the water resources in Spain. SURFEX model has available a variety of parametrizations and different hydrology options that have been tested in this study. Both hydrological models have been tested and evaluated in a river basin (Miño Alto) selected by stakeholders and not affected by anthropogenic river flow regulations. Observed water inflow at the Belesar reservoir is used for verification purposes. Preliminary results show a good correlation between model outputs and inflow observations. Not surprisingly SIMPA obtains better correlations as it is calibrated with observations but some configurations of SURFEX also obtain comparable results. In particular, for this basin located in a wet region with the simpler force-restore ISBA-3L scheme for diffusion shows better results than the ISBA-DIFF scheme that resolves the diffusion equations in the vertical.