Geophysical Research Abstracts
Vol. 21, EGU2019-10500, 2019
EGU General Assembly 2019

Sub-seasonal hydrological forecasting for Itaipu Dam in Paraná River Basin, Southern Brazil

Erik Schmitt Quedi and Fernando Mainardi Fan

Universidade Federal do Rio Grande do Sul, Instituto de Pesquisas Hidráulicas, Porto Alegre - RS, Brazil (fernando.fan@ufrgs.br)

Hydrological forecasts within sub-seasonal timescale are still in a scientific research phase in Brazilian and South American context. It is expected that these predictions will bring benefits to sectors such as hydro-energy and operational applications. In this sense, in the current work we performed assessments aiming on evaluating the quality and usefulness of sub-seasonal precipitation forecasts to the Paraná River Basin, one of the most important basins of South America in terms of energy generation, contemplating the bi-national Itaipu hydroelectric power plant and more than others 150 large reservoirs plants. The quantitative precipitation used was originated from the European Centre for Medium-Range Weather Forecast (ECMWF)
The Ensemble Verification System (EVS) Software was applied to perform a statistical verification of the sub-seasonal precipitation forecasts, through deterministic and probabilistic metrics on the period ranging the years of 2015 and 2016, using the raw data and in a bias corrected format.
We also proceeded simulations of sub-seasonal streamflow forecasts using the MGB semi-distributed hydrological model, testing the ECMWF data as input - resulting in the development of a sub-seasonal H-EPS. The streamflow forecasts were benchmarked against the simulations using as input the climatological information, known as the extended streamflow prediction (ESP).
This study is one of the first evaluation of the sub-seasonal forecasts data for hydrologic forecasting purposes done in South America context. The assessment of the future rainfall allowed the inference of the performance of these precipitation forecasts for later use in hydrological modeling, also quantifies some of the errors associated with the data.
Results so far pointed that the streamflow predictions using the sub-seasonal precipitation forecast data presents greater predictability, or better skill, than those using historical information on the tested timescale. In this regard, these forecasts may be explored particularly in applications such as reservoir inflow, flood and drought control and the evolution of extreme events several weeks ahead.