

EGU22-12817

<https://doi.org/10.5194/egusphere-egu22-12817>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Exploratory analysis of Sub-seasonal to Seasonal precipitation forecasting using Machine Learning Techniques

Mohamed Elbasheer and Gerald Corzo Perez

IHE Delft Institute for Water Education, Netherlands (mel010@un-ihe.org)

Sub-seasonal to seasonal (S2S) forecasting ranges from two weeks to two months. This range of time is significant and has a substantial socio-economic impact for many societal applications such as agriculture, food security and risk mitigation because it gives a reasonable margin of time for any management measure (for example, disaster or risk mitigation measures) that need one or two weeks to be implemented. However, the reliability of the S2S forecasting is still underdeveloped, and many studies and even competitions have been promoted to aim at the study of how can Machine learning and other techniques help. So, in this study we evaluate the accuracy and reliability of the ECMWF S2S precipitation forecasts focusing on the extreme events (above and below normal precipitation events) using three verification methods; Receiver operating characteristic curve (ROC), Reliability diagram and Ranked probability skill score (RPSS). For this evaluation, three regions are selected globally. In addition to the accuracy evaluation, we investigated the use of machine learning techniques such as k-nearest neighbors (k-NN), Logistic Regression (LR) and Multilayer Perceptron (MLP) to improve the accuracy and reliability of the ECMWF S2S forecast. To select the appropriate input variables for the machine learning models; An analysis of temporal and spatial continuity of the variables is done using the Pearson correlation coefficient for temporal correlation and the experimental variogram for spatial continuity.