

Analysis of the Extreme Hydrometeorological Events in the Theoretical Hydraulic Potential and Streamflow Forecast

Authors : Sara Patricia Ibarra-Zavaleta, Rabindranarth Romero-Lopez, Rosario Langrave, Annie Poulin, Gerald Corzo, Mathias Glaus, Ricardo Vega-Azamar, Norma Angelica Oropeza

Abstract : The progressive change in climatic conditions worldwide has increased frequency and severity of extreme hydrometeorological events (EHE). Mexico is an example; this has been affected by the presence of EHE leaving economic, social and environmental losses. The objective of this research was to apply a Canadian distributed hydrological model (DHM) to tropical conditions and to evaluate its capacity to predict flows in a basin in the central Gulf of Mexico. In addition, the DHM (once calibrated and validated) was used to calculate the theoretical hydraulic power and the performance to predict streamflow before the presence of an EHE. The results of the DHM show that the goodness of fit indicators between the observed and simulated flows in the calibration process (NSE=0.83, RSR=0.021 and BIAS=-4.3) and validation: temporal was assessed at two points: point one (NSE=0.78, RSR=0.113 and BIAS=0.054) and point two (NSE=0.825, RSR=0.103 and BIAS=0.063) are satisfactory. The DHM showed its applicability in tropical environments and its ability to characterize the rainfall-runoff relationship in the study area. This work can serve as a tool for identifying vulnerabilities before floods and for the rational and sustainable management of water resources.

Keywords : HYDROTEL, hydraulic power, extreme hydrometeorological events, streamflow

Conference Title : ICCCH 2018 : International Conference on Climate Change and Humanity

Conference Location : Osaka, Japan

Conference Dates : March 29-30, 2018