عنوان مقاله:

Development of Regression-based Hydrologic Model for Estimating Inflows to Tarbela Reservoir Service Unavailable

محل انتشار:

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خلاصه مقاله:

The assessment of daily discharges at the Tarbela Dam is one of the major concerns for the reservoir operational team. As per record, the existing model used by Tarbela Dam Project (TDP) Engineers has not been reliably estimating the inflows to the reservoir as compared to those obtained from the reservoir operational data. This paper explores the development of a new hydrologic model using regression techniques. For this, four years of representative data for the period from ۲۰۱۳ to ۲۰۱۶ were obtained for daily inflows at four gauging stations namely, Indus river at Tarbela, Indus river at Besham Qila, Siran river near Phulra, and Brandu iver near Daggar. Both multiple linear regression (MLR) and multiple nonlinear regression (MNLR) were performed to develop models taking inflows at Tarbela as the response variable and inflows at the remaining three upstream-gauging stations as the explanatory variables. Based on several statistical measures and the visual inspection of the testing models, the MNLR provided a better representation of the relationship between the Tarbela inflows and the upstream-gauging stations' inflows. The best-fit nonlinear model declared the inflows at Besham as the most influential explanatory variable followed by the inflows at Phulra, while eliminating those at Daggar, suggesting that the inflows to Tarbela can effectively be estimated without the inclusion of Daggar inflows. The outcomes of the newly developed nonlinear model are considerably better in comparison to those of the existing model used by TDP Engineers. This study is helpful for the reservoir operational team to estimate the daily flows based on upstream-gauging stations data; it is recommended to update the model to estimate inflows to the reservoir for every three to four years.The assessment of daily discharges at the Tarbela Dam is one of the major concerns for the reservoir operational team. As per record, the existing model used by Tarbela Dam Project (TDP) Engineers has not been reliably estimating the inflows to the reservoir as compared to those obtained from the reservoir operational data. This paper explores the development of a new hydrologic model using regression techniques. For this, four years of representative data for the period from ۲۰۱۳ to ۲۰۱۶ were obtained for daily inflows at four gauging stations namely, Indus river at Tarbela, Indus river at Besham Qila, Siran river near Phulra, and Brandu iver near Daggar. Both multiple linear regression (MLR) and multiple nonlinear regression (MNLR) were performed to develop models taking ... inflows at Tarbel

کلمات کلیدی:

Hydrologic Model, Tarbela Reservoir, Upstream-gauging Stations, Multiple Linear Regression, Multiple Nonlinear Regression