

عنوان مقاله:

Developing an ANN Based Streamflow Forecast Model Utilizing Data-Mining Techniques to Improve Reservoir Streamflow Prediction Accuracy: A Case Study

محل انتشار:

ژورنال مهندسی عمران، دوره 4، شماره 5 (سال: 1397)

تعداد صفحات اصل مقاله: 22

نویسندگان:

Hamed Zamani Sabzi - *Postdoctoral research associate, Dept. of Geography and Environmental Sustainability, University of Oklahoma, 100 East Boyd St, SEC Suite 662, Norman, OK 73019*

James Phillip King - *Professor, Dept. of Civil Engineering, New Mexico State University, MSC 3CE, PO Box 30001, Las Cruces, NM, USA 88003, and member of the Engineering Research Center for Re-inventing Urban Water Infrastructure, Stanford University*

P.E.M Asce - *Research Scientist, Dept. of Geography and Environmental Sustainability, University of Oklahoma, 100 East Boyd St., EC Suite 562, Norman, OK 73019, USA, 88003*

Naci Dilekli - *Postdoctoral Research Associate, Texas AgriLife Research & Extension Center at El Paso, Texas A&M University System, 1380 A&M Circle, El Paso, TX 79967*

خلاصه مقاله:

This study illustrates the benefits of data pre-processing through supervised data-mining techniques and utilizing those processed data in an artificial neural networks (ANNs) for streamflow prediction. Two major categories of physical parameters such as snowpack data and time-dependent trend indices were utilized as predictors of streamflow values. Correlation analysis of different models indicate that, for the period of January to June, using fewer predictors led to simpler modeling with equivalent accuracy on daily prediction models. This did not hold in all periods. For monthly prediction models, accuracy was improved compared to earlier works done to predict monthly streamflow for the same case of Elephant Butte Reservoir (EB), NM. Overall, superior prediction performance was achieved by utilizing data mining techniques for pre-processing historical data, extracting the most effective predictors, correlation analysis, extracting and utilizing combined climate variability indices, physical indices, and employing several developed ANNs for different prediction periods of the year.

کلمات کلیدی:

Artificial Neural Networks; Data Mining; Streamflow Prediction; Reservoir Management

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/804090>



