Calibration of Conceptual Models for Rainfall Runoff Simulation

Jain, S K

Hydrological Sciences Journal, vol. 38, No. 5 : 431-441, 1993

Conceptual mathematical models are a useful tool for rainfall-runoff modelling of a basin. The calibration of such models has attracted the attention of a number of hydrologists since unique and optimal parameters are difficult to obtain. The calibration of a conceptual model is discussed through a simple conceptual model whose parameters are determined using a search technique. It is shown that the optimization algorithm converges to a global optimum even when the errors in the initial parameters are quite significant and the input environment is noisy.

Application of SHE for Irrigation - Command Area Studies in India

Lohani, V.K., Refsgaard, J.C., Clausen, T., Erlic, M., and Storm, B.

Journal of Irrigation and Drainage Engineering, ASCE, Vol. 199, No. 1: 34-49, 1993

One of the key topics in irrigation engineering today is water management in irrigated command areas. This paper presents application of a comprehensive modelling approach based on the System Hydrologique European (SHE), which allows an integrated modelling of all the relevant processes - overland flow, unsaturated zone flow, interception or evapotranspiration, ground-water flow, and river-channel flow to irrigation studies - at different scales ranging from a small plot to an entire command. Results of modelling studies, the Barna Command area in Madhya Pradesh, central India are presented. The SHE simulated the advancing front of soil moisture as surface irrigation originated from the head end of a field, resulting in a non-uniform water distribution along the field. Furthermore, the effect of a shortage of water supply at the tail end of an irrigation canal was simulated. The study was carried out within the framework of an Indo-European project cooperation resulting in the transfer of the SHE technology to the National Institute of Hydrology, U.P., India.

Some Issues of Water Quality Monitoring

N. C. Ghosh, C. K. Jain and A. Tyagi

Asian Environment, 15(2), 78-91, 1993.

Macrolocation and microlocation, besides the economic externalities, are the two important criteria to identify location of monitoring and sampling stations for a river reach. Available techniques for selecting of monitoring stations would give an idea of probable sites for monitoring and sampling, however, spot survey would be the main criterion to judge the final location. Sharp's procedure, which is widely used for selecting location of monitoring station, would be more effective to fix the monitoring networks for a large basin having number of tributaries, which are like a stream rather than a basin led by a small river. A case example discussed herein highlights issues involved in the water quality monitoring.

Springflow Simulation of Satluj River in the Western Himalayas
Singh Pratap and M C Quick

Snow & Glacier Hydrology, IAHS Publ. No. 218, 261-271, 1993

Streamflow simulation is carried out for the Satluj River in the Western Himalayan region using the UBC Watershed Model. Snowmelt and glacier melt runoff constitutes the major part of flow during spring and summers and in this river. Daily simulation is made considering the whole watershed as a single unit and splitting it into two sub-basins. In the latter case streamflows are simulated for each sub-basin separately and total outflow is obtained by simply adding the flows. Superior results are obtained by dividing the watershed into two different sub-basins. The results indicate that combining two hydrologically different watersheds into a single watershed reduces simulation or forecasting accuracy. It is reported that areal distribution of precipitation is the most important factor in the streamflow simulation because snowpack is built up by the model from precipitation-elevation relationships.