

Analysis of Flow to a Large-Diameter Well Experiencing Well Loss

Mishra, G.C., and Chachadi, A.G.

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Unsteady flow of a large-diameter well in a confined aquifer experiencing well losses has been analyzed by the discrete kernel approach. The well storage reduces the well loss component and the well storage is effective in the beginning of pumping. The efficiency of a well is overcome by increasing the well radius. The variation of specific drawdown in a large-diameter well experiencing well loss with pumping rate is nonlinear. The nondimensional time drawdown graph at a large-diameter well, in which the well loss component follows the Jacob's equation, is not unique but dependent on pumping rate.

Correlation of Turbidity with Indian Remote Sensing Satellite-1A Data

Choubey, V K

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India Remote Sensing satellite-1A Linear Imaging Self Scanning System (IRS-1A-LISS-1) multispectral digital data acquired over the Tawa reservoir region have been analysed to evaluate the turbidity in the surface water. Tawa reservoir water samples were collected on 20 Oct. 1988 concurrent with IRS-1A overpass. The turbidity was measured at each sampling point in the field with a nephelometer. Reservoir water samples were analysed for total suspended matter, grain size and minerology. The results indicate that, in the turbidity range between 15-45 NTU, a positive relationship exist between the turbidity and visible wavelength band 1, 2 and 3 (0.45 to 0.68), are more useful than longer wavelengths (near infrared) in quantifying turbidity. The concentration, minerology and grain size of the suspended matters are the main factors which influence the reflected radiance at low concentration levels (15-45 NTU) of turbidity. There is a positive correlation between reflectance, turbidity and suspended sediment concentration. It can be concluded that, as turbidity increases in the 15-45 NTU range, the spectral response increases. It appears that IRS-1A-LISS-1 data could be developed as a practical tool in water quality monitoring.

Estimation Of Suspended Solids Using Indian Remote Sensing Satellite - 1A Data; A Case Study From Central India

V K Choubey and V Subramanian.

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The objective of this study was to use Indian Remote Sensing Satellite - 1A (IRS-1A) Linear Imaging Self Scanning - I (LISS-I) digital data in combination with field measurement for the estimation of suspended solids concentration in a reservoir. For this purpose, a small reservoir (Tawa), on the Tawa river of the Narmada basin in Central India, was studied. The water samples were collected on 28th September and 20th October 1988, concurrent with IRS-1A overpass. The relation between 20 October 1988 LISS-I digital data and measured values of suspended solids concentration were quantified using simple linear and multiple regression equations.

The results indicate that in the concentration range 10-15 ppm, functional relations exist between suspended solids concentration and visible wavelengths Bands 1, 2 and 3 (0.45 and 0.68 micro m). As the concentration of suspended solids increases, the spectral response also increases in the range 10-50 ppm. Visible wavelength bands (0.45-0.68 micro m) are more useful than the near-infrared Band 4(0.77-0.89 micro m). Band 3 (0.62-0.68 micro m) especially has proved to be best for the quantification of suspended solids concentration.

IRS-1A LISS-I digital data can be used successfully to quantify suspended solids concentrations. Based on the results of this study, it appears that the regression technique has a strong potential for the application of IRS-1A data in this area and possibly to other reservoirs in India.

Application of the SHE to Catchments in India Part 1 General Results

Refsgaard J C, S M Seth, et al.

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The System Hydrologique European (SHE) modelling system has been applied to six subcatchments totalling approximately 15000 km² of the Narmada Basin in Madhya Pradesh, central India. The study was carried out within the framework of an Indo-European cooperative project aimed at a transfer of the SHE technology to National Institute of Hydrology, India. This paper presents the current status of the SHE, and then focuses on the experiences gained in applying it to basins of a size likely to be of practical interest, with a data availability characteristic of developing countries. Results from the largest of the six basins are presented and discussed along with summary results from all six basins. The procedures adopted and practical recommendations are given with regard to data collection model preparation and

parameter assessment, calibration approach and planning of field investigations. Finally, general conclusions regarding SHE applicability to Indian hydrological conditions are presented.

Application of the SHE to Catchments in India Part 2. Field Experiments and Simulation Studies with the SHE on the Kolar Subcatchment of the Narmada River

S K Jain , B Storm, J C Bathurst, J C Refsgaard and R D Singh

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The results of SHE modelling of the 820 km² Kolar catchment in madhya Pradesh, Central India are presented. The data collection, the associated field investigations, the calibration and the modelling results are discussed along with the assessment of model parameters. Based on the experiences obtained in this study from modelling and field experiments, the necessity of fieldwork and the hydrological realism of the final model representation of the basin are discussed.

A Risk-based Approach for Flood Control Operation of a Multipurpose Reservoir

Jain S K, G N Yoganarasimhan and S M Seth

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Many approaches are available for operation of a multipurpose reservoir during flood season; one of them is allocation of storage space for flood control. A methodology to determine a reservoir operation policy based on explicit risk consideration is presented. The objective of the formulation is to maximize the reservoir storage at the end of a flood season while ensuring that the risk of an overflow is within acceptable limits. The Dynamic Programming technique has been used to solve the problem. This approach has been applied to develop operation policies for an existing reservoir. The performance of the policy was evaluated through simulation and was found to be satisfactory.