CONTENTS

Urbanization: Hydrologic-Hydraulic-Damage Effects by Stuart G. Walesh and Randolph M. Videkovich	141
Impact of Energy Development on Ground Water by the Task Committee on the Impact of Energy Development on Groundwater Resources of the Groundwater Hydrology Committee of the Hydraulics Division	157
Estimation of Direct Runoff from Urban Watersheds by Aolad Hossain, A. Ramachandra Rao, and Jacques W. Delleur	169
Calibration of Hydrological Model Using Optimization Technique by Ronald E. Manley	189
Environmental Effects of Hydraulic Structures by the Task Committee on Environmental Effects of Hydraulic Structures of the Committee on Hydraulic Structures of the Hydraulics Division	203
Sedimentation of River Navigation Channels by Jørgen Fredsøe	223
Optimal Design of Water Distribution Networks by Antonio Cenedese and Paolo Mele	237
Flood-Frequency Analyses with Prerecord Information by Gary D. Tasker and Wilbert O. Thomas, Jr.	249
Parallel Cascades Model for Urban Watersheds by Mordechai M. Diskin, Simon Ince, and Kwabena Oben-Nyarko	261

This Journal is published monthly by the American Society of Civil Engineers. Publications office is at 345 East 47th Street, New York, N.Y. 10017. Address all ASCE correspondence to the Editorial and General Offices at 345 East 47th Street, New York, N.Y. 10017. Allow six weeks for change of address to become effective. Subscription price to members is \$12.00. Nonmember subscriptions available; prices obtainable on request. Second-class postage paid at New York, N.Y. and at additional mailing offices. GT, HY.

The Society is not responsible for any statement made or opinion expressed in its

publications.

TECHNICAL NOTES

Proc. Paper 13511

by Ranjan Ariathurai and Kandiah Arulanandan
DISCUSSION
Proc. Paper 13507
Simulation Accuracies of Gradually Varied Flow, by J. Peter Jolly and Vujica Yevjevich (July, 1974. Prior Discussions: June, July, 1975). closure
Submerged Buoyant Jets in Quiescent Fluids, by Daniel T. L. Chan and John F. Kennedy (June, 1975. Prior Discussion: Dec., 1975). closure
Applicability of Unit Stream Power Equation, by Chih Ted Yang and John B. Stall (May, 1976. Prior Discussions: Dec., 1976, Feb., Mar., Apr., 1977). closure
Safety Factors for Riprap Protection, by Michael A. Stevens, Daryl B. Simons, and Gary L. Lewis (May, 1976. Prior Discussions: Dec., 1976, Apr., July, 1977). closure
Accurate Explicit Equation for Friction Factor, by Akalank K. Jain (May, 1976). errata
Explicit Equations for Pipe-Flow Problems, by Prabhata K. Swamee and Akalank K. Jain (May, 1976). errata
Effects of Overbank Flow in Flood Computations, by Tawatchai Tingsanchali and Norbert L. Ackermann (July, 1976). closure

Colin R. Dudgeon (Sept., 1976. Prior Discussion: Aug., 1977).	
closure	302
Exact Solution of Gradually Varied Flow, by Mohammad Akram Gill (Sept., 1976. Prior Discussions: Mar., July, Aug., 1977).	
Closure	305
Wet and Dry Periods of Annual Flow Series, by Zekâi Şen (Oct., 1976. Prior Discussion: Sept., 1977). closure	
closure	307
Flow at Grade-Break from Mild to Steep Slopes, by Richard G. Weyermuller and M. Gamal Mostafa (Oct., 1976. Prior Discussions: Aug., Sept., 1977).	
closure	307
Hydraulic Modeling of Mixing in Stratified Lakes, by Peter M. Moretti and Dennis K. McLaughlin (Apr., 1977).	
by Iyyanki V. Muralikrishna and Harihar Raman	308
Hydraulic Jumps and Waves at Abrupt Drops, by Nallamuthu Rajaratnam and Nestor Vincente Ortiz (Apr., 1977). by Edward H. Wilson	210
by Edward H. Wilson	310 311
Numerical Solution for Flow under Sluice Gates,* by Lewis T. Isaacs (May, 1977).	
by Philip L. Betts	313
Coupled Dynamic Streamflow-Temperature Models,* by David S. Bowles, Danny L. Fread, and William J. Grenny (May, 1977).	•••
by Forrest Holly and Jean Cunge	316
Mean Behavior of Buoyant Jets in a Crossflow, by Steven J. Wright (May, 1977).	
by Vincent H. Chu	318
Evolution of Multijet Sleeve Valve, by William W. Watson (June, 1977).	
by Philip H. Burgi	321
Stability Analysis of Floating and Submerged Ice Floes,* by Mehmet S. Uzuner (July, 1977).	
by Jean-Claude P. Tatinclaux	322

^aDiscussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.

Urban Runoff Digital Computer Model, by Sanguan Phamwon and Yu-Si Fok (July, 1977).	
by Charles D. D. Howard	325
Numerical Model for Discrete Settling, by Hasan Zuhuri Sarikaya (Aug., 1977).	
by Joseph R. Reed	326

INFORMATION RETRIEVAL

The key words, abstract, and reference "cards" for each article in this Journal represent part of the ASCE participation in the EJC information retrieval plan. The retrieval data are placed herein so that each can be cut out, placed on a 3×5 card and given an accession number for the user's file. The accession number is then entered on key word cards so that the user can subsequently match key words to choose the articles he wishes. Details of this program were given in an August, 1962 article in CIVIL ENGINEERING, reprints of which are available on request to ASCE headquarters.

^{*}Discussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.