931632 231612

> PAPERS PRESENTED AT THE INTERNATIONAL CONFERENCE ON

## Water Quality Modelling in the Inland Natural Environment

Bournemouth, England: 10-13 June, 1986

Organised and sponsored by BHRA, The Fluid Engineering Centre.

Co-sponsored by the International Association for Hydraulic Research and the Institution of Water Engineers and Scientists





## International Conference on Water Quality Modelling in the Inland Natural Environment

Bournemouth, England: 10-13 June, 1986

## CONTENTS

Paper		Page
A1	WATER QUALITY MANAGEMENT I Planning investment for river quality using a catchment simulation model. A.E. Warn, Anglian Water, U.K.	01
A2	Water quality modelling of the Birmingham Tame. J.R. Martin and M.B. Green, Severn-Trent Water Authority, U.K.	09
A3	Water quality modelling in the Porsuk river. I.E. Gonenc and D. Orhon, Technical University of Istanbul, Turkey.	27
B1	WATER QUALITY MANAGEMENT II TOMCAT: A computer model designed specifically for catchment quality planning within the water industry. S.R. Brown, Thames Water Authority, U.K.	37
B2	The Anglian Water approach to river quality planning. A.D. Barnden, P.J. Matthews and A.E. Warn, Anglian Water, U.K.	51
B3	River quality modelling in the management of the Trent catchment. J.R. Martin and D.J. Brewin, Severn Trent Water Authority, U.K.	61
C1	INTEGRATED WATER QUALITY MODELLING I SENSMOD: A simple experimental non-point source model system. G. Jolankai, Water Resources Research Centre - VITUKI, Hungary.	77
C2	TRADE, a simple water quality model for transport, adsorption and decomposition of solutes in the soil. C.W.J. Roest, Institute for Land and Water Management Research ICW, The Netherlands.	93
54	INTEGRATED WATER QUALITY MODELLING II	100
D1	B.H. Gilding, Twente University of Technology, The Netherlands.	103
D2	Evaluation of a simplified process model for water and sediment yield prediction. D.M. Hartley, USDA-ARS, T.C. Sheng and O.R. Stein, Colorado State University, U.S.A.	121
D3	A comparison of nitrogen losses (as nitrate-N) during storm runoff and baseflow con- ditions on an agricultural catchment. P.F. Hillman and G. Whyman, University of Southampton, U.K.	131
E1	<b>TRANSPORT OF POLLUTANTS - UNSATURATED ZONE I</b> The prediction of pollutant transport from shallow disposal sites in low permeability media. T.W. Broyd, R.W. Paige and J.L. Stephens, Atkins Research & Development, U.K.	147
E2	Parameter identification in models of unsaturated solute transport. H.S. Wheater, R. Abeliuk and R. Perry, Imperial College, U.K.	171

E3	Solute transport and chemical processes: the present state of the unsaturated zone component of the SHE modelling system. J.C. Refsgaard, H.C. Ammentorp, K.H. Jensen, Danish Hydraulic Institute and T.H. Christensen, Technical University of Denmark, Denmark.	187
E4	A proposal for an unsaturated zone oxygen transport and consumption model. J.C. Refsgaard, H.C. Ammentorp, Danish Hydraulic Institute and T.H. Christensen, Technical University of Denmark, Denmark.	199
F1	<b>TRANSPORT OF POLLUTANTS UNSATURATED ZONE II</b> Modelling the volatilization of methane from contaminated groundwaters. G.B. Davis and C. Barber, CSIRO Division of Groundwater Research, Australia.	211
F2	Experimental studies on the migration of petrochemical pollutants into unsaturated aquifers. C. Iamandi, M. Manescu and I. Bica, Civil Engineering Institute, Bucharest, Romania.	221
G1	<b>TRANSPORT OF POLLUTANTS SATURATED ZONE</b> Groundwater pollution problems of Bornova plain in Turkey. A. Turkman, Dokuz Eylul University, Turkey.	239
G2	A model for water quality management of aquifers. D. Tolikas, P. Latinopoulos and Y. Mylopoulos, Aristotle University of Thessaloniki, Greece.	247
G3	Modelling mass transport in the saturated zone - a case study. J.D. Porter and R. MacKay, University of Newcastle upon Tyne, G.M. Williams, C.A.M. Ross and D. Noy, British Geological Survey, U.K.	259
H1	POLLUTION PROCESSES IN LAKES AND RESERVOIRS Lake simulation for a river purification scheme. G. Thompson, Binnie & Partners, U.K.	277
H2	Wind induced sediment resuspension in shallow lakes. L. Somlyody, Water Resources Research Centre - VITUKI, Hungary.	287
H3	Determination of optimal chemical dosages and individual outputs in multiple reservoir-single treatment plant systems. A. Appan, Nanyang Technological Institute, Republic of Singapore and A.B. Swann, Malawi Polytechnic, Malawi.	299
H4	The application of empirical modelling to eutrophication management in Lough Neagh. R.V. Smith, C. Jordan and D.A. Stewart, Department of Agriculture for Northern Ireland, U.K.	309
J1	POLLUTION PROCESSES IN ESTUARIES I A two-dimensional mathematical model study of the nitrate levels in an inland natural basin. R.A. Falconer, University of Birmingham, U.K.	325
J2	Modelling of pollutant dispersion in estuaries. A. James, University of Newcastle upon Tyne, U.K. and J.K. Park, University of Berkeley, U.S.A.	345
JЗ	Effects of phosphate load on algal content in impounded streams. D. Muller and V. Kirchesch, Federal Institute of Hydrology, F.R. Germany.	359
K1	POLLUTION PROCESSES IN ESTUARIES II Mixing and dispersion in estuaries: which mathematical model and why. R. Smith, University of Cambridge, U.K.	375

K2	A dynamic water quality simulation model for a freshwater estuary and riverine system. K.K. Lee and C.L. Chen, University of Wisconsin - Milwaukee, U.S.A.	387
КЗ	Forecasting the future salinity regimes of Garaet El Ichkeul, Tunisia after a water diversion scheme and wetland conservation measures. G.E. Hollis, University College London, U.K.	403
L1	<b>RIVER MODELLING I</b> The aggregated dead zone (ADZ) model for dispersion in rivers. P.C. Young and S.G. Wallis, University of Lancaster, U.K.	421
L2	A procedure for prediction of the flux of solutes across the sediment/water interface in rivers. G.B. McBride, Ministry of Works and Development, New Zealand.	435
L3	Pollutant transport in surface flows - a new boundary element approval O. Lafe, University of Lagos, Nigeria.	449
M1	RIVER MODELLING II Numerical computation of natural river temperatures. R. Gras, A. Gilbert, Electricite de France and D. Roult, SOGREAH Consulting Engineers, France.	457
M2	Modelling benthic oxygen demand in the Tarawera River. J.C. Rutherford, Ministry of Works and Development, New Zealand.	473
МЗ	Urban pollution of rivers - the UK water industry research programme. I.T. Clifforde, WRC Engineering, A.J. Saul, University of Manchester and J.M. Tyson, North West Water, U.K.	485
N1	ACIDIFICATION OF SURFACE AND GROUNDWATER Acidification of groundwater in the Netherlands. J. Hoeks, Institute for Land and Water Management Research (ICW), The Netherlands.	493
N2	Modelling preferential elution of pollutants during snowmelt. E.M. Morris, Institute of Hydrology, U.K.	503
N3	Modelling streamwater response to acid deposition. H.S. Wheater, K.H. Bishop, M.B. Beck and D. Drummond, Imperial College, R. Har- riman and D. Wells, Freshwater Fisheries Laboratory, R.J. Sargent, Forth River Purification Board, U.K.	517
N4	Regionalization of predictions of effects of atmospheric acidic deposition on surface waters. G.M. Hornberger, B.J. Cosby and E.B. Rastetter, University of Virginia, U.S.A.	535
P1	URBAN DRAINAGE Probabilistic modelling of urban runoff quality. J.B. Ellis, Middlesex Polytechnic, U.K.	551
P2	A conceptual model for investigating the pathways utilised by heavy metal pollutants in urban stormwater runoff. P.D. Hedges, J.H. Wren and T.R.E. Chidley, University of Aston, U.K	559
P3	De-icant pollution of airport run-off - development of a simulation model for evalua- tion of run-off management strategies. M.R.G. Taylor and J.M. Denner, Consultants in Environmental Science Ltd., and P.W. Jowitt, Imperial College Lender, LLK	579
	i oomit, imperial oollege condon, o.r.	