

Contents

Preface	vi
RIDDICK, A., HUGHES, A., KESSLER, H. & GILES, J. Introduction to integrated environmental modelling to solve real world problems: methods, vision and challenges	1
Vision Strategic Requirements and Challenges	
PEACH, D., RIDDICK, A., HUGHES, A., KESSLER, H., MATHERS, S., JACKSON, C. & GILES, J. Model fusion at the British Geological Survey: experiences and future trends	7
MOORE, R. V. & HUGHES, A. G. Integrated environmental modelling: achieving the vision	17
SUTHERLAND, J., TOWNEND, I. H., HARPHAM, Q. K. & PEARCE, G. R. From integration to fusion: the challenges ahead	35
Case Studies	
FARRELL, R., VERVERS, M., DAVISON, P., HOWLETT, P. & WHITEMAN, M. Splicing recharge and groundwater flow models in the Environment Agency National Groundwater Modelling System	55
PASANEN, A. H. & OKKONEN, J. S. 3D geological models to groundwater flow models: data integration between GSI3D and groundwater flow modelling software GMS and FeFlow®	71
ROYSE, K. R., HILLIER, J. K., HUGHES, A., KINGDON, A., SINGH, A. & WANG, L. The potential for the use of model fusion techniques in building and developing catastrophe models	89
WILDHABER, M. L., DEY, R., WIKLE, C. K., MORAN, E. H., ANDERSON, C. J. & FRANZ, K. J. A stochastic bioenergetics model-based approach to translating large river flow and temperature into fish population responses: the pallid sturgeon example	101
WILDHABER, M. L., WIKLE, C. K., MORAN, E. H., ANDERSON, C. J., FRANZ, K. J. & DEY, R. Hierarchical stochastic modelling of large river ecosystems and fish growth across spatio-temporal scales and climate models: the Missouri River endangered pallid sturgeon example	119
LAXTON, J. L. Geological map fusion: OneGeology-Europe and INSPIRE	147
Social Aspects of Integrated Environmental Modelling	
GLYNN, P. D. Integrated Environmental Modelling: human decisions, human challenges	161
GOBER, P., WHITE, D. D., QUAY, R., SAMPSON, D. A. & KIRKWOOD, C. W. Socio-hydrology modelling for an uncertain future, with examples from the USA and Canada	183
MAKROPOULOS, C. Thinking platforms for smarter urban water systems: fusing technical and socio-economic models and tools	201
Software Solutions and Methodology	
CONRADS, P. A. & ROEHL, E. A. JR. The use of data-mining techniques for developing effective decision support systems: a case study of simulating the effects of climate change on coastal salinity intrusion	221
ROWE, E. C., WRIGHT, D. G., BERTRAND, N. & REIS, S. Fusing and disaggregating models, data and analysis tools for a dynamic science–society interface	235
KINGDON, A., GILES, J. R. A. & LOWNDES, J. P. Future of technology in NERC data models and informatics: outputs from InformaTEC	245
BEVEN, K. & LAMB, R. The uncertainty cascade in model fusion	255
Index	267