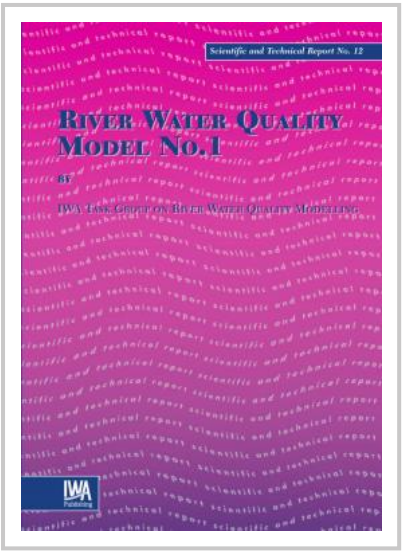
River Water Quality Model No.1

Editor(s): P Reichert, D Borchardt, Mogens Henze, W Rauch, P Shanahan, L Somlyody, Peter A. Vanrolleghem



This Scientific and Technical Report (STR) presents the findings of the IWA Task Group on River Water Quality Modelling (RWQM) in a critical evaluation of the current state of the practice in water quality modelling.

A major limitation in model formulation is the continued reliance on BOD as the primary state variable, despite BOD does not including all biodegradable matter. A related difficulty is the poor representation of benthic flux terms. As a result, it is impossible to close mass balances completely in most existing models. These limitations impair predictive ability in situations of marked changes in a river's pollutant load, streamflow, morphometry, or other basic characteristics.

RWQM 1 aims to serve as a framework for river water quality models that overcome these deficiencies in traditional water quality models and the failure to close mass balances between the water column and sediment. To these ends, the model incorporates fundamental water quality components and processes to characterise carbon, oxygen, nitrogen, and phosphorus cycling instead of biochemical oxygen demand.

The model is presented in terms of process and components represented via a 'Petersen stoichiometry matrix', the same approach used for the IWA Activated Sludge Models. The full RWQM1 includes 24 components and 30 processes and provides detailed examples on reducing components to fit specific water quality problems. Detailed explanations of the model components, process equations, stoichiometric parameters, and kinetic parameters are provided, as are example parameter values and two case studies.

The STR is intended to launch a participatory process of model development and to involve water quality professionals worldwide in the continued work developing a new water quality modelling approach.

This text will be an invaluable reference for researchers and graduate students in water resources, hydrology, water quality, or environmental modelling in departments of environmental engineering, natural resources, civil engineering, chemical engineering, environmental sciences, and ecology. Water resources engineers, water quality engineers and technical specialists in environmental consultancy, government agencies or regulated industries will also value this critical assessment of the state of practice in water quality modelling.

Scientific & Technical Report No. 12

Publication Date: 31/08/2001
ISBN13: 9781900222822
eISBN: 9781780402789
Pages: 144

Print:
Standard price: £99 / €124 / $149
Member price: £74 / €93 / $111

eBook:
Standard price: £99 / €124 / $149
Member price: £74 / €93 / $111