Comparative study of models for wet weather pollutant loads analysis		
Whole term	1994. 7～1997. 2	

(Purpose)

This study was aimed at compilation of basic information regarding prevailing status of application of overseas models for wet weather pollutant loads analysis in Japan, and was conducted during a period of three years spanning from FY1994 to FY1996. Investigations carried out through FY1994 and FY1995 enabled classification of different models with distinct features, histories of development and basic principles into two broad categories, namely, European and American ones. Two models among the European ones, named, 'HYDROWORKS' and 'MOUSE', and one among the American models, named, 'XP-SWMM' were finally selected in view of their sound theoretical basis and actual performance as well as the mutual independence of the selected models. The rainwater runoff and associated pollutant loads in several selected drainage districts were simulated using these models.

In FY1996, the selected models were evaluated from viewpoints such as sensitivity analyses of selected parameters, applicability of models, differences among selected models etc. Simultaneous comparison of these models with the existing domestic (Japanese) models namely modified RRL method combined with PWRI model was also attempted. The overall assessment of the overseas models in the light of the three-year investigation was finally summarized in the report.

(Results)

1. Sensitivity analysis of parameters

The selected models (HYDROWORKS, MOUSE, XP-SWMM) were all based upon distinct surface runoff analysis methods (basic formula). Therefore, in order to conduct and compare flow simulations accurately, the different parameters, which are responsible for influencing the results in case of each of the models, needed to be examined.

Accordingly, sensitivity analyses of different parameters were conducted while using the same data as input. Mainly the parameters like 'total flow', 'peak flow', and 'peak time' were focused upon during this analysis.

2. Simulation of surface runoff and pollutant loads in actual drainage districts

Simulation-models were applied for six drainage districts (4 separate sewer types and 2 combined types), and accuracy of the simulation results was assessed by comparing with the observed data.

While this investigation revealed, to a certain extent, the advantages and shortcomings of each model for runoff analysis, it was concluded that further investigation was necessary to elucidate the validity of the models.

3. Performance of models

The following performances should be further investigated to enhance the applicability of oversea models in Japan,

1) The oversea models have adequate hydraulic analysis models for pipe network.
2) These models are available for the analysis taking into account hydraulic structures along with pipe networks.
3) These models provide simple manipulation of different types of data (rainfall, drainage, and pipe network) and higher analysis speed.
4) These models enable simultaneous analysis of storm water runoff and associated pollutant loads in each model.
5) These models provide various ways to present the simulation results ('2D diagram', 'cross-section diagram', 'animation' etc.).

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