

Integral System for Nonpoint Source Pollution Modeling in Surface Waters

by

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ABSTRACT

This research describes an integrated system to model nonpoint source pollution in surface waters. Two diffuse pollution models were implemented in a Spatial Decision Support System (SDSS) with common interfaces and Geographic Information System (GIS) capabilities. The system includes pre- and post-processing tools, model control and sensitivity analysis for the models. The construction of the interfaces for the AGNPS (Agricultural Non-Point Source) model and WATFLOOD (a flood forecast hydrological model) and their link with the decision support system RAISON (Regional Analysis by Intelligent Systems On microcomputers) are presented. A water quality component was developed for the WATFLOOD model in order to deal with sediment and nutrient transport. Using data for the Duffins Creek watershed, the AGNPS model is used to assess the results from the water quality component coupled into WATFLOOD. Hourly measured data for two separate events were compared against both models. Sensitivity analysis and decision support tools provide a complete setup and the full integration of the system.

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DEDICATION

With all my love I dedicate this thesis to:

My wife Angeles, my sons Alejandro and Daniel and my daughter Marcela

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