

A Crop Growth Subroutine for Watershed Resources Management (WRM) Model

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Abstract : Vegetation has a marked effect on runoff and has become an important component in hydrologic model. The watershed Resources Management (WRM) model, a process-based, continuous, distributed parameter simulation model developed for hydrologic and soil erosion studies at the watershed scale lack a crop growth component. As such, this model assumes a constant parameter values for vegetation and hydraulic parameters throughout the duration of hydrologic simulation. Our approach is to develop a crop growth algorithm based on the original plant growth model used in the Environmental Policy Integrated Climate Model (EPIC) model. This paper describes the development of a single crop growth model which has the capability of simulating all crops using unique parameter values for each crop. Simulated crop growth processes will reflect the vegetative seasonality of the natural watershed system. An existing model was employed for evaluating vegetative resistance by hydraulic and vegetative parameters incorporated into the WRM model. The improved WRM model will have the ability to evaluate the seasonal variation of the vegetative roughness coefficient with depth of flow and further enhance the hydrologic model's capability for accurate hydrologic studies

Keywords : crop yield, roughness coefficient, PAR, WRM model

Conference Title : ICABES 2018 : International Conference on Agricultural, Biological and Ecosystems Sciences

Conference Location : Miami, United States

Conference Dates : March 12-13, 2018