

AN ABSTRACT OF A THESIS

DEVELOPMENT OF AN OPEN-BOOK WATERSHED MODEL FOR RAPID PROTOTYPING OF SATELLITE-BASED FLOOD FORECASTING IN INTERNATIONAL RIVER BASINS

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An open-book watershed model was developed, verified, and implemented with a view to assess its effectiveness in rapid prototyping of satellite-rainfall based flood monitoring systems for International River Basins (IRBs) for Global Precipitation Measurement (GPM) mission. The model follows conservation of mass and momentum and has minimum requirement for calibration. Most of the data needs of the model were generally available from existing geophysical databases. The physical consistency of model was demonstrated through sensitivity analysis of some geophysical basin parameters pertinent to rainfall-runoff transformation. Model is validated using Zvi (1970) of UIUC WES laboratory lab-scale data. An application scenario for a hypothetical IRB was demonstrated using in situ data over Oklahoma and real-time satellite product from NASA. It was observed that the developed open book model is a useful tool for understanding emerging issues on flood forecasting in IRBs for GPM.