



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004TX155B

Title: Near Real-Time Flood Prediction Using Hourly NEXRAD Rainfall Data for the State of Texas

Project Type: Research

Focus Categories: Floods, Models, Surface Water

Keywords: Floods, Modeling, Climate Data, Use of Real-Time Data

Start Date: 03/01/2004

End Date: 02/28/2005

Federal Funds: \$4,950

Non-Federal Matching Funds: \$28,305

Congressional District: 8th

Principal Investigators:

Bakkiyalakshmi Palanisamy

Raghavan Srinivasan

Abstract

The overall goal of this project is to better predict and display runoff on an hourly basis through the use of advanced weather data and state-of-the-art computer models. This project, which builds upon a previous TWRI-NIWR study awarded to Jennifer Hadley Jacobs, will use NEXRAD rainfall data from the U.S. National Weather Service (NWS) as an input parameter. Rainfall data will be input to the Soil Water Assessment Tool (SWAT, which is a distributed hydrologic parameter model that uses water balance methods to calculate evapotranspiration, infiltration, and streamflows. However, SWAT has not been evaluated and calibrated for flood-related studies, including runoff.

This study will use NWS weather data from 1999 to 2003 and streamflow data from the USGS. Texas will be grouped into several distinct hydrologic response units, each of which will represent a unique soil and land use combination. Hourly runoff will be calculated for 4 km x 4 km grid cells in each hydrologic response unit using the Green & Ampt infiltration equation. Once runoff values are calculated, they will be compared to observed streamflows.

The project is expected to develop real-time flood protection estimates for Texas' 23 major river basins at a 4 km x 4 km scale. Regularly updated maps generated through Geographic Information Systems (GIS) will be made available on the Spatial Sciences Laboratory website, <http://www-ssl.tamu.edu>. The study will provide practical information for water resources decision makers and will simulate related studies that integrate real-time water resources data with GIS methods.