USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002TX58B

Title: Real-Time Distributed Runoff Estimation Using NEXRAD Precipitation Data

Project Type: Research

Focus Categories: Models, Floods, Hydrology

Keywords: distributed hydrologic model, real-time runoff, NEXRAD

Start Date: 03/01/2002

End Date: 02/01/2003

Federal Funds: $4,764

Non-Federal Matching Funds: $26,329

Congressional District: 8th

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Abstract

Throughout history, Texas has often experienced extreme rainfall and flood events. Real-time data processing and improved flood forecasting can play a vital role in minimizing damages from these natural disasters. Before such improvements in water resources management can be made, reliable rainfall data need to be obtained. Currently-used rain gages are generally insufficient to capture data across enough geographically distributed sites to provide an accurate assessment of hydrologic conditions.

The goal of this project is to develop near real-time estimates of runoff for Texas, using precipitation data from the Next Generation RADAR [NEXRAD] network, which is administered by the U.S. National Weather Service.

In this project, Geographic Information System [GIS] databases will be created which represent Texas as a 4 kilometer [km] x 4 km grid that will correspond to NEXRAD displays. Information will also be presented for land uses, and soil types. Daily runoff will be calculated with the USDA/ Natural Resource Conservation Service curve number method.

Anticipated results from this project will be the creation of a GIS that displays projected daily surface runoff. Once calibration and validation procedures are completed, these runoff maps will be accessible on the WorldWide Web. The findings will stimulate related research into developing real-time water balances and will aid water planning efforts.