



After the Storm

On June 5, 2001, Tropical Storm Allison formed off the coast of Galveston and pounded 28 Texas counties for 5 days. The storm brought more than 3 feet of rain to many neighborhoods in the Houston area and became the costliest tropical storm in the history of the U.S.

In August 2001, the Harris County Flood Control District (HCFCD) and FEMA Region VI jointly initiated the Tropical Storm Allison Recovery Project (TSARP) to rapidly restudy Harris County's floodplains in an effort to reduce the potential for damage from the next extreme rainfall event. In just over three years, a team involving more than 20 consulting firms and contractors delivered Preliminary Digital Flood Insurance Rate Maps (DFIRMs) and the updated Flood Insurance Study (FIS) to all 34 communities within Harris County. To manage a program of this complexity, FEMA and the HCFCD selected a team of consultants: Michael Baker, Jr., Inc. and Brown & Gay Engineers, Inc.

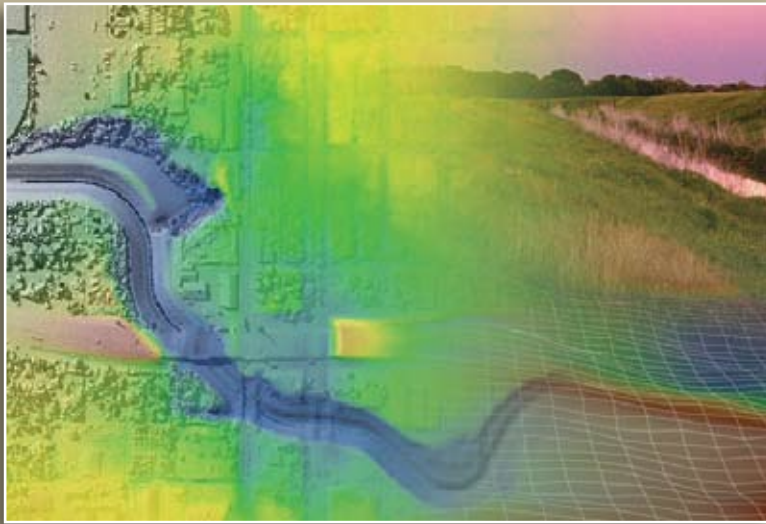
The TSARP covered a large geographic area with 1,200 stream miles to study in 22 watersheds. With a population of more than 4 million, Harris County encompasses 34 communities, including Houston, each with its own local floodplain administrator. The volume of data and stakeholders and the associated coordination effort was tremendous. Normally, it might take 15 years to complete a project of this magnitude. Due to federal funding requirements, the team had to deliver preliminary flood data by March 2003, a mere 18 months into the study. The Preliminary DFIRMs and updated FIS were delivered just 18 months later.

The TSARP also involved considerable technical challenges. The existing floodplain maps in Harris

County were based on outdated USGS maps and existing hydrologic and hydraulic models. The existing benchmark network and flood elevation data were based upon 1973 elevation datum, which required frequent adjustments due to subsidence. Early in the process, the team determined that the TSARP deliverables must include modernizing all related data in order to deliver highly accurate and usable maps.



The 1,700-square-mile TSARP study area is one of the largest areas mapped under a single contract using LiDAR technology, in which a pulsed laser is directed toward the earth's surface from a small propeller aircraft flying a precise grid at an altitude of approximately 3,000 feet. An onboard computer



collects highly precise elevation data on a 2,000-foot wide swath. The team supplemented the LiDAR data with conventional field survey data for more than 10,000 cross-sections of the drainage channels to ensure the highest possible accuracy.

Prior to the TSARP, relatively few flood insurance rate maps had been produced in digital format. The FEMA specifications for DFIRMs are very recent. This project has produced 147 individual maps with flood hazard information in GIS format.

Because T. S. Allison affected more than 2 million people and got the public's attention, the team had a highly visible public outreach program. They systematically gathered public input and encouraged broad participation. The public could view the progress and find the preliminary flood hazard information on the TSARP website at any time.



Potentially, the greatest value of TSARP is the prototype and experience that it has provided as FEMA implements its Multi-Hazard Map Modernization Program on a national basis. The goal of this initiative is to overhaul the nation's flood hazard mapping system and to have updated maps in digital format for the entire nation within 5-7 years. TSARP has demonstrated that updating an entire county can be accomplished within a relatively short time with new technology and a new user-friendly format.

By developing highly accurate, updated, user-friendly flood hazard data, the TSARP helped residents and business owners in Harris County understand and reduce their vulnerability to the next big flood. The potential to preserve lives and property provides immeasurable social and economic benefits. This new, updated information will assist government agencies, businesses, and developers to make better decisions on where to build new houses and buildings. It will also assist HCFCD and FEMA to better focus its buy-out programs to remove structures that are susceptible to repeated flooding.



The TSARP's proactive public outreach program, noted previously, has maintained a higher awareness of flooding issues in the community. The purchase of flood insurance policies within Harris County and surrounding areas has dramatically risen during the three years since Tropical Storm Allison.