Automated Flood Early Warning System:
Benefits and Implementation Challenges

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Nolan Creek - August 1, 2011
Nolan Creek - September 7, 2010

(Photographer unknown)
Nolan Creek - September 7, 2010

(Photographer unknown)
Nolan Creek - September 7, 2010

(Photographer unknown)
Watercrest Road, Killeen – May 2007

(Photo by Linda McMurray)
Nolan Creek Park - Killeen

(Photo: Temple Daily Telegram)
Homes damaged in Nolanville flooding – September 2007

(Photo: Temple Daily Telegram)
History

- Fort Hood Water Quality and Sediment Monitoring Program
- Monitoring equipment provided simple flood alert phone messages
- Developed into Flood Alert System with Telemetry (FAST)
Current Fort Hood Flood Alert System

- Six locations
- Three major streams
- Real time monitoring
- Web based data
- Alarm messaging
System Hardware

• Solar powered

• Water level sensor

• Cellular telemetry
System Operation

FLOOD STAGE: Alarm messaging via IP to email list

BASE FLOW: Continuous monitoring
10 minute data update via IP
Data posted to web page

Web site for real time monitoring

Alerts via email

Blackland Server for Email and Web site

Cell Phone

Stream Depth Gauge

Stream Crossing

10 min (IP)
Fort Hood - Flood Alert System with Telemetry (FAST)

Cowhouse Creek Crossings

- FM116 (Picoike)
  - Last reading: 04/27/09 20:28
  - Last reading: 04/27/09 20:28
  - Update in 6.8 min
  - Alarm @ 4.5 ft
  - Reset @ 2.25 ft

- Georgetown Road
  - Last reading: 04/27/09 20:28
  - Last reading: 04/27/09 20:28
  - Update in 6.8 min
  - Alarm @ 10.5 ft
  - Reset @ 5.25 ft

- West Range Road
  - Last reading: 04/27/09 20:28
  - Last reading: 04/27/09 20:28
  - Update in 6.8 min
  - Alarm @ 3 ft
  - Reset @ 1.5 ft

Rainfall measured in the last hour at Cowhouse Cr. and Georgetown Rd:
- 0.00 in

House Creek Crossings

- Georgetown Road
  - Last reading: 04/27/09 20:28
  - Last reading: 04/27/09 20:28
  - Update in 6.8 min
  - Alarm @ 2 ft
  - Reset @ 1 ft

- West Range Road
  - Last reading: 04/27/09 20:28
  - Last reading: 04/27/09 20:28
  - Update in 6.8 min
  - Alarm @ 3.0 ft
  - Reset @ 1.5 ft

Henson Creek Crossing

- West Range Road
  - Last reading: 04/27/09 20:28
  - Last reading: 04/27/09 20:28
  - Update in 6.8 min
  - Alarm @ 2 ft
  - Reset @ 1 ft

Stream Level (ft)

Graphs showing water levels and alarms for each location.
Fort Hood “Clear Sky” flood event – 50 minute time lapse - ~3 ft crest
• One monitoring station operational - Nolan Creek @ Paddy Hamilton Road
• Second station to be deployed later this year - Harker Heights area
Nolan Creek Flood Alert Sensor

Nolan Creek Flood Alert System
Pilot program initiated by the City of Belton and
Blackland Research and Extension Center
Belton City Manager: Mr. Sam List
Blackland Principal Investigator: Dr. Dennis Hoffman
System development and implementation: Dr. June Wolfe

Current Stream Level at Paddy Hamilton Road: 1.044 ft
Last reading received from sensor: 03/02/11 10:38 Update in: 5.0 min
Rainfall in the last hour: 0.00 in. in the last 24 hours: 0.00 in. System Power: 31.8 VDC

Nolan Creek water level over the past twelve hours

Flood Potential

[Graph showing Nolan Creek water level and flood potential over time]
Questions?

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Nolan Creek Flood Alert System Website:
fthoodflood.tamu.edu/NolanCreek.jpg