The Halloween Flood 2013

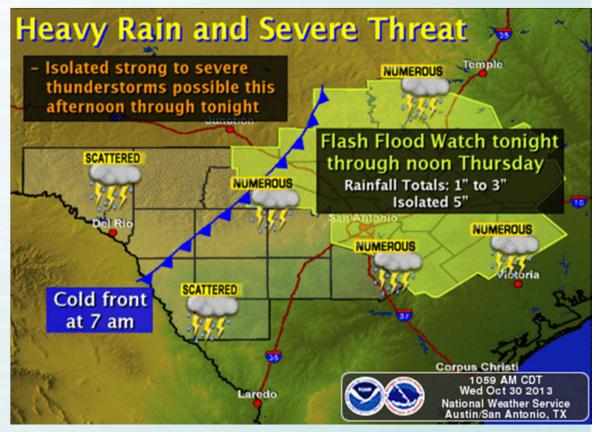




NWS Rainfall Prediction

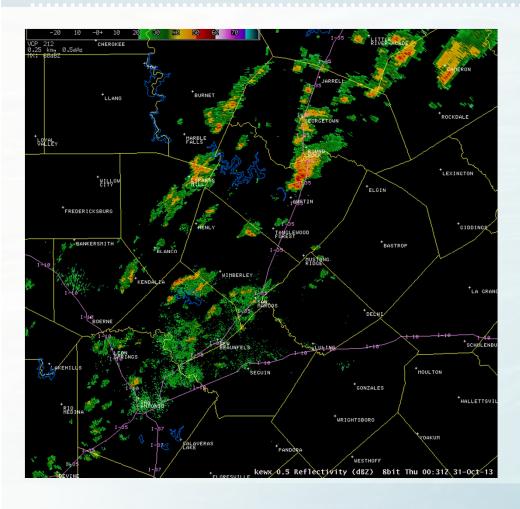
heavy rainfall is possible ... tonight through early Thursday. Localized flooding is possible. Slight chance of severe thunderstorms.

rainfall, 1-3 inches of rain possible with isolated totals near 4-5 inches. Localized flooding possible...Minor flooding along creeks and streams.





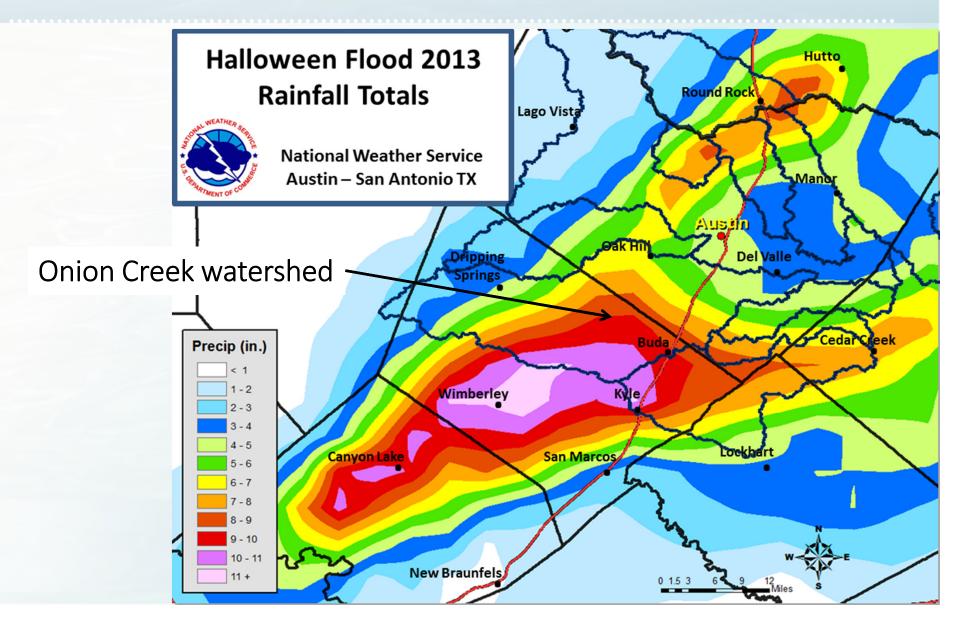
Storm Movement



- For the first 12 hours of the storm, training occurred from southwest to northeast
- For the second 12 hours, the training also had an eastward movement
- Soils were saturated because of previous rainfall that had occurred on October 13



Actual Rainfall Totals



October 30 & 31, 2013 Details

- Flooding City-wide
- Most intense rainfall happened between midnight and 4:00 a.m. on 10/31, in the Onion Creek watershed, where 9" 10" fell
- Onion Creek flooding peaked at 9:30 a.m. with its highest recorded depth of 40.15 ft, since 1921 estimated flow rate of 135,000 cfs estimated at 170-year return period
- Presidential disaster declaration Public assistance



Storm Damage

- 825 Homes impacted Citywide
- 40 roads closed
- Public infrastructure
- 4 fatalities in Austin and Travis County





Lakewood Drive





Lakewood Drive Overtops. First time since Tropical Storm Hermine in 2010. Photo: KVUE





William Cannon Bridge over Onion Creek







Pleasant Valley Road













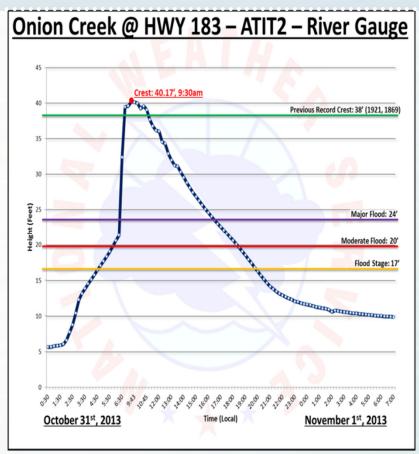
US Highway 183 Bridge over Onion Creek



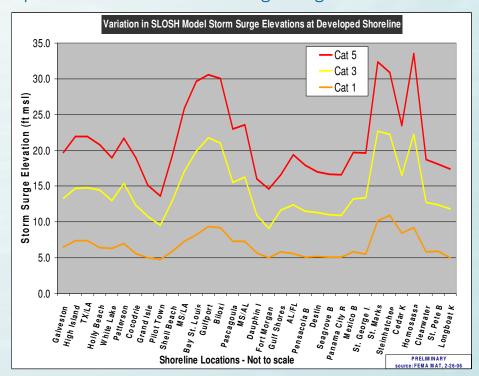




The Onion Creek Halloween Flood *exceeded* a Gulf Coast Category 5 hurricane storm surge



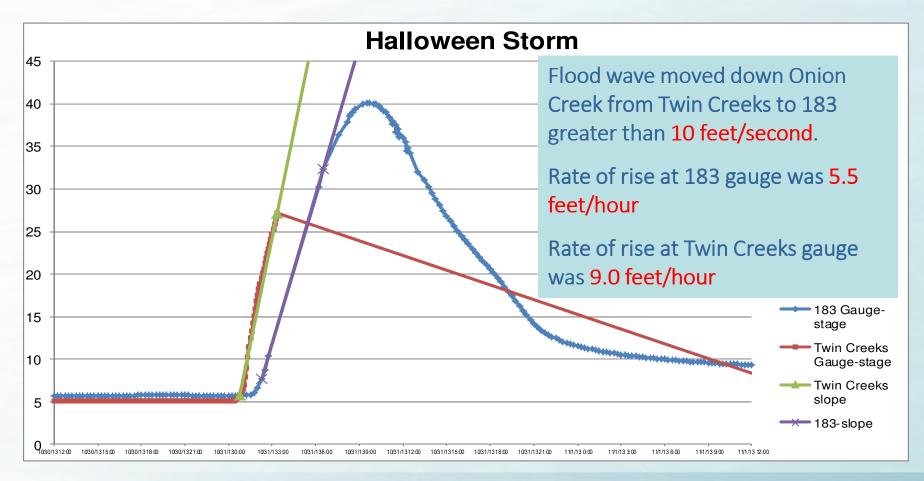
Expected Hurricane Storm Surge Heights on Gulf Coast



Halloween Flood on Onion Creek



Flood Wave Speed





STATESMAN INVESTIGATES FLOOD RESPONSE

Response to flooding: What went wrong?

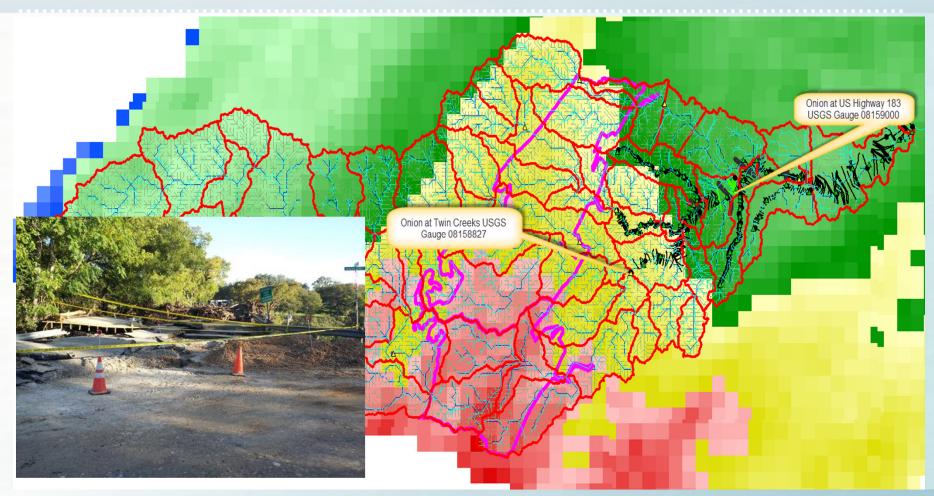


Brandon Lopez, 4, is rescued from his flooded home on Canella Drive on Oct. 31. Officials are reviewing the reaction to the flood by first responders, saying there was one major equipment glitch, and that the city's Reverse 911 system wasn't used quickly enough. JAYJANNER/AMERICAN-STATESMAN

WATCHDOG COVERAGE Inaccurate forecast, slow warnings, equipment failures questioned.



USGS Twin Creeks Gauge washed out



The USGS Gauge at Twin Creeks on Onion Creek was washed away when the bridge was overtopped. It stopped reporting at 03:20 on 10/31/13.



USGS 183 Gauge stopped reporting

- Stopped reporting at 04:24. Last stage reading was 16.41 feet (no action taken)
- USGS manual measurements began at 06:48
- FEWS requested updated forecast models from the Gulf Coast River Forecast Center (Advanced Hydrological Prediction Service)





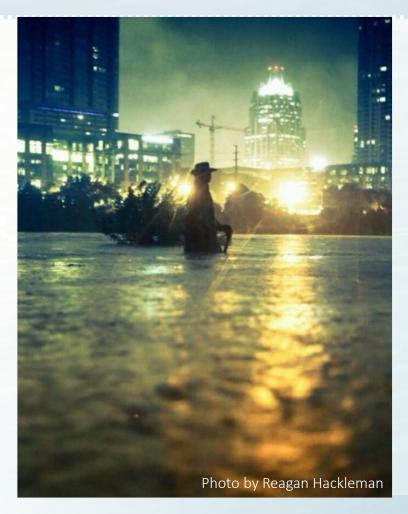
Telemetry and Model Issues

- Austin rain gauges sporadically did not "talk" to receiving station
 - Radar rainfall vendor did not receive timely data
 - Did not have any telemetry issues on October 13, 2013
- LCRA tower in Buda was struck by lightening and was out of service temporarily
- FEWS Onion Creek prediction model relied on two USGS gauges that did not work during middle to late portion of storm event

FEWS recognized these problems early, and quickly mobilized Field Operations and USGS for ground measurements, and NWS for model forecasts.



Flooding throughout Austin







Why Flood Warning?

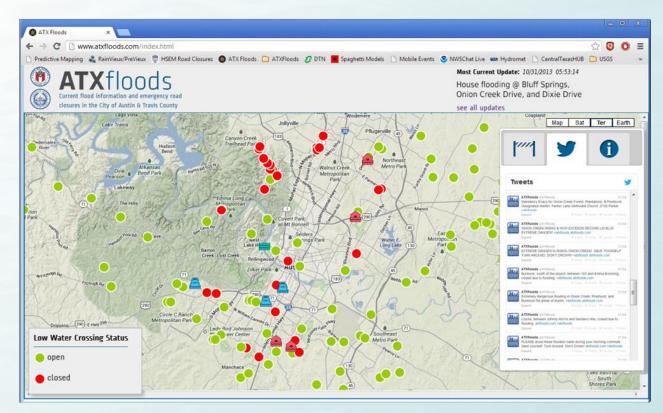
- Monitor weather and alert emergency personnel
- Direct field crews to close roads and prevent loss of life (75% of flood fatalities in Texas occur in vehicles)
- Provide guidance to first responders and emergency personnel during a storm
- Provide public with flood alert notifications
- Educate public about flood hazards



ATXfloods.com

- 40,000 unique visitors during the storm
- Site shown on local news broadcasts and referred to by TV meteorologists
- Tweets from

 @atxfloods Twitter
 account about closures
 and flooding reached
 tens of thousands





Flood Warning Improvements

- "Flood Hardening" of USGS gauges
 - Partially complete
- Improve telemetry technology for FEWS sites
 - Pilot test in progress using LCRA radio system
- Improve communication to public during storm events
 - Subscription sign up for ATXfloods Alerts!
- Install updated traffic camera system
- Harden the installation of FEWS software and hardware products
- Design additional applications on flood forecast mapping server



ATXfloods Alerts!

- Limitations to the ENS system
- ATXfloods Alerts!= watch
- ENS = warning
- Subscription
 service Public
 has to opt
 in...Public has to
 sign up



Save Yourself! Sign Up for Flood Notifications



ATXFloods Alerts, a service of the City of Austin, notifies the public of road closures due to flooding and rapidly rising creeks within the Austin city limits. You can choose to receive notifications through text, email message, and/or phone.



ver página en Español

Flooding Notifications: Roads and Creeks

Austin's in the heart of Flash Flood Alley and subject to flooding even in a drought.

You are the one best able to protect yourself, your family and your neighbors from flooding. ATXFloods Alerts will help you know when to keep an eye on changing conditions, so you can take action to protect yourself.

Roads: Subscribers to ATXFloods Alerts will be notified of Austin's first road closure during a storm by text and/or email. Additional updates on road closures will be posted in real-time at www.ATXFloods.com.

Creeks: To help you be aware when a creek is rapidly rising near you, subscribers will be notified once by text, email and/or phone. This notification means you should begin monitoring weather and creek conditions through NOAA weather radio, television and radio reports, etc.



Field Operations





- Removed 156 tons of debris from 280 structure locations
- Responded to more than 600 3-1-1 calls



Stream Restoration Group

- Assessed and surveyed roadway infrastructure damage from erosion
- Provided design concepts and cost estimates to Public Works for repairs
- Provided regulatory support required for FEMA emergency project funding





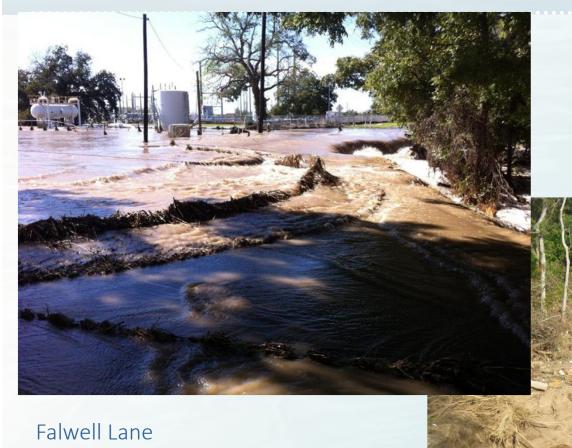
Stream Restoration Group



WATERSHED PROTECTION

River Plantation Bridge

Stream Restoration Group



The Halloween Flood 2013



