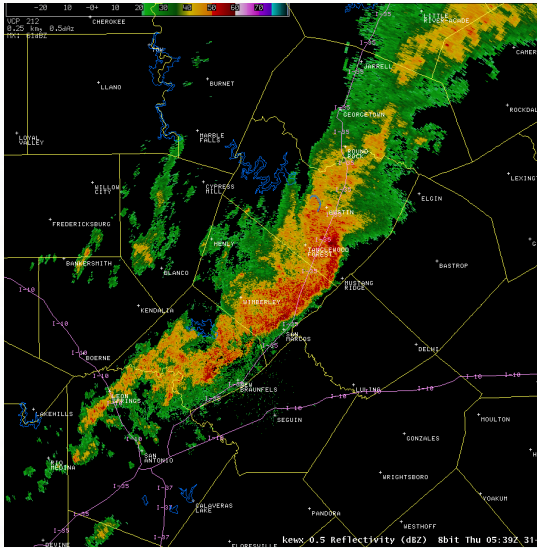


# The Halloween Flood 2013





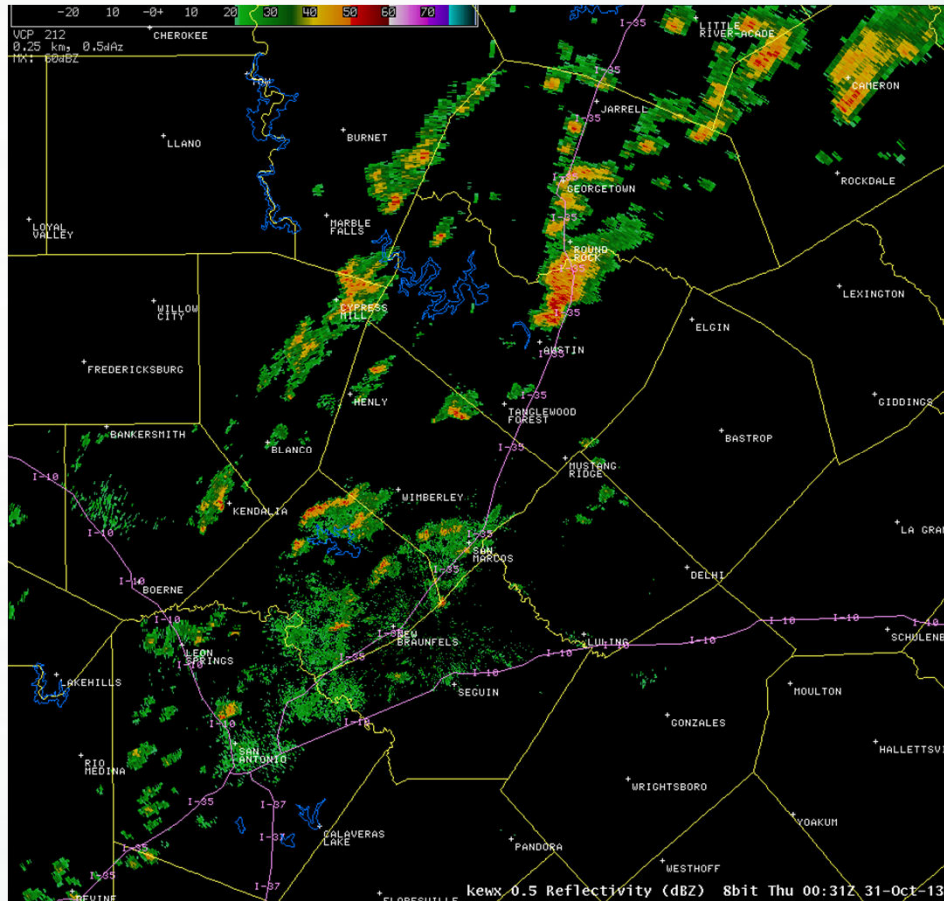
# NWS Rainfall Prediction

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

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



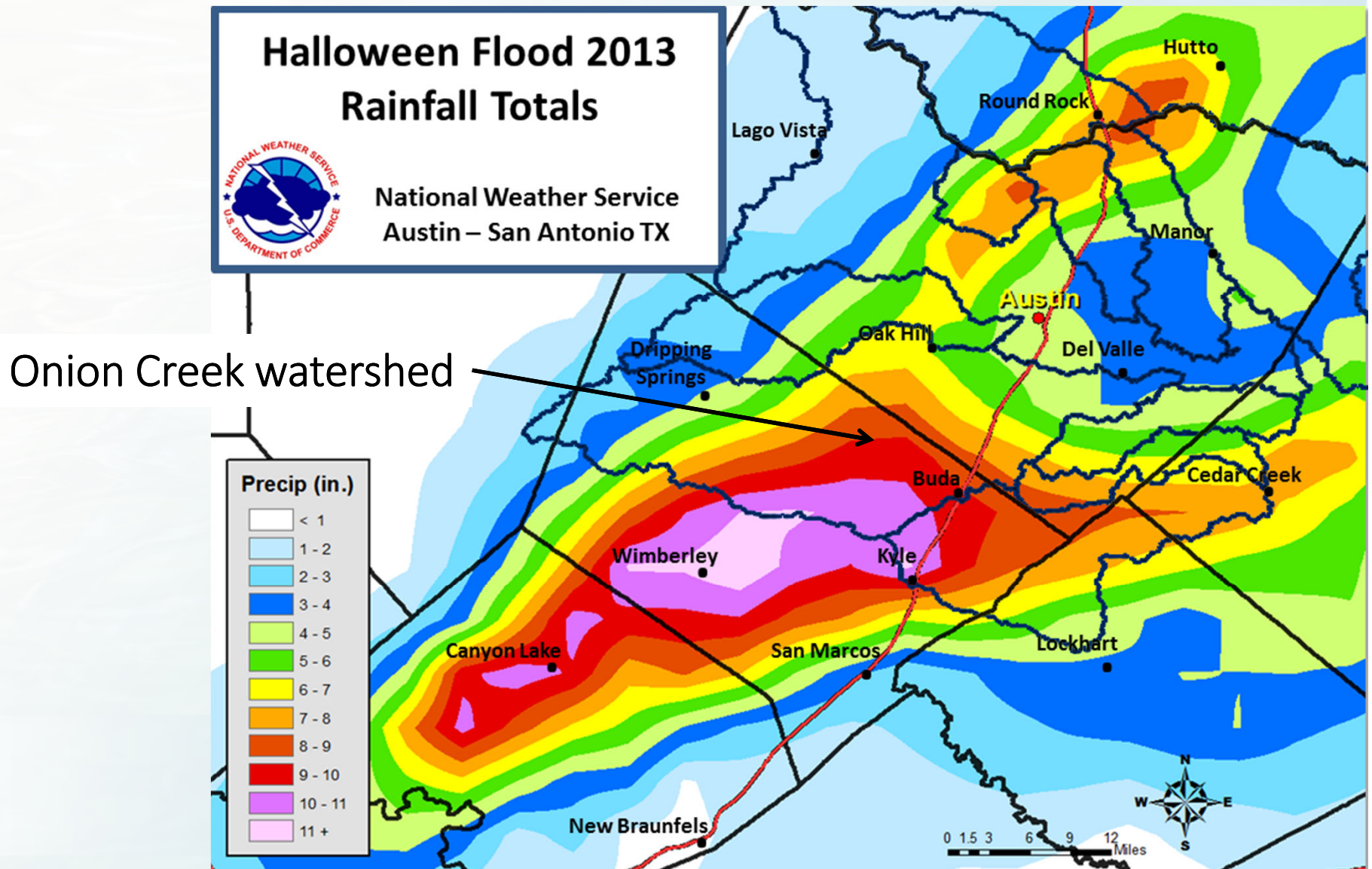
# Storm Movement



- 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

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- NWS issues first **Flash Flood Emergency** ever in Austin/Travis/Hays/Comal counties.
- Walnut Creek, Shoal Creek, Williamson Creek, and Bull Creek all came out of banks, as did Lady Bird Lake
- Closed 40 roads across the City
- Most intense rainfall happened between midnight and 4:00 a.m. on 10/31, in the Onion Creek watershed, upstream of the Twin Creeks USGS gauge 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

# Storm Damage

- 825 Homes impacted City-wide
- Public infrastructure
- 4 fatalities in Austin and Travis County





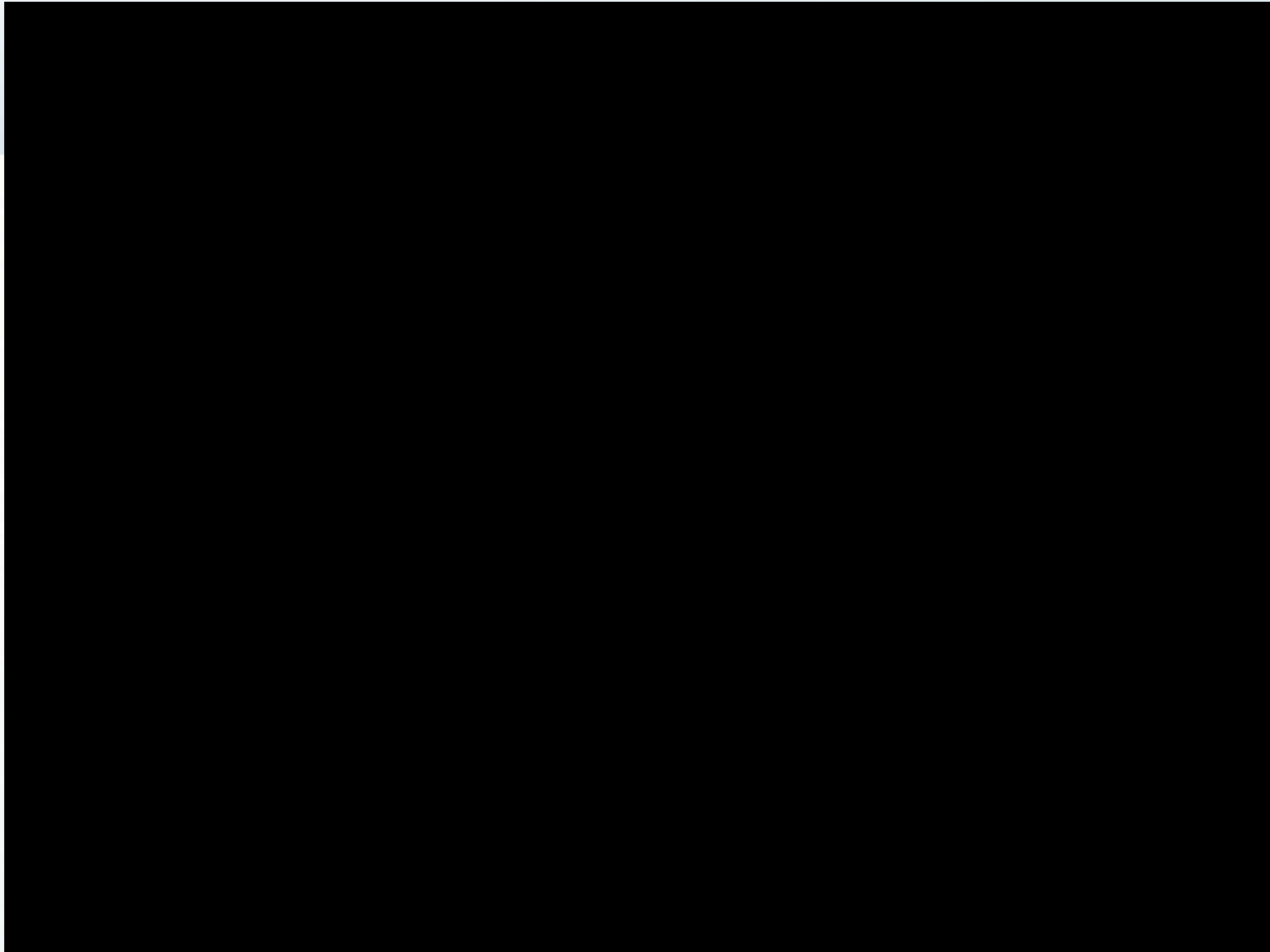


Lakewood Drive Overtops. First time since Tropical Storm  
Hermine in 2010. Photo: KVUE



Pleasant Valley Road





Onion downstream of US Highway 183



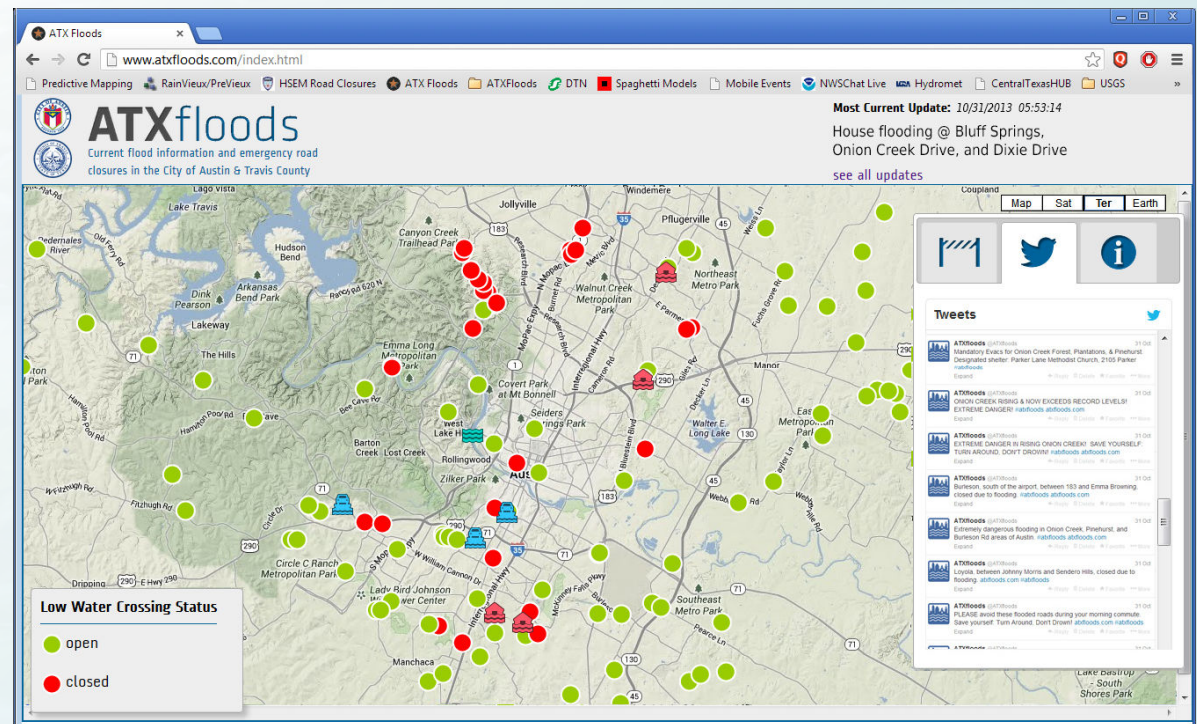
Onion Creek





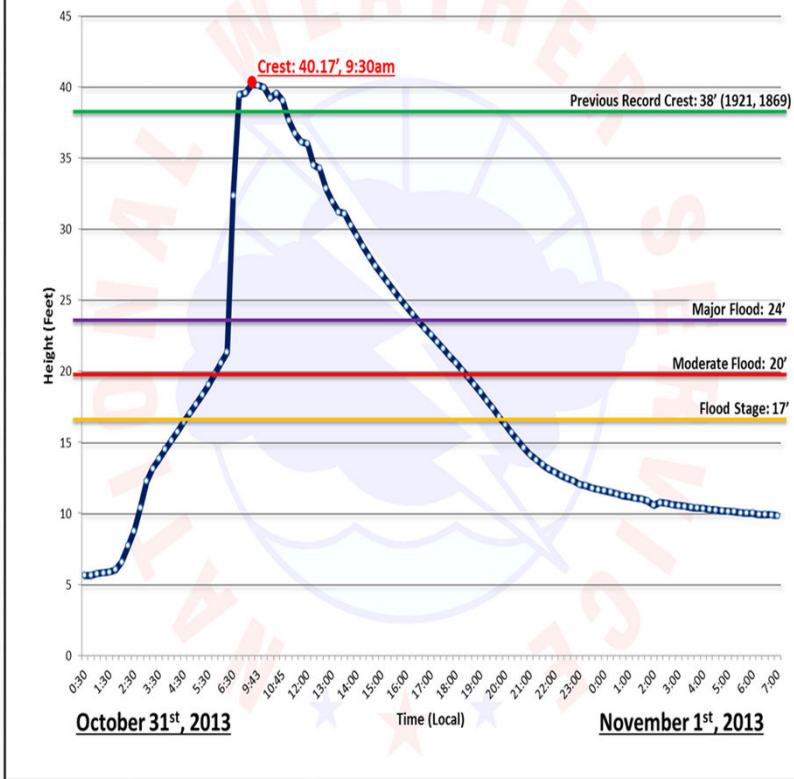
# ATXfloods.com

- 40,000 unique visitors during the storm—approximately 5% of the city visited the site
- 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



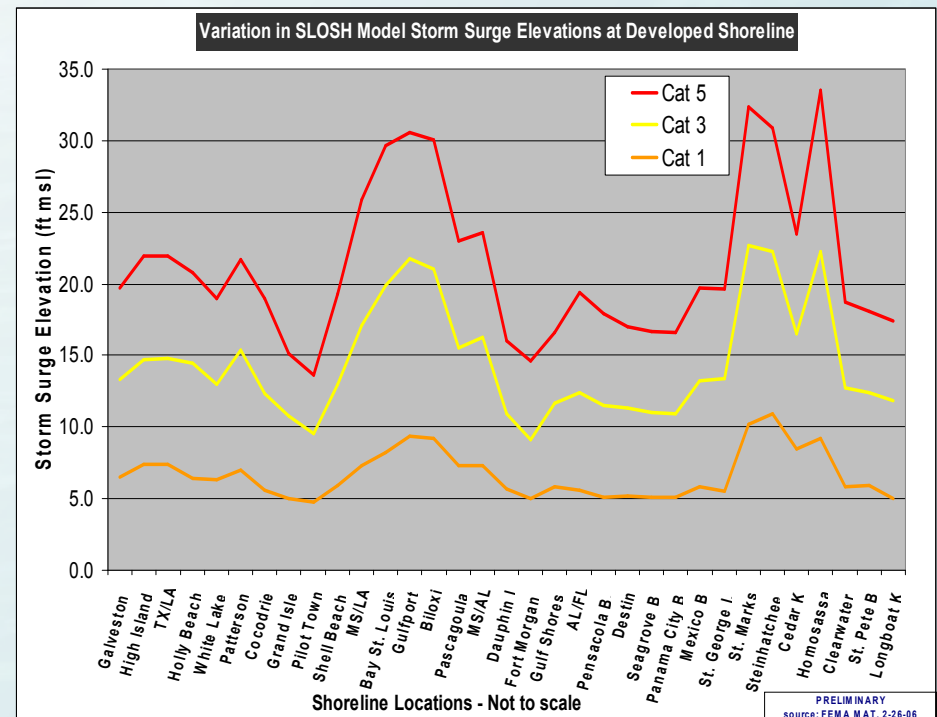
# The Onion Creek Halloween Flood *exceeded* a Gulf Coast Category 5 hurricane storm surge

Onion Creek @ HWY 183 – ATIT2 – River Gauge



Halloween Flood on Onion Creek

Expected Hurricane Storm Surge Heights on Gulf Coast





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. JAY JANNER / AMERICAN-STATESMAN

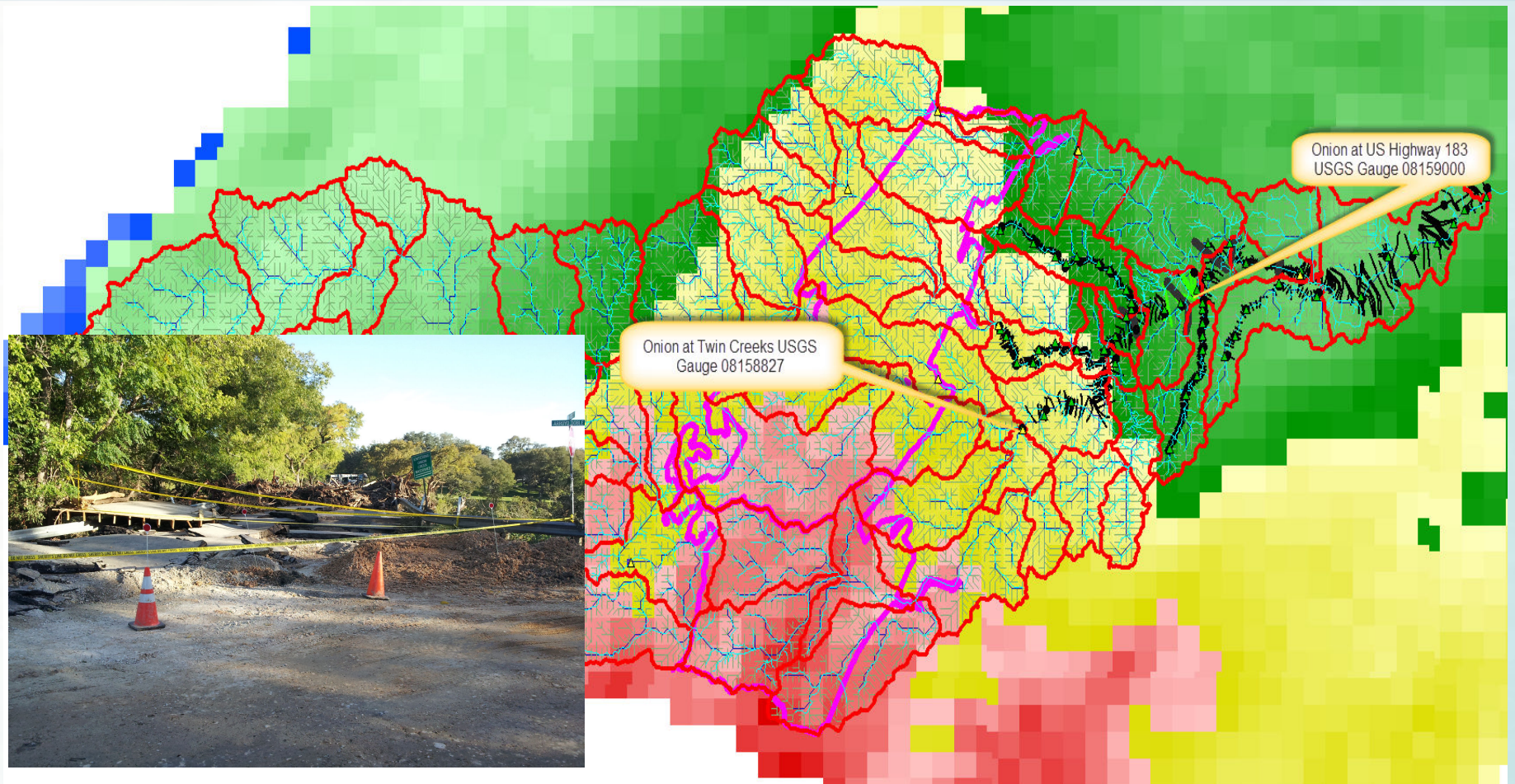
**WATCHDOG  
COVERAGE**

Inaccurate forecast, slow warnings,  
equipment failures questioned.

City of Austin  
**WATERSHED  
PROTECTION**



# 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)
- FEWS contacted USGS
- USGS manual measurements began at 06:48



# 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.*



# City Resources overwhelmed by the magnitude of the event

- Flooding throughout Austin, not just Onion Creek

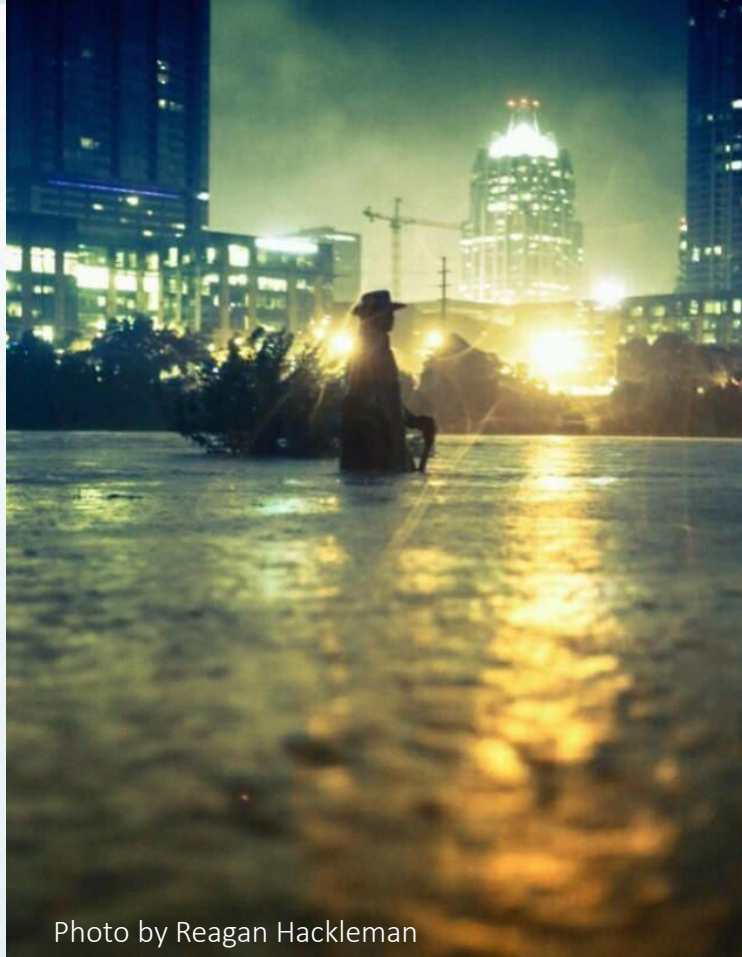


Photo by Reagan Hackleman

# Why Flood Warning?

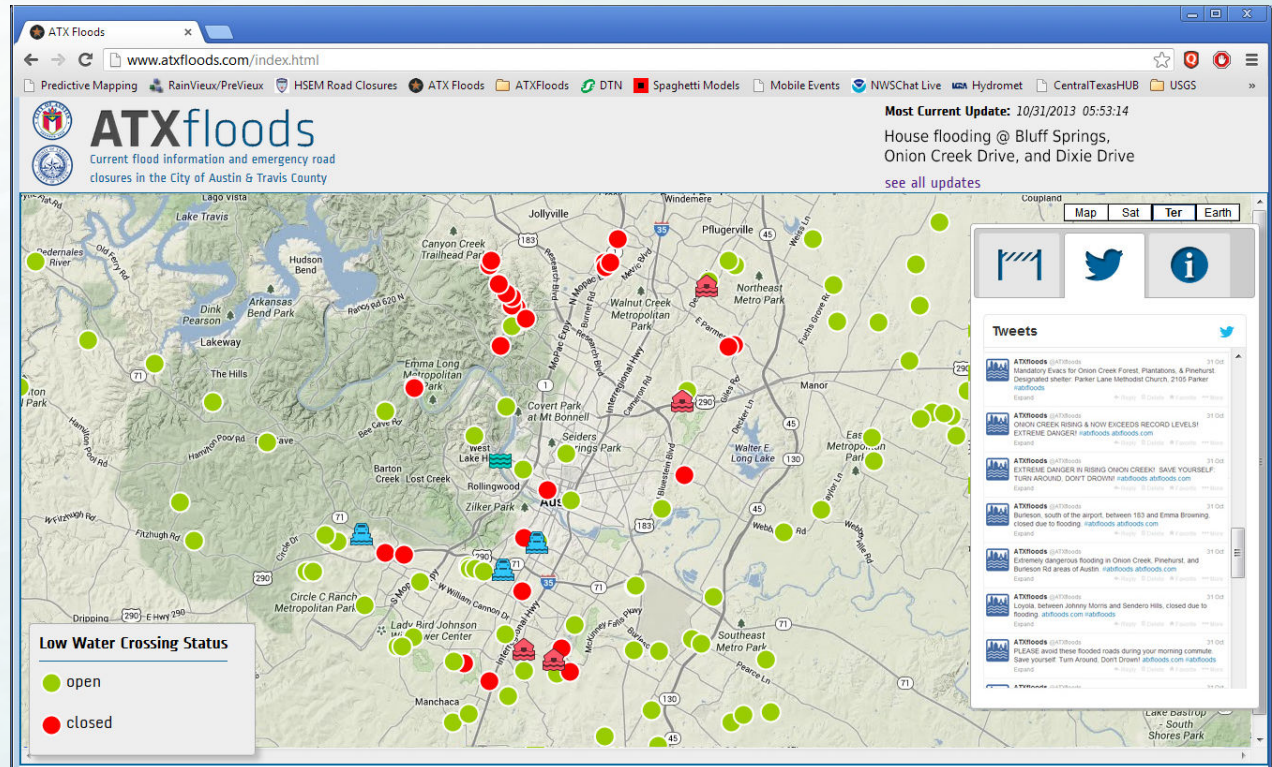
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- Monitor weather and alert emergency personnel
- Direct field crews to close roads and prevent loss of life (75% of flood fatalities in Texas occur in vehicles)
- Provide guidance to first responders and emergency personnel during a storm
- Provide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



# Moving forward

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“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 forecast mapping server



# Field Operations



- Worked closely with flood warning staff
- Crews closed 40 roads
- Provided field verification of flooding areas





# Field Operations



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



# Pollution Prevention and Reduction (PPR)



11/07/2013

City of Austin

**WATERSHED  
PROTECTION**



# Pollution Prevention and Reduction (PPR)





# Pollution Prevention and Reduction (PPR)





# Pollution Prevention and Reduction (PPR)





# Pollution Prevention and Reduction (PPR)

- Continue removing small chemical containers until all have been recovered
- Evaluate and remove any newly found drums in waterways or on City property
- Continue to encourage community to call 24-Hour Pollution Hotline 512/974-2550 when they see chemicals



# Stream Restoration Group





# Stream Restoration Group



# Status of Buyout Program

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- Corps Project Area – 483 properties total
  - 323 purchased before flood
  - 116 recovery buyout funding
  - 44 to be funded by Corps
- WPD requesting bond funding on 6/26/2014
  - 140 properties in lower Onion Creek
- 229 properties remain in priority areas of 100-year floodplain in lower Onion Creek



# The Halloween Flood 2013

