

# CITY OF AUSTIN LOWER ONION CREEK FLOOD MITIGATION BUYOUT PROJECT

*creating successful  
partnerships*



# TOPICS

- Flooding in Austin
- Project History & Implementation
- Impact of Recent Floods
- Existing & Future Project Partnerships
- Lessons Learned

# AUSTIN, TEXAS



# FLASH FLOOD ALLEY

- **Rainfall:** Some of the highest recorded rainfall intensities
- **Soils:** Rocks and clay – poor infiltration
- **Terrain:**
  - Slopes on west
  - Flatter on east
  - **Urban Core:** steep slopes in upper portions of watersheds, flatter terrain in lower portions, leading to flashy watersheds
- **Development:**
  - Heavily urbanized
  - Lots of development along creeks
  - Mostly built out prior to current floodplain regulations

# NOTABLE FLOOD EVENTS

- **April 1915**
  - 35 fatalities
  - 10" in 24 hours
- **September 1921 (Thrall)**
  - 32" in 12 hours
  - 38.2" in 24 hours
- **October 1960**
  - 11 fatalities, 200 evacuees
  - \$2.5M in damages
  - 10" in 24 hours
- **May 1981**
  - 13 fatalities
  - >\$35M in damages
  - 10" in 6 hours
- **October 1998**
  - 7" in < 24 hours
  - 25 fatalities
  - > 450 damaged homes
- **November 2001**
  - 10" in less than 24 hours
  - > \$500k in damages
- **January 2007**
  - 5" in 5 hours
  - 23 swift water rescues
- **September 2010**
  - 12" in 24 hours
  - 1 fatality; 194 tons of debris removed from lake and trail areas

# NOTABLE FLOOD EVENTS

- **October 2013**

- 12.6" in 12 hours
- 6 swift water rescues

- **October 2013**

- flood of record
- >12" in 24 hours
- 6 fatalities

- **May 2015**

- >300 flooded structures & roadways
- 8 days of rain, >8"

- **October 2015**

- 13" in 24 hours
- >400 damaged homes

- **June 2016**

- 5" in 12 hours
- > 40 flooded structures & roadways

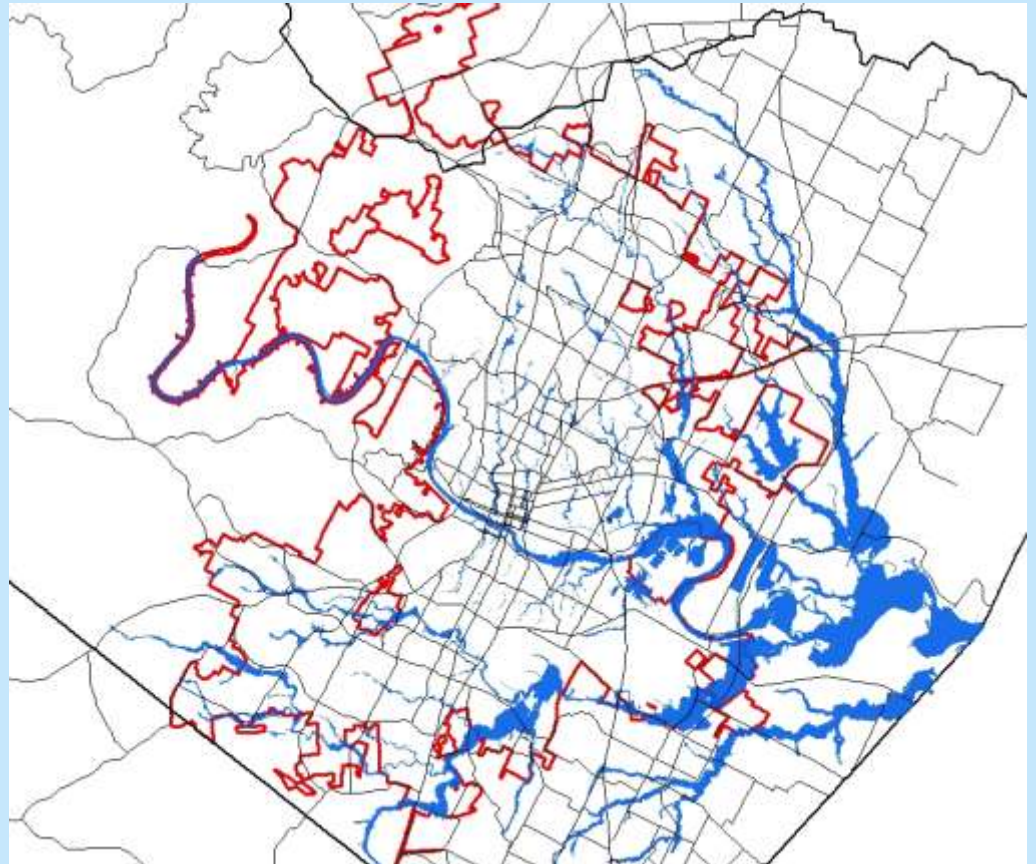
# CITY OF AUSTIN FLOODPLAIN

## ■ City:

- Population: ~915,000
- ~ 280 square miles

## ■ Floodplain:

- ~ 30 square miles
- ~ 5,200 structures in 100-year floodplain
- ~ 2,100 structures at risk of interior inundation
- ~ 640 roadway crossings at risk of flooding



# FLOOD MITIGATION STRATEGIES

- **Development/Floodplain Regulations**
- **Flood Early Warning System**
- **Structural Drainage Improvement Projects**
  - Detention ponds
  - Bridge/culvert upgrades
  - Channel modifications
  - Stormdrain improvements
- **Nonstructural Projects - Floodplain Buyouts**



# FLOODPLAIN BUYOUT PROJECTS

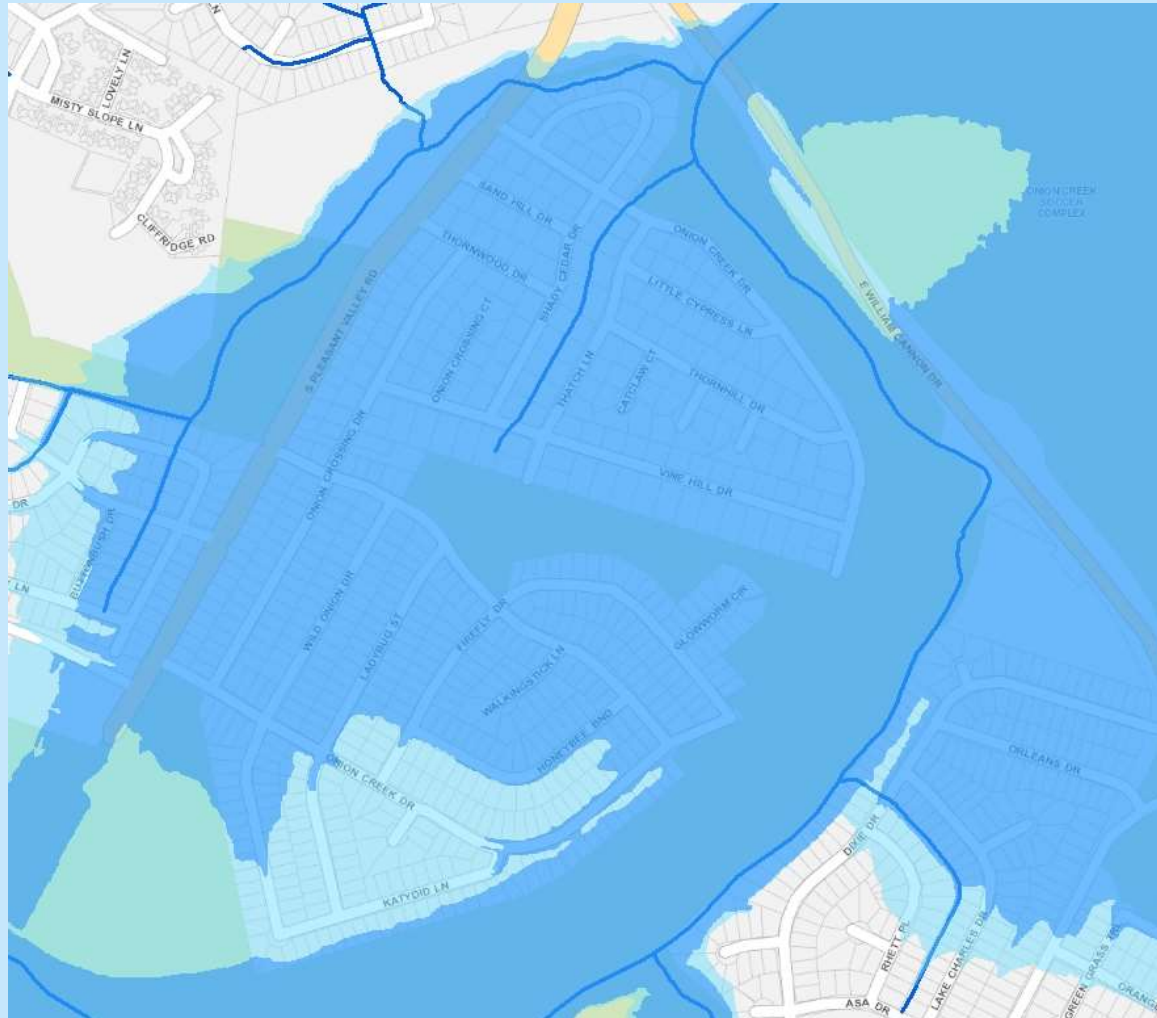
- **OBJECTIVE:** Improve life safety conditions and reduce flood hazard related property damage
- Buyouts pursued in areas where structural mitigation not cost effective
- >1000 properties acquired to date
- Buyout areas converted to open space
- Future development restricted



# FUNDING

- **City Sources:**
  - Drainage Utility Fee
  - Bonds
  - Regional Stormwater Management Program
  
- **Partnerships with other agencies:**
  - FEMA (i.e., Hazard Mitigation Grant Program)
  - Army Corps of Engineers

# LOWER ONION CREEK PROJECT AREA



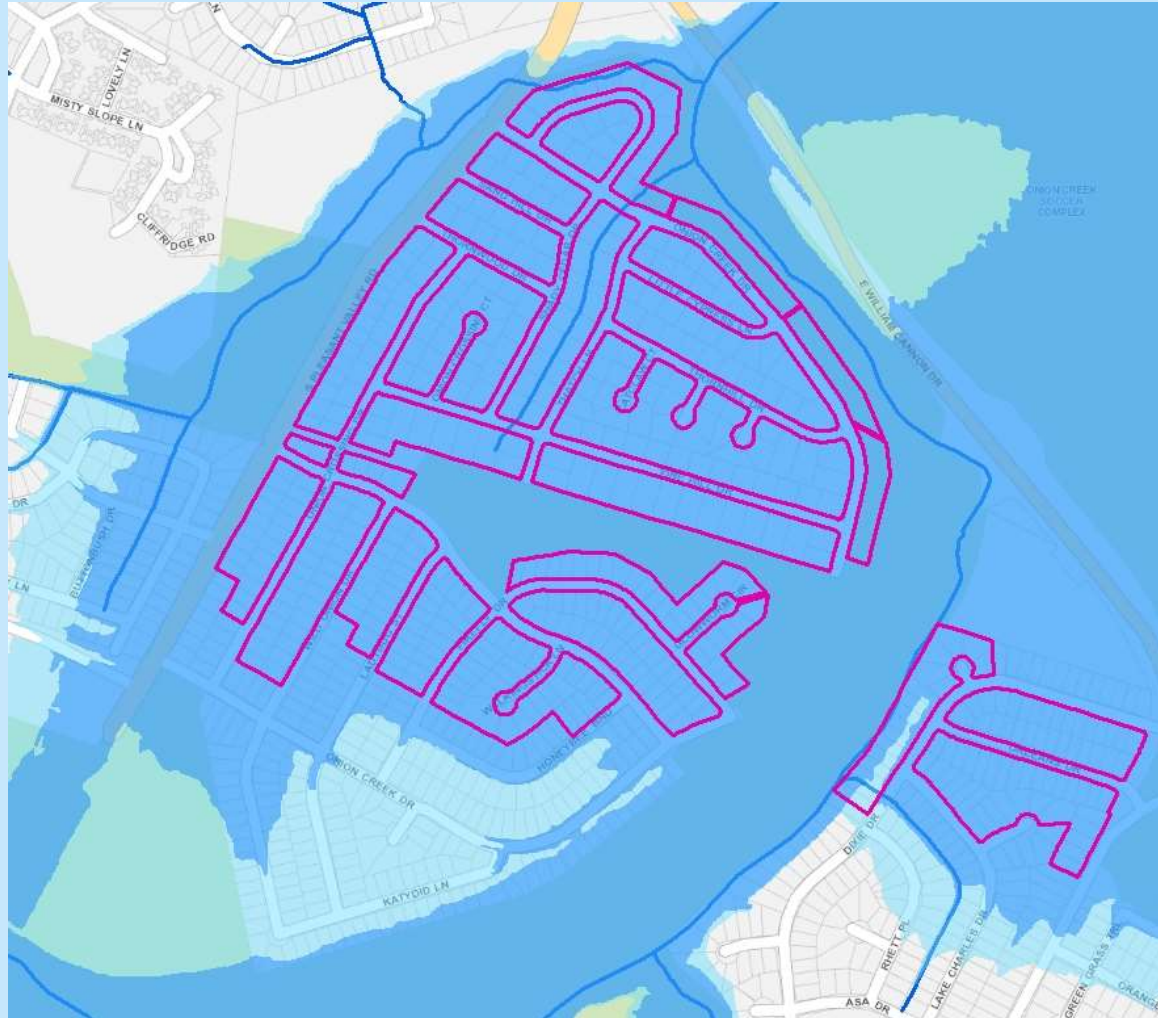
# PROJECT HISTORY

- 823 properties at risk of flooding, limited access
- 1998 – request to U.S. Army Corps of Engineers to conduct flood control study
- Austin voters approved \$2.4 million in bonds to buy flood-prone homes near Onion Creek in 1998, buyouts began in 1999
- Corps study evaluated structural & non-structural solutions
- Structural solutions evaluated:
  - Detention
  - Channel modifications
  - Diversions
  - Levees/Floodwalls

# PROJECT HISTORY

- 2006 - Feasibility study recommendation:
  - Acquisition of 483 properties at highest risk in 25-year floodplain
  - Recreational amenities
  - Ecosystem restoration
- \$73.2M cost estimate, shared
- No project authorization or funding

# USACE PROJECT AREA



# BUYOUT IMPLEMENTATION

- Prior to 2006: 109 acquisitions, City funded
- 2006 – 2008: 114 acquisitions, FEMA grant
- 2008 – 2013: 100 acquisitions, City funded

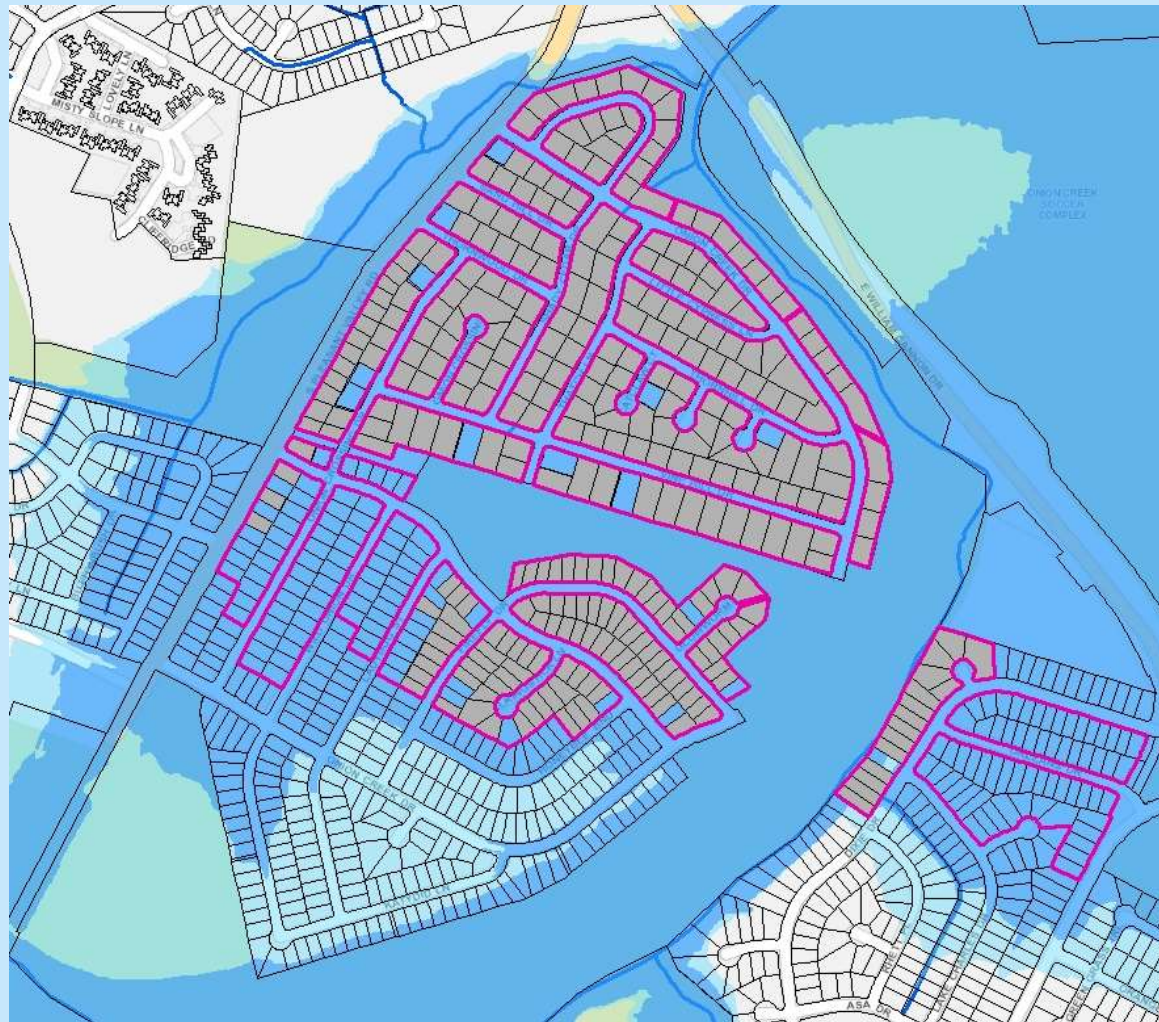
## Cost:

- \$36.5M, including \$7.8M from FEMA grant
- (No federal funding from Army Corps yet)

**323 properties acquired as of end of October 2013**

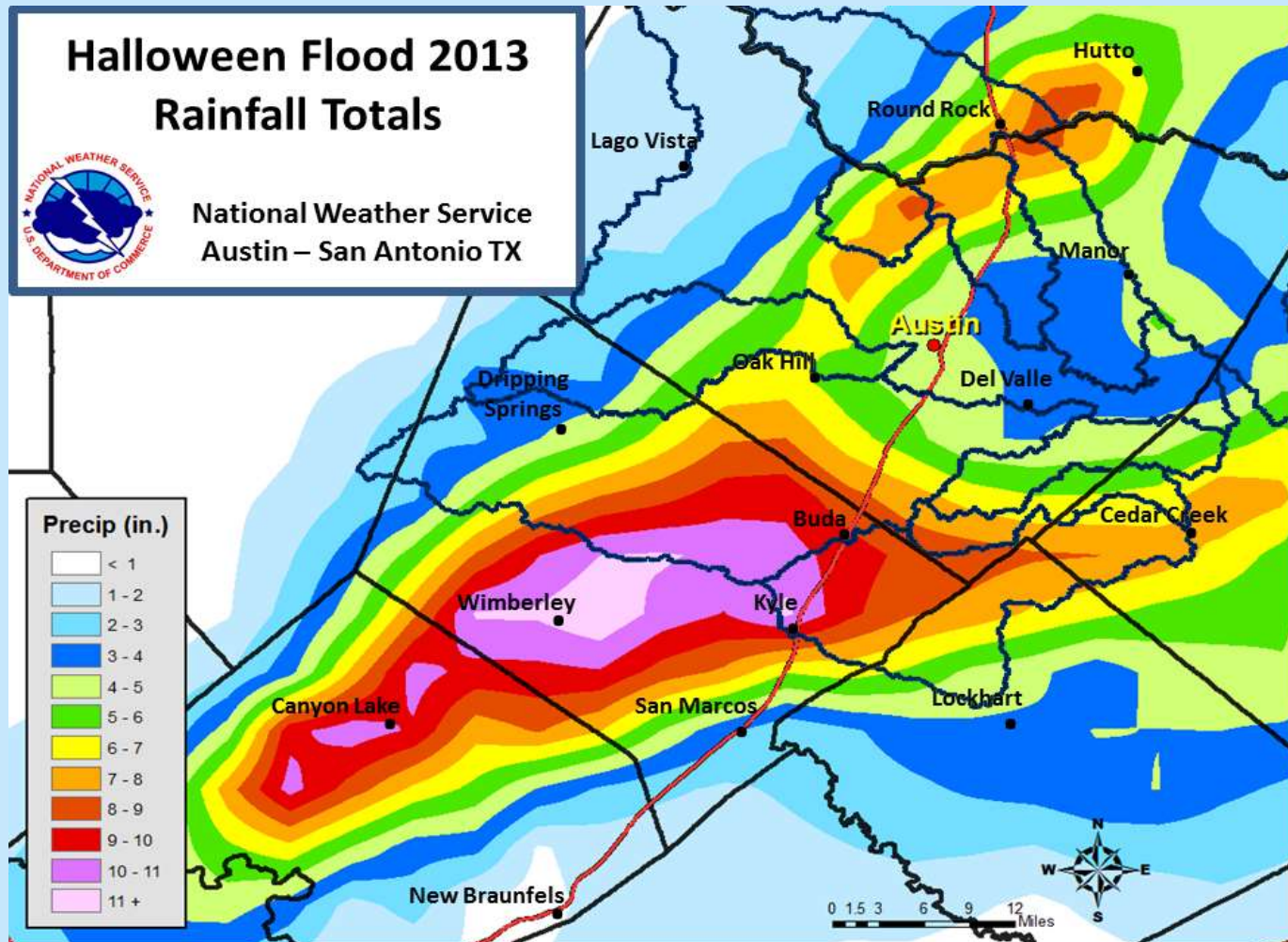


# STATUS ON 10/30/2013

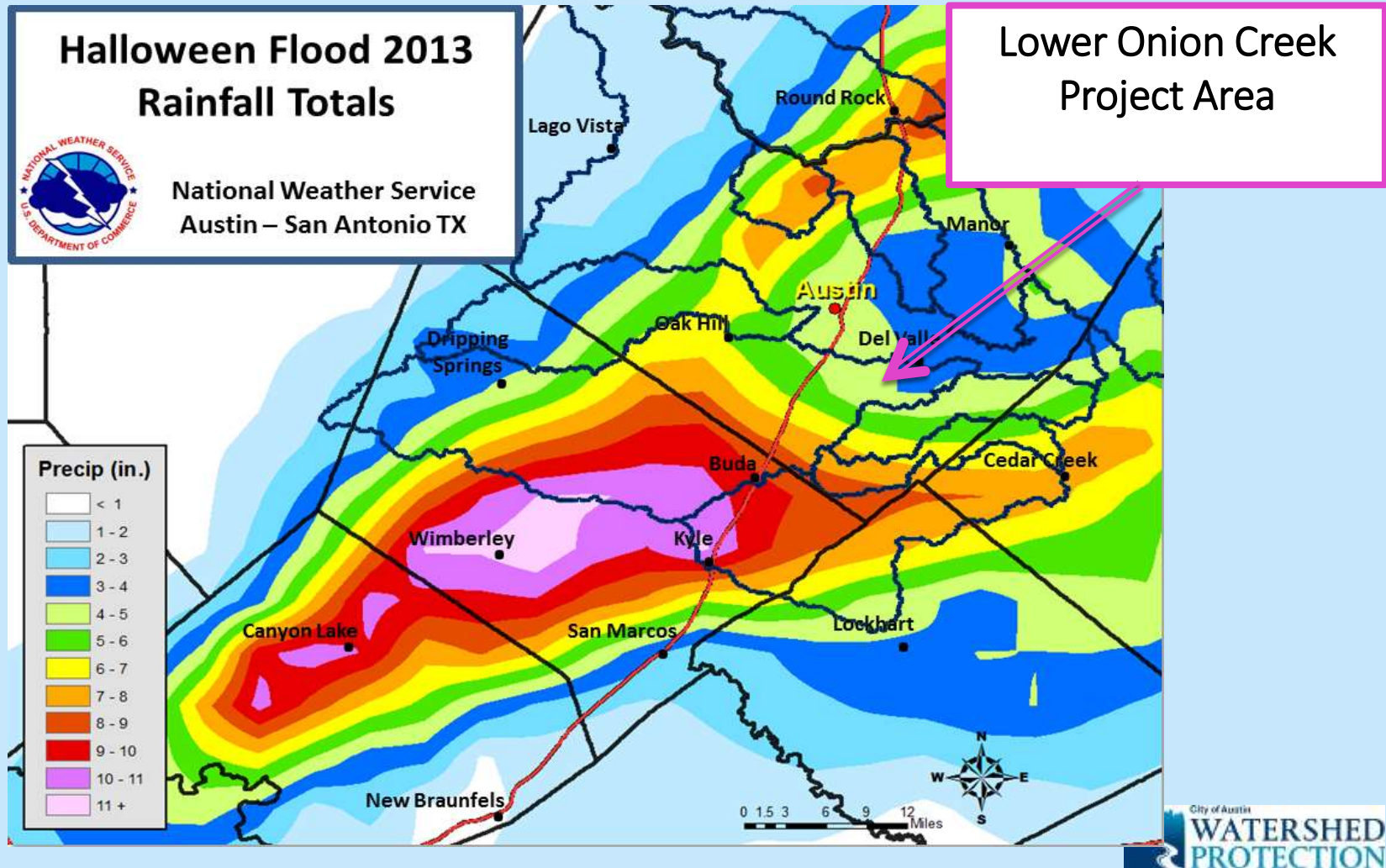




# OVERNIGHT 10/30/2013



# OVERNIGHT 10/30/2013



# 2013 HALLOWEEN FLOOD





# 2013 HALLOWEEN FLOOD



# 2013 HALLOWEEN FLOOD

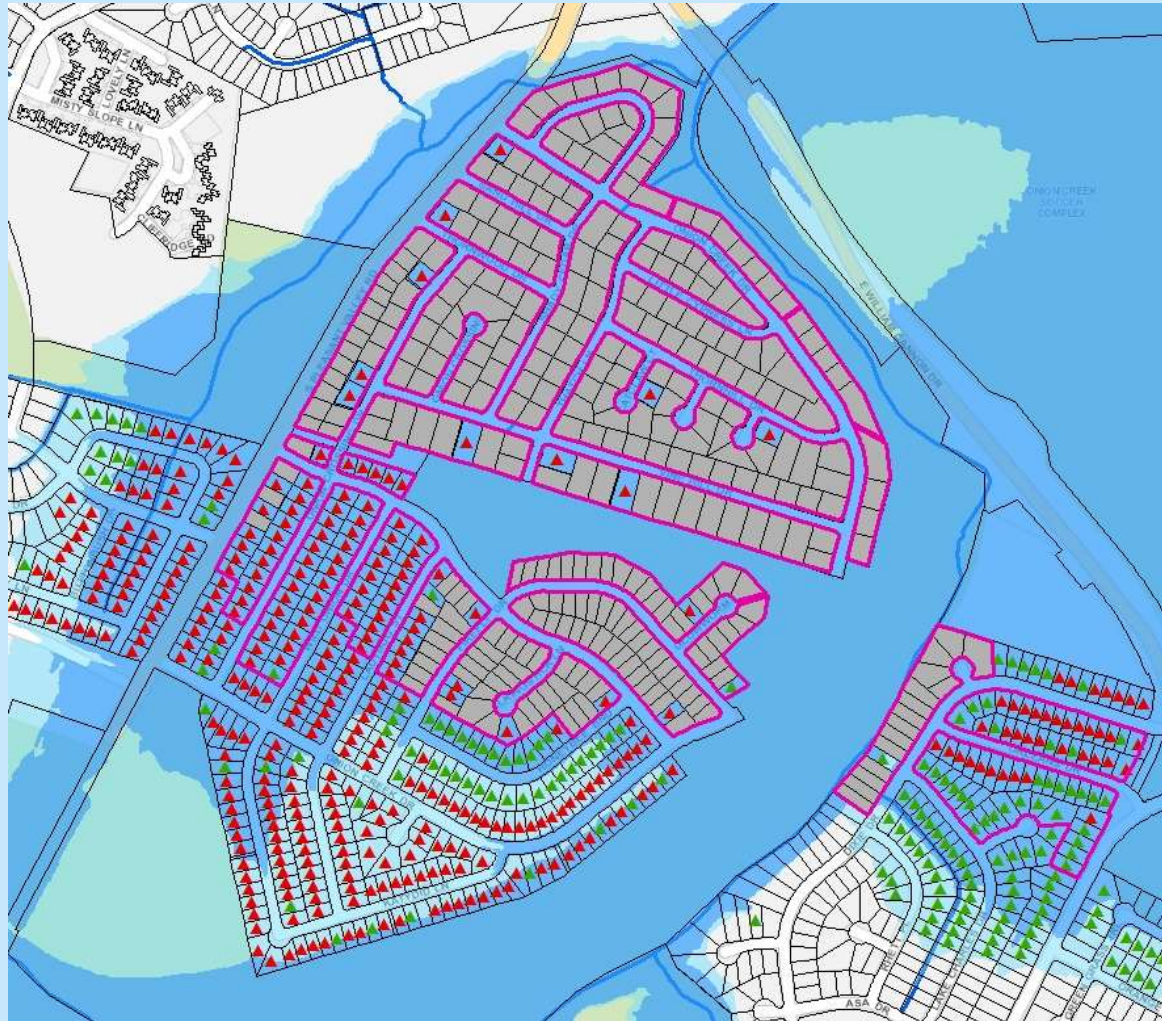




# 2013 HALLOWEEN FLOOD



# 2013 HALLOWEEN FLOOD

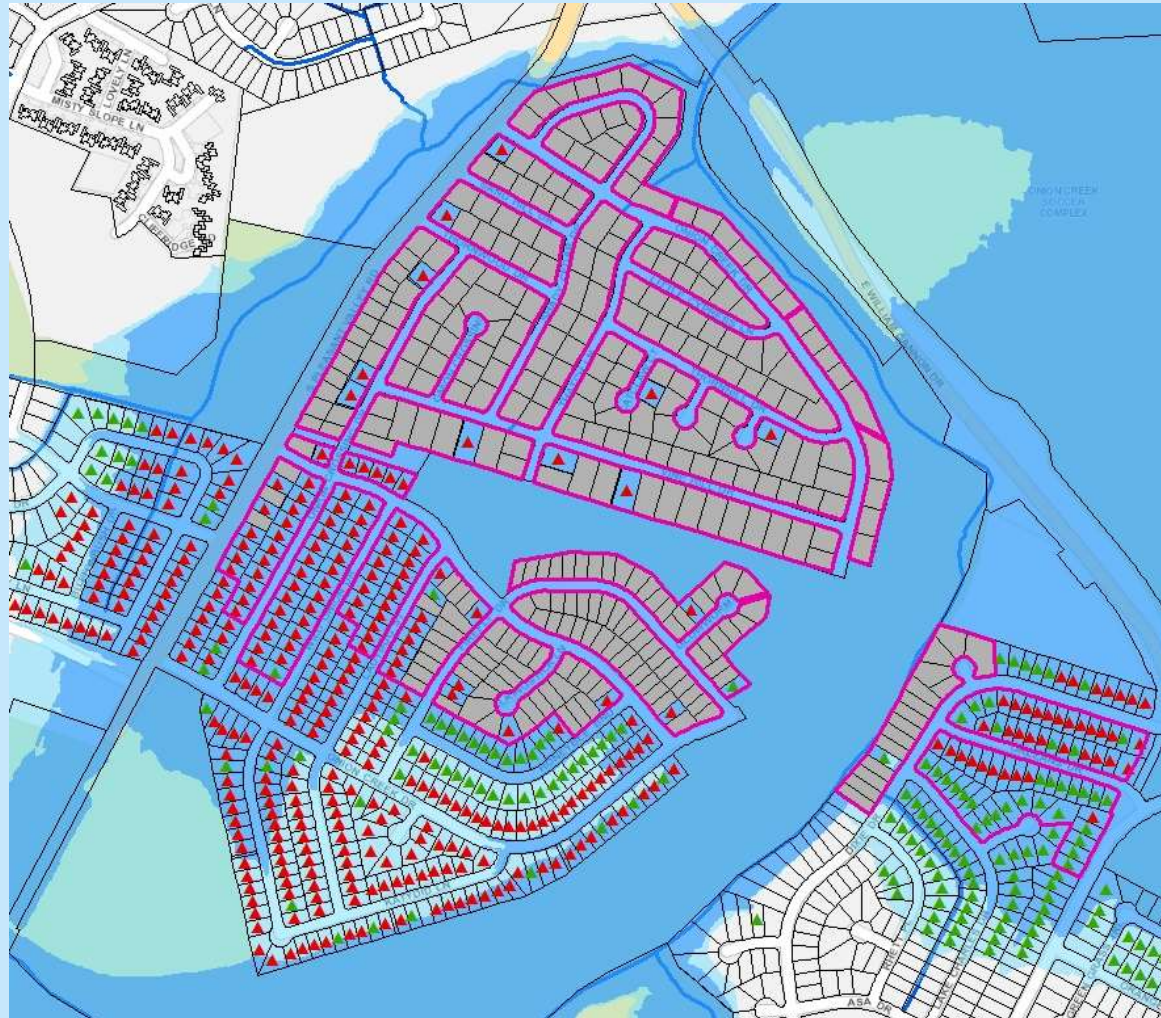


# RAPID BUYOUT IMPLEMENTATION

- November 2013 - Recovery Buyout Program
  - \$19.6M to expedite purchase of most of remaining homes in the Corps buyout area
  - Funds identified through project savings and postponements
- December 2014 - first federal appropriations for project
- 26 properties remaining as of end of October 2015



# 2013 HALLOWEEN FLOOD



Map of the Union Creek Soccer Complex area showing project areas. The map is color-coded: green for 25-Year Project Area, yellow for 100-Year Project Area, and pink for Army Corps Project Area. Major roads include S Pleasant Valley Rd, E William Cannon Dr, and various residential streets like Misty Slope Ln, Cliffwidge Rd, and Union Creek Trl. The Union Creek Soccer Complex is located to the east of the main residential area.

# RAPID(ER) BUYOUT IMPLEMENTATION

## 25-Year Buyout Area

- 137 properties
- \$35.5M approved by City Council in June 2014
- Buyout process began in August 2014
- 117 properties acquired as of end of October 2015

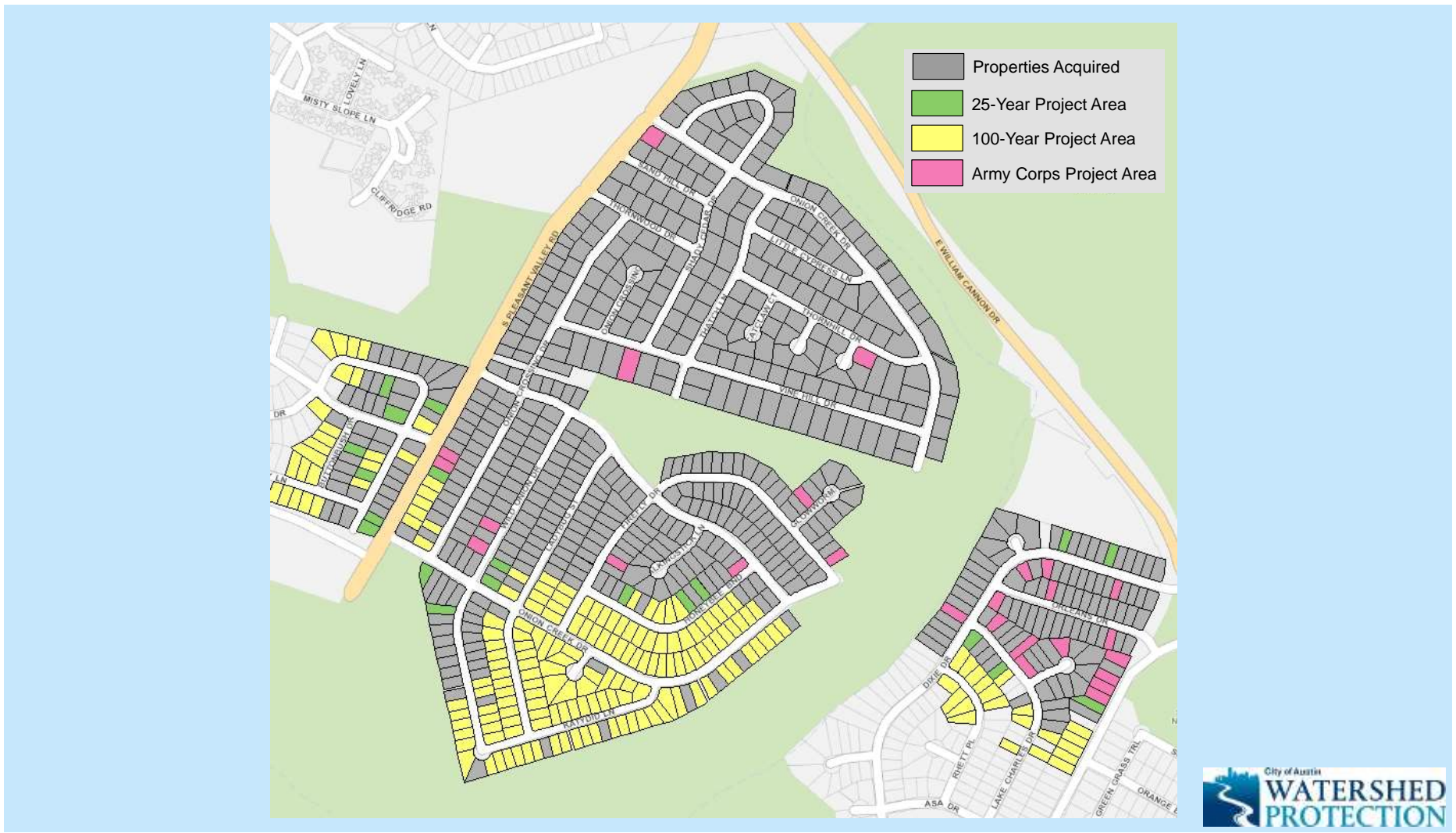
# MORE RAPID(ER) BUYOUT IMPLEMENTATION

## 100-Year Buyout Area

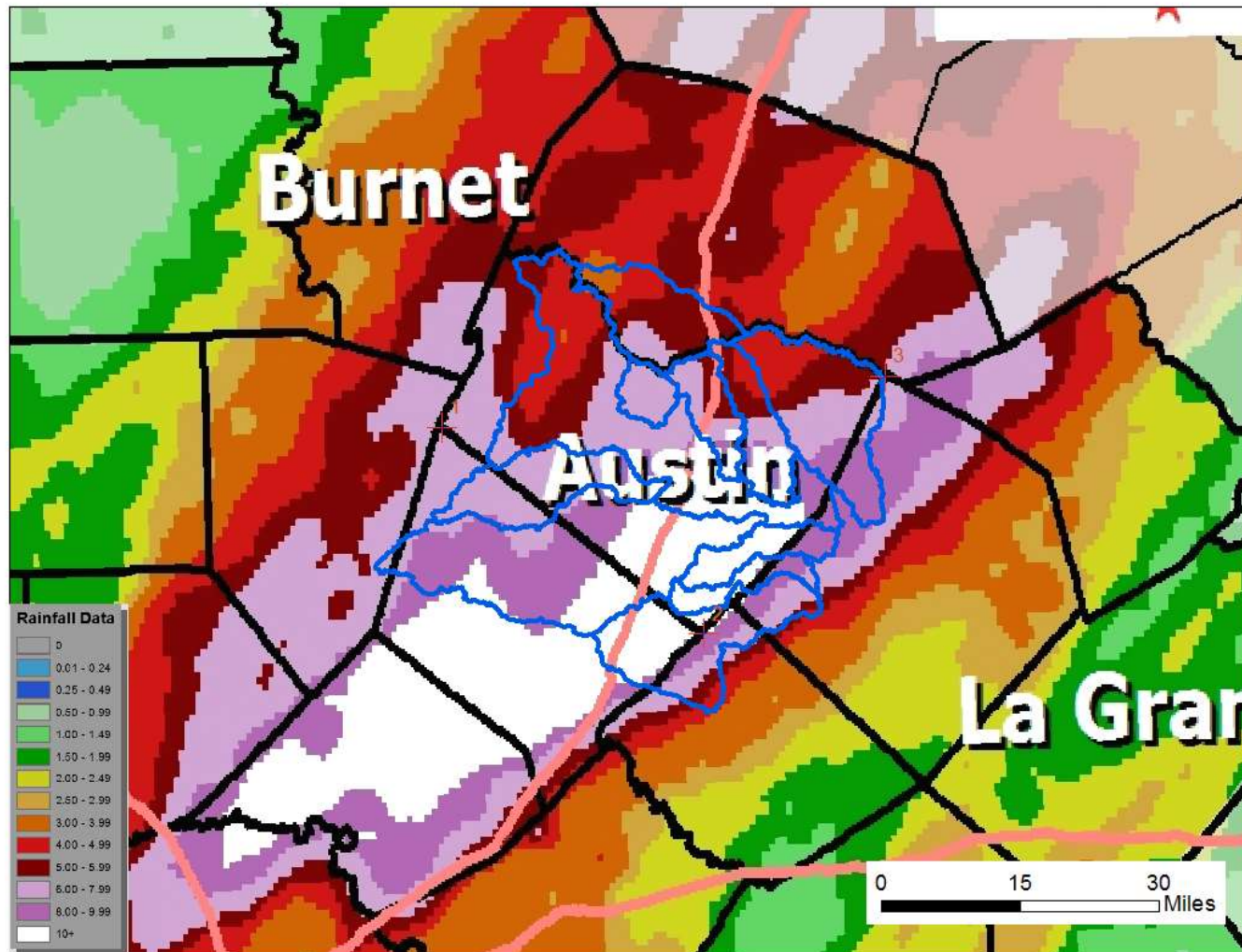
- 203 properties
- \$60M approved by City Council in September 2014
- \$1.5M HMGP grant awarded
- Buyouts process began in June 2015
- Phased approach, ~15-20 buyouts initiated per month
- 11 properties acquired as of end of October 2015



**STATUS ON 10/30/2015**

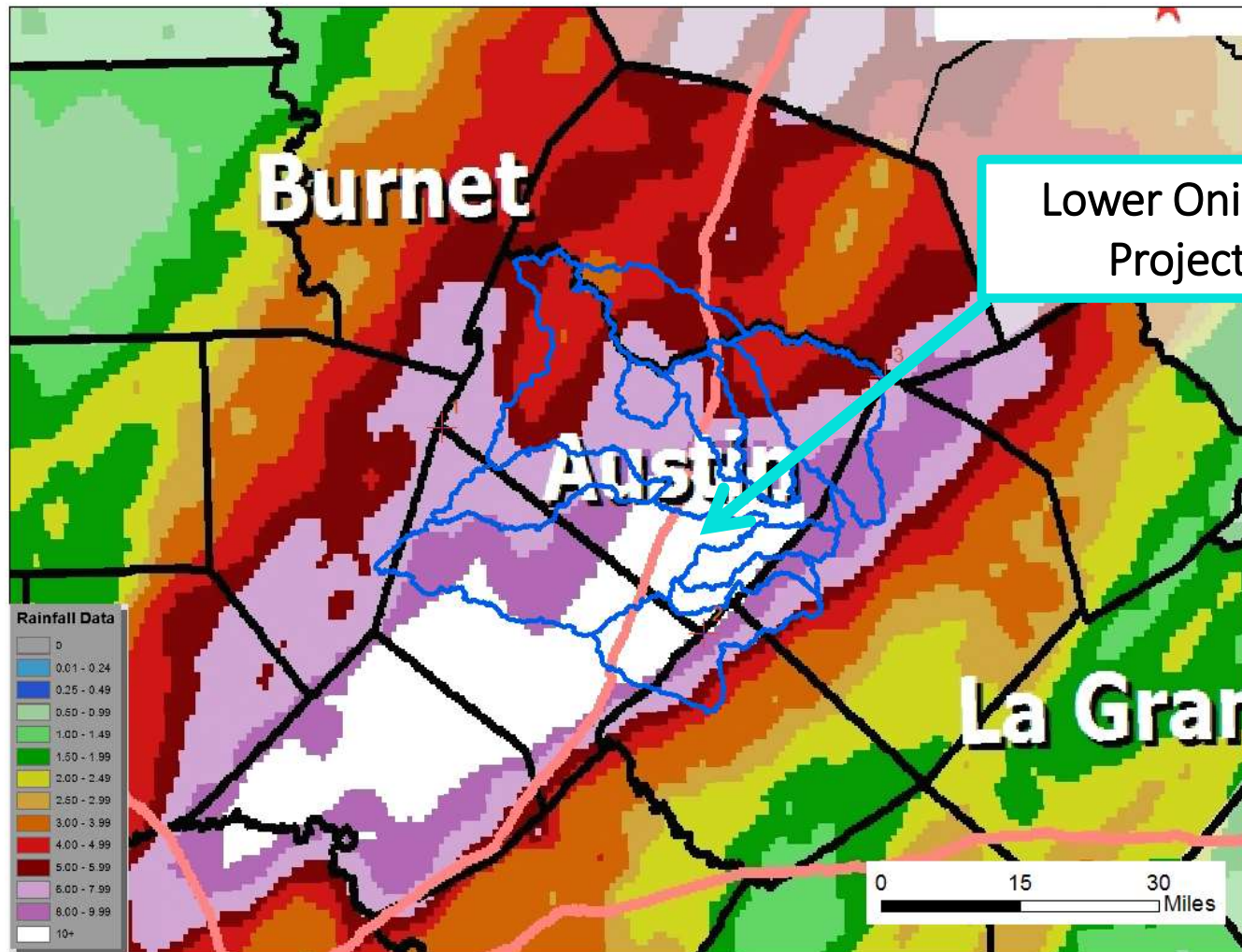


# MORNING OF 10/30/2015





# MORNING OF 10/30/2015



# 2015 HALLOWEEN FLOOD





# 2015 HALLOWEEN FLOOD



# 2015 HALLOWEEN FLOOD



Lower Onion Creek  
Photo courtesy of  
Robert Kibbe & Ans Aguirre



# MORE RAPID(ER) IMPLEMENTATION, AGAIN

- Buyout process initiated for ~100 properties in 2 months
- All interested owners received offers before end of 2016
- Continued reimbursement requests to Army Corps
- Collaboration with Army Corps recreation design
- Collaboration with other stakeholders for long-term plans



## CURRENT STATUS



# POST PROJECT POSSIBILITIES

- Open space conversion
- Riparian restoration
- Recreational uses
- Community gardens
- Wildflower meadows
- Outdoor classrooms
- Collaboration with neighborhood groups



Must be compatible with floodplain and within limitations of development restrictions

# ARMY CORPS PROJECT



ONION CREEK YARBREE BEND RECREATION



# COMMUNITY GARDENS



2019

WATERSHED  
PROTECTION



# OTHER USES



# LESSONS LEARNED/CHALLENGES

- **Partnerships & Project Planning**
- **Partnerships & Project Implementation**
- **Partnerships & Post-Project Management**

# PARTNERSHIPS & PROJECT PLANNING

- Prioritization
- Identification of feasible solutions
- Community engagement
- City Council buy-in
- Funding & resource needs
- Partnership opportunities:
  - Funding constraints
  - Timing implications
  - Agency interests & requirements

# PARTNERSHIPS & PROJECT IMPLEMENTATION

- Continuous community engagement
- 1:1 consultations with property owners & tenants
- Phasing
- Avoiding “checkerboarding”
- Security, theft, vandalism
- Interim maintenance
  
- Partnerships:
  - Funding availability
  - Records & reporting
  - Additional partner requirements



# PARTNERSHIPS & POST-PROJECT MANAGEMENT

- Development restrictions
- Neighborhood engagement
- Continuous monitoring, maintenance
- Signage, bollards/barricades
- Clearly defined uses
  
- Partnerships:
  - Limitations on future uses
  - Local organizations

PAM KEARFOTT, P.E., CFM  
CITY OF AUSTIN  
WATERSHED PROTECTION DEPARTMENT  
(512) 974-3361  
[PAM.KEARFOTT@AUSTINTEXAS.GOV](mailto:PAM.KEARFOTT@AUSTINTEXAS.GOV)

