

The Austin Approach to Recharge Zone & Groundwater Protection

A scenic view of the Austin skyline, featuring several tall skyscrapers, partially obscured by a dense line of green trees. In the foreground, a body of water (likely a lake or river) is visible, with a small boat carrying people in the distance. The sky is clear and blue.

2016 New Partners for Smart Growth Conference
“What Water Agencies Are Afraid to Tell
Land-Use Decision-Makers”

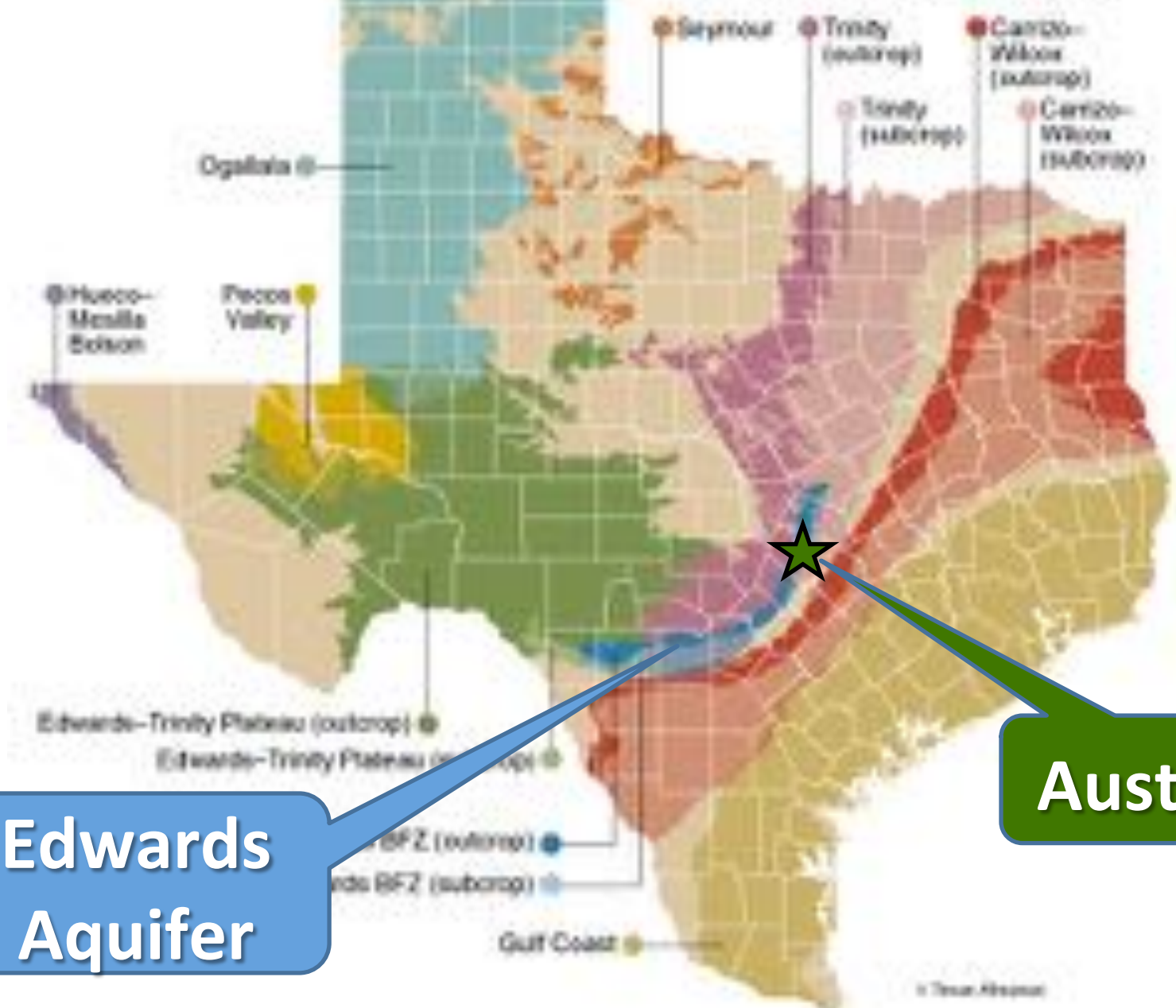
Matt Hollon
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Presentation Overview

- Austin Context & Challenges
- Regulatory Protections
- Capital: structural control retrofits & land acquisition
- Programs
- Regional Cooperation
- Resiliency



Major Aquifers of Texas



**Edwards
Aquifer**

Austin

Austin's Setting



- Edge of Texas Hill Country
- Situated Along Balcones Fault
- Presence of Karst Aquifer
- Riverine Lake System
- Numerous Creeks
- Barton Springs

Austin's Icons

- Barton Springs Pool (“the Soul of the City”)
- McKinney Falls
- Lake Austin, Lady Bird Lake, and the Colorado River



Hill Country

Blackland Prairie

Lake Travis

**Water
Supply**

Lake Austin

Creeks

**Barton
Springs** ★

*Lady Bird
Lake*

Aquifer

*McKinney
Falls* ★

Colorado River

Floodplains

Welcome to
AUSTIN

Austin's Growth

- Austin is the 11th largest city in the U.S.
- Fastest growing city in the U.S. (Forbes 2014)
- Current* population
 - 910,833 people within the city
 - 2.0 million in the greater Austin area

* Oct. 2015: <https://www.austintexas.gov/demographics>



Citizen Involvement

- Austin is a highly aware & educated community
- Austin is a politically & socially active community



On the morning of the SOS election, swimmers at Barton Springs joined hands in silence, forming a giant circle around the pool.

Goals of Our Regulations

- Preserve and Restore Natural Function
- Protect Sensitive Resources
- Minimize Site Disturbance
- Manage Stormwater Runoff



History of Our Regulations

1974 Creeks Ordinance

1980 Lake Austin Watershed Ordinance

Barton Creek Watershed Ordinance

Williamson Creek Watershed Ordinance

1981 Lower Watersheds Ordinance

(Slaughter, Onion, Bear, and Little Bear Creeks)

1982 Landscape Ordinance

History of Our Regulations

1983 Protected Tree Ordinance

1986 Comprehensive Watersheds Ordinance

1991 Urban Watersheds Ordinance

1992 Save Our Springs (SOS) Ordinance

2010 Heritage Tree Ordinance

2013 Watershed Protection Ordinance

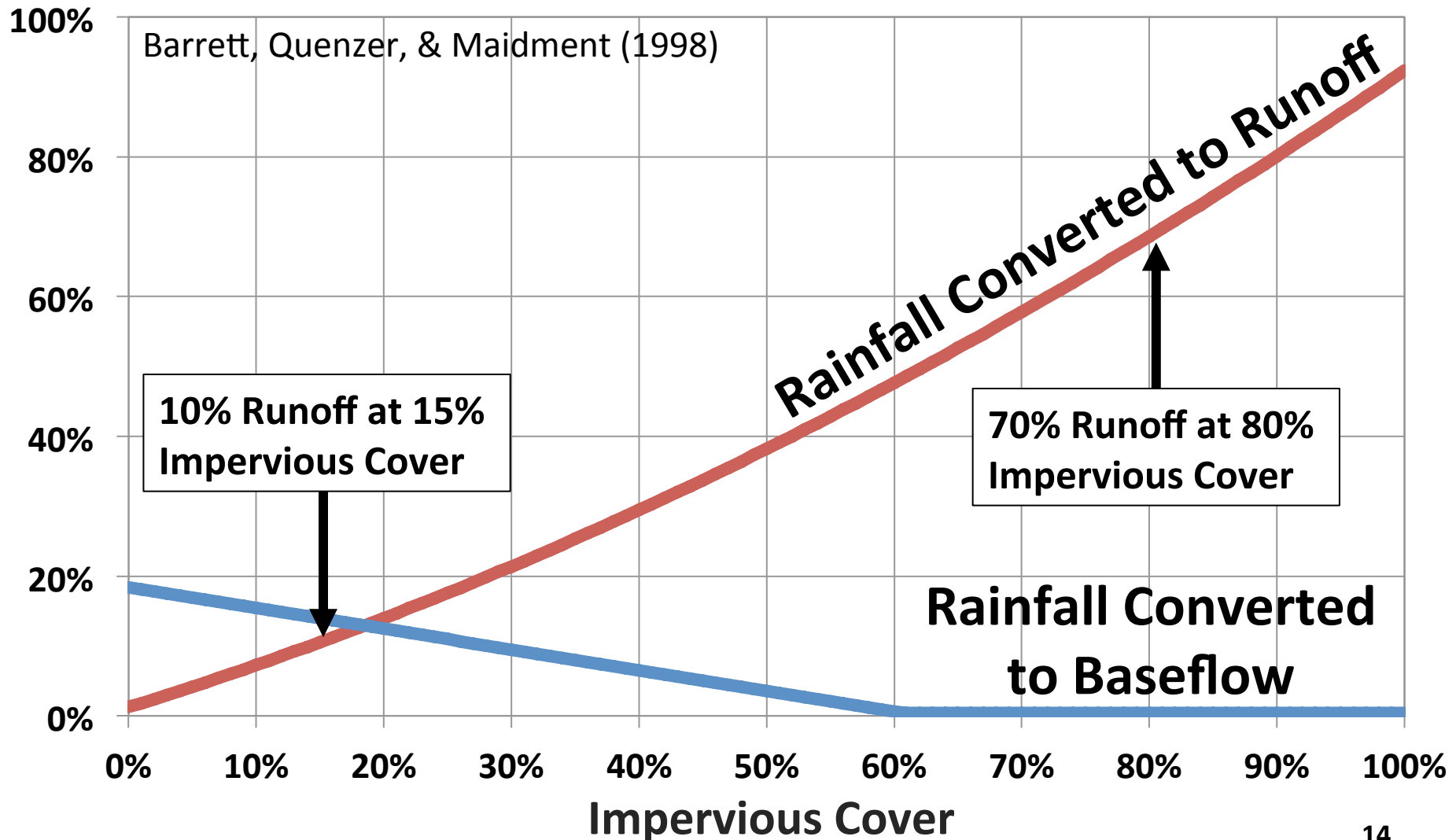
Barton Springs Zone (BSZ)



Save Our Springs (SOS) Ordinance

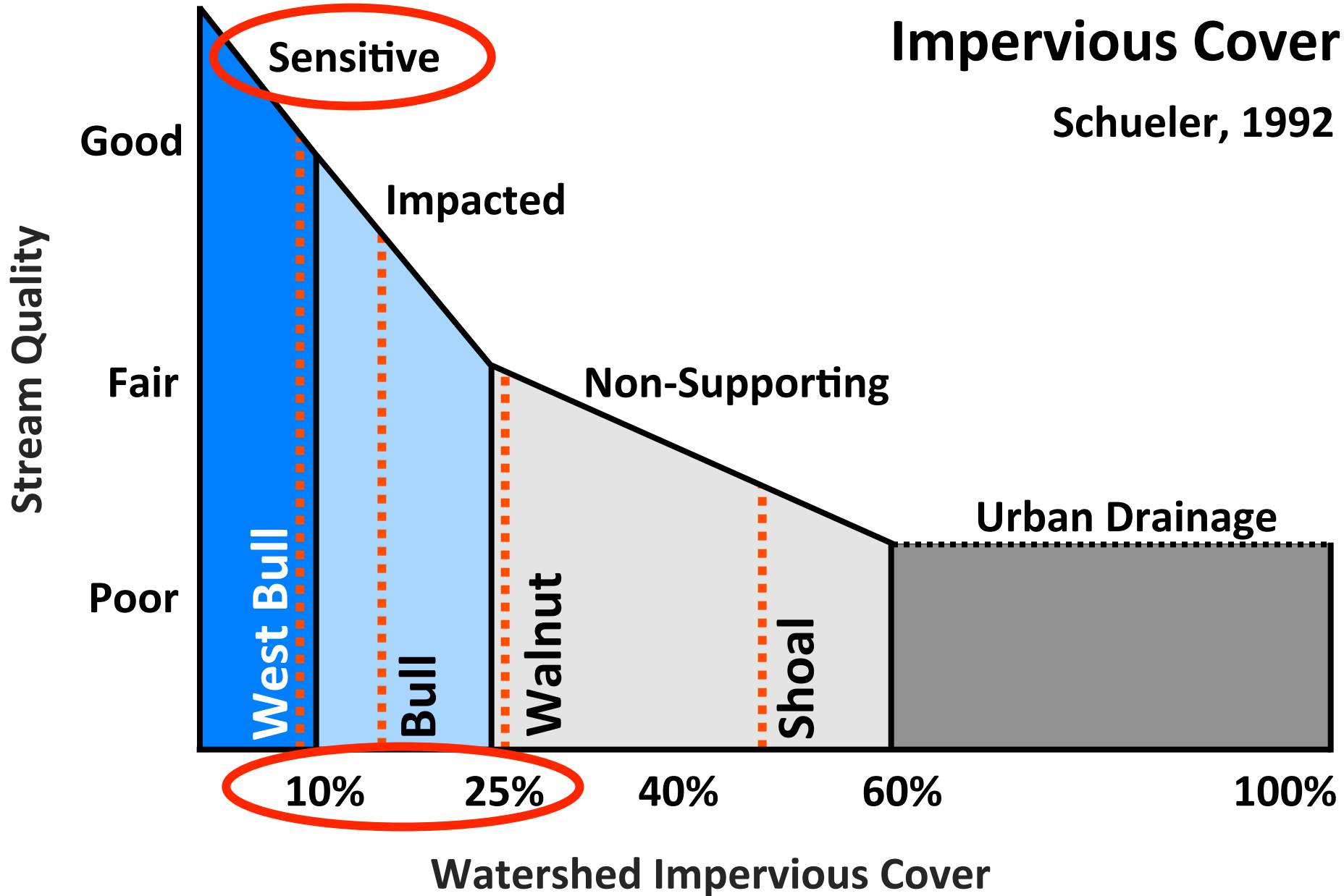
- Passed by Citizen referendum 1992
- Strict impervious cover limits
- “Non-degradation” structural water quality (WQ) controls
- Stream setbacks
- No variances—Council amendments only
- “Supermajority” Council votes to amend
- Call for structural WQ retrofits
- Successfully defended in courts

Impervious Cover, Runoff, & Baseflow



Impacts of Impervious Cover

Schueler, 1992



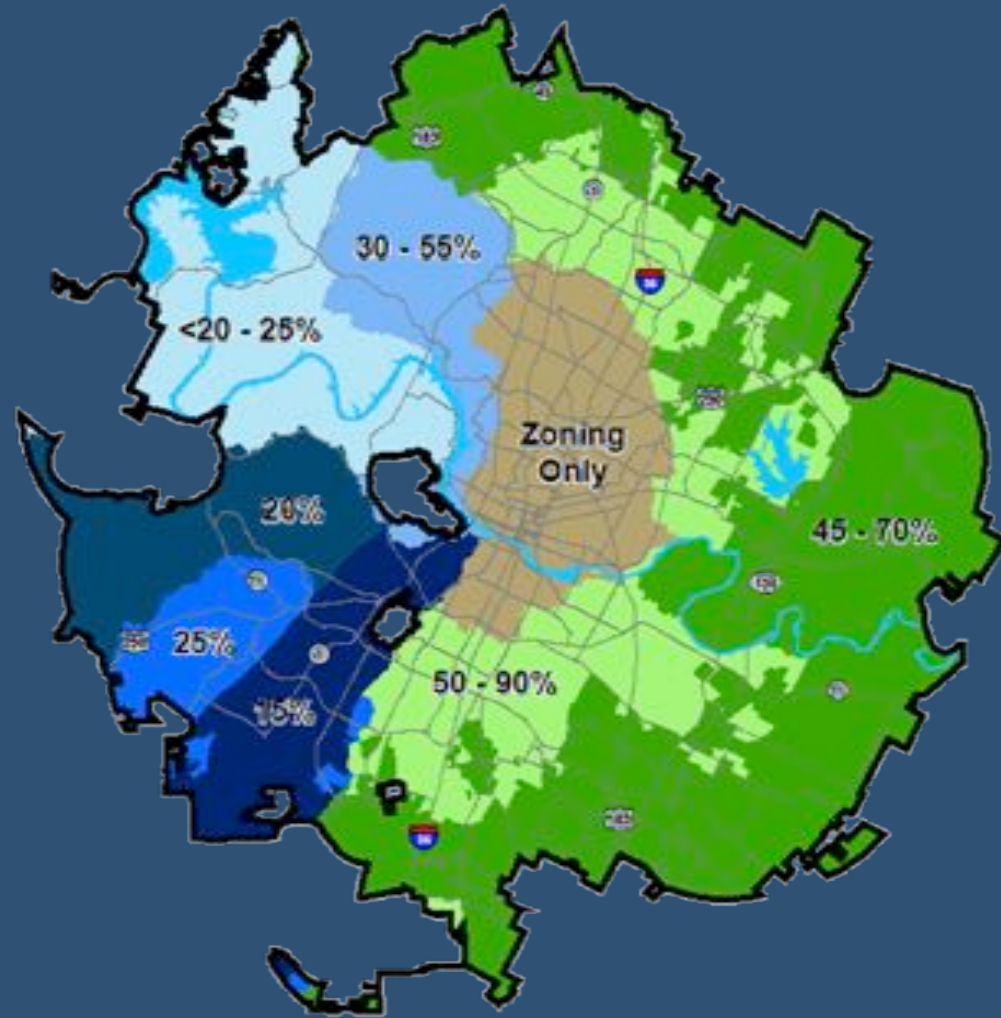
Impervious Cover

- Impervious cover is any surface that prevents infiltration of water into the ground, such as roads, parking lots, & buildings
- Limits placed on impervious cover vary by land use & watershed



Impervious Cover

- Limits vary by area of town and land use
- Higher imperv. cover limits in Urban & Suburban
- More restrictive for Water Supply watersheds & Barton Springs Zone



Protect Austin's natural resources and environmental systems by limiting land use and transportation development in sensitive environmental areas and preserving areas of open space (Imagine Austin Comprehensive Plan, LUT P22)

Stream & Erosion Hazard Setbacks

- Setbacks from creeks prohibit development except for low-impact uses like parks and trails
- Erosion hazard zone keeps resources from



Critical Environmental Features

- Setbacks protect sensitive features from development & preserve in a more natural state
- Features include bluffs, canyon rimrocks, caves, sinkholes, springs, & wetlands



Wetland



Sinkhole



Spring



Rimrock



Tree Protections

- Requirements are designed to achieve a balance of re-forestation and preservation
 - Protected & heritage trees
 - Mitigation requirements

Steep Slopes

- Limitations on construction for steeper areas of the site (greater than 15 percent)
- Stabilize and revegetate disturbed slopes



Cut and Fill Limits

- Cut and fill for site grading is limited to 4 feet, with exceptions (e.g. foundations, right-of-way)





Erosion & Sedimentation Controls

- Also known as construction-phase controls
- Required for all development until permanent revegetation has been established

Structural Stormwater Controls

- Water Quality Control
 - Capture and treat a required volume for the site
 - Non-degradation for the Barton Springs Zone
- Flood Mitigation
 - Match peak flow rates to predevelopment





Sedimentation/Sand Filtration



Wet Pond



Flood Detention



Vegetative Filter Strip



Rain Garden



Biofiltration

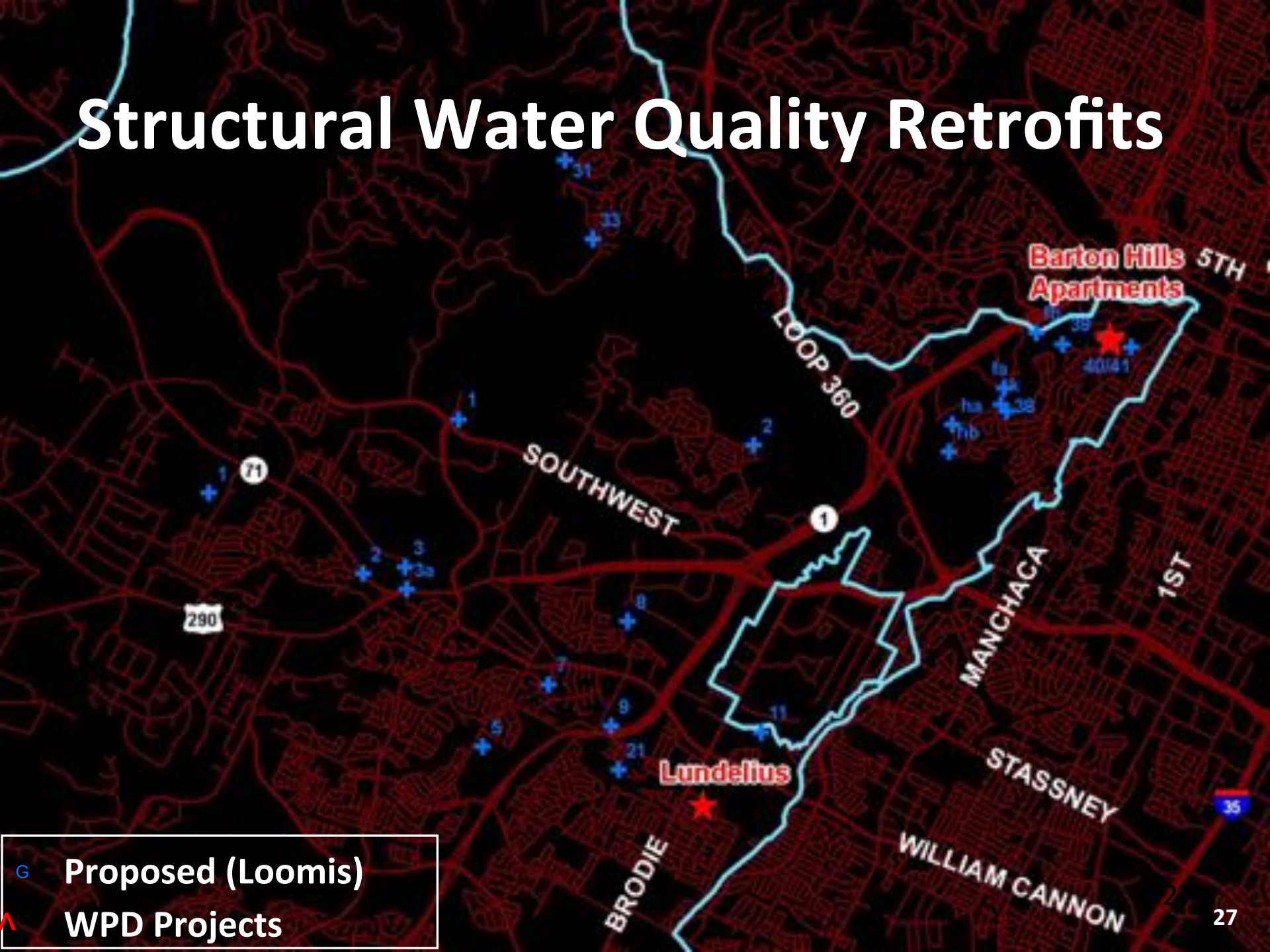


Retention-Irrigation



Rainwater Harvesting

Structural Water Quality Retrofits



G Proposed (Loomis)
A WPD Projects



Water Quality Protection Land Acquisition Program



Acquisition Criteria

- Creek and Aquifer Protection
- Avoided Pollution – Prevention of Development
- Contiguity
- Management Considerations
- Public Use Value (2006)
- Financial Feasibility

History: Acquisition

May 1998	\$65M	15,047 ac.
Nov. 2000	\$13.4M	5,000 ac.
Nov. 2006	\$50M	6,530 ac.
Nov. 2012	<u>\$29.2M</u>	<u>1,777 ac.</u>
	\$157.6M	28,354 ac.

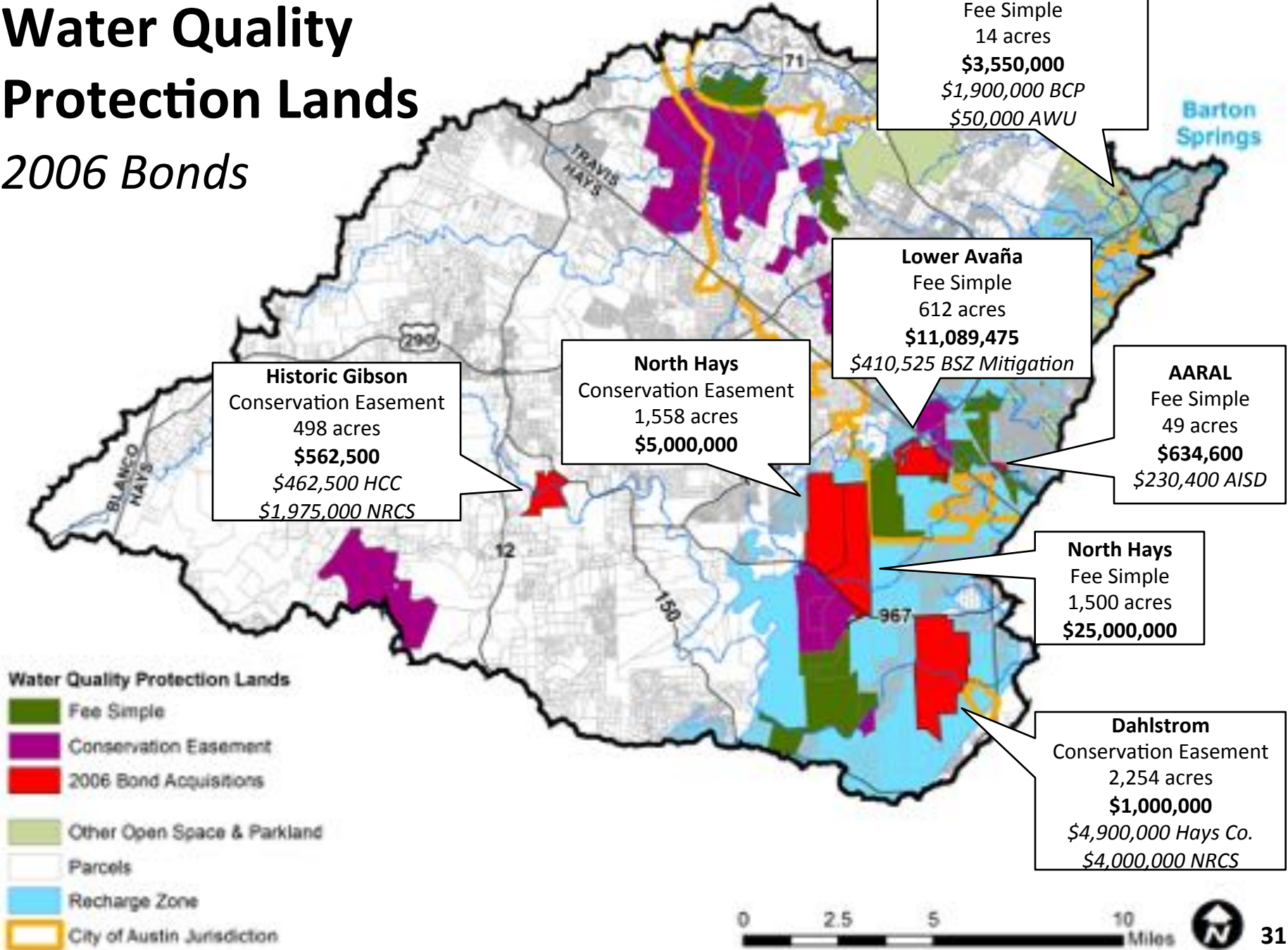
Partnership Contributions \$24M

Conservation Easements (17,513 ac.) 62%

Fee Simple Acquisition (10,841 ac.) 38%

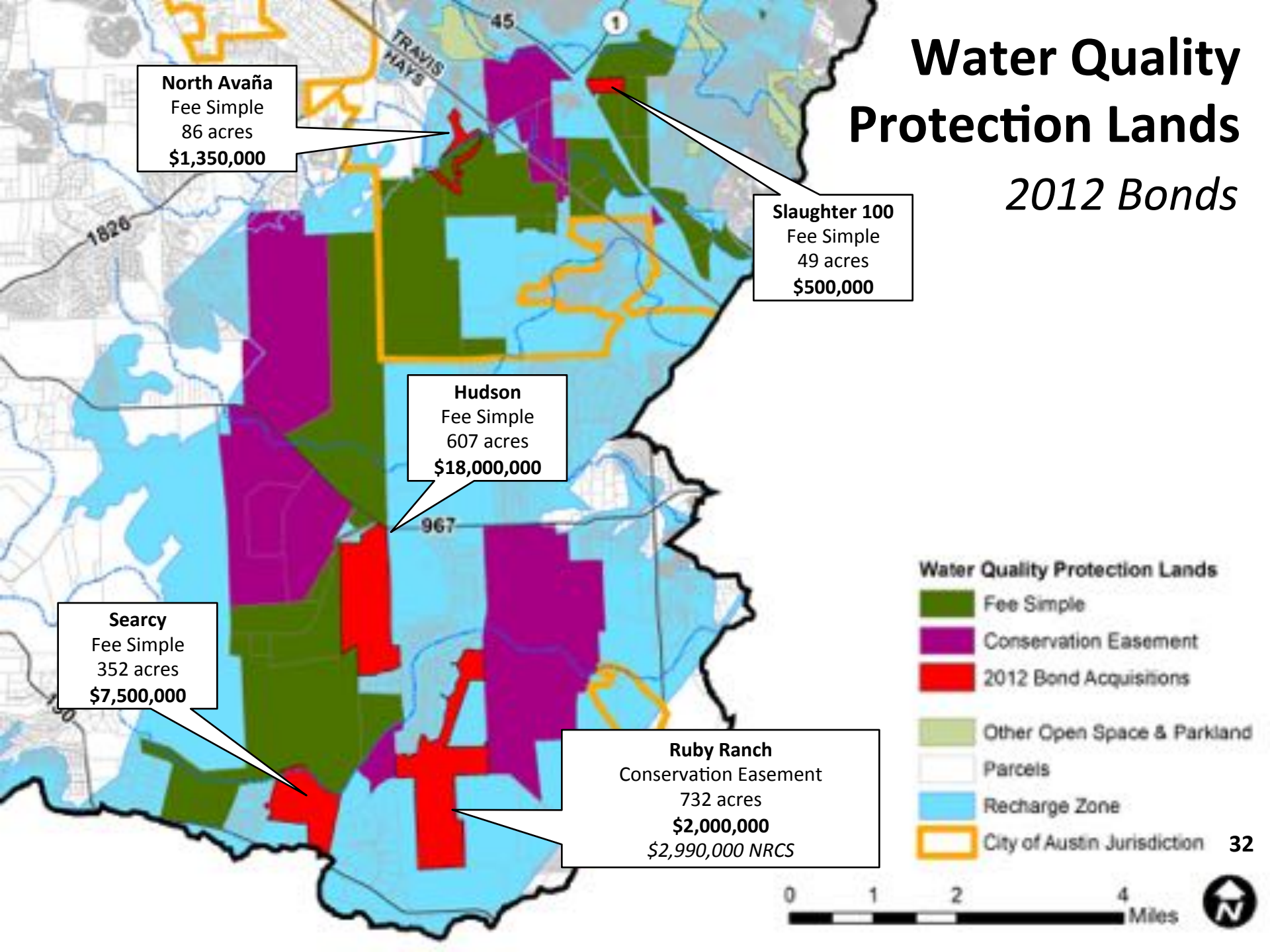
Water Quality Protection Lands

2006 Bonds



Water Quality Protection Lands

2012 Bonds





Land Acquisition Benefits

- 24.5% of the Barton Springs recharge zone is protected as Water Quality Protection Land
- An additional 6% is protected as Balcones Canyonlands Preserve or parkland
- Includes 100's of significant karst features
- Miles of creeks recharging the aquifer

Programs

- Monitoring
- Wastewater management
- Public education
- Development review and inspection
- Infrastructure inspection & maintenance
- Master planning & evaluation
- Many, many others!

Jurisdictions within the Barton Springs Zone

 Barton Springs Zone

 County Line

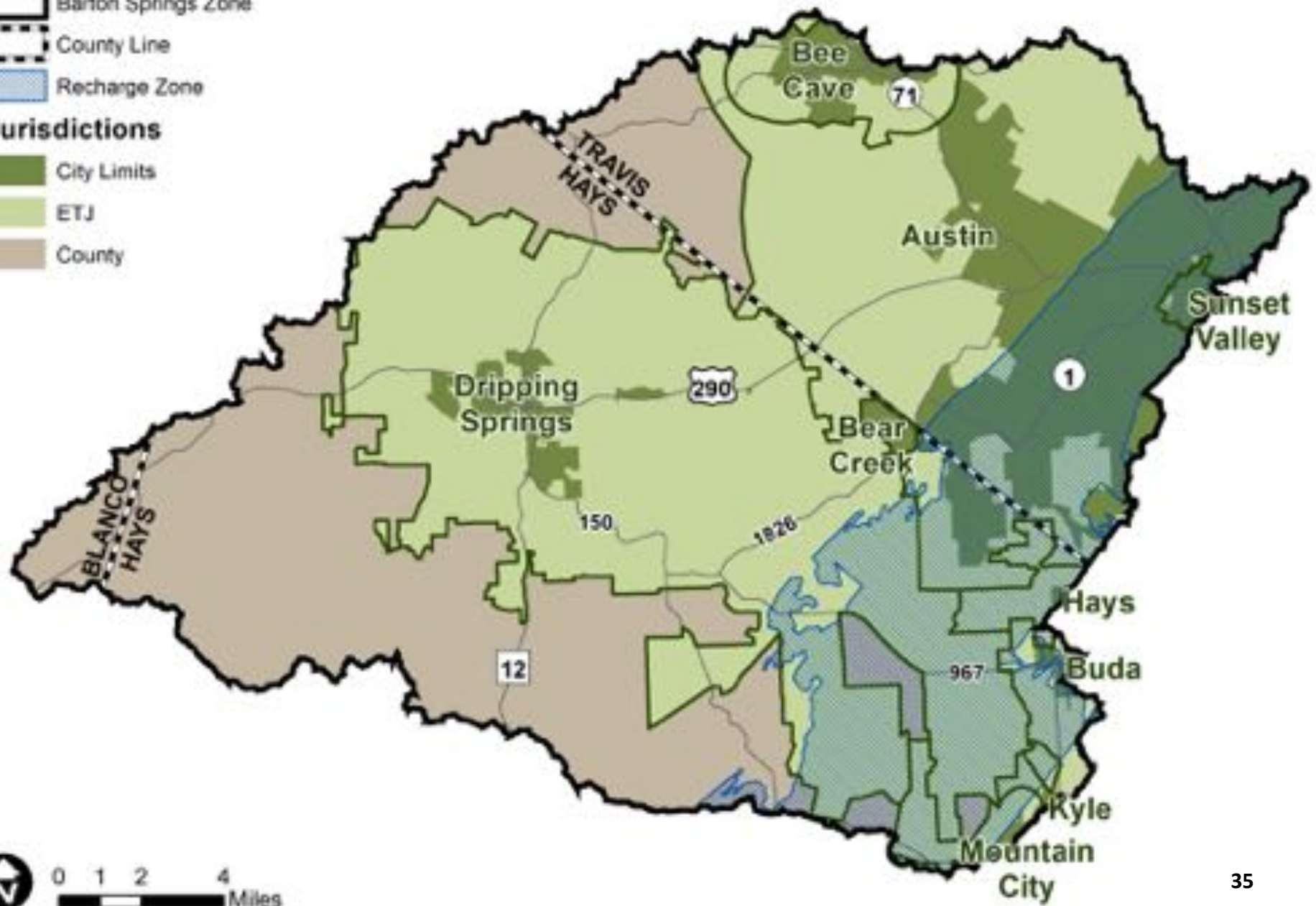
 Recharge Zone

Jurisdictions

 City Limits

 ETJ

 County

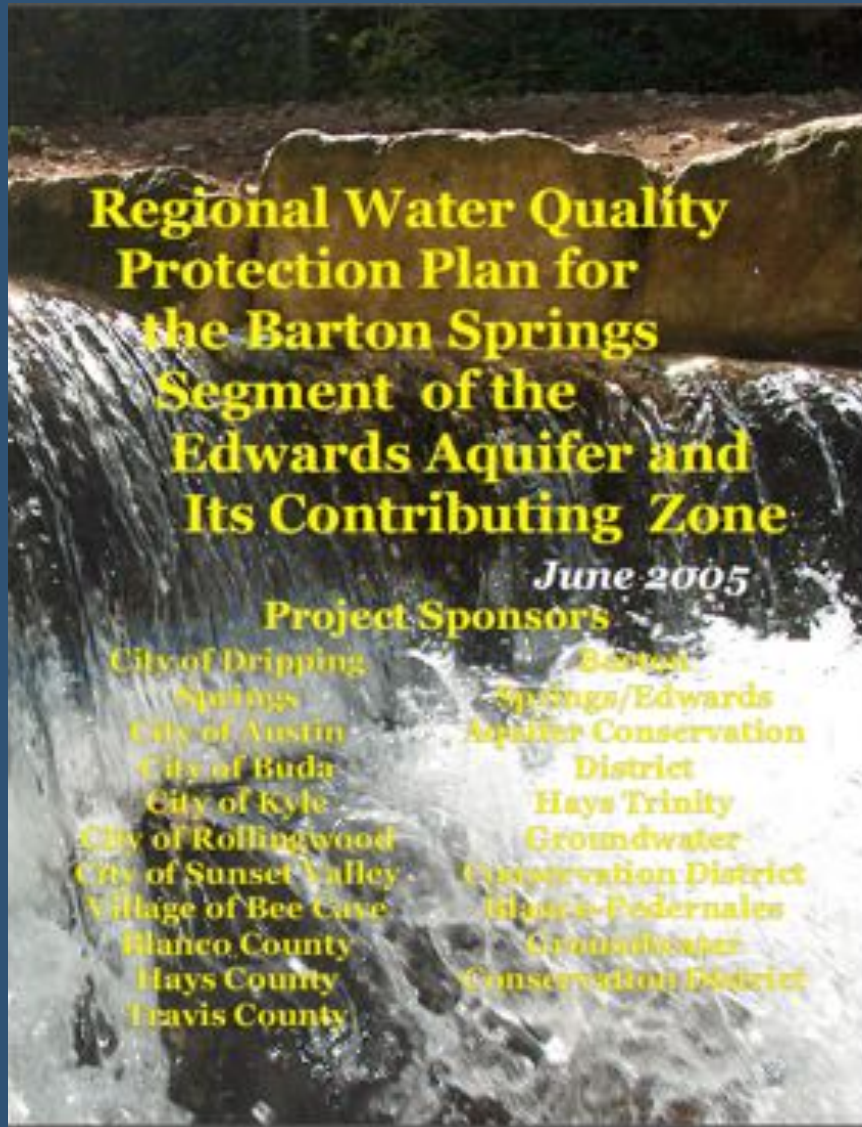


Regulatory Authority

- Austin is a home rule city
 - Corporate limits (full & limited)
 - Planning jurisdiction (5 mile ETJ)
- Regulatory Authority
 - Texas Local Government Code
 - Texas Water Code
- State Law Limitations
 - Vesting Statute (“Grandfathering”)
 - Takings Statute

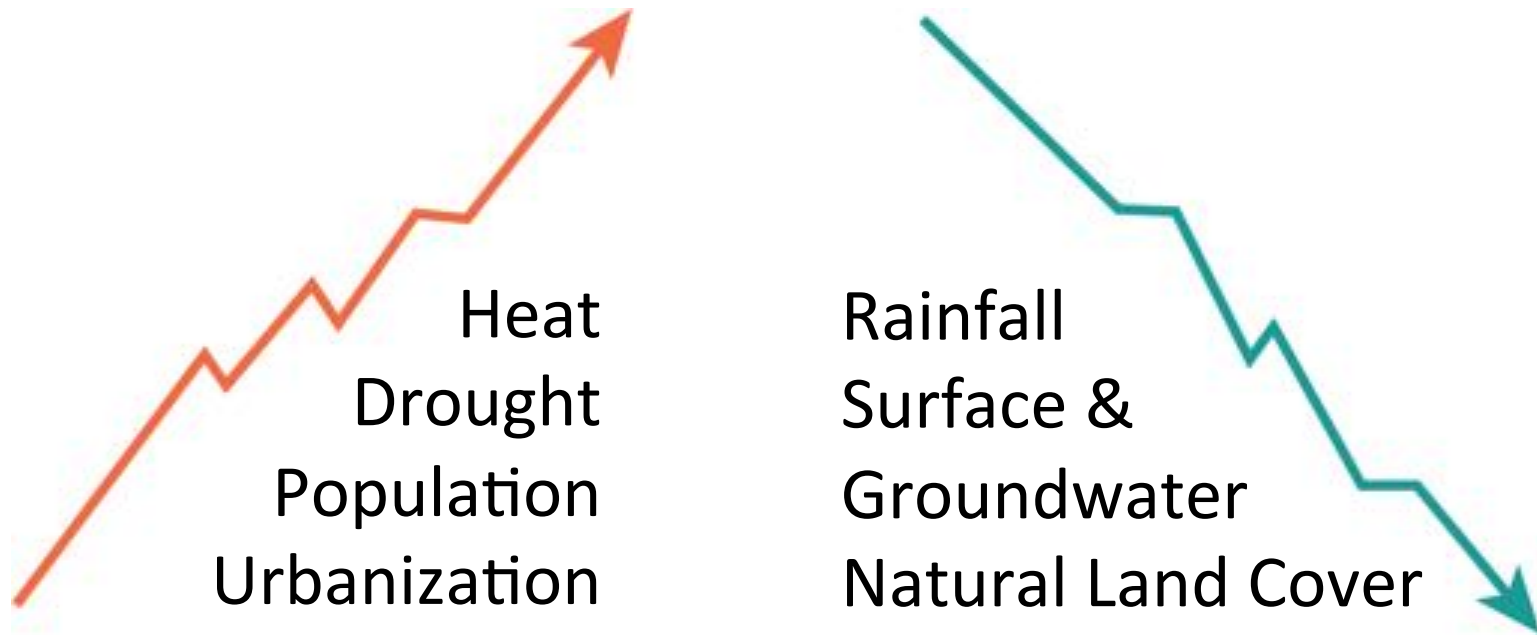


2005 BSZ Regional Water Quality Protection Plan



- Multiple regional participants
- Best science
- Acknowledges regional solution essential
- Flexible, ongoing implementation

Challenges & Opportunities: Connecting the Dots...



BUT...

1. Can incorporate natural systems & rainwater storage in designs to offset water use, preserve quality of life
2. Practical methods & models have already been implemented in other cities

Summary

- Recharge enhancement and protection of sensitive lands is difficult but critical
- Need a variety of solutions: regulations, programs, capital projects, regional cooperation
- Need resilient approach for extreme weather



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