Water Resource Issues in Travis County

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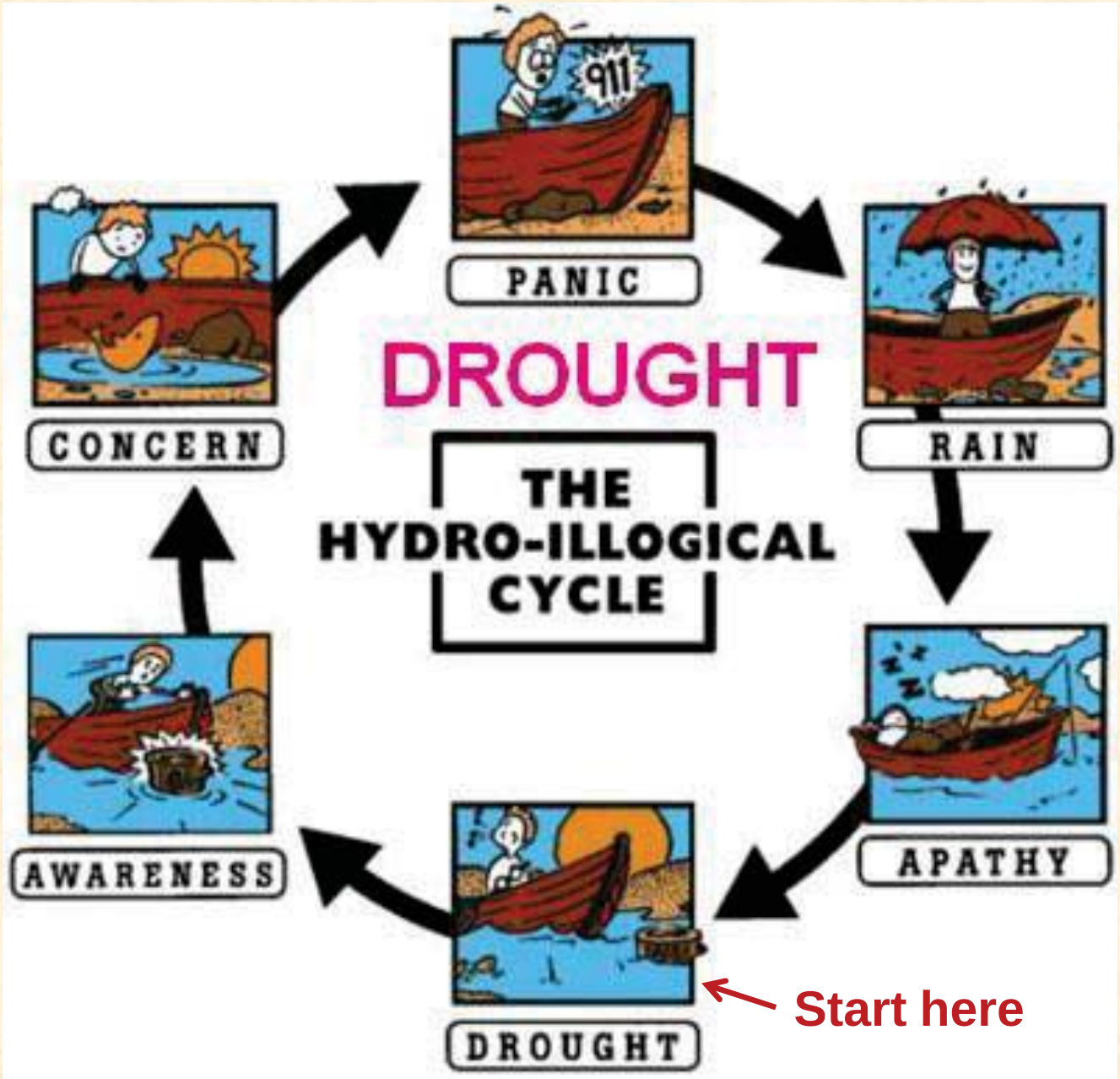
Hamilton Pool

Presentation organization

- Austin floods
- Austin water quality
- Stream bank erosion
- Barton Springs
- City of Austin Watershed Protection Master Plan
- Travis County current and future water shortages

Reality—how we deal with drought, floods, and pollution



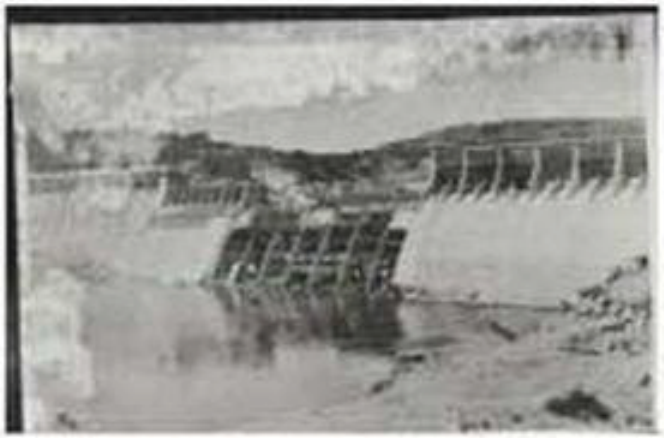
Austin floods

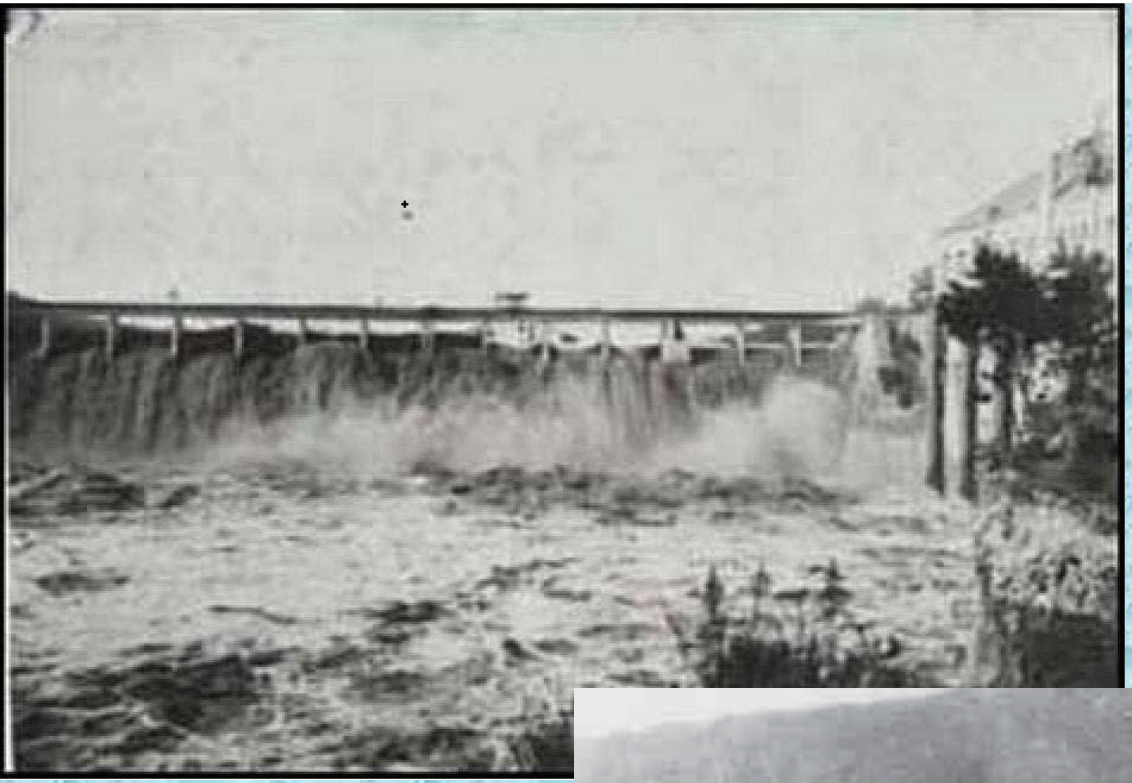
1893: Austin dam built (McDonald Lake)

Austin's dam was deemed as the largest masonry dam in the World

1900: Dam destroyed by flood

1912: Rebuilt





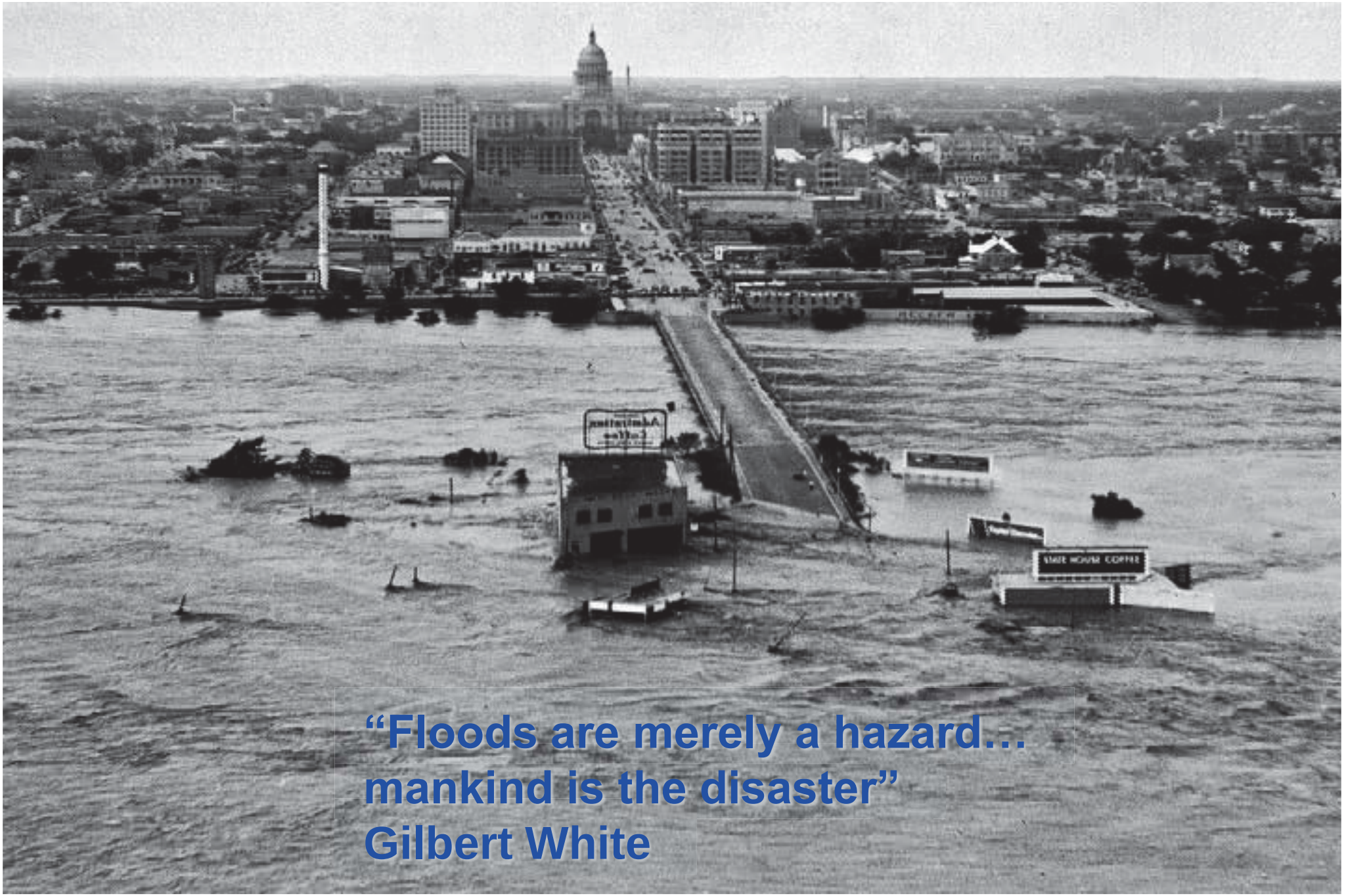
1915: Flood damaged dam

Floods in **1935**, **1936**, and **1938** crippled the dam further

1940: Rebuilt again

1915 flood over Congress Avenue

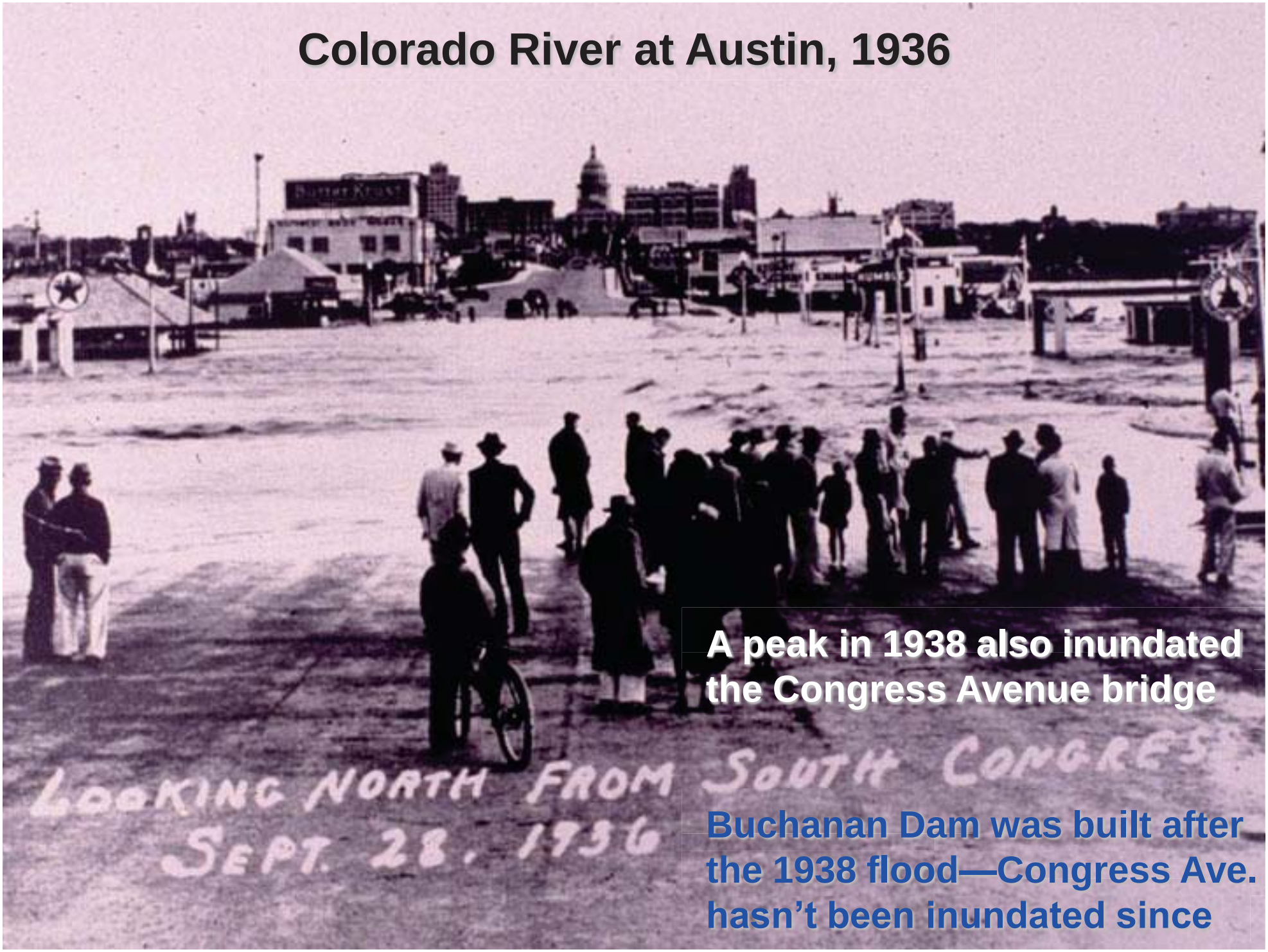
Colorado River at Austin, 1935



"Floods are merely a hazard…
mankind is the disaster"
Gilbert White

1935 flood peak from Colorado River documented on wall in Iron Works BBQ restaurant, corner of Red River Drive and First Street

Colorado River at Austin, 1936



A peak in 1938 also inundated the Congress Avenue bridge

Buchanan Dam was built after the 1938 flood—Congress Ave. hasn't been inundated since

Austin, Texas, 1981 Memorial Day flood

13 people drowned, $36 million damages

Deemed as a 100-year flood-- but the inundated structures were located within the identified 100-year flood plain. At the time, at least 7,000 families were known to live within 100-year flood plains in Austin—most did not know.

Flooded area superimposed on aerial photo of part of Shoal Creek basin

Shoal Creek near 12th Street

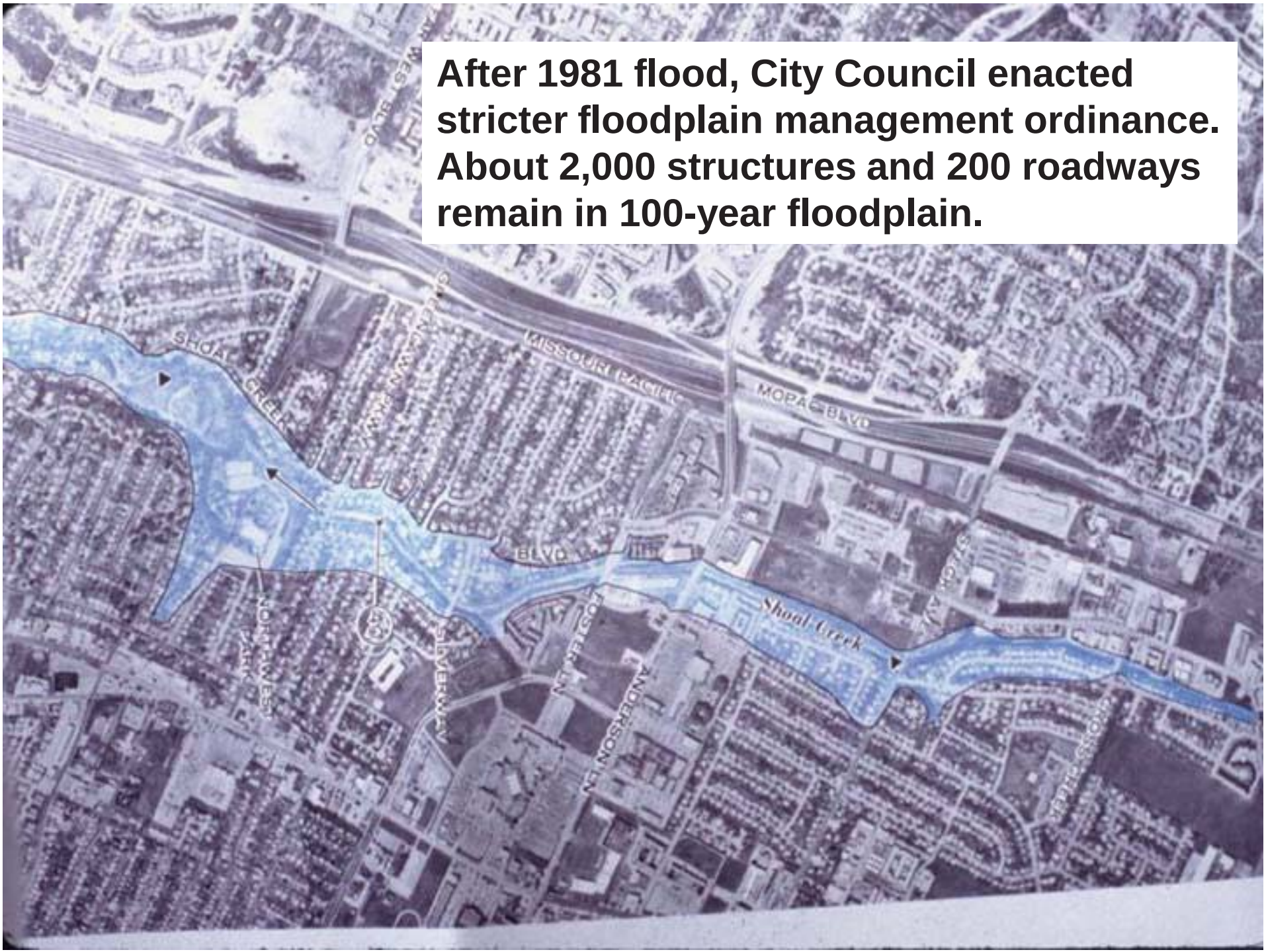
Mayor wants city to tell residents about flood threat

By JANET WILSON
American-Statesman Staff

Press release after flood

Mayor Carole McClellan wants more than 7,000 families notified that they live on the city's 100-year flood plain.

Austin, May 24-25,1981- Shoal Creek Floodplain



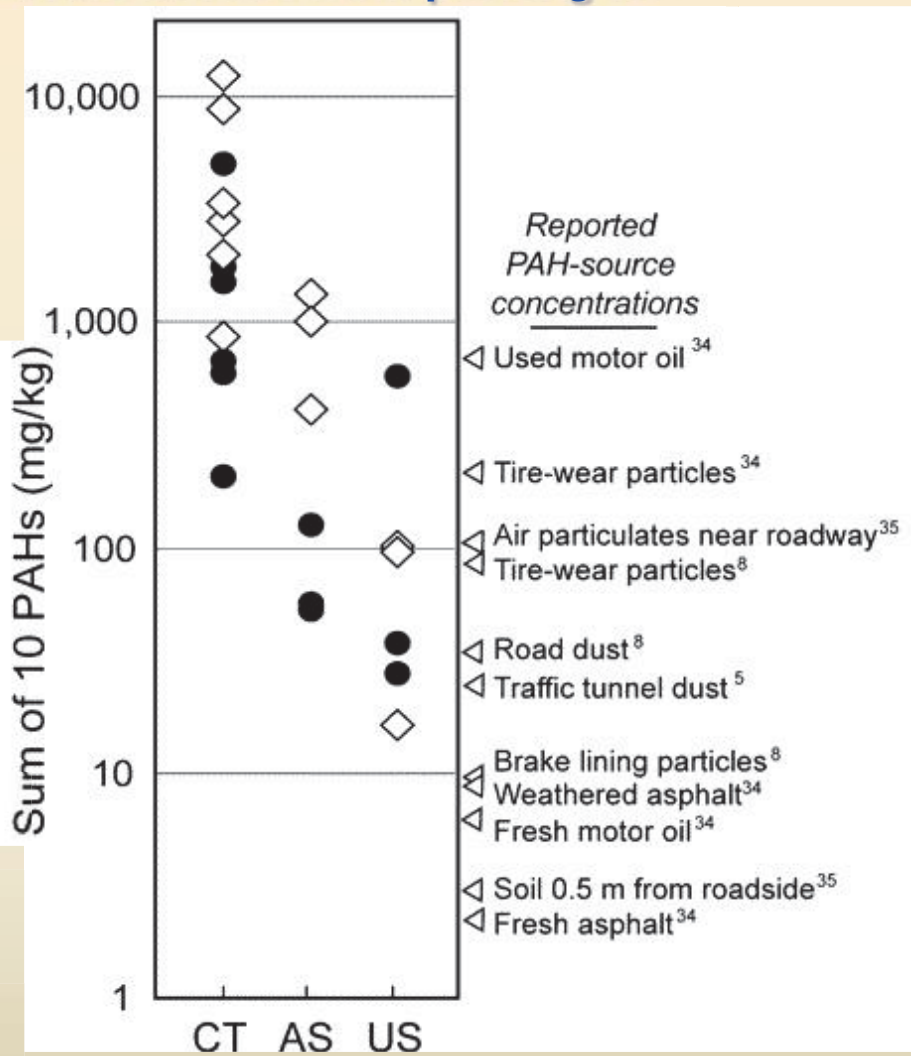
Austin water quality

PAH from Parking lot sealants

represent a newly discovered major source of urban contamination. PAH (polycyclic aromatic hydrocarbons), a group member of organic compounds, are in fuels such as gasoline, coal, and fuel oil. PAH levels in runoff from parking lots (including Austin) have been much greater than levels in used motor oil.

Sealants reapplied every few years. About 600,000 gallons of sealant are applied annually in Austin.

Levels of PAH from parking lots



coal-tar-emulsion-sealed

asphalt-emulsion-sealed

unsealed asphalt or concrete

Construction sediment

Construction typically involves building highways, roads, structures, parking lots, utility lines, and work access roads. Soils are disturbed and vegetation often removed. During this process, many tons of sediment are transported to streams, lakes, and aquifers.

Stream crossing construction

Sediment into Lady Bird Lake from construction of motel

Sediment in Barton Creek flood through Barton Springs pool

Other Construction pollutants

Typical construction site pollutants include fluids from construction equipment, adhesives, paints, cleaners, masonry, cement, fertilizers, pesticides, and wastes from plumbing, heating, and air conditioning installations. Below is an example of pesticides in runoff from Bee Cave Galleria development in the Barton Creek basin.

Bee Cave Galleria in Barton Creek basin

Pesticide washed into creek from improperly stored bags

Dead fish in receiving stream

Construction sediment controls most used in Texas

Silt fences which often fail during large storms

Example of construction sediment problem

Hamilton Pool, West Travis County, prior to June 2007

Road cut for land development in Hamilton Creek basin began June, 2007

Example of construction sediment problem (cont.)

Road cut along Hamilton Creek after rainfall

Hamilton Pool--first rain after road cut construction began

Leaking sewer lines

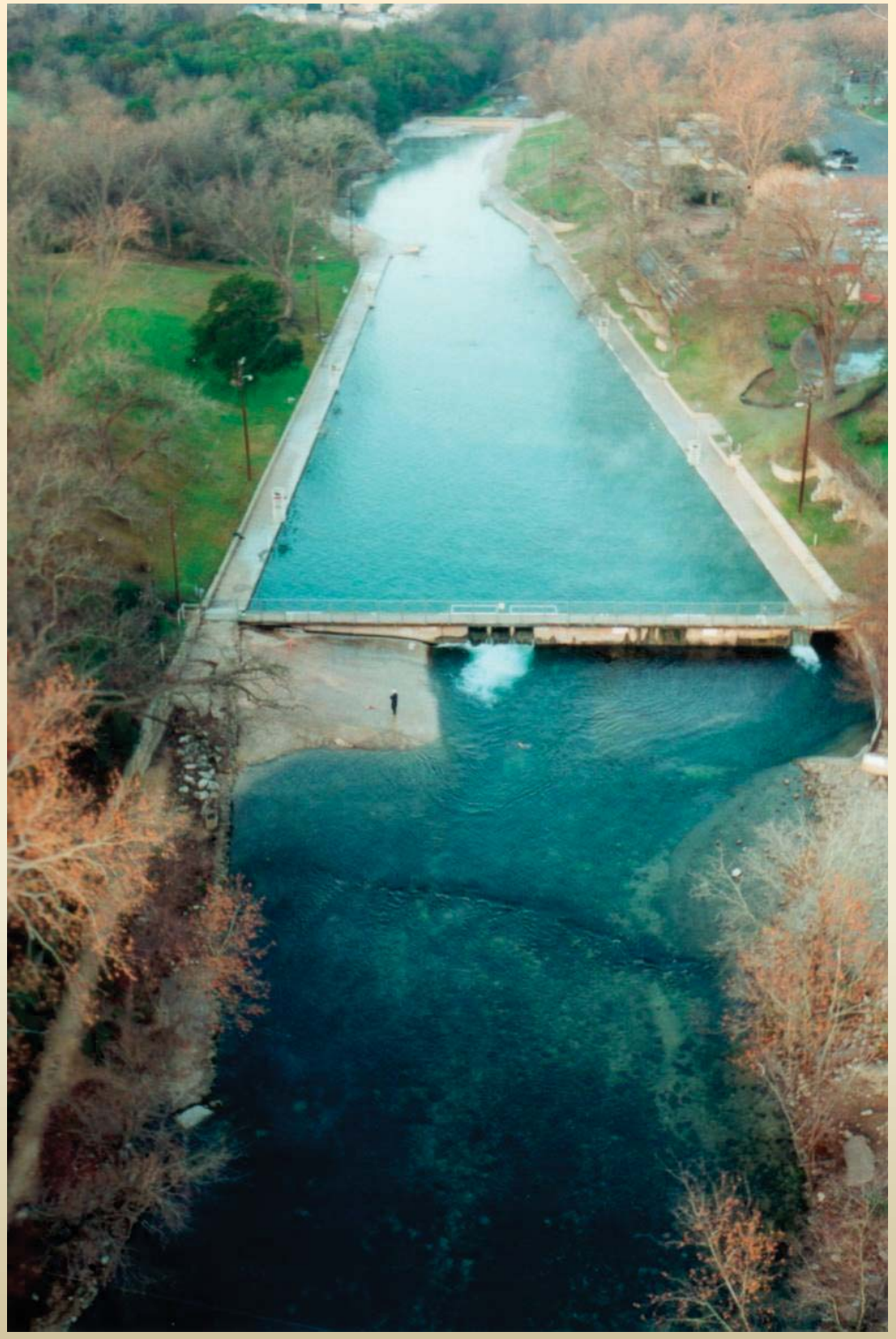
Another sewer line in Barton Creek

Leaking sewer line in Tannehill Branch, Austin

Stream bank erosion

Urbanization causes increases in the number of bankfull flows. More frequent floods cause bank erosion as shown in photos of streams in developed basins in the Austin area.

Bank Erosion (cont.)



Barton Springs

Springflow quantity

Historic average flow 32 mgd

Pumpage 7 mgd—springflow reduced

60,000 people using Edwards aquifer associated with Barton Springs.

Increased population and drought threaten water availability.

Toxic chemicals taint Barton waters

TOXIC WATERS

AN AUSTIN TREASURE AT RISK

Decades-old fuel waste cited as possible source

City closes Barton pool

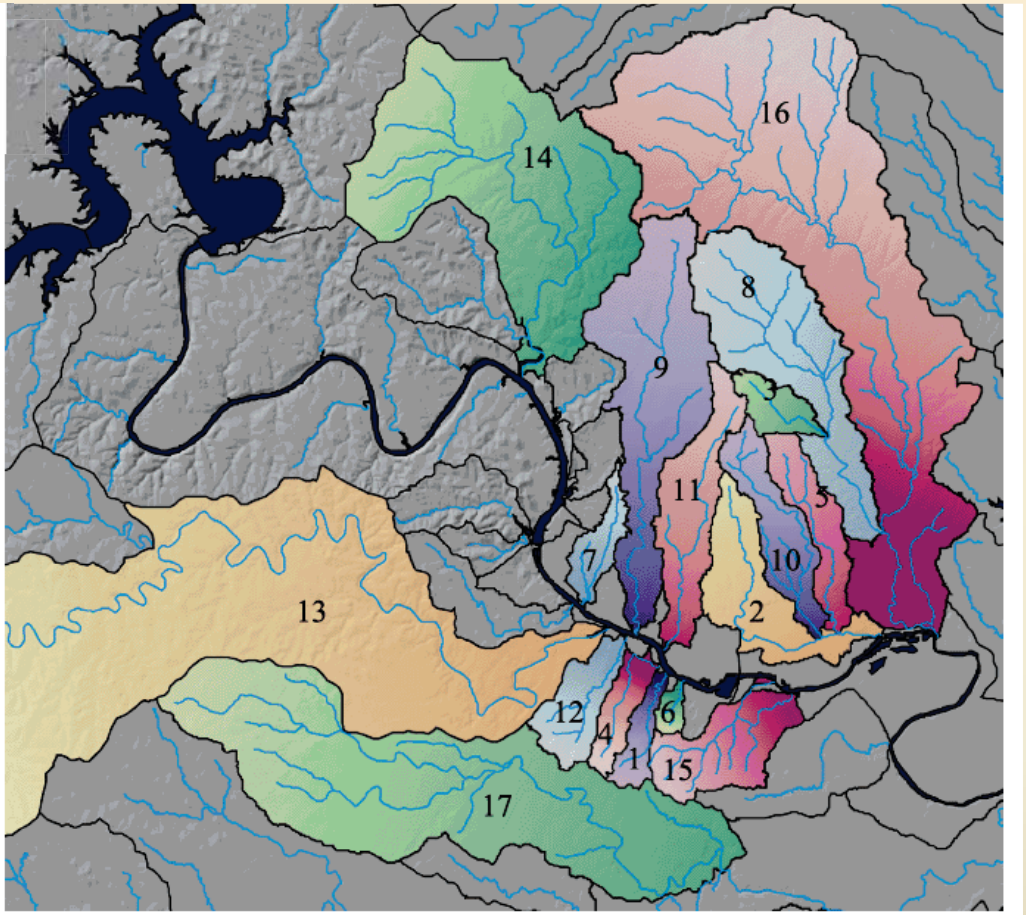
POOL, OTHER CITY CREEKS MAY POSE HEALTH RISK

Table 2. Degradation in water quality at Barton Springs					
		Normalized period median values			
Water Quality Contaminant	**Flow condition**	**1975-1979 or 1980-1984**	**1995-1999**	**Change from early to late period**	**Percent change**
Specific conductance (microsiemens per centimeter)	Baseflow without recharge	655	677	22	3%
	Baseflow with recharge	590*	646	56	9%
	Storm flow	624	642	18	3%
Dissolved oxygen (parts per million)	Baseflow without recharge	6.8	5.7	1.1	16%
Total organic carbon (parts per million)	Storm flow	1.5	3.4	1.9	127%
Sulfate (parts per million)	Baseflow with recharge	28.3*	38.8	10.5	37%
Turbidity (nephelometric turbidity units)	Storm flow	5.3	7	1.7	32%
Note:					
* data for 1981 and 1982 removed from analyses because of affects due to sewer line break					

www.ci.austin.tx.us/watershed/oprslade.htm

City of Austin Watershed Protection Master Plan

- Access flooding, water quality, and erosion problems
- Prioritize problems and identify solutions

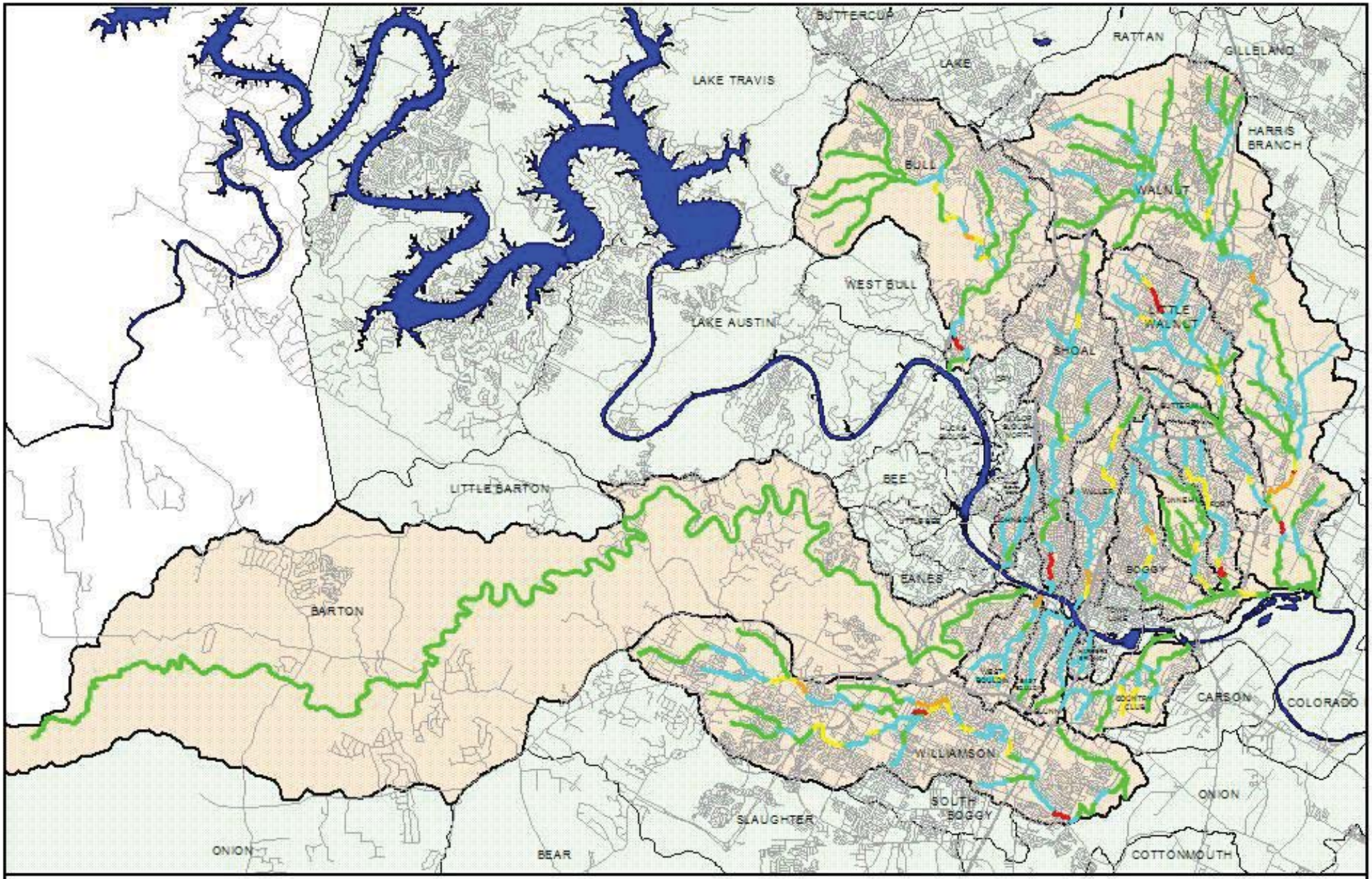


Urban Watersheds

1. Blunn (BLU)
2. Boggy (BOG)
3. Buttermilk (BMK)
4. East Bouldin (EBO)
5. Fort Branch (FOR)
6. Harper's Branch
7. Johnson (JOH)
8. Little Walnut (LWA)
9. Shoal (SHL)
10. Tannehill (TAN)
11. Waller (WLR)
12. West Bouldin (WBO)

Non Urban Watersheds

13. Barton (BAR)
14. Bull (BUL)
15. Country Club (CNT)
16. Walnut (WLN)
17. Williamson (WMS)

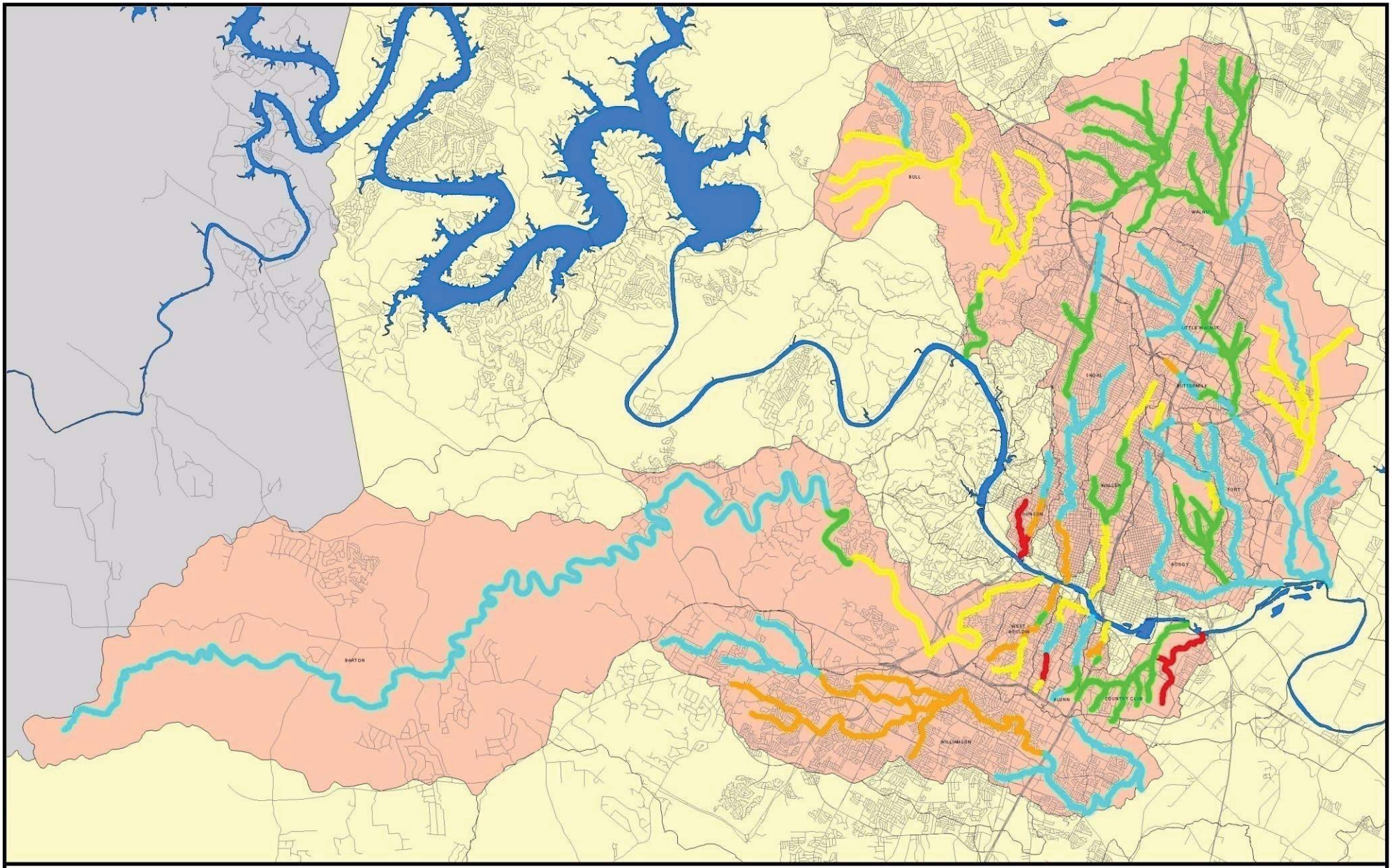


Watershed Protection Department

Flood Problem Ratings

N

Flood Problem Rating
- Very Low
- Low
- Moderate
- High
- Very High
- Roads
- Lakes & Rivers
- Phase 1 Watersheds
- Austin Area Watersheds



Water Quality Problem Ratings
For Existing Conditions

2 0 2 4 Miles

N

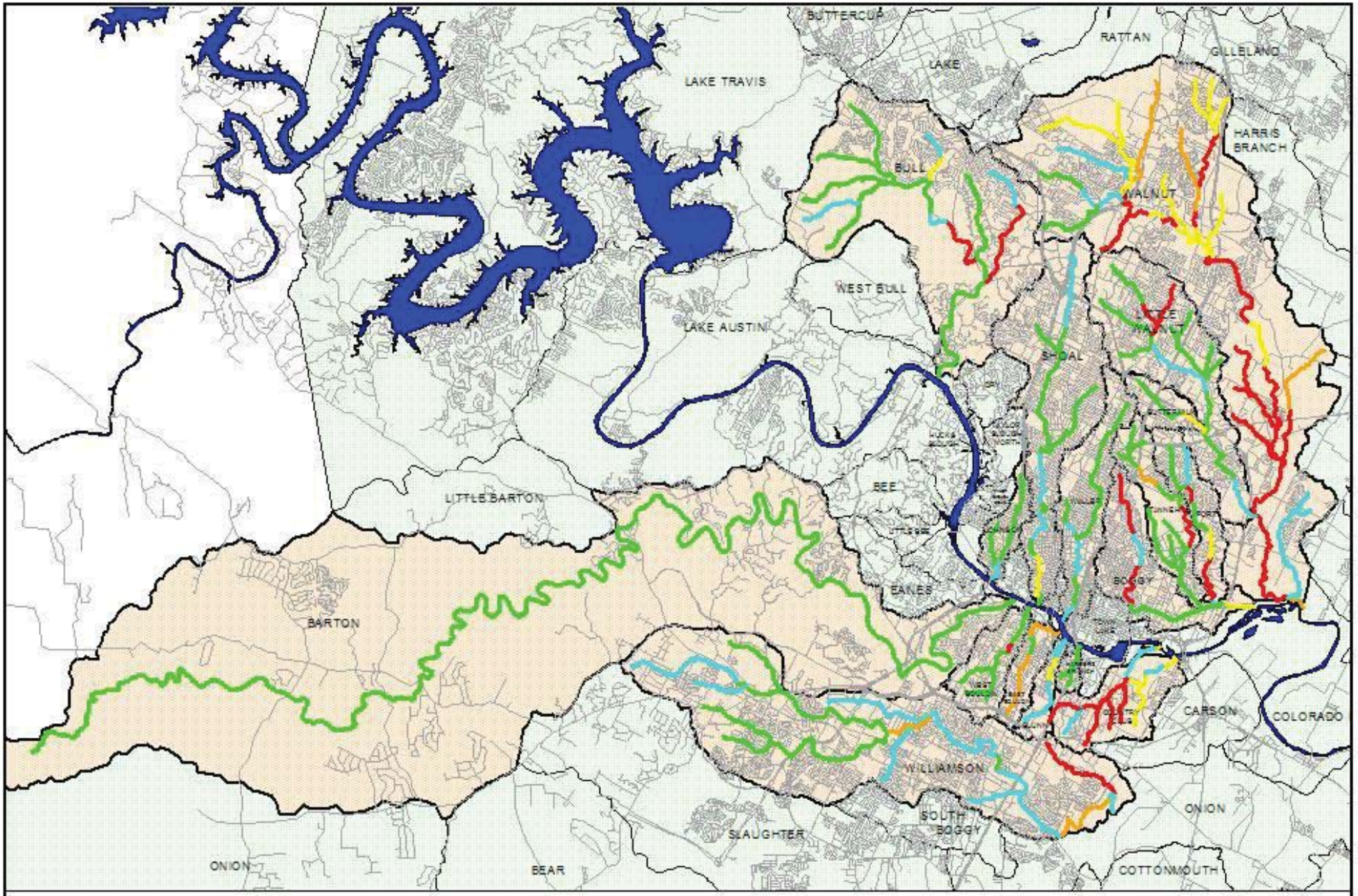
Water Quality Ratings

- Very Low
- Low
- Moderate
- High
- Very High
- Roads
- Lakes & Rivers
- Phase 1 Watersheds
- Austin Area Watersheds

CITY OF AUSTIN FOUNDED 1839

Watershed Protection Department

Plotted 5/31/01.



Watershed Protection Department

Erosion Problem Ratings

N

Erosion Problem Rating
- Very Low
- Low
- Moderate
- High
- Very High
- Roads
- Lakes & Rivers
- Phase 1 Watersheds
- Austin Area Watersheds

Watershed Protection Master Plan
Phase 1 Watersheds Report

Findings and Recommendations

- **Flood, erosion, and water quality problems are pervasive and will worsen if correction action not taken**

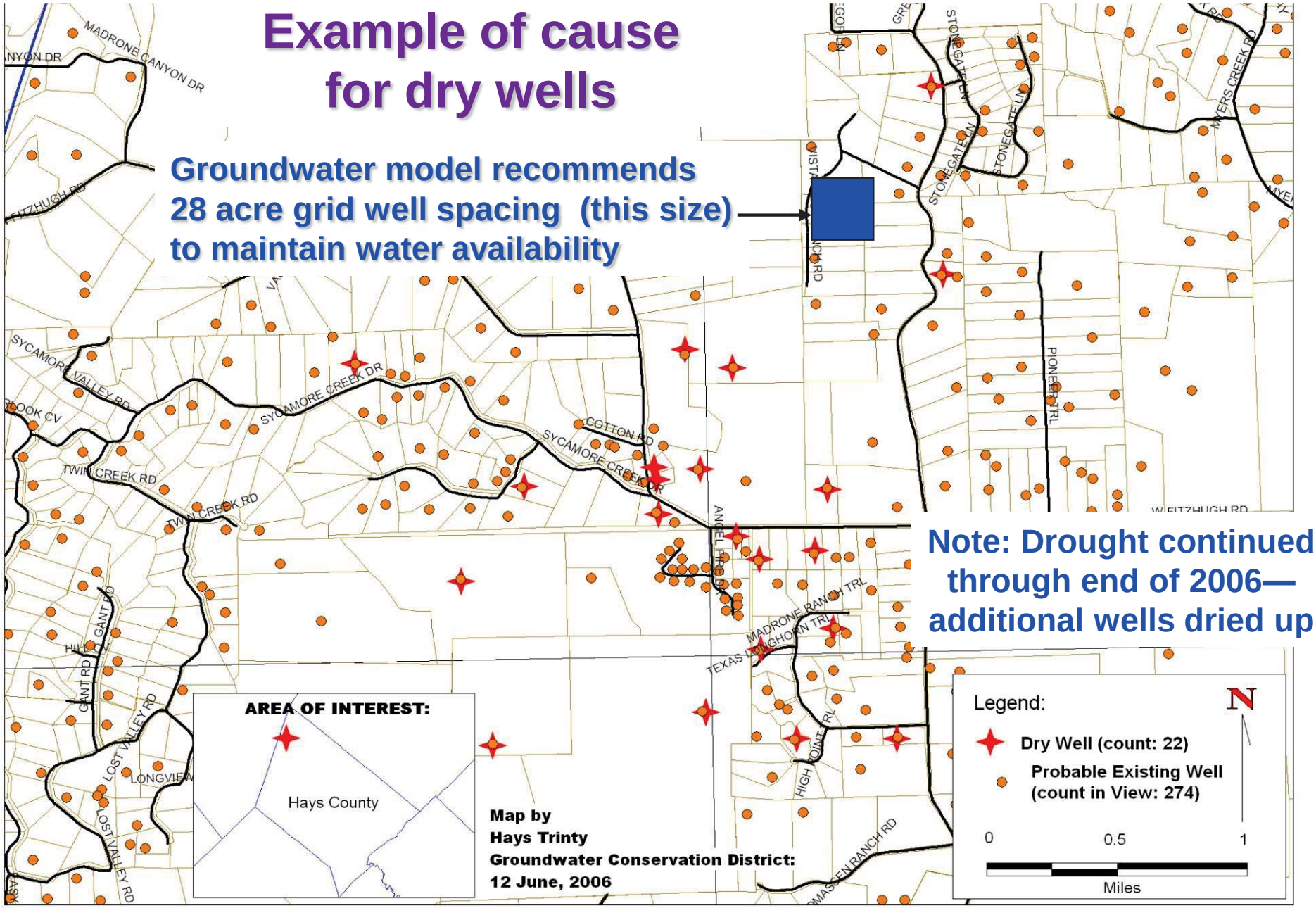
- **Over next 40 years, $800 million in capital funds needed for corrective action**

- **Additional funding of $2-5 million per year needed for maintenance, review and inspection, public education, and design support**

Travis County current and future water shortages

Example of cause for dry wells

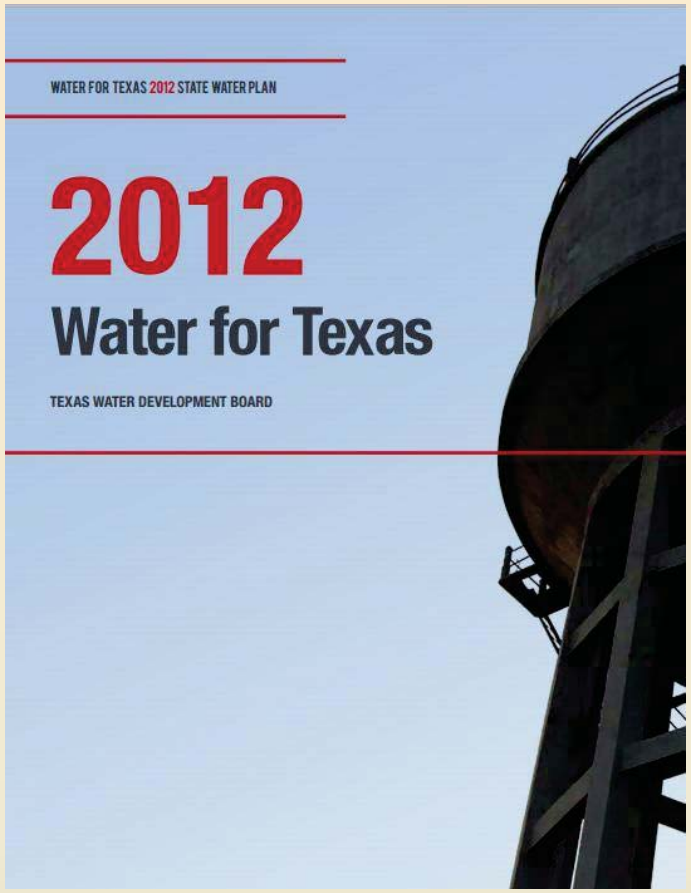
Groundwater model recommends 28 acre grid well spacing (this size) to maintain water availability



Note: Drought continued through end of 2006— additional wells dried up

Northridge Subdivision, NW Hays County, June 12, 2006

Texas Water Plan 2012



Texas Water Development Board

Purpose of Plan

Estimate current and future water needs (shortages) and identify water management strategies and associated costs to meet future needs.

Based on

- **Data and analyses of current and future population, water use, and water availability**
- **Severe drought conditions (water use at maximum and availability at minimum)**
- **6 water use types: i.e., municipal (urban & rural) , irrigation, livestock, manufacturing)**

http://www.twdb.state.tx.us/wrpi/swp/swp.asp

Municipal (urban and rural) water needs (shortages) for Travis County

2010 Severe drought conditions

WATER USER GROUP	Demand	Water Supply	Need
BARTON CREEK WEST WSC	401	348	(53)
BEE CAVE VILLAGE	1,177	241	(936)
GOFORTH WSC	30	19	(11)
JONESTOWN	467	338	(129)
LAKEWAY	4,750	3,069	(1,681)
RIVER PLACE ON LAKE AUSTIN	1,470	900	(570)
ROUND ROCK (Travis County)	399	241	(158)
Totals	8,694	5,156	(3,538)

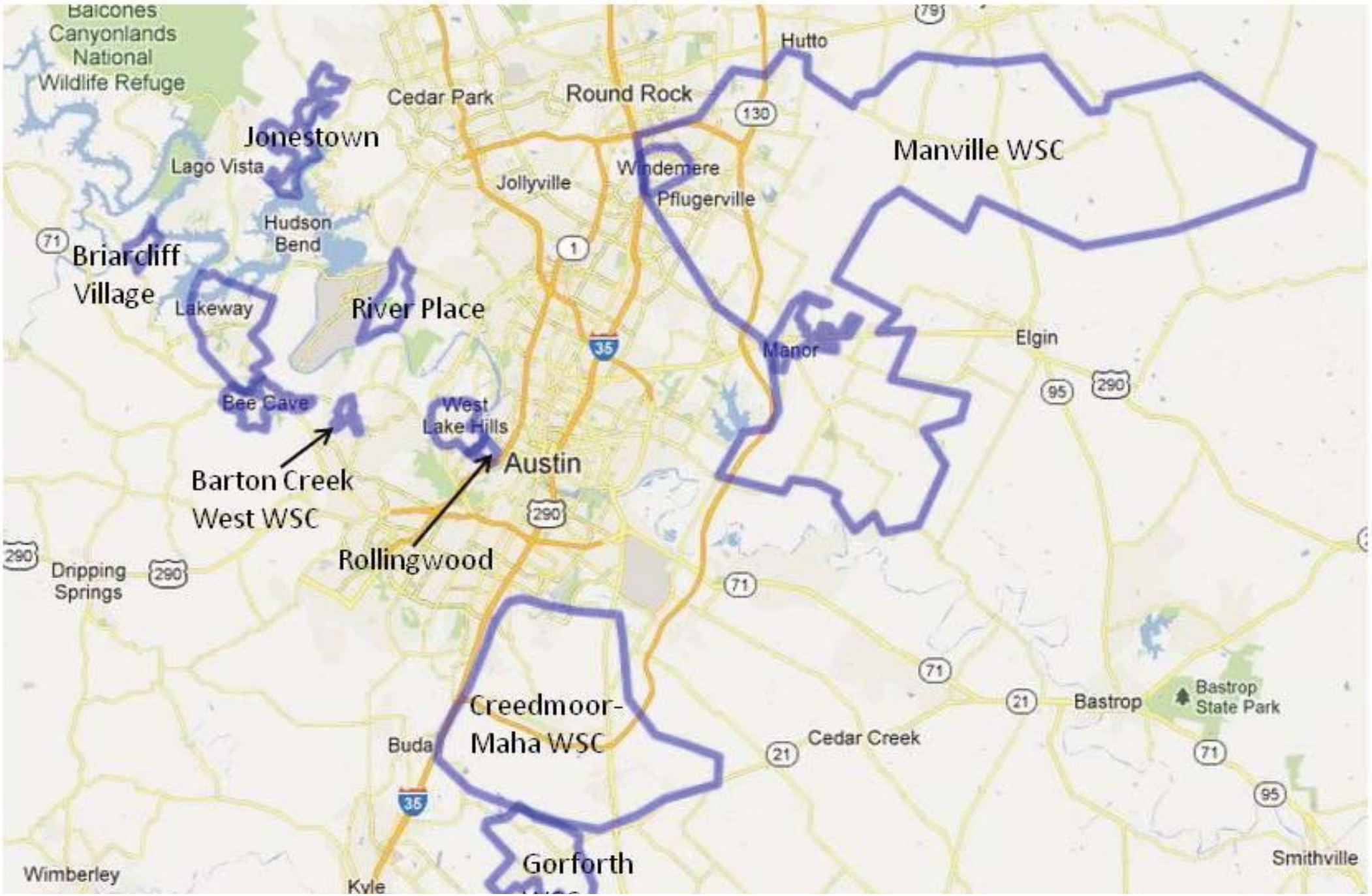
28,000 people
Need volume = 16% of Lake Austin

2030 Severe drought conditions

WATER USER GROUP	Demand	Water Supply	Need
BARTON CREEK WEST WSC	395	348	(47)
BEE CAVE VILLAGE	1,647	241	(1,406)
BRIARCLIFF VILLAGE	345	300	(45)
CREEDMOOR-MAHA WSC	820	272	(548)
GOFORTH WSC	47	17	(30)
JONESTOWN	625	296	(329)
LAKEWAY	6,582	3,069	(3,513)
MANOR	1,834	661	(1,173)
MANVILLE WSC	2,898	2,067	(831)
RIVER PLACE ON LAKE AUSTIN	1,723	900	(823)
ROLLINGWOOD	374	-	(374)
ROUND ROCK (Travis Co.)	792	264	(528)
WEST LAKE HILLS	2,049	-	(2,049)
WINDERMERE UTILITY CO.	2,201	-	(2,201)
Totals	22,332	8,435	(13,897)

105,000 people
Need volume = 60% of Lake Austin

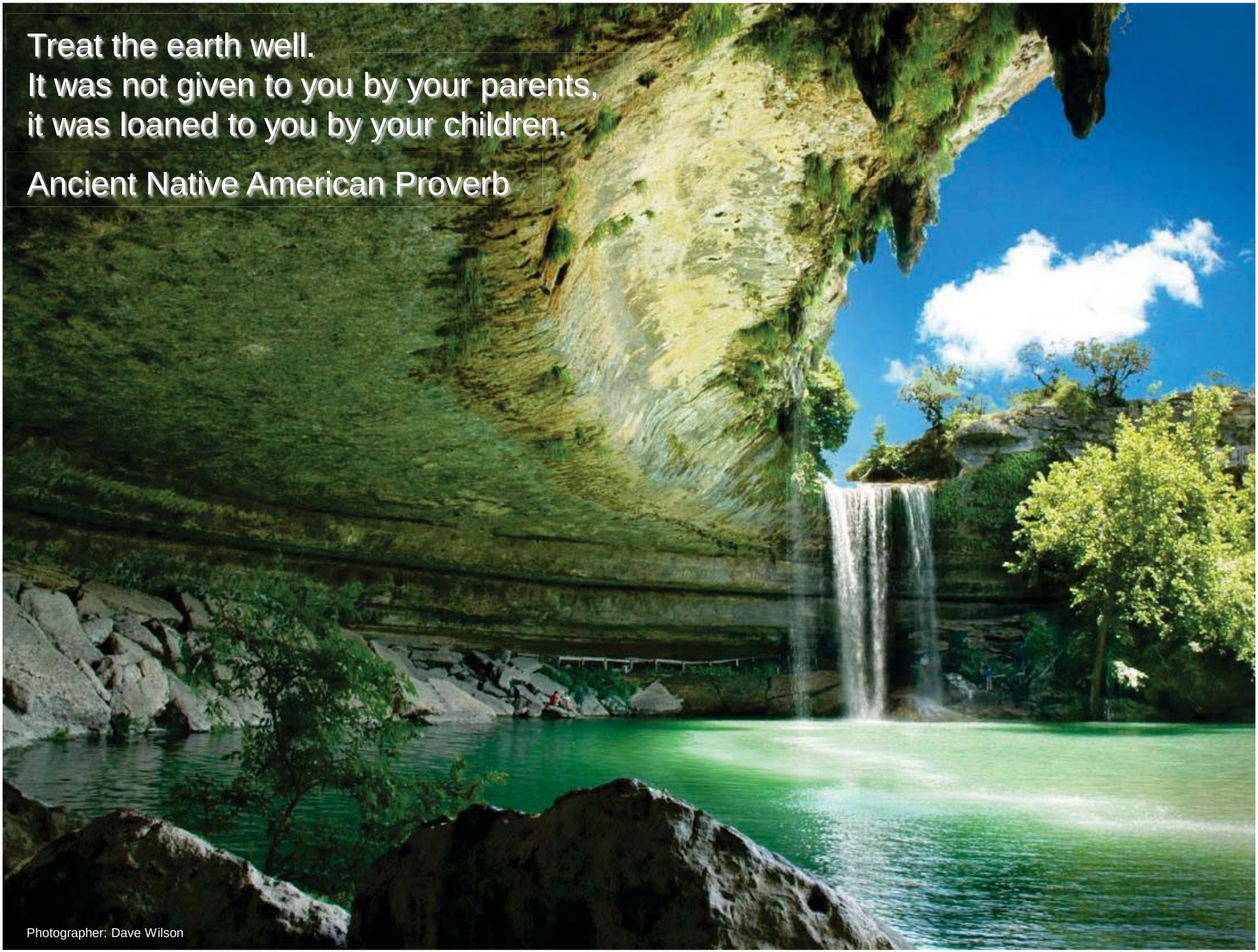
Service areas--Travis County municipal water shortages, 2030



2060 Severe drought conditions

WATER USER GROUP	Demand	Water Supply	Demand
AUSTIN	293,095	230,132	(62,963)
BARTON CREEK WEST WSC	391	348	(43)
BEE CAVE VILLAGE	2,164	241	(1,923)
BRIARCLIFF VILLAGE	449	300	(149)
CREEDMOOR-MAHA WSC	1,030	223	(807)
ELGIN	25	22	(3)
GOFORTH WSC	63	15	(48)
JONESTOWN	809	255	(554)
LAKEWAY	8,641	3,069	(5,572)
MANOR	2,378	661	(1,717)
MANVILLE WSC	4,019	985	(3,034)
PFLUGERVILLE	12,441	10,460	(1,981)
RIVER PLACE ON LAKE AUSTIN	1,717	900	(817)
ROLLINGWOOD	373	-	(373)
ROUND ROCK	1,167	210	(957)
TRAVIS COUNTY WCID #18	1,683	1,400	(283)
WEST LAKE HILLS	2,471	-	(2,471)
WEST TRAVIS COUNTY REGIONAL WS	2,023	6,543	4,520
WINDERMERE UTILITY COMPANY	2,180	-	(2,180)
Totals	337,119	255,764	(81,355)

1.78 million people
Need volume = 3.7 times greater than Lake Austin


Treat the earth well.
It was not given to you by your parents,
it was loaned to you by your children.
Ancient Native American Proverb
Photographer: Dave Wilson