Suitability and Sustainability

Stormwater Management and Environmental Protection

June 6, 2012

Brian Reis, PE

RPS Espey

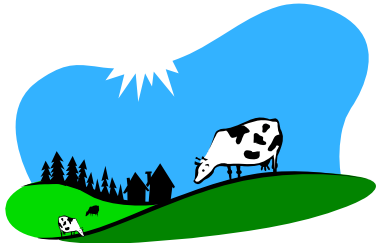
Outline

- RPS Espey's role in the planning process
- Key state and federal requirements
- Our unique water quantity and water quality challenges
- Summary of additional things to consider as we move forward

RPS Espey

RPS Espey's Role Part 1 of 2
Land Use Suitability Analysis/Mapping

- The suitability of areas for development will initially be identified through a mapping exercise to determine which areas are more restrictive than others.



Most Restrictive

Least Restrictive

  - Statutory requirements/existing regulations
  - Community values (quality of life, historic areas, cultural value)
  - Environmental protection goals

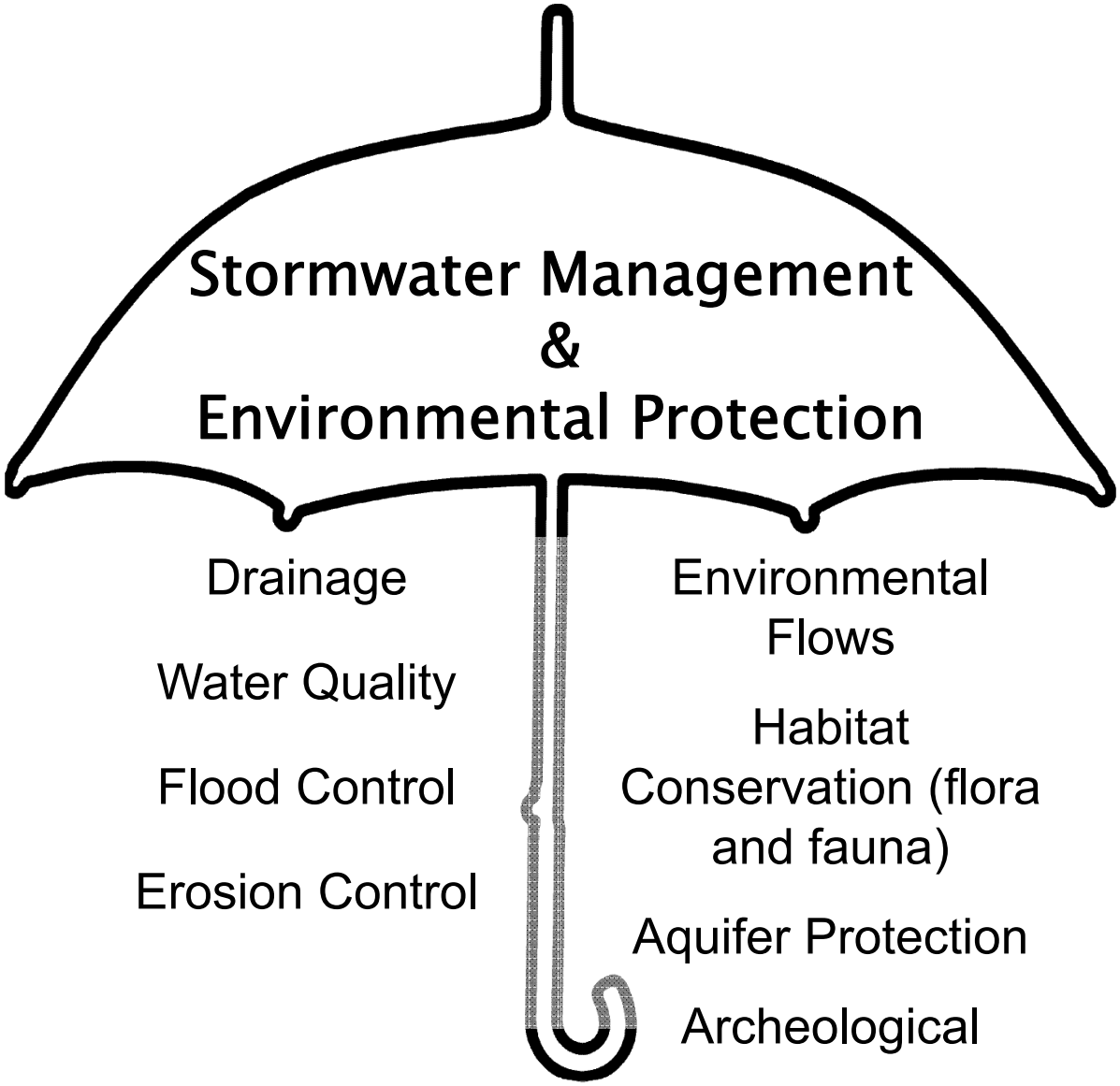
RPS Espey

RPS Espey's Role Sustainability

Part 2 of 2

- Drainage
- Flood Control
- Water Quality
- Erosion Control
- Other Environmental Protection Issues
  - Environmental Flows
  - Habitat Conservation (flora and fauna)
  - Aquifer Protection
  - Archeological
  - Etc.

RPS Espey


Stormwater Management
&
Environmental Protection
Drainage
Water Quality
Flood Control
Erosion Control
Environmental Flows
Habitat Conservation (flora and fauna)
Aquifer Protection
Archeological
Etc.

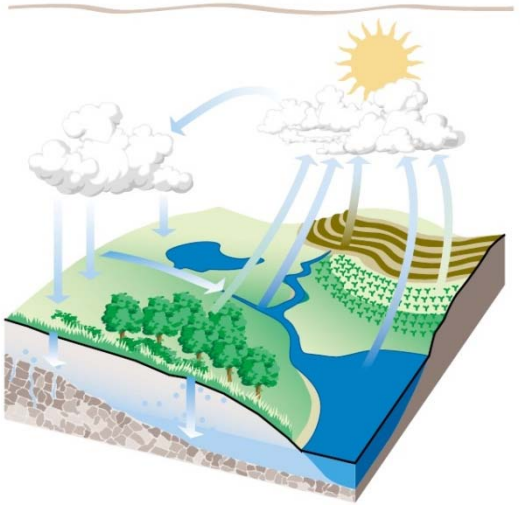
Key state and federal requirements

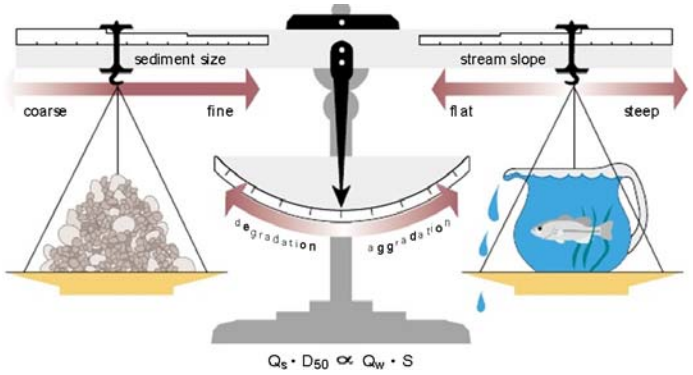
- Storm Water Management Program
  - Regulated by the TCEQ / MS4 Permit
  - Control discharges of pollutants

- Habitat Conservation Plan
  - Required by the USFWS / Incidental Take Permit
  - Identifies activities required to minimize impacts to threatened and endangered species

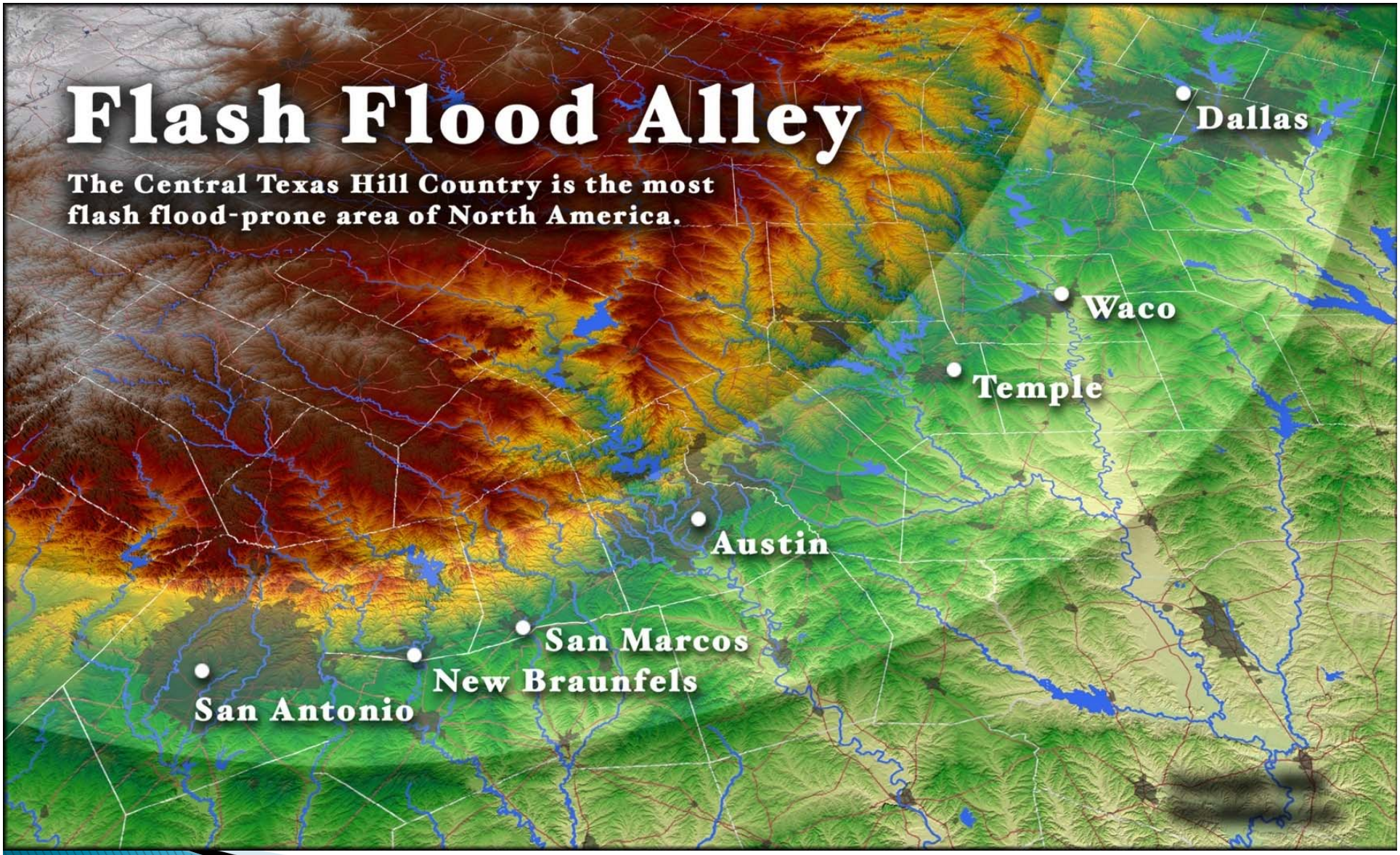
Adverse impacts can result from…

- Physical <u>increases</u>
  - Peak flow rates
  - Frequency of bank full conditions
  - Stormwater pollution
  - Sediment transport (aggradation)
  - Etc.
- Physical <u>reductions</u>
  - Base flow
  - Infiltration
  - Sediment transport (degradation)
  - Etc.

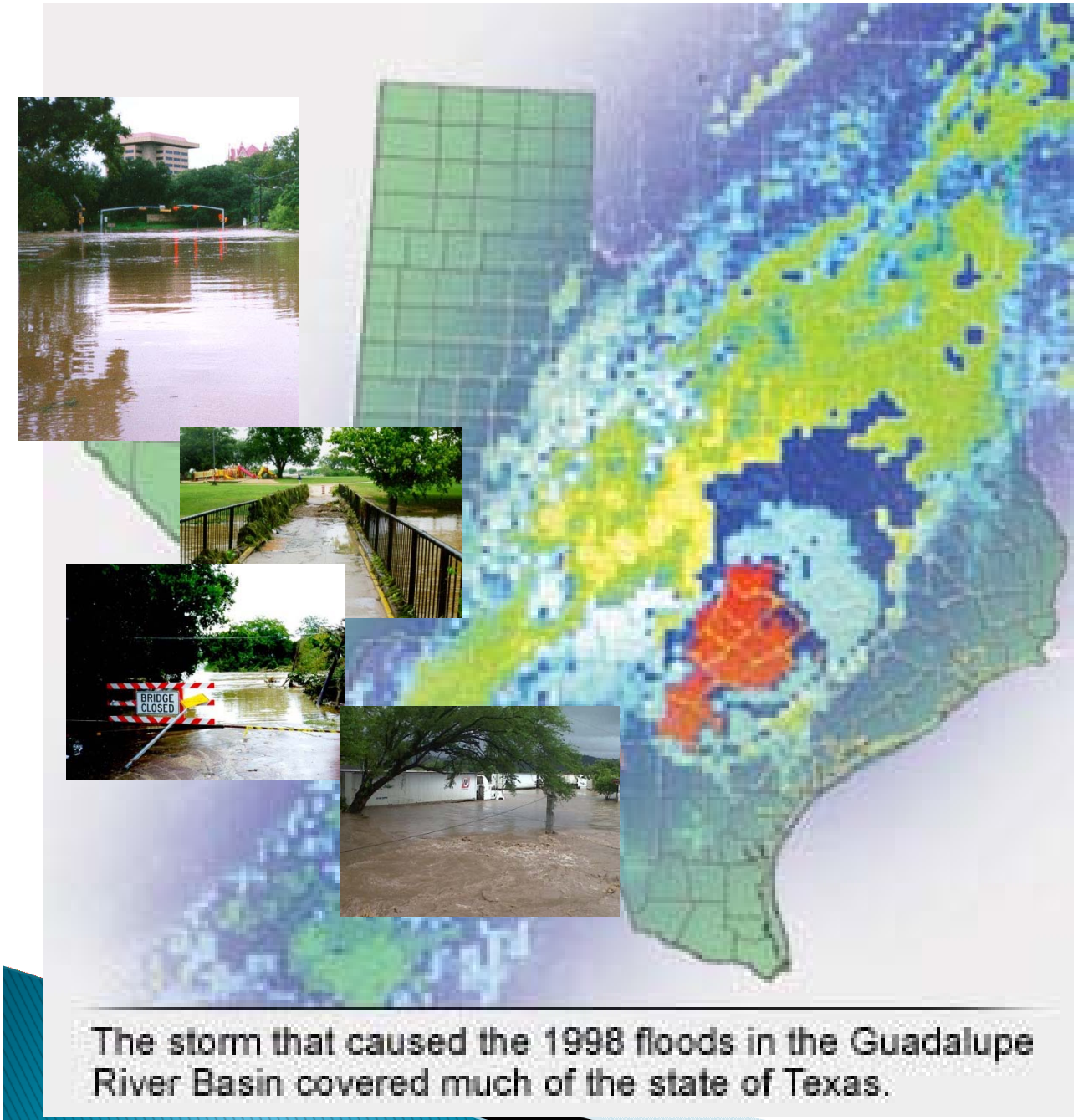




RPS Espey


Flash Flood Alley
The Central Texas Hill Country is the most flash flood-prone area of North America.
Dallas
Waco
Temple
Austin
San Marcos
New Braunfels
San Antonio

RPS Espey



The storm that caused the 1998 floods in the Guadalupe River Basin covered much of the state of Texas.

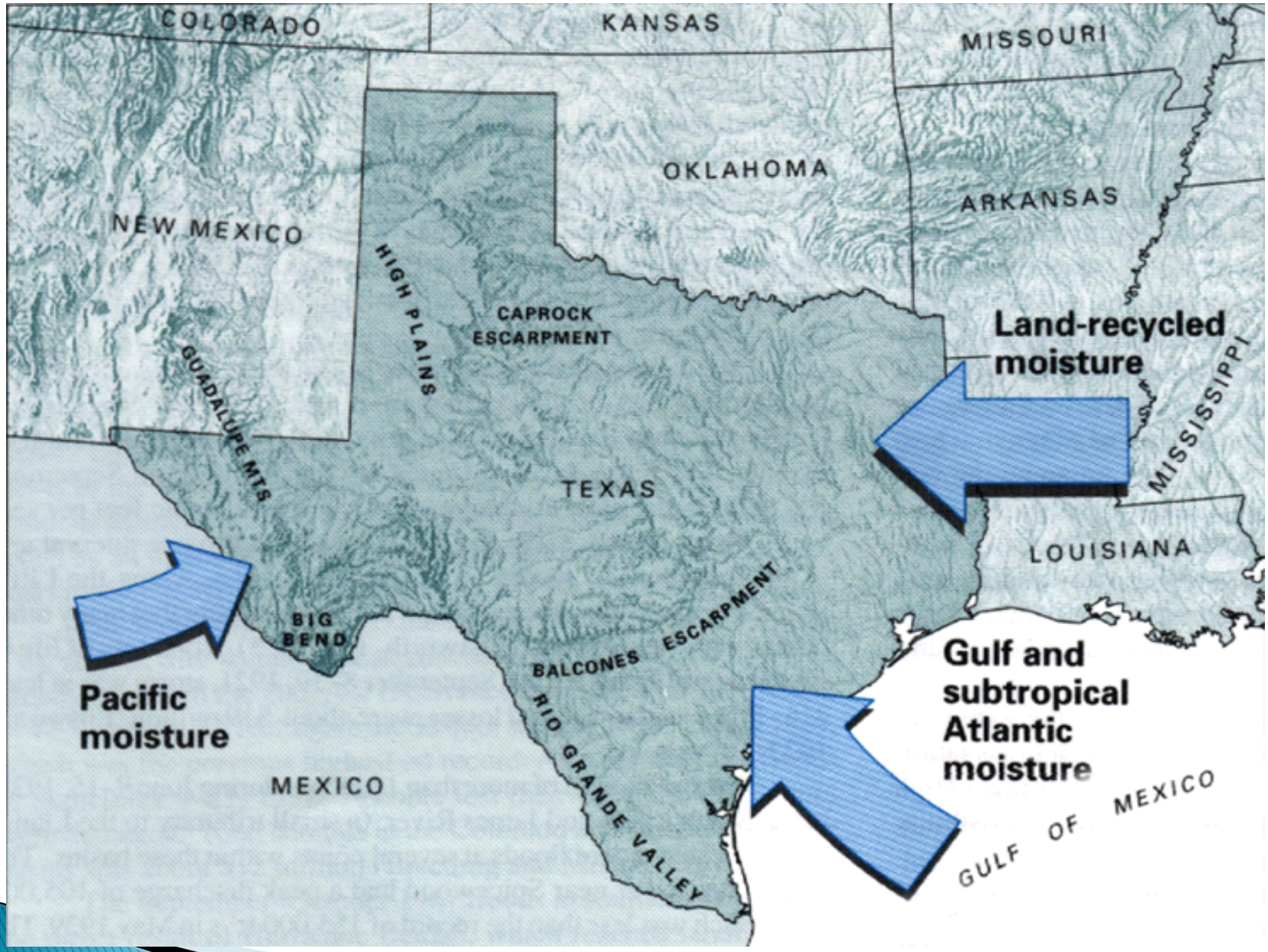
Oct. 17–18, 1998

20–30 inches

31 deaths

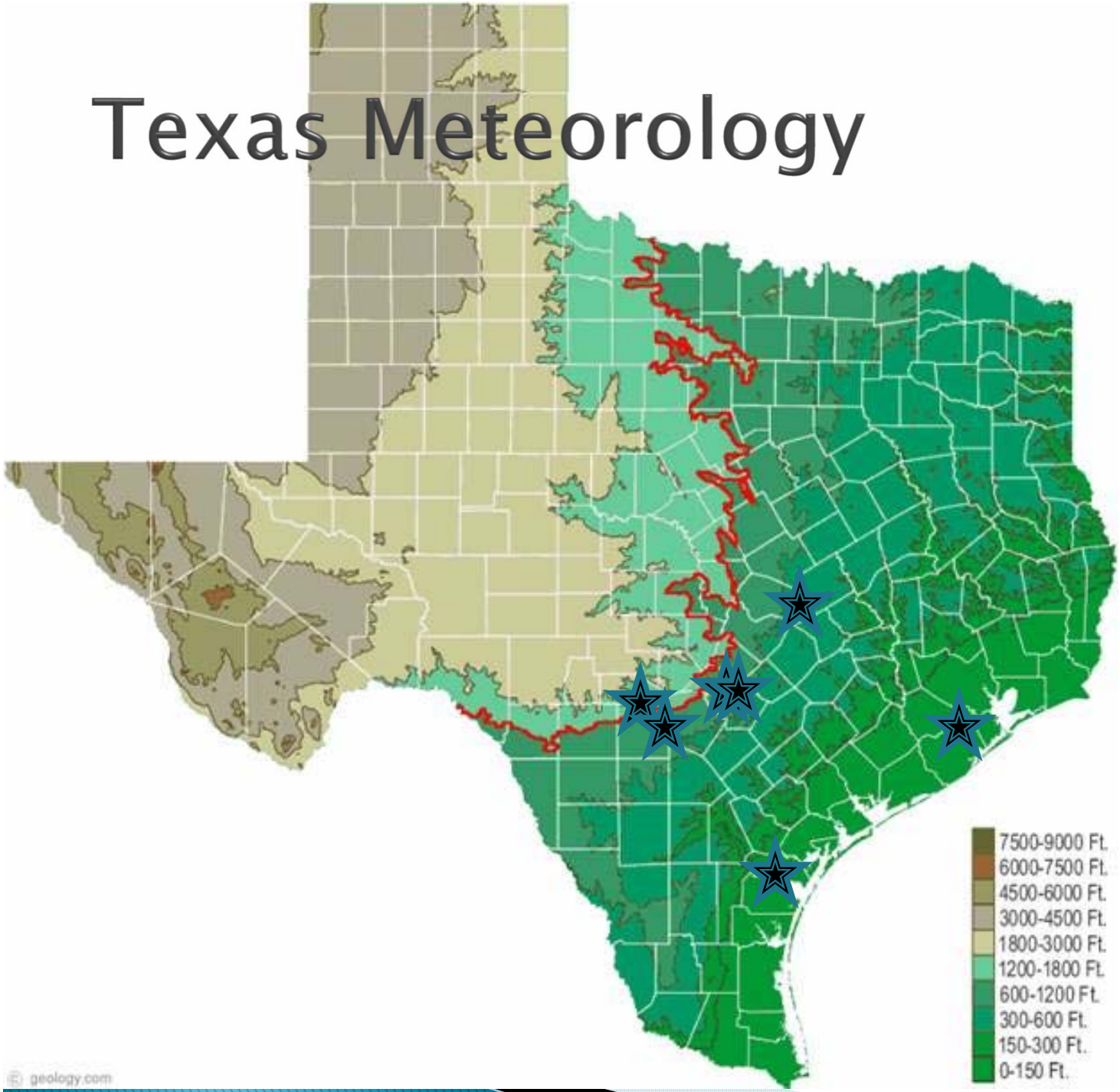
$750 million in damages

RPS Espey


COLORADO
KANSAS
MISSOURI
OKLAHOMA
ARKANSAS
NEW MEXICO
HIGH PLAINS
CAPROCK ESCARPMENT
GUADALUPE MTS
Land-recycled moisture
MISSISSIPPI
TEXAS
LOUISIANA
BIG BEND
BALCONES ESCARPMENT
Pacific moisture
Gulf and subtropical Atlantic moisture
RIO GRANDE VALLEY
MEXICO
GULF OF MEXICO

RPS Espey

Texas Meteorology



24 hours
Thrall 39" 1921
Alvin 50" 1979
Medina 30" 1978

6 hours
New Braunfels 15" 1972

4 hours
Odem 30" 1984

3 hours
D'Hanis 18" 1935

1 hours
New Braunfels 10" 1972

RPS Espey

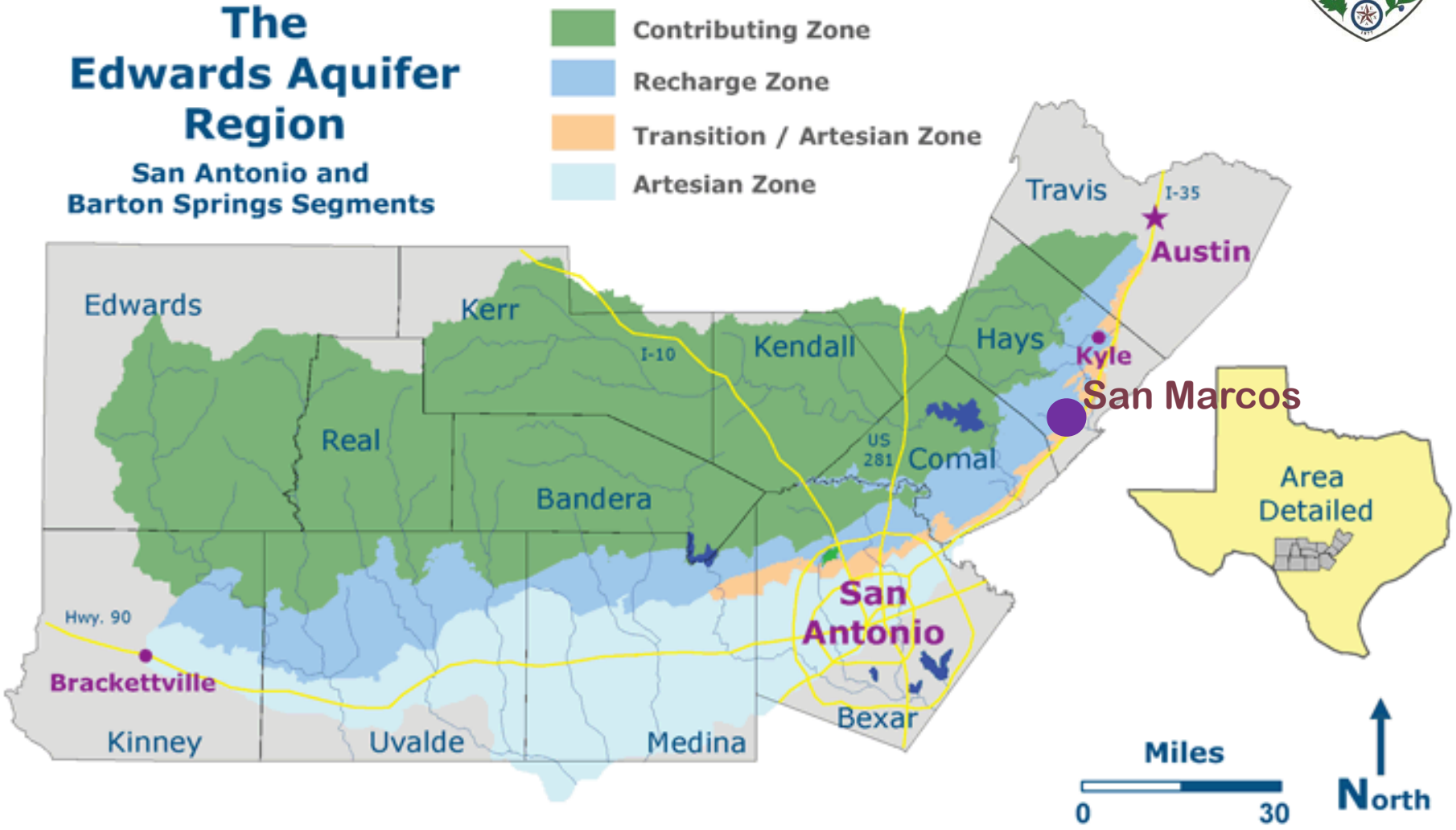
City's Quantity Criteria (1 of 2)

- 100-year are to be conveyed / contained within ROW
- Peak flow shall not cause increased inundation of any building or roadway for the 2-, 5, 10-, 25-, 50- or 100-year storms
- Detention is required for the 2- and 25-year storms

City's Quantity Criteria (2 of 2)

- Development within the floodplain shall not increase the base flood elevation by more than 1 foot.
- Development within the floodway shall not result in any increase in the base flood.
- Floodplain alterations shall not create an erosive water velocity (> 6 fps) on- or off-site.

Water Quality Considerations



RPS Espey

Water Quality Considerations

- One of the largest springs in TX
- Recreation area
- Home to several threatened or endangered species
  - Texas Blind Salamander
  - Fountain Darter
  - Texas Wild Rice
- Pending regulations
  - EPA/TCEQ (MS4)
  - USFWS (HCP)

City's Quality Criteria

- Limits on impervious cover
  - Slopes (i.e. <15%, 15% to 25%, > 25%)
  - Special areas: Edwards Aquifer, SM River Corridor
- WQ Zones and Buffer Zones
- Discourages the use of enclosed storm sewer systems and promotes sheet flow / infiltration
- Permanent Best Management Practices (BMPs)
  - Edwards Aquifer – limits increase in TSS
  - SM River Corridor – requires removal of lead, zinc, iron, TP, TN, TSS and fecal coliform

Additional Things to Consider
(Water Quality vs Impervious Cover)

- Strong relationship between water quality and impervious cover
- The most significant contributor to impaired streams is non-point source pollution.
- Compact development approach accommodates more activity while consuming less space, in turn reducing overall imperious cover that helps to maintain watershed functions.

RPS Espey

Additional Things to Consider
(Density)

- Building compact, walkable, mixed-use communities can reduce the overall per capita amount of impervious cover in the watershed

Impervious Cover ↑ = Water Quality ↓

Density ↑ ≠ Water Quality ↓

RPS Espey

Sustainable development is…

- Managing quality and quantity of stormwater
- Protecting natural and cultural resources
- Promoting development in appropriate places
- Creating complete mixed-use communities

…and many other things.

RPS Espey

Summary

- RPS Espey's role in the planning process
- Key state and federal requirements
- Our unique water quantity and water quality challenges
- Summary of additional things to consider as we move forward

RPS Espey