

Atlas 14 & the City of San Marcos City Council Workshop

June 14, 2019

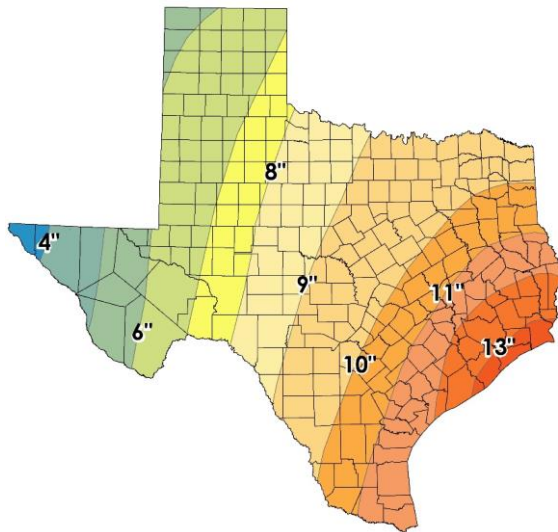
Rainfall, how do we use it?

- **Design Infrastructure**
 - Storm drains / inlets
 - Open channels
 - Detention systems
 - Bridges / culverts
- **Basis for**
 - Floodplain Regulations
 - Design Criteria
 - Hydrologic & Hydraulic Analysis

WHAT IS ATLAS 14? | RAINFALL DATA HISTORY

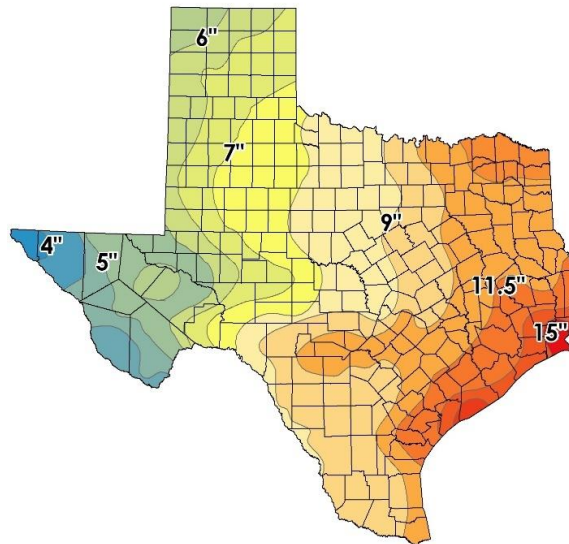
1961 TP-40

Weather Bureau Technical
Paper 40
— Rainfall up to 1958



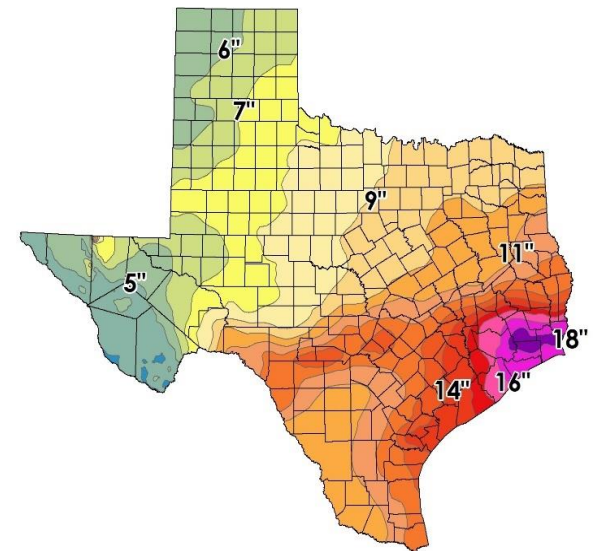
1998 USGS

■ Depth-Duration Frequency
of Precipitation for Texas
— Rainfall up to 1994

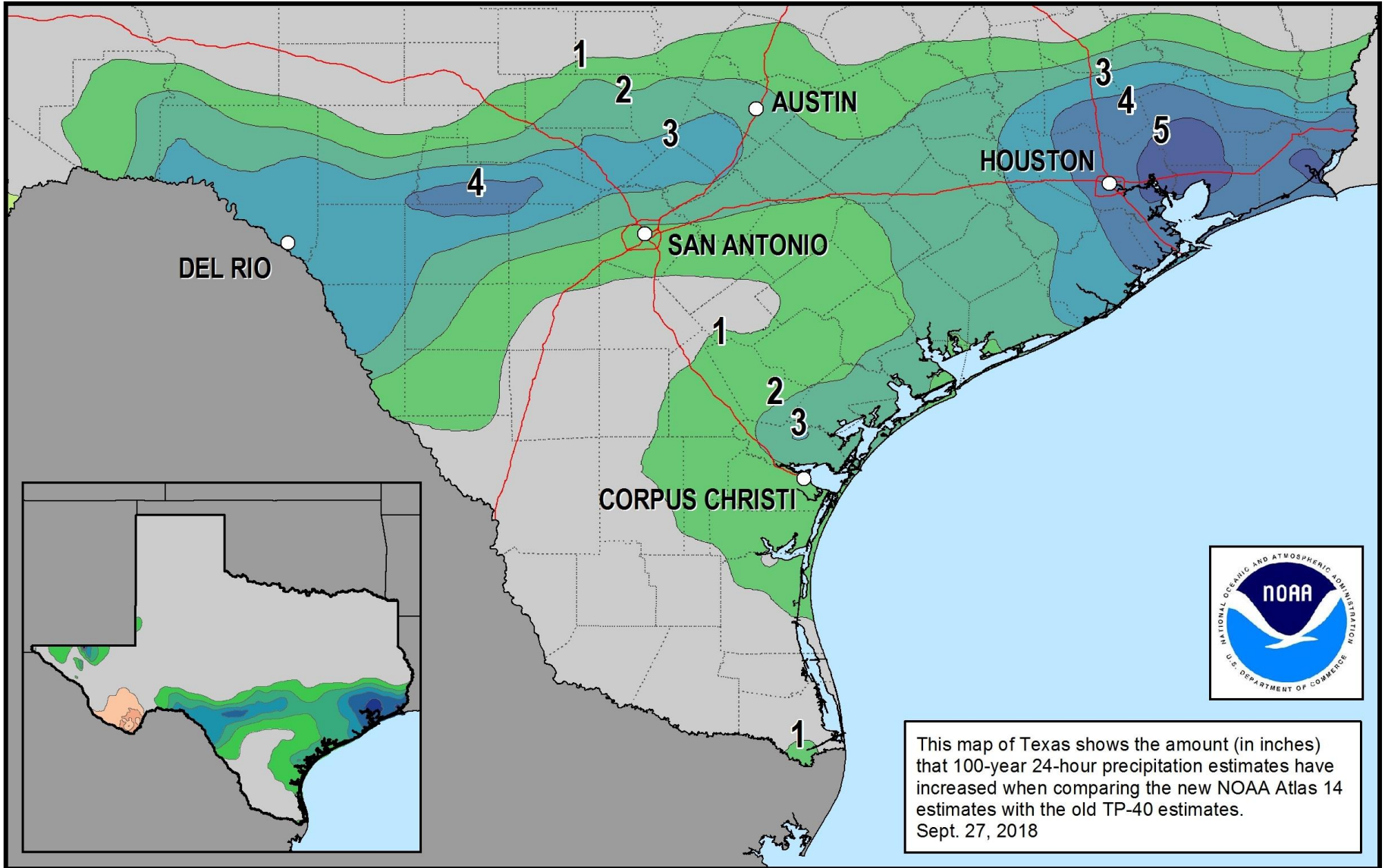


2018 ATLAS 14

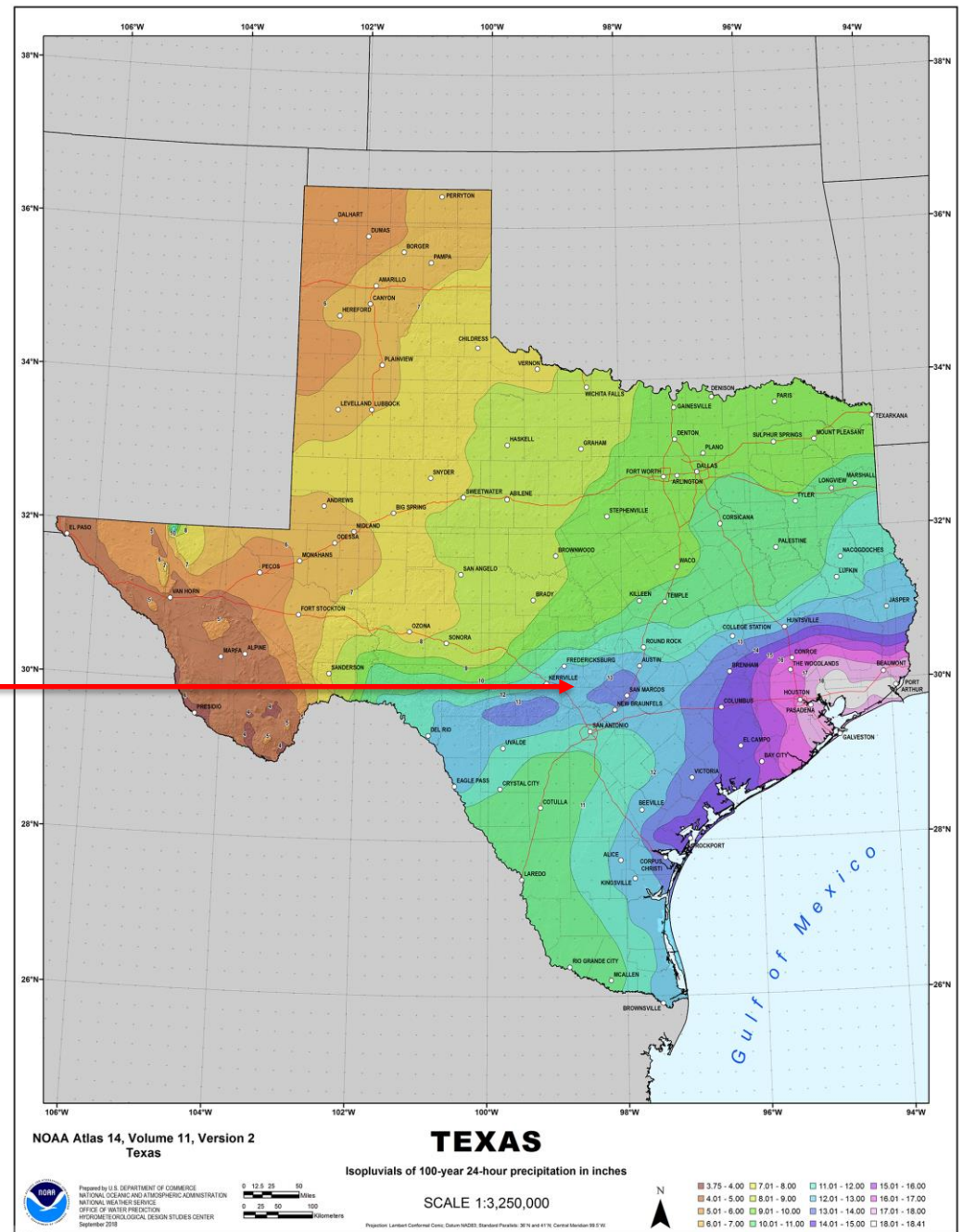
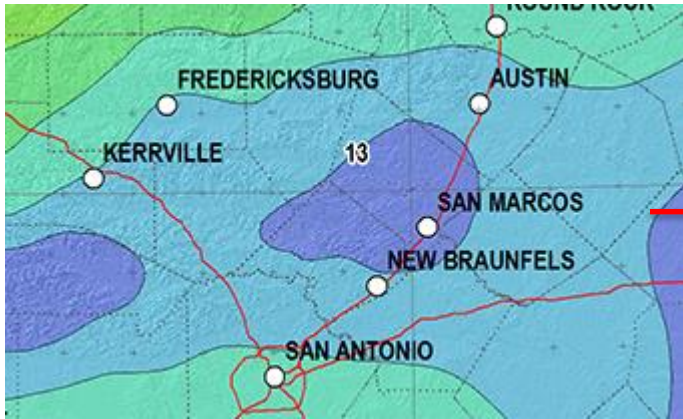
■ NOAA Atlas 14, Volume 11
Precipitation Frequency Atlas
of the United States, Texas
— Rainfall up to 2017



24-hour, 100-year
Precipitation



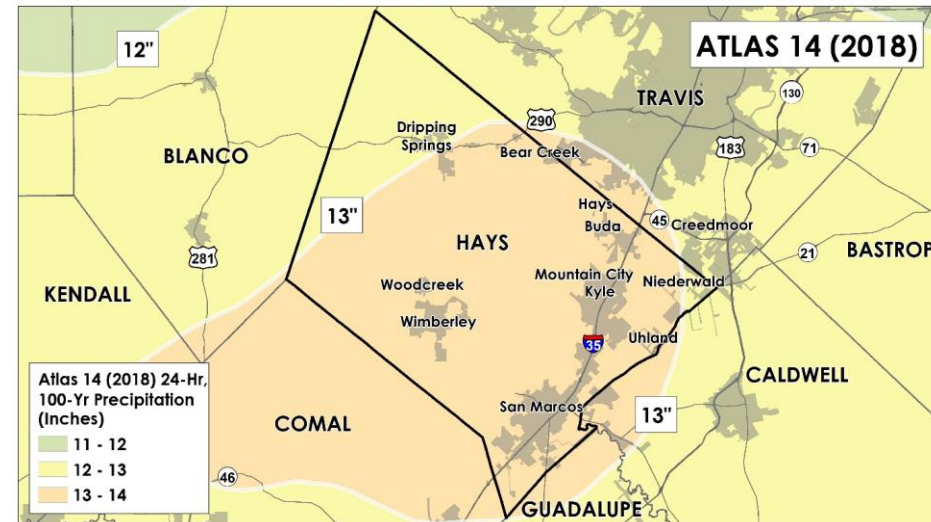
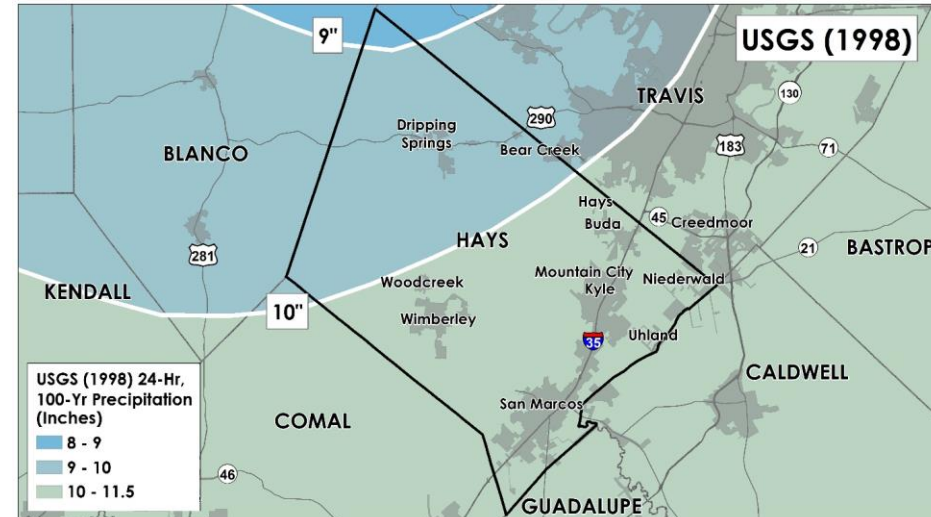
100 Year - 24 Hour Rainfall (inches)



WHAT IS ATLAS 14? | CHANGES

HAYS COUNTY

Frequency Event	Annual Chance Probability	Countywide Average 24-hour Precipitation Depths (inches)	
		USGS (1998)	ATLAS 14 (2018)
500-year	0.2%	13.8	19.9
100-year	1%	10.5	13.3
50-year	2%	9.2	11.0
25-year	4%	7.9	9.1
10-year	10%	6.4	7.0
5-year	20%	5.3	5.6
2-year	50%	3.8	4.2
1-year	100%	1.4	3.1



WHAT IS ATLAS 14? | FREQUENCY NOMENCLATURE

CHANGING HOW WE COMMUNICATE FLOOD RISK

Flood Events	Probability of Occurrence in ANY given year	Percent Chance of Occurrence in ANY given year	Percent Chance of Occurrence over a 30-year Mortgage
500-year	1 in 500	0.2%	6%
100-year	1 in 100	1%	26%
50-year	1 in 50	2%	45%
10-year	1 in 10	10%	96%

What does this mean?

- **More rainfall requires larger infrastructure**
 - Private development
 - Public / Capital Improvement Projects
 - More cost
- **Floodplain maps**
 - Floodplains will expand
 - More homes and businesses are at risk than previously thought
- **Regulations / Criteria**
 - Will require updates

What are Others Doing?

- **Central Texas Atlas 14 Group**
- **Participating Agencies**
 - Cities (Austin, San Marcos, San Antonio, Georgetown, etc.)
 - Counties (Hays, Travis, Williamson)
 - Texas Department of Transportation (TxDOT)
- **Meeting monthly – sharing efforts**

What are Others Doing?

- **Texas Department of Transportation**
 - Adopted as ***best available data*** in November 2018
 - TxDOT Hydraulic Design Manual to be updated 2019
 - Projects in Planning and Schematic Phases will incorporate
 - Projects in Final design will use case by case
- **City of Austin**
 - Issued Guidance Document for design criteria changes
 - Recommended Floodplain Code Changes (Until maps changed)
 - Updating maps – 2 to 3 years plus time for FEMA process
 - Outreach on changes
- **Hays & Travis Counties**
 - Evaluating options

Outside of Central Texas?

- **City of Houston / Harris County Flood Control District**
 - Revised regulations
 - New and substantial improvements within the 500-year floodplain to be built to 2-feet above the adjacent FEMA 500-year floodplain
 - In the process in revising floodplain maps
- **Other Texas communities evaluating revising regulations**

San Marcos Considerations

- **FEMA Floodplain maps**
 - New version to be released in Summer 2020
 - New maps will not reflect Atlas 14 rainfall
 - To update, will require revised H&H models, mapping and FEMA approval process
 - Coordination with FEMA and USACE
- **Changes to City ordinances and design criteria**
- **Changes to CIP projects**

San Marcos Evaluation

- **Hydrologic Testing**
 - Precipitation values (new rain amounts)
 - Distribution (how it rains over time)
 - Loss methodologies (how it runs off)
- **Preliminary Results show flow increases**
 - Riverine Areas
 - Atlas 14 1% (100-year) = Current 0.4% (250-year)
 - Atlas 14 4% (25-year) = Current 2% (50-year)
 - Higher Impacts in non-riverine areas than riverine areas

Evaluation Recommendations

- **Update Design Criteria to reflect Atlas 14**
 - In-process development projects vested under old values
 - Evaluate changes to in-process CIP projects on a case by case basis.
 - Use updated criteria on future projects
- **Further evaluation needed to determine changes to regulation of FEMA floodplains**
 - Existing enhanced regulations provide some safety margin in lieu of revised maps.
 - Need to determine how to revise to reduce future risk.

Implementation

- **Update Design Criteria – August 2019**
 - Notification to development community
 - Revised criteria posted on website
 - Incorporate any LDC changes in update process
- **Further evaluation needed to determine changes to regulation of FEMA floodplains**
 - Existing enhanced regulations provide some safety margin in lieu of revised maps.
 - Evaluating how to revise to reduce future risk.
 - Recommendation for ordinance revisions in the Fall

Questions