

## **Late June and Early July Floods of 2002 Over The Texas Hill Country and South Central Texas**

**The extreme magnitude of dry periods followed by extreme flooding, over the Texas Hill Country and South Central Texas, like what happened in 2002 was similar to the following historical weather events in the area since 1950: 1. The extreme dry period from 1950 to 1956 that ended with floods in the spring of 1957; 2. The dry period in the summer of 1967 that ended with floods from the remnants of Hurricane Beulah in September 1967; 3. The extreme dry period in the drought of 1970-1971 that ended with floods in August 1971; 4. The very dry summer of 1978 that ended with extreme floods in August 1978 associated with the remnants of Tropical Storm Amelia; 5. The dry late summer and fall of 1991 that ended with floods in December 1991 and the on going heavy rain events in the first half of 1992; and 6. The very dry period from the spring 1998 to early August 1998 that ended with floods in August 1998, associated with the remnants of Tropical Storm Charley, and shortly followed by the Floods of October 1998.**

**By itself, June 2002 was a month of precipitation extremes, in a month that began very dry, and then ended in the last 5 days with much more widespread rain, that lead into extreme flooding, and then increased into a major flood event by June 30th to the first 6 days of July 2002. After a mostly hot and dry month in June, a few changes began to unfold on June 25 and 26. On Tuesday afternoon June 25th, widely scattered showers and a few thunderstorms formed over the eastern part of South Central Texas. In the early evening hours, the shower activity moved west and dissipated bringing only spotty rains to parts of South Central Texas. The next day June 26th, the day began with continued hot temperatures under the high late June Subtropical Sun. Afternoon highs rose to 99 at San Antonio, 103 at Del Rio, and 97 at Austin Mabry and Austin Bergstrom. In the afternoon showers and thunderstorms formed again, giving way to a few more afternoon and evening showers and thunderstorms on Wednesday June 26th. On June 27th, the shower and thunderstorm activity increased more, as locally heavy rain fell in a few isolated spots. Shower and thunderstorm activity continued to increase the 28th and 29th, as more widespread rains came. Locally heavy rains fell in parts of the hill country. Daytime highs moderated significantly also, from their lofty levels, above normal yet not any record highs, of June 2002.**

**By June 30th, heavy rains fell across parts of the hill country again and extended east to the Austin and San Marcos Areas. On July 1st very heavy rains, from showers and thunderstorms, broke out in the predawn hours and continued most of the day, with very heavy rain in the late afternoon and early evening. Flooding occurred over the Texas Hill Country and also parts of South Central Texas. San Antonio International Airport picked up 9.52 inches of rain on just the 1st, setting not just a record daily rainfall for July 1st, also for the whole month of July, exceeding even the July Monthly record of 8.29 inches in July of 1990. In the late evening hours showers and thunderstorms began to form again before midnight. After midnight on July 2nd, the showers and thunderstorms formed again in the**

predawn hours of July 2nd, and brought another round of very heavy rains to the area once again. More flooding occurred. Although the rain let up in the afternoon, it returned again the night of the 2nd and early morning of the 3rd. Rains calmed down in the mid to late afternoon of the 3rd, only to make a come back, and increase again in the evening and night of the 3rd and into the morning of July 4th. With the ground already saturated from heavy rains since late June, more flooding occurred. The heaviest rains fell to the north, northwest, and west of San Antonio, and also over parts of west and northwest Bexar County. Although the rains let up some in the afternoon of the 4th, they returned once again the evening of the 4th, and then again increased after Midnight. In the early morning hours of Friday, July 5th, a retuning wave of heavy rains from the south moved across the area, and continued after sunrise until the early afternoon. This caused more flooding.

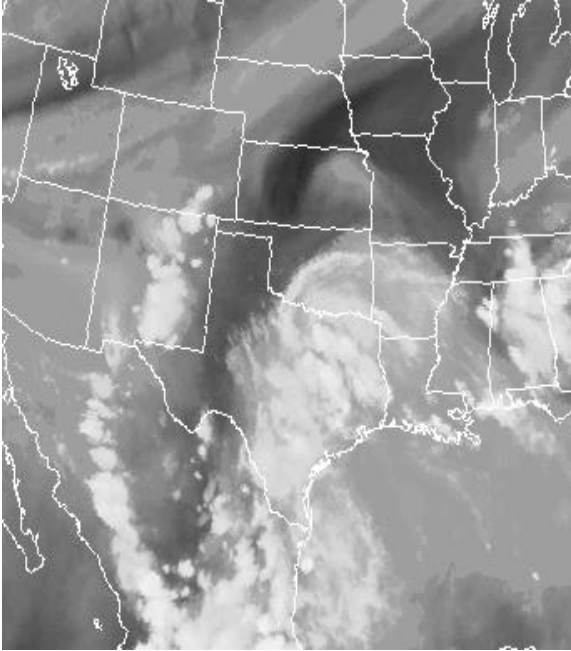
As the low pressure system finally moved further north on the night of Friday the 5th to early morning of Saturday the 6th, the rain activity moved north and west of South Central Texas. During the day of Saturday July 6th, daytime heating caused scattered showers and thunderstorms to form in the afternoon. Rainfall amounts were not has heavy, as only spotty locally heavy rains came. On the night of the 6th and early morning of the 7th, an area of showers and thunderstorms moved in from the west over parts of Val Verde County. These showers and thunderstorms dissipated just before sunrise over parts of Kinney, Edwards and Real Counties.

In the daylight hours on Sunday, July 7th, the day began with sunny skies, and then in the afternoon widely scattered showers and thunderstorms popped up again. These showers and thunderstorms dissipated in the early evening. The same pattern returned Monday July 8th, with mostly sunny conditions in the morning, giving way to widely scattered showers and thunderstorms in the afternoon that dissipated in the evening hours.

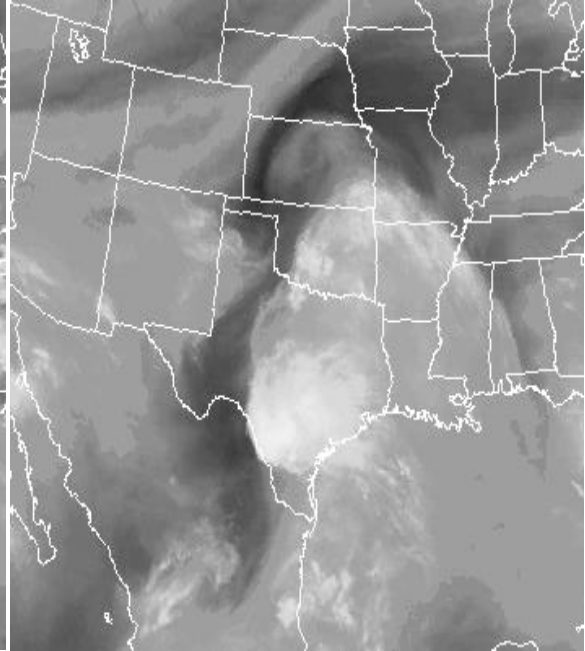
A tropical wave move across the southern tip of Texas the night of Tuesday July 9th and morning of Wednesday July 10th. This pattern help bring scattered afternoon to early evening showers and thunderstorms Tuesday the 9th. On Wednesday the 10th, the showers were widely scattered in the morning over the southern parts of South Central Texas, and spread north to become scattered afternoon to early evening showers and thunderstorms. Afternoon highs were moderated some on the 10th, by multi layered clouds associated with the tropical wave as it moved west across parts of Northeast Mexico.

For the first 10 days of July 2002, the month is the wettest July and was the 3rd wettest month of record for San Antonio, with 15.72 inches of rain. For the first 10 days of July Austin Bergstrom has picked up 3.56 inches of rain, while at Austin Mabry the total is at 4.39 inches. Del Rio has had 0.15 inches of rain in the first 10 days of July 2002.

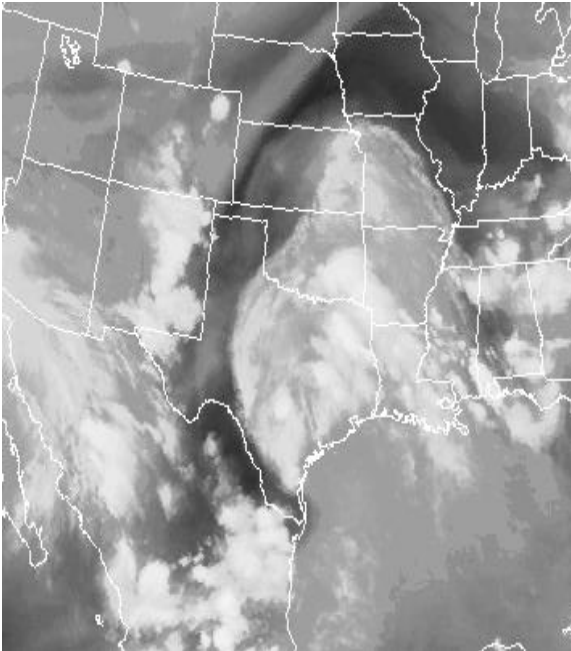
A collection of water Vapor Satellite Photos follows, beginning at 715 pm June 30th and ending at 715 pm July 6th.



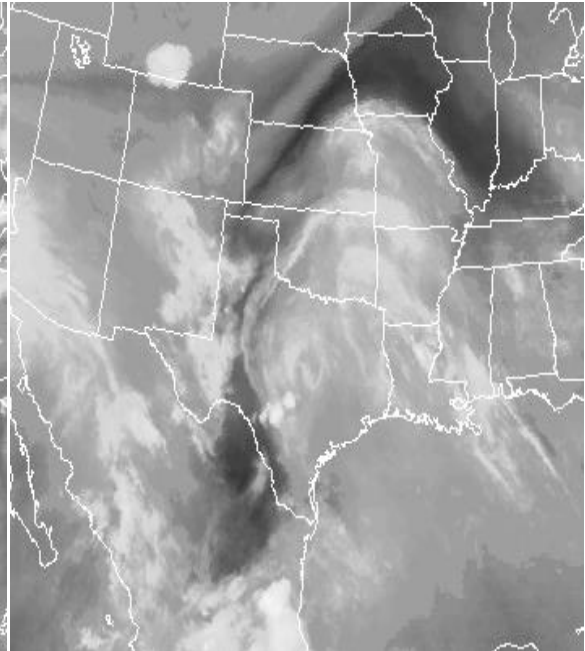
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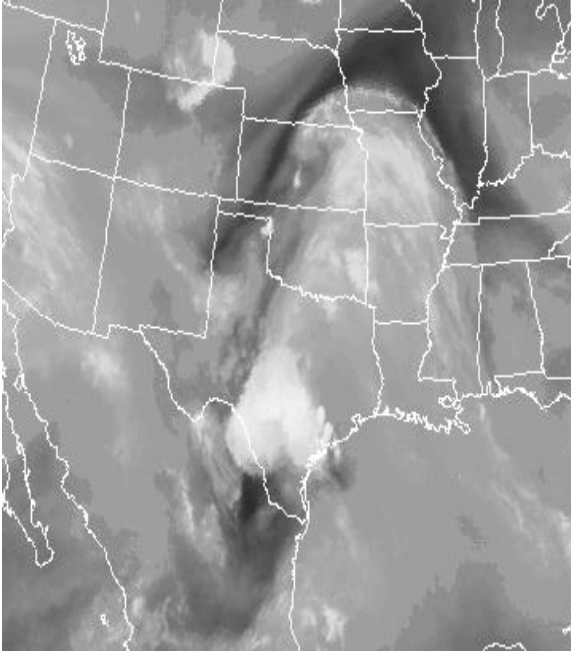
**715 AM CDT Mon Jul 01, 2002**



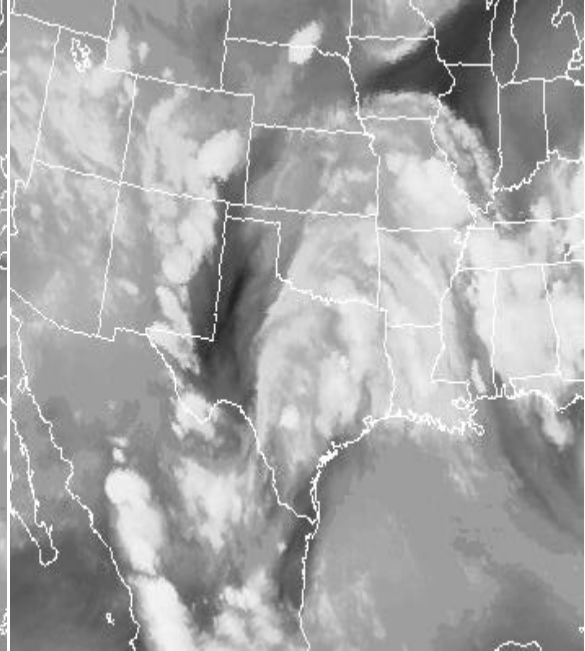
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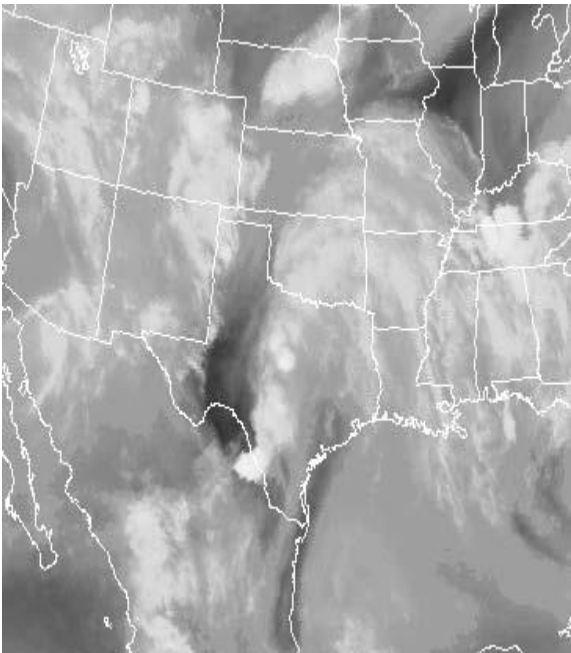
**115 AM CDT Tue Jul 02, 2002**



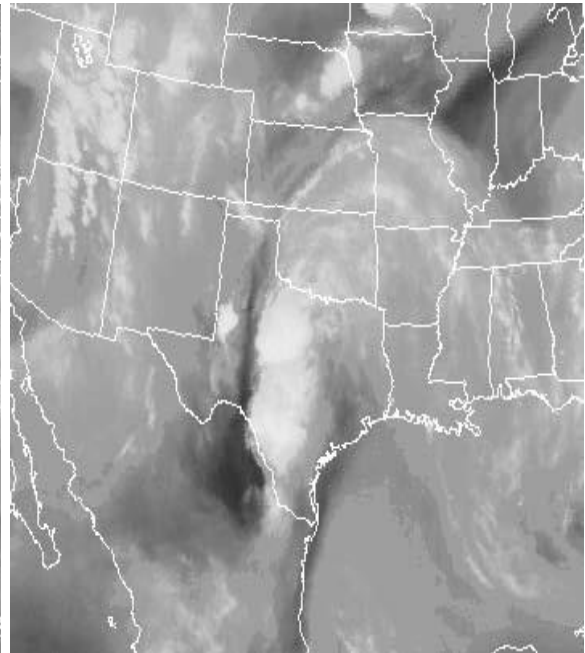
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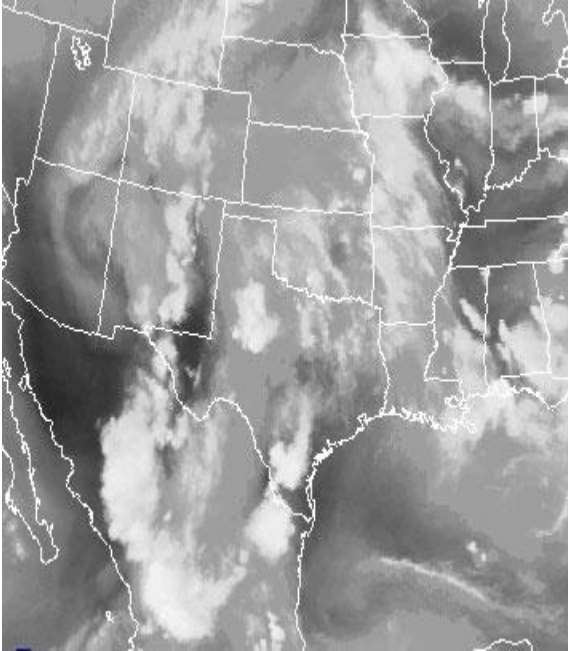
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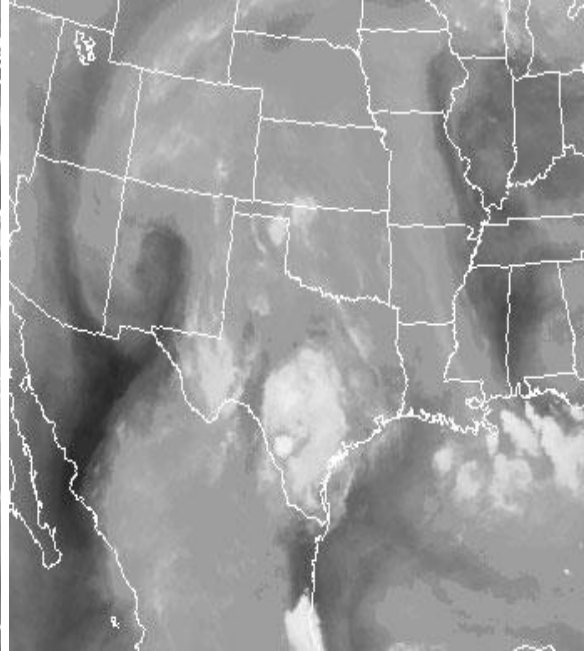
**11:15 AM CDT Wed Jul 03, 2002**



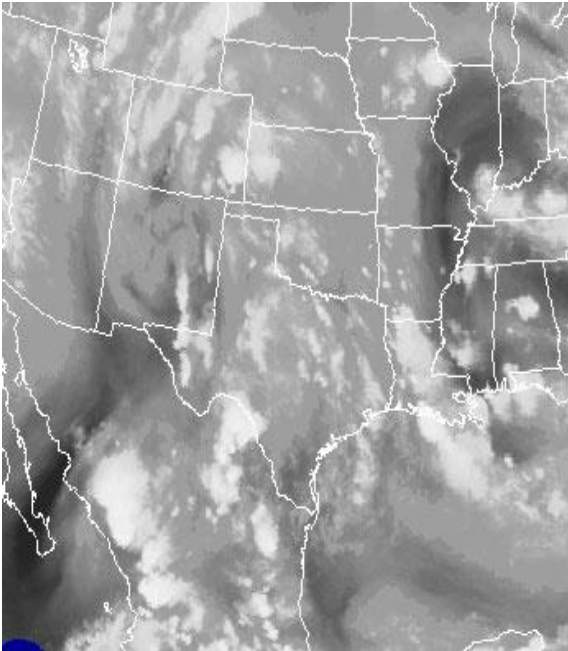
**7:15 AM CDT Wed Jul 03, 2002**



**715 PM CDT Thu Jul 4, 2002**



**715 AM CDT Fri Jul 5, 2002**



**715 PM CDT Fri Jul 5, 2002**



**715 PM CDT Sat Jul 6, 2002**

**Some of the rainfall amounts for June 30th to July 6, 2002 are listed below.**

PRELIMINARY RAINFALL TOTALS:

BEXAR COUNTY

SAN ANTONIO INTL AIRPORT:	16.92
HORAL/JAMAICA DRIVE:	18.56
SUN VALLEY/FAIR VALLEY:	12.46
FIVE PALMS/ELK RUNNER:	12.01
MOUNT COSBY/MCKINLEY:	21.84
MARBACH	15.51
8 NNE SAN ANTONIO:	13.30
LOOP 1604/BULVERDE:	14.43
VANCE JACKSON/DEZAVALA:	20.31
BLANCO RD AND LOOP 1604:	18.12
JACKSON KELLER/BLANCO	15.42
HELOTES:	33.75
WOODS OF SHAVANO:	23.00
SOUTH OF BULVERDE	
3 ACORN RANCH:	24.68
VANCE JACKSON/HUEBNER:	22.75

BLANCO COUNTY

JOHNSON CITY:	12.85
10 W OF BLANCO:	29.27
JOHNSON CITY: PERDINALES:	14.35

COMAL COUNTY

1 E OF BULVERDE:	24.24
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GILLESPIE COUNTY

6 N OF FREDERICKSBURG:	18.68
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GUADALUPE COUNTY

8 S OF SEGUIN:	22.37
CITY OF SEGUIN:	13.20
3 ENE OF NEW BRAUNFELS:	18.85
GRUENE:	13.75

KENDALL COUNTY

6 N OF BOERNE:	30.74
SISTERDALE:	33.55
1 S OF COMFORT:	31.69
CITY OF BOERNE:	27.28

KERR COUNTY

3 W OF CAMP VERDE:	26.30
11 SW OF KERRVILLE:	30.10

LEE COUNTY

FEDOR:	18.78
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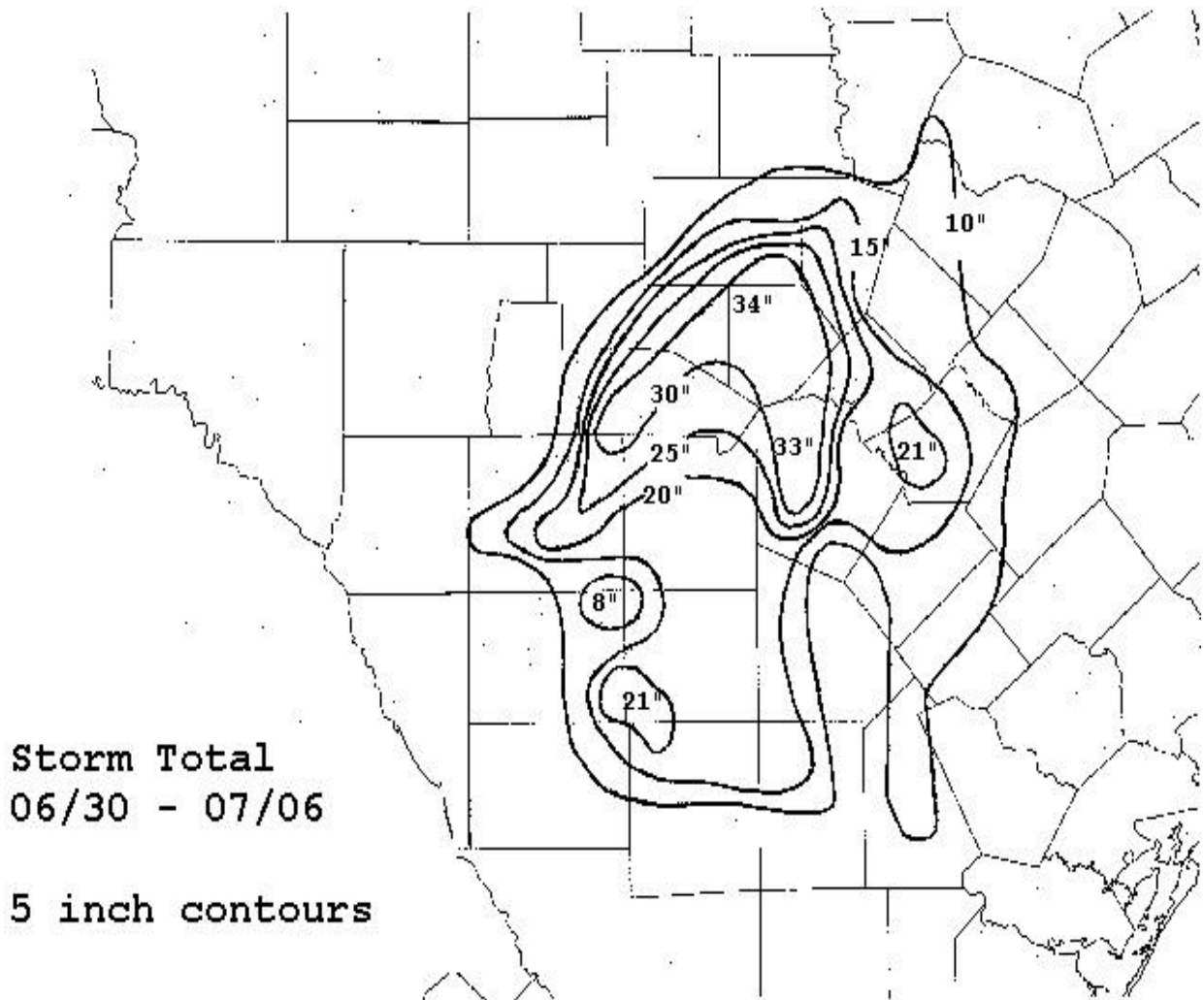
UVALDE COUNTY

SABINAL: 18.48

WILSON COUNTY

FLORESVILLE: 14.00

**The map below shows the rainfall from June 30th to July 6th.**







**Guadalupe River at New Braunfels Looking South  
at 945 AM CDT Friday July 5th, 2002**





**Guadalupe River at New Braunfels Looking North  
at 945 AM CDT Friday July 5th, 2002**



**Cibolo Creek at Selma Looking North  
at 1000 AM CDT Friday July 5th, 2002**

**A preliminary analysis of the rainfall data shows that the flood of late June and early July 2002 brought maximum rainfall amounts of near 30 to near 34 inches over west and north parts of Bexar County; parts of Kendall County; southern parts of Gillespie County; eastern parts of Kerr County; parts of Bandera County; the northeast part of Uvalde County; and the northwest part of Medina County. As more rainfall data is collected and analyzed, the maximum rainfall amounts for the flood of late June and early July 2002 may be updated. A big flood event came to the western part of South Central Texas in July 1976, when Del Rio had 13.18 inches of rain, bringing floods to the Del Rio area and along the Rio Grande. Rains, with showers and thunderstorms affected South Central Texas from July 3rd to July 20th, 1976, in another flood and rain event over South Central Texas in July. Formerly July 1990 was the wettest July in San Antonio, with 8.29 inches of rain. For the first 10 days of July 2002 San Antonio has had 15.72 inches of rain, the**

**wettest July and 3rd wettest month of record. For the first 10 days of July Austin Bergstrom has picked up 3.56 inches of rain, while at Austin Mabry the total was at 4.39 inches. Del Rio has had 0.15 inches of rain in the first 10 days of July 2002.**