

# **HYDROLOGIC DATA BRIEF FOR THE EDWARDS AQUIFER THROUGH FEBRUARY 2017**

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## UVALDE COUNTY RAINFALL (in inches) for 2017

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly Rainfall (2017)	0.80	1.58										
1981-2010 Climate Normals	1.18	1.25	1.76	1.71	3.03	2.97	2.79	1.81	2.59	2.88	1.54	1.09
Difference	-0.38	0.33										

30-year Normal Average	24.60
Total for January - February 2017	2.38
30-year Normal Average January - February 2017	2.43
Total Difference for Year to Date	-0.05
Percent of 30-year Normal Average Year to Date	98%

Rainfall Data provided by National Weather Service (NWS) rainfall station located at Garner Field Airport.

## MEDINA COUNTY RAINFALL (in inches) for 2017

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly Rainfall (2017)	0.41	1.31										
1981-2010 Climate Normals	1.38	1.49	2.13	1.98	3.38	3.49	2.09	1.67	2.60	3.31	1.58	1.14
Difference	-0.97	-0.18										

30-year Normal Average	26.24
Total for January - February 2017	1.72
30-year Normal Average January - February 2017	2.87
Total Difference for Year to Date	-1.15
Percent of 30-year Normal Average Year to Date	60%

Rainfall Data provided by NWS rainfall station located at Hondo Municipal Airport.

**1981-2010 Climate Normals** are NCDC's latest three-decade averages of climatological variables, including temperature and precipitation. This new product replaces the 1971-2000 Climate Normals product, which remains available as historical data.

SOURCE: <https://www.ncdc.noaa.gov/cdo-web/datatools/normals>

## BEXAR COUNTY RAINFALL (in inches) for 2017

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly Rainfall (2017)	2.72	3.61										
1981-2010 Climate Normals	1.76	1.79	2.31	2.10	4.01	4.14	2.74	2.09	3.03	4.11	2.28	1.91
Difference	0.96	1.82										

30-year Normal Average	32.27
Total for January - February 2017	6.33
30-year Normal Average January - February 2017	3.55
Total Difference for Year to Date	2.78
Percent of 30-year Normal Average Year to Date	178%

Rainfall Data provided by NWS rainfall station located at San Antonio International Airport.

## COMAL COUNTY RAINFALL (in inches) for 2017

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly Rainfall (2017)	2.78	2.33										
1981-2010 Climate Normals	1.86	2.02	2.66	2.28	3.97	4.78	2.62	1.95	3.09	4.25	2.87	2.27
Difference	0.92	0.31										

30-year Normal Average	34.62
Total for January - February 2017	5.11
30-year Normal Average January - February 2017	3.88
Total Difference for Year to Date	1.23
Percent of 30-year Normal Average Year to Date	132%

Rainfall Data provided by NWS rainfall station located at New Braunfels Municipal Airport.

**1981-2010 Climate Normals** are NCDC's latest three-decade averages of climatological variables, including temperature and precipitation. This new product replaces the 1971-2000 Climate Normals product, which remains available as historical data.

SOURCE: <https://www.ncdc.noaa.gov/cdo-web/datatools/normals>

## HAYS COUNTY RAINFALL (in inches) for 2017

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly Rainfall (2017)	2.46	2.66										
1981-2010 Climate Normals	2.06	1.92	2.48	2.72	4.13	4.64	2.5	2.19	3.42	4.33	3.05	2.29
Difference	0.40	0.74										

<b>30-year Normal Average</b>	<b>35.73</b>
<b>Total for January - February 2017</b>	<b>5.12</b>
<b>30-year Normal Average January - February 2017</b>	<b>3.98</b>
<b>Total Difference for Year to Date</b>	<b>1.14</b>
<b>Percent of 30-year Normal Average Year to Date</b>	<b>129%</b>

Rainfall Data provided by NWS rainfall station located in San Marcos.

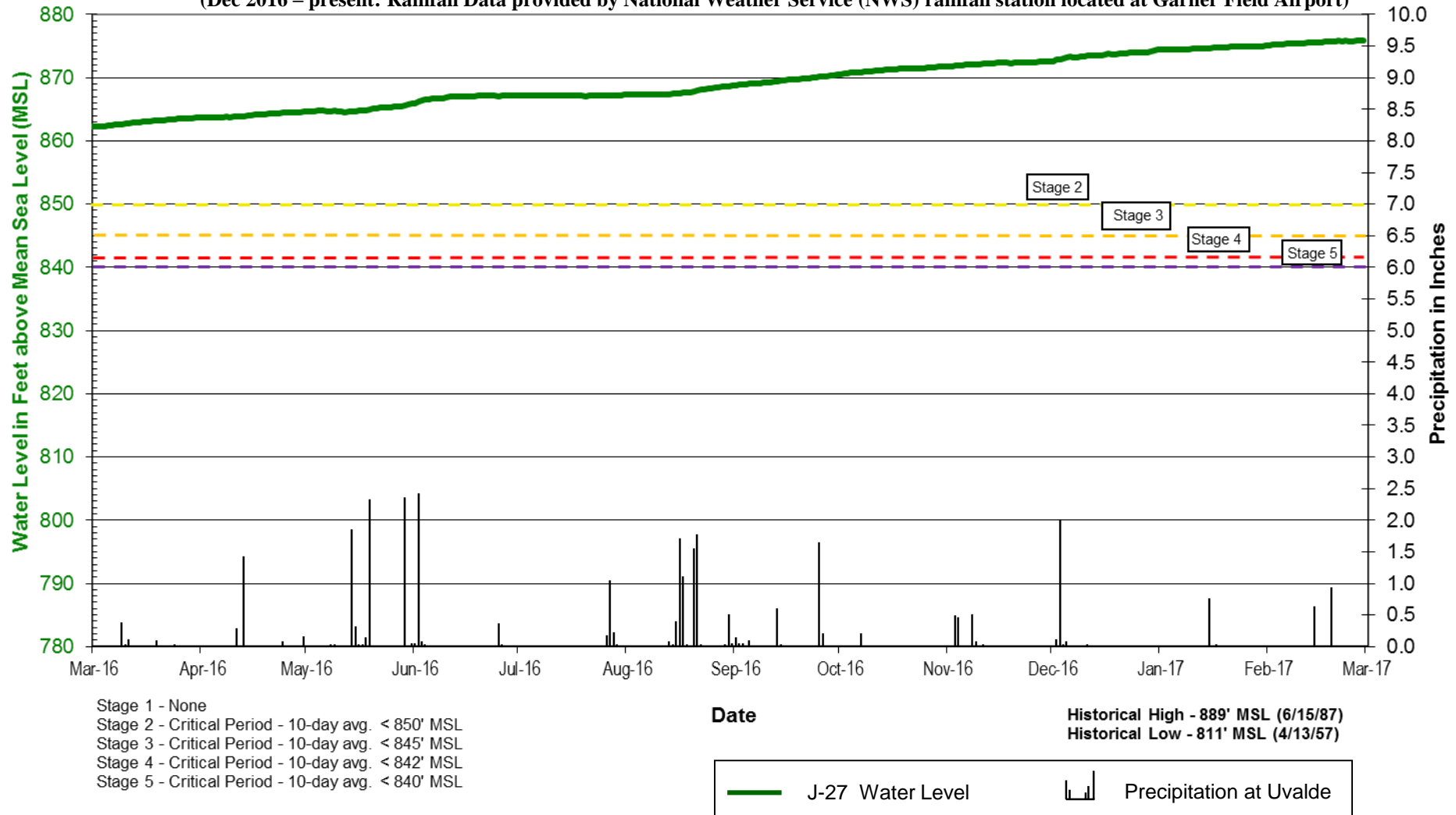
Rainfall Data provided by EAA Gauge HA158 located about 0.25 miles west of Bobcat Stadium.  
NWS Rainfall Station at San Marcos Airport-out of service

**1981-2010 Climate Normals** are NCDC's latest three-decade averages of climatological variables, including temperature and precipitation. This new product replaces the 1971-2000 Climate Normals product, which remains available as historical data.  
SOURCE: <https://www.ncdc.noaa.gov/cdo-web/datatools/normals>

# Hydrograph of the Uvalde County Index Well (J-27) and Precipitation at Uvalde

(Feb – Nov 2016: Rainfall Data provided by EAA Rain Gauge UV033 located 4.4 miles south of the City of Uvalde)

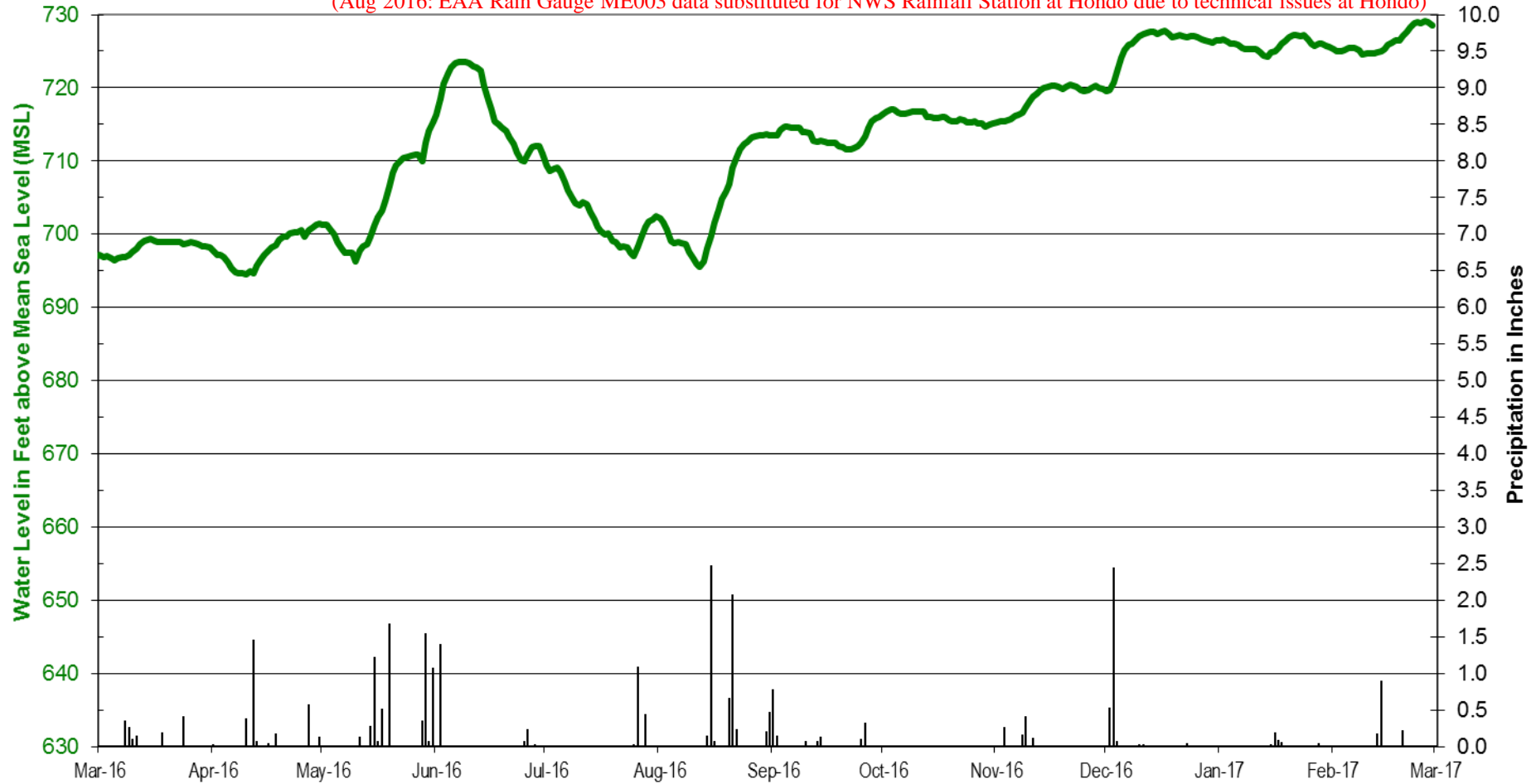
(Dec 2016 – present: Rainfall Data provided by National Weather Service (NWS) rainfall station located at Garner Field Airport)



# Hydrograph of the Medina County Hondo City Well and Precipitation at Hondo

(NWS Rainfall Station: Hondo Municipal Airport)

(Aug 2016: EAA Rain Gauge ME003 data substituted for NWS Rainfall Station at Hondo due to technical issues at Hondo)



CPM in Medina County is triggered by:  
 the 10-day average water level at J-17 or  
 the 10-day average springflow at Comal Springs or at San Marcos Springs

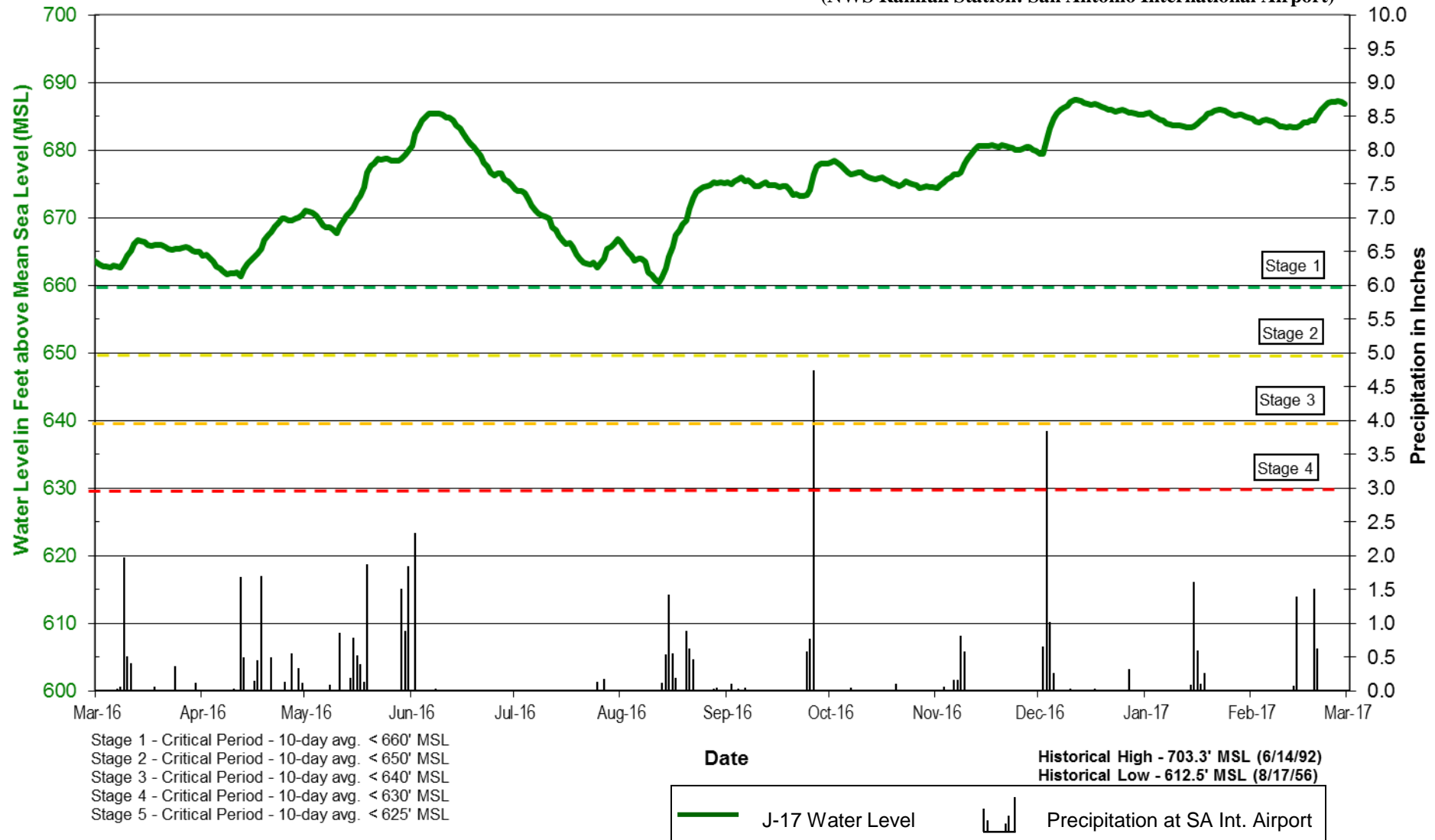
Date

Historical High - 779' MSL (6/15/92)  
 Historical Low - 651' MSL (6/30/90)



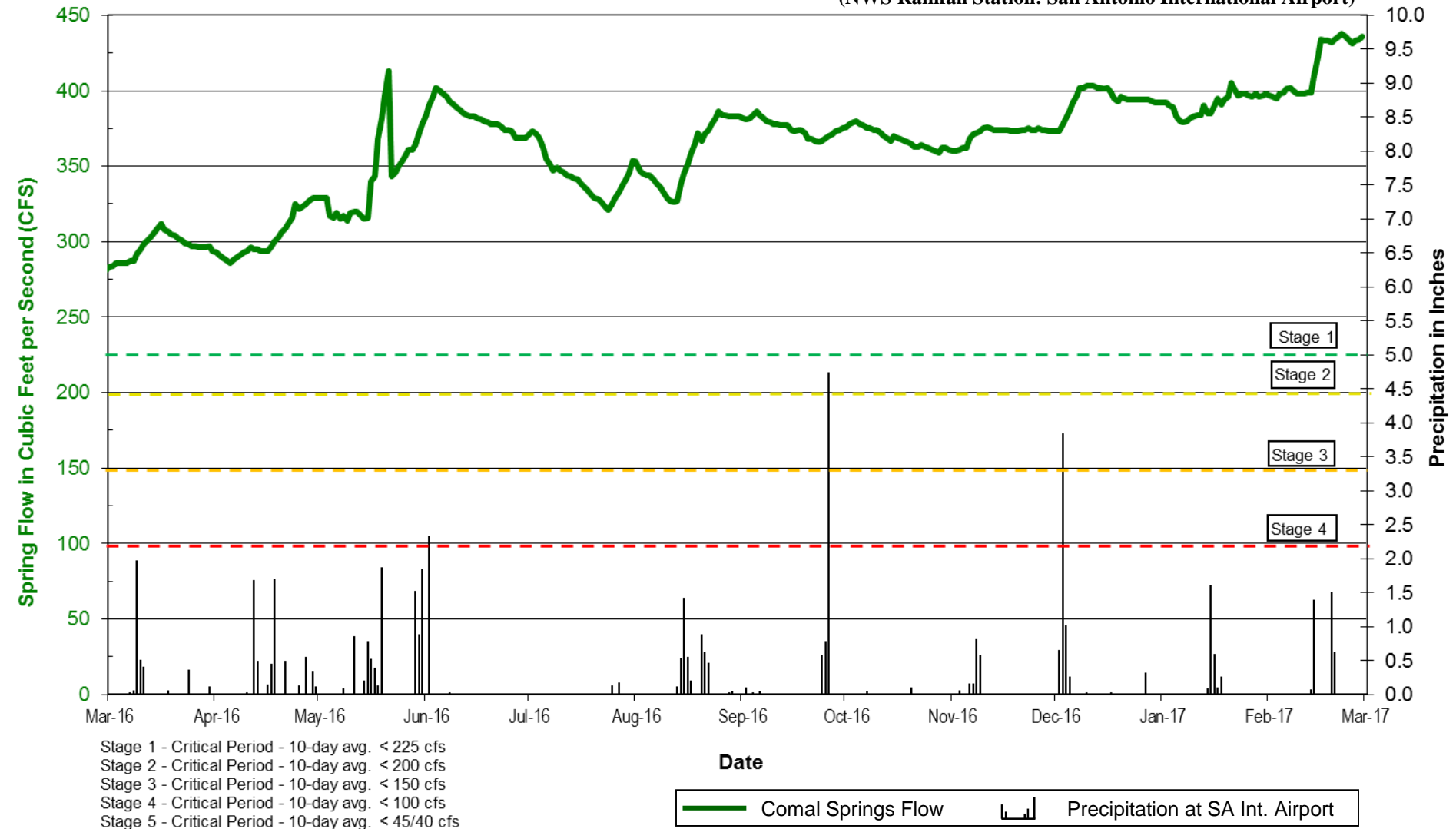
# Hydrograph of the Bexar County Index Well (J-17) and Precipitation at San Antonio

(NWS Rainfall Station: San Antonio International Airport)



# Hydrograph of the Comal Springs Discharge and Precipitation at San Antonio

(NWS Rainfall Station: San Antonio International Airport)



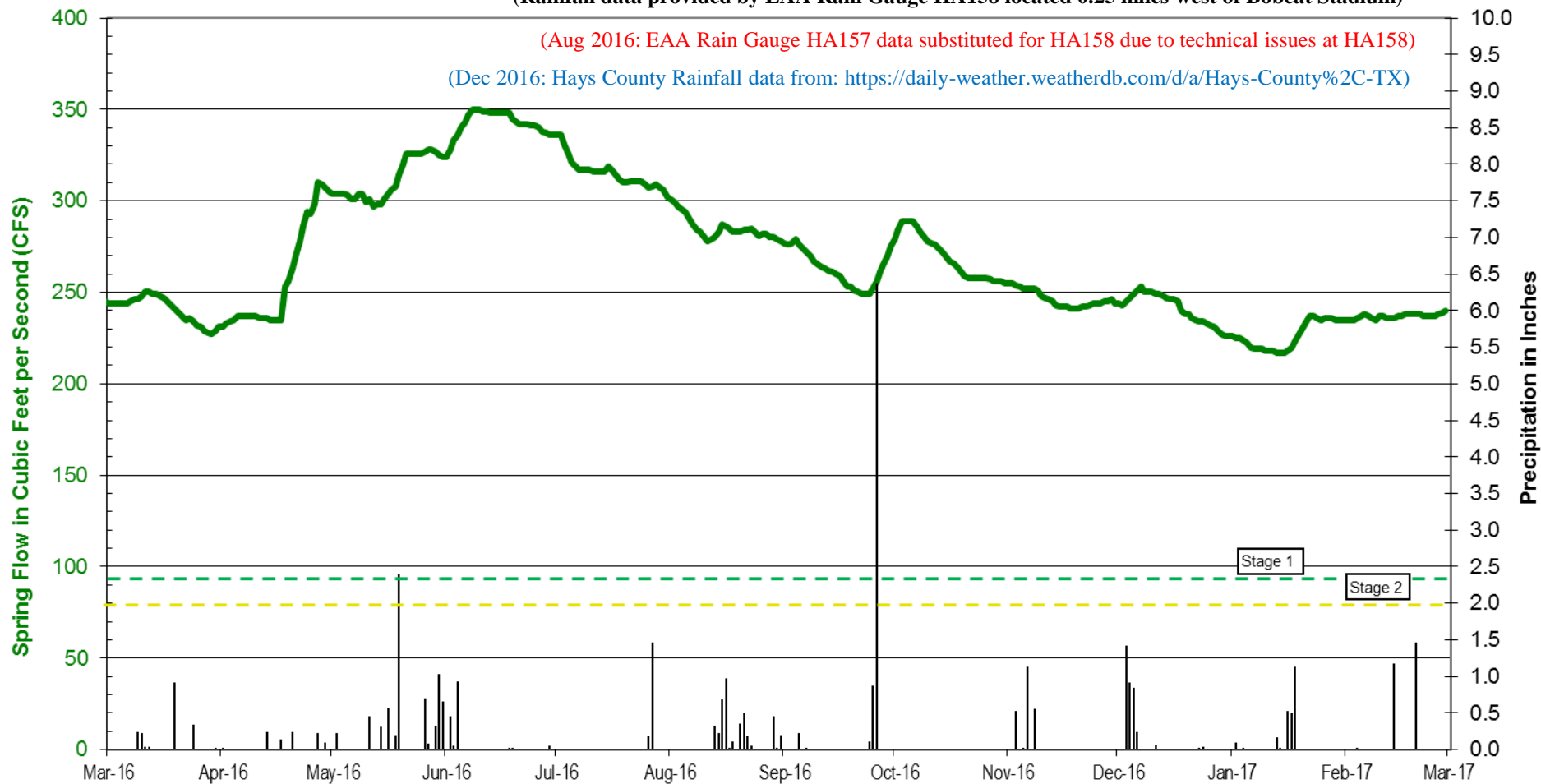


# Hydrograph of the San Marcos Springs Discharge and Precipitation at San Marcos

(Rainfall data provided by EAA Rain Gauge HA158 located 0.25 miles west of Bobcat Stadium)

(Aug 2016: EAA Rain Gauge HA157 data substituted for HA158 due to technical issues at HA158)

(Dec 2016: Hays County Rainfall data from: <https://daily-weather.weatherdb.com/d/a/Hays-County%2C-TX>)



Stage 1 - Critical Period - 10-day avg. < 96 cfs  
 Stage 2 - Critical Period - 10-day avg. < 80 cfs  
 Stage 3 - None  
 Stage 4 - None  
 Stage 5 - None

Date

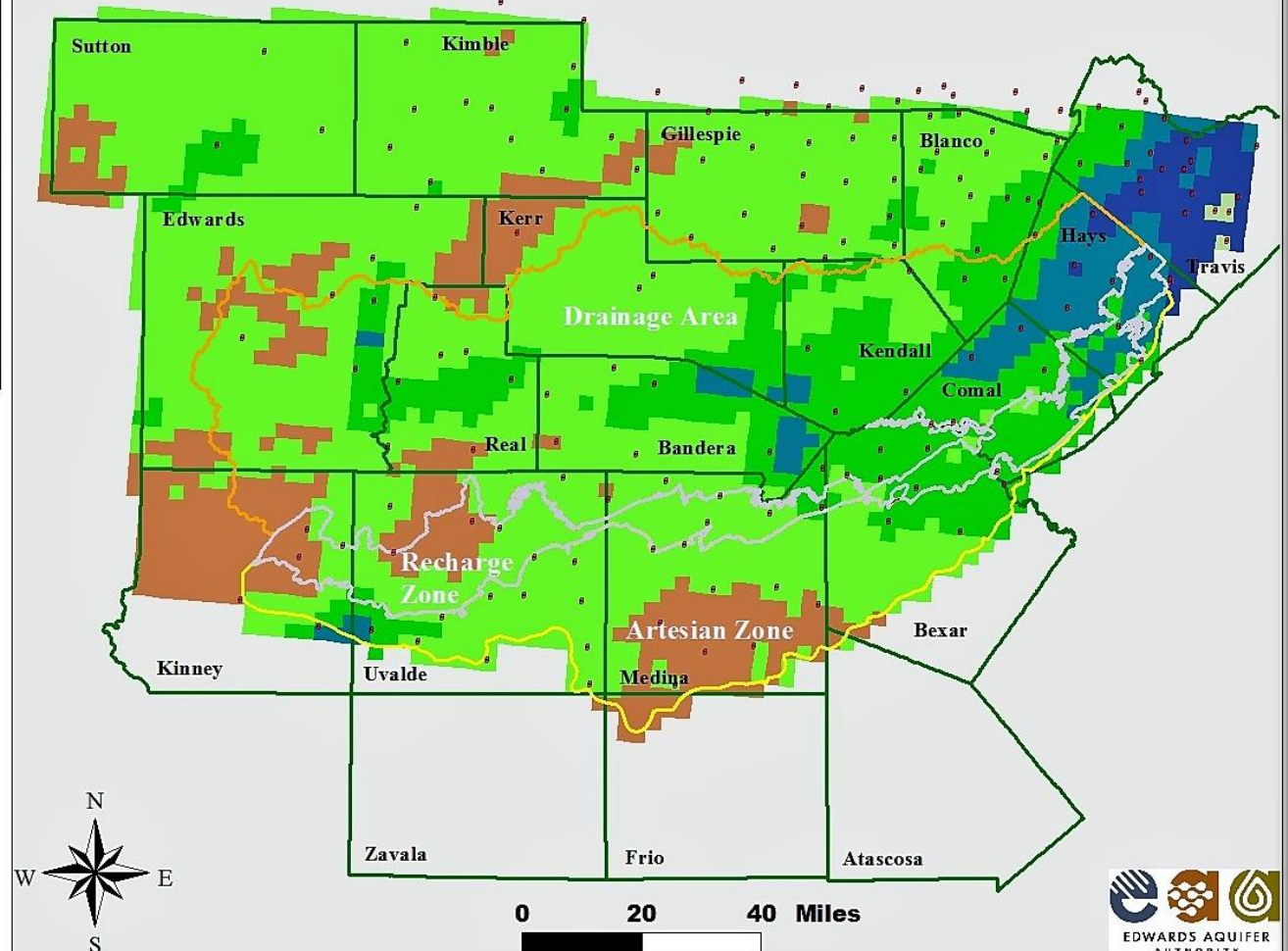
San Marcos Springs Flow    Precipitation at San Marcos

# Calibrated January 2017 Rainfall Totals

- Rain Gauge
- County Line
- Artesian Zone
- Drainage Area
- Recharge Zone

## Rainfall Total (Inches)

- 5 - 6
- 4 - 5
- 3 - 4
- 2 - 3
- 1 - 2
- 0 - 1



## **Real-time Precipitation Gauging System and Hydrologic Data Collection**

The Edwards Aquifer Authority (EAA) operates 74 “real-time” precipitation gauges that record data on six-minute intervals and transmit these data to the EAA’s office via a radio-telemetry system. Rain gauges are located on the Edwards Aquifer Contributing Zone, Recharge Zone, and Artesian Zone. Acquired data have many uses including aquifer recharge calculations, production of rainfall maps, and in a variety of research projects. The EAA also collects water level data from a series of aquifer monitor wells in the region, including two index wells: Well J-27, in Uvalde County and Well J-17, in Bexar County. Water level data from the Hondo City well in Medina County are also included in this data brief. Through a cooperative agreement with the U.S. Geological Survey, the EAA monitors the discharge at Comal Springs and San Marcos Springs.

## **Rainfall Evaluation – January 2017 Vieux & Associates Doppler Rainfall Map**

The calibrated January 2017 Rainfall Totals Map was prepared by Vieux & Associates for the EAA using NEXRAD Doppler Radar and the EAA’s precipitation gauge data. Calibrating the NEXRAD data with the EAA’s precipitation gauge data improves the accuracy of the precipitation maps and is calculated using a four-kilometer grid system. Rain gauge locations are indicated on the map.

With the exception of the central & western counties, most counties in the region received above average rainfall in the month of January. The most significant rainfall occurred, however, in the far northeastern portion of the region outside the Contributing Zone. Here, the highest rainfall totals occurred in Travis County where between 3 and 6 inches was recorded. In the Contributing Zone of the Edwards Aquifer system, isolated areas in eastern Edwards, north & northeastern Bandera, and southwestern Kendall counties recorded between 3 and 5 inches, while a larger area from northcentral Comal to the Hays-Travis County line recorded between 2 and 5 inches of rainfall. The Recharge Zone recorded between 1 and 5 inches; the most occurring in southern Comal & Hays counties where between 3 and 5 inches was recorded. Most of the Artesian Zone recorded between 0 and 3 inches; the most occurring in an isolated area on the Kinney-Uvalde County line where between 3 and 5 inches was recorded.

## Rain Evaluation – Precipitation Gauge Data – February 2017

The entire region received above average rainfall in the month of February with some high totals in the north central and southeastern areas. However, the February 2017 maximum monthly total rainfall amounts in the EAA's gauges ranged from 0.40 to 3.52 inches. The highest reported 24-hour rainfall event from the EAA's precipitation gauge network in February, by county, were as follows: Bandera, 2.08 inches; Bexar, 1.86 inches; Blanco, 1.89 inches; Comal, 2.42 inches; Edwards, 1.59 inches; Hays, 1.46 inches; Kendall, 1.29 inches; Kinney, 0.71 inches; Medina, 1.75 inches; Real, 2.00 inches; and Uvalde County, 1.46 inches. The highest 24-hour rain event recorded in the region was 2.42 inches of rain that occurred on February 20th at a gauge located on the west side of FM484, about 5 miles south of the intersection of FM484 & FM32 in northern Comal County.

## Evaluation of February 2017 Aquifer Levels and Spring Discharge

The Aquifer responded to the above average rainfall that occurred in most areas throughout the region. The San Antonio Pool Index Well (J-17) *increased* 2.1 feet to 686.9 feet above mean sea level (msl) while the City of Hondo Well *increased* 3.0 feet to 728.6 feet msl. The Uvalde Pool Well (J-27), also *increased* 0.8 feet to 875.8 feet msl.

The February daily average springflow for Comal Springs, *increased* 38 cubic feet per second (cfs) to 436 cfs, which is 132 cfs *above* the February monthly average discharge of 304 cfs. The daily average springflow for San Marcos Springs *increased* 5 cfs to 240 cfs, which is 65 cfs *above* the monthly average discharge of 175 cfs for February. Please note that the discharge amounts are estimates and may be adjusted up or down as more direct flow measurements are obtained.

## Summary of Current Aquifer Levels and Spring Discharges – March 2017

The official daily high water level for the Uvalde Pool Index Well (J-27) was 875.9 ft. msl on March 8, 2017, which is 8.4 ft. *above* the J-27 March monthly average of 867.5 ft. msl. The daily high water level at the San Antonio Pool Index Well (J-17) was 686.6 ft. msl on March 8, 2017; 18.3 ft. *above* the J-17 March monthly average of 668.3 ft. msl. The daily average discharge at Comal Springs on Tuesday, March 7, 2017, was reported to be 444 cfs, 143 cfs *above* the March average of 301 cfs while the daily average discharge at San Marcos Springs on March 7, 2017 was reported to be 243 cfs, 67 cfs *above* the March average of 176 cfs. Please note that the discharge values are estimates and may be adjusted up or down as more direct flow measurements are obtained.

## Summary of Current Regional Aquifer Conditions

Warmer than normal temperatures continue to prevail in the first quarter of 2017. However, at or above normal precipitation continues to allow the Edwards Aquifer region to remain above Critical Period Management (CPM) thresholds. The U.S. Department of Agriculture - U.S. Drought Monitor Index indicated that abnormally dry to slightly severe drought conditions exist in the northern, eastern, and extreme southern areas in the State of Texas. As a result, about 25% of Texas is experiencing some form of seasonal or short-term drought condition.

The Climate Prediction Center (CPC) reported that, “La Niña conditions are no longer present, with slightly below-average sea surface temperatures (SSTs) observed across the central equatorial Pacific and above-average SSTs increasing in the eastern Pacific.” Currently, at the end of the La Niña Advisory, “ENSO-neutral conditions have returned and are favored to continue through at least the Northern Hemisphere spring 2017.” The US Seasonal Drought Outlook still shows drought conditions virtually absent in most areas of Texas while development and persistence is likely at the southern tip of Texas. The NWS - Climate Prediction Center’s Long Range Outlook continues to forecast above normal temperatures, but equal chances of above, below, or normal precipitation for south central Texas into May 2017.