

Item 8.1: 2021 Summer Weather Update

Chris Coleman ERCOT Senior Meteorologist

Urgent Board of Directors Meeting

ERCOT Public June 7-8, 2021

Summer 2021 Weather Outlook

- 2011 similarities and differences will we see a repeat?
- La Niña (and other drivers) update
- Examining recent summers as references
- Summer 2021 temperature outlook
- Summer 2021 precipitation outlook
- Drought update
- Hurricane update



2011 similarities and differences

- La Niña reached an intensity this past winter not seen since 2010-11
- Winter precipitation was generally dry both years



 Both winters were relatively mild – with exception to a period of extreme cold that occurred in February (the two coldest periods this century)



2011 similarities and differences

- However, the spring seasons varied greatly
- Spring 2011 was the hottest on record (1895-current) for maximum temperatures. It was also the driest on record
- Spring 2021 is coming in much cooler and wetter





- In order to challenge the prolonged, extreme heat of summer 2011, a build from the spring is likely needed and has not happened
- Summer heat in Texas is very much shaped by dry ground. The driest spring on record in 2011 allowed for summertime temperatures to occur in the spring and continue to build into the summer
- It's very unlikely the necessary ingredients are in place for the summer of 2021 to match or exceed the summer of 2011



La Niña Update

• The current La Niña is the strongest since 2010-11

2010	1	1.6	1.0	-	0.6	0.1	0.4	0.0	1.0	1.4	1.5	1.5	1.5
2010		1.0	1.3	1	0.6	0.1	-0.4	-0.9	-1.2	-1.4	-1.5	-1.5	-1.5
2011		-1.4	-1.2	-0.9	-0.6	-0.3	-0.2	-0.2	-0.4	-0.6	-0.8	-1	-1
2012		-0.7	-0.5	-0.4	-0.4	-0.3	-0.1	0.1	0.3	0.3	0.3	0.1	-0.2
2013		-0.4	-0.4	-0.3	-0.2	-0.2	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3
2014		-0.4	-0.4	-0.2	0.1	0.3	0.2	0.1	0.0	0.2	0.4	0.6	0.7
2015		0.6	0.6	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.5	2.6
2016		2.5	2.2	1.7	1.0	0.5	0.0	-0.3	-0.6	-0.7	-0.7	-0.7	-0.6
2017		-0.3	-0.1	0.1	0.3	0.4	0.4	0.2	-0.1	-0.4	-0.7	-0.9	-1
2018		-0.9	-0.8	-0.6	-0.4	-0.1	0.1	0.1	0.2	0.4	0.7	0.9	0.8
2019		0.8	0.8	0.8	0.8	0.7	0.5	0.3	0.1	0.1	03	0.5	0.5
2020		0.5	0.6	0.5	0.3	0.0	-0.2	-0.4	-0.6	-0.9	-1.2	-1.3	-1.2
2021		-1.1	-0.9	-0.8									
		DJF	JFM	FMA	МАМ	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ

Negative values = La Niña Positive values = El Niño

La Niña Update

- Forecast is for La Niña to weaken to neutral through summer then re-intensify to La Niña in the fall season
- Of the 8 La Niña events that reached moderate or stronger intensity, 7 spanned at least two years





Recent Summers in Texas (daily max temp anomalies, averaged Jun-Sep)



Fifteen Year Max Temperature Anomaly in °F from 20150601 to 20150930







Fifteen Year Max Temperature Anomaly in °F from 20160601 to 20160930



Fifteen Year Max Temperature Anomaly in °F from 20200601 to 20200930







Fifteen Year Max Temperature Anomaly in °F from 20170601 to 20170930







Ranks from 1895-2020 (1 = hottest, 126 = coolest)

Hottest third: 2011, 2012, 2013, 2015, 2018, 2019, 2020 Middle third: 2014, 2016, 2017 Mildest/coolest third: None (2007, most recent)

ERCOT Public

Summer 2021 Temperature Outlook

- Top matches, recent years: 2008 (78), 2006 (47), 2000 (14), 1999 (62), and 1996 (92)
- Top matches, distant years: 1956 (2), 1951 (8)
- Top matches, past decade: 2018 (31), 2013 (33), 2012 (17)
- Hottest third: 2018, 2013, 2012, 2000, 1956, 1951
- Middle third: 2008, 2006, 1999
- Mildest third: 1996
- Best chance of above-normal summer: West
- Best chance for a near-normal summer: Coast
- Very unlikely to rank as hot as 2011
- More likely to rank between 15th and 35th
- More likely to rank milder than 35th than approach 2011
- Minimum temperature could rank hotter than Maximum temperature

Summer 2021	#85-#126	<u>#64-#84</u>	#36-#63	<u>#15-#35</u>	<u>#6-#14</u>	<u>#2-#5</u>	<u>2011/#1</u>
6 Temperature Outlook (n	5%	18%	22%	33%	17%	4%	1%

While forecast accuracy drops predicting a month's temperatures more than a couple months in advance, August 2021 shows the highest potential for above-normal temperatures; This summer could start mild due to spring rain but heat up mid-to-late summer





Summer 2021 Temperature Outlook

Ranks from 1895-2020 (126 years)

<u>100-degree days in 2020</u> Houston: 8 (tied for second most since 2011) San Antonio: 36 (second most since 2011) Austin: 49 (third most since 2011) Dallas: 9 (least since 2007)

100-degree days in 2021

Dallas has higher potential to record more 100-degree days than 2020 than the other three large cities.

The Rio Grande Valley also has potential for more 100-degree days than last year

In general, portions of West Texas shows the highest potential for a hotter-than-normal summer





Summer 2021 Precipitation Outlook

Ranks from 1895-2020 (1 = driest 126 = wettest)

90 to 100%

near normal

75 to 90%

pelow normal

much below

- Top matches, recent years: 2008 (83), 2006 (51), 2000 (12), 1999 (36), and 1996 (119)
- Top matches, distant years: 1956 (2), 1951 (39)
- Top matches, past decade: 2018 (111), 2013 (67), 2012 (55)
- Driest third: 2000, 1999, 1956, 1951
- Middle third: 2013, 2012, 2008, 2006
- Wettest third: 2018, 1996
- A wet spring doesn't correlate well with a wet summer
- Recent trends (La Niña, PDO-) point toward drier weather returning this summer
- However, as with the summer temperature forecast showing greater potential to be milder than hotter, summer rainfall also has greater potential to be wetter than drier than the current forecast

Wichita Falls Lubbock Paris Mineral Wells Dallas-Fort Worth Abilene Wink Midland Lufkin San Angelo Waco Junction Austin Houston Galveston San Antonio Victoria Corpus Christi Summer 2021 Laredo **Precipitation Outlook** Brownsville

Amarillo



Drought Outlook

- Drought conditions have improved significantly this spring
- Opportunity for the drought to expand this summer
 U.S. Drought Monitor
- Parts of West and South TX will continue to have greatest concern for drought



Texas

May 25, 2021 (Released Thursday, May. 27, 2021) Valid 8 a.m. EDT

	Drought Conditions (Percent Area)								
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4			
Current	61.55	38.45	25.29	<mark>1</mark> 5.87	9.05	4.94			
Last Week 05-18-2021	47.79	52.20	32.95	20.31	12.16	5.93			
3 Month s Ago 02-23-2021	24.20	75.80	50.65	28.18	16.29	4.27			
Start of Calendar Year 12-29-2020	<mark>8.80</mark>	91.19	81.10	50.33	30.09	<mark>13.0</mark> 3			
Start of Water Year 09-29-2020	57.34	4 2.65	31.96	20.91	12.02	3.29			
One Year Ago 05-26-2020	66.97	33.03	7.85	1. 19	0.00	0.00			



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

<u>Author:</u> Adam Hartman NOAA/NWS/NCEP/CPC



droughtmonitor.unl.edu

Drought Outlook

Note the tremendous improvement since early-spring This should help minimize extreme temperatures at least to start summer



Hurricane Forecast

 Long-term average numbers: 14/7/4

(named storms/hurricanes/major hurricanes)

- 2021 forecast: 18/8/5
- 2020: 30/14/7
- 2020 and 2005 are the only years with more than 19 named storms

- 2021 forecast would rank among the most active
- Ana became a Tropical Storm on May 23
- Sea Surface Temperatures (map below) are running above-normal over most of the Atlantic Basin as of late-May

NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 23 May 2021





- The historical average # of tropical cyclones in the Gulf is 4
- This season is likely to have multiple tropical cyclones in the Gulf to monitor

ercot