



# West Texas Weather Modification Association

## Monthly Operations Report

### September 2023 Operations Report

The month of September contained 4 days of operations.

<b>Date</b>	<b>Flares</b>	<b>Counties seeded</b>
<b>9/15</b>	<b>6G+2H</b>	<b>Sutton</b>
<b>9/19</b>	<b>RECON</b>	<b>RECON</b>
<b>9/25</b>	<b>44G+4H</b>	<b>Irion, Crockett</b>
<b>9/27</b>	<b>28G+3H</b>	<b>Sutton, Sterling, Irion</b>
<b>TOTAL</b>	<b>78G+9H</b>	

September 2023 began to see a pattern change across the region, though not all precipitation chances resulted in operations. On the 15<sup>th</sup>, a small cell in southern Sutton County was seeded as isentropic ascent over a weak cold front took place. This storm was marginal. Meanwhile, rain events occurred but with challenging flight conditions or overnight convection during the first three weeks of the month. However, by the 25<sup>th</sup>, better conditions took place which resulted in seeding in Irion County near Barnhart where a split storm pushed south into Crockett County. This cell was seeded aggressively as it pushed south through Crockett County. On the 27<sup>th</sup>, more favorable conditions took place with seeding in Sutton, Sterling, and Irion Counties. Here, storms were seeded along a broken cold front though challenging flight conditions took place later in the flight. Cloud bases were lowering, and a dry pocket in the mid-levels resulted in quickly collapsed storm. It was certainly a sign that the atmosphere was changing into a more fall-like pattern.

Flare usage of the month was 78 glaciogenic flares and 9 hygroscopic flares with a total flight time of 7.60 hours. This brings the annual totals through September to 788 glaciogenic flares and 74.25 hygroscopic flares totaling 67 flight hours. These numbers are comparable to the 2022 and 2021 seasons.

San Angelo's 3.92" was well above the average of 2.51" for the year. This brings the annual total to 13.16" which is still below the average of 16.46". However, some areas across the region saw 4+". These include areas of Crockett, Schleicher, Sterling, Tom Green, and Sutton Counties. The area average for the month was 3.68" with an area average for the year so far of 12.24".

Looking ahead into fall, El Nino is present and strengthening. The response from this is starting to be felt after a few rain events to start October. Long range models continue to suggest that above average precipitation chances will be in place for November through February. Meanwhile, conditions for next spring continue to look favorable as El Nino will still be in place with a +2 degree sea surface temperature anomaly, which is 4 times the threshold for El Nino.



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Monthly rain gauge measurements from nearest locations inside and out of the target area recorded either by the National Weather Service, Texas Tech University, Mesowest as well as CoCoRaHS.

### September 2023 (Normal's of 1.66" from Midland to 2.51" in San Angelo)

Crockett County		Sterling County		Area Average	
Ozona 32SW	2.50	Sterling City (TTU)	4.07	3.68	
Escondido Draw	4.30	Irion County			
Ozona 19.6S	-	Mertzon (TTU)	3.03	Out of Target Area	
Ozona Airport	-	Mertzon (S)	-	Junction (Kimble)	2.43
Fort Lancaster	4.30	Barnhart	2.74	Abilene (Taylor)	4.85
Reagan County		Tom Green		Midland (Midland)	1.01
Big Lake (TTU)	2.76	Wall	3.82	St. Lawrence (GL)	2.07
Acton Ranch	-	San Angelo 7NW	5.73	Lomax (Howard)	2.27
Schleicher County		Knickerbocker	4.00	Fort McKavett (MN)	6.26
Eldorado 0.2	3.16	Carlsbad	3.75	McCamey (Upton)	1.89
Eldorado 22.6ENE	2.87	Miles	3.55	Menard (Menard)	3.08
Eldorado 14.5ENE	5.17	San Angelo (NWS)	3.92		
Sutton County		Christoval	-		
Sonora	4.02	Water Valley	4.05		
Sonora 23.9E	1.61				

### Year to Date (Normal's of 10.99" from Midland to 16.46" in San Angelo)

Crockett County		Sterling County		Area Average	
Ozona 32SW	12.27	Sterling City (TTU)	13.30	12.24	
Escondido Draw	13.37	Irion County			
Ozona 19.6S	-	Mertzon (TTU)	14.72	Out of Target Area	
Ozona Airport	-	Mertzon (S)	-	Junction (Kimble)	11.40
Fort Lancaster	15.28	Barnhart	7.14	Abilene (Taylor)	21.04
Reagan County		Tom Green		Midland (Midland)	2.59
Big Lake (TTU)	7.30	Wall	14.78	St. Lawrence (GL)	8.13
Acton Ranch	-	San Angelo 7NW	20.09	Lomax (Howard)	10.02
Schleicher County		Knickerbocker	16.89	Fort McKavett (MN)	18.24
Eldorado 0.2	11.24	Carlsbad	14.62	McCamey (Upton)	5.67
Eldorado 22.6ENE	13.61	Miles	16.31	Menard (Menard)	13.21
Eldorado 14.5ENE	14.42	San Angelo (NWS)	13.16		
Sutton County		Christoval	-		
Sonora	13.56	Water Valley	12.72		
Sonora 23.9E	12.69				