10-Year TWMA Increase from Weather Modification

- 12% over the last 10 years
- 1.5" additional rainfall per year

10-Year Enhanced Recharge of the Edwards Trinity Aquifer due to Weather Modification

- Roughly 100,000 acre-feet of additional recharge can be expected from weather modification over karst aquifers in a semi-arid climate.

5-Year Moving Average of Percent of Normal Rainfall within (blue) vs. outside (red) of the WTWMA Target Area

Since 2004, within the target area, percent of normal rainfall was 102%, with only 89% of normal outside of the target area. 13% difference

1891 - Robert Dyrenforth was the first to try rainmaking experiments near Midland.
1910 - GW Post attempted to modify the weather along the Caprock using kites and dynamite.
1946 - Schaefer and Langmuir discovered that dry ice in a cloud provokes the crystallization of water vapor.
1971 - CRMWD introduces first operational program in Texas.
1997 - STWMA is developed.
1999 - SWTREA is developed.
2000 - PGCD is developed.
2002 - SOAR is developed.
2003 - TPWMA is developed. Texas Department of Licensing and Regulation oversees permits and licenses.
2014 - Wichita and Rolling Plains weather modification programs are developed.
$3-$6 million per year across each target area.

One additional inch of precipitation can bring benefits of $19-$38 (Johnson, 2014).

For every dollar spent, one additional inch of water from weather modification will have a return of $19-$38 (Johnson, 2014).


For $0.04/Acre, one additional inch of precipitation can bring benefits of $3-$6 million across each target area (Johnson, 2014).

$10 - $34/Acre (Wyatt, Carver, 1997)

One additional inch of water can improve the four major crops grown in West Texas by $10 - $34/Acre (Wyatt, Carver, 1997).

For every dollar spent, one additional inch of precipitation from weather modification will have a return of $19-$38 (Johnson, 2014).