RAIN ENHANCEMENT TECHNOLOGIES

OPERATIONS REPORT: LA SAL, UT (WA25001)

Preliminary - January 2026

Version 0.1

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Revision History

Ver #	Comments	Author	Approved	Date
0.0c	Original Document Development - Draft	Jeffrey Chagnon, Scott Morris, Rutuja Dongre	N/A	12/2/25
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2. *Executive Summary*

This report provides a preliminary review of the Weather Enhancement Technology Array (WETA) installed by Rain Enhancement Technologies (RET) on the Flat Iron Mesa, outside Moab Utah. WETA is a self-sufficient and 'off grid' solution installed to provide enhancement of precipitation in year-round operations – Snow and Rainfall – over the La Sal Mountain Ranges.

2.1. Operational Summary

1. This report contains 19 days from 11/15/25 to 12/3/25.
    a. WETA installed and operating for 9 of those days from 11/15/25.
    b. Precipitation Events occurred on 10 of the 19 days evaluated in this report.
    c. No adverse weather conditions or storms occurred during this operating period
2. Early evaluation shows 3 very promising enhancement events consistent with HySPLIT modelling and WETA operation
3. Feedback from local sources is that the "storms are different and more intense" on days when WETA is operating
4. Preliminary operational evaluation shows positive signs supporting WETA having enhanced precipitation events over the target La Sal Ranges
5. Radiometrics Radiometer operating from 15th November
    a. Power use 2 to 4 times higher than specified by Radiometrics creating power availability issues on site.
6. Incorrect protective equipment on solar array has caused limitation on peak solar performance.
    a. Does not impact operation on overcast days, changes implemented remotely to 'work around' until full repair implemented.
7. Window missed for the installation of more instruments in the ranges for 2025 due to good snowpack formation limiting access.

2.2. Actions and Improvements

1. Establish further historic data sources against which current data sources can be evaluated. This includes working with USDA Avalanche Forecasting to access historic snowpack data to support statistical evaluation as well as existing SnowTel sites.
2. Addition of load shedding and backup generator for improved power reliability on site (planned December '25 and January '26)
3. Installation of further instrumentation in La Sal Ranges (Planned March/April 2026)
4. For each event, identification of treatment and control probabilities based on HySPLIT simulations
5. Based on those treatment probabilities, provide a preliminary estimation of treatment effect sizes in radar and gauge observations with >1 month data available.

6. Incorporation of analysis of radiometer observations.
7. WETA operations will continue to target predicted precipitation events that are not considered adverse weather conditions.

3. Operations Summary

Table 1 details the operating schedule during the reporting period. WETA was active during several precipitation episodes, as described in Section 3 of this report.

Several technical issues required attention:

- On the 16th a solar fault was identified and local support reset the fault with remote modifications made by RET.
- Energy demand from the Radiometer exceeded the 100W specified before installation by a factor of 2 (consistently) and up to 4 times when an internal heater was active.
- Energy management has been critical at Flat Iron to avoid loss of both Radiometer and WETA function as well as loss of communications from over discharge on battery bank.

Despite these issues, WETA operated for all but one precipitation event.

Table 1. Operating schedule for the WETA during the reporting period 11/15/2025 to 12/3/2025. Periods of WETA operation are shaded green.

DATE	WETA on/off
15-Nov	0935 on
16-Nov	on
17-Nov	1035 off
18. Nov	off
19. Nov	off
20-Nov	1531 on
21-Nov	1049 off
22. Nov	off
23. Nov	off
24. Nov	off
25. Nov	off
26. Nov	off
27. Nov	off
28-Nov	0738 on
29-Nov	on
30-Nov	1146 off / 1546 on
1-Dec	0134 off

2-Dec	1158 on / 2356 off
3-Dec	off

4. *Data and Analysis*

4.1. Summary of Precipitation Events

Several precipitation events occurred during the reporting period. The WETA operated during these events, except for 18-19 November, when power issues were being resolved. Figures 1 and 2 summarize the observed precipitation and snow accumulation, respectively. Three distinct active periods during WETA operations are evident as follows:

- Period 1 – 16th November to 17th November,
- Period 2 – 20th November to 21st November,
- Period 3 – 30th November to 2nd December.

Each of the above provides an opportunity to review the circumstantial evidence for precipitation enhancement. Section 4.3 highlights the evidence for enhancement during Period 1.

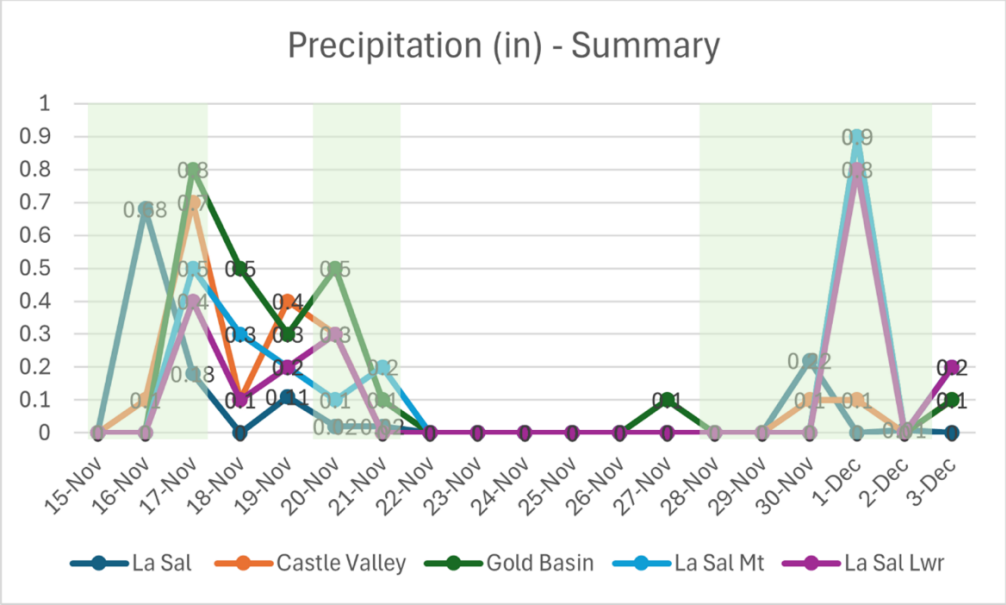

Figure 1. Daily total precipitation accumulation (in) for period 15 November to 3 December 2025. Periods of WETA operation are highlighted in green.

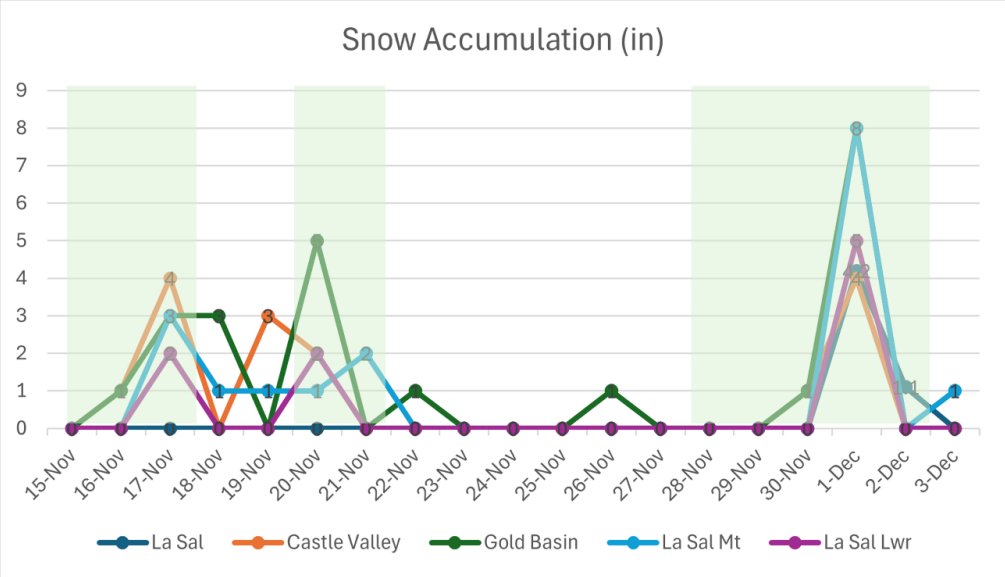

Figure 2. As in Figure 1, but for snow accumulation (in).

4.2. Evaluation of Case for Enhancement

Several rounds of showers occurred along a frontal boundary that was draped across the eastern portion of Utah (Fig 3) late on 11/16 into early 11/17. A strong signal for enhancement was evident in the analysis of radar reflectivity and precipitation accumulation.

To determine the probable movement of the ion plume, particle trajectories were simulated using NOAA's HySPLIT (Hybrid Single Particle Integrated Trajectory) model. Simulated trajectories were launched from the WETA location over a period of 6 hours, beginning at 0600 UTC and relaunched at 0900 UTC. Figure 4 presents a map showing the density of particle trajectories. The region of highest density is located to the north and east of the WETA site, while individual precipitation cells drifted to the east. Optimal enhancement was thus likely over the La Sal Mountains due to intersection with the ion plume.

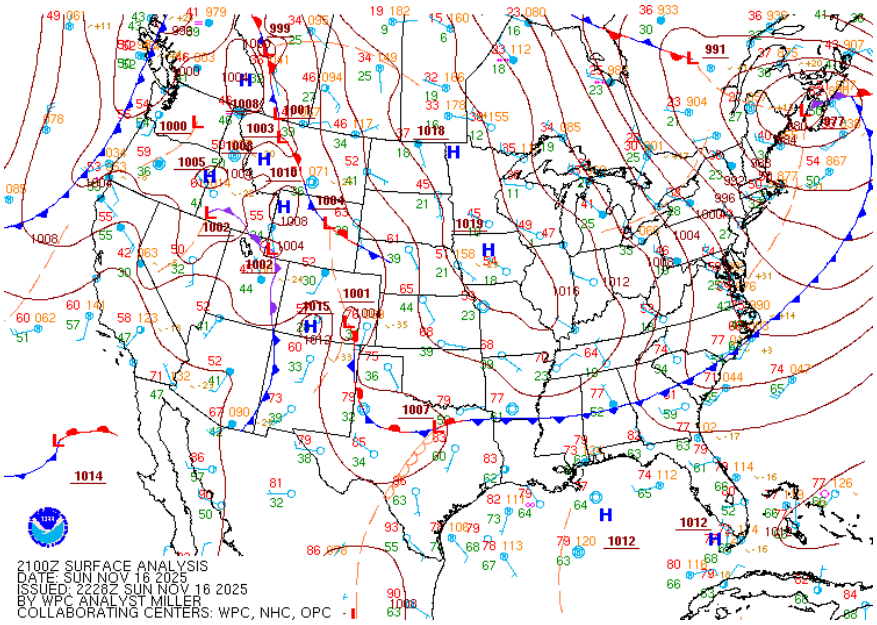

Figure 3. Surface weather analysis for 2100 UTC on 16 November 2025.

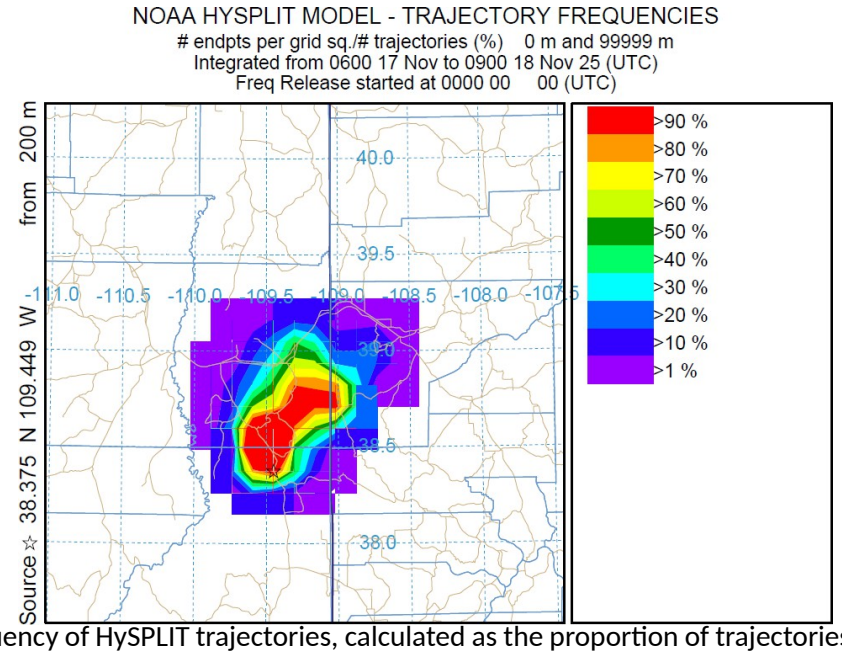

Figure 4. Frequency of HySPLIT trajectories, calculated as the proportion of trajectories located within each quarter degree grid cell, on 17 November 2025. Trajectories were launched from the WETA coordinates, marked as a star icon on the map. Meteorological data supplied by the High-Resolution Rapid Refresh (HRRR) model.

Radar reflectivity and radar-derived accumulation were analysed throughout the event. While showers were widespread across the region there was a distinct preference for showers to originate, linger, or intensify over the La Sal range, immediately to the east of the ion plume.

Figure 5 presents a sequence of radar reflectivity scans from the WSR88d radar located in Grand Junction, CO. Analysis was completed at an elevation angle of 0.5 degrees to avoid reflection of the mountains. Of note is the sustained presence of radar returns over the La Sal range occurring well after showers had cleared the eastern half of the state (e.g., see Fig 5, bottom panel).

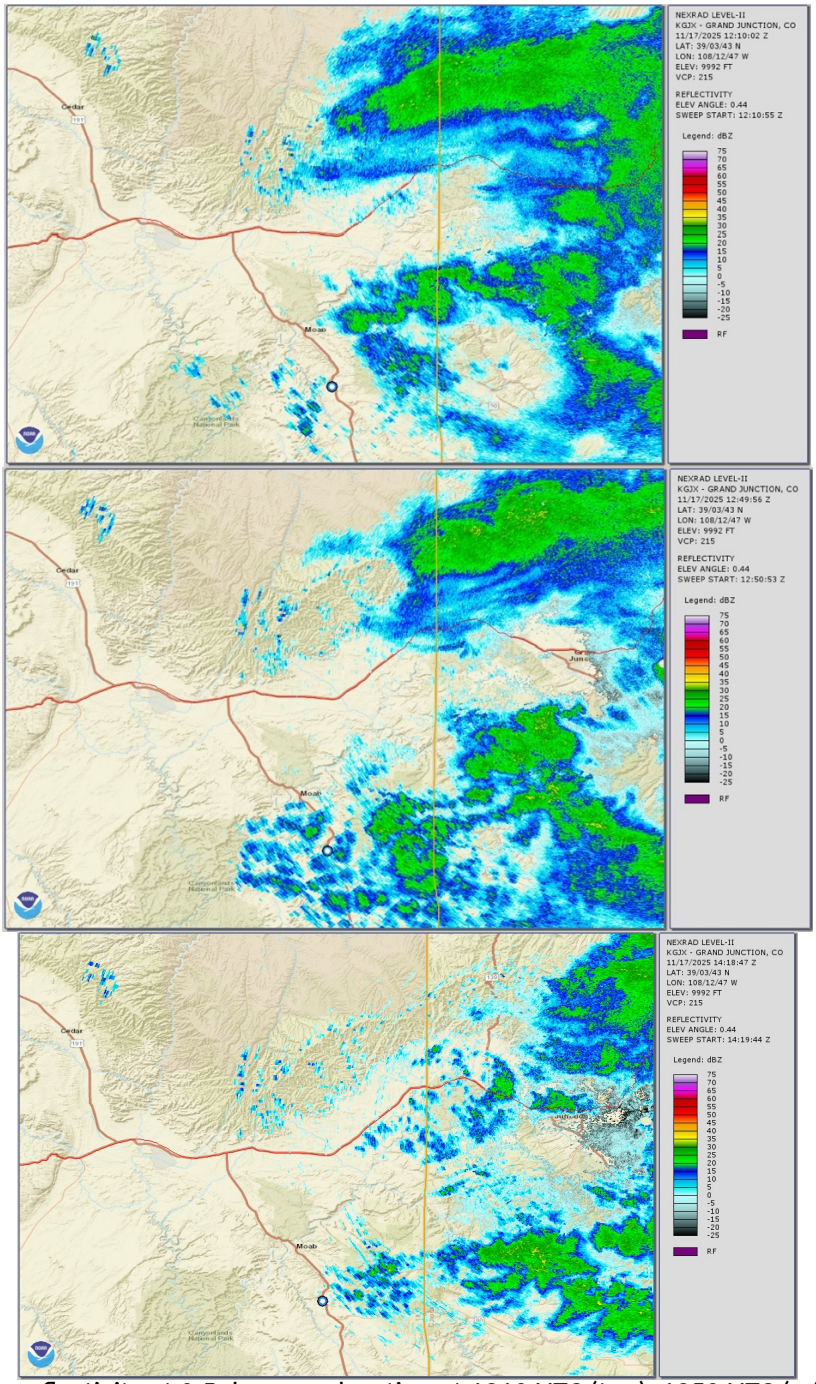

Figure 5. Radar reflectivity at 0.5 degrees elevation at 1210 UTC (top), 1250 UTC (middle), and 1418 UTC (bottom) on 17 November 2025. The WETA location is marked by the white circle.

The tendency for showers to linger and intensify over the La Sal range is also evident in radar-derived accumulated precipitation (Figure 6). A localized area of higher precipitation amounts exceeding 0.5 inches is evident to the north-west of the city of La Sal where the La Sal range is located and where enhancement due to ionization from the WETA was expected.

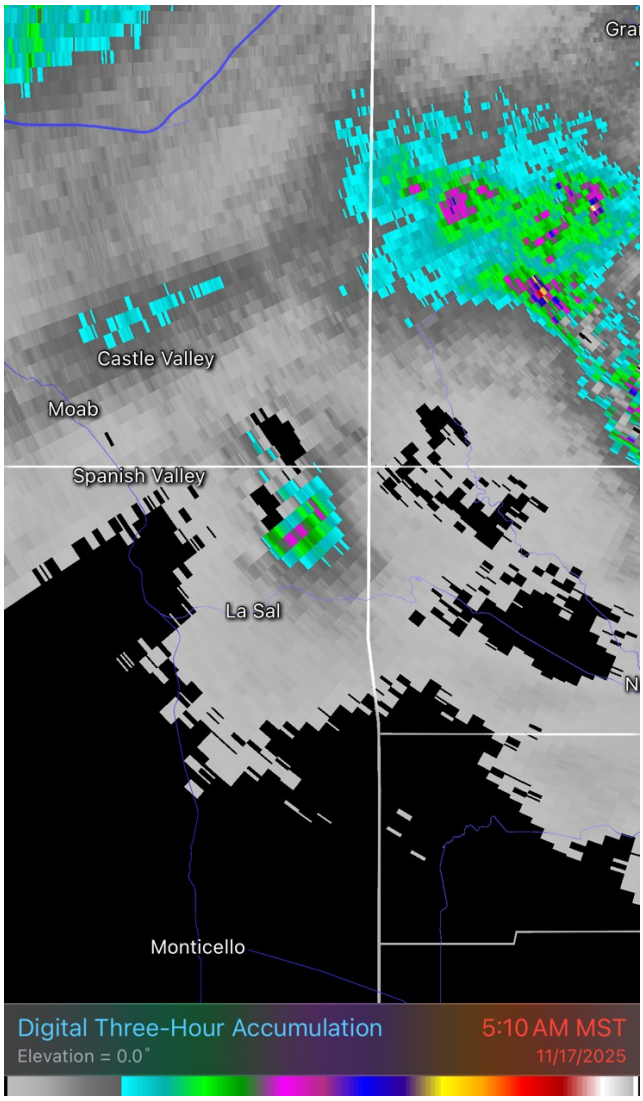

Figure 6. Radar-derived three-hour accumulated precipitation ending 0510 MST (1210 UTC) on 17 November 2025. Purple colors correspond to 0.5 inches or more.

5. References

5.1. Data Sources

Observational data from all available sources are being archived and analysed on an ongoing basis. Table 2 summarizes the sources of data that have been archived to date. Additional gauges and weather stations will be deployed when weather permits (expected Q1 2026).

Table 2. Summary of observational data sources being archived.

Type of Data Source	Specific Locations	Data Description	Granularity /Frequency
Radar	Grand Junction, CO	Radar reflectivity, velocity, precipitation accumulation, and all Level II and III fields at all elevation angles	~5 minutes
Radiometer	Moab, UT	Relative humidity, liquid water content in all scan directions	One minute
Weather Station	South Mesa, UT Gold Basin, UT Moab, UT US-191 at MP 104 Flat Iron, UT Hole N The Rock, UT La Sal, UT SR-46 at MP 12.5 La Sal Divide (UT DOT), UT	Weather variables such as precip, wind speed, wind direction, temperature etc.	Hourly
SNOTEL	Castle Valley, UT Gold Basin, UT La Sal Mtn, UT La Sal Mtn Lower, UT	Snow/Water equivalent monitoring	Daily