



Use of Weather Information in Hot Air Balloon Flight Planning and Operations

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Commercial Balloon Pilots

Overview:

- Types of balloons
- Basic weather needed for ballooning
- Weather info looked at
 - 5+ days before
 - 2-3 days before
 - day of flight
- Weather sites used at launch site

Hot Air Balloons vs Gas Balloons

- Colorful & special shapes
- Fly 1-2 hrs.
- Use propane
- Fly 500 – 1,000 ft. AGL

- Mainly white, round
- Fly for days
- Use helium or hydrogen
- Fly 5,000 -17,999 ft. MSL



Hot Air Balloons

Sport vs Commercial Use

- Pilot + 1 to 4 passengers
 - Usually fly crew members familiar with balloons
 - May fly competitions with fast ascents and descents to targets
- Pilot + up to 15 passengers
 - Fly first-time, paying passengers
 - Much larger envelopes, more surface area to feel wind
 - More gentle flight profiles

Basic Weather for Ballooning

- Good weather conditions
 - Balloons are VFR aircraft
- Light winds (<7 kts) on surface
- Winds aloft in a good direction to a safe landing site
- Observe micro meteorology
 - Inversions
 - Orographic winds
- Minimal thermal activity

Five + days out

- Used to make plans for a flight
- AWS Prog charts for surface weather
- NWS charts for winds and wind directions
- Windy (www.windy.com)
- Weather Underground (www.wunderground.com)
- Hysplit Trajectories for gas balloon flights
(NOAA Air Resources Laboratory)

Albuquerque Balloon Launch Point Hourly Forecasts
 Click on one of the Balloons on the Map for a Detailed Point Forecast

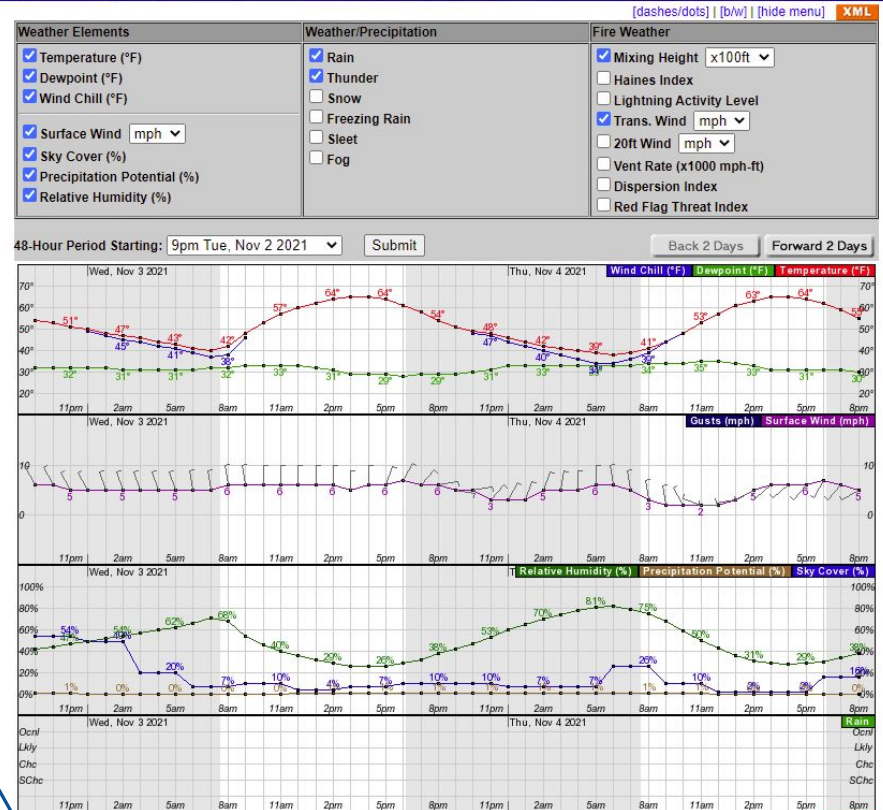


From ABQ NWS web site

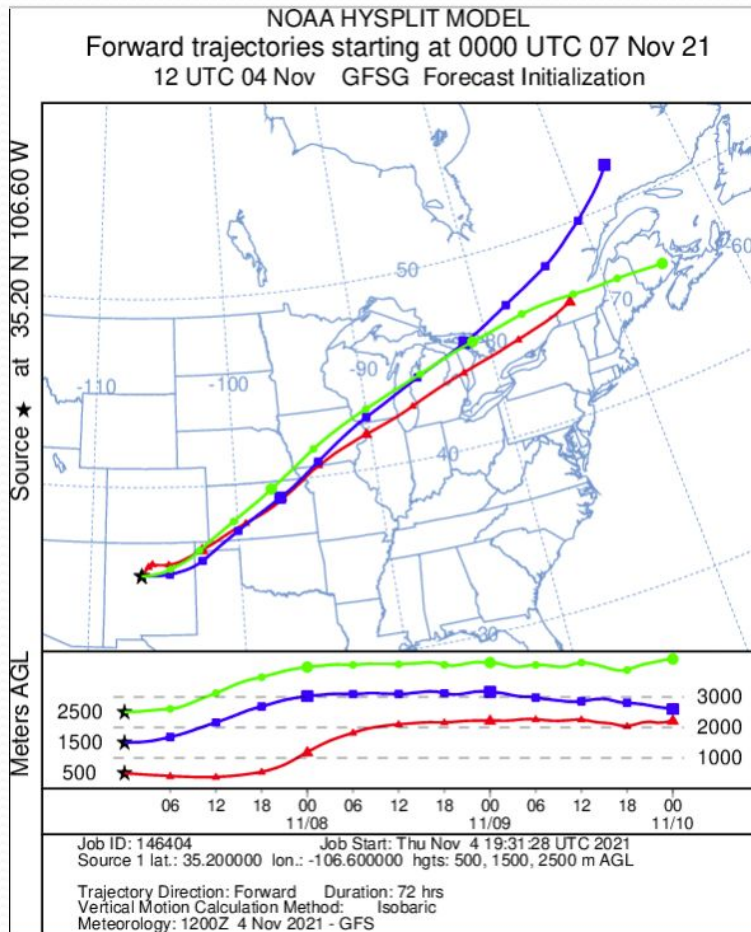
Point Forecast: 2 Miles N Paradise Hills NM
 35.22N 106.7W (Elev. 5344 ft)

Last Update: 2:54 pm MDT Nov 2, 2021

Hourly Weather Forecast Graph



Hysplit Trajectory



- Starts Saturday evening
- 72 hrs.
- 3 elevations

2-3 days out

- To confirm plans for a flight
- Line up crew for flight

- NWS charts for winds and wind directions
- Windy (www.windy.com)
- Weather Underground (www.wunderground.com)
- SkewT-LogP (<https://rucsoundings.noaa.gov>)

SkewT-LogP

- <https://rucsoundings.noaa.gov>
- Can use GFS model for forecast plots
- Displays vs **Altitude**
 - Wind speed & direction
 - Temperature & Dewpoint
 - Possible inversions
- Also shows
 - Lifted Index
 - CAPE
 - Cloud formation heights
 - ... and much more

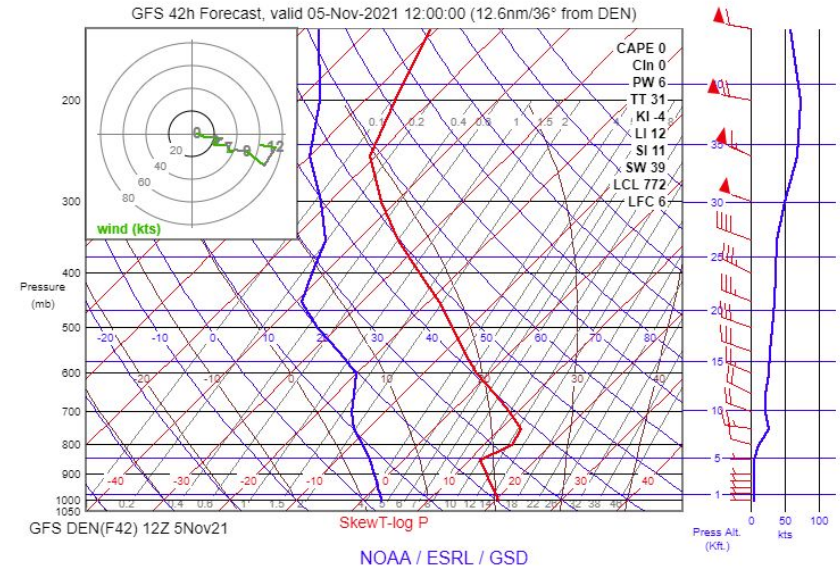
Instructions | Site info: METARs, RAOBs (**Latest RAOB times**), Airports (in another window) | version history (in another window)
 It may take 30 seconds for the initial data to load
 Several changes. See change details (in another window) for more information. (To get the new code, you may have to hold down I

Latest Op40 analysis is valid at **23:00 03-Nov-21 UTC**.

Latest Bak40 analysis is valid at **23:00 03-Nov-21 UTC**.

For up-to-date information about the status of RAP runs, see the [RAP forum \(new window\)](#).

(You can subscribe to this forum to get email copies of new posts.)



Load Soundings Get text 0.5 mb scale SkewT/Tephi. Wind scale: 40/100 Simple plot

DEN(F42) 12Z 5Nov21	DEN(F36) 06Z 5Nov21	DEN(F30) 00Z 5Nov21	DEN(F27) 21Z 4Nov21
DEN(F24) 18Z 4Nov21	DEN(F21) 15Z 4Nov21	DEN(F18) 12Z 4Nov21	DEN(F15) 09Z 4Nov21
DEN(F12) 06Z 4Nov21	DEN(F9) 03Z 4Nov21	DEN(F6) 00Z 4Nov21	DEN(F3) 21Z 3Nov21
DEN(A) 18Z 3Nov21			

Day of flight

- Leidos Flight Services
 - Surface charts
 - Isobars (more than 3 in state = too windy)
 - Where fronts are
 - Winds at 9,000 & 12,000 ft. MSL (add to 50 = going to get windy)
 - Local airport METRAs for winds and pressure
- BalloonCast (<http://blastvalve.com/weather>)
- Windy
- Weather underground
- SkewT-LogP chart

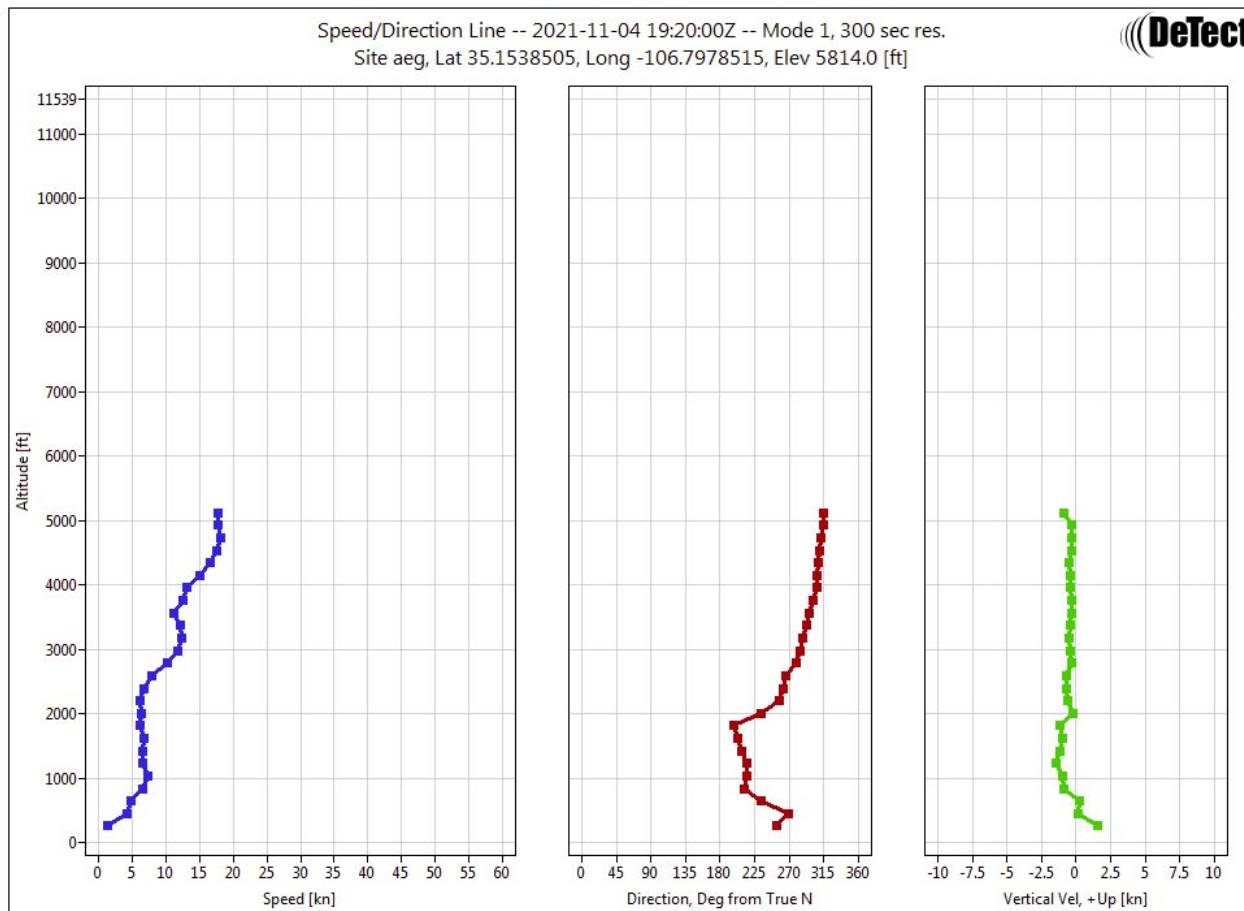
At launch site

- PiBal
- Radiometrics Wind Profiler at Double Eagle II Airport (<http://detect.rwp.abq.s3-website-us-west-2.amazonaws.com>)
- Ryan Carlton wind site (<https://ryancarlton.com>)
- Phone apps & web sites
 - Weather underground
 - Windy
 - MyRadar
 - Other weather sites

Radiometrics Wind Plots

Low Mode; Full altitude

Time Since Update: 05 minute(s), 48 second(s)



Ryan Carlton web site

		<h2 style="color: yellow;">Rio Rancho, NM</h2> <p style="text-align: center;">Rio Rancho, NM, USA</p>					
<input type="text" value="Enter a Location"/>		Sunrise 7:29 AM MDT		Sunset 6:11 PM MDT		Elevation 6037 ft	
<u>RAP</u>	8:00 PM MDT	9:00 PM MDT	10:00 PM MDT	11:00 PM MDT			
11/2/2021 9:40 PM	11/2/2021	11/2/2021	11/2/2021	11/2/2021			
0 ft	253 @ 2 KT _s $\frac{60^{\circ}\text{F}}{25^{\circ}\text{F}}$	168 @ 2 KT _s $\frac{59^{\circ}\text{F}}{24^{\circ}\text{F}}$	161 @ 1 KT _s $\frac{58^{\circ}\text{F}}{25^{\circ}\text{F}}$	215 @ 2 KT _s $\frac{57^{\circ}\text{F}}{25^{\circ}\text{F}}$			
92 ft	290 @ 4 KT _s $\frac{60^{\circ}\text{F}}{24^{\circ}\text{F}}$	276 @ 2 KT _s $\frac{59^{\circ}\text{F}}{24^{\circ}\text{F}}$	316 @ 2 KT _s $\frac{58^{\circ}\text{F}}{24^{\circ}\text{F}}$	296 @ 3 KT _s $\frac{57^{\circ}\text{F}}{25^{\circ}\text{F}}$			
253 ft	300 @ 6 KT _s $\frac{59^{\circ}\text{F}}{24^{\circ}\text{F}}$	308 @ 4 KT _s $\frac{59^{\circ}\text{F}}{24^{\circ}\text{F}}$	322 @ 5 KT _s $\frac{58^{\circ}\text{F}}{24^{\circ}\text{F}}$	314 @ 5 KT _s $\frac{57^{\circ}\text{F}}{25^{\circ}\text{F}}$			
518 ft	306 @ 8 KT _s $\frac{58^{\circ}\text{F}}{24^{\circ}\text{F}}$	317 @ 7 KT _s $\frac{58^{\circ}\text{F}}{24^{\circ}\text{F}}$	329 @ 9 KT _s $\frac{57^{\circ}\text{F}}{24^{\circ}\text{F}}$	328 @ 7 KT _s $\frac{56^{\circ}\text{F}}{24^{\circ}\text{F}}$			
899 ft	311 @ 11 KT _s $\frac{56^{\circ}\text{F}}{24^{\circ}\text{F}}$	321 @ 11 KT _s $\frac{56^{\circ}\text{F}}{24^{\circ}\text{F}}$	333 @ 12 KT _s $\frac{55^{\circ}\text{F}}{24^{\circ}\text{F}}$	336 @ 10 KT _s $\frac{55^{\circ}\text{F}}{24^{\circ}\text{F}}$			
1385 ft	314 @ 14 KT _s $\frac{53^{\circ}\text{F}}{23^{\circ}\text{F}}$	323 @ 14 KT _s $\frac{53^{\circ}\text{F}}{23^{\circ}\text{F}}$	334 @ 14 KT _s $\frac{53^{\circ}\text{F}}{24^{\circ}\text{F}}$	338 @ 13 KT _s $\frac{52^{\circ}\text{F}}{23^{\circ}\text{F}}$			
1959 ft	316 @ 15 KT _s $\frac{50^{\circ}\text{F}}{23^{\circ}\text{F}}$	324 @ 15 KT _s $\frac{50^{\circ}\text{F}}{23^{\circ}\text{F}}$	334 @ 16 KT _s $\frac{50^{\circ}\text{F}}{23^{\circ}\text{F}}$	339 @ 15 KT _s $\frac{50^{\circ}\text{F}}{22^{\circ}\text{F}}$			
2598 ft	317 @ 17 KT _s $\frac{47^{\circ}\text{F}}{22^{\circ}\text{F}}$	324 @ 16 KT _s $\frac{47^{\circ}\text{F}}{22^{\circ}\text{F}}$	334 @ 16 KT _s $\frac{46^{\circ}\text{F}}{22^{\circ}\text{F}}$	338 @ 16 KT _s $\frac{46^{\circ}\text{F}}{20^{\circ}\text{F}}$			
3301 ft	315 @ 18 KT _s $\frac{43^{\circ}\text{F}}{21^{\circ}\text{F}}$	322 @ 16 KT _s $\frac{43^{\circ}\text{F}}{21^{\circ}\text{F}}$	331 @ 17 KT _s $\frac{43^{\circ}\text{F}}{21^{\circ}\text{F}}$	332 @ 17 KT _s $\frac{43^{\circ}\text{F}}{19^{\circ}\text{F}}$			
4075 ft	310 @ 19 KT _s $\frac{40^{\circ}\text{F}}{21^{\circ}\text{F}}$	315 @ 18 KT _s $\frac{39^{\circ}\text{F}}{21^{\circ}\text{F}}$	323 @ 19 KT _s $\frac{39^{\circ}\text{F}}{20^{\circ}\text{F}}$	323 @ 19 KT _s $\frac{39^{\circ}\text{F}}{18^{\circ}\text{F}}$			
4311 ft	308 @ 20 KT _s $\frac{38^{\circ}\text{F}}{21^{\circ}\text{F}}$	312 @ 19 KT _s $\frac{38^{\circ}\text{F}}{20^{\circ}\text{F}}$	320 @ 19 KT _s $\frac{38^{\circ}\text{F}}{19^{\circ}\text{F}}$	320 @ 19 KT _s $\frac{38^{\circ}\text{F}}{18^{\circ}\text{F}}$			

Questions?

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