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

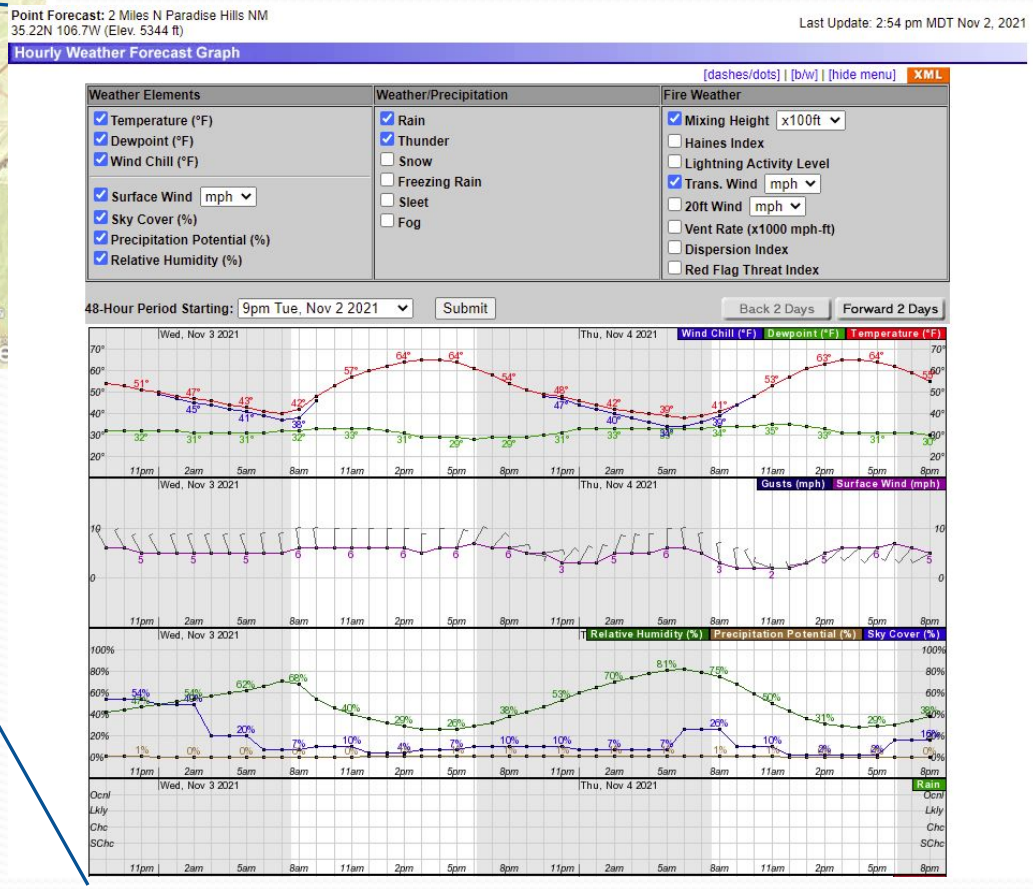
Five + days out

- Used to make plans for a flight

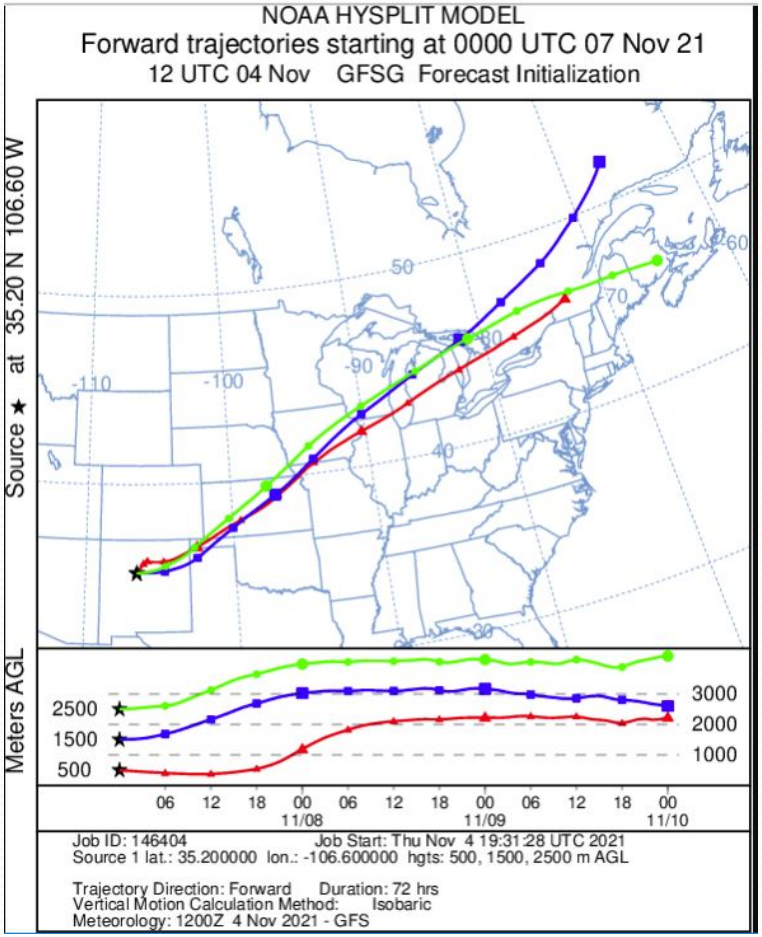
- AWS Prog charts for surface weather
- NWS charts for winds and wind directions
- Windy (www.windy.com)
- Weather Underground (www.wunderground.com)

- Hysplit Trajectories for gas balloon flights
  (NOAA Air Resources Laboratory)

From ABQ NWS web site



Hysplit Trajectory



- Starts Saturday evening
- 72 hrs.
- 3 elevations

2-3 days out

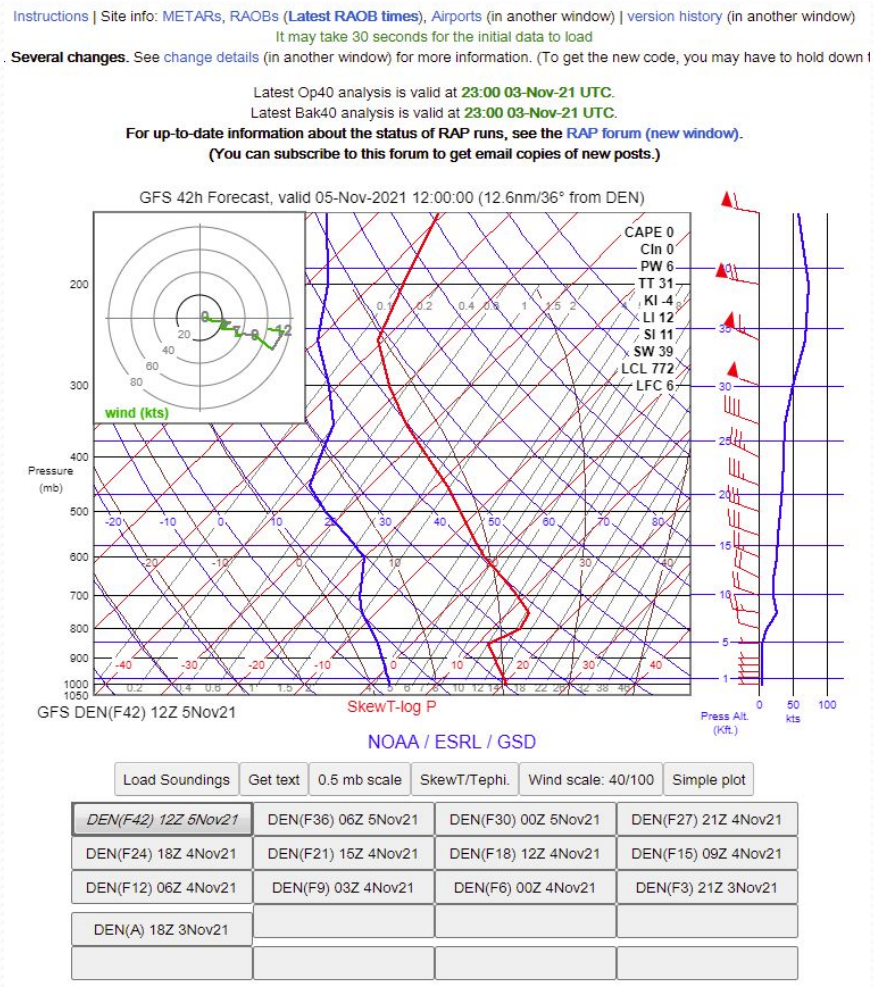
- To confirm plans for a flight
- Line up crew for flight

- 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



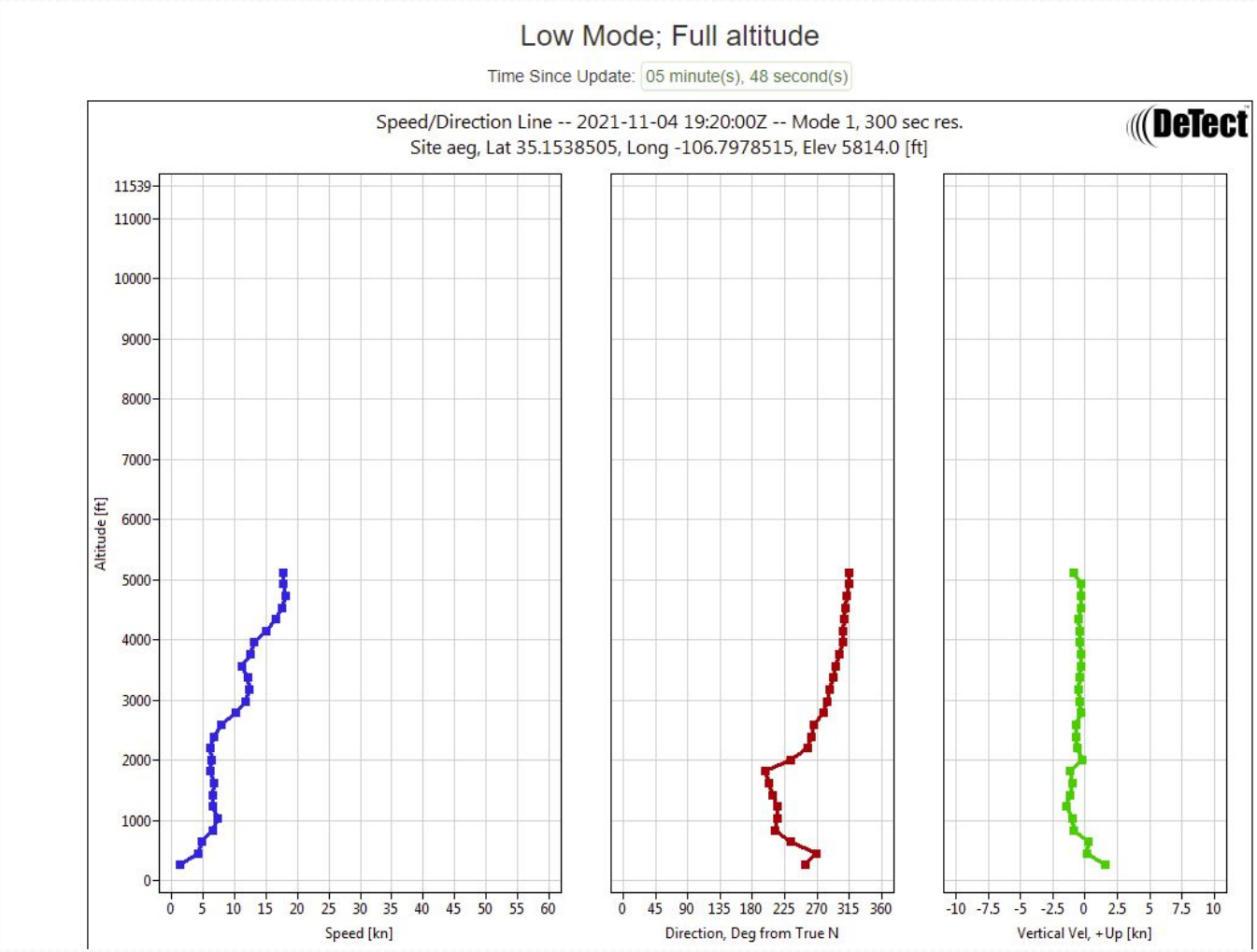
Day of flight

- 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



Ryan Carlton web site

Rio Rancho, NM

Rio Rancho, NM, USA

Enter a Location

Sunrise 7:29 AM MDT | Sunset 6:11 PM MDT | Elevation 6037 ft

RAP 11/2/2021 9:40 PM	8:00 PM MDT 11/2/2021	9:00 PM MDT 11/2/2021	10:00 PM MDT 11/2/2021	11:00 PM MDT 11/2/2021
0 ft	253 @ 2 KTs 60°F / 25°F	168 @ 2 KTs 59°F / 24°F	161 @ 1 KTs 58°F / 25°F	215 @ 2 KTs 57°F / 25°F
92 ft	290 @ 4 KTs 60°F / 24°F	276 @ 2 KTs 59°F / 24°F	316 @ 2 KTs 58°F / 24°F	296 @ 3 KTs 57°F / 25°F
253 ft	300 @ 6 KTs 59°F / 24°F	308 @ 4 KTs 59°F / 24°F	322 @ 5 KTs 58°F / 24°F	314 @ 5 KTs 57°F / 25°F
518 ft	306 @ 8 KTs 58°F / 24°F	317 @ 7 KTs 58°F / 24°F	329 @ 9 KTs 57°F / 24°F	328 @ 7 KTs 56°F / 24°F
899 ft	311 @ 11 KTs 56°F / 24°F	321 @ 11 KTs 56°F / 24°F	333 @ 12 KTs 55°F / 24°F	336 @ 10 KTs 55°F / 24°F
1385 ft	314 @ 14 KTs 53°F / 23°F	323 @ 14 KTs 53°F / 23°F	334 @ 14 KTs 53°F / 24°F	338 @ 13 KTs 52°F / 23°F
1959 ft	316 @ 15 KTs 50°F / 23°F	324 @ 15 KTs 50°F / 23°F	334 @ 16 KTs 50°F / 23°F	339 @ 15 KTs 50°F / 22°F
2598 ft	317 @ 17 KTs 47°F / 22°F	324 @ 16 KTs 47°F / 22°F	334 @ 16 KTs 46°F / 22°F	338 @ 16 KTs 46°F / 20°F
3301 ft	315 @ 18 KTs 43°F / 21°F	322 @ 16 KTs 43°F / 21°F	331 @ 17 KTs 43°F / 21°F	332 @ 17 KTs 43°F / 19°F
4075 ft	310 @ 19 KTs 40°F / 21°F	315 @ 18 KTs 39°F / 21°F	323 @ 19 KTs 39°F / 20°F	323 @ 19 KTs 39°F / 18°F
4311 ft	308 @ 20 KTs 38°F / 21°F	312 @ 19 KTs 38°F / 20°F	320 @ 19 KTs 38°F / 19°F	320 @ 19 KTs 38°F / 18°F

Questions?

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