

A large, white, anvil-shaped cumulonimbus cloud dominates the upper half of the image, set against a clear blue sky. Below the cloud, a vast mountain range stretches across the horizon, with several peaks covered in patches of snow. The foreground shows more detailed mountain terrain with rocky outcrops and snow. The overall scene is a high-altitude landscape.

Forecasting Boomer Thermal Days

Kempton Izuno
November 4, 2017

Agenda

- Intro
- Approach & Tools
- Case Studies



Definitions & Assumptions

- Long Range: 10+ days
- Really long range forecasting = Climate
- California
- Assumptions
 - ✓ Cu thermal day
 - ✓ You know BLIPMAPS, RASP

Why

Incredible days are 2-3x better than average days

Days you'll remember when you can't fly anymore

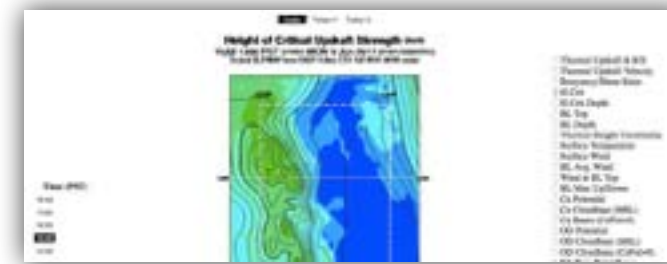
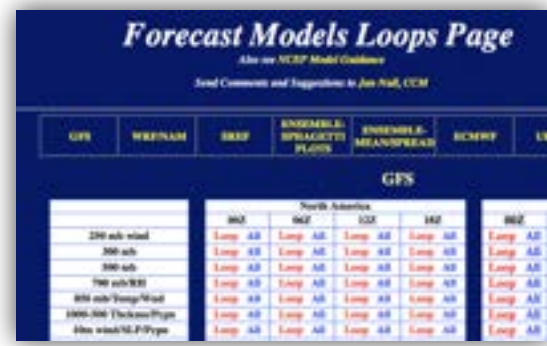
Commit to a plan today!

Approach

Need lead time

- What to look for
- The forecasting pace
- The mood of the weather

Tools



Days Out	Site	Confidence
16	GGweather NCEP Loops	Hmmm...
10	GGweather NCEP Loops , Unisys GFS	Clear calendar
5	GGweather NCEP Loops , Unisys GFS	Commit
2	GGweather NCEP Loops , Unisys GFS , RASP , BLIPMAP , Windy	Pre-Flight prep

Tool Usage

Forecast Models Loops Page
Also see NCEP Model Guidance
 Send Comments and Suggestions to Jan Null, CCM

GFS	WRF/NAM	SREF	ENSEMBLE-SPHAGETTI PLOTS	ENSEMBLE-MEANS/SPREAD	ECMWF	UK
GFS						
	North America					
	00Z	06Z	12Z	18Z	00Z	
250 mb wind	Loop All	Loop All	Loop All	Loop All	Loop All	
300 mb	Loop All	Loop All	Loop All	Loop All	Loop All	
500 mb	Loop All	Loop All	Loop All	Loop All	Loop All	
700 mb/RH	Loop All	Loop All	Loop All	Loop All	Loop All	
850 mb/Temp/Wnd	Loop All	Loop All	Loop All	Loop All	Loop All	
1000-500 Thcknss/Pcpr	Loop All	Loop All	Loop All	Loop All	Loop All	
10m wind/SLP/Pcpr	Loop All	Loop All	Loop All	Loop All	Loop All	

UNISYS | *Driving Your Tomorrow*

Unisys Weather

GFS - US - 4Panel - Initial

MODEL: NAM (17)

TYPE: Namc (16)

REGION: US EU SA AU

PLOT: SL Pres/Prec, 1000/500 Pres, 1000 mb, 850 mb, 700 mb, 500 mb, 300 mb, 200 mb, 100 mb, 500 mb, 400 mb, 300 mb, 200 mb, 100 mb

TIME: Initial 12hr 24hr 36hr 48hr 60hr 72hr 84hr 96hr 108hr 120hr 132hr 144hr 156hr 168hr 180hr 192hr 204hr 216hr 228hr 240hr 252hr 264hr 276hr 288hr 300hr 312hr 324hr 336hr 348hr 360hr 372hr 384hr 396hr 408hr 420hr 432hr 444hr 456hr 468hr 480hr 492hr 504hr 516hr 528hr 540hr 552hr 564hr 576hr 588hr 600hr 612hr 624hr 636hr 648hr 660hr 672hr 684hr 696hr 708hr 720hr 732hr 744hr 756hr 768hr 780hr 792hr 804hr 816hr 828hr 840hr 852hr 864hr 876hr 888hr 900hr 912hr 924hr 936hr 948hr 960hr 972hr 984hr 996hr 1008hr 1020hr 1032hr 1044hr 1056hr 1068hr 1080hr 1092hr 1104hr 1116hr 1128hr 1140hr 1152hr 1164hr 1176hr 1188hr 1200hr 1212hr 1224hr 1236hr 1248hr 1260hr 1272hr 1284hr 1296hr 1308hr 1320hr 1332hr 1344hr 1356hr 1368hr 1380hr 1392hr 1404hr 1416hr 1428hr 1440hr 1452hr 1464hr 1476hr 1488hr 1500hr 1512hr 1524hr 1536hr 1548hr 1560hr 1572hr 1584hr 1596hr 1608hr 1620hr 1632hr 1644hr 1656hr 1668hr 1680hr 1692hr 1704hr 1716hr 1728hr 1740hr 1752hr 1764hr 1776hr 1788hr 1800hr 1812hr 1824hr 1836hr 1848hr 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20880hr 20892hr 20904hr 20916hr 20928hr 20940hr 20952hr 20964hr 20976hr 20988hr 21000hr 21012hr 21024hr 21036hr 21048hr 21060hr 21072hr 21084hr 21096hr 21108hr 21120

Case Studies

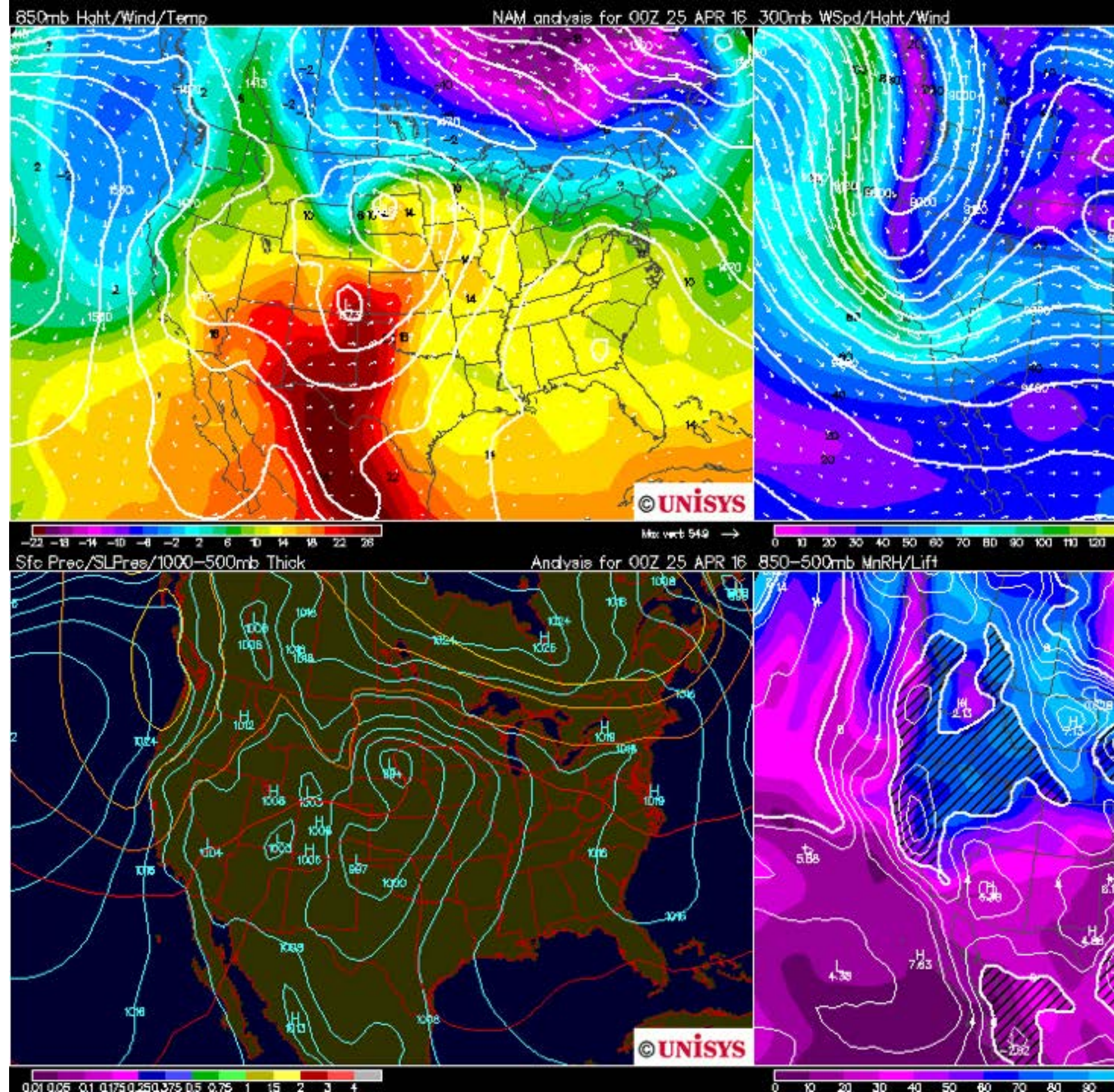
- Apr 24, 2016 Williams
- May 13, 2016 Portland
- Aug 17, 2016 Goose Lake

A large, white, anvil-shaped cumulonimbus cloud dominates the upper half of the image, set against a clear blue sky. Below the cloud, a rugged mountain range is visible, with some peaks covered in snow. The text is overlaid on the lower half of the image.

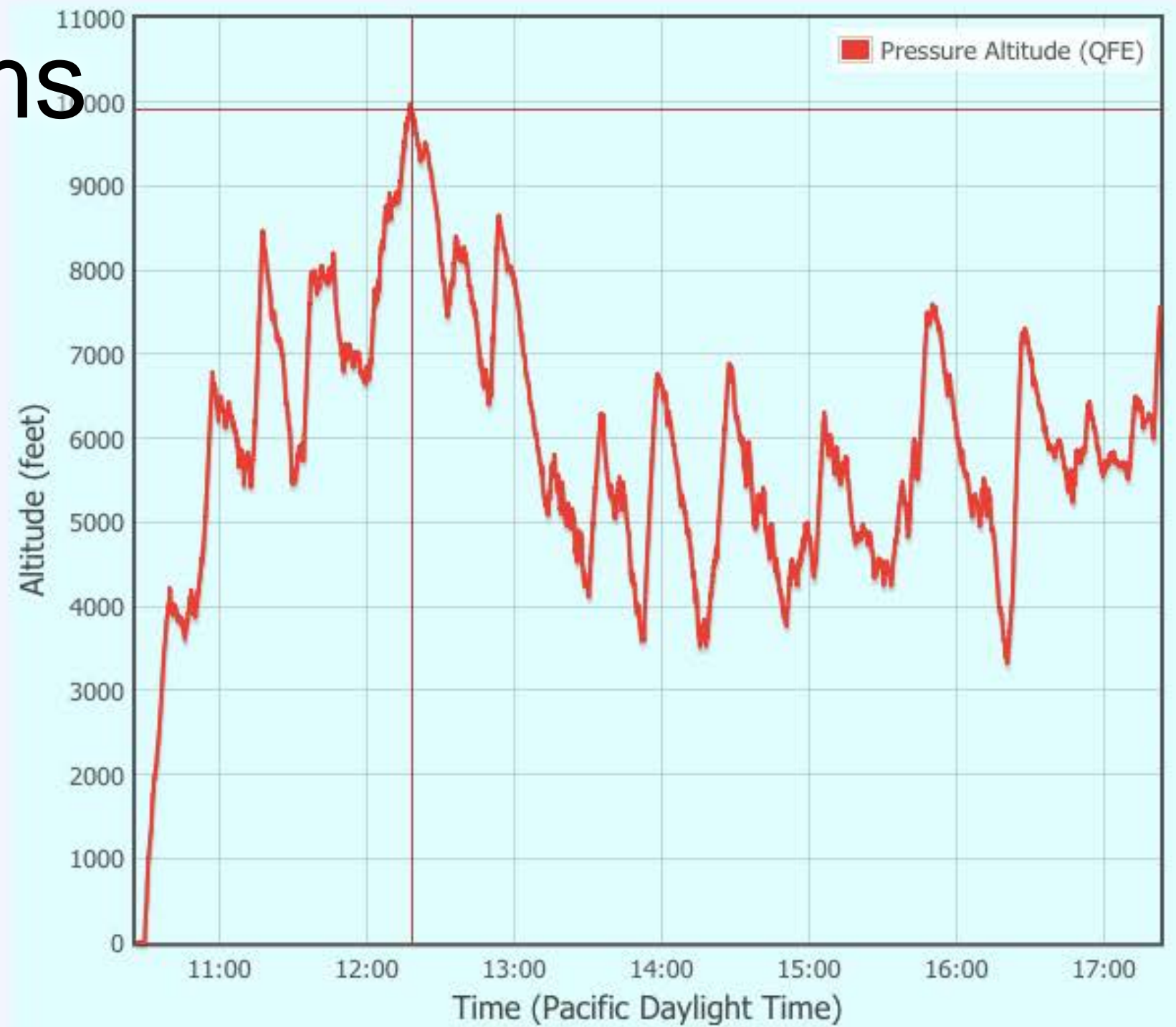
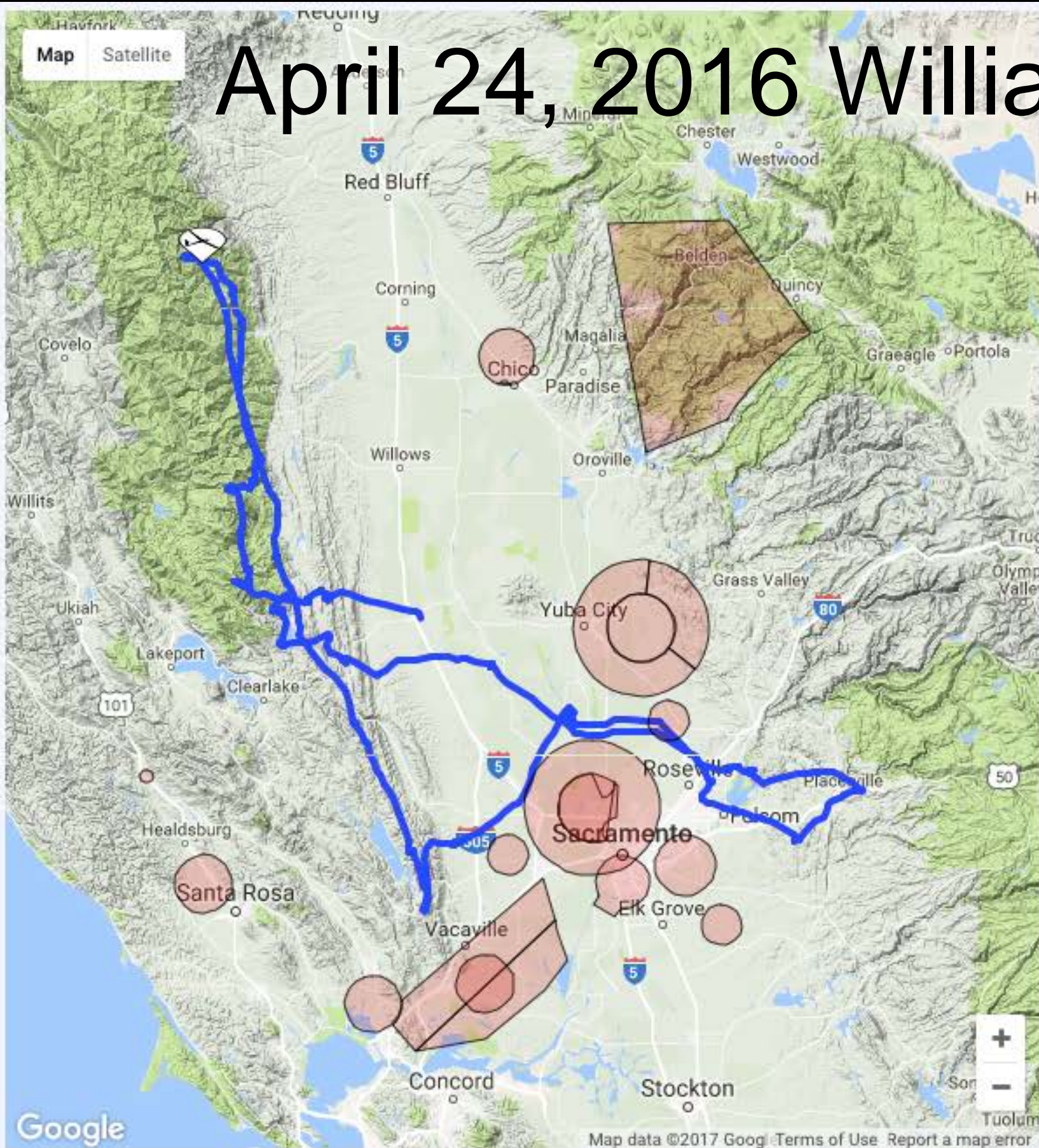
Case Study #1: Apr 24, 2016
Williams

April 24, 2016 Williams

- Lead Time: 6 days
- Leading indicator:
upper level low
- Unstable!
- 40-50% rel. humidity
- And other lessons...



April 24, 2016 Williams



Time: 12:18:19 PDT: **Position:** 40°1.037'N 122°49.100'W:

Height AGL

Flight mode: Cruising: **Altitude:** QFE (baro) 9902 feet:

Vario: -0.9 knots: **Ground speed:** 75 kt



9:14a



12:09p



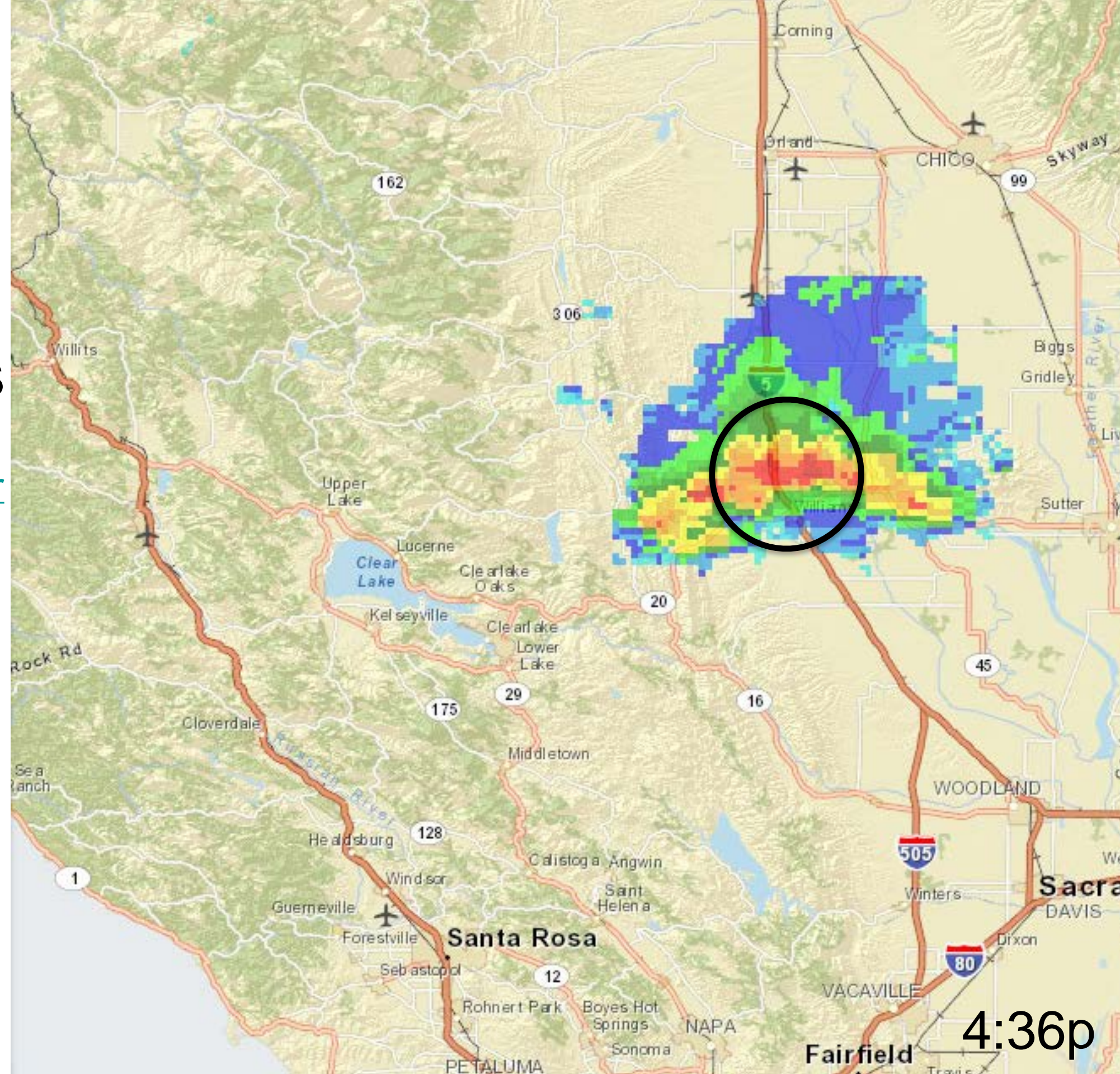




April 24, 2016 Williams

- Historic Doppler images

<https://gis.ncdc.noaa.gov/maps/ncei/radar>



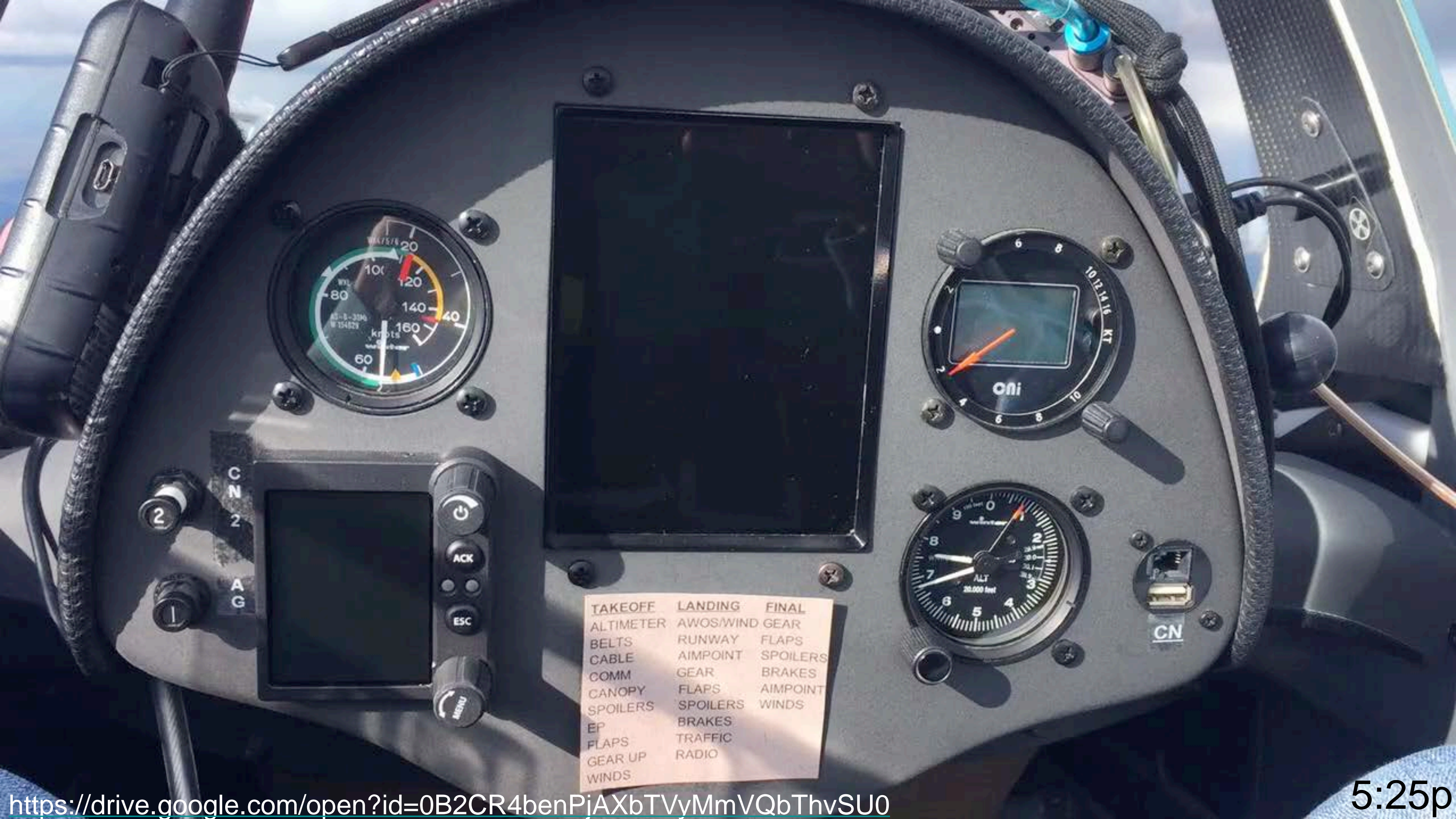
April 24, 2016 Williams

- Current Doppler page

<https://radar.weather.gov/radar.php?rid=mux&product=n0r&overlay=11101111&loop=no>

- Bookmark on phone!
- Now back to the flight...





TAKEOFF	LANDING	FINAL
ALTIMETER	AWOS/WIND	GEAR
BELTS	RUNWAY	FLAPS
CABLE	AIMPOINT	SPOILERS
COMM	GEAR	BRAKES
CANOPY	FLAPS	AIMPOINT
SPOILERS	SPOILERS	WINDS
EP	BRAKES	
FLAPS	TRAFFIC	
GEAR UP	RADIO	
WINDS		

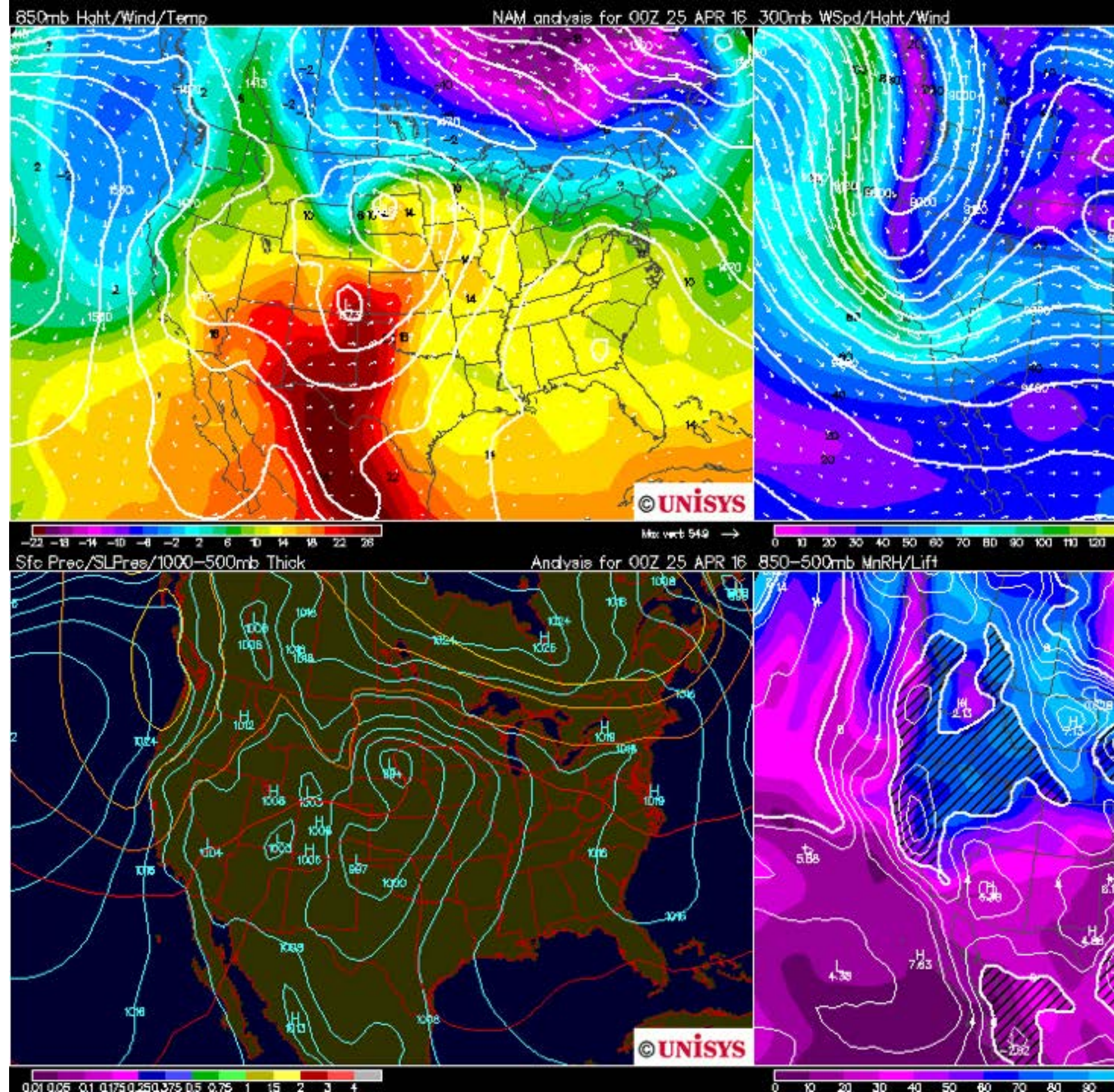


6:00p



April 24, 2016 Williams

- Lead Time: 6 days
- Leading indicator:
upper level low
- Unstable!
- 40-50% rel. humidity
- And other lessons...



Lessons Learned / Reinforced

Great soaring, but...

- #1 option = Altitude!
- Use ALL tools: Text, Doppler, look outside
- Memorable and AWESOME

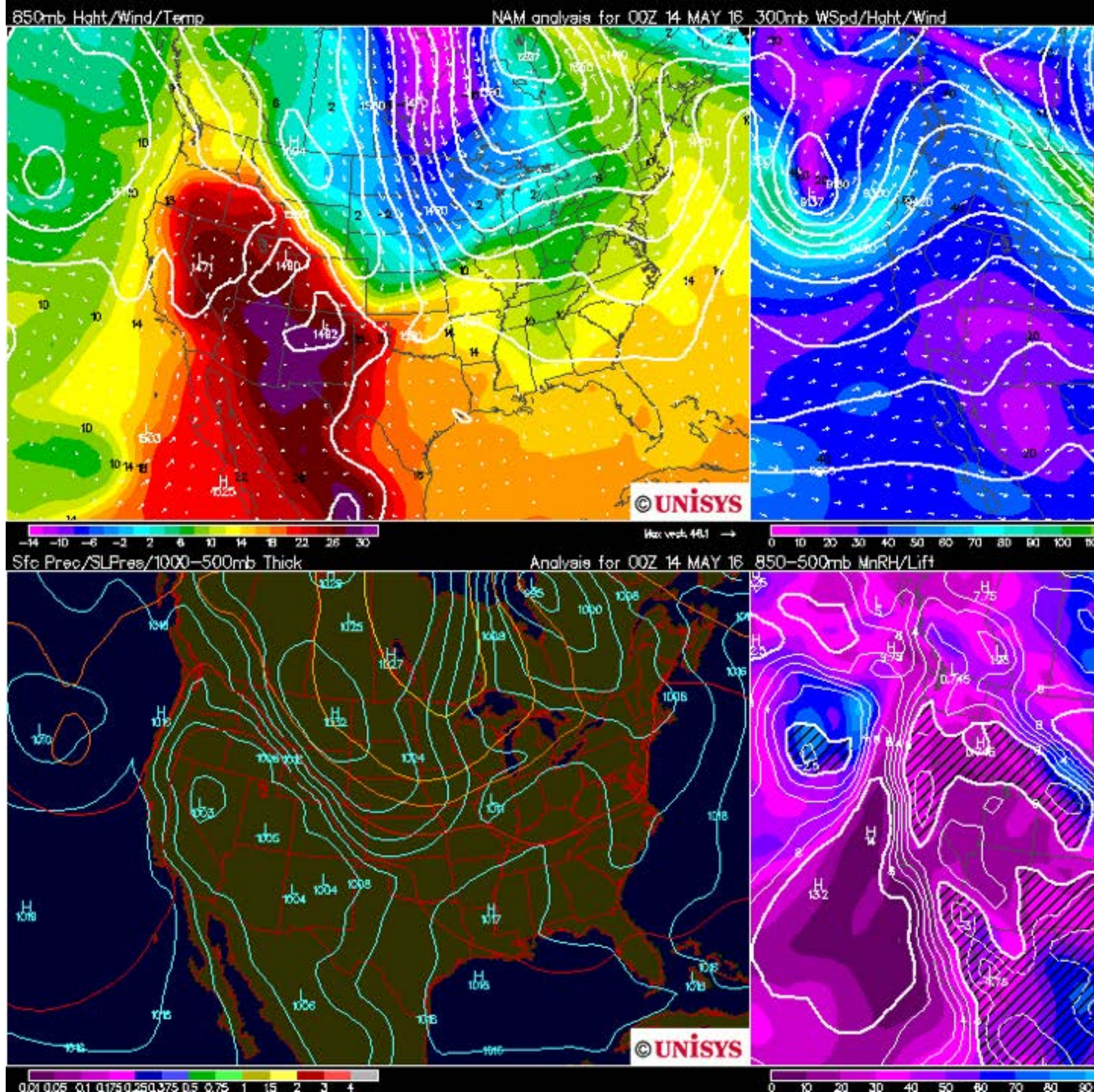


A large, white, billowing cumulus cloud formation rises from a mountain range under a clear blue sky. The cloud is the central focus, with a dense, rounded top and a base that appears to be rising from the mountain peaks. The mountains below are rugged and covered in patches of snow, with some green vegetation visible in the lower elevations. The sky is a deep, clear blue, providing a stark contrast to the white cloud.

Case Study #2: May 13, 2016
Portland (PDX)

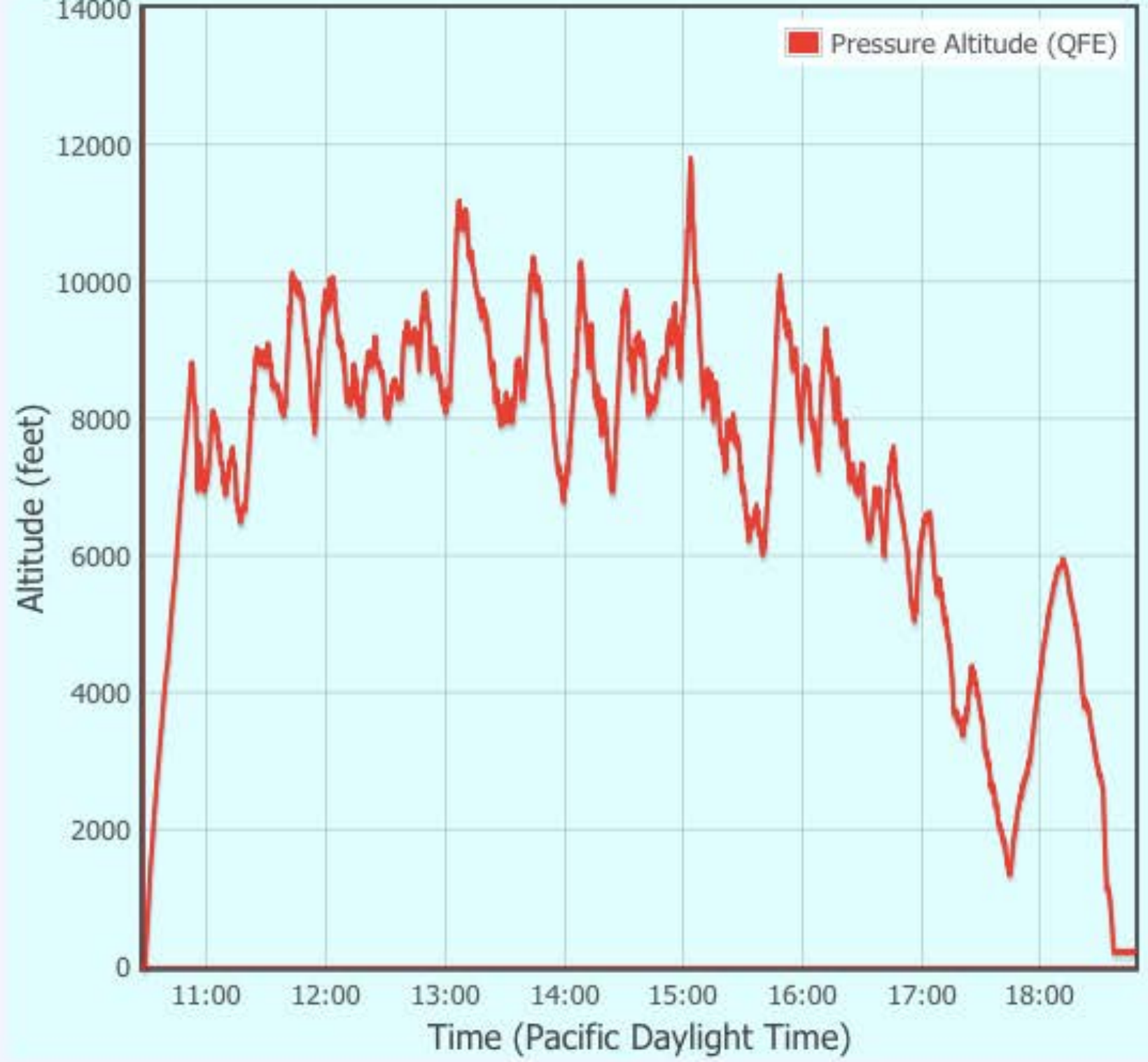
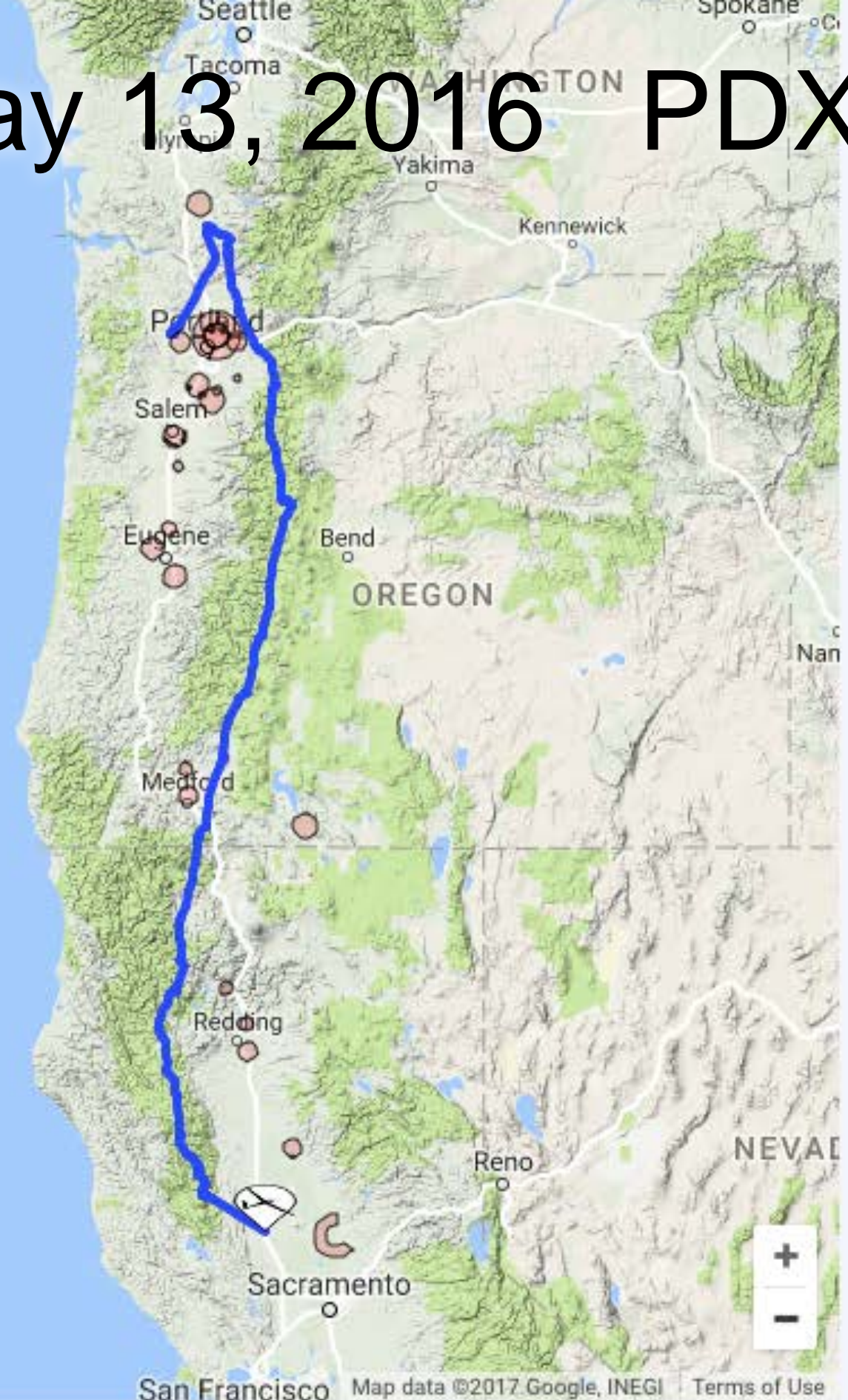
May 13, 2016 PDX

- 5 day lead time
- Leading indicator: heating & instability plus tailwind
- Plan #1: Fly up the Cascades, fly back next day
- Issue: Rain moving in



Map Satellite

May 13, 2016 PDX



Time: 10:27:49 PDT: **Position:** 39°9.614'N

Height AGL

122°7.912'W: **Flight mode:** Pre take off:

Altitude: QFE (baro) 0 feet:





12:41p



Woohoo!! ..but..



3:20p

... 20 minutes later...

Woohoo is replaced by
HooDoo. What happened?



Santiam Junction



4:26p



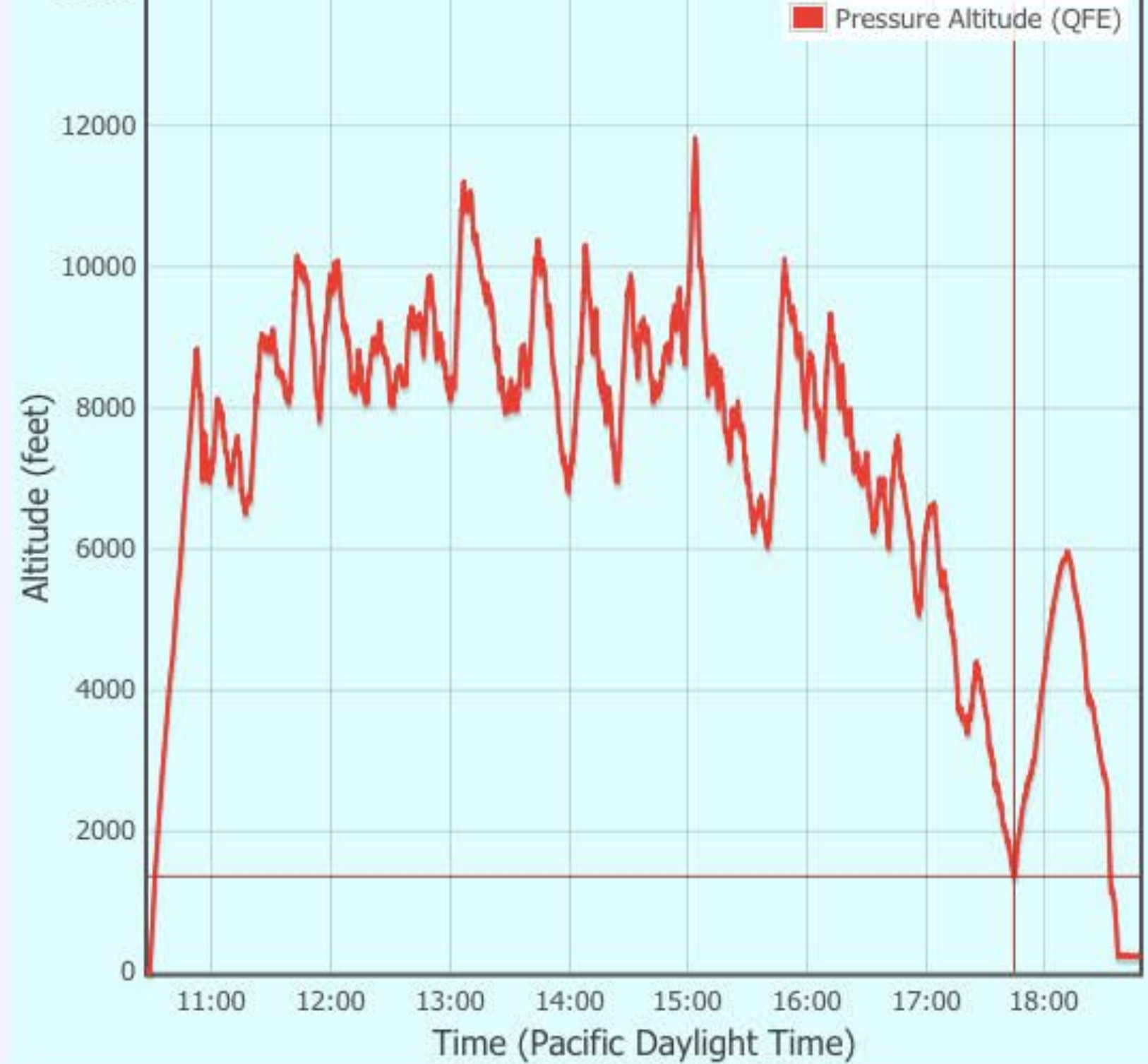
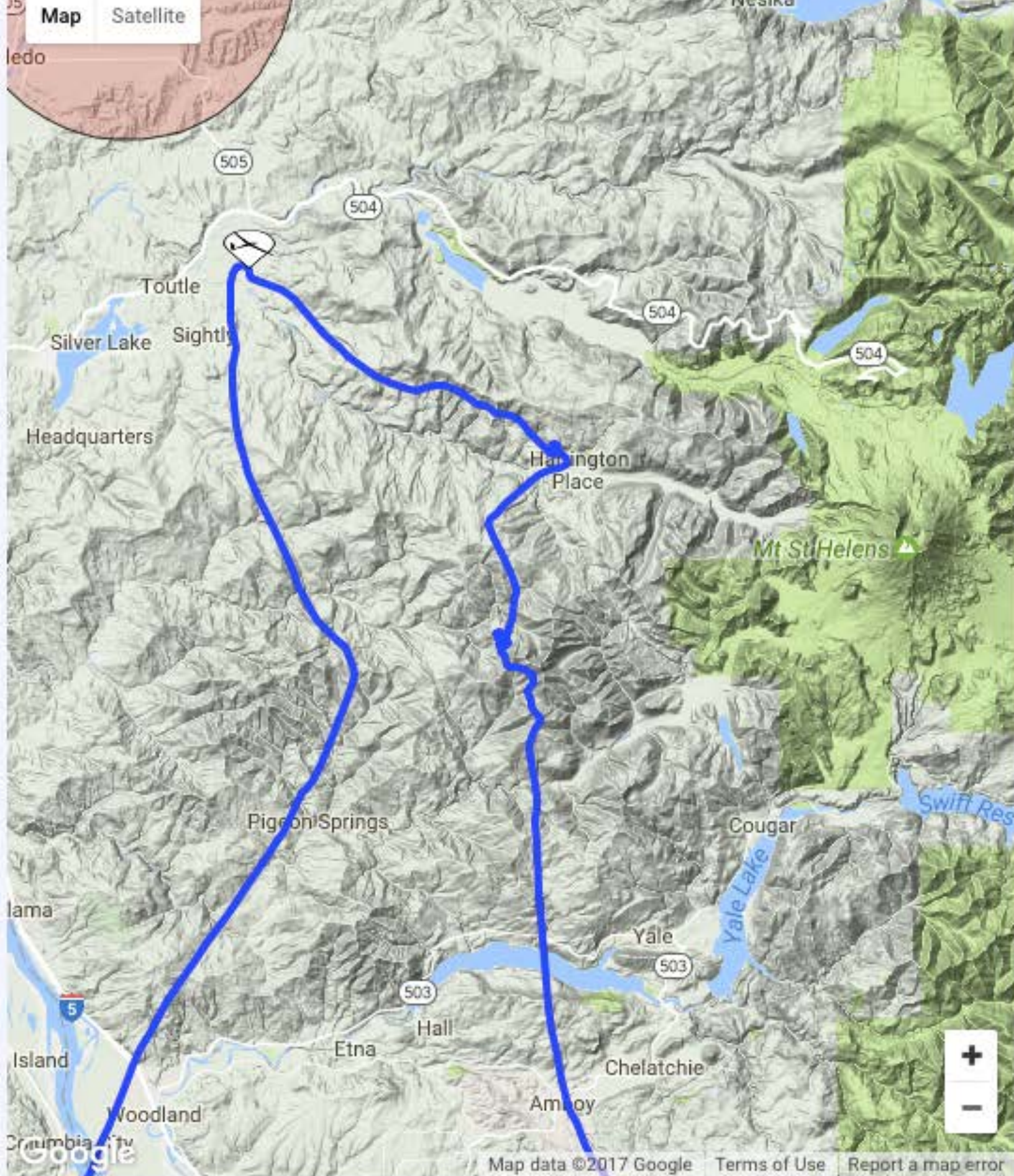
4:47p



4:51p



5:12p



Time: 17:44:20 PDT: **Position:** 46°19.959'N

122°40.508'W: **Flight mode:** Cruising:

Altitude: QFE (baro) 1352 feet: **Vario:** -1.3 knots:

Height AGL



6:27p



6:30p



Note clothing

7:33p



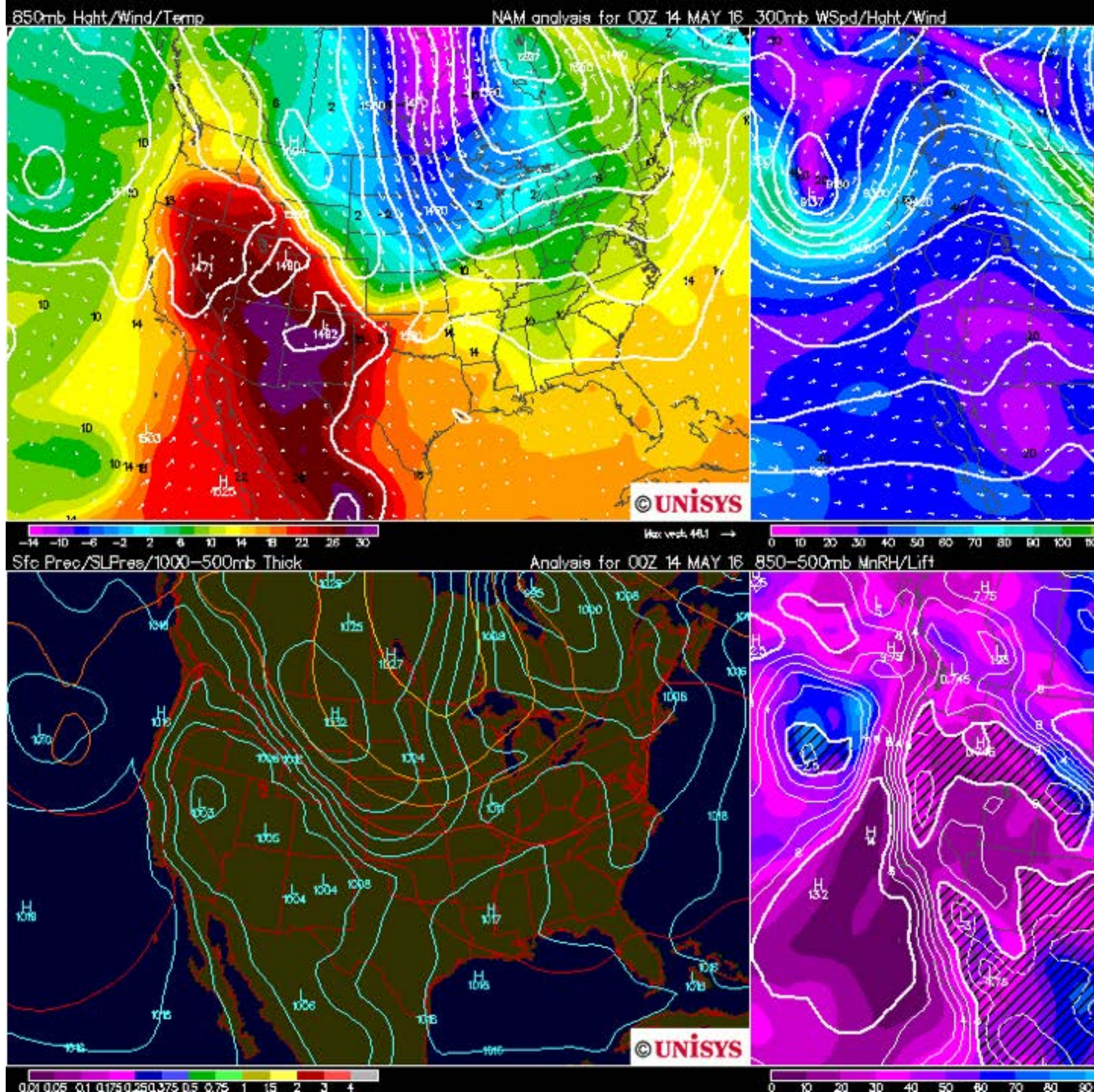
ASH30Mi

1005F
30

30

May 13, 2016 PDX

- 5 day lead time
- Leading indicator: heating & instability plus tailwind
- Plan #1: Fly up the Cascades
- Memorable and AWESOME

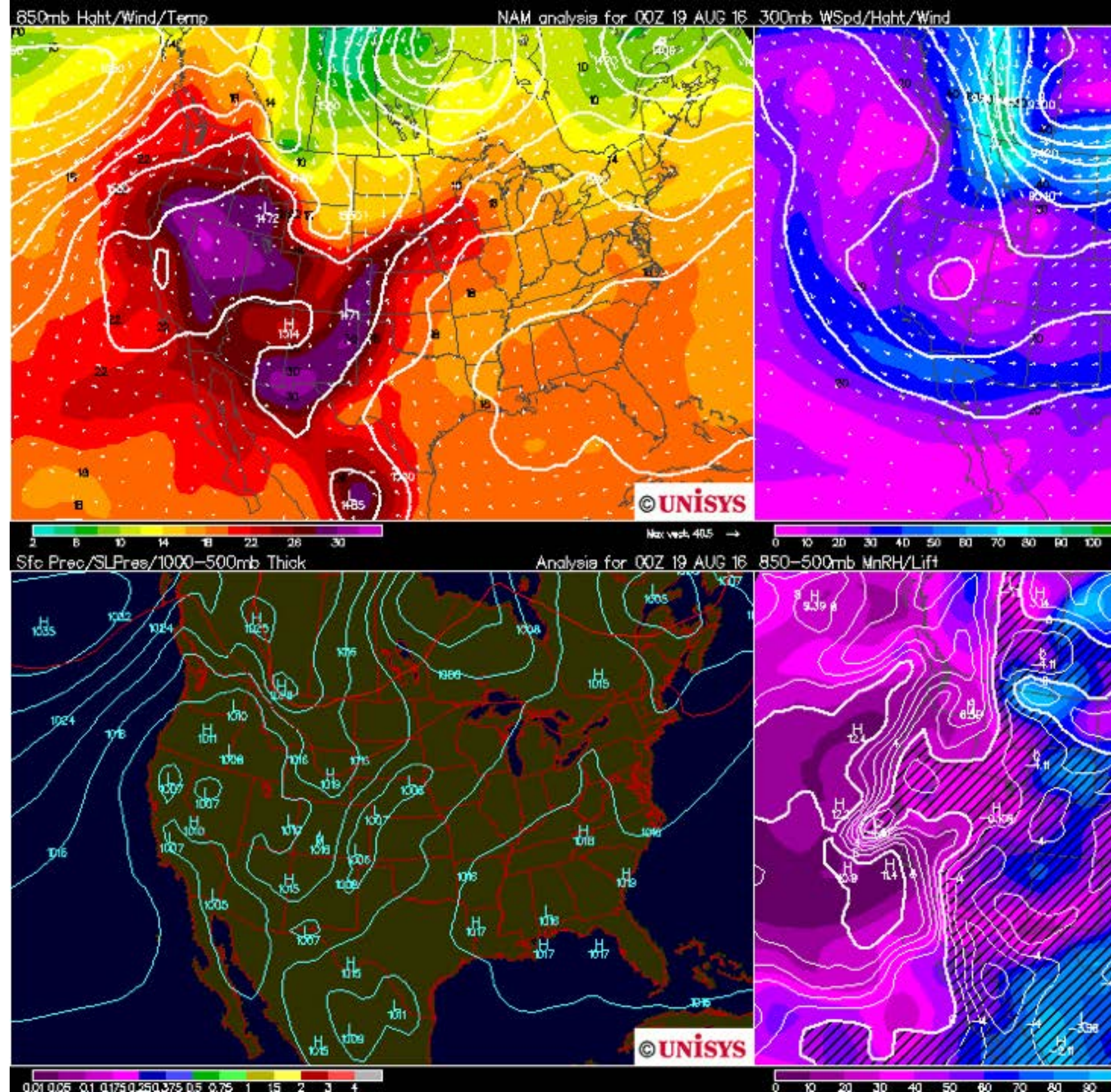


A large, white, billowing cumulus cloud formation dominates the upper half of the image, set against a clear blue sky. Below the cloud, a mountain range is visible, with patches of snow on the peaks and ridges. The text is overlaid on the middle of the image.

Case Study #3: Aug 17, 2016
Goose Lake

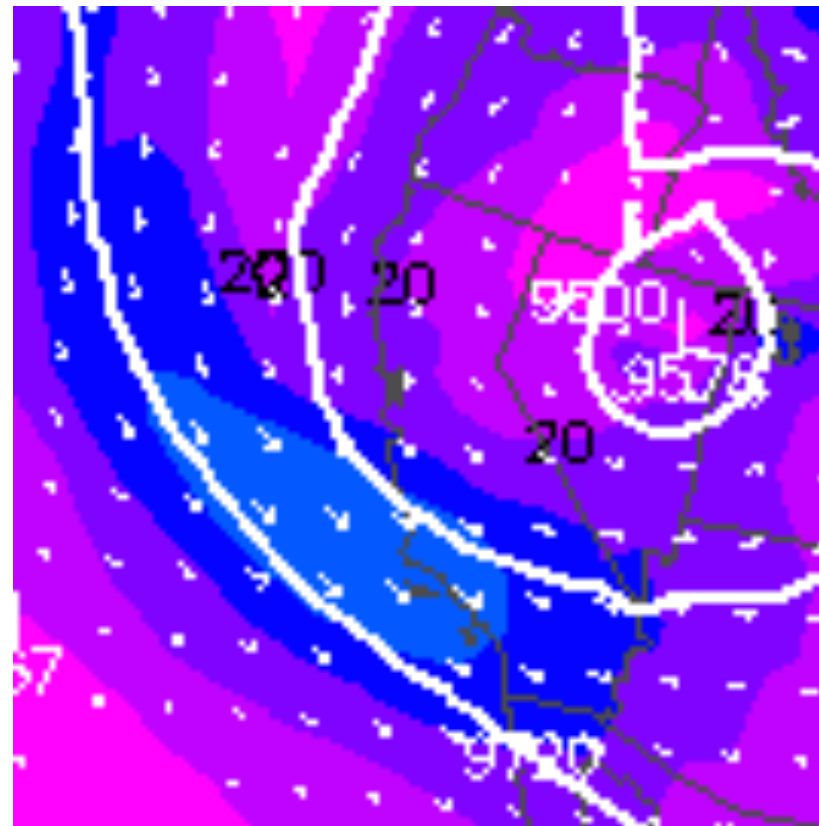
August 17, 2016 Goose Lake

- 4 day lead time
- Leading indicator:
upper level low and
OD on 40% rh
- Note RH level

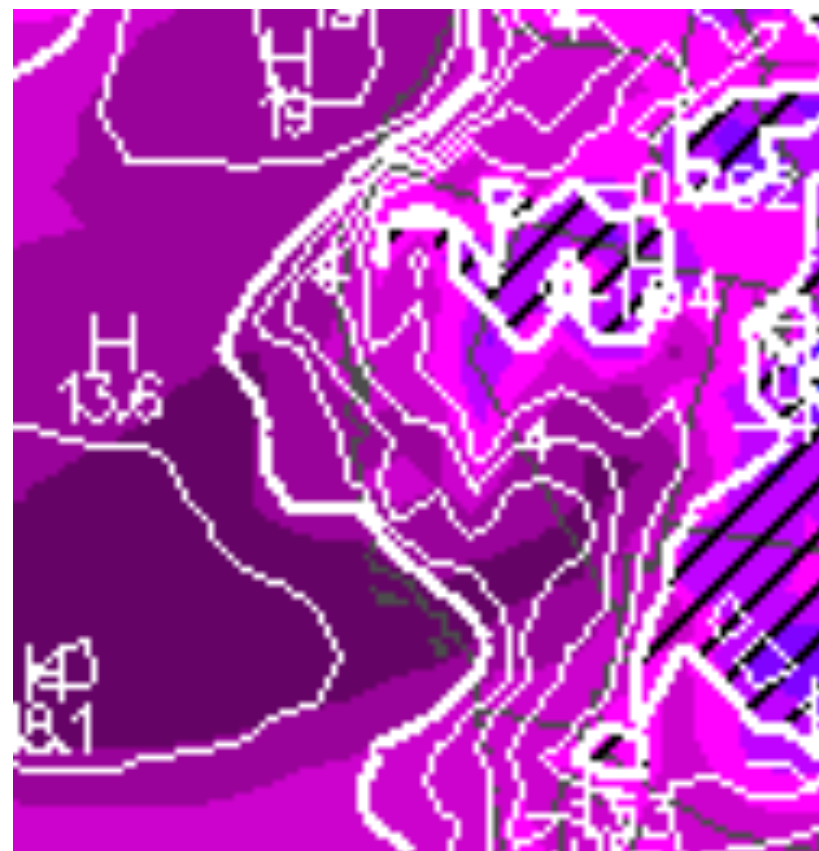


August 17, 2016 Goose Lake

- 4 day lead time
- Leading indicator:
upper level low and
OD on 40% rh
- Note RH level



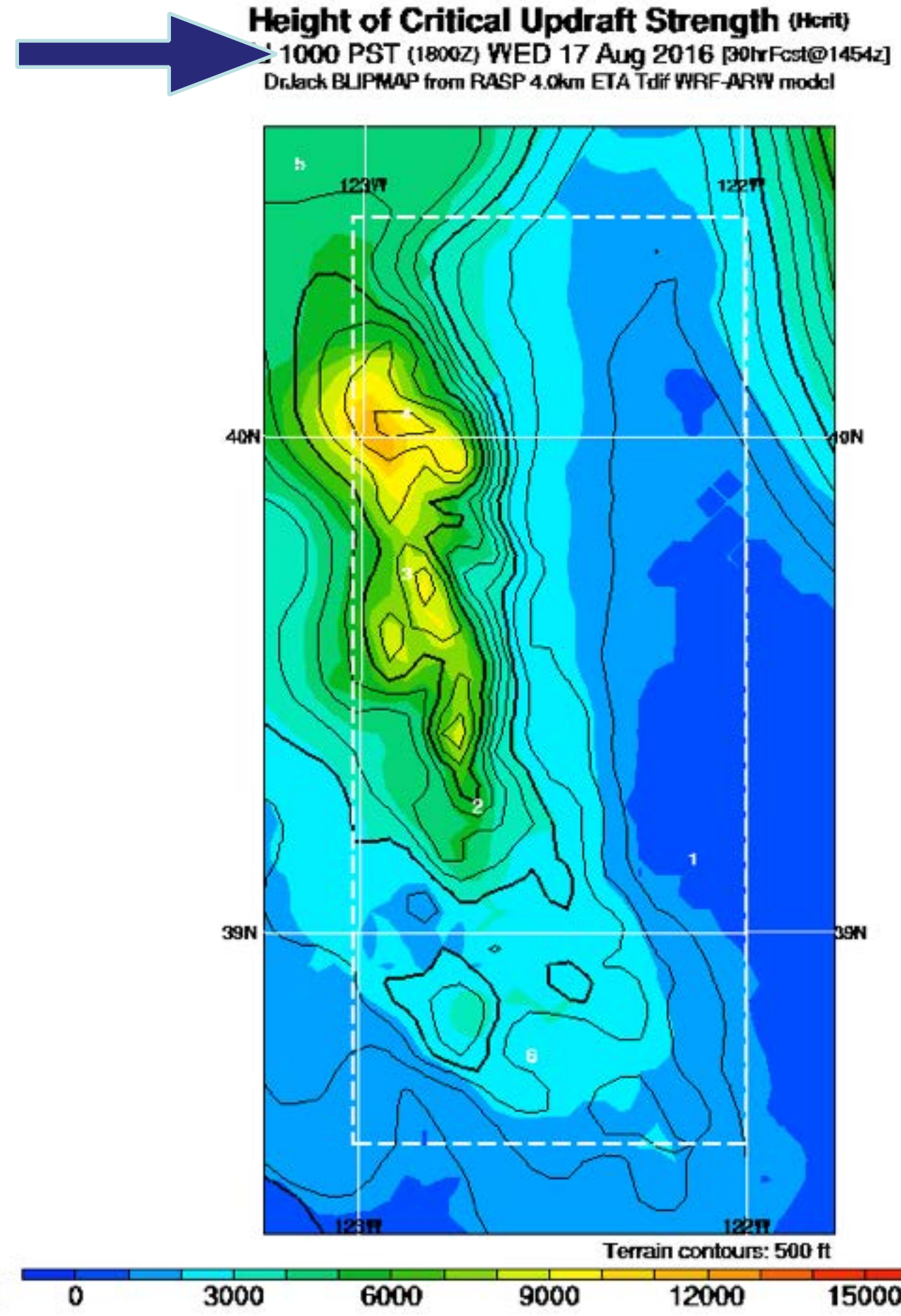
300mb



relative
humidity

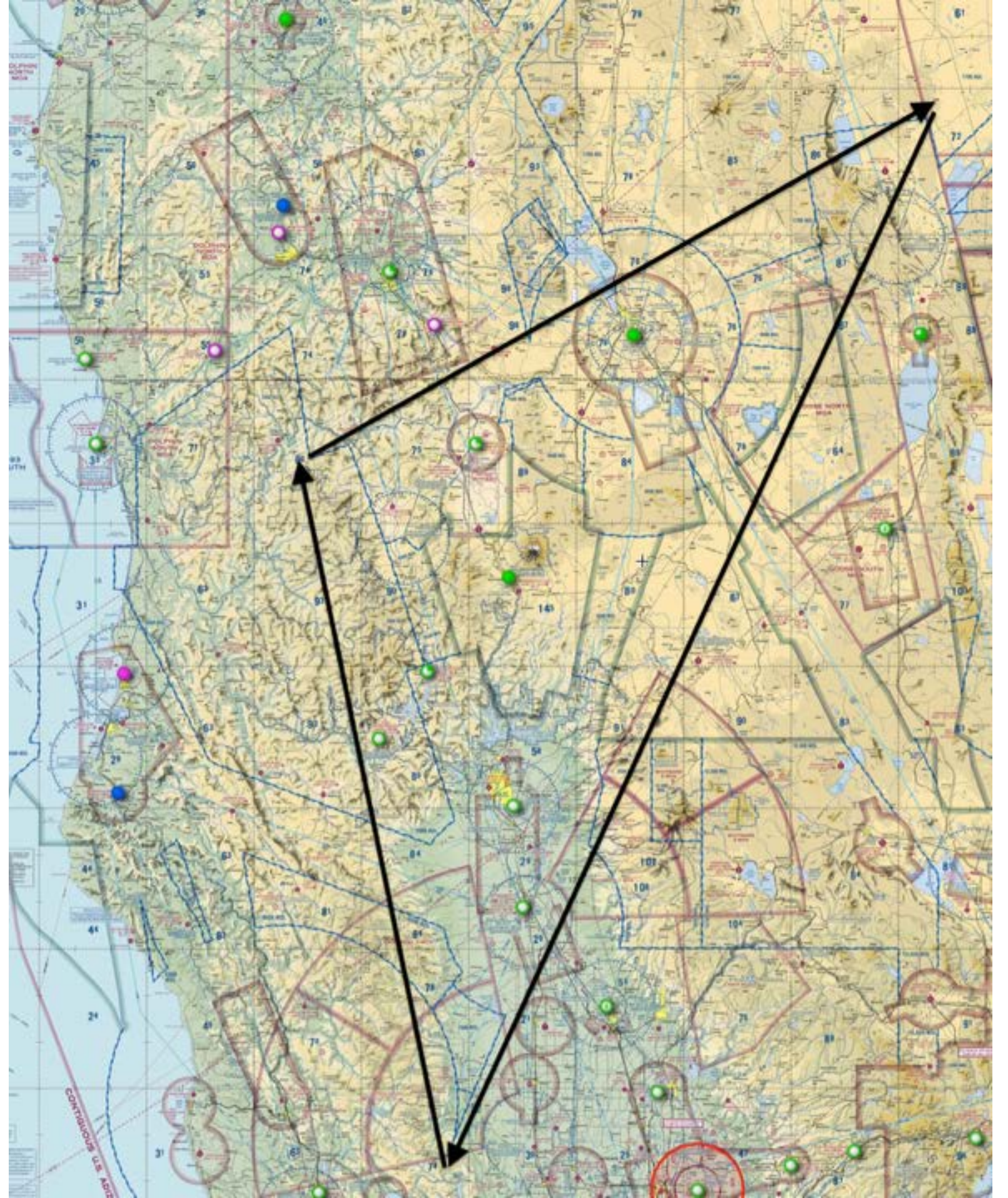
August 17, 2016 Goose Lake

- 4 day lead time
- Leading indicator:
upper level low and
OD on 40% rh
- Early start points to...



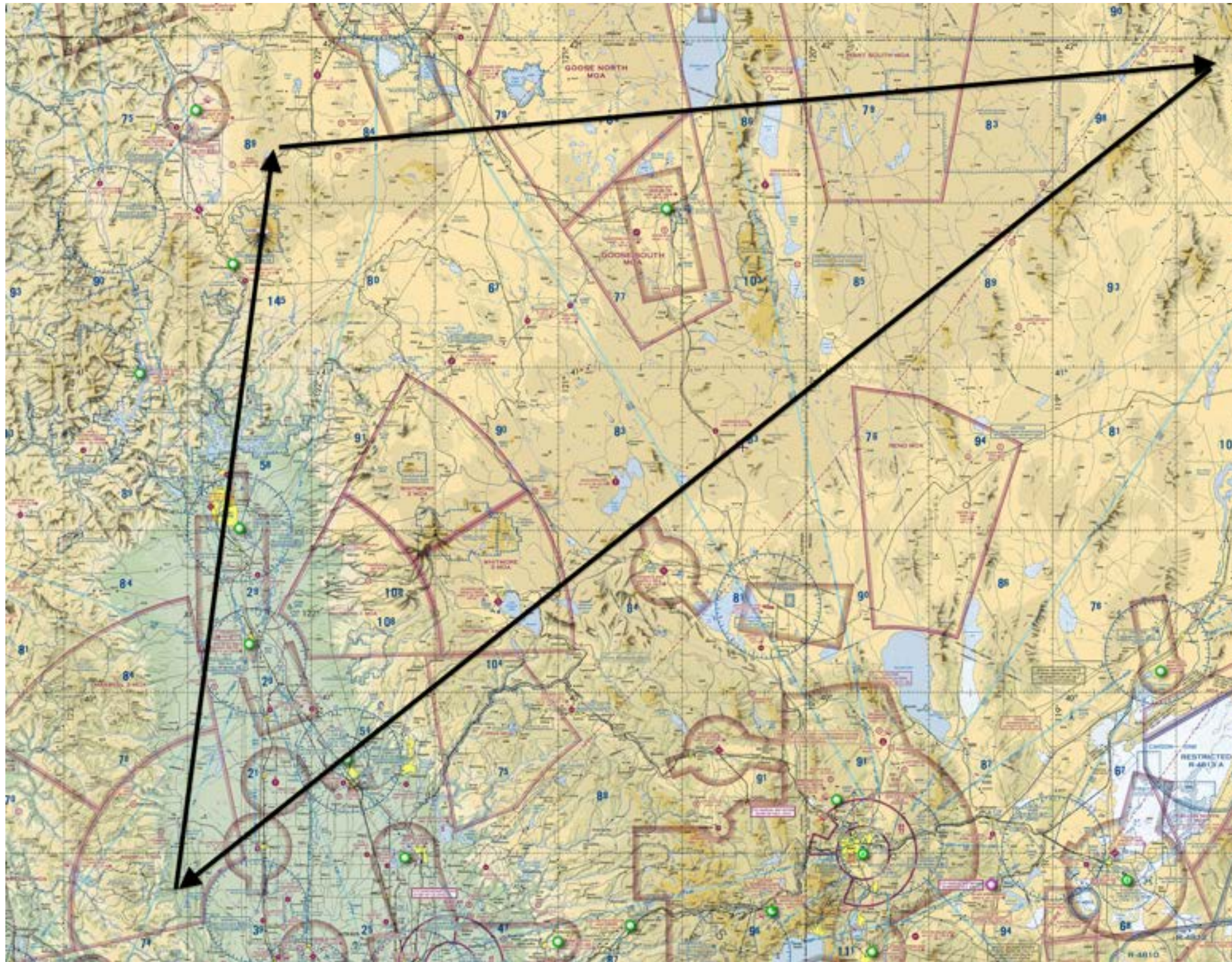
August 17, 2016 Goose Lake

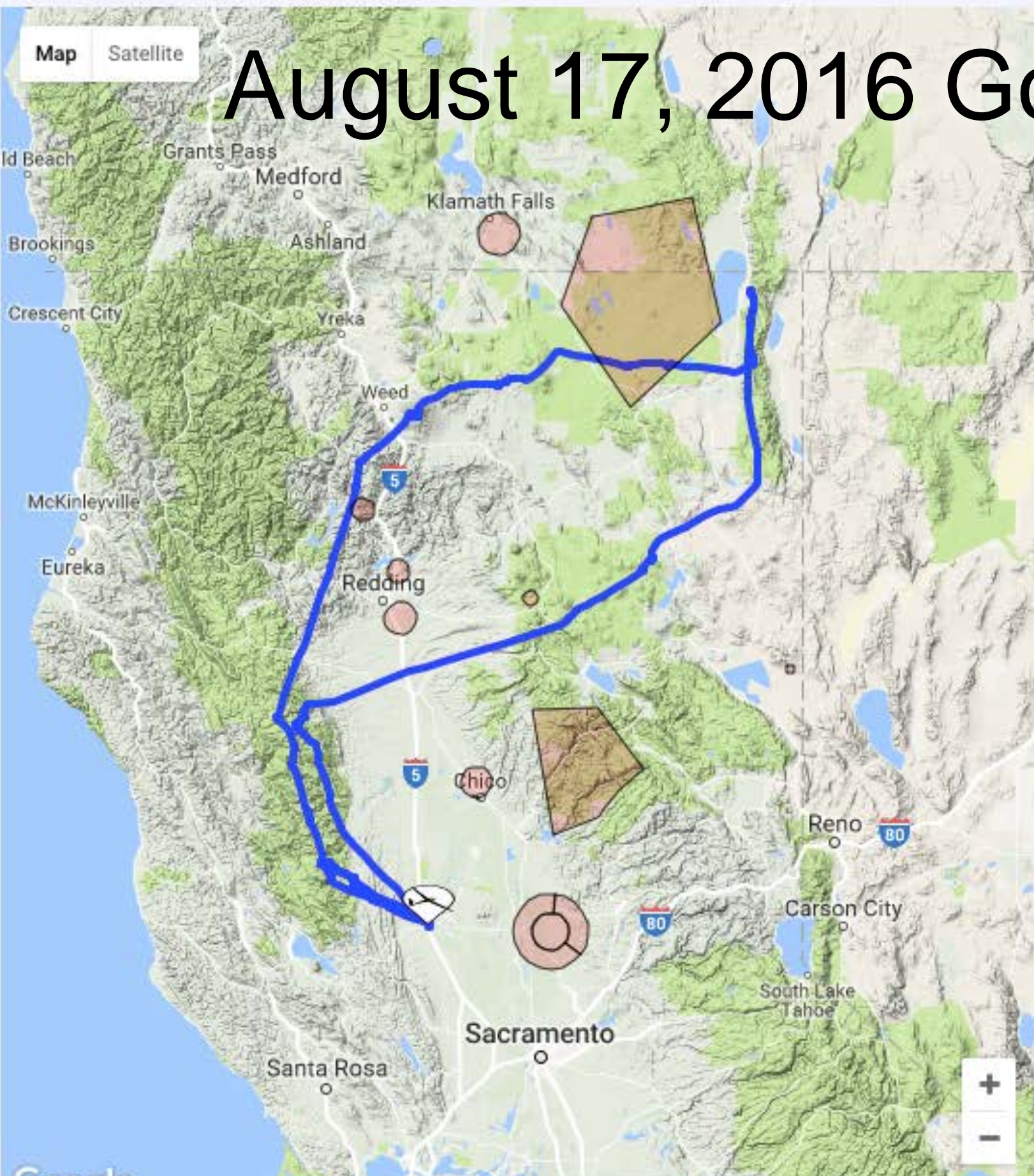
- 4 day lead time
- Leading indicator:
upper level low and
OD on 40% rh
- Early start points to...
- 1000K attempt, but...



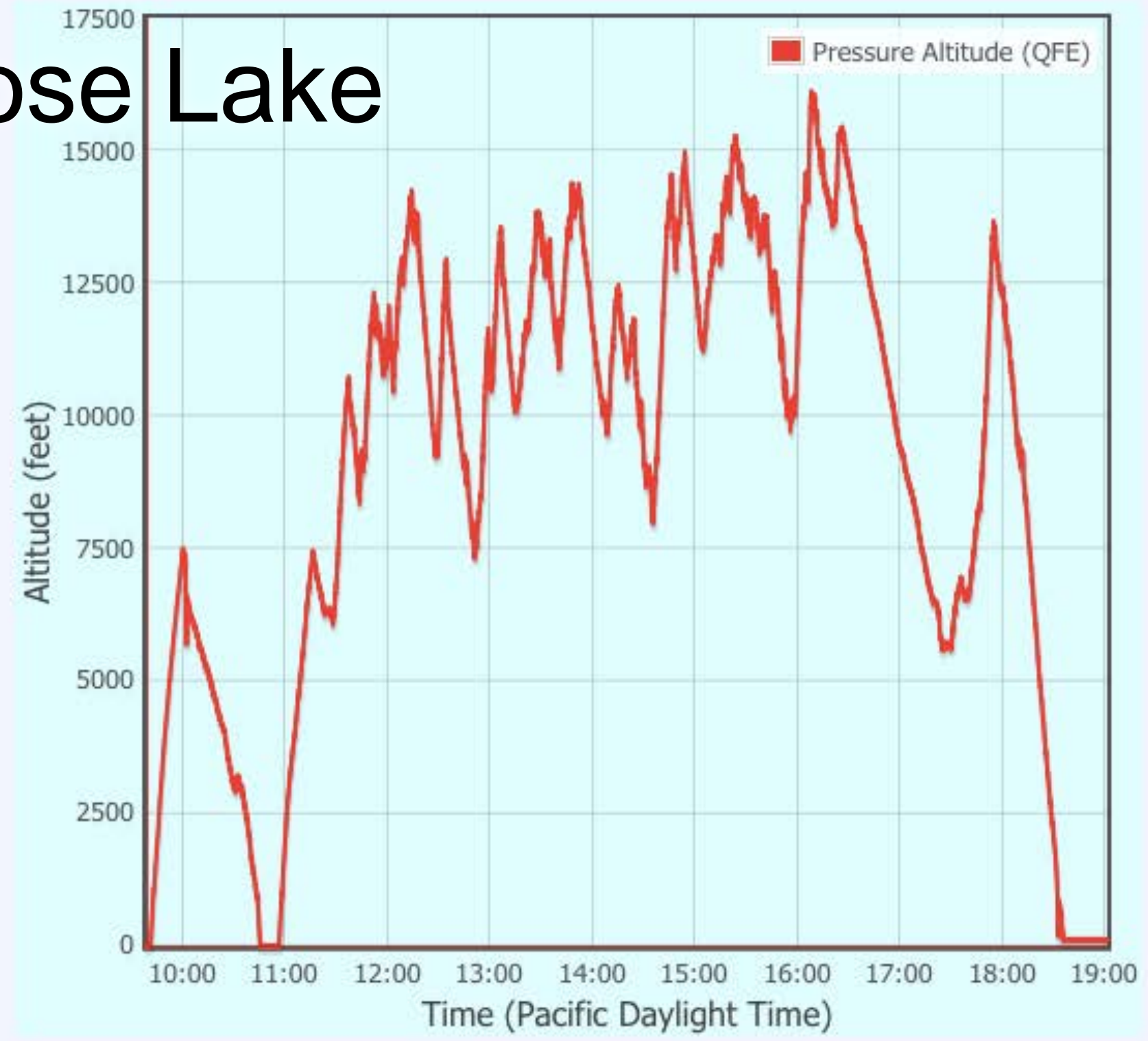
August 17, 2016 Goose Lake

- 4 day lead time
- Leading indicator:
upper level low and
OD on 40% rh
- Early start points to...
- 1000K attempt, but...
- late in 1000K season





August 17, 2016 Goose Lake



Time: 09:38:51 PDT: **Position:** 39°9.604'N
122°7.912'W: **Flight mode:** Pre take off:

Height AGL



12K bases at 11:38a



1:06p



2:26p

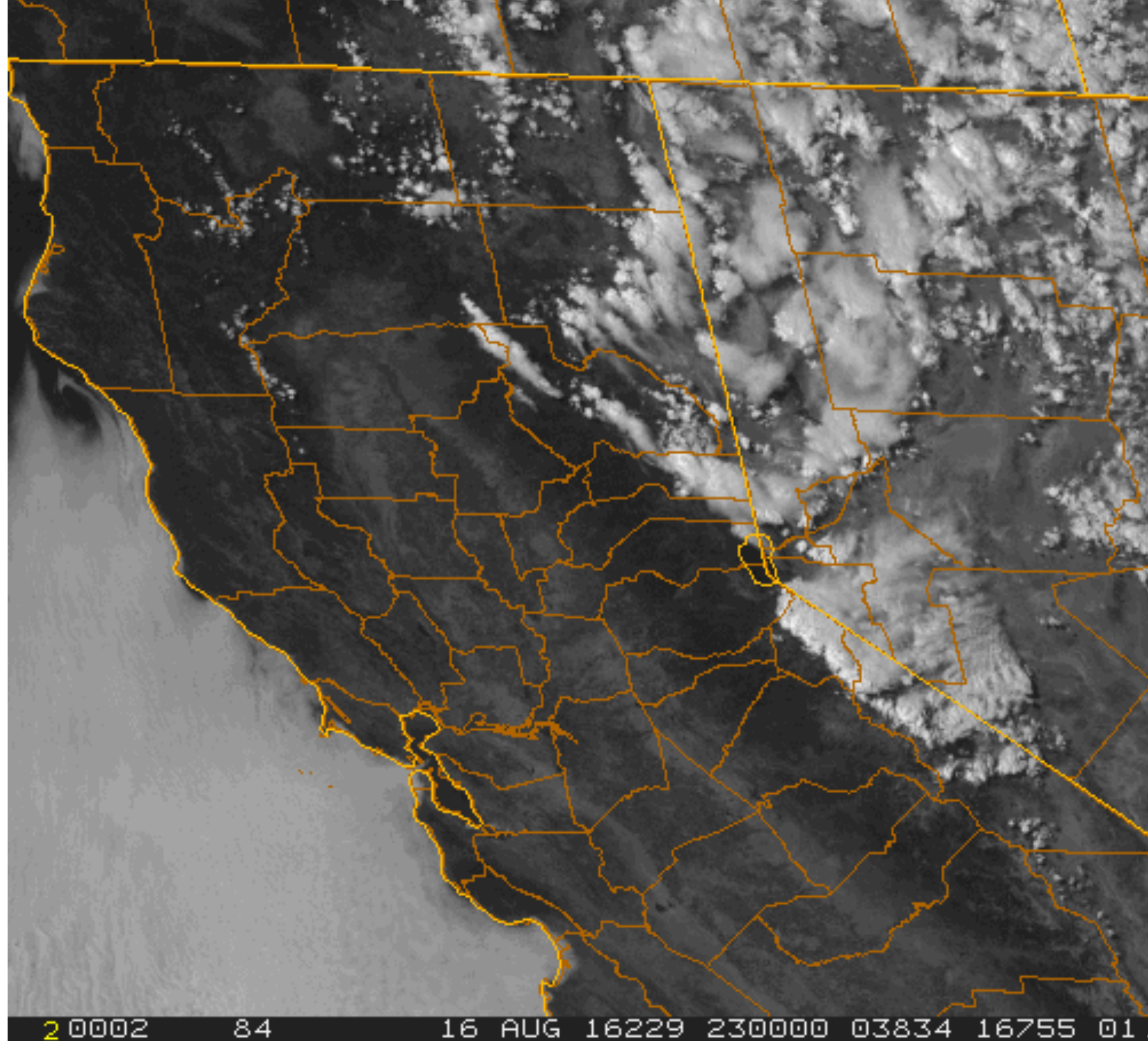


August 17, 2016 Goose Lake

At 13K ft, I get 3 bars =
sat pic!

<http://www.wrh.noaa.gov/satellite/?wfo=rev>

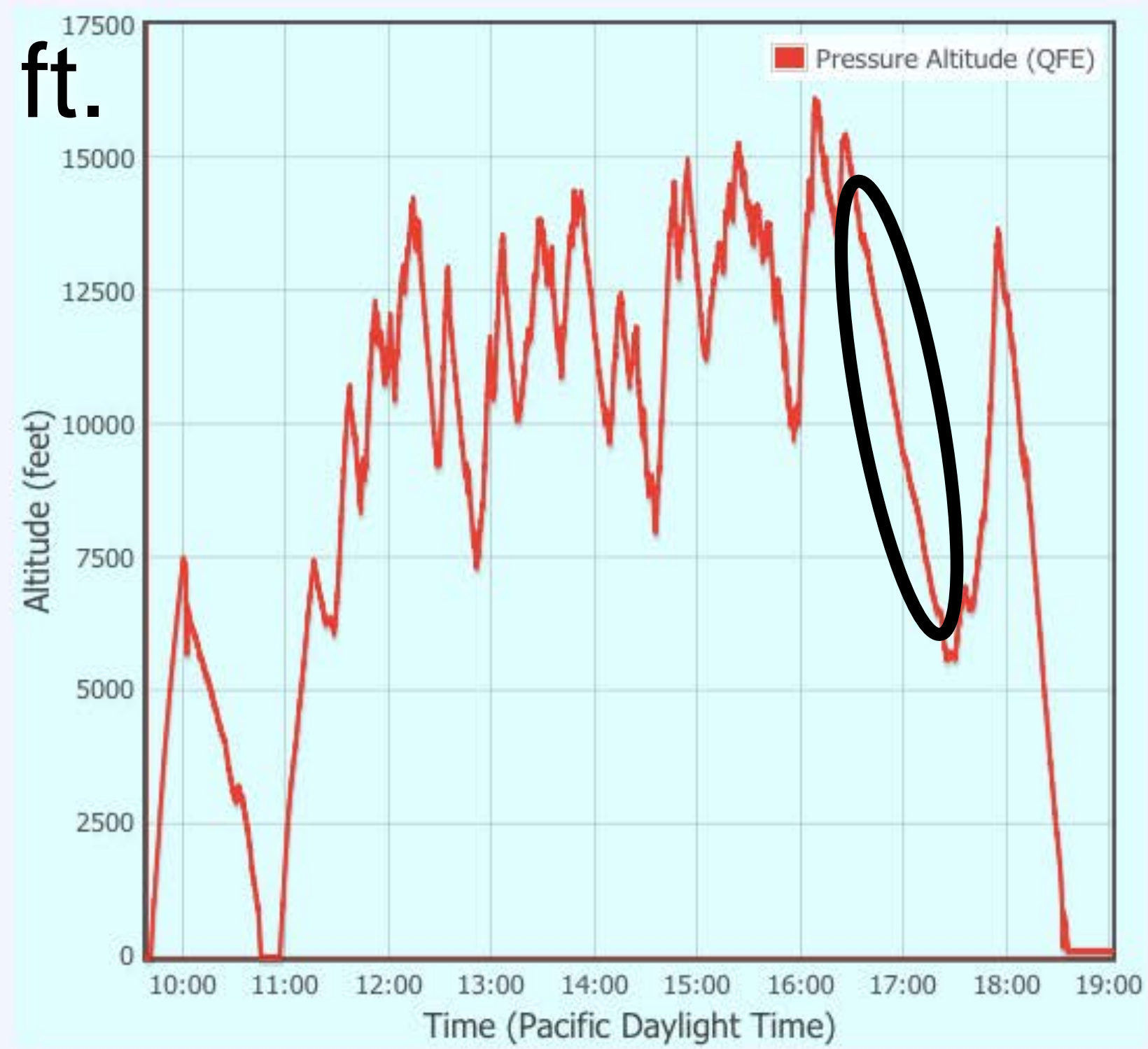
Bookmark on phone!





4:11p

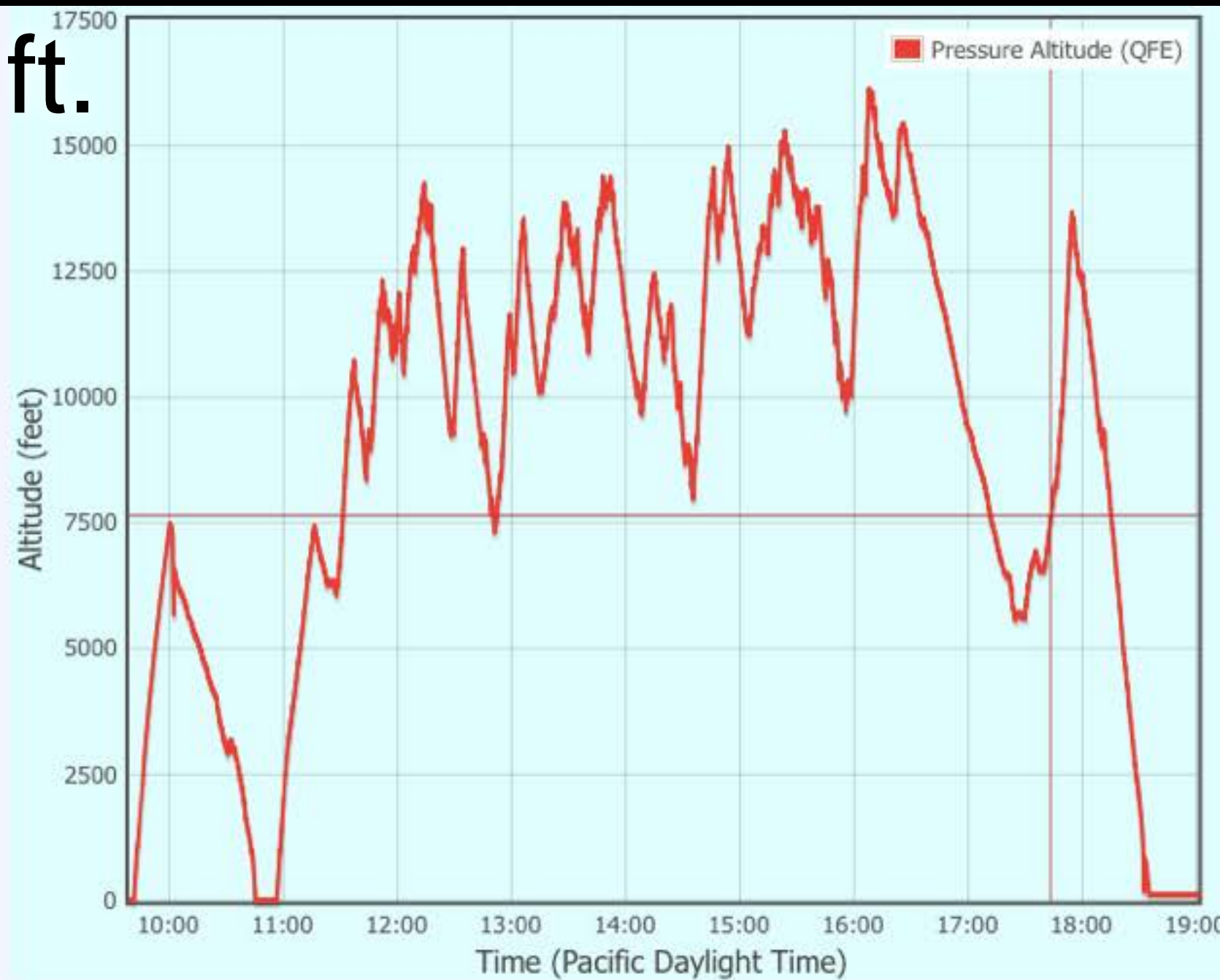
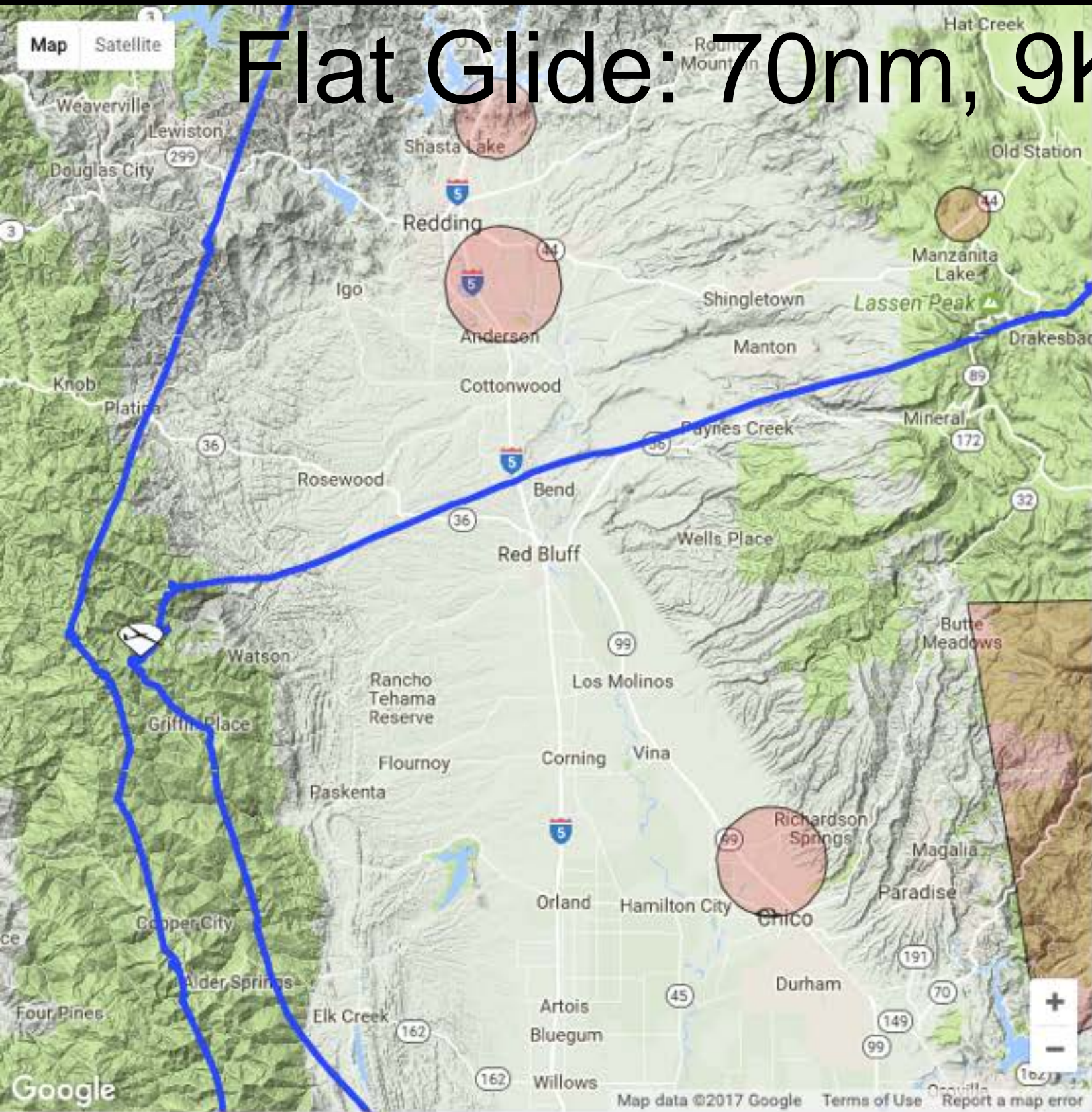
Task distance: 704.4 miles



Time: 09:38:51 PDT: Position: 39°9.604'N
122°7.912'W: Flight mode: Pre take off:

Height AGL

Flat Glide: 70nm, 9K ft.



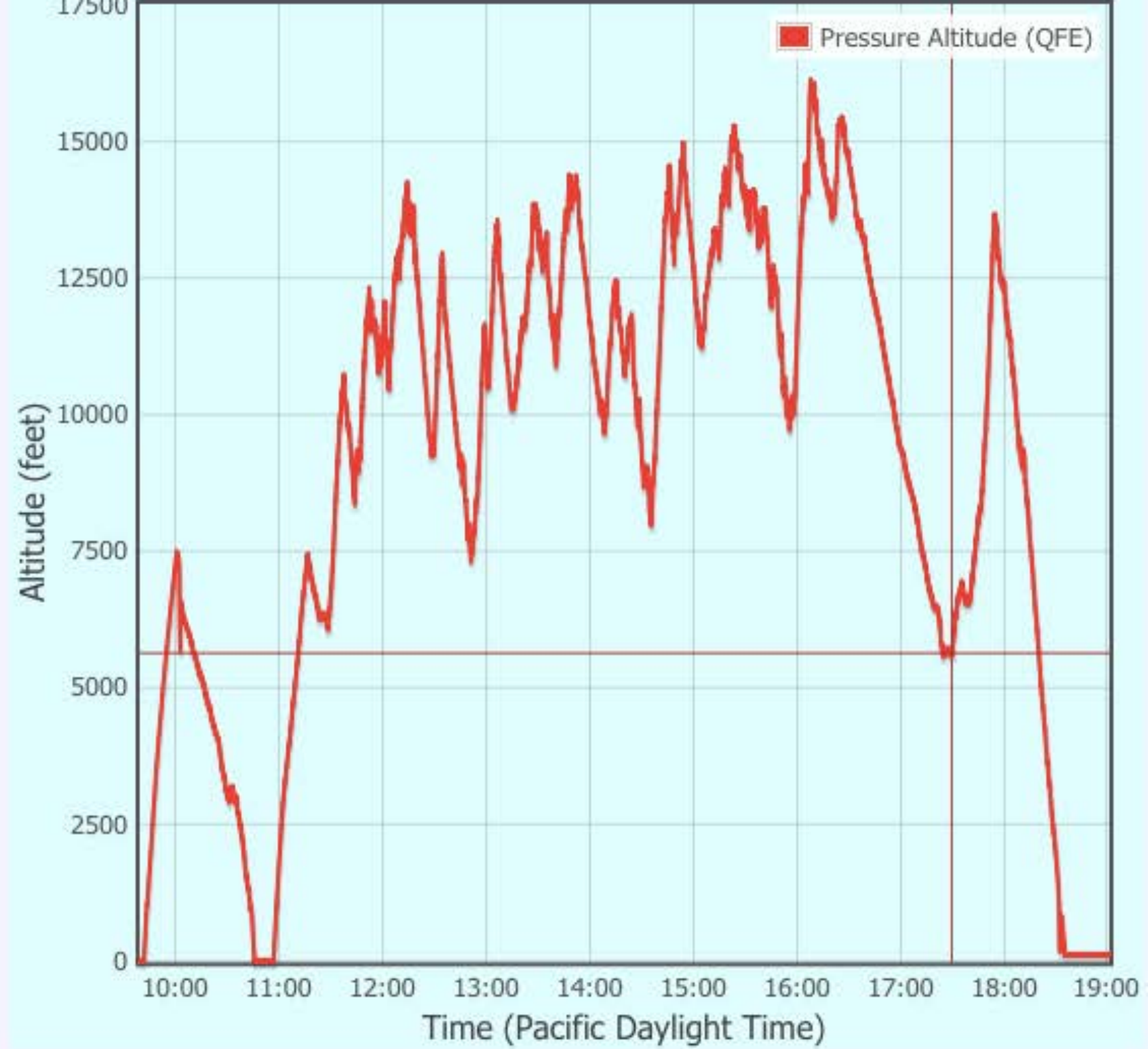
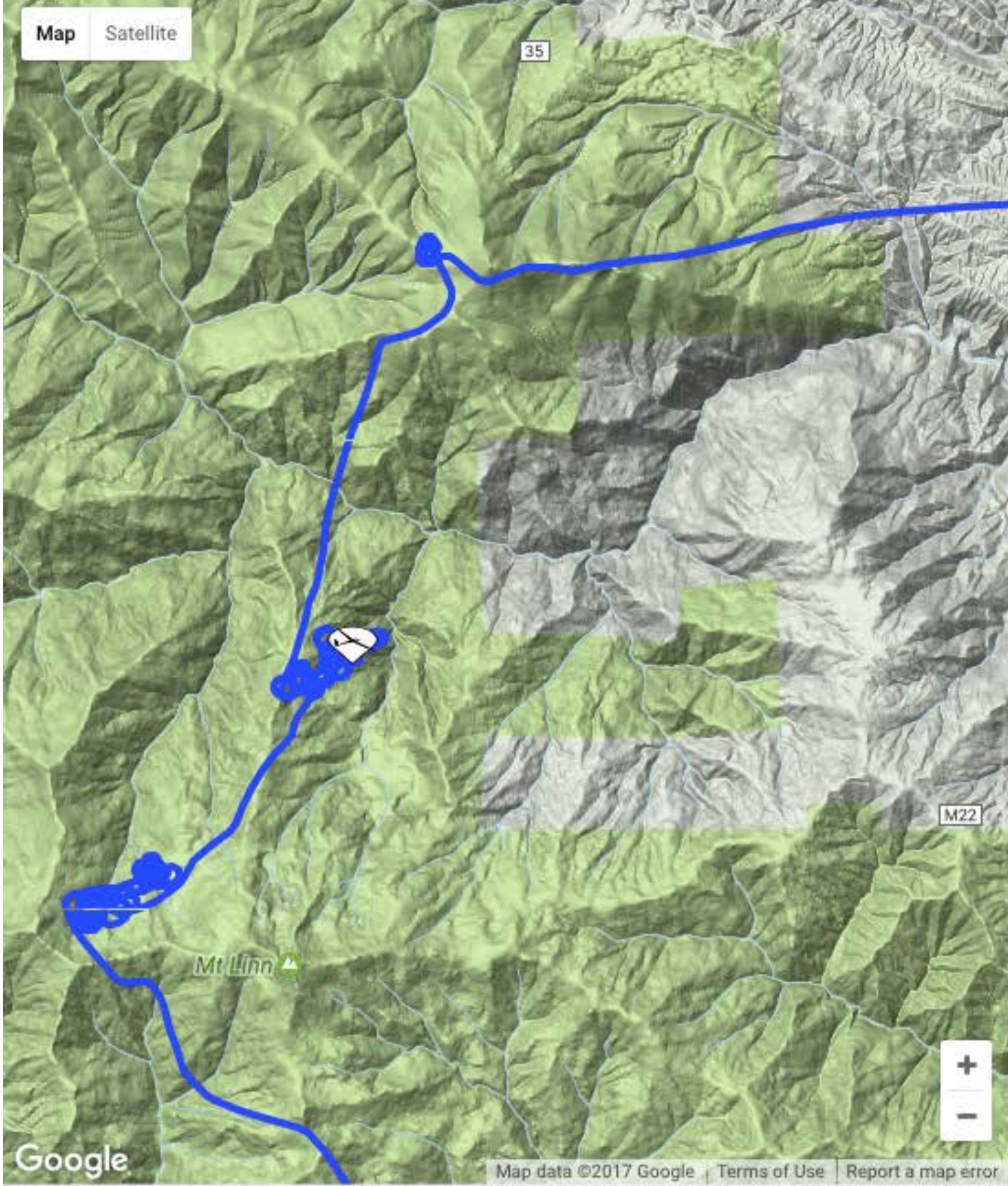
Time: 17:43:47 PDT: **Position:** 40°2.862'N 122°52.770'W:

Flight mode: Circling: **Altitude:** QFE (baro) 7628 feet:

Vario: +3.2 knots:

Height AGL

Thermal detail



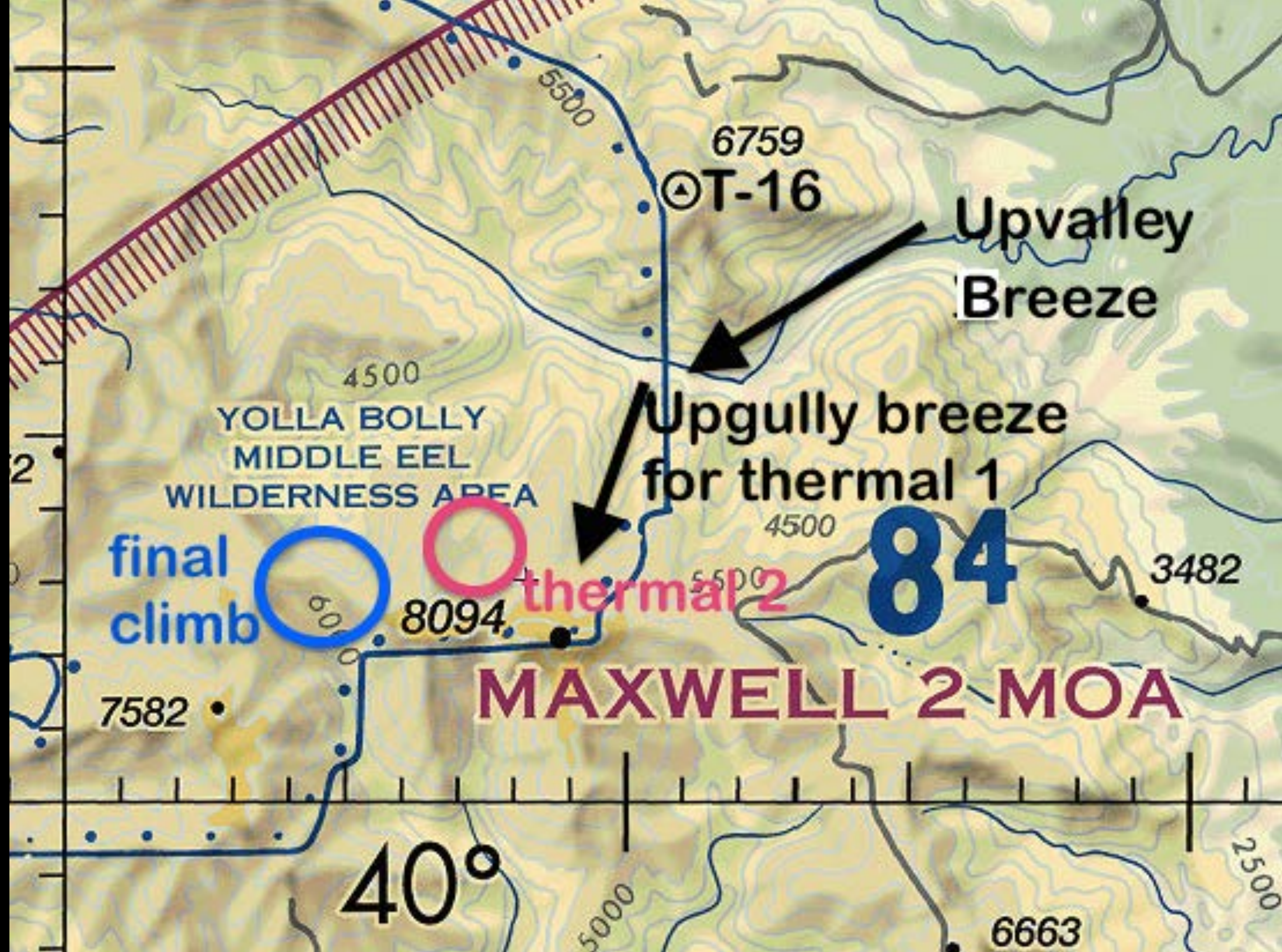
Time: 17:29:36 PDT: **Position:** 40°4.766'N

122°50.581'W: **Flight mode:** Circling:

Altitude: OFE (baro) 5636 feet: **Vario:** +0.1 knots:

Height AGL

Thermal detail

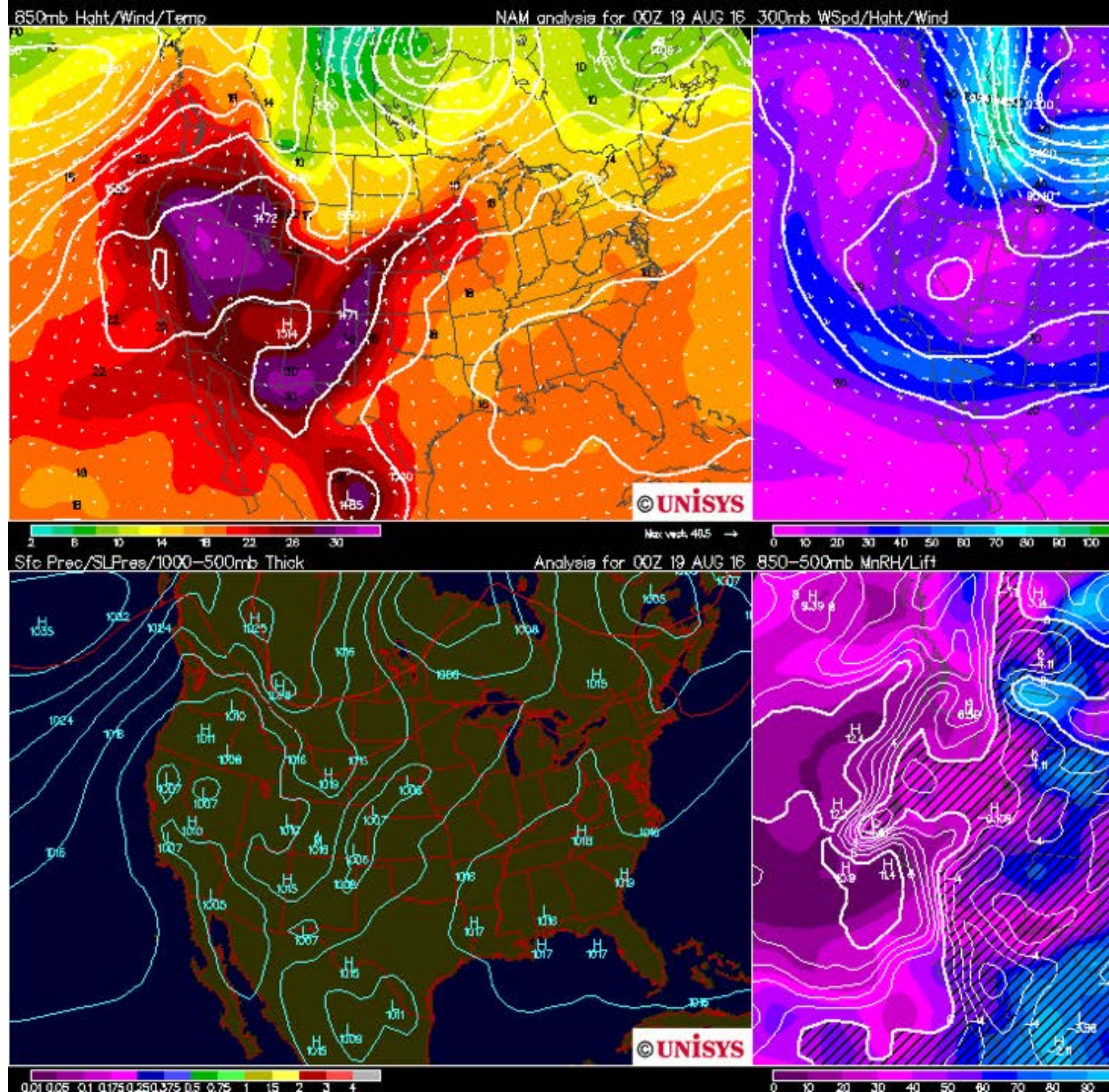




<https://drive.google.com/open?id=0B2CR4benPjAXcXI1aVR0Mkg4ODg>

August 17, 2016 Goose Lake

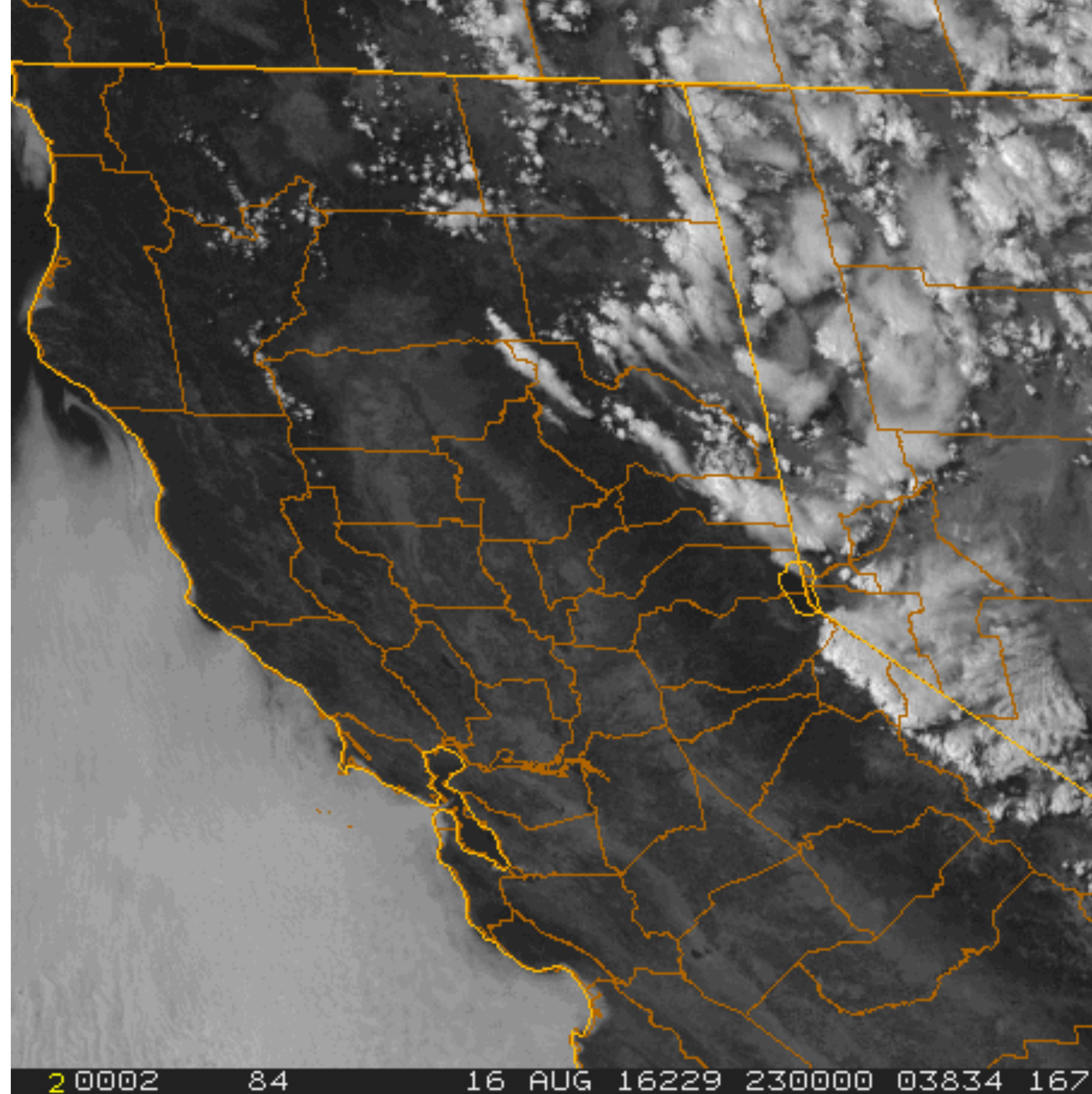
- 4 day lead time
- Leading indicator:
upper level low and
OD on 40% rh
- Note RH level



Lessons Learned

Coulda been a 1000K...

- Messed up start, but...
- Prove climb after crossing
- Thanks to CNVV
- but still Memorable and **AWESOME**



CNVV



Centre National de Vol à Voile

Saint-Auban - Alpes de Haute Provence - France



CNVV

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France

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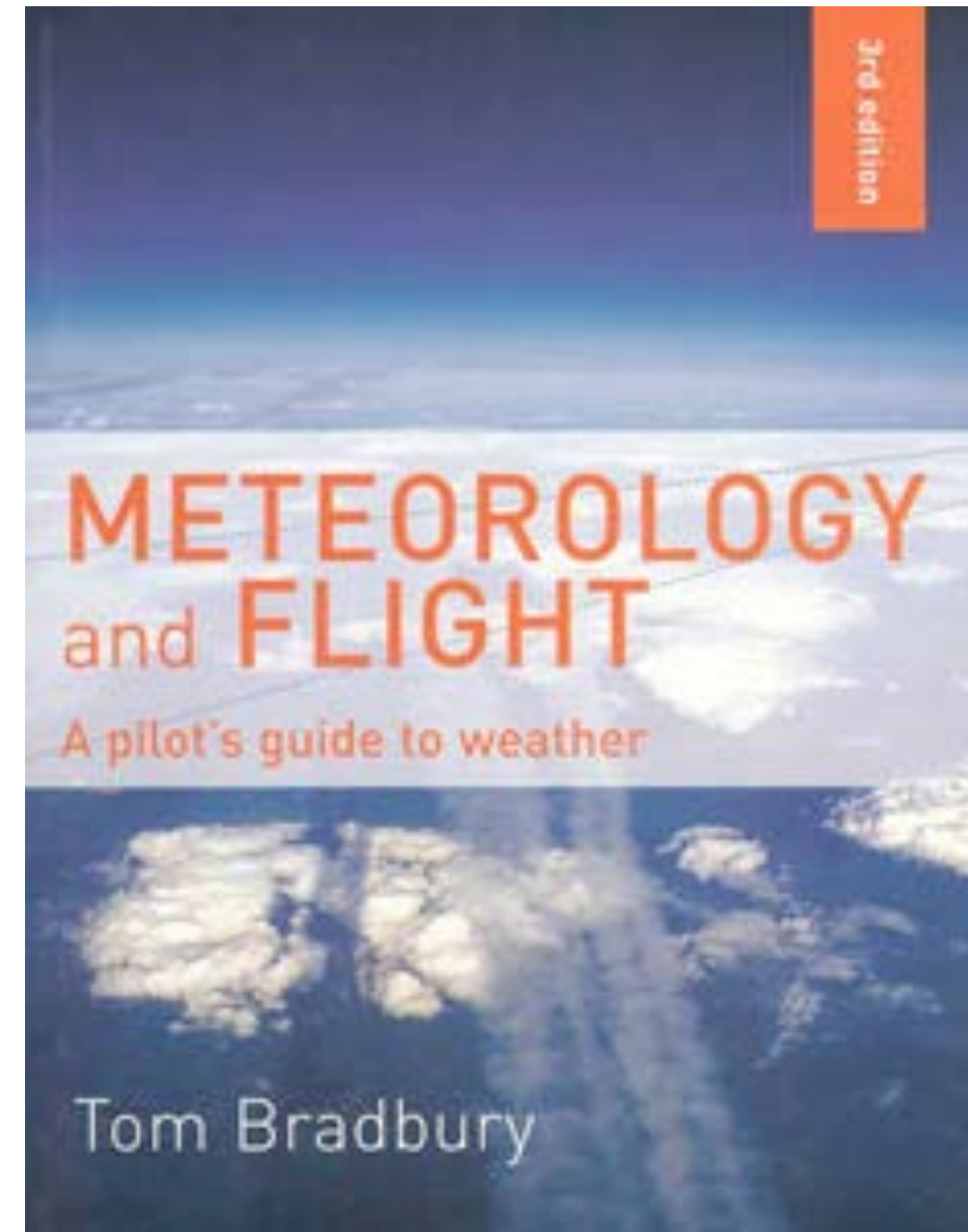
CENTRE NATIONAL DE VOL À VOILE Contact Helen or Patricia : + 33 492 642 971 or booking@cnvv.net

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Meteorology and Flight, A Pilot's Guide to Weather

Author: Tom Bradbury
Paperback, First published in 1989, Third Edition in 2000, reprinted in 2004

186 pages



Questions?





Forecasting Boomer Thermal Days

Kempton Izuno
November 4, 2017