ALBUQUERQUE SOARING CLUB

Welcome to Cross Country Country

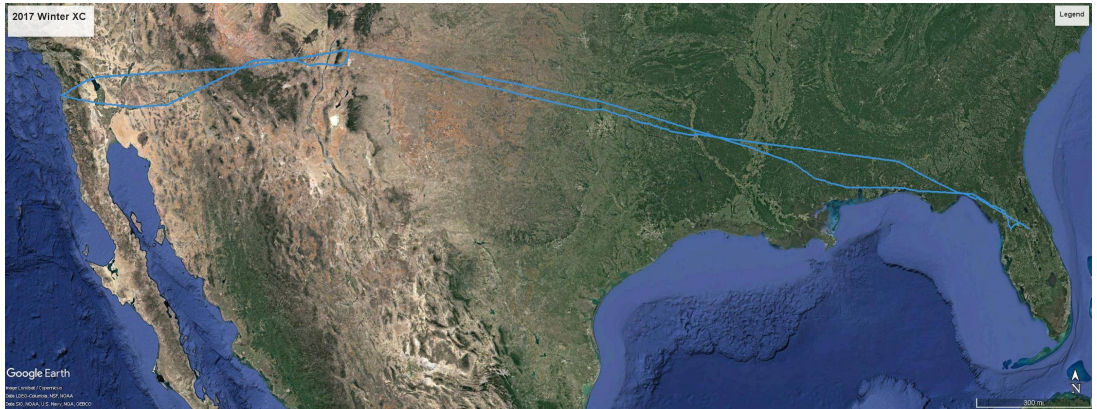
Soaring Weather

Use of Weather Information in Glider Flight Planning and Operations

5 November 2021
SAWS IX Sheraton Uptown
Director Geoffrey Aiken (5C)

Geoffrey Aiken PE

- Soaring since 2005, national flights and glider flights in CA, FL, UT, and NM
- Commercial License, Powered License, Part 107 License, Tow Pilot, Self Launch Motor Glider, Tailwheel, Sundance Ride Pilot, ASC President…
- Participated in initial Nephi, UT Soaring Camp and competed in 2011 and 2012 Moriarty Super Regionals
- ASC President 2017, 2018



Agenda

- Soaring Overview
- Forecasting for Flight
- Soaring Forecast Tools
- Questions

United States Soaring

- Over 25,000 glider pilots
- Over 150 glider clubs

Soaring Society of America

2024 38TH FAI WORLD GLIDING CHAMPIONSHIP
UVALDE ★ TEXAS ★ USA
AUGUST 25 - SEPTEMBER 7, 2024

Albuquerque Soaring

- Based at the Moriarty Municipal Airport (0E0)
- Established in 1960
- ~80 Members

Half the formation in Wave during Turkey Fest 1987 at Alamogordo

Welcome to Cross Country Country

ALBUQUERQUE SOARING CLUB

Albuquerque Soaring Club is a not for profit conducting flight operations 30 minutes east of Albuquerque at New Mexico's Moriarty Municipal Airport. The airport sits at over 6000 ft to serve as a gateway to the Sandia, Sangre and Manzano mountain ranges. The finest year round conditions in the United States including 15 knot thermals to 22000 ft, mountain wave to 34000 ft and orographic lift allow members to fly cross country for hundreds of miles into Colorado and back without burning an ounce of gasoline.

www.abqsoaring.org

www.facebook.com/ABQsoaring

Instagram #abqsoaring
OLC - Moriarty Soaring
Email: abqsoaring@gmail.com

Monthly Fees *Plus Club Initiation Fee*	
Regular	$42.00
Associate	$13.00
Youth	$0.00
Flight Fees	
Pattern Tow *Training Flight*	$17.00
2000 ft Tow *Cross Country Flight*	$36.00
Grob Flight Hour *with Instructor*	$23.00

Come soar with us!

Cross Country Soaring

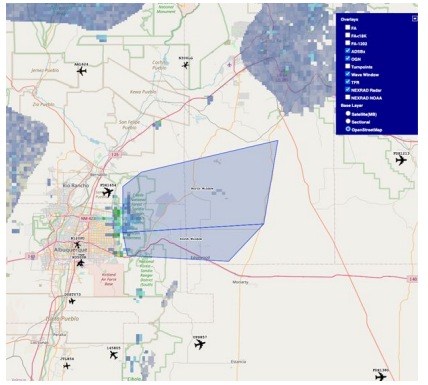
Gliders

- Not slow
  - Race at 186 mph flat out
  - Average 105 mph over a 600-mile course
- Not light
  - Load with water to have more energy at height
- Not simple
  - Flaps, engines, radios, transponders, GPS glide computers, AHRS, 3D Wind, PowerFLARM…

Glider Flight

- Typically aerotow to launch
  - Use modified crop duster tow plane
  - Are connected by a 200’ Rope
  - Typically tow to 1,800 feet
- Require lift effects to cover distance
  - Sink to maintain speed of flight
  - Do not “require wind” to fly
  - Typically thermal to <18,000 feet

New Mexico Soaring

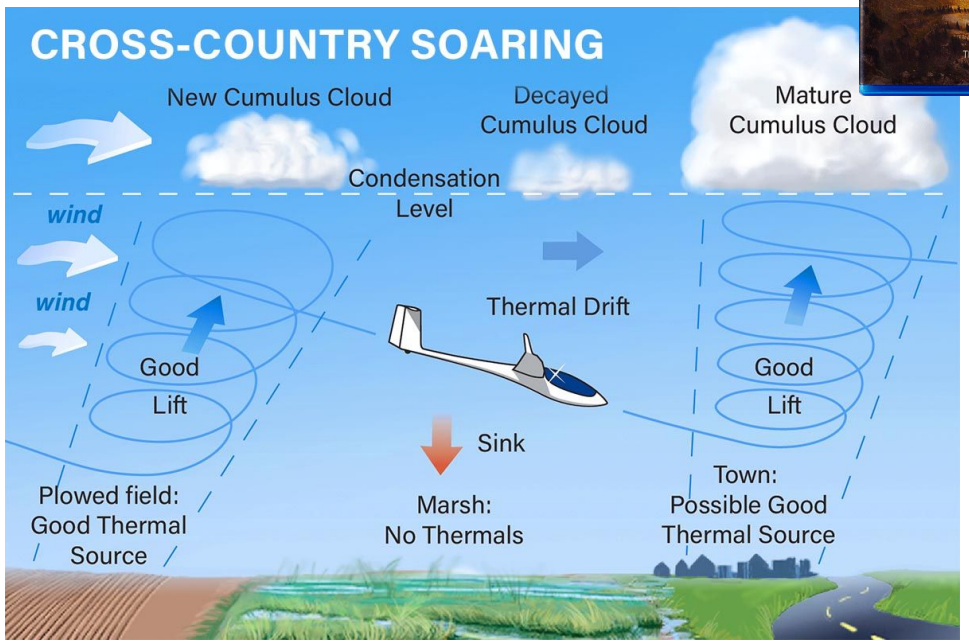


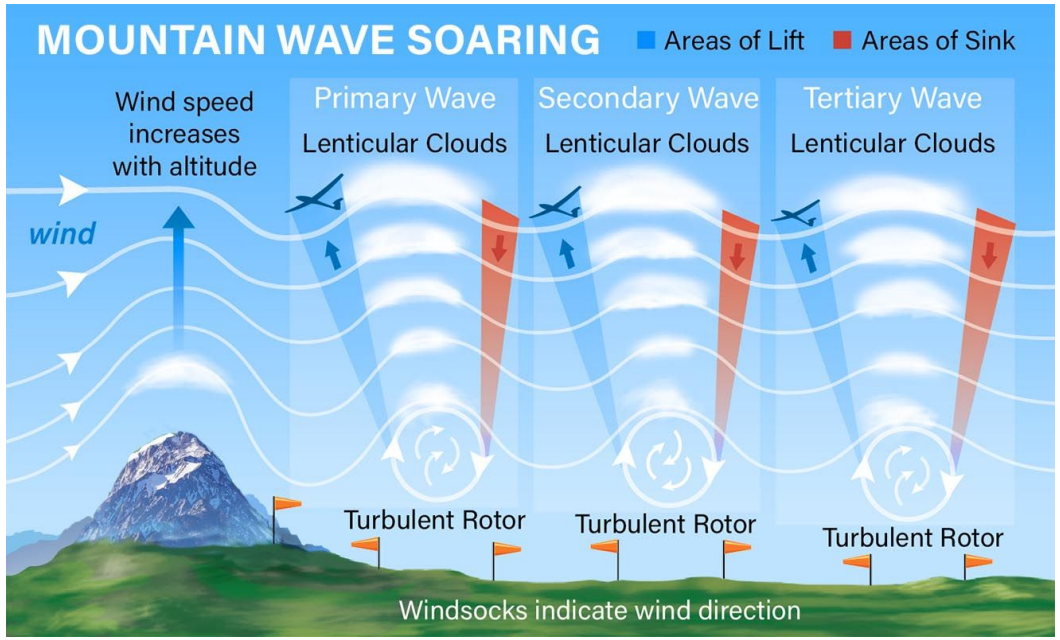
Thermal Flight (Summer)

- Powerful – Outclimb a jet leaving the ABQ Sunport

Wave Soaring (Winter)

- NM Record 36,000 feet
- World Record 76,000 feet

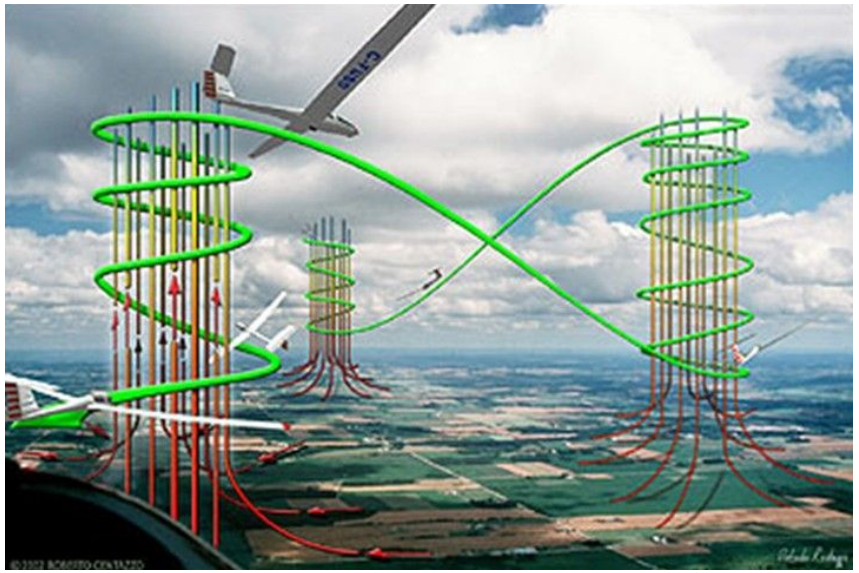


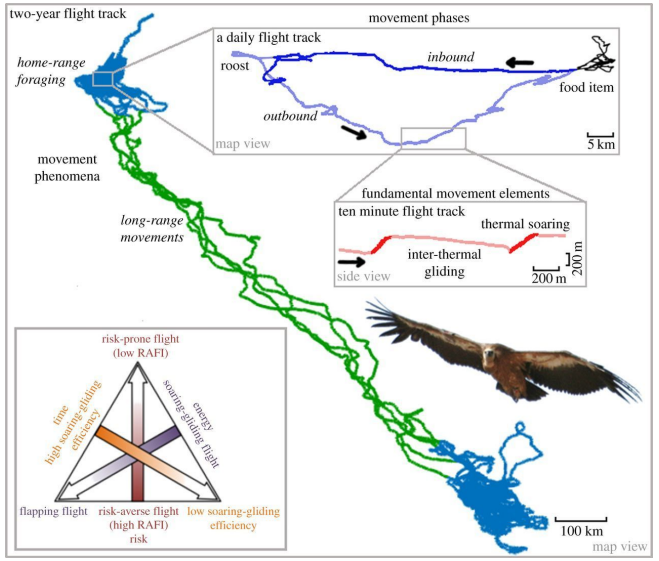


Definition of a Great Soaring Day

Courtesy of Brian Resor

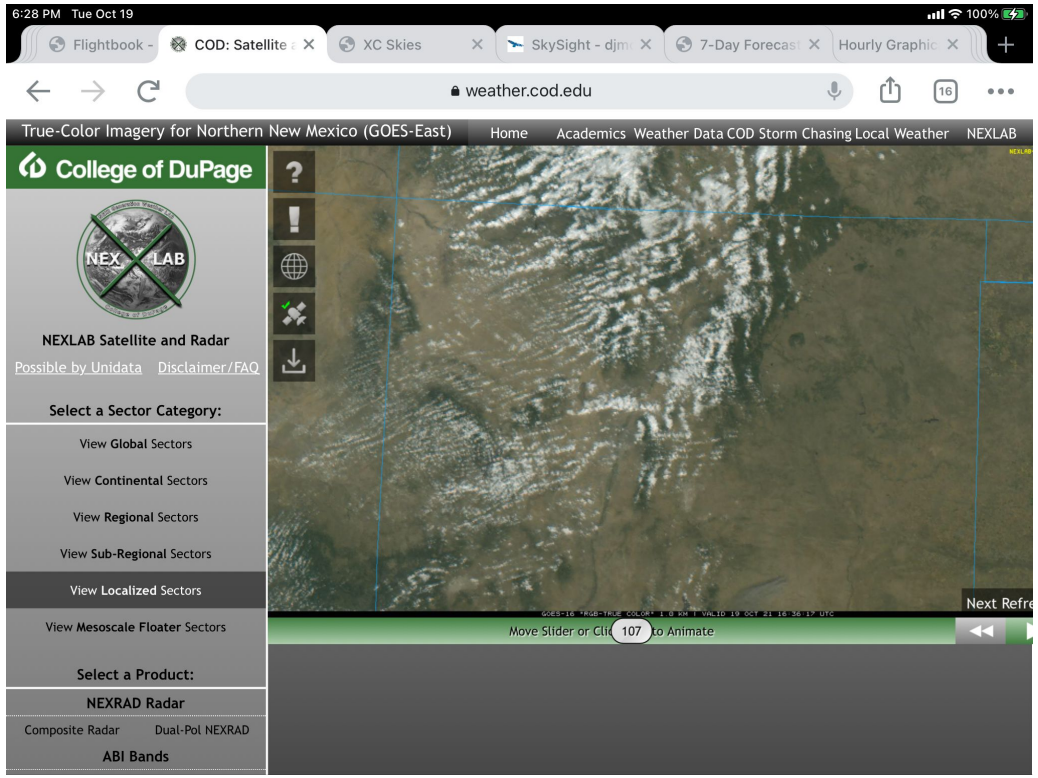
- Unstable convective boundary layer
- Thickness of 5-6k AGL – Higher is better
- Light winds of 15kt or less, minimal shear or gradients
- Adequate moisture for fair weather Cu but not so much to cause too much rain, overdevelopment, or storms
- Consistent conditions starting in late morning and lasting until sunset





Good forecasting is necessary for good flights!

Everywhere they went they were greeted with a familiar cry surfers have heard 1,000 times each, “You guys reeeeally missed it; you should’ve been here yesterday.” – ***The Endless Summer***

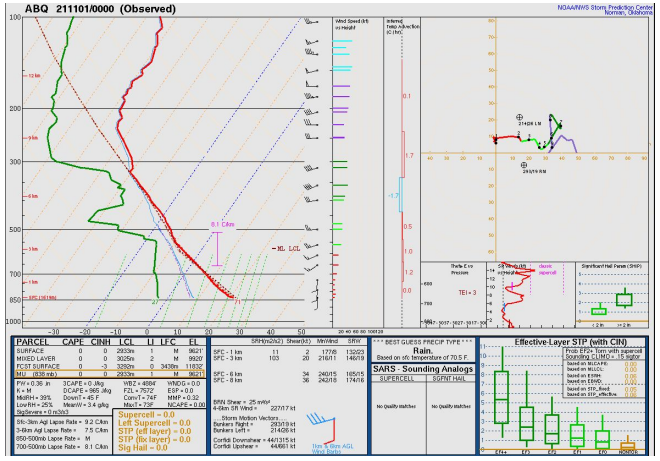


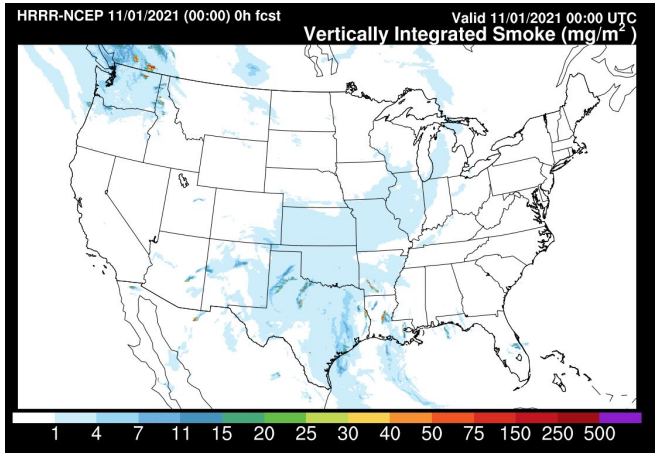
New NWS Forecasting Site

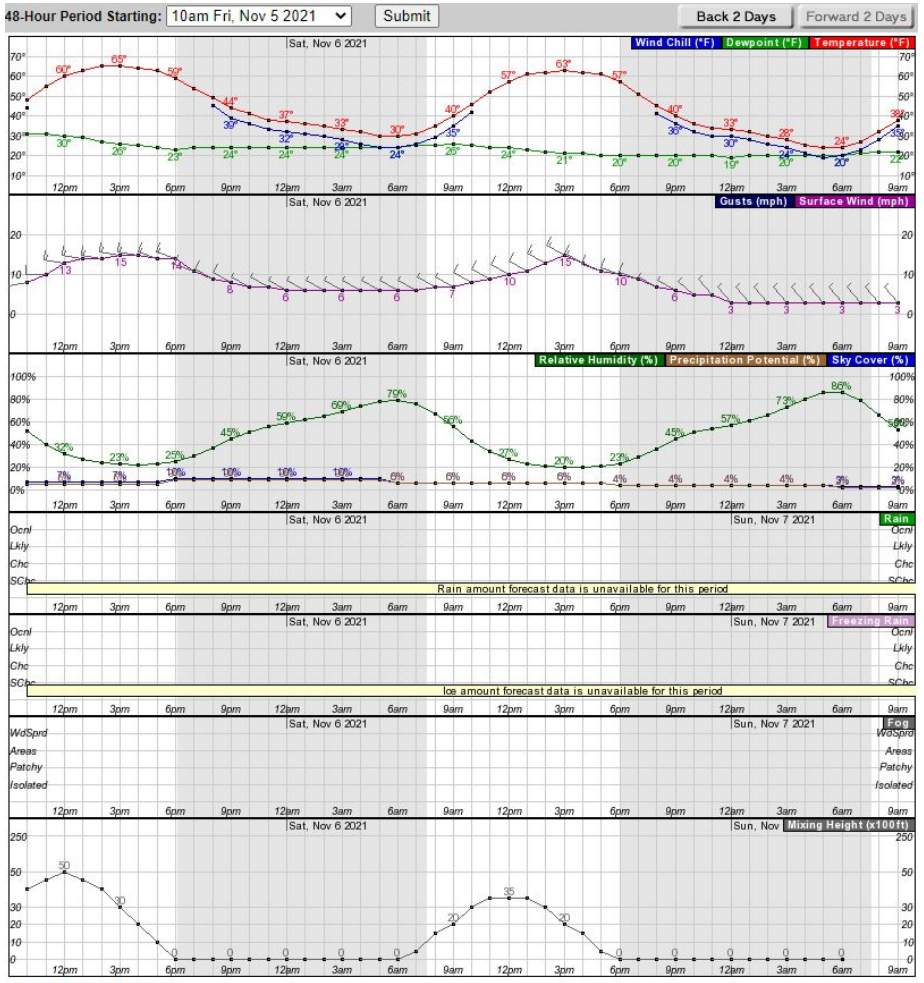
- Get Started
- NWS Albuquerque – [Aviation Decision Support]

Albuquerque Soaring Forecast | Moriarty Soaring Forecast

```
Soaring Forecast for Moriarty NM
National Weather Service Albuquerque NM
1938 MDT Sunday October 31 2021

This forecast is for Monday, November 1, 2021:

If the trigger temperature of 60.5 F/15.8 C is reached...then
   Thermal Soaring Index..... Good
   Maximum rate of lift..... 752 ft/min (3.8 m/s)
   Maximum height of thermals..... 14905 ft MSL (8563 ft AGL)

Forecast maximum temperature..... 67.0 F/19.9 C
Time of trigger temperature..... 1200 MDT
Time of overdevelopment..... None
Middle/high clouds during soaring window..... None
Surface winds during soaring window..... 20 mph or less
Height of the -3 thermal index..... 11988 ft MSL (5646 ft AGL)
Thermal soaring outlook for Tuesday 11/02..... Good


Remarks...

Sunrise/Sunset..... 07:25:30 / 18:09:33 MDT
Total possible sunshine..... 10 hr 44 min 3 sec (644 min 3 sec)
Altitude of sun at 12:47:31 MDT... 40.25 degrees

Upper air data from numerical model forecast valid on 11/01/2021 at 0600 MDT

Freezing level..... 11760 ft MSL (5418 ft AGL)
Convective condensation level... 16117 ft MSL (9775 ft AGL)
Lifted condensation level..... 15511 ft MSL (9169 ft AGL)
Lifted index..... +3.7
K index..... +1.1

Height  Temperature  Wind  Wind Spd  Lapse Rate  ConvectionT  Thermal  Lift Rate
ft MSL  deg C deg F   Dir   kt  m/s  C/km F/kft  deg C deg F  Index    fpm  m/s
-------------------------------------------------------------------------------
 50000  -63.0 -81.4   270   22   11   0.6   0.3   87.2 188.9    39.5      M    M
 45000  -62.2 -80.0   270   23   12  -0.4  -0.2   65.8 150.5    28.9      M    M
```

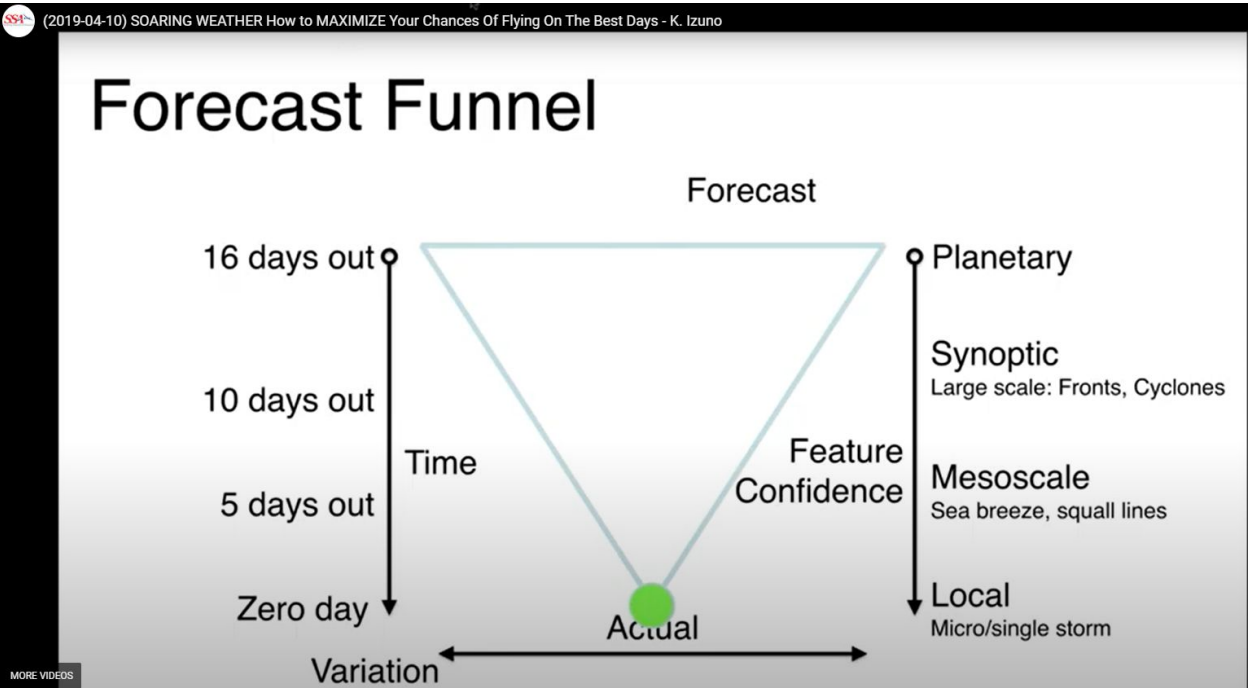


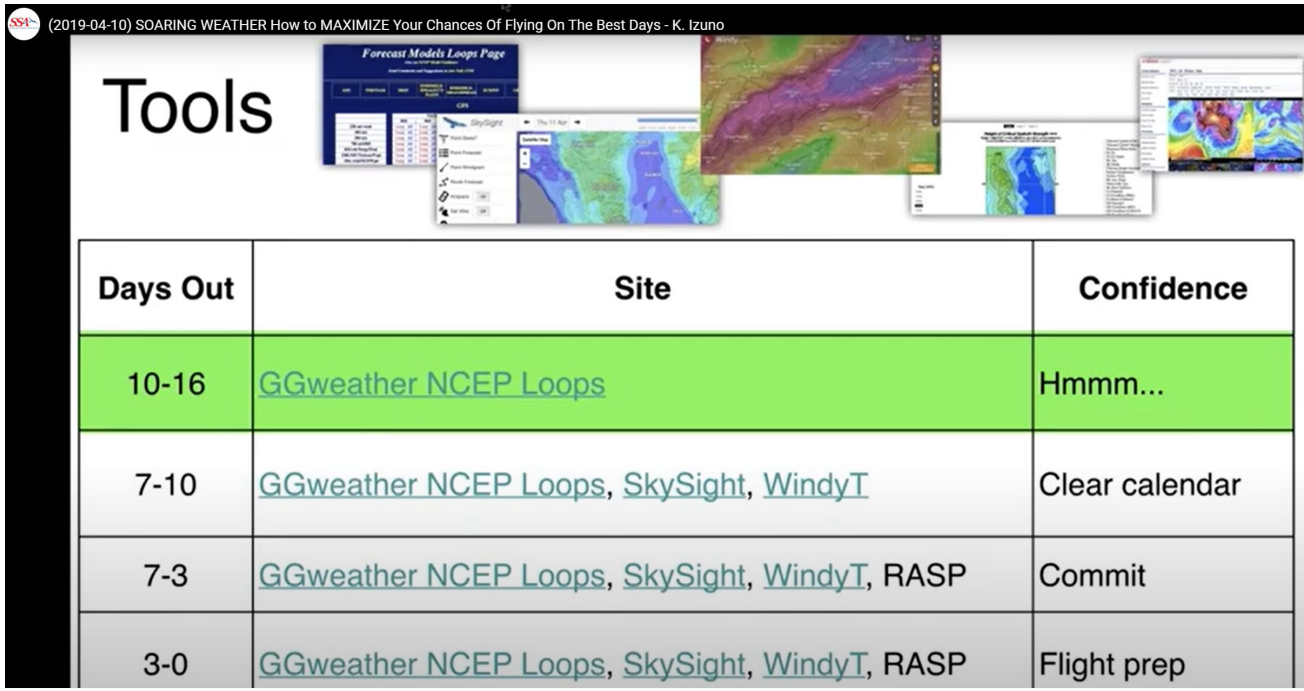




Friday, November 5 at 2pm
Temperature: 65 °F Dewpoint: 27 °F Wind Chill: N/A Surface Wind: W 14mph
Sky Cover (%): 7% Precipitation Potential (%): 5% Relative Humidity (%): 24%
Rain: <10% Freezing Rain: <10% Fog: --
Mixing Height: 4000ft

Forecast Window and Confidence





Days Out	Site	Confidence
10-16	GGweather NCEP Loops	Hmmm...
7-10	GGweather NCEP Loops, SkySight, WindyT	Clear calendar
7-3	GGweather NCEP Loops, SkySight, WindyT, RASP	Commit
3-0	GGweather NCEP Loops, SkySight, WindyT, RASP	Flight prep

What kind of “task” should I fly today?

Factors

- Wind
  - Surface
  - Aloft
  - Development/Progression
- Lift
  - Heights
  - Climb rates
  - Development/Progression
  - Thermal/Wave/Convergence/Ridge
- Cloud (Visibility) information
- Terrain

Options

- Contest
  - OLC
  - Regional/National/World
- Triangle
- Out-and-Return
- Straight distance
- Free/WX Driven
- Family time

Pilot Skills and Decisions

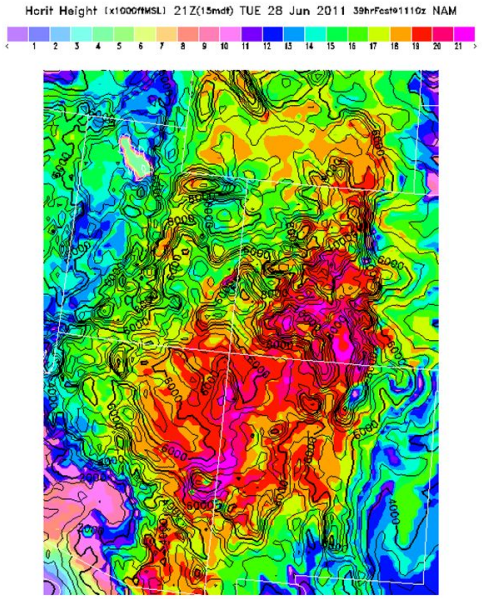
- How are my skills for the conditions on the ground/launching today?
- … in the air today?
- … at the end of the flight/landing today?
- What kind of terrain will I be flying over today?
- How well can I read the conditions and “change gears” appropriately?
- What kind of aircraft do I have and what condition is it in?
- How am I feeling physically, mentally, and what kind of food and drink did I bring?
- …

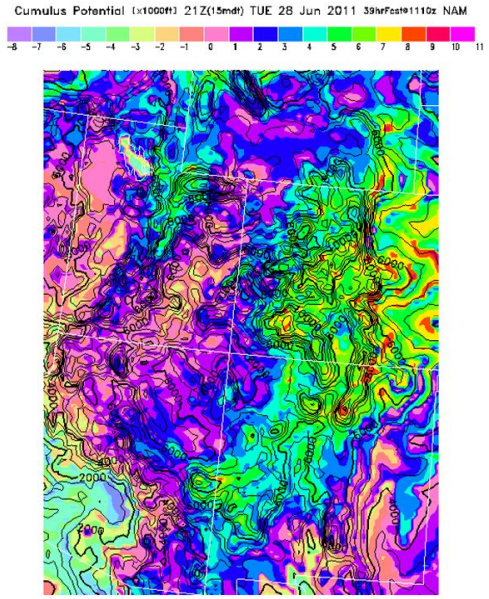
Evolving Tools for Soaring Forecast

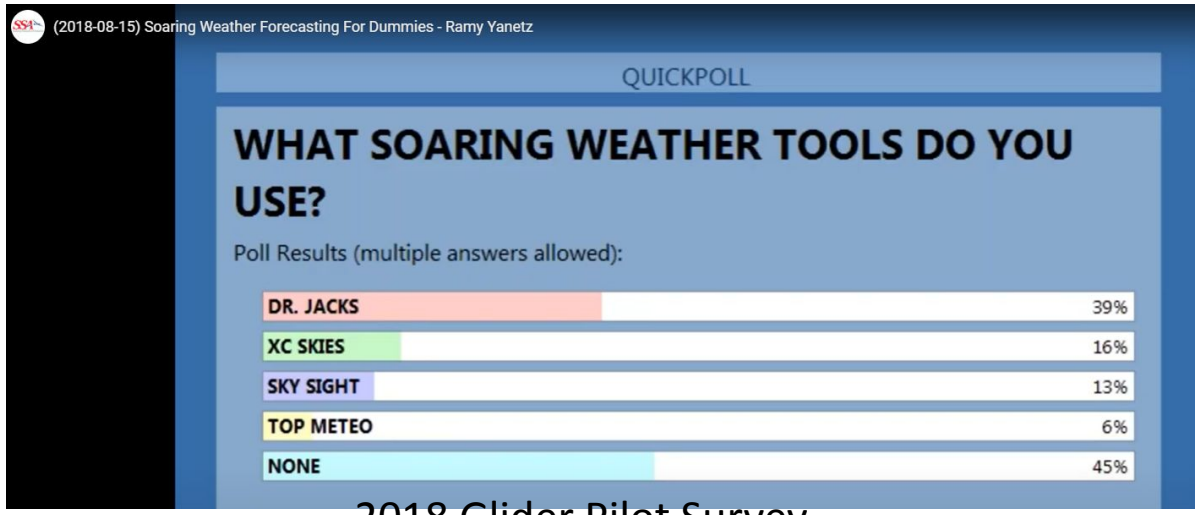
RASP BLIPMAP UniViewer – Moriarty Example

Boundary Layer Information Prediction MAP (BLIPMAP) created by Dr. John W. (Jack) Glendening, Meteorologist

- Regional Atmospheric Soaring Prediction (RASP)
- Hosted by volunteers
- Higher resolution than NAM



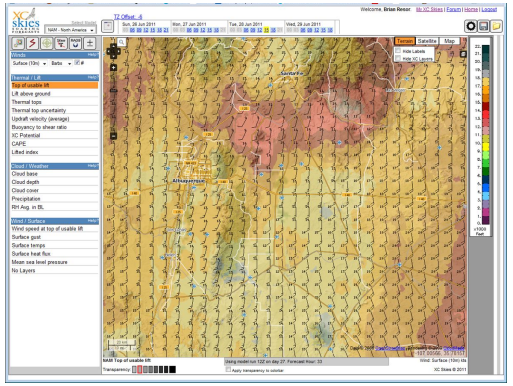


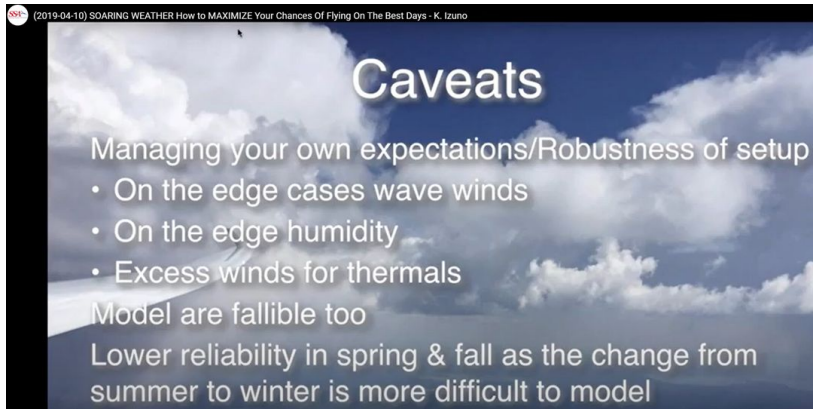


2018 Glider Pilot Survey

XC Skies

- Subscription Based

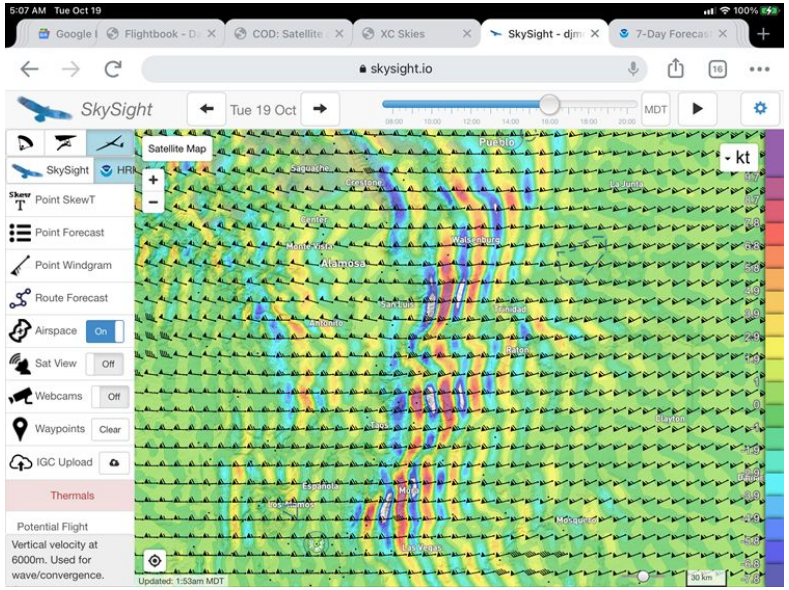




SkySight Example

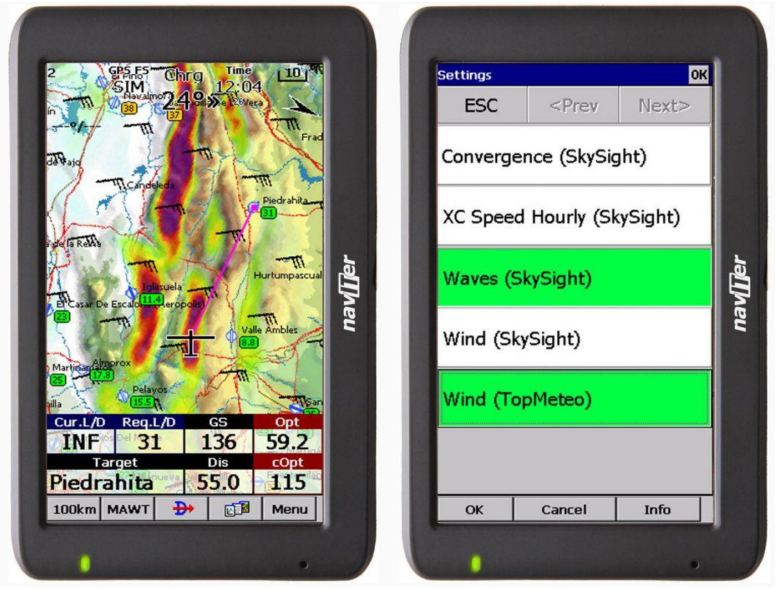
Forecast

- Browser shows that this day is looking pretty good
- Refined model as date approaches



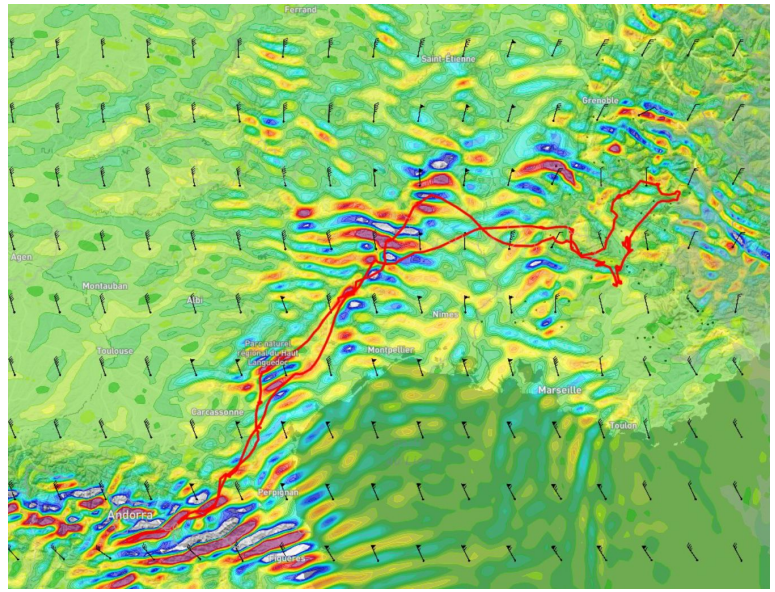
Flight

- Load forecast on flight computer
- Assess the day and how to apply that prediction

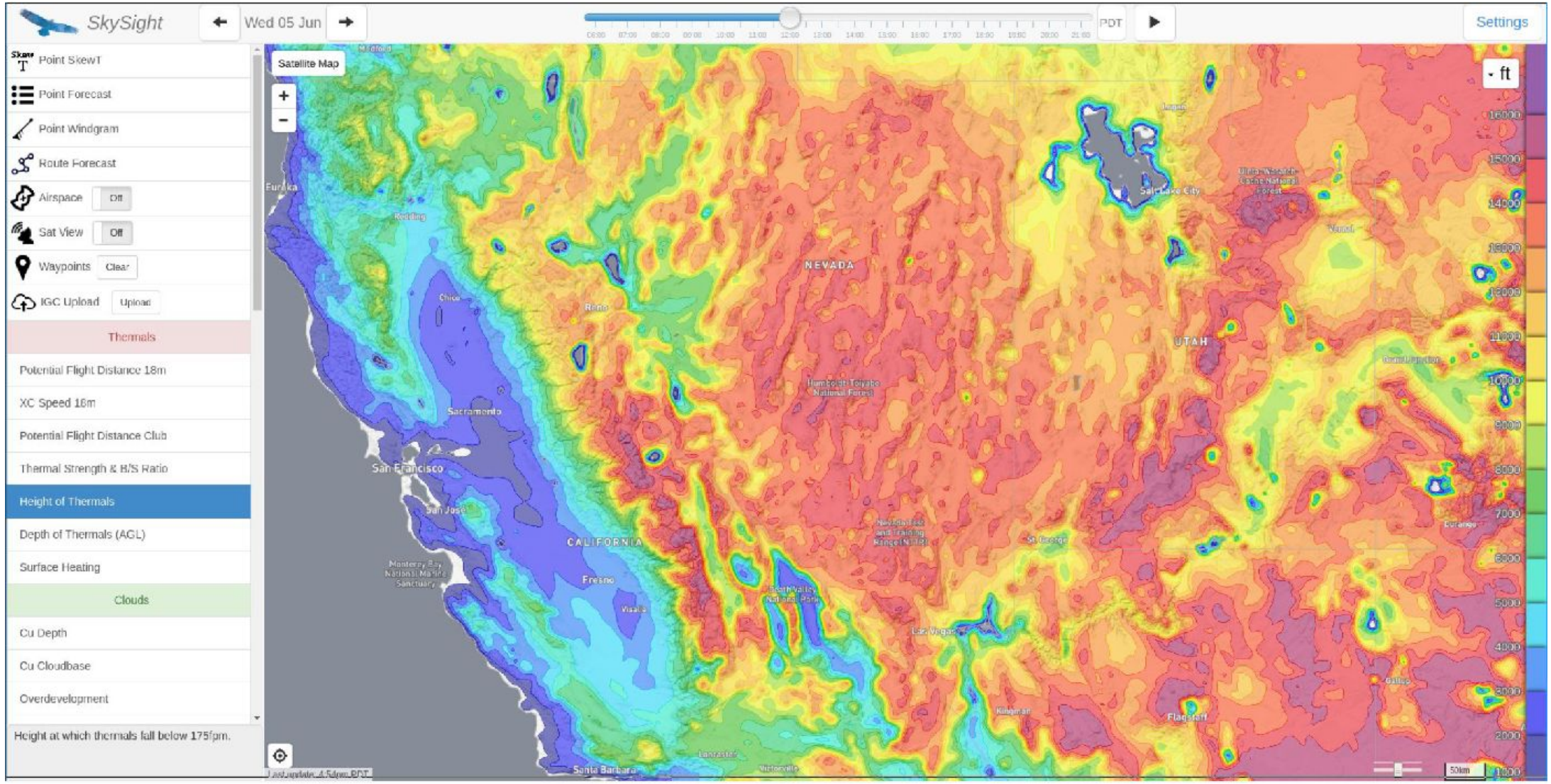


Analysis

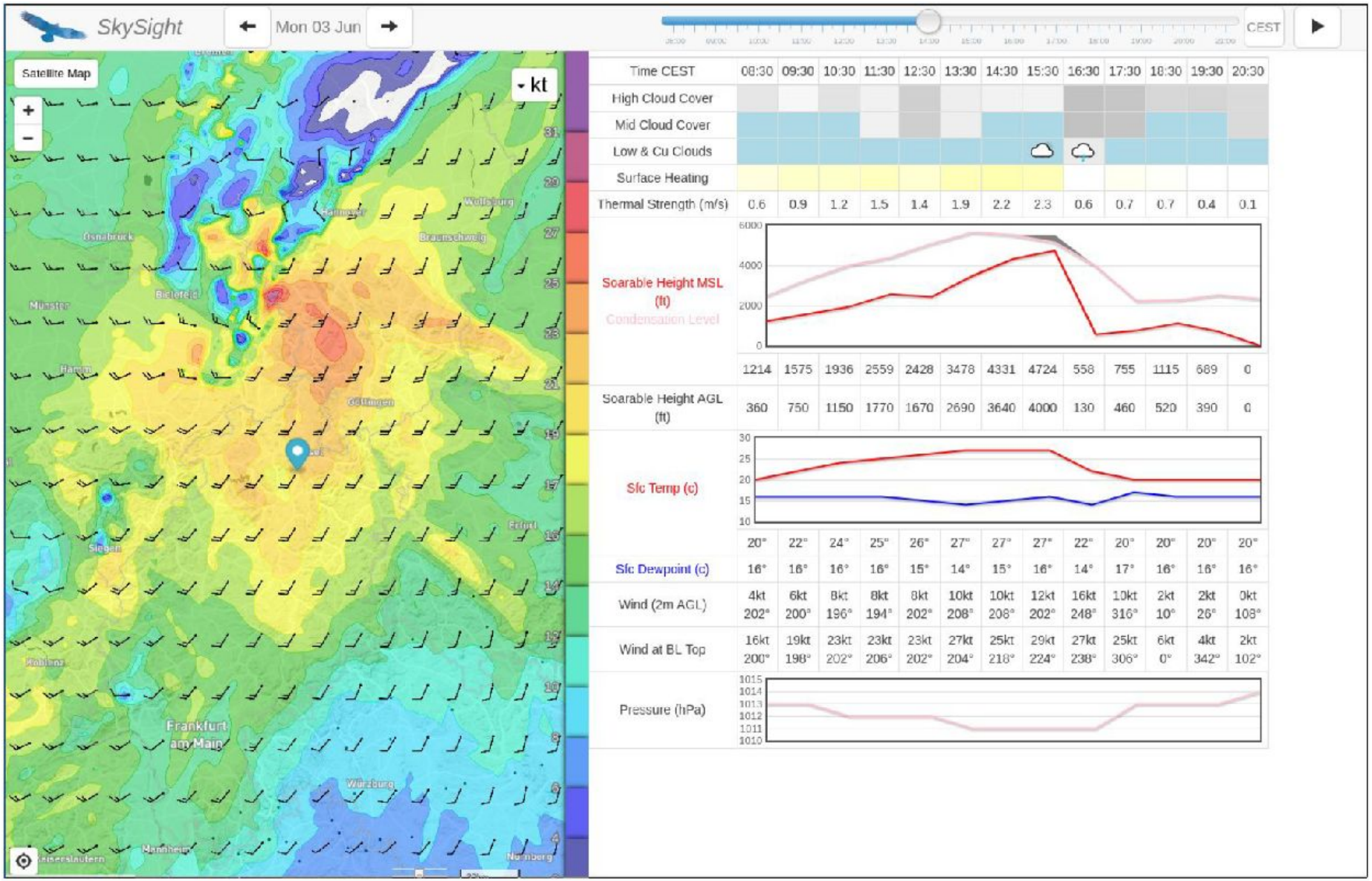
- GPS log uploaded to the OLC
- Analysis with tools like SeeYou



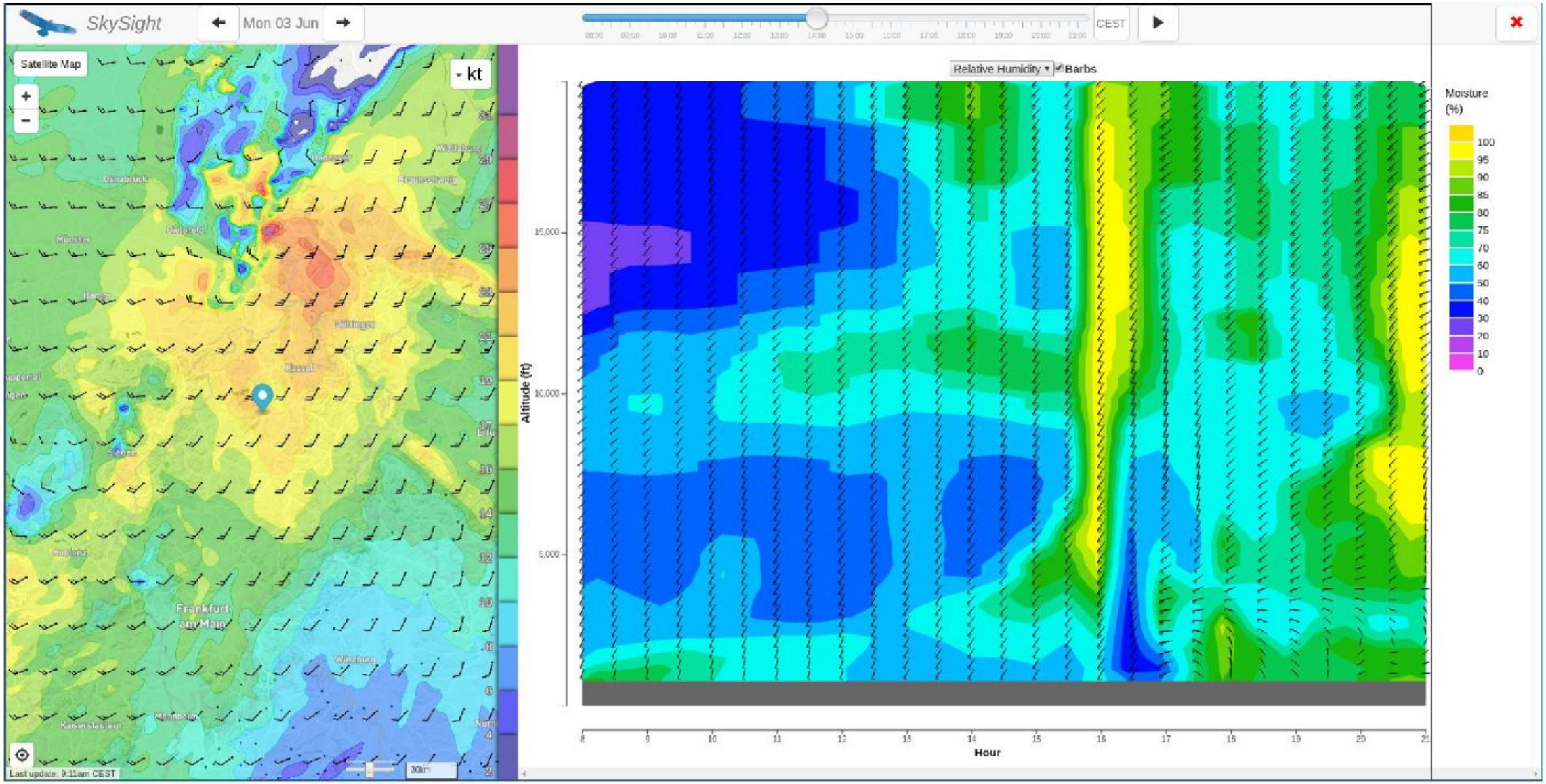
SkySight Forecast – Contour Map



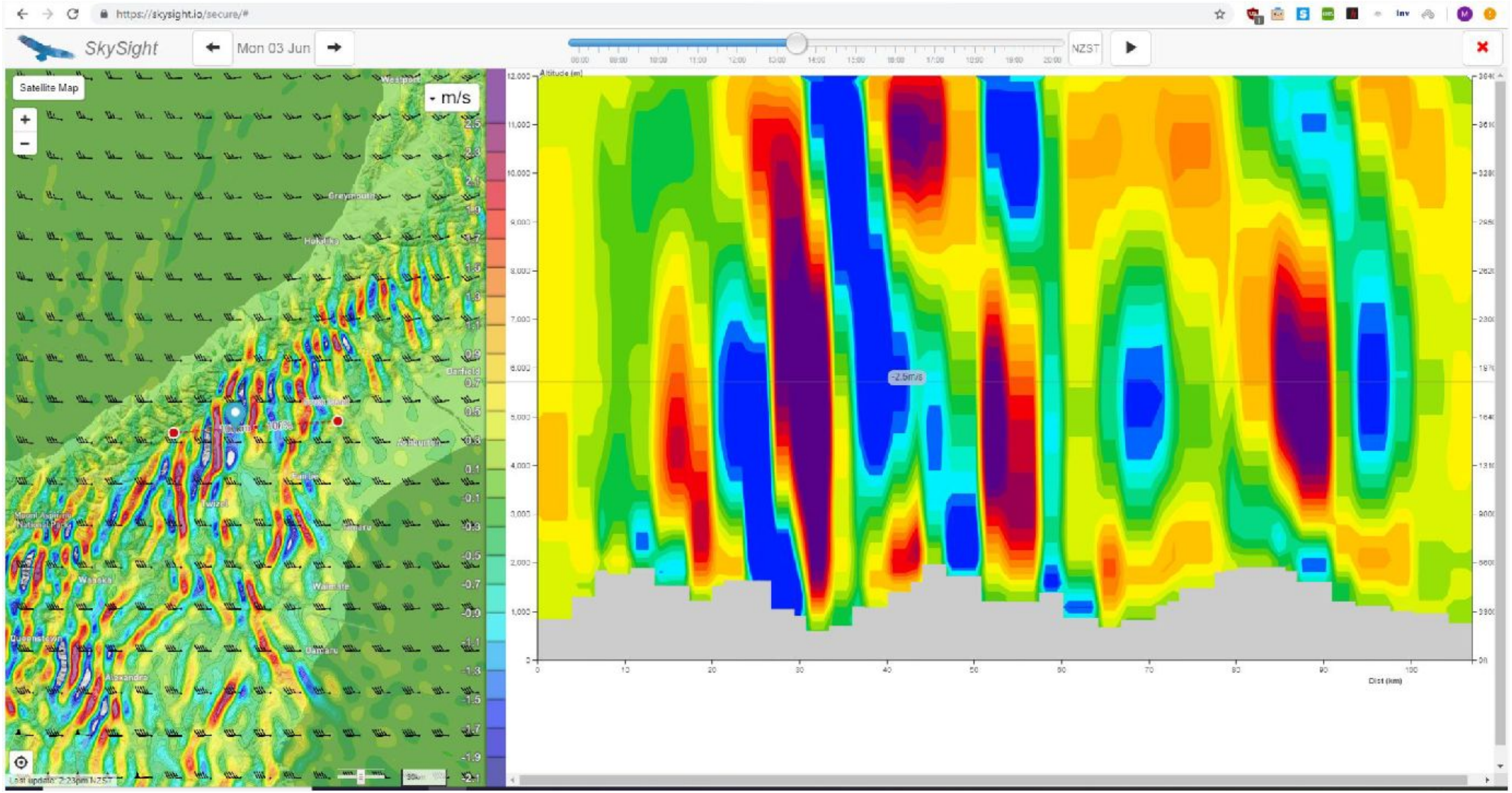
SkySight Forecast – Point



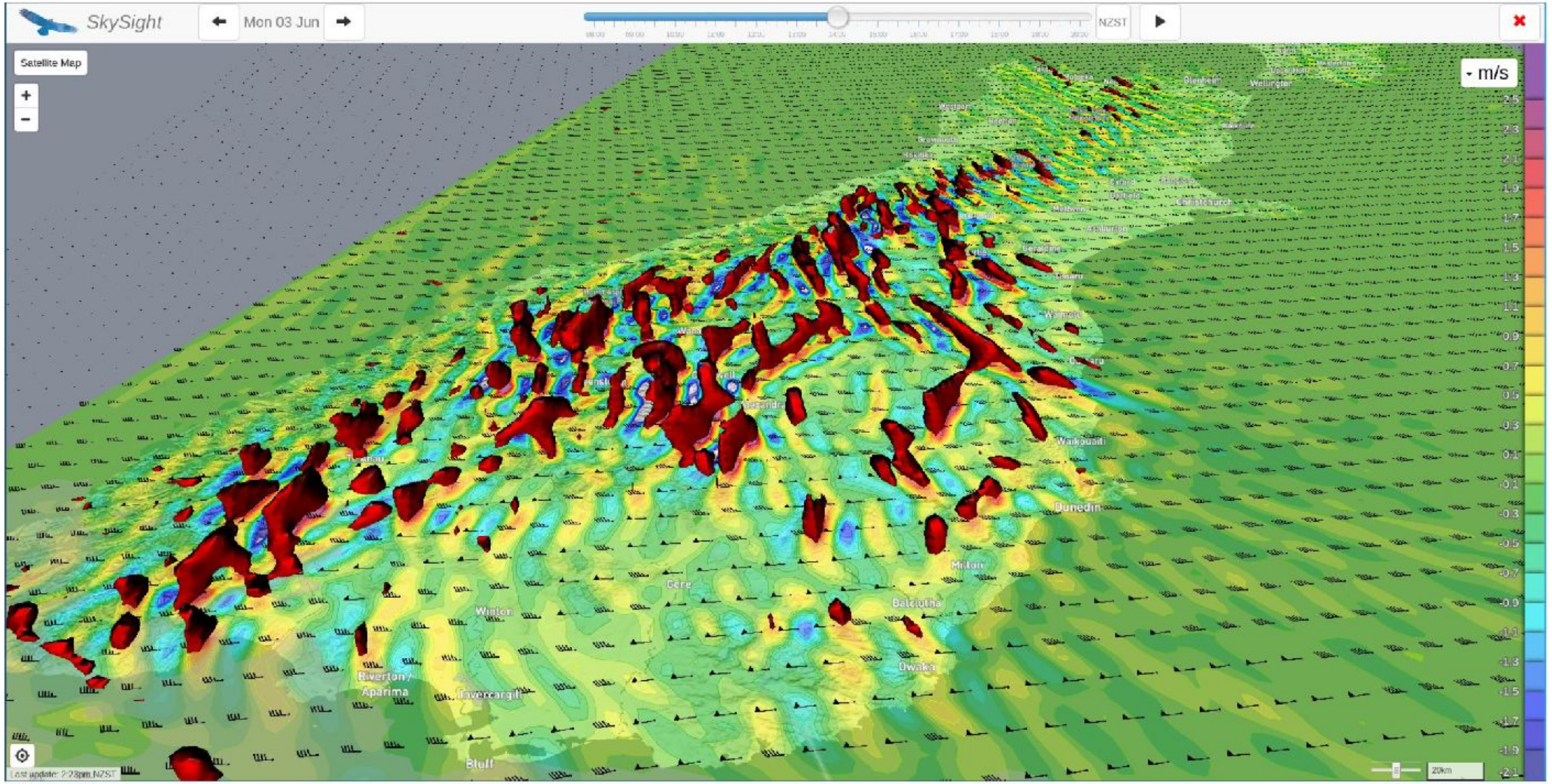
SkySight Forecast – Windgram



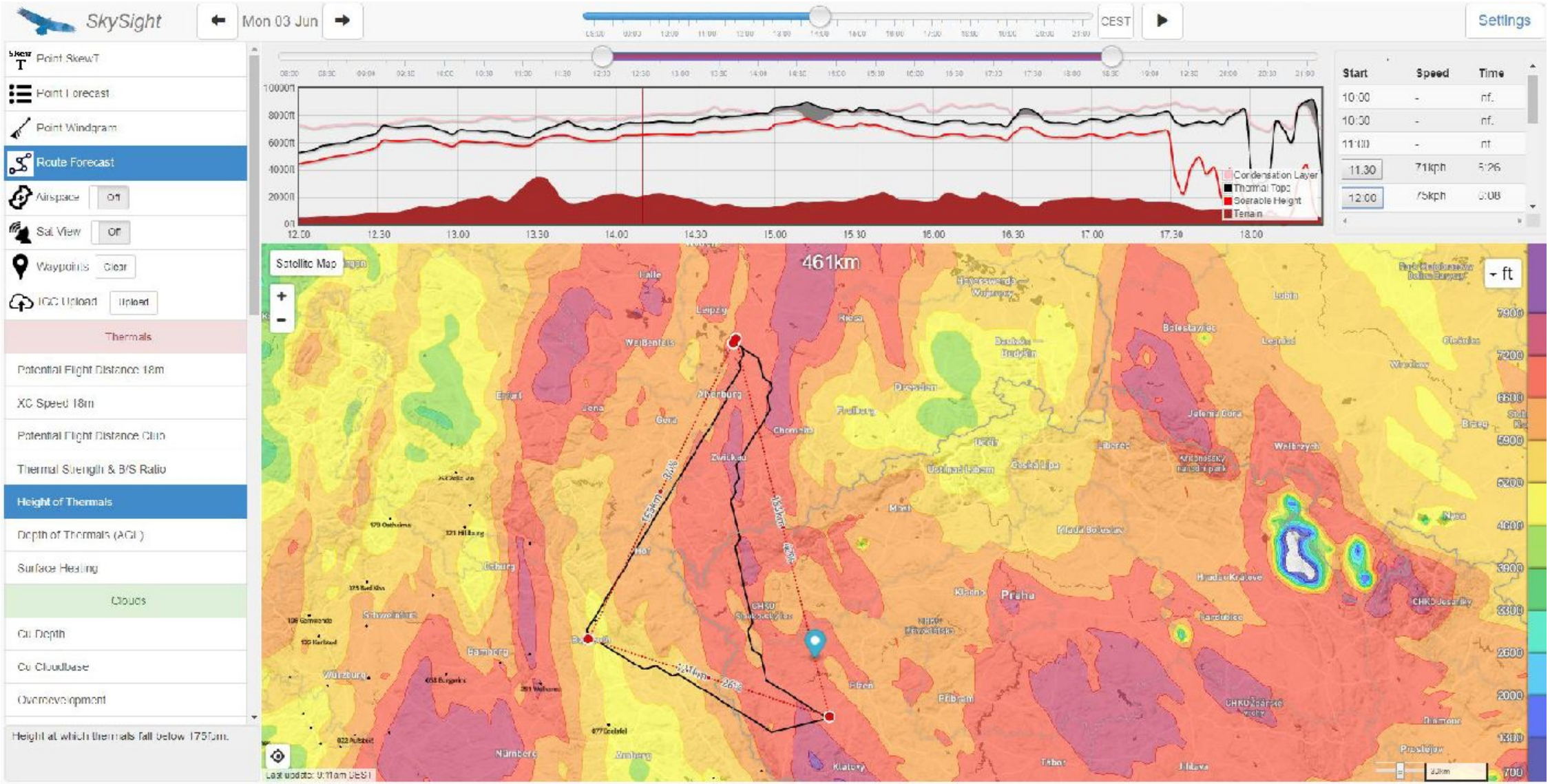
SkySight Forecast – Wave Cross Section



SkySight Forecast – 3D Wave



SkySight Forecast – Route



Questions?

Thank you for your time and a special thanks to the Moriarty Airport, ASC members, skysight.io's M. Scutter, along with the statistics and weather materials provided by SSA members on SSA.org