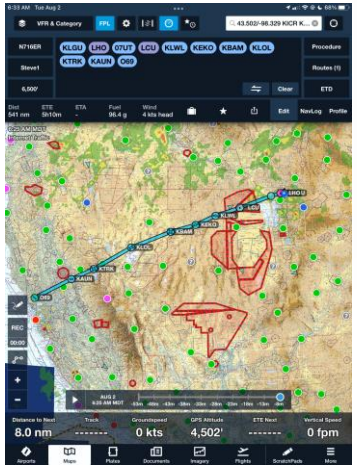
The National FAA Safety Team Presents

Federal Aviation Administration

Topic of the Month – August, 2024

Pre-flight & In-flight Weather Resources



Presented to: AOPA Flying Clubs Safety Meetings

Prepared by: Steve Bateman and Rich Doyle

Date: At Your Club's Next Safety Meeting

Produced by:
The National FAA Safety Team (FAASTeam)

PDF Of These Slides Available For Your Further Study and Use

- **Actual slides post on the third Sunday of every month (August 18th)**
- **https://bit.ly/ToMSafetyArticle**

- **Select the safety article (month) of interest**
- **Open and save the PDF**
- **I'LL SHOW THIS INFO AGAIN AT THE END OF THE PRESENTATION**

- **Thanks to the AOPA Flying Clubs Initiative**

YOU CAN FLY
FLYING CLUBS

Overview

- **Weather related accidents – how do things go wrong?**
- **Pre-take-off weather resources**
  - Not a comprehensive list
  - Sample of resources available today
  - Many third-party resources are available—*choose wisely!*
- **In-flight weather resources**
  - Not a comprehensive list
  - Sample of resources available today
- **Pre-landing weather resources**
  - ATIS, AWOS, Remarks (DA, Lighting, distant NE…), Eyeballs

Why This Is Important…

Non-commercial GA, fixed wing

In 2021, 938 “accidents”, 166 fatalities

Figure 1.4: General Aviation Accidents in 2021

2021 Non-commercial fixed-wing

	Accidents	Fatal Accidents
Pilot-Related	**647** 69%	**103** 62%
Mechanical	**151** 16.1%	**12** 7.2%
Other / Unknown	**128** 13.6%	**46** 27.7%
null	**12** 1.3%	**5** 3%

https://www.aopa.org/training-and-safety/air-safety-institute/accident-analysis/richard-g-mcspadden-report

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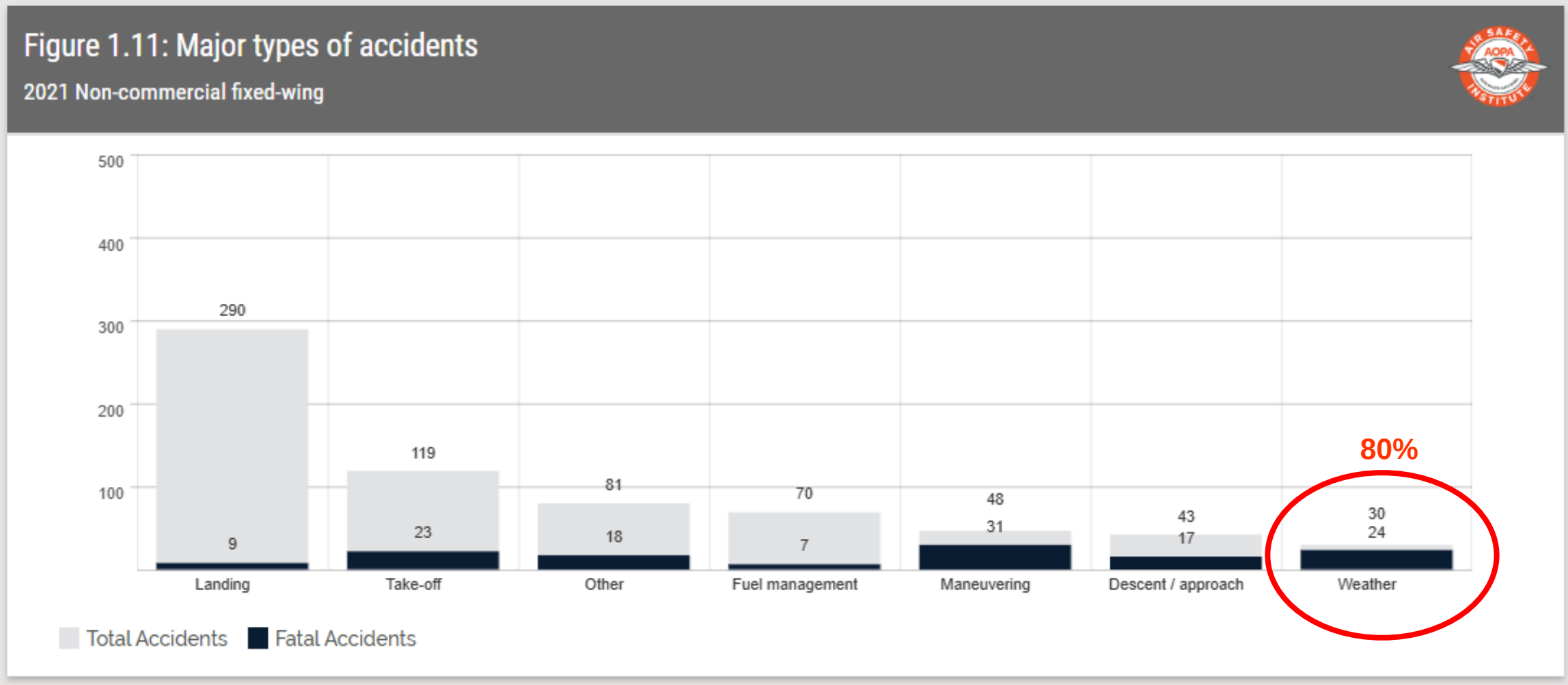

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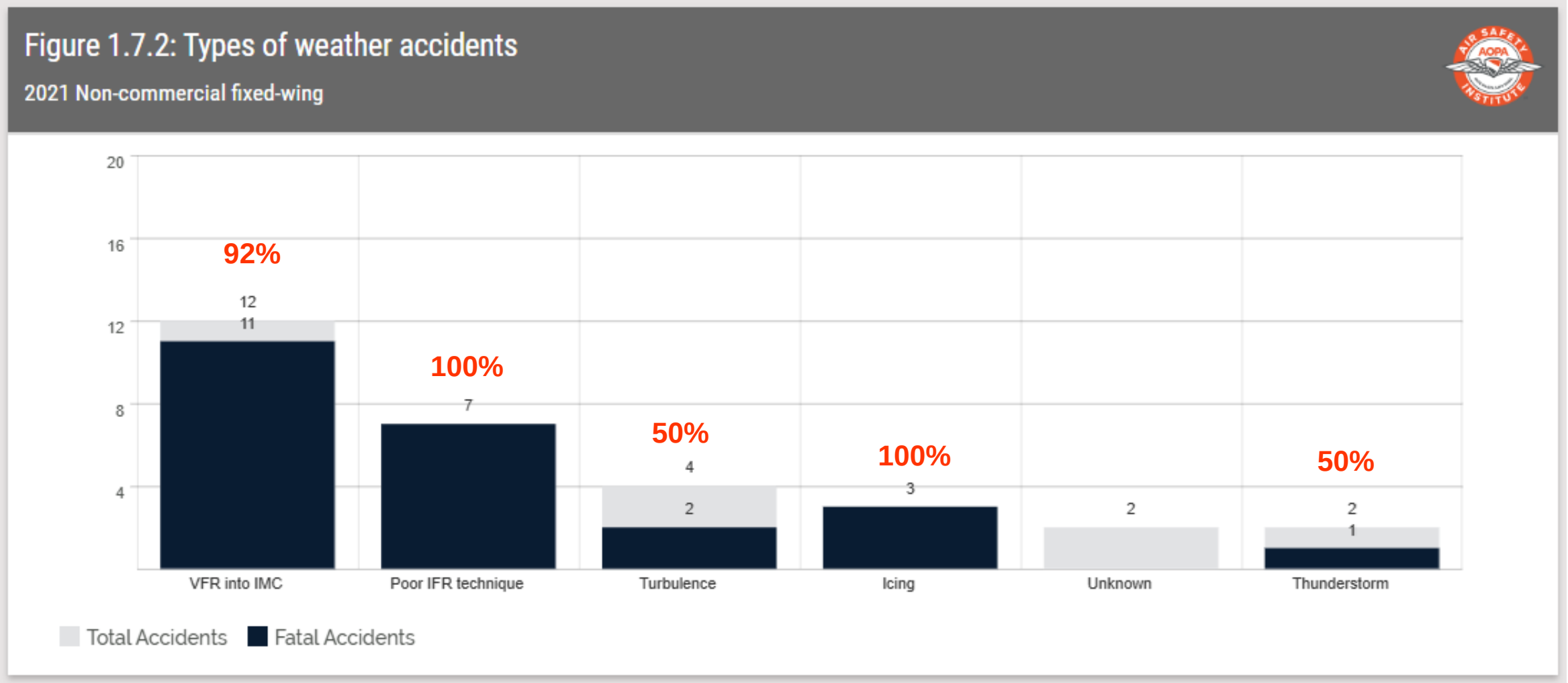

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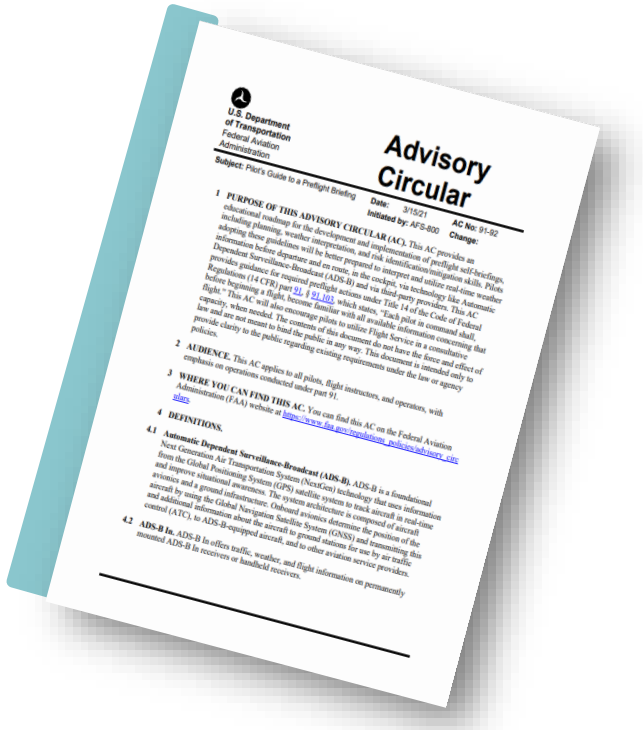
Resources

- **FAA H-8083-28 Aviation Weather Handbook**
  - Incorporates information from and replaces:
  - AC 00-6, Aviation Weather
  - AC 00-24, Thunderstorms
  - AC 00-30, Clear Air Turbulence Avoidance
  - AC 00-45, Aviation Weather Services
  - AC 00-54, Pilot Windshear Guide
  - AC 00-57, Hazardous Mountain Winds

https://www.faa.gov/sites/faa.gov/files/FAA-H-8083-28_FAA_Web.pdf

Resource

- **AC 91-92: Pilot's Guide to a Preflight Briefing**
  - Extensive ADS-B discussion
  - Flight Service web services
  - Self-briefing information and tips
  - Single-pilot Resource Management (SRM)



This AC provides a roadmap for the implementation of preflight self-briefings, including planning, weather interpretation, and risk identification/mitigation skills

Pilots will be better prepared utilize real-time weather information before departure and en-route, in the cockpit, via Automatic Dependent Surveillance-Broadcast (ADS-B)

More on AC 91-92 (Latest 03-15-2021)

- Encourages pilots to conduct regulatory compliant *pre-flight self-briefings*

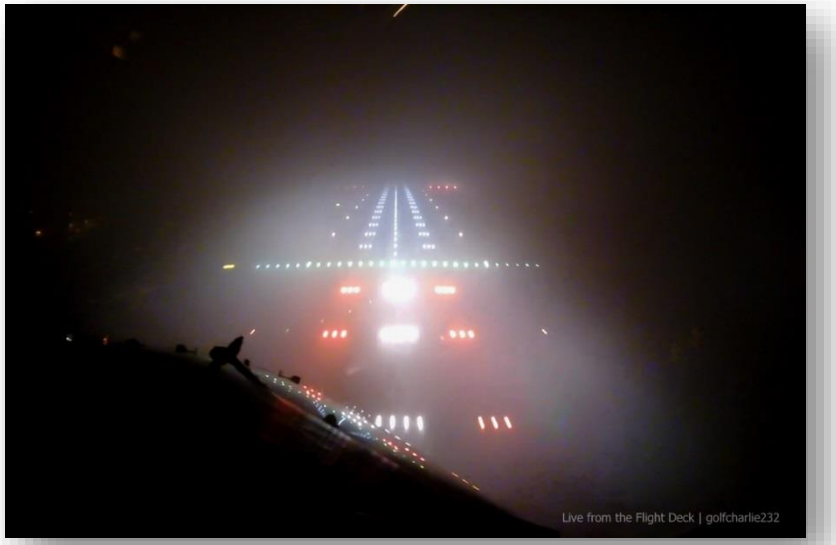
- Replaces FAA publications:
  - General Aviation Pilot's Guide to Preflight Weather Planning, Weather self-Briefings, and Weather Decision Making
  - How to
  - Obtain a Good Weather Briefing

https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_91-92.pdf

More on AC 91-92

- **True or False:**
  - To be legal (91.103) official weather briefings can only be obtained from flight service, therefore, a self weather briefing is not legal
- **Generally, false:**
  - "For many GA pilots, the Flight Service Station (FSS) remains an important source of comprehensive weather and aeronautical information. However, most pilots have become more accustomed to performing a self-briefing than calling an FSS"
  - *The FAA considers that a self-briefing can be compliant with current Federal aviation regulations*
  - *Pilots are encouraged to utilize online automated weather resources to conduct self-briefings prior to contacting Flight Service*
  - *Pilots who have preflight information are better prepared to make in-flight decisions as real-time weather information is consumed*
- **Note: If in any doubt or want a discussion, call Fight Service**

Weather analysis and decision making are big parts of our job (Remember FAR 91.103?)



§ 91.103 (Know all there is to know…)

- **§ 91.103 Preflight action.**

Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include—

(a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:

- **(1)** For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and
- **(2)** For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

Pre-Flight Self-Briefing Resources

Preflight Self-Briefing - Government Resources

1800wxbrief.com	Leidos Flight Service FAA Contract Vendor	Go!
weathercams.faa.gov	FAA Weather camera network and interactive map display	Go!
aviationweather.gov	NOAA/Government website for aviation weather	Go!
Fly.faa.gov/flyfaa/usmap.jsp	FAA Flight Delay Information	Go!
nhc.noaa.gov	National Hurricane Center (NHC)	Go!
notams.aim.faa.gov/notamSearch	Federal NOTAM System (FNS)	Go!
spc.noaa.gov	NOAA Storm Prediction Center (SPC)	Go!

ssd.noaa.gov/VAAC/vaac.html	Volcanic Ash Advisory Centers (VAAC)	Go!
sua.faa.gov	Special Use Airspace (SUA)	Go!
tfr.faa.gov/tfr2/list.html	Temporary Flight Restrictions (TFR)	Go!
weather.gov	National Weather Service Forecast Office (NWSFO)	Go!
weather.gov/aawu	Alaska Aviation Weather Unit (AAWU)	Go!
weather.gov/hfo	National Weather Service Forecast Office Honolulu, HI	Go!
wpc.ncep.noaa.gov	Weather Prediction Center (WPC)	Go!

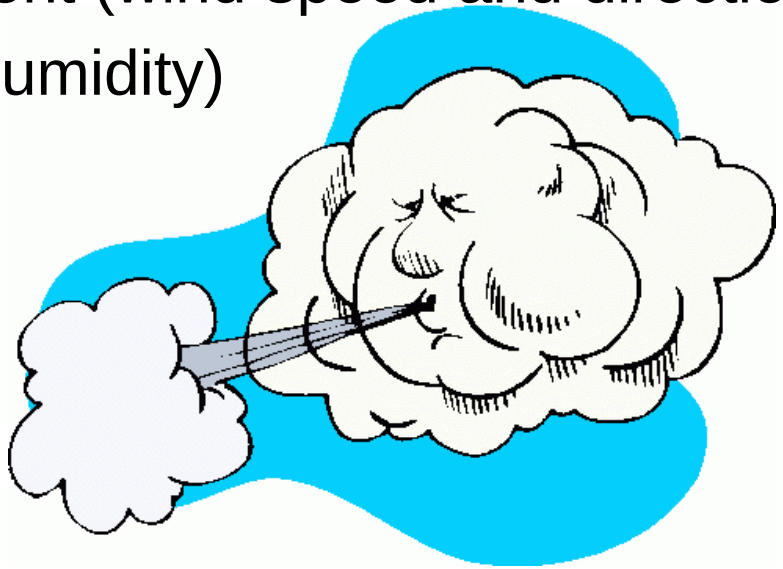
Note: Additional third-party automated resources may be used to conduct preflight self-briefings

Weather Is Caused By…?

- **Uneven heating of the earth's surface, resulting in:**
  - Temperature gradients
  - Rising/falling air
  - Condensation, fog, clouds, viz
  - Pressure gradients
  - Wind vector

Three Basic Elements of Weather are…

1) Temperature (warm or cold)
2) Air movement (wind speed and direction)
3) Moisture (humidity)



Temperature, wind, and moisture combine to varying degrees to create conditions that affect pilots

So, these are things we should know about!

Best Practices When Planning

- **Pre-flight weather review is a regulatory requirement (FAR 91.103)**
- **Use more than one (trusted) weather data source**
- **Plan to be late**
- **Plan for alternatives**
- **Frequent scenario training for weather related contingencies**
  - Diversions, etc.
- **Check weather often while en-route…many options**

Making Sense of the Data

How will the weather affect this flight?

- **Visibility (vs terrain)**
  - Viz, cloud clearance, separation
  - Flight rules
- **Wind (head, tail, turbulence…)**
- **Aircraft performance (density altitude)**
- **…and it all changes with the weather…**

Types of Pre-Flight Briefings

Briefing Type	Value	Time Frame
Outlook	• Provides weather information available in advance • For planning purposes • Gives indication of weather elements that may be a factor for your flight	• 6-48 hours before flight
Standard	• Provides a complete and detailed depiction of the weather elements for the intended flight • Pilot will have a clear indication of the weather-related risk factors for the flight • On subsequent briefings, compare METARs to prior Terminal Aerodrome Forecast (TAF) to determine if the forecasts are accurate (e.g., improving as forecast)	• Within 6 hours of flight • Can be obtained multiple times for flights during dynamic weather
Abbreviated	• Provides pilot with updated information for specific elements of the weather • Focuses on the more dynamic elements of the weather that may have changed since the standard weather briefing was obtained • Helps pilot focus on the specific risk areas for the intended flight in an efficient manner • Can be used in flight for proactive reaction to changing weather	• As soon as practical before flight

Pre-Flight Briefing Elements

Briefing Elements	Description	OTLK	SB	AB
Adverse Conditions	• IFR conditions, mountain obscurations, thunderstorms, icing, turbulence, volcanic ash, dust/sandstorms, tropical cyclones, high density altitude, low-level wind shear, strong low-level winds • Adverse aeronautical information, including adverse NOTAMs (airport/runway closures, air traffic delays, TFRs, etc.)	Y	Y	Y
Synopsis	Weather systems, frontal systems and/or air masses	Y	Y	
Current Conditions	• Current observations for departure, en route, and destination • Includes METARs, PIREPs, satellite, and NEXRAD imagery		Y	Y
Forecast Conditions	Forecasts for departure, en route and destination	Y	Y	Y
Winds Aloft	Winds aloft forecast (interpolate between levels) and temperature at proposed altitude		Y	
NOTAMS	NOTAMs for departure, en route and destination	Y	Y	Y
Restrictions or SUA	Prohibited areas (P40, P56) and SFRA around Washington DC	Y	Y	Y
Air Traffic Control (ATC) Delays	ATC delays and flow control advisories		Y	Y

OTLK-Outlook ***SB-Standard Briefing*** ***AB-Abbreviated Briefing***

Adverse Weather Element

Adverse Weather

Review AIRMETs, SIGMETs, Center Weather Advisories, PIREPs, or any other advisory or information issued for the geographical location of the planned flight for the following weather conditions:

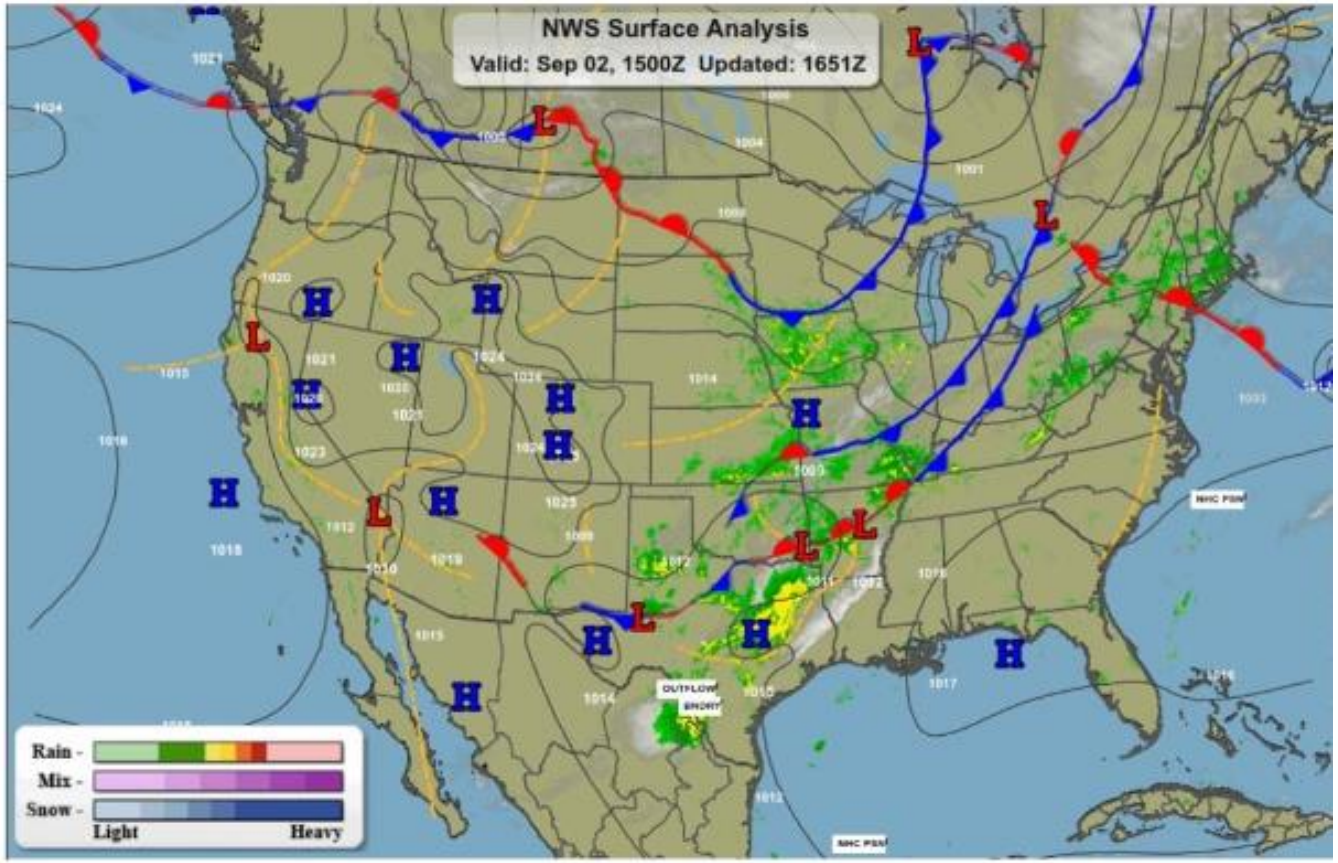
- IFR conditions
- Mountain obscurations
- Thunderstorms
- Icing
- Turbulence
- Dust/Sandstorms
- Tropical cyclones
- High density altitude
- Low-level wind shear
- Strong low-level winds
- Volcanic Ash

Synopsis Element

A synopsis or “birds' eye” view of weather systems provides information on major weather elements that may affect all phases of flight

These weather systems include frontal types and movement, locations of high and low pressure, formation of major weather elements, and upper air wind gradients

The synopsis is a prelude to what you will see in the METARs and TAFs



Current Conditions Element

Review current weather (METARs, satellite, GFA, FAA weather cameras) for all phases of flight to determine if VFR flight is possible

- Ceilings and visibility
- Wind speed and direction
- Temperature, density altitude, and dewpoint

Check for recent PIREPs to see what other pilots are experiencing

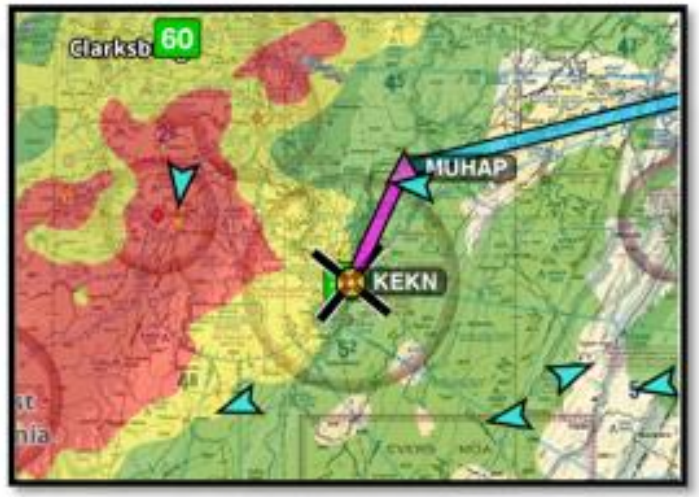
Flight Rules

Category	Ceiling		Visibility
Visual Flight Rules VFR	greater than 3,000 feet AGL	and	greater than 5 miles
Marginal Visual Flight Rules MVFR	1,000 to 3,000 feet AGL	and/or	3 to 5 miles
Instrument Flight Rules IFR	500 to below 1,000 feet AGL	and/or	1 mile to less than 3 miles
Low Instrument Flight Rules LIFR	below 500 feet AGL	and/or	less than 1 mile

NEXRAD Element (Even delayed on your computer)

NEXRAD is a great addition to preflight planning and inflight weather awareness. There are several aspects to NEXRAD that can get you in trouble if you do not understand their behavior.

- The NEXRAD image is delayed, so the picture you are seeing is a historical view of where the weather was 2-8 minutes ago



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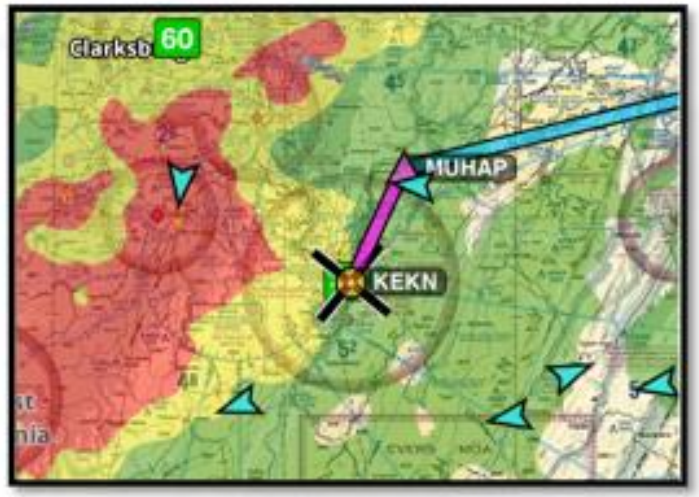

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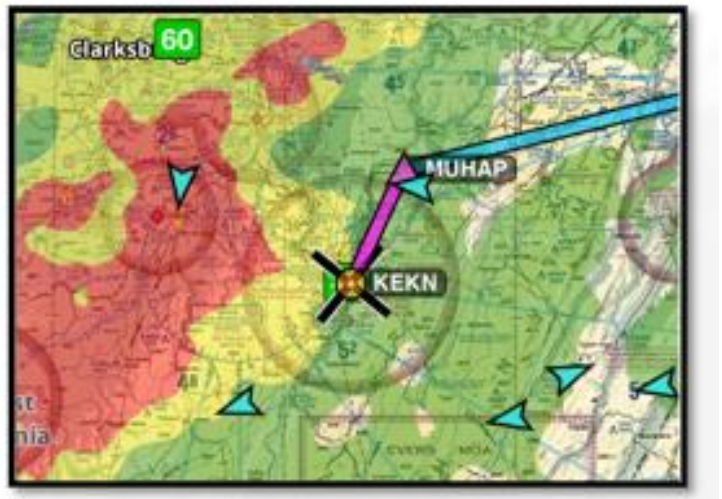

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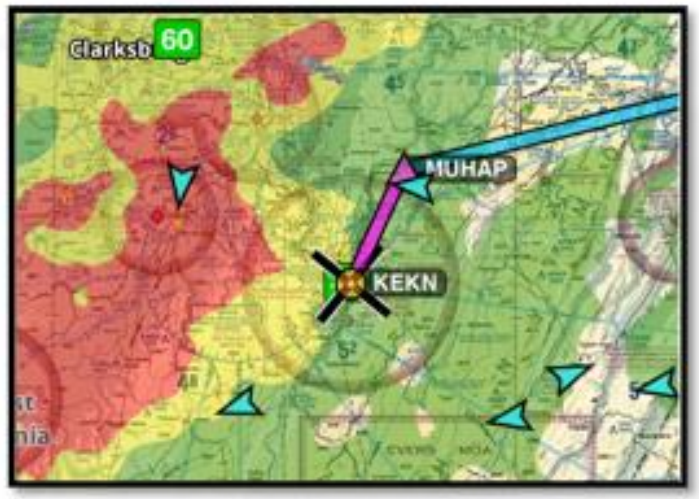
- For red and magenta cells, stay 10 and 20 miles away from the edge of the green NEXRAD image



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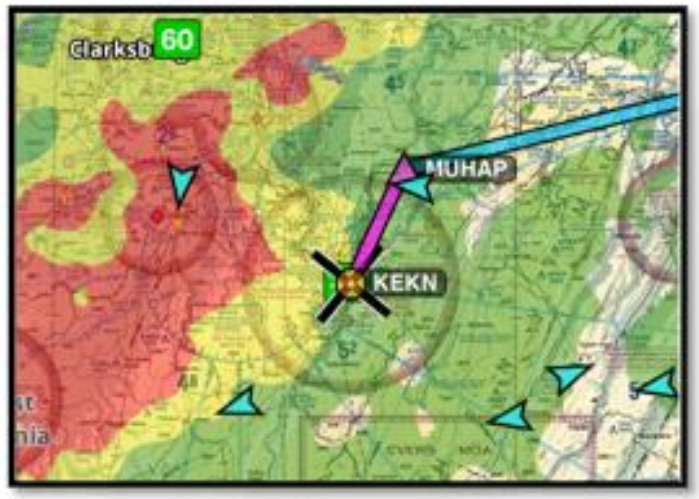
- Different online and in cockpit resources can depict the intensity of weather with a different number of colors. This means on one, the view of a cell is shown in red (which we know to avoid) and on another the same cell might be a lighter yellow



Forecast Conditions Element

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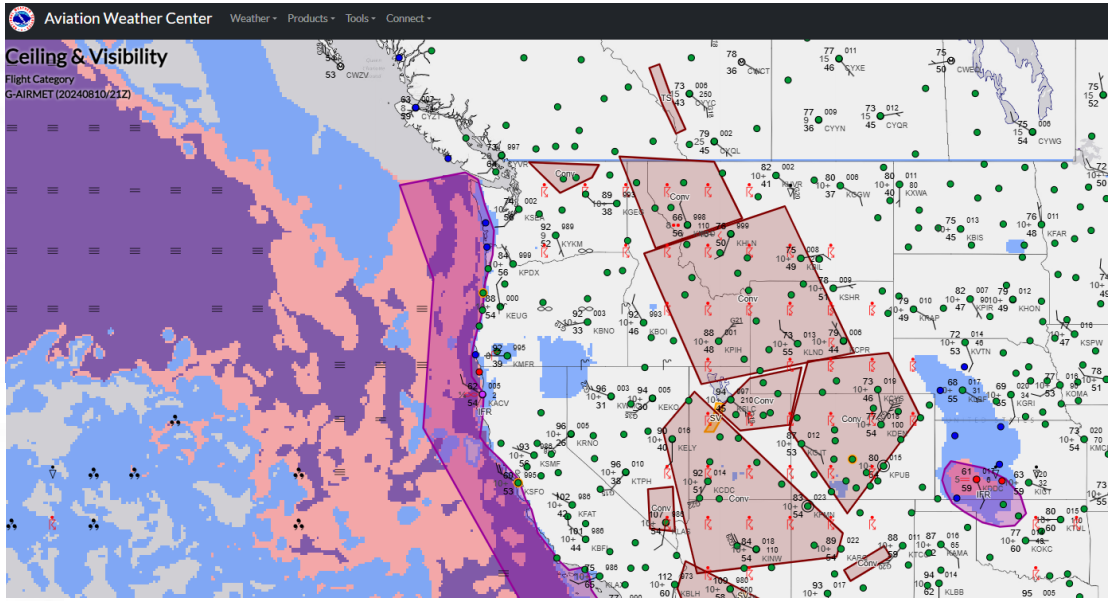

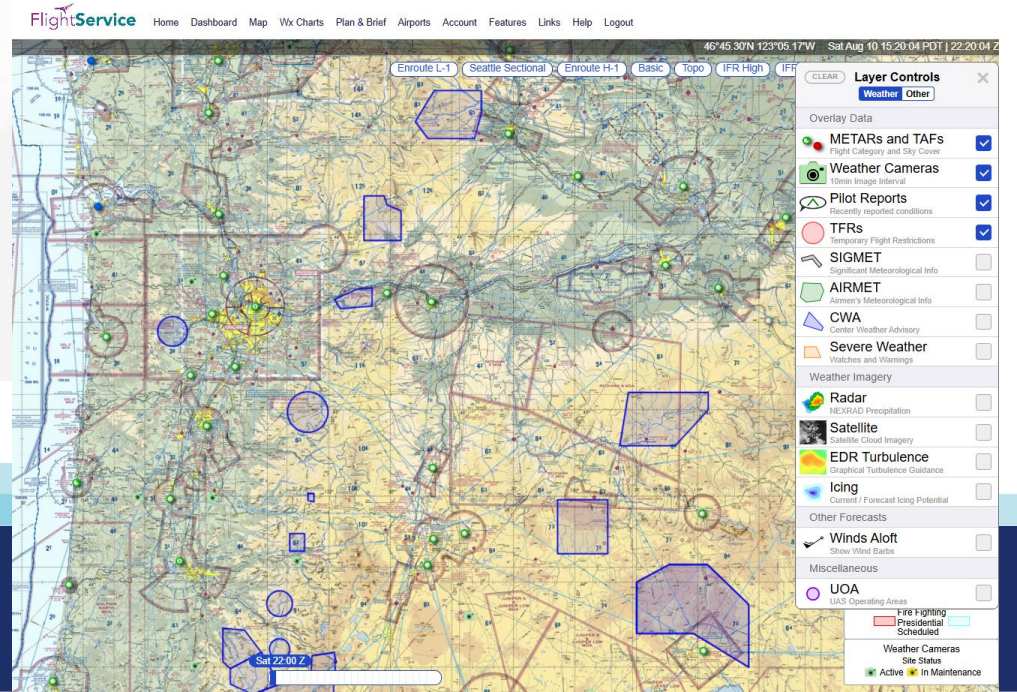

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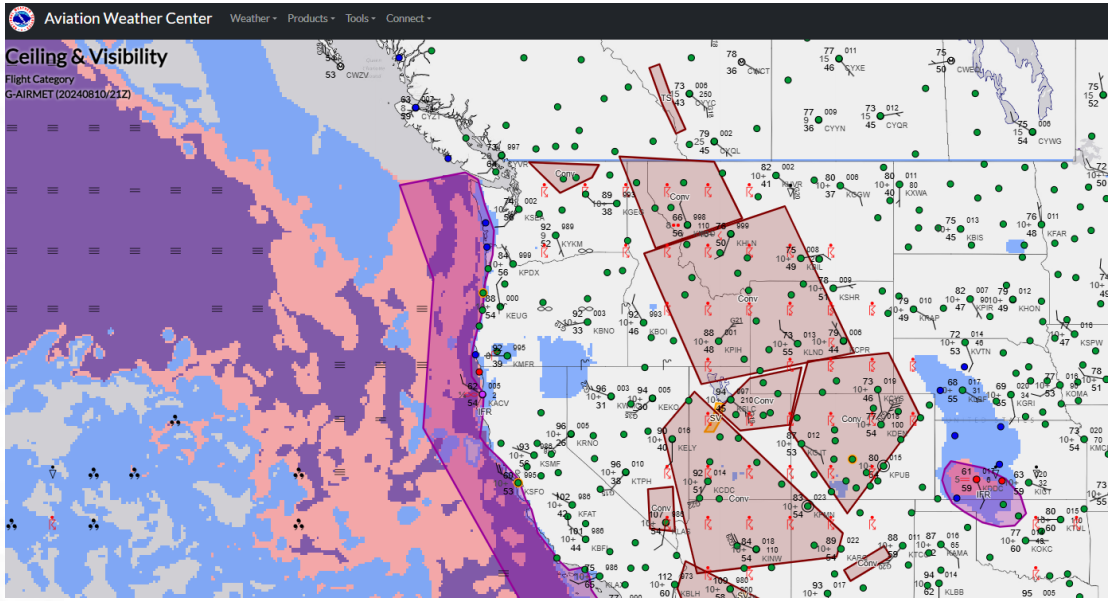
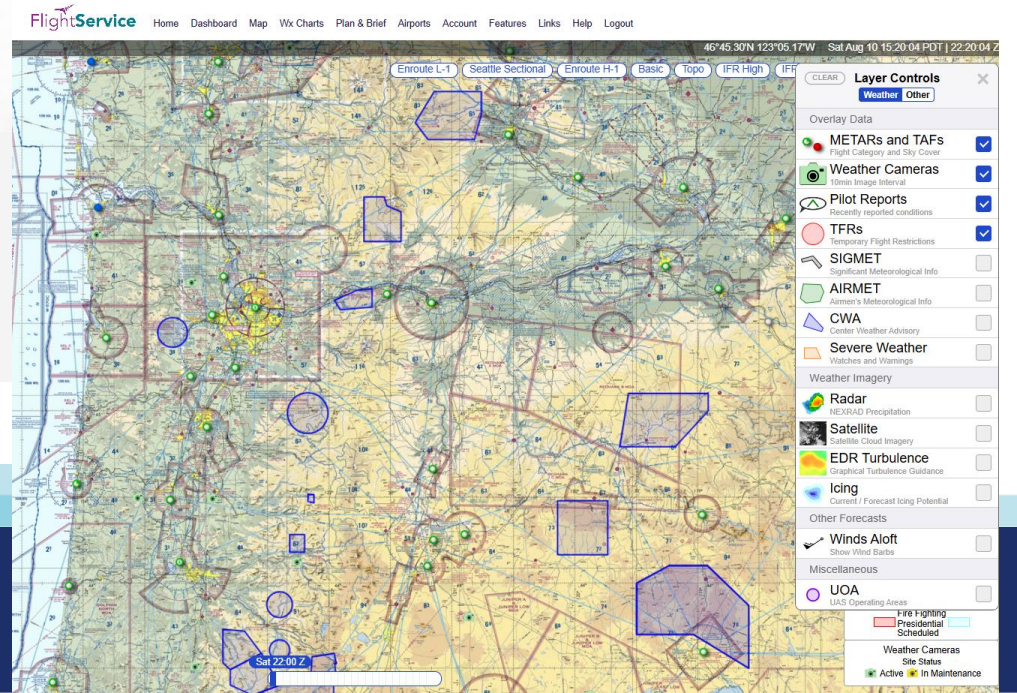
The Graphical Forecast for Aviation (GFA) and interactive maps provide current and forecast conditions for specific geographical areas and are useful to determine the forecast weather for all phases of flight.





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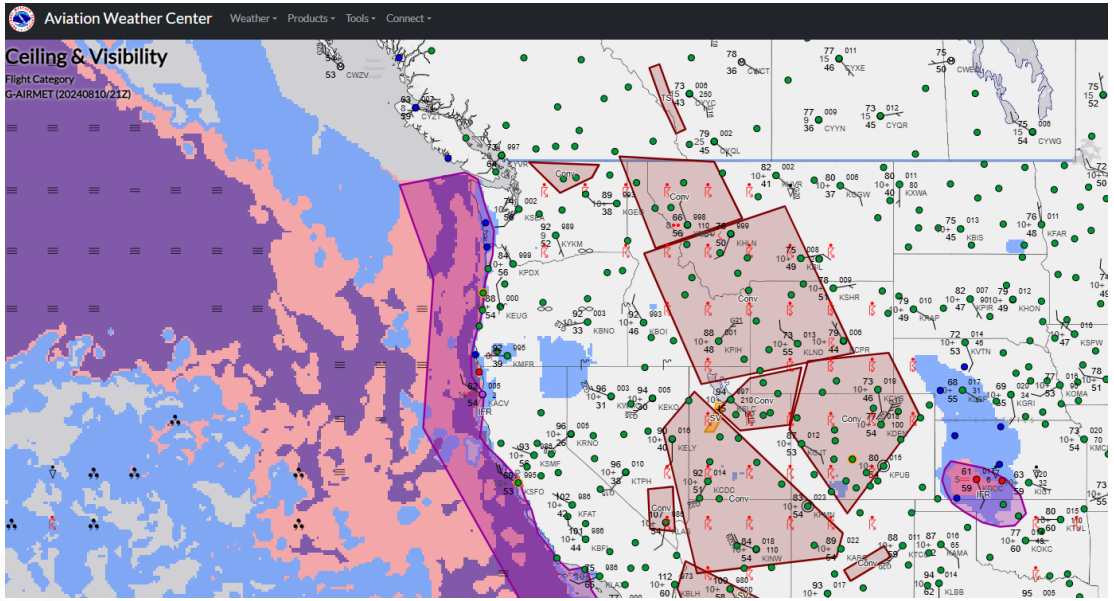
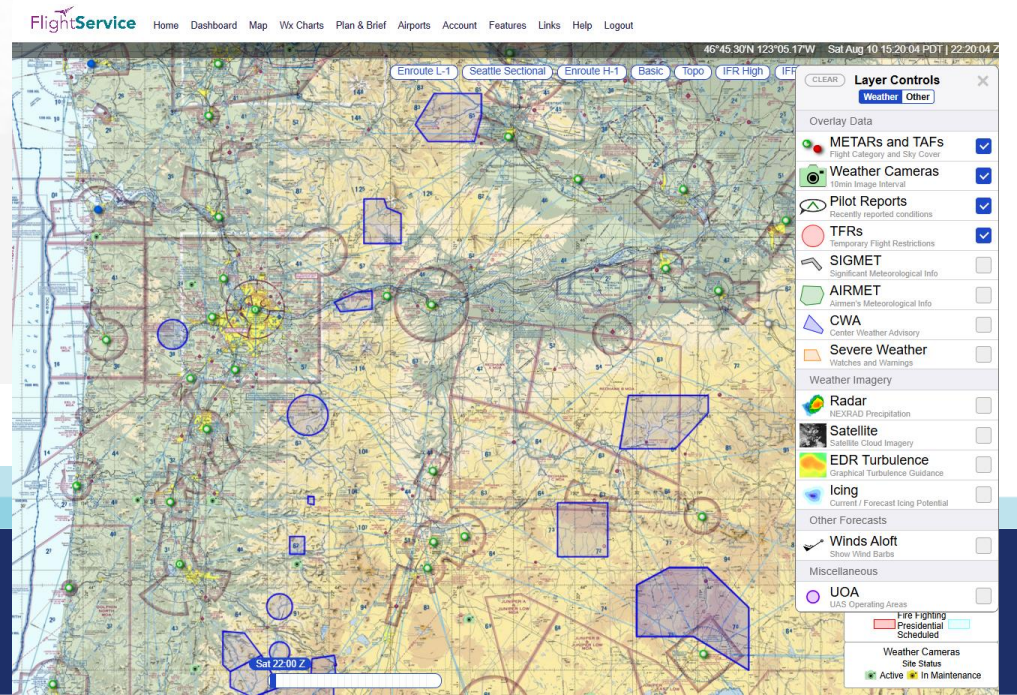
Compare METARs to prior forecasts and current forecasts to see the trends that are developing, and to verify that the current forecast is accurate and coming to fruition.





Wind Speed and Direction Element

Know surface wind direction, speed, and gust factor for departure and destination airports to determine:

- Runway and approach speeds to use
- If cross winds exist, and if so, that they do not exceed the cross wind component for the aircraft (consult the POH) or your ability

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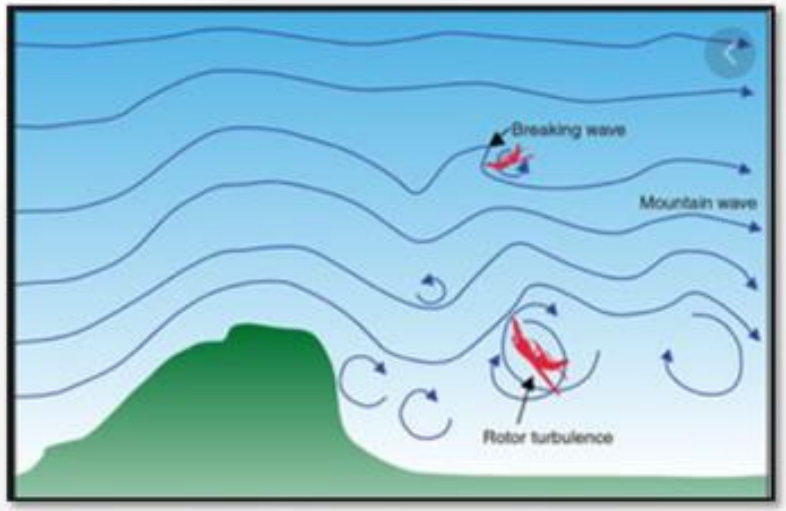
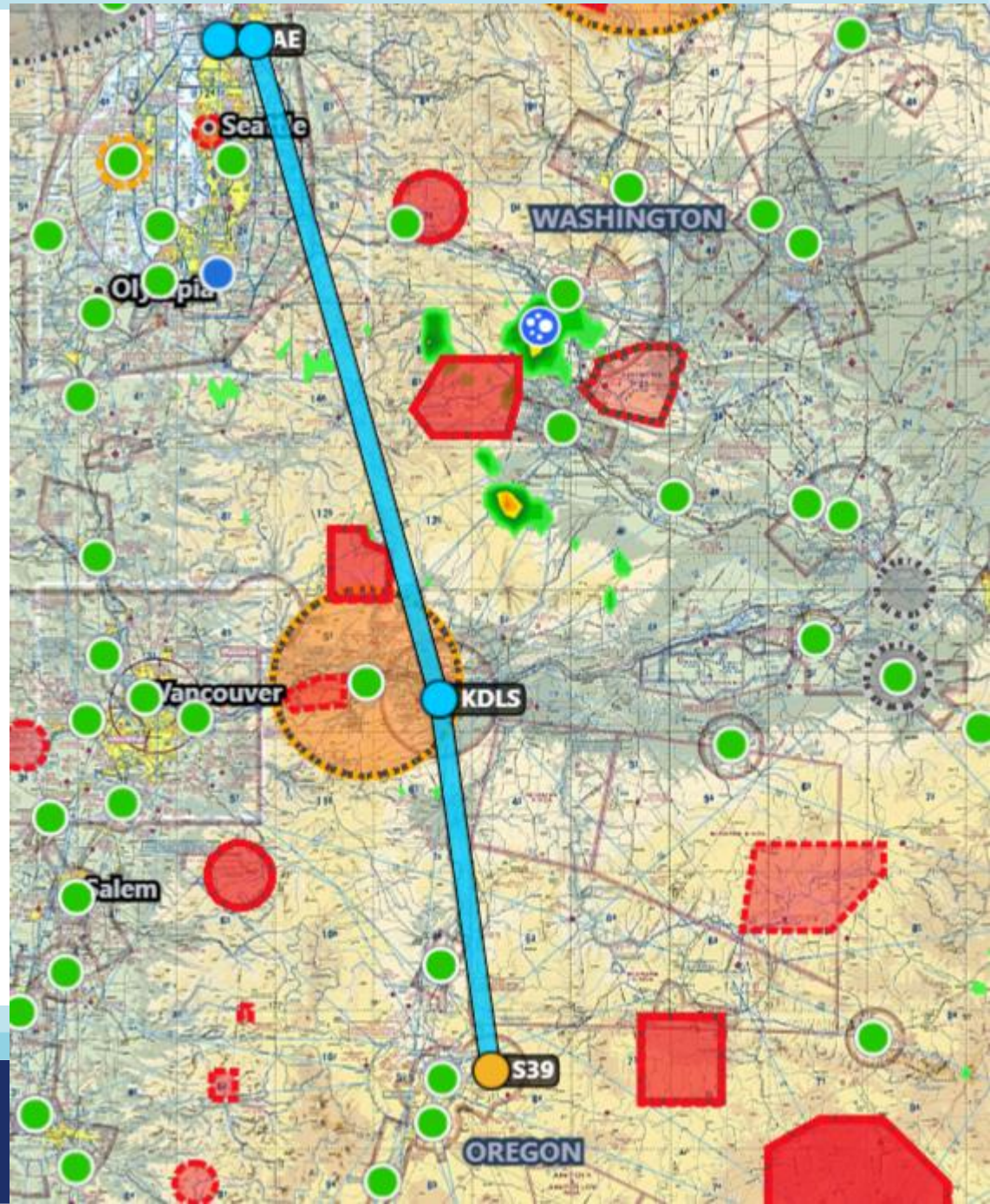
Know winds aloft direction and speed along the planned route to determine:

- Expected ground speed, time en route, and needed fuel
- If adverse conditions exist such as turbulence, mountain waves, or low-level wind shear



NOTAM and TFR Element

- Check NOTAMs for the planned flight to know about:
  - Airspace & airport limitations, changes, outages etc.
  - Adverse NOTAMs
  - Adverse aeronautical information
  - Service outages
  - Obstacles
- Check for SFRAs and active TFR and SUAs
- Study the route of flight to know about obstacles and high terrain along the route



Cloud Awareness Element

Clear of Clouds

Remaining clear of clouds requires constant awareness of cloud bases, terrain heights and the ability to recognize when cloud bases are getting lower during flight

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Lowering Cloud Bases

Lowering cloud bases impact minimum safe altitude, forces you downward toward terrain and increases the chance of entering instrument (IFR) conditions

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Developing Ceilings

Be aware of broken or overcast clouds developing in flight to avoid getting stuck on top

Visibility Awareness Element

It is critical to remain aware of changing weather conditions that can reduce visibility en route

Diminishing flight visibility can be difficult to recognize or estimate. Don't assume it will improve

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Visibility in flight, even if above minimums (3SM) when departing, can diminish en route due to:

- HAZE: A very common weather element, not always observed at the surface can be encountered in flight. It can rapidly reduce inflight visibility to less than VFR minimums causing unsafe flight conditions

Reduced Visibility on a VFR Day

Valley Fog forming next to a ridge

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- VIRGA: Precipitation not reaching the ground, Virga is a rarely forecast condition that may also reduce visibility
- FOG: If the temperature approaches the dewpoint, fog is likely to develop. Fog is also common near mountains and in cold climates

Reduced Visibility on a VFR Day

Valley Fog forming next to a ridge

Temperature and Density Awareness Element

Density altitude directly affects aircraft performance during takeoff, landing and go-arounds.

It is very important to know the effect density altitude will have on your aircraft's performance when departing from airports on hot days, at high altitude in high terrain areas

It's imperative to consult your Pilot Operating Handbook (POH) to determine if such a departure is possible.

When it doesn't work out: https://www.youtube.com/watch?v=OVM3RRd1vf0

Pre-Flight Tools

- Big picture – graphical tools
  - ✓ Aviation Weather Center (AWC)
  - ✓ National Weather Service (NWS)
  - ✓ Graphical Aviation Forecast (replaces the old Area Forecast)

- Pre-flight briefing:
  - ✓ Flight Service - 1800WXBRIEF.com
  - ✓ Favorite EFB
  - ✓ Area briefing
  - ✓ Route briefing
  - ✓ AOPA Weather

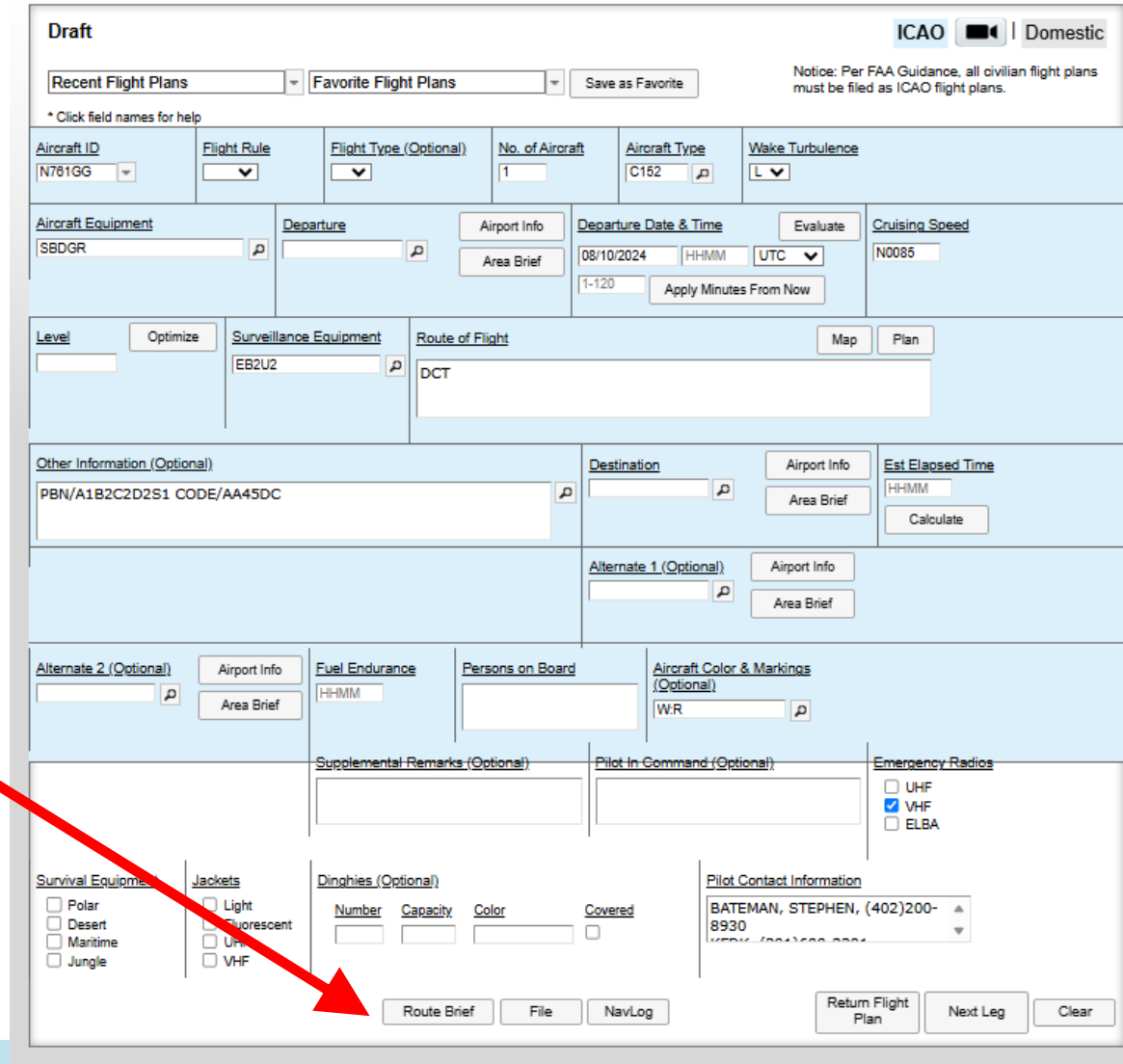
- Then…call a briefer
  - ✓ 1-800-WXBRIEF
  - ❖ Driving off a cliff not recommended
  - ❖ So, VFR not recommended…?

- No-Go/Go? (Baseline is to no-go)

Hangar-Talk Myths Busted #1:

Does the self-briefing need to be recorded or documented by the automation site(s) I use?

- There is no FAA requirement for a self-brief to be recorded
- If you prefer to have your self-briefing preparation recorded, consider using the Route Brief functionality on 1800wxbrief.com
- Third-party applications may also offer recorded briefing functionality



Hangar-Talk Myths Busted #2:

If I use graphical tools (GFA, interactive maps) to conduct preflight planning, do I still need to use the "route briefing" functionality on the website or app that provides a full textual briefing?

- Full textual (i.e., route briefing) functionality is not required to be used
- The goal is to conduct a comprehensive preflight self-briefing; if you have done this (i.e., covered all the checklist items) using the graphical tools, you do not need to use full textual briefing functionality
- However, the route briefing functionality is a good idea as a double check that you have not missed something in your own workflow

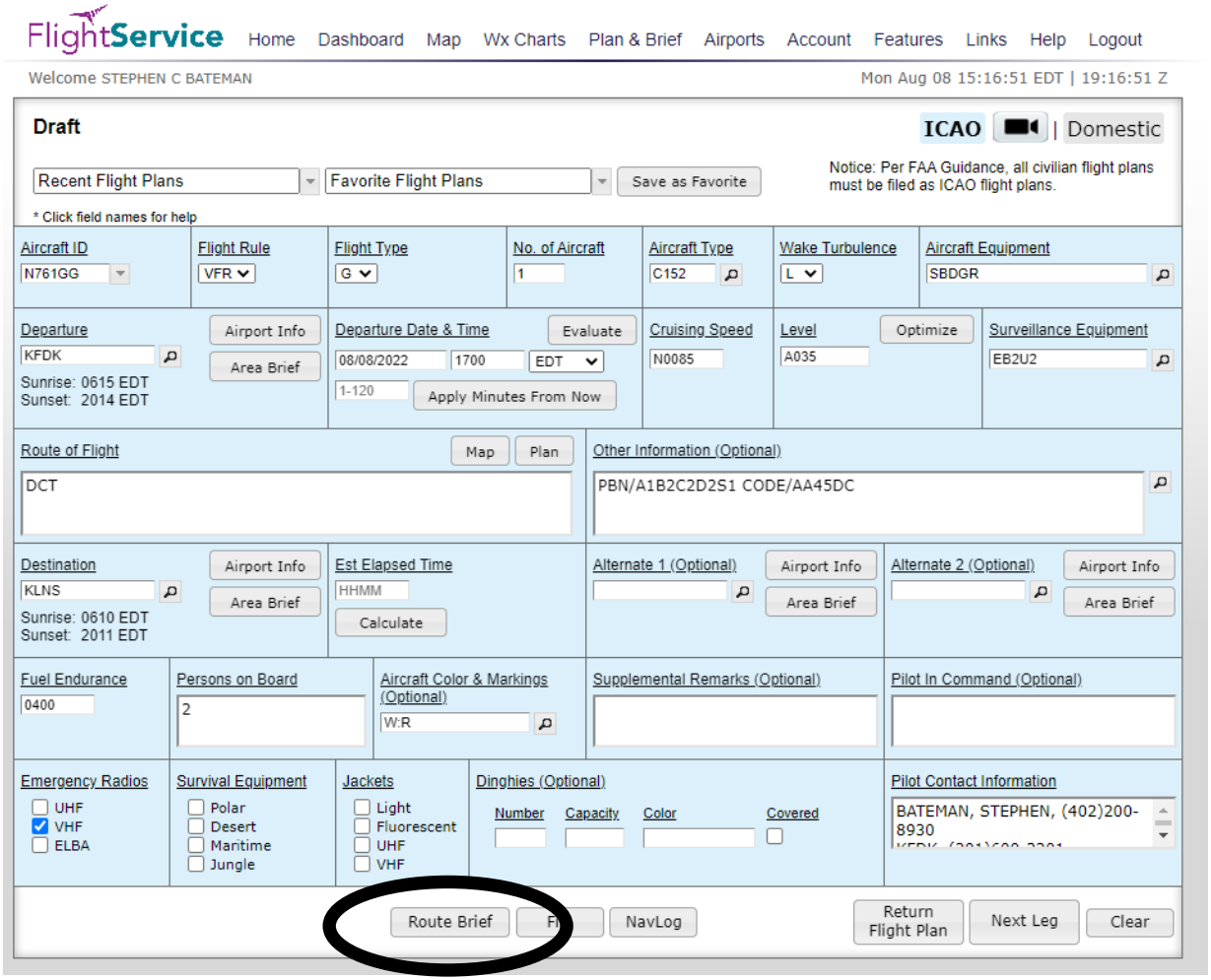
Hangar-Talk Myths Busted #3:

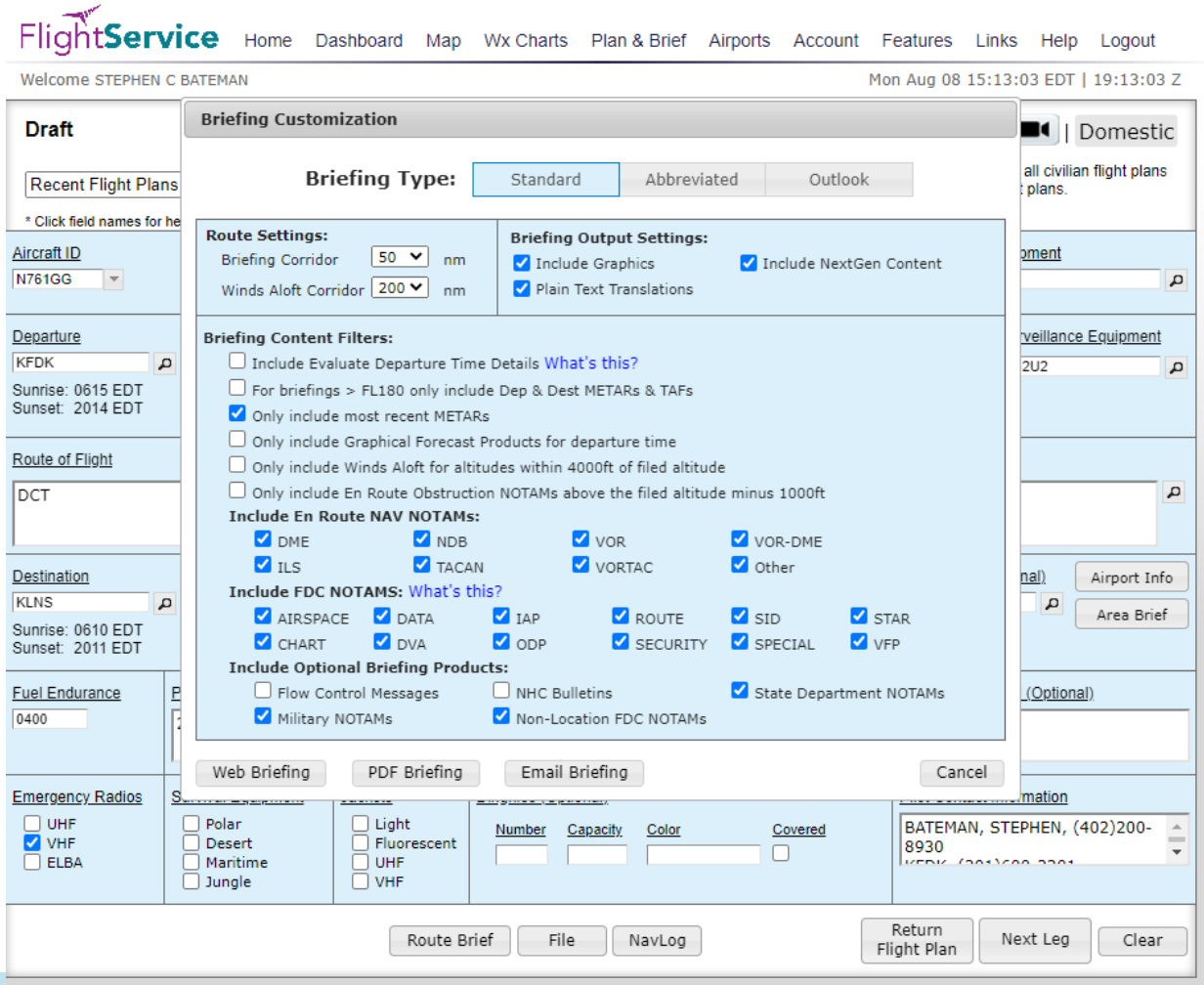
If I conduct a self-brief and still decide to call Flight Service, will they know what I have done online?

- YES, if you have used 1800wxbrief.com and requested a route briefing
- YES, if you have used a third-party application that links to your 1800wxbrief.com account and uses an approved route briefing product*
- NO, if you have used just the graphical functionality on 1800wxbrief.com or third-party sites

Doing a Route Briefing may shorten your wait time when calling FSS

So, why not just do it?

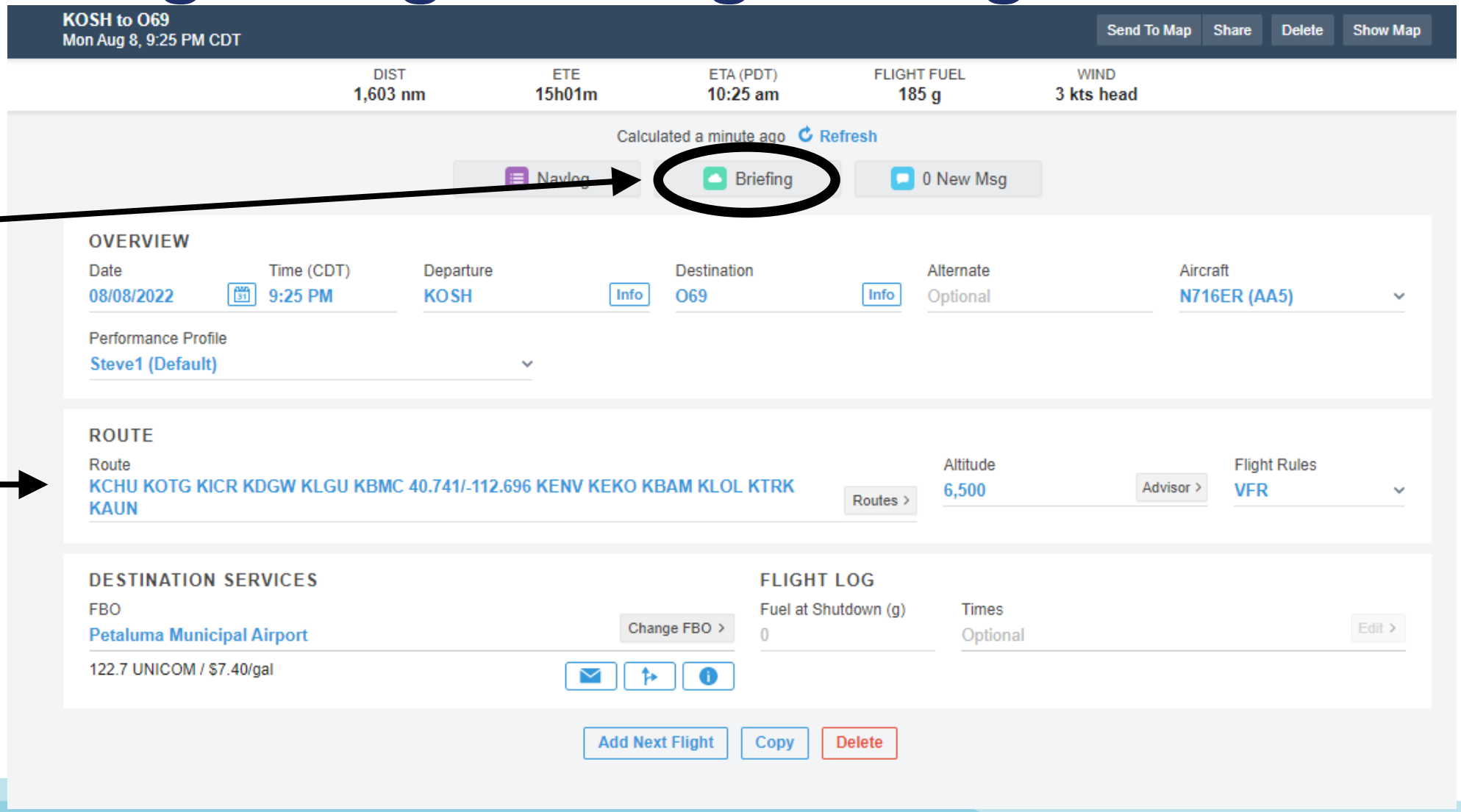




Route Briefing Using Foreflight “Flights”

Route Briefing

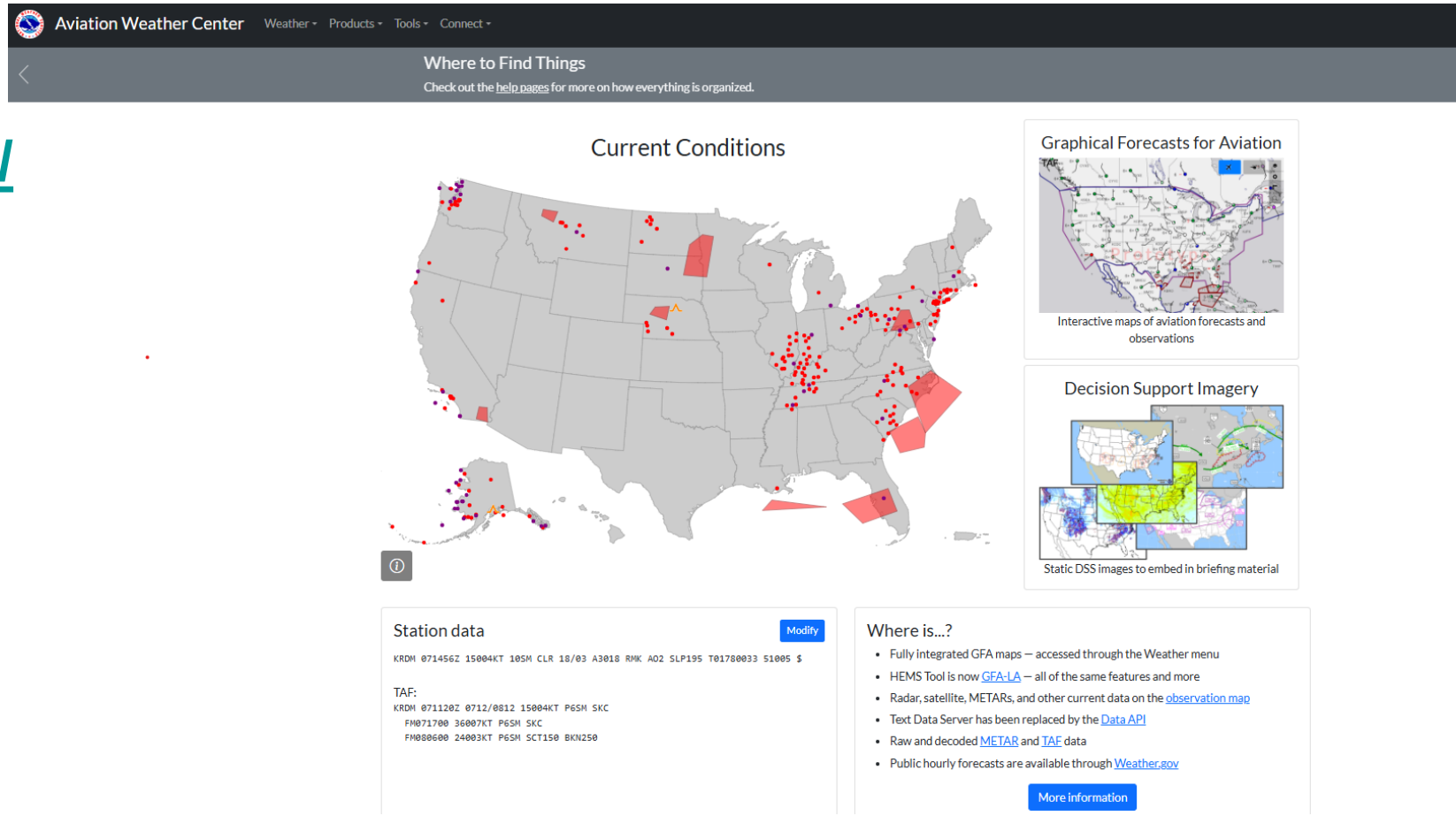
Route



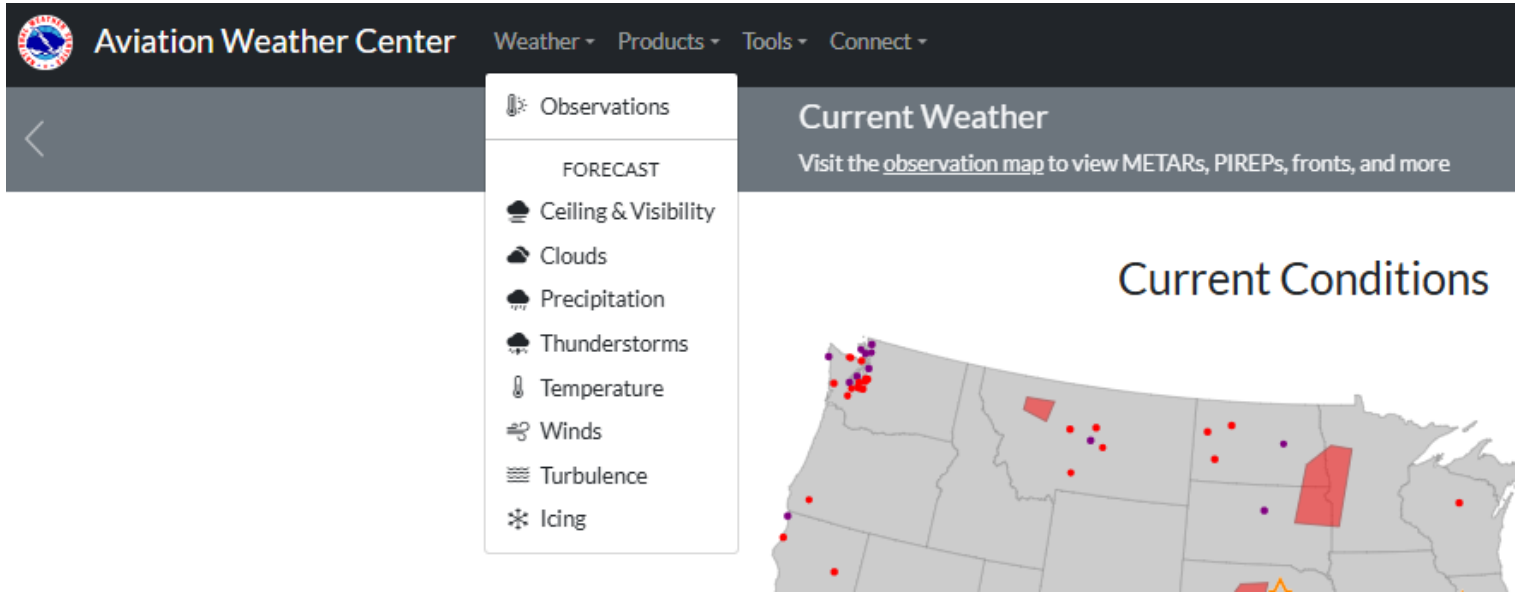
Aviation Weather Center—AWC

- https://aviationweather.gov/

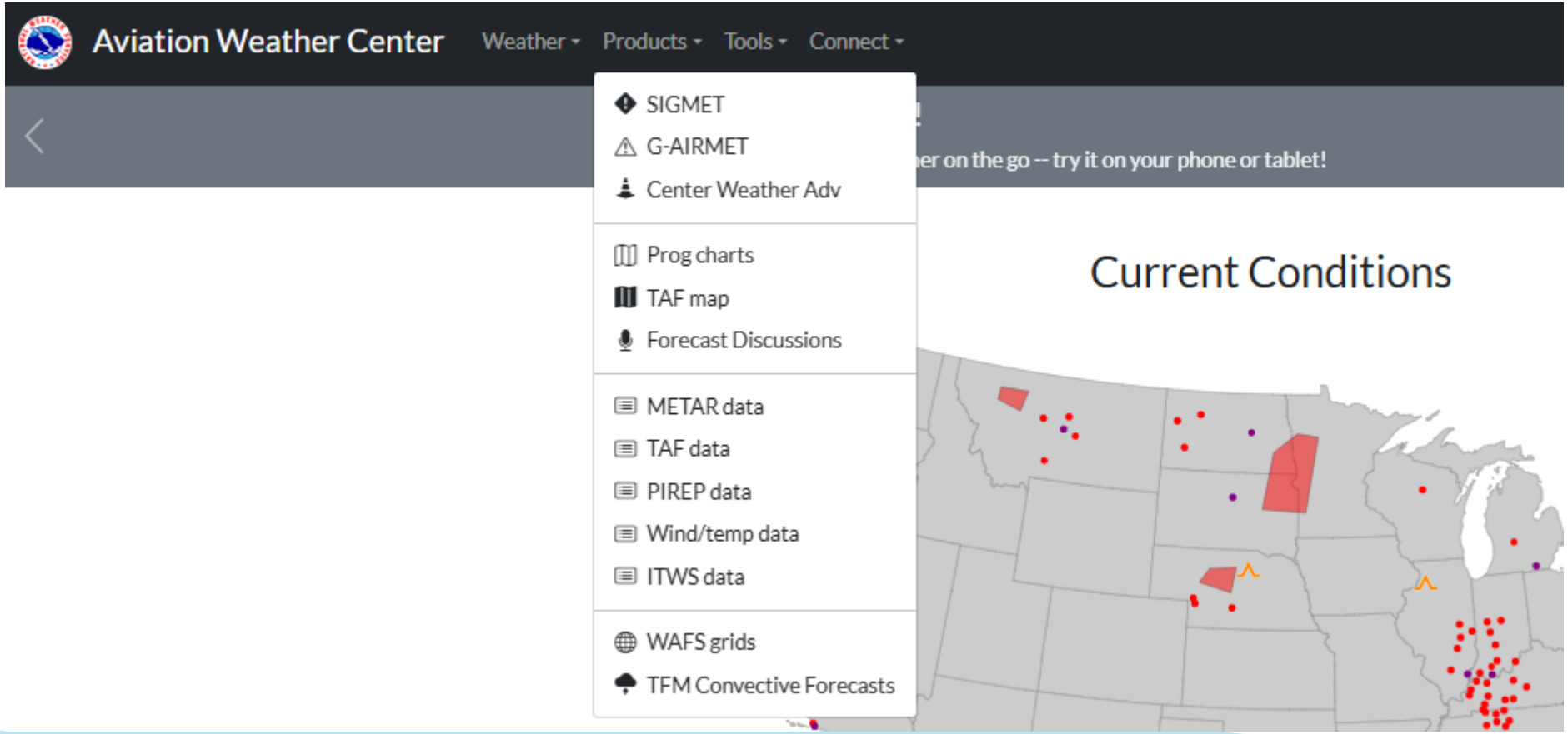
- Amazing!
- One stop shop for official weather
- Lots of graphical renderings
- “A picture is worth a thousand contractions”
- Past, present and future



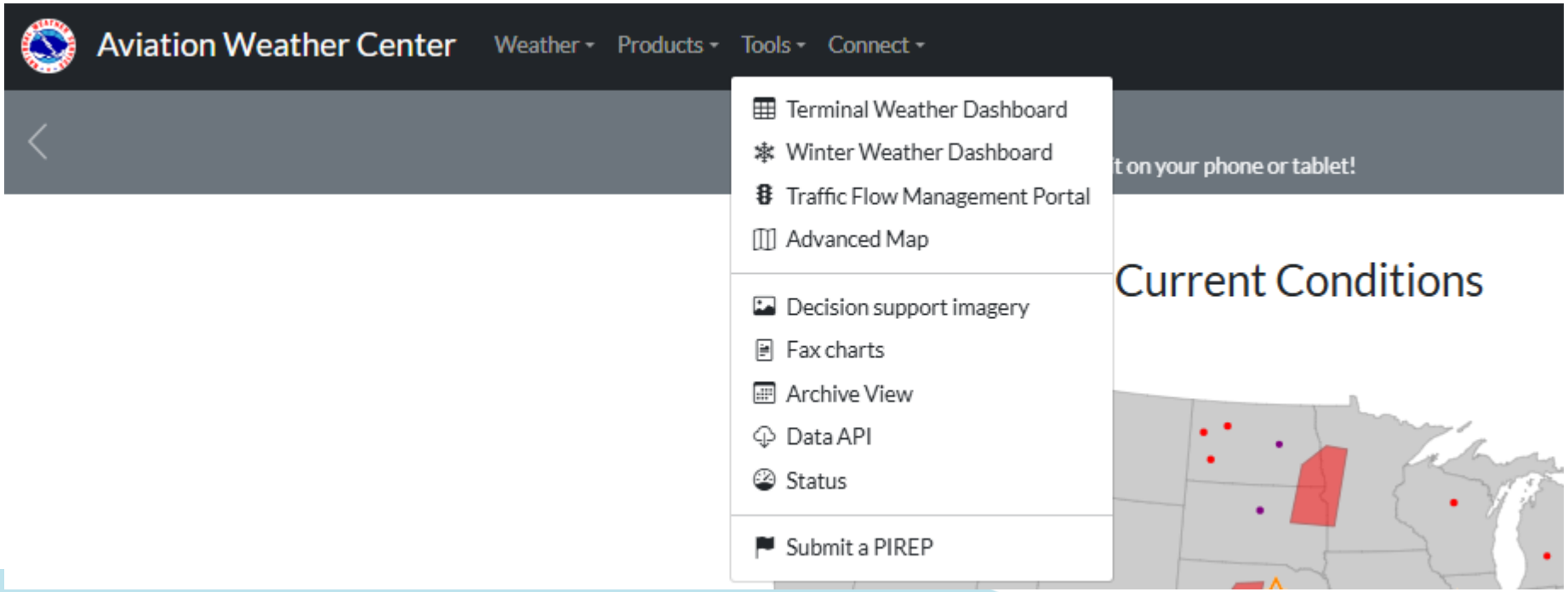
Aviation Weather Center—AWC



Aviation Weather Center—AWC



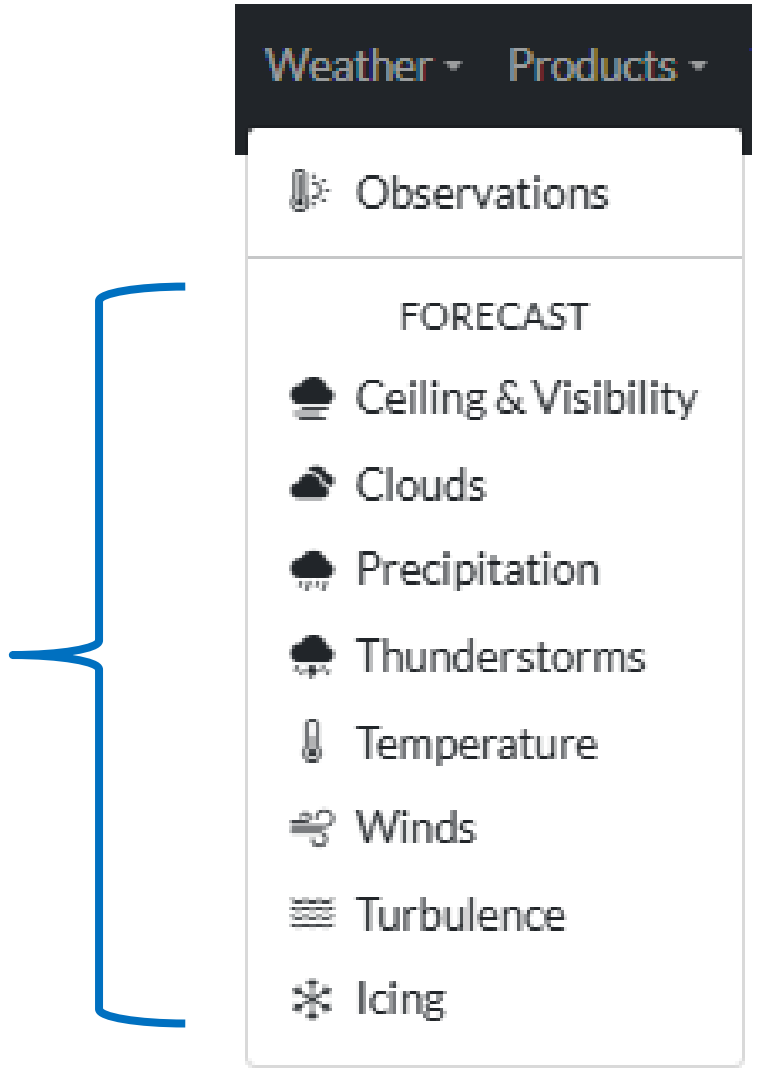
Aviation Weather Center—AWC



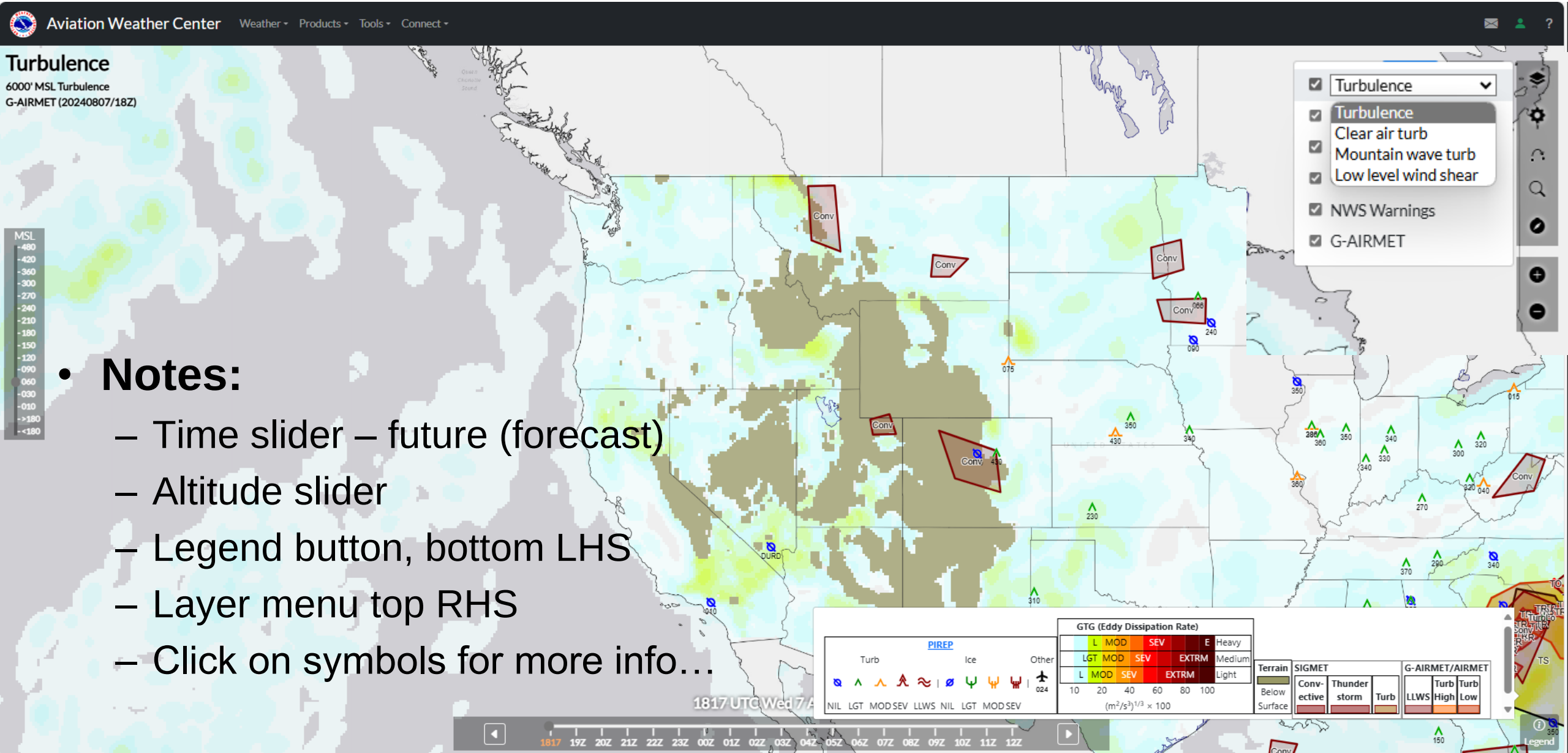
Forecast GFA (BTSSB)

- **Graphical Forecast for Aviation**
  - Previously Graphical Area Forecast

- **Now fully integrated in AWC via the "Weather -> Forecast" menu…all forecast products**

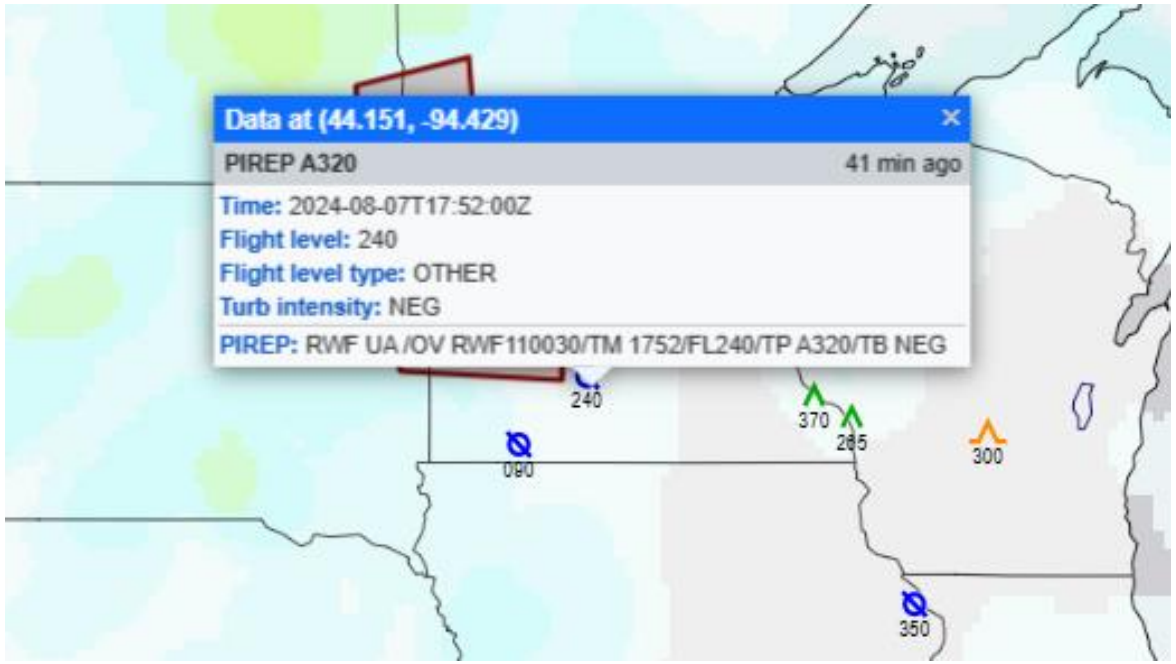


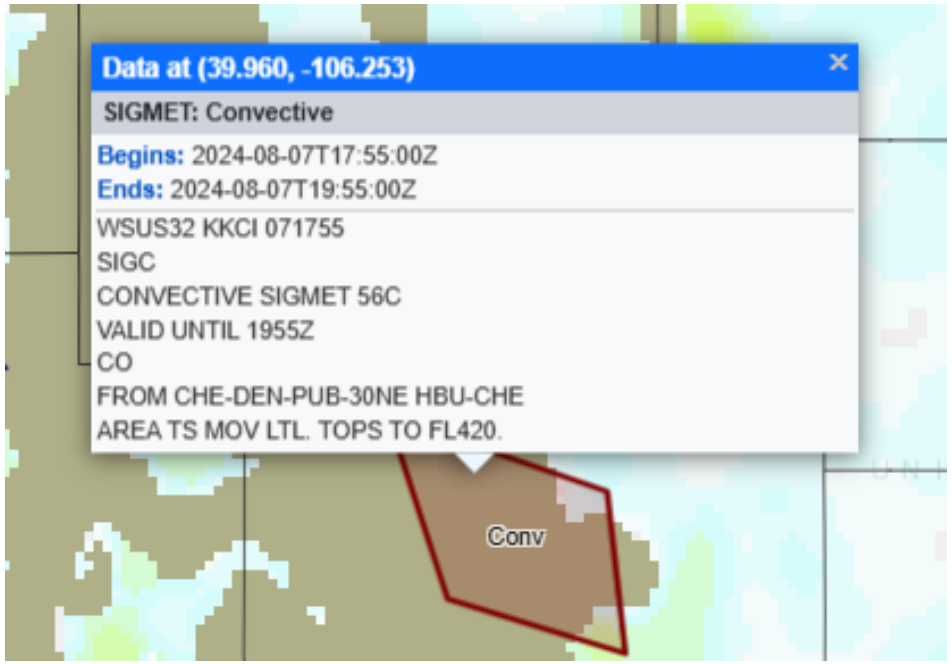
Forecast GFA – Example, Turbulence:



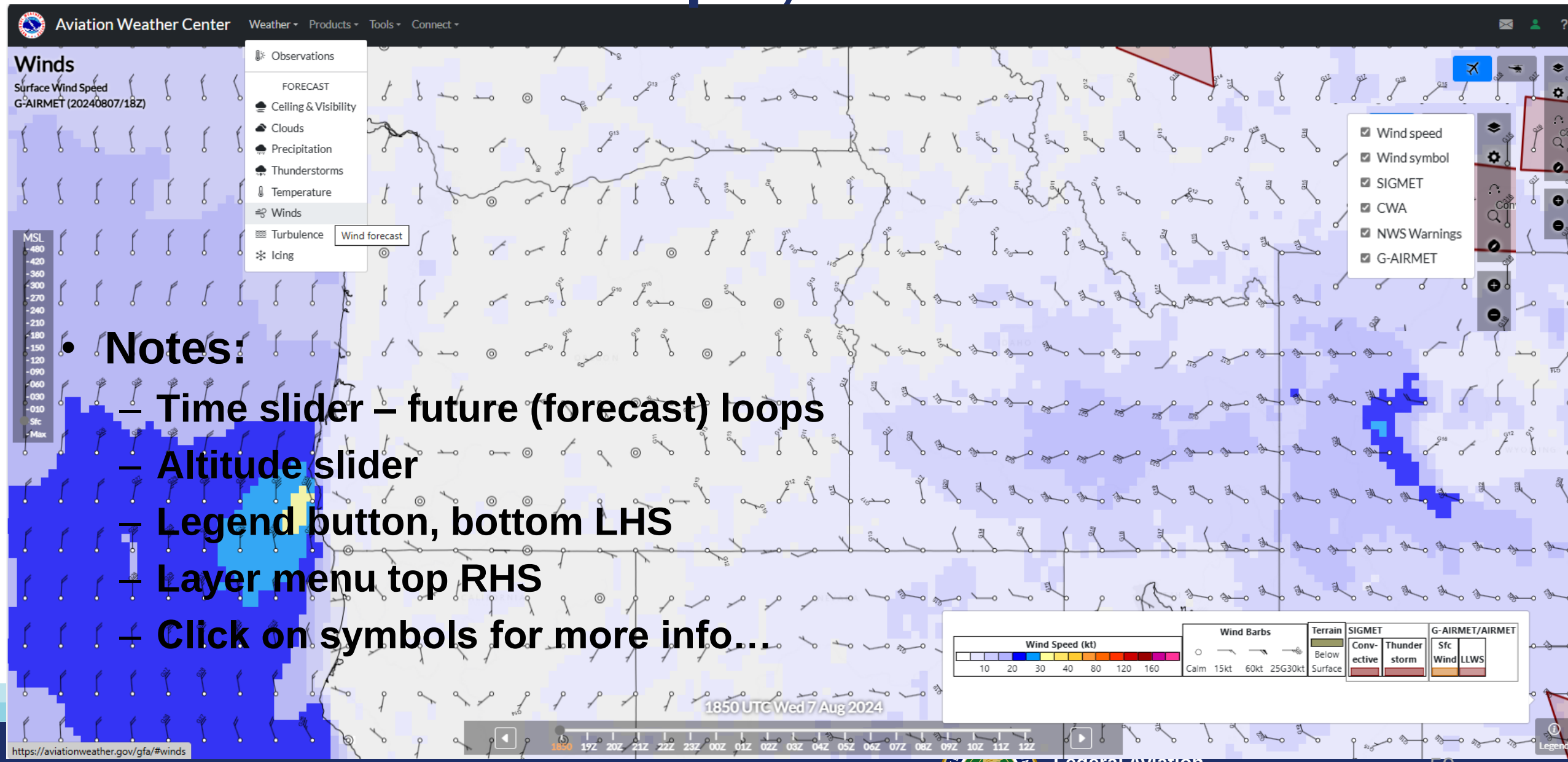
- **Notes:**
  - Time slider – future (forecast)
  - Altitude slider
  - Legend button, bottom LHS
  - Layer menu top RHS
  - Click on symbols for more info…

Forecast GFA – Example, Turbulence:



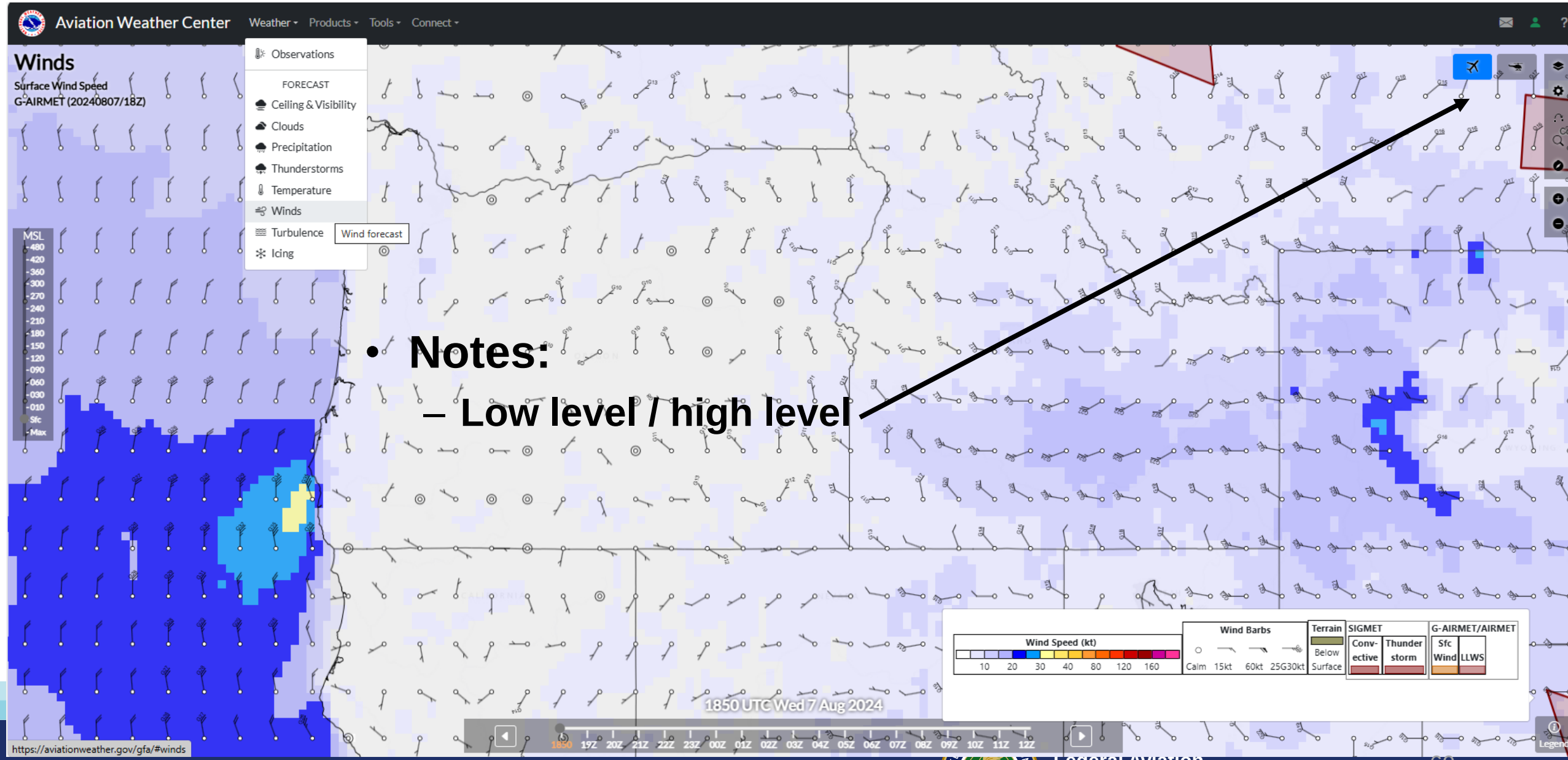


Forecast GFA – Example, Wind:

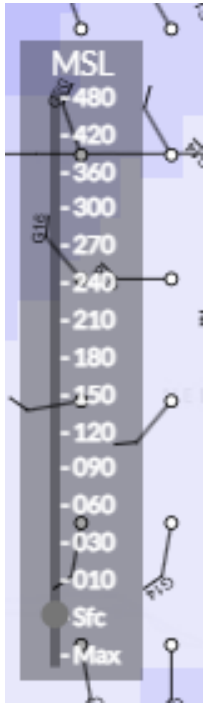


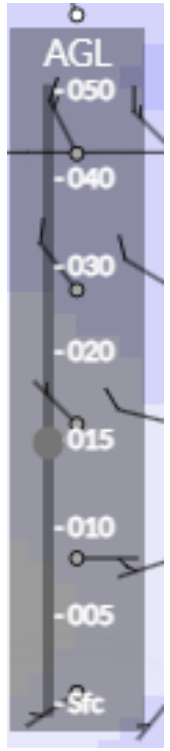
- **Notes:**
  - Time slider – future (forecast) loops
  - Altitude slider
  - Legend button, bottom LHS
  - Layer menu top RHS
  - Click on symbols for more info…

Forecasts GFA – Example, Wind:



Forecast GFA – Example, Wind:

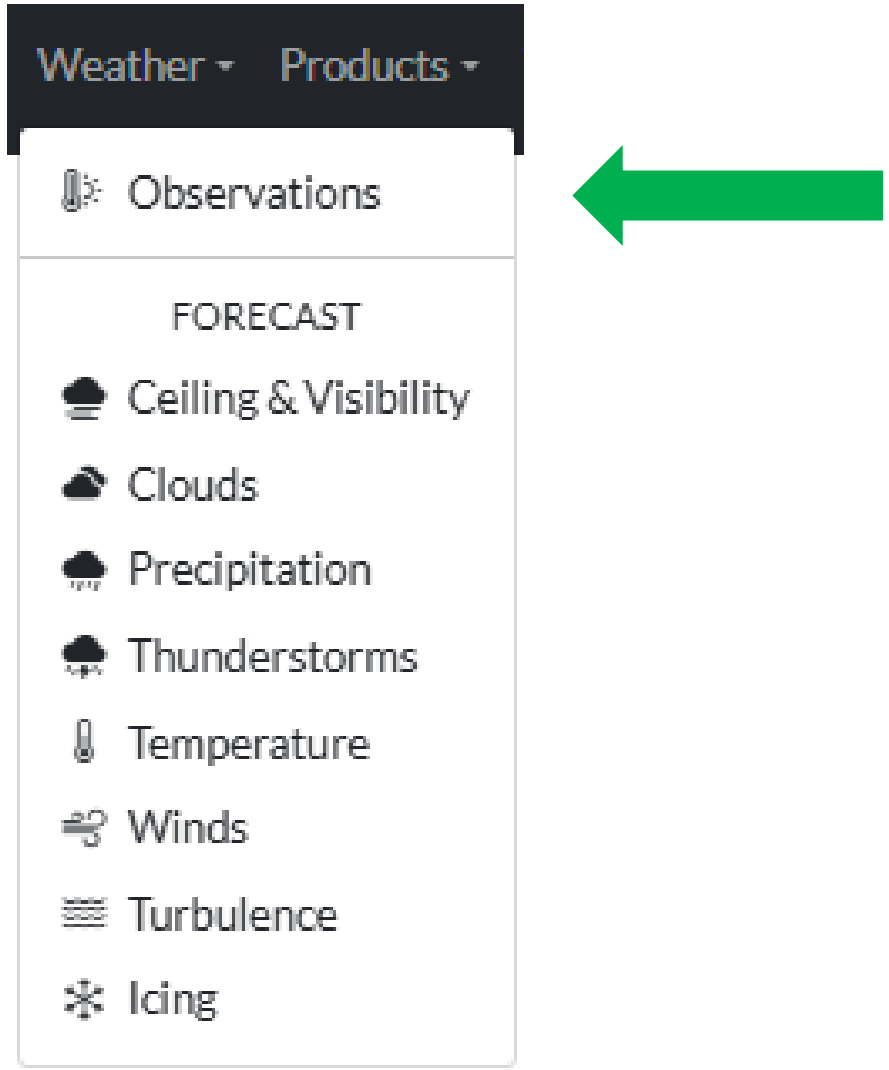




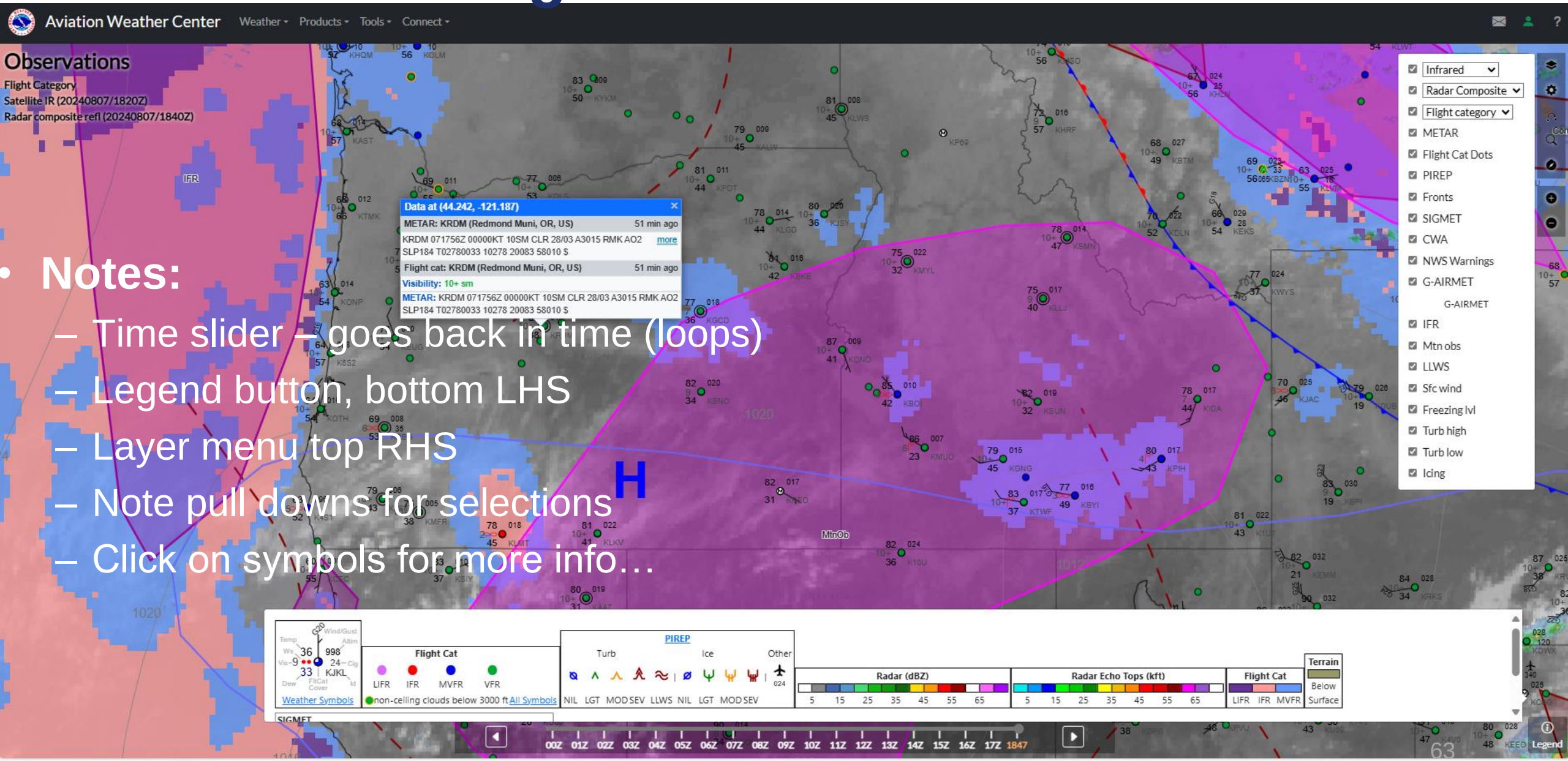
- **Notes:**
  - **Airplane = high level;**
  - **Helicopter = low level**

AWC Observations

- **Observations under “Weather -> Observations”**



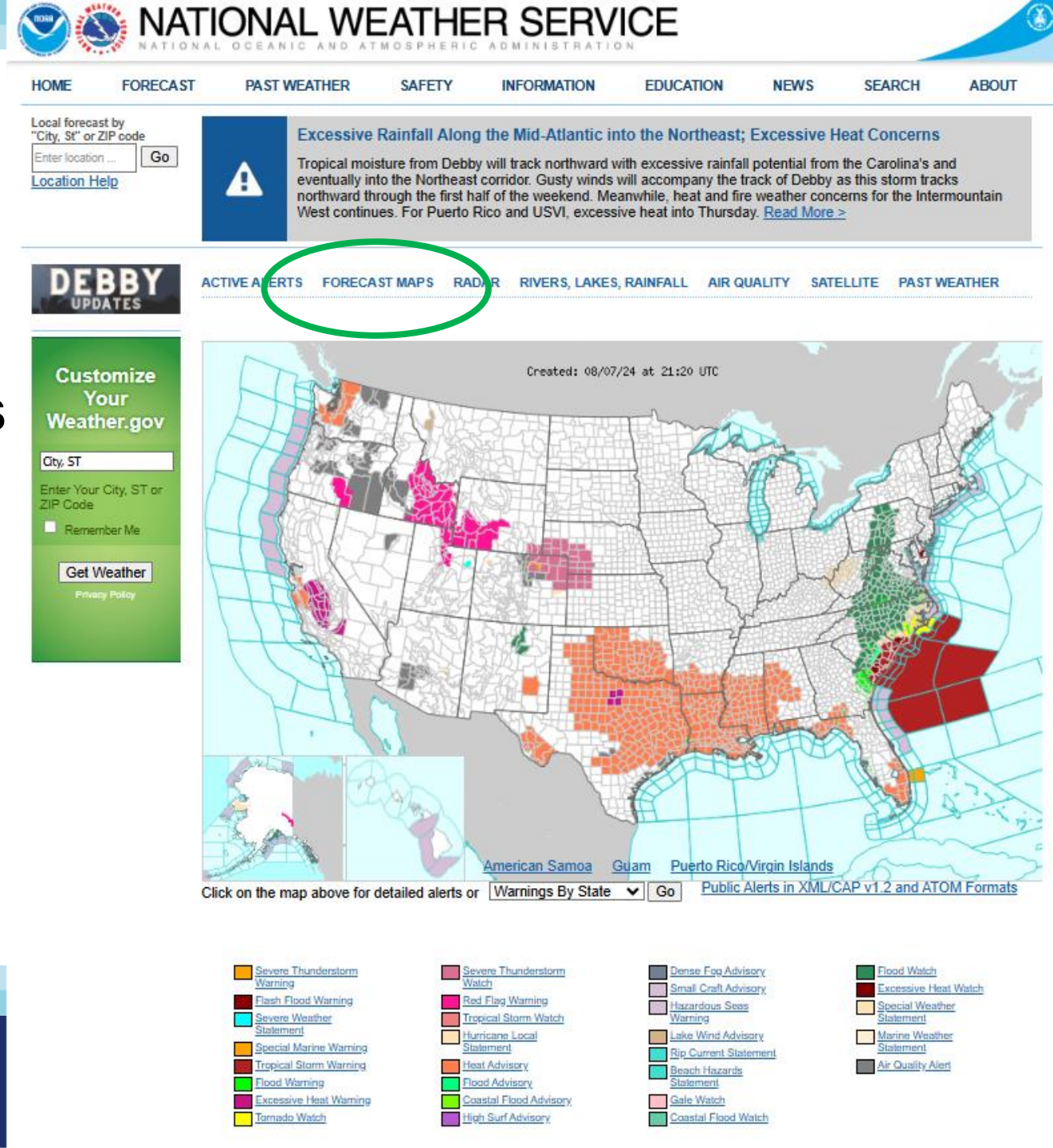
Observations Page:



- **Notes:**
  - Time slider – goes back in time (loops)
  - Legend button, bottom LHS
  - Layer menu top RHS
  - Note pull downs for selections
  - Click on symbols for more info…

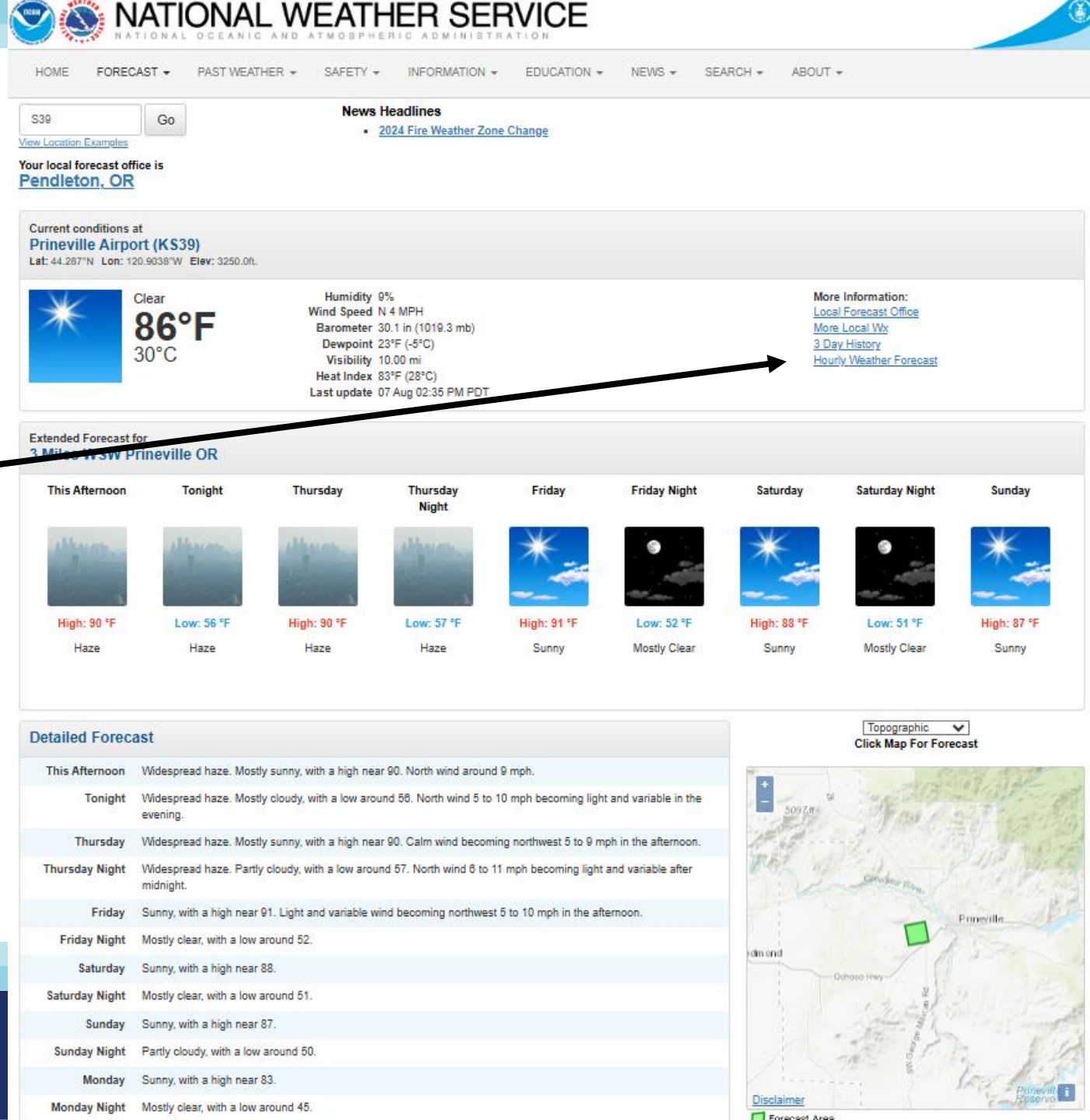
NWS Site:

- https://www.weather.gov/
- Amazing website
- So much data and so many tools
- Spend lots of time on this site!



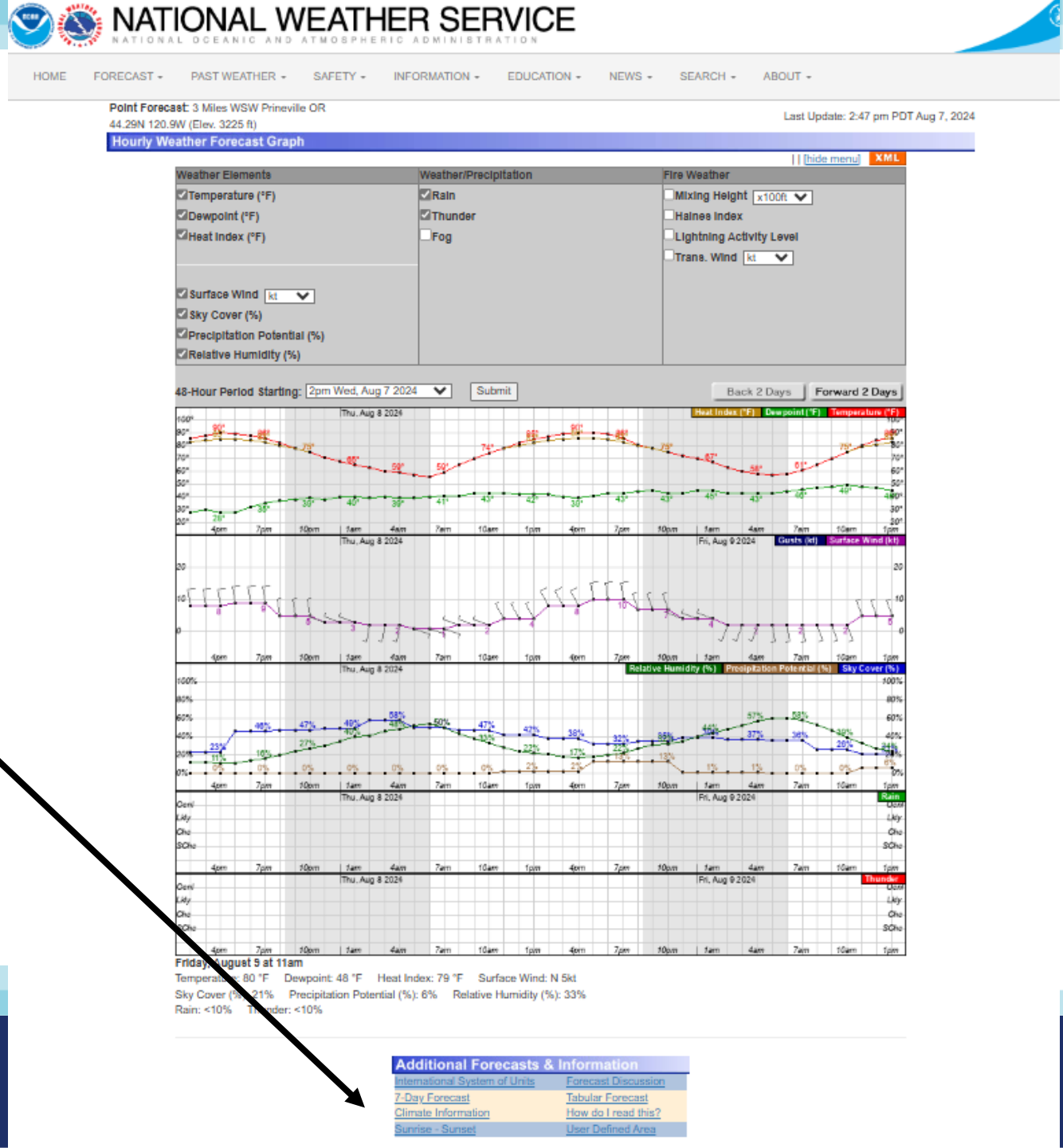
NWS Site:

- **Enter airport ID**
- **Click here**



Meteogram

- **Local by hour forecasts from NWS site**
- **More interesting stuff here:**



NATIONAL WEATHER SERVICE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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Local forecast by "City, St" or ZIP code

Enter location ... Go

Location Help

Excessive Rainfall Along the Mid-Atlantic into the Northeast; Excessive Heat Concerns

Tropical moisture from Debby will track northward with excessive rainfall potential from the Carolina's and eventually into the Northeast corridor. Gusty winds will accompany the track of Debby as this storm tracks northward through the first half of the weekend. Meanwhile, heat and fire weather concerns for the Intermountain West continues. For Puerto Rico and USVI, excessive heat into Thursday. Read More >

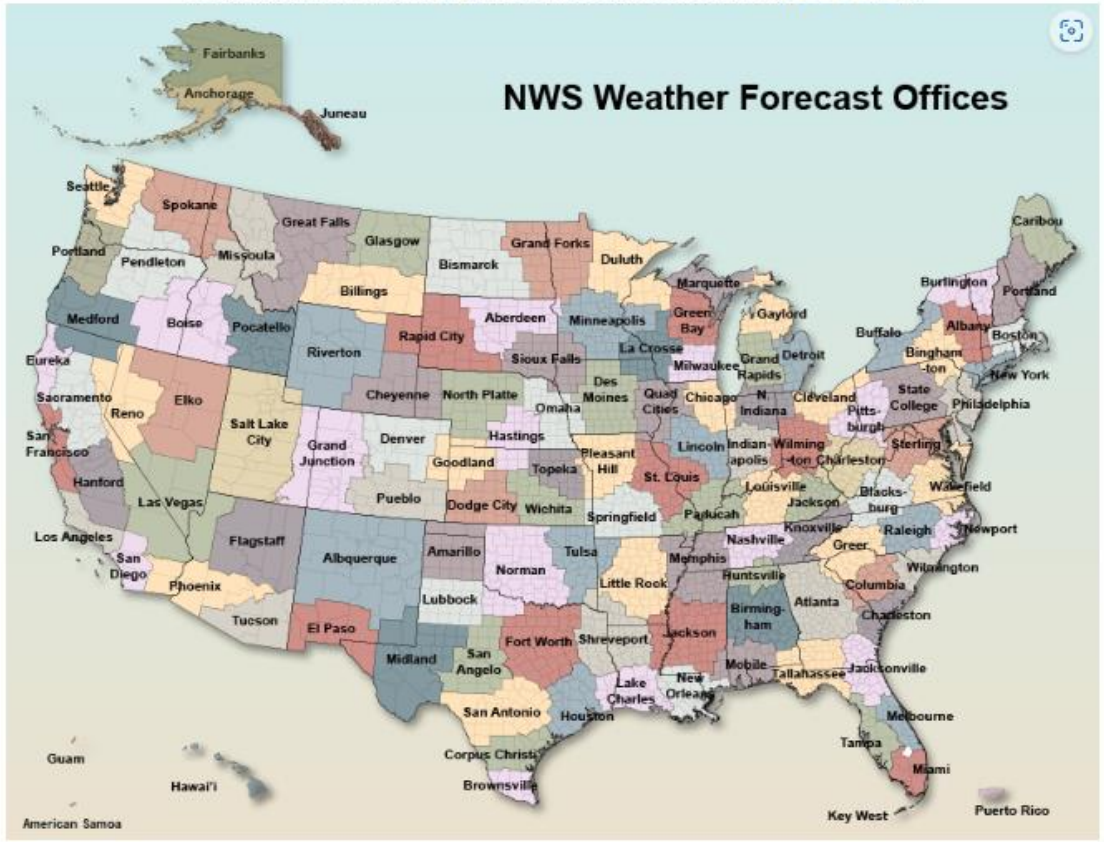
Climate

Weather.gov > Climate

National Weather Service
National Headquarters

For the latest climate forecasts see the Climate Prediction Center (CPC) web page.

The map below is your portal to NWS Climate information. Select an area of interest and you will be directed to the local Weather Forecast Office page to access their climate data. [User Video]



National Weather Service
Climate Prediction Center

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Search the CPC Go

NCEP Quarterly Newsletter

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El Niño/La Niña
MJO
Blocking
AAO, AO, NAO, PNA
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Global Monsoons

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USAID
Alaska
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Educational
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Meetings
CPC Seminars
Publications

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Vision & Mission
Who We Are

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CPC Web Team

Climate News

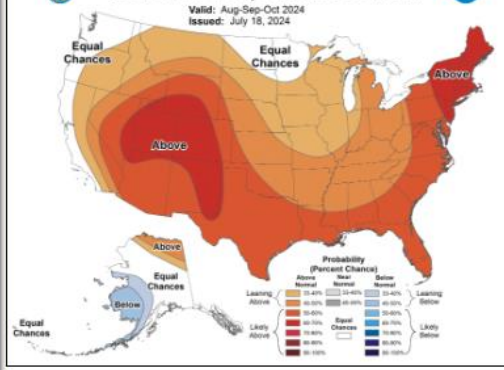
- WPC-CPC Key Message (Issued 7 Aug 2024) - Potential Re-Emergence of Excessive Heat Across the Lower Mississippi Valley and Southern Plains Later Next Week
- ENSO-neutral is expected to continue for the next several months, with La Niña favored to emerge during August-October (70% chance) and persist into the Northern Hemisphere winter 2024-25 (79% chance during November-January) (11 July 2024)

Click on product title to go to product page. Move cursor over product parameter name to display the graphic -- click to enlarge. Links to these same products are also available below.

6-10 Day Outlook (Interactive) Temperature Precipitation	One Month Outlook (Interactive) Temperature Precipitation
8-14 Day Outlook (Interactive) Temperature Precipitation	Three Month Outlook (Interactive) Temperature Precipitation
Week 3-4 Outlooks Temperature Exp. Precipitation	8-14 Day U.S. Hazards Outlook Composite Probabilistic: Temp Precip Snow Wind
U.S. Drought Information Monitor Monthly Outlook Seasonal Outlook	Global Tropics Hazards Outlook Weeks 2 and 3

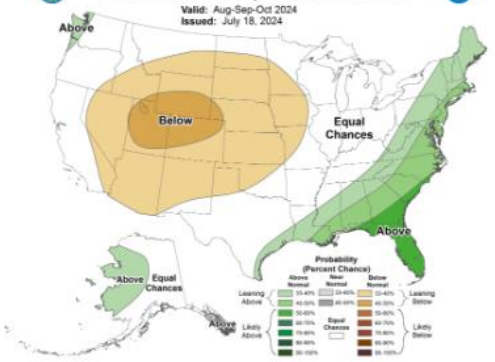
Seasonal Temperature Outlook

Valid: Aug-Sep-Oct 2024
Issued: July 18, 2024



Seasonal Precipitation Outlook

Valid: Aug-Sep-Oct 2024
Issued: July 18, 2024



Local Climate, Water & Weather Topics

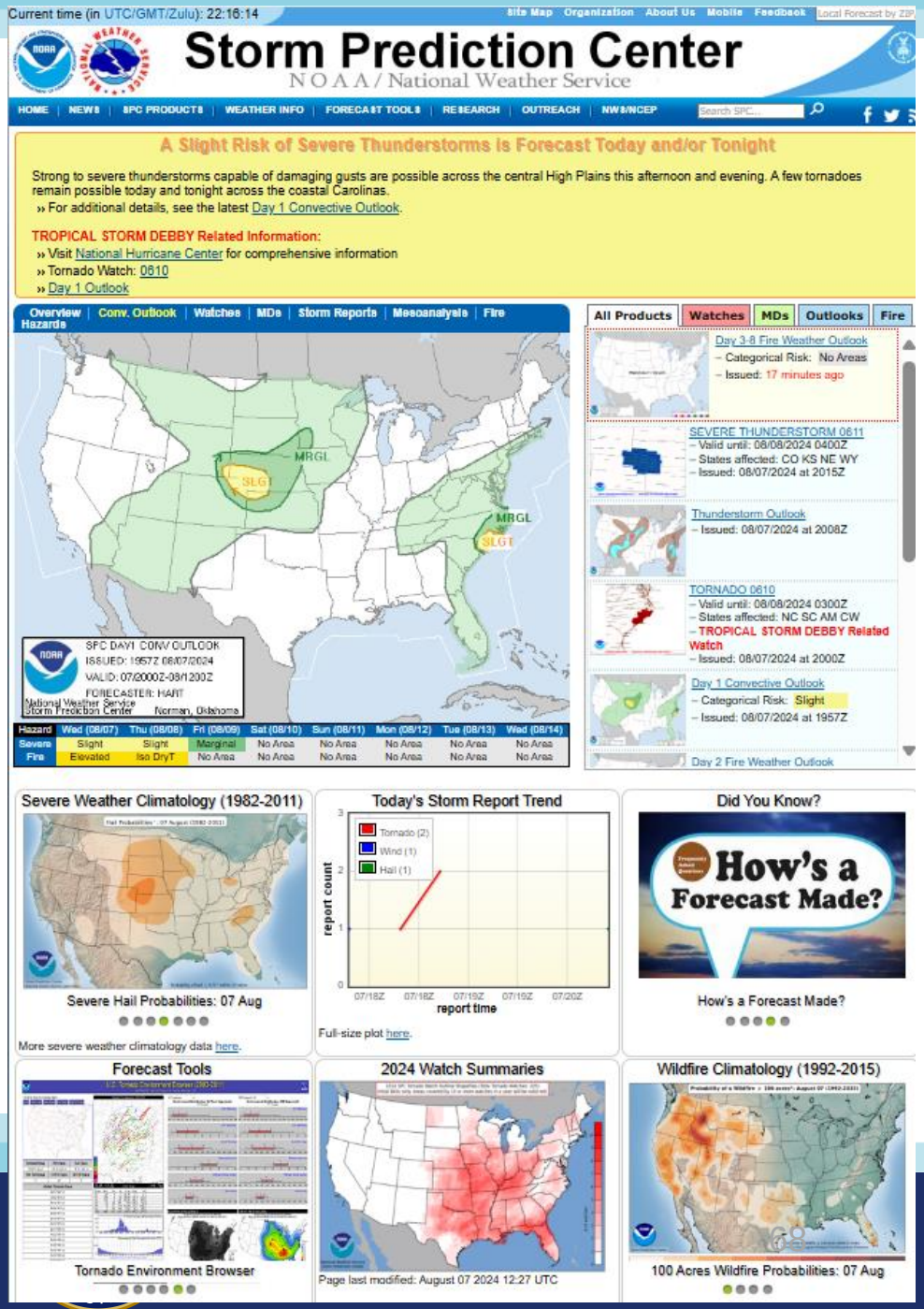
U.S. Hazards Outlook
U.S. Drought Information
ENSO Diagnostic Discussion
Climate-Weather
Expert Assessments Products
Expert Assessments Index

Outlooks Products
Outlooks Index
Monitoring and Data Products
Monitoring and Data Index
El Niño/La Niña
Stratosphere

Pacific Islands
International
Partnerships
Outreach
CPC Information
Contact Us

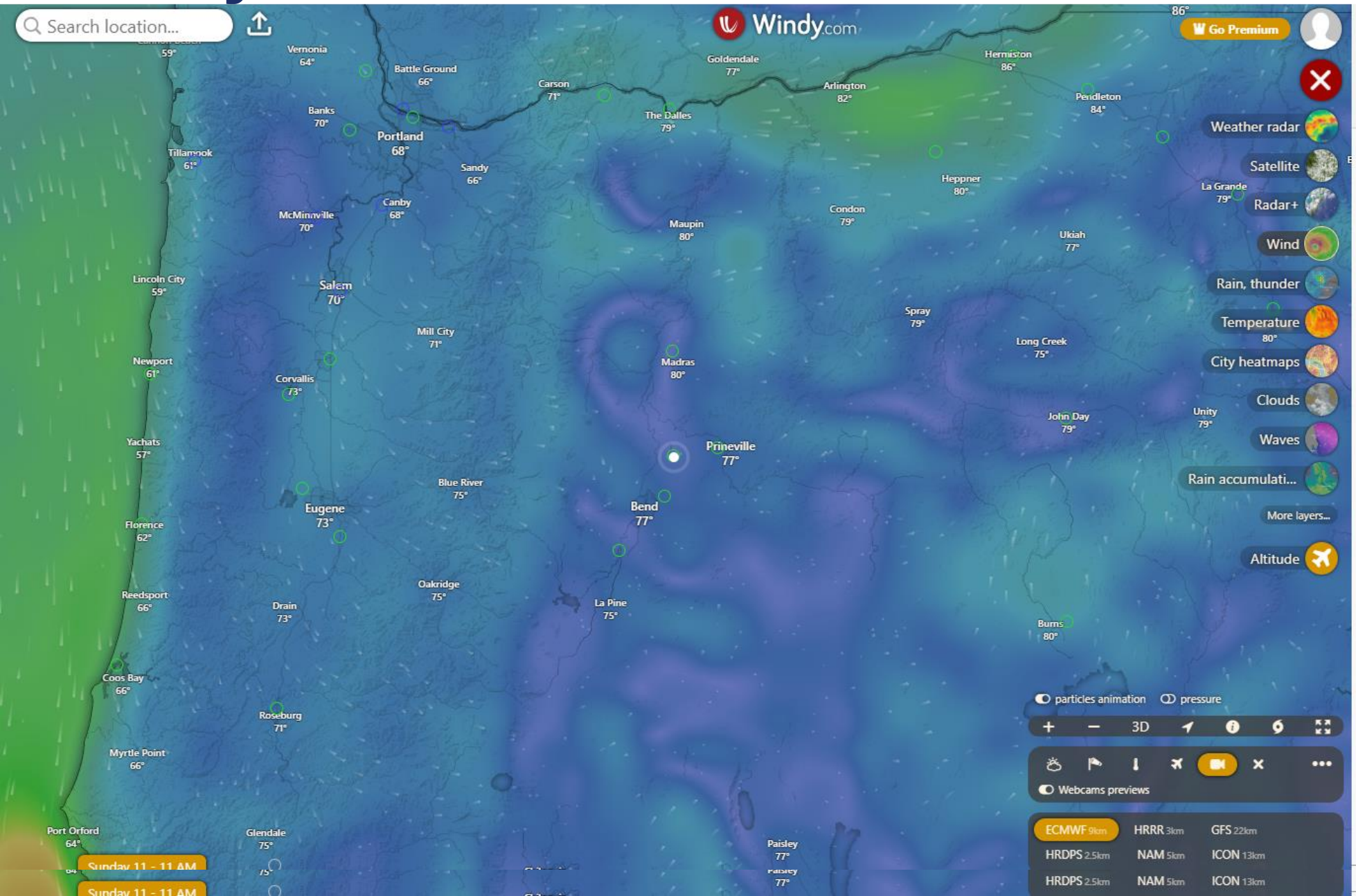
Storm Prediction Center

https://www.spc.noaa.gov/



Windy

https://www.windy.com/



KRDM - RDM

Roberts Field

Rwys, info | METAR | Webcams | NOTAM

METAR

raw mode

1h 1m ago: VFR

Wind calm. Visibility 10sm. No clouds under 12,000 ft. Temperature 26°C, dew point 7°C. Altimeter 30.05inHg. ASOS station.

Remark: AUTO AO2 SLP146 T02610072 10267 20122 58010 $

- 2h 1m ago: VFR
- 3h 1m ago: VFR
- 4h 1m ago: VFR
- 5h 1m ago: VFR

TAF

Issued 1h 25m ago - all times local

From Sunday 11:00 till Monday 11:00:

Wind variable 5kt. Sky clear.

From Sunday 13:00:

Wind 330° 10kt. Sky clear.

From Sunday 16:00:

Wind 320° 14kt, gusting 21kt. Clouds few 25000ft.

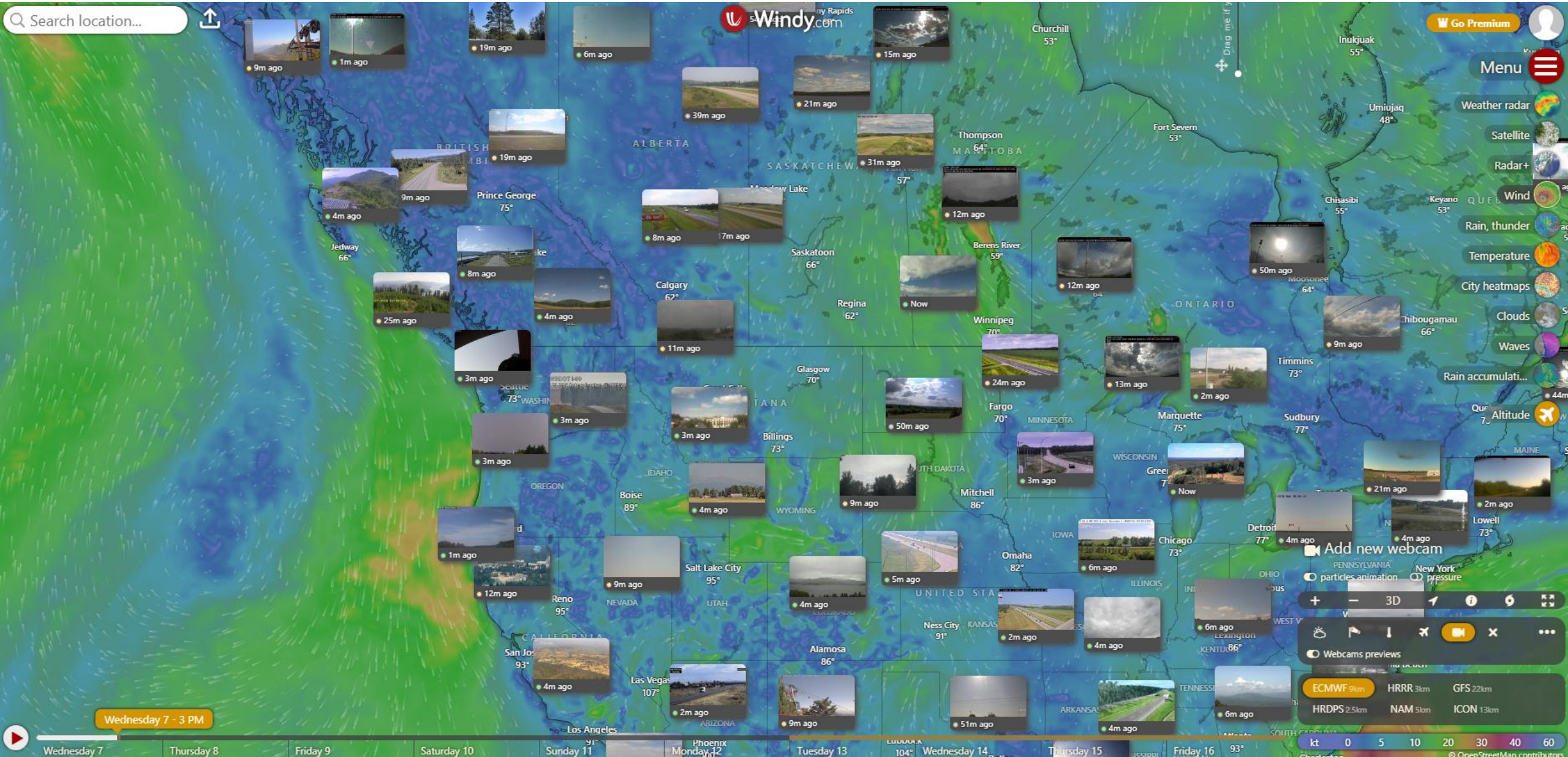
From Sunday 22:00:

Wind variable 5kt. Clouds few 25000ft.

METEOGRAM

Windy (with Web Cams)

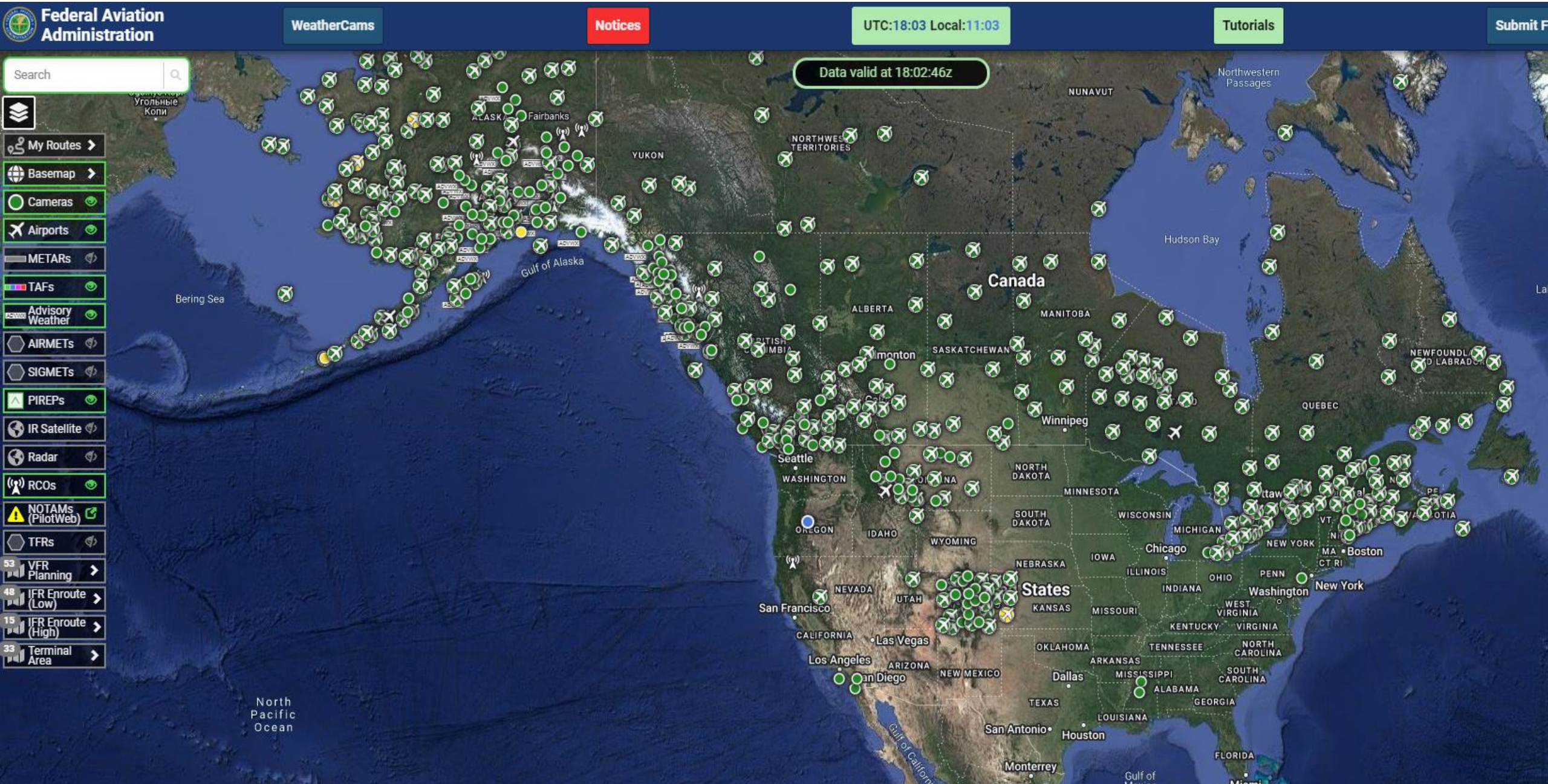
https://www.windy.com/



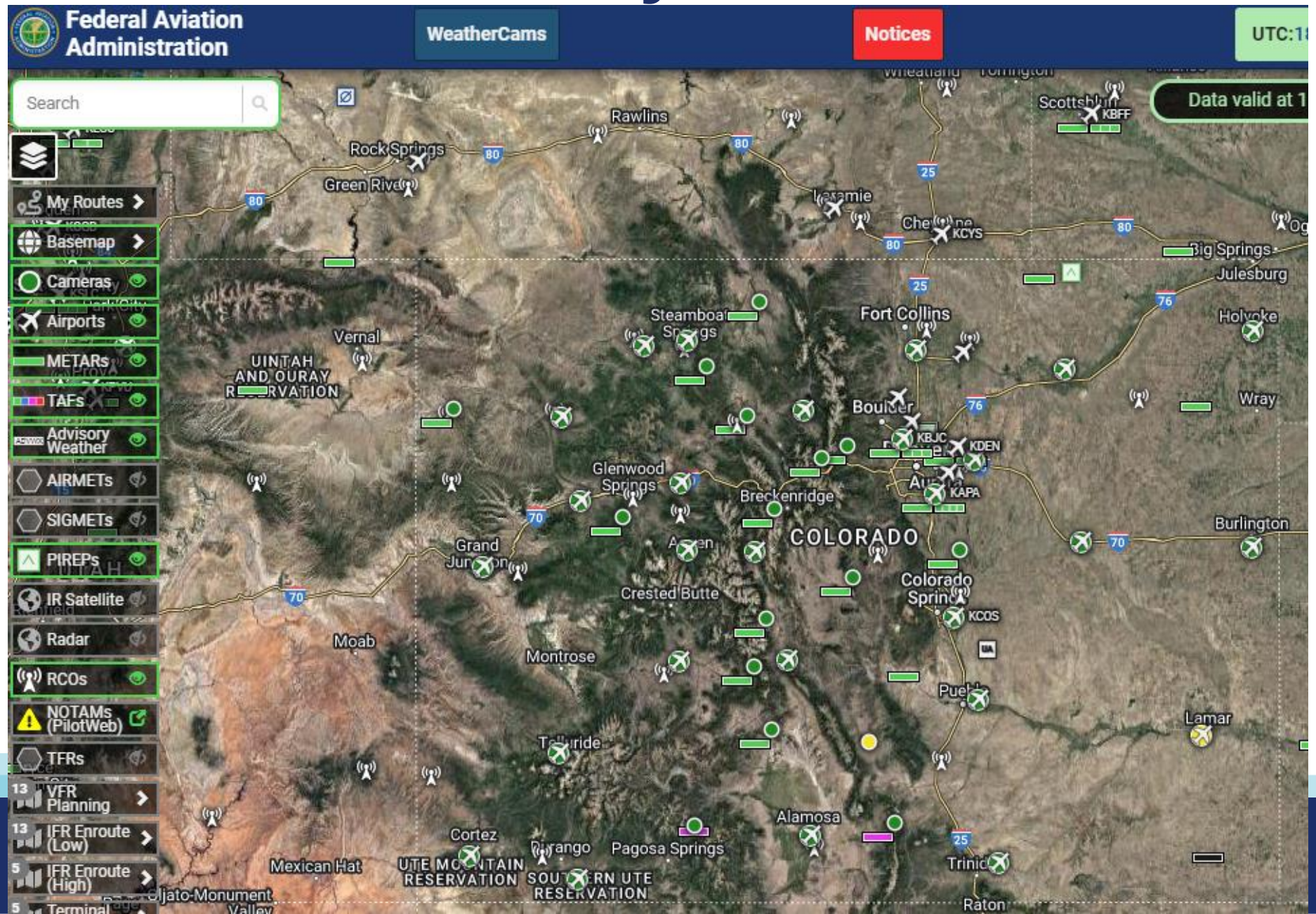
Talking of Web Cams (Remote Observations)…

- **Started in Alaska in 1999**
- **Resulted in 85% reduction in weather-related accidents**
- **Some co-located with remote (off-airport) weather stations**
  - Remote AWOS
- **Cameras around mountain tops/ridges, passes, etc.**

Now Nationwide and In-filling: https://weathercams.faa.gov/

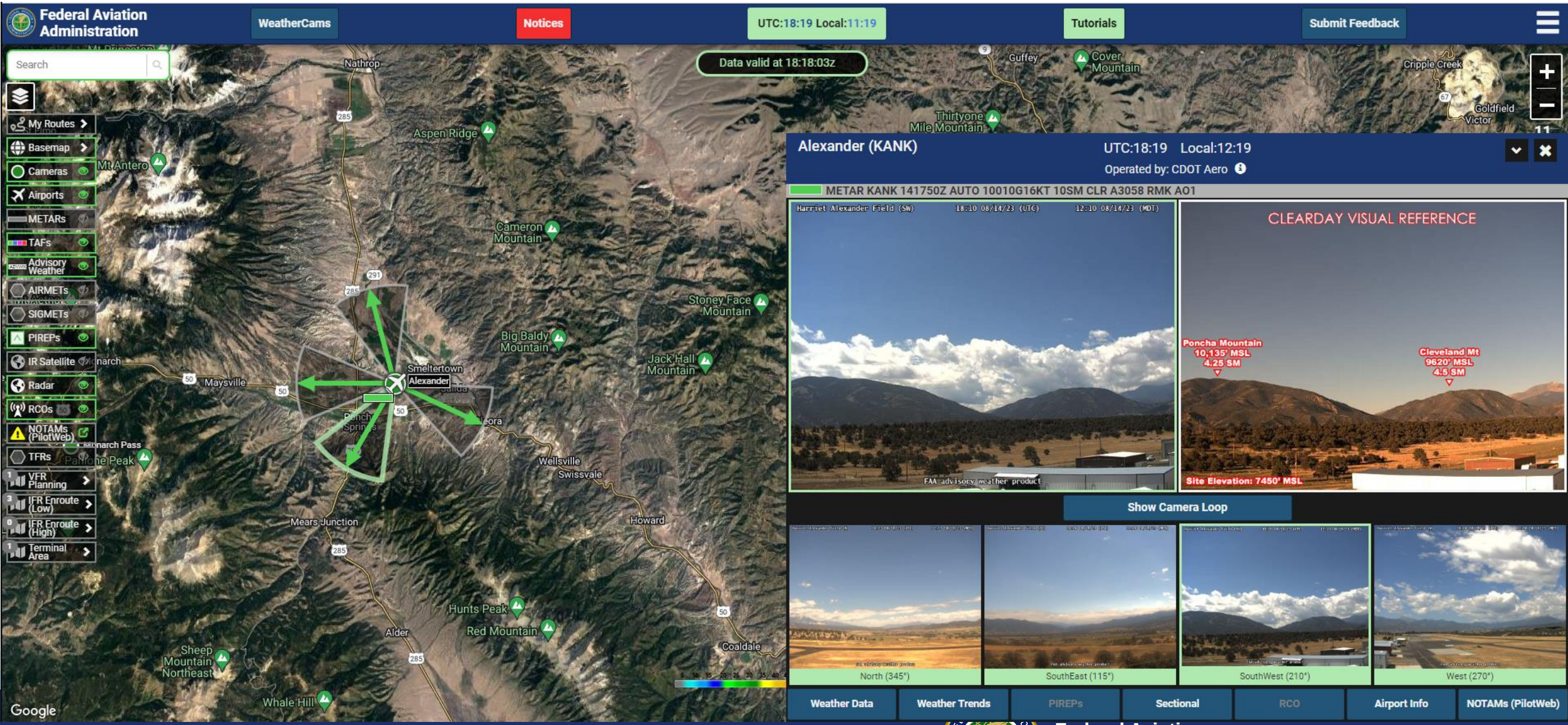


Lots of Features and Layers: https://weathercams.faa.gov/



Airports With WXCAM

https://weathercams.faa.gov/

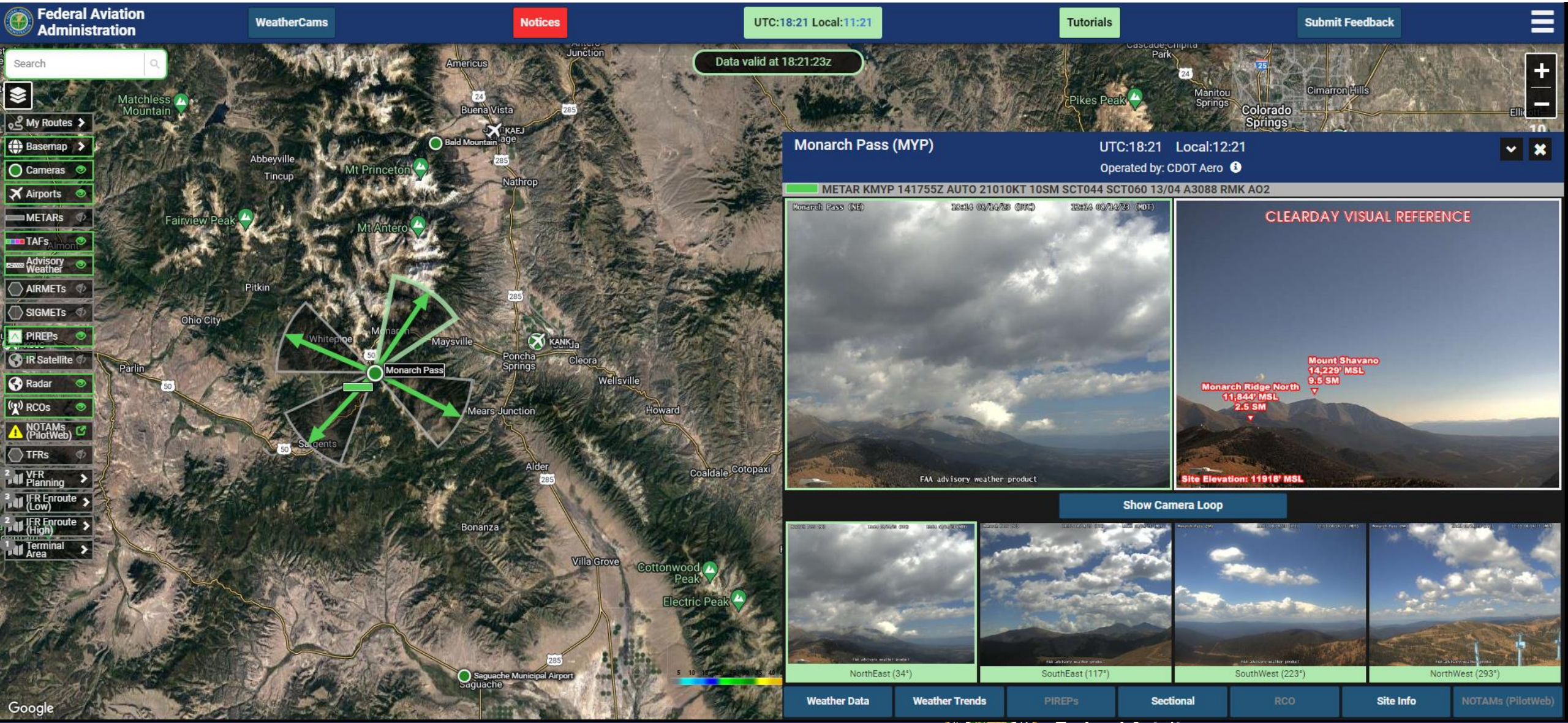


Federal Aviation Administration

More options, here

Mtn. Pass with WXCAM

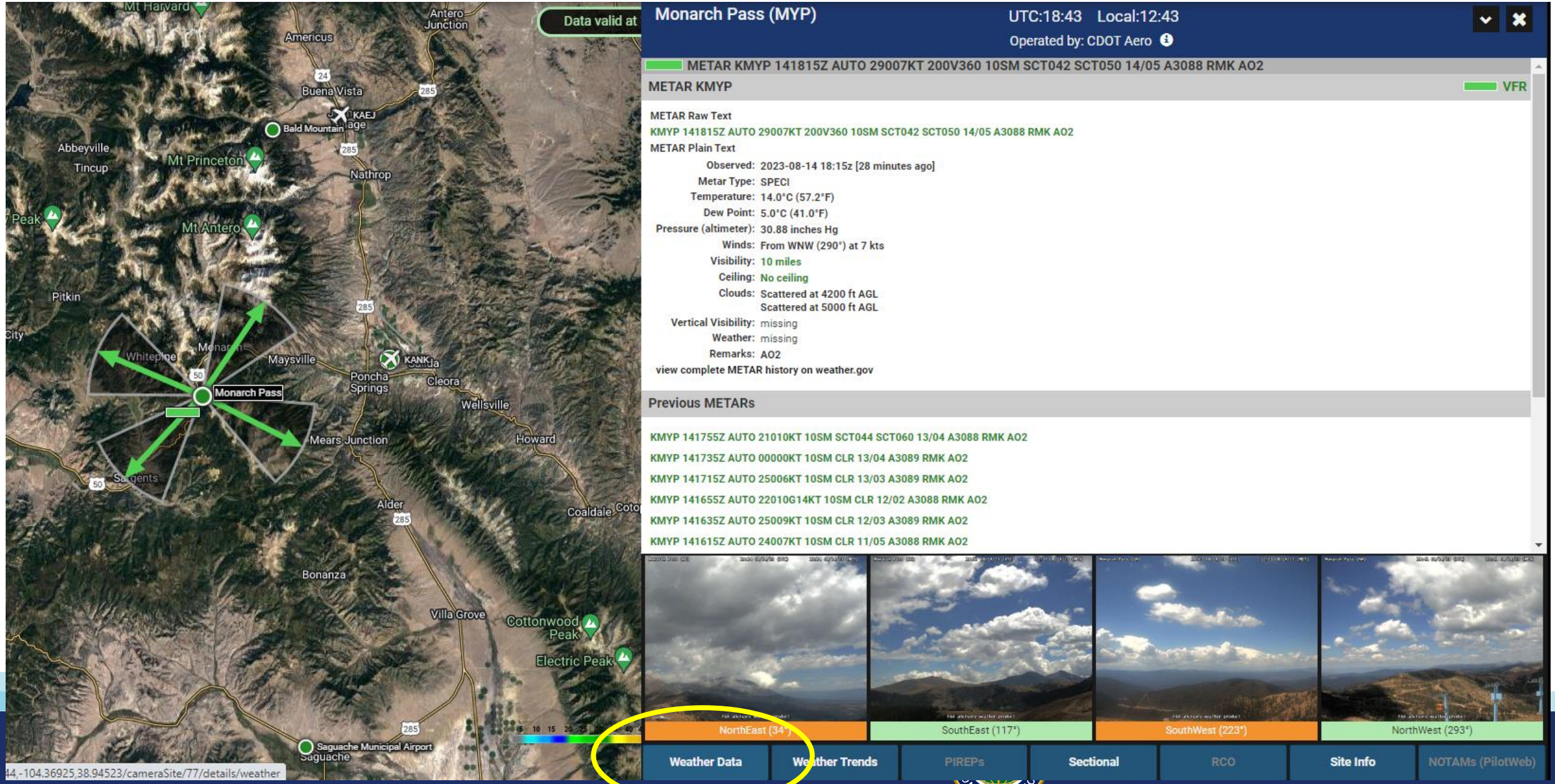
https://weathercams.faa.gov/



Federal Aviation Administration

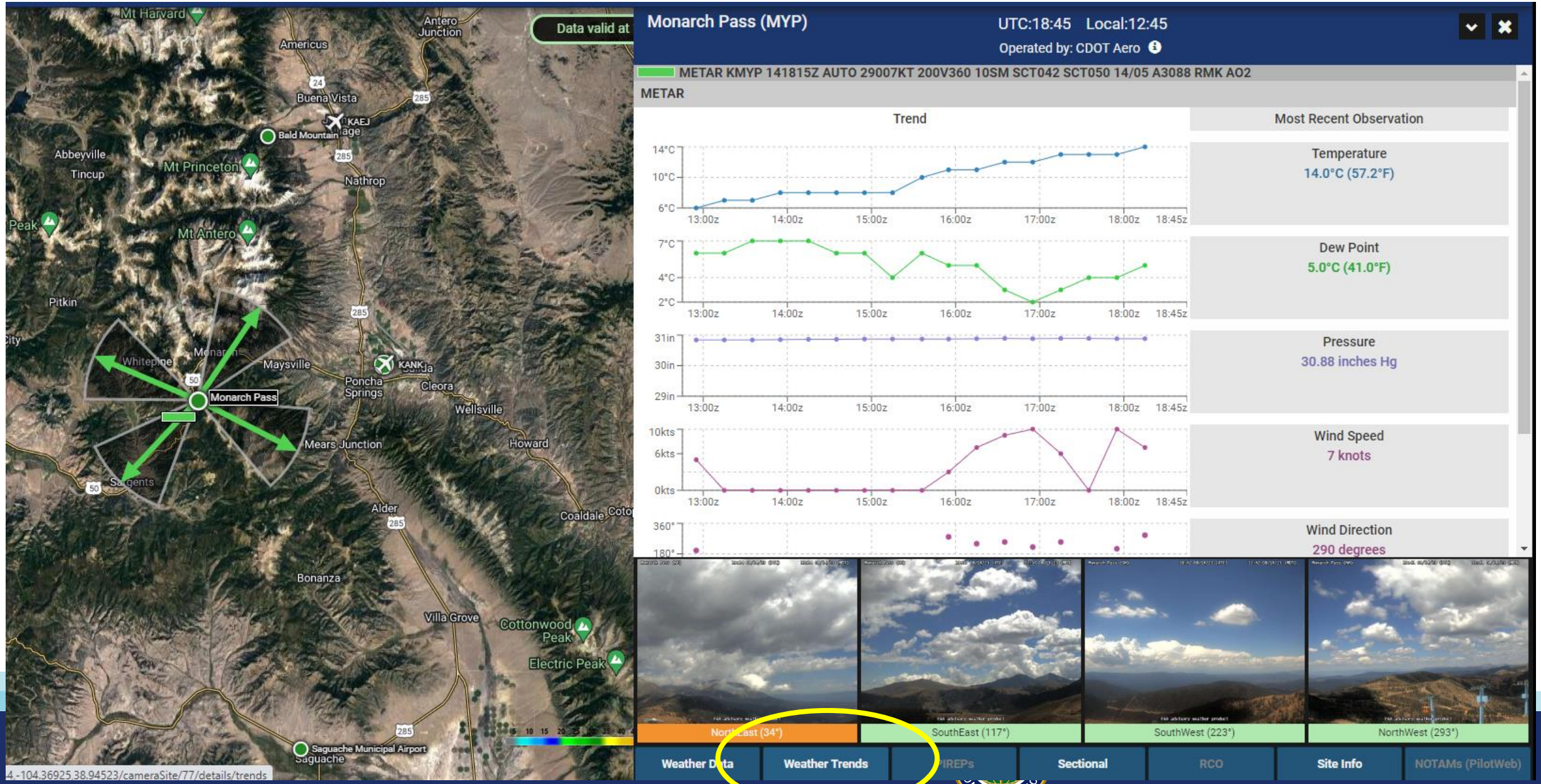
More options, here

Pass With WXCAM and AWOS https://weathercams.faa.gov/



Pass With WXCAM

https://weathercams.faa.gov/

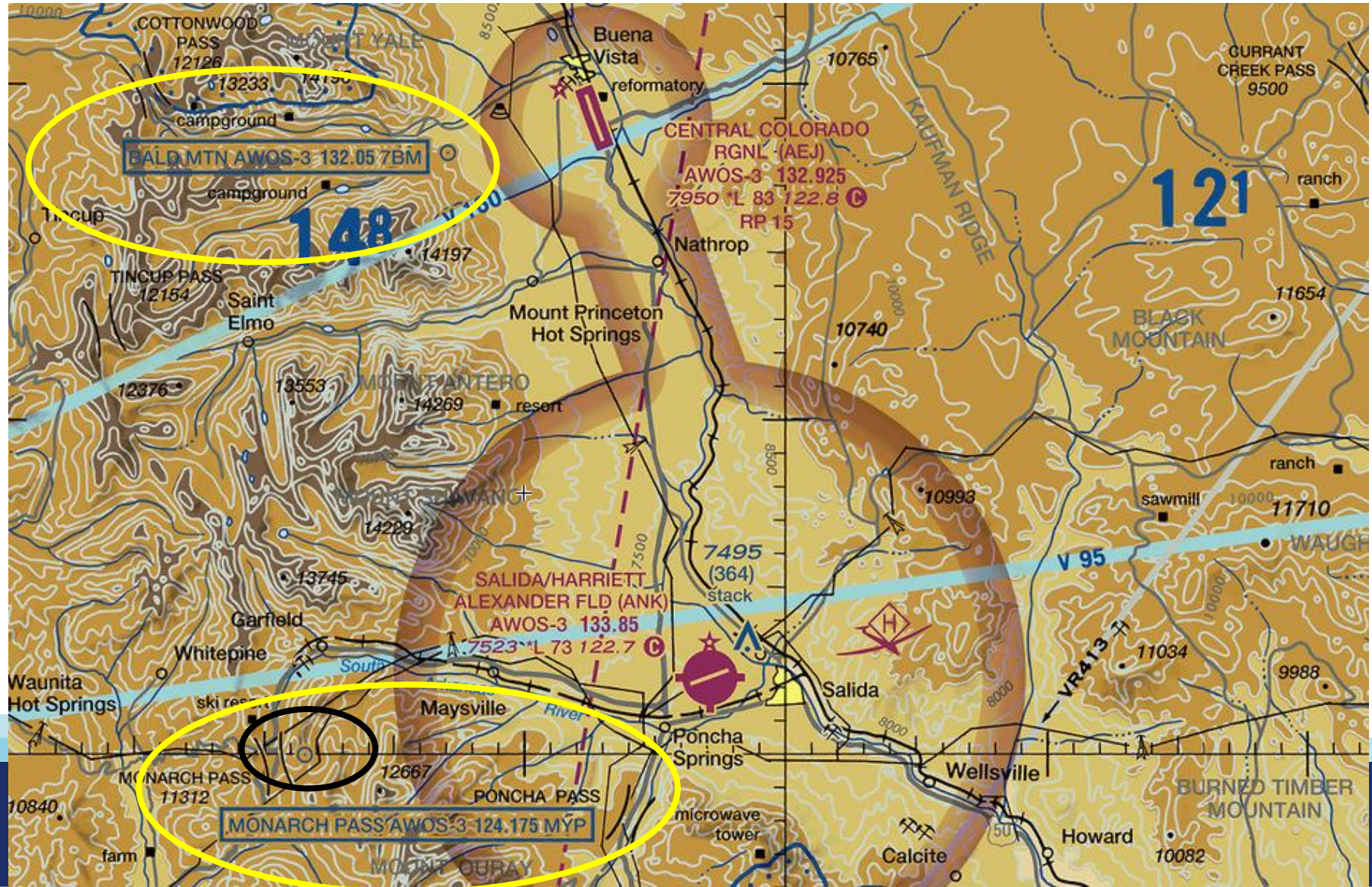


Also, RCOs

https://weathercams.faa.gov/

Use Remote AWOS Along Your Route

May or may not have collocated WXCAM



Many Airports Have Webcams: Prineville S39

Locate AWOS

- https://www.faa.gov/air_traffic/weather/asos

Surface Weather Observation Stations (ASOS/AWOS)

Click a state or territory or select from the drop down to view weather observation station data for that area.

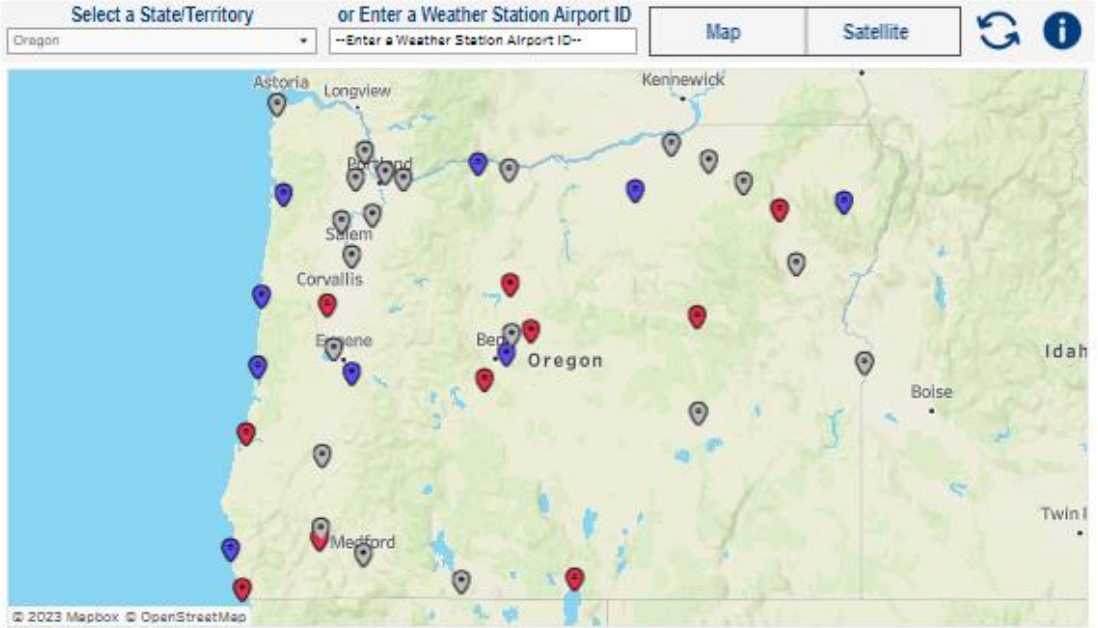
Select a State/Territory --Select a State/Territory--

or Enter a Weather Station Airport ID --Enter a Weather Station Airport ID--

AWOS by State

Surface Weather Observation Stations (ASOS/AWOS)

Click a state or territory or select from the drop down to view weather observation station data for that area.



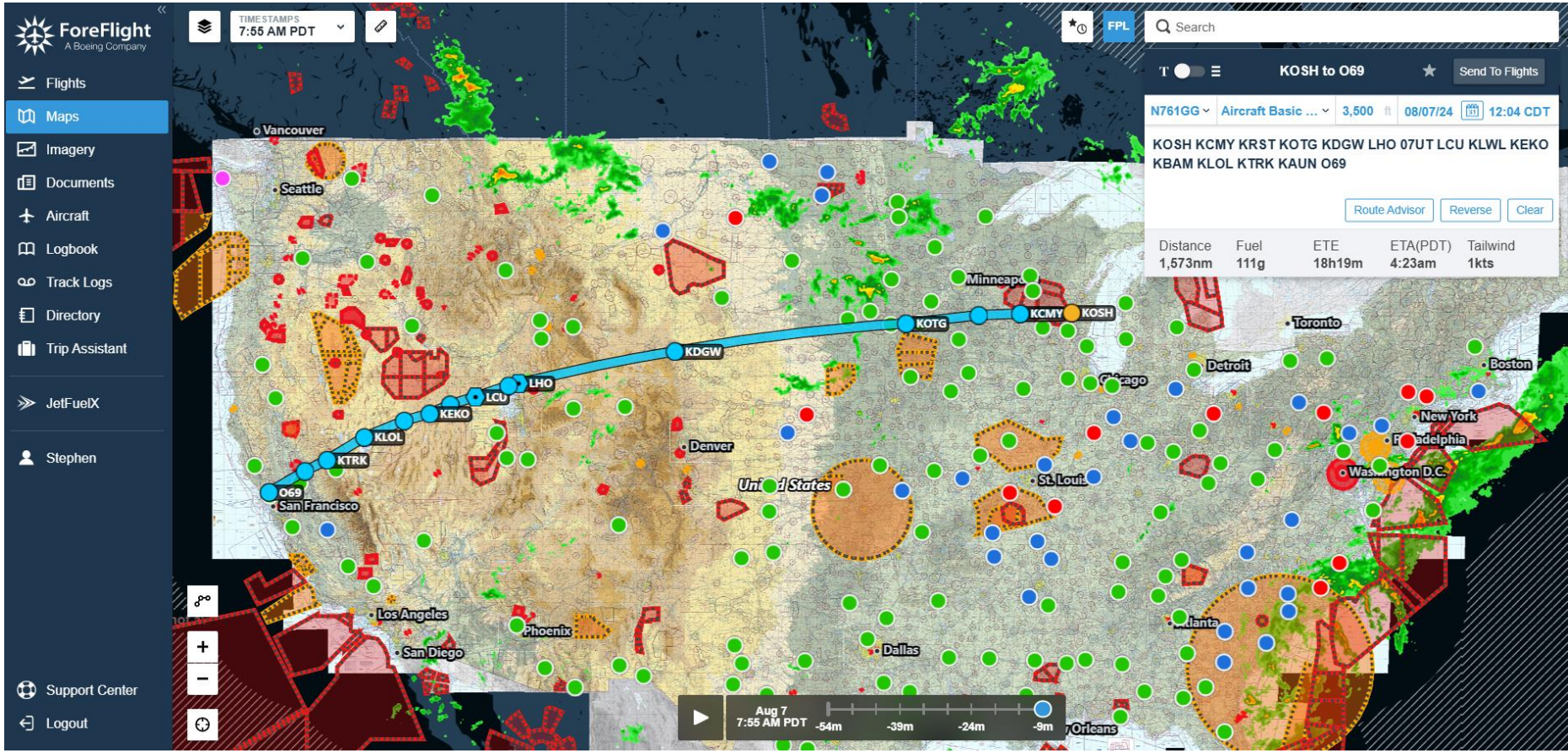
ASOS AWOS-3 AWOS-3PT

ID	Location	County	State	Frequency	Phone	Type
K3S8	Grants Pass	Josephine	Oregon	120	(541) 955-3392	AWOS-3PT
K4S1	Gold Beach	Curry	Oregon	118.15	(541) 247-2518	AWOS-3
K4S2	Hood River - Ken Jernstedt	Hood River	Oregon	134.375	(541) 386-2386	AWOS-3
K6S2	Florence	Lane	Oregon	118.225	(541) 997-8664	AWOS-3
K9S9	Lexington	Morrow	Oregon	134.475	(541) 989-8657	AWOS-3
K77S	Creswell - Hobby	Lane	Oregon	119.275	(541) 895-2349	AWOS-3
KAST	Astoria - Astoria Regional Airport	Clatsop	Oregon	135.375	(503) 861-1371	ASOS
KBDN	Bend	Deschutes	Oregon	134.425	(541) 382-1477	AWOS-3
KBKE	Baker - Baker City Municipal Airport	Baker	Oregon	134.275	(541) 523-5412	ASOS
KBNO	Burns - Burns Municipal Airport	Harney	Oregon	135.575	(541) 573-1382	ASOS
KBOK	Brookings	Curry	Oregon	132.025	(541) 412-8682	AWOS-3PT
KCVO	Corvallis	Benton	Oregon	135.775	(541) 754-0081	AWOS-3PT
KDLS	Dallesport - The Dalles - Columbia Gor..	Klickitat	Oregon	135.175	(509) 767-1726	ASOS
KEUG	Eugene - Mahlon Sweet Field Airport	Lane	Oregon	ATIS 125.225	(541) 461-3114	ASOS
KGCD	Ogilvie	Grant	Oregon	118.375	(541) 575-1122	AWOS-3PT
KHIO	Hillsboro - Portland-Hillsboro Airport	Washington	Oregon	ATIS 127.65	(503) 615-4314	ASOS
KHRI	Hermiston - Hermiston Municipal Airport	Umatilla	Oregon	135.225	(541) 567-8580	ASOS

Share

- https://www.faa.gov/air_traffic/weather/asos

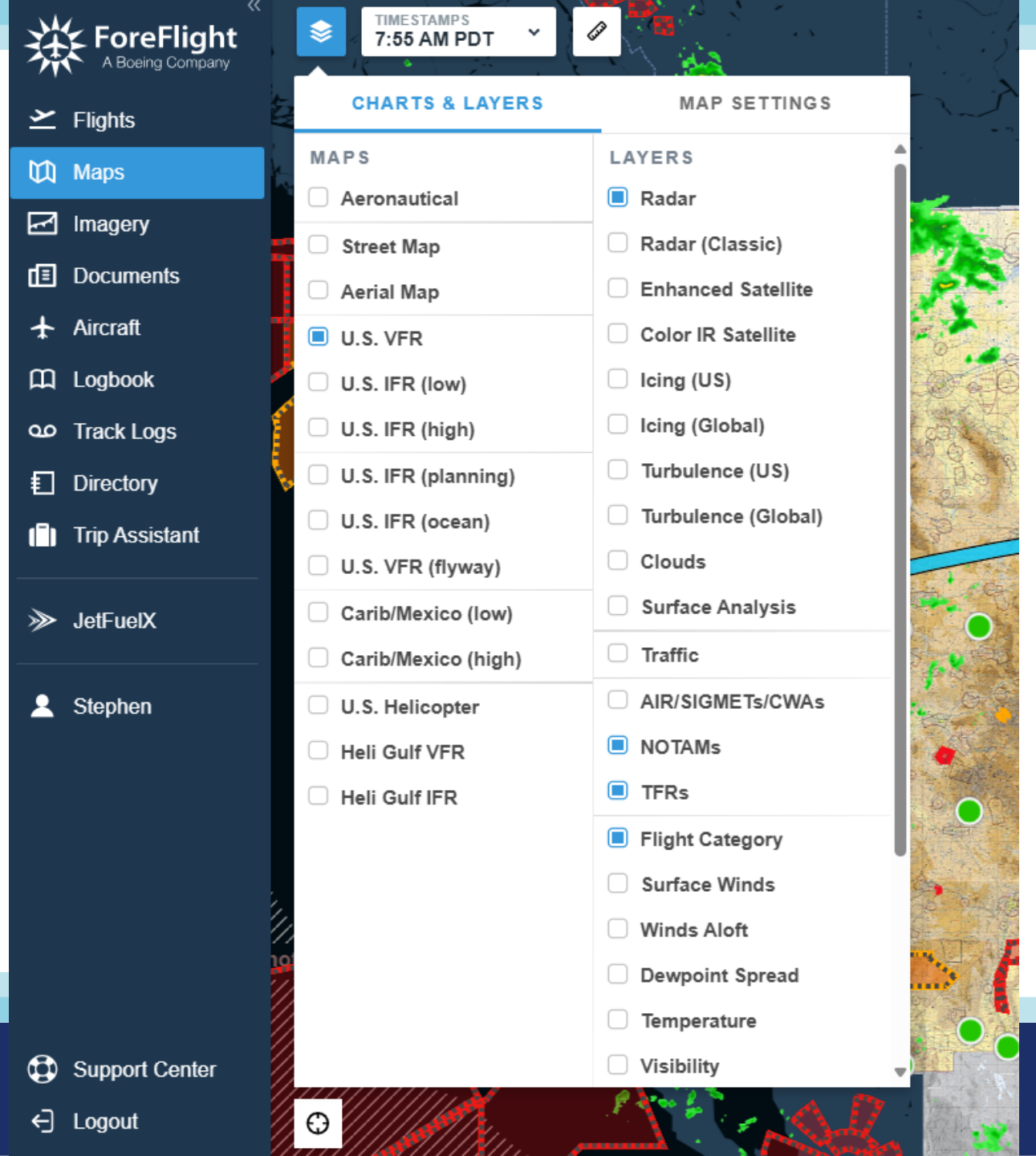
Foreflight Web



- **Foreflight web**
  - Big screen planning
  - Get to know the layers!
  - Save in Flights for FF mobile access

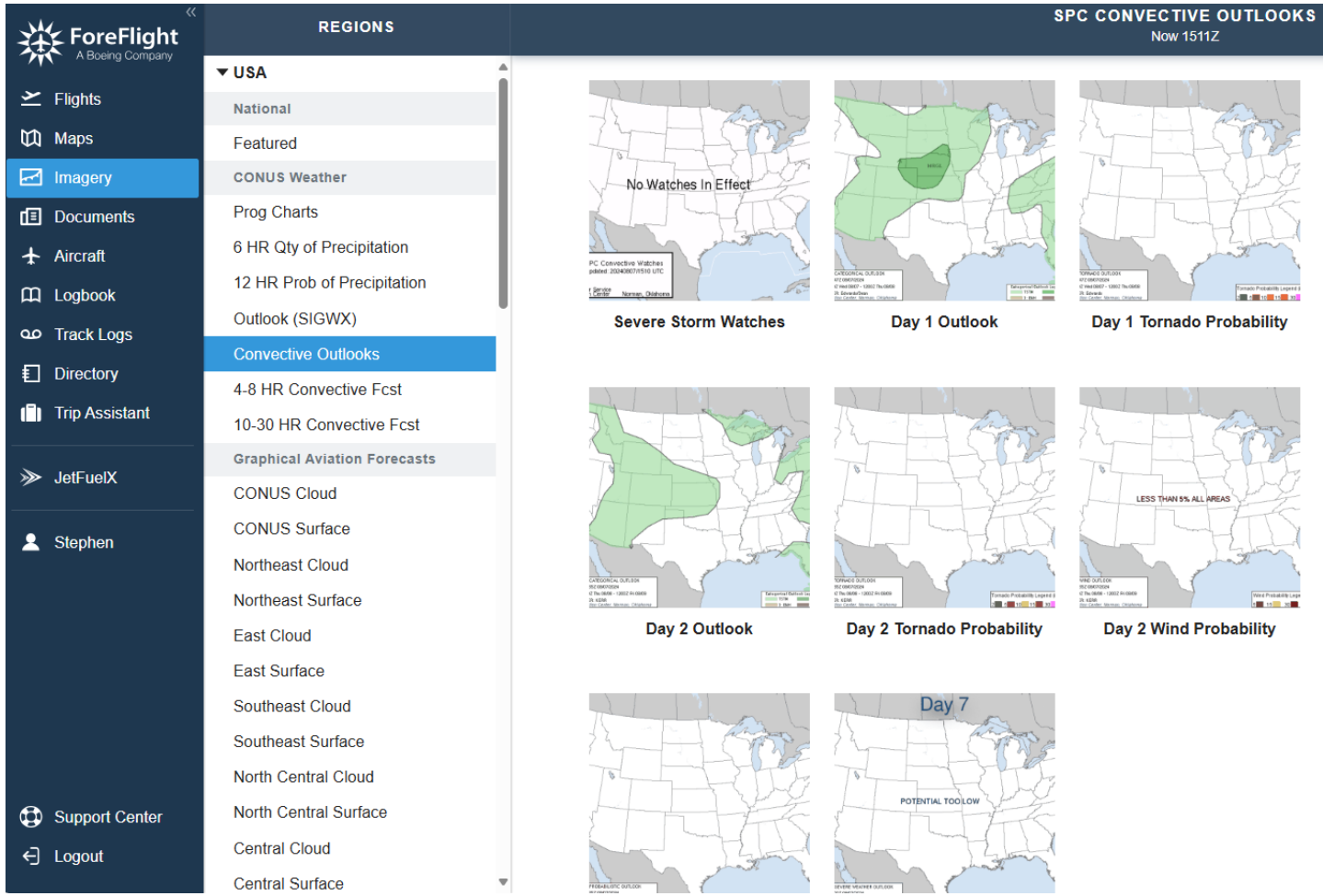
Foreflight Web

- **Foreflight Web**
  - Get to know the layers!
  - It will only show what you select!



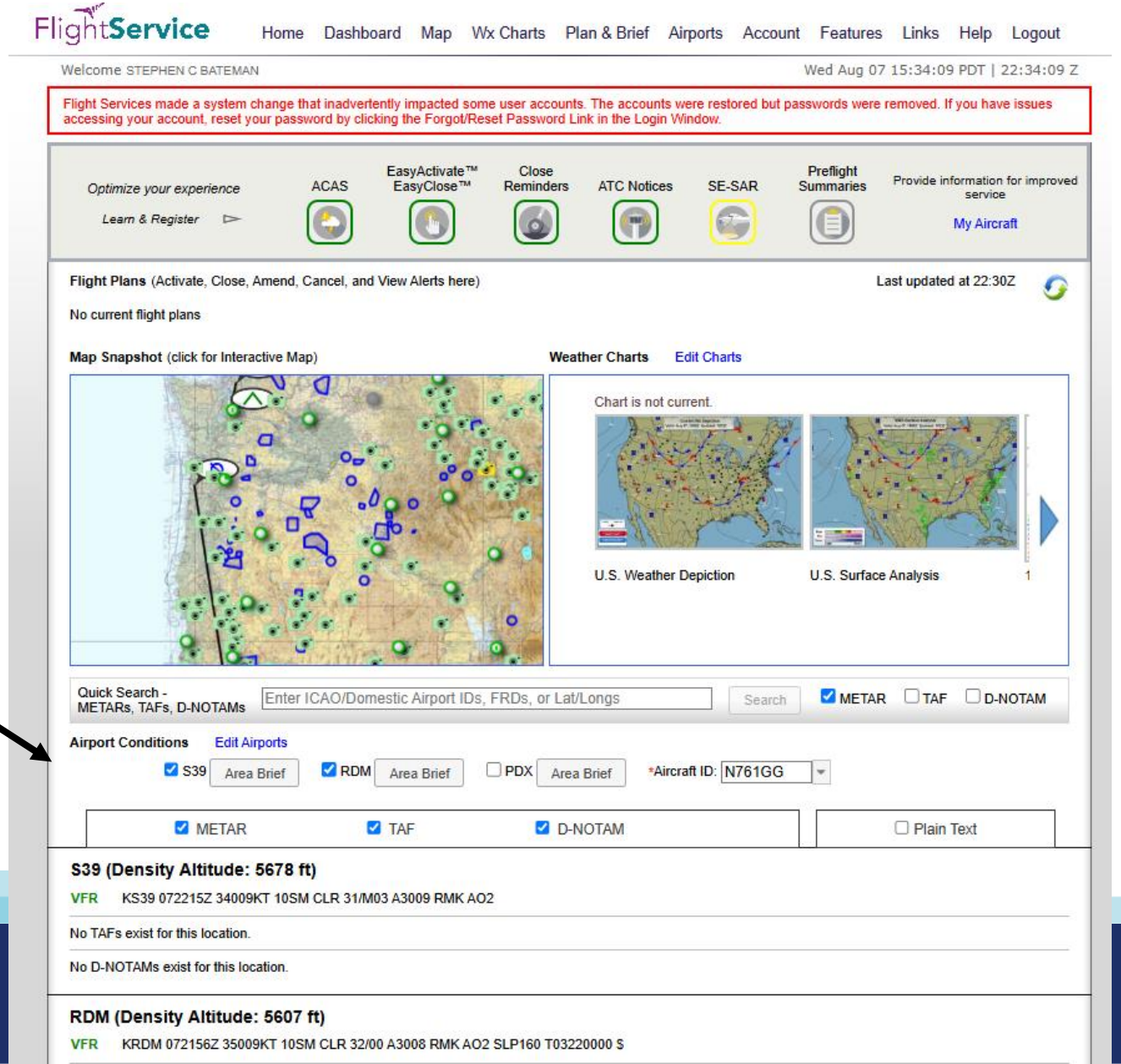
Foreflight Web

- **Portal to other WX products**



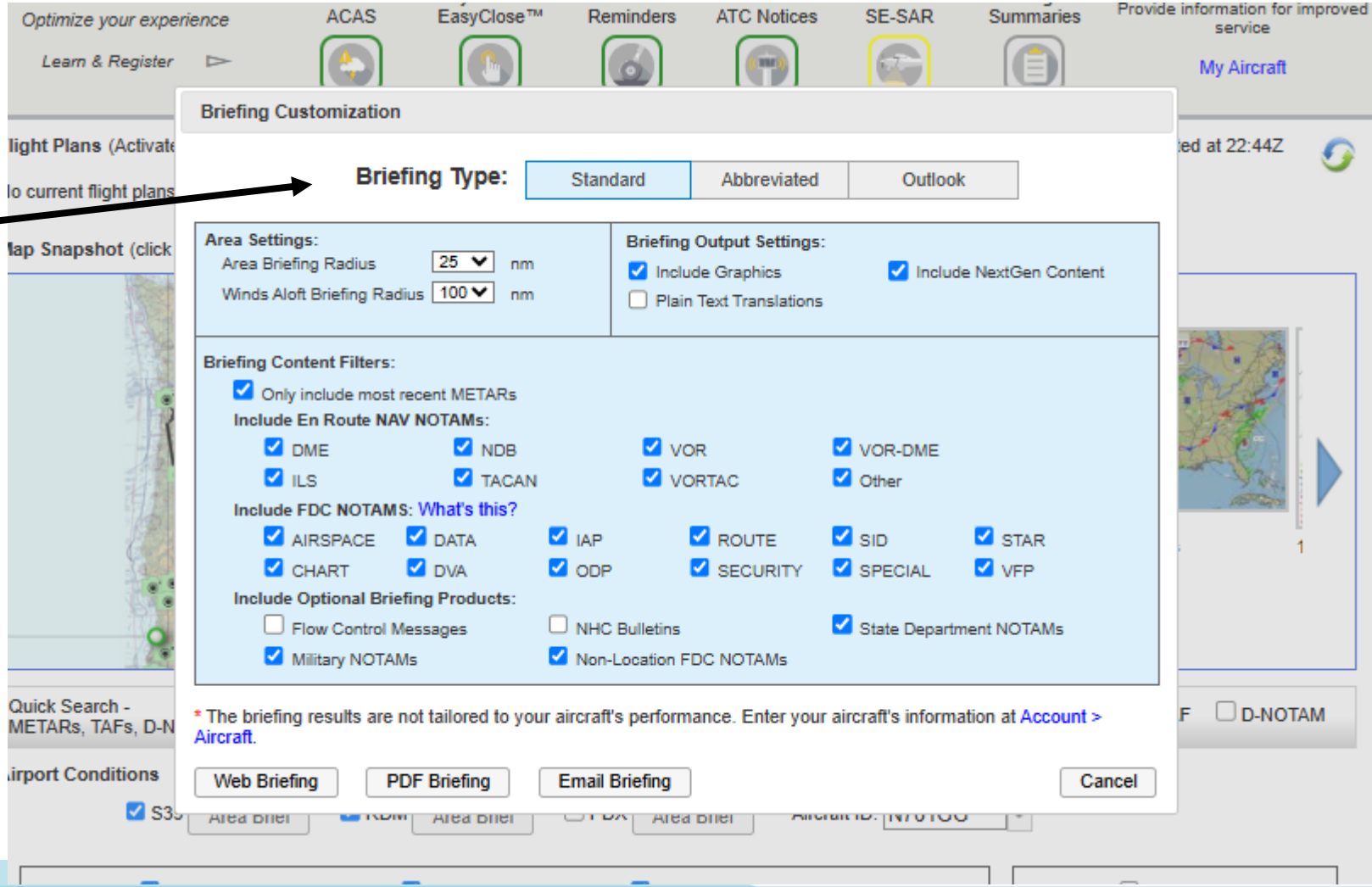
The Ultimate: Flight Service https://www.1800wxbrief.com

- **Work hard to get to know this website – it is magnificent!**
- **Set up your dashboard**
- **Area brief feature**

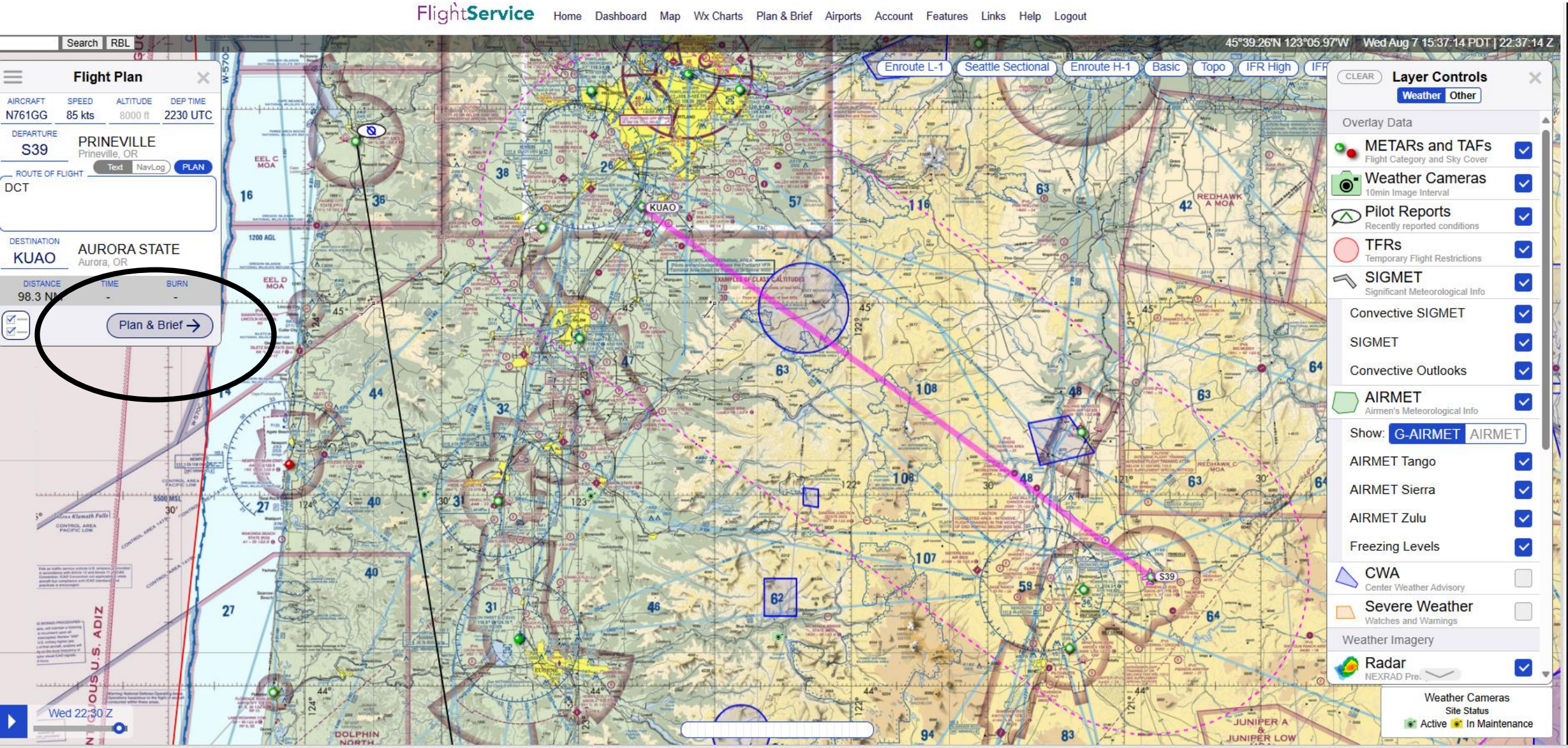


Flight Service Area Brief

- **Area brief**
- **Excellent “should I continue or not” tool**
- **25NM radius**



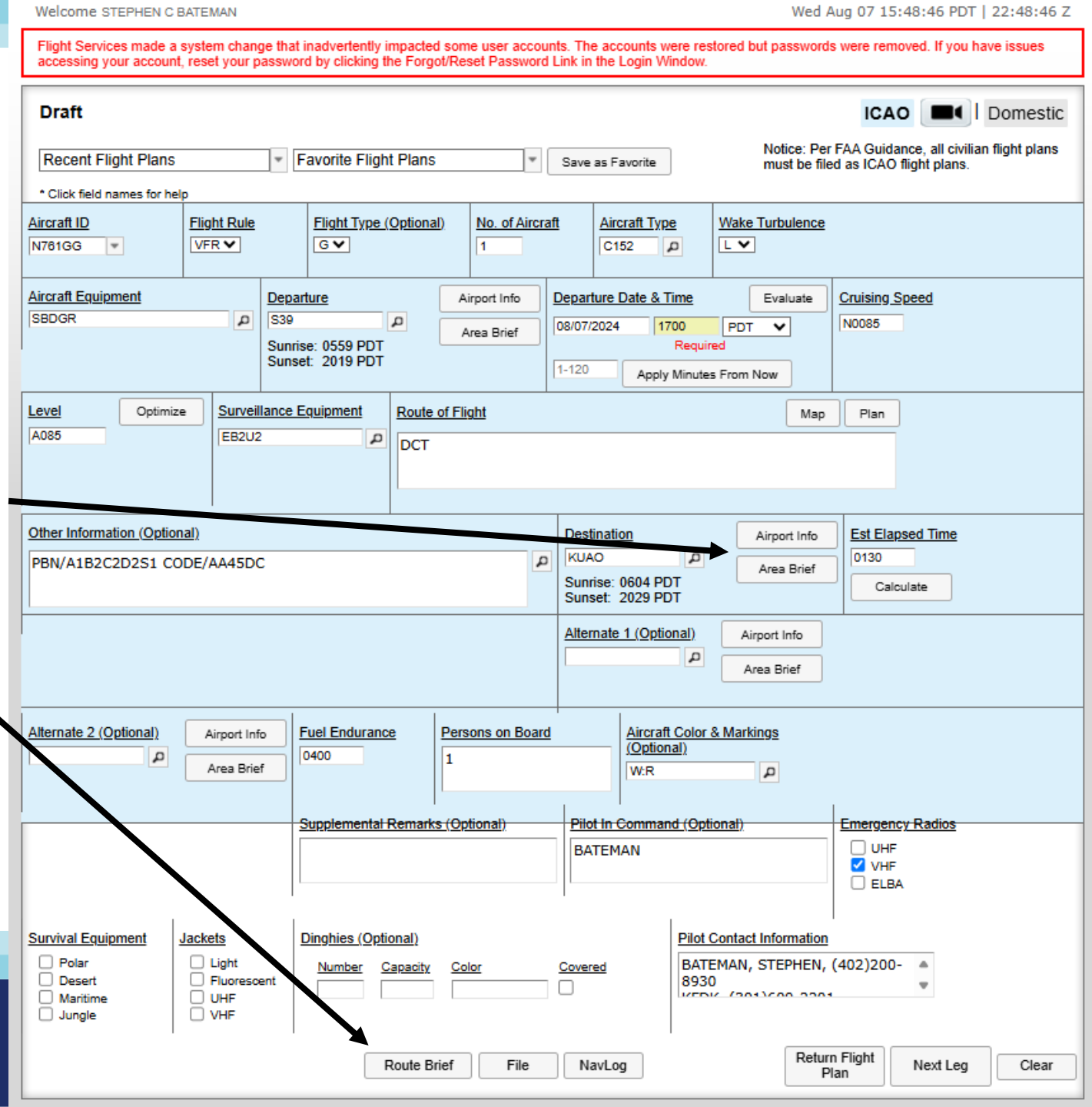
Flight Service Interactive Map



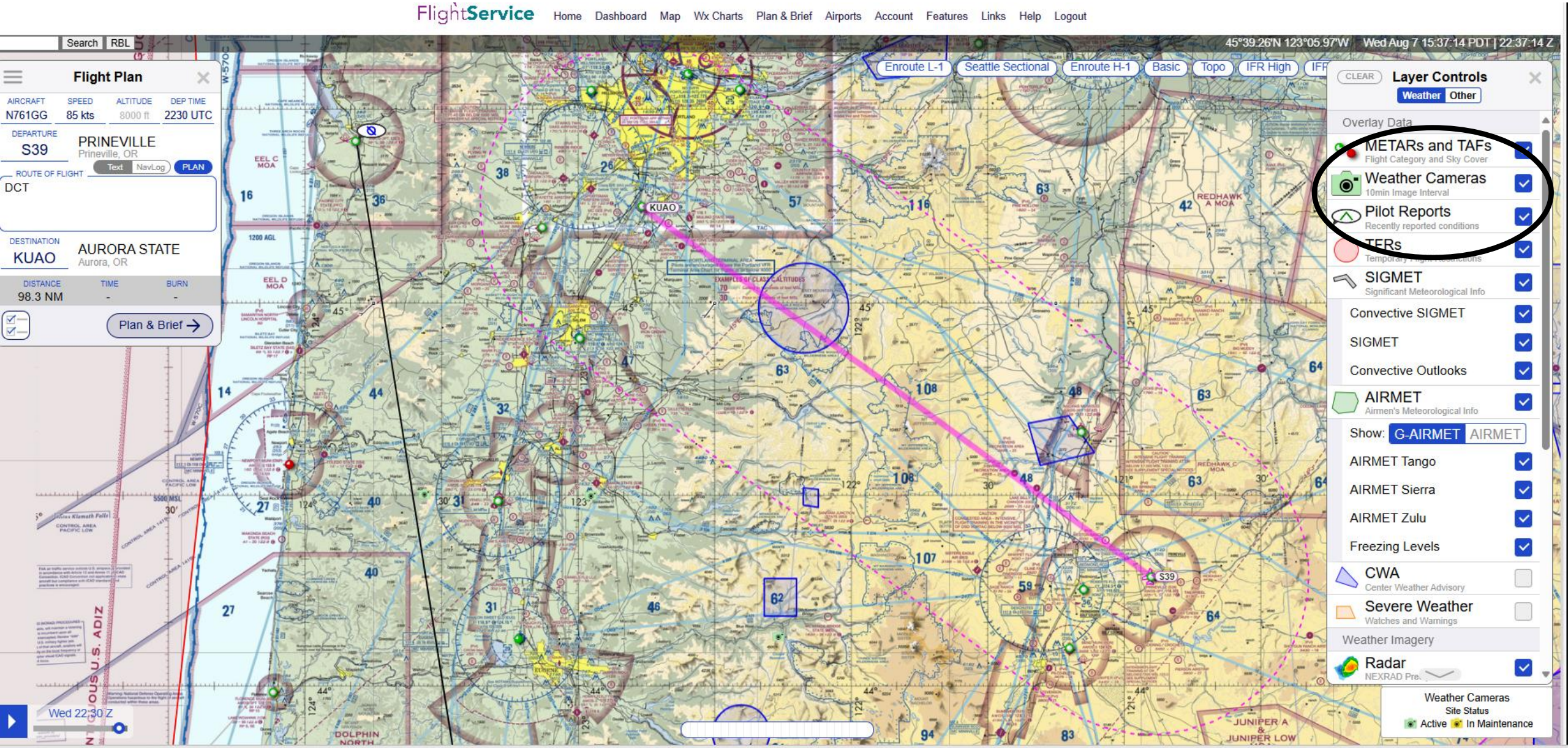
FSS Plan and Brief

- ICAO flight plan form
- Can save aircraft info
- Area Brief for each airport
- Route Brief

- Can file the flight plan and get text/email updates and reminders to close the plan



Flight Service Interactive Map - WXCAMs

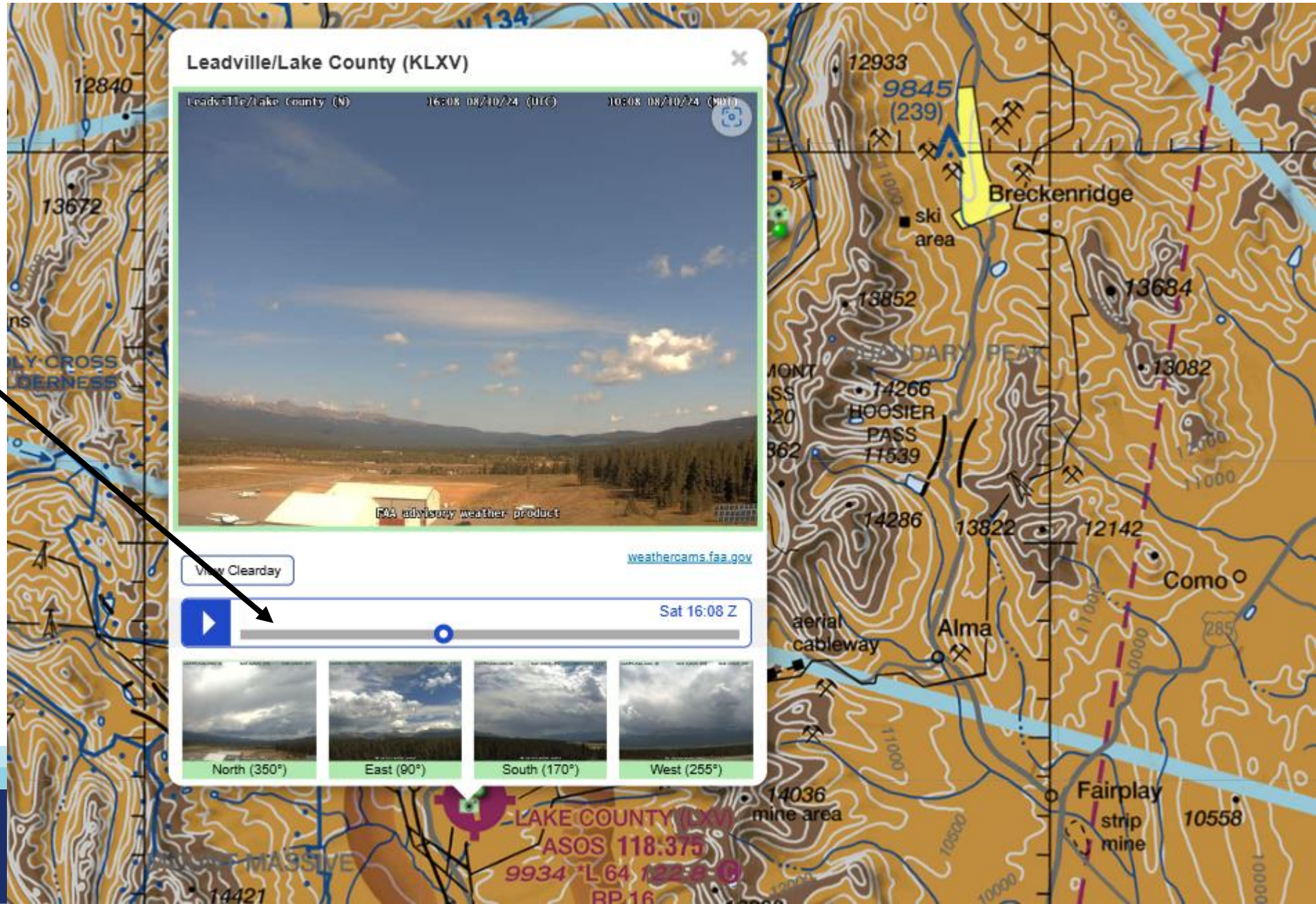


Flight Service Interactive Map - WXCAMs

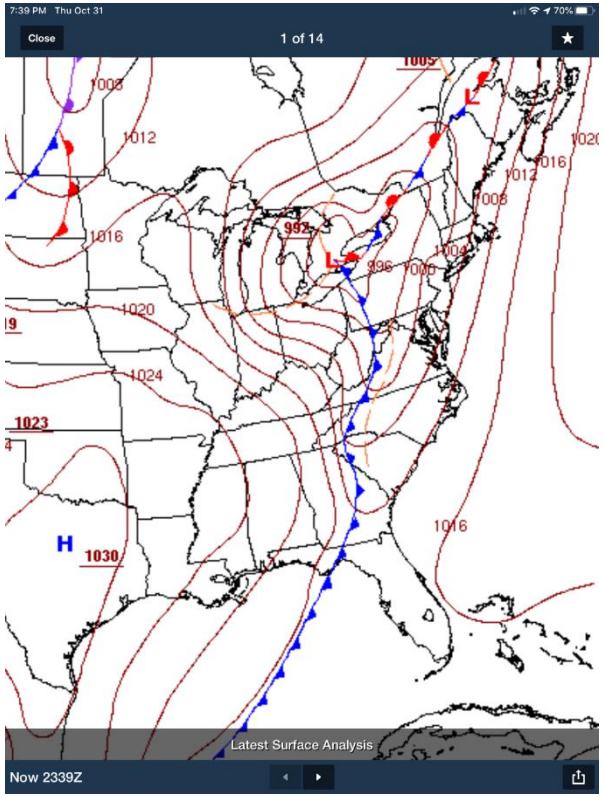
- **Tricky to see the small camera symbol but click on it…**

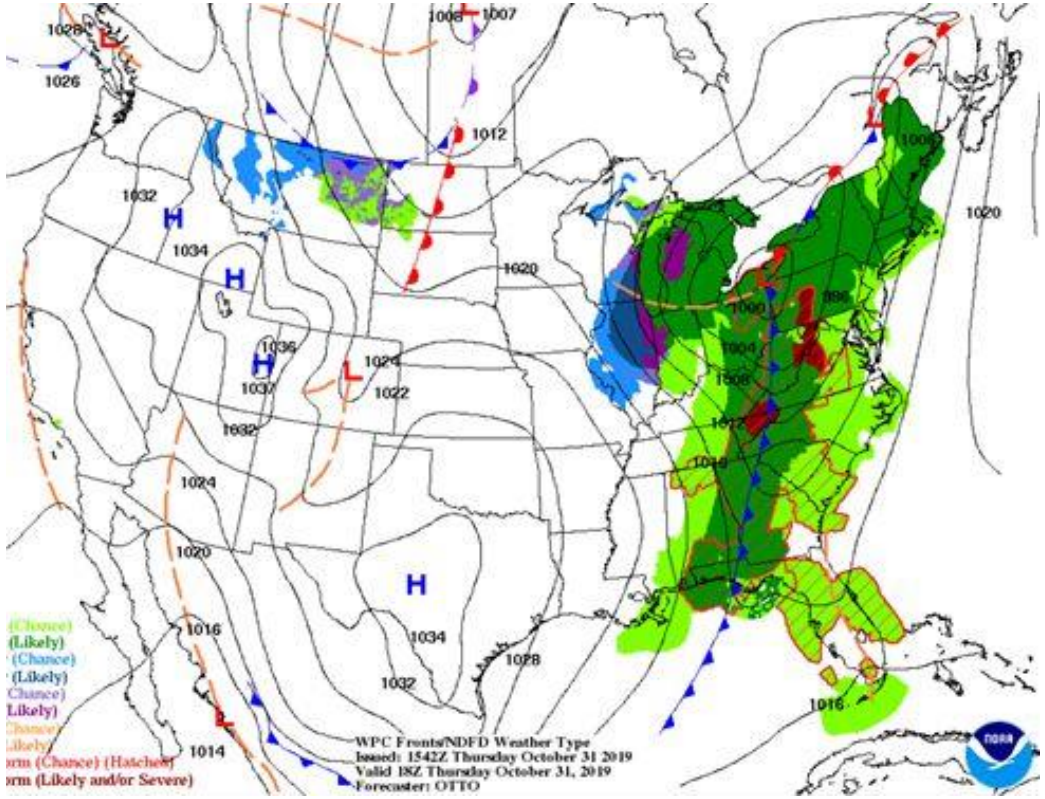
Flight Service Interactive Map - WXCAMs

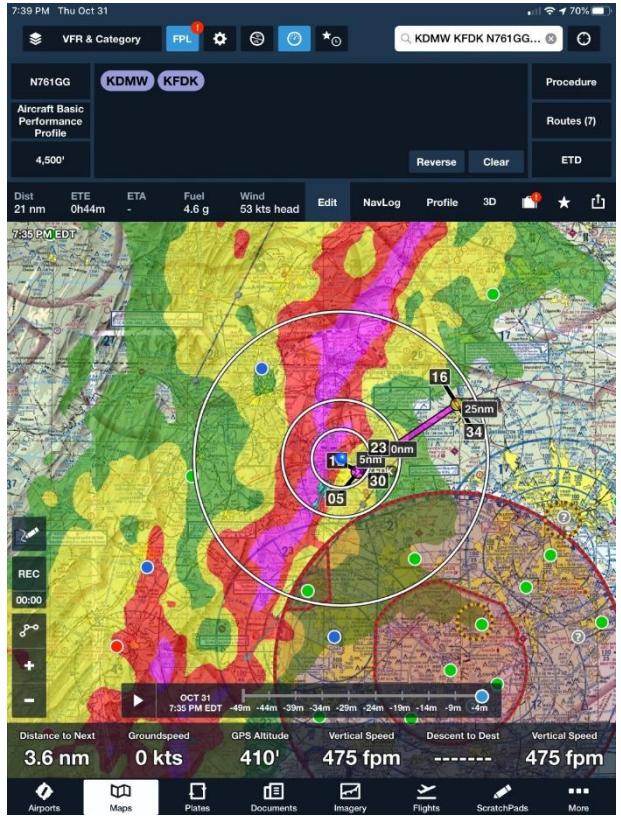
- **Loop through the images**



Different Views…Give more Info…
Fast Moving Cold Front…October 2019





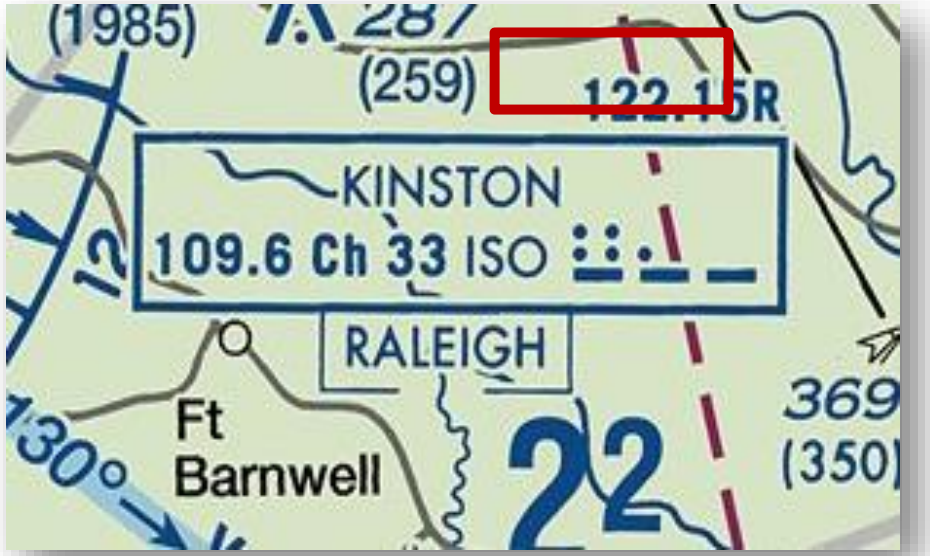


Still Want to Go?

In-Flight Tools

In-Flight Weather Sources

- **Flight Service (FSS) en-route weather**
- **Frequencies depicted on VOR data block**
  - *When talking with FSS, always give a PIREP in return*
  - FSS transmits & receives on 122.2 MHz, “everywhere”
  - FSS receives on 122.15 MHz & transmits on 109.6 MHz (VOR). (Audio panel switch and volume)

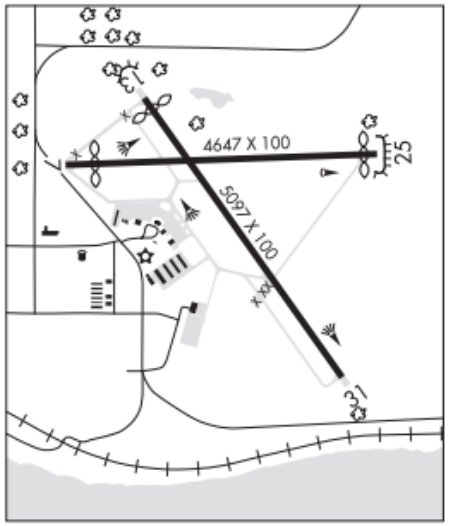


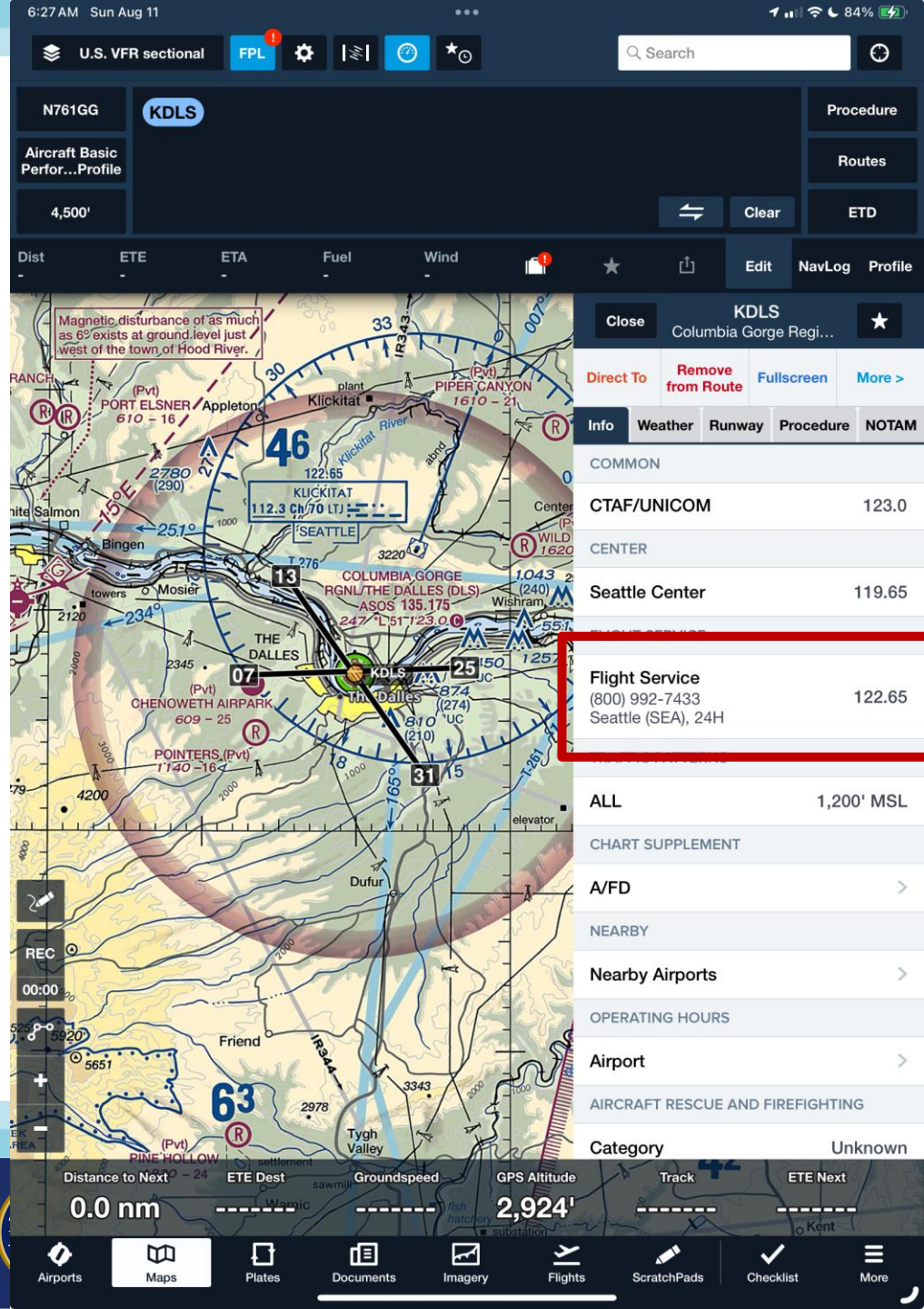
In-Flight Weather Sources

- **Flight Service (FSS) en-route weather**
- **EFB airport info**
- **Not shown in chart supplement entry**

THE DALLES

COLUMBIA GORGE RGNL/THE DALLES MUNI (DLS)(KDLS) 2 NE UTC–8(–7DT) N45°37.16′ W121°10.10′ SEATTLE H–1B, L–13A IAP
247 B NOTAM FILE DLS
RWY 13–31: H5097X100 (ASPH) S–30, D–30 PCN 32 F/C/X/T MIRL 0.5% up SE
RWY 13: Thld dsplcd 200′. Trees.
RWY 31: REIL.
RWY 07–25: H4647X100 (ASPH) S–30, D–30 MIRL 0.7% up E
RWY 07: Thld dsplcd 440′. Trees.
RWY 25: Thld dsplcd 196′.
SERVICE: S4 **FUEL** 100LL, JET A1 **LGT** ACTIVATE MIRL Rwy 13–31, Rwy 07–25 and REIL Rwy 31–CTAF. REIL opr on 7 clicks only.
AIRPORT REMARKS: Attended 1600–0200Z‡. Waterfowl on and inovf arpt. PPR for overweight ldgs. Mountains byd 5000′ apch Rwy 31.
AIRPORT MANAGER: 509-767-2272
WEATHER DATA SOURCES: ASOS 135.175 (509) 767–1726.
COMMUNICATIONS: CTAF/UNICOM 123.0
Ⓡ **SEATTLE CENTER APP/DEP CON** 119.65
CLEARANCE DELIVERY PHONE: For CD ctc Seattle ARTCC at 253-351-3694.
RADIO AIDS TO NAVIGATION: NOTAM FILE DLS.
KLICKITAT (VH) (DH) VORW/DME 112.3 LTJ Chan 70 N45°42.82′ W121°06.05′ 186° 6.3 NM to fld. 3220/21E.
VOR unusable:
003°–017° byd 40 NM
192°–198° byd 40 NM
207°–211° byd 40 NM
306°–311° byd 40 NM
LDA/DME 109.35 I–DLS Chan 30(Y) Rwy 25. LOC unusable byd 33° rgt of course. Unmonitored.





In-Flight Weather Sources

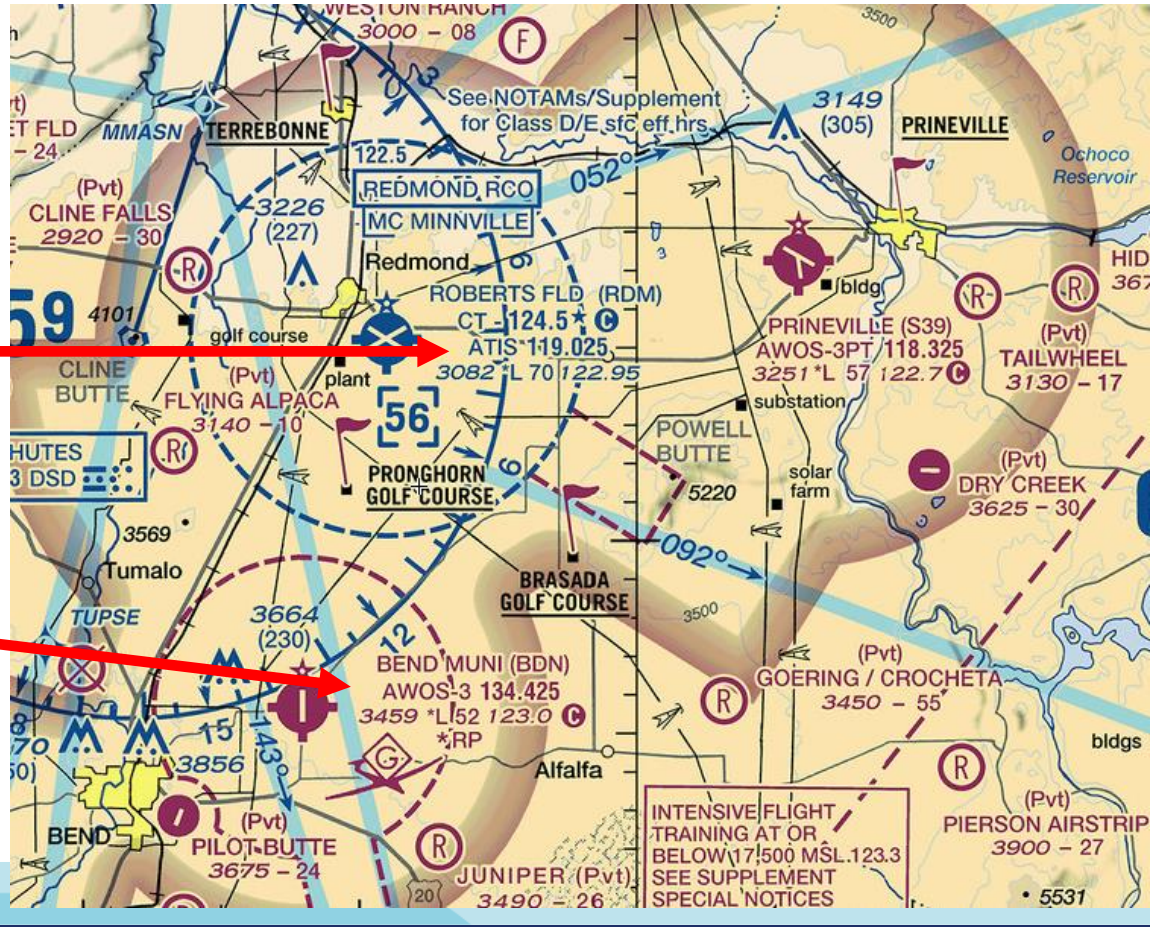
- **Automated Surface Observing System (ASOS)**
- **Automated Weather Observing System (AWOS)**
- **“One-minute weather”**
- **Source for METARs**

In-Flight Weather Sources

- **Automated Terminal Information Service (ATIS)**

ATIS (could be up to an hour old)
“Wind Check, Please”

AWOS



ASOS Information

METAR Element	Information Provided
Wind Direction, Speed, & Character	Tens of degrees – Knots, Gusts
Visibility	Up to & including 10 statute miles
Runway Visual Range (RVR)	At selected sites
Basic present weather	Type and intensity
Obstructions to vision	Fog, mist, haze, & freezing fog
Sky condition	Cloud height and amount to 12,000 Ft. AGL CLR, FEW, SCT, BKN, OVC
Ambient & Dew point Temperatures	Degrees Celsius
Pressure	Altimeter Setting In. Hg.
Remarks	Automated, Manual, & Plain Language – depending on service level

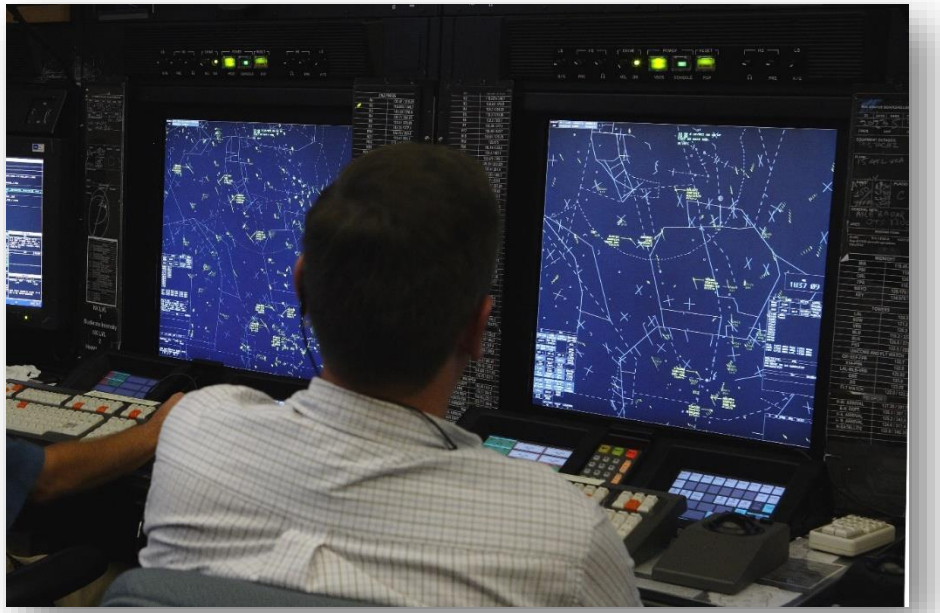
AWOS Information

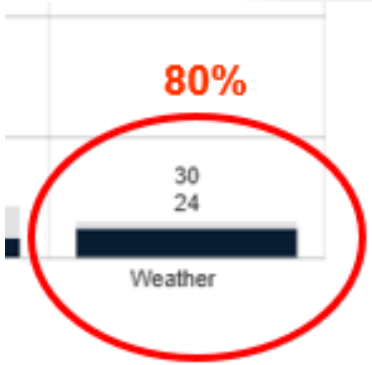
AWOS Type	Information Provided
AWOS-A	Altimeter Setting
AWOS-AV	Altimeter Setting & Visibility
AWOS-1	Altimeter Setting, Wind speed & direction, Temperature, Dew Point, & Density Altitude
AWOS-2	AWOS-1 plus Visibility
AWOS-3	AWOS-2 plus Cloud & Ceiling Data
AWOS-3P	AWOS-3 plus Precipitation Discriminator
AWOS-3PT	AWOS-3P plus Thunderstorm/Lightning
AWOS-3T	AWOS-3 plus Thunderstorm/Lightning
AWOS-4	AWOS-3 plus precipitation type and accumulation, freezing, thunderstorm, & runway surface information

Air Traffic Control

- **Limited ability and time to forward weather information**
- **You can learn a lot by just listening**
- **Don’t wait until the last minute to make diversion requests**

- **Psst!…use the “e-word” if you get into weather trouble…remember…**

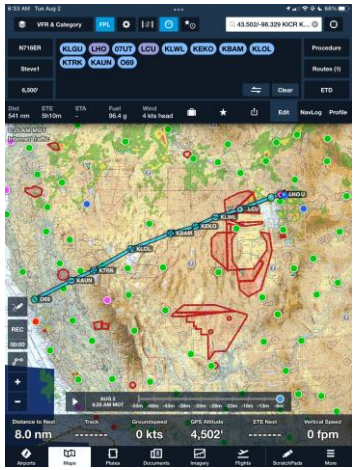




ADS-B FIS-B (Flight Information Services Broadcast)

The Non-Traffic Side of ADS-B IN

Rich Doyle

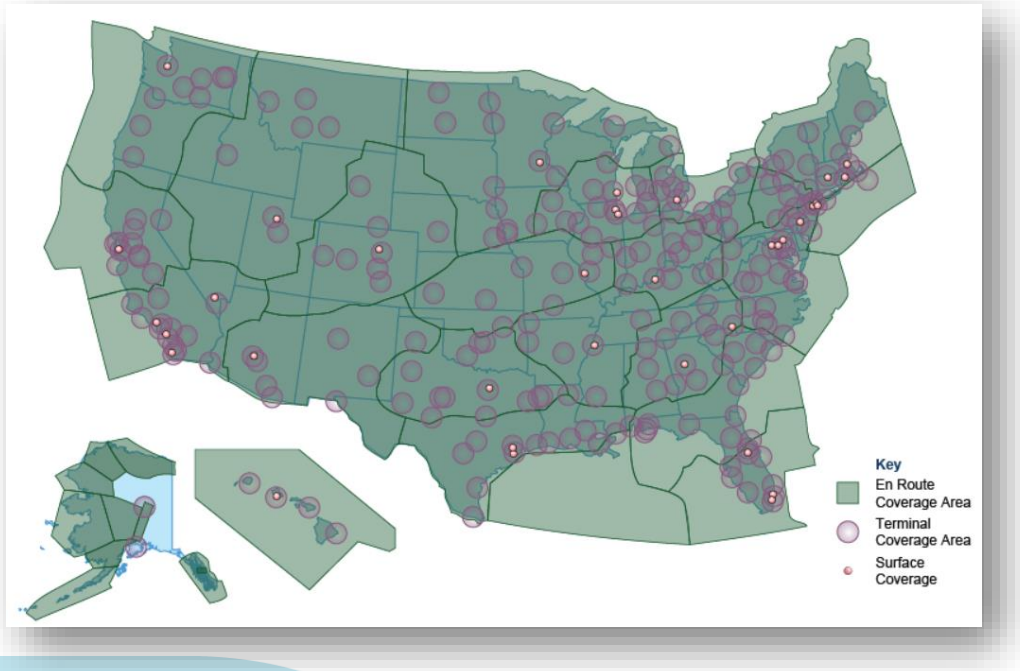


Automatic Dependent Surveillance-Broadcast

- **ADS-B OUT**
  - The “mandate” to operate in controlled (transponder) airspace
- **ADS-B IN**
  - The benefit to us for complying with the mandate (“data link”)

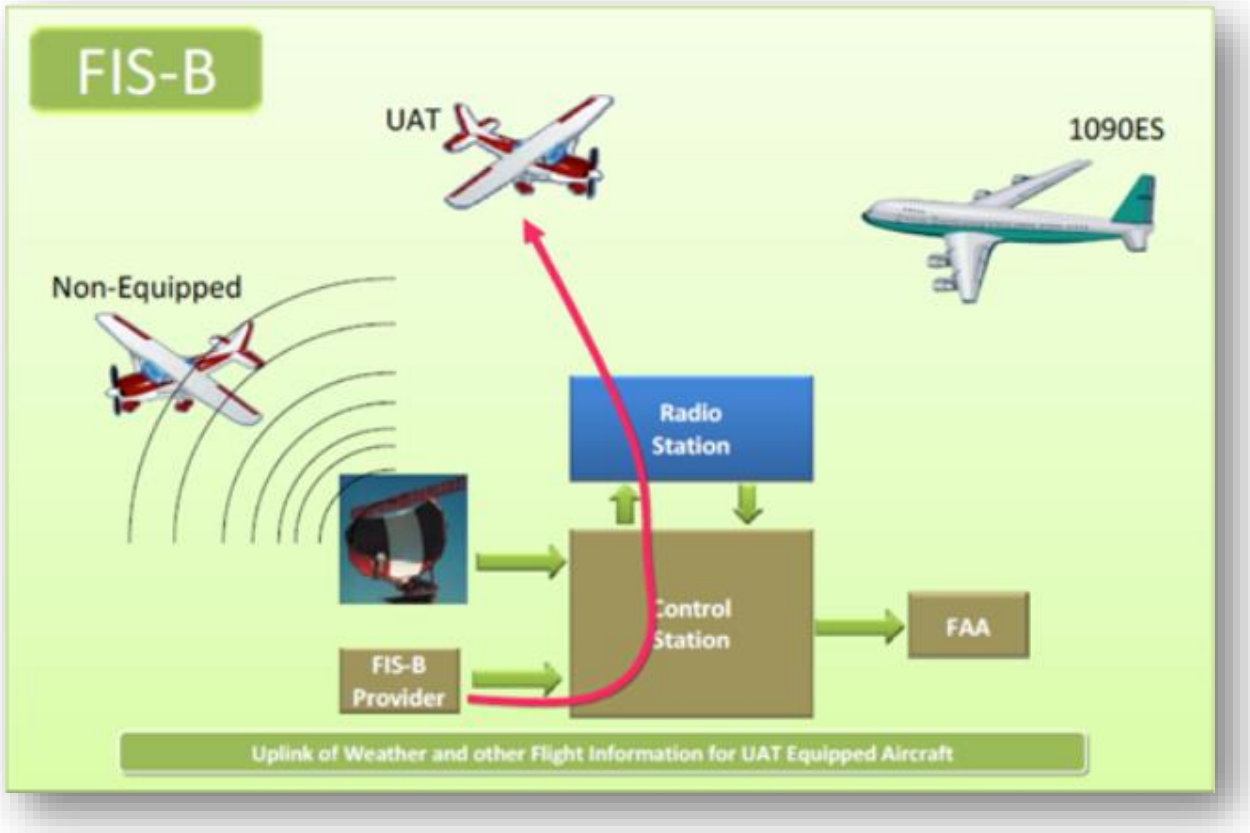
ADS-B IN Applications

- **Traffic Information Services - Broadcast (TIS-B) (1090 and UAT)**
- **Flight Information Services - Broadcast (FIS-B) (UAT only)**
  - UAT is broadcast on 978 MHz
- **When equipping, get dual-band IN**
- **At least use a hand-held…**



FIS-B

- **Available to ADS-B UAT equipped aircraft/handhelds**
- **System broadcasts aeronautical information products from the FAA and weather products from the National Weather Service**



FIS-B Products (Radar can be ~15-mins old)

AIRMETs	TAFs
Convective SIGMETs	Amended TAFs
SIGMETS	Winds & Temperature Aloft
METARS	Lightning
SPECIs	Turbulence
National NEXRAD	Icing
Regional NEXRAD	Cloud Tops
D-NOTAMs	Graphical AIRMETs
FDC-NOTAMs	Center Weather Advisories
PIREPS	TIS-B Service Status
Special Use Airspace (SUA) Status	

Note: All radar tools pull data from NOAA NEXRAD and crunch/display it differently

Note: Radar shows precipitation not clouds/viz

The Basics

- **This set of services is provided unsolicited to anyone with an operating ADS-B IN setup receiving 978UAT**
  - Typically, ABS-B receivers “listen” on this and 1090ES channels
- **FIS-B is transmitted continuously from the ADS-B towers on 978UAT only**
- **Requires line-of-sight to at least one tower—may not be available close to ground level**
- **There is no interaction with an aircraft’s ADS-B OUT configuration, nor does it require ADS-B OUT capability from the receiving aircraft**
- **978UAT is a US-only capability, though the system can provide information beyond US borders**

What Does It Provide?

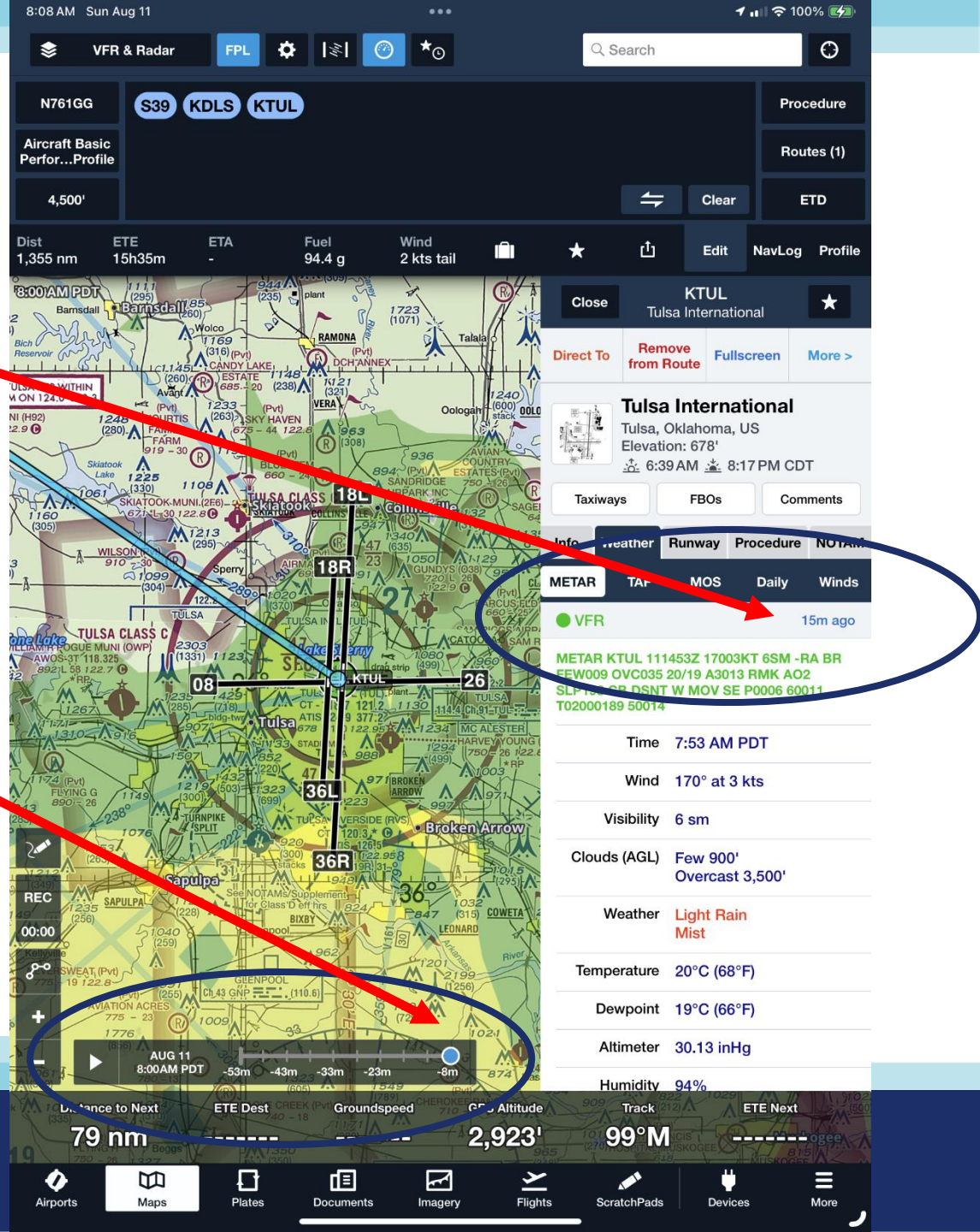
- **Weather information—lots!**
- **TFRs – updated in "real" time.**
- **MOA and other restricted airspace status.**
  - Still prudent to check!
- **NOTAMs**

Limitations

- **Transmissions from towers may not be available at levels close to or on the surface**
- **There is some time delay. This is typically 5-15 minutes but could be somewhat longer**
  - Composite radar takes time to crunch—allegedly up to 15-minutes
  - Then there is a transmission delay
- **Radar and other returns should NOT be used for severe weather avoidance**
  - It's only a general depiction of conditions
- **Usefulness and scope of the data is dependent on the features and capabilities of your display system**
- **Provides ASOS/AWOS data, but not full ATIS. Example of missing information: "visual approaches in use, landing and departing runways 5 and 11"**
- **Note: Foreflight Performance Plus Plan needed for D-ATIS**

Limitations

- **Read the time stamp**
  - This is the age of the data
- **Understand the time slider for radar layer (trend)**
  - At least 8-mins old, here



SiriusXM Aviation Services

- **Subscription required (next slide)**
- **Weather info via satellite, not ground**
- **“Near Real Time”**
  - 2.5 minute weather update
  - Look for time stamp
- **Cloud-to-ground and cloud-to-cloud lightening**
- **Good for *strategic* planning (not tactical)**
- **Just as bad as FIS-B for threading the needle**
- **Not a substitute for on-board weather radar**

Service Coverage Area

SiriusXM Aviation Services

SiriusXM Pilot Express

$29.99/mo

Plus $25 initial activation fee. See Offer Details below.

Radar & Lightning

Essential weather information for all pilots.

SiriusXM Pilot for ForeFlight

$39.99/mo

Plus $25 initial activation fee. See Offer Details below.

Cloud & Echo Top | Radar & Lightning

This package is designed specifically for use with the ForeFlight mobile app.

SiriusXM Pilot Preferred

$59.99/mo

Plus $25 initial activation fee. See Offer Details below.

Cloud & Echo Top | Radar & Lightning

Builds on the Express package with forecasts and weather observations.

SiriusXM Pilot Pro

$99.99/mo

Plus $25 initial activation fee. See Offer Details below.

Extended Forecast | Cloud & Echo Top | Radar & Lightning

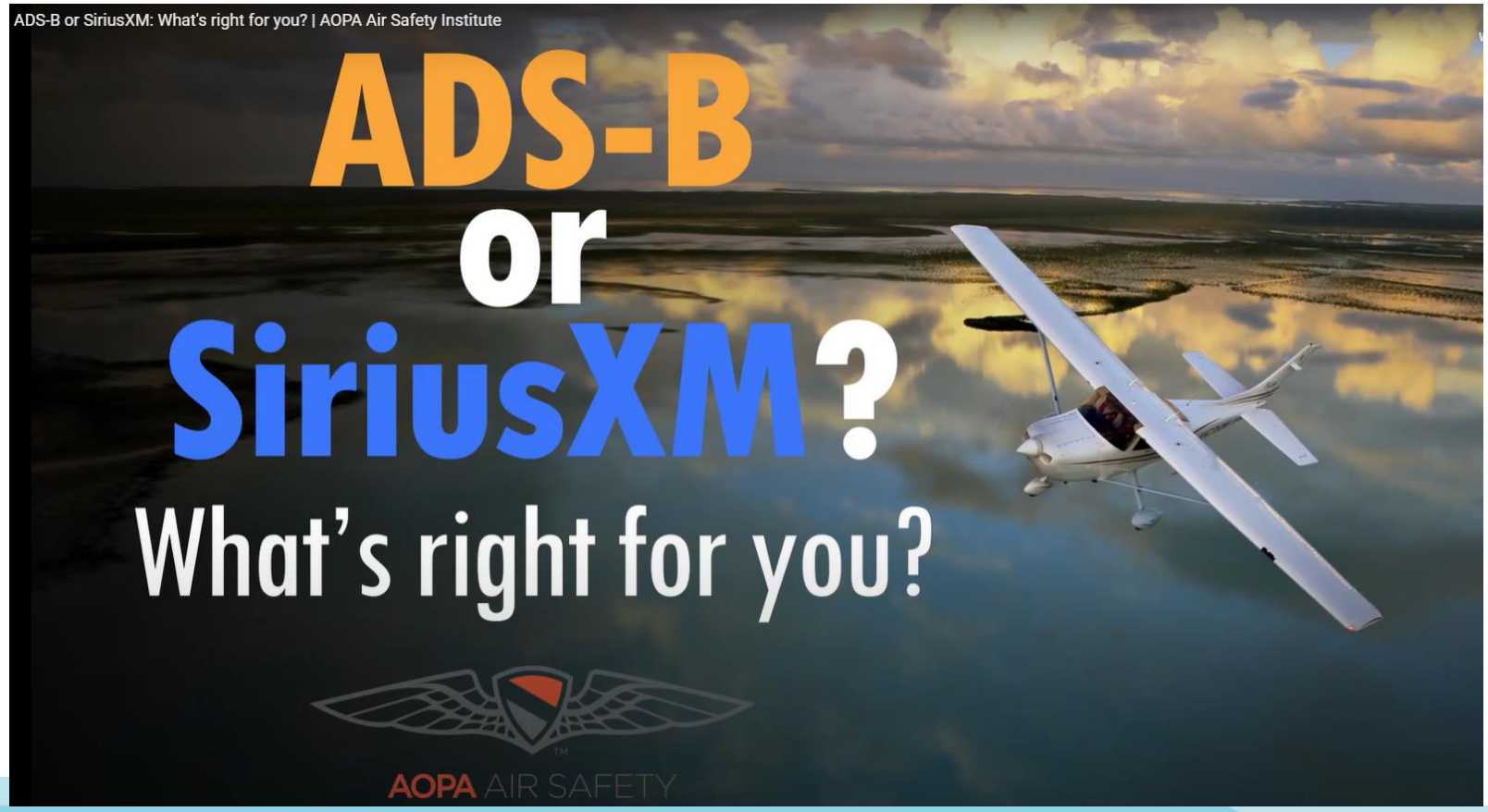
SiriusXM Aviation's most comprehensive package for pilots who need SiriusXM's full weather service.

FIS-B vs SiriusXM Weather

- **There are some advantages to SiriusXM:**
  - Refresh rate and surface availability
  - It can provide music and other audio feeds to the cockpit
- **It uses a different information channel so it requires additional equipment and a monthly subscription.**
- **XM is weather-centric. Various non-weather items provided by FIS-B require higher subscription level (NOTAM, TFR…)**
- **Some EFB products can provide XM weather on the (ADS-B) screen along with other data**

SiriusXM Aviation Services

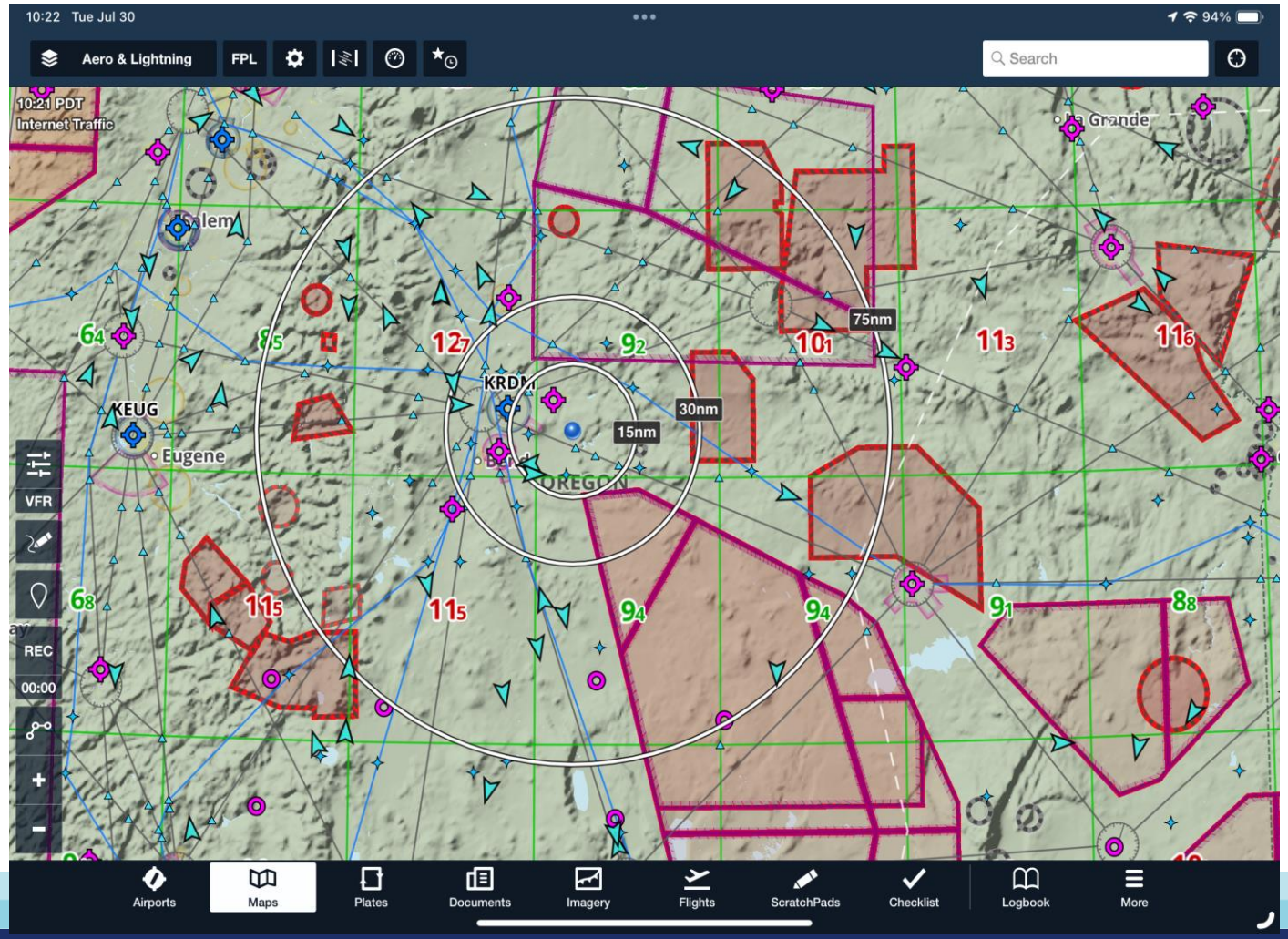
- **AOPA ASI comparison:**
  https://www.youtube.com/embed/gcD54HMqONs



Notes on Examples that Follow

- **These are various Foreflight screens**
- **This is not meant to imply that only Foreflight provides these data**
- **Other EFBs that depict this information have different screen navigation and will likely display it in different formats than shown**

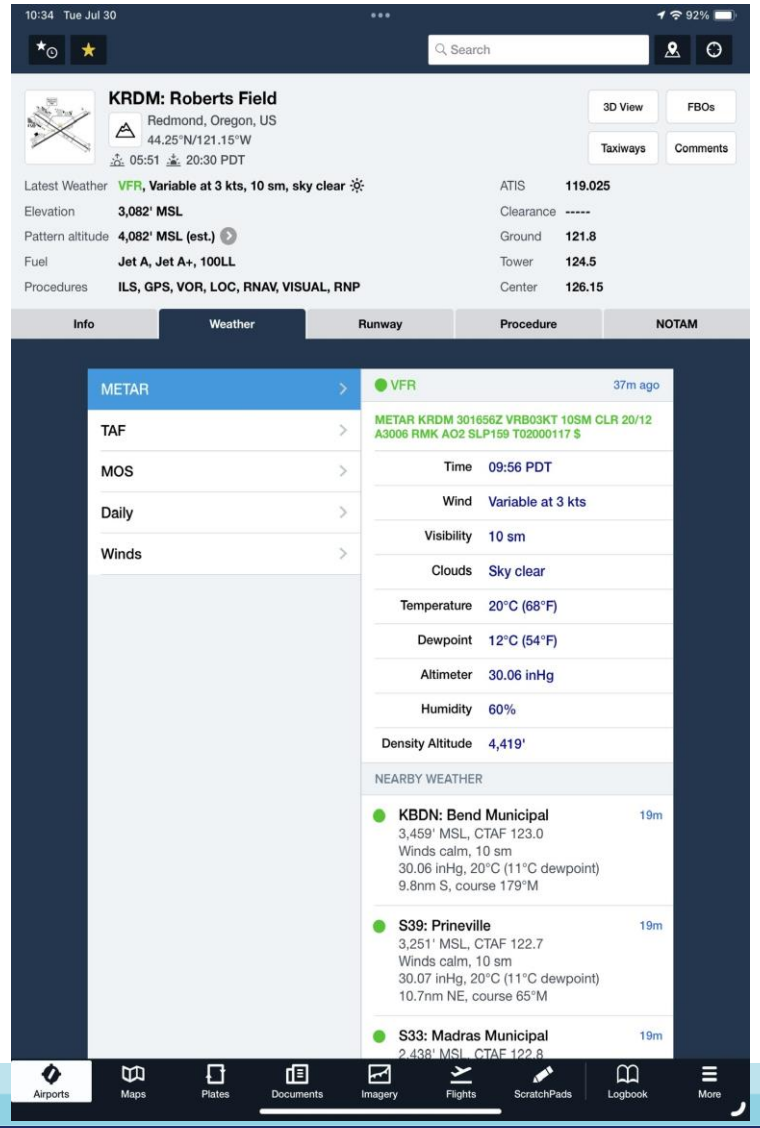
Foreflight Airspace Condition Display



- **TFRs galore (firefighting)**
- **MOAs active and not.**

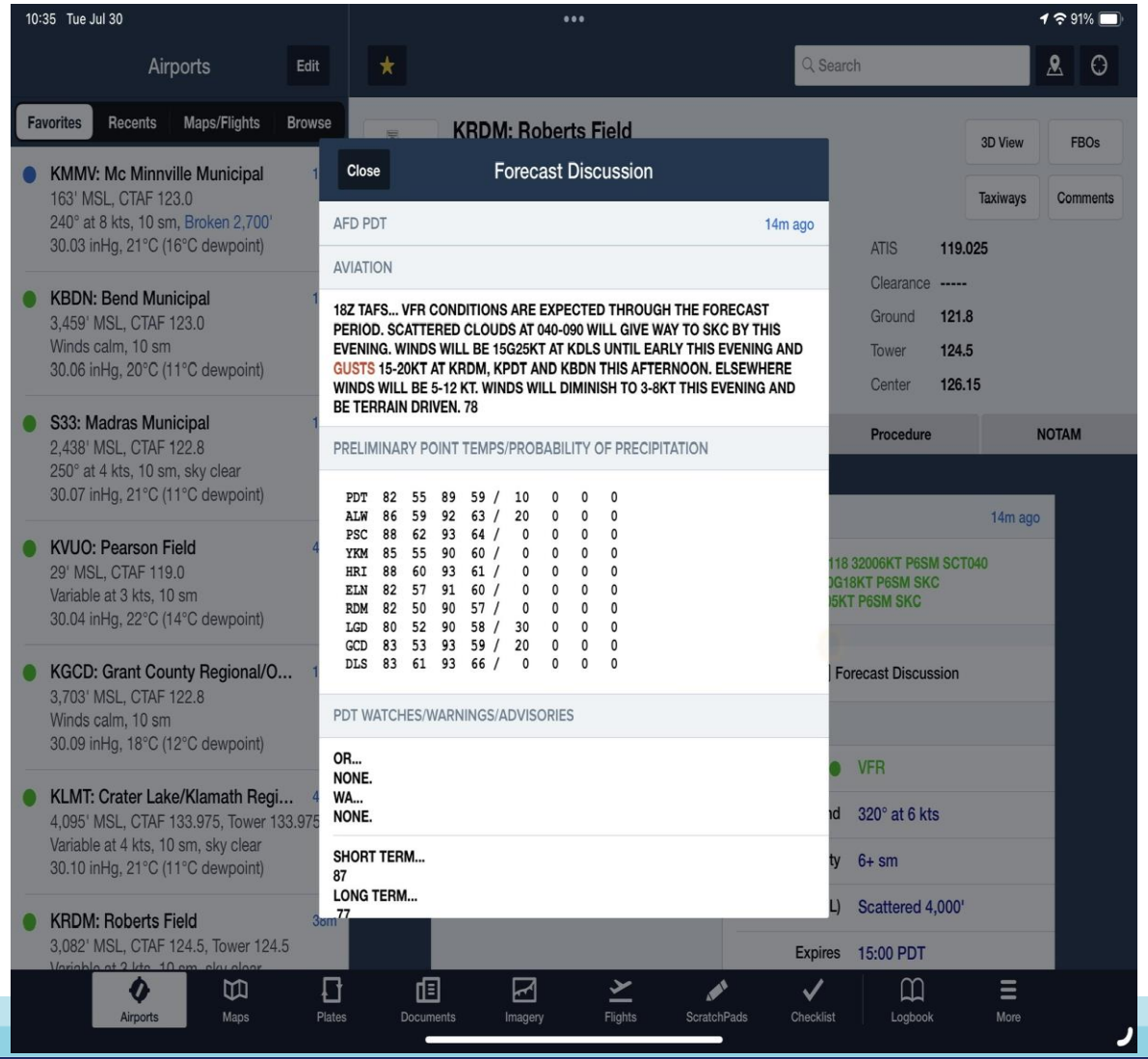
Federal Aviation Administration

Foreflight Terminal Weather Display



- **Although a Towered airport, you see ASOS, not ATIS.**
- **Note various other weather depictions available.**

Remember “Area Forecasts”?



They sort of went away, but it’s only a title change

In Foreflight, select “TAF” (previous slide) and then select “Forecast Discussion”

Foreflight Map Weather Layers

- Slide bar at bottom shows that radar data is 15-minutes old
- The animation slider can be used to show development and track over the previous hour
- Note the other weather-related layers and items that can be selected
- Not all can be simultaneously displayed

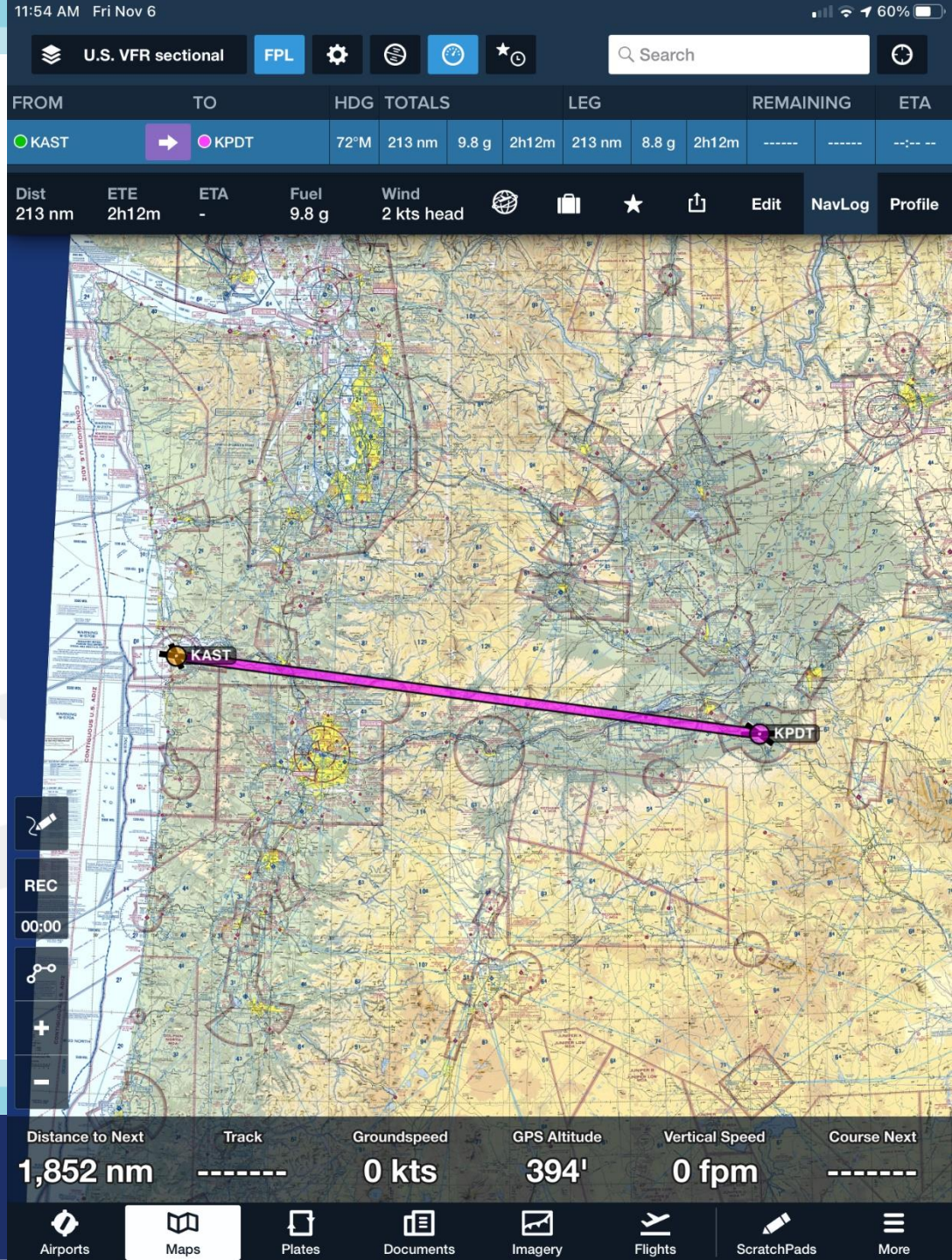
FIS-B Summary

- **Lots of information related to your planned and in-progress flights is available for free, given ADS-B IN capability**
- **Get familiar with what's available and how to get to relevant information using your EFB of choice**
- **Know how to turn-on required layers!**
- **Don't even think about picking your way through convective or icing conditions using this data alone**

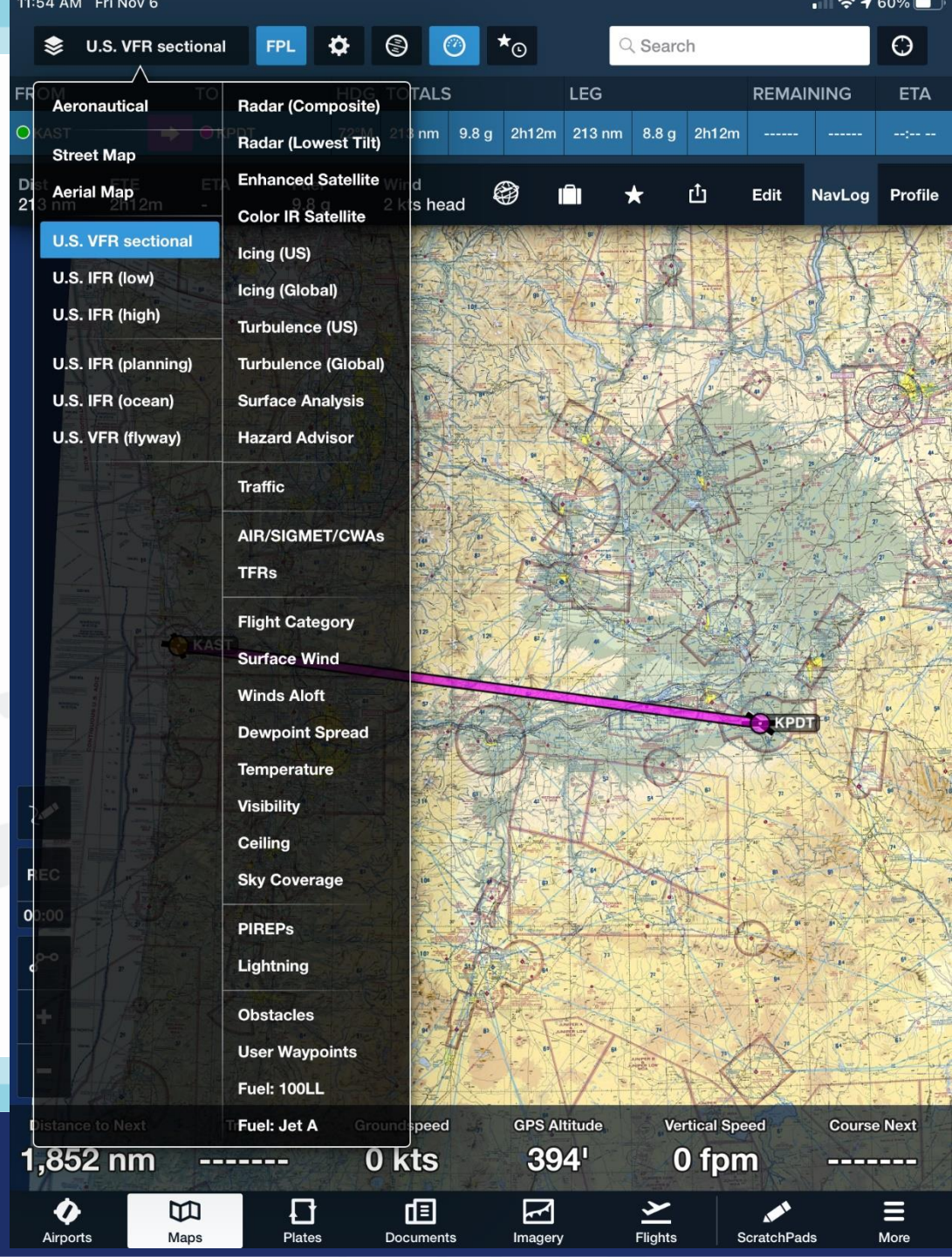
EFB

1. Charged and/or plugged-in
2. Connected to a source of FIS-B and TIS-B
4. You understand the limitations
5. Position it so it doesn’t overheat!
6. Know the layers menu!

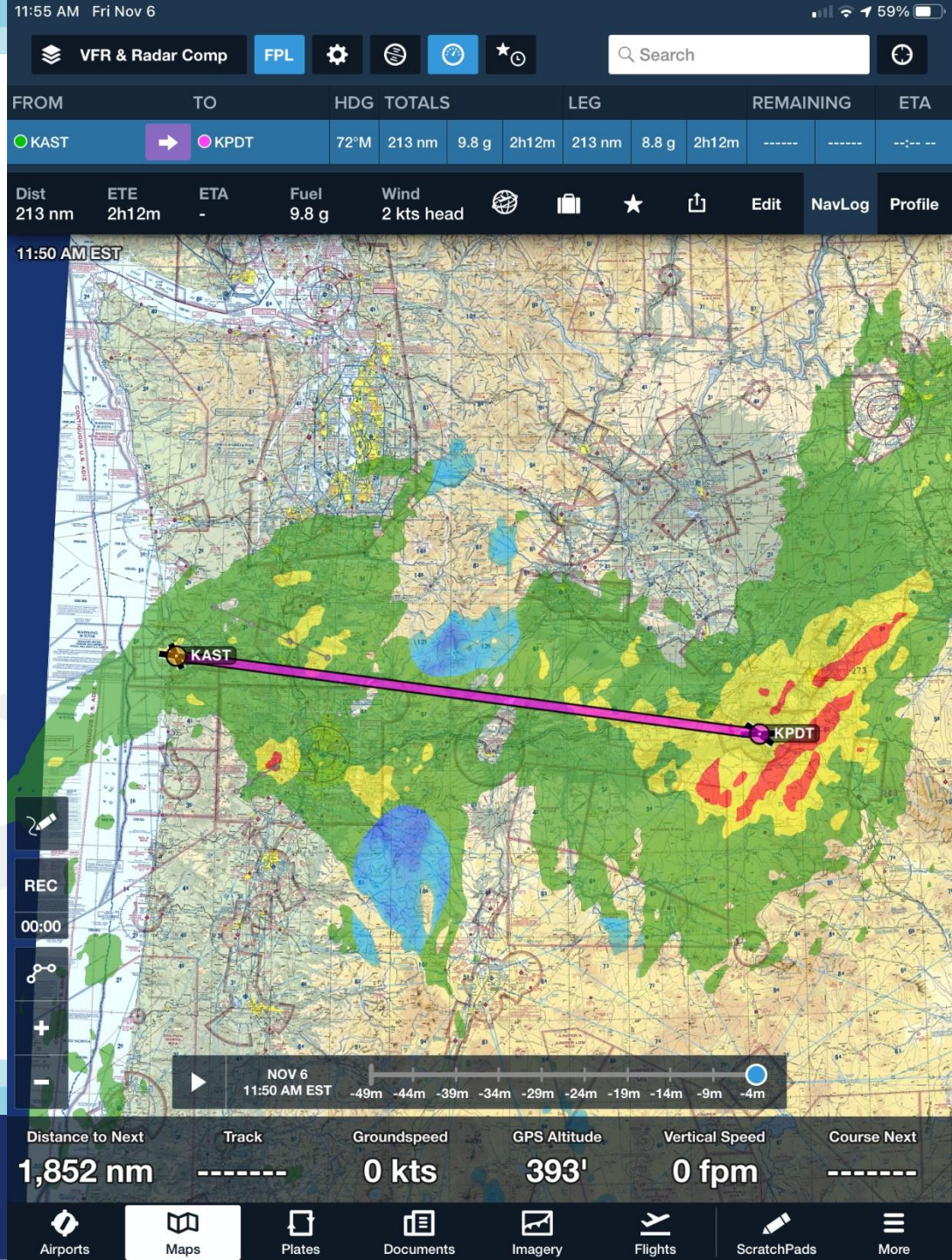
- **Astoria to Pendleton, OR**
- **This looks okay…**



- **Oh…wait…better turn on RADAR layer**

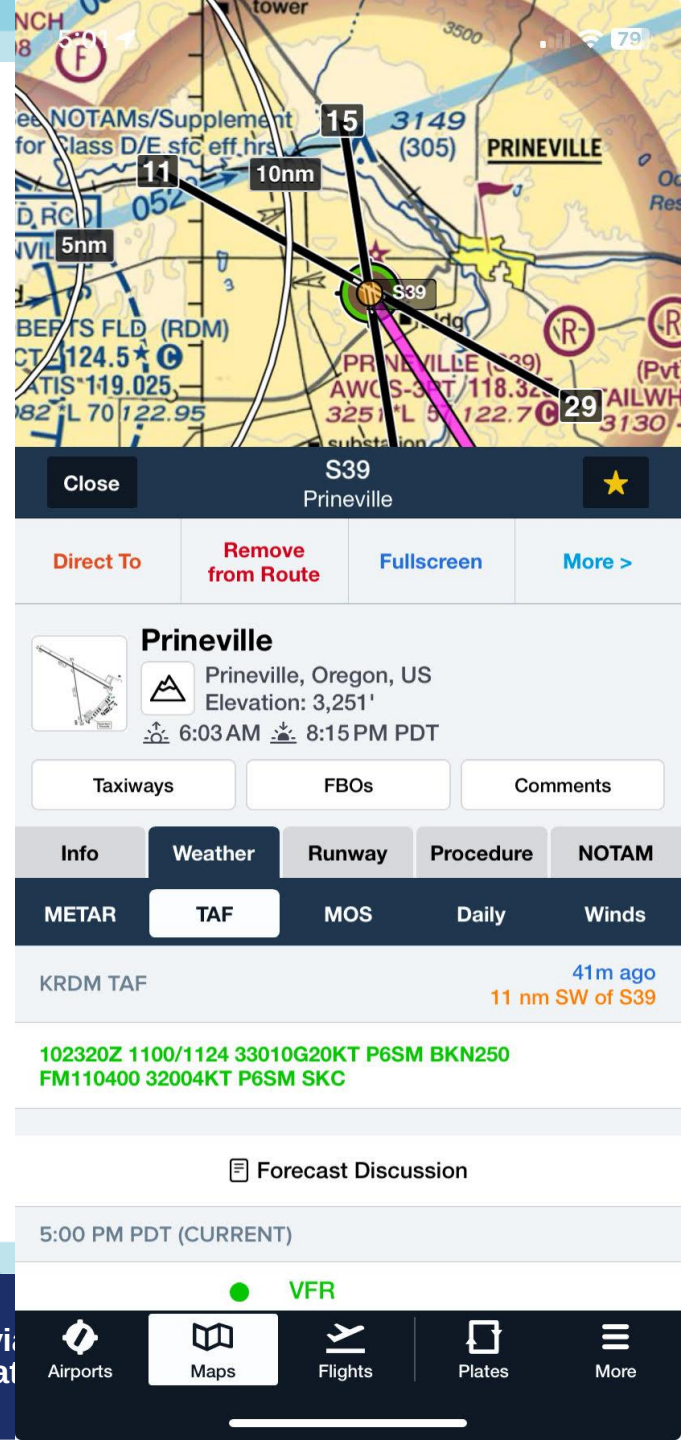


- **Umm…might be okay by the time we get there…more planning to do!**



TAF, MOS and Forecast Discussion

TAF	MOS/LAMP	Forecast Discussion
Created by meteorologists at NWS regional WX forecasting offices (WFOs).	Created using computer-based statistical modeling methods.	Written by the TAF creator to describe WX conditions in the forecaster's own words.
A concise statement of forecasted WX conditions over a 24 (or 30) hour period.	A "forecast guidance" product that provides "virtual" forecasts for airports where TAFs not issued, and over a longer forecast period.	May include concerns that cannot be encoded in the TAF and provide the forecaster's reasoning and level of confidence.
Issued every 6 hours, beginning at 0000Z.	Provides a 72-hour look-ahead in 3-hour increments. (Hourly for first 25 hours, via LAMP.)	Issued approximately every 6 hours to correspond with the release of the latest TAFs.
Covers a 5 sm radius of airport center. VCNTY covers 5-10 sm.	For a given airport, similar coverage area as TAF.	Covers the entire area within a WFO's geography.
Satisfies "Preflight Action" and IFR flight plan requirements.	Does not satisfy FAR requirements. Therefore primarily a supplemental tool.	Does not satisfy FAR requirements. Therefore primarily a supplemental tool.
	Includes some information not found in TAFs (e.g. Temp/DP).	



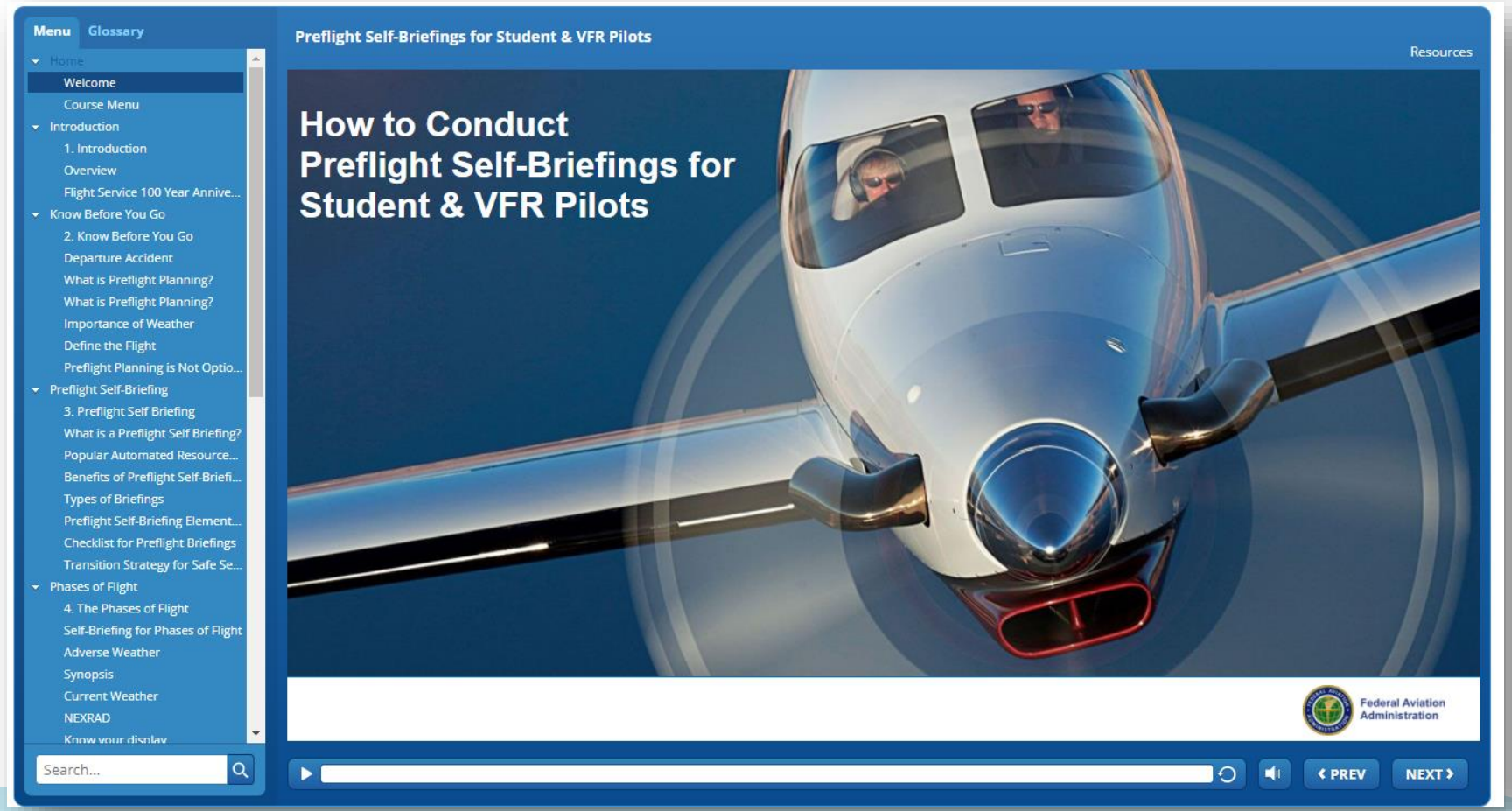
Federal Aviation Administration

Cautions & Tips

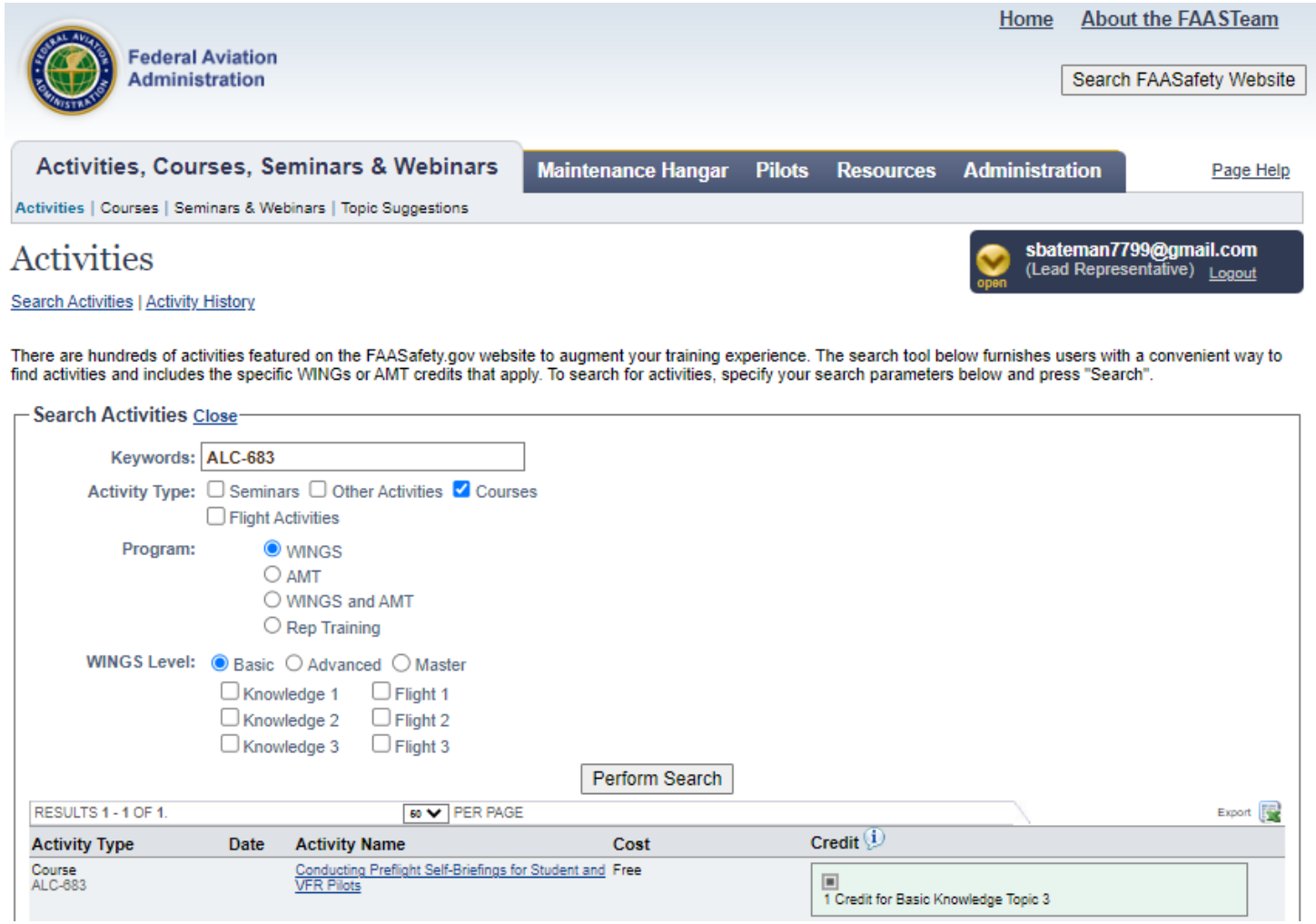
- **Don’t fixate on the equipment**
  - Cockpit displays don’t tell the whole story
    - We still have to look outside
- **Understand what the displays tell you… and what they don’t**
  - You may not see all the traffic in your area
  - …or all the weather ahead
- **Make weather avoidance decisions early**
  - Don’t wait till you’re too close to choose a route
  - Refine your decisions as more information becomes available
  - Obey the 20-mile rule

Want to know more?

WINGS course ALC-683 – I challenge you to take this tonight!



Finding it…



https://bit.ly/WINGS-ALC-683

Yep…I did it…

FAA Aviation Safety

Certificate of Achievement

This is to certify that

Stephen Bateman

has successfully completed the
FAA Safety Team Aviation Learning Center Online Course

Conducting Preflight Self-Briefings For Student And Vfr Pilots

Course Number ALC-683
Presented by AJI-1560, ATO Safety and Technical Training

July 3, 2024

Certificate Number 0351922-20240703-00683

Patricia Mathes, Manager, National FAA Safety Team

Proficiency and Peace of Mind

- **Regularly scenarios with your CFI**
- **“Revert to training”…only works if…?**
- **Practice, practice…**
  - Get in your head
  - …and keep it there…
- **Document in *WINGS***

FAASTeam

Safer Skies Through Education

Proficient Pilots are:

- **Competent** - They train regularly to keep their aviation skills razor sharp.
- **Confident** - They understand their capabilities and equally importantly they understand and operate within their limitations.
- **Safe** - Most importantly, they are safe.

WINGS Phase = Flight Review

WINGS Instruction = CFI Renewal

Have you earned your *WINGS*?

AC 61-91J

Federal Aviation Administration

•Homework

- Read FAA H-8083-28 Aviation Weather Handbook
- Read AIM Chapter 7, Section 1 – Safety of Flight
- Practice using 1800wxbrief.com for weather, briefings and filings
- Do *WINGS* course ALC-683
- If you use Foreflight, practice on the ground!
- Call flight service before flight…at least for latest NOTAMs and TFRs
- Call flight service in flight
  - Give a PIREP and ask for weather updates

References

- **AC 00-63A Use of Flight Deck Displays of Digital Weather and Aeronautical Information**
  - https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_00-63A.pdf

- **AC 90-114B Automatic Dependent Surveillance-Broadcast Operations**
  - https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_90-114B.pdf
- **AC 91-92 Pilot's Guide to a Pre-flight Briefing**
  - https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1036892
  -

References

- **Aeronautical Information Manual**
  - faa.gov/air_traffic/publications/media/aim_basic_dtd_4-20-23.pdf
  - Chapter 7 – Safety of Flight
    - Section 1 - Meteorology
- **FAA ADS-B Information**
  - https://www.faa.gov/nextgen/equipadsb/
- **Automated Surface Observing Systems**
  - https://www.weather.gov/asos/
  - https://www.faa.gov/air_traffic/weather/asos/

Thank you for attending

- **You are vital members of our GA safety community**

Next Month's ToM:

The National FAA Safety Team Presents

Topic of the Month
September
GA Aircraft Exhaust Systems

Presented to: Safety Minded Aviators, Everywhere…
By: Stephen Bateman, CFI, Chocks Away Aviation, LLC
Date: Tuesday 17th September 2024

Produced by:
The National FAA Safety Team (FAASTeam)

PDF Of These Slides Available For Your Further Study and Use

- **Actual slides post on the third Sunday of every month (August 18th)**
- **https://bit.ly/ToMSafetyArticle**

- **Select the safety article (month) of interest**
- **Open and save the PDF**
- **I'LL SHOW THIS INFO AGAIN AT THE END OF THE PRESENTATION**

- **Thanks to the AOPA Flying Clubs Initiative**

YOU CAN FLY
FLYING CLUBS