



The Front



NOAA's National Weather Service

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Mountain Flight Planning: Tips for Flying During Significant Mountain Weather

By Katy Barnham, Aviation Program Leader, NWS Riverton, WY

Especially for smaller aircraft, navigating mountain passes can be extremely dangerous during the winter months when mountain conditions can change rapidly. Inadequate planning may result in aircraft accidents or even pilot and passenger death. Improve your odds by using NWS resources when creating your initial flight plans and when deciding whether to fly. Here are some key factors to consider.

Expect bad weather: Knowing upcoming weather systems helps you determine the best time to fly based on forecasted icing or turbulence. You can evaluate weather conditions in hour-by-hour detail to find the best window for flying through mountain passes (Figure 1). In addition to hourly weather conditions, you can determine the potential for significant weather systems expected across the area by keeping track of ongoing watches, warnings, or advisories.

Be prepared for icing: As planes ascend a mountain, atmospheric moisture can accumulate on the body of the plane and freeze, resulting in a layer of ice on the plane's chassis. This ice can add significant weight

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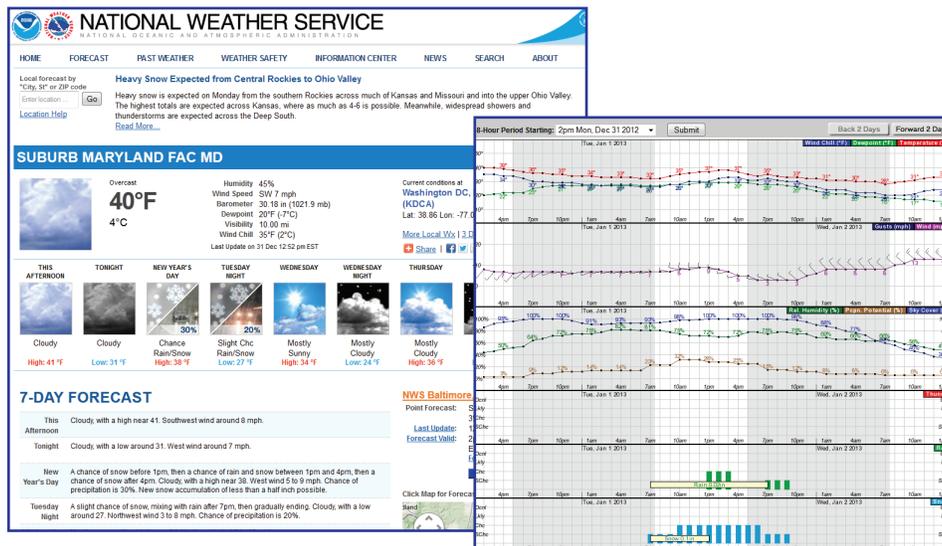


Figure 1: Hour-by-hour flight details

The Front

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Mission Statement

To enhance aviation safety by increasing the pilot's knowledge of weather systems and processes and National Weather Service products and services.

to a plane, markedly altering the ability of the plane to clear mountain tops. The Aviation Weather Center maintains a [Webpage solely to evaluate the icing threat](#) across the United States.

Know how to handle turbulence: Turbulence is a sudden upward or downward movement, usually associated with unsettled air. Turbulence can cause planes to

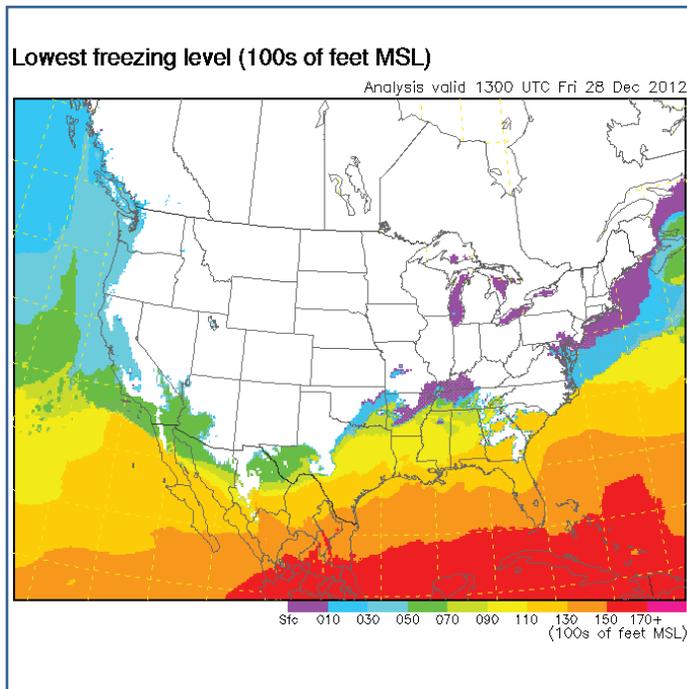
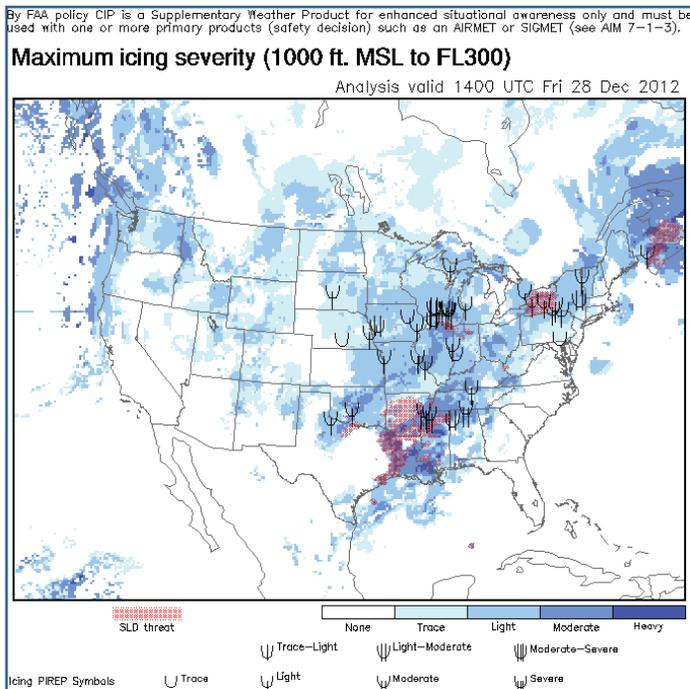
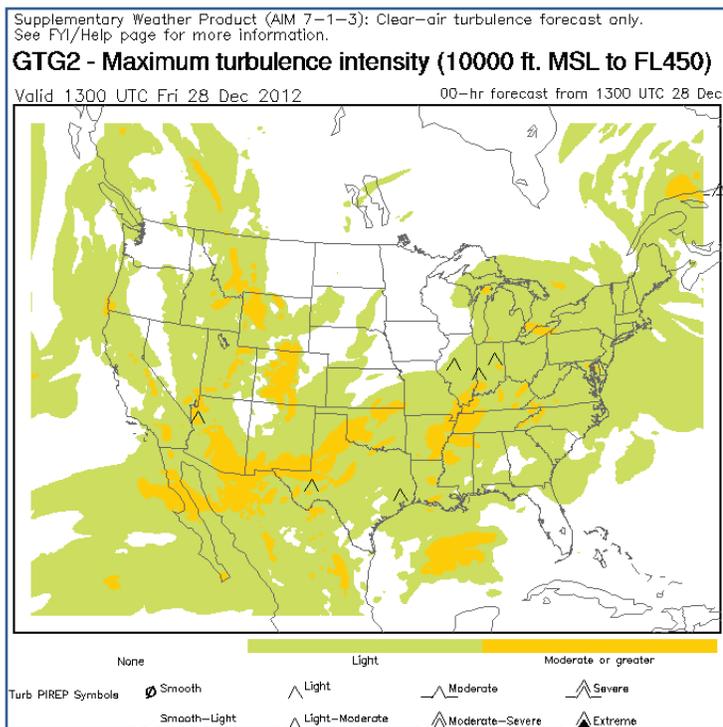


Figure 2: For the latest icing information, go to <http://aviationweather.gov/adds/icing/>



experience sudden loss in altitude, which can have tragic results when traversing mountain tops. The Aviation Weather Center [turbulence page](#) is a great asset.

Identify Alternate Airports: Identifying alternate airports is vital in flight planning. If a mountain pass ends up being too dangerous due to weather conditions, you need to know your landing options in advance. Local NWS offices issue [Terminal Aerodrome Forecasts for various airports](#) across their forecast areas. These forecasts can be evaluated by pilots to find a compatible airport that is accessible in emergency situations.

NWS Resources for Safe Flying

Figure 3: Turbulence data is online at <http://aviationweather.gov/adds/icing/>

◆ Center Weather Advisory

(CWA): Aviation weather warnings for hazards currently occurring, such as thunderstorms, severe icing or turbulence, and low ceilings and visibility. These products are typically 1-2 hours in duration (see article on next page for more on these products)

- ◆ **Meteorological Impact Statement (MIS):** 2-24 hour forecasts for imminent weather conditions expected to impact aviation interests
- ◆ **AIRMETS/SIGMETs:** Advise pilots of potentially hazardous weather
- ◆ **Pilot Reports:** Used to determine the presence of turbulence and icing in flight, and low-level wind shear at area airports. These reports not only provide critical information to pilots following the same route, but may result in NWS issuing CWAs, AIRMETS/SIGMETs or amendments to existing AIRMETS, SIGMETs, and TAFs. *As a pilot, please send in Pilot Reports whenever potentially hazardous conditions are encountered, or when forecast conditions are not being observed in-flight.*

Friendly Reminders

- ◆ No flight is a MUST flight.
- ◆ Take time to account for additions to plane weight (passengers, baggage, etc.) when evaluating the icing threat.
- ◆ Be prepared for quickly changing weather over mountain ranges, which can drastically increase the difficulty of making a mountain pass.
- ◆ Every flight requires full preflight evaluation, regardless of your experience level with a specific mountain pass.
- ◆ Weather observing equipment is sparse on mountains, so conditions may vary from the forecast.
- ◆ Turn around if conditions are too hazardous, especially before making your mountain ascent.
- ◆ File your flight plan.
- ◆ Respect the mountains!

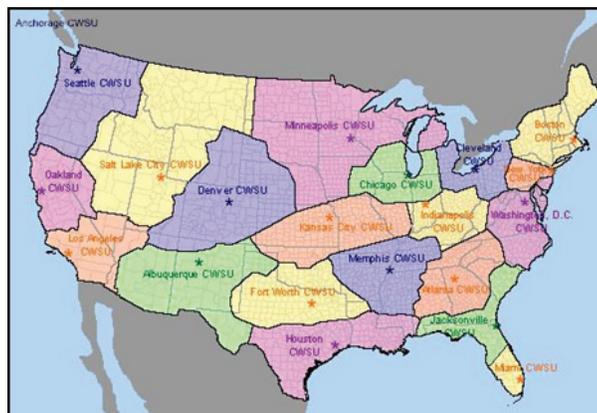
Get to Know Us

[Your National Weather Service \(NWS\) Local Office:](#) produces general forecasts and the Terminal Aerodrome Forecast (TAF) products used to indicate upcoming weather at specific airports.

[The Aviation Weather Center:](#) in Kansas City, MO, is responsible for various en route aviation related guidance including AIRMETS and SIGMETs

[Center Weather Service Units](#) are responsible for issuing statements of flight hazards such as turbulence, icing, and low ceilings via the CWA and MIS.

Figure 4: NWS Center Weather Service Unit areas of responsibility



Two Ways to Improve Aviation Situational Products

By [Michael Graf](#), Meteorologist, NWS Aviation Services Branch

Pilots can improve their Weather Situational Awareness by using two key products: the Area Forecast Discussion (AFD) and Center Weather Advisory (CWA).

The AFD is produced by your local NWS offices. These discussions initially developed as a way for forecasters to provide reasoning and uncertainty behind the public forecast. Over the years that discussion has expanded to include aviation and marine sections.

The AFD is hosted by Aviation Weather Center (AWC) in Kansas City, MO. The AWC hosts the only Website that consolidates all aviation discussions into one handy display. At the [AFD site](#), you'll see areas that highlight your local region, and a discussion that covers the local TAFs.

The AFD is an efficient way to quickly review the areas you're concerned about. Figure 1 below illustrates the aviation discussion broken out for Cleveland and the impacts to the TAFs. For more information on the AFD, see the November 2005 edition of [The Front](#).

of [The Front](#).

Now let's look at CWAs. The NWS Center Weather Service Units (CWSUs) issues these useful advisories. A CWA is an aviation weather warning for conditions meeting or approaching national in-flight advisory (AIRMET, SIGMET or Convective SIGMET) criteria.

A CWA is primarily used by air crews to anticipate and avoid adverse weather conditions in the en route and terminal environments. [CWAs are also available on the AWC Website](#).

CWAs are valid for up to 2 hours and may include forecasts of conditions expected to begin within 2 hours of being issued. If conditions are expected to persist after the advisory's valid period, a statement to that effect is included in the last line of the text.

Additional CWAs are issued as needed. If there is a significant change in the phenomenon described in a CWA, the CWSU issues a new CWA for that phenomenon. If the forecaster deems it necessary, CWAs may be issued hourly to cover intense convective activity.

For a complete review with CWA examples, see advisory circular [AC-0045G available online](#). Look for Section 6.4.

Three examples follow here.

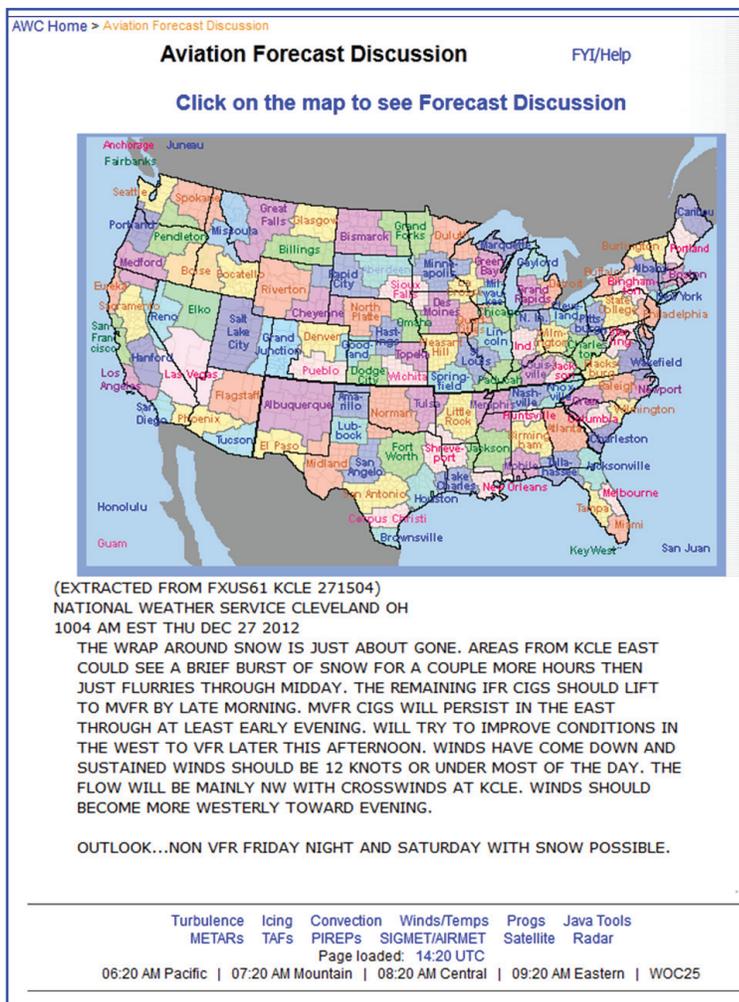


Figure 1: NWS County Warning Areas with aviation discussion for Cleveland, OH

Example 1

ZME1 CWA 081300
 ZME CWA 101 VALID TIL 081500
 FROM MEM TO JAN TO LIT TO MEM
 OCNL TS MOV FM 26025KT. TOPS TO FL450

What Does It Mean?

Center Weather Advisory issued for the Memphis, Tennessee ARTCC on the 8th day of the month at 1300 UTC.

The 1 after the ZME in the first line denotes this CWA has been issued for the first weather phenomenon to occur for the local calendar day.

The 101 in the second line denotes the phenomenon number again (1) and the issuance number (01) for this phenomenon.

The CWA is valid until the 8th of the month at 1500 UTC.

From Memphis, Tennessee to Jackson, Mississippi to Little Rock, Arkansas to Memphis, Tennessee.

Occasional thunderstorms moving from 260 degrees at 25 knots.

Tops to flight level 450.

Example 2

ZLC3 CWA 271645
 ZLC CWA 303 VALID TIL 271745
 CNL CWA 302.
 SEE CONVECTIVE SIGMET 8W

What Does It Mean?

Center Weather Advisory issued for the Salt Lake City, Utah ARTCC on the 27th day of the month at 1645 UTC.

The 3 after the ZLC in the first line denotes this CWA has been issued for the third weather phenomenon to occur for the local calendar day.

The 303 in the second line denotes the phenomenon number again (3) and the issuance number (03) for this phenomenon.

The CWA is valid until the 27th day of the month at 1745 UTC.

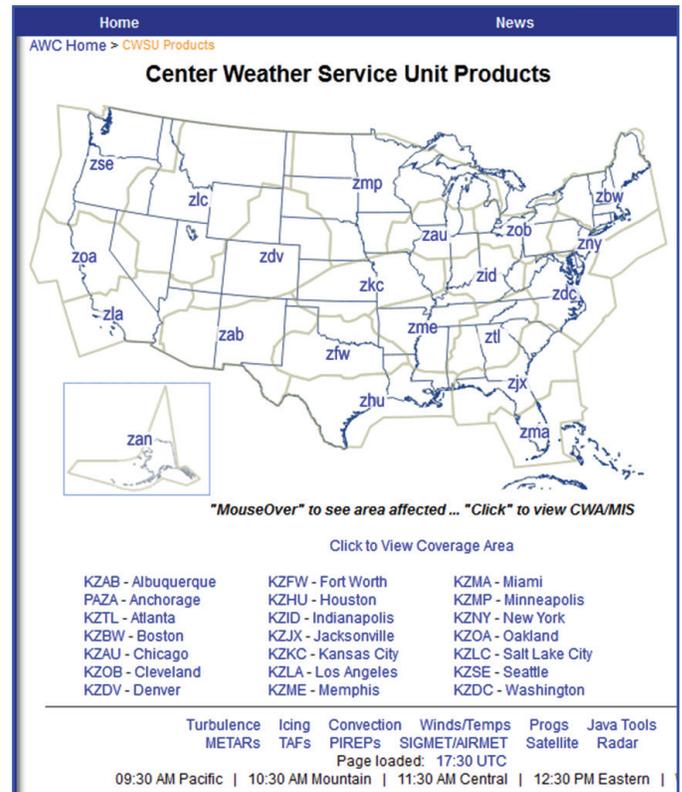


Figure 2: CWSU product map

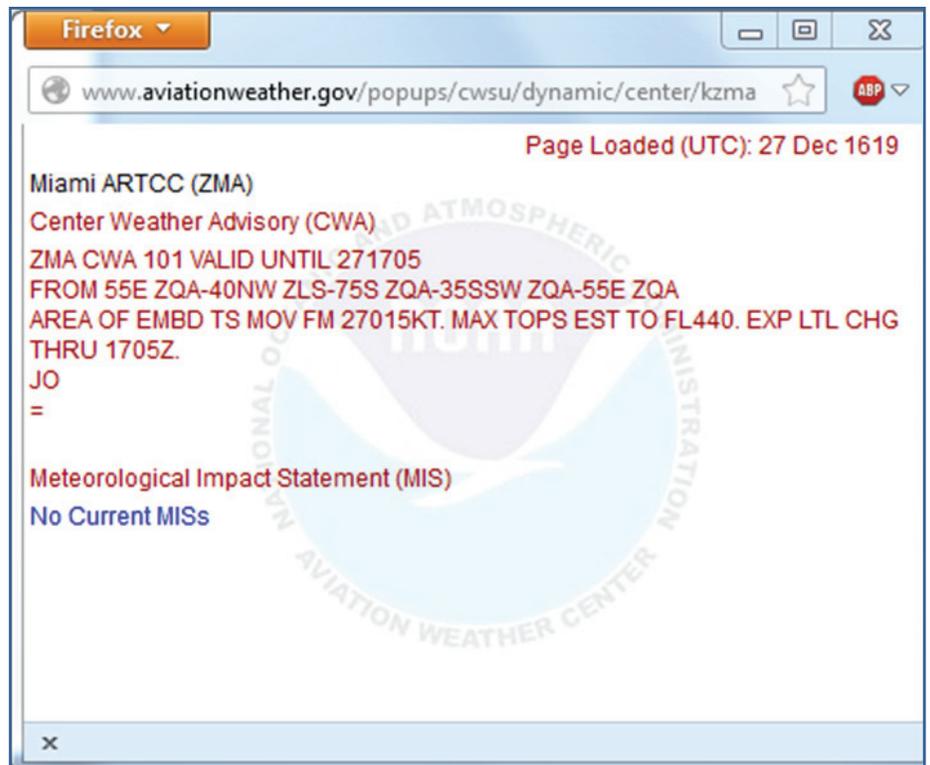


Figure 3: Sample Center Weather Advisory

CWA number 302 has been cancelled.
See Convective SIGMET 8W.

Example 3

ZME1 CWA 040100
ZME CWA 101 VALID TIL 040300
VCY MEM
SEV CLR ICE BLW 020 DUE TO FZRA. NUMEROUS ACFT REP RAPID
ACCUMULATION OF ICE DRG DES TO MEM. NO ICE REPS ABV 020. CONDS
CONTG
AFT 03Z. NO UPDATES AFT 040200Z.

What Does It Mean?

Center Weather Advisory issued for the Memphis, Tennessee ARTCC on the 4th day of the month at 0100 UTC.

The 1 after the ZLC in the first line denotes this CWA has been issued for the first weather phenomenon to occur for the local calendar day.

The 101 in the second line denotes the phenomenon number again (1) and the issuance number (01) for this phenomenon.

The CWA is valid until the 4th day of the month at 0300 UTC. For the Memphis, Tennessee vicinity.

Severe clear icing below 2,000 feet MSL due to freezing rain.

Numerous aircraft report rapid accumulation of icing during descent to Memphis.

No icing reports above 2,000 feet MSL.

Conditions continuing after 0300 UTC. No updates after 4th day of the month at 0200 UTC.

END...