

# Flying Weather:

## Aviation Weather Safety in the Intermountain West



CWSU Salt Lake City

Volume 3 Issue 1

June 2019

## Summertime in the West: What Pilots Should Know!

By: Rick Dittmann, Meteorologist-in-Charge, NWS CWSU Salt Lake City

During the warmer half of the year, the jet stream migrates north toward and in to Canada. The result are weather phenomena changes that impact flight. Some of these are dangerous. Thunderstorms generate powerful updrafts and downdrafts, often accompanied by heavy rain and hail. They generate dangerous cross winds and low level wind shear. These winds can create dramatically lower visibility in rain, hail and often blowing dust. They can obscure mountain tops or entire mountains in low clouds.

Sometimes the West gets caught under growing high pressure ridges. When this occurs, oppressive heat typically develops. When heat occurs at high altitudes, density altitude issues become significant. You can view more about this significant hazard on page 7.

Roughly 40 percent of weather related aircraft accidents occurred wherein the pilot did not receive a weather briefing. At the CWSU ZLC, we are trying to supplement your weather briefing with resources designed to keep you informed of the often rapidly changing conditions. One of these ways is via our web page which you can find at [weather.gov/zlc](http://weather.gov/zlc). Here, you can peruse relevant products like CWAs, MISs, AIRMETs, SIGMETs, CSIGs, PIREPs, etc. Headlines highlighting weather of significance from the nine Weather Forecast Offices under our service umbrella can also be found on our page. Periodically, we will create a weather story graphic and post it to the page. Weather Stories help provide a graphical idea of what we usually say with words. We receive positive feedback from our customers regarding these weather stories.

### What's Inside?

- NWS Great Falls & Environment Canada
- What is the TCF?
- New TAF for West Yellowstone
- Thunderstorm Impacts to the NAS
- NWS Las Vegas "Flight Path" Episode
- Seasonal Outlook
- High Density Altitude Impacts
- Aviation Outreach & Education

The screenshot shows the National Weather Service website for the Center Weather Service Unit Salt Lake City, UT. The page features a navigation menu with links for HOME, FORECAST, PAST WEATHER, SAFETY, INFORMATION, EDUCATION, NEWS, SEARCH, and ABOUT. Below the navigation, there is a local forecast section with a search box for "City, ST, or ZIP code" and a "Go" button. To the right of the search box is a "Location Help" link. Below the search box is a "News Headlines" section with a list of headlines: "Thunderstorms In The Forecast", "NWS Salt Lake City - 2nd Wettest Spring", "NWS Elko - Flood Warnings", "NWS Riverton - Warmer and Drier, Isolated Showers and Storms West", and "NWS Billings - Flooding Threats". Below the headlines is an "Additional Headlines" link. To the right of the headlines is a weather story thumbnail titled "Thunderstorm Activity Continues For ZLC-Area Today" with a "MORE UNSTABLE WX" link. At the bottom of the page, there is a "Center Weather Service Unit Salt Lake City, UT" logo and a "Salt Lake City, UT Center Weather Service Unit" logo.

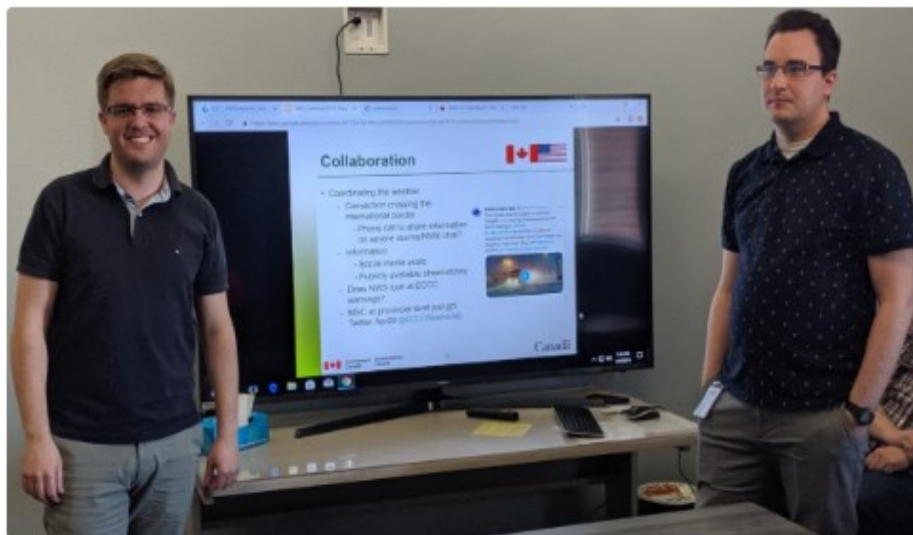
An example of the banner portion of the CWSU ZLC web page showing headlines and a clickable weather story thumbnail.

Finally, do you enjoy social media? We are a part of the Facebook and Twitter communities. If you like or follow us, you will have access to the variety of posts and tweets we send from our accounts: [Facebook.com/NWSCWSUZLC](https://www.facebook.com/NWSCWSUZLC) and [@Twitter.com/NWSCWSUZLC](https://twitter.com/NWSCWSUZLC). Furthermore, we forward many posts and tweets from the WFOs in and around our area of responsibility.

# NWS Great Falls Hosts Environment Canada Meteorologists

By: Jason Anglin, Meteorologist, NWS Great Falls

During the week of May 6th, 2019, the National Weather Service (NWS) Great Falls Weather Forecast Office (WFO) hosted two Environment Canada (EC) meteorologists (Jim Tirone and Tom Anderson) from the Prairie and Arctic Storm Prediction Centre (PASPC), located in Edmonton Alberta, Canada. One of the topics of discussion included Digital Aviation Services (DAS) support, along with the differences and similarities in how our two nations work aviation support. Aviation Program Leaders, Jane Fogleman and Jason Anglin, worked through a set of 18Z TAFs while EC guests observed, interacted, and compared methodologies throughout the process.



*Meteorologists Jim Tirone (left) and Tom Anderson (right) of Environment Canada presenting on their operations and collaborations*

One difference worth noting is how Canadian aviation products are produced versus their American counterparts. NWS TAFs and Airport Weather Warnings (AWWs) are produced locally at the WFO for those airports which reside within the WFO's County Warning Area (CWA). Other NWS aviation products such as Center Weather Advisories, Meteorological Impact Statements, and SIGMETs are produced and disseminated by regional Center Weather Service Units (CWSUs) and nationally at the NWS Aviation Weather Center (AWC). Canada issues TAFs, SIGMETs, and

other aviation forecast products using two aviation forecast offices called Canadian Meteorological Aviation Centres (CMACs) located in Edmonton and Montreal. Although EC PASPC forecasters do not write TAFs, they are trained to in their forecast development training and may request to work shifts with their co-located CMAC aviation office. Some will do this to obtain experience with TAF production and dissemination, create aviation products, and gain experience outside their normal public service duties. Finally, they shared the importance of collaboration between the public desks of the PASPC and the aviation desks of the CMAC.

Those at NWS Great Falls could not thank their Environment Canada counterparts enough for their time and willingness to share their strategies for serving the public and key partners. Aviation services were only one part of the many items shared during this multiple day meet-up. This communication and collaboration will allow American and Canadian meteorologists to identify innovations that can be made on either side of their shared borders. This innovation will improve support to not only our similar aviation partners, but also to our comparable public users.

# Traffic Flow Management Convective Forecast (TCF)

By: Amy Macpherson, Senior Aviation Meteorologist, NWS Aviation Weather Center

The Aviation Weather Center (AWC) located in Kansas City, MO dedicates one of its five 24/7 domestic operations forecast desks to convective forecasting for the purpose of air-traffic planning and management across the National Airspace System (NAS). The TCF is a high-confidence convection forecast issued every two hours. It concentrates on radar reflectivities and echo tops at the 4, 6 and 8 hour timeframes (all times in UTC). With this in mind, it is important to note not all convective activity will be included on the TCF product; only scattered or greater areas with high confidence meeting the minimum criteria of 40 dBZ and FL250 are included.

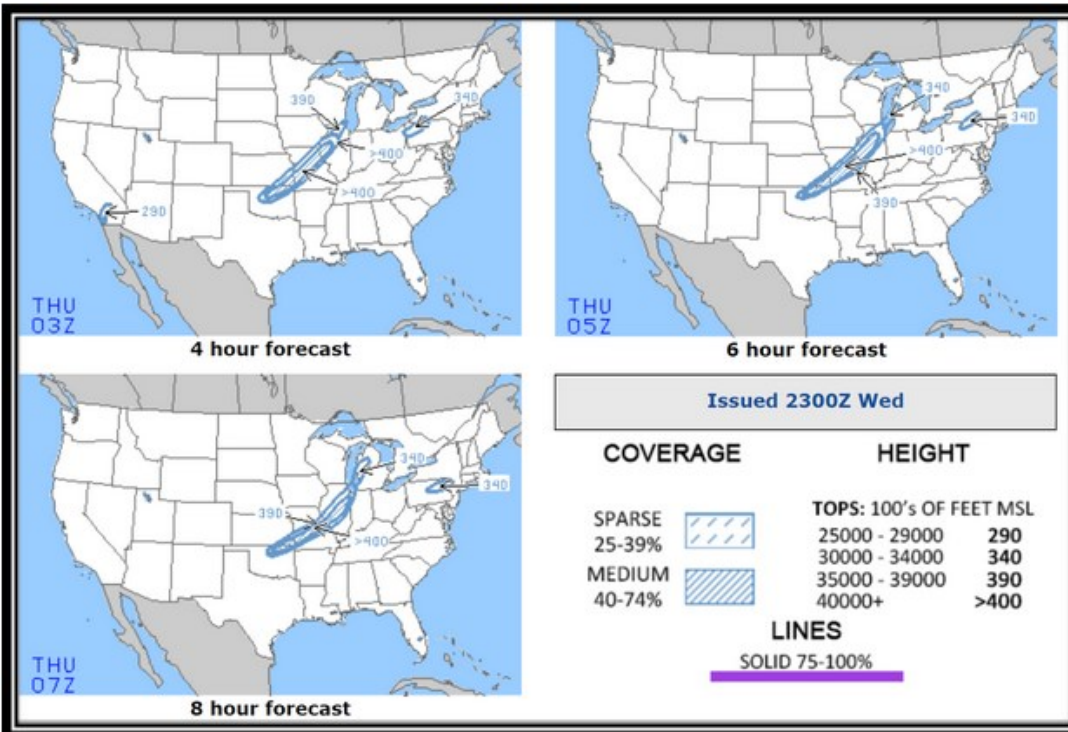


Image 1: Example of the TCF product as displayed on the AWC's website at [www.aviationweather.gov/tcf](http://www.aviationweather.gov/tcf)

Before every issuance, the AWC TCF forecaster initiates and facilitates a 30-minute collaboration session with multiple aviation partners across the NAS. This collaboration includes meteorologists at the Center Weather Service Units (CWSUs), major airlines, aviation industry stakeholders, the Canadian Meteorological Aviation Centre (CMAC), and the FAA Command Center in Warrenton, VA. All of our partners can provide input and suggestions to the TCF during the collaboration sessions. The AWC TCF forecaster then considers all input and makes the necessary modifications before issuing the final product to the users. These collaboration sessions with our partners make the TCF product a true team effort that provides a consistent picture and message. The final TCF product is posted to the Aviation Weather Center's website at [www.aviationweather.gov/tcf](http://www.aviationweather.gov/tcf) (Image 1). The TCF is widely used by air traffic management units at the national level (FAA Command Center) and regional level (Air Route Traffic Control Centers) as well as major airlines. Having air traffic plans in place well in advance of anticipated convection has great logistical and economic impacts to the aviation industry including minimizing the number of diversions and unscheduled delays.

The TCF season across the NAS runs from March 1st through October 31st when convective impacts are at their highest, while the CMAC portion runs from April 1st to September 30th and includes convective impacts across southern Ontario and Québec. During the winter months, an automated version of the TCF is generated from high-resolution model data and is available to users for planning purposes.

# NWS Great Falls Preparing for Addition of West Yellowstone TAF

By: Jason Anglin , Meteorologist, NWS Great Falls

At 18z on July 16th, 2019, NWS Great Falls will start serving the aviation community of West Yellowstone, Montana (KWYS) by producing a 24 hour Terminal Aerodrome Forecast (TAF) every six hours. West Yellowstone is the closest full service airport to Yellowstone National Park, has a runway length that can accommodate general and commercial aircraft, and has ILS, NDB, and GPS instrument approach capabilities. In an effort to ensure a smooth start up of TAF services, NWS Great Falls met with two key potential users of this new service. Troy Hunter is the Ennis Airport Manager and Operations Manager for Choice Aviation in Ennis and West Yellowstone. Dave Ball is a pilot for Air Methods, a medevac company



that operates a helicopter year round in West Yellowstone in support of medical emergencies in Yellowstone National Park. NWS Meteorologist Jason Anglin met with Troy in Ennis, MT, and with Air Methods Pilot Dave Ball. The findings from Troy and Dave have proven to reassure the importance of a TAF in West Yellowstone.

During the informative meeting, Troy gave insights to triumphs and challenges of the September 2016 start up of the Ennis (KEKS) TAF. The goal is to take the lessons learned from this spin up to apply to the upcoming start of the West Yellowstone TAF. Troy gave valuable insights on the traffic, terrain, weather, and other challenges of the West Yellowstone Airport. West Yellowstone hosts 2 to 3 commercial flights a day May through September. With the West Yellowstone Airport being the closest full service airport to the park, high amounts of general aviation traffic are also expected each year. Troy and Dave gave great insight into the potential biggest user of a TAF in West Yellowstone, medevac services provided by helicopter and fixed wing aircraft of Air Methods. Pilot Dave Ball explained they have a helicopter and medical crew on standby 24/7 in West Yellowstone that can only fly VFR conditions. Fixed wing aircraft can be flown into West Yellowstone from Idaho in most conditions. These medevac services are provided year round by helicopter, despite the runway being closed in the winter.

Important findings of this meeting were shared during a staff meeting at NWS Great Falls by Aviation Program Leaders Jane Fogleman and Jason Anglin. Both Troy and Dave have also agreed to become key partners in making sure aviation services in southwest Montana remain top notch. All parties expressed excitement and commitment to making sure this new TAF service begins and continues successfully. With complex terrain and even more complex weather, the addition of a TAF in West Yellowstone should help enhance safety for the aviation community in and around Yellowstone National Park.

# Thunderstorm Impacts to the National Airspace System

By: David Bieger, Meteorologist-in-Charge, Air Traffic Control System Command Center

When most people think of summer, some images that come to mind are those of neighborhood cook-outs, family vacations at the beach, and sunny, warm days spent relaxing in the shade. But for those who rely on air transportation to make those dreams a reality, the nightmare of severe weather can often loom large.



At the Federal Aviation Administration's Air Traffic Control System Command Center, the Aviation Weather Center's National Aviation Meteorologists stand watch daily. Working in close collaboration with National Weather Service meteorologists at the FAA's 21 Air Route Traffic Control Centers, they provide timely, relevant, accurate and consistent environmental information to traffic flow management specialists. This close collaboration ensures One NWS, One Forecast!



Summer hazards, such as thunderstorms, can make air travel difficult, if not impossible. This can lead to traffic management initiatives such as Grounds Stops and Ground Delay Programs, as well structured routing and Airspace Flow Programs. All of these can cause delays, or even cancellations...not to mention unhappy passengers. Nearly two-thirds of all delays in the National Airspace System are due to weather, and account for \$20B in losses annually!

When thunderstorms threaten the NAS, the NAMs aid TFM planners as they determine the appropriate TMIs needed to ensure the safe and efficient movement of aircraft in the NAS. This often

leads to developing routes that take flights around areas of thunderstorms...sometimes very far out of the way. For example, routes through ZLC's airspace can sometimes extend all the way up into Canada...in order to avoid thunderstorms in the Midwest! Sometimes large numbers of flights all have to go through the same areas between storms. Just like rush hour traffic, this can cause congestion, and slow flights down a lot.

The next time you're flying, either as a pilot or passenger, keep an eye on the sky, and an eye on the forecast, and know that there are many, many people working very hard to keep you safe. We want you to enjoy the summer...and many more summers to come!



# NWS Las Vegas Featured in “Flight Path” Episode

By: Chris Outler, Senior Meteorologist, NWS Las Vegas



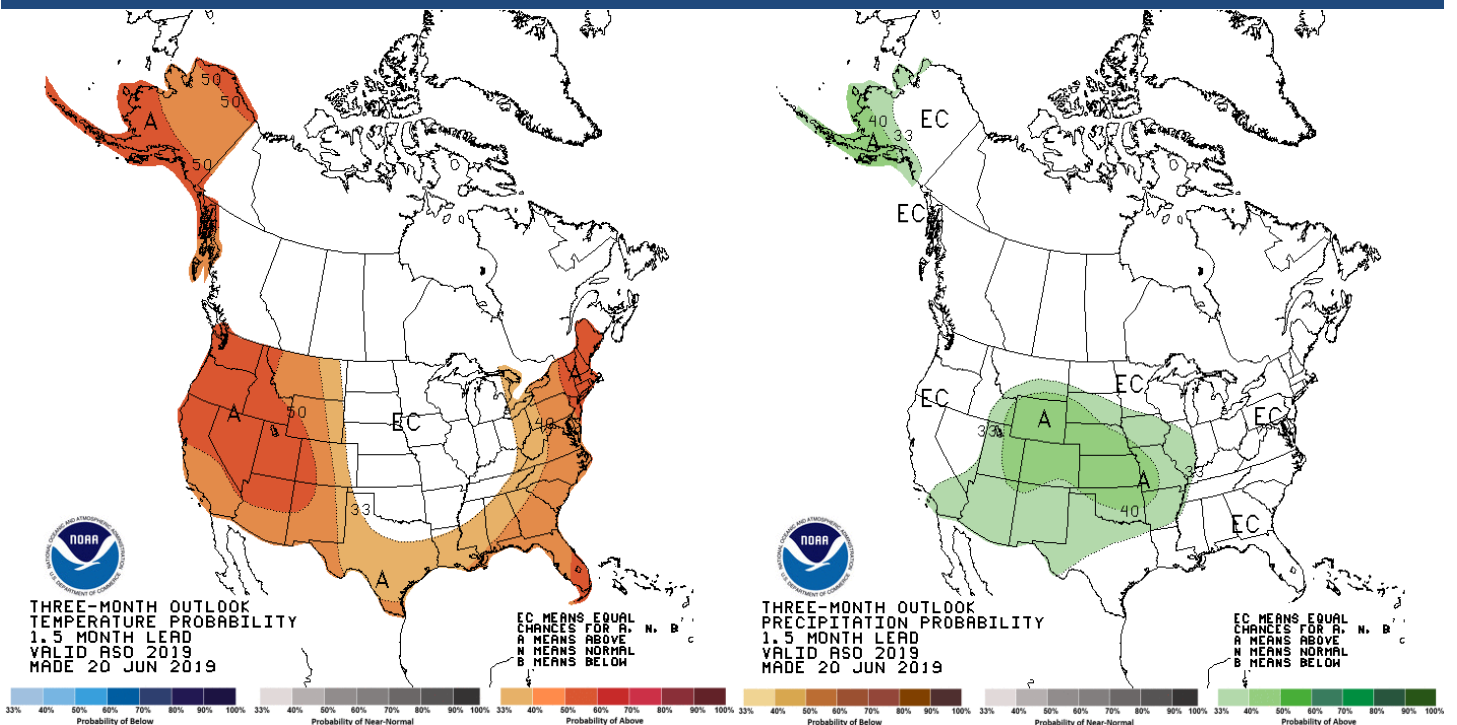
One of the biggest partners NWS Las Vegas serves is McCarran International Airport, where wind and weather can have far reaching impacts across both southwestern and national airspace. Ranked as the 8th busiest airport in the country, extensive decision support is needed by air traffic management and airport operations on a daily basis. We recently had the opportunity to share just how critical weather forecasting is to aviation in a recent episode of ‘Flight Path,’ a monthly aviation special which is put together by McCarran’s public affairs and marketing team.

The 25 minute video has multiple segments highlighting ongoing construction and maintenance projects, airport history, and security upgrades, and concludes with a 2 minute feature about the National Weather Service and our relationship with McCarran International Airport.

In addition to daily TAF issuances, the Las Vegas forecast office also issues twice daily email briefings specifically tailored to aviation operations and traffic management needs, and has a direct line to the McCarran Tower and TRACON which we use on a daily basis to notify of changes to the TAF. We also attend monthly stakeholders meetings at the airfield, which fosters a closer relationship with aviation partners and allows us to fine tune our services to their needs. Check out the video at <https://youtu.be/dcW0Eip3BX0?t=1145>, the NWS segment starts at 19:05. Enjoy!



## Seasonal Outlook for July — August — September 2019





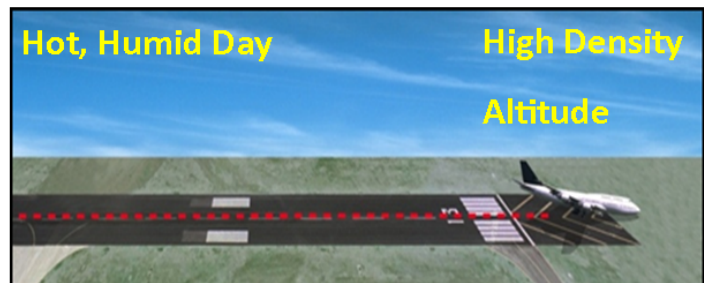
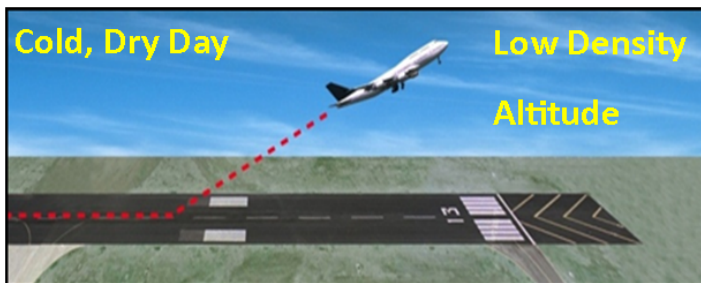
# High Density Altitude

## High density altitude accounts for 7.3% of all U.S. aviation weather-related accidents.

**Density Altitude** – The altitude in the standard atmosphere at which the air has the same density as the air at the point in question. An aircraft will have the same performance characteristics as it would have in standard atmosphere at this altitude.

**High Density Altitude** – A condition of the atmosphere that reduces an aircraft's performance capability to below a level of standard performance at a specified altitude.

**Service Ceiling** – The maximum density altitude where the best rate-of-climb airspeed will produce a 100 feet-per-minute climb a maximum weight while in a clean configuration with maximum continuous power.



### Air density is determined by: Pressure, Temperature, and Humidity.

On a hot, muggy day, the air becomes “thinner” or less dense, and its density at a pilot’s location is equivalent to a higher altitude in the standard atmosphere.

- Thus the term “high density altitude.”

Pilots must determine if high density altitude will impact their flight by:

- Calculating density altitude
- Checking their aircraft performance charts.

### High Density Altitude Hazards

- Reduced Power (engine ingests less air to support combustion)
- Reduced Thrust (propeller has less “grip” and jet exhausts less mass)
- Reduced Lift (air exerts less upward force on the airfoils)
- Longer takeoff roll is required
- Smaller rate of climb
- Lowers aircraft’s service ceiling
- Longer landing roll required

Material from: NOAA National Weather Service Warning Decision Training Branch

# Aviation Weather Education & Outreach: Helping Controllers AND Pilots

By: Sarah Rogowski, Meteorologist, NWS CWSU Salt Lake City

CWSU forecasters provide seasonal weather refresher training to air traffic controllers twice a year in what are called “Mandatory Briefings.” In April, we discussed Spring weather concerns, including thunderstorms, fire weather and smoke, and high density altitude impacts.

Sarah Rogowski, CWSU Salt Lake City, and Charlotte Dewey, NWS Salt Lake City, presented weather refresher classes to the pilots of Keystone Aviation. This class discussed the upcoming spring and summer aviation hazards as well as information about NWS Aviation resources.

Charlotte Dewey, NWS Salt Lake City, participated in a Career Panel for Aviation at Westminster College for students from Roland Hall High School.



***There are plenty of ways to keep up  
with aviation weather!***

**[aviationweather.gov](http://aviationweather.gov)**

**[weather.gov/zlc](http://weather.gov/zlc)**

**[Twitter.com/NWSCWSUZLC](https://twitter.com/NWSCWSUZLC) @NWSCWSUZLC**

**[Facebook.com/NWSCWSUZLC](https://facebook.com/NWSCWSUZLC)**

**Safe Flying!**

**Questions / Comments? [w-zlc.webmaster@noaa.gov](mailto:w-zlc.webmaster@noaa.gov)**