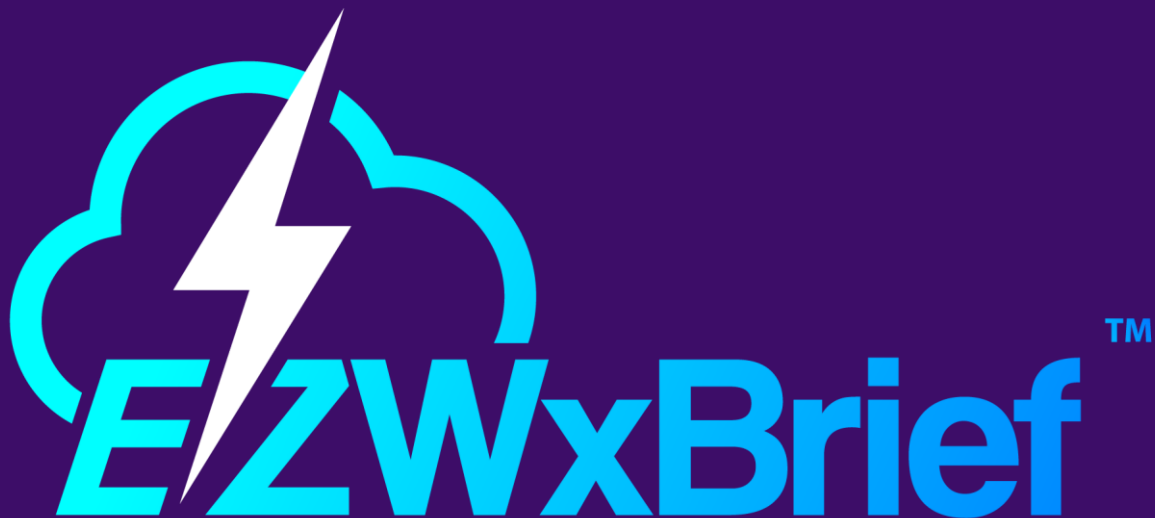AVWXWORKSHOPS INC

EZWxBrief Pilots Guide

Version 1.2.2

Consistent with EZWxBrief version 1.2.0

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1/1/2024

EZWxBrief Pilots Guide with no background

Your complete guide on how to use the EZWxBrief progressive web app

EZWxBrief Pilots Guide

Version 1.2.2

Table of Contents

EZWxBrief is designed to run on both a desktop and laptop computer using an Internet web browser. It is also optimized to run as a progressive web app (PWA) on any computer including portable electronic devices such as Apple's iPad and iPhone as well as portable Android devices. Consequently, there's no need to download an app from the Apple App Store or Google Play Store as it runs within an Internet web browser on any device. The Website address for **EZWxBrief** is https://ezwxbrief.com.[1] For the best experience, we recommend that you install **EZWxBrief** as a PWA (instructions provided below) and that your computer's operating system and browser software be maintained at the latest version.

Getting started with EZWxBrief

This section represents a "Quick Start" primer to briefly cover how to use the basic features of the application to begin enjoying the simplicity of EZWxBrief. It is strongly recommended, however, to read through the entire **EZWxBrief** pilot's guide before reaching out to our customer support team (support@ezwxbrief.com) for further clarification or to report a bug or other issue. Once signed in to **EZWxBrief**, the **Start** button or **EZFavorites** are the primary portal to the various features within the application.

EZWxBrief is a decision-support tool used by general aviation pilots providing supplemental guidance[2] exclusively for **preflight** route planning for flights lasting one hour or longer. The first task is to create a basic route.[3] From the **Start** button, tap or click on the **Plan a route** choice[4] from the Quick Start menu. This will open the EZMap where route planning begins.[5] Tap or click on the Route editor button (shown right) and enter the **Departure** airport identifier,

Destination airport identifier and choose a cruise altitude.[6] Note that as characters are entered in the Departure or Destination fields, a list of matching airport identifiers will

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[1] For best results, please refrain from using www.ezwxbrief.com.
[2] EZWxBrief does NOT count as an official weather briefing. See advisory circular, 00-45H, Change 2.
[3] No route is defined on the initial use of EZWxBrief.
[4] This action only needs to be performed if the current webpage is not the EZMap.
[5] EZFavorites can also be utilized as a portal into the application.
[6] This is initially defaulted to 10,000 feet MSL and can be adjusted in increments of 500 feet.

be suggested.[7] **It is important to <u>select</u> one of the identifiers in the list presented. Otherwise, the application will not recognize this as a valid entry.** In the example below, the route of flight is left blank since it is optional.[8] Lastly, choose whether the winds aloft are to be used to calculate a ground speed[9] based on the forecast winds aloft. Using the same example below, the route chosen is from KJFK (JOHN F KENNEDY INTL) direct to KDAN (DANVILLE RGNL) at an altitude of 12,000 feet. Forecast winds will not be used to calculate the ground speed based on the selection. Click or tap on the **Apply** button to plot the great circle route on the EZMap.

When a route has been defined, the EZDeparture Advisor will appear at the bottom of the EZMap as shown below. The EZDeparture Advisor consists of a time label that is above a matrix of red, yellow, green and gray[10] dots. Press and hold this time label and

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[7] For airports without an ICAO identifier (e.g., 1V8), use the 3-character airport identifier.

[8] The route of flight can include most airports as well as other waypoints (e.g., VOR identifiers, fixes or intersections). EZWxBrief will not accept victor or jet airways, SIDS or STARS. Up to **five** waypoints can be entered in the route of flight.

[9] The true airspeed defined in the EZSettings is utilized here as well.

[10] A gray dot indicates that the specific personal minimum category could not be evaluated for the departure time. This is usually due to missing forecast elements.

drag it to the right to advance the departure time.[11] Each **column** represents a different time of departure[12] and each **row** represents a specific personal weather minimum category (described later). The color of the dots is determined when the map is rendered based on the evaluation of the personal weather minimum categories for the associated time of departure.[13]
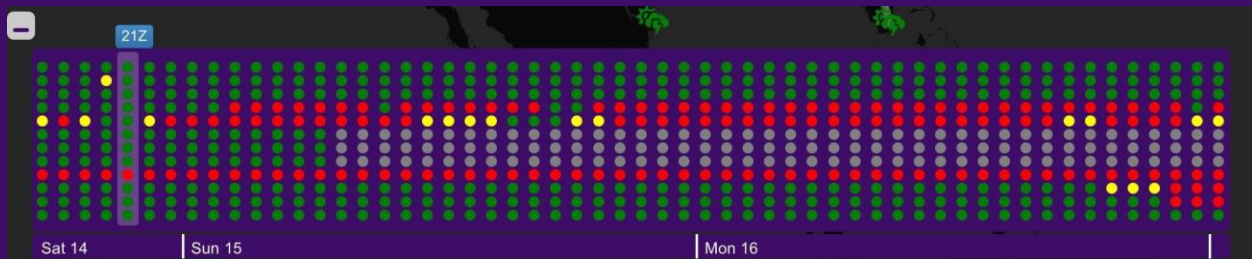
To minimize the EZDeparture Advisor, tap or click on the "−" sign found in the upper left. A tap or click on any EZDeparture Advisor column will enumerate the details for that departure time as shown below. The current EZSettings for each personal weather minimum category are shown in parenthesis.
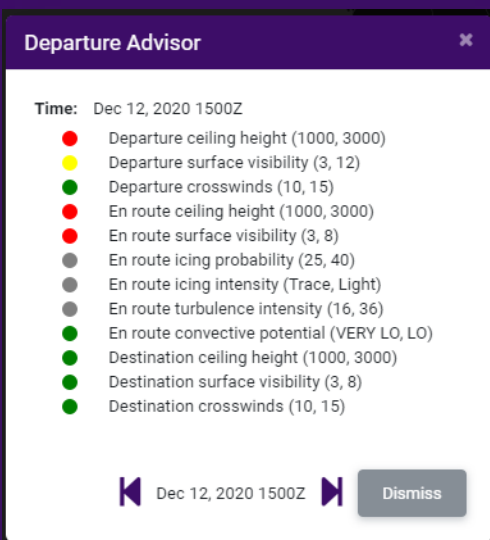
To change the personal weather minimum settings for each category, tap or click on **Start** and choose the **Manage my preferences** option.[14] This will open the EZSettings panel where any user preferences can be changed including **General Settings**, **Aircraft Settings** and **Personal Minimums** settings. Simply tap or click on the "plus" sign (**+**) in front of the label to view all of the available settings. Tap or click on the "minus" (-) sign to collapse the list of settings.

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[11] To see the latest observations (METARs) and pilot weather reports, the label needs to be positioned to the far left.

[12] The time will be local or Zulu (UTC) based on the EZSettings defined by the user. Zulu time will be depicted with a **Z** following the time. If no Z is shown, local (device) time is shown.

[13] The entire duration of the route is examined to determine the specific color.

[14] The settings icon (gear button) can also be used to launch the EZSettings panel.

Each **Personal Minimum** category (e.g., ceiling at the departure airport) has a slider that consists of a position for green and red. The red position can be thought of as the pilot's personal weather minimum for that specific category. If the weather forecast is evaluated to be equal or "exceed" the red setting threshold,[15] this defines an unacceptable **high risk** for that specific category. On the other hand, green is used as a conservative setting to define a threshold with a very low risk. In other words, if the weather is forecast to be "better" than or equal to the setting value for green, this creates an acceptable **low risk** for that specific category. There is no specific setting for yellow given that it is positioned between the green and red thresholds. Therefore, yellow depicts a moderate risk that satisfies the personal weather minimum setting defined by the red value chosen but does not satisfy the conservative setting which is defined by the green value chosen. The pilot must decide for each category how to set the low and high personal risk thresholds for each proposed route.[16] Tap or click on the **Save Settings** button to store the changes to these settings. When settings are changed, the EZDeparture Advisor is refreshed to evaluate the weather for those new settings.
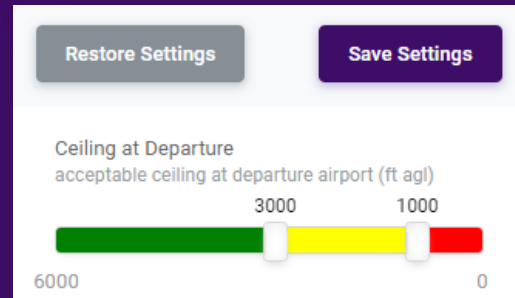
The EZDeparture Advisor shown below depicts the results of the evaluation for the proposed route for each personal weather minimum category and for each possible departure time over the next 60 hours.[17] Columns containing all green dots will depict a departure time that meets all of the conservative Personal Minimum settings and represents a **low** risk departure for the proposed route. On the other hand, columns with one or more red dots depict one or more personal weather minimum categories have exceeded the threshold(s) previously set. Such a result highlights a **high** risk for the proposed route of flight.

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[15] Exceed in this context means that the weather condition is forecast to be **worse** than the value set. For crosswind evaluation, for example, that means a number **higher** than the value set whereas for surface visibility that will mean a number **lower** than the value set.

[16] The current personal weather minimums stored apply to any active route.

[17] The total number of possible departure times is relative to the duration of the route and the availability of the forecast weather. Shorter routes may have more than 60 possible departure times and longer routes may have less.
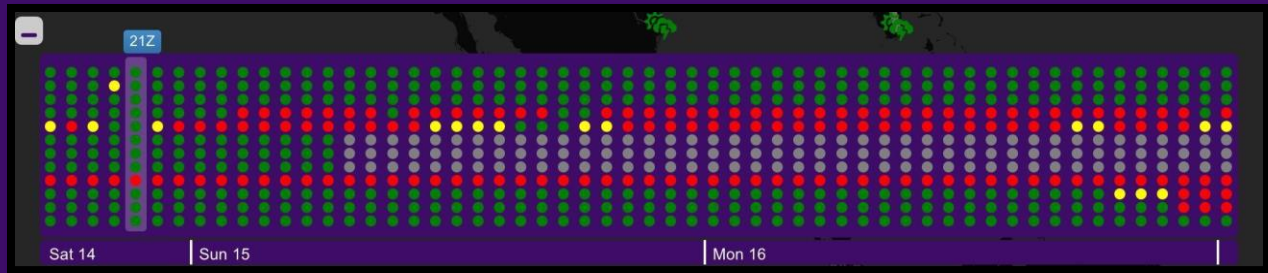
One or more layers can be added to the EZMap. Simply tap or click on the layer selector button at the top of the EZMap (shown left) and within the layer selector menu choose the layer(s) to add. Each layer may have one or more attributes to allow the layer to be filtered further.[18] As shown to the right, tap on the layer name **or white chevron** to view/open the associated attributes.[19] Tap or click on the specific filter. For example, shown on the right, the **SIGMETs** layer is selected and the attributes are opened. The Dust & Sandstorms attribute is selected (all other attributes are deselected). As a result, only SIGMETs that qualify as Dust & Sandstorms will be shown on the EZMap and all other SIGMET types will be filtered. Tap **All** to turn on all attributes for that layer. To close the layer selector, simply tap or click on the layer selector button or click or tap away from the layer selector menu.
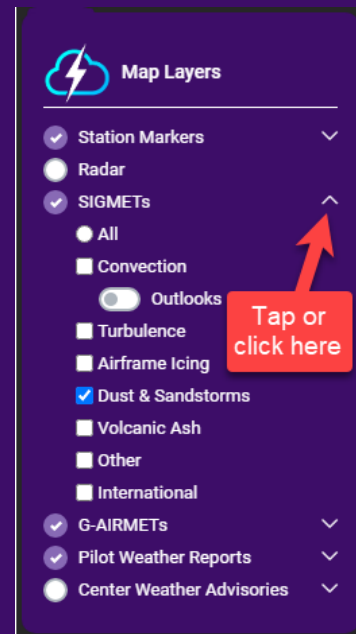
To see a vertical cross section of the route, tap or click on the EZRoute Profile button (shown left) from the top of the EZMap. This will display a vertical route profile (icing probability

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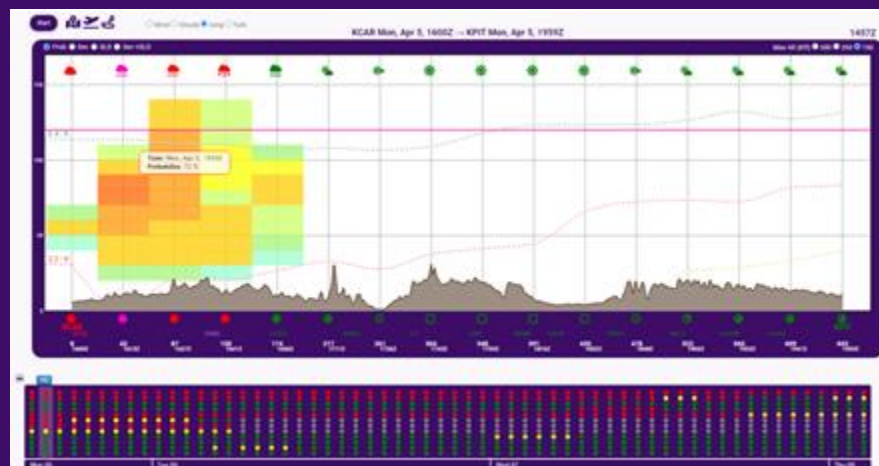
[18] The Radar layer does not have any attributes at this time.
[19] Use the same action to close the attributes for the layer.

vertical profile is shown above and right) that also employs the same EZDeparture Advisor. To change the time of departure, advance the EZDeparture Advisor to the right to see the results of the winds and temperature aloft, clouds, icing and turbulence along the route of flight. The Route editor button is also available from the EZRoute profile page to edit the proposed route. Note that the active route cannot be deleted from the EZRoute Profile, but must be deleted from the EZMap Route editor.

Tap or click on the EZAirport button (shown left) to see the airport Meteogram and other airport-specific weather observations and forecasts such as METARs, Terminal Aerodrome Forecasts (TAFs), Forecast Discussions, Skew-T diagram and Localized Aviation MOS Program (LAMP).

Tap or click on the Refresh button (shown left) to reload the data shown on the map and reevaluate the EZDeparture Advisor. The circular arrow on this button will turn orange and then red to indicate that the data shown on the map may be 30 or more minutes old.

Tap or click on the Settings button (shown left) to make changes to the various EZSettings. This includes the application preferences (e.g., units for time, temperature, visibility, etc.), aircraft settings and EZMinimums. The EZSettings panel can also be accessed through the Quick Start menu.

Tap or click on the Information button (shown left) to see the EZMap legends. Specific legends are shown only for active layers currently displayed on the EZMap.

Tap or click on the list button (shown left) to display the EZFavorites panel. This will show any folders or favorites that have been saved. Favorites can be visited (launched), deleted, renamed, moved or duplicated from this panel. Favorites can also be created or deleted custom folders. The EZFavorites can also be accessed through the Quick Start menu.

Lastly, to see the comprehensive static imagery provided by **EZWxBrief**, tap or click on the **Start** button and select **View static weather imagery** from the Quick Start menu.

EZWxBrief & browsers

While most features of **EZWxBrief** will render properly within any Internet browser, for the best user experience we recommend using the **latest** version of Google Chrome running on a desktop computer when possible. **EZWxBrief** is generally compatible with the latest version of Apple's Internet browser, Safari, Mozilla's Firefox Internet browser and Microsoft's Edge Internet browser. At this time, no other Internet browsers have been tested for compatibility.

The data shown in **EZWxBrief** is constantly changing. Also, new versions of **EZWxBrief** will be released. Sometimes, when changes are made to the **EZWxBrief** application or its data, they don't register immediately due to browser caching. A hard refresh is a way of clearing the browser's cache for a specific page or to force it to load the application's newest software. A hard refresh or reload will usually fix outdated data or outdated browser code, though occasionally completely clearing the cache and restarting the browser may be necessary.

In Chrome, a hard refresh can be done by using one of the following two short cut methods if you are on computer with a keyboard. With **EZWxBrief** as the active page do the following...

For Windows -

1. Hold down the **Ctrl** key and click the **Reload** button (as shown below).
2. **Or**, hold down the **Ctrl** key and then press[20] the **F5** function key.

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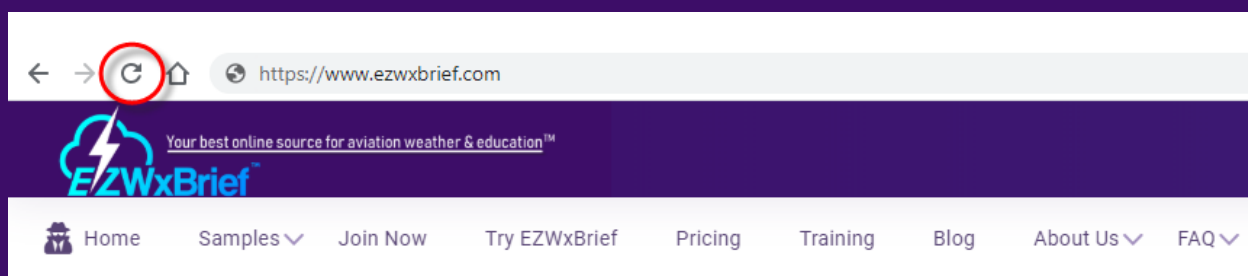
[20] In this Pilots Guide, "press" is used generically to represent either a mouse click or on touch screens, a tap action when the context is not critical.

For MacOS -

1. Hold ⇧ **Shift** and click the **Reload** button.
2. **Or**, hold down the ⌘ **Cmd** and ⇧ **Shift** keys together and then press **R**.

Either one of these actions should reload the page when using Google Chrome.

To completely clear the cache, hold down **Ctrl** and ⇧ **Shift** keys and then press **Delete**. This will open up a new tab within Chrome with the following URL - chrome://settings/clearBrowserData. Under **Basic** settings on this page (shown to the right) be sure that only the last box is checked. You can uncheck the first two boxes to avoid loss of other critical browser data. Next, click the button in the lower right that says **CLEAR DATA**. Please be patient, this can take a minute or more to clear the cache depending on the amount of cached files and the speed of your computer.
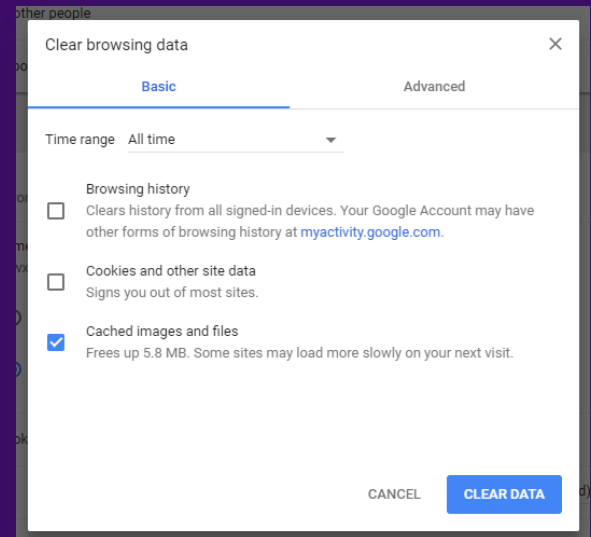
EZWxBrief Progressive Web App installation

A progressive web app, also known as a PWA, is supported by every most popular Internet browser and platform. There are many other popular apps (e.g., Twitter, Uber, Starbucks) that employ the PWA concept. Progressive web apps use modern web application programming interfaces (APIs) along with a traditional progressive enhancement strategy to create cross-platform web applications. These apps work everywhere and provide several features that give them the same user experience advantages as native apps that you might download from Apple's App Store or Google's Play Store. However, depending on your device (computer or portable device) there are specific limitations defined below. The advantage of a PWA is that you do not have to download a new version of the application every time there's a new version released. Also, you can install the **EZWxBrief** PWA on as many devices as you wish, and it's not limited by country[21]. Unlike native apps, when installing EZWxBrief as a PWA it does not decrease the capacity of storage on your device. All of the data and code is executed in the browser.

Using the directions below, you can install (or uninstall) **EZWxBrief** on your device(s). Installing the PWA creates an icon on your home screen or desktop that you tap or double click to start **EZWxBrief** with each use. It has a "look and feel" just like a native app without all of the overhead. Similar to native apps, a PWA has no "back" or "forward" buttons to navigate between pages. This allows the screen "real estate" to be more effectively balanced and optimized than running **EZWxBrief** within a browser. Below are PWA installation instructions for Android, Windows and Apple devices.

Android – If you own any Android phone or tablet, PWA installation is supported by the **Google Chrome** browser.

To install the **EZWxBrief** PWA on any portable Android device, simply follow the step-by-step instructions below.

Chrome on Android

1) Start the Google Chrome browser and enter https://ezwxbrief.com in the browser's address bar. You do <u>not</u> need to be signed in to your **EZWxBrief** account.

2) Tap on the kebob menu (vertical ellipsis) shown below.

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[21] Apps for Apple and Google are distributed by countries.
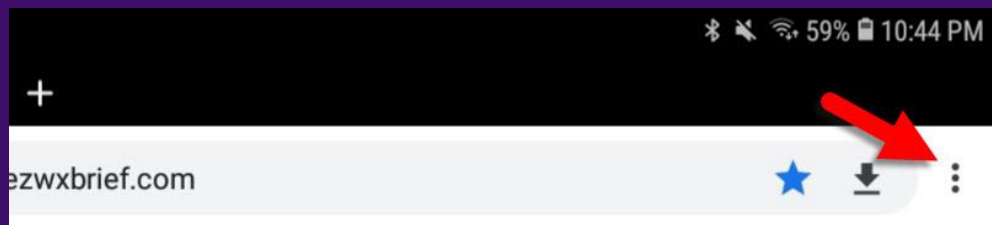
3) Select **Add to Home screen** from this drop down menu.
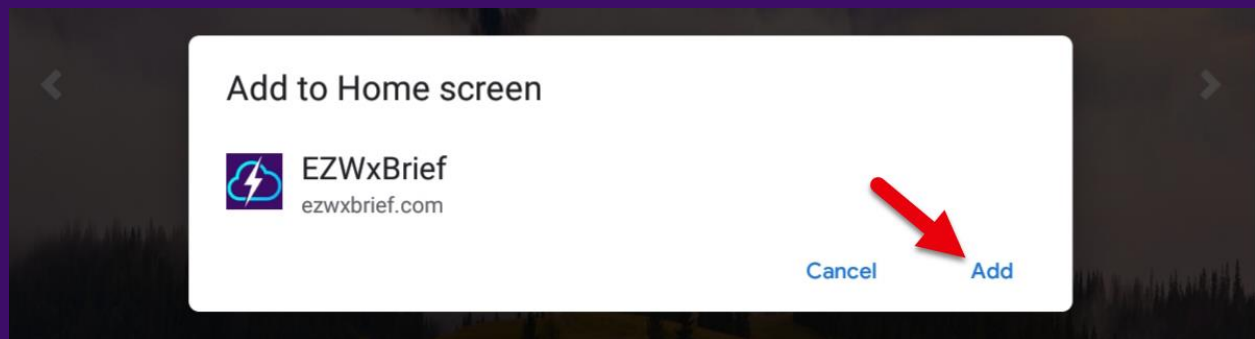
4) Select **Add** to complete the final step.

This will place an **EZWxBrief** icon on your device's home screen and within the Apps folder. Tapping on that icon will open up the **EZWxBrief** Chrome PWA. Uninstalling the **EZWxBrief** Chrome PWA is the same as deleting any other app. Press and hold the icon on your home screen until the **EZWxBrief** icon begins to bounce. Then tap on **Uninstall** to delete the icon from the home screen.

Microsoft Windows – For all Windows devices, PWA installation is supported by Google Chrome and Microsoft Edge.

Chrome on Windows

1) Start the Google Chrome browser and enter https://ezwxbrief.com in the Chrome address bar. You do not need to be signed in to your EZWxBrief account.
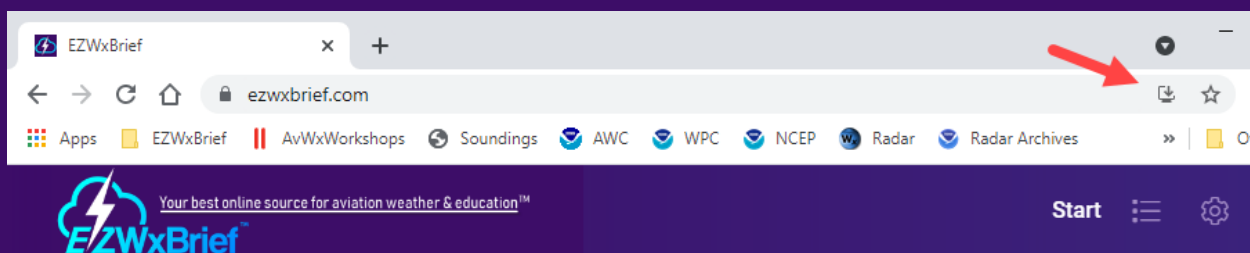
2) As shown above, click on the computer monitor icon with the down arrow at the far-right end of the browser's address bar. Hovering your mouse cursor over this icon will show an "Install EZWxBrief" label.

3) In the dialog box that appears, click on **Install** to complete the process.

This will place an **EZWxBrief** icon on your desktop. A double-click on that icon will open up the **EZWxBrief** Chrome PWA.
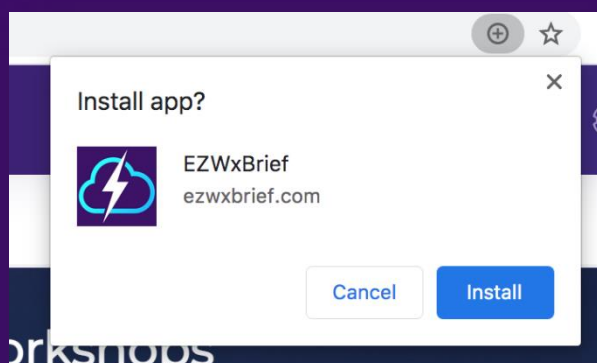
To uninstall, first start the **EZWxBrief** PWA. Then in the upper-right corner click on the kebob icon (vertical ellipsis) and select the **Uninstall EZWxBrief** option as shown on the left. Then in the dialog box that appears, click on **Remove**. You can optionally, check the box to clear all **EZWxBrief** data from Chrome. This will remove the **EZWxBrief** icon from your desktop.
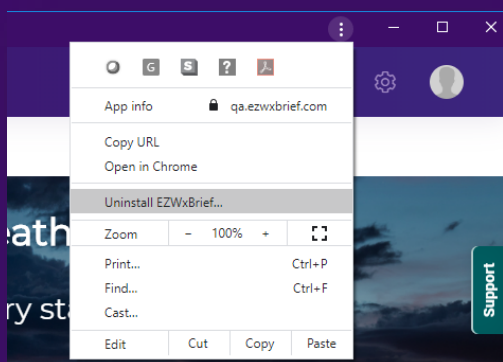
Edge on Windows

1) Start the Microsoft Edge browser and enter https://ezwxbrief.com in the Edge address bar. You do not need to be signed in to your EZWxBrief account.
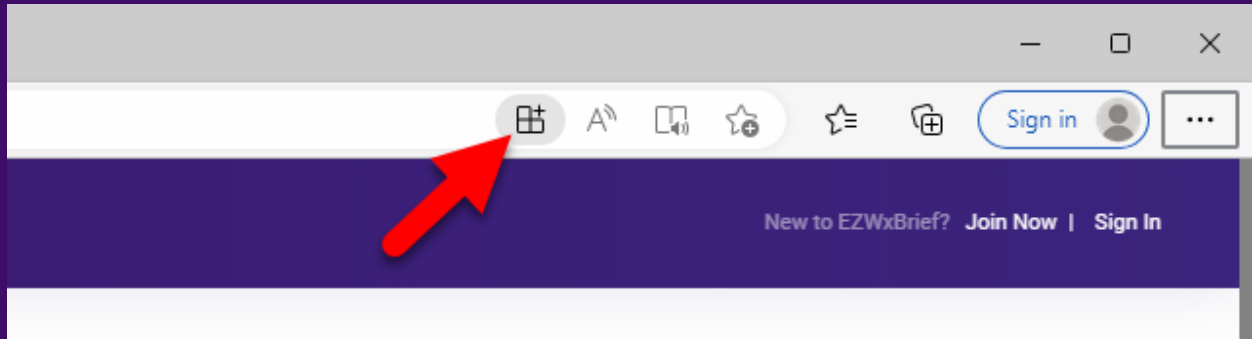
2) As shown above, click on the App Available icon at the right end of the browser's address bar. Hovering your mouse cursor over this icon will show an "App Available. Install EZWxBrief" label.

3) In the dialog box that appears, click on **Install** to complete the process.

This will place an **EZWxBrief** icon on your desktop. A double-click on that icon will open up the **EZWxBrief** Chrome PWA.
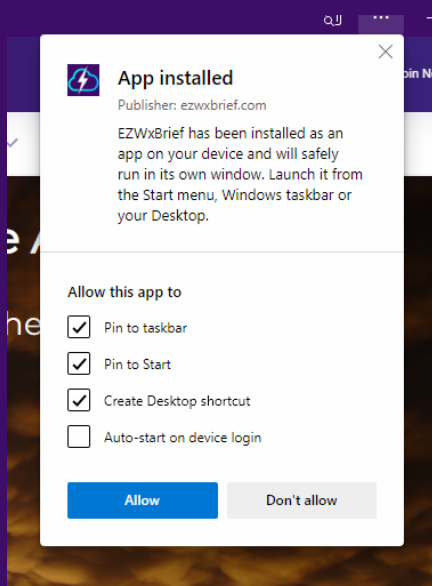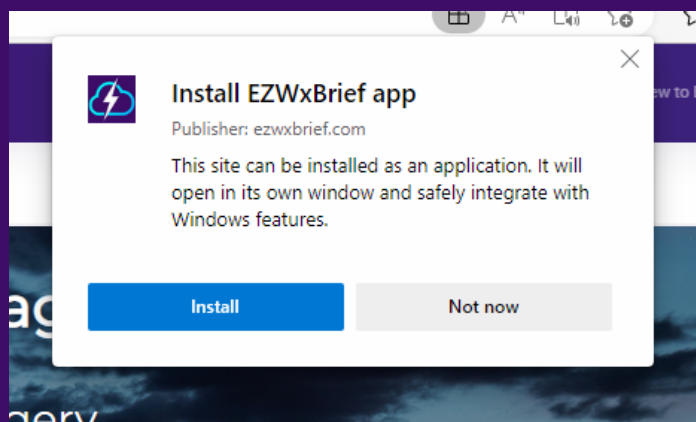
Lastly, you will then have the option to allow the EZWxBrief app to be pinned to the taskbar, pinned to the start menu, create a desktop icon or auto-start on device login. It is highly recommended that you at least create a desktop icon. This will allow EZWxBrief to be started with a simple double-click from your desktop similar to launching any other desktop application.

To uninstall EZWxBrief from your device, simply go to the Windows settings to Add or Remove software. This is similar to removing any Windows application.

Apple – If you own any Apple portable device (e.g. iPad or iPhone), PWA installation is supported by **Safari** only. For MacBook and iMac devices, PWA installation is supported by **Google Chrome** only and is not supported by Safari at this time.

Chrome on MacBook and iMac

1) Start the Google Chrome browser and enter https://ezwxbrief.com in the Chrome address bar. You do not need to be signed in to your **EZWxBrief** account.
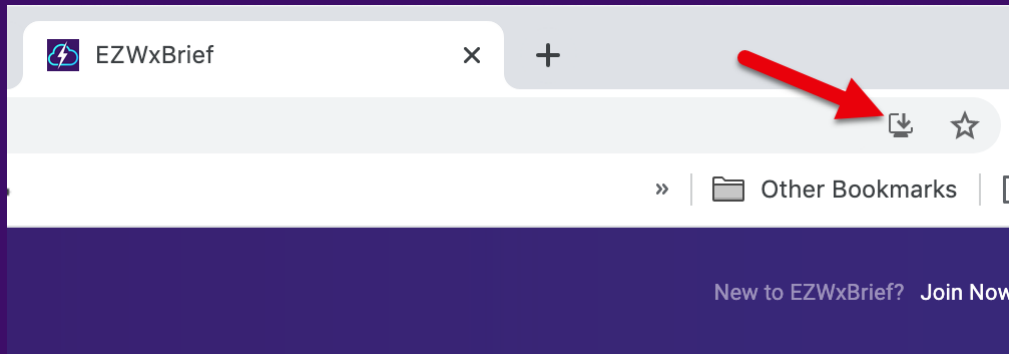
2) As shown above, click on the computer monitor icon with the down arrow at the far-right end of the browser's address bar (hovering over this will show an **Install EZWxBrief** label).

3) In the dialog box that appears, click on **Install** to complete the process.

This will place an **EZWxBrief** icon on your desktop. A double-click on that icon will open up the **EZWxBrief** Chrome PWA.

To uninstall, start the **EZWxBrief** PWA. Then in the upper-right corner click on the kebob icon (vertical ellipsis) and select the **Uninstall EZWxBrief** option as shown on the right. Then in the dialog box that appears (see below), click on **Remove**. You can optionally, check the box to clear all **EZWxBrief** data from Chrome. This will remove the **EZWxBrief** icon from your desktop.
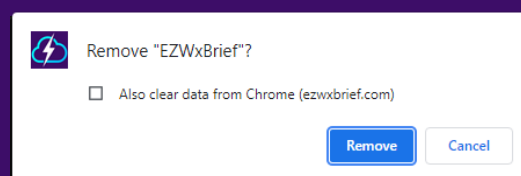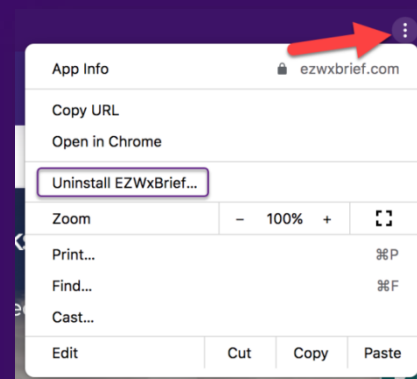
Safari on iPad and iPhone

To install the **EZWxBrief** PWA on any portable Apple device, simply follow the step-by-step instructions below.

1. Start the **Safari** browser on your portable device and enter https://ezwxbrief.com in the Safari address bar. You do not need to be signed in to your **EZWxBrief** account.

2. For the iPad, in the upper-right corner, tap on the "Send To" button as shown on the right (the iPhone, Send To button is located at the bottom of the Safari browser window).

3. Select the **Add to Home Screen** option from the Send To menu.
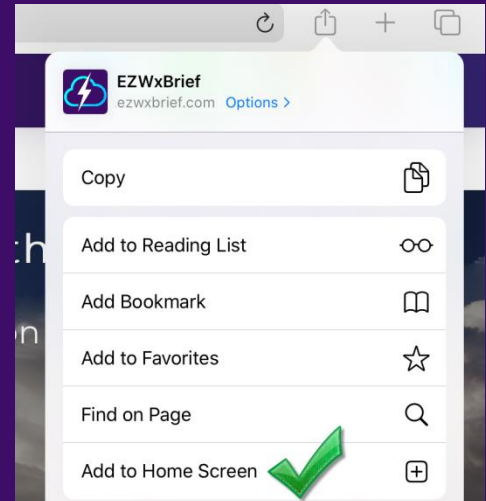
4. Select **Add** to complete the process.
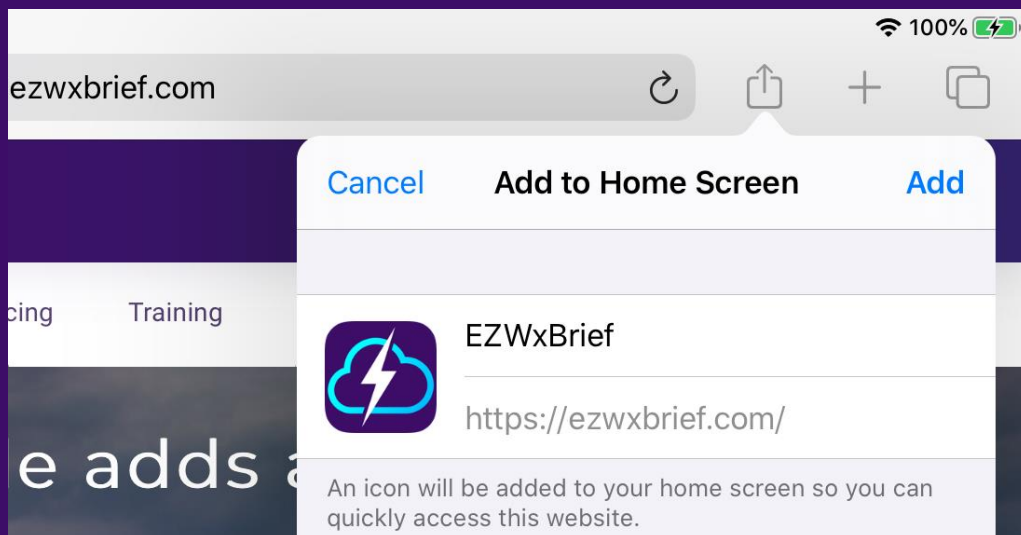
This will place an **EZWxBrief** icon on your device's home screen. Tapping on that icon will open up the **EZWxBrief** Safari PWA.
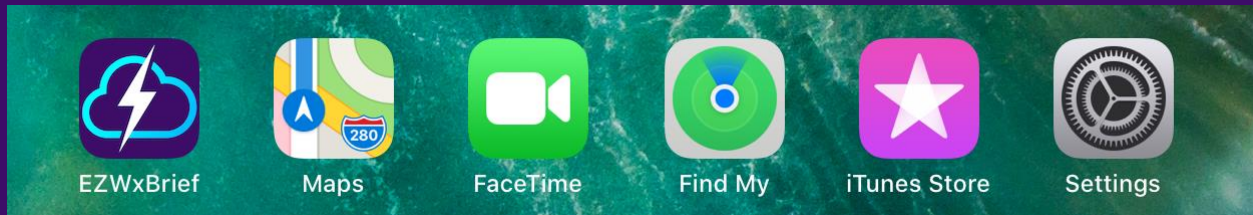
Uninstalling the **EZWxBrief** Safari PWA is the same as deleting any other app on your portable device. Press **and hold** the icon on your home screen until all of the icons begin to jiggle. Then tap on the **X** to uninstall the EZWxBrief PWA.
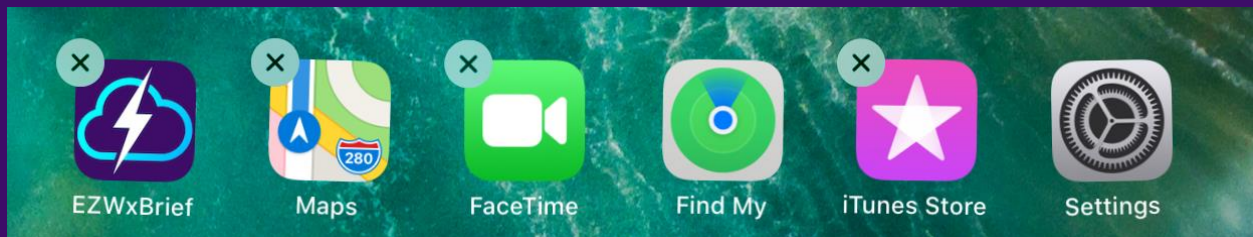
Trials, annual membership & renewal

To sign in and enjoy the simplicity of **EZWxBrief** you need to register a new account under a 14-day trial membership or purchase an <u>annual</u> membership using a major credit card (Visa, MasterCard or Discover only please) or you can pay using your personal or business **PayPal** account. **We do not accept checks or bank/wire transfers.** Currently, only annual memberships are available.

Trials

A trial membership provides you with access to all the awesome features within the **EZWxBrief** application for a period of 14 calendar days. When your trial membership expires you will be able to sign in, but those awesome features that are <u>not</u> deemed as free will be unavailable.
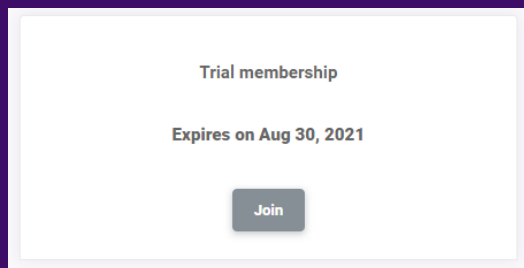
As a trial member you can join as an annual member even after your trial has expired. **There's no need to register again.** First, **Sign In** under your trial account. After successfully signing in, the **Join** button is available on the Home page at the top. A tap or click on that button will walk you through the process to join and pay for an annual subscription to EZWxBrief and set up your account to renew automatically on your membership anniversary. Alternatively, you can visit your **User Profile** and you will see a **Join** button (as shown above).

Auto-renewal

During registration, you can set your account to automatically renew each year at your membership anniversary. Any account set to renew automatically using the credit card on file will receive a **$10 discount** on your **next** and all subsequent annual renewals (please note that this discount does not apply to the <u>initial</u> member registration even if you agree to renew automatically). Note that you cannot use your PayPal account if you want your account to renew automatically. You can change this setting and the credit card you have on file[22] at any time by visiting your user profile. If you have set your membership to renew automatically, one week before your membership expires, you will receive a courtesy email reminding you that your account will renewal automatically on your membership anniversary. If your membership has expired and you set your account

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[22] EZWxBrief uses a very secure merchant account to store and protect your financial information.

to renew automatically **you will be charged the discounted annual membership** and your auto-renewal profile will be stored as well.

Renewals

Occasionally, promotions for annual memberships may be offered at aviation events, during webinars or through other marketing venues. Please note that promotion codes expire and cannot be used for renewals.

If you have not set your annual membership to renew automatically, you have a unique option to "**Tell us what you want to pay**" for an **EZWxBrief** annual membership. **This is not a donation per se**, but we simply do not want price to get in the way of giving you access to a life-saving tool that will minimize your exposure to adverse weather. To qualify for this option, you must meet **all** the following conditions...

1. Not be enrolled in automatic renewal.

2. Not be on a trial membership or expired trial membership.

3. Be within 30 days of your **annual** membership anniversary or have an expired annual membership.

If your account is not set to renew automatically, you will receive an automated email renewal reminder **30 days** prior to your membership anniversary date. To exercise the "**Tell us what you want to pay**" renewal option, sign in to **EZWxBrief** and visit your user profile page.

Annual membership

Expires on Dec 31, 2019
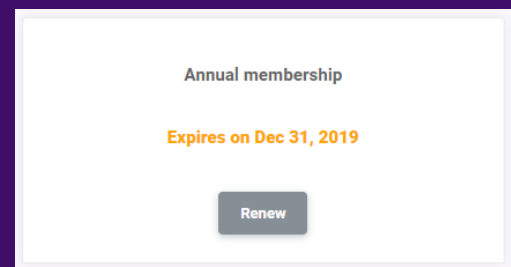
Renew

On the profile page you will see a button labeled **Renew** (as shown above). Tap or click on this button and you will be taken to the **EZWxBrief** subscription and payment page.

The amount you'd like to pay this year:

69.00

You will see a charge from "AVWXWORKSHOPS COM" on your billing statement.

On this form you will see a field that contains the following label, "**The amount you'd like to pay this year**" with a suggested price. Enter the amount in U.S. dollars you would like to spend on the

EZWxBrief annual membership. While you have the option to enter any dollar amount, we ask you to consider a <u>reasonable</u> price point so you can continue to enjoy the simplicity of **EZWxBrief** for years to come. Note that you can also put in an amount **greater** than the suggested price of the annual membership. Either way, you will receive our gratitude and our dedication to take this groundbreaking application even further. **Please note: Members that renew for less than $30 will be required to join again at the full EZWxBrief price when their renewed annual membership expires the following year.**

Next, choose whether you want to use a credit card or use your PayPal account for payment. If using a credit card, fill out all the required fields in the payment form and agree to the terms and conditions. When finished, tap or click on **Submit** to make your payment. Alternatively, you can use your PayPal account to pay for your annual membership renewal.[23] **It's that EZ!**

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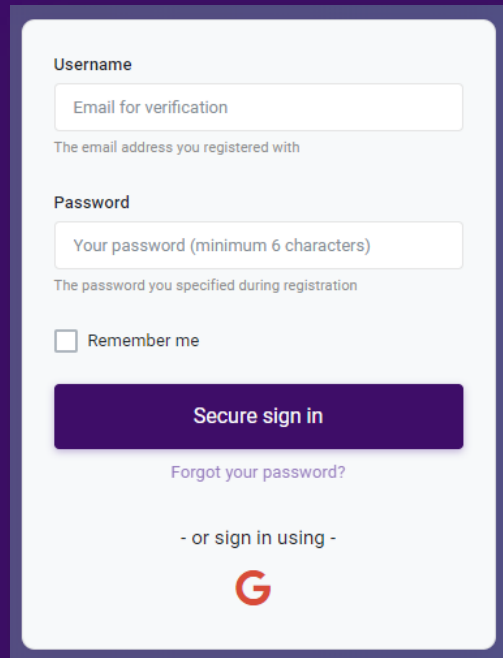
[23] PayPal cannot be used for auto-renewals.

Signing in
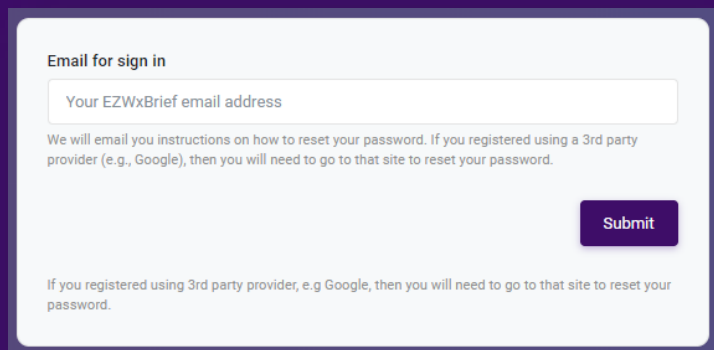
The sign in screen is the same regardless of the device, operating system, browser, or type of computer you are using. If you registered using a 3rd party provider such as Google, you will use that email address and password to sign in. Tap or click on the appropriate 3rd party provider's icon located at the bottom of the sign in screen to authenticate through that provider.

Otherwise, the email address you used when you initially registered with **EZWxBrief** will be your username. Simply enter your username and password and tap or click on the **Secure sign in** button. This will take you to the **EZWxBrief** Home page if your membership has expired. Otherwise, it will take you to the EZMap to begin planning a flight.

If you select the "**Remember me**" box when signing in, your encrypted credentials are remembered using a browser cookie if you close the **EZWxBrief** application without signing out. When you reopen **EZWxBrief**, those encrypted credentials are used again to automatically sign in. When you sign out, you are stating explicitly you want your encrypted credentials removed. As such, on the next sign in attempt you will be required to enter your username and password again.

If you do not remember your password, tap, or click the **Forgot your password?** hyperlink on the sign in page. This will take you to a page where you will enter the email address you used when you registered and allow you to reset your password. After entering your email address tap or click on

the **Submit** button and we will send you an email with detailed instructions on how to reset your password. **Please do not reply to this email. Note:** If you registered using a 3rd party such as Google, you will need to go to that site to reset your password.

If you do not receive an email within one or two minutes, please check your spam or junk folder for that email. On the page that appears after you tapped or clicked on **Submit**, you can request to have that email resent. If after ten minutes you still have not received an email from **EZWxBrief**, feel free to tap or click on the chat widget on the lower-right corner of the webpage and we will be happy to assist you in resetting your password (please note that the chat feature is only available during normal business hours, Monday through Friday eastern time). Alternatively, you can also send an email to the **EZWxBrief** support team at **support@ezwxbrief.com**.

The email will contain a single hyperlink to reset your password. It can only be used once. Tap or click on that hyperlink or copy-paste the entire Web address contained in the email into your Internet browser's address bar. Enter the desired password and retype that password in the next field to confirm. Passwords must be at least 6 characters in length and contain at least one upper case (A-Z), one lower case (a-z), one number (0-9) and one special character (e.g. !@#$%^&*.-,). You may assign passwords that you may have used in the past. Once your password has been successfully reset, you will be directed to sign in using your new password.
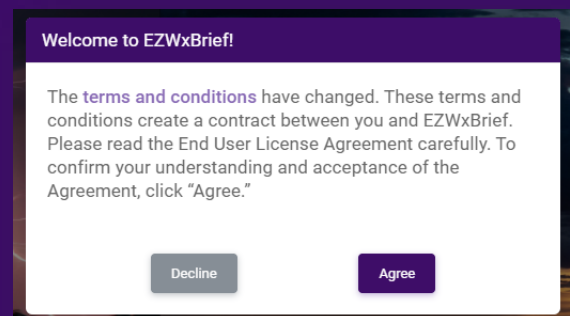
If there has been an update to the **EZWxBrief** End User License Agreement (EULA), upon the next sign in you will be asked to "Agree" to those terms and conditions (as shown right). If you choose "Decline" then you will be signed out of **EZWxBrief** and taken to the **EZWxBrief** Home page.

Signing out

There isn't a reason to sign out of the **EZWxBrief** application. However, to do so tap or click on the **Start** button and select **Sign Out**. Signing out can also be accomplished by tapping or clicking on the profile picture on the upper-right corner of the Home page and then select **Sign Out**. This action will display the **EZWxBrief** visitors Home page.

Home page

The Home page provides an overview of the **EZWxBrief** application using a carousel of title pages. The carousel will change automatically or you can click on the white chevrons on both sides of the page to move backward and forward through the carousel. A tap or click on the "Learn More" button for these pages will take you to a new page with a more detailed description.

Shown below is the menu that visitors will see on the Home page.[24]
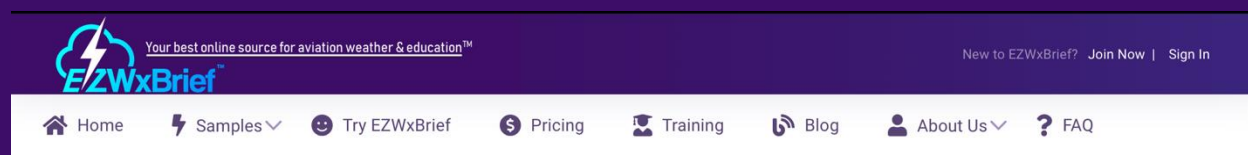
From here a visitor can **Sign In** to **EZWxBrief** or become a member by choosing **Join Now**. This menu allows visitors to view samples of the online workshops and static imagery, join as a trial member, view **EZWxBrief** membership pricing, book one-on-one online training (https://avwxtraining.com/online-training) and view the blog (https://avwxtraining.com/blog)[25] containing the **EZWxBrief** release notes and other educational posts. Under the **About Us** selection, visitors can also view pages to contact the **EZWxBrief** support team, view the support page, and see more information about the **EZWxBrief** Team that built this revolutionary application. Lastly, this menu provides access to a list of frequently asked questions (FAQ).

When members successfully sign in to **EZWxBrief**, the main menu will be abbreviated containing a subset of options as shown below. To get started simply tap or click on Start to being enjoying the simplicity of **EZWxBrief**.
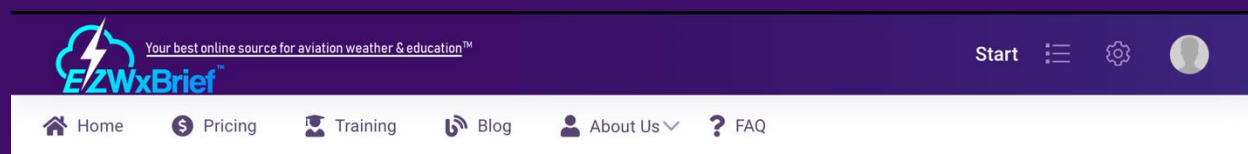
In addition to the options on the main menu, on the **EZWxBrief** masthead containing the logo you will also have the ability to view and manage favorites (list icon), change

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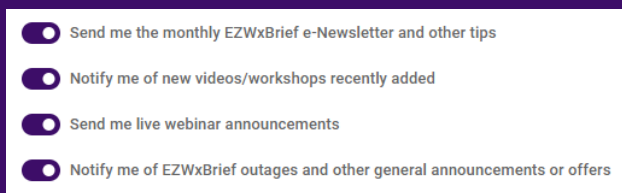
[24] A visitor is an anonymous user that has not signed in to EZWxBrief. This is the view that members will see after a successful sign out.
[25] Note that you do NOT need to sign in or join the avwxtraining.com site. This site is simply used to host the EZWxBrief blog and is freely available to view.

settings and preferences (gear icon) and view your user profile. This is only available if you are signed in to your **EZWxBrief** account.

User profile

When signed in, you will be able to visit your user profile page. In the user profile you can add or change your profile picture (avatar), change your password (see below), update your auto-renewal setting (and credit card on file when auto-renewal is set) and make updates to your name, address, phone number and email subscriptions. Please understand that we will never share your personal information without your permission. At this time, you are not permitted to change your email address. Please reach out to our support team if your email address has changed. When updates are complete, be sure to tap or click on the **Save** button at the bottom-right of this profile page.

When you joined **EZWxBrief**, you selected whether you wanted to receive email notifications. At the end of the user profile you can tell us what email notifications you would like to receive as shown above. Unless you choose otherwise, we will send you a monthly EZNewsletter, new videos/workshops that have been recently added, live webinar announcements and notification of outages and other offers. Regardless of your choices above, the CAN-SPAM Act permits **EZWxBrief** to send emails that contain only transactional or relationship content. This would include, for example, sending you an email receipt after your subscription renewal, instructions on how to reset your password or a reminder that your subscription will expire soon.

Changing your password

If there's a need to change your password, this can be done in the user profile. Tap or click on the **Start** button and then choose **Manage my account** from the Quick Start menu. This will navigate to the user profile page where you will see a button labeled Change Password. Tap or click on that button to see three fields. Enter your current password followed by the new password and confirm that new password by re-entering it in the last field. Passwords must be at least 6 characters in length and contain at least one upper case (A-Z), one lower case (a-z), one number (0-9) and one special character (e.g. !@#$%^&*.-,).

The Quick Start button

Quick Start
What would you like to do?

- 🏠 Go to the Home page
- ☰ Manage my favorites
- 🚶 Plan a route
- ✈ View airport weather
- 🖼 View static weather imagery
- 🖥 Watch online workshops
- ⚙ Manage my preferences
- 👤 Manage my account
- 📄 View the Pilots Guide
- ⏻ Sign Out

The **Quick Start** button (referred hereafter as the "Start button") is one of the portals to navigate anywhere within the **EZWxBrief** application. While learning how to use EZWxBrief it is recommended that you use the Quick Start menu to navigate through the application, especially when running **EZWxBrief** as a progressive web app (PWA).

If you are ever lost within **EZWxBrief**, tap or click on the **Start** button at any place in the application and you will be able sign out of **EZWxBrief**, view and manage your favorites, manage your account within your user profile, manage your application settings and preferences, watch online workshops, view static weather imagery, plan a route, view airport weather and view this **EZWxBrief** Pilots Guide. The only major feature you cannot access from the Start button is the EZRoute Profile. This is limited since a route is not required to use **EZWxBrief**. However, you can always launch a route favorite which will open up the EZRoute Profile for the stored route.

EZFavorites

In **EZWxBrief** you can save and organize your favorite routes, static imagery, airports, 7-day forecasts and workshops. This is like the way you bookmark a favorite website using your Internet browser. Favorites can be thought of as a secondary portal into the application that will save you several button presses. These are specific to your **EZWxBrief** account and cannot be shared with other users at this time.
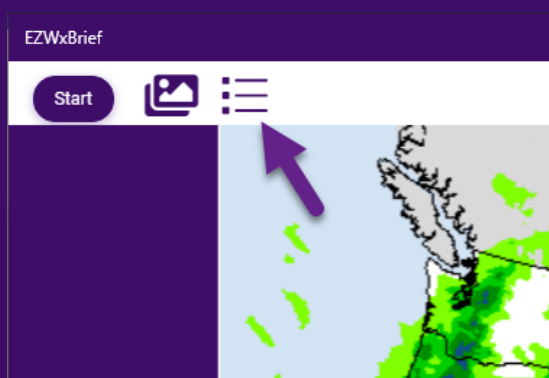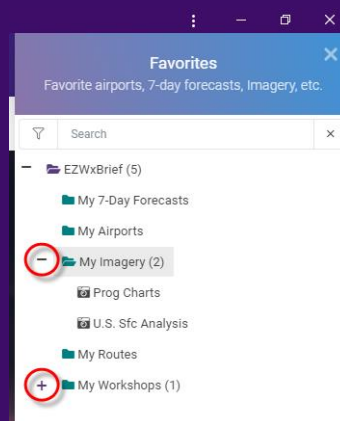
To access and manage your favorites, simply tap or click on the **Start** button and choose "**Manage your favorites**" or tap or click on the **list icon**) that appears in the masthead on the **EZWxBrief** Home page or on the EZMap, EZRoute , EZAirport, and EZImagery pages like the one shown to the left. Additionally, you will have the option of creating custom folders to better organize the favorites. Please note that favorites and favorite folders can only be added, deleted, or changed when signed in to your **EZWxBrief** account.

EZWxBrief root folder

All favorites are contained within the **EZWxBrief** root folder. This folder cannot be deleted, moved, or renamed. On your first use of the application, you will see five custom folders labeled, My 7-Day forecasts, My Airports, My Imagery, My Routes, and My Workshops. These custom folders can be used to organize favorites. **They are not required** so they can be deleted or renamed at any time based on your own preferences. Moreover, a custom folder can contain favorites of differing classes or types (e.g., imagery and airport).
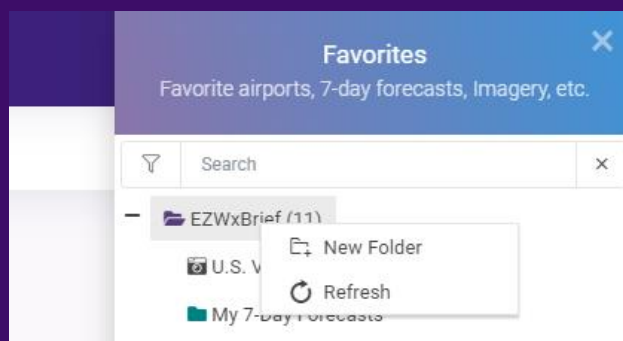
Custom folders

It is a benefit to create custom folders to better organize favorites. A custom folder can be created in several ways. First, tap or right-mouse click on the **EZWxBrief root** folder which will provide the option to create a **New Folder** as shown above. Next, provide a name for the new custom folder (see right). Any combination of upper- or lower-case letters, numbers or special characters (including spaces) can be used for a custom folder name and the name chosen does <u>not</u> have to be unique. Once the name is chosen, tap or click on **Add** to create this folder. The new folder can always be renamed later.
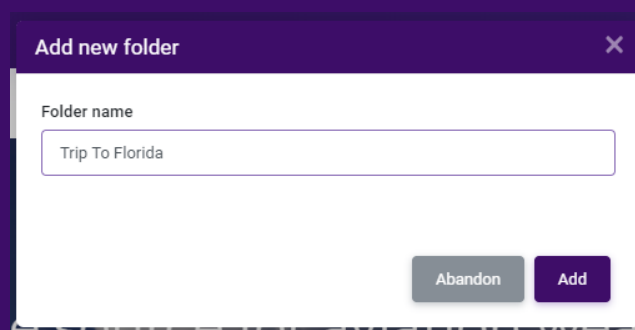
Expanding or collapsing custom folders

If a custom folder contains at least one favorite, a **Plus** sign (**+**) will appear before the name of the folder. Tapping or clicking on this plus sign will expand (open) the folder to expose or list the contents of the folder. This will change the plus to a **Minus** sign (**-**) to indicate that the folder is open. To collapse (close) the folder, tap or click on the minus sign. The minus will then change to a plus. The number located in parenthesis after the folder name indicates the number of favorites contained in the custom folder.

Adding a favorite

Favorites can be created for 7-Day forecasts, Airports, Imagery, Routes, and Workshops. To add or remove a favorite, simply tap or click on the **Heart** icon while viewing that item. This icon may appear in a different location depending on the type of favorite you are saving. For example, the Heart icon for routes can be found in the EZRoute Editor. A solid-filled heart indicates that it is currently saved in one or more favorite folders. For example, on the EZImagery Page, you and find the heart icon in the lower-right corner as shown to the left. In this case, the heart icon is not filled so it does not appear in the EZFavorites. Moreover, you can tap or click on a filled Heart icon to remove it as a favorite or add it to another folder or even same
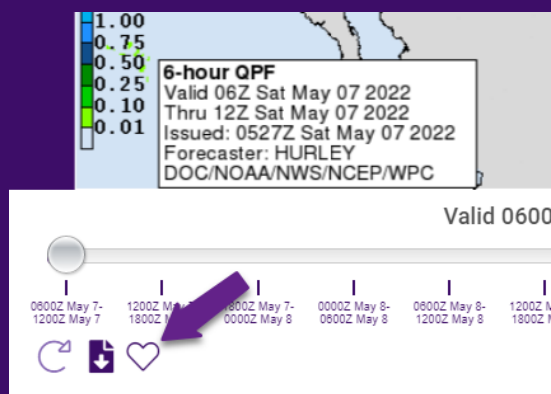
folder with a different name. In other words, the same item can be duplicated within the EZFavorites in multiple locations.

The option of saving that favorite in the **EZWxBrief** root folder (default), adding it to a new folder or saving it in an existing custom folder (**Destination Folder**) is provided. To add it to a new folder, tap or click on **Add new folder**. Choose a name for the new custom folder like the New Folder action mentioned above, then tap or click on **Add Folder**.
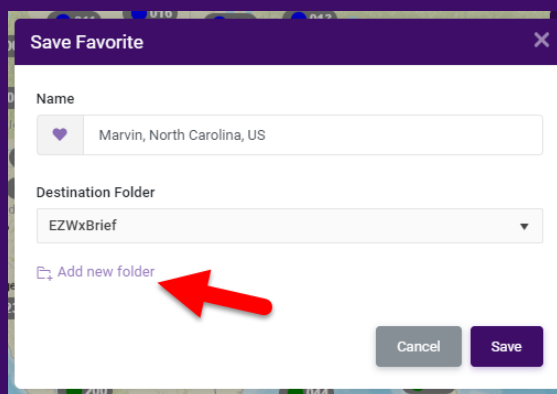
Whether you are adding it to the root, existing or new folder, a **Name** for the favorite must be chosen. Choose the default name provided or choose a different name. Once a folder name has been chosen, tap or click **Add** to create this new folder. For the favorite name any combination of upper- or lower-case letters, numbers, or special characters (including spaces) can be used for the favorite name. Also, the name chosen does **not** have to be unique. Click or tap on **Save** to add it to your favorites. The heart will become solid (filled) and a confirmation message is displayed to indicate that your favorite has been saved.

Favorites can also be cloned. That is, any favorite can be duplicated multiple times. This allows the same favorite to exist in more than one folder. This may be especially useful when creating two or more custom folders that may contain the same favorite airports, 7-Day forecasts or imagery for similar routes. If you see a solid heart icon, this means that item has been saved as a favorite one or more times. Tapping or clicking on a filled heart icon will enable you to add it to the **EZWxBrief** root folder, create a new folder, save it in an existing custom folder or remove the favorite.

Removing a favorite

There are two ways to remove a favorite. First, tap or click on the Start menu and choose **Manage your favorites**. In the **EZWxBrief** root folder or one of the custom folders, locate the favorite to be removed. Tap or right-mouse click on that favorite and select **Delete**. Tap or click on the **Delete** button to remove the favorite. Note that this will remove only that instance of the favorite. In other words, if the favorite had been

previously cloned (i.e., the favorite exists in more than one folder), other instances of that favorite will be preserved.

Second, a favorite can be removed right at the source where it was added as a favorite. While viewing the favorite to be removed (e.g., viewing a specific imagery collection), simply tap or click on the **filled** heart icon for that item. This will bring up the **Save Favorite** dialog box on the right. Click on the **Delete favorite** link and the favorite shown will be deleted. If the favorite exists in only one folder, the solid fill will be removed leaving just an outline of a heart to inform you that it has been removed as a favorite. When this favorite to be removed has been cloned (i.e., the favorite exists in more than one folder), a dialog box will advise, "**Are you sure you want to delete this favorite in all folders?**" A tap or click on the **Delete** button will remove it from the **EZWxBrief** root folder and **all** custom folders where it exists. In that case, the solid fill will be removed from the heart icon for this item.
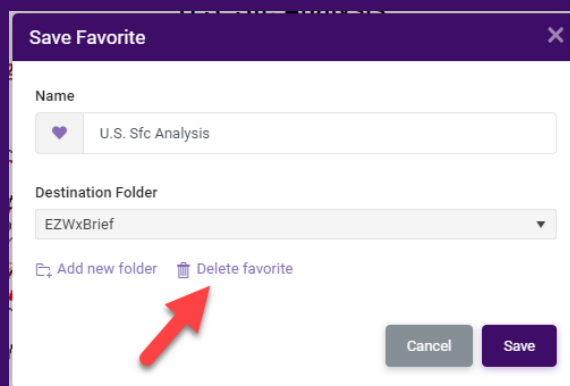
Reordering and moving favorites and folders

Any favorites located within the **EZWxBrief** root folder or custom folder can be reordered by a drag and drop action using a mouse or your finger on a touch screen display. Press-and-hold or click-and-hold the favorite you would like to move. Drag that favorite to the desired location (just above or below another favorite or custom folder) and lift your finger from the screen or mouse button to complete the reorder operation. At this time, custom folders **cannot** be moved/reordered.

Using a similar procedure, you can drag and drop any favorite located at the **EZWxBrief** root level into a custom folder. Press-and-hold or click-and-hold the favorite and hover it over the desired destination folder. Raise your finger off the screen or mouse button to move (drop) it into that folder.

You can also drag a favorite out of one custom folder into the **EZWxBrief** root folder or into another custom folder. Tap or click on the plus sign to expand the custom folder containing the favorite you would like to move. Press or click-and-hold that favorite and

drag it to hover over the **EZWxBrief** root folder or desired destination folder. Raise your finger from the screen or mouse button to complete the move (drop) operation.

Rename a favorite or custom folder

To rename a favorite or custom folder, simply tap or right-mouse click on the name of the favorite or folder you would like to rename. This will provide the option to choose a new name for the favorite or custom folder. Type the desired name and tap or click **Edit** to complete the operation or choose **Abandon** to keep the same name.

To visit a favorite

The purpose of maintaining favorites is to quickly visit those items you view often. When you want to visit a saved favorite (7-Day forecast, Airport, Imagery, Route or Workshop), you simply tap or click on the **Start** menu and choose **Manage your favorites**. Alternatively, find and tap or click on the list icon located in the **EZWxBrief** masthead or located on the EZMap, EZRoute or EZAirport pages. Either case, this will open the drawer containing the favorites. From there, you simply expand the folder containing the favorite you would like to visit and click the favorite's name. When on a portable touch screen device, a tap on the favorite name will bring up a short context menu. Tapping on **View** will then visit that favorite. In other words, a tap or click on a Route favorite, will make that the active route and open the EZRoute Profile and load the entire route. A tap or click on an Airport favorite will take you to the meteogram for that airport. A tap or click on a Workshop or Imagery favorite will load the favorite Workshop or Imagery group, respectively. Lastly, a tap or click on a favorite 7-Day forecast will visit the EZMap with the current 7-Day forecast loaded for that favorite airport or city/town.

The EZ7-Day forecast

This feature provides the latest surface observation and public forecast for most airports and cities in the United States[26] starting with the current day through the following six calendar days. For airports within the U.S., the public forecast is issued by the National Weather Service (NWS).

To locate the EZ7-Day forecast within **EZWxBrief**, tap or click on **Start** and select **Plan a route** from the menu. The 7-Day forecast is conveniently located in the upper-right corner of the EZRoute map. For portable devices, tap on the EZ7-Day icon (picture of a sun and cloud as shown to the left) located near the zoom in/out map control. Any airport identifier (ICAO or FAA) or city name can be entered for locations in the United States. **Currently the EZ7-Day forecast does not support towns or cities outside of the U.S.** After entering at least three characters[27] and after a brief pause, **EZWxBrief** will query the database and provide suggestions for airport identifiers or city names that match the characters entered. For example, if "Marvin" is entered in the example above, it will show two choices located in the U.S., namely, Marvin, North Carolina and Marvin, South Dakota. Simply tap or click on one of the suggestions to retrieve the EZ7-Day forecast for that city or airport. If there are no matches in the database, the search will provide a **NO DATA FOUND** result.
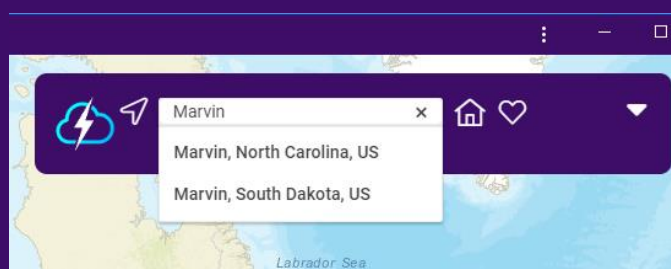
On the 7-Day forecast panel notice three icons that will allow you to retrieve the EZ7-Day forecast for your current location, home airport or you can add or remove it from your EZFavorites.

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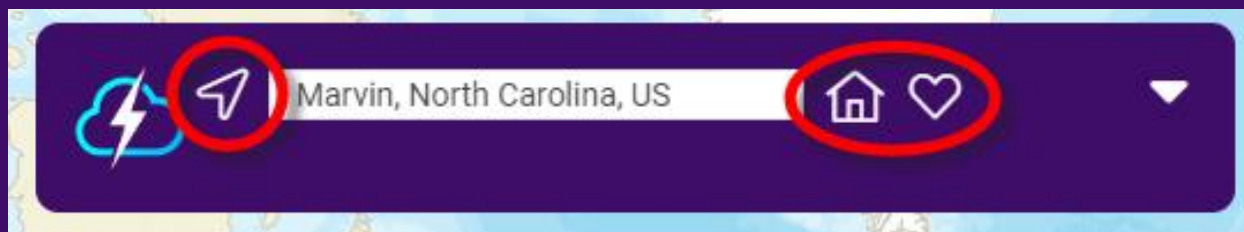
[26] Please note that the number of cities and airports outside of the U.S. is very limited.
[27] You may enter upper **or** lower case characters.

1) Tap or click on the "Home" icon to retrieve the EZ7-Day forecast for your home airport as stored in your general EZSettings.

2) Tap or click on the "Heart" icon to add or remove the airport or city from your EZFavorites (see **Adding a favorite** above).

3) Tap or click on the geolocation icon (far left on the EZ7-Day panel) to retrieve the EZ7-Day forecast for your current location. Geolocation refers to the identification of the geographic location of a device via a variety of data collection mechanisms. Typically, most geolocation services use network routing addresses or internal GPS devices to determine this location. Please note that geolocation is device-specific and browser-specific. This means that browsers or devices must support geolocation to use it through any Internet application. Chrome, Firefox and Safari all support geolocation on most devices.

To use this feature, you will need to give **EZWxBrief** permission to use your current location. For example, on an iPhone using Safari, you may receive the message to the right "to update your browser's settings." If you see this

We are unable to determine your current location. You will need to update your browser's settings to allow it to use your location.

Close

message it means that you have not given Safari permission to allow location access. Follow the directions below to grant access on an iPhone or iPad for Safari.
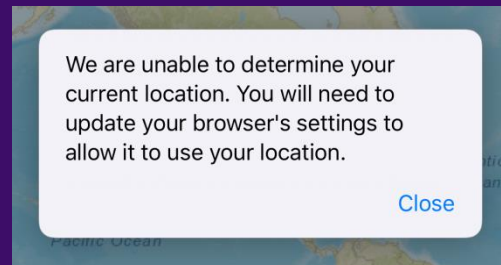
1) Go to your device **Settings**

2) Select **Privacy**

3) Select **Location Services** (location services must be turned on). Please note, the **EZWxBrief** application does not record or track your current location and this is never made available to other users.

Safari Websites

ALLOW LOCATION ACCESS

Never ✓

Ask Next Time

While Using the App

App explanation: "Websites you visit may request your location."

4) Find Safari in the list near the bottom. Permission can be granted on a one-time basis or only when using the application.
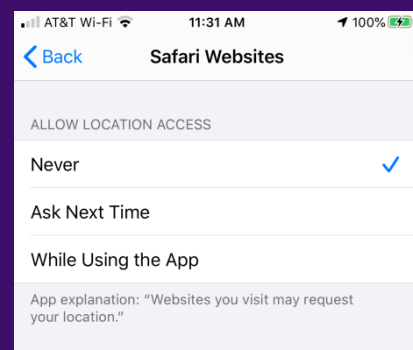
The **Ask Next Time** option will prompt **EZWxBrief** for your permission to use your current location each time you sign in to the application. This procedure is similar for other browsers and devices. Important: When making changes to these geolocation

settings, be sure to restart your browser or close and restart **EZWxBrief** if running it as a PWA.
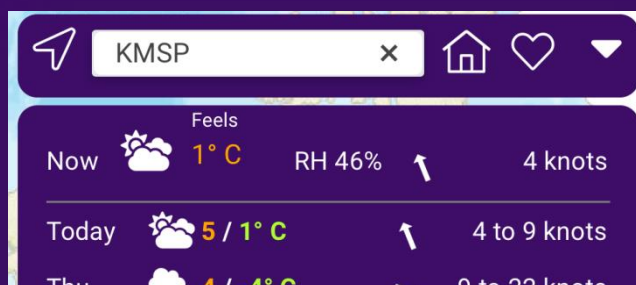
The top row labeled as "**Now**" in the EZ7-Day forecast provides the latest surface observation. This includes the present weather (icon), air temperature, relative humidity, wind direction (arrow) and wind speed. If a city is entered, it will retrieve the latest observation from the closest reporting station (usually an airport) for that city. Also, you may see a "Feels" like temperature that will time-swap between the actual temperature whenever there is a wind chill or heat index present.

Below the latest observation you will find a forecast for the current day followed by the forecast for the next six days. Tap or click on **This Weeks Forecast** to reveal the forecast for all seven days. Depending on the size of the device, the EZ7-Day forecast will include a weather icon showing the expected weather for that day as well as the forecast maximum and minimum temperature followed by the wind direction and wind speed.
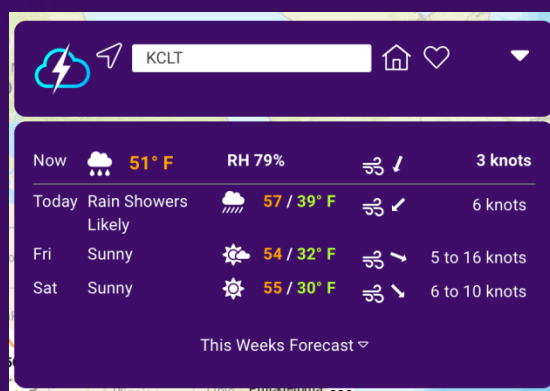
On larger displays, you will see a plain English text overview for that day and evening's weather. Temperature will be displayed in degrees Celsius or Fahrenheit depending on your general EZSettings. Similarly, wind speed will be displayed in knots or miles per hour depending on your settings.
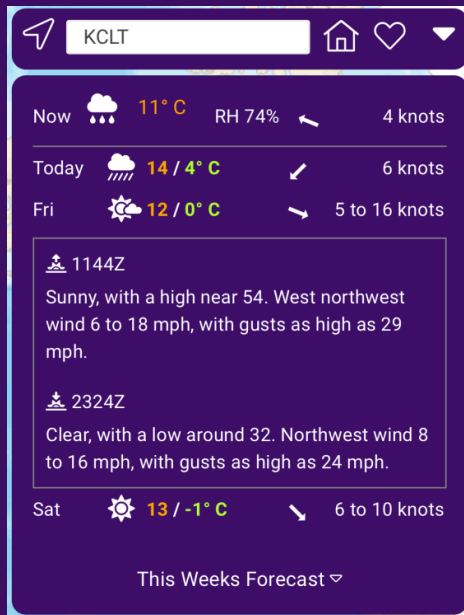
To see the full plain English textual forecast, tap or click on the day of interest. This will expand and show the full plain English text immediately below as shown to the left. A second tap or click on the day of interest will collapse the text. Alternatively, you can tap or click on another day's forecast which will expand and display the text for that day and collapse the other forecast text.

In this view, the time of the sunrise and sunset is shown for that day and location. Depending on your time preference in the EZSettings, these times will be shown as device (local) time or Zulu. Note that for the plain English text, the temperature forecast will always be shown in Fahrenheit and the wind forecast will always be shown in miles per hour. For airports outside of the U.S., the full text forecast will be much abbreviated compared to forecasts within the U.S.

Weather & flight category

There are many locations throughout the **EZWxBrief** application that include a depiction of weather and/or flight category[28]. Consequently, the table below will be referenced in many sections throughout this pilots guide. Context is important; do not confuse these colors with the "traffic light" concept of red, yellow and green used for personal weather minimums and the EZDeparture Advisor.

Category	Color	Ceiling Height (feet AGL)		Visibility (statute miles)
Low IFR	Magenta	Below 500 feet	and/or	Less than 1 mile
IFR	Red	500 feet to below 1,000 feet	and/or	1 to less than 3 miles
MVFR	Blue	1,000 feet to 3,000 feet	and/or	3 to 5 miles
VFR	Green	Greater than 3,000 feet	and	Greater than 5 miles

To depict the current weather or forecast weather at an airport, the National Weather Service (NWS) defines what is referred to as flight category[29]. As shown in the table above, this includes four categories to include Visual Flight Rules (VFR), Marginal Visual Flight Rules (MVFR), Instrument Flight Rules (IFR) and Low Instrument Flight Rules (LIFR). These take into consideration **both** the ceiling height and surface visibility. Ceiling is defined as the lowest broken or overcast cloud deck or vertical visibility into an obscuration[30] as measured or forecast as the height above the ground (AGL).

The cloud coverage depicts how much of the sky is taken up by clouds. An overcast cloud deck is represented by a completely filled circle and partially filled circles represent broken (3/4), scattered (1/2) or few coverage (1/4). No fill depicts a cloud-free sky (see the Appendix for a complete description). The colors used to fill the marker are based on the evaluation of the flight category from the table above. A marker with no fill could be outlined in any of the four flight category colors above. For example, if the sky was expected to be clear, however, visibility was expected to be 2 statute miles, a red outlined marker (indicating a flight category of IFR) with no fill would be shown.

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[28] Note that some other applications will erroneously refer to this as flight rules. Flight rules refers to those defined in 14 CFR § 91 that include Visual Flight Rules (VFR), Instrument Flight Rules (IFR) and Special VFR. Flight category is related to the weather conditions at an airport or station.
[29] Flight category typically combines both ceiling and visibility, but it can also be referenced separately for ceiling and visibility.
[30] This is also referred to as an indefinite ceiling.

In addition to flight category, icons are provided to represent forecast weather conditions such as nonconvective precipitation type (rain, snow, freezing precipitation), thunderstorms, cloudy or partly cloudy sky, fog, gusty winds and clear sky.

EZWxBrief forecast domain

The observations, forecasts and advisories provided by **EZWxBrief** will cover much of North America. However, when planning a route, the high-resolution forecast guidance covers a limited area that includes the conterminous United States and coastal waters, southern Canada and northern Mexico as shown in the image below. When creating a route, entering airports or waypoints outside of this domain, this will result in an error message.
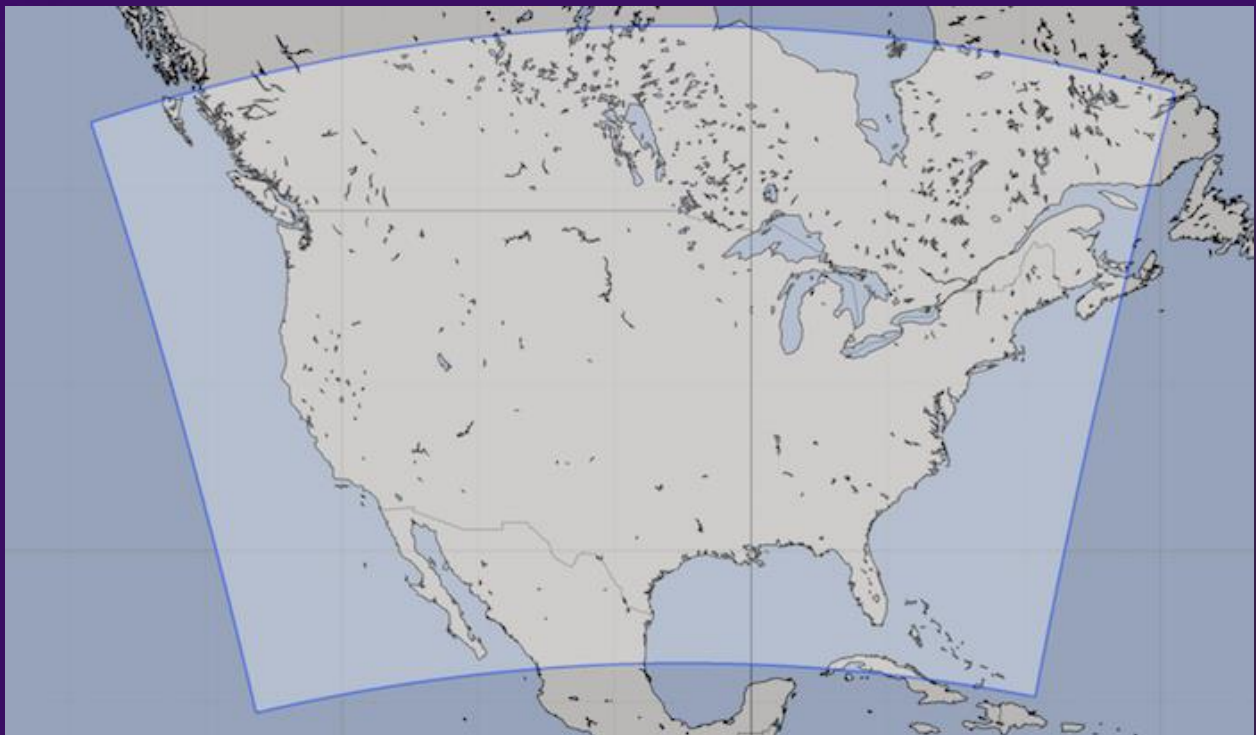
EZSettings

Many of the settings in **EZWxBrief** are more than just user preferences. Instead, they include the ability to control how the application responds to the forecast weather along the proposed route based on the personal minimums defined. Additionally, you will be able to set your preference for units of time, temperature, wind, distance and visibility. More importantly, you will also be able to specify your aircraft settings and personal weather minimums. All these settings are stored and synced between devices.

To change the settings simply tap or click on the **Start** button and choose **Manage your preferences** from the menu. You can also tap or click on the "cog wheel" button to view or alter your current EZSettings. This will open the settings panel. Settings are organized into three sections, namely, General Settings, Aircraft Settings and Personal Minimums. When changes to your settings are made, tap or click on the **Save Settings** button to store your modifications. Alternatively, if you do not want to save your changes, click on the **X** in the upper right of the settings panel. This will bring up a dialog box. Tap or click on the **Abandon and Close** button to exit without saving your changes.

General settings

If not already expanded, to modify the general settings tap or click on the plus (**+**) sign next to **General Settings**. Here you will be able to change or set your **Home Airport**, and preferences for units to include time, temperature, wind speed, distance and visibility.

Home Airport: For the best experience, there are many locations in the application that may need to know your home airport. Simply type the three- or four-letter airport identifier for your home airport into this field. It is **not** optional, so this field is defaulted to the Charlotte Douglas International Airport (KCLT).

Time preference: In **EZWxBrief** there are times listed in many places throughout the application. You have the option to display the device time (local time) or Zulu time (UTC). Simply tap or click on the button to toggle it between **Zulu** and **Local**. Note that all times in the application are displayed as a 24-hour clock unless otherwise specified as a.m. or p.m.

If you set your preference to Zulu, you will notice a **Z** located behind the time as shown below from the EZWxBrief Vertical Profile. If there isn't a **Z** present, then you have your

preference set to the device (local) time. Please note that this setting does <u>not</u> affect the time shown in the Zulu clock on the EZMap, EZRoute Profile, EZImagery and EZAirport views.
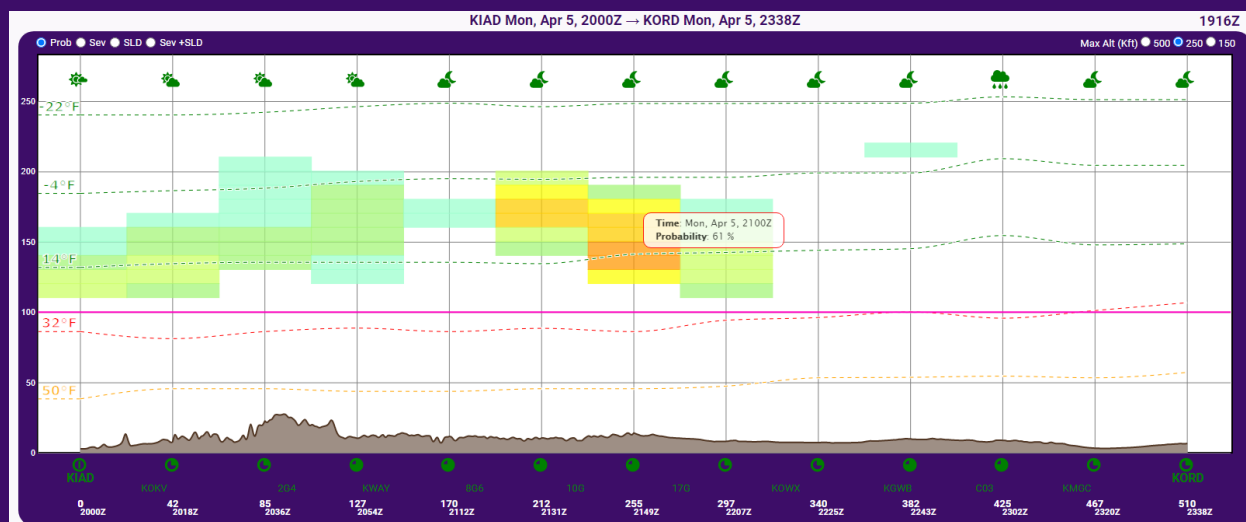
Temperature preference: There are many places in **EZWxBrief** that display a temperature. You have the option to display the temperature in degrees Celsius or Fahrenheit. This choice is made under the Temperature Unit preference as shown below. Most of the time, the temperature will be depicted with a **°F** (Fahrenheit) or **°C** (Celsius) to the right of the temperature.

Aircraft settings

To modify the aircraft settings, tap or click on the plus (**+**) sign next to **Aircraft Settings** to specify the aircraft category as well as set the true airspeed for the aircraft you are flying. This will allow **EZWxBrief** to calculate the effective groundspeed based on the winds aloft forecast for your proposed route.
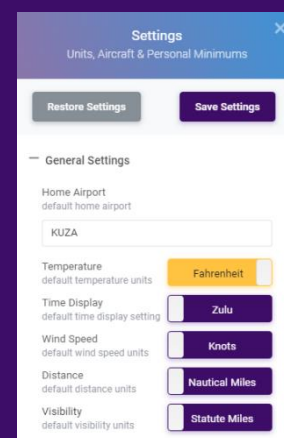
Takeoff weight category: Modify this setting to specify the category of the aircraft you are flying based on maximum takeoff weight (MTW). Choose from **Light** (< 15,500 lbs), **Medium** (15,500 to 300,000 lbs) or **Heavy** (> 300,000 lbs). This category setting is currently used for determining how to contour (color) the eddy dissipation rate (EDR) forecast for turbulence EZRoute and EZAirport pages. See the EDR setting in the EZMinimums below.

En route profile: Modify this setting to specify the average true airspeed in knots for the en route phase of flight. Simply press and slide the white bar left or right to adjust the setting to choose true airspeed (in 1 knot increments) for your aircraft. **Please note,** given the **EZWxBrief** route engine doesn't account for a different airspeed in the climb and descent phases, it is recommended that you set this true airspeed to be a lower value than what you would normally use. Otherwise, this will produce a higher-than-normal ground speed that is used to calculate distances and time as shown at the bottom of the EZRoute Profile.

EZMinimums

Personal minimums

One of the key features of the **EZWxBrief** application is to incorporate your personal weather minimums. These settings provide the capability to set the personal risk level that will be evaluated based on the weather forecast along the proposed route. These weather elements include ceiling height, surface visibility, surface wind (crosswind), thunderstorm potential, turbulence, and icing. If not already expanded, tap or click on the plus (**+**) sign next to **Personal Minimums**. Here you will be able to set all the personal weather minimums listed below. To collapse the Personal Minimums settings, tap or click on the minus (**-**) sign.

Most pilots have set personal limits (minimums) when it comes to various weather factors. The term "minimums" refers to the **minimum acceptable weather conditions**. These minimums often depend on your own risk tolerance, whether or not you'll be flying VFR or IFR, time of day, type of aircraft you are flying, how often you've flown recently, the route and/or altitude you will be using, overall flight experience and most important, weather.[31] To make it **EZ**, **EZWxBrief** uses a "traffic light" concept of green, yellow and red to define those personal minimums for each weather element. For example, you may be very comfortable making a 10 knot or less crosswind landing at your destination. In that case you would set **10 knots** as the maximum setting for green. However, you may feel very uncomfortable with a crosswind greater than 20 knots. You would set **20 knots** as the minimum setting for red. That leaves a crosswind from 11 to 19 knots to be set to yellow which suggests you are outside of your primary comfort zone, but still within your personal limits for crosswind. When a route is created, **EZWxBrief** will check the forecast crosswind (if available) at your destination based on the time of arrival. A result of green, yellow, or red will quickly help you determine if the wind forecast along your route meets or exceeds your personal minimums.

Each setting has two slider bars that require you choose values that define a go (green) or stay (red) condition. To set the value press and drag the green and red slider bars to the right or left until it defines the respective limits you want to set. **Tip:** For most of the

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[31] At this point in time, there isn't a consideration for day or night flight and EZWxBrief is designed only to evaluate weather-related aspects of the flight.

settings, as you move both sliders close to the left or right edge, it will automatically change the scale of the slider to allow further granularity in the setting. Nevertheless, you will always need to define a range for green, yellow, and red or accept the default values provided.

Important note: Not all weather elements are available for every airport or future time. In those cases, that weather component will not be evaluated.

Crosswind at Departure Airport

This setting defines your personal crosswind limitations for takeoff based on the forecast wind conditions (if available) for the best opportunity runway at your departure airport. The crosswind at departure airport sliders

will increment one knot at a time, however, the lowest values that can be set are 3 and 8 knots for green and red, respectively with the highest values at 26 and 31 knots, respectively. At this time there is no way to take into consideration runway surface type (e.g. grass or paved) or runway length. This uses the 10-meter (33 feet) AGL wind forecast.
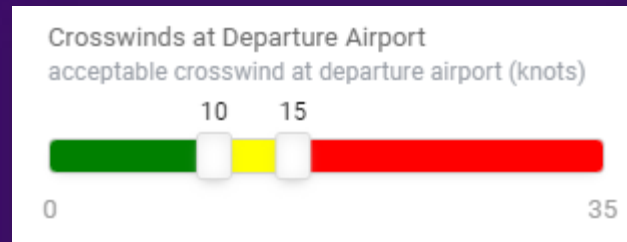
Lead time availability: 1 to 66 hours.

Crosswind at Destination Airport

This setting defines your personal crosswind limitations for landing based on the forecast wind conditions (if available) for the best opportunity runway at your destination airport. The crosswind at destination airport sliders

will increment one knot at a time, however, the lowest values that can be set are 3 and 8 knots for green and red, respectively with the highest values at 26 and 31 knots, respectively. At this time there is no way to take into consideration runway surface type (e.g. grass or paved) or runway length. This uses the 10-meter (33 feet) AGL wind forecast.
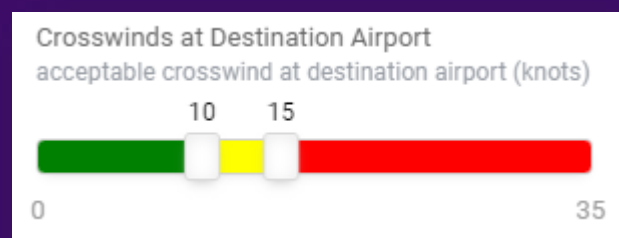
Lead time availability: 1 to 66 hours.

En Route Turbulence Intensity

This setting defines your personal minimums for turbulence intensity at your proposed altitude while en route. This uses a forecast parameter called eddy dissipation rate (EDR). EDR is an aircraft-independent meteorological field expressed in m^2/s^3. An atmosphere that causes eddies to dissipate rapidly is one that is likely turbulent. **Therefore, the higher the EDR value, the higher the intensity of turbulence.** Typically EDR varies from close to 0, "smooth", to near 1, "extreme" for most aircraft types. **Note:** Actual EDR settings are multiplied by 100 for ease of interpretation and the slider is scaled from 0 to 100 accordingly.
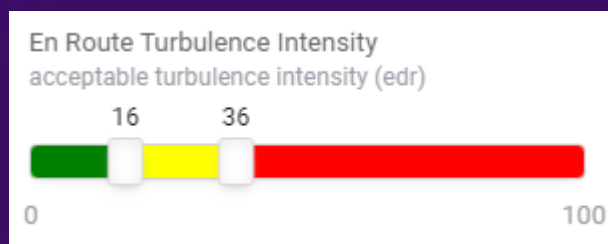
Aircraft weight class	EDR * 100			
	Light	Moderate	Severe	Extreme
Light	13	16	36	64
Medium	15	20	44	79
Heavy	17	24	54	96

Most pilots are aware that the aircraft's maneuvering speed is higher when the aircraft is heavier. Moreover, heavier aircraft (Boeing 787) will experience the same EDR value of turbulence differently than a lighter aircraft (Cessna 172). Therefore, using the table above, the maximum takeoff weight is used to define the EDR that is applicable.

- Light < 15,500 lbs maximum takeoff weight (e.g. Cirrus SR22, Piper Cub, LJ23)
- Medium (or large) 15,500 - 300,000 lbs maximum takeoff weight (e.g. A320, B737, G5, MD80)
- Heavy > 300,000 lbs maximum takeoff weight (e.g., A330, A380, B787, B777)

As an example, a light aircraft will begin to report moderate turbulence beginning with an EDR of 16 whereas a heavy aircraft will begin to report moderate turbulence with an EDR of 24. Therefore, if you are flying a light aircraft and are uncomfortable with severe turbulence, you should set the red slider to at least 36. The en route turbulence intensity sliders will advance at one EDR * 100 increment at a time, however, the lowest values

that can be set are 3 and 13 for green and red, respectively with the highest values at 83 and 93, respectively.

Lead time availability: 1 to 18 hours.

En Route Icing Probability

This setting defines your personal minimums for the probability of airframe icing at your proposed altitude while en route. This is a calibrated probability defined by a percentage from 0 to 100. A higher probability means that airframe icing is more certain. Keep in mind, as the lead time increases, the probability of icing will naturally decrease due to uncertainty. Therefore, it is unlikely probabilities for icing will exceed 50% beyond a lead time of 15 hours. The en route icing probability sliders will advance at one percent at a time. However, the lowest values that can be set are 3 and 13 for green and red, respectively with the highest values at 84 and 94, respectively.
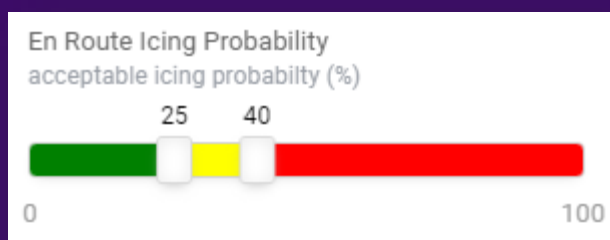
Lead time availability: 1 to 18 hours.

En Route Icing Intensity

This setting defines your personal minimums for the intensity of airframe icing at your proposed altitude while en route. Categorical choices include None, Trace, Light, Moderate and Heavy. Although pilots report "severe" icing versus heavy icing, severe is not used since this is reserved for how the aircraft reacts to the meteorological conditions, not the meteorological conditions themselves.
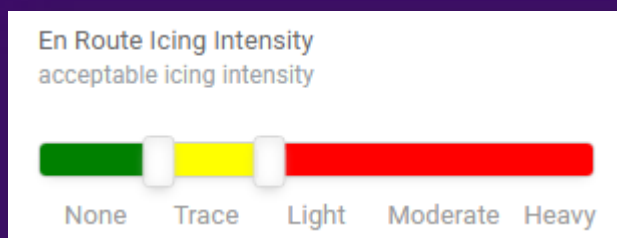
Moving the left-most slider all the way to the left will identify a conservative personal minimum for icing severity as "None." Therefore, green will only be evaluated for this personal minimum category when the altitude chosen for the route has no icing potential identified. Moving the right-most slider all the way to the right

will set the personal minimum to Heavy such that red will be evaluated if the altitude chosen crosses through a region of heavy icing.

Lead time availability: 1 to 18 hours.

En Route Convective Potential

This setting defines your personal minimums for the convective threat along your proposed route. Categorical choices include None, Very Lo (low), Lo (low), Med (medium), Hi (high), Very Hi (very high). Keep in mind that this does not mean thunderstorm potential. Most deep, moist convection that exists to include showery precipitation (e.g., rain or snow showers) does not have lightning. This convective potential personal minimums includes any threat of deep convection that produces some form of precipitation.
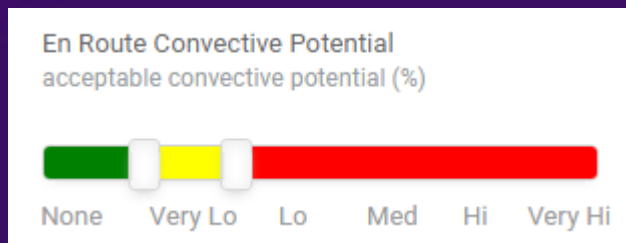
Moving the left-most slider all the way to the left will identify a conservative personal minimum for convective potential as "None." Therefore, green will only be evaluated for this personal minimum category when the route has no risk of deep, moist convection producing precipitation. Moving the right-most slider all the way to the right will set the personal minimum to Very Hi such that red will be evaluated if the route chosen crosses through a region where deep, moist convection producing precipitation is definite.

Lead time availability: 1 to 66 hours.

Ceiling at Destination

This setting allows you to define your personal minimums for ceiling height at the destination airport. A ceiling in this context is defined as the lowest broken or overcast cloud deck. Note that cloud layers forecast as scattered or few are not considered a ceiling.
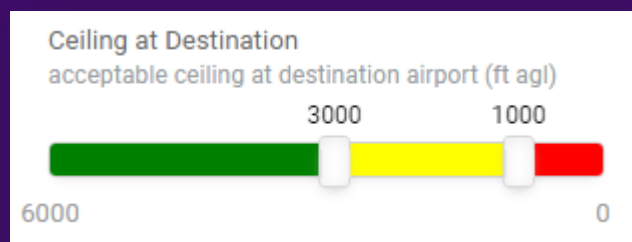
Assuming a route is defined, **EZWxBrief** will examine the <u>forecast</u> ceiling[32] (if any) at your destination airport valid at the estimated time of arrival and determine if it meets or exceeds these thresholds. Moving the ceiling at destination sliders left and right will change the value of either setting at 100-foot increments. However, the lowest values that can be set are 100 and 200 feet for red and green, respectively, with the highest values at 5800 feet and 5900 feet, respectively.

Lead time availability: 1 to 66 hours.

Example:

If you define red with a threshold of 500 feet and green with a threshold of 1,000 feet, a ceiling at your estimated time of departure that is forecast to be 500 feet (or lower) will fall below your personal minimums and be flagged as red on the EZDeparture Advisor. On the other hand, a ceiling of 1,000 feet (or higher) forecast at the destination airport will meet your personal minimums and be flagged as green. Ceiling forecasts greater than 500 feet and less than 1,000 feet will be flagged as yellow in this example.

Ceiling at Departure
This setting allows you to define your personal minimums for ceiling height at the departure airport. A ceiling in this context is defined as the <u>lowest</u> broken or overcast cloud deck. Note that cloud layers forecast as scattered or few are not considered a ceiling.

Ceiling at Departure
acceptable ceiling at departure airport (ft agl)
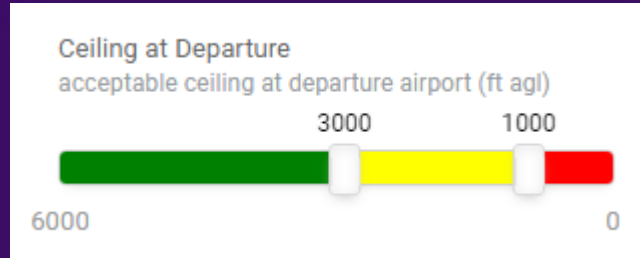
Assuming a route is defined, **EZWxBrief** will examine the <u>forecast</u> ceiling[33] (if any) at your departure airport valid at the estimated time of departure and determine if it meets or exceeds these thresholds. Moving the ceiling at departure sliders left and right will change the value of either setting at 100-foot increments. However, the lowest values that can be set are 100 and 200 feet for red and green, respectively, with the highest values at 5800 feet and 5900 feet, respectively.

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[32] Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.
[33] Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

Lead time availability: 1 to 66 hours.

If you define red with a threshold of 300 feet and green with a threshold of 800 feet, a ceiling at your estimated time of departure that is forecast to be 300 feet (or lower) will be flagged as red on the EZDeparture Advisor. On the other hand, a ceiling of 800 feet (or higher) forecast at the destination airport will meet your personal minimums and be flagged as green. Ceiling forecasts greater than 300 feet and less than 800 feet will be flagged as yellow in this example.

Ceiling Along Route

This setting allows you to define your personal minimums for the ceiling height along the proposed route. This setting may be more appropriate for pilots flying under Visual Flight Rules (VFR). A ceiling in

this context is defined as the <u>lowest</u> broken or overcast cloud deck. Note that cloud layers forecast as scattered or few are not considered a ceiling.
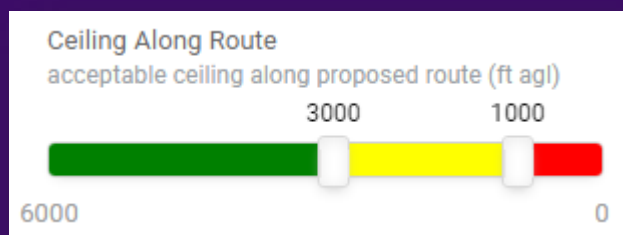
Assuming a route is defined, **EZWxBrief** will examine the <u>forecast</u> ceiling[34] along the entire route (including the departure and destination airports) to determine if it meets or exceeds these thresholds. Moving the ceiling along route sliders left and right will change the value of either setting at 100-foot increments. However, the lowest values that can be set are 100 and 200 feet for red and green, respectively, with the highest values at 5800 feet and 5900 feet, respectively.

Lead time availability: 1 to 66 hours.

If you define red with a threshold of 200 feet and green with a threshold of 500 feet, a ceiling at any point along your route that is forecast to be 200 feet (or lower) will be flagged as red on the EZDeparture Advisor. On the other hand, a ceiling of 500 feet (or

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[34] Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

higher) that is forecast at any point along your route will meet your personal minimums and be flagged as green.

Surface Visibility at Destination
This setting allows you to define your personal minimums for the surface visibility at the destination airport. Assuming a route is defined, **EZWxBrief** will examine the forecast surface visibility[35] at your destination airport valid at the estimated time of arrival and

determine if it meets or exceeds these thresholds. Moving the surface visibility at destination sliders left and right will change the value of either setting at 0.5 statute mile increments. However, the lowest values that can be set are 1.5 and 0.5 statute miles for green and red, respectively, with the highest values set at 14.5 and 13.5 statute miles, respectively.
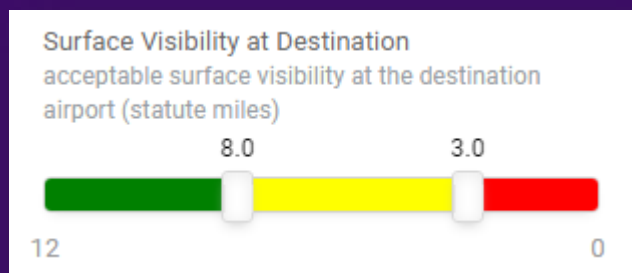
Lead time availability: 1 to 66 hours.

Example:

If you define red with a threshold of 2 statute miles and green with a threshold of 5 statute miles, a surface visibility at your estimated time of departure that is forecast to be 2 statute miles (or less) will fall below your personal minimums and be flagged as red on the EZDeparture Advisor. On the other hand, a surface visibility of 5 statute miles (or more) forecast at the destination airport will meet your personal minimums and be flagged as green. A surface visibility forecast greater than 2 statute miles and less than 5 statute miles at the destination airport will be flagged as yellow in this example.

Surface Visibility at Departure
This setting allows you to define your personal minimums for the surface visibility at the departure airport. Assuming a route is defined, **EZWxBrief** will examine the forecast

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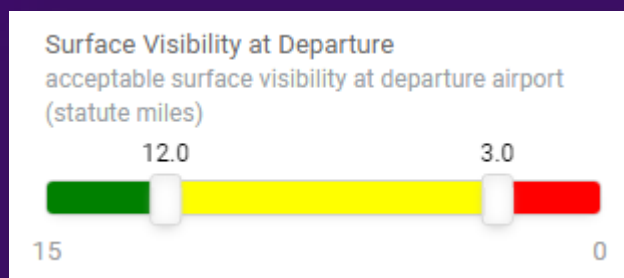
[35] Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

surface visibility[36] (if any) at your departure airport valid at the estimated time of departure and determine if it meets or exceeds these thresholds. Moving the surface visibility at destination sliders left and right will change the value of either setting at 0.5 statute mile increments. However, the lowest values that can be set are 1.5 and 0.5 statute miles for green and red, respectively, with the highest values set at 14.5 and 13.5 statute miles, respectively.

Lead time availability: 1 to 66 hours.

Example:

If you define red with a threshold of 1 statute mile and green with a threshold of 3 statute miles, a surface visibility at your estimated time of departure that is forecast to be 1 statute mile (or less) will fall below your personal minimums and be flagged as red on the EZDeparture Advisor. On the other hand, a surface visibility of 3 statute miles (or more) forecast at the departure airport will meet your personal minimums and be flagged as green. A surface visibility forecast greater than 1 statute mile and less than 3 statute miles at the departure airport will be flagged as yellow in this example.

Surface Visibility Along Route

This setting allows you to define your personal minimums for the surface visibility along the proposed route. This setting may be more appropriate for pilots flying under Visual Flight Rules (VFR). Assuming a route is defined, **EZWxBrief** will examine the forecast surface

visibility[37] along the entire route (including the departure and destination airports) to determine if it meets or exceeds these thresholds. Moving the surface visibility along the route sliders left and right will change the value of either setting at 0.5 statute mile increments. However, the lowest values that can be set are 1.5 and 0.5 statute miles for green and red, respectively, with the highest values set at 14.5 and 13.5 statute miles, respectively.

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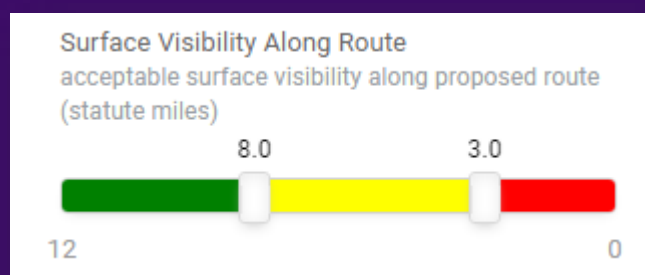
[36] Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.
[37] Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

Lead time availability: 1 to 66 hours.

Example:

If you define red with a threshold of 4 statute miles and green with a threshold of 7 statute miles, a surface visibility at any point along your route that is forecast to be 4 statute miles (or less) will be flagged as red on the EZDeparture Advisor. On the other hand, a surface visibility of 7 statute miles (or more) that is forecast at any point along your route will meet your personal minimums and be flagged as green.

Saving settings

When finished, tap or click on **Save Settings**. To restore all of the settings back to the factory default, tap or click on **Reset Settings**. You can also click on the **X** in the upper-right corner to abandon any changes without saving. In that case, the application will remind you that, "You have changes to your settings that have not been saved. Do you want to save these changes?" Tap or click on **Save and close** to save your changes or tap or click on **Abandon and close** to abandon without saving your changes.

EZMap

Although defining a route is optional, **EZWxBrief** includes a basic interactive map that allows you to plan a route and determine the departure time that minimizes your exposure to adverse weather using the EZDeparture Advisor. To navigate to the EZMap from any location within **EZWxBrief**, tap or click on the **Start** button and then select **Plan a route** from the menu options[38]. Buttons are also available on the Airport and EZRoute to navigate to the EZMap. Note that selecting a route from the EZFavorites will activate that route and open the EZRoute Profile and not the interactive map.

Base map

EZWxBrief has one of four base maps. To change the base map, simply tap or click on the **Map** icon and select from Street (default), Topo, Terrain or Dark. This choice is remembered such that if you were to close **EZWxBrief** or exit the EZMap, the last base map choice will be preserved and used. Topo and Terrain are primarily used to highlight the underlying terrain. Specifically, mountain ranges show up nicely on these two maps. The Topo map has the most detail and it may be difficult to view some of the weather layers depending on the color and size of the layer item. Perhaps the map with the greatest contrast and best viewing is the Dark mode. This works the best when using **EZWxBrief** in a dimly lit situation, but also works well to provide contrast to the items displayed on the map.
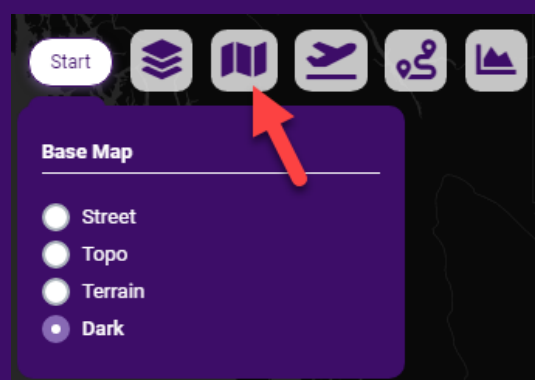
Zooming and panning

Integral to all interactive maps is the ability to pan and zoom. EZMap provides that capability through a variety of different methods depending on the device running the application. The map has a default **+** (zoom in) and **–** (zoom out) button (as shown to the right). There are a total of seven zoom levels available. When the inner-most zoom level is reached, the **+** button will be deactivated. Similarly, when the outer-most zoom level is reached, the **–** button is deactivated. To pan the map, simply use a click-hold-and-drag action with the

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[38] It is strongly suggested that all route planning begin with the EZMap. Be sure to validate that the resulting route shown on the EZMap is the expected route to be briefed.

left mouse button. The map will pan (slide) in any direction that the cursor is moved while holding down the left mouse button.

A mouse with a thumb wheel can also invoke the zoom in/out function. Moreover, a double click on the map using a mouse will zoom in on the map toward that area where the mouse was clicked[39]. On a touch screen a standard pinch and zoom with a two-finger gesture can be used to zoom in and out accordingly. **Important:** When panning and/or zooming the map **give the application time to respond**. The map is typically refreshed and might take a second or two to render the layers with each operation.

Route planning

Integral to the **EZWxBrief** application is the proposed route. Although there isn't a requirement to have an active route, one must be defined to leverage the EZRoute vertical profile and EZDeparture Advisor. Only a single route can be active at any one time.

Given that, **EZWxBrief** is primarily an application to help pilots minimize their exposure to adverse weather and is not intended to provide full navigation and routing capabilities that may be available through a full-featured Electronic Flight Bag (EFB) application. The **EZWxBrief** database does, however, contain most VFR and IFR waypoints, intersections, NAVAIDs and other fixes, but is **not** designed to accept complex routes that may include Victor and Jet airways, Standard Instrument Departures (SIDs) or Standard Terminal Arrival Routes (STARs). However, routes can be manually defined by entering a departure and destination airport along with an optional route of flight **with five waypoints** that consists of one or more airport identifiers, intersections, fixes, navigation aids (NAVAIDs) and other waypoints.[40]

To create a route, tap or click on the **Start** button and choose the **Plan a route** option.[41] This will open up the EZMap where route planning always begins. To add a new route or edit an existing route, simply tap or click on the route editor icon located at the top of the

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[39] There is not a zoom out mouse click action.
[40] The departure and destination airports and other waypoints in the EZWxBrief database may not be current and should not be used for navigation purposes.
[41] This action only needs to be performed if the current page is not the EZMap.

EZMap (see above). If no route exists, enter the three-letter (FAA) or four-letter (ICAO) airport identifier[42] into the Departure and Destination fields. As characters are entered, a smart filter will show matching airports (to include the identifier followed by the name of the airport).[43] Select one of the airport identifiers listed to add the departure and destination airport, respectively, to the route. "No Data Found" with be shown if the airport identifier entered is not discovered in the **EZWxBrief** database.[44]

An optional route of flight may also be entered **containing up to five waypoints**. These are flyover waypoints that are located between the departure and destination airport. They can include any combination of airports, NAVAIDs, intersections, and other fixes.[45] These are entered similar to the departure and destination airports. Tap or click to focus the cursor in the route of flight field and then type the waypoint identifier. The list of suggestions will include the identifier (or partial identifier) and the state and country so that the correct identifier can be chosen. Pick the desired identifier from the list shown

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[42] Only airport identifiers can be entered for the departure and destination. The departure and destination airports can be the same, but there must be at least one waypoint in the route of flight.
[43] It may take a second or two for the smart filter to begin making suggestions. Please be patient.
[44] This may be more problematic for airports outside of the U.S.
[45] Note that the waypoints in the route of flight cannot also include the departure or destination airport. You cannot have duplicate waypoints in the route of flight.

to add it to the route of flight. Once the waypoint is chosen, another waypoint can be added immediately following the most recent waypoint in the route of flight. To remove a waypoint from the route of flight field, click or tap on the **X** positioned at the end of the identifier. Please note that waypoints in the route of flight cannot be reordered within the route of flight field and waypoints cannot be entered between other waypoints.

After the departure airport, destination airport and optional route of flight are all populated, choose the desired MSL altitude.[46] This altitude is used by the EZDeparture Advisor to evaluate certain personal minimums such as en route icing and turbulence along the proposed route. To change the altitude, tap or click within the field to focus the cursor for editing. For minor adjustments, the altitude can be changed by a click or tap on the up or down arrow to increase or decrease the altitude in increments of 500 feet.

By default, the route editor will assume a "zero wind" calculation. In other words, the true airspeed entered in the EZSettings will be used as the ground speed to calculate the duration of the flight independent of the winds aloft. If desired, the **Use Forecast Winds** switch can be set to calculate the ground speed using the forecast winds aloft at the altitude chosen.[47]

Once a valid route and altitude is entered, tap or click on the **Apply** button to load the route and render the route line on the EZMap.[48] Click or tap on the route profile icon to load the current route and navigate to the EZRoute vertical profile page.

If a route currently exists, the departure, destination and route of flight fields will be populated with the most recent route entered. To edit the departure or destination airport, simply tap or click on the **X** on the right side of the field to clear the text and then follow the entry procedure above to enter a new airport. It's also possible to tap or click within these fields and backspace over the name of the airport to clear it or triple-click to highlight the data in the field and begin entering the new airport identifier.

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[46] An altitude is always required.
[47] At this time, the true airspeed does not factor in the climb or descent profile.
[48] Great circle routes are calculated.

Reversing and clearing routes

To reverse the current route, tap or click on the **Reverse** button. This will swap the destination and departure airports and will also reverse the route of flight waypoints (if any). To empty the fields within the route editor simply tap or click on the **Clear** button within the route editor. This will remove the departure and destination airport along with the route flight (if any). The altitude will be set to the default of 10,000 feet and the **Use Forecast Winds** switch will be set to off.

There is no specific reason to ever delete a route given that a route is necessary for the EZDeparture Advisor to function and to populate data in the EZRoute vertical profile. Nevertheless, to delete a route, click on the **Delete** button. Like **Clear**, this will empty all fields in the route editor and reset the **Altitude** and **Use Forecast Winds** settings. It will also remove the route from the EZMap and reset the EZDeparture Advisor to the "no route" instance. Note, **Delete** can only be performed when using the EZMap page. It is not available in the route editor from the EZRoute vertical profile page.

Favorite routes

Routes can be saved as favorites or favorite routes can be loaded. Once a complete route has been defined, tap or click on the heart icon in the route editor to the left of the **Apply** button. This will provide a prompt to choose a name and custom folder to store the favorite. Like other favorites, the same route can be saved in multiple custom folders. Anytime you create a route, **EZWxBrief** will search through your favorites to determine if such a route exists. If so, it will make the heart icon solid indicating that it is a current favorite. When you modify the favorite route in any way (e.g., remove or add a waypoint or departure or destination airport), it will turn the heart from filled to unfilled.

To open a favorite route previously saved tap or click on the **Start** button and select **Manage my favorites** to open the Favorites panel. In the Favorites panel, locate the route in one of the custom folders or **EZWxBrief** root folder. Tap or click on that favorite route and the EZRoute Profile will be loaded with the favorite route.

Layer selector

EZWxBrief provides the capability to add one or more weather layers to the EZMap. There are three types of layers: (1) observational data such as pilot weather reports (PIREPs), surface observations (METARs) and radar; (2) advisories such as SIGMETs, G-

AIRMETs and Center Weather Advisories; and (3) forecasts such as the proprietary EZForecast. **Important: In order to see the latest observations (e.g., METARs and PIREPs), the EZDeparture Advisor needs to be positioned to the nominal time or left most position.**

To add or remove a weather layer, tap or click on the layer selector button (shown below) to reveal the layer menu. Multiple layers can be added at the same time. Keep in

mind that adding multiple layers may result in a complex and cluttered map making it difficult to discern the weather for any area or route. Therefore, it is recommended to minimize this complexity by limiting the number of layers displayed simultaneously to no more than two or three.

Station Markers

Airports are typically used as observation stations and provide a location for aviation forecasts. However, there are other reporting stations available that are not at airports[49]. **EZWxBrief** provides access to both surface observations (METARs) and the proprietary EZForecast for many airports throughout the U.S, Canada, Mexico, and Caribbean.

To view the latest METARs or EZForecast, tap or click on the **Layer Selector** button and select **Station Markers** from the menu. This will present a list of Station Marker attribute filters to include Use Personal Mins, Flight Category, Ceiling Height, Surface Visibility, Surface Wind Speed, Surface Wind Gust, Surface Temperature, Surface Dewpoint, Dewpoint Depression and Weather. These filters are valid for both observations (METARs) and forecasts. Only one Station Marker filter can be applied at any time. Some filters have additional attributes to further filter the Station Markers shown on the EZMap. A tap or click on the station marker will provide the details of the surface observation or

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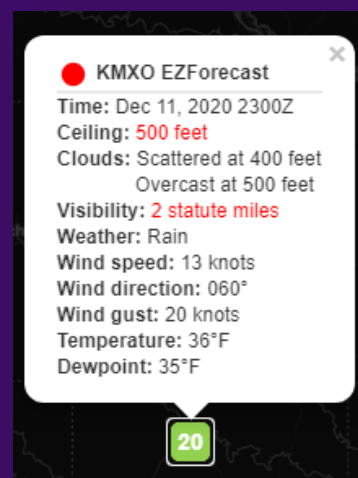
[49] A station is used as a generic term rather than assuming that all stations are airports. They can be buoys, ships or other points that are not specifically airports. For example, Mount Washington, New Hampshire (KMWN) is a reporting station that is not an airport.

EZForecast for that station (airport). With or without an active route, the forecast associated with the Station Marker depicted on the EZMap are valid at the time set on the EZDeparture Advisor and are independent of the proposed route of flight. Therefore, if the EZDeparture Advisor is set at 23Z, then the forecast provided by every Station Marker on the EZMap is also valid at 23Z.[50]

Category	Personal minimum risk (low, moderate and high)
Green	Satisfies the referenced personal minimums with sufficient margin
Yellow	Approaches the referenced personal minimums (moderate risk)
Red	Falls below the referenced personal minimums threshold (high risk)

Use Personal Mins – this provides the capability to evaluate the current or forecast weather at a station (airport) against a subset of personal minimums previously defined within the EZSettings. Three attributes are available to include flight category[51], ceiling height and surface visibility. Moreover, this can be applied to the EZSettings for the departure airport (Depart), en route airport (En route) or destination airport (Dest) accordingly. The result will be a solid-filled marker using the traffic light concept outlined in the EZSettings section of this guide and correspond to the table above. Please note that the application of these personal minimums applies only for the time set on the EZDeparture Advisor regardless if a route is defined or not.

For example, this layer can be used to determine a suitable alternate airport.[52] Assume the EZDeparture Advisor is set to 18Z and the attributes are set to use the (1) flight category for the (2)

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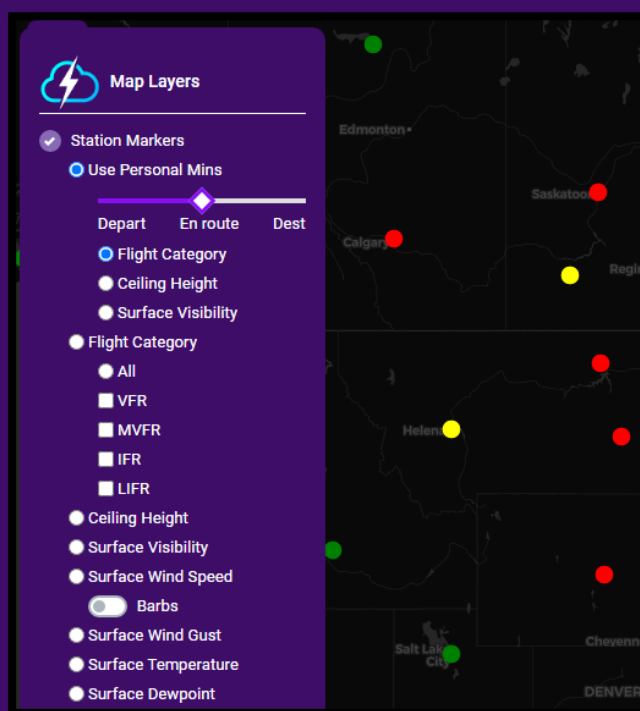
[50] Observations such as METARs and PIREPs are valid at the time shown in the tabular data pop-up.
[51] Flight category combines the categorical ceiling height and categorical surface visibility.
[52] Whether or not an airport makes a legal alternate depends on many factors that are not considered by this application at this time.

destination airport personal minimums. **EZWxBrief** will examine the EZForecast or observations for all stations to determine if the station's flight category falls within the green, yellow or red category defined within the departure airport EZSettings. Stations on the EZMap that display as a solid-filled red circle are likely not suitable candidates for an alternate airport. Conversely, stations shown by a solid-filled green circle are likely well within a margin of safety and may make a good alternate. A solid-filled yellow circle may also be a suitable alternate, but these airports should be used with caution. **Of course, the result depends strictly on the thresholds defined in the EZSettings.**

Flight Category – this provides the capability to filter the markers based on the current or forecast flight category. As shown in the table below the flight category can be one of four values to include Low Instrument Flight Rules (LIFR), Instrument Flight Rules (IFR), Marginal Visual Flight Rules (MVFR) and Visual Flight Rules (VFR). The flight category combines both the ceiling height and surface visibility to produce a categorical value according to the table below.

Category	Color	Ceiling		Visibility (statute miles)
Low IFR	Magenta	Below 500 feet	and/or	Less than 1 mile
IFR	Red	500 feet to below 1,000 feet	and/or	1 to less than 3 miles
MVFR	Blue	1,000 feet to 3,000 feet	and/or	3 to 5 miles
VFR	Green	Greater than 3,000 feet	and	Greater than 5 miles
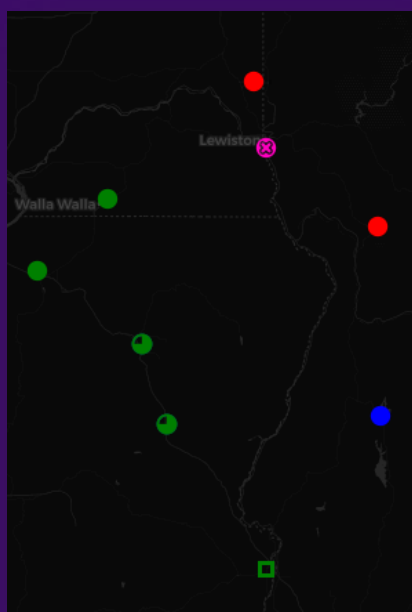
The flight category marker is rendered on the EZMap as a filled (overcast), partially filled (scattered, broken or few) or unfilled (sky clear) colored circle depending on the sky cover and flight category observation or forecast for the station based on the time selected from the EZDeparture Advisor. It can also be rendered as a colored square based for observational flight category designations when the sky is cloud free below 12,000 feet AGL for the station.[53] Indefinite ceilings are shown as a circular marker with an **X** in the center. When the sky cover

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[53] These are typically automated surface observations.

or flight category is unknown,[54] the marker will be shown as a colored question mark.

Ceiling Height – This is the prevailing ceiling height[55] reported or forecast for the station based on the time selected from the EZDeparture Advisor. Also included is a filled circle colored to represent the flight category contributed by the ceiling (green is VFR, blue is MVFR, red is IFR and magenta is LIFR). A ceiling is the lowest broken or overcast cloud deck or vertical visibility (VV) into an obscuration[56]. If a ceiling is not reported or forecast, the station's marker will be omitted for this layer.
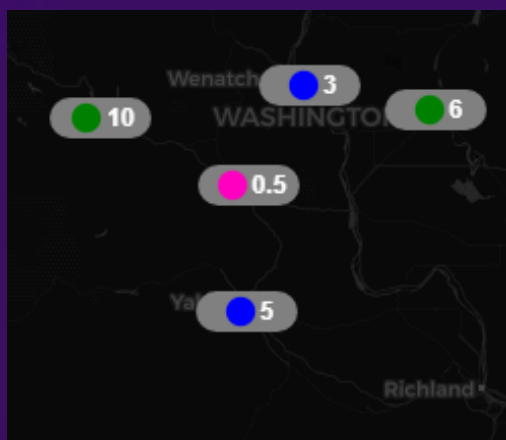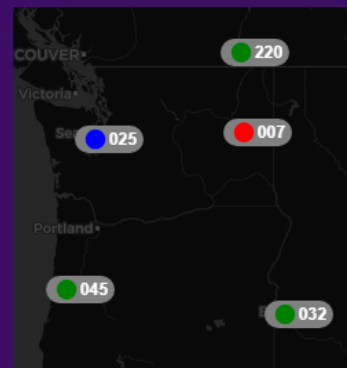
Surface Visibility –

This is the prevailing surface visibility reported or forecast for the station based on the time selected from the EZDeparture Advisor. This can be displayed in statute miles or meters depending on the user's EZSettings. Also included is a filled circle colored to represent the flight category contributed by the visibility (green is VFR, blue is MVFR, red is IFR and magenta is LIFR).

Surface Wind Speed – This square marker is the prevailing surface wind speed reported or forecast for the station based on the time selected from the EZDeparture Advisor. For the forecast, this uses the 10-meter (33 feet) AGL wind speed.

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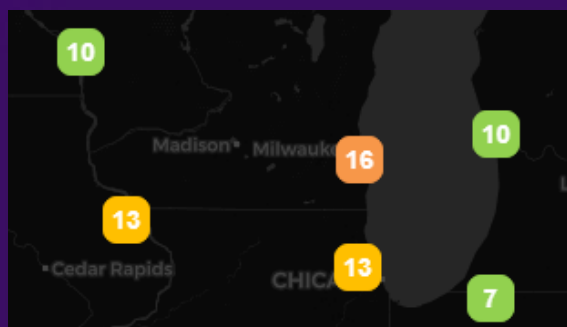
[54] This situation typically occurs when the ceiling, visibility or sky coverage is missing from the observation or forecast for the station.
[55] Ceiling heights and heights of clouds are always reported or forecast as above ground level (AGL) height.
[56] This is also called an indefinite ceiling. Forecasts do not consider the potential of indefinite ceilings.

This can be displayed in knots or miles per hour depending on the user's EZSettings. A zero is shown for an observation or forecast of calm wind. The marker is color-coded for the magnitude of the wind speed. Shades of green represent a prevailing wind speed of 10 knots or lower. When the wind speed increases, warm colors such as yellow, orange, or red denote wind speeds in excess of 10 knots. **Note that these colors for wind are to represent the magnitude of the wind and should not be confused with the red, yellow, and green personal minimums.**

Surface Wind Gust – This square marker is the surface wind gust reported or forecast for the station based on the time selected from the EZDeparture Advisor. For the forecast, this uses the 10-meter (33 feet) AGL wind gust. This can be displayed in knots or miles per hour depending on the user's EZSettings. The marker is color-coded for the magnitude of the wind gust. Shades of green represent a wind gust at or below 20 knots. When the wind gust increases, warm colors such as yellow, orange, or red denote wind gusts in excess of 20 knots. If a wind gust is not reported or forecast, the station's marker will be omitted for this layer. **Note that these colors for wind are to represent the magnitude of the wind and should not be confused with the red, yellow, and green personal minimums.**
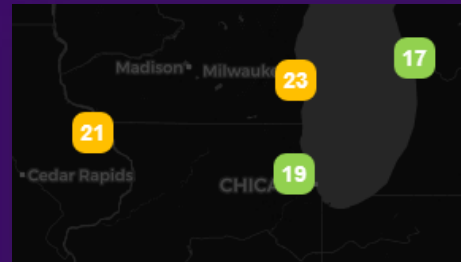
Surface Wind Barbs – This marker represents a graphical depiction of the reported or forecast wind speed and wind direction using standard wind barbs (knots) for the time selected from the EZDeparture Advisor. For the forecast, this uses the 10-meter (33 feet) AGL wind direction. Tap or click on the **Barbs** switch to turn the wind barb depiction on or off. This represents the prevailing winds and does not factor in the wind gusts. **Note that these colors for wind barbs are to represent the magnitude of the wind and should not be confused with the red, yellow and green personal minimums.**

Surface Temperature – This round marker is the surface temperature reported or forecast for the station based on the time selected from the EZDeparture Advisor. This can be displayed in degrees Fahrenheit or Celsius depending on the user's EZSettings. Cooler colors such as purple, blue, and green represent colder temperatures whereas warmer colors such as yellow, orange or red represent warmer temperatures.

Surface Dewpoint – This round marker is the surface dewpoint temperature reported or forecast for the airport based on the time selected from the EZDeparture Advisor. This can be displayed in degrees Fahrenheit or Celsius depending on the user's EZSettings. Cooler colors such as purple, blue, and green represent colder temperatures whereas warmer colors such as yellow, orange, or red represent warmer temperatures.
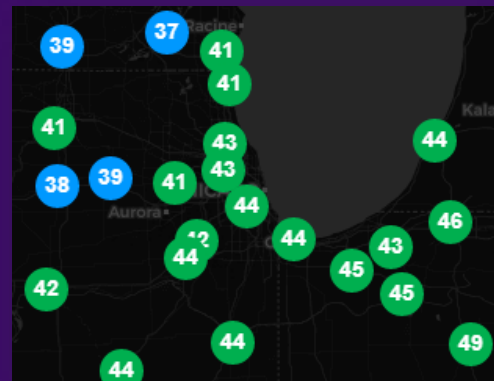
Dewpoint Depression – This round marker for the dewpoint depression is the temperature-dewpoint spread reported or forecast based on the time selected from the EZDeparture Advisor. Large dewpoint depressions are characteristics of dryer and less humid air. Conversely, small dewpoint depressions are indicative of more humid air which can lead to reduced visibility, haze, or fog. This can be displayed in degrees Fahrenheit or Celsius depending on the user's EZSettings. Cooler colors such as purple, blue, and green represent smaller dewpoint depressions and warmer colors such as yellow, orange or red represent larger dewpoint depressions.

Weather – This is the predominant present weather depiction observed or forecast for the station based on the time selected from the EZDeparture Advisor. Stations where the weather is unknown or missing are color coded as a gray icon or for missing as a question mark. When windy or gusty conditions occur, a wind icon will be used if there is no other weather
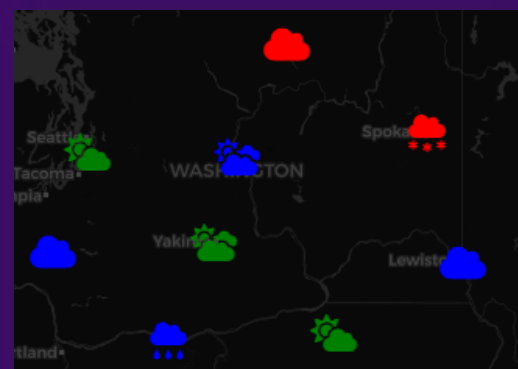
phenomenon to report (e.g., rain, snow, fog). Like other weather icons, the symbol will be color-coded based on the station's overall flight category.

Radar

The most recent 30 minutes of the NEXRAD 0.5-degree base reflectivity mosaic[57] for the conterminous U.S and coastal waters, Alaska, Hawaii and Puerto Rico is available with a loop at 5-minute intervals. When selected, a mini-control panel will become available to animate the radar loop. For the best experience on small devices, it is best to use the (**+/-**) controls to change the zoom level when the radar layer is displayed.

SIGMETs

These **SIG**nificant **MET**eorological Information (SIGMET) advisories are issued on an **as-needed** basis by meteorologists at the Aviation Weather Center (AWC). SIGMETs are concise, brief descriptions of the development and occurrence or expected occurrence in time and space of specified en route weather phenomena which may affect the safety of all aircraft operations. A SIGMET advises of widespread **nonconvective** weather over the conterminous United States and adjacent coastal waters, except as shown below, that is potentially hazardous to all aircraft:

> a. Severe airframe icing not associated with thunderstorms.

> b. Severe or extreme turbulence or clear air turbulence (CAT) not associated with thunderstorms.

> c. Dust storms or sandstorms lowering surface or in-flight visibilities to below 3 statute miles.

and of:

> a. Volcanic ash.

> b. Tropical cyclones.

Widespread defines an area that is at least 3,000 square miles which equates to about 60% of the size of the state of Connecticut.

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[57] This radar mosaic only has very basic decluttering applied. As a result, false returns will be present such that gust fronts and outflow boundaries are not filtered.

SIGMETs are **not** routinely issued and have no defined schedule. Therefore, it is possible to have no active SIGMETs available to add to the EZMap. SIGMETs for severe or extreme turbulence and airframe icing live and die by pilot weather reports. In other words, they are typically not issued until pilots begin reporting those hazardous conditions. Unless they are associated with a tropical cyclone, they are valid for four hours from the time they are issued. SIGMETs for tropical cyclones are valid for a six hour period.

To view the latest SIGMET(s), the EZDeparture Advisor needs to be positioned to a time that falls within the valid period of the active SIGMET(s). Tap or click on the **Layer Selector** button and select **SIGMETs** from the menu. This will present a list of SIGMET attribute filters based on the possible weather hazards to include Convection, Turbulence, Airframe Icing, Dust & Sandstorms, Volcanic Ash and Other[58]. Select one or more of these filters or choose **All** to display all SIGMETs[59] that are currently active for the time selected. If no SIGMETs are active for the filter(s) chosen or time selected, an alert message "No SIGMETs displayed" will be momentarily shown[60]. Note that if the EZDeparture Advisor is slid to the right beyond the SIGMET's valid time, they will be subsequently hidden from view since the time set is beyond the valid time of the SIGMET.

While SIGMETs are issued by meteorologists as a textual forecast, they describe georeferenced areas or lines of hazardous weather that can be rendered as polygons. All SIGMETs are depicted on the EZMap as a red-colored polygon regardless of the weather or hazard. Each polygon will have a label that describes the SIGMET type (e.g., Icing). A tap or click on a SIGMET polygon will invoke a pop up containing a tabular description for that SIGMET along with the raw SIGMET text.

Convective SIGMETs

Convective **SIG**nificant **MET**eorological Information (SIGMET) is a textual forecast issued by meteorologists at the Aviation Weather Center (AWC) and describes the occurrence

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[58] Given that a SIGMET is a freeform textual advisory, it is rare that parsing the raw SIGMET text may result in an undetermined SIGMET type. This will be categorized and displayed under the "Other" SIGMET attribute filter.

[59] This includes Convective SIGMETs and International SIGMETs.

[60] The alert message is only displayed when no SIGMETs are displayed for the totality of attributes currently selected. For example, selecting the Turbulence attribute when no SIGMETs for turbulence exist may not result in an alert message if there are SIGMETs displayed for other SIGMET attribute selections.

or expected occurrence of thunderstorms[61] over the conterminous United States and adjacent coastal waters within two hours of the issuance time.

Convective SIGMETs are only issued for convection that represents a significant threat to aviation. While all thunderstorms and deep, moist convection are dangerous to all pilots, it's not until they form in long lines, larger areas or are embedded or severe that they are extremely hazardous to aviation. Often thunderstorms that meet convective SIGMET criteria will require the pilot to consider alternates and carry extra fuel. Convective SIGMETs are issued when, during the valid period, any of the following criteria occur or are forecast to occur:

> a. A line of thunderstorms at least 60 nautical miles and 40% coverage along that line.
>
> b. An area of active thunderstorms affecting at least 3,000 square miles.
>
> c. Severe thunderstorms or embedded thunderstorms occurring for more than 30 minutes of the valid period regardless of the size of the area.

Convective SIGMETs are issued only when the above criteria are met. Therefore, it is possible to have no active convective SIGMETs available to add to the EZMap. When the criteria are met, convective SIGMETs are typically issued at 55 minutes past each hour. However, a special convective SIGMET can be issued when either of the following criteria are met and/or forecast to be met for more than 30 minutes of the scheduled valid period:

> a. Tornado, hail greater than or equal to 3/4th inch diameter[62], or wind gusts of 50 knots or more is reported or indicated when the previous convective SIGMET did not mention severe thunderstorms.
>
> b. Indications of rapidly changing conditions, if in the forecaster's judgement, they are not sufficiently described in existing SIGMETs.

To view the latest convective SIGMET(s), the EZDeparture Advisor needs to be positioned to a time that falls within the valid period of the convective SIGMET(s). Tap or

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[61] Keep in mind that the presence or expectation of lightning is _not_ one of the criteria required to issue a convective SIGMET. Therefore, the terms "thunderstorms" and "deep, moist convection" should be considered interchangeable.
[62] The National Weather Service (NWS) defines severe hail as 1 inch in diameter or greater.

click on the **Layer Selector** button and select **SIGMETs** from the menu. This will present a list of SIGMET attribute filters based on the possible weather hazards. Select **Convection** to display all convective SIGMETs that are currently active for the time selected.

While convective SIGMETs are issued by meteorologists as a textual forecast, they describe georeferenced areas or lines of hazardous convective weather that can be rendered as polygons. All convective SIGMETs are depicted on the EZMap as a red-colored polygon. Each polygon will be labelled with TS. A tap or click on a convective SIGMET polygon will invoke a pop up containing a tabular description for that convective SIGMET along with the raw text.

Convective outlooks

The same forecaster at the Aviation Weather Center that issues convective SIGMETs will also issue convective outlooks. Typically issued at 55 minutes past each hour, these outlooks describe larger areas that are forecast to contain thunderstorms that are expected to meet convective SIGMET criteria within the next **two-to-six-hour period** of the issuance time. Whereas convective SIGMETs depict regions where active thunderstorms are occurring, convective outlooks are a **forecast** for thunderstorms. It is important to understand that these are outlooks and not "SIGMETs" themselves.

To view the latest convective outlook(s), the EZDeparture Advisor needs to be positioned to a time that falls within the **valid period** of the convective outlook(s). Tap or click on the **Layer Selector** button and select **SIGMETs** from the menu. This will present a list of SIGMET attribute filters based on the possible weather hazards. Select **Convection** to turn on the convective SIGMETs[63]. Next, make sure the **Outlooks** switch is set to the **On** position (slid to the right). Sliding the switch to the left will remove the convective outlooks from the EZMap. Unselecting the Convective attribute will also remove the convective outlooks (if any) from the EZMap.

While convective outlooks are issued by meteorologists as a textual forecast, they describe georeferenced areas of potential convective weather that can be rendered as polygons. All convective outlooks are depicted on the EZMap as a yellow-colored polygon. There are no labels for convective outlooks. A tap or click on a convective

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[63] Note that one or more convective outlooks areas may exist even though no convective SIGMETs are currently active. It is also true that there may be one or more convective SIGMETs active without any convective outlooks issued.

outlook polygon will invoke a pop up containing a tabular description for that convective outlook along with the raw text.

International SIGMETs

SIGMETs issued by the Aviation Weather Center (AWC) cover the conterminous U.S. and follow U.S. coding standards. Any SIGMET issued outside of the U.S. follows the international coding standard. The aviation hazards are similar to the U.S. SIGMETs except SIGMETs due to convection are treated the same as other hazards. Here is the list of hazards:

- Thunderstorms (occasional, embedded, frequent)
- Tropical cyclones
- Turbulence
- Icing
- Volcanic ash
- Dust and sandstorms
- Radiological cloud

International SIGMETs are defined within a specific Flight Information Region (FIR) and are issued on an as-needed basis and are usually valid for four hours[64]. Most FIRs are aligned with a country's airspace or a subset of that airspace. Ocean regions also have FIRs where SIGMETs are issued and covered by adjacent countries. The U.S. does issue international SIGMETs for Alaska and for oceanic areas off the east coast of the U.S., Gulf of Mexico and a large part of the central northern Pacific. **While these SIGMETs are worldwide, only SIGMETs that cover North American FIRs are shown in EZWxBrief**. On the EZMap, they are depicted as a red polygon with a label similar to other SIGMETs.

To view the latest international SIGMET(s), the EZDeparture Advisor needs to be positioned to a time that falls within the valid period of the SIGMET(s). Tap or click on the **Layer Selector** button and select **SIGMETs** from the menu. This will present a list of SIGMET attribute filters based on the possible weather hazards. Select **International** to display all international SIGMETs that are currently active for the time selected.

While international SIGMETs are issued by meteorologists as a textual forecast, they describe georeferenced areas or lines of hazardous convective weather that can ordinarily be rendered as polygons. All international SIGMETs are depicted on the

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[64] The issuance time and valid times of International SIGMETs vary with country.

EZMap as a red-colored polygon regardless of the type of hazardous weather. Each polygon will have a label that describes the SIGMET type (e.g., TS). A tap or click on a SIGMET polygon will invoke a pop up containing a tabular description for that SIGMET along with the raw SIGMET text.

Graphical AIRMETs

These en route advisories also known as G-AIRMETs are issued by meteorologists at the Aviation Weather Center (AWC) and are a forecast for hazardous weather throughout the conterminous U.S. and coastal waters. They are issued **four** times a day at 0245Z, 0845Z, 1445Z and 2045Z and amended as needed. Each issuance package includes the "initial" snapshot (0 hour) and a snapshot with a lead time of 3, 6, 9 and 12 hours. For example, the G-AIRMET forecast package issued at 0845Z includes an initial snapshot valid at 0900Z, 3 hour forecast valid at 1200Z, 6 hour forecast valid at 1500Z, 9 hour forecast valid at 1800Z and a 12 hour forecast valid at 2100Z. Unlike the legacy AIRMET[65] that is valid for a period of six hours, these snapshots are valid at a single moment in time, and therefore, depict the **coverage** of hazardous weather at that time.

G-AIRMETs are advisories for widespread[66] hazardous weather that includes moderate non-convective turbulence (Hi and Lo), moderate non-convective airframe icing, multiple freezing levels[67], non-convective low level wind shear, sustained surface winds greater than 30 knots, IFR conditions and mountain obscuration. Keep in mind that each snapshot may contain multiple areas that are rendered as color-coded georeferenced polygons on the EZMap. In addition to the color coding, each polygon has a specific label listed below to denote the type of hazard and the applicable altitudes (if any).

- TurbHi – Turbulence at or above 18,000 feet MSL
- TurbLo – Turbulence at or below 18,000 feet MSL
- Icing – Airframe icing
- Mult Frz – Multiple freezing levels
- LLWS – Non-convective low level wind shear below 2,000 feet AGL

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[65] EZWxBrief does not provide access to the legacy AIRMET text. The legacy AIRMET is now an automated byproduct of the operational G-AIRMETs and consists of the union of the first three (initial, 3 hour and 6 hour) G-AIRMET snapshots. The legacy AIRMET outlook is also automatically generated and consists of the last three (6 hour, 9 hour and 12 hour) G-AIRMET snapshots.
[66] Widespread is an area covering at least 3,000 square miles (~60% the size of the state of Connecticut).
[67] EZWxBrief does not provide a layer that depicts the freezing level G-AIRMET. The freezing level forecast G-AIRMET can be found in the EZImagery.

- Sfc Wind – Sustained surface winds greater than 30 knots
- IFR – Ceilings less than 1,000 feet AGL and/or visibility less than 3 statute miles due to any combination of precipitation, fog, mist, haze, smoke or blowing snow
- Mtn Obsc – Mountains obscured by any combination of clouds, fog, precipitation, haze, mist and/or smoke

Turbulence (Hi and Lo), airframe icing, and multiple freezing levels depict three-dimensional areas including the vertical extent of the hazard in hundreds of feet above mean sea level (MSL). The label on the polygon includes a base altitude (or SFC for surface) and the top altitude for the hazard in 100s of feet above mean sea level. For airframe icing, the base altitude can vary due to a variation in the freezing level.

The surface wind G-AIRMET depicts regions where sustained surface winds (e.g., winds below 1,000 feet AGL) are greater than 30 knots. Wind gusts at the surface in this region may be higher.

The non-convective LLWS G-AIRMET depicts regions where the winds from the surface to 2,000 feet AGL increase rapidly through the wind shear layer. Note this is not a forecast for turbulence or associated with thunderstorms or deep, moist convection. In many cases the air may be very smooth especially when the phenomenon occurs in the overnight or early morning hours.

The multiple freezing levels G-AIRMET depicts regions where two or more freezing levels exist. This is not a forecast for airframe ice. In fact, it could be in a region where the sky is clear or the likelihood of icing is extremely low. However, in regions where precipitation and icing is likely, areas with multiple freezing levels may lead to regions of supercooled large drop (SLD) icing (e.g. freezing rain).

To view the latest G-AIRMETs, the EZDeparture Advisor needs to be positioned to a time that falls within the valid time of the active G-AIRMETs.[68] Tap or click on the **Layer Selector** button and select **G-AIRMETs** from the menu. This will present a list of G-AIRMET attribute filters based on the possible weather hazards to include Airframe Icing, Turbulence Hi, Turbulence Lo, IFR Conditions, Mountain Obscuration, Non-convective LLWS and SFC Winds > 30 knots. Select one or more of these filters to display the G-

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[68] Even though G-AIRMETs are valid at a specific time (e.g., 1200Z), EZWxBrief will display the G-AIRMETs for the period from the valid time up to the valid time of the **next** G-AIRMET snapshot (if any). For example, if the 3 hour G-AIRMET snapshot is valid at 1200Z, then it will be displayed when the EZDeparture Advisor is set to 1200Z, 1300Z and 1400Z.

AIRMETs that are currently active for the time selected. In addition, the Mult Frz Levels (multiple freezing levels) G-AIRMET can be selected with the Airframe Icing attribute[69] by moving the switch to the right. If no G-AIRMETs are active for the filter(s) chosen, an alert message "No G-AIRMETs displayed" will be momentarily shown.[70] Note that if the time is advanced beyond the valid period of the G-AIRMETs, they will be removed from the EZMap display.

G-AIRMETs are issued as a graphical product and do not have a textual description similar to the legacy AIRMET or SIGMET. Instead, many G-AIRMETs include metadata. For example, G-AIRMETs for mountain obscuration includes one or more obscuring phenomena such as PCPN (precipitation), FU (smoke) or HZ (haze). A tap or click on a G-AIRMET polygon will invoke a pop up containing a tabular description for that G-AIRMET that also will decode metadata (if any).

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[69] The multiple freezing levels G-AIRMET implies that there are two or more freezing levels within the polygon(s) depicted, not that there is an airframe icing hazard in this region. Multiple freezing levels in regions where airframe icing is expected can imply freezing precipitation (e.g., freezing rain or ice pellets).
[70] The alert message is only displayed when no G-AIRMETs are displayed for the totality of attributes currently selected. For example, selecting the Turbulence Hi attribute when no G-AIRMETs for turbulence exist may not result in an alert message if there are G-AIRMETs displayed for other G-AIRMET attribute selections (e.g., Airframe Icing).

Pilot Weather Reports

Also known as PIREPs, pilot weather reports (UA or UUA) provide a first-hand account of the weather experienced during the departure, en route and approach phases of flight. Note that **EZWxBrief** only shows pilot weather reports and not aircraft reports (AIREPs).

To view the PIREPs on the EZMap, the EZDeparture Advisor needs to be positioned to the left most position or nominal time. Tap or click on the **Layer Selector** button and select **Pilot Weather Reports** from the menu. This will present a list of pilot weather report attribute filters based on the possible weather hazard categories to include Icing, Turbulence and Weather & Sky.[71] Select one or more of these filters to display the pilot weather reports that are currently active for that filter(s). Tap or click on **All** to show all categories of pilot weather reports. Pilot weather reports can also be filtered to include only urgent reports (UUA) by sliding the **Urgent Only** switch to the right. When this switch is set to **On**, only urgent pilot weather reports will be shown on the EZMap and all other reports will be filtered.
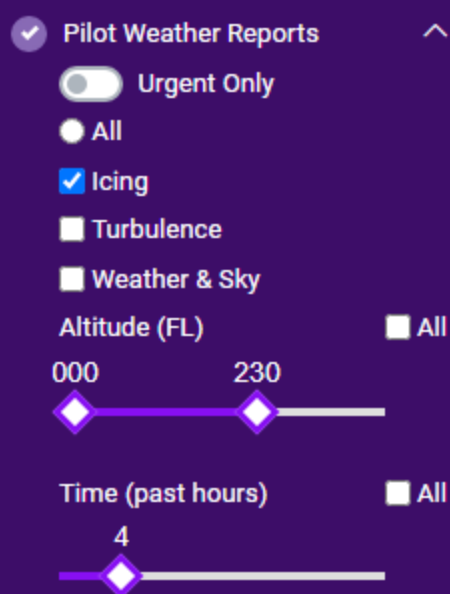
Pilot weather reports can also be filtered based on altitude and time. The altitude filter contains two sliders to set the lower and upper limits (in hundreds of feet) of the filter. Only PIREPs that are reported at altitudes that fall between[72] the two sliders will be shown. The minimum altitude that can be set is **000** which represents an altitude to include a surface report (SFC) and the maximum altitude is **450** (flight level 450 or 45,000 feet MSL). If the pilot weather report does not identify an altitude[73], it will always be shown regardless of the settings on the altitude filter. Tap or click on **All** in the altitude filter to show pilot weather reports for all altitudes. **EZWxBrief** maintains an archive of pilot weather reports for the previous 24 hours. The time slider attribute will filter the reports by age. For example, setting the filter to 2 will only show the pilot

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[71] These are typically reports that do not include turbulence or icing reports (e.g., wind, visibility, or cloud heights).
[72] The altitudes set are inclusive.
[73] This often occurs when the pilot weather report is DURD (during descent) or DURC (during climb).

weather reports that were issued over the previous two hours. Tap or click on **All** to show all pilot reports that have occurred in the last 24 hours[74].

Pilot weather report markers as shown on the right are decluttered based on the EZMap zoom level. To see more reports, simply zoom in on the map area of concern. As the zoom level increases, more pilot reports will be shown.

Like the one shown on the right, weather reports are shown as markers on the EZMap that consist of a standard icon and altitude (if provided) based on the hazard(s) reported. If provided in the report, the flight level (altitude) is shown below the icon (e.g., 100 is flight level 100 or 10,000 feet MSL). Urgent pilot weather reports (UUA) are always shown as red icons regardless of the hazard type since they report severe conditions.[75]

Specifically, icing and turbulence icons are chosen based on the intensity of icing or turbulence experienced.[76] As depicted on the left, icing reports are shown as blue icons, turbulence reports are shown as tan icons and weather & sky are shown as a black icon resembling an airliner. A negative report for icing or turbulence is depicted as a blue or tan null symbol[77], respectively. When a pilot weather report consists of a report for both icing and turbulence and the icing and turbulence attributes are selected, they are shown concatenated side-by-side as shown on the right. In this case there's report of moderate turbulence and light icing at FL100.

	ICE	TURB
NONE	Ø	Ø
TRACE	⊔	
TRACE-LIGHT	⊔	
SMOOTH-LIGHT		--
LIGHT	Ψ	∧
LIGHT-MODERATE	⊔	∧
MODERATE	Ψ	∧
MODERATE-SEVERE	⊔	∧
SEVERE	Ψ	∧
SEVERE-EXTREME		∧
EXTREME		▲

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[74] The minimum setting is one hour.
[75] This includes reports of severe or extreme turbulence, severe icing or low level wind shear.
[76] It is worth noting that pilot weather reports are highly subjective.
[77] A null symbol is a circle with a slash through the center.

Note the attribute filters are additive. For example, if only the **Icing** filter and selected and if the altitude filter is set from 002 to 100 and the time filter is set to 3, only pilot weather reports for icing between 200 and 10,000 feet MSL that have occurred in the last 3 hours will be shown. After changing any filter, an alert message will briefly appear that provides a total number of pilot reports meeting the criteria chosen or "No PIREPs Displayed" will be momentarily shown.

A tap or click on the pilot weather report marker will invoke a pop up containing the decoded tabular report followed by the raw coded report as shown on the right.

PIREP E145
Time: Dec 11, 2020 2015Z
Flight level: 50
Temperature: 0°C
Icing intensity: Moderate
Icing type: Rime
Cloud coverage: Overcast
Cloud base: 1200 ft MSL
PIREP: GCK UA /OV GCK180005/TM 2015/FL050/TP
E145/SK OVC012/TA 00/IC MOD RIME/RM /ZKC
FDC/FX
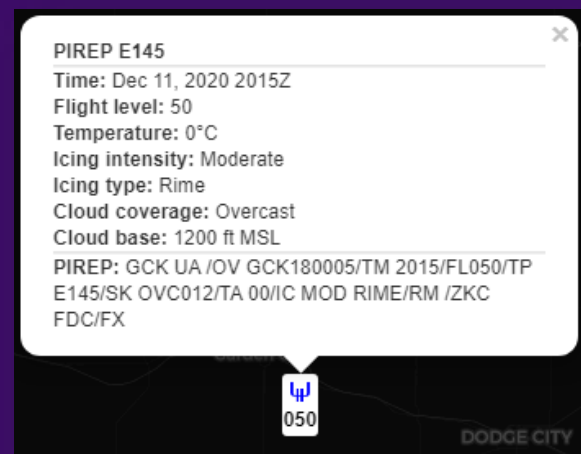
Center Weather Advisories

These advisories are issued by meteorologists at the Center Weather Service Units (CWSUs) co-located with the various Air Route Traffic Control Centers (ARTCCs) throughout the U.S. CWAs are not routinely issued and have no defined schedule. Therefore, it is quite common to have no active CWAs available to add to the EZMap. Moreover, they have a very short lead time and are typically valid for a two hour period from the time they are issued.

To view the latest CWA(s), the EZDeparture Advisor needs to be positioned to a time that falls within the valid period of the CWA(s)[78]. Tap or click on the **Layer Selector** button and select **Center Weather Advisory** from the menu. This will present a list of CWA attribute filters based on the possible weather hazards to include Airframe Icing, Turbulence, IFR Conditions, Convection and Other[79]. Select one or more of these filters or choose **All** to display all CWAs that are currently active for the time selected. If no CWAs are active for the filter(s) chosen, an alert message "No CWAs displayed" will be

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[78] This will be typically when the EZDeparture Advisor is slid all the way to the left.
[79] Given that a CWA is a freeform textual advisory with no prescribed format, it is rare that parsing the raw CWA text may result in an undetermined CWA type. This will be categorized and displayed under the "Other" CWA attribute filter.

momentarily shown[80]. Note that if the time is advanced beyond the valid period of the CWA(s), they will be removed from the EZMap display.

While CWAs are issued by meteorologists as a textual forecast, they describe georeferenced areas or lines of hazardous weather that can ordinarily be rendered as polygons. All CWAs are depicted on the EZMap as a cyan-colored polygon regardless of the intensity of weather or hazard described. This is to distinguish them from other advisories. Each polygon will have a label that describes the CWA type (e.g., TS). They can be issued for in-flight weather hazards to include, conditions meeting or expecting to meet convective SIGMET criteria, moderate or greater airframe icing, moderate or greater turbulence, mountain wave activity, heavy precipitation, freezing precipitation, conditions at or approaching low IFR, sustained surface winds and gusts greater than 30 knots, non-convective low level wind shear below 2,000 feet AGL, volcanic ash and dust storms or sandstorms. A tap or click on a CWA polygon will invoke a pop up containing a tabular description for that CWA along with the raw CWA text.

CWAs tend to be complimentary to the G-AIRMET and SIGMETs issued by forecasters at the Aviation Weather Center (AWC). In most cases, they describe a smaller region of adverse weather or a hazard that has not met national in-flight advisory criteria.

Note that **EZWxBrief** does not provide access to the Meteorological Impact Statement (MIS) also issued by meteorologists at the CWSUs. They can be viewed by visiting the Aviation Weather Center (AWC) website at https://aviationweather.gov/cwamis.

Map disambiguity

Polygons, markers or other elements depicted on the EZMap may offer a subset or preview of information through the use of color, line type, text labels and/or symbols. Beyond this limited metadata, some of these elements may have additional information available (e.g., valid time). To get that complete information will require a tap or click depending on the device. In some cases, the tap or click on the element may be unambiguous when choosing a single polygon (e.g., SIGMET), station marker or pilot weather report. This will result in a pop up to show the supporting information for that marker or polygon.

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[80] The alert message is only displayed when no CWAs are displayed for the totality of attributes currently selected. For example, selecting the Turbulence attribute when no CWAs for turbulence exist may not result in an alert message if there are CWAs displayed for other CWA attribute selections.

However, when multiple layers are added or polygons overlap a tap or click on the EZMap may be ambiguous. When this occurs, the pop up will display all of the relevant information for each displayed polygon based on the location where the tap or click was initiated. In some instances the pop up may need to be scrolled to see the data for other polygons. Additionally, the text will have a background highlight with breaks so it is easier to determine where the text for each advisory starts and stops.

Map refresh

EZWxBrief caches data in the browser when possible to limit the amount of time it takes to navigate through the application (e.g., switching between the EZMap and EZRoute Profile). When a new route is created or a route is updated or any EZSettings are changed, the data shown on the EZMap and EZDeparture Advisor are once again retrieved from the database and refreshed on the display. Depending on the length of the route,[81] a refresh may take as little as 6 seconds to more than 20 seconds to evaluate the route and replace the cached data currently displayed on the screen.
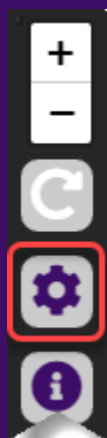
At any time, the data on the map can be refreshed manually by a tap or click on the refresh button shown to the left. This will command EZWxBrief to retrieve the most recent weather data from the database and re-evaluate the route in its entirety including the EZDeparture Advisor.

EZSettings change

The preferences in the application do not change often. However, if there's a desire to change the EZSettings from the EZMap, simply tap or click on the gear icon as shown to the left which will open up the EZSettings panel. From this panel the general preferences, aircraft preferences and the EZMinimums can be updated. After these settings are updated and saved, this will command EZWxBrief to retrieve the most recent weather data from the database and re-evaluate the route in its entirety including the EZDeparture Advisor.

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[81] Please note that longer routes and more route of flight waypoints have to acquire and evaluate more data, and therefore, gives rise to a longer waiting period to refresh.

EZDeparture Advisor

The heart and soul of the **EZWxBrief** application is the EZDeparture Advisor. It is designed to evaluate all of the relevant personal weather minimums (EZMinimums) against the forecast weather **along the entire proposed route of flight** to determine the overall flight risk for ceiling height, surface visibility, surface wind speed, airframe icing, turbulence and convective potential. This means that it is factoring in the groundspeed and taking into consideration the weather that is expected to occur when you arrive at the various points along the route.

The EZDeparture Advisor is made available only when a route has been created. It appears at the bottom of the EZMap and EZRoute Profile pages. The EZDeparture Advisor consists of **two** basic components, namely, the departure time slider and the evaluation of the flight risk based on the personal weather minimums (EZMinimums) defined in the EZSettings.

The departure time is set by moving a slider bar left and right. To advance the time, press and hold the **time readout** located at the top of the row of dots and move it to the right. This advances the time of departure at an hourly interval.[82] **Tip:** as you press and hold the time readout for a touch screen device your hand and fingers will obscure the EZDeparture Advisor grid. However, as you press and drag the time readout, **you can slide your finger down** to the bottom of the display as you are moving it left or right so you can easily see the whole grid. As long as you don't lift your finger you can increase or decrease the departure time and have full visibility to the display.
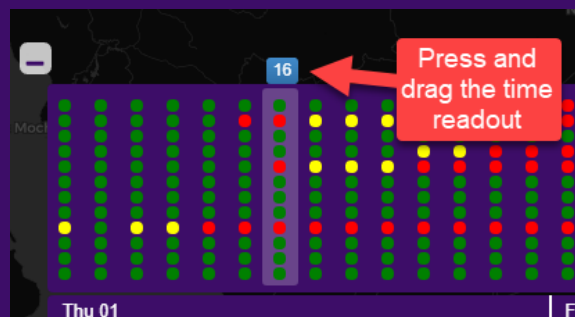
The first departure time (when the slider is placed to the far left position) is always defaulted to the top of the <u>next</u> whole hour (called the nominal time). For example, if the current time is 1749Z, then the first possible departure time will be 18Z. This time shown in the EZDeparture Advisor is dependent on the preference saved in the

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[82] The total number of departure times depends on the availability of forecast guidance and the duration of the flight. In general, the number of departure times offered will be between 60 and 66 hours.

EZSettings. If the preference is set to Zulu time, the time will be followed by the letter **Z**. If there isn't a Z behind the time, it local (device) time.

The EZDeparture Advisor works by examining the **entire** route of flight **and also factors in the flight's calculated duration**[83] to look for any weather conditions that meet or exceed the EZMinimums for the entire route. This is done for each possible time of departure.[84] The result of this evaluation consists of a grid of red, yellow, green and gray dots. Each **column** in the EZDeparture Advisor **column** represents a different time of departure[85] and each **row** represents a specific personal weather minimum category. The color of the dots in the grid is determined when the map or route profile is rendered based on the evaluation of the EZMinimums categories for the associated times of departure and uses the "traffic light" concept as defined in the EZMinimums. For example, if the departure time is set to 21Z for a fight with a duration of two hours, then if the crosswind forecast at the destination airport **at the time of arrival** (23Z) exceeds the crosswind personal minimum setting, it will show up as red in the 21Z column. Otherwise it will show as yellow or green depending on the forecast crosswind at the time of arrival.
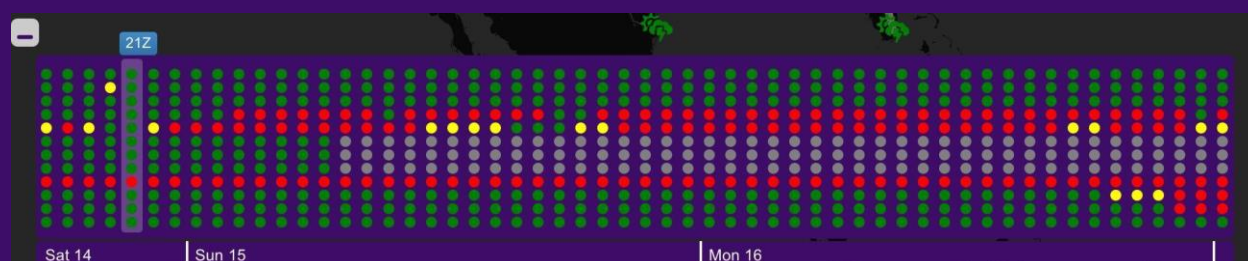
The rows in the EZDeparture Advisor grid are ordered by the phase of flight, that is, departure, en route and arrival from top to bottom. The top three rows define the personal weather minimum categories for (1) ceiling height, (2) surface visibility and (3) surface crosswinds at the **departure** airport. The next six rows define the **en route** categories for (4) ceiling height, (5) surface visibility, (6) icing probability, (7) icing intensity, (8) turbulence intensity and (9) convective potential. The last three rows show the result of the (10) ceiling height, (11) surface visibility and (12) surface crosswinds at the **destination** airport. **Tip:** It may be difficult to remember the specific personal weather minimum category for any particular row. On devices with a mouse, simply

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[83] This is based on the ground speed calculated for the flight, if selected by the user.
[84] Normally 66 hours.
[85] The time will be local or Zulu (UTC) based on the EZSettings defined by the user. Zulu time will be depicted with a **Z** following the time. If no Z is shown, local (device) time is shown.

hover the mouse over any dot and a tool tip will be displayed to see the specific personal weather minimum category for that row.

A gray dot on the EZDeparture Advisor implies that insufficient forecast guidance is available to evaluate the personal weather minimum for the given departure time. At this point in time, icing and turbulence evaluations are only done for the first 18 hours of departure times. Consequently, any departure times beyond 18 hours will result in gray dots being shown for the remainder of the departure times.

A tap or click on any column will enumerate the details for that time of departure as shown on the right. As a reminder, the EZMinimums for each personal minimum category will be shown in parentheses. The actual weather that caused a particular color to appear can be determined by examining the EZRoute Profile for ceiling, visibility, turbulence, icing and convection along the route of flight.

Departure Advisor ✖

Time: Dec 12, 2020 1500Z
- 🔴 Departure ceiling height (1000, 3000)
- 🟡 Departure surface visibility (3, 12)
- 🟢 Departure crosswinds (10, 15)
- 🔴 En route ceiling height (1000, 3000)
- 🔴 En route surface visibility (3, 8)
- ⚪ En route icing probability (25, 40)
- ⚪ En route icing intensity (Trace, Light)
- ⚪ En route turbulence intensity (16, 36)
- 🟢 En route convective potential (VERY LO, LO)
- 🟢 Destination ceiling height (1000, 3000)
- 🟢 Destination surface visibility (3, 8)
- 🟢 Destination crosswinds (10, 15)

⏮ Dec 12, 2020 1500Z ⏭ Dismiss

To minimize the EZDeparture Advisor, tap or click on the "minus sign" button that appears on the left side. This will collapse all of the rows of dots into a single row. This single row represents the worst case scenario for each departure time or column.[86] For example, if the departure time contains only green and yellow dots, then the minimized row will be shown as yellow. On some smaller devices in landscape orientation, the EZDeparture Advisor will be minimized by default.

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[86] Gray dots are ignored when the EZDeparture Advisor is minimized.

EZRoute Profile

One of the more advanced features of **EZWxBrief** is the vertical depiction along the route called a vertical route profile or also may be referred to as a vertical cross section. Such a route profile is an incredibly useful tool to visualize how the weather will impact your proposed route over the next two to three days. This includes exposure to adverse weather such as airframe icing, turbulence, ceiling height, surface visibility, convection and wind.

The EZRoute Profile is available from the EZMap[87] or EZAirport pages when launching a route from the EZFavorites panel. To use the EZRoute Profile, a route consisting of a departure airport, destination airport and optionally up to five route of flight waypoints must be defined using the route editor. Once a valid route is defined, tap or click on the <u>Profile icon</u> (shown to the left) and this will render the vertical profile for the active route based on the time set for the EZDeparture Advisor. The last route entered is always remembered and retained. Once the profile is displayed, the route can be modified or deleted using the route editor. Please note that the route can only be deleted when viewing the route on the EZMap. This function is not available when viewing the EZRoute Profile. Tap or click on the route editor button within the route profile (including the altitude) to make changes to the current route and tap or click on **Apply** to see the result.

The route profile is comprised of the main viewport, route information for time and distance and supplementary forecast points (equidistant segments), proximity airports along the route and the EZDeparture Advisor. From the image below, the scrollable main viewport (red) consists of the vertical y-axis depicting the flight level (e.g., 100 is 10,000 feet MSL) and the horizontal x-axis showing the weather and terrain along the route. Below the main viewport, segmented route of flight information (yellow) is provided. The departure airport is shown on the left and the destination airport is shown on the right. Therefore, time and distance always increase from left to right. Optional waypoints entered into the route of flight are depicted at their respective location(s) along the route and always shown in gray. For portable devices using smaller screen sizes, the main viewport can be scrolled to the right or left as necessary to view longer routes.

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[87] A route must be defined for the route profile to have any meaning.
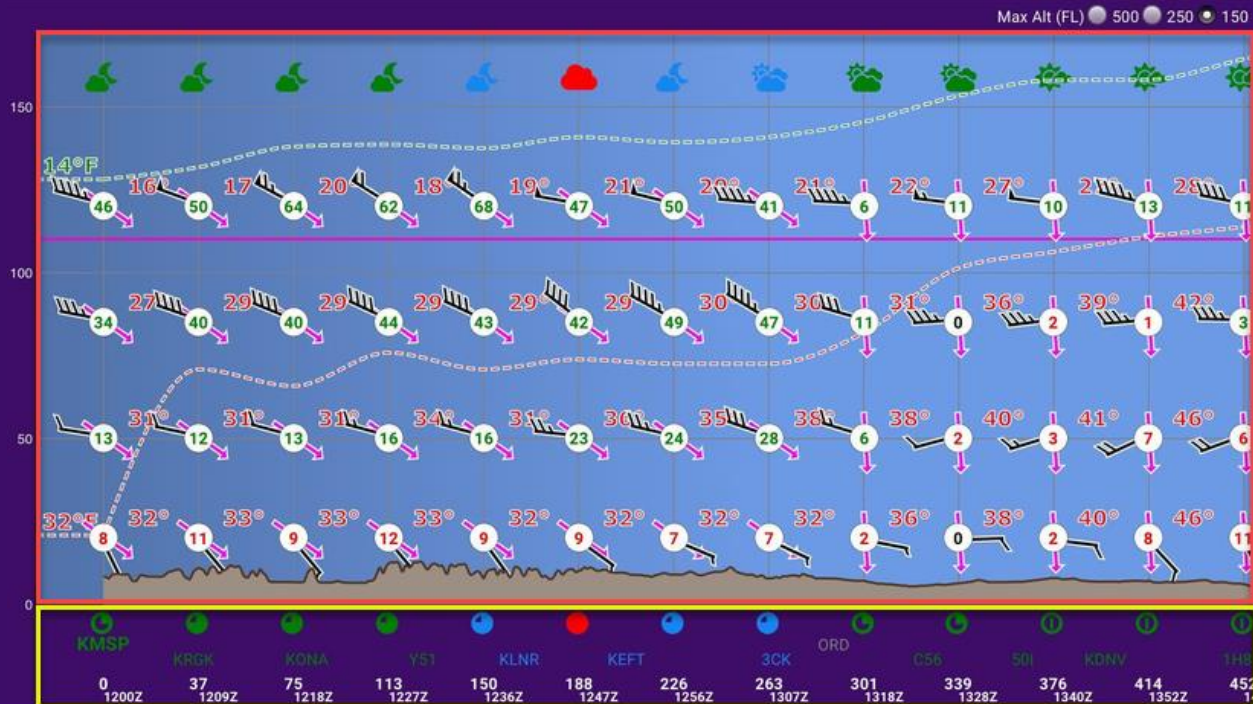
The main viewport is divided into two or more equidistant segments for a route longer than 25 nautical miles. The length of the route will determine the number of segments. Shorter routes will have fewer segments and response times will be faster. Routes over 1000 nautical miles will have at most 14 segments and response times will be slower. Each segment's start and endpoint becomes the location where forecast data is rendered on the profile. Weather forecast data (e.g., icing, turbulence, clouds) is stacked vertically at these forecast points along the route.

Terrain along the route is shown in light brown at the bottom of the main viewport. The terrain depicted in **EZWxBrief** does not account for any other obstructions such as radio towers or moored balloons. Please consult the latest VFR sectionals or other official FAA documentation for obstruction information. Terrain is displayed as the highest precedence over other weather data or reference lines shown on the route profile.

As shown in the red rectangle in the image below, the cumulative distance[88] from the departure airport and estimated time of arrival at each segment point is shown below the route of flight. The estimated time of arrival is always relative to the time set on the EZDeparture Advisor.[89] The arrival time for each segment is calculated using the true

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[88] The distance is in nautical miles or kilometers depending on the preferences chosen in the EZSettings
[89] Note that the time the route begins is always defaulted to the top of the hour.

airspeed provided in the EZSettings (under Aircraft Settings). This may factor in the headwind and tailwind component if the Use Forecast Winds toggle was applied in the route editor.

The time is shown as device or system time (displayed using the 24-hour clock) or Zulu time depending on the preferences chosen in the EZSettings. If the preference is set to Zulu, the time will be listed followed by the letter **Z**. On devices without a touch screen[90], hover with a mouse over the distance and time shown along the route to see the Zulu and the local time at each point (displayed using the 12-hour clock). Moreover, if the route crosses one or more time zones, the local time at the segment points will be listed accordingly along with the current device's time zone.

To help distinguish between night and day the profile's viewport background color will be either light blue (for daytime) or black (for nighttime). During times of dusk and dawn the light blue will be shown to fade from blue into black and black into blue, respectively. The only exception is the icing profile view that will show a white background for all times of the day. This is to avoid a conflict with the icing severity forecast which also uses a similar shade of blue.

When a route is defined, the editor also requires a cruise altitude[91] to be chosen. This is depicted on each route profile using a solid horizontal magenta line as shown below for 10,000 feet MSL. This is especially useful as a reference for flight through areas of clouds, airframe icing and turbulence aloft. At the moment, the climb and descent profiles are not shown. Consequently, the calculation of ground speed from the en route

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[90] On touch screen devices, tap on the distance and time to see this information.
[91] This is based on mean sea level height.

true airspeed (and optionally the winds aloft) assumes that the flight originates at the en route altitude.[92]
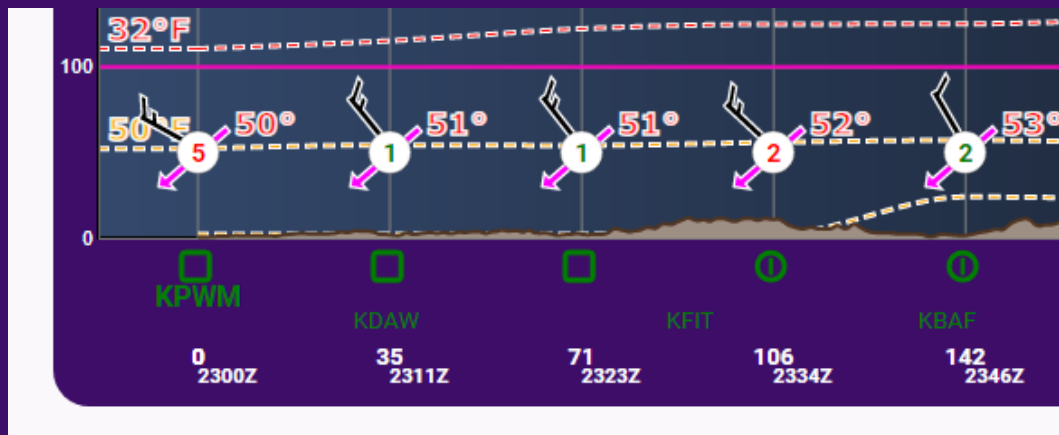
Immediately below the route profile viewport a row of station markers are provided. These are located at the start and endpoint of each segment for the entire route. The first point on the far left represents the EZForecast for the departure airport and the last point on the far right represent the EZForecast for the destination airport. Intermediate markers are not at airports, but present the forecast conditions along the route at the surface. These define EZForecast points within approximately three nautical miles of the route.

The color of these markers defines the flight category based on the ceiling height and surface visibility. Sky coverage is also depicted graphically. A square marker identifies a clear sky and circular markers define sky cover with few, scattered, broken or overcast. Tap on or hover over the marker to see a tabular view of the EZForecast for that location along the route that includes the valid time, clouds, surface visibility, surface wind speed and wind direction, surface temperature and surface dewpoint. When a ceiling exists, clouds can also include a lower scattered cloud layer as well.

The EZRoute Profile has four possible views to choose from. This includes Winds (default), Clouds, Icing and Turbulence. Select the desired view(s) from the radio buttons provided. These views are mutually exclusive; therefore, to avoid a cluttered view only one view can be selected at any one time.

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[92] It is recommended that the true airspeed chosen in the preferences be underestimated to account for the lower true airspeed experienced during climb and descent.

Additionally, the maximum altitude or flight level (FL) depicted for each of these four route profile views can be set by selecting one of three radio buttons corresponding to FL500, FL250 or FL150 as shown on the right. For example, if FL150 is selected, the top altitude on the left side (y-axis) of the route profile viewport will be 15,000 feet. This allows better vertical resolution of the display when flight planning for lower altitudes. It is strongly encourage to always check the FL500 level for clouds given that deeper weather systems are often more significant.
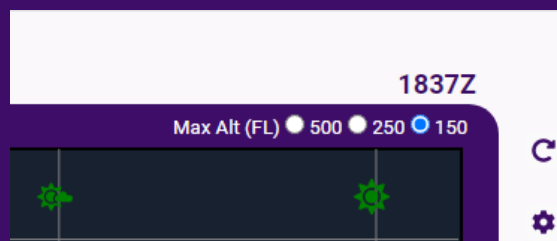
Winds & Temps – this vertical profile (Wind) provides the forecast upper level winds and temperatures from the surface to 45,000 feet MSL or FL450. At each segment point along the route, a circle marker will provide the forecast wind speed and direction using a standard wind barb shown in black.

Max Alt	1st Level (feet MSL)	2nd Level (feet MSL)	3rd Level (feet MSL)	4th Level (feet MSL)	5th Level (feet MSL)
FL150	2,000	5,000	8,500	12,000	N/A
FL250	2,000	6,500	12,000	16,000	22,000
FL500	5,000	16,000	25,000	35,000	45,000

The table above defines the altitude (MSL) that corresponds to each row of winds for each of the three maximum altitude (Max Alt) settings mentioned above.

Wind barbs point in the direction "from" which the wind is blowing and depicted using a reference to true north. A wind "from the west" is a barb on the left side of the circle marker as shown below. Additionally, each marker will also provide the forecast temperature in degrees Fahrenheit or Celsius depending on the temperature preference from the EZSettings. A thick magenta arrow is provided marking the course (heading) of the route
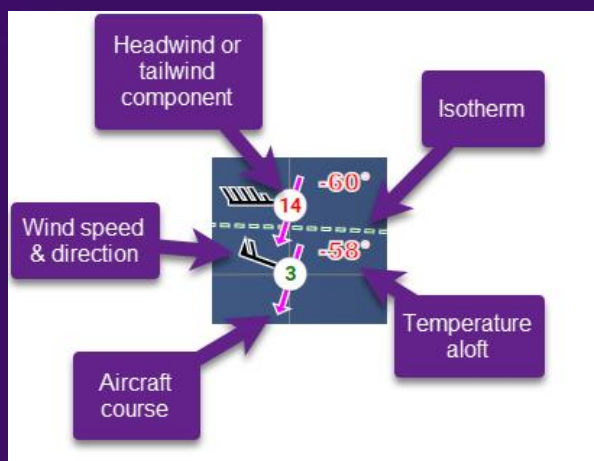
at that location and altitude also in reference to true north. Therefore, an arrow pointed toward the <u>bottom</u> of the display is a 180° heading. The wind speed and direction combined with the course provides a quick reference to determine if there will be a headwind or tailwind at the prescribed altitude and location along the route.

Moreover, at the center of the white circle, the magnitude of the headwind/tailwind component is provided. A number in green indicates the magnitude of a **tailwind** in knots whereas a number in red indicates the magnitude of a **headwind** in knots. For a direct crosswind, a black **0** will be placed in the white circle. For light and variable or calm winds aloft, a black **C** will be shown and no wind barb will be present.

Tapping on or hovering over the wind/temperature marker will show the details in tabular form as shown on the right. This includes the valid date and time of the forecast used along

with the temperature, wind speed, wind direction, course and departure from standard temperature.[93]

The Winds & Temps profile highlights the temperature aloft using lines of constant temperature or isotherms. These are depicted as colored dashed lines separated by 10°C intervals. Brown/tan dashed lines depict isotherms for a temperature aloft warmer than 0°C. Green dashed lines depict isotherms for a temperature aloft colder than 0°C. And the 0° C isotherm (freezing level) is depicted as a red dashed line. Most icing encounters happen when the static air temperature is between 0°C and -20°C when visible moisture is present. At the moment, **EZWxBrief** only depicts the lowest freezing level.

Clouds – this vertical profile contains a depiction of cloud cover and isotherms along the route of flight. Clouds are depicted as **white** rectangles showing the height of the cloud layers that are expected to be **broken or overcast**. A light **gray** rectangle represents a **scattered or few** layer of clouds.

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[93] Departure from standard subtracts the current temperature from the temperature of the standard atmosphere for the respective altitude. A temperature below standard will be shown in blue and temperatures above standard will be shown in red.

Icing – this vertical profile depicts the threat of airframe icing along the proposed route of flight. This includes the icing probability, icing severity and supercooled large drop (SLD) potential. Forecasts for airframe icing are currently limited to 30,000 feet MSL and below with a lead time of 18 hours or less.

Icing probability

Icing probability is depicted graphically as a percentage from 10% to 85%. Colors are assigned to percentage ranges (e.g., 10% to 20%, 20% to 30%, etc.). Cooler colors such as blue and green depict lower probabilities whereas warmer colors such as yellow, orange and red depict higher probabilities. Any icing probabilities that are less than 10% are not shown.

Note that this is a **calibrated** probability and the percentages will naturally decrease as time increases. In other words, an icing event that is two hours from the current time will have more certainty than one that is 18 hours in the future. Consequently, beyond the lead time of 12 hours it is rare to see a forecast probability of **more than** 50%. This is important when evaluating the personal minimums in the EZSettings for icing probability for longer lead times.

To see specific probability forecasts within the icing viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on the same location. This will provide a tabular summary including the valid time of the forecast and the icing probability (%) at that altitude and location along the route of flight.

Three possible alert messages may be posted in the main icing profile viewport for the icing probability.

1) No icing is forecast for this route – this alert will post when the entire route has a forecast icing probability of less than 10%. This alert provides a visual confirmation when no icing forecast is rendered for the given route of flight.

2) Icing forecast not available for this departure time – this alert will post when the EZDeparture Advisor is set to a time beyond the lead time availability of the icing forecast.

Icing severity

Icing severity provides a forecast for severity (intensity) of icing using a categorical forecast. Intensities include trace, light, moderate and heavy. Heavy is used instead of

severe given that severe is reserved for how the aircraft reacts to the meteorological conditions, not the meteorological conditions themselves.

Icing severity is presented in the icing profile viewport as shades of blue with lighter shades of blue depicting lower intensity and darker shades of blue depicting higher intensity. The type of icing (e.g., clear) is not provided by this forecast. Below are the definitions of trace, light and moderate icing from a reporting perspective as defined in the Aeronautical Information Manual (AIM). Heavy is not defined in the AIM.

Trace – Ice becomes perceptible. Rate of accumulation slightly greater than sublimation. Deicing/anti-icing equipment is not utilized unless encountered for an extended period of time (over1 hour).

Light – The rate of accumulation may create a problem if flight is prolonged in this environment (over 1 hour). Occasional use of deicing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the deicing/anti-icing equipment is used.

Moderate – The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or flight diversion is necessary.

To see specific severity forecasts within the icing viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on the same location. This will provide a tabular summary of the valid time of the forecast and the icing severity at that altitude and location along the route of flight.

Three possible alert messages may be posted in the main icing profile viewport for the icing severity.

1) No icing is forecast for this route – this alert will post when the entire route has a forecast icing severity is less than trace. This alert provides a visual confirmation when no icing forecast is rendered for the given route of flight.

2) Icing forecast not available for this departure time – this alert will post when the EZDeparture Advisor is set to a time beyond the lead time availability of the icing forecast.

SLD

All water in the liquid phase at a temperature colder than 0°C is referred to as supercooled liquid water (SLW). This is independent of physical size of the drop. Supercooled large drop (SLD), however, describes an icing environment where the median volumetric diameter of the liquid drops is greater than 50μm (microns) in diameter. Just for reference, the average human hair has a diameter of 100μm.

SLD icing is depicted graphically as a percentage from 10% to 100%. Colors are assigned to percentage ranges (e.g., 10% to 20%, 20% to 30%, etc.). Similar to icing probability, cooler colors such as blue and green depict a lower likelihood whereas warmer colors such as yellow, orange and red depict a higher likelihood. Any SLD forecasts that are less than 10% are not shown.

Note that the SLD forecast is **not** a calibrated probability, but an icing potential (i.e., likelihood) and the percentages will not necessarily decrease as time increases. Currently the EZDeparture Advisor does not take into consideration SLD forecasts for icing.

To see SLD forecasts within the icing viewport area, simply hover the mouse cursor over the desired region. This will provide a tabular summary of the valid time of the forecast and the SLD potential at that altitude and location along the route of flight.

Icing severity + SLD

Lastly, the icing profile provides a combination of the icing severity and SLD forecasts. This simply repeats the icing severity forecast depicted in shades of blue and overlays the SLD using a single red hatched pattern. To see SLD and severity forecasts within the icing viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on the same location. This will provide a tabular summary of the valid time of the forecast, the icing severity forecast and the SLD potential (%) forecast at that altitude and location along the route of flight.

In addition to the icing probability, severity and SLD forecasts, the icing profile also includes the temperature aloft using lines of constant temperature or isotherms. These are depicted as colored dashed lines separated by 10°C intervals. Brown/tan dashed lines depict isotherms for a temperature aloft warmer than 0°C. Green dashed lines depict isotherms for a temperature aloft colder than 0°C. And the 0° C isotherm (freezing level) is depicted as a red dashed line.

Turbulence – this vertical profile (Turb) depicts the threat of both convective and non-convective turbulence along the proposed route of flight. This includes clear air turbulence, mountain wave turbulence and a forecast that combines the clear air and mountain wave turbulence. Forecasts for turbulence are currently limited to 45,000 feet MSL and below with a lead time of 18 hours or less.

Turbulence is forecast as an eddy dissipation rate (EDR). EDR is an objective, aircraft-independent, universal measure of turbulence based on the rate at which energy dissipates in the atmosphere. In other words, it is a measure of the turbulent state of the atmosphere. When the atmosphere is dissipating energy quickly (i.e. the EDR is large), atmospheric turbulence levels are high. But the implication for aircraft bumpiness depends on the size (weight) of the aircraft.

EDR has a range from 0.0 to 1.0 in units of m^2/s^3. Therefore, the higher the EDR value, the higher the intensity of turbulence. Typically EDR varies from close to 0, "smooth", to near 1, "extreme" for most aircraft types. **Note:** Actual EDR values in **EZWxBrief** are multiplied by 100 for ease of interpretation. Therefore the values will range from 0 to 100 accordingly.

Most pilots are aware that the aircraft's maneuvering speed is higher when the aircraft is heavier. Moreover, heavier aircraft (Boeing 787) will experience the same EDR value of turbulence differently than a lighter aircraft (Cessna 172). Therefore, using the table below, the maximum takeoff weight is used to define the EDR that is applicable.

- Light < 15,500 lbs maximum takeoff weight (e.g. Cirrus SR22, Piper Cub, LJ23)

- Medium (or large) 15,500 - 300,000 lbs maximum takeoff weight (e.g. A320, B737, G5, MD80)

- Heavy > 300,000 lbs maximum takeoff weight (e.g., A330, A380, B787, B777)

Aircraft weight class	EDR * 100			
	Light	Moderate	Severe	Extreme
Light (default)	13	16	36	64
Medium	15	20	44	79
Heavy	17	24	54	96

Colors as listed below are assigned to the various categorical turbulence categories based on the aircraft weight class above and as selected in the Aircraft EZSettings.

Green - light turbulence
Brown/tan - moderate turbulence
Red - severe turbulence
Dark red - extreme turbulence.

Clear air turbulence

This selection depicts turbulence that occurs outside of the cloud boundary. Most clear air turbulence occurs in the jet stream at altitudes above 15,000 feet MSL. However, 25% of all reports of clear air turbulence occurs within or near cirrus clouds. It will also occur in the planetary boundary layer and is often referred to as thermal turbulence. Most high level clear air turbulence tends to be more rhythmic in nature whereas low level clear air turbulence tends to have a more random bumpiness.

Mountain wave turbulence

This selection depicts turbulence that occurs solely as a result of gravity-induced mountain wave activity. Mountain waves occur when unstable air ascends into stable air above the mountain ridge tops. Keep in mind that some mountain wave activity will be laminar and may not produce eddies that cause rapid acceleration or deceleration that are felt in flight. Instead, there still may be an up and downwash in non-turbulent lee waves not predicted by this forecast.

Combined turbulence

This selection combines the gravity-induced mountain wave turbulence along with the clear air turbulence forecasts.

A few words of caution

The corridor used in **EZWxBrief** only considers a narrow slice of the atmosphere and depends on the resolution of the data being used. It's important to acknowledge that this tiny corridor is like driving down the road looking through a straw. It's very possible that your route of flight could be bumping up against some serious weather. Just by shifting your route by 75 to 100 nm may put you in that more challenging weather. Or perhaps you end up running late; a change of just two or three hours might also cause you to be in weather you hadn't planned to encounter based on the original narrow corridor shown in the vertical profile. These vertical views have such a huge glance value, that they can easily lure you into the trap that everything looks great until you

stray from the original plan. Therefore, it's important not to forget the big weather picture. Looking at the surface analysis, prog charts, constant pressure charts, convective outlooks, etc. are still a must. You can find all of this other weather guidance in the EZImagery.

Also note that EZWxBrief makes heavy use of the Internet browser's cache making the application faster when switching between the EZMap, EZRoute Profile, EZImagery and EZAirport pages. The data you see on the EZRoute Profile has been cached and will remain unchanged unless triggered through a route change, EZSettings change or has aged beyond 30 minutes where it will once again refresh the route automatically. You an also refresh the EZRoute Profile at any time by a click or tap on the refresh button.

EZAirport

Meteogram

One of the advanced features of the **EZWxBrief** application is the Meteogram. This graphically depicts how the weather is expected to change at a particular airport over the next two to three days from the surface to 30,000 feet. There are several ways to view the EZAirport page. The approach that is widely available from any page is to tap or click on the **Start** button and select the **View airport weather** option from the menu. This will populate the airport page with data from airport viewed last.[94] The EZAirport page is also available using a button located on the EZMap or EZRoute pages.
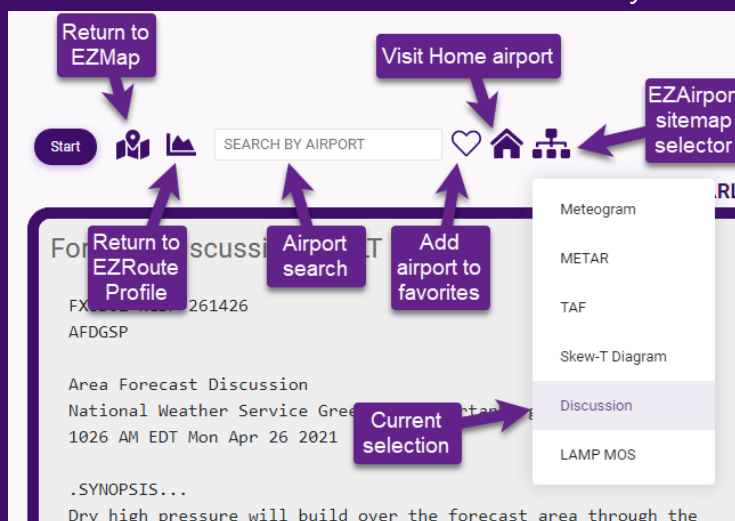
Moreover, a tap or click on a proximity airport or segment forecast point shown in the EZRoute vertical profile will launch the EZAirport page for this airport or nearest airport.

Airports can be viewed by entering the airport identifier on the EZAirport page. To focus the cursor, tap or click in the airport search field. Enter the three-letter (FAA) or four-letter (ICAO) airport identifier. As characters are entered, a smart filter will show matching airports (to include the identifier followed by the name of the airport).[95] Select one of the airport identifiers from the list. "No Data Found" with be shown if the airport identifier entered is not discovered in the **EZWxBrief** database. Please note that airports can only be viewed that are located in the **EZWxBrief** forecast domain. The entry of an airport outside of this domain will result in the error message, "**This airport is outside of the EZWxBrief forecast domain**." Tap or click on the **X** located in the airport search field to clear the current entry.

The Meteogram can be viewed in a 1-Day (24 hours) or 3-Day (66 hours) view using a switch located on the EZAirport page.

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[94] If this is the first time visiting the EZAirport page, the Home airport defined in the EZSettings will be used.
[95] It may take a second or two for the smart filter to begin making suggestions. Please be patient.

Whether viewing the Meteogram in the 1 day or 3 day instance, time increases from the left side of the diagram to the right with each column representing a specific forecast time. The first time presented on the left is always the top of the <u>previous</u> hour. For example, if the current time is 1418Z, the first left column will represent 1400Z.[96] For the 3 day instance, columns are provided every four hours whereas they are shown at an hourly interval for the 1 day instance. Tap or click on the "3 Days" switch located in the upper-right corner of the EZAirport page to toggle the meteogram view between 1 and 3 days.

The Meteogram is divided into four distinct sections. This includes clouds/visibility in the main viewport as well as a time series graph depicting the forecast for (1) temperature/dewpoint or surface wind; (2) ceiling or visibility; and (3) precipitation probability or convective potential. Given the amount of information presented, each section of the Meteogram will be discussed separately below.

Terrain: The height of the terrain for the airport is presented as a brown color at the bottom of the viewport area within the Meteogram. The dark brown line at the top of the brown region is the airport's elevation.

Time: At the bottom of the Meteogram you will see a presentation of the time window banner. Depending on what has been set in the Meteogram settings (described earlier), this can be set to depict the weather over the next 1 day (24 hours) or 3 days (66 hours). Each of these instances may look a bit different, but use the same conventions described below. If a **Z** is present after the two digit hour as in the example below, this means the time setting in the Preferences is set to use Zulu time. If no **Z** is present, the time shown is based on local (device) time. Similar to the EZRoute vertical profile, to aid in the recognition of day and night, the background of the viewport shows light blue shading to identify daylight hours (sunrise to sunset) and black shading denotes nighttime hours (sunset to sunrise).

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[96] Even though this is a time in the recent past, it is using the most recent forecast that is available for that time.

CITY OF COLORADO SPRINGS MUNI (KCOS)
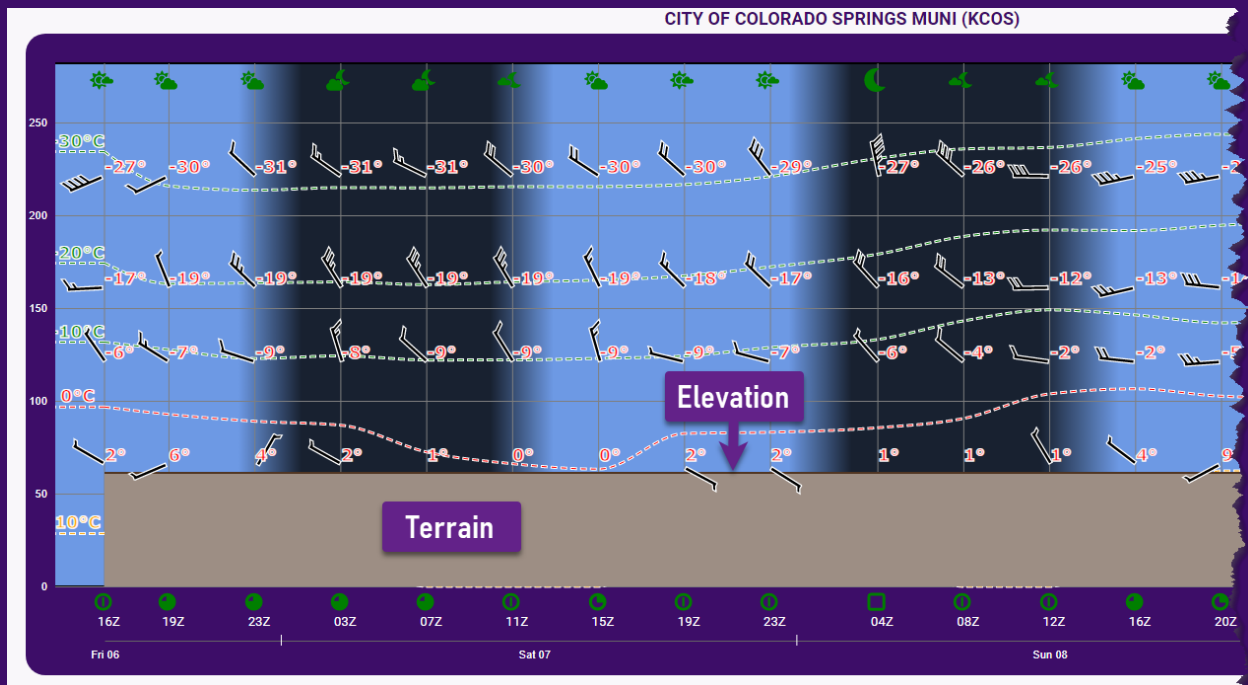
Meteogram time series graphs

Complimentary to the Meteogram, three time series graphs depicting various forecast elements are provided below the main Meteogram viewport. These graphs represent forecast guidance for the airport over a 1 day or 3 day period for the airport chosen. Consistent with the Meteogram, time advances from left to right. Depending on the value of the 3-Day switch, the data points along the graph will be presented at a one-hour or four-hour interval for the 1-Day or 3-Day depiction, respectively. Each time series shares a graph between two different forecast elements. For example, the graph below depicts the forecast temperature and dewpoint with the ability to switch the graph to show a forecast for surface wind. Furthermore, additional details are available for any point in the time series. Simply hover the cursor over or tap on the point of interest to see the details as shown below for the temperature and dewpoint time series graph.

1) Temperature and dewpoint forecast

Tap or click on the **Temp/Dewpoint** selection to view the forecast temperature (orange) and forecast dewpoint temperature (cyan) for the chosen airport (see below).
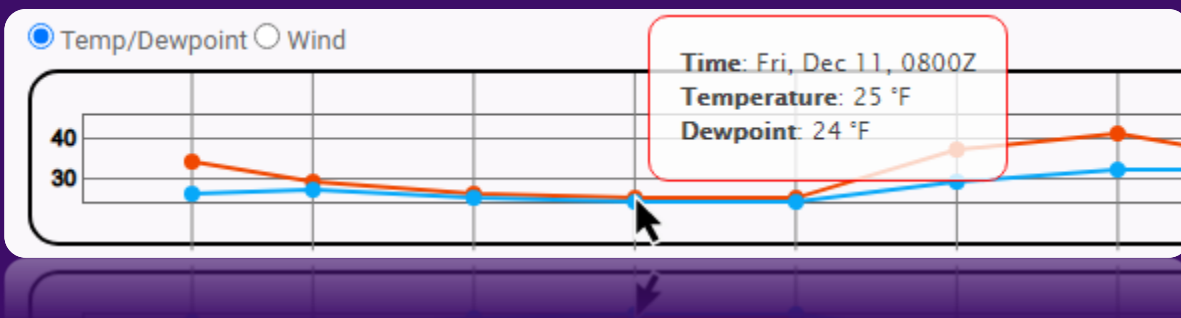
The temperature scale is depicted on the left in degrees Fahrenheit or degrees Celsius depending on the preferences chosen in the EZSettings.

2) Wind forecast

Tap or click on the **Wind** selection to view the forecast wind speed, wind direction and wind gusts for the chosen airport (see below). Wind speed is depicted graphically using
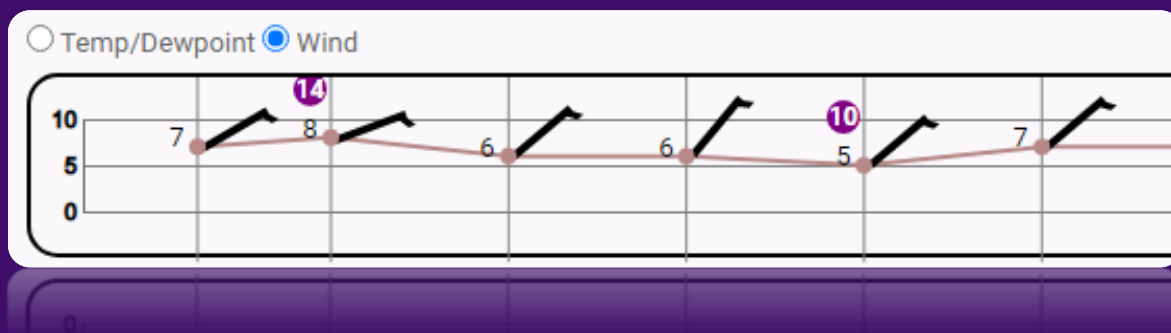
a series of light brown dots connected by a light brown line. To increase the glance value, the forecast wind speed is shown digitally next to the light brown dot on the graph. Alternatively, standard wind barbs shown in black depict the wind speed and direction.[97] When forecast, wind gusts are shown at the top of the graph within a **purple** circle. The wind speed scale is provided on the left in knots or miles per hour (mph) depending on the preferences chosen in the EZSettings.

3) Ceiling height and lowest cloud base

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[97] Standard wind barbs show the direction of the winds as blowing "from."

Tap or click on the **Ceiling/LCB** selection to view the forecast ceiling height[98] and lowest cloud base for the chosen airport (see below). The graph depicts ceiling heights or the lowest cloud base that are below 5,000 feet. When a ceiling below 5,000 feet is

Ceiling/LCB ○ VIsibility

Time: Fri, Dec 11, 1500Z
Clouds: Scattered at 400 feet
Overcast at 500 feet

50
25
0
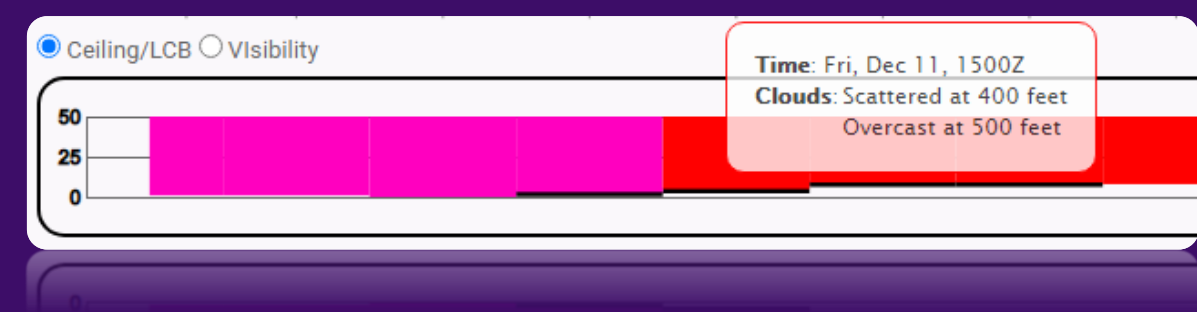
expected, it will be shown as a color-coded filled rectangle. The bottom of the colored rectangle is placed at the forecast ceiling height on the graph. Colors represent the specific flight category as shown in the table below.

Low IFR	IFR	MVFR	VFR
CIG < 500	500 ≤ CIG < 1000	1000 ≤ CIG ≤ 3000	CIG > 3000

When a second layer of clouds with coverage of scattered or few is expected to exist below the ceiling, the lowest cloud base (LCB) will be depicted by a horizontal black line placed at the lowest cloud base height.

4) **Surface visibility**

Tap or click on the **Visibility** selection to view the forecast surface visibility for the chosen airport (see below). Surface visibility is depicted graphically using a series of

○ Ceiling/LCB ● VIsibility

Time: Fri, Dec 11, 1500Z
Visibility: 1.7 statute miles

15
10
5
0

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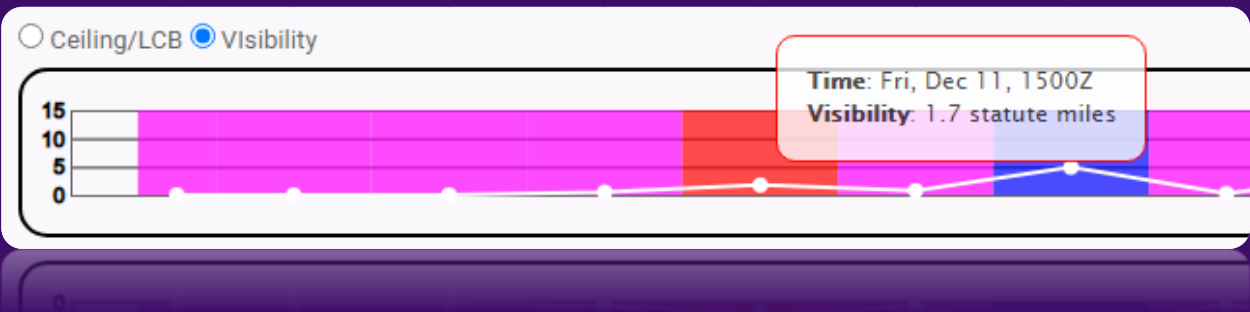
[98] A ceiling is the lowest broken or overcast cloud deck.

white dots connected by a white line. This represents the surface visibility expected at the airport at the valid time. Colors represent the specific flight category as shown in the table below.

Low IFR	IFR	MVFR	VFR
VIS < 1SM	1SM ≤ VIS < 3SM	3SM ≤ VIS ≤ 5SM	VIS > 5SM

5) Precipitation probability

Tap or click on the **Precip prob** selection to view the 1-hour calibrated probability of precipitation forecast for the chosen airport (see below). The 1-hour probability of precipitation is depicted graphically using a series of blue dots connected by a blue line with a solid green fill below. This is presented as a percentage where a value of 0%
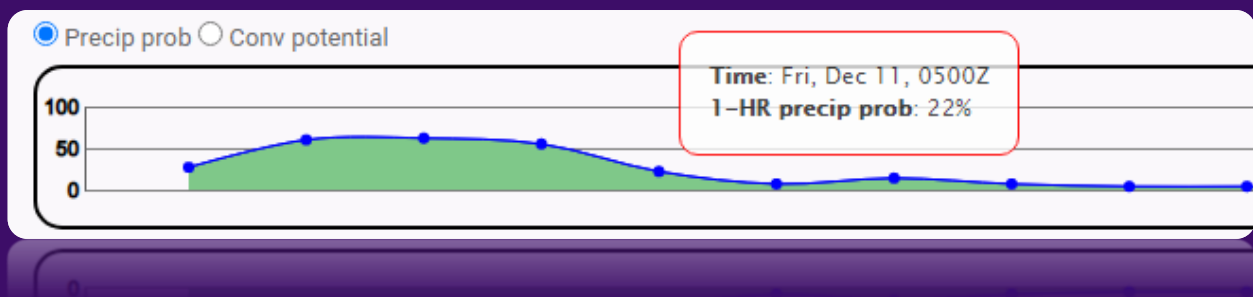
indicates no chance of precipitation expected at the airport in the previous hour <u>ending</u> at the valid time and a value of 100% indicates a certain chance of precipitation expected at the chosen airport within the previous hour ending at the valid time. Note that this does <u>not</u> depict the type of precipitation (e.g., rain, snow, freezing rain) or whether it is convective or nonconvective.

6) Convective potential

Tap or click on the **Conv Potential** selection to view the thunderstorm and convective potential for the chosen airport (see below). The 1-hour thunderstorm probability is
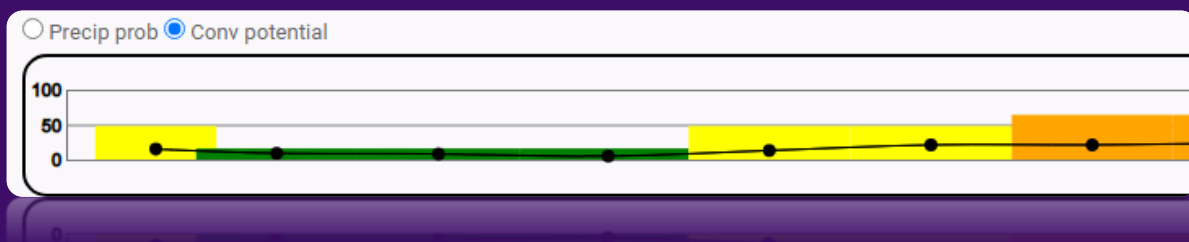
depicted graphically using a series of black dots connected by a black line. This is the probability that convection will produce lightning over the previous hour <u>ending</u> at the valid time. Additionally, the categorical convective potential is provided using color-coded rectangles. Colors shown in the table below identify the categorical risk of convection. Note that convection could be showery precipitation that does not contain lightning. So it is very possible in some circumstances to see a very high convective potential with little or no probability of thunderstorms.

None	Very low	Low	Medium	High	Very high

In addition to the meteogram, **EZWxBrief** provides the latest surface observations (METARs), terminal aerodrome forecasts (TAFs), Skew-T log (p) diagram, area forecast discussions (AFDs) and the Localized Aviation MOS Program (LAMP).

METARs

Choosing the **METAR** option form the EZAirport sitemap menu will show the <u>latest</u> 12 hours of coded[99] surface observations for the selected station (airport) **beginning with the most recent**. Depending on the station, this will include all routine observations from stations that utilize an Automated Surface Observing System (ASOS) or Automated Weather Observing System (AWOS) in the U.S. Reports will also include special observations (**SPECI**) when the criteria is met.[100] Surface observations from some stations outside of the U.S. are also provided. Note that some airports do not make and transmit official METAR reports even when automated sensors are co-located at the airport. If there are no observations to show for the airport chosen, a message "**There are no METAR issued for this airport**" will be displayed. The ceiling and visibility are color-coded based on the categorical value shown in the table below. The wind speed and wind gust will be color-coded as brown if the sustained wind speed is greater than 14 knots and/or the wind gust is greater than 19 knots.

Category	Color	Ceiling Height (feet AGL)	Visibility (statute miles)
Low IFR	Magenta	Below 500 feet	Less than 1 mile
IFR	Red	500 feet to below 1,000 feet	1 to less than 3 miles
MVFR	Blue	1,000 feet to 3,000 feet	3 to 5 miles

[99] At this point in time, there are no decoded METARs provided by EZWxBrief.
[100] At this time, EZWxBrief does <u>not</u> label a surface observation with the SPECI tag to signify a special observation.

VFR	Green	Greater than 3,000 feet	Greater than 5 miles

Additionally, the METAR code in the present weather field for thunderstorms that includes TS or VCTS are highlighted in Red to denote dangerous convective weather.

TAFs

Choosing the **TAF** option from the EZAirport sitemap menu will show the <u>latest</u> 12 hours of coded[101] terminal aerodrome forecasts (TAFs) for the selected station (airport) **beginning with the most recent**. TAFs from some stations outside of the U.S. are also provided. If there are no TAFs to show for the airport chosen, a message "**There are no TAFs issued for this airport**" will be displayed. The ceiling and visibility are color-coded based on the categorical values shown in the table below. The wind speed and wind gust will be color-coded as brown if the expected sustained wind speed is greater than 14 knots and/or the wind gust is greater than 19 knots. Also highlighted in brown are forecasts for non-convective LLWS (e.g., WS020/15045KT). Additionally, the TAF code in the present weather field for thunderstorms that includes TS or VCTS are highlighted in Red to denote dangerous convective weather is expected. If the TAF has been amended, an **AMD** tag will be included at the end of the TAF.

Category	Color	Ceiling Height (feet AGL)	Visibility (statute miles)
Low IFR	Magenta	Below 500 feet	Less than 1 mile
IFR	Red	500 feet to below 1,000 feet	1 to less than 3 miles
MVFR	Blue	1,000 feet to 3,000 feet	3 to 5 miles
VFR	Green	Greater than 3,000 feet	Greater than 5 miles

AFD

Choosing the **AFD** option form the EZAirport sitemap menu will show the most recent Area Forecast Discussion (AFD) based on the location of the station (airport).

The area forecast discussion or AFD is not a discussion describing the legacy area forecast (FA) that was retired on October 10, 2017. The AFD is created by forecasters physically located at each of the local weather forecast offices (WFOs) that are sprinkled throughout the U.S. and its territories. The same forecaster that issues the TAFs for airports that fall within their county warning area (CWA) is also responsible for creating

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[101] At this point in time, there are no decoded TAFs provided by EZWxBrief.

a portion of the corresponding AFD. The county warning areas for the 122 weather forecast offices are shown below. **Therefore, AFDs are not available for airports outside of the United States.**
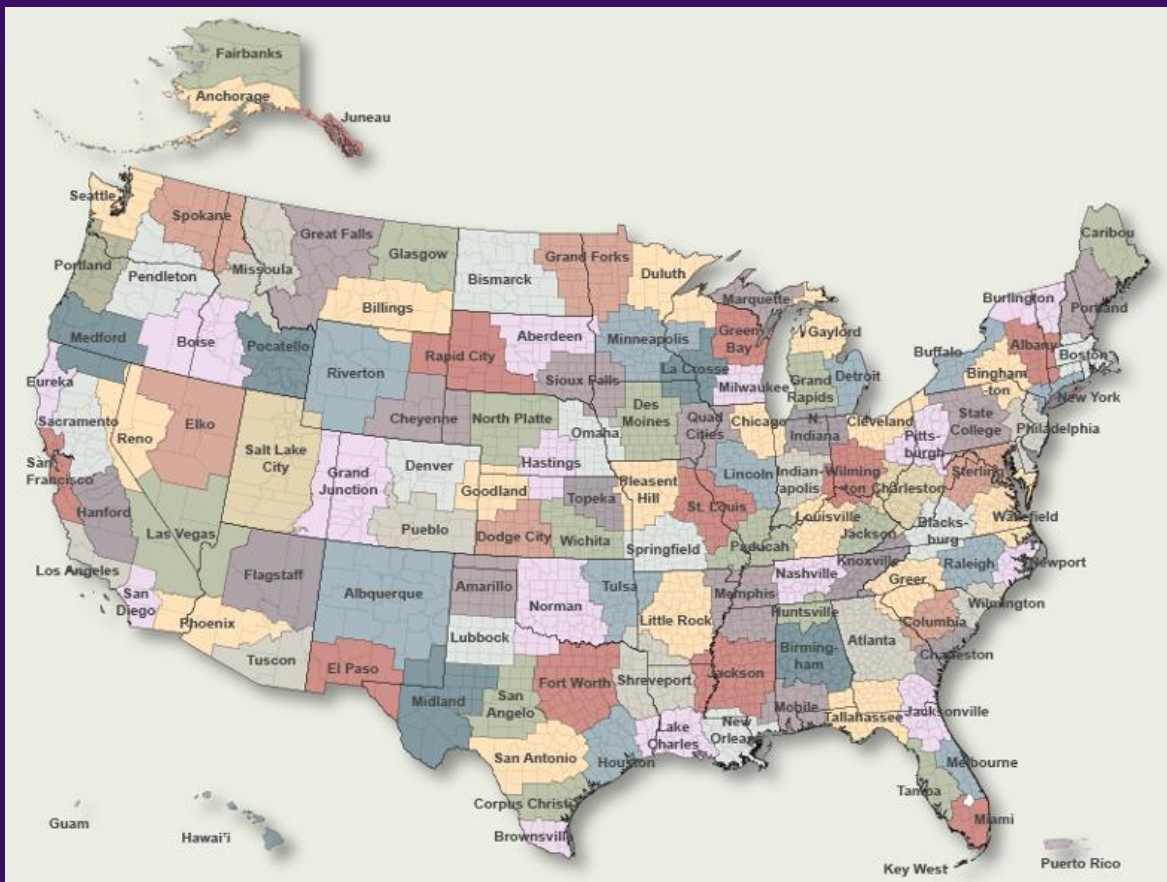
While not a two-way conversation, the AFD is a vehicle that the forecaster can use to broadcast his or her technical reasoning behind the forecast issued; it's a way for a pilot to learn what the forecaster is thinking about the current trends in the weather and the resulting forecast. It is also gives the forecaster an opportunity to express how confident they are, what could go wrong or describe one or more alternate scenarios. At times, terminal forecasts have been way off base, however, there have been very few AFDs that didn't somehow confront the potential of a busted forecast before it happened.

The AFD was originally created to enhance communication between forecasters at neighboring WFOs. Even though it is written in plain English, it can be quite technical at times and contain a lot of jargon. Even so, it can be extremely useful to pilots. Typically

the discussion starts out with a synopsis or overview of the current meteorological big picture to identify synoptic-scale trends in the immediate future. After the synopsis, some forecast offices just include a "Discussion" section whereas the forecast offices in the eastern region of the U.S. break the discussion down into near term, short term and long term. This part of the AFD can vary greatly in size and detail from one forecast office to the next or even from one forecaster to the next.

Of interest to pilots, every AFD has a section dedicated to aviation. If one exists, it will be highlighted in blue in the text. This section is specifically created to address the terminal forecasts that fall within the county warning area (CWA) for that specific forecast office. In some cases, the AFD may also provide an aviation outlook beyond the typical 24- or 30-hour forecast period. TAFs are issued at least four times a day at 0000, 0600, 1200 and 1800 UTC. While there is no required issuance time for the AFD, it is ordinarily available within an hour or two after the TAFs are issued and may be amended at any time.

Skew-T

Choosing the **Skew-T** option from the EZAirport sitemap menu will open up a new browser tab and show the Skew-T analysis and the next 19 forecast hours based on the location of the station (airport). A total of 20 Skew-T log (p) diagrams will be available from the Rapid Refresh (RAP) model for most airports in North America. This essentially provides a shortcut to NOAA's RUC Soundings interactive website.

LAMP MOS

Choosing the **LAMP MOS** option from the EZAirport sitemap menu will display the latest Localized Aviation Model Output Statistics (MOS) Program (LAMP) bulletin based on the location of the station (airport). The LAMP forecast only provides guidance for selected airports[102] in the United States. The message, "**There are no LAMP forecasts issued for this airport**" will be shown if a LAMP bulletin is unavailable for the airport entered.

LAMP is a close relative to the Global Forecast System (GFS) MOS forecast. While the GFS MOS guidance is updated every six hours, LAMP is run hourly and produces an hourly forecast with a lead time to 25 hours. It still uses the GFS model guidance, however, every hour it takes in the most recent observations (surface observations,

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[102] The number of LAMP stations has been increasing over the years, but currently the total number of stations is approximately 2000.

radar, lightning, etc.) valid at or near the airport and factors these observations into the resulting forecast. Therefore, if the original forecast is deviating from the actual weather, LAMP is able to take that into account and adjust to the changing conditions to produce a more representative forecast.

Each column in the tabular bulletin represents a specific valid time that is always shown in Zulu (UTC). Each row in the tabular bulletin represents a different forecast element. The LAMP provides many forecast elements that include cloud coverage (CLD), ceiling height (CIG), surface visibility (VIS) and obstruction to visibility (OBV). All four of these elements are categorical forecasts based on the legend below. For example, a ceiling of "**3**" does not imply a ceiling of 300 feet or 3,000 feet. Instead a value of 3 identifies a range of ceiling heights that fall into the IFR category or 500 to 900 feet as shown in the legend.[103] Similarly, a visibility category of "3" identifies a range of visibility between 1 and 2 statute miles.

Definitions of Categorical Elements

MAV Ceiling Height Categories	
1	< 200 feet
2	200 - 400 feet
3	500 - 900 feet
4	1000 - 1900 feet
5	2000 - 3000 feet
6	3100 - 6500 feet
7	6600 - 12,000 feet
8	> 12,000 feet or unlimited ceiling

MAV Visibility (VIS) Categories	
1	< 1/2 miles
2	1/2 - < 1 miles
3	1 - < 2 miles
4	2 - < 3 miles
5	3 - 5 miles
6	6 miles
7	> 6 miles

MAV Cloud (CLD) Categories	
CL	clear
FW	few > 0 to 2 octas
SC	scattered > 2 to 4 octas
BK	broken > 4 to < 8 octas
OV	overcast

MAV Obstruction to Vision (OBV) Categories	
N	none of the following
HZ	haze, smoke, dust
BR	mist (fog with visibility >= 5/8 mile)
FG	fog or ground fog (visibility < 5/8 mile)
BL	blowing dust, sand, snow

The LAMP bulletin also provides a forecast for wind direction (WDR), wind speed (WSP) and wind gust (WGS) in knots. Wind gusts are forecast when the wind is expected to gust to a value greater than or equal to 14 knots. The characters NG will be displayed signifying "no gust" is expected to occur for the specific time. Temperature (TMP) and dewpoint temperature (DPT) are in degrees Fahrenheit. LAMP also provides a categorical forecast for conditional ceiling height (CCG) and conditional surface visibility (CVS). These are forecasts for ceiling and visibility, contingent on precipitation occurring. Typically, less favorable flight conditions

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[103] Ceiling height is always referenced as above ground level (AGL).

exist during precipitation events. Therefore, CCG and CVS will usually forecast values **at or below** the corresponding unconditional CIG/VIS categorical forecasts.[104]

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[104] Although precipitation typically lowers the visibility and ceiling, the LAMP forecast of conditional ceiling height and/or visibility that are greater than their unconditional counterpart should not necessarily be deemed meteorologically inconsistent.

EZWorkshops

EZWxBrief provides an extensive library of aviation weather training workshops. To view the list of workshops available in the library, tap or click on the **Start** button and then select **Watch online workshops**. Every workshop contains both audio and video. Workshops can be viewed by any trial member or a member with an **EZWxBrief** subscription that has not expired. Please note that a few Basic workshops have been designated as **free**. Any user with or without an **EZWxBrief** membership can view these free workshops.

The "bite-sized" workshops are typically 5 to 15 minutes in length. They are designed to help pilots understand weather topics that are poorly taught or to describe how to properly use weather guidance to make better preflight decisions. Consequently, there is no recommended order in which to view them. Workshops can only be viewed with an active Internet connection and cannot be downloaded to your computer or portable device for offline viewing. There are also longer workshops that were previous designed as "premium" workshops that are one or more hours long. You no longer must purchase premium workshops separately.

Initially, when selecting **Watch online workshops** from the **Start** button, all workshops shown are available in the library. Using a mouse, you can scroll the workshop list using a thumbwheel on the mouse or by a click and drag action on the scroll bar located on the right side of the workshop list. On a device with a touch screen, you can press and drag the workshop list up or down to scroll with your finger. Please note that we use a "lazy loading" concept when the list is scrolled. As you scroll beyond what is currently displayed, there will be a brief pause to load the next set of workshops in the library.

Reordering workshops

To reorder the workshops alphabetically by title or by duration, tap or click on the workshop reorder button (located to the right and above the workshop list) and select the desired order shown in the menu. The workshop list will be reordered based on your choice. For users that do not have an account or are not signed in, the workshops designated as "free" are initially listed first and can be subsequently reordered as desired.
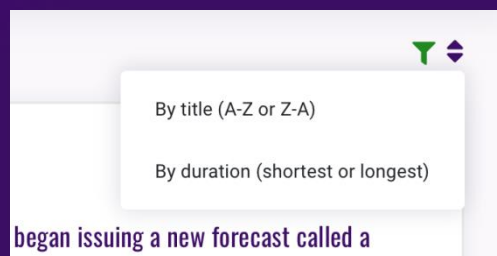
Playing a workshop

Each individual workshop listed will contain a thumbnail image, title, duration and description. From time to time, new workshops will be added to the extensive **EZWxBrief** library. When a "**New**" ribbon is shown over the workshop image (like the example on the left), this indicates that the workshop was added to the **EZWxBrief** library in the last 30 days. To start a workshop, tap or click on the Play button icon located over the thumbnail image. The workshop will open and begin playing. For the best viewing experience, we recommend that you view the workshop in landscape orientation when viewing it on a portable device such as an iPad or iPhone. To end the workshop and return to the workshop list, simply tap or click on the **X** button in the upper-right.

The workshop will then be marked as "viewed." As a reminder, a check mark will be placed to the right of the Duration when you have started the workshop[105]. This is a way for you to quickly determine which workshops you have previously viewed. If you are signed in and do not see a Play button, it likely means you may have an expired membership. In those cases, you will see a **Renew** button (or **Join Now** button for an expired trial membership).

Filtering workshops

In addition to reordering by title and duration, the list of workshops can be filtered by specific categories or search criteria. When viewing the list of workshops tap or click on the filter button (funnel icon) to the left of the reorder icon. This will display the filter selection criteria and allow you to filter the workshop list based on specific criteria you choose.

First, you can filter the workshops list by entering a descriptive text into the **Search Content** field. This searches the library of workshops and will filter the list for workshops that has a title that contains this descriptive text. Note that the search is not case sensitive. For example, if you enter **precipitation** into the search field only those

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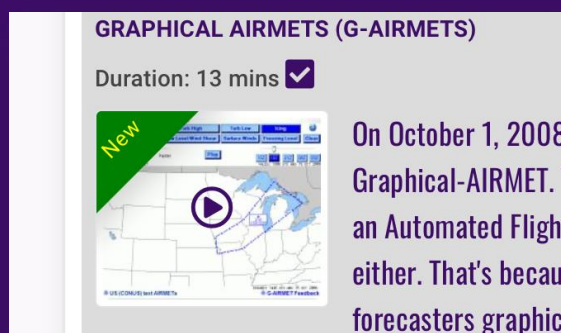
[105] This only indicates that you have started a workshop and does not indicate that you have viewed the workshop from beginning to end.

workshops that contain "precipitation" **in the title** will be shown. For the best experience, we recommend that you enter only a one- or two-word description. Consequently, entering "precipitation type" is likely too specific and will likely yield no results.

Workshops can also be filtered by Skill Level and Category. Each workshop has been tagged with a single skill level to include Beginner, Intermediate, Advanced and Expert. Any workshop will only be tagged with a single skill level. Selecting the plus (+) sign next to **Skill Level** will filter the list based on these levels. You can select one or more of these skill levels and then tap or click on **Apply Filters** to see the list of workshops tagged with those skill levels. If you are new to **EZWxBrief**, starting with Beginner level workshops and working toward Expert level workshops is a good approach.

Lastly, the workshop list can be filtered using predefined categories. Each workshop is tagged with one or more categories such as Convection, Airframe Ice, Fog, or Constant Pressure Charts, just to name a few. Selecting the plus (+) sign next to **Category** will filter the workshop list based on these categories. You can select one or more of these categories and then tap or click on **Apply Filters** to see the list of workshops tagged with those categories.

In summary, you could search for **Advanced** level workshops that are tagged with both the **Airframe Ice** and **Constant Pressure Charts** category. Clicking or tapping on **Apply Filter** will filter all the workshops from the view that do not contain these criteria. To remove all the filter criteria and display a list of **all** workshops in the library, tap or click on **Clear Filter**.

If you are signed in, you can also add or remove a workshop from your EZFavorites. Every workshop will show a Heart icon in the workshop list to the right. Simply tap or click on the Heart icon to add that workshop as a favorite. A filled Heart identifies that you have added it to one or more of your favorites folders.

Workshop sharing

From time to time, you may want to share a workshop with another **EZWxBrief** member or perhaps with another pilot. A tap or click on the share icon will allow you to send a URL to one or more email addresses (separated by a comma). You can also copy the URL to the clipboard and paste it into an email or post it online. If you are posting this Web address online or sending it in an email, please understand that the hyperlink to

the workshop will open the **EZWxBrief** application and for some workshops may require an unexpired **EZWxBrief** membership to play.

Workshop player

When playing a workshop, a **Menu** and **Transcript** tab will be located in the workshop sidebar on the left. When you tap or click on the Transcripts tab it will show a written or printed version of the workshop's spoken audio that you can use to follow along as the workshop is played.

Each workshop is an audio and video presentation that contains a series of slides (usually ten or more) listed by title under the Menu tab in the workshop sidebar. Once the workshop is started, play automatically progresses from one slide to the next; there is no need to advance the slides manually. A tap or click on any slide title in the sidebar Menu will advance the workshop to the beginning of that slide and play will resume from that location in the workshop. All workshops will end with a summary and short quiz to test your comprehension.
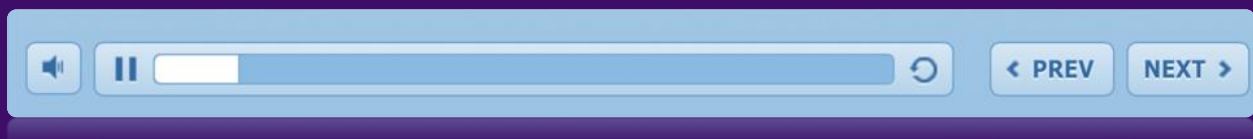
If you close a workshop before completing the quiz, the application remembers where you stopped. When restarting the workshop on that same device, you will be asked if you would like to resume the workshop where you left off. Tap or click **Yes** to resume or **No** to start the workshop from the beginning.

When viewing any workshop, a traditional progress or seek bar and player controls are available at the bottom of the workshop (shown above). This allows you to move forward (NEXT) or backward (PREV) in the presentation. Using the controls on the progress bar, you can also pause or play the presentation at any time. The progress bar itself is a slider. A tap or click on the progress bar will start the slide from that point. You can also press and drag the progress bar to a new location within the slide. Unlike a tap or click on a location in the progress bar, this action will pause the workshop. To resume the slide from that point, you will need to click on the Play button.

If you do not hear any sound, do the following. **(1)** make sure the volume on your device is not muted. **(2)** if using **EZWxBrief** in a browser such as Google Chrome, click on the Pause button in the progress bar to stop the presentation. Next, click on the Play

button to resume. Sound should begin once the Play button is clicked a second time. You can also click or tap in the progress bar which will have the same effect. **(3)** if you are viewing a workshop on an iPad or iPhone, most likely you have your sound muted. On older iPads (such as the one pictured to the right) there is a manual switch on the right side of the device. To hear sound, simply slide the switch to the opposite setting. On an iPhone, you may need to be sure that your iPhone sound is not muted with the manual switch on the side of the device.
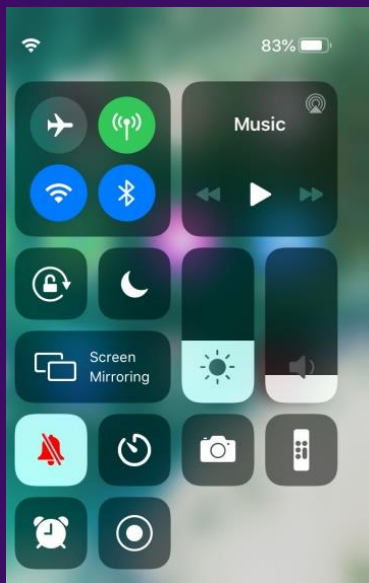
Otherwise, for a newer iPad that does not have a physical mute switch, you need to go to the iPad home screen and swipe down from the upper-right corner on a newer iPad or swipe from the bottom up on an older iPad (like you do to turn on the flashlight app). You will see a bell icon. Make sure the bell shows white. If it is red with a line through it (as shown on the left), it means your sound for these workshops is muted. Tap on that bell to turn it white and sound will now play when the workshop is playing.

EZImagery

The **EZWxBrief** static imagery contains the most comprehensive weather guidance available online. To view the imagery, tap or click on **Start** and then select **View Static Weather Imagery** from the menu. This will open the **EZWxBrief** imagery viewer. Trial and annual members enjoy unlimited access to all of the static imagery. When your membership expires, some imagery will remain freely available, but most will be purposely blurred indicating that your membership has expired.

The imagery viewer consists of the main viewport, imagery menu, player controls, progress bar and other features to include sharing imagery, exporting images and saving imagery favorites. It also shows the current Zulu (UTC) time in the upper-right corner of the page. This clock is not affected by the time preference chosen in the EZSettings.

Imagery collections – The static imagery is organized into weather product collections. Many of these collections may be further subdivided into folders that are organized by geographic regions (e.g., Northeast, Southeast, etc.), product type (Wind, Temperature, etc), altitude or forecast lead times. For collections with two or more static images, they will be assembled into an animated loop.

To view the list of imagery collections, tap or click on the imagery icon (as shown on the right). This will open up the full imagery menu. This menu can be scrolled to view all of the collections available. For collections that are further subdivided, a folder icon will be present to the left of the collection group with an up/down-arrow on the right. A tap or click on the name will expand the folder to reveal the imagery collections or other encapsulated folders. Collection names containing the animated imagery will have an image icon to the left of the name. To view the images within the collection, tap or click on this name to open it in the imagery viewport.
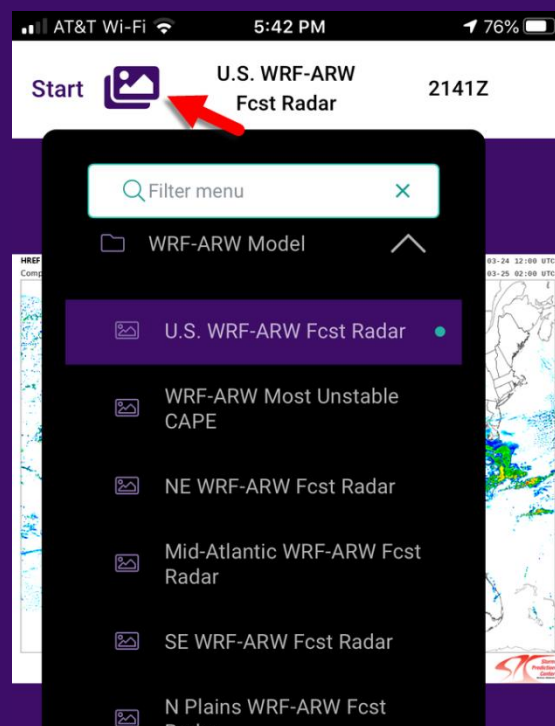
Note: EZWxBrief stores the last imagery collection viewed and will default to this collection (if defined) in the viewport when returning to the EZImagery.

Animation – Player controls are provided at the bottom of the imagery viewer to animate the images contained in the collection. Controls to start and pause the animation as well as controls to step forward and backward through the animation are available. Moreover, an animation progress bar is also available to determine the current location within the loop and to advance the animation in a more ad hoc fashion. The progress bar contains a movable place marker that defines the relative location within the animation. A tap or click on the bar will advance the place marker to that point and display the image that is represented by that location within the loop. Alternatively, pressing and sliding the place marker right and left will seamlessly animate the imagery forward and backward displaying the respective images in the viewport. For some collections, this feature allows you to view the movement of weather in time and space.

Most of the images in a collection are valid at a single date and time. Some images, however, are valid over a range of time. The valid date and time (or range of time) of the current image shown in the viewport is provided immediately under the progress bar. In some cases, it may not be possible for the application to determine the valid date and time. In that case, it will instruct you to reference the time stamp on the image.

Most imagery collections are ordered by time, however, some are ordered by altitude (e.g., icing and turbulence). For time-oriented collections, they are ordered from oldest to newest for observational data or from earliest lead time to a lead time furthest in the future for forecast data. Collections based on observational data such as surface analysis charts, CONUS radar, satellite, pilot weather reports and the icing analyses contain imagery valid in the recent past. When viewing these collections, the image with the most recent valid time will be displayed and the place marker will be initially positioned on the far right side of the progress bar. For collections that denote a forecast, the guidance with the shortest lead time will be displayed with the place marker positioned on the far left of the progress bar.

Imagery collections that are based on altitude will be valid at a single time. Animating the imagery for these collections changes the altitude from lowest to highest. Therefore, playing the animation or sliding the place marker from left to right will increase the altitude as the loop progresses.

Smart filter – The imagery menu contains a smart filter that allows you to enter a string of characters to search for a particular imagery collection. In the search field enter the text you would like to search for and the imagery menu will be filtered as you type to leave only collections with names that contain that string. For example, if you want to show only collections that contain the word radar, type "radar" (without quotes) into the search field and it will filter the menu to leave those collections that have "radar" in the name. Keep in mind that "radar" may be abbreviated as "Rdr" and may not appear in the search results. The filtered menu will continue to persist until the search field is cleared.

Pan and zoom – When viewing any image, you can zoom in and pan the image in all directions. This can be done with a mouse by a double click or double tap with a finger on a touch screen. This will take the image to its maximum zoom level. Another double click or double tap will zoom out to the maximum level. Alternatively, the "fit-to" button can be used to bring a zoomed image back to a maximum zoom level. A press and drag action will pan the image[106]. On a touch screen device you can zoom in or out using a two finger pinch action. When an image is zoomed, a single finger can be used to pan the image. Lastly, you can also animate a zoomed image using the player controls or by sliding the progress bar place marker. The image will remain zoomed during any animation.

Export an image – Any image in a collection can be saved to your local drive whether you are on a desktop, laptop or portable device. Simply tap or click on the **Export** button and it will be downloaded to your device via your browser.

Sharing imagery collections – From time to time you may want to share an imagery collection with another **EZWxBrief** member or perhaps with another pilot. A tap or click on the share icon will allow you to send a URL to one or more email addresses (separated by a comma)

as shown to the right. You can also copy the URL to the clipboard and paste it into an email or post it online. If you are posting this Web address online or sending it in an email, please understand that the hyperlink to the imagery will open the **EZWxBrief**

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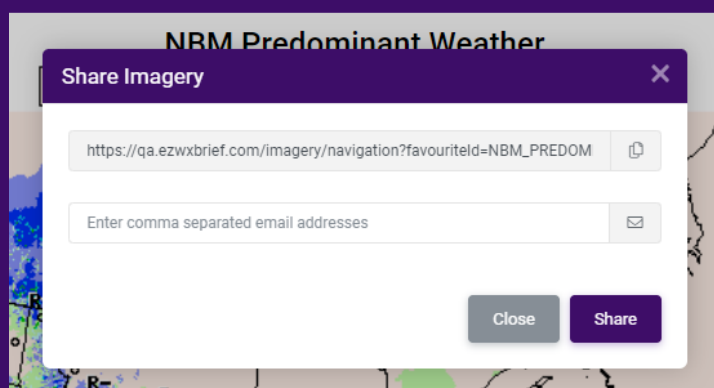
[106] The pan operation is only available when the image is zoomed.

application and some imagery may require an unexpired **EZWxBrief** membership to view. Also, it will always show the latest weather imagery regardless of when the imagery was shared.

**Freshness of imagery –** While there is an attempt to keep all of the imagery up to date, please understand that some image collections are taken from sites that are not monitored operationally and may become stale at times. So it is critical to always examine the date-time stamps on the charts to be sure you are looking at the latest issuance. In some cases, the imagery may show as being temporarily unavailable. If you experience any of these situations, please feel free to send an email to our support team to let us know.
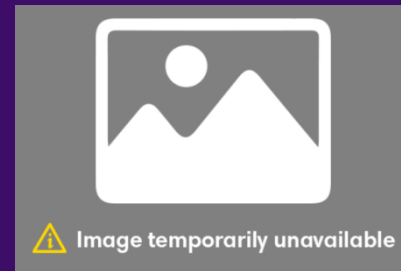
MSL surface analysis
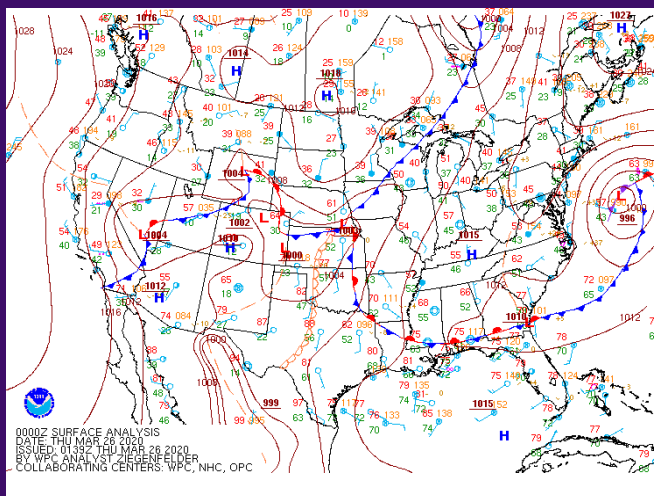
All preflight briefings should begin with a look at what happened in the recent past. What has occurred over the last day or two is the springboard for what is about to happen in the near future. So it is difficult to gain an appreciation for the forecast without knowledge of how the weather has evolved up to the present time. Consequently, the mean sea level (MSL) surface analysis chart is one of the best places to start your weather briefing. It will help you identify the current evolution of the major weather systems affecting the U.S.

The surface analysis is issued every three hours by highly trained meteorologists at the Weather Prediction Center (WPC) located in College Park, Maryland. A surface analysis is not a forecast. Instead, it represents a subjective analysis of actual weather conditions occurring at the surface at a specific time in the recent past. This analysis is valid at the synoptic times of 0000Z, 0300Z, 0600Z, …, 2100Z. The WPC ordinarily posts the latest surface analysis at about 90 minutes after the valid time shown on the chart. For example, the 1500Z surface analysis becomes available around 1630Z. Therefore, it is

already 90 minutes old by the time it is available within **EZWxBrief**, but the weather depicted on the chart is still valid at 1500Z regardless of the time it was issued.

The surface analysis chart depicts an isobaric analysis of pressure in millibars adjusted to a single height, that is, mean sea level. This is unlike a constant pressure chart which depicts the mean sea level height of a single pressure surface. High and low pressure centers and the location and type of frontal zones are depicted on this chart. This includes the location of cold, warm, stationary and occluded fronts as well as the location of pressure troughs, dry lines, squall lines and outflow boundaries. The frontal and isobaric analyses are overlaid on surface observations also known as station models depicting the conditions around the valid time of the chart at various official National Weather Service (NWS) reporting stations, ordinarily airports.

The surface analysis chart is simply a snapshot in time. So it is best to go back at least 24 hours in the past to identify trends in the weather that may persist into the next day or two. This is best accomplished using a surface analysis loop. A loop such as this helps to identify the speed and direction of movement as well as the intensification or dissipation of the major weather features. For example, if a cold front is moving rapidly to the east, it's likely that the current weather 100 miles to the west might find itself in your area in about three or four hours. On the other hand, a front that has stalled may indicate the weather is unlikely to change all that much in the near future.

Included in **EZWxBrief** is a national loop covering the conterminous U.S. as well as regional loops for the Eastern, Central and Western U.S. When a region is selected the most recent surface analysis image available is shown[107]. Each loop spans a time of approximately 24 hours beginning with the oldest analysis and ending with the most recent analysis. Please see this page for a legend of surface fronts and boundaries depicted in these surface analysis charts. For guidance on how to read the surface station models, please see this page.

At the National level, a separate radar and satellite composite loop is also available. The national NEXRAD Doppler radar mosaic and color-enhanced infrared satellite valid at the time posted on the chart are overlaid on the isobaric and frontal analyses.

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[107] The loop control will begin on the far right.

National forecast chart

The National Forecast Charts are prepared by highly trained meteorologists at the Weather Prediction Center (WPC) and provides an overview of expected weather for the next three days with an emphasis on certain hazardous and significant weather. They summarize forecasts from the Storm Prediction Center (for severe thunderstorm and tornado outlooks as well as critical fire weather), the National Hurricane Center (for tropical storm and hurricane forecasts), and the Weather Prediction Center (for information concerning heavy rainfall, flooding, winter weather, and general weather). With overlaid frontal forecasts, this guidance serves as a high level overview of the expected weather for the next three days. **Note:**

Fronts depicted on this forecast are valid at a single time that occurs at the beginning of the valid date-time stamp. Weather areas (legend depicted to the right) are valid over a 12 hour period defined by the valid date-time range shown on the map.

The current day's chart is updated twice each day, once in the early morning (by 1000Z), and again in the afternoon (by 2200Z). The charts for Days 2 and 3 are currently updated daily at 1000Z, but can be updated more frequently as conditions warrant.

Prog charts

Short and extended range forecasts also known as "prog" charts are prepared by highly trained meteorologists at the Weather Prediction Center (WPC). They issue forecasts with a 6 to 168 hour lead time for the conterminous U.S., southern Canada, and northern Mexico. The primary goal is to depict the evolution of major weather systems that will affect the conterminous U.S. during the next 6 to 60 hours.
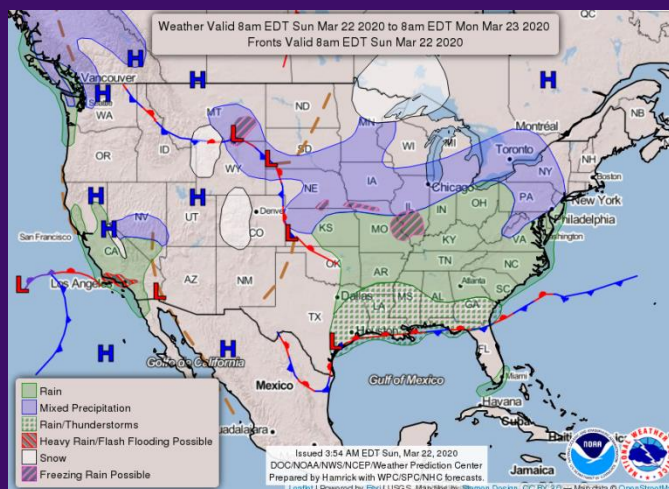
These short range forecasts are issued twice a day and include the expected surface pressure patterns (isobars), circulation centers (highs and lows) and fronts with a lead time of 6, 12, 18, 24, 36, 48 and 60 hours. A color mosaic depicting the type, coverage (extent) and likelihood of precipitation are extracted from the National Digital Forecast Database (NDFD) that is prepared by forecasters at the NWS local Weather Forecast Offices (WFOs) in collaboration with the WPC. Consequently, the precipitation forecasts depicted on these charts is strictly limited to the conterminous U.S. and coastal waters and does not extend into Canada or Mexico.
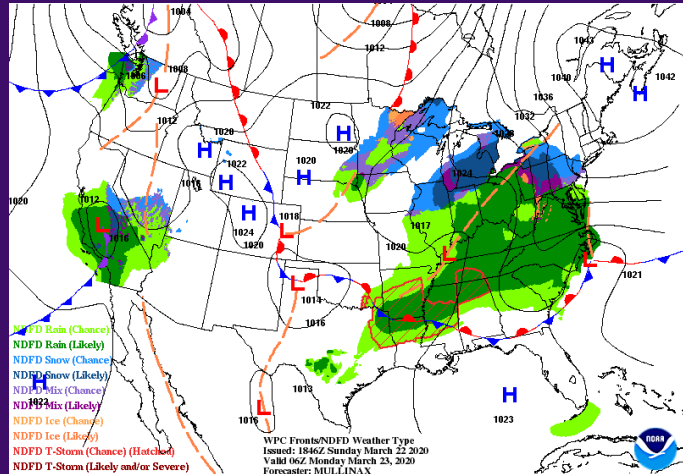
This is an instantaneous precipitation forecast valid at the time listed on the chart. Therefore, it shows the coverage or extent of that precipitation type expected to reach the surface at the valid time. Precipitation is shown using two color shades (light and dark) representing the likelihood of precipitation reaching the surface during that time.

- Rain (Chance) - There is a 15-54% chance of measurable rain (≥0.01") at the valid time.
- Rain (Likely) - There is a 55% or greater likelihood of measurable rain (≥0.01") at the valid time.
- Snow (Chance) - There is 15-54% chance of measurable snowfall (≥0.01" liquid equivalent) at the valid time.
- Snow (Likely) - There is a 55% or greater likelihood of measurable snow (≥0.01" liquid equivalent) at the valid time.
- Mix (Chance) - There is a 15-54% chance of measurable mixed precipitation (≥0.01" liquid equivalent) at the valid time. "Mixed" can refer to precipitation where a combination of rain and snow, rain and ice pellets (sleet), or snow and ice pellets are forecast.
- Mix (Likely) – There is a 55% or greater likelihood of measurable mixed precipitation (≥0.01" liquid equivalent) at the valid time. "Mixed" can refer to precipitation where a combination of rain and snow, rain and ice pellets (sleet), or snow and ice pellets are forecast.

- Ice (Chance) - There is a 15-54% chance of measurable freezing rain (≥0.01") at the valid time.
- Ice (Likely) – There is a 55% or greater likelihood of measurable freezing rain (≥0.01") at the valid time.
- Thunderstorm (Chance) - There is a 15-54% chance of thunderstorms at the valid time. Areas are displayed with diagonal hatching enclosed in a red border.
- Thunderstorm (Likely and/or Severe) – A dark red filled area depicts a 55% or greater chance of thunderstorms and/or the potential exists for some storms to reach severe levels at the valid time. A severe storm is one that produces strong straight line winds (>50 knots), large hail (> 1" diameter) and/or tornadoes.

Extended range forecasts are also issued by forecasters at the WPC. Surface pressure patterns (isobars), circulation centers and fronts are depicted with a lead time of 72 hours (Day 3) through 168 hours (Day 7) and is valid on each day at 1200Z.[108] Unlike the precipitation on the short range prog charts, precipitation areas are 6-hour probability forecasts (depicted using two colors. Dark colors depict regions with the highest probability of rain, snow, ice or thunderstorm.

Quantitative precipitation forecasts

The Quantitative Precipitation Forecasts (QPF) are prepared by highly trained meteorologists at the Weather Prediction Center (WPC) and is a
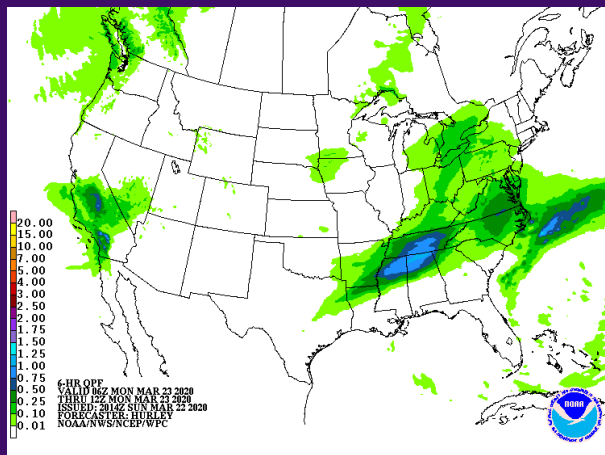
forecast for the quantity of precipitation expressed in inches that is expected to reach the surface over a specific period of time. In this case, the period is six hours so the forecast is referred to as a 6-hour QPF. It is important to note that QPF does not distinguish between the type of precipitation (e.g., rain, snow, ice pellets) nor does it tell you if the precipitation is the result of deep, moist convection or thunderstorms.

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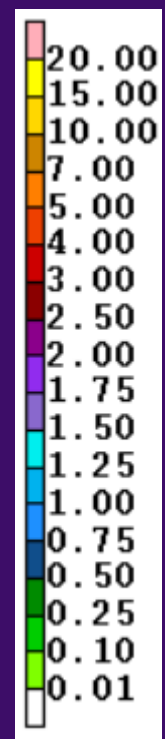
[108] The precipitation forecast overlaid on the extended range fronts and isobaric forecast is a 6-hour precipitation probability valid from 18Z to 00Z after the valid time on the chart.

Solid-filled color contours are drawn based on the scale shown on the left side of the chart (see right). In the case of frozen precipitation such as snow or ice pellets, the scale roughly approximates the melted equivalent. Typically 12 inches of melted snow is about 1 inch of rainfall.

Moreover, the QPF doesn't specify when the precipitation is expected within the valid range of time; it could fall all in the first hour, all in the last hour or it could be a continuous light rain falling throughout the entire forecast period. This is especially important to understand when the precipitation may be from convection. Often during the warm season, most of the precipitation forecast may fall within an hour or two and that could be near the beginning or end of the forecast period leaving much of the valid time free of precipitation.

Forecasts are provided in a loop with a lead time out to 84 hours (3.5 days). Each image in the loop shifts the time window by 6 hours for a total of 13 periods.

Probability of precipitation

The probability of precipitation (PoP) is an extended-range forecast for Day 3 through Day 7 covering the conterminous U.S. These forecasts are issued twice a day by highly trained meteorologists at the Weather Prediction Center (WPC) and depict the probability that precipitation will reach the surface within a 12 hour valid period.

A loop is provided for Day 3 through Day 7 that includes two 12-hour forecast periods each for day. For example, if today is Thursday, the loop will include two 12-hour forecast periods each for Sunday (Day 3), Monday (Day 4), Tuesday (Day 5), Wednesday (Day 6) and the following Thursday (Day 7). The 12-hour span of time generally coincides with either a daytime (1200Z to 0000Z) or nighttime (0000Z to 1200Z) period. Please note that the valid time on the chart represents the ending time of the 12-hour forecast period.
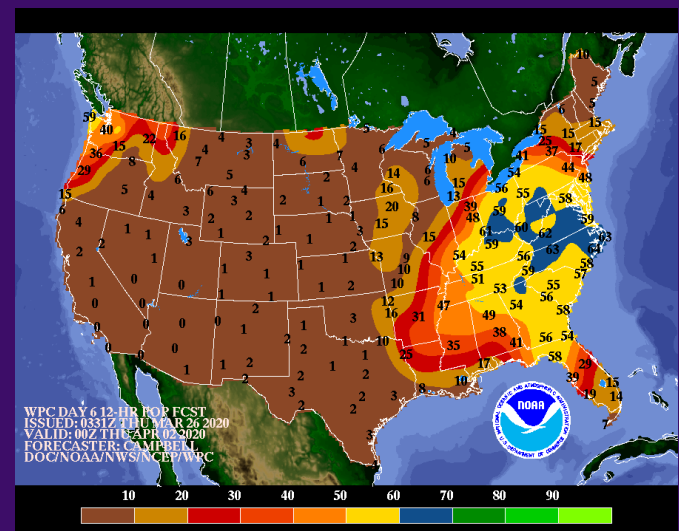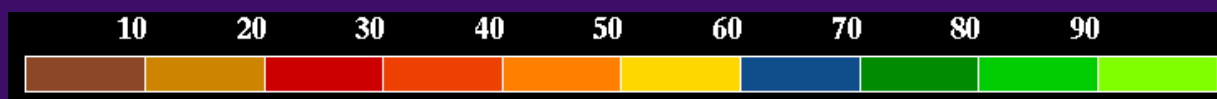
Probabilities are contoured using solid colors as shown in the legend at the bottom of the chart (see below). Green colors denote higher probabilities with brown being the lowest probability. Numbers shown on the map define a probability for a particular city over the valid forecast period, in this case 12 hours. Higher numbers denote high forecaster confidence that measurable precipitation will reach the surface within the valid forecast period.

MRMS composite reflectivity

This depicts a mosaic of the WSR-88D NEXRAD Doppler weather radars throughout the conterminous U.S. These images have an extremely high glance value and are packed with guidance assuming that a pilot knows how to interpret all the

colors. The colors represent the strength of returned energy to the radar expressed in values of decibels of Z (dBZ) where Z is the reflectivity parameter (shown b). The dBZ values equate to approximate rainfall rates. A value of 20 dBZ is typically the point at which light rain begins. The values from 60 to 65 dBZ is about the level where 1" diameter hail can occur.

Any individual radar can operate in one of two modes, namely, precipitation and clear air. When the radar is in precipitation mode, the range of dBZ values displayed can be as low as 5 to a maximum of 75, whereas clear air mode offers a range from -28 to +28. The reason negative dBZ values can occur in clear air mode is because the dBZ is a logarithmic function. So an increase of 3 dBZ actually represents a doubling of power returned! Anytime Z is less than 1 mm6/m3, dBZ becomes negative. Negative dBZs are only found when the radar is in clear air mode.

For this mosaic, the reflectivity is a composite reflectivity taken from the Multi-Radar/Multi-Sensor (MRMS) system. The radar depiction is filtered to remove non-precipitation returns called ground clutter typically located around the various radar sites especially at night or early morning.

Images in this collection are generated at 4-6 minute intervals spanning the previous three hours in total. When this imagery collection is rendered, the cursor is initially placed on the newest image. It's important to understand that it takes time to produce these images and the even the most recent image at the end of the animation may be 5 minutes or more old.

Pilot weather reports
This provides a graphical depiction of the geographical location of latest routine and urgent pilot weather reports (PIREPs) over the conterminous U.S. to include reports for airframe ice, turbulence and weather & sky conditions. Each airframe ice and turbulence PIREP is depicted using a standard symbol and colored according to the intensity reported by the crew. Also included adjacent to each symbol is the altitude of the report (in hundreds of feet) along with the type of icing (e.g., rime) or frequency of turbulence (e.g., continuous), respectively. Urgent PIREPs are shown with a red symbol. The legend for each type of report is shown at the bottom of the chart. In addition to the national view, there are six geographic regions to choose from that include the northeast, southeast, north-central, south-central, northwest and southwest.

Each chart will show one or more pilot weather reports over a specific range of time listed at the top of the chart. However, the timestamp shown below the progress bar provides the date and time each image was created. There is no standard range of time, therefore, each image in the loop will likely overlap with other previous or later images. It is common in the overnight hours for there to be no pilot reports shown. In that case, the chart will show "No reports during this time" in place of the timestamp normally shown on the chart.

A historical loop of pilot weather reports is provided over the previous five hours ordered from oldest to the most recent reports when animated.

Visible and infrared satellite

The satellite imagery contains national and regional satellite images from the GOES-16 (East) and GOES-17 (West) satellites. The visible channel senses reflected solar radiation. Clouds, the earth's atmosphere, and the earth's surface all absorb and reflect incoming solar radiation. Visible satellite images, which look like black and white photographs, are derived from these satellite signals. Clouds usually appear white or various shades of bright gray, while oceans, lakes and trees appear black or darker shades of gray. Care needs to be taken when the earth's surface is covered in snow. Snow reflects much of the light back toward the satellite and can look remarkably like clouds. With snow cover large rivers or lakes show up as dark elements on the image implying that the white areas may be snow. Also, clouds tend to move and change shape and texture when looking at satellite imagery in a loop over time. After the sun has set and before the sun has risen, these images will be totally black leaving just the geopolitical boundaries present.

In the infrared (IR) channel, the satellite senses energy as heat. The earth's surface absorbs about half of the incoming solar energy. Clouds and the atmosphere absorb a much smaller amount. The earth's surface, clouds, and the atmosphere then re-emit part of this absorbed solar energy as heat. The infrared channel senses this re-emitted radiation. A major advantage of the IR channel is that it can sense energy at night, so this imagery is available 24 hours a day.

The IR imagery in **EZWxBrief** is a color enhanced satellite image. This satellite imagery can be one of the best tools to determine the height of the actual cloud tops especially when there is only one homogeneous cloud layer. This product shows the temperature (in degrees Celsius) of the cloud top or surface of the earth using a color scheme. Using the temperature scale at the bottom of the image, the warmer colors such as orange and red are temperatures above 0°C and the cooler colors such as yellow, green, blue and purple are temperatures below 0°C. By comparing this temperature to the actual temperatures aloft, you can get a reasonable estimate of the height of the cloud tops. Very cold cloud tops (below -40°C) are indicative of deep, moist convection or thunderstorms. Most important, cloud tops with colors of yellow, pale green and light blue indicate that the cloud tops are likely dominated by supercooled liquid water representing an airframe icing hazard.

In addition to the national view, there are eight geographic regions to choose from that include the northeast, southeast Great Lakes, Midwest, plains, Rocky Mountains, northwest and southwest. These satellite images are generated every 15 minutes. It's important to understand that it takes time to produce these images and even the most recent image at the end of the animation may be 30 minutes or more old. A historical loop is provided over the most recent seven hours ordered from the oldest to the most recent imagery when animated.

SIGMETs

SIGMETs are en route advisories for (**SIG**nificant **MET**eorological information). These are issued on an as-needed basis by highly trained meteorologists at the Aviation Weather Center (AWC). This includes SIGMETs for widespread severe nonconvective airframe ice, severe or extreme nonconvective turbulence, dust storms or sandstorms lowering visibilities to less than three miles and volcanic ash. Widespread implies an area of at least 3,000 square miles or about 60% the size of the state of Connecticut. Many SIGMETs for icing and turbulence are only issued by meteorologists when pilots begin reporting those severe conditions. Therefore, these SIGMETs live and die by pilot weather reports. When issued, SIGMETs are valid for a four-hour period or they can be cancelled at any time when conditions turn out to be less than severe. SIGMETs are shown as red polygons labeled with a red turbulence or icing symbol. The bases and tops of the SIGMETs in hundreds of feet are also provided.

SIGMETs are also issued for active areas of convection that poses a significant threat to aviation. In other words, they are not a forecast for convection that hasn't yet developed. Instead they are a warning about convection that is currently ongoing. A single pulse thunderstorm[109] that isn't severe isn't all that dangerous as long as you don't fly through it or under it. It may only require a small deviation to avoid such a thunderstorm. However, when convection covers large regions of airspace or are organized into a long line or are severe or embedded, then these situations demand greater respect and may require the pilot a greater deviation and a need to carry extra fuel. Therefore, the criteria includes an area of convection at least 3,000 square miles with at least 40% coverage in that area, a line of convection at least 60 nautical miles long with at least 40% coverage along that line, an area of embedded thunderstorms of any size or area or thunderstorms that are designated by a forecaster at the local

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[109] Colloquially known as an air mass thunderstorm.

Weather Forecast Office (WFO) as severe. Keep in mind that lightning and rainfall intensity is not part of the criteria.

Convective SIGMETS are routinely issued at 55 minutes past each hour or they can be issued on an as-needed basis during rapidly developing convective events. Convective SIGMETs are valid for a two hour period; however, the next issuance of convective SIGMETs will replace those currently in place. These are shown as red polygons denoted by a thunderstorm symbol. The maximum tops of the convection in hundreds of feet are provided as well. For convective tops over 45,000 feet, they will be labeled as 450 ABV.

Additionally, meteorologists at the AWC issue a convective outlook that will appear on the convective SIGMET chart as an orange-colored polygon. These polygons are forecast, not advisories that depict regions where convection is expected to reach convective SIGMET criteria over the next two to six hours. They are updated hourly along with convective SIGMETs.

A historical loop is provided over the previous five hours ordered from oldest to newest. The SIGMETs collection is subdivided into a chart that consolidates all SIGMETs onto one chart as well as separate charts for convection icing, turbulence and dust storms and sandstorms (IFR conditions). Given that volcanic ash is rare, there isn't a separate chart for that SIGMET. Instead, look for volcanic ash SIGMETs to appear on the **All SIGMETs** chart.

Graphical AIRMETs
Graphical AIRMETs or G-AIRMETs are en route advisories issued for adverse weather conditions that are not expected to meet national SIGMET criteria. This encompasses advisories for the freezing level (and multiple freezing levels), widespread moderate non-convective airframe ice, widespread moderate non-convective turbulence (high and low altitude), widespread strong sustained surface winds greater than 30 knots, widespread non-convective low level wind shear (LLWS) below 2,000 feet AGL and widespread IFR conditions and mountain obscuration. Widespread defines an area greater than 3,000 square miles. G-AIRMETs are routinely issued by forecasters at the Aviation Weather Center (AWC) every six hours at 0245Z, 0845Z, 1445Z and 2045Z and amended as necessary. Every G-AIRMET issuance provides five snapshots each valid at a single time. Therefore, this is a forecast for **coverage** of a particular adverse weather element at the valid time on the chart. This includes an Initial snapshot and forecasts with a lead time of 3, 6, 9 and 12 hours.

Cloud top heights

This is the MSL height forecast of the cloud tops in 5,000 foot intervals for lead times of 1, 2, 3, 6, 9, 12, 15 and 18 hours. This forecast guidance is based on numerical model forecasts from the Rapid Refresh (RAP) model and is issued hourly.

US GFA

Provides static imagery for the Graphical Forecasts for Aviation (GFA) for clouds and surface conditions over the conterminous U.S. This provided forecast guidance with lead times of 3, 6, 9, 12, 15 and 18 hours. Included are graphics of surface visibility depicted in colored contours, overlays of surface wind and gusts depicted with standard wind barbs, overlays of predominant weather type (i.e., haze, fog, smoke, blowing dust/sand), overlays of Graphical AIRMETs to include Instrument Flight Rules (IFR) and Strong Surface Wind, and overlays of predominant precipitation type (i.e., rain, snow, mix, ice, or thunderstorm) coincident with any cloud (see this page).

Canadian GFA

Provides static imagery for the Graphical Area Forecast (GFA) for clouds, weather, turbulence and icing over Canada. This includes a 0, 6 and 12 hour forecast.

Gridded LAMP MOS (GLMP)

Model Output Statistics (MOS), as the name suggests, is derived from the output of numerical weather prediction models. Numerical weather prediction models are run on a scheduled basis. Models such as the North American Mesoscale (NAM) and Global Forecast System (GFS) are executed every six hours.

The output of these models provides forecasters with long- and short-range guidance in the form of various meteorologically significant variables. These and other derived data are then displayed on various charts and diagrams used by meteorologists in order to make a forecast. However, these models do not automatically produce a point forecast for a specific town or airport. The job of MOS is to take the "raw" model forecast and attempt to improve on it using a statistical method to produce an objective and more useful site-specific forecast (e.g. at an airport).

To make a numerical weather prediction model forecast better, MOS must take into account a historical record of observations at forecast points such as airports, remove any known systematic model biases and quantify any uncertainty into probability forecasts. Moreover, through a statistical approach MOS transforms the model's forecast

into sensible weather elements that the model does not directly forecast to include those important to aviation such as ceiling height, surface visibility, surface wind speed and direction and the probability of precipitation and/or thunderstorms.

The last step is to place these forecasts on a high resolution grid so that static imagery can be created. At a basic first-order level, the gridding process takes these MOS forecasts that are valid at individual stations and systematically spreads those forecasts out based on station proximity and differences in elevation. The results of the gridded MOS from the LAMP (GLMP) are provided in the **EZWxBrief** static imagery.

The Gridded Local Aviation MOS program (LAMP) is updated hourly and provides an hourly forecast for sky cover, ceiling height, surface visibility, wind speed and direction, wind gusts, convective and lightning probability and convective and lightning potential.
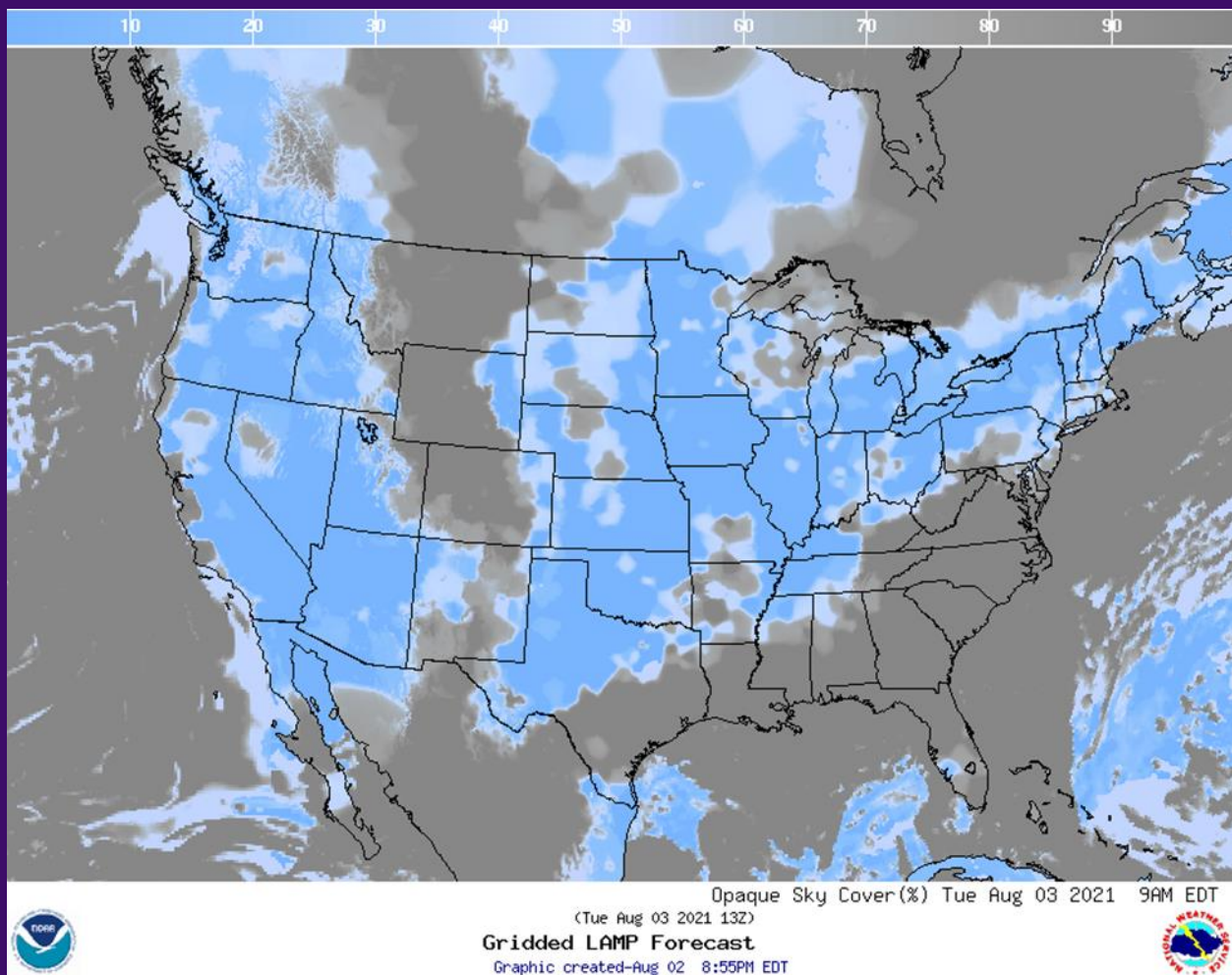
Sky cover

The LAMP gridded forecast provides an hourly forecast of sky cover for the conterminous U.S. coastal waters, southern Canada and northern Mexico. Traditionally, sky cover is based on the amount of sky covered in oktas as shown in the table below. In other words, the coverage was converted to a categorical value of clear, few, scattered, broken or overcast. The gridded LAMP sky cover forecast, however, uses the percentage of sky covered by any clouds and not oktas.

Category	Cloud cover (oktas)	Percentage
Clear	Zero cloud coverage	< 12.5
Few	1/8 – 2/8	12.5 to 25
Scattered	3/8 – 4/8	25 to 50
Broken	5/8 – 7/8	50 to 87.5
Overcast	8/8 cloud coverage	> 87.5

As shown in the legend at the top of the image below, shades of blue are generally consistent with a sky that contains clouds that are categorically scattered, few or clear. Shades of gray, on the other hand, are regions dominated by clouds that have a categorical coverage of broken or overcast. Although gray areas likely define a broken or overcast ceiling, this forecast does not provide the ceiling height. In other words, the

broken or overcast clouds in the sky cover LAMP forecast could be a high cirrus deck or it could be a LIFR stratus deck. Maximum lead time of this forecast is 25 hours.

Ceiling height

The LAMP gridded forecast provides an hourly forecast of ceiling height (height above the ground) for the conterminous U.S. and coastal waters, southern Canada and northern Mexico with a maximum lead time of 25 hours. **This forecast takes into account the height of terrain.**

LAMP ceiling height only provides a forecast for ceilings below 12,000 feet AGL. Therefore, the light brown areas indicate the lack of a broken or overcast sky cover below 12,000 feet (not necessarily clear below 12,000 feet). In other words, the ceiling in the light brown is either greater than 12,000 feet or is unlimited. It could also imply a scattered or few cloud deck that exists below 12,000 feet AGL.

As shown in the legend at the top of the image below, low IFR ceilings using shades of purple (< 500 feet), IFR ceilings using shades of red (500 to 1,000 feet), MVFR ceilings using shades of yellow and blue (1,000 to 3,000 feet) and VFR ceilings are depicted using shades of green (>3,000 feet).

Ceiling Height(100s of feet) Tue Aug 03 2021 9AM EDT
(Tue Aug 03 2021 13Z)
Prototype Run 00:30   Gridded LAMP Forecast
Graphic created-Aug 02 8:55PM EDT
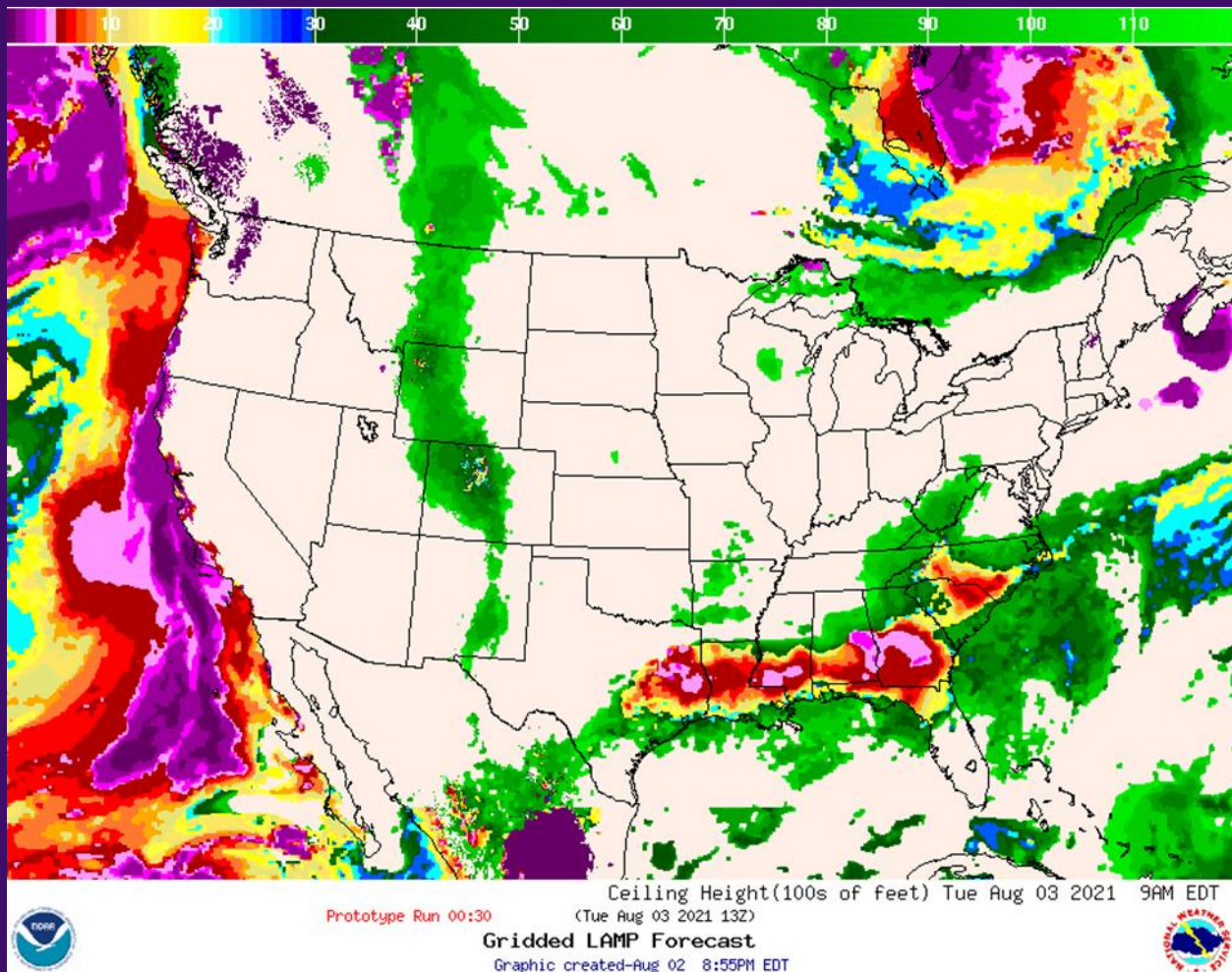
Surface visibility

The LAMP gridded forecast provides an hourly forecast of surface visibility (statute miles) for the conterminous U.S. and coastal waters, southern Canada and northern Mexico with a maximum lead time of 25 hours.

LAMP surface visibility only provides a forecast for visibilities below 10 statute miles. Therefore, the light brown areas indicate visibility greater than 10 statute miles. As shown in the legend at the top of the image below, low IFR visibilities are depicted using shades of purple (< 1 statute mile), IFR visibility using shades of red (1 to 3 statute

miles), MVFR visibility using shades of yellow and blue (3 to 5 statute miles) and VFR visibility are depicted as shades of green (>5 statute miles).
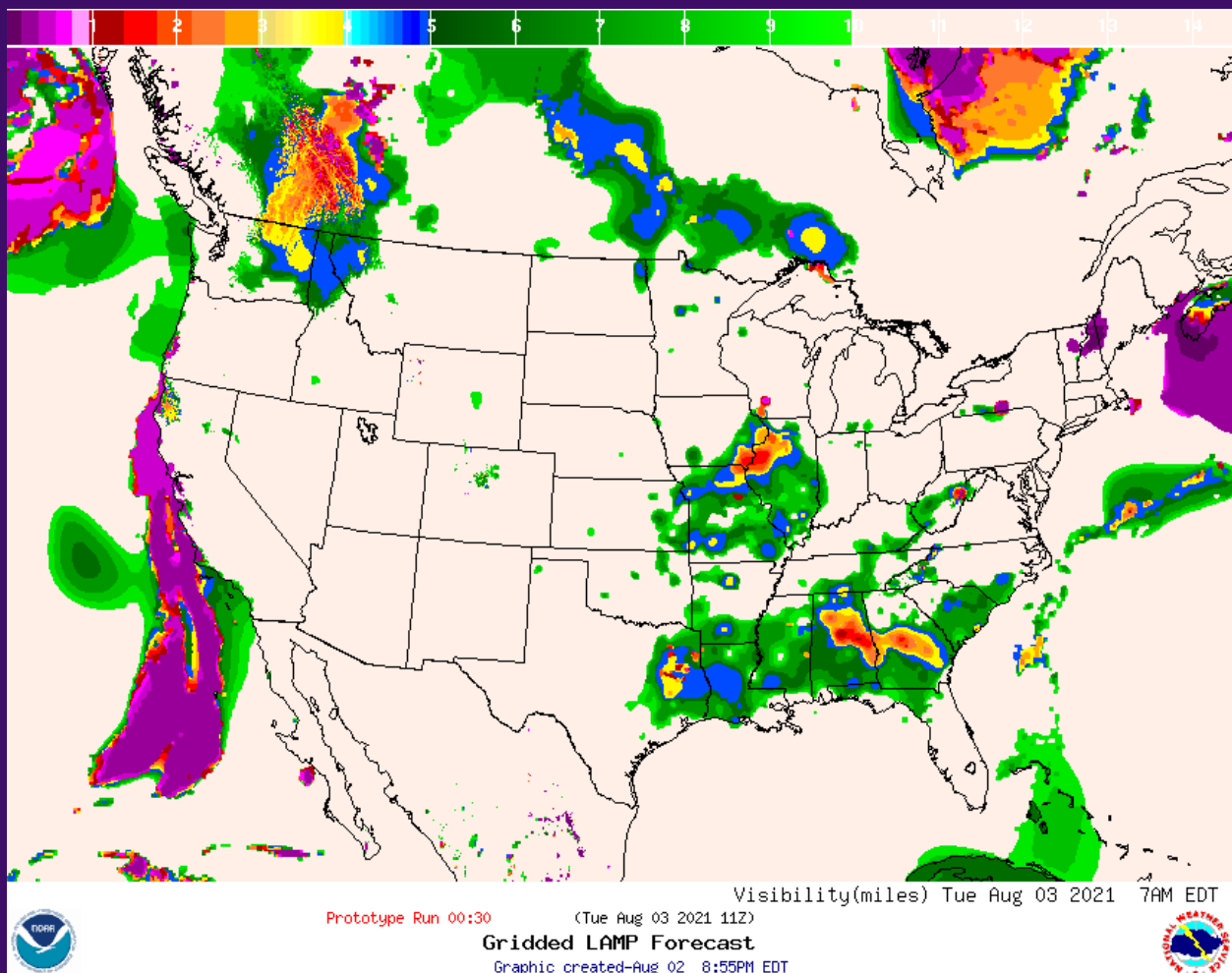
Wind speed

The LAMP gridded forecast provides an hourly forecast of surface wind speed (knots) for the conterminous U.S. and coastal waters with a maximum lead time of 25 hours.

Wind speed and direction are depicted using both colors for the magnitude of the wind and a random low resolution grid of wind barbs to depict both wind speed and direction. As shown in the legend at the top of the image below, prevailing wind speeds under 5 knots are shown using shades of gray with 5 to 18 knots shown using shades of purple, 18 to 25 knots shown using shades of blue, 25 to 35 knots shown using shades of green, 35 to 40 knots shown using shades of yellow and orange and 40 knots or greater shown using shades of red.

Wind Speed(kts) & WindDir For Mon Aug 16 2021   3PM EDT
(Mon Aug 16 2021 19Z)
Gridded LAMP Forecast
Graphic created-Aug 15 2:55PM EDT
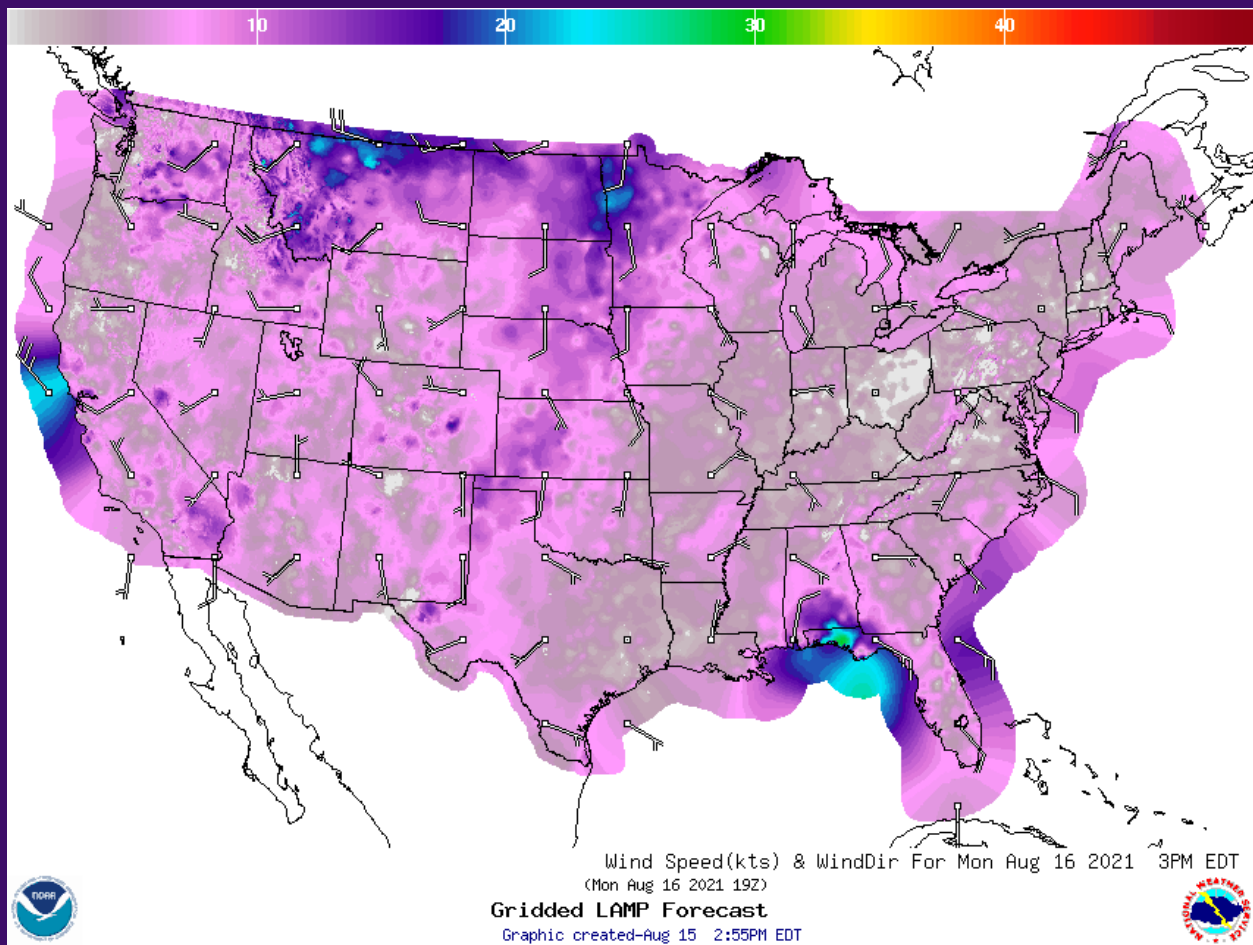
Wind gusts

The LAMP gridded forecast provides an hourly forecast of surface wind gusts (knots) for the conterminous U.S. and coastal waters with a maximum lead time of 25 hours.

Wind gusts are depicted using colors for the magnitude of the wind gust. As shown in the legend at the top of the image below, wind gusts under 5 knots are shown using shades of gray with 5 to 18 knots shown using shades of purple, 18 to 25 knots shown using shades of blue, 25 to 35 knots shown using shades of green, 35 to 40 knots shown using shades of yellow and orange and 40 knots or greater shown using shades of red.
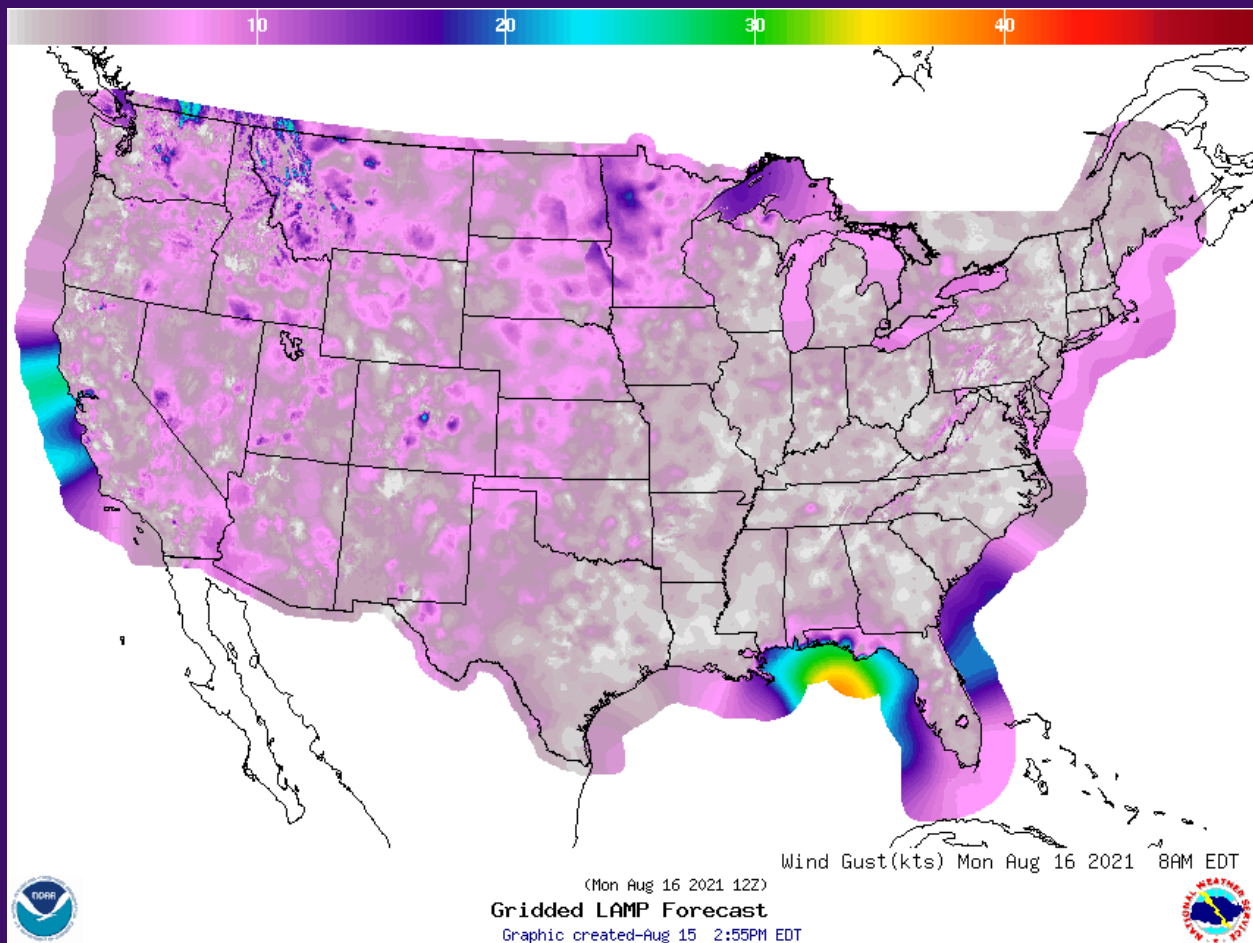
Wind Gust(kts) Mon Aug 16 2021 8AM EDT
(Mon Aug 16 2021 12Z)
Gridded LAMP Forecast
Graphic created-Aug 15 2:55PM EDT

Convective potential

The LAMP gridded forecast provides an hourly forecast of the convective potential for the conterminous U.S. and coastal waters, extreme southern Canada and extreme northern Mexico with a maximum lead time of 25 hours.

The convective potential describes the likelihood that deep, moist convection will occur within the hour prior to the valid time on the chart. Note that this is a convective potential, not a thunderstorm potential.[110] As shown in the legend at the top of the image below, this is accomplished through a derived (categorical) forecast rendition consisting of Low (Red), Medium (Orange) and High (Yellow). Note that the convective

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[110] Not all dangerous deep, moist convection contains lightning.

potential nicely portrays the convection threat levels especially as corresponding probabilities may vary greatly across the U.S.[111]

1-hr Convection Potential ending Sun Aug 15 2021   8PM EDT
(Mon Aug 16 2021 00Z)
Localized Aviation MOS Program
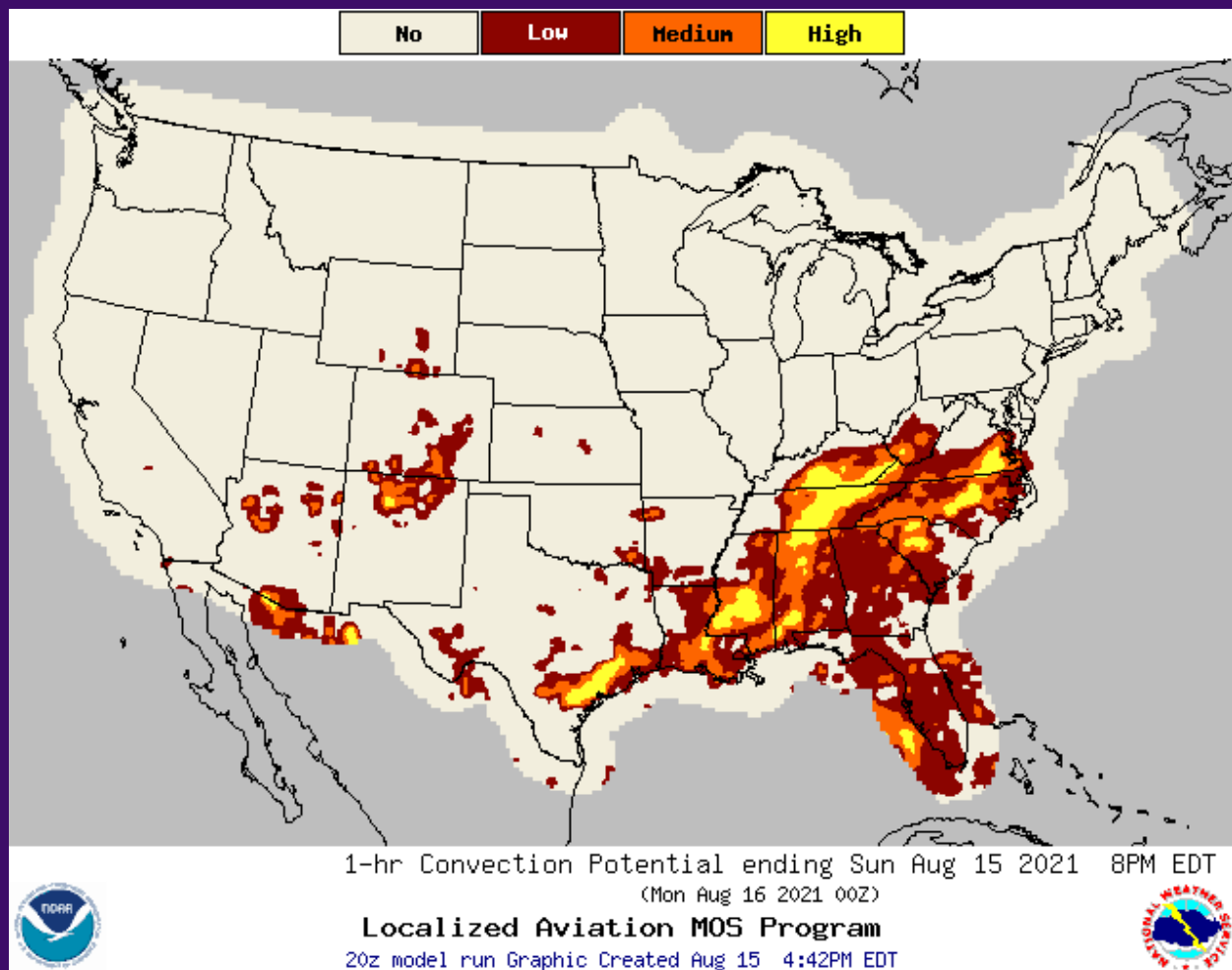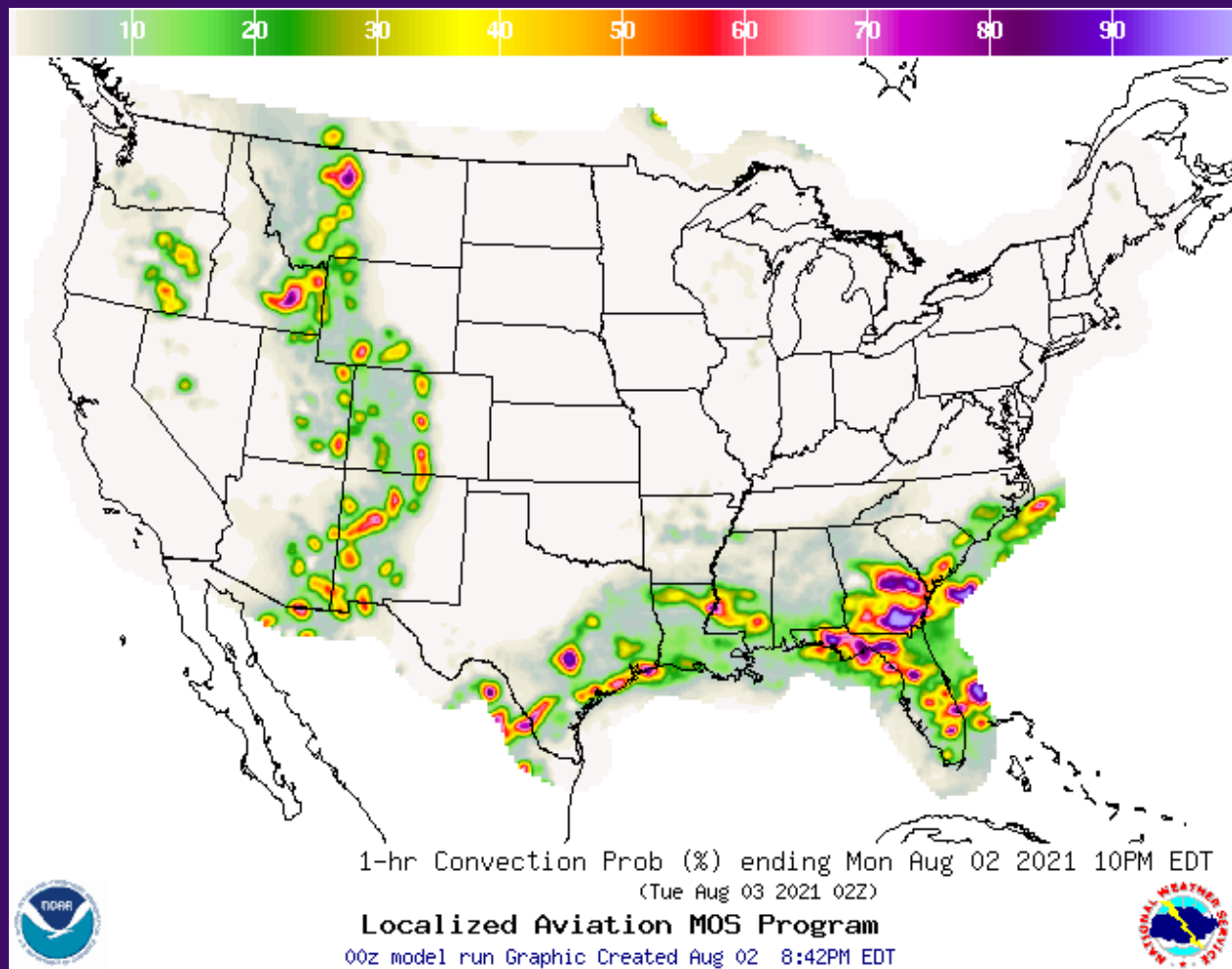20z model run Graphic Created Aug 15 4:42PM EDT

Convective probability

The LAMP gridded forecast provides an hourly forecast of the convective probability for the conterminous U.S. and coastal waters, extreme southern Canada and extreme northern Mexico with a maximum lead time of 25 hours. This is the same as the categorical convective potential except that that this forecast is represented as a calibrated probability. As shown on the legend at the top of the chart below, the higher the probability, the more likely deep, moist convection will exist for the hour prior to the valid time on the chart.
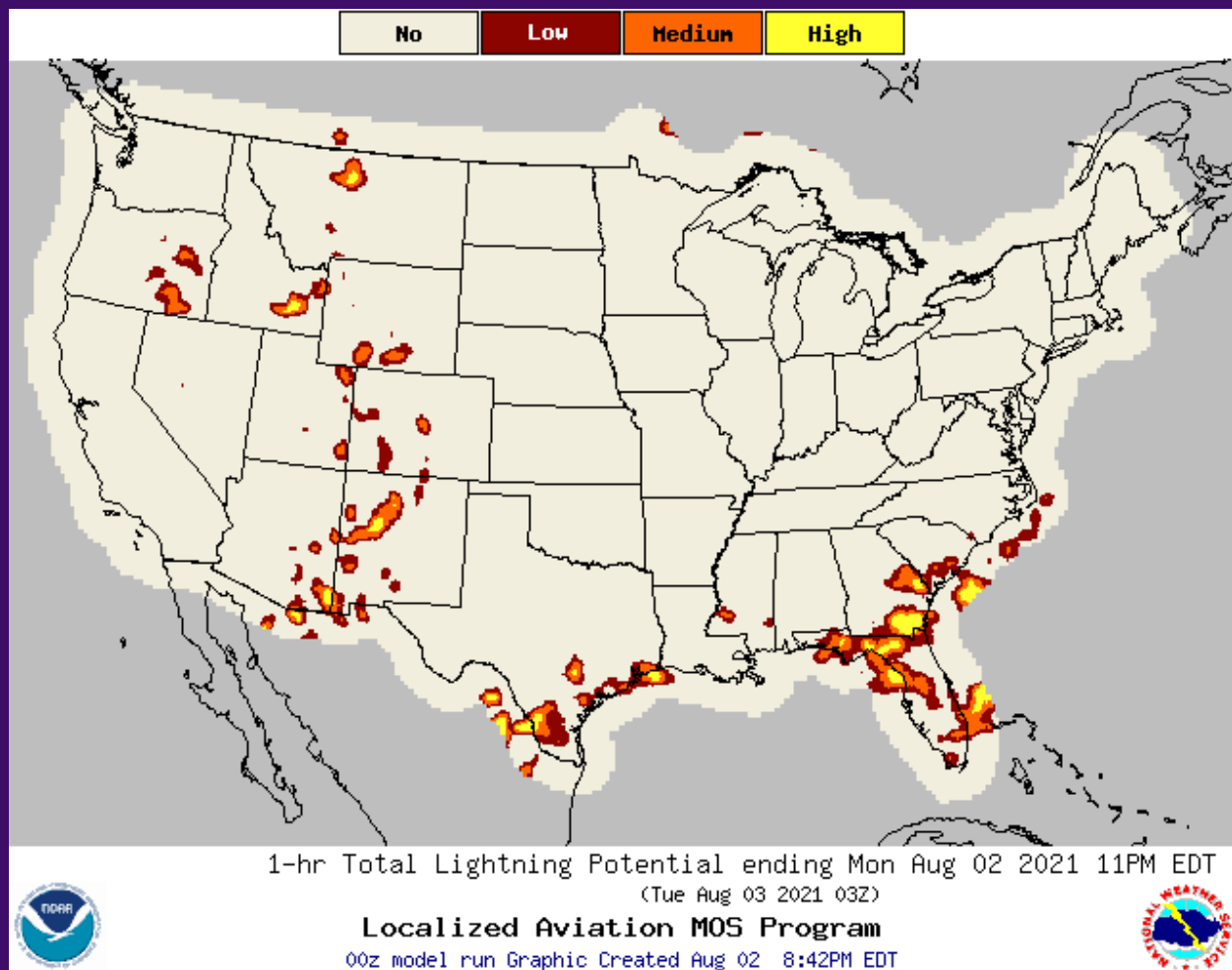
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[111] This convective potential is similar to the convective potential personal weather minimum and the convective potential for the meteogram time series, except that this only has four categorical values whereas the personal minimum and meteogram has a higher resolution at six.

1-hr Convection Prob (%) ending Mon Aug 02 2021 10PM EDT
(Tue Aug 03 2021 02Z)
Localized Aviation MOS Program
00z model run Graphic Created Aug 02 8:42PM EDT
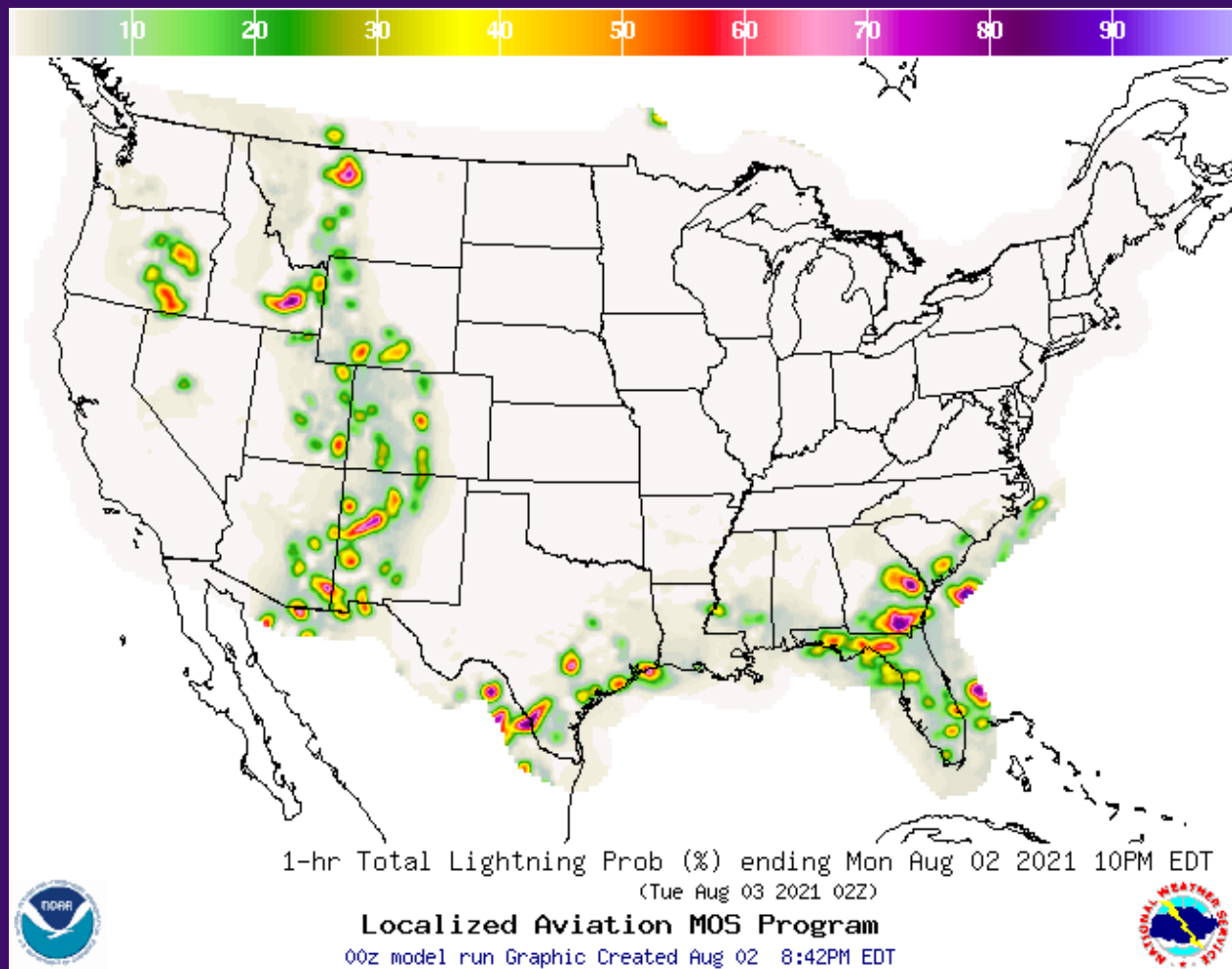
Lightning potential

The LAMP gridded forecast provides an hourly forecast of the lightning potential for the conterminous U.S. and coastal waters, extreme southern Canada and extreme northern Mexico with a maximum lead time of 25 hours.

The lightning potential describes the likelihood that deep, moist convection containing lightning will occur within the hour prior to the valid time on the chart. The LAMP lightning potential is defined as the occurrence/nonoccurrence of expected reflectivity greater than 40 dBZ and/or one or more lightning flashes in within 20-km of any point during the 1-hour valid period. As shown in the legend at the top of the image below, this is accomplished through a derived (categorical) forecast rendition consisting of Low (Red), Medium (Orange) and High (Yellow). Note that the lightning potential nicely portrays the thunderstorm threat levels especially as corresponding probabilities may vary greatly across the U.S.

| No | Low | Medium | High |

1-hr Total Lightning Potential ending Mon Aug 02 2021 11PM EDT
(Tue Aug 03 2021 03Z)
Localized Aviation MOS Program
00z model run Graphic Created Aug 02 8:42PM EDT

Lightning probability

The LAMP gridded forecast provides an hourly forecast of the lightning probability for the conterminous U.S. and coastal waters, extreme southern Canada and extreme northern Mexico with a maximum lead time of 25 hours. This is the same as the categorical lightning potential except that that this forecast is represented as a calibrated probability. As shown on the legend at the top of the chart below, the higher the probability, the more likely deep, moist convection containing at least one lightning strike within 20-km of any point will exist for the hour prior to the valid time on the chart.

1-hr Total Lightning Prob (%) ending Mon Aug 02 2021 10PM EDT
(Tue Aug 03 2021 02Z)
Localized Aviation MOS Program
00z model run Graphic Created Aug 02 8:42PM EDT

HREF model

The High Resolution Ensemble Forecast (HREF) ARW (HRW) member aggregates existing high-resolution models, and produces probability and mean and probability-matched mean fields for a number of parameters to include several to support aviation. The HREF model is refreshed four times each day and provides a forecast with a lead time to 48 hours with hourly time steps in the animation. Simulated reflectivity (forecast radar) is updated twice each day with a lead time of 48 hours with hourly time steps in the animation

This includes probability forecasts for flight category, ceiling and echo top heights. First, it is important to note that all of the forecasts in this collection are a calibrated probability in order to quantify uncertainty. Therefore, they are not absolute forecasts for ceiling height or flight category. Red and purple shaded regions are indicative of high chances whereas shaded green regions are low chances. No shaded colors indicate the probability is below 10%.
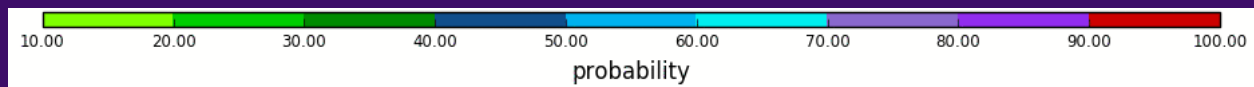
probability

Included are three collections that represent forecasts for the probability of marginal VFR (MVFR), IFR and low IFR (LIFR) flight category. A flight category takes into consideration both the ceiling and visibility as shown in the table below. Keep in mind that these probabilities let you know what the most/least likely flight category will be. For example, the forecast may show a region where there's a 70-80% chance of a MVFR flight category (light purple in the legend above), however, it does not preclude that there could still be a chance of IFR or even LIFR within that same area or maybe no chance at all. It simply says that MVFR conditions are most likely to occur based on a probability of 70%.

Category	Color	Ceiling		Visibility (statue miles)
LIFR	Magenta	Below 500 feet	and/or	Less than 1 mile
IFR	Red	500 feet to below 1,000 feet	and/or	1 to less than 3 miles
MVFR	Blue	1,000 feet to 3,000 feet	and/or	3 to 5 miles
VFR	Green	Greater than 3,000 feet	and	Greater than 5 miles

In addition, there are three collections that depict the probability for ceilings below 3,000 feet, 2,000 feet and 1,000 feet. Using the same legend as above, this is simply a probability that ceilings will be below that respective altitude threshold. Therefore, areas that are shaded by red and purple will have the highest probability of being below that threshold whereas green shaded regions (or no shade at all) imply there is little chance of the ceiling below that threshold. Therefore, if you are concerned about IFR ceilings (ceilings < 1,000 feet) at your destination airport upon arrival, you would want to look for a time that has a low probability using the collection that depicts the probabilities of ceiling height below 1,000 feet.

There are two collections that define probability forecasts for echo top heights. These define regions where echo tops are most likely to be above 30,000 and 35,000 feet. Echo tops above these thresholds identify regions where deep, moist convection or thunderstorms are expected, which is indicative of dangerous convective turbulence. This also may help pilots who are flying into the flight levels to choose the best route.

In addition, the simulated reflectivity forecast from the HREF model is also an hourly interval with a lead time of 48 hours. It is run twice a day at 0000 and 1200 UTC. It will become available about five or six hours after this time (approximately 0500 and 1700 UTC, respectively). This provides a forecast for most unstable CAPE (MUCAPE) and simulated reflectivity for the CONUS and regional areas.

GFS model

Forecasts generated by the Global Forecast System (GFS) numerical weather prediction model are provided for the latest execution cycles to include 0000, 0600, 1200 and 1800 UTC. In addition to the analysis for the latest cycle, forecasts are provided through 120 hours (5 days). This includes a forecast for MSL pressure, 850 mb temperature (degrees Celsius) and 6-hour accumulated precipitation. Precipitation forecasts are valid during the six hours prior to the valid time shown on the chart. Additionally, a constant pressure chart analysis and forecasts for 850 mb (~5,000 feet MSL), 700 mb (~10,000 feet MSL), 500 mb (~18,000 feet MSL) and 300 mb (~30,000 feet MSL) are also available. Forecasts from this model are normally available between around four hours after the execution cycle times. For example, the 1200 UTC cycle ordinarily becomes available around 1600 UTC on average. Please see this page for specific model run status.

NAM model

Forecasts generated by the North American Mesoscale (NAM) numerical weather prediction model are provided for the latest execution cycle to include 0000, 0600, 1200 and 1800 UTC. In addition to the analysis for the latest cycle, forecasts are available through 84 hours (3.5 days). This includes a forecast for MSL pressure that also includes the 850 mb temperature (degrees Celsius) and 6-hour accumulated precipitation. Precipitation forecasts are valid during the six hours prior to the valid time shown on the chart. Additionally, a constant pressure chart analysis and forecasts for 850 mb (~5,000 feet MSL), 700 mb (~10,000 feet MSL), 500 mb (~18,000 feet MSL) and 300 mb (~30,000 feet MSL) are also available. Forecasts from this model are normally available between two and three hours after the execution cycle times. For example, the 1200 UTC cycle ordinarily becomes available around 1400 to 1500 UTC. Please see this page for specific model run status. Also included is lowest model layer simulated reflectivity from the most recent execution cycle of the high resolution North American Mesoscale (NAM) model. Forecasts for convective indices from the NAM are also provided. This includes forecast for surface-based convective available potential energy (SBCAPE), most unstable convective available potential energy (MUCAPE), mixed layer convective

available potential energy (MLCAPE) and most unstable lifted index (MULI). The NAM also include a 3 km model resolution for simulated reflectivity overlaid on top of an IR satellite forecast. The simulated reflectivity shows the expected precipitation type reaching the surface. Forecasts are available at hourly intervals through 60 hours. Please see this page for specific model run status.

RAP/HRRR model

This is the simulated reflectivity forecast from the High Resolution Rapid Refresh (HRRR) model. The HRRR is run hourly and produces forecasts out to 15 hours using one hour and 15 minute forecast time steps depending on the specific product viewed. Simulated reflectivity products provide forecasts at 1000 meters AGL. Please see this page for specific model run status.

Storm prediction center

Storm Prediction Center (SPC) convective outlooks and forecast products. Day 1 means today, Day 2 means tomorrow, Day 3 is the following day. Severe thunderstorm or tornado watches (WW) are regions where active areas of severe thunderstorms including hail to 1 inch in diameter or greater, strong winds and tornadoes are possible. Clicking on any of the Day 1, Day 2, Day 3 and Day 4-8 outlooks will bring up the outlook discussion in a separate window. Current mesoscale discussions (MD) represent areas that are likely for the development of strong storms, heavy rain or dangerous winter weather (heavy snow or ice). MDs may also contain a description of an event currently under a severe thunderstorm or tornado watch. Enhanced resolution thunderstorm outlooks are valid over a four hour period (except for the overnight forecast from 0400 to 1200 UTC) and contain a probability forecast for general organized convective activity (severe or not). The thunderstorm probabilities take into account both the expected areal coverage and probability for thunder to occur. Therefore, a 40% probability means that given similar environmental conditions, thunder would be observed at any one location (in either a county or city) within the 40% thunder probability area four times out of ten, or 40% of the time.
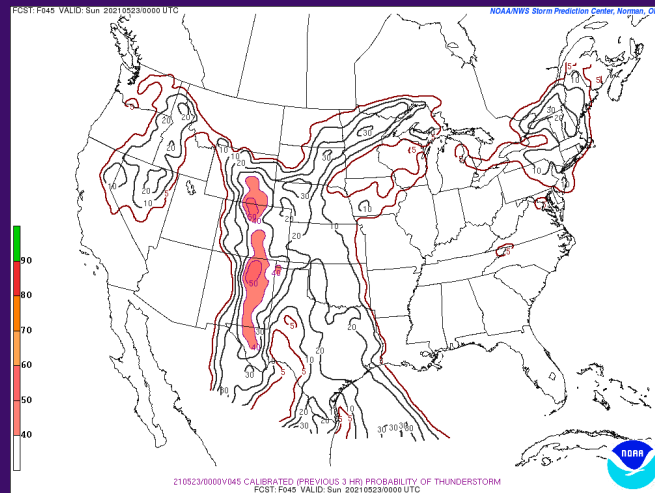
Thunderstorm probability forecast

This is the calibrated thunderstorm probability forecast from the Short Range Ensemble Forecast (SREF) model. Calibrated thunderstorm probability forecasts are available for a 1, 3 and 4 hour time period. The date-time stamp on the chart is the ending time of the valid period. For example, if the chart is valid at 1500 UTC on the 23rd of the month, the

valid period for the 3-hour calibrated thunderstorm probability forecast is from 1200 to 1500 UTC on that day.

Contours shown on the chart are roughly equivalent to the probability of a thunderstorm within 10 miles of a point covering the 1, 3 or 4 hour time periods. This product only shows the probability of convective events that are expected to produce at least one lightning strike, and therefore, may not cover all areas of deep, moist convection. Also, the product does not forecast areas of nonconvective precipitation. White locations outside of the 3 or 5 percent contoured areas simply imply there is less than a 3 or 5 percent probability of thunderstorms within the valid time period. In other words, it does not imply a zero percent probability.

The 3-hour calibrated thunderstorm probability and 3-hour severe thunderstorm probability forecasts provide guidance through 84 hours. Each image in the collection shifts the time window by a 3 hour period, whereas each image in the 1-hour and 4-hour collections shift the time window by 1 hour with forecast projections to 36 hours.

Please note that it is common for the first few forecasts in each of these collections to be valid in the recent past. This is primarily due to the inherent nature of the SREF model and when a complete set of images become available to the application for download.

Convective forecast guidance
This guidance consists of two different forecasts to include the Traffic Flow Management (TFM) Convective Forecast (TCF) and Extended Convective Forecast Product (ECPF). The TCF is a high confidence graphical representation of forecasted convection meeting specific criteria of coverage, intensity and echo top height. The TCF graphics are produced every two hours and are valid at 4-, 6-, and 8-hours after issuance time.
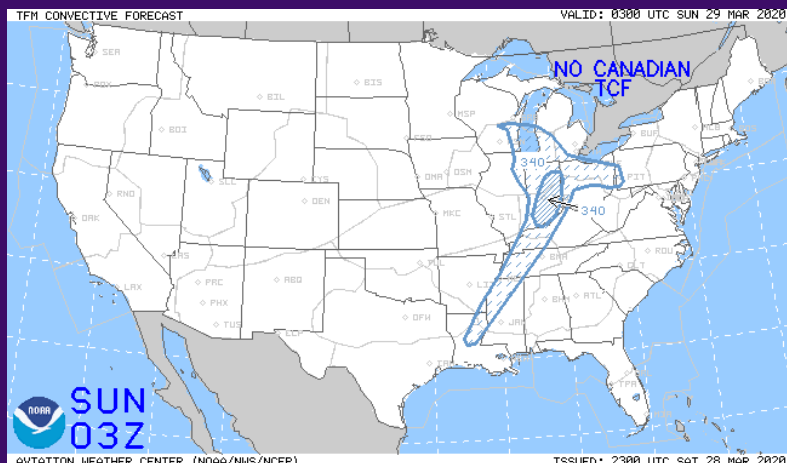
From March 1 through October 31 the TCF is collaboratively produced by meteorologists at the Aviation Weather Center, Federal Aviation Administration (FAA) Air Traffic Control System Command Center (ATCSCC), Center Weather Service Units (CWSU), various airlines and by other authorized participants. Automated routines will continue to make the TCF available from November through February. Please note that lines of convection are not depicted when automated routines produce the TCF.

Areas of convection in the TCF include any area of convective cells containing (at a minimum):

a. Composite radar reflectivity of at least 40 dBZ;

b. Echo tops at or above FL250;

c. Coverage (a & b) of at least 25% of the polygon area;

d. Forecaster confidence of at least 50% (High) that criteria (a, b, & c) will be met.

Lines of convection in the TCF include any lines of convective cells:

a. Composite radar reflectivity of at least 40 dBZ having a length of at least 100 nautical miles; and

b. Having a linear coverage of 75% or greater; and

c. Having echo tops at or above 25,000 feet (FL250).

d. Forecaster confidence of at least 50% (High) that criteria (a, b, & c) will be met.

All four of the threshold criteria listed above for both areas and lines of convection are required for inclusion in the TCF. This is defined as the minimum TCF criteria. Coverage is indicated by broken hatching (25-39%) and striped hatching (40-74%) as shown in the legend above. Keep in mind that this is NOT a forecast for thunderstorms. Moreover, it is created to provide forecast guidance to air traffic managers and may not always take into consideration areas or lines of convection that may or may not meet convective SIGMET criteria. Lastly, the echo tops provided in the TCF are not a forecast for maximum tops as they are in a convective SIGMET. Instead, they attempt to define the echo top height that pilots are most likely to encounter. Therefore, most general aviation pilots may not find this guidance as useful unless you are flying above 25,000 feet.

In this same collection you will also find the extended TCF graphics. The extended TCF guidance is an automated high resolution model blend denoting a high confidence graphical representation of forecasted convection meeting specific criteria of model echo top and

convective precipitation fields. The extended TCF graphics are produced every two hours and valid at 2 hour increments from 10 to 30 hours after issuance time.
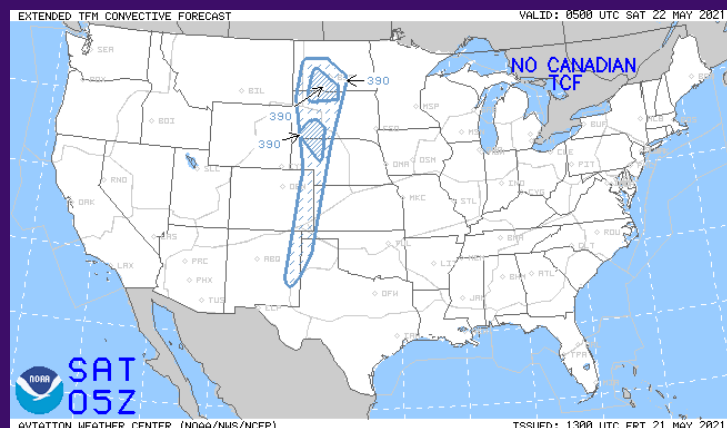
Areas of convection expected to be indicated by composite radar reflectivity values of at least 40 dBZ are identified by blue polygons in 2 hour increments for 10-30 hour forecasts from the issuance time. Similar to the TCF, coverage is indicated by broken hatching (25-39%) and striped hatching (40-74%). Within each extended TCF polygon, echo tops are assigned by the maximum 75th percentile echo tops as derived from four high resolution numerical weather prediction models.

The TCF and extended TCF are seamlessly provided together within the product animation. The first three images represent the 4, 6 and 8-hour TCF with the remaining images in the loop providing the extended TCF with a lead time from 10 hours through 30 hours at two hour intervals.

Not to be confused with the extended TCF, the Extended Convective Forecast Product (ECFP) is a graphical representation of the forecast probability of thunderstorms. This is meant to pick up at the end of the TCF to identify graphically where in the U.S. thunderstorms are likely for a lead time of 30 to 72 hours. Each forecast shows the probability over a 6 hour period.
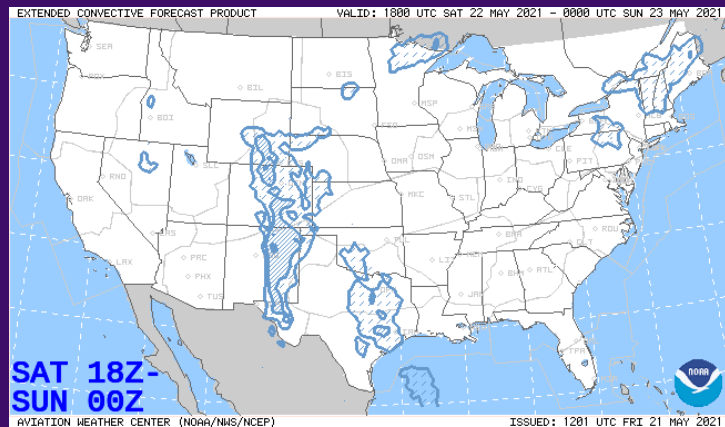
This automated graphical forecast is created from the Short Range Ensemble Forecast (SREF) calibrated thunderstorm probability guidance. Contours are drawn using TCF-like shading as shown above. Dashed areas represent 40-59% probability, solid lined areas represent 60-79% probability, and solid blue filled areas represent greater than 80% probability all within the forecast 6 hour period.
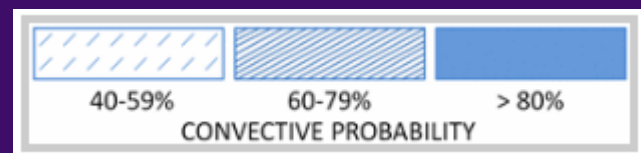
Lowest freezing level

This is a forecast of the lowest freezing level from the Rapid Refresh (RAP) model. The forecast is update hourly. The RAP model produces forecasts with a lead time from 1 to 18 hours at hourly time intervals. The lowest freezing level is depicted with an increment of 2,000 feet in hundreds of feet above mean sea level (MSL) using the scale at the bottom of the chart. Areas depicted in white consist of regions where the entire temperature profile above the surface is below 0°C. Hatched areas (if present) imply there are
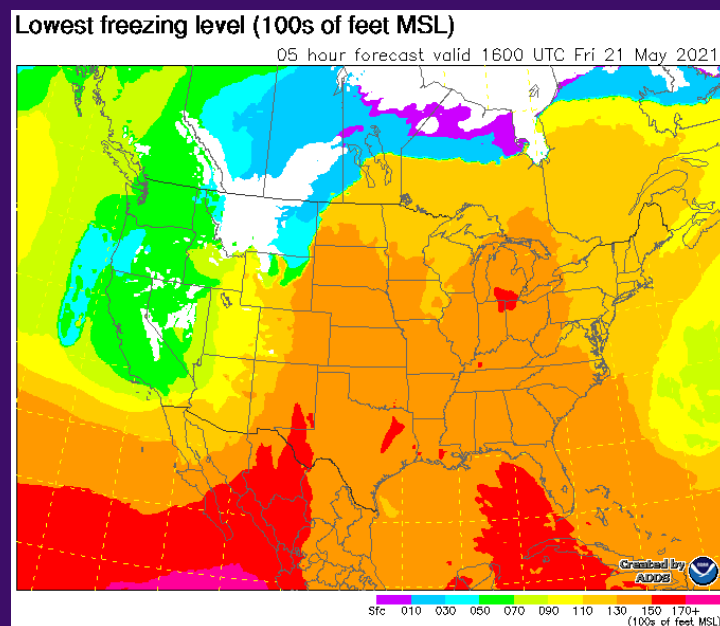
multiple freezing levels with the color presented in the hatched areas as the lowest freezing level.

Icing analyses

This represents the latest CIP severity product looped by altitude with the composite (maximum) severity shown as the last image in the loop.

Icing scenario attempts to explain the cloud's microphysical-properties, especially clouds containing supercooled large water drops (SLD). This can help to determine hazardous areas of potential in-flight aircraft icing. Here's a brief overview of the various icing scenario categories.

BWN: Below warm nose - Classical FZRA structure with FZRA, PE, RA, FZDZ and/or DZ observed at the surface. The subfreezing layer resides beneath the melting layer (warm nose). Cloud top temperature (CTT) less than -12 degrees C.

AWN: Above warm nose - Classical FZRA structure with FZRA, PE, RA, FZDZ and/or DZ observed at the surface. Cloudy area above melting layer (warm nose). Cloud top temperature (CTT) less than -12 degrees C.

AS: All snow - All sounding levels less than 0 degrees C. Snow is the only precipitation observed at the surface.

CR: Cold rain - RA is observed at surface and Cloud Top Temp (CTT) less than or equal to -12 degrees C.

WMPCP: Warm precipitation: Any non-snow precipitation observed at surface with a CTT greater than -12 degrees C.

CPCP: Cold non-snow, non-rain - FZRA, PE, FZDZ and/or DZ observed at the surface with CTT greater than or equal to -12 degrees C.

CONV: Convective - Lightning strikes within 25 km and 15 minutes.

Icing forecast by altitude

This is the Forecast Icing Product (FIP) looped over an altitude. Included are forecasts from the 13 km resolution RAP model and the 13 km RAP model found on the Aviation Digital Data Service (ADDS)

Icing forecast by hour

This is the Current Icing Product (CIP) and Forecast Icing Product (FIP) looped over an altitude for the CIP analysis and subsequent FIP forecasts through 18 hours.

Icing masked severity

This is the Current Icing Product (CIP) and Forecast Icing Product (FIP) 25-percent and 50-percent masked severity looped over an altitude for the CIP analysis and subsequent FIP forecasts through 18 hours. Masked severity combines the probability product with the severity product. Areas with less than a 25-percent or 50-percent probability will be grayed out or masked to leave only the icing severity with the greatest probabilities.

Turbulence by altitude

This is the Graphical Turbulence Guidance (GTG-3) product looped over an altitude. Included are forecasts from the 13 km resolution RAP model for Clear Air Turbulence, Mountain Wave Turbulence and the combination of the two.

Getting support

When viewing the **EZWxBrief** home page, you can select **About Us** from the main menu bar. This provides details about the **EZWxBrief** application that includes the **EZWxBrief** version number. When sending comments, questions, feedback or bug reports to our awesome support team (**support@ezwxbrief.com**), please include the **EZWxBrief** version number in your email as well as the device and operating system version you are using. The support page provides a link to the latest **EZWxBrief** release notes as well as details on how to learn more about the **EZWxBrief** application. If you use social media, **EZWxBrief** can be found on Facebook (https://facebook.com/ezwxbrief), Instagram (https://instagram.com/ezwxbrief) and YouTube (http://youtube.com/@ezwxbrief).

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Most pilots are weatherwise, but some are otherwise.™

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