

AVWXWORKSHOPS INC

EZWxBrief Pilots Guide

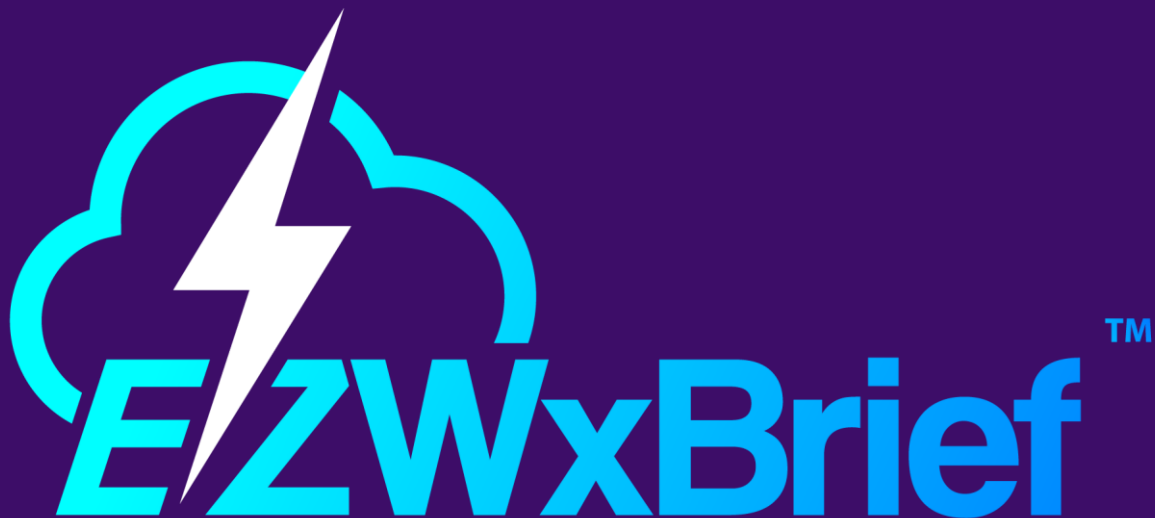
Version 2.0.3

Consistent with EZWxBrief version 2.0.3

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10/17/2024

EZWxBrief Pilots Guide with no page color



EZWxBrief Pilots Guide

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

Version 2.0.3

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EZWxBrief™ is designed to run on both a desktop and laptop computer

using an Internet web browser. More importantly, it is 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 user 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 today. It is strongly recommended, however, to read through the entire **EZWxBrief** pilots 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 **Dashboard** or **Saved Items** are the primary portal to the various advanced features within the application. Those features are described in greater details later in this guide.

EZWxBrief is a decision-support tool used by general aviation pilots providing supplemental weather guidance² exclusively for **preflight** route planning for flights expected to last one hour or longer. The first task is to create a basic route.³ From the **Dashboard**, press⁴ the **Plan a route** button under the **Recent Routes** list. This will open up the route editor where route planning begins.⁵ Enter the **Departure** airport identifier⁶, optional route of flight⁷, and **Destination** airport identifier. Lastly, choose a cruise altitude.⁸ Note that as characters are entered in the departure, route of flight, and

¹ For best results, please refrain from using www.ezwxbrief.com.

² EZWxBrief does should NOT be considered an official weather briefing. It is for supplemental use only. See [FAA-H-8083-28](#), Aviation Weather Handbook for the definition of an official weather briefing.

³ No route is defined on the initial use of EZWxBrief.

⁴ Unless otherwise necessary, the term "press" will be used generically throughout this guide to denote a click via a mouse or tap via a touch screen in lieu of using the phrase "click or tap" each time.

⁵ The route editor can be invoked by pressing on the Route button that appears in multiple locations within the app (e.g., Map, Airport Wx and Route Profile views).

⁶ The route editor accepts the four-character ICAO identifier (e.g., KJFK) or the three-character FAA identifier (e.g., 2V5).

⁷ This includes airport identifiers, NAVAIDs (e.g., VOR/NDB), fixes, intersections and other waypoints.

⁸ This is initially defaulted to 10,000 feet MSL and can be adjusted in increments of 500 feet up to and including 45,000 feet.

destination fields, a list of matching airport identifiers will be suggested.⁹ It is important to select one of the suggested identifiers in the list provided. Alternatively, if the desired identifier is at the top of the list of suggested airports or when typing the **full** identifier (e.g., **KJFK**), simply add a space at the end of the identifier which will obviate the need to make a manual selection.¹⁰ This provides an efficient way to type several waypoints back-to-back with spaces in between for the route of flight field. As each space is entered, the identifier will be validated and added to the departure, route of flight or destination fields accordingly. In the example on the right, the route of flight is left blank since it is optional.¹¹

Next, select a proposed cruise **Altitude**. Lastly, by sliding the **Use Forecast Winds** toggle to the right, **EZWxBrief** will use the latest winds aloft forecast to calculate a groundspeed based on the aircraft's true airspeed that has been chosen in the **Settings** panel (under Aircraft Settings). The route chosen in the example on the right departs from KJFK (JOHN F KENNEDY INTL) direct to KDAN (DANVILLE RGNL) at an altitude of 12,000 feet MSL. Forecast winds will be used to calculate the groundspeed with the toggle button in the right-most position.

Enter/Edit/Delete route

Delete Reverse Clear Save

Departure*

KJFK - JOHN F KENNEDY INTL

Route of Flight

ENTER WAYPOINT ID(S)

Destination*

KDAN - DANVILLE RGNL

Altitude (MSL)* 12,000 **Use Forecast Winds**

Open in Map Open in Profile

* Required field

Once a valid route has been entered into the route editor, there are two options to activate a proposed route. The first option is to press on the **Open in Map** button to have it open the **Map** view and plot a great circle route based on the proposed route

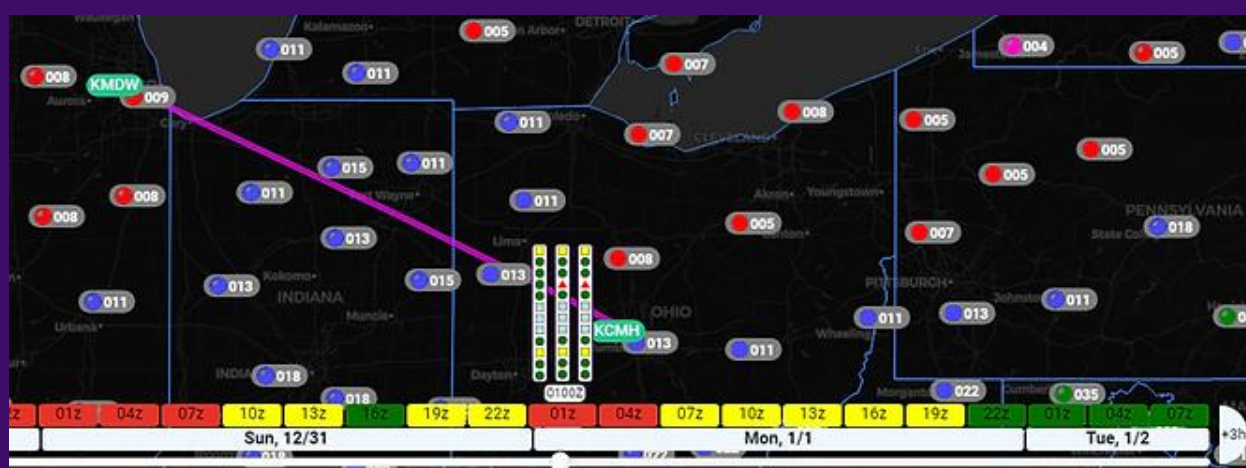
⁹ For airports without an ICAO identifier (e.g., 1V8), use the 3-character airport identifier.

¹⁰ Typing a space will always select the entry at the top of the suggested list of identifiers.

¹¹ The route of flight can include most airports as well as other waypoints (e.g., VOR identifiers, NDBs, fixes or intersections). EZWxBrief will not accept victor or jet airways, SIDS or STARS. Although not a hard limitation, it is suggested that you enter no more than five waypoints in the route of flight.

entered. Alternatively, pressing on the **Open in Profile** button will activate the proposed route and open it in a vertical cross section in the **Route Profile** view.

When a route has been activated, the EZDeparture Advisor™ will appear at the bottom of the **Map** and **Route Profile** views. The EZDeparture Advisor™ from bottom to top as shown below consists of a time slider and handle, a date bar labeled with the day of week, month and day (e.g., Sun, 12/31) and a time series of summary blocks colored **red**, **yellow**, **green** or **gray**.¹² Press and hold the time slider handle and drag it to the right or left to change the time of departure.¹³ The data on the Map (e.g., Station Markers, SIGMETs, CWAs, PIREPs, etc.) will change accordingly based on the departure time set.



EZWxBrief uses a simple traffic light concept to quantify the risk based on the user's personal weather minimums¹⁴. **Red** represents high risk, **yellow** represents moderate risk and **green** represents low risk. This concept will be explained in greater detail later in this guide.

The color of the three-hour summary blocks is determined based on the evaluation of the personal weather minimum categories for the associated time of departure.¹⁵ The time label shown on the summary block is the middle time of that three-hour range. In the example above, the red summary block is labeled as 01Z. This is a summary block that evaluates the personal minimums to include the times of 00Z, 01Z and 02Z. Note

¹² A gray rectangle indicates that the specific personal minimum category could not be evaluated for the departure time. This is usually due to missing forecast elements or when the departure time is in the past twelve hours for the Map.

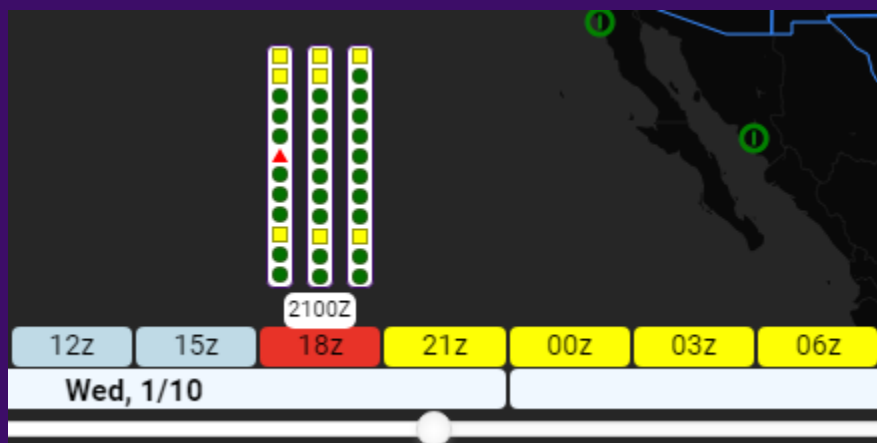
¹³ The departure time can be set using 10 minute increments.

¹⁴ Personal weather minimums can be changed in the Settings panel.

¹⁵ The entire duration of the route is considered when determining the specific color of the summary block.

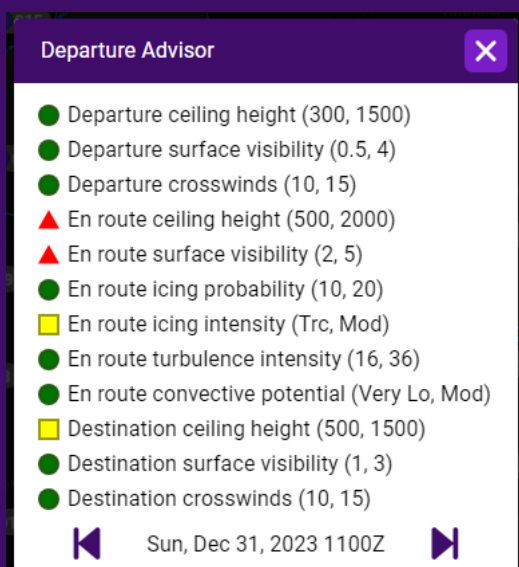
that pressing on any of the summary blocks will cause the time slider to automatically advance the time that's labeled on the block selected.

If the block is **red** this means that **one or more** personal weather minimum categories evaluate to a **high** risk in that three-hour time frame. A **yellow** block means there's one or more personal weather minimum categories



that evaluates to a **moderate** risk and a **green** block means that all categories in that time range meet the conservative **low**-risk personal weather minimums.

As the departure time is changed or when hovering the cursor over any of the three-hour summary blocks using a mouse¹⁶, three columns will appear that show all twelve personal minimums for the departure time (center column) as well as the twelve personal minimums for the previous hour (left column) and the subsequent hour (right column).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 for the proposed route for that departure time. On the other hand, columns with one or more **red** triangles 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 for that departure time. Any **yellow** squares indicate a **moderate** risk for the flight for the departure time. The EZDeparture Advisor™ evaluates the

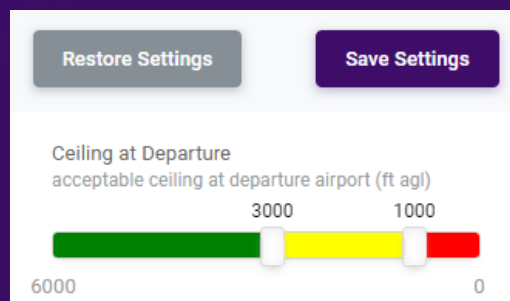
¹⁶ One on a touch screen, a single tap will perform the same function as hovering using a mouse. A second tap on that block will advance the time slider to the departure time labeled on the block.

¹⁷ To support color-blind users, shapes are used in addition to colors.

proposed route for each personal weather minimum category and for each possible departure time over the next 72 hours.¹⁸

The personal weather minimum settings for each category can be changed by pressing on Settings button (gear icon) in the masthead. This will open the Settings panel where any user preferences can be changed including

General Settings, Aircraft Settings and **Personal Minimums** settings. Press the “plus” sign (+) in front of the label to view all of the available settings. Press on the “minus” (-) sign to collapse the list of settings.

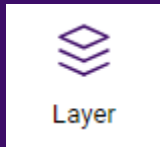


Each **Personal Minimum** category (e.g., Ceiling at Departure) has a slider that consists of a position for **green** and **red**. The **red** position can be thought of as the pilot’s personal weather minimum for that specific category. If the weather forecast is evaluated to be equal or “exceed” the **red** setting threshold,¹⁹ 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 user must decide for each category how to set the low and high personal risk thresholds for each proposed route.²⁰ Press on the **Save Settings** button to store the changes. When settings are changed, the EZDeparture Advisor™ is refreshed to evaluate the weather for those new personal weather minimums.

¹⁸ 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 slightly more than 72 possible departure times and longer routes may have less.

¹⁹ “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.

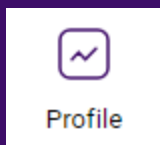
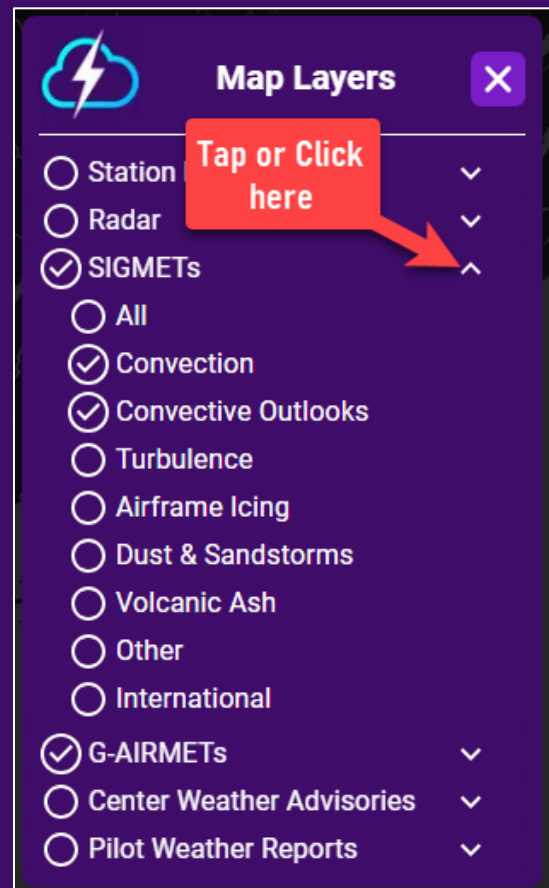
²⁰ The current personal weather minimums stored only apply to an active route.



The Map provides the capability to add one or more data layers. Adding a layer to the Map is accomplished through the Layer selector. Press the Layer selector button (shown left) and the layer selector menu will be displayed. Within the menu, choose the desired layer(s) to add to the Map.

Each layer may have one or more attributes to allow the layer to be filtered or decluttered.

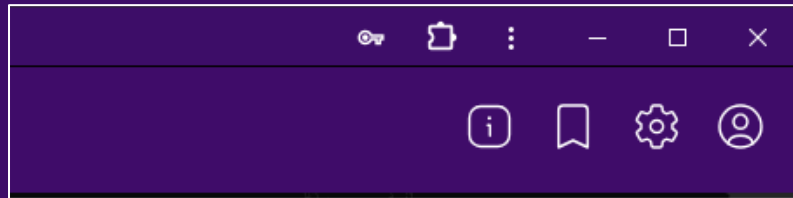
As shown on the right, within the Layer selector menu press the **white chevron** to view/open the associated attributes.²¹ Next, select the specific attribute(s) to filter the layer. For example, shown on the right, the **SIGMETs** and **G-AIRMETs** layers are selected and the SIGMETs attributes are opened. The **Convection** and **Convective Outlooks** attributes are selected (all other attributes are deselected). As a result, only Convective SIGMETs and Convective Outlooks (if any) will be shown on the Map and all other SIGMET types will be filtered. Tap **All** to turn on all attributes for that layer. To close the layer selector, simply press the layer selector button or the **X** in the upper-right corner.



To see a vertical cross section of the route, press the Profile button (shown left). If an active route exists, this will open and render a vertical route profile that also employs a similar EZDeparture Advisor™. If no active route exists, the Route Editor will be displayed to plan a new route. From the Route Profile, 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.

²¹ Use the same action to close the attributes for the layer.

The masthead provides a consistent menu from any location within the app to include (from left to right) Help (info), Saved Items (ribbon/bookmark), Settings (gear) and User Profile buttons.



Press the **Settings** button (gear icon) in the masthead to make changes to the various Settings. This includes the application preferences (e.g., units for time, temperature, visibility, etc.), aircraft settings and personal minimums.



Press the **Help** (info) button²² (shown left) in the masthead to see the Map legends. Specific legends are shown only for active layers currently displayed on the Map.



Tap or click on the **Saved Items** button (ribbon or bookmark icon) to display the Saved Items panel. This panel provides access to any custom folders or items (e.g., routes, airports and imagery collections) that have been previously saved. These folders and items can be viewed (launched), deleted, renamed, moved or duplicated from this panel. New custom folders can also be created from the Saved Items panel.



Lastly, press the **User Profile** button to view or change your account information including the ability to view the membership expiration date, change your password, cancel/renew your membership, update the credit card on file for an active membership and update your personal information (e.g., email address, mailing/billing address, phone number, etc.).

This section provides a basic overview to begin to enjoy the simplicity of **EZWxBrief**. The remainder of this Pilots Guide will provide additional details including how to use the Dashboard, Static Imagery, Route Profile and Airport Wx views.

²² The info button will provide different information depending on the current view being shown. Not all EZWxBrief pages will have help information available.

EZWxBrief & browsers

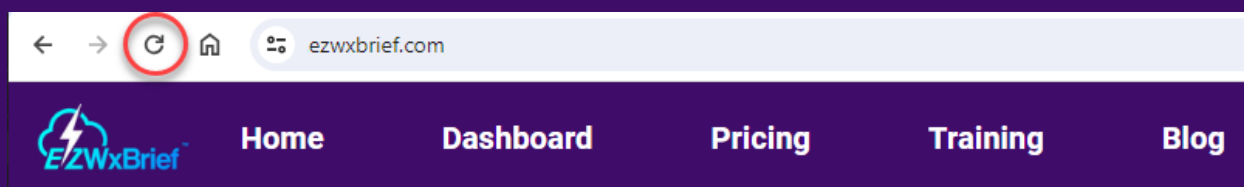
While most features of **EZWxBrief** will render properly within any Internet browser, for the best user experience we recommend using the **latest** version of [Google Chrome](#) running on a desktop computer when possible. **EZWxBrief** is generally compatible with the latest version of Apple's Internet browser, Safari, Mozilla's Firefox Internet browser Microsoft's Edge Internet browser and Brave. At this time, **no** other Internet browsers have been tested for compatibility.²³

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 of the browser is a way of clearing the browser's cache for a specific page or to force it to load the application's newest software and data. A hard refresh or reload will usually fix stale 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 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 the **F5** function key.
3. **Or**, hold down the **Ctrl** and **↑ Shift** keys and press **R**.



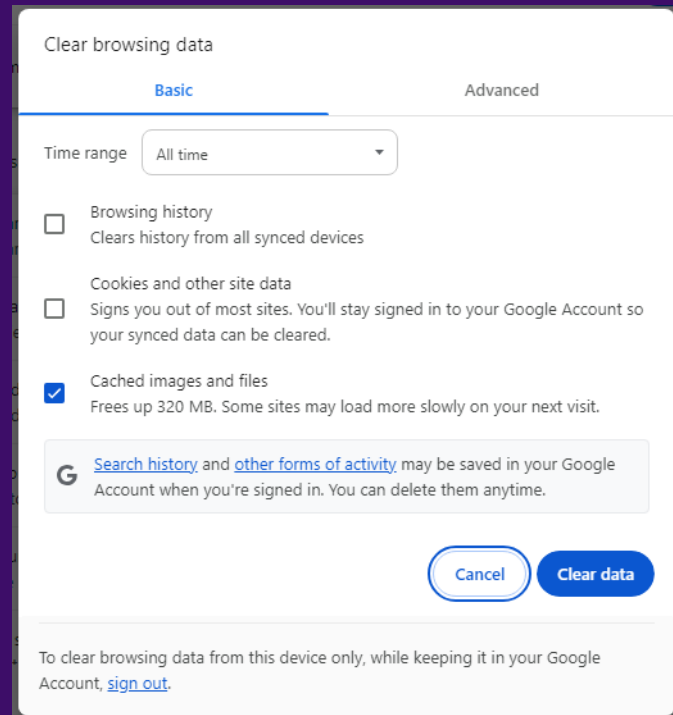
For MacOS -

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

²³ Many of the most common Internet browsers will support installing EZWxBrief as a progressive web app.

Either one of these actions should reload the page when using Google Chrome.²⁴ This will work when **EZWxBrief** is running as a progressive web app or running directly in a browser tab (the latter method is **not** recommended).

To completely clear the cache in **Chrome**, hold down the **Ctrl** and **⇧ Shift** keys and then press **Delete** (**⌘ Cmd**, **⇧ Shift** and **Delete** on MacOS). This will open up a new tab within Chrome with the following URL in the address bar - <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. Select **All time** for the Time range field at the top. 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 browser cache depending on the number of cached files and the speed of your device.²⁵



²⁴ Other Internet browsers may support similar commands to refresh the current page.

²⁵ Other Internet browsers may support similar features to delete the cache.

EZWxBrief Progressive Web App installation

A progressive web app, also known as a PWA, is supported by most popular Internet browser and platforms. There are many other popular apps (e.g., Walmart, 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 the Apple App Store or Google 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.²⁶ 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. Please note that the app cannot be used without a high speed Internet connection.

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. The PWA has a "look and feel" just like a native app without all of the overhead.²⁷ Similar to native apps, a PWA has no address bar or browser tabs and does not provide "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.²⁸ Below are PWA installation instructions for Android, Windows and Apple devices.

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

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

²⁶ Apps for Apple and Google are distributed by countries.

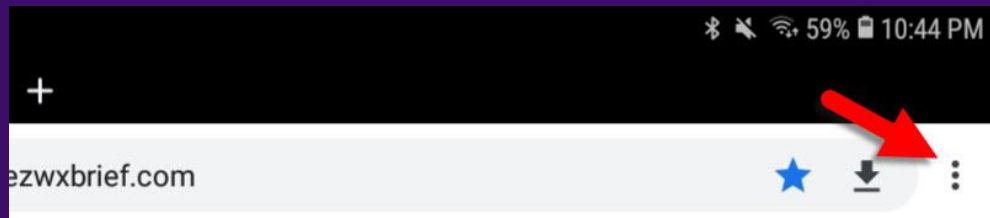
²⁷ There is no address bar, back/forward buttons or tabs that take up valuable space on smaller devices.

²⁸ Maximizing the window and using Full Screen mode (F11) may achieve the same results.

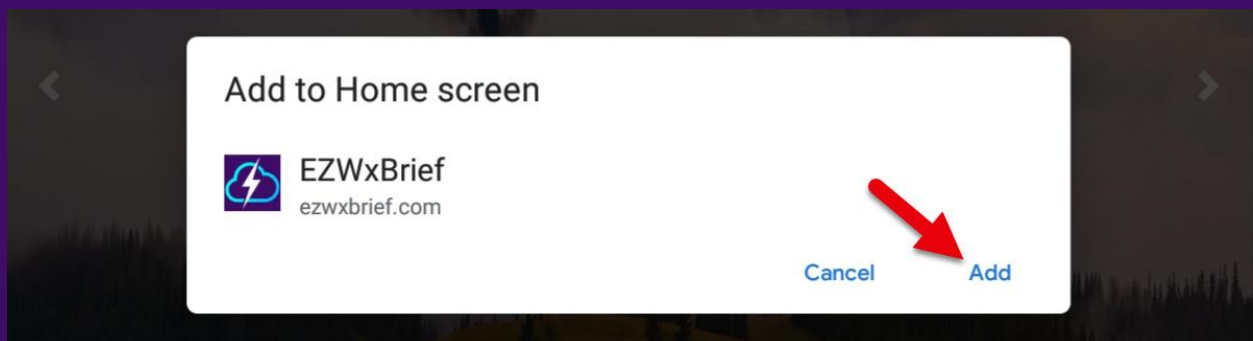
Chrome on Android

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

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



3) Select **Add to Home screen** from this drop-down menu.



4) Select **Add** to complete the final step.

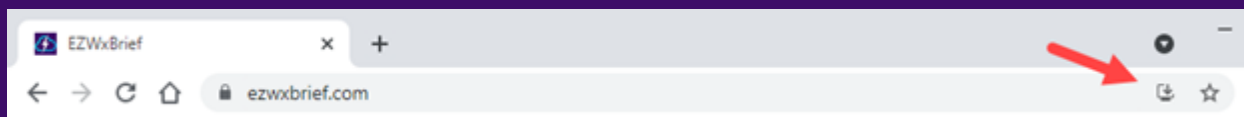
This will place an **EZWxBrief** icon on your device's home screen and within the Apps folder. Tapping on that icon will open up the **EZWxBrief** Chrome PWA. Uninstalling the **EZWxBrief** Chrome PWA is the same as deleting any other app. Press and hold the icon on your home screen until the **EZWxBrief** 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, Microsoft Edge and Brave.

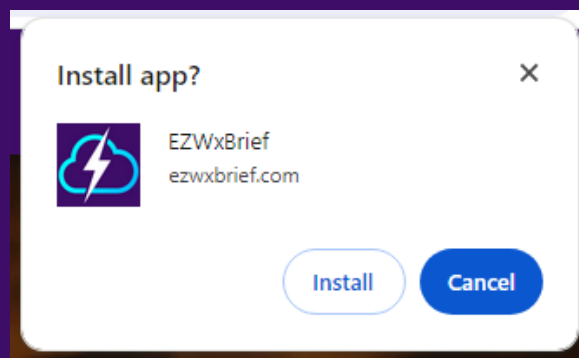
Chrome and Brave on Windows

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



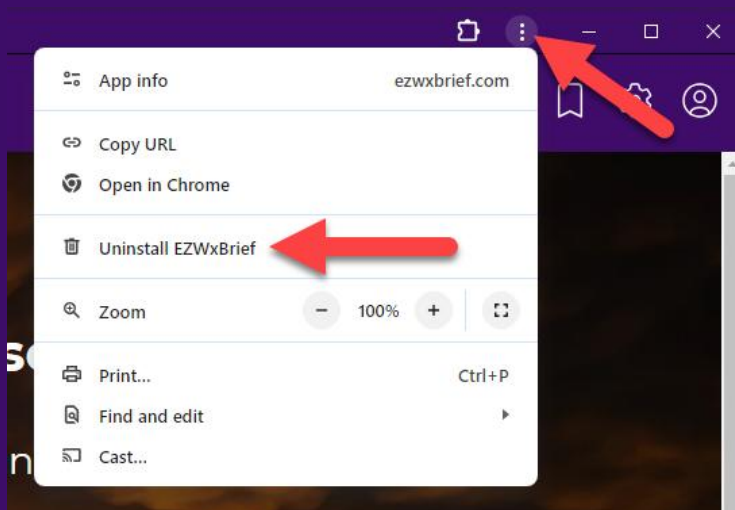
2) As shown above, click on the computer monitor icon containing a down arrow at the far-right end of the browser's address bar. Hovering your mouse cursor over this icon will show an "**Install EZWxBrief**" label.

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.

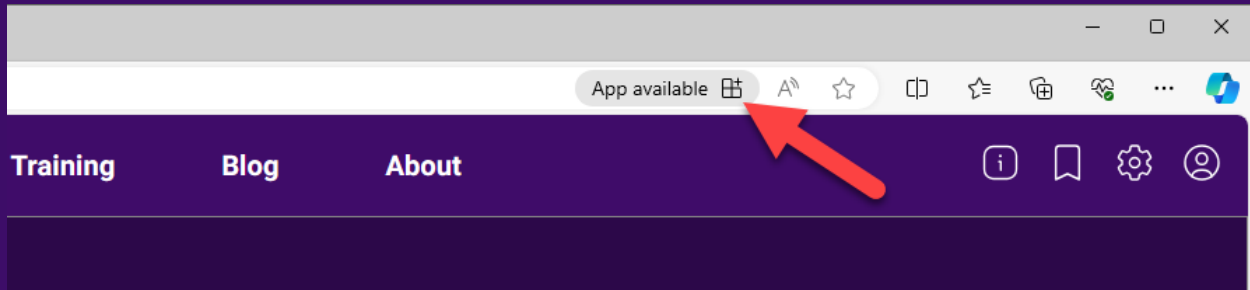
4) To uninstall, first start the **EZWxBrief** PWA. Then in the upper-right corner click on the kebob icon (vertical ellipsis) and select the **Uninstall EZWxBrief** option as shown below. Then in the dialog box that appears, click on **Remove**. You can optionally, check



the box to clear all **EZWxBrief** data from Chrome. This will remove the **EZWxBrief** icon from your desktop.

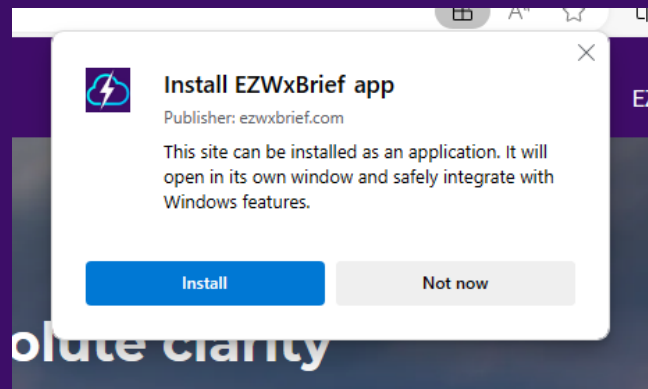
Edge on Windows

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.

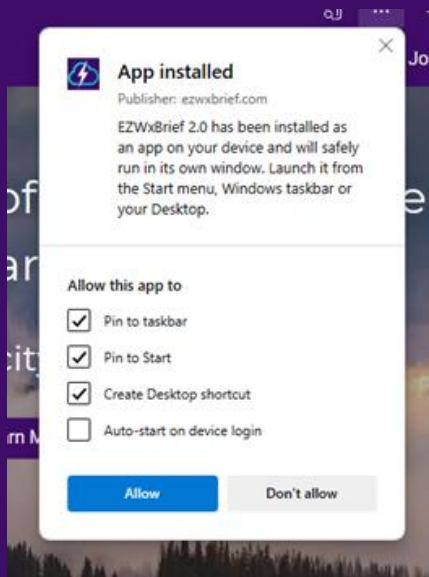


2) As shown above, click on the **App Available** icon at the right end of the browser's address bar. Hovering your mouse cursor over this icon will show an "App Available. Install EZWxBrief" label.

3) In the dialog box that appears as shown on the right, press **Install** to complete the process.



The app will automatically open as a PWA after the install (this may take a minute). When this occurs, **four** options will be provided 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.

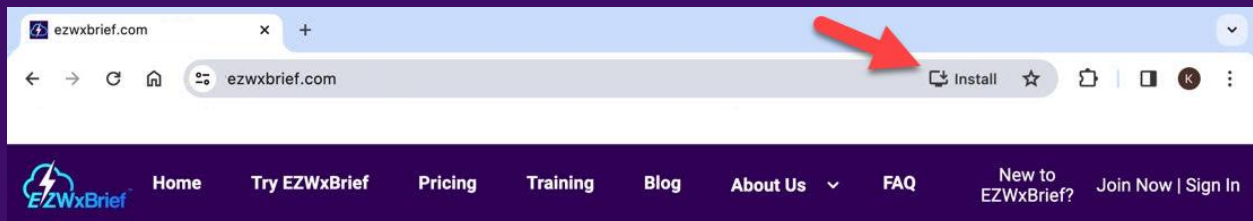


To uninstall EZWxBrief from your device for Edge, simply go to the Windows settings to **Add or Remove** programs. Locate EZWxBrief in the list of installed programs. This is similar to removing any Windows application from a desktop or laptop computer. This can also be done with the application running and clicking on the ellipsis in the header which will allow you to view all installed apps.

Apple – For MacBook and iMac devices, PWA installation is supported by **Google Chrome** only and is not supported by Safari at this time.

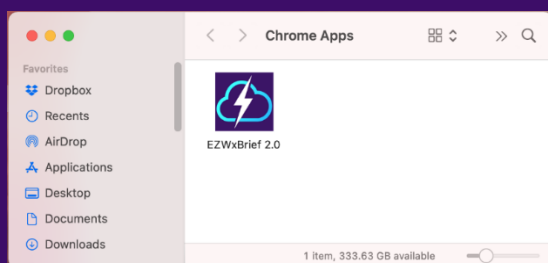
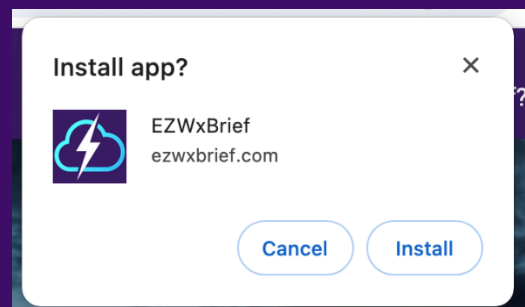
Chrome on MacBook and iMac

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 (shown on the right), click on **Install** to complete the process. This will place an **EZWxBrief** icon in the **Chrome Apps** folder (shown below) which you can move to your desktop. A double-click on that icon will open up the **EZWxBrief** Chrome PWA.



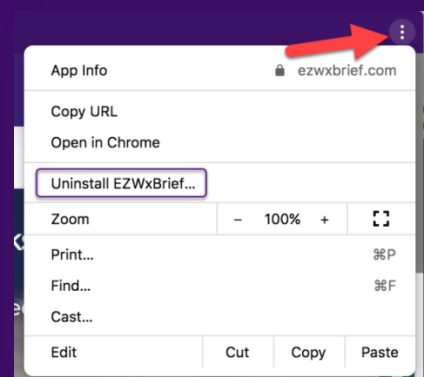
To uninstall, start the **EZWxBrief** PWA. Then in the upper-right corner of the PWA, click on the kebob icon (vertical ellipsis) and select the

Uninstall

EZWxBrief

option from the

menu as shown below. 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 the Chrome Apps folder.



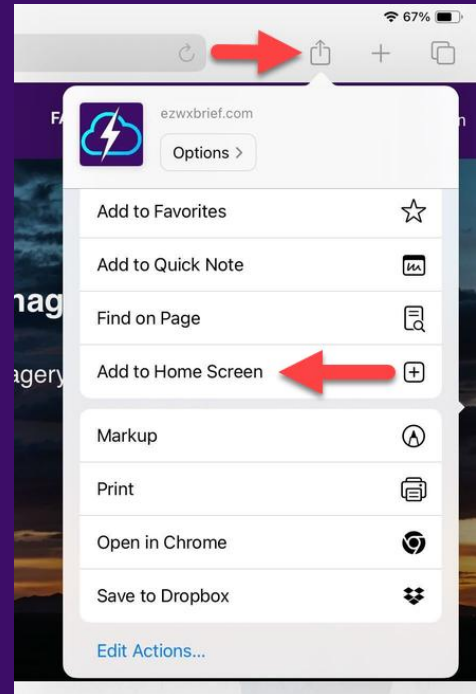
Safari and Chrome on iPad and iPhone

To install the **EZWxBrief** PWA on any portable Apple device, simply follow the step-by-step instructions below. The process is nearly identical for both Safari and Chrome.

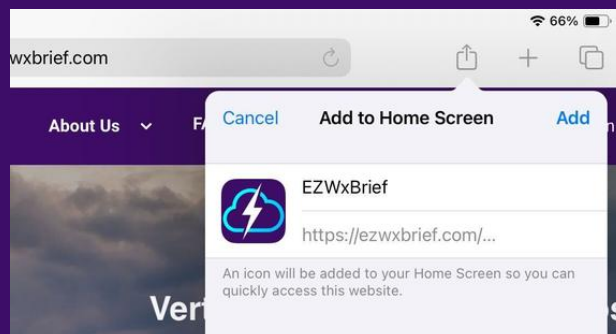
1. Start the **Safari** browser on your portable device and enter <https://ezwxbrief.com> in the Safari or Chrome address bar. You do not need to be signed in to your **EZWxBrief** account.

2. For the iPad, in the upper-right corner, tap on the "Send To" or "Share" button as shown on the right. Note that iPhone, "Send To" button for Safari is located at the bottom of the Safari browser window on most installations or located at the end of the address bar for Chrome.

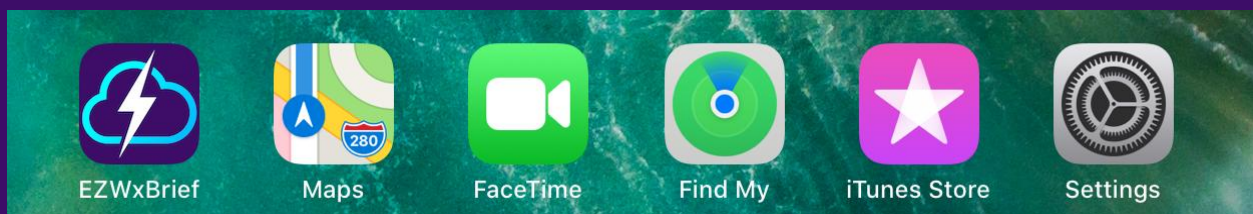
3. Scroll down the menu and select the **Add to Home Screen** option from the Send To menu shown on the right.



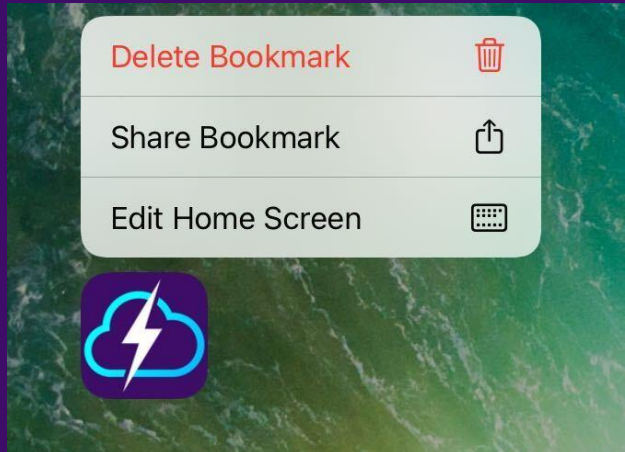
4. The default name that is suggested can be used or it may be changed. Select **Add** to complete the process.



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 momentarily hold** the **EZWxBrief** icon. This will bring up the menu shown on the right. Then tap on the **Delete Bookmark** selection and then confirm to uninstall the EZWxBrief PWA. It's that EZ.

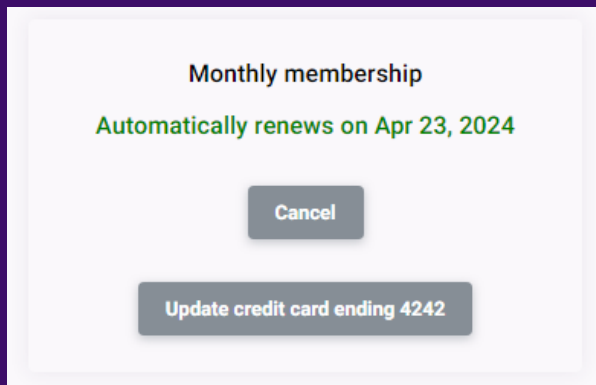


Trial, monthly membership & renewal

To sign in and enjoy the simplicity of **EZWxBrief** you need to register a new account that begins with a **free** 30-day trial membership. After the 30-day trial has completed, all memberships will be renewed on a monthly basis. This means that during the registration process trial members will be required to provide their credit card in order to create a recurring billing profile in **EZWxBrief**. Once a valid credit card (Visa, MasterCard or Discover) has been accepted, the membership will be set to renew automatically on the same day each month after the 30-day trial period ends. If the trial membership is not cancelled prior to the expiration date, the credit card provided will be charged the monthly fee. **Checks, bank/wire transfers, Venmo, Zelle and PayPal are not accepted.** Currently, only monthly memberships are available.

Trials

A trial membership provides access to all the awesome features within the **EZWxBrief** progressive web app for a period of 30 calendar days at no charge. After 30 days, the credit card provided during registration will be charged the monthly membership fee. A trial member can cancel their membership at any time from the User Profile page to



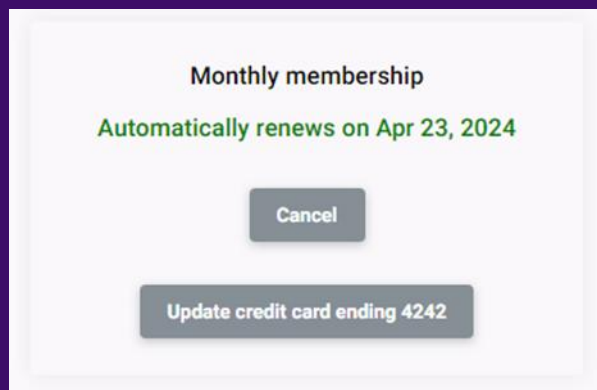
avoid incurring any charge. To deactivate the recurring billing profile, press the **Cancel** button. After the trial membership has been canceled, all of the features of the app will be available until the 30-day trial period is complete. When the trial membership expires those awesome features will be unavailable and you will no longer be able to enjoy the simplicity of EZWxBrief.

To renew an expired **EZWxBrief** trial membership that has been previously canceled, there is no need to register again. To renew, **Sign In** under the email address used to register the trial account. After successfully signing in, follow the prompts or navigate to the User Profile page and press the **Renew** button. This will provide a form to set up the recurring billing profile once again. If the renewal takes place after the 30-day trial period has ended, the credit card provided in the form will be charged the monthly membership fee.

Auto-renewal

Every account that has an active membership will have a recurring billing profile that expires on a specific day each month. This account will automatically renew each month on the membership expiration date using the credit card on file. The membership can be canceled at any time by visiting the User Profile page by pressing the **Cancel** button and confirming that you want to cancel the membership. After the membership has been canceled, all of the features of the app will be available until the membership expiration has been reached.

In the event the credit card on file has expired or another credit card is desired, the card number and/or card expiration date can be updated. For memberships with an active recurring billing profile that has not been canceled, a button to **Update credit card**



ending NNNN, where NNNN is the last four digits of the credit card on file will be present in the User Profile page as shown on the left. Pressing this button will display a form that can be used to update the credit card on file.

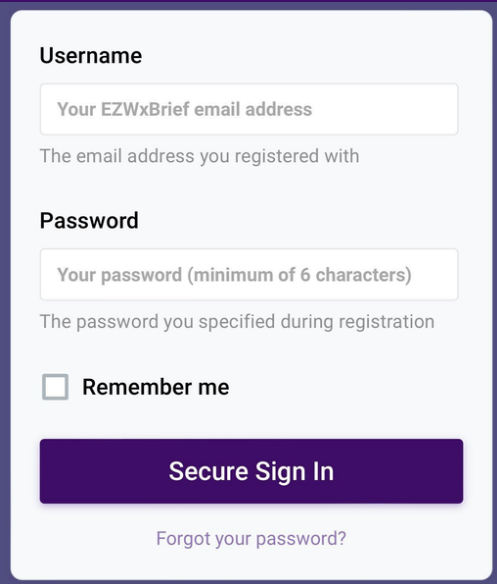
In the event the credit card transaction fails to process on the membership expiration date²⁹, the recurring billing profile will be

automatically deactivated. No attempt will be made to try to run the credit card on file. The membership will remain active for the remainder of the calendar day. If this occurs, an email is sent to the user that documents that the recurring billing profile has been deactivated. To avoid a disruption in service, Sign In to EZWxBrief and follow the prompts or press the Renew button that will be present on the User Profile page.

²⁹ This could happen for a variety of reasons to include an invalid credit card number on file, expired credit card or a refusal from the card-issuing bank.

Signing in

To sign in, start the **EZWxBrief** app (or type <https://ezwxbrief.com> into the browser's address bar) and locate the "Sign In" button in the upper-right corner of the Home page. The sign in screen is the same regardless of the device, operating system, browser, or type of computer you are using. The email address used during the initial registration with **EZWxBrief** will be the username for the sign in process. Simply enter this username and password and press the **Secure Sign In** button as shown on the right. A successful sign in will navigate to the **EZWxBrief** Home page if the account's membership has expired. Otherwise, it will navigate to the default **Landing Page** (Home page, Dashboard, Map or Imagery) as defined in the **General Settings**.



Username

Your EZWxBrief email address

The email address you registered with

Password

Your password (minimum of 6 characters)

The password you specified during registration

☐ Remember me

Secure Sign In

[Forgot your password?](#)

If the "**Remember me**" box is selected on the sign in page, the encrypted credentials are remembered using a browser session cookie. When **EZWxBrief** is restarted, those encrypted credentials are used again to automatically authenticate the account with no need to enter a username or password. However, any time an explicit attempt to sign out without simply closing the app will delete the encrypted credentials along with the session cookie. As such, the username and password will be required on the next sign in attempt for this device. However, if the app is restarted and is requiring you to sign in again, follow these recommendations:

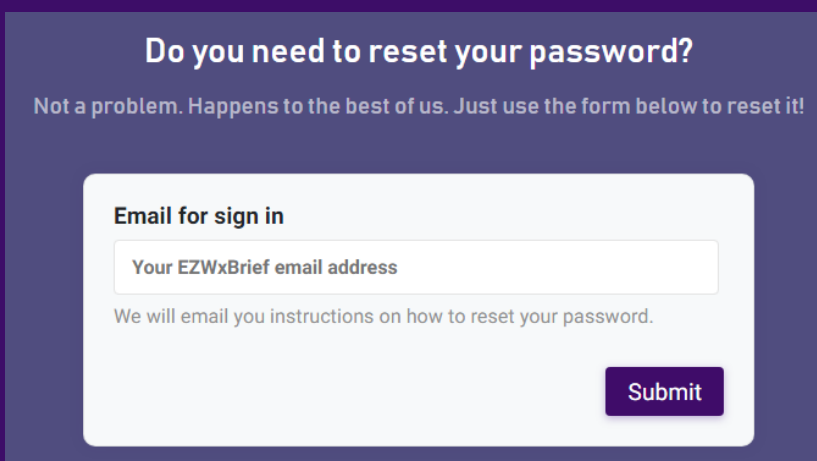
- 1) Sign in to the app using your email address and password **without** selecting the **Remember Me** box on the sign in screen.
- 2) Sign out of the app manually. In other words, press the **User Profile** button in the upper-right corner and then select the **Sign Out** option from the User Profile menu. This will delete the session cookie.
- 3) Sign in a second time using your email address and password. However, this time, select the **Remember Me** box on the sign in screen.
- 4) To test that this fixed the issue, close the app **without signing out**.
- 5) Restart the app and it should sign in without asking for credentials.

Please note that some releases may force you to sign back in regardless of the process described above.

A password that has been forgotten can be reset with a tap or click on the **Forgot your password?** hyperlink on the sign in page. This will bring up a form shown on the right to enter the email address (username) associated with the account. After entering the email address, press the

Submit button and an email with detailed instructions on how to reset your password will be immediately sent to this email address assuming an account exists under this address. **Please do not reply to this email.** Note that this email is automated and may end up in a junk or spam folder. If this email has not been received after 10 minutes, feel free to send an email to support@ezwxbrief.com and the awesome **EZWxBrief** support team will be happy to assist to reset the password.

This email will contain a single hyperlink to reset the password. **It can only be used once and will expire after seven days.** Press on that hyperlink or copy-paste the entire Web address contained in the email into the 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. !@#\$%^&*.-,). Previous passwords can always be reused.

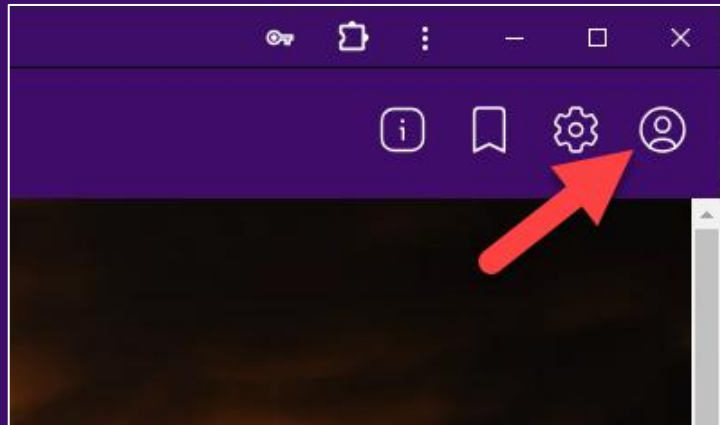


The screenshot shows a web form for password reset. At the top, it asks 'Do you need to reset your password?' and reassures the user that it's a common problem. Below this is a section titled 'Email for sign in' which contains a text input field labeled 'Your EZWxBrief email address'. A message below the field states 'We will email you instructions on how to reset your password.' A blue 'Submit' button is located at the bottom right of the form.

Signing out

With the **EZWxBrief** app, there isn't a need to sign out.³⁰ The app can be signed in on multiple devices and there's no feature that will automatically sign out of the session when no activity is detected after a period of time.

The **Sign Out** capability will be listed on the User Profile menu in the masthead (shown right) so signing out of the application can be done at any point in time from any page within the app. A new sign in will be required on the device after explicitly signing out of the app regardless if the "Remember me" option was selected when initially signing in on the same device. Moreover, a new release may also prompt you to sign back in based on any changes to the authentication process.



³⁰ If using EZWxBrief on a public computer, it is recommended to sign out of the app when finished.

EZWxBrief Home page

The Home page provides an overview of the **EZWxBrief** application using a carousel of title pages. The carousel will change automatically or the white chevrons on both sides of the page can be selected to move backward and forward through the carousel. Pressing on the **Learn More** button for each of these pages will navigate to a new page with a more detailed description of that feature.

Shown below is the site menu that visitors will see on the Home page.³¹



From here a visitor can **Sign In** to **EZWxBrief** or become a member by choosing **Join Now**. This menu allows visitors to join as a trial member (**Try EZWxBrief**), view **EZWxBrief** membership pricing, book one-on-one online training (<https://avwxtraining.com/online-training>) and view the **EZWxBrief** blog (<https://avwxtraining.com/blog>)³² containing the latest 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 innovative application. Lastly, this menu provides access to a list of frequently asked questions (FAQ).

When members successfully sign in to **EZWxBrief**, the site menu of the Home page will now include an option to visit the **Dashboard** as shown below. To get started simply press the **Dashboard** menu option to begin enjoying the simplicity of **EZWxBrief**.



In addition to the options on the main menu, the **EZWxBrief** masthead contains the **EZWxBrief** logo and four buttons to view and manage Saved Items (ribbon or

³¹ A visitor is an anonymous user that has not signed in to EZWxBrief. This is the view that members will see after successfully signing out.

³² Note that there's no reason 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 without any additional membership.

bookmark icon), view/change settings and preferences (gear icon) and view the user profile page. Keep in mind that this is only available when signed in to **EZWxBrief**.

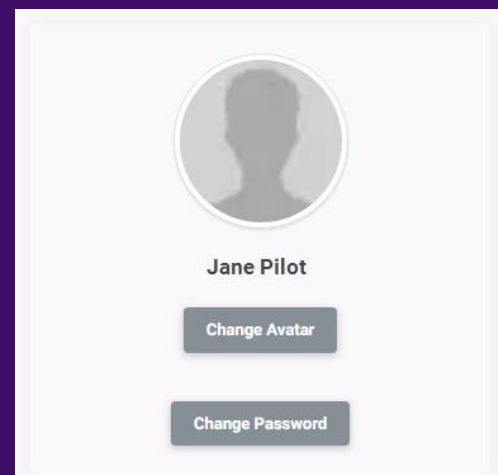
User profile

When signed in, the user profile page will be available regardless of your current subscription status. The user profile page is used to add or change the profile picture (avatar), change the account password (see below), cancel or renew a monthly membership, update the credit card on file for users with a recurring billing profile and make updates to personal information such as the email address, name, mailing address, phone number and email preferences. **Please understand that we will never share your personal information without your permission.** When updates are complete, be sure to press the **Save** button at the bottom-right of this user profile page. Pressing **Abandon** will revert changes back to previously saved information.

A toggle is available in the user profile to let **EZWxBrief** administrators know if you prefer to opt in or opt out of email specific notifications. This was originally set during the initial registration process. When toggled on, the **EZWxBrief** administrator will send you a monthly EZNewsletter, and notify you of any outages and other special offers or educational opportunities via email. Regardless of this choice, the CAN-SPAM Act permits **EZWxBrief** administrators to send emails that contain only transactional or relationship content. This would include, but is not limited to, sending an email receipt after a subscription renewal, instructions on how to reset a password or a reminder that a membership will expire soon or has recently expired.

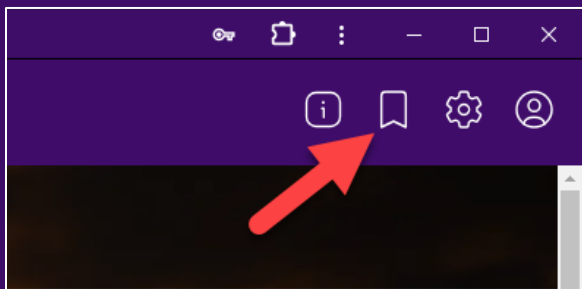
Changing the account password

Changing the password for the account can be done in the user profile. From any page, press the User Profile button in the masthead and then choose **Profile** from the menu. This will navigate to the user profile page where a button labeled **Change Password** will be available as shown on the right. A form with three fields will be presented when pressing the Change Password button. Enter the current account 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., !@#\$%^&*.-,).



Saved Items

Favorite routes, imagery collections and airports can be saved and organized within **EZWxBrief**. These are generically referred to as “Saved Items.” This is similar to bookmarking a favorite website using an Internet browser. Moreover, saved items can be thought of as a secondary portal into the app that will speed up input and eliminate the need for extra button presses. These are specific to your **EZWxBrief** account and cannot be shared with other users at this time.

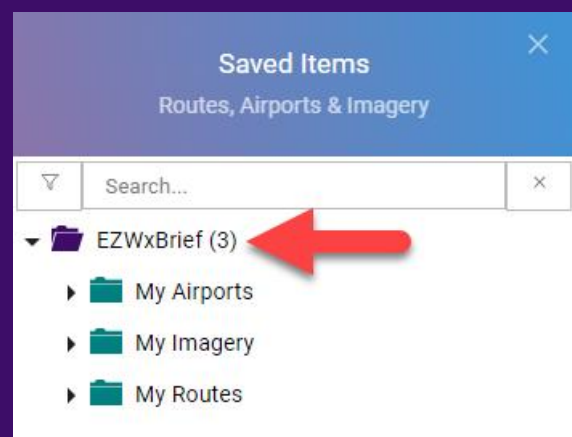
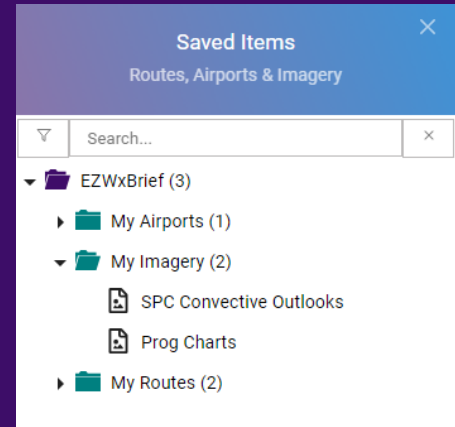


To access and manage the saved items, simply press the ribbon icon that appears in the masthead on the **EZWxBrief** Home page as well as the masthead for the Map, Route Profile, Airport Wx, and Imagery views as shown to the left. Additionally, custom folders can be created to organize

all saved items. Please note that saved items and folders can only be accessed when signed in to **EZWxBrief** with an account that has an unexpired membership.

EZWxBrief root folder

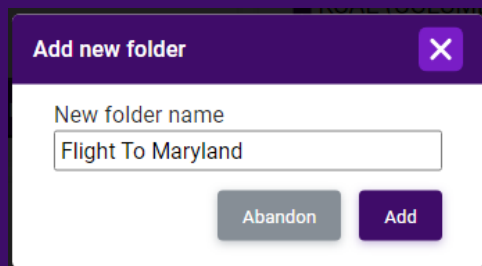
All saved items and custom folders are contained within the **EZWxBrief** root folder. This root folder cannot be deleted, moved, renamed or duplicated. On the first use of the app, three custom folders labeled, **My Airports**, **My Imagery** and **My Routes** will be available. These default custom folders **are not required** so they can be deleted or renamed at any time. Moreover, any custom folder can contain saved items of differing classes or types (e.g., both imagery collections and airports).



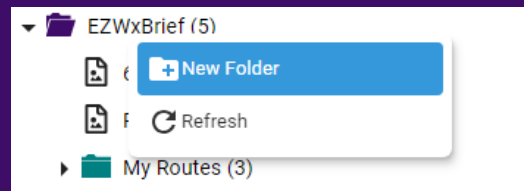
Custom folders

It is a benefit to create custom folders to organize saved items. A folder can be created when saving items or by pressing the **EZWxBrief** root folder name in the Saved Items panel. This will provide an option to create a

New Folder. Next, provide a name for the new custom folder (see below). 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 not have to

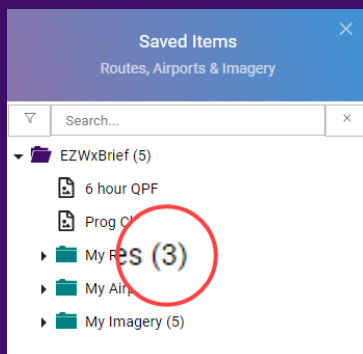
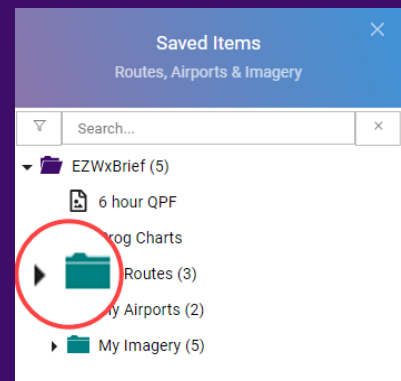


be unique. Once the name is entered, press **Add** to create this folder. The new custom folder can always be renamed later. Nesting of custom folders is not permitted. In other words, custom folders cannot be created within other custom folders or moved into a custom folder.



Expanding or collapsing custom folders

All collapsed custom folders (including the **EZWxBrief** root folder) will have a right-pointing triangle to the left of the name of a closed folder icon as shown on the right. If the folder contains one or more items, pressing on this triangle will expand (open) the folder to expose all of the items in that folder. This will cause the triangle to change to a downward-pointing triangle with an open folder icon to indicate that the folder is open. To collapse (close) the folder, press the downward-pointing triangle again. This will change it back to a right-pointing triangle with a closed folder icon.

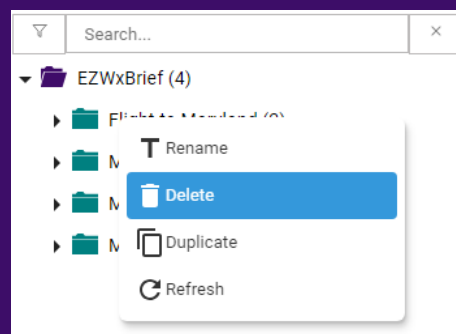


If the custom folder has at least one saved item, the number located in parenthesis after the folder name (shown to the right of the folder's right) indicates the number of saved items contained in the custom folder. The number to the right of the **EZWxBrief** root folder only includes those folders or items in the folder itself and does not total up items within other custom folders.

Remove a custom folder

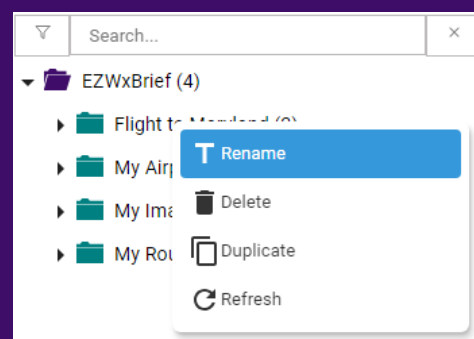
To remove a custom folder from the saved items, locate the folder to be removed and press on the folder's name. This will bring up a menu (shown to the right) to Rename, Delete, Duplicate and Refresh. Press **Delete** to remove the folder. This will create a dialog box to confirm that the folder selected and **all of its contents** will be removed from the saved

items. Press **Yes** to remove the folder or **No** to abandon the deletion. Note that the **EZWxBrief** root folder cannot be removed.



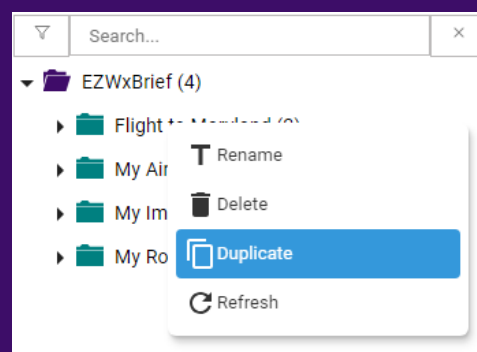
Rename a custom folder

To rename a custom folder, locate the folder to be renamed and press on the folder's name. This will bring up a menu (shown to the right) to Rename, Delete, Duplicate and Refresh. Press **Rename** to rename the folder. This will create a dialog box to choose a new name. Press **Rename** to accept the new folder name entered or **Abandon** to keep the original name. Note that the **EZWxBrief** root folder cannot be renamed.



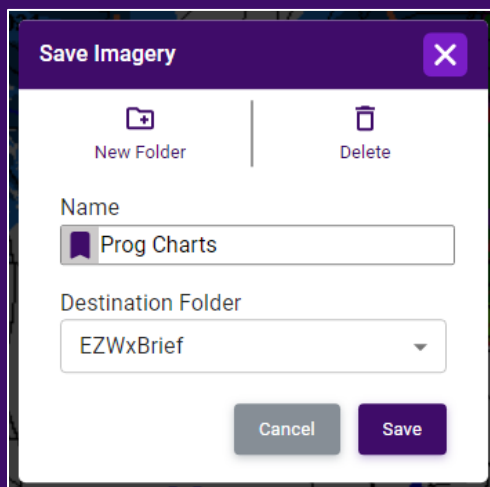
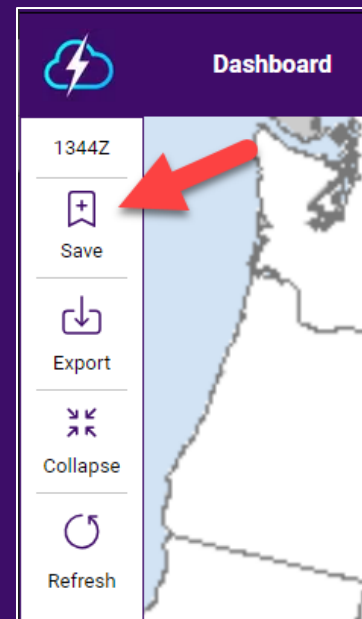
Clone a custom folder

To clone or duplicate a custom folder, locate the folder to be cloned and press on the folder's name. This will bring up a menu (shown to the right) to Rename, Delete, Duplicate and Refresh. Press **Duplicate** to clone the folder. This will create a dialog box to choose a new name for the duplicate folder if desired. Press **Duplicate** to accept the cloned folder name or **Abandon** to keep the default name. All items (e.g., routes, imagery collections and airports) contained within the folder to be cloned will be exactly replicated based on the items in the source folder. Note that the **EZWxBrief** root folder cannot be duplicated.



Add a saved item

Airports, imagery collections and routes can be saved to the **EZWxBrief** root folder or to any custom folder. To add or remove a saved item, simply press the **Save** button while viewing that item. This button may appear in a different location depending on the type of item you are saving and the context. For example, the **Save** button for routes can be found in the route editor or when displaying a route in the profile view. A solid-filled ribbon icon indicates that the item is currently saved in one or more folders. For example, on the Imagery view, the **Save** button is located in the upper-left corner (see right). In this case, the ribbon icon is not filled so this imagery collection does not appear in any saved folders. If the ribbon icon is filled, the **Save** button can be pressed to remove it as a saved item from all folders or it can be saved to another custom folder or the same folder with the same or different name. In other words, the saved item can appear within the saved items in multiple folders or multiple times within the **EZWxBrief** root folder.



When the **Save** button is pressed, four options are available. The item can be **(1)** added to the **EZWxBrief** root folder; **(2)** added to an existing custom folder; **(3)** added to a newly created folder; **(4)** if the current item is saved in one or more folders, the item can be deleted from all folders.

If the ribbon icon in the **Name** field is solid (filled) as is shown on the left, then it has been previously saved in one or more folders. To add it

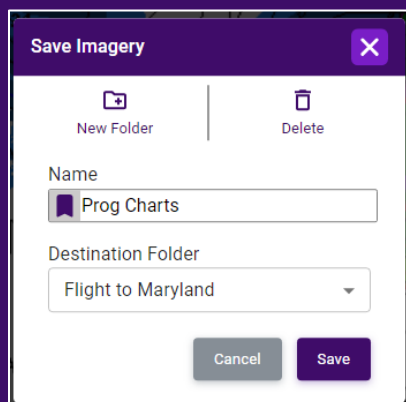
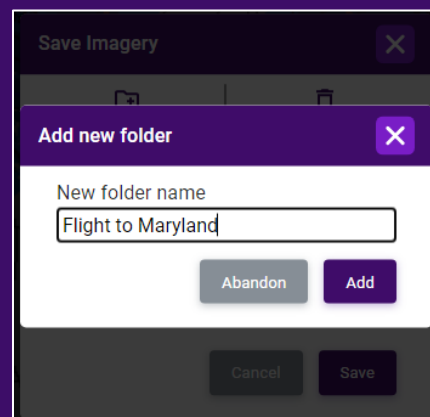
to an existing folder or the **EZWxBrief** root folder, simply press the dropdown in the **Destination Folder** field to show a list of existing folders³³. After choosing the desired folder from the list, press the **Save** button to add it to that folder. Whether you are adding an item to the **EZWxBrief** root folder, other existing or new folder, a **Name** for

³³

The EZWxBrief root folder will always be available even if there are no custom folders.

the item must be chosen. Choose the default name (if provided) or enter a different name. Any combination of upper- or lower-case letters, numbers or special characters (including spaces) can be used for an item name and does not have to be unique.

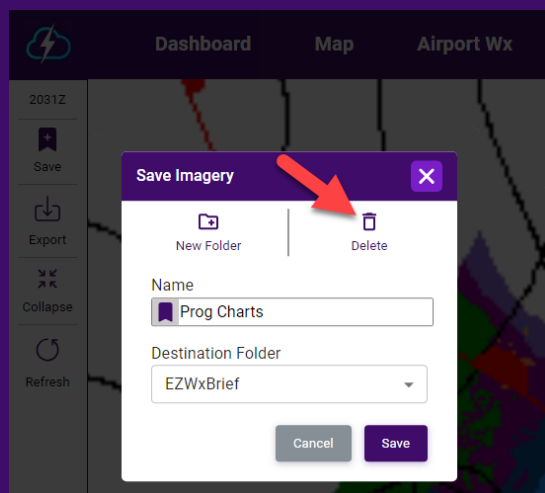
To add the item to a new custom folder, press the **New Folder** button. Next, choose a name for the new custom folder then press the **Add** button to create this new folder. This will create a new custom folder regardless if any items are added to it. For the folder name any combination of upper- or lower-case letters, numbers, or special characters (including spaces) can be used for the folder name. Also, the name chosen does **not** have to be unique. The folder created will become the default name in the **Destination Folder** field. Press **Save** to add the saved item to the chosen destination folder.

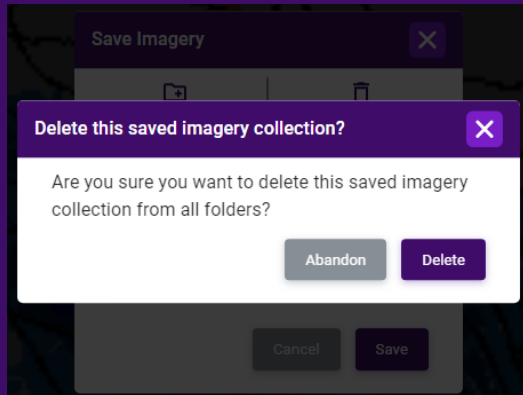


Removing a saved item

There are two ways to remove a saved item. First, in the Saved Items panel, locate the item to be deleted in the **EZWxBrief** root folder or other custom folder. Press on that item and select **Delete**. Press **Yes** to confirm the item will be removed from the folder. Note that this will remove only that saved instance. In other words, if the item had been previously saved (i.e., the item exists in more than one folder), other instances will be preserved.

Second, a saved item can be removed right at the source where it was added as a favorite. While viewing the saved item to be removed (e.g., viewing a specific imagery collection, airport or route), the Save button should be filled solid. Simply press this **Save** button to bring up the dialog box shown on the right (shown for imagery). Click on the **Delete** button and then confirm that the saved item will be deleted (shown below).

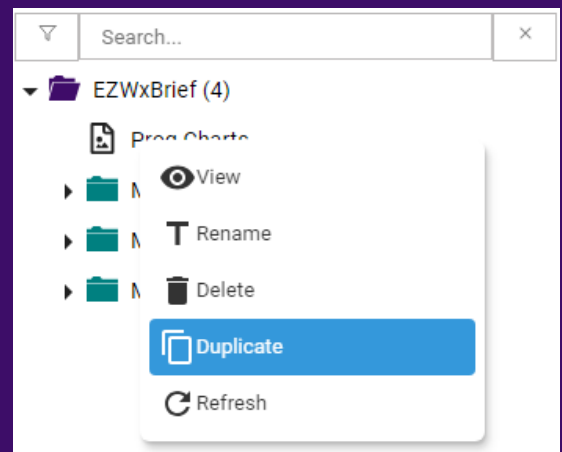




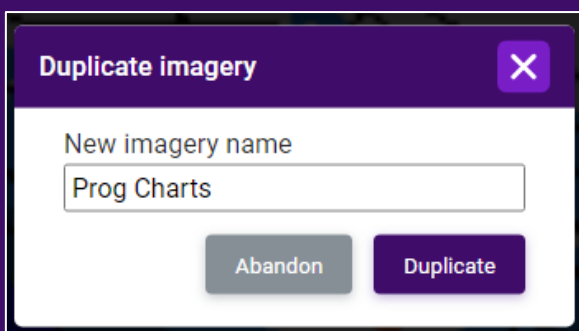
When the saved item to be removed has been cloned (i.e., the item exists in more than one folder), a dialog box will advise, “**Are you sure you want to delete this saved item from all folders?**” Press the **Delete** button to remove it from the **EZWxBrief** root folder and **all** custom folders where it exists. Once complete, the solid fill will be removed from the Save button for this item.

Clone a saved item

Similar to custom folders, saved items can also be cloned one or more times and can exist in multiple folders. This can be done in three ways. First, as mentioned earlier, when cloning a folder, this will replicate all of the saved items in that folder. Second, when viewing the Saved Items panel, press the item that you want to clone. This will bring up a menu (shown to the right) to View, Rename, Delete, Duplicate and Refresh.



Press Duplicate to clone the item. This will create a dialog box to choose a new name for the duplicate item if desired. Press **Duplicate** to accept the cloned item name or **Abandon** to keep the default name.

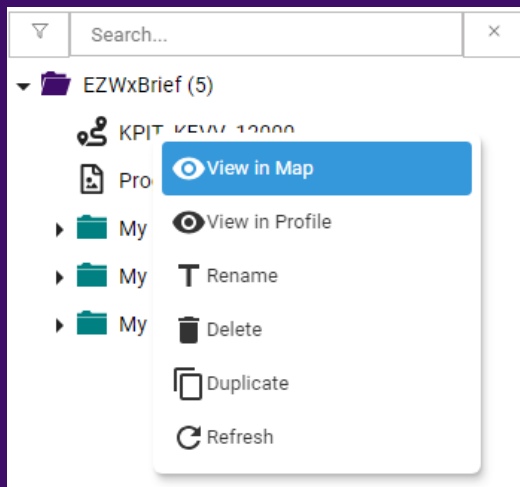
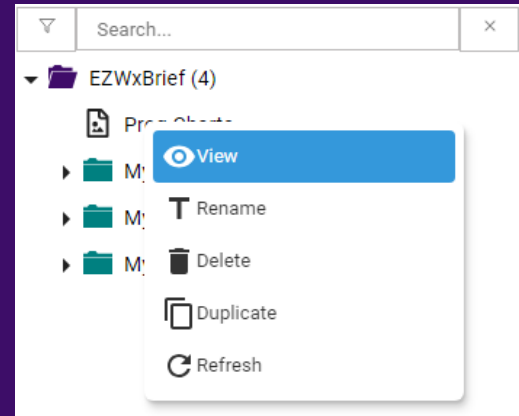


Third, if you see a solid-filled Save icon, this means that item has been saved one or more times. Pressing the **Save** button will enable you to add it to the **EZWxBrief** root folder, create a new folder or save it in an existing custom folder. Any saved item can be duplicated multiple times.

View a saved item

The main benefit of saved items is to be able to quickly view a favorite route, airport or imagery collection. To view a saved item, locate the item to be viewed in the **EZWxBrief** root folder or other custom folder. Press on that item and select **View** from the menu (see right).

For imagery items, this will open up the Imagery view for the saved collection. In the event the imagery collection, no longer exists, the opportunity to delete that imagery collection from the saved folders will be offered.



For airport items, this will open up the Airport Wx view and display the Meteogram, METAR, TAF, Discussion or the Skew-T (temporarily removed) based on the most recent selections.

For route items, there are two choices to include **View in Map** and **View in Profile** as shown on the left. Pressing the **View in Map** option will open up the Map and make the saved route active. Pressing **View in Profile** will open up the route in the vertical route profile view and make the saved route active.

Reordering and moving saved items and folders

Any saved items contained 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 item you would like to move. Drag that favorite to the desired location (just above or below another item or custom folder) and lift your finger from the screen or mouse button to complete the reorder operation.

Using a similar procedure, you can drag and drop any item 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 an item out of one custom folder into the **EZWxBrief** root folder or into another custom folder. First expand the custom folder containing the item you would like to move. Press or click-and-hold that item 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.

Weather & flight category

There are many locations throughout the **EZWxBrief** application that include a depiction of weather and/or flight category³⁴. Consequently, the table below will be referenced in many sections throughout this 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 a flight category³⁵. 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)³⁶. 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 obscuration³⁷ 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

Flight category				
	VFR	MVFR	IFR	LIFR
Clear below 12,000 ft				
Sky clear				
Few				
Scattered				
Broken				
Overcast				
Indefinite ceiling				

³⁴ 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.

³⁵ Flight category typically combines both ceiling and visibility, but it can also be referenced individually for ceiling and visibility.

³⁶ The NWS also uses Very Low Instrument Flight Rules (VLIFR) that represents a ceiling below 200 feet and visibility below 1/2SM. This is not used in the EZWxBrief app.

³⁷ This is also referred to as an indefinite ceiling.

depicts a cloud-free sky. 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.

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

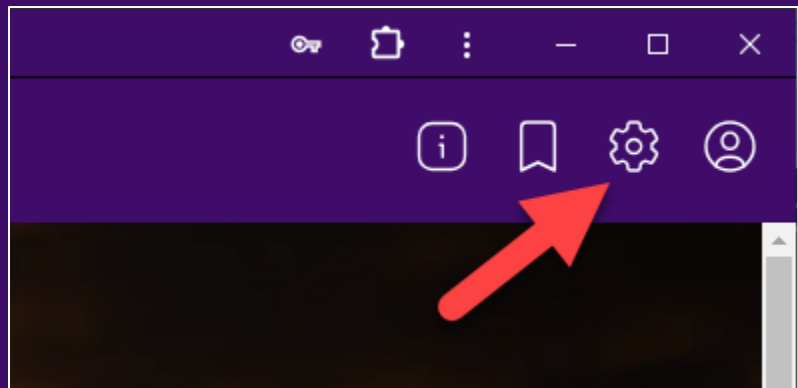
The observations, forecasts and advisories provided by **EZWxBrief** will cover much of North America. However, when planning a route, the high-resolution forecast guidance covers a limited area that includes the conterminous United States and coastal waters, southern Canada and northern Mexico as shown in the image below. Airports and other waypoints in the EZWxBrief database are limited to those within this domain.



Settings

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 weather minimums defined. Additionally, preference for units of time, temperature, wind, distance and visibility can be set. 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 press the gear icon in the masthead (shown to the right) to view or alter your current settings. This will open the settings panel. Settings are organized into three sections, namely, General Settings, Aircraft

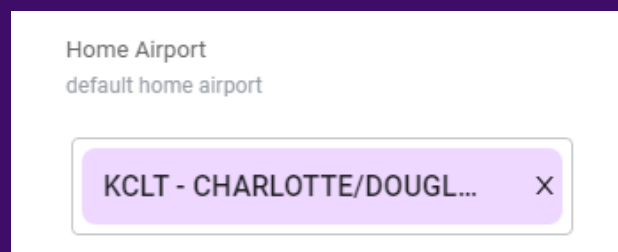


Settings and Personal Minimums. When changes to your settings are made, press the **Save Settings** button to store your modifications. Alternatively, if you do not want to save your changes, click on the **X** in the upper right of the settings panel. This will bring up a dialog box. Press **Abandon and Close** button to exit without saving your changes.

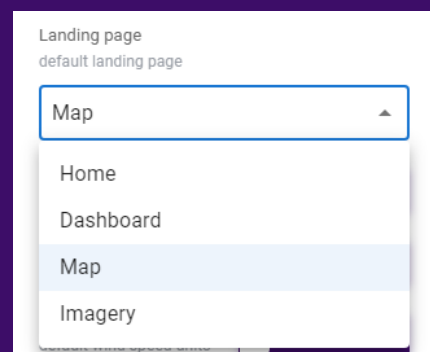
General settings

If not already expanded, to modify the general settings press the plus (+) sign next to **General Settings**. Under the **General Settings**, the **Home Airport**, **Landing Page** and unit preferences to include **Time Display**, **Temperature**, **Wind Speed**, **Distance** and **Visibility** can be set.

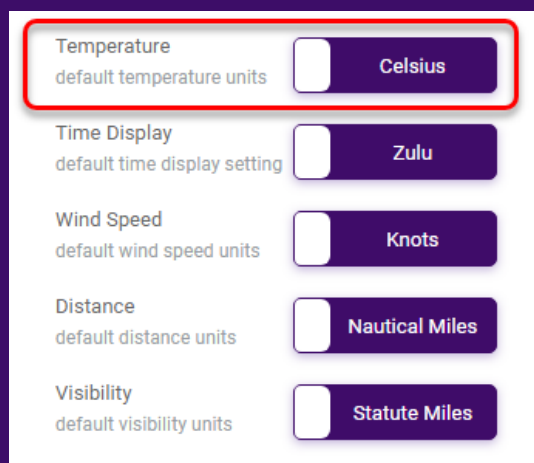
Home Airport: For the best experience, there are many locations in the application that may need to know your home airport. Simply type the three-character FAA identifier or four-character ICAO airport identifier for your home airport into this field. It is **not** optional. A home airport is required. So, this field is defaulted to KCLT – Charlotte/Douglas International Airport.

A screenshot of the 'Home Airport' input field. The label 'Home Airport' is at the top, with 'default home airport' in smaller text below it. The input field contains the text 'KCLT - CHARLOTTE/DOUGL...' and has a small 'X' icon to its right for clearing the field.

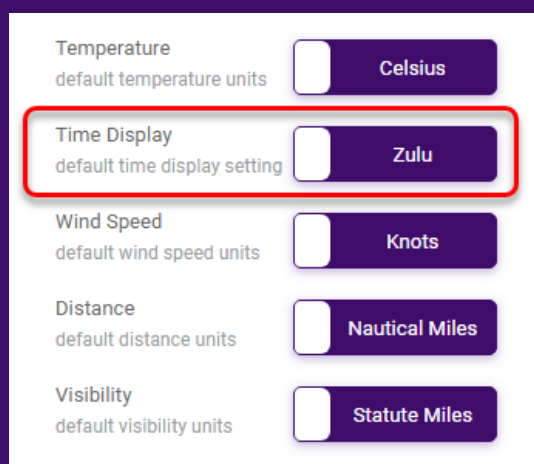
Landing Page: This is the default page the user will land on after a successful sign in attempt assuming the user's membership has not expired. The options include the **EZWxBrief** Home page, Dashboard, Map and Imagery. For users with an expired membership, this setting will be ignored and the Home page will always be the default landing page after authentication.



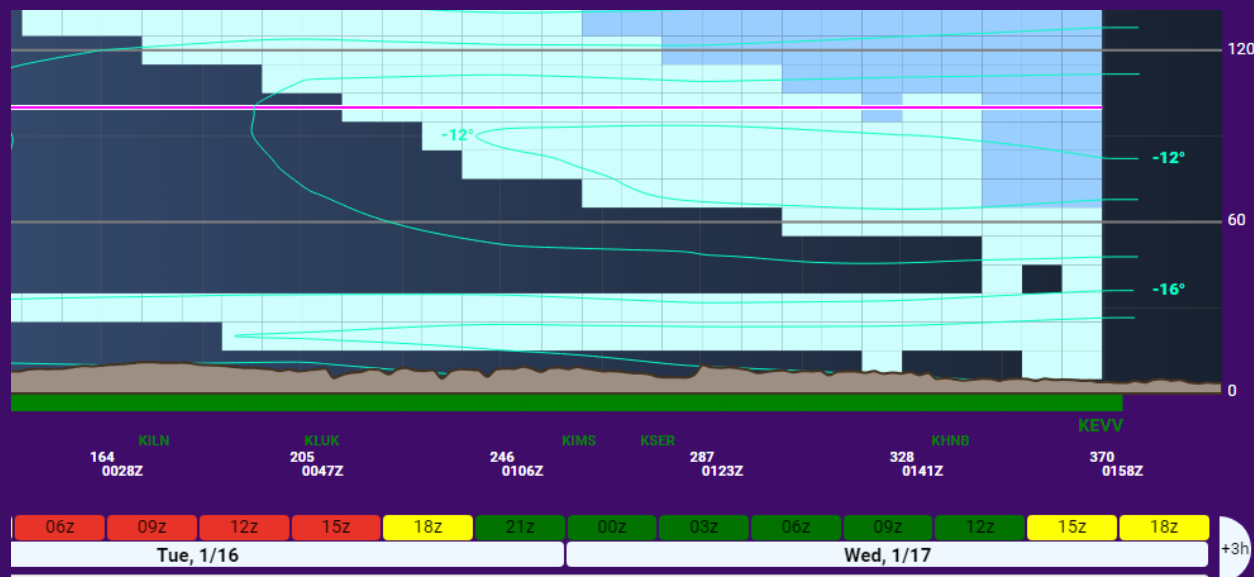
Temperature preference: There are many places in **EZWxBrief** that display a temperature. This includes options to display the temperature in degrees Celsius or degrees Fahrenheit. This choice is made under the **Temperature** unit preference. Most of the time, the temperature will be depicted with a °F (Fahrenheit) or °C (Celsius) to the right of the temperature. However, for the isotherms in the route profile or meteogram, the isotherm toggle button will depict the temperature preference to avoid having a repetitious "F" or "C" at the end of every isotherm rendered.



Time Display preference: In **EZWxBrief** there are times listed in many places throughout the app. You have the option to display the **Local** time or **Zulu** time (UTC). Local time is always based on the time zone of the device. Simply press on the button to toggle it between **Zulu** and **Local**. Note that all local times in the application are displayed as a 24-hour clock unless otherwise specified as a.m. or p.m. Also note that this setting does not affect the time shown on the Zulu clock. The Zulu clock appears in the masthead on handheld devices or at the top of the left menu bar on the Map, Imagery, Airport Wx and the Route Profile views. This remains Zulu time as a reference throughout the app.



If the time preference is set to **Zulu**, a **Z** will be placed behind the time as shown below for the route profile view. If there isn't a **Z** present for the segment points or in the EZDeparture Advisor™, then the preference is set to the Local (device) time.



Wind speed, distance and visibility preferences

Options to change the units for the display of wind speed, distance and visibility are also provided. Wind speed can be set to knots (default) or to miles per hour (mph). Distance units can be set to nautical miles (default) or to kilometers. Visibility units can be set to statute miles (default) or meters.

Wind Speed

default wind speed units

☐
☒

Knots

Distance

default distance units

☐
☒

Nautical Miles

Visibility

default visibility units

☐
☒

Statute Miles

Aircraft settings

To modify the aircraft settings, press the plus (+) sign next to **Aircraft Settings** to specify the aircraft category as well as set the True Airspeed for the aircraft. If desired during route creation, 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). Press the setting to make a selection. The background turns orange to indicate the active takeoff weight category selected. This category setting is currently used for determining how to contour (color) the eddy dissipation rate (EDR) forecast for turbulence rendered on the Route Profile and Meteogram views. See the EDR setting in the Personal Minimums preferences below.

The screenshot shows the 'Aircraft Settings' section. Under 'Takeoff weight category', there is a sub-label 'maximum takeoff weight category'. Below this are three buttons: 'Light' (highlighted in orange), 'Medium' (dark blue), and 'Heavy' (dark blue). Each button has its weight range below it: '< 15,500 lbs', '(15,500 - 300,000 lbs)', and '> 300,000 lbs' respectively. Below the buttons, the 'True Airspeed' section is visible, showing a slider set to 182 knots.

True airspeed: Modify this setting to specify the **average** true airspeed in knots for the **en route** phase of flight. Simply press and slide the white handle left or right to adjust the setting to the desired true airspeed (in one knot increments) for the aircraft. This allows EZWxBrief to determine the effective groundspeed using the forecast winds aloft for the route profile assuming the "Use Forecast Winds" toggle in the route editor has been set. **Please note** the **EZWxBrief** route engine does not account for a different airspeed in the climb and descent phases at this time; therefore, it is recommended to set this true airspeed to a slightly lower value to account for this especially on flights over 500 nautical miles. Otherwise, this will produce a higher-than-normal ground speed that is used to calculate accumulated distance and arrival time at the segment points that are rendered at the bottom of the Route Profile view.

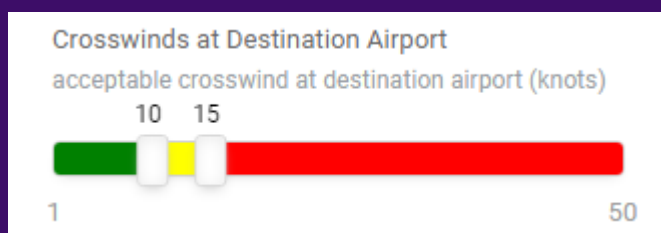
This screenshot is similar to the one above, showing the 'Aircraft Settings' section. The 'Takeoff weight category' section is visible but not highlighted. The 'True Airspeed' section is highlighted with a red box. It shows the label 'True Airspeed' and 'true airspeed for en route operations (knots)', with a slider set to 182.

Personal minimums

One of the groundbreaking features of the **EZWxBrief** app is to incorporate personal weather minimums into preflight planning for a route. These settings provide the capability to set the personal risk level that is 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 airframe icing. If not already expanded, press 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, press on the minus (-) sign.

Most pilots have set personal limits (minimums) for various weather elements. The term "minimums" refers to the **minimum acceptable weather conditions**. These minimums often depend on the pilot's own risk tolerance, depending on the flight rules (VFR or IFR), time of day, type of aircraft, recency of flight, the route and/or altitude proposed, overall flight experience and most important, weather.³⁸

To make it **EZ**, **EZWxBrief** uses a "traffic light" concept of **green**, **yellow** and **red** to define those personal minimums for each weather element. Each personal minimum setting has two slider handles to choose values that define a low risk (**green**) threshold on the left or high risk (**red**) threshold on the right. To set the value, press and drag the slider bars to the right or left until it defines the respective limits desired. Default settings are provided for all new users.



In the example on the left for crosswinds at the destination airport, 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 personal minimum setting (left handle) for **green** for the destination airport as shown above. This means that any crosswind forecast of 10 knots **or less** at the time of arrival at the destination airport will evaluate to **green** (low risk) in the EZDeparture Advisor™. At the other extreme, you may feel very uncomfortable with a crosswind greater than 15 knots. In this case, you would set **15**

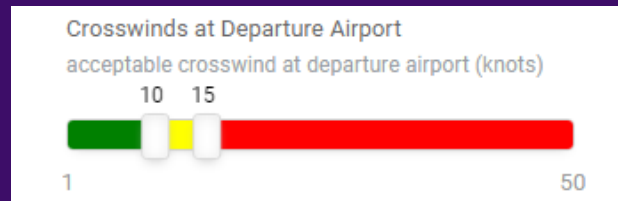
³⁸ At this point in time, there isn't a consideration for day versus night or mountainous terrain. EZWxBrief is designed to only evaluate weather-related risks of the flight.

knots as the setting (right handle) for **red** at the destination airport. This means that any crosswind forecast of 15 knots or greater at the time of arrival at the destination airport will evaluate to **red** (high risk) in the EZDeparture Advisor™. This value defines your personal minimum for crosswinds at the destination airport. That leaves a crosswind from 11 to 14 knots to be set to **yellow** by default which suggests you are outside of your conservative comfort zone (10 knots or less), but still within your personal limits for crosswind (15 knots or more). This means that any crosswind forecast of 11 to 14 knots at the time of arrival at the destination airport will evaluate to **yellow** (moderate risk) in the EZDeparture Advisor™.

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

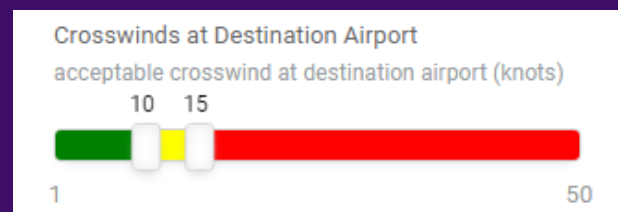
Assuming an active route, this setting defines the personal crosswind limitations for **takeoff** based on the forecast wind conditions (if available) for the best opportunity runway at the departure airport. The crosswind at departure airport sliders will increment one knot at a time, however, the lowest values that can be set are 2 and 5 knots for green and red, respectively, with the highest values at 46 and 49 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 that is updated hourly.



Lead time availability: 1 to 72 hours.

Crosswind at Destination Airport

Assuming an active route, this setting defines the personal crosswind limitations for **landing** based on the forecast wind conditions (if available) for the best opportunity runway at the destination airport. The crosswind at destination airport sliders will increment one knot at a time, however, the lowest values that can be set are 1 and 4 knots for green and red, respectively, with the highest values at 47 and 50 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 that is updated hourly.

Lead time availability: 1 to 72 hours.

En Route Turbulence Intensity

Assuming an active route, this setting defines the personal minimums for turbulence intensity at the proposed altitude while en route and does not take into account turbulence for the climb or



descent. 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 in **EZWxBrief** 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)

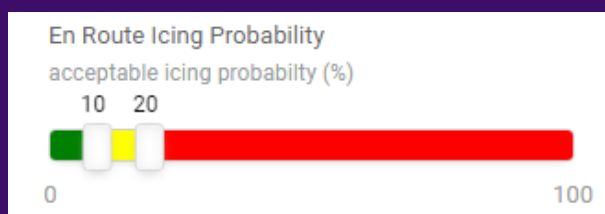
As an example, a light aircraft will begin to report moderate turbulence beginning with an EDR of 16 whereas a heavy aircraft will begin to report moderate turbulence with an

EDR of 24. Therefore, if you are flying a light aircraft and are uncomfortable with severe turbulence, you should set the red slider handle 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 0 and 6 for green and red, respectively, with the highest values at 94 and 100, respectively.

Lead time availability: 1 to 18 hours.

En Route Icing Probability

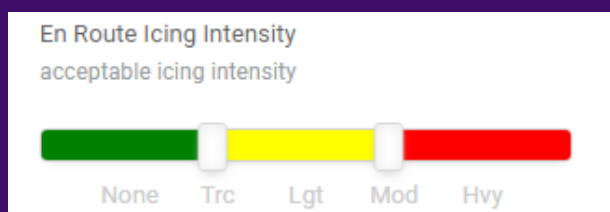
Assuming an active route, this setting defines the personal minimums for the probability of airframe icing at the proposed altitude while en route and does not take into account icing for the climb or descent. This is a calibrated probability defined by a percentage from 0 to 100. A higher probability means that airframe icing is more certain. Keep in mind, as the lead time increases, the probability of icing will naturally decrease due to temporal 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 0 and 6 for green and red, respectively with the highest values at 94 and 100, respectively.



Lead time availability: 1 to 21 hours.

En Route Icing Intensity

Assuming an active route, this setting defines the personal minimums for the intensity of airframe icing at the proposed altitude while en route and does not take into account icing for the climb or descent. 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.



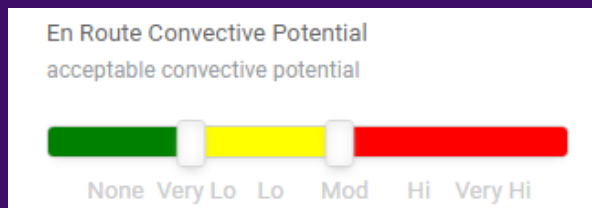
Moving the left-most slider all the way to the left will identify a conservative personal minimum for icing severity as "None." Therefore, green will only be evaluated for this

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 21 hours.

En Route Convective Potential

Assuming an active route, this setting defines the personal minimums for the convective threat along the proposed route. Categorical choices include None, Very Lo (low), Lo (low), Mod (moderate), 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 minimum includes any threat of deep convection that produces some form of precipitation and convective turbulence.

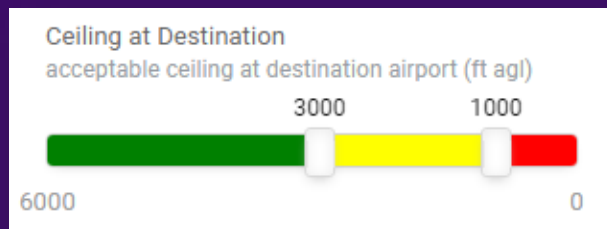


Moving the left-most slider all the way to the left will identify a conservative personal minimum for convective potential as "None." Therefore, green will only be evaluated for this personal minimum category when the route has no risk of deep, moist convection producing precipitation. Moving the right-most 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 72 hours.

Ceiling at Destination

Assuming an active route, this setting defines the 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 and are not evaluated.

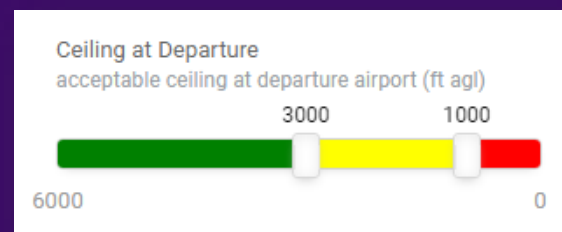


With an active route defined, **EZWxBrief** will examine the forecast ceiling³⁹ (if any) at the destination airport valid at the estimated time of arrival and determine if it meets or exceeds these thresholds. Moving the “ceiling at destination” sliders left and right will change the value of either setting at 100-foot increments. However, the lowest values that can be set are 100 and 300 feet for red and green, respectively, with the highest values at 5700 feet and 5900 feet, respectively.

Lead time availability: 1 to 72 hours.

Ceiling at Departure

Assuming an active route, this setting defines the personal minimums for ceiling height at the **departure** 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 and are not evaluated.

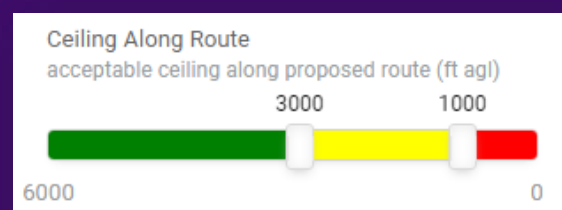


With an active route defined, **EZWxBrief** will examine the forecast ceiling⁴⁰ (if any) at the departure airport valid at the estimated time of departure and determine if it meets or exceeds these thresholds. Moving the “ceiling at departure” sliders left and right will change the value of either setting at 100-foot increments. However, the lowest values that can be set are 100 and 300 feet for red and green, respectively, with the highest values at 5700 feet and 5900 feet, respectively.

Lead time availability: 1 to 72 hours.

Ceiling Along Route

Assuming an active route, this setting defines the 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 lowest broken or overcast cloud deck. Note that



³⁹ Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

⁴⁰ Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

cloud layers forecast as scattered or few are not considered a ceiling and are not evaluated.

With a route defined, **EZWxBrief** will examine the forecast ceiling⁴¹ 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 300 feet for red and green, respectively, with the highest values at 5700 feet and 5900 feet, respectively.

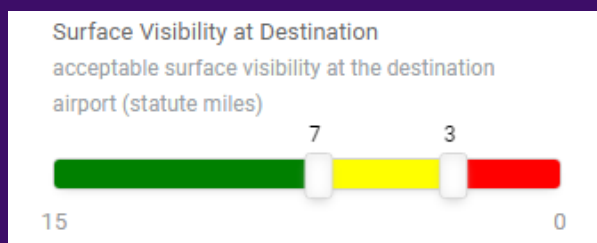
Lead time availability: 1 to 72 hours.

Surface Visibility at Destination

Assuming an active route, this setting defines the personal minimums for the surface visibility at the **destination** airport.

With an active route defined, **EZWxBrief** will examine the forecast surface visibility⁴² at the 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.

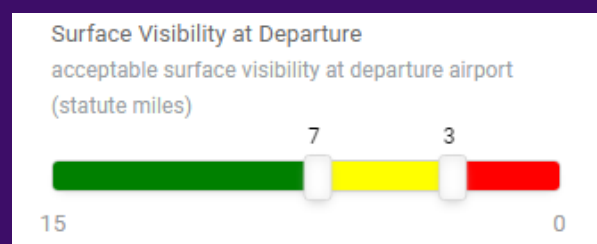


Lead time availability: 1 to 72 hours.

Surface Visibility at Departure

Assuming an active route, this setting defines the personal minimums for the surface visibility at the **departure** airport.

With an active route defined, **EZWxBrief** will examine the forecast surface visibility⁴³ (if any) at the departure airport



⁴¹ Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

⁴² Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

⁴³ Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

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.

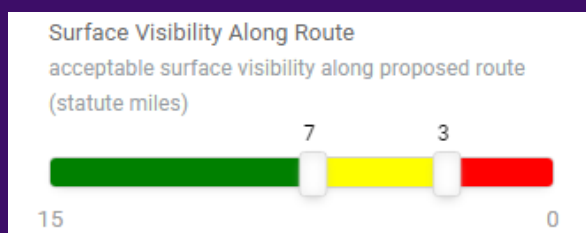
Lead time availability: 1 to 72 hours.

Surface Visibility Along Route

Assuming an active route, this setting defines the personal minimums for the surface visibility along the proposed route.

This setting may be more appropriate for pilots flying under Visual Flight Rules (VFR). With a route defined, **EZWxBrief**

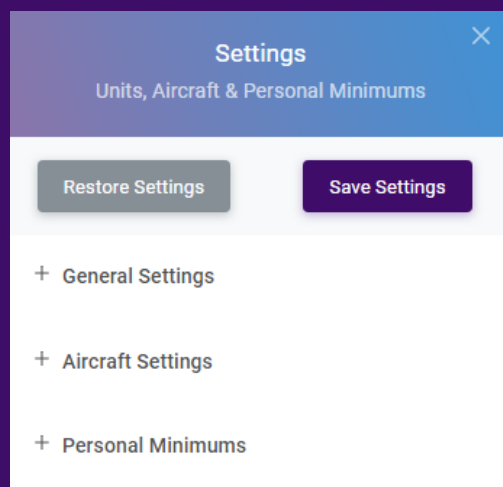
will examine the forecast surface visibility⁴⁴ along the entire route (including the departure and destination airports) to determine if it meets or exceeds these thresholds. Moving the surface visibility along the route sliders left and right will change the value of either setting at 0.5 statute mile 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.



Lead time availability: 1 to 72 hours.

Save settings

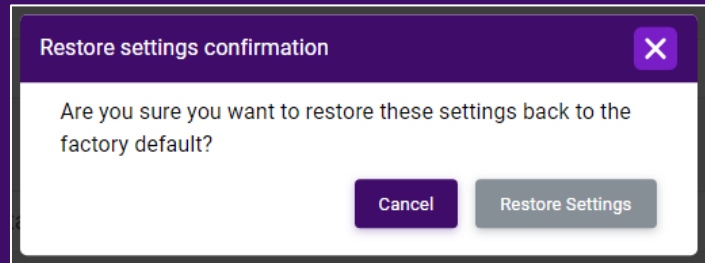
When finished, press the **Save Settings** button to store any changes to the general, aircraft and personal minimum settings. This will force the application to reevaluate the active route (if any) to utilize these new settings. To abandon any changes without saving, press the **X** in the upper-right corner of the Settings panel. In that case, the application will confirm that, "You have changes to your settings that have not been saved. Do you want to save these changes?"



⁴⁴ Terminal Aerodrome Forecasts (TAFs) are not used in this evaluation.

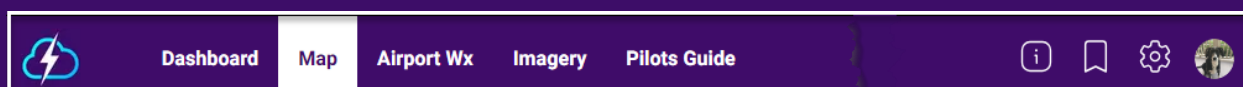
Press **Save and close** to save your changes or press **Abandon and close** to abandon without saving your changes.

To restore all of the settings back to the **factory default**, press **Restore Settings**. A confirmation will be offered to make sure settings should be returned to the factory default. Press Restore Settings to restore and save the factory default settings.



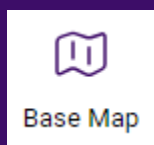
Map

Although defining a route is optional, **EZWxBrief** includes an interactive map that includes the EZDeparture Advisor™ as a way to plan and plot a great circle route.⁴⁵ The EZDeparture Advisor™ is specifically designed to quantify your personal risk by leveraging your personal weather minimums. The EZDeparture Advisor™ graphically depicts this risk so that you can quickly find a departure time that minimizes your exposure to adverse weather.



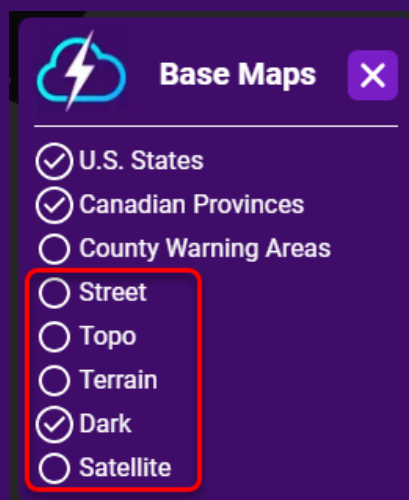
To navigate to this interactive map (called the Map view) from any location within **EZWxBrief**, select the **Map** option from the Sitemap menu as shown above or from the hamburger menu in the masthead for handheld devices⁴⁶. Moreover, the Map view will be automatically opened when the **Open in Map** option is chosen from the route editor, selecting a Saved route or selecting a Recent route listed in the **Dashboard**.

Base map



EZWxBrief has a total of five base maps to choose from. To change the base map, simply press the **Base Map** menu selection (shown left). This will display

the **Base Maps** menu containing all the available choices. The options include (1) Street (default), (2) Topo, (3) Terrain, (4) Dark or (5) Satellite. These base maps are mutually exclusive. That is, when a base map selection is made, it replaces the currently displayed base map. This choice is remembered such that when navigating away from the map or closing the app, the last base map chosen will be preserved and used upon returning to the Map view at a later time.



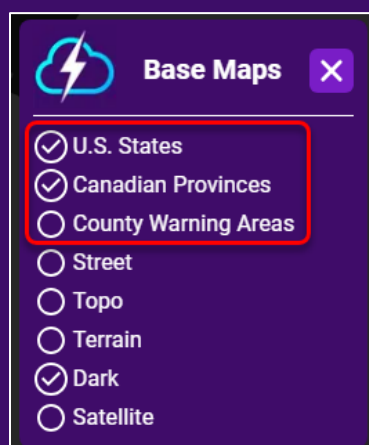
The Topo and Terrain base maps are best used to highlight the underlying terrain features. Specifically, mountain ranges show up nicely on these two maps. The Topo

⁴⁵ It is strongly suggested that all route planning begin with the map. Be sure to validate that the resulting route shown on the map is the expected proposed route used by the app.

⁴⁶ The Map option is not available from the EZWxBrief Home page sitemap menu.

map has the most detail of the two, however, it may be difficult to view some of the weather layers depending on the color and size of the layer item. The map with the greatest contrast and best viewing is the Dark map. This works the best when using **EZWxBrief** in a dimly lit environment, but also works well to provide contrast to the many items displayed on the map.

Lastly, the Satellite base map is useful to examine the airport environment to include the runway configuration. By zooming in on the map, a satellite view of the airport can be easily seen as shown on the right. Keep in mind, this image may be old and may not represent the most accurate depiction of the current airport environment. It is best to utilize official FAA-approved airport diagrams and not rely on the satellite view shown in **EZWxBrief**.



To augment the Base Maps mentioned above, the capability to select and outline the **U.S. States** and **Canadian Provinces** is provided. This renders a blue outline of the U.S. states and Canadian provinces over the selected base map. Additionally, the NWS County Warning Areas (CWAs) can be outlined over the base map. The U.S. states and County Warning Area maps are mutually exclusive. That is, selecting the County Warning Area option will deselect the U.S. states (if selected) and vice versa. The County Warning Areas are those regions that

define the forecast area for each of the various NWS local Weather Forecast Offices (WFO) throughout the United States and its territories. Meteorologists at these offices issue the Terminal Aerodrome Forecasts (TAFs) for airports residing within these areas and they also construct the Area Forecast Discussion (AFD) that describes the weather expected in their respective County Warning Area.

Zooming and panning

Integral to all interactive maps is the ability to pan and zoom. The map provides a zoom capability through a variety of different methods depending on the device running the app. First, the Map has a default **+** (zoom in) and **-** (zoom out) button (as shown to the right). Additionally, a Home button (shown at the bottom) will zoom the map out to its furthest extent and pan the map so that the United States is centered.



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 clicked⁴⁷. On a touch screen a standard two-finger pinch and zoom 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 quickly but might take a second or two to render the more complex layers (e.g., Radar).⁴⁸

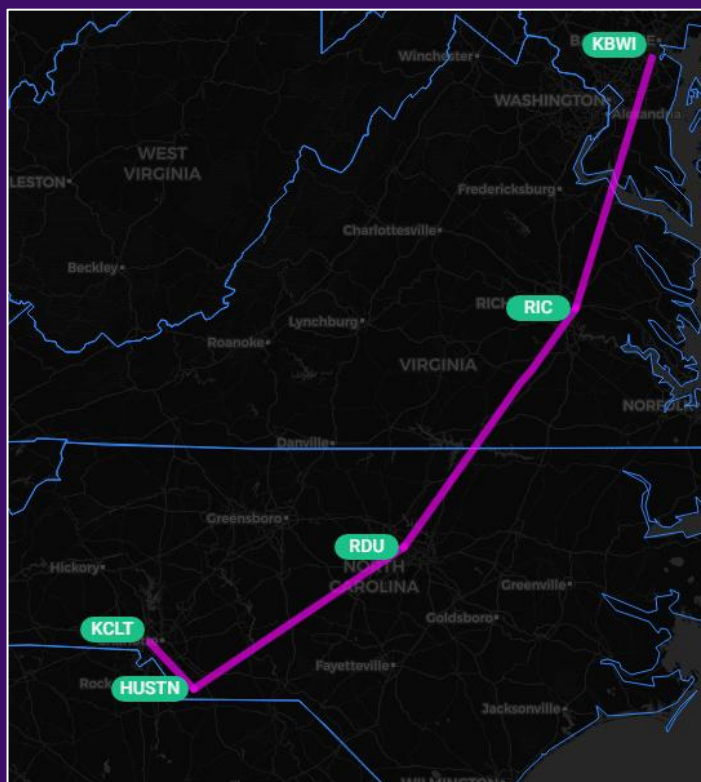
To pan the map, simply use a press-and-drag action with the left mouse button or finger. The map will pan (slide) in any direction that the cursor is moved while holding down the left mouse button or while pressing and dragging with a finger.

⁴⁷ There is not a zoom out mouse click action.

⁴⁸ There currently a bug in the mapping software used (i.e., Leaflet) for some touch screen devices. It is recommended that any pinch and zoom operation be done slowly. Fast pinch and zoom gestures will cause the app to reset or crash at times.

Route planning

Integral to the **EZWxBrief** progressive web app is the proposed route. Although there isn't a requirement to have an active route, one must be defined to leverage the vertical route profile and EZDeparture Advisor™. Only a single route can be active at any one time⁴⁹. The route is plotted on the map as a magenta line and the departure, destination and optional route waypoints are depicted in pale green as shown on the right.



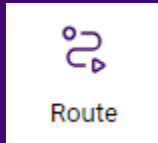
Given that, **EZWxBrief** is primarily an application primarily to assist pilots to minimize their exposure to adverse weather, it is not intended to provide full navigation and routing capabilities that may be available through a heavyweight Electronic Flight Bag (EFB) application (e.g., Garmin Pilot). The **EZWxBrief** database does, however, contain most private and public airports, VFR and IFR waypoints, intersections, NAVAIDs and other fixes in the conterminous United States, 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 that consists of one or more airport identifiers, intersections, fixes, navigation aids (NAVAIDs) and other waypoints.⁵⁰ The departure and destination can be the same airport as long as there is at least one other waypoint in the route of flight.⁵¹ Although there is no limit on how many waypoints that can be entered in the route of flight field, **it is recommended to utilize at most five.**⁵²

⁴⁹ Planned routes do not consider stopover times for refueling on longer flights.

⁵⁰ The departure and destination airports and other waypoints in the EZWxBrief database may not be current and should not be used for navigation purposes.

⁵¹ Zero-length legs are not permitted.

⁵² The application will be slower to respond as more waypoints are added to the route of flight.



From the **Map**, a new route can be created by pressing on the **Route** icon shown on the left.⁵³ This will open up the route editor shown on the right. The route editor consists of a row of buttons at the top to **Delete** the active route, **Reverse** the route, **Clear** the route editor back to its default and **Save** a valid route in a Saved Items folder. The route editor can be moved to any location on the Map as desired through a press and drag on the **Enter/Edit/Delete route** title bar. Pressing on the **X** in the upper right will close the route editor without making any changes to the active route and any changes made will be discarded.

A route consists of a **Departure** airport, optional **Route of Flight**, **Destination** airport, **Altitude** and an option to **Use Forecast Winds** aloft to calculate the effective groundspeed from the **Settings** (Aircraft Settings) for **True Airspeed**. Once a valid route is entered, press the **Open in Map** button to activate the route. The Map view will be opened (if not the current view) and the route will be rendered as a magenta line.

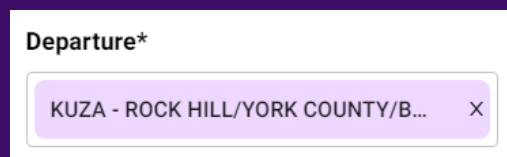
If no active route exists (default), first tap or click in the Departure or Destination field to focus the cursor and then enter the three-letter (FAA) or four-letter (ICAO) airport identifier⁵⁴ into the **Departure** and **Destination** airport fields. As two or more characters are entered, a "smart filter" like the one shown left lists matching airports (to include the identifier followed by the name of the airport).⁵⁵ Select one of the airport identifiers suggested to add the airport to the route. Alternatively, type the full identifier and press the **space bar** or **Enter** key to fill in the airport

⁵³ The route editor can be invoked using Recent Routes from the Dashboard and the Saved Items panel, as well as the Route Profile and Airport Wx views.

⁵⁴ Only airport identifiers can be entered for the departure and destination field. The departure and destination airports can be the same, but there must be at least one waypoint in the route of flight.

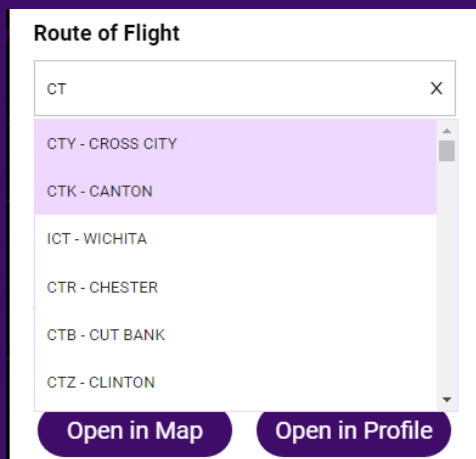
⁵⁵ It may take a second or two for the smart filter to begin making suggestions. Please be patient.

identifier. Valid identifiers will populate the Departure and Destination airport fields as shown on the right. Pressing the **X** at the end of the field will delete the identifier from the route to allow entry of a different airport identifier. "Identifier not found" will be shown below the field if the airport identifier entered is not discovered in the **EZWxBrief** aeronautical database.⁵⁶



Departure*

KUZA - ROCK HILL/YORK COUNTY/B... X



Route of Flight

CT X

CTY - CROSS CITY

CTX - CANTON

ICT - WICHITA

CTR - CHESTER

CTB - CUT BANK

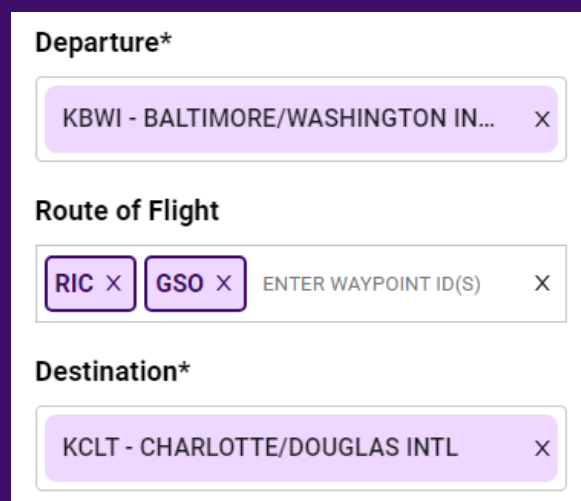
CTZ - CLINTON

Open in Map Open in Profile

An optional **Route of Flight** may also be entered. 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.⁵⁷ First, tap or click within the route of flight field to focus the cursor and then type the desired waypoint identifier. Similar to the **Departure** and **Destination** airport fields, a list of suggestions will include the identifier (or partial identifier) and the city/location so that

the correct identifier can be chosen. Pick the desired identifier from the list of suggested identifiers 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. Alternatively, typing the full identifier followed by the **space bar** will automatically enter the waypoint into the Route of Flight field. This allows a rapid succession of waypoints to be typed without the need to choose from the suggested list for each waypoint. In the example on the right, the route of flight consists of the Richmond (RIC) and Greensboro (GSO) VORs.

To remove a waypoint from the **Route of Flight** field, press the **X** positioned at the end of the waypoint identifier. This will remove that single waypoint from the list leaving behind the other waypoints (if any)



Departure*

KBWI - BALTIMORE/WASHINGTON IN... X

Route of Flight

RIC X GSO X ENTER WAYPOINT ID(S) X

Destination*

KCLT - CHARLOTTE/DOUGLAS INTL X

⁵⁶ This may be more problematic for nondomestic airports (e.g., Canada, Mexico, etc.).

⁵⁷ You cannot have duplicate waypoints in the route that create a zero-length leg.

in the **Route of Flight** field. To remove **all** waypoints in the **Route of Flight**, press the **X** at the end of the **Route of Flight** field.

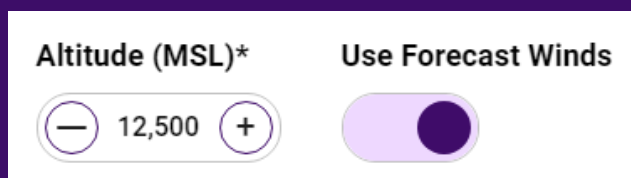
To add a waypoint prior to another previously entered waypoint, add the new waypoint **at the end of the list** and then press-and-drag the waypoint to the right location with the desired order. In other words, there's no option to **directly** enter a new waypoint prior to any other waypoint in the **Route of Flight** field.

After the Departure airport, Destination airport and optional Route of Flight are populated, choose the desired cruise altitude in 500-foot increments.⁵⁸ This altitude is used by the EZDeparture

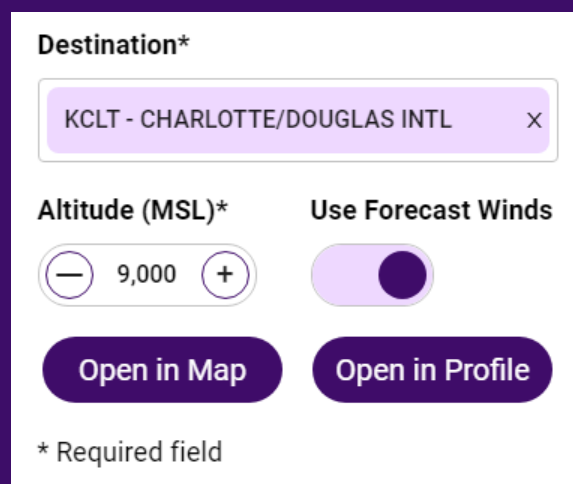
Advisor™ to evaluate personal weather minimums such as en route icing and turbulence along the proposed route. To change the altitude, tap or click within the field to focus the cursor for editing. For minor adjustments, the altitude can be changed by pressing on the **(-)** or **(+)** to decrease or increase the altitude, respectively, in increments of 500 feet.

By default, the route editor will assume a “zero wind” calculation. In other words, the True Airspeed established in the Settings will be used as the groundspeed to calculate the duration of the flight independent of the winds aloft. If desired, the **Use Forecast Winds** toggle shown above can be set (moved to the right) to calculate the groundspeed using the forecast winds aloft at the altitude chosen.⁵⁹

Once a valid route and altitude is entered, press the **Open in Map** button to activate the route and render a great circle route line on the Map.⁶⁰ Alternatively, press the **Open in Profile** button to activate and open the route in the Route Profile page. This also



This image shows a section of the flight planning interface. It features a label 'Altitude (MSL)*' followed by a numeric input field containing '12,500'. On either side of the field are circular buttons with minus and plus signs. To the right is a toggle switch labeled 'Use Forecast Winds', which is currently turned on (the slider is to the right).



This image shows a larger section of the flight planning interface. At the top is a text input field labeled 'Destination*' containing 'KCLT - CHARLOTTE/DOUGLAS INTL' and a clear button (X). Below this are the same 'Altitude (MSL)*' and 'Use Forecast Winds' controls seen in the previous image, but with the altitude set to '9,000'. At the bottom are two large, rounded rectangular buttons: 'Open in Map' and 'Open in Profile'. A footnote '* Required field' is located at the bottom left of this section.

⁵⁸ An altitude is always required and is defaulted to 10,000 feet MSL.

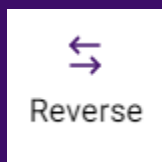
⁵⁹ At this time, the True Airspeed does not factor in the climb or descent profile.

⁶⁰ Great circle routes are calculated between each leg.

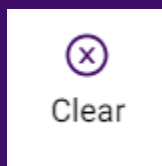
evaluates the route against the personal minimums to render in the EZDeparture Advisor™.

If an active route currently exists, the departure, destination, route of flight and altitude fields will be populated using the values from the most recent route.⁶¹ To edit the departure or destination airport, simply press 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.

Reversing and clearing routes

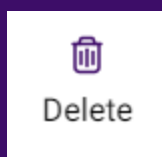


To reverse the current route in the route editor, press the **Reverse** button shown on the left that is located at the top of the route editor. This will swap the destination and departure airports and will also reverse the route of flight waypoints (if any). Press the **Open in Map** button to activate this new route.



To empty the fields within the route editor simply press the **Clear** button shown on the left that is located at the top of 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** toggle will be set to off.

Deleting a route

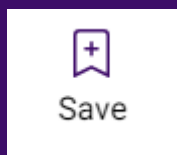


The route editor provides the capability to delete the active route if one exists. There is no specific reason to delete a route given that a route is necessary for the EZDeparture Advisor™ to evaluate the personal minimums and to populate data in the vertical route profile. Nevertheless, to delete the active route, click on the **Delete** button as shown on the left that is located at the top of the route editor. A confirmation dialog will appear to be sure you want to delete the active route. 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 Map and reset the EZDeparture Advisor™ to the "no route" instance.⁶² Note, if the **Delete** operation is performed while viewing the Route Profile view, it will automatically navigate to the **Map** view since there's no route to show.

⁶¹ Or the route is launched using a Recent Route or from the Saved Items folders.

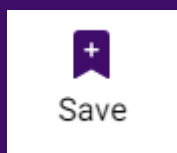
⁶² The EZDeparture Advisor will show all gray blocks when no active route exists.

Saved routes

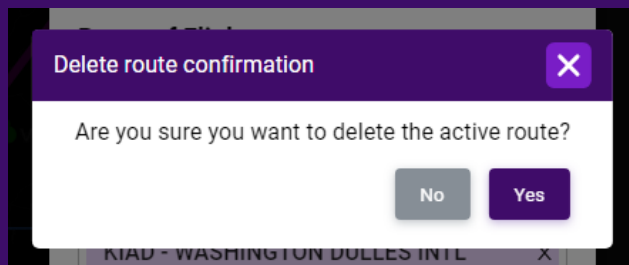


Routes can be saved to the **EZWxBrief** root folder, existing custom folder or a new custom folder. Also, saved routes can be opened in the Map or Route Profile views. Once a complete route has been defined,

press the **Save** button at the top of the route editor. 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 a route is saved, **EZWxBrief** will search through all saved folders to determine if the exact route exists.⁶³ If so, it will make



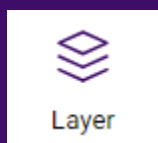
the **Save** icon solid as shown on the left indicating that it is saved in one or more folders. When the saved route is modified in any way (e.g., remove or add a waypoint or change the Departure or Destination airport or altitude), it will turn the **Save** icon from a filled icon to unfilled.



To edit a saved route, open the Saved Items panel (gear icon) in the masthead and find the route of interest in the **EZWxBrief** root folder or any of the custom folders. Press on that route and select **View in Map** or **View in Profile** from the menu. This will make the saved route active and open the route in the Map or Route Profile view, respectively.

Layer selector

EZWxBrief provides the capability to add one or more weather layers to the **Map**. There are three classes 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 and the forecast radar layer.



To add or remove a weather layer on the **Map**, press the **Layer** selector button shown on the left to reveal the **Map Layers** menu. To select a layer, press the circle to the left of the desired layer name. The circle will show a

⁶³ An exact route is one that has the same Departure airport, route of flight, destination airport and altitude.

check mark if the layer is selected. Shown right, the Station Markers layer is the only layer selected.

Multiple layers can be overlaid 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.

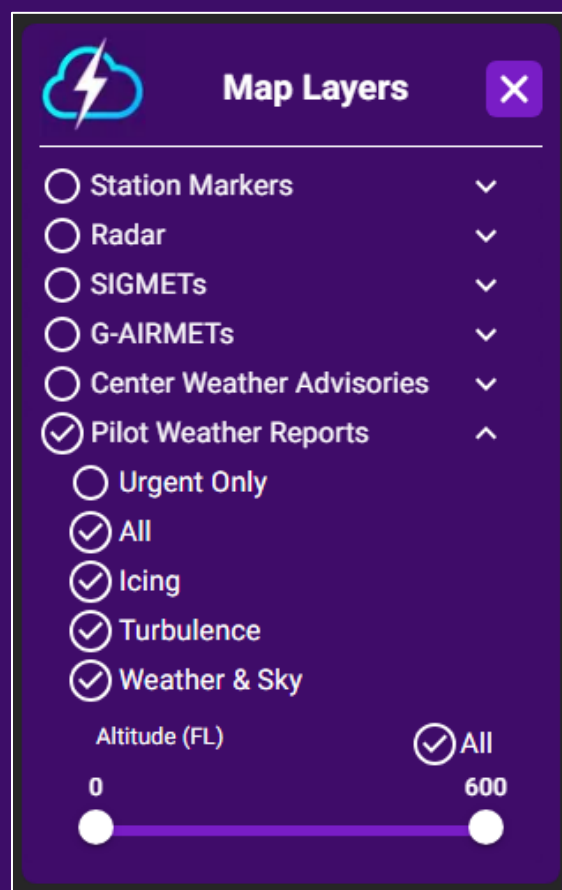
Therefore, it is recommended to minimize this complexity by limiting the number of layers displayed simultaneously to no more than two or three.

Each layer has one or more attributes. Pressing the down-pointing caret to the right of the layer's name will expand the layer to show the available attributes for that layer. For example, the PIREPs layer shown on the right has attributes to filter the PIREPs on the Map by type and altitude.

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 airports⁶⁴. **EZWxBrief** provides access to both surface observations (METARs) and the proprietary EZForecast for many airports throughout the U.S, Canada, Mexico, and northern Caribbean Sea.

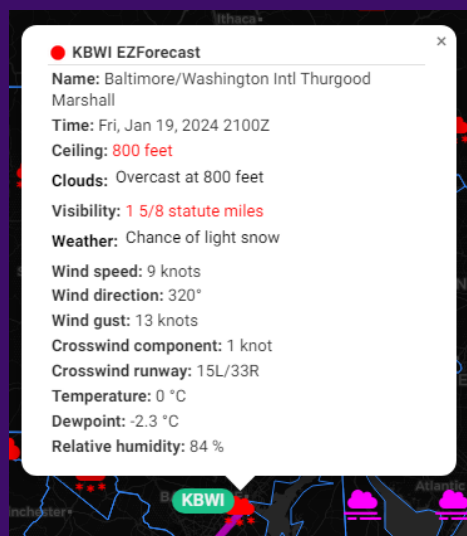
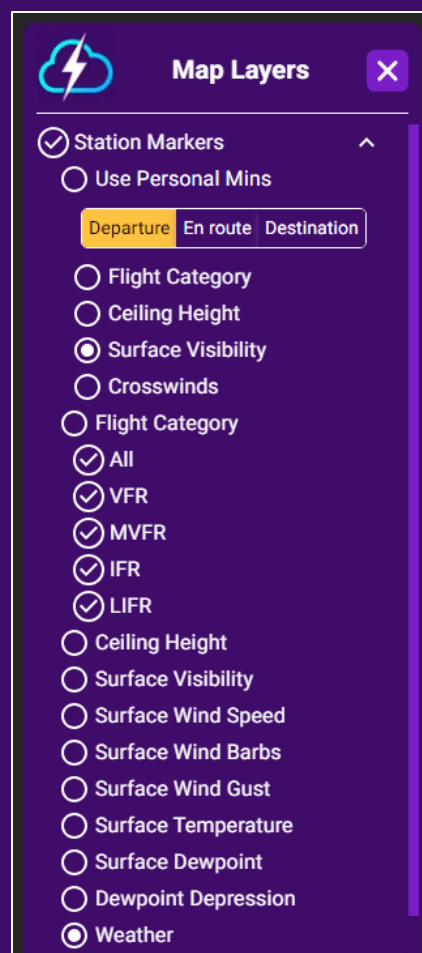
To view the latest METARs or EZForecast, press the **Layer** selector button and select **Station Markers** from the menu. This will



⁶⁴ 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.

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, Wind Barbs, Surface Temperature, Surface Dewpoint, Dewpoint Depression and Weather. These filters are valid for both surface 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 rendered on the **Map**.

Surface observation markers are displayed on the Map based on their observation time. For example, if an observation was issued at 1753Z, it won't be rendered on the Map until the EZDeparture Advisor™ is set to 1800Z.⁶⁵ As the departure time is advanced, this marker will remain on the Map for a duration of 75 minutes after the observation time unless a more recent observation become available for the station or the EZForecast is available to replace it.



The EZForecast markers, on the other hand, are valid at hourly intervals. For example, if the forecast is valid at 1800Z, it will remain on the Map until the next hourly forecast is available at 1900Z. Therefore, advancing the departure time by one hour at a time will update all of the markers on the Map for each forecast in the future.

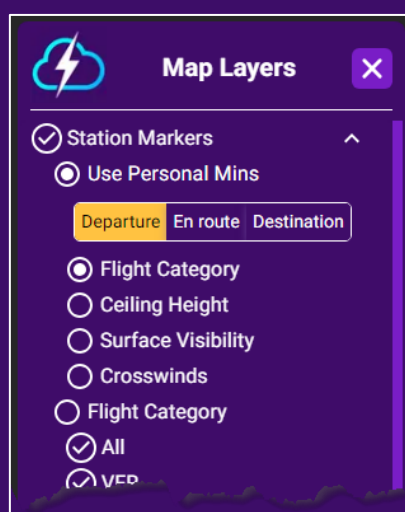
Pressing any station marker on the Map will provide the details of the surface observation or EZForecast in a tabular display (shown left) for that station. With or without an active route, the forecast

associated with the Station Marker depicted on the Map are valid at the time set on the EZDeparture Advisor™ and are independent of the proposed route of flight. Therefore, if

⁶⁵ The departure times have a 10 minute temporal resolution on the EZDeparture Advisor™.

the EZDeparture Advisor™ is set at 21Z, then the forecast provided by every Station Marker on the **Map** is also valid at 21Z.⁶⁶

The top line of the tabular display shows the flight category marker (VFR/green, MVFR/blue, IFR/red and LIFR/magenta) followed by the station identifier and type (i.e., surface observation or EZForecast). The tabular data includes the name of the airport, valid time of the observation or forecast followed by any pertinent weather data from the observation or forecast that also includes density altitude (observations only), crosswind component for the best opportunity runway and the best opportunity crosswind runway used in the crosswind calculation.



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 Settings. Four attributes are available to include flight category,⁶⁷ ceiling height, surface visibility and crosswinds. Moreover, this can be applied to the **Departure** minimums, **En route** minimums or **Destination** minimums accordingly. The result will be a solid-filled marker using the traffic light concept outlined in the Settings section of this guide and correspond to the table below. Please note that the

application of these personal minimums applies only for the time set on the EZDeparture Advisor™ regardless if an active route is defined or not.

Category	Shape ⁶⁸	Personal minimum risk (low, moderate and high)
Green	Circle	Satisfies the threshold with a conservative margin (low risk)
Yellow	Square	Approaches the threshold (moderate risk)
Red	Triangle	Falls below the threshold (high risk)

For example, this layer can be used to determine a suitable **alternate** airport.⁶⁹ Assume the EZDeparture Advisor™ is set to 1800Z and the attributes are set to use the (1) Flight Category for the (2) Destination airport personal minimums. **EZWxBrief** will examine the

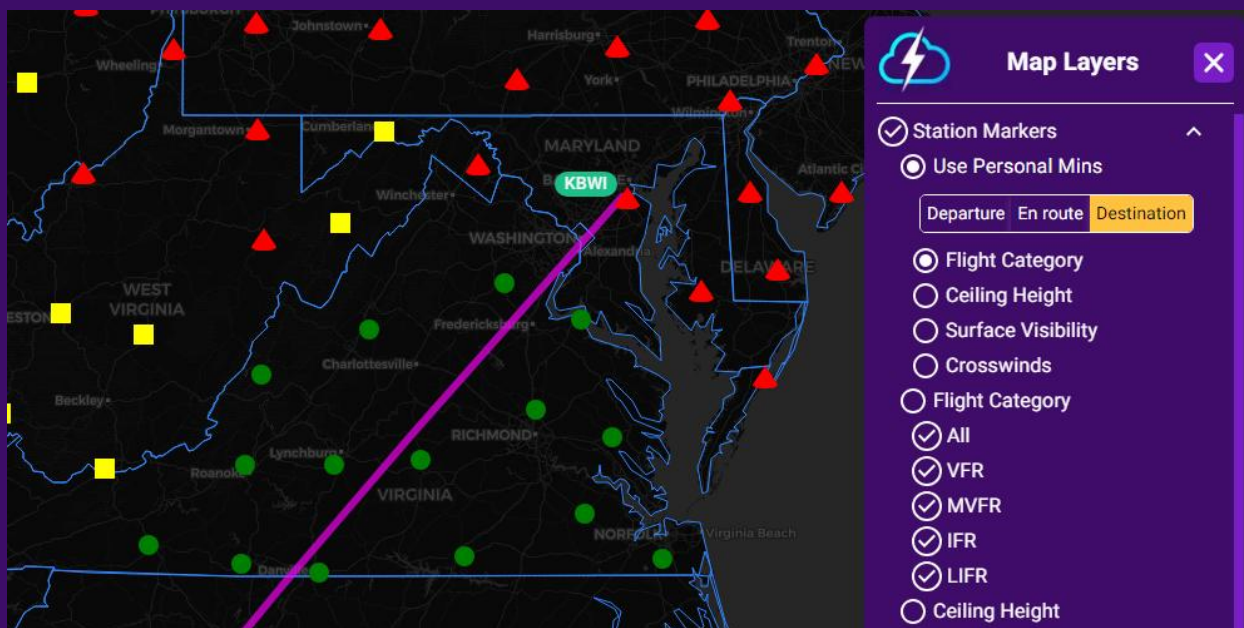
⁶⁶ Observations such as METARs and PIREPs are valid at the time shown in the tabular data pop-up.

⁶⁷ Flight category combines the categorical ceiling height and categorical surface visibility.

⁶⁸ In addition to colors, shapes are used for accessibility for color-blind users.

⁶⁹ Whether or not an airport makes a legal alternate depends on many factors that are not considered by this application at this time.

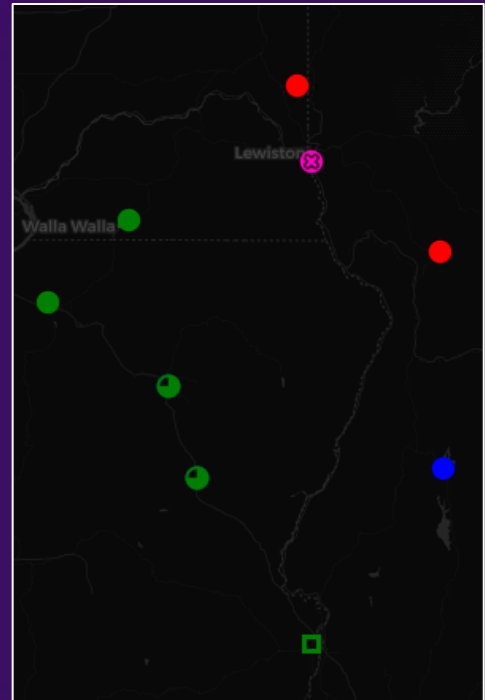
EZForecast or observations for all stations to determine if the station's flight category falls within the **green**, **yellow** or **red** category defined within the departure airport Personal Minimum Settings. Stations on the **Map** that display as a solid-filled **red** triangle are likely not suitable 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** square may also be a suitable alternate, but these airports should be used with caution. **Note that the result depends strictly on the thresholds defined in the Personal Minimums Settings.**



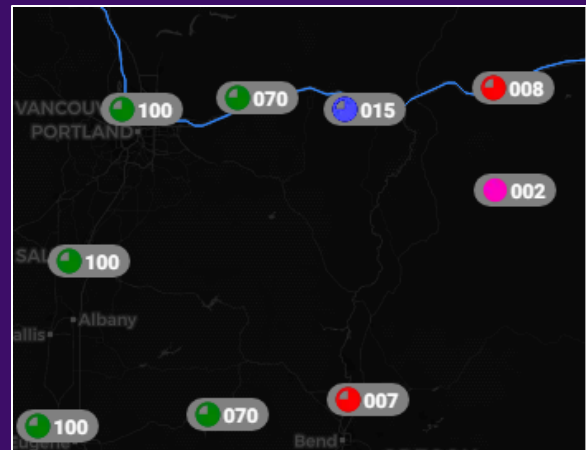
Flight Category – this provides the capability to filter the markers based on the current or forecast flight category. As shown in the table below the flight category can be one of four values to include Low Instrument Flight Rules (LIFR) shown in magenta, Instrument Flight Rules (IFR) shown in red, Marginal Visual Flight Rules (MVFR) shown in blue and Visual Flight Rules (VFR) shown in green. 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)
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

The flight category marker is rendered on the Map 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 departure 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.⁷⁰ Indefinite ceilings are shown as a circular marker with an **X** in the center. When the sky cover or flight category cannot be determined from the surface observation or forecast,⁷¹ the marker will be shown as a black dashed circle⁷² for observations or gray solid circle for the EZForecast.



Ceiling Height – This is the prevailing ceiling height⁷³ in hundreds of feet reported or forecast for the station based on the time selected from the EZDeparture Advisor™. Also included is a fully- or three-quarters-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.⁷⁴ It's important to note that if a ceiling is not reported or forecast, the station's marker will be omitted for this layer.



⁷⁰ These are typically automated surface observations.

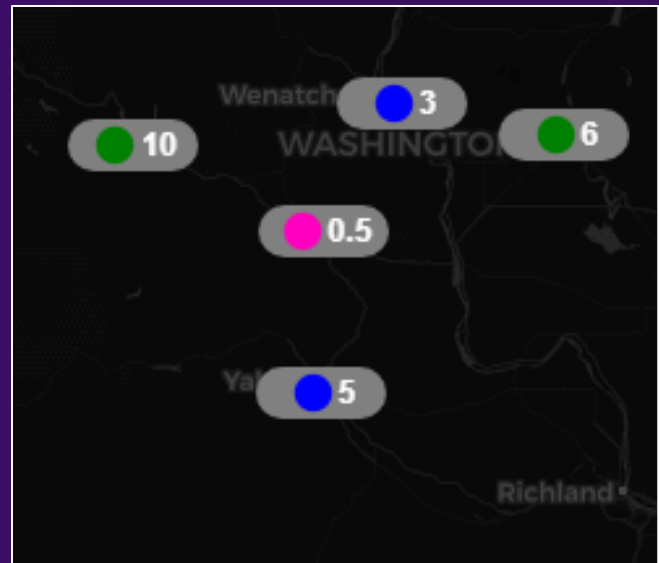
⁷¹ This situation typically occurs when the ceiling, visibility or sky coverage is missing from the observation or forecast for the station.

⁷² This does not show up on the Dark base map.

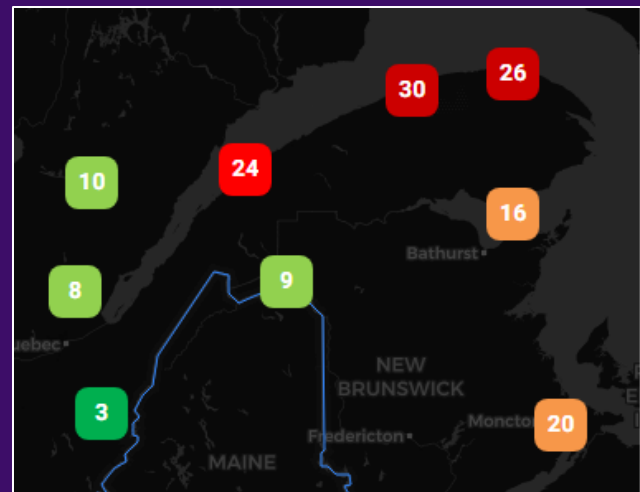
⁷³ Ceiling heights and heights of clouds are always reported or forecast as above ground level (AGL) height.

⁷⁴ This is also called an indefinite ceiling. Forecasts do not consider the potential of indefinite ceilings.

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 visibility unit preference chosen in the General Settings. 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).

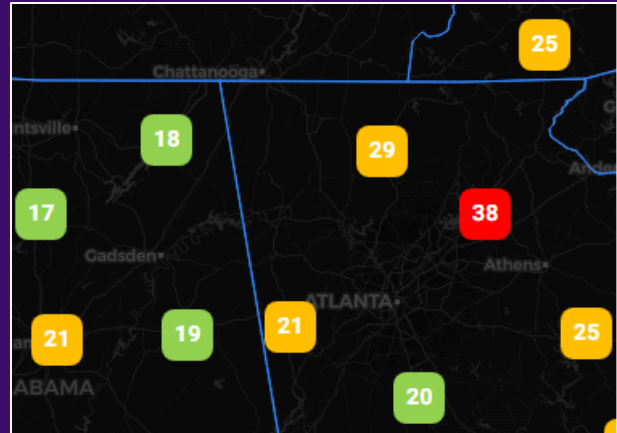


Surface Wind Speed – This square marker is the prevailing surface wind speed reported or forecast for the station based on the time selected from the EZDeparture Advisor™. For the forecast, this uses the 10-meter (33 feet) AGL wind speed. This can be displayed in knots or miles per hour depending on the wind speed unit preference chosen in the General Settings. 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 wind speed unit preference chosen in the General Settings. The marker is color-coded for the

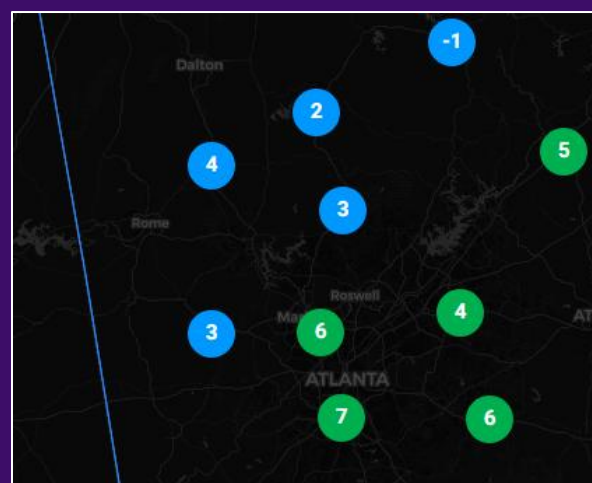
magnitude of the wind gust. Shades of **green** represent a wind gust at or below 20 knots. When the wind gust increases, warm colors such as **yellow**, **orange**, or **red** denote wind gusts in excess of 20 knots. If a wind gust is not reported or forecast, the station's marker will be omitted for 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.



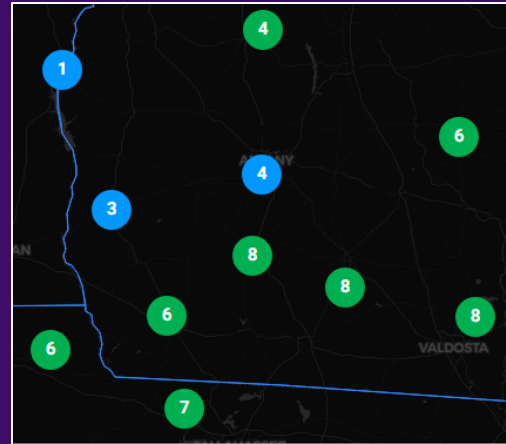
Surface Wind Barbs – This marker represents a graphical depiction of the reported or forecast wind speed and wind direction using standard wind barbs (knots) for the time selected from the EZDeparture Advisor™. For the forecast, this uses the 10-meter (33 feet) AGL wind direction. This represents the 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.



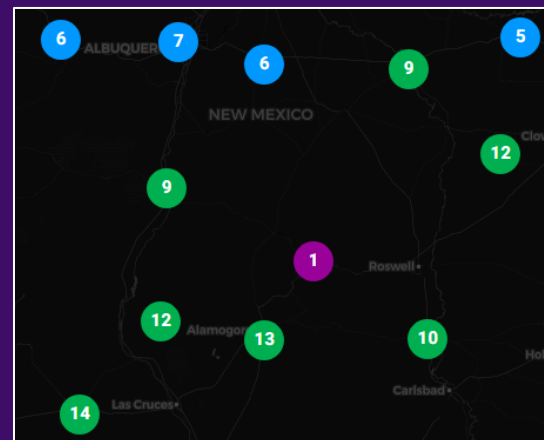
Surface Temperature – This round marker is the surface temperature reported or forecast for the station based on the time selected from the EZDeparture Advisor™. This can be displayed in degrees Fahrenheit or Celsius depending on the temperature unit preference chosen in the General Settings. Cooler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



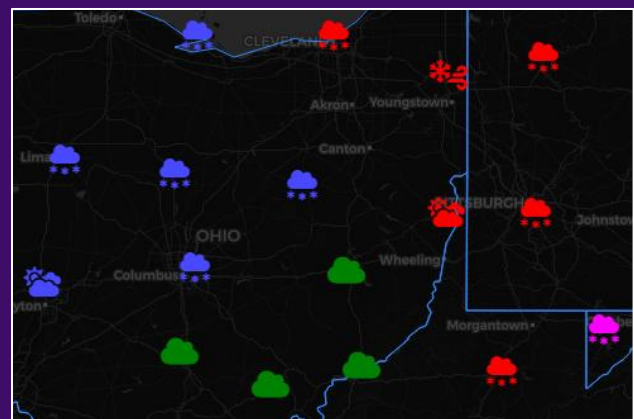
Surface Dewpoint – This round marker is the surface dewpoint temperature reported or forecast for the airport based on the time selected from the EZDeparture Advisor™. This can be displayed in degrees Fahrenheit or Celsius depending on the temperature unit preference chosen in the General Settings. Cooler 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 based on the temperature units preference chosen in the General Settings. 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.



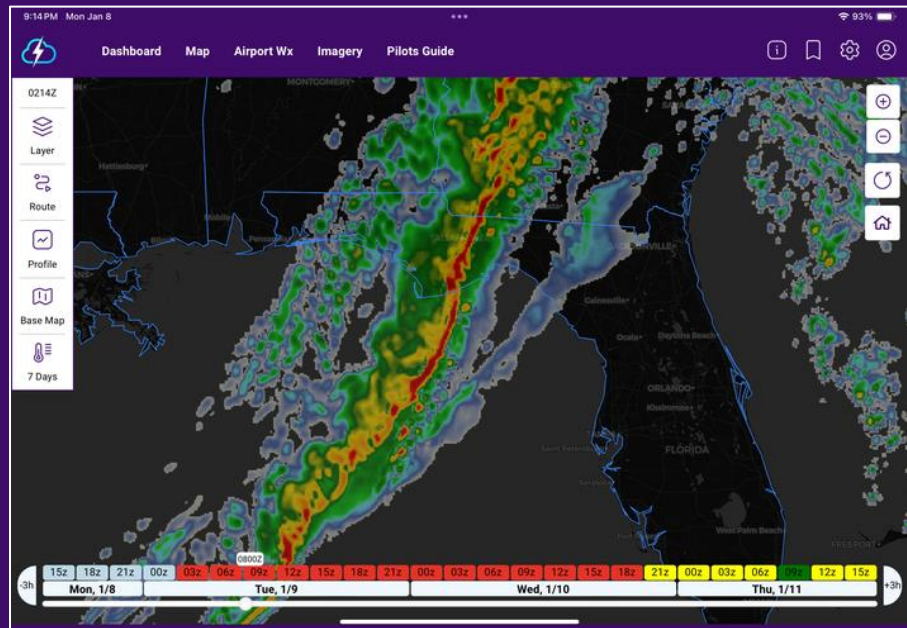
Weather – This is the predominant or present weather depiction observed or forecast for the station based on the time selected from the EZDeparture Advisor™. Stations where the weather is unknown or missing are color coded as a gray icon or for missing as a question mark. When windy or gusty conditions 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

This layer provides the most recent 30 minutes of the NEXRAD 0.5-degree base reflectivity mosaic⁷⁵ for the conterminous U.S and coastal waters, Alaska, Hawaii and Puerto Rico is available with a loop at 10-minute intervals.



Additionally, the forecast radar mosaic from the High Resolution Rapid Refresh (HRRR) like that shown above is provided over the next 36 hours. The forecast is available in 15 minute intervals for the first 18 hours and then at a one hour interval through 36 hours. 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 highly trained 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:

⁷⁵ 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.

- a. Severe airframe icing not associated with convection
- b. Severe or extreme turbulence or clear air turbulence (CAT) not associated with convection
- c. Dust storms or sandstorms lowering surface or in-flight visibilities to below 3 statute miles

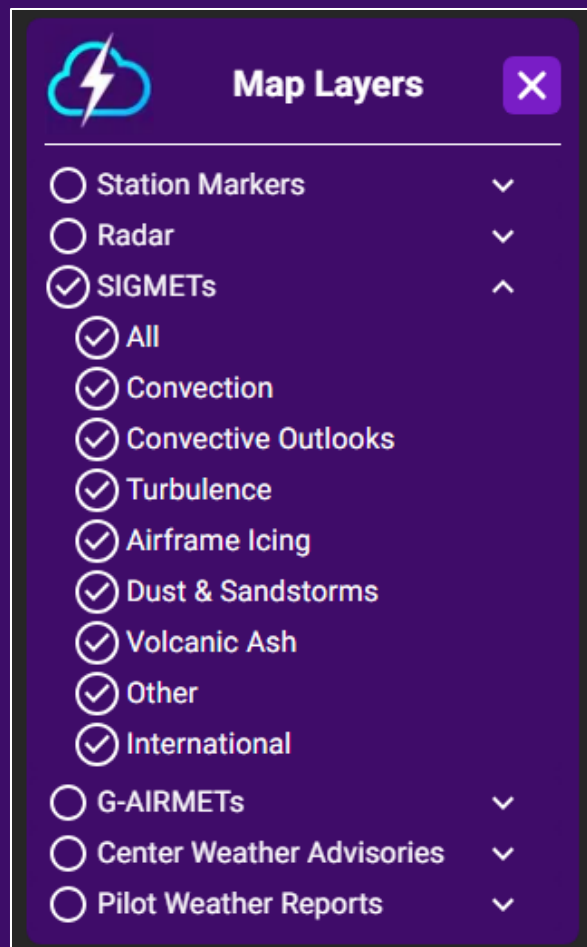
and of:

- 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.

SIGMETs are **not** routinely issued and have no defined schedule. Therefore, it is possible to have no active SIGMETs available to add to the Map. SIGMETs for severe or extreme turbulence and airframe icing often live and die by pilot weather reports. In other words, they are typically not issued until pilots begin reporting those hazardous conditions. In fact, the SIGMET text will often include a remark such as **RPTD BY ACFT** or **RPTD BY B767**. 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. SIGMETs can be canceled at any time if the conditions are later found to be more moderate rather than severe.

To view the latest SIGMET(s), the EZDeparture Advisor™ needs to be positioned to a departure time that falls within the valid period of the active



SIGMET(s). To view SIGMETs, press on the **Layer** selector button and select **SIGMETs** from the menu. If the SIGMET attributes are not expanded, press the downward-pointing caret on the right to show the attributes. This list of SIGMET attribute filters is based on the possible weather hazards to include Convection, Convective Outlooks,⁷⁶ Turbulence, Airframe Icing, Dust & Sandstorms, Volcanic Ash, International and Other.⁷⁷

Select one or more of these filters or choose **All** to display all SIGMETs⁷⁸ that are currently active for the time selected. Note that if the EZDeparture Advisor™ is advanced to the left or right beyond the SIGMET's valid time, they will be subsequently hidden from view since the time set is not within the valid time of the SIGMET. Note that only the latest SIGMETs are shown on the Map and a historical record of those SIGMETs is only available through a static imagery collection.

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 Map as a red-colored polygon, like the turbulence SIGMET shown on the right, regardless of the weather or hazard. Each polygon will have a label that describes the SIGMET type (e.g., TURB). A press 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 **S**ignificant **M**eteorological Information (SIGMET) is a textual forecast issued by highly trained meteorologists at the Aviation Weather Center (AWC) and describes the occurrence or expected occurrence of



⁷⁶ Convective Outlooks are technically not SIGMETs, but they are included in the SIGMETs attribute filter given they are closely related to Convective SIGMETs.

⁷⁷ 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.

⁷⁸ This includes Convective SIGMETs and International SIGMETs.

thunderstorms⁷⁹ 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 Map. 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:

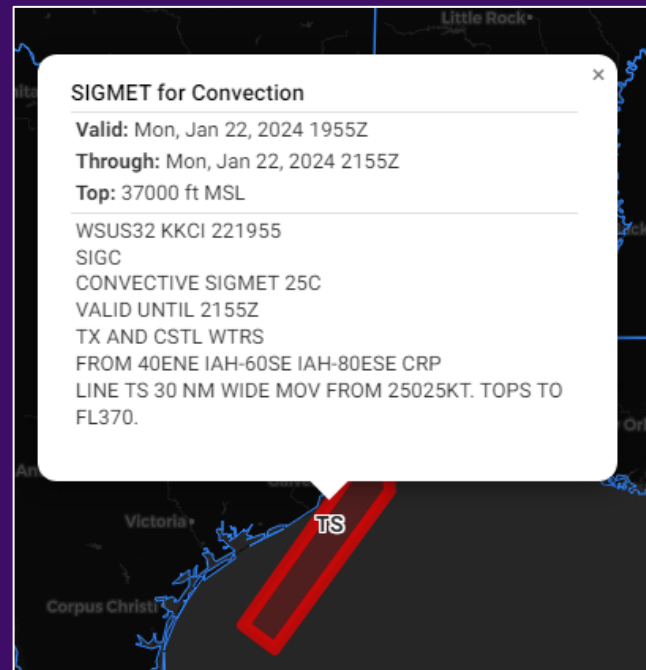
- a. Tornado, hail greater than or equal to 3/4th inch diameter,⁸⁰ or wind gusts of 50 knots or more is reported or indicated when the previous convective SIGMET did not mention severe thunderstorms.
- b. Indications of rapidly changing conditions, if in the forecaster's judgement, they are not sufficiently described in existing SIGMETs.

⁷⁹ 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.

⁸⁰ The National Weather Service (NWS) defines severe hail as 1 inch in diameter or greater.

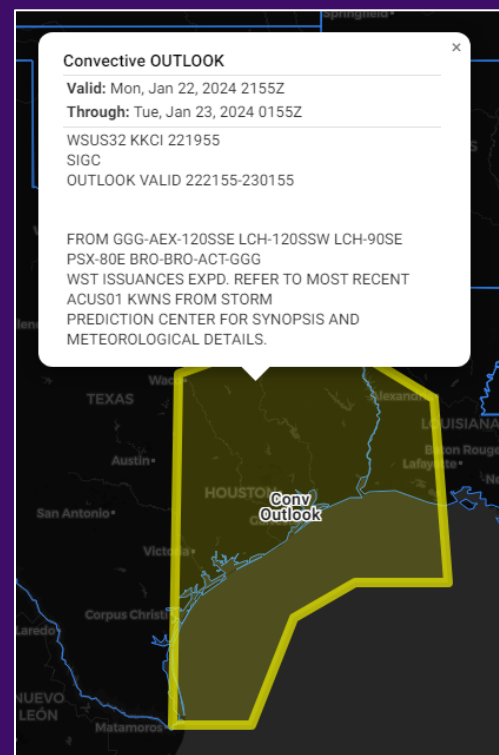
To view the latest convective SIGMET(s), the EZDeparture Advisor™ needs to be positioned to a time that falls within the valid period of the convective SIGMET(s). Press the **Layer** selector button and select **SIGMETs** from the menu. This will present a list of SIGMET attribute filters based on the 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 Map as a **red**-colored polygon. Each polygon will be labelled with **TS**. Pressing on the 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 departure time that falls within the **valid period** of the convective outlook(s). Press 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 **Convective Outlooks** to turn on any active convective outlooks.⁸¹

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 Map as a **yellow**-colored polygon and are labeled as **Conv Outlook**. Pressing on a convective 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 immediate coastal waters 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 hours⁸². 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

⁸¹ 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.

⁸² The issuance time and valid times of International SIGMETs vary with country.

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 Map, they are depicted as a red polygon with a label similar to other convective and nonconvective SIGMETs.

To view the latest international SIGMET(s), the EZDeparture Advisor™ needs to be positioned to a departure time that falls within the valid period of the SIGMET(s). Press 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 Map 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 09Z, 3-hour forecast valid at 12Z, 6-hour forecast valid at 15Z, 9-hour forecast valid at 18Z and a 12-hour forecast valid at 21Z. Unlike the legacy AIRMET⁸³ 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.

⁸³ 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. The legacy AIRMET text will be eliminated in 2025.

G-AIRMETs are advisories for widespread⁸⁴ hazardous weather that includes moderate nonconvective turbulence (Hi and Lo), moderate nonconvective airframe icing, multiple freezing levels,⁸⁵ nonconvective 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 Map. 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 MSL⁸⁶
- TurbLo – Turbulence at or **below** 18,000 feet MSL
- Icing – Airframe icing
- Frz – Multiple freezing levels
- LLWS – Nonconvective low level wind shear below 2,000 feet AGL
- 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 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.

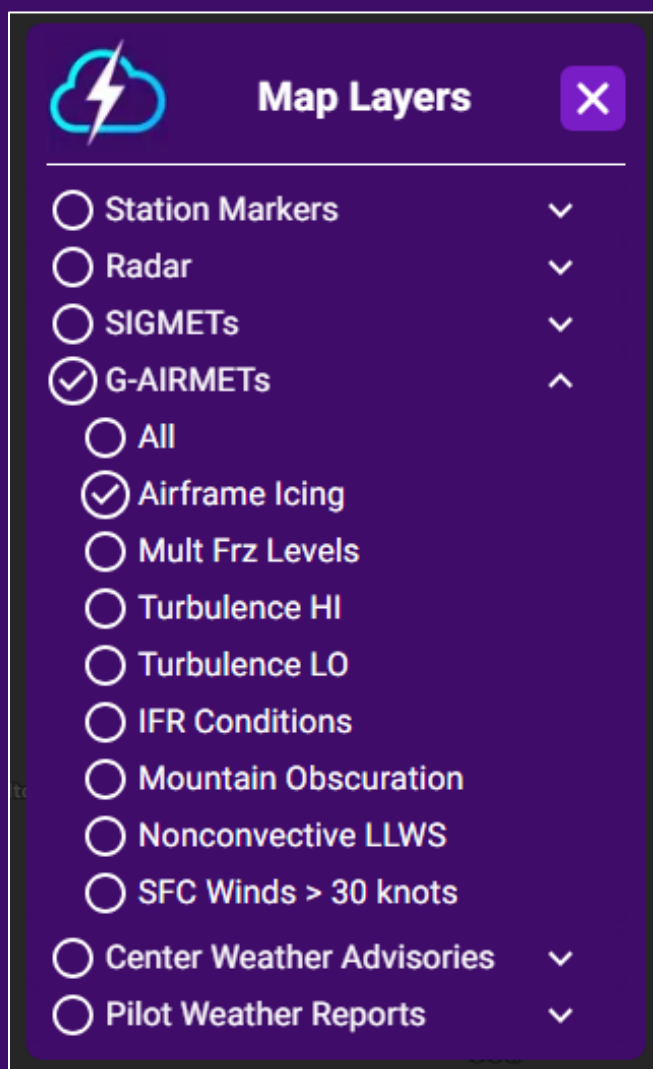
The non-convective LLWS G-AIRMET depicts regions where the winds from the surface to 2,000 feet AGL increase rapidly through the wind shear layer. Note this is not a forecast for turbulence or associated with thunderstorms or deep, moist convection. In

⁸⁴ Widespread is an area covering at least 3,000 square miles (~60% the size of the state of Connecticut).

⁸⁵ EZWxBrief does not provide a layer that depicts the freezing level G-AIRMET. The freezing level forecast G-AIRMET can be found in the Imagery view.

⁸⁶ The 18,000 feet separation between TurbHi and TurbLo is somewhat arbitrary. Depending on the situation, forecasters are permitted to issue a TurbLo G-AIRMET with the top of the turbulence above 18,000 feet MSL. Similarly, with a TurbHi, forecasters can issue a base below 18,000 feet MSL.

many cases the air may be very smooth especially when the phenomenon occurs in the overnight or early morning hours.



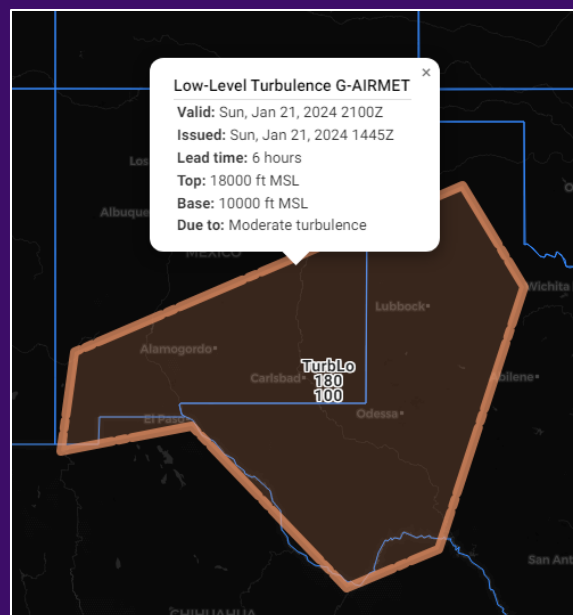
The multiple freezing levels G-AIRMET depicts regions where two or more freezing levels exist. This is not a forecast for airframe ice, however. In fact, it could be in a region where the sky is clear or the likelihood of icing is extremely low. However, in regions where precipitation and icing are likely,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

To view the latest G-AIRMETS, the EZDeparture Advisor™ needs to be positioned to a departure time that falls within the valid time of the active G-AIRMETS.⁸⁷ Press 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,

Multiple Freezing Levels, Turbulence Hi, Turbulence Lo, IFR Conditions, Mountain Obscuration, Nonconvective LLWS and SFC Winds > 30 knots. Select one or more of these filters to display the G-AIRMETS that are currently active for the time selected. Note that if the time is advanced beyond the valid period of the G-AIRMETS, they will be removed from the Map display.

⁸⁷ 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 any departure time from 1200Z to 1459Z.

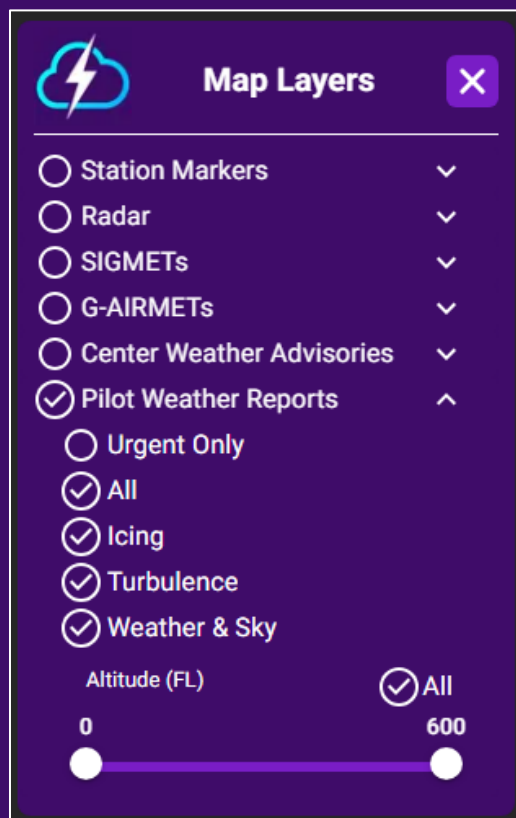
G-AIRMETs are issued as a graphical product and do not have a textual description similar to the legacy AIRMET or SIGMET. Instead, many G-AIRMETs include metadata. For example, G-AIRMETs for mountain obscuration includes one or more obscuring phenomena such as PCPN (precipitation), FU (smoke) or HZ (haze).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



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 PIREPs, press 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.⁸⁸ 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 selecting the **Urgent Only** filter. This will filter out all reports except those that are classified as urgent.



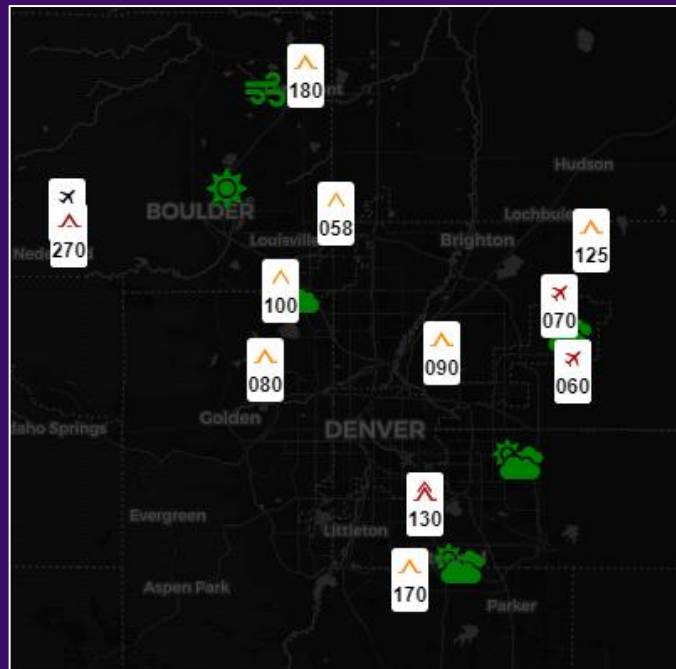
⁸⁸ These are typically reports that do not include turbulence or icing reports (e.g., wind, visibility, or cloud heights).

For PIREPs to be visible on the Map, the departure time needs to be set to a time that is within the most recent twelve hours. As the departure time is advanced from left to right, a PIREP marker will remain on the Map for a duration of 75 minutes after the time the report was issued.

Pilot weather reports can also be filtered based on altitude. 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 between⁸⁹ 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 **600** (flight level 600 or 60,000 feet MSL). If the pilot weather report does not identify an altitude⁹⁰, it will always be shown regardless of the settings on the altitude filter. Select the **All** option 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.

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

Like the one shown on the right, weather reports are shown as markers on the Map 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.⁹¹



⁸⁹ The altitudes set are inclusive.

⁹⁰ This often occurs when the pilot weather report is DURD (during descent) or DURC (during climb).

⁹¹ This includes reports of severe or extreme turbulence, severe icing or low-level wind shear.

	ICE	TURB
NONE	∅	∅
TRACE	U	
TRACE-LIGHT	W	
SMOOTH-LIGHT		--
LIGHT	W	^
LIGHT-MODERATE	W	^
MODERATE	W	^
MODERATE-SEVERE	W	^
SEVERE	W	^
SEVERE-EXTREME		^
EXTREME		^

Specifically, icing and turbulence icons are chosen based on the intensity of icing or turbulence experienced by the pilot or crew.⁹² As shown on the left, icing reports are depicted as blue icons, turbulence reports are depicted as tan icons and weather & sky are depicted as a black icon resembling an airliner. A negative report for icing or turbulence is depicted as a blue or tan null symbol,⁹³ 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. In the example shown on the right, this PIREP

contains a report of moderate turbulence and light icing at FL100.



Note the attribute filters are additive. For example, if only the **Icing** attribute filter is selected and the altitude filter is set from 100 to 200, all PIREPs will be filtered except those reports for icing between FL100 (10,000 feet) and FL200 (20,000 feet) where the issuance time is within the previous 75 minutes. Keep in mind, the filter chosen may create a scenario where no PIREP markers are displayed for the time set in the EZDeparture Advisor™.

Pressing on the pilot weather report marker shown on the Map will invoke a pop up containing a decoded tabular report followed by the raw coded report like the one 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

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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.⁹⁴ CWAs are not routinely issued and have no defined schedule.

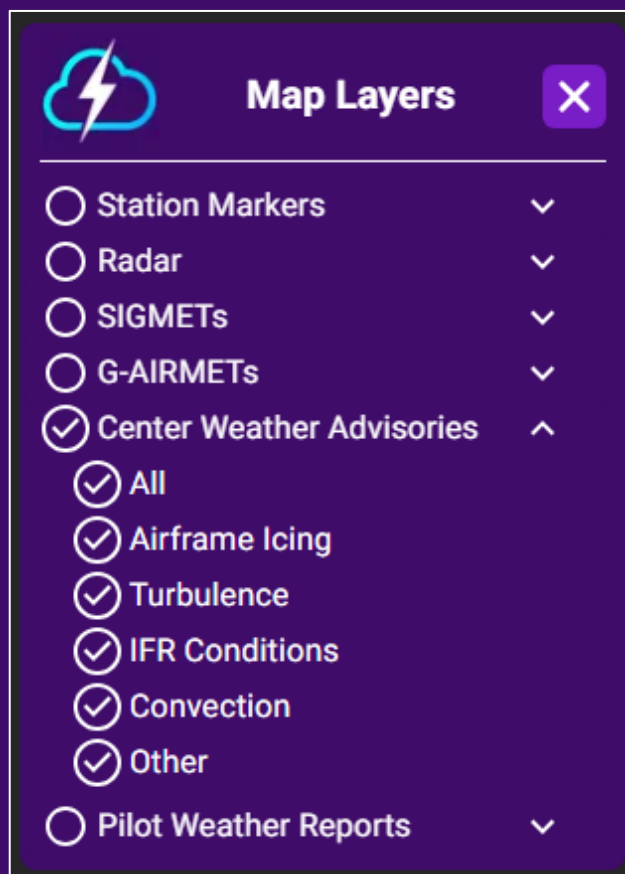
⁹² It is worth noting that pilot weather reports are highly subjective.

⁹³ A null symbol is a circle with a slash through the center.

⁹⁴ Note that EZWxBrief does not provide access to the Meteorological Impact Statement (MIS) also issued by meteorologists at the CWSUs.

Therefore, it is quite common to have no active CWAs available to add to the Map. Moreover, they have a very short lead time and are typically valid for a two-hour period from the time they are issued. CWAs tend to be complimentary to the G-AIRMETs 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.

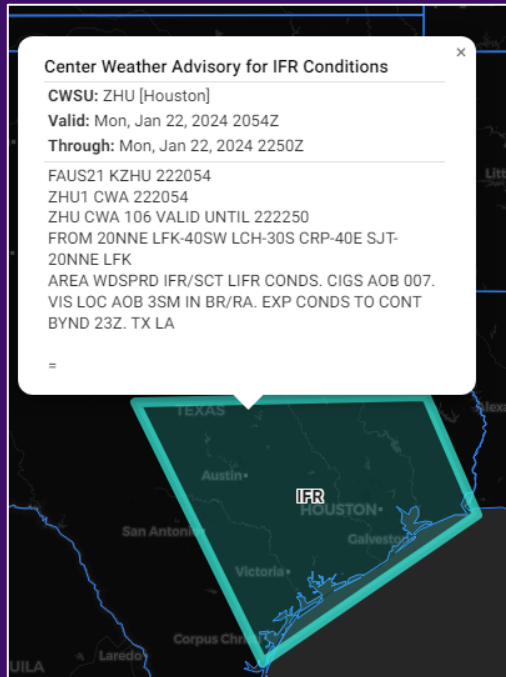
To view the latest CWA(s), the EZDeparture Advisor™ needs to be positioned to a time that falls within the valid period of the CWA(s).⁹⁵ Press the **Layer** selector button and select **Center Weather Advisories** from the Map Layers menu. As shown on the right, this will present a list of CWA attribute filters based on the possible weather hazards to include Airframe Icing, Turbulence, IFR Conditions, Convection and Other⁹⁶. 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 momentarily shown⁹⁷. Note that if the time is advanced beyond the valid period of the CWA(s), they will be removed from the Map view.



⁹⁵ Only the latest CWAs issued are rendered. EZWxBrief does not store a historical record of CWAs.

⁹⁶ 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.

⁹⁷ 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.



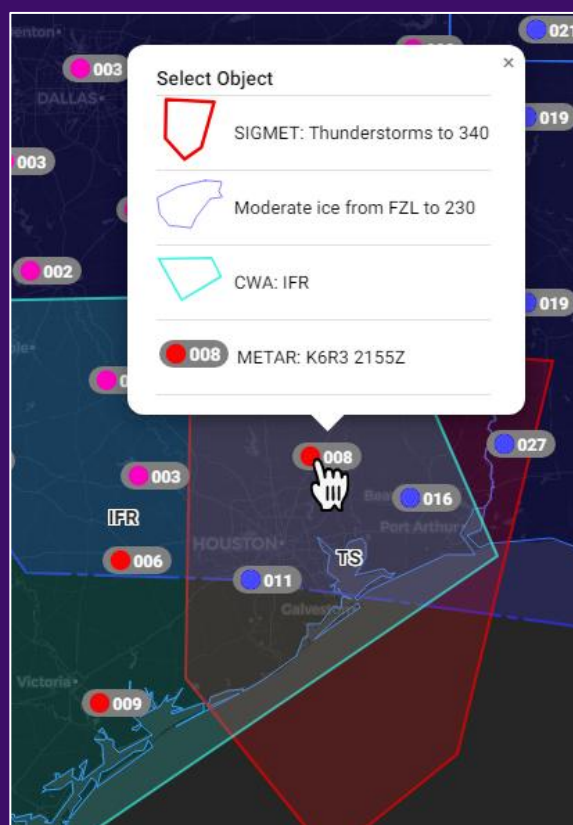
While CWAs are issued by meteorologists as a textual forecast, they describe georeferenced areas of hazardous weather that can ordinarily be rendered as polygons. As shown on the left, all CWAs are depicted on the Map as a cyan-colored polygon regardless of the intensity of weather or hazard described. This is to distinguish them from other advisories that often augment SIGMETs and G-AIRMETs. Each polygon will have a label that describes the CWA type (e.g., IFR). They can be issued for in-flight weather hazards to include, conditions meeting or expected 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 press on a CWA polygon will invoke a tabular description for that CWA along with the raw CWA rendered at the bottom.

Map disambiguitiy

Polygons, markers or other elements depicted on the Map 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, pressing on the element may be unambiguous when choosing a single polygon (e.g., a SIGMET), station marker or pilot weather report. This will result in a tabular description to show the supporting information for that marker or polygon.

However, when multiple layers are added and two or more objects in those layers overlap, pressing a location on the Map may be ambiguous. When this occurs, a disambiguitiy menu like the one shown above will list all of the relevant objects at the point selected on the Map. In this example, pressing the ceiling marker labeled **008**, shows four objects to include a convective SIGMET, G-AIRMET, CWA and the METAR for the 6R3 airport. From this menu, select the one of interest to show the associated tabular description.



Map refresh

When possible, EZWxBrief caches data in the browser to limit the amount of time it takes to navigate through the application. When a new route is created or a route is updated or any **Settings** are changed, the data shown on the Map and EZDeparture Advisor™ are once again retrieved from the database and refreshed on the display. At any time, the data on the Map can be refreshed manually by pressing the **Refresh** button.⁹⁸



⁹⁸ Note that the Refresh button will only affect the Map Layers currently rendered will not trigger EZWxBrief to reevaluate of the personal minimum thresholds for the EZDeparture Advisor™.

EZDeparture Advisor™

The heart and soul of the **EZWxBrief** application is the EZDeparture Advisor™. It is designed to evaluate all of the user's relevant personal weather minimums against the forecast weather **along the entire proposed route of flight** to determine the overall flight risk for ceiling height, surface visibility, surface crosswind component, airframe icing, turbulence and convective potential. This means that it is factoring in the groundspeed⁹⁹ and taking into consideration the weather that is expected to occur when you arrive at the various segment points along the route and at the destination.

The EZDeparture Advisor™ is made available only when a route has been activated. It appears at the bottom of the **Map** and **Route Profile** views. The EZDeparture Advisor™ consists of **three** basic components. The first is the departure time slider at the bottom. The departure time is set by moving the slider handle left and right. To advance the time, press and hold the handle and move it to the right. This advances the time of departure at a ten-minute interval and will change the data presented on the Map or Route Profile accordingly.¹⁰⁰ Similarly, press and hold the handle and move it to the left to decrement the departure time at a ten-minute interval. Pressing on the +1h or -1h buttons on each end of the EZDeparture Advisor™ will increment or decrement the departure time by one hour, respectively. Pressing on any of the summary blocks will advance the departure time to the time shown on the block.



Immediately above the time slider is the date bar that is coincident with the time slider. This date bar includes the day of the week, month and day of the month (e.g., Tue, 1/23). Above the date bar is a time series of summary blocks colored red, yellow, green

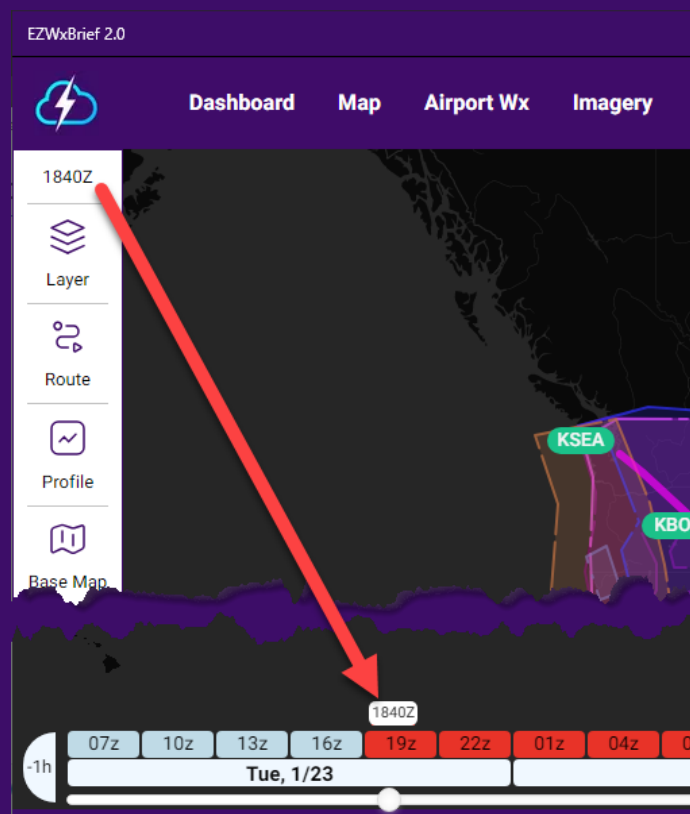
⁹⁹ In the route editor, an option is present to use forecast winds aloft in the calculation of the groundspeed. Otherwise, the true airspeed will be used based on the value in the settings.

¹⁰⁰ 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 66 and 72 hours on most flights.

or gray.¹⁰¹ This represents the evaluation of the flight risk based on the personal weather minimums as defined in the settings (gear icon in the masthead). If no route exists, the summary blocks will be all gray when viewing the Map.

As the slider is moved, a time label that sits above the summary blocks also moves in tandem and indicates the exact time of departure that is chosen. Times shown in the EZDeparture Advisor™ can be set to display Zulu time or local (device) time. The time units are determined by the **Time Display** preference in the **General Settings**. If a **Z** is appended to the time, this means the time preference is set to **Zulu**, otherwise it is local (device) time.

When the EZDeparture Advisor™ is shown for the first time, the slider handle will be placed at the current time as shown on the right. As the departure time is changed during normal use, **EZWxBrief** will remember the last departure selected. If the app is closed or the you navigate within the app to other views (e.g., Airport Wx, Dashboard, etc.), upon returning to the Map (or Route Profile) view, the time slider handle will be placed at this last known departure time. If the last known departure time is outside of the range of the EZDeparture Advisor™, then it will once again be placed at the current time.¹⁰²

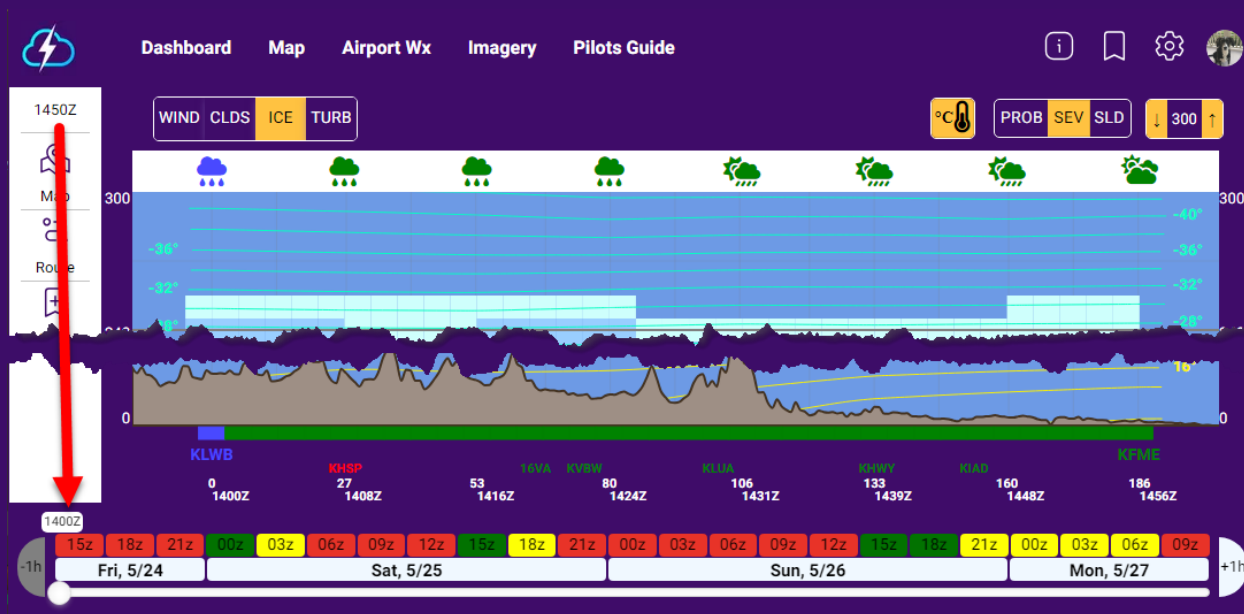


The EZDeparture Advisor™ has an important difference depending on whether it is depicted at the bottom of the **Map** view versus the bottom of the **Route Profile** view. For the **Route Profile** view, the first possible time (left-most position) will always begin with the time representing the top of the most recent hour. For example, if the current

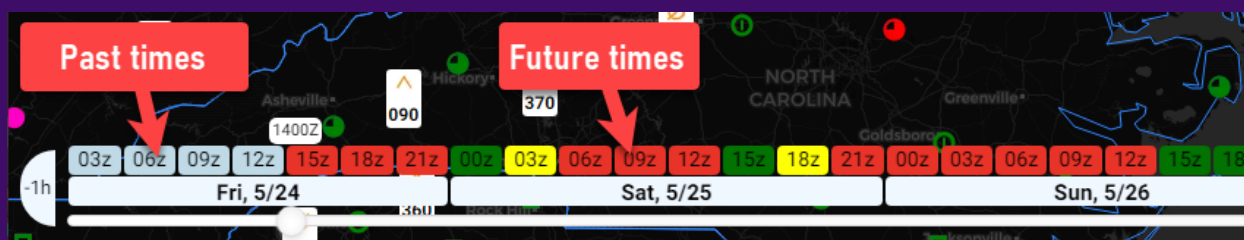
¹⁰¹ A gray rectangle indicates that the specific personal minimum category could not be evaluated for the departure time. This is usually due to missing forecast elements or when the departure time is in the past twelve hours.

¹⁰² This will most often occur when the app has been closed for a period time and then restarted.

time is 1450Z as shown below, the first selectable departure time will be 1400Z.¹⁰³ The maximum lead time available with the EZDeparture Advisor™ is 72 hours.¹⁰⁴ This, however, will depend on the duration of the route and availability of forecast guidance. Longer routes will shorten the maximum lead time available since the arrival time at the destination airport cannot exceed the forecast guidance available (e.g., ~72 hours).



For the **Map** view, departure times include the current time as well as times that extend up to twelve hours prior to the current time. This is to account for historic observational data such as pilot weather reports (PIREPs), surface observations (METARs) and advisories such as G-AIRMETs, SIGMETs and CWAs that have a current issuance time in the recent past. These prior times show up as gray summary blocks. The maximum lead time of the EZDeparture Advisor™ is 72 hours when no active route exists.



The EZDeparture Advisor™ works by examining the **entire** route of flight **and also factors in the flight's calculated duration**¹⁰⁵ to look for any weather conditions that

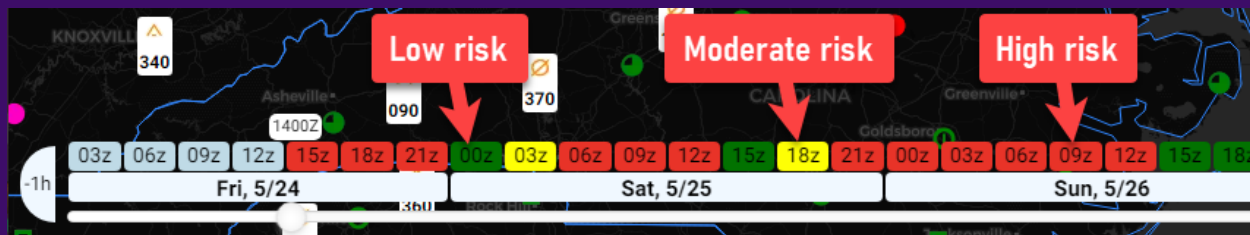
¹⁰³ Departure times in the past are not available for the Route Profile view.

¹⁰⁴ The maximum lead time is the limit that the departure time can be advanced into the future.

¹⁰⁵ This is based on the true air speed setting or ground speed calculated for the flight, if selected.

meet or exceed the personal weather minimums for the entire route. This is done for each possible time of departure.¹⁰⁶

To provide a high glance value, **EZWxBrief** uses a simple traffic light concept to quantify the risk based on the personal weather minimums previously set by the user.¹⁰⁷ **Red** represents **high** risk, **yellow** represents **moderate** risk and **green** represents **low** risk. The color of the three-hour summary blocks is determined based on the evaluation of the personal weather minimum categories for the associated time of departure.¹⁰⁸ The time label shown on the summary block is the middle time of that three-hour range. In the example below, the departure time is set to 1400Z. Therefore, the **green summary** block that is labeled as 00Z describes the evaluation of the user's personal minimums to include the times of 23Z, 00Z and 01Z.



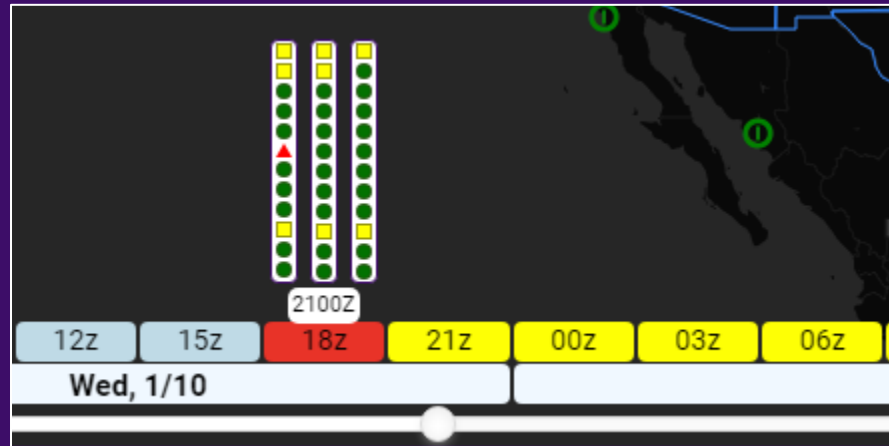
If the summary block is **red** this means that **one or more** personal weather minimum categories evaluate to a **high** risk **within that three-hour time frame** and not just at the time labeled on the block. A **yellow** block means there's one or more personal weather minimum categories that evaluates to a **moderate** risk for those three hours and a **green** block means that all categories in that three-hour time range meet the conservative **low**-risk personal weather minimums. A light gray block has two meanings. For the Map, gray blocks will appear for all times in the past twelve hours. For departure times in the future to be gray means that the EZDeparture Advisor™ could not evaluate the personal minimums for the entire three-hour block of time. This may occur due to an unlikely outage of the base weather data along the route used to evaluate the personal minimums.

¹⁰⁶ Normally 66 hours.

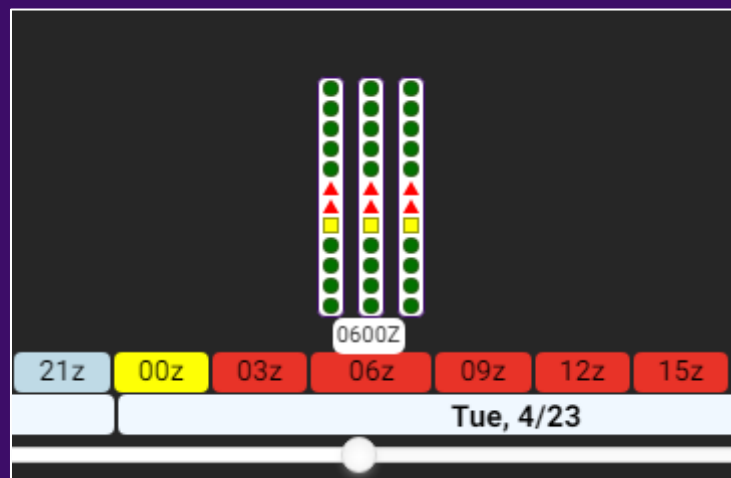
¹⁰⁷ Personal weather minimums can be changed in the Settings panel.

¹⁰⁸ The entire duration of the route is considered when determining the specific color of the summary block.

As the departure time is changed, or in the example below, when hovering the cursor over any of the three-hour summary blocks using a mouse,¹⁰⁹ three columns will appear above that block that depict all twelve personal minimums for the departure time (center column) as well as the twelve personal minimums for the previous hour (left column) and the subsequent hour (right column).¹¹⁰



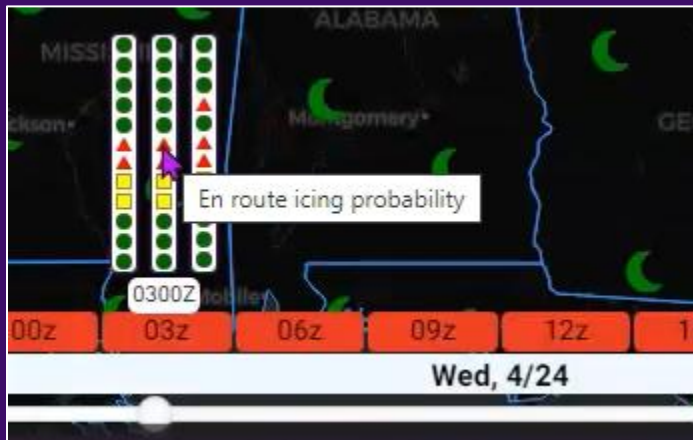
Columns containing all **green** dots will depict a departure time that meets all of the conservative personal minimum settings and represents a **low** risk for the proposed route. In contrast, a departure time with columns containing one or more **red** triangles indicate one or more personal weather minimum categories have exceeded the threshold(s) previously defined in the personal minimum settings. Such a result highlights a **high** risk for the proposed route of flight for that departure time. Lastly, any departure time with one or more **yellow** squares (but with no red triangles) indicate that all of the personal minimums have been met, but perhaps not by a significant margin represents a **moderate** risk for the flight. The EZDeparture Advisor™ evaluates the proposed route for each personal weather minimum category and for each possible departure time over the next 72 hours.¹¹¹



¹⁰⁹ On a touch screen, a single tap will perform the same function as hovering using a mouse. A second tap on that block will advance the time slider to the departure time labeled on the block.

¹¹⁰ To support color-blind users, shapes are used in addition to colors for each column of personal minimums.

¹¹¹ 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 slightly more than 72 possible departure times and longer routes may have less.

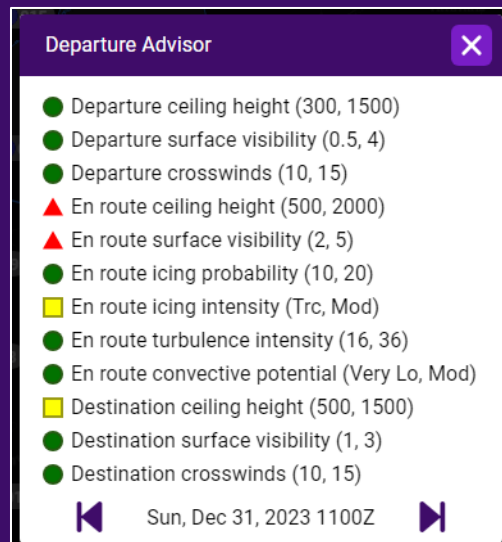


The rows in the EZDeparture Advisor columns are ordered by the phase of flight, that is, departure, en route and arrival from top to bottom. The top three rows define the personal weather minimum categories for (1) ceiling height, (2) surface visibility and (3) surface crosswinds at the **departure** 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 hover the mouse over any dot in a column and a tool tip will be displayed to see the specific personal weather minimum category for that row as shown on the left.¹¹²

A gray square on the EZDeparture Advisor™ implies that insufficient forecast guidance is available to evaluate the personal weather minimum for the given departure time over the entire duration of the flight. This will always be the case for turbulence and airframe icing evaluations for departure times beyond 18 and 21 hours, respectively.

Pressing on any of the three columns will enumerate the details for the time of departure listed on the respective summary block like the one shown on the right. Pressing the forward and back arrows shown at the bottom will increase or decrease the departure time by one hour, respectively, without the need to move the time slider.¹¹³ As a reference, the settings for each personal minimum category will be shown in parentheses. The actual weather that



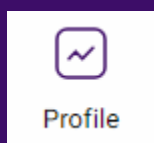
¹¹² This feature is not available without a mouse (i.e., touch screen devices).

¹¹³ This action, however, will not change the time that is set on the time slider.

caused a particular color to appear can be determined by examining the **Route Profile** for ceiling, visibility, turbulence, icing and convection along the proposed route of flight.

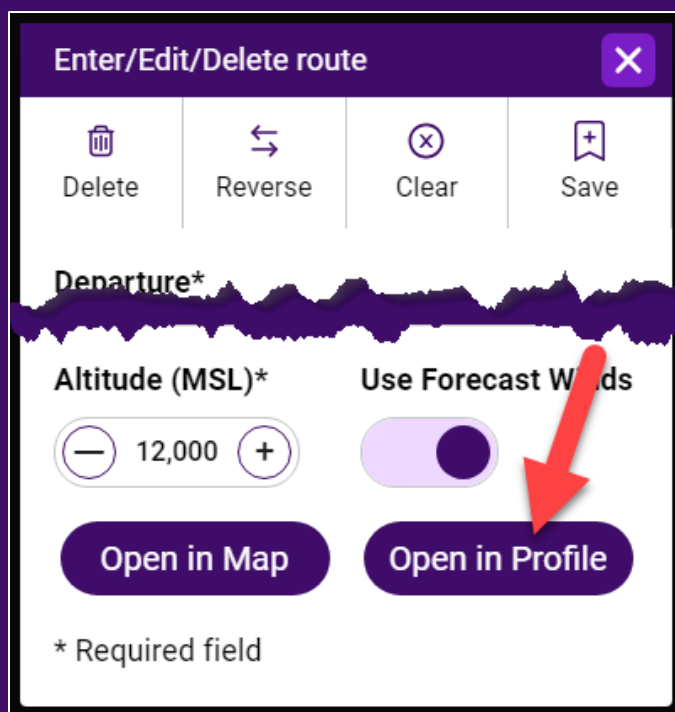
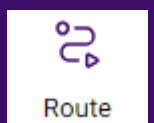
Route profile view

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 three days. This includes exposure to adverse weather such as airframe icing, turbulence, low ceilings, reduced surface visibility, and convection and provides access to winds and temperature aloft.



To use the Route Profile, a route consisting of a departure airport, destination airport,

optional route of flight and altitude must be activated using the route editor. Once an active route is defined¹¹⁴ and rendered on the Map, press the **Profile** button that is available from the Map view. This will navigate to the **Route Profile** view and will render the vertical cross section for the active route based on the departure time set within the EZDeparture Advisor™. Note that the

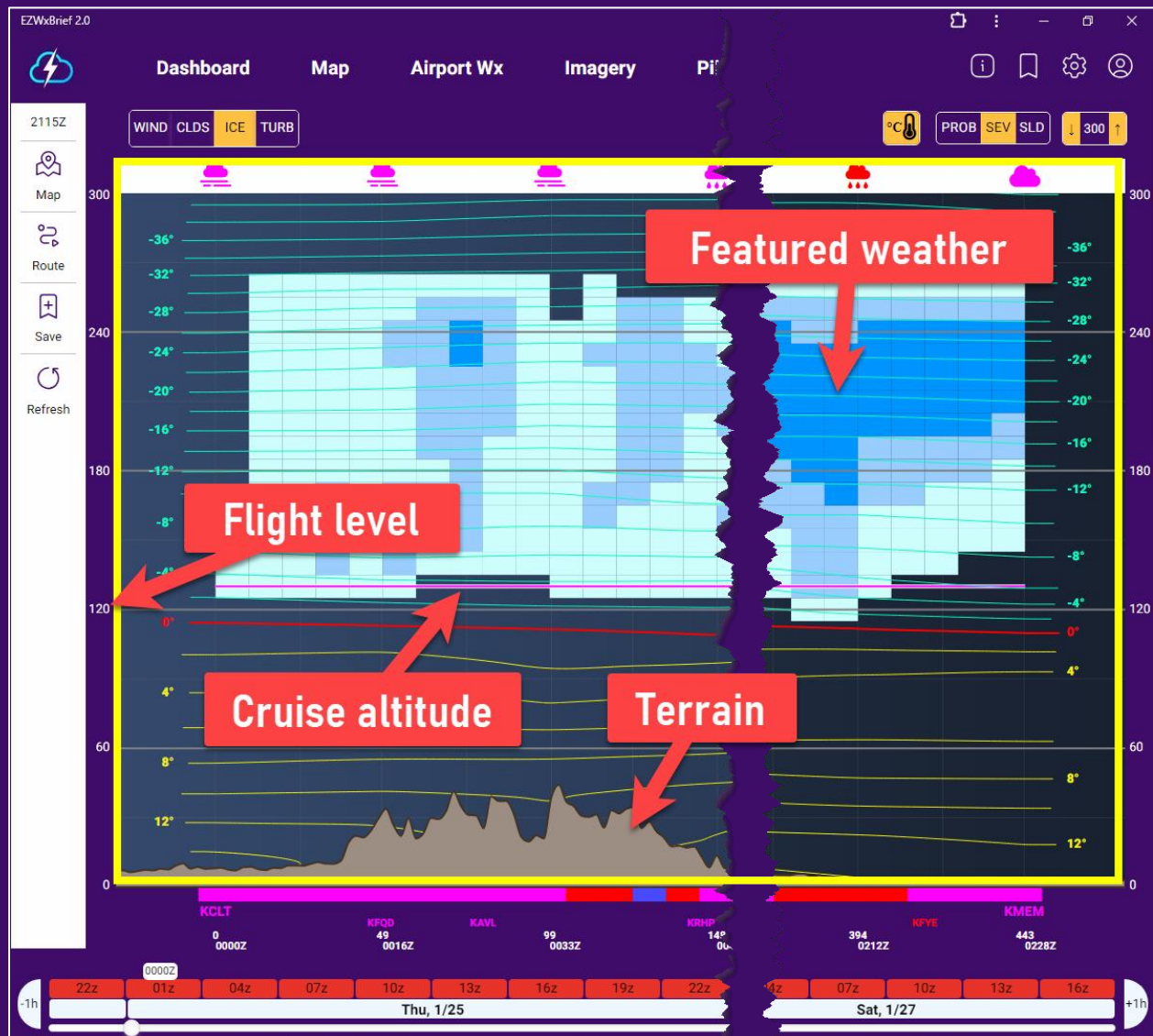
A screenshot of the "Enter/Edit/Delete route" interface. At the top, there's a title bar with a close button (X). Below it are four buttons: "Delete" (trash icon), "Reverse" (double arrow icon), "Clear" (X in circle icon), and "Save" (bookmark icon). The main area has a "Departure*" field with a map icon. Below that is an "Altitude (MSL)*" field with a minus button, the value "12,000", and a plus button. To the right is a "Use Forecast Winds" toggle switch, which is currently turned on. At the bottom are two large buttons: "Open in Map" and "Open in Profile". A red arrow points to the "Open in Profile" button. A footnote at the bottom says "* Required field".

the route can be modified or deleted using the route editor. If a route is deleted when viewing the Route Profile view, the route will be deactivated and the Route Profile view will be replaced with the Map view by default.

The Route Profile view can also be opened from a saved route through the Saved Items panel **View in Profile** option. As shown on the right, the route editor provides an **Open in Profile** button at the bottom of the route editor. After editing an existing or recent route or creating a new route, pressing on this button will make this the active route and open the Route Profile view accordingly.

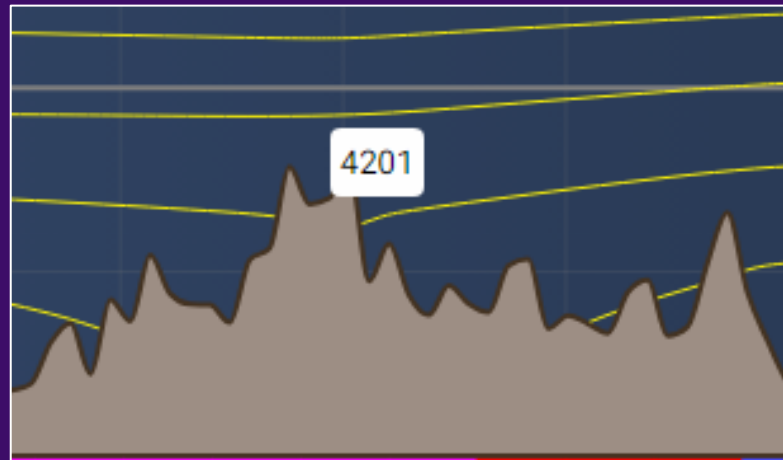
¹¹⁴ An active route must be defined for the route profile to be depicted. In the absence of a route, pressing the Profile button will display the route editor.

From top to bottom, the route profile is comprised of the viewport controls, segmented predominant weather icons, main viewport area (includes terrain), flight category bar, route of flight waypoints, proximity airports, segment points for time and accumulated distance and the EZDeparture Advisor™.



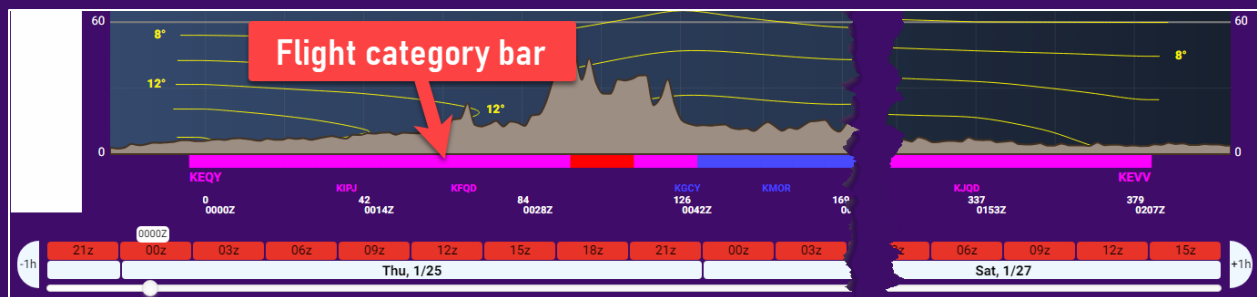
The scrollable main viewport shown within the yellow rectangle above, consists of the vertical Y-axis depicting the flight level (e.g., 120 is 12,000 feet MSL) and the horizontal X-axis showing the featured weather and terrain along the proposed route of flight. The cruise altitude chosen in the route editor is shown by a horizontal magenta line. **For handheld devices**, this viewport area is scrollable horizontally. With a mouse or finger, press and drag this area to the right or left as needed to view the remainder of the route not currently displayed.

Terrain along the route is shown in light brown at the bottom of the main viewport area. 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. When hovering the cursor over the terrain,¹¹⁵ a readout of the mean sea level height of the terrain at that point will be rendered like the example shown above.

The Flight Category Bar is situated immediately below the terrain in the viewport area. This depicts a continuous high-resolution surface flight category forecast for the entire route of flight.

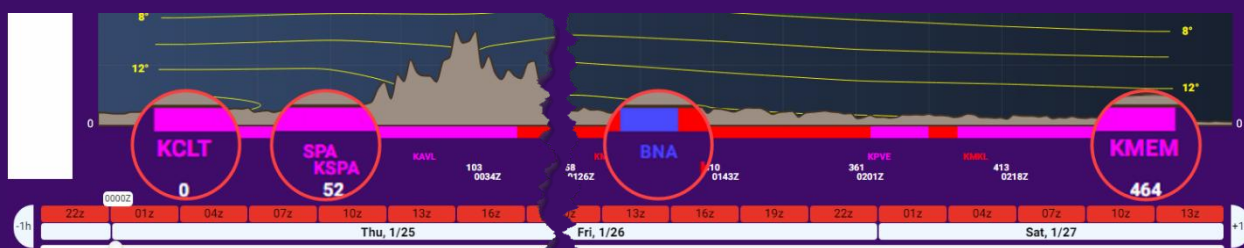


The flight category can be one of four values to include Low Instrument Flight Rules (magenta), Instrument Flight Rules (**red**), Marginal Visual Flight Rules (**blue**) and Visual Flight Rules (**green**). The flight category combines both the ceiling height and surface visibility to produce a categorical value according to the table below. For handheld devices, the Flight Category Bar will scroll horizontally along with the main viewport area.

¹¹⁵¹¹⁵ For touch screens, tapping on the light brown terrain area will show the same readout for that point.

Category	Color	Ceiling		Visibility (statute 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

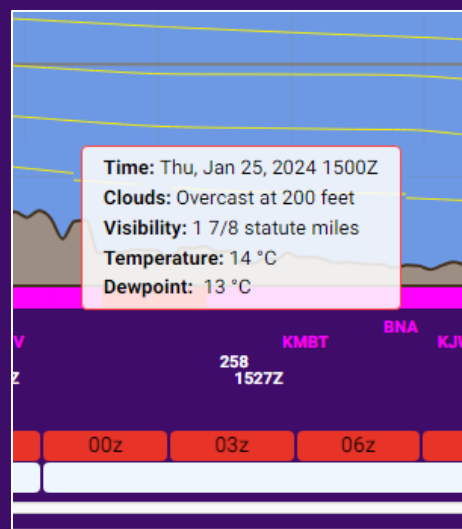
Below the Flight Category Bar are the waypoints for the proposed route. This consists of the departure airport on the far left, destination airport on the far right and any optional route of flight waypoints positioned at their respective location(s) along the route. Therefore, time and distance always increase from left to right. These are color-coded using the table above based on the surface flight category forecast. In the example below, the proposed route is **KCLT SPA BNA KMEM**. For handheld devices, the route of flight waypoints will scroll horizontally along with the main viewport area.



Hovering the cursor over these identifiers¹¹⁶ will provide a tabular display showing the forecast for clouds, visibility, temperature and dewpoint. If the waypoint is an airport, the wind direction and wind speed forecast for that airport will be shown as well.

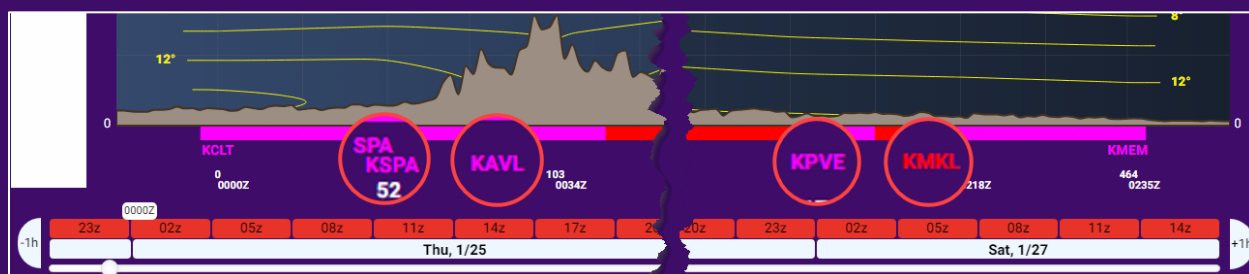
Clicking on any airport identifier using a mouse will navigate to the Airport Wx view for this airport. For a touch screen, tapping on the airport identifier will open up the tabular display mentioned above and also provide a button to **Visit Airport** that will navigate to the Airport Wx view for this airport.

Below the route of flight waypoints line, proximity airports are determined for the route. These are primarily designed to provide familiar airports (i.e., landmarks) along the route that are within 25



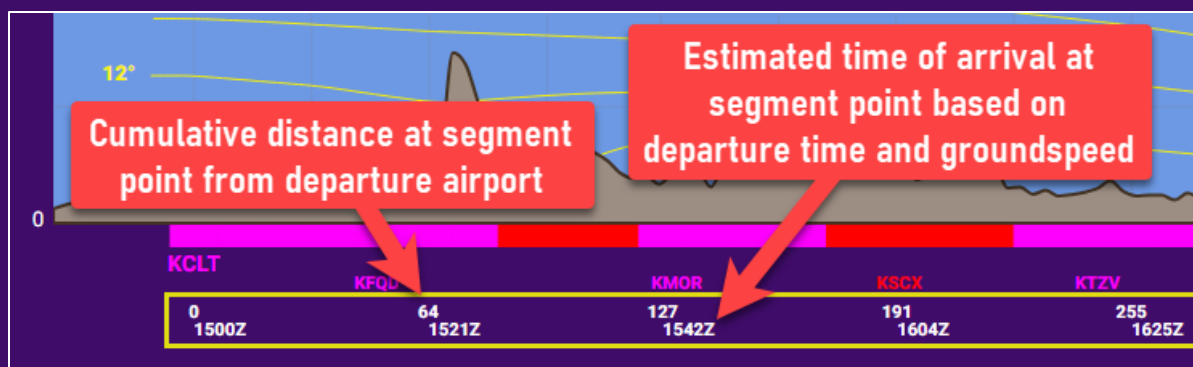
¹¹⁶ For touch screens a tap on the identifier will show the tabular display.

nautical miles from the route itself. These proximity airports are positioned close to the equidistant route segment points (described below) at their respective cross track location(s) along the route. Similar to the route of flight waypoints, these identifiers are color-coded using the table above based on the surface flight category forecast. In the case where there are no nearby airports (e.g., over a large body of water or for shorter routes), then a latitude/longitude point will be rendered at the segment point.



Shown above, the proximity airports for this route include KSPA, KAVL, KPVE and KMKL among others.

The main viewport is divided into equidistant segments. 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.



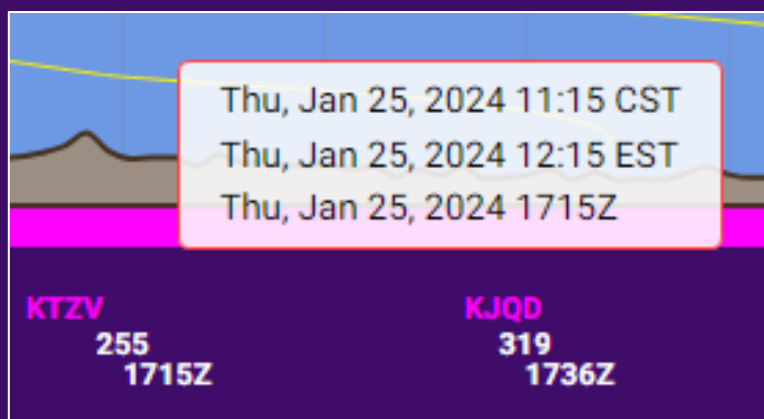
Shown in the **yellow** rectangle above, the cumulative distance¹¹⁷ from the departure airport and estimated time of arrival at each segment point is rendered immediately below the proximity airport line. The estimated time of arrival is always relative to the time set on the EZDeparture Advisor.¹¹⁸ The arrival time for each segment is calculated

¹¹⁷ The distance is in nautical miles or kilometers depending on the preferences chosen in the General Settings.

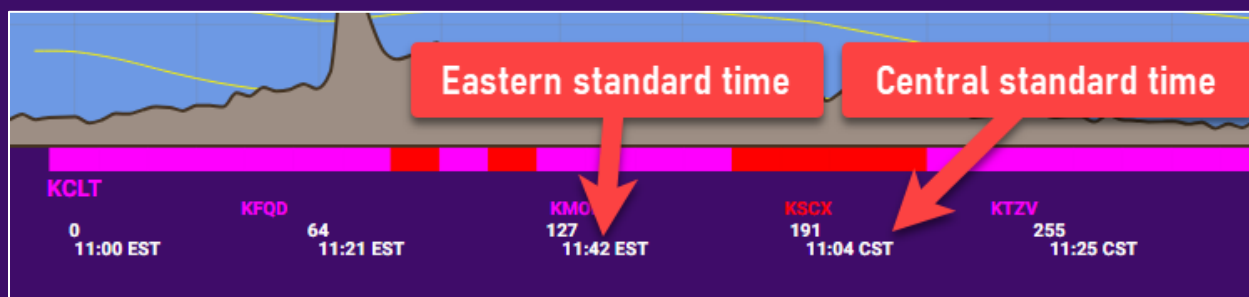
¹¹⁸ The EZDeparture Advisor™ has a resolution of 10 minutes for the Route Profile view.

using the true airspeed provided in the **Aircraft Settings**. This may factor in the headwind and tailwind component to determine the groundspeed 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 **Time Display** preference chosen in the General Settings. If the preference is set to **Zulu**, the time will be listed followed by the letter **Z**. On devices without a touch screen,¹¹⁹ hover with a mouse over the estimated time of arrival shown along the route to see the Zulu and the local time (displayed using the 12-hour clock) at each point. Moreover, if the route crosses one or more time zones, the local time at the segment points will be listed along with the device's time zone.

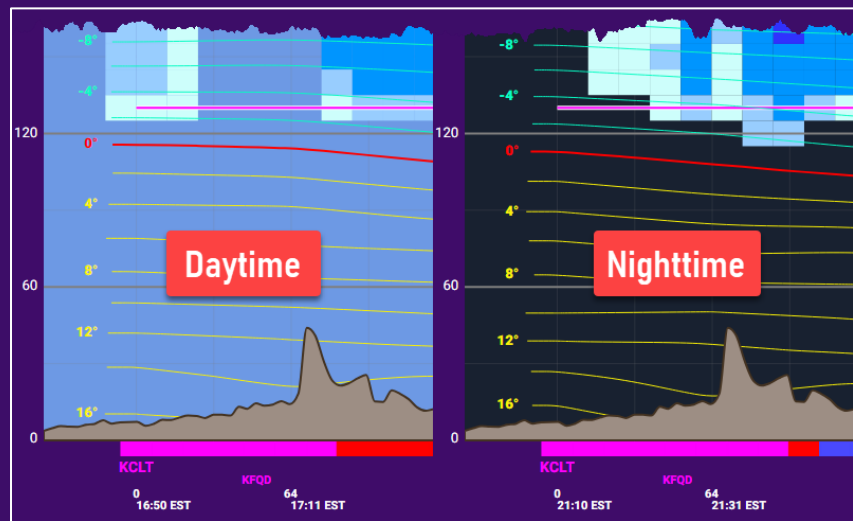


When the **Time Display** preference is set to **Local** (device time), the estimate time of arrival at each segment point will display the local time zone that's appropriate for that point. Shown below, the device is located in the eastern time zone. The route originates in the eastern time zone (departure airport is KCLT) and then crosses from the eastern time zone into the central time zone. As a result of this, the segment points will change from showing EST to CST in the example below.

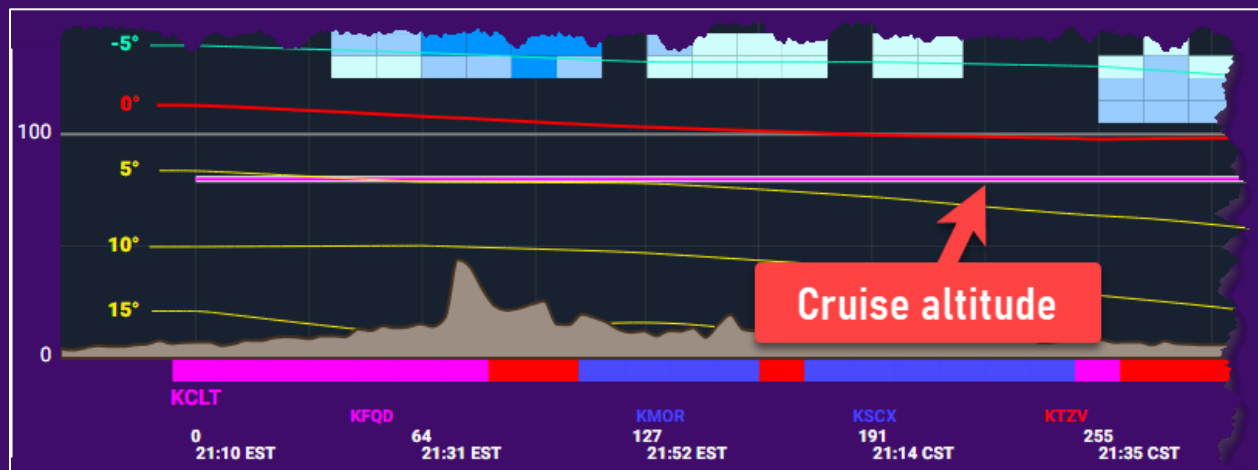


¹¹⁹ On touch screen devices, tap on the time of arrival to see this tabular display.

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.



When a route is active, the route editor also requires a cruise altitude¹²⁰ to be chosen. This is depicted on each route profile using a solid horizontal magenta line as shown below for 8,000 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 true airspeed (and optionally the winds aloft) assumes that the flight originates at the en route altitude.¹²¹

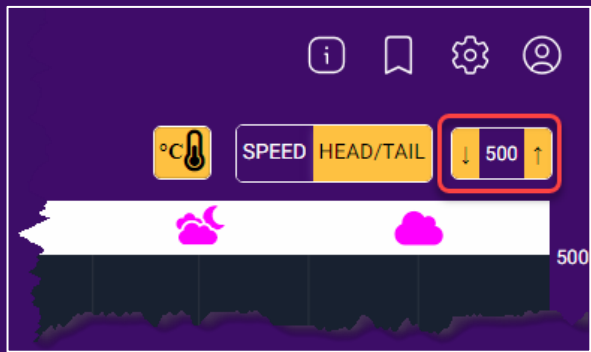
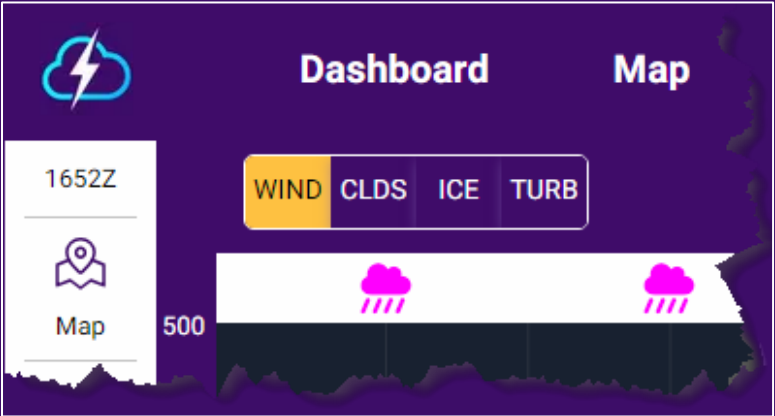


¹²⁰ This is based on mean sea level height.

¹²¹ It is recommended that the true airspeed chosen in the preferences be underestimated to account for the lower true airspeed typically experienced during climb and descent.

The Route Profile has four featured views to choose from. This includes **WIND** (default), **CLDS** (clouds), **ICE** (airframe icing) and **TURB** (turbulence). Select the desired view from the buttons provided. These views are mutually exclusive; therefore,

to avoid a cluttered view only one of these four views can be selected at any one time. Shown on the right, the feature view selected is **WIND**. The selected view has a yellow/gold background. This selection is remembered and retained such that navigating back to the Route Profile will once again display the last selected featured view.



Additionally, the maximum altitude or flight level (FL) depicted for each of these four featured views can be set by pressing the up- or down-pointing arrow corresponding to 500 (FL500), 300 (FL300) or 200 (FL200). For example, as shown on the left, if 500 is selected, the top altitude on the Y-axis of the Route Profile viewport will be 50,000

feet. Pressing on the down-arrow to the left of 500 will change the maximum altitude to FL300. Pressing the down-arrow again will change it to FL200.

This allows better vertical resolution of the display when flight planning for lower altitudes. However, it is strongly encouraged to always check the FL500 level for clouds given that deeper weather systems are often more significant.

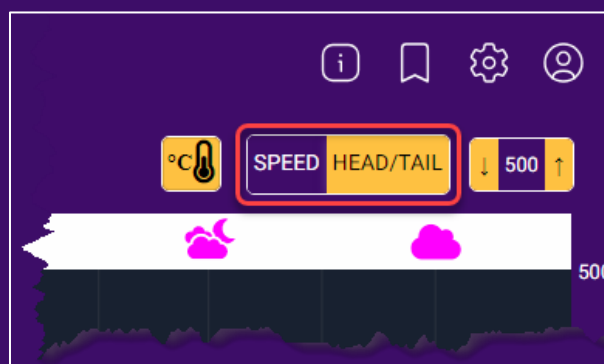
Winds & Temperature

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 wind marker will provide the forecast wind speed and direction as well as the crosswind component for multiple levels. The table below defines the altitude levels (thousands of

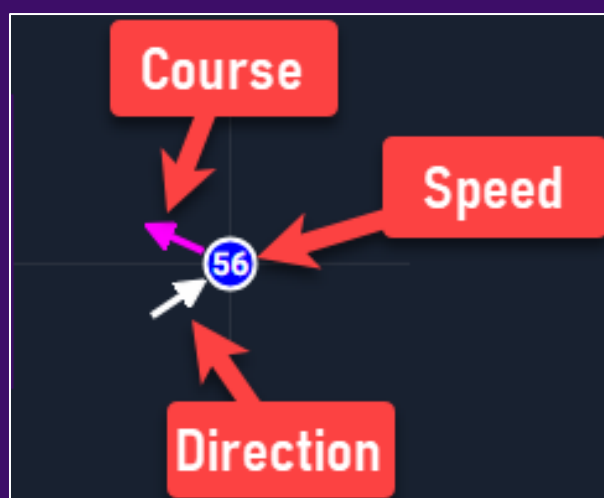
feet MSL) that corresponds to each row of winds for each of the three maximum altitude settings mentioned above.

Max Alt	1 st Level	2 nd Level	3 rd Level	4 th Level	5 th Level	6 th Level	7 th Level	8 th Level	9 th Level
FL200	2K	4K	6K	8K	10K	12K	14K	16K	18K
FL300	3K	6K	9K	12K	15K	18K	21K	24K	27K
FL500	5K	10K	15K	20K	25K	30K	35K	40K	45K

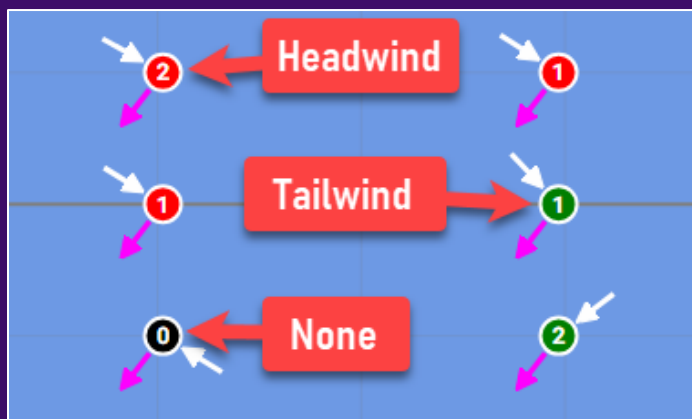
In addition to the maximum altitude, the featured Route Profile view for **WIND** provides two variations. This includes a choice for **SPEED** (wind speed) or **HEAD/TAIL** (headwind/tailwind component) as shown on the right. The selected option will have a yellow/gold background.



When the option selected is **SPEED**, the center of the wind marker will be blue. For this instance, the number depicted in the marker represents the forecast wind speed in knots at that altitude, location and time¹²². A thick magenta arrow is provided that marks the course (heading) of the route at that location in reference to true north. Therefore, a magenta arrow pointed toward the bottom of the display represents a course of 180°. The thick white arrow represents the wind direction **which it is blowing from** as referenced to true north. Therefore, an arrow at the top pointed down toward the marker, is a wind from the north (360°). In the example above, the wind is **from** 235° (southwest) at 56 knots with a course of 295°.

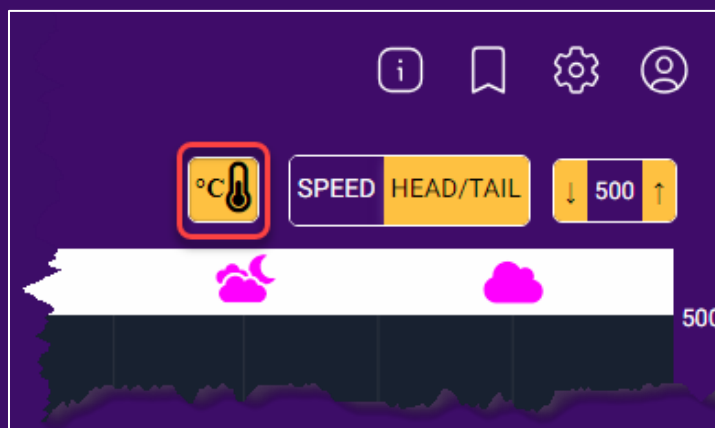


¹²² A “C” in the center of the marker represents a light and variable or calm wind.

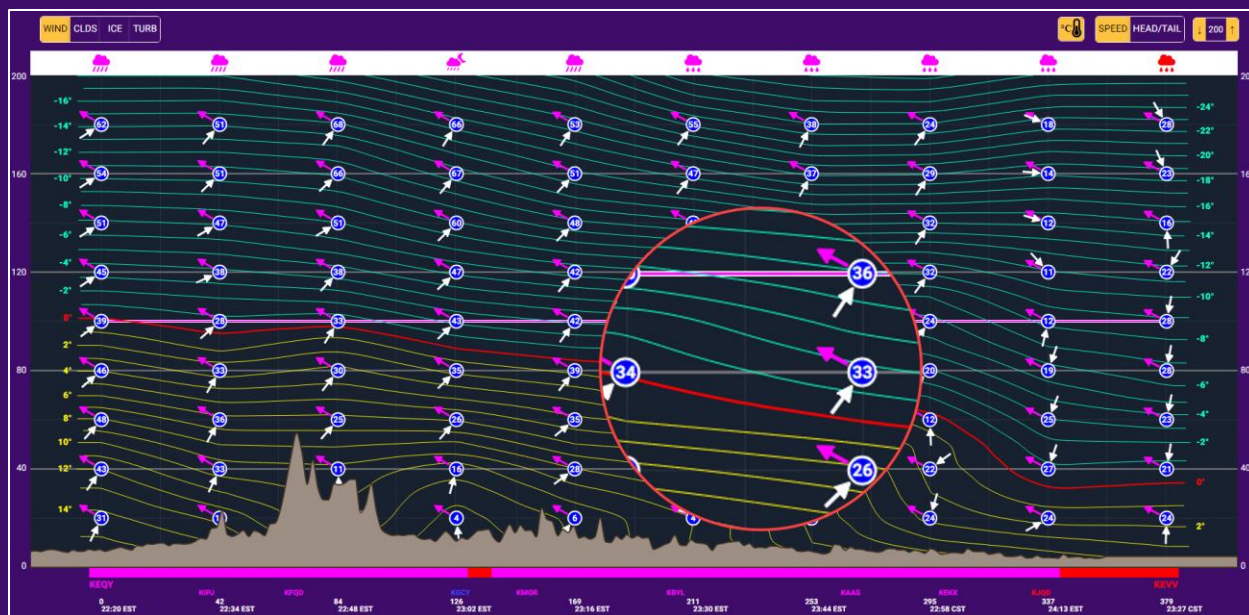


When the option selected is **HEAD/TAIL**, the number depicted in the marker represents the forecast crosswind component in knots. The center of the wind marker will be colored red for a headwind, green for a tailwind or black when there's a direct crosswind.

On the **WIND** view, to show or remove the lines of constant temperature, also known as isotherms, press the button with a thermometer icon that is positioned to the immediate left of the **SPEED** and **HEAD/TAIL** option button. This will show or remove the isotherms, from the **WIND** view. The button is labeled with a °C or °F depending on the current **Temperature** unit preference in the General Settings. A yellow/gold button means the isotherms are depicted in the viewport area with the wind markers overlaid.



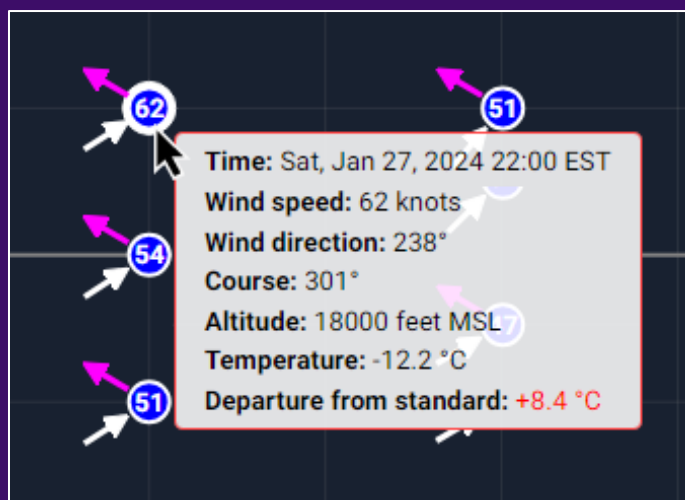
The isotherms are depicted as solid-colored lines. In order to reduce clutter, they are separated by a 1°C interval for a maximum altitude setting of FL200, 2°C interval for a maximum altitude setting of FL300 and 5°C interval for a maximum altitude setting of FL500. Isotherms representing a temperature colder than 0°C (32°F) are depicted as a cyan line. Conversely, isotherms for a temperature warmer than 0°C are depicted as a solid yellow line. Lastly, the 0°C isotherm (melting level) is depicted as a bold red line. Although there are many exceptions, most icing encounters happen when the static air temperature (SAT) is between 0°C and -15°C when visible moisture is also present.



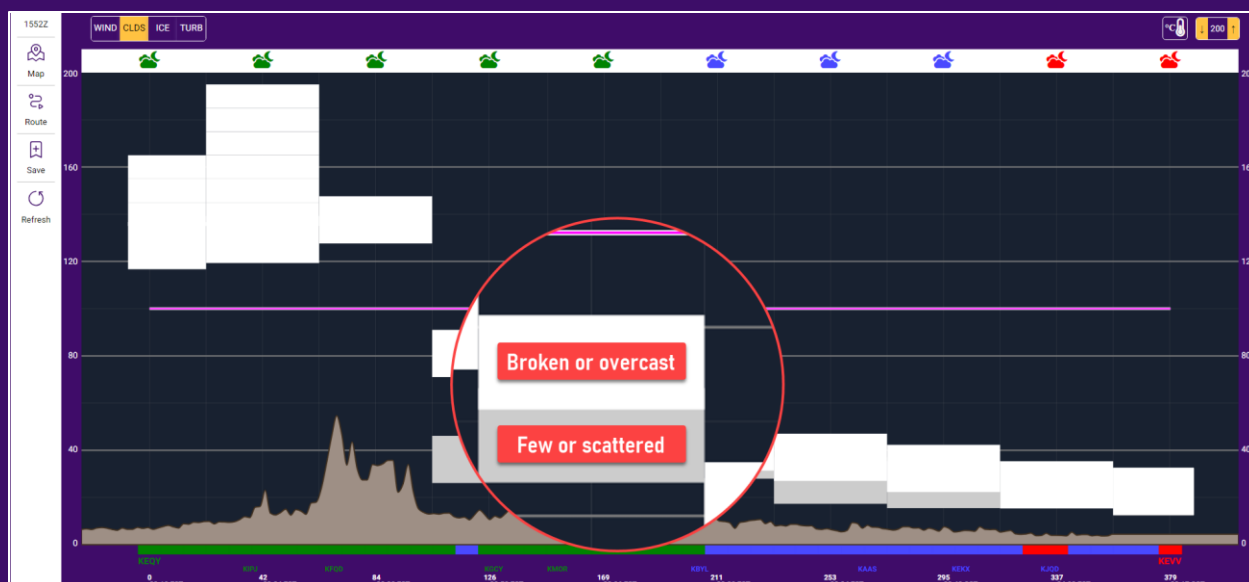
Hovering over the wind marker with a mouse¹²³ will show more details in tabular form as shown on the right. This includes the valid date and time of the forecast used along with the wind speed in knots, wind direction, course, altitude, temperature and departure from standard temperature. Departure from standard subtracts the forecast temperature from the temperature of a standard atmosphere for the respective altitude. A temperature below standard will be shown in as a negative number in blue and temperatures above standard will be shown as a positive number in red.

Clouds

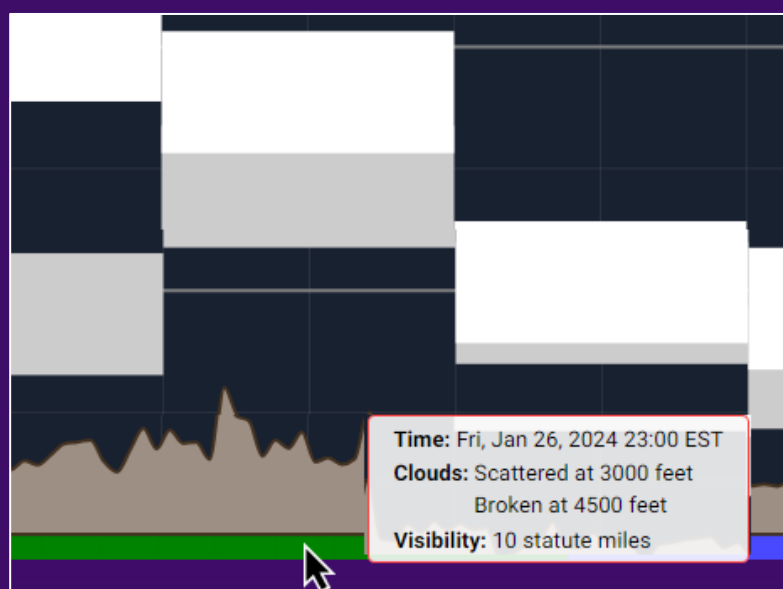
This vertical profile (**CLDS**) contains a depiction of cloud cover and isotherms along the route of flight. Clouds are depicted as bright **white** rectangles showing the height of the cloud layers that are expected to be **broken or overcast**. A light **gray** rectangle represents a **few or scattered**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



¹²³ For touch screens, tapping on the marker will show the tabular display.



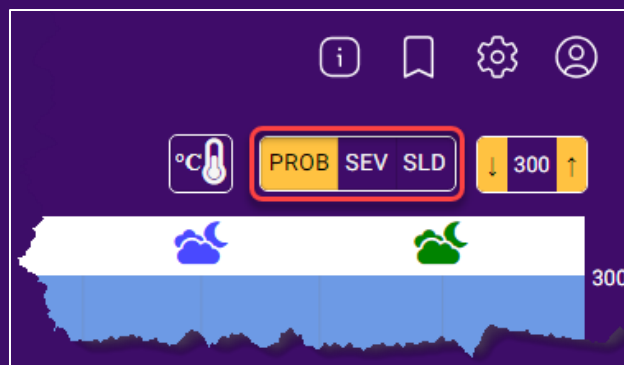
To determine the height of the bases of the clouds, hover over the Flight Category Bar at that segment point. This will show the details of the cloud heights and sky coverage of each layer in a tabular summary. In the example on the right, the lowest layer is scattered at 3,000 feet AGL with a higher broken cloud layer at 4,500 feet AGL.



Icing

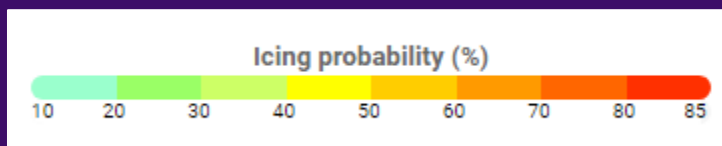
This vertical profile (**ICE**) depicts the threat of airframe icing along the proposed route of flight. This includes the icing probability, icing severity and supercooled large drop (SLD) potential. Forecasts for airframe icing are currently limited to 30,000 feet MSL and below with an approximate lead time of 21 hours or less.

The featured Route Profile view for **ICE** provides the ability to filter the display for Probability (**PROB**), Severity (**SEV**) and **SLD**. The icing probability option is mutually exclusive with both the severity and SLD options. However, the severity and SLD selections can be selected at the same time. The selected option(s) will have a yellow/gold background.



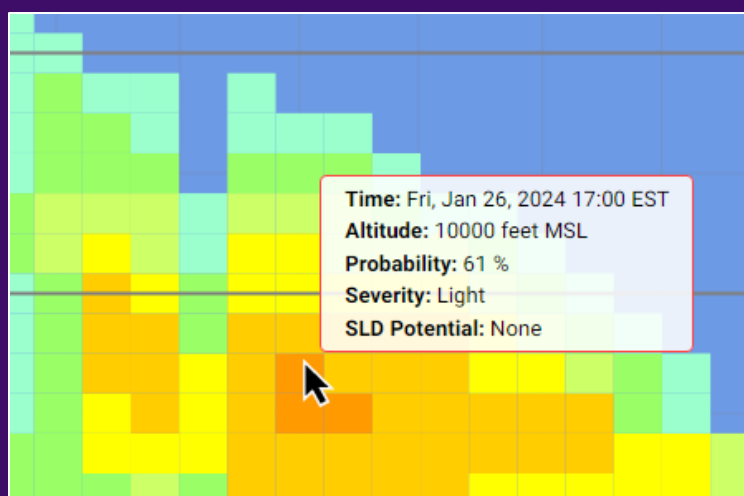
Icing probability

Icing probability (**PROB**) 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 lead time increases. In other words, an icing event that is two hours from the current time will have more certainty than one that is 21 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 Settings for icing probability for longer lead times.



To see specific probability forecasts within the viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on location of interest. This will provide a tabular summary including the valid time of the forecast, altitude (feet above mean sea level), icing probability (%),

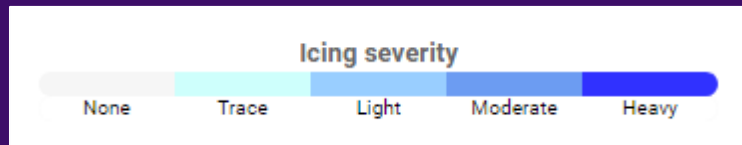
categorical icing severity and SLD potential (%) at that altitude and location along the route of flight.

Icing severity

Icing severity (**SEV**) provides a forecast for severity (intensity) of icing using a categorical forecast.

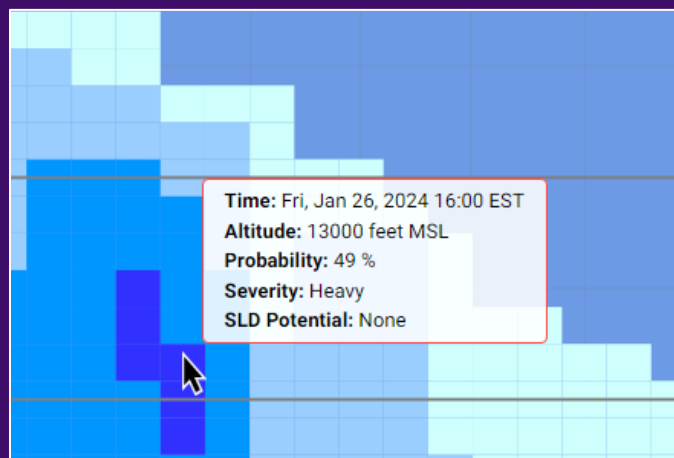
Intensities include trace, light,

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., rime) is not provided by this forecast. Below are the definitions of trace, light, moderate and severe icing from a reporting perspective as defined in the section 7-1-19 of FAA's [Aeronautical Information Manual \(AIM\)](#). Note that **Heavy** is not defined in the AIM. Therefore, it is not included in the definitions below.

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



Trace – Ice becomes noticeable. The rate of accumulation is slightly greater than the rate of sublimation. A representative accretion rate for reference purposes is less than ¼ inch (6 mm) per hour on the outer wing. The pilot should consider exiting the icing conditions before they become worse.

Light – The rate of ice accumulation requires occasional cycling of manual deicing systems to minimize ice accretions on the airframe. A representative accretion rate for reference purposes is ¼ inch to 1 inch per hour on the unprotected part of the outer wing. The pilot should consider exiting the icing condition.

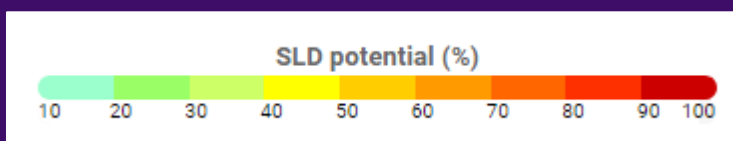
Moderate – The rate of ice accumulation requires frequent cycling of manual deicing systems to minimize ice accretions on the airframe. A representative accretion rate for reference purposes is 1 to 3 inches per hour on the unprotected part of the outer wing. The pilot should consider exiting the icing condition as soon as possible.

Severe – The rate of ice accumulation is such that ice protection systems fail to remove the accumulation of ice and ice accumulates in locations not normally prone to icing, such as areas aft of protected surfaces and any other areas identified by the manufacturer. A representative accretion rate for reference purposes is more than 3 inches per hour on the unprotected part of the outer wing. By regulation, immediate exit is required.

SLD

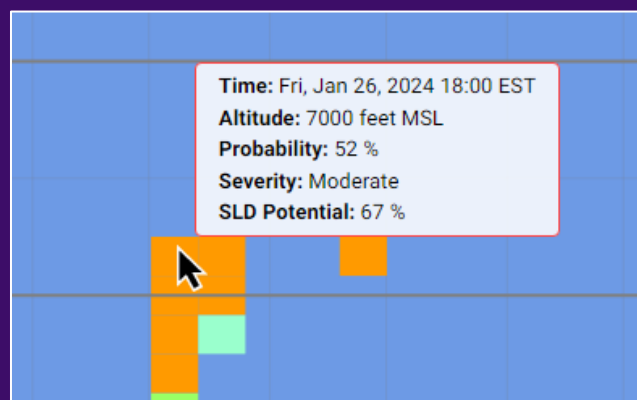
Icing probability (**SLD**) is depicted graphically as a

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.



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.

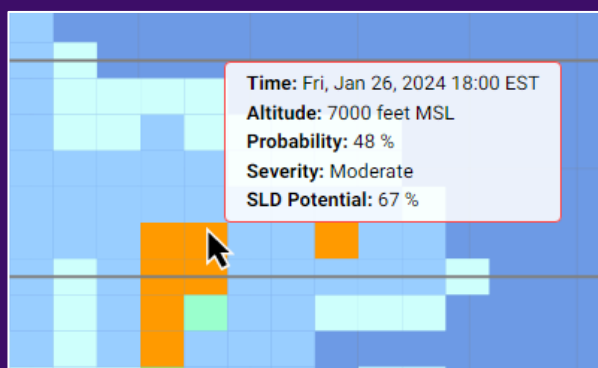
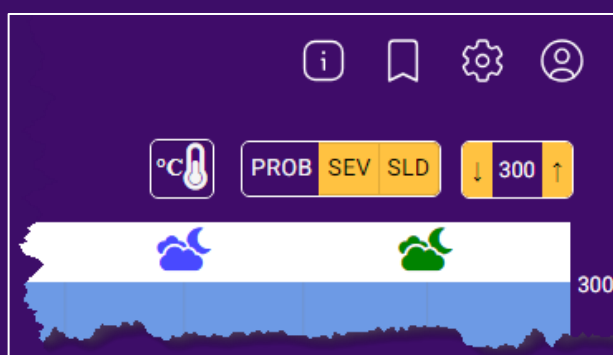
Note that the SLD forecast is **not** a calibrated probability, but an icing potential (i.e., likelihood) and the percentages will not necessarily decrease as time increases. At this time, the EZDeparture Advisor™ only considers icing probability and icing severity and does not take into consideration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



To see specific SLD forecasts within the viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on location of interest. This will provide a tabular summary including the valid time of the forecast, altitude (feet above mean sea level), icing probability (%), categorical icing severity and 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 by selecting the **SEV** and **SLD** options simultaneously as shown on the right. This simply repeats the icing severity forecast depicted in shades of **blue** and overlays the SLD potential as described

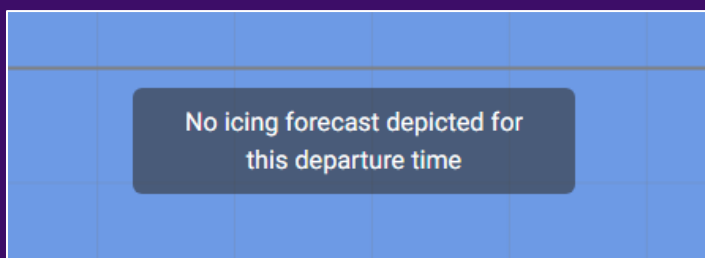


above. To see SLD and severity forecast details within the icing viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on the same location. This will provide a tabular summary of the valid time of the forecast, the icing severity forecast and the SLD potential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

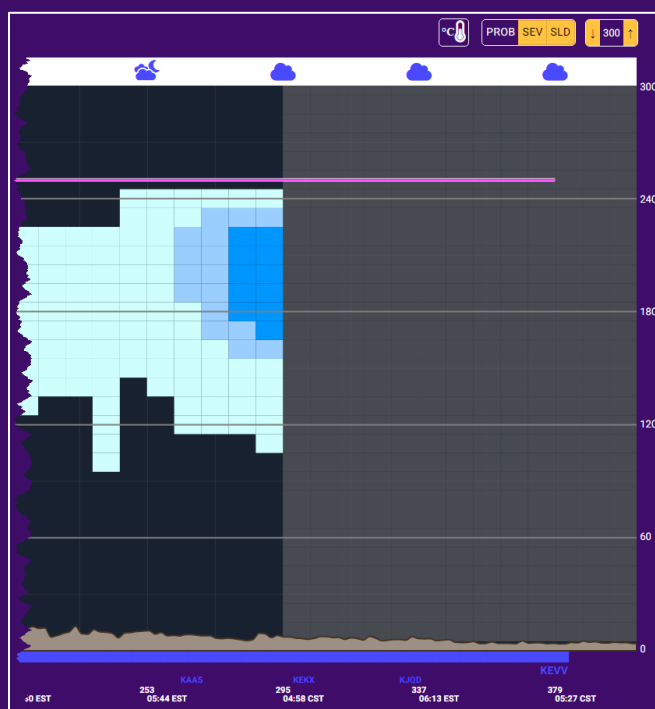
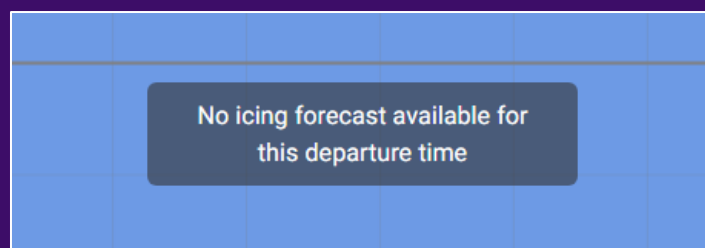
One of two possible alert messages may be posted in the main icing profile viewport for the icing probability, severity or SLD forecasts.

1) **No icing is forecast depicted for this departure time** – this alert will post when the entire route has a forecast icing probability of less than 10% for icing probability (**PROB**). This alert provides a visual confirmation when no icing

forecast is rendered for the proposed route of flight at the departure time set on the EZDeparture Advisor™. For icing severity (**SEV**), this alert will post when the proposed route has a forecast icing severity is less than trace at the departure time set on the EZDeparture Advisor™. Lastly, this alert will post then the SLD potential for the proposed route has an SLD potential of less than 10% for the given route of flight at the departure time set on the EZDeparture Advisor™.

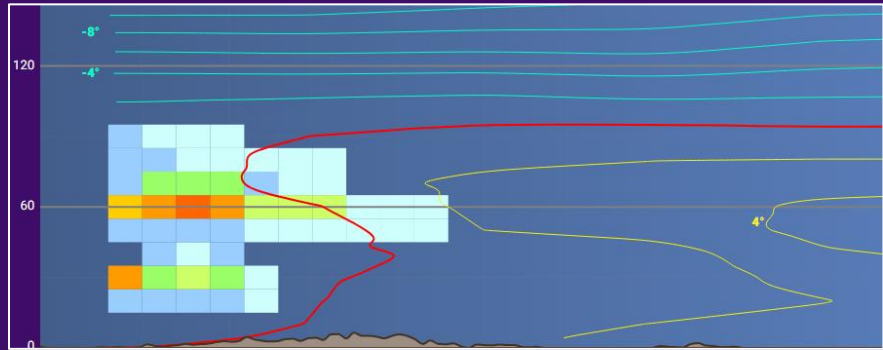


2) **No icing forecast available for this departure time** – this alert will post when the EZDeparture Advisor™ is set to a time beyond the lead time availability of the icing forecast.



For some departure times, only part of the proposed route will have an icing forecast available. In this case, a dark hatched region as shown on the right will cover the location where the icing forecast is not available. In this instance, the arrival times for the latter part of the route are past the available lead time of the icing forecasts.

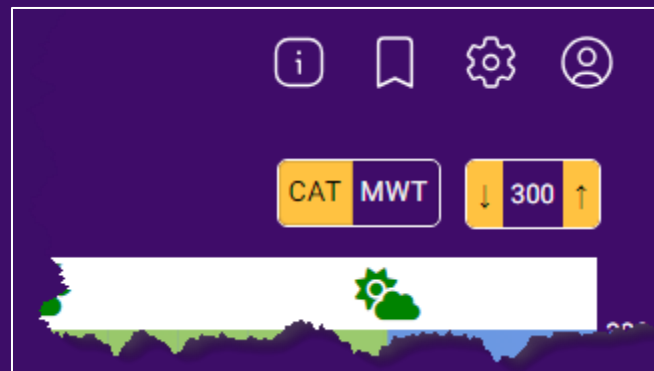
In addition to the icing probability, severity and SLD forecasts, the icing profile also includes the temperature forecast using lines of constant temperature or



isotherms. The isotherms are depicted as solid-colored lines. In order to reduce clutter, they are separated by a 1°C interval for a maximum altitude setting of FL200, 2°C interval for a maximum altitude setting of FL300 and 5°C interval for a maximum altitude setting of FL500. Isotherms representing a temperature colder than 0°C (32°F) are depicted as a cyan line. Conversely, isotherms for a temperature warmer than 0°C are depicted as a solid yellow line. Lastly, the 0°C isotherm (melting level) is depicted as a bold red line. Although there are many exceptions, most icing encounters happen when the static air temperature (SAT) is between 0°C and -15°C when visible moisture is also present.

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 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.



The featured Route Profile view for **TURB** provides the ability to filter the profile to render clear air turbulence (**CAT**) and mountain wave turbulence (**MTW**). These can be selected independently or together to create a combined forecast.

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.

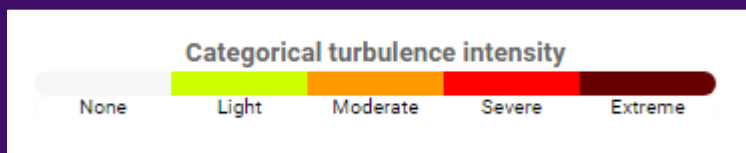
EDR has a range from 0.0 to 1.0 in units of m^2/s^3 . Therefore, the higher the EDR value, the higher the intensity of turbulence. Typically, EDR varies from close to 0, "smooth", to near 1, "extreme" for most aircraft types. **Note:** Actual EDR values in **EZWxBrief** are multiplied by 100 for ease 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 shown on the right are assigned to the various turbulence categories based on the aircraft weight class for Light (default), Medium and Heavy aircraft in the table above. This is chosen within the Settings under the **Aircraft Settings**.



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.

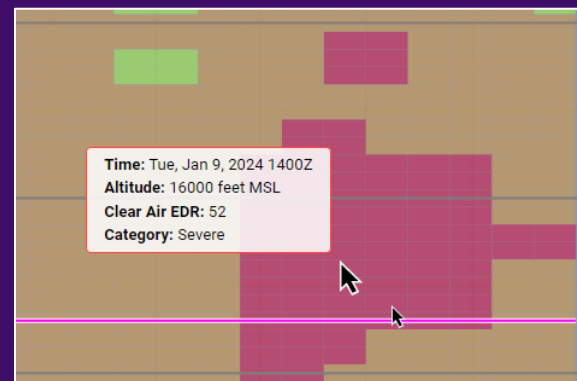
Mountain wave turbulence

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

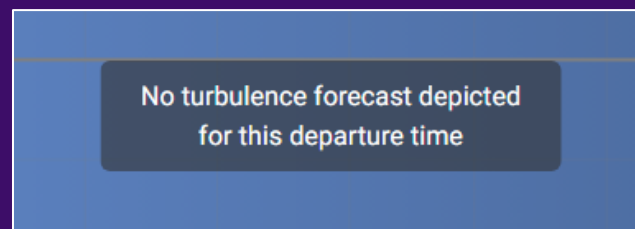
This selection combines the gravity-induced mountain wave turbulence along with the clear air turbulence forecasts.

To see specific forecast for **CAT**, **MWT** (or combined) within the viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on location of interest. This will provide a tabular summary including the valid time of the forecast, altitude (feet above mean sea level), clear air EDR and categorical turbulence at that altitude and location along the route of flight.

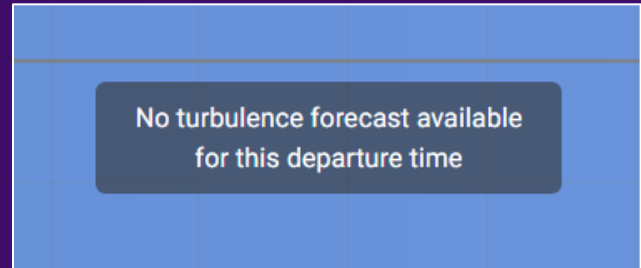


One of two possible alert messages may be posted in the main turbulence profile viewport for the clear air and mountain wave turbulence forecasts.

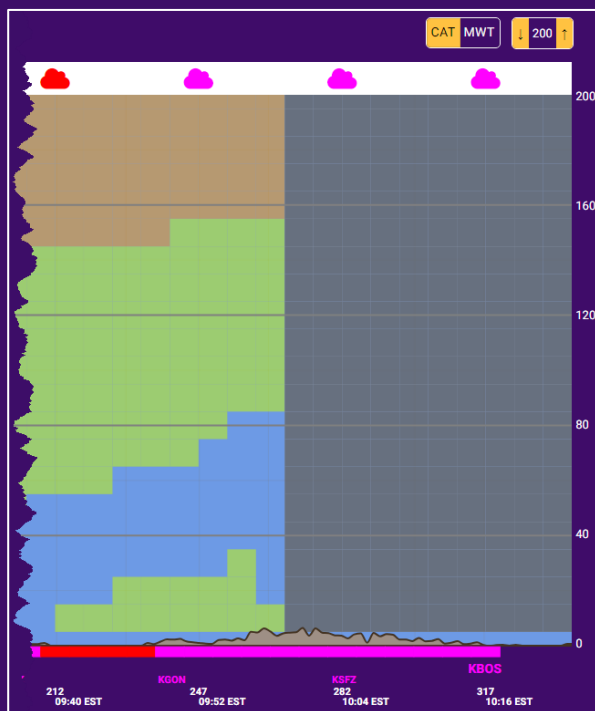
1) **No turbulence is forecast depicted for this departure time** – this alert will post when the entire route has a forecast EDR value of less than 13. This alert provides a visual confirmation when no **CAT** or **MWT** turbulence forecast is rendered for the proposed route of flight at the departure time set on the EZDeparture Advisor™.



2) No turbulence forecast 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 turbulence forecast.



For some departure times, only part of the proposed route will have a turbulence forecast available. In this case, a dark hatched region as shown below will cover the location where the turbulence forecast is not available. In this instance, the arrival times for the latter part of the route are past the available lead time of the turbulence forecasts.



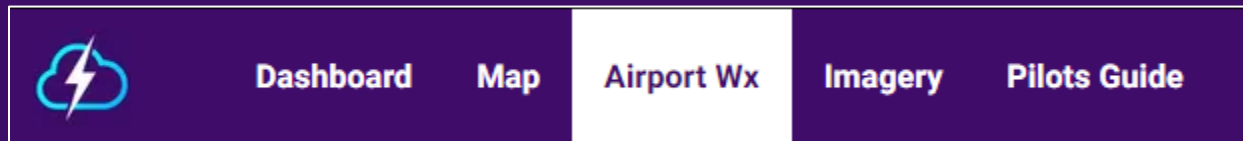
A few words of caution!

The route 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 the proposed route of flight could be bumping up against some serious weather. Just by shifting the route by 75 to 100 nm may put the route in that more challenging weather. Moreover, a delay of just two or three hours might also cause the route to be in challenging weather that wasn't expected based on the original time of departure.

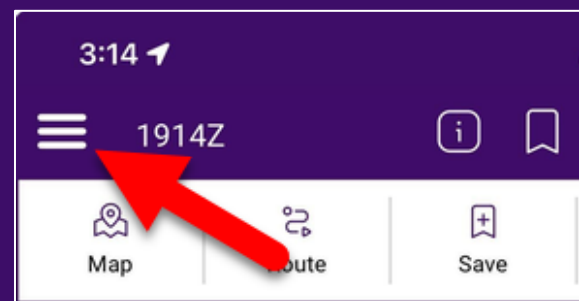
These vertical views have such a huge glance value, that they can easily lure the pilot into the trap that everything looks great until the pilot strays from the original plan. Therefore, it's important not to forget the big weather picture. Looking at the surface analysis, prog charts, constant pressure charts, convective outlooks, etc. are still a must. All of this other weather guidance can be found in the Imagery view.

Airport view

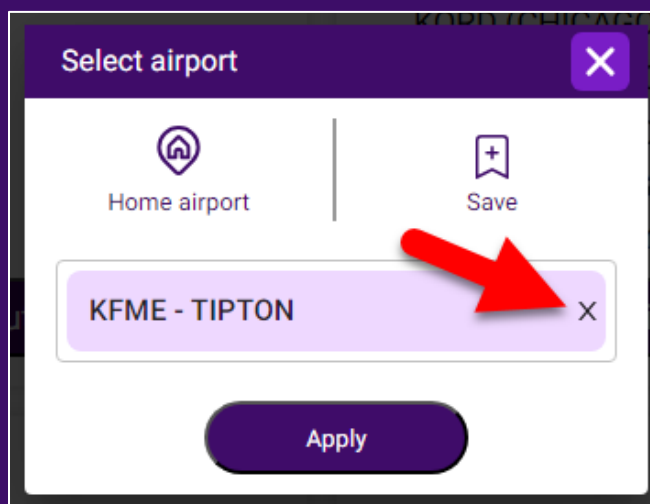
For airports within the **EZWxBrief** domain, the **Airport** view provides airport-specific weather guidance to include routine surface observations (METARs), special observations (SPECIs), terminal aerodrome forecasts (TAFs), area forecast discussions (AFD), Skew-T log (p) diagram (temporarily removed) and a time-series graph called a Meteogram.



There are several ways within the app to launch the **Airport** view. The approach that is widely available from most of the featured pages¹²⁴ is to select the **Airport Wx** option from the main site menu (shown above) or from the hamburger menu found in the upper-left corner of handheld devices (shown right).

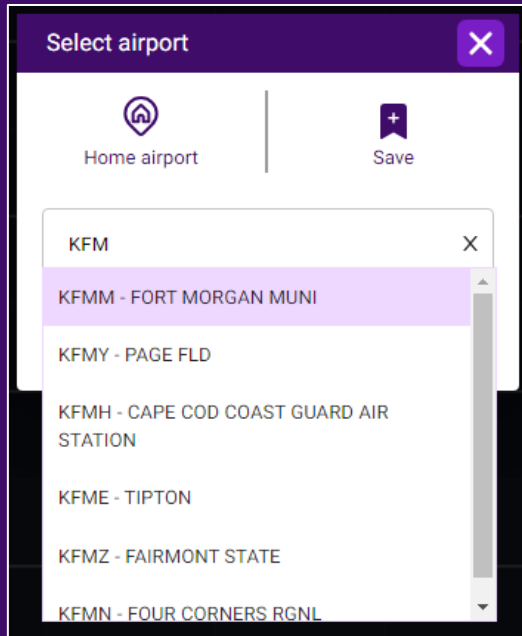


Choosing this option will open the airport selector shown below. In some cases, the airport identifier field may be empty or the airport identifier may automatically be loaded with the most recent airport viewed. If an airport identifier is already present in this field and is not the desired airport, press on



the **X** located at the end of the airport search field (see left) to clear the current entry. Once cleared, the cursor will remain focused in the airport search field. This will allow you to enter a different three-letter (FAA) or four-letter (ICAO) airport identifier you want to view. Alternatively, press the **Home airport** button to automatically fill in your Home airport captured in the **General** settings.

¹²⁴ The user needs to be signed in and have an active membership to view this menu.



As characters are entered, a smart filter will engage to show matching airports (in no particular order) to include the identifier followed by the official name of the airport as shown left).¹²⁵ Select one of the airport identifiers from the list or press the space bar to select the identifier at the top of the list (e.g., KFMM – FORT MORGAN MUNI). The message “Identifier not found” will be shown if the airport identifier entered is not discovered in the **EZWxBrief** database.¹²⁶ Once the airport field is filled with the desired airport, press **Apply**. This will open the **Airport** view for this selected airport.

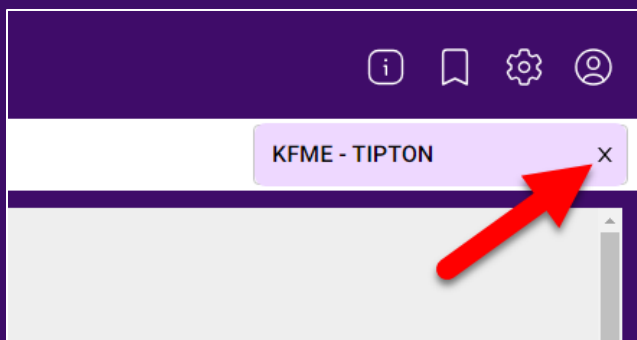
In addition to the menu options, the **Airport** view can also be launched by pressing -

- (1) An airport name contained in the section within the Dashboard for **Recent airports** (if any) or by pressing the **Airports** button below the recent list (this button opens up the Airport view using the most recent airport viewed)
- (2) An airport name in the **Saved** section of the Dashboard
- (3) An airport name contained in the **Saved Items** panel.
- (4) A proximity airport identifier or airport identifier contained in the route as rendered in the **Route Profile** view.

Once the Airport view is rendered, a different airport can be chosen by entering the new airport identifier within the airport search field found in the upper-right corner of the **Airport** view. If an airport identifier is already present in this field, press on the **X** located

¹²⁵ It may take a second or two for the smart filter to begin making suggestions. Please be patient.

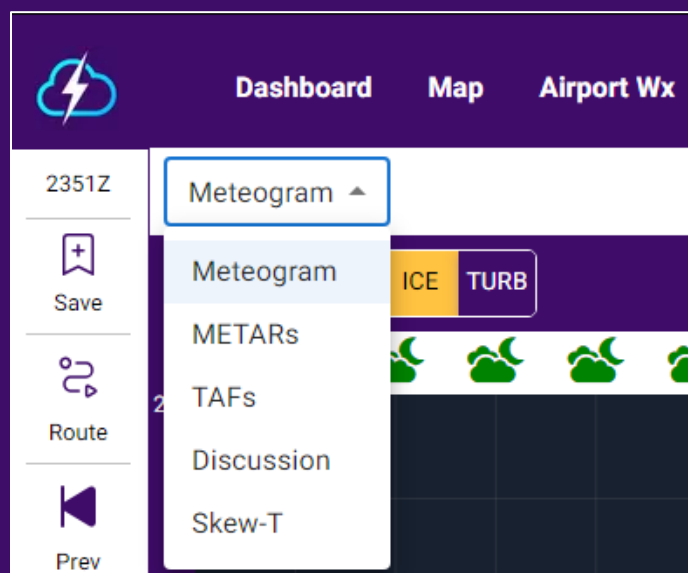
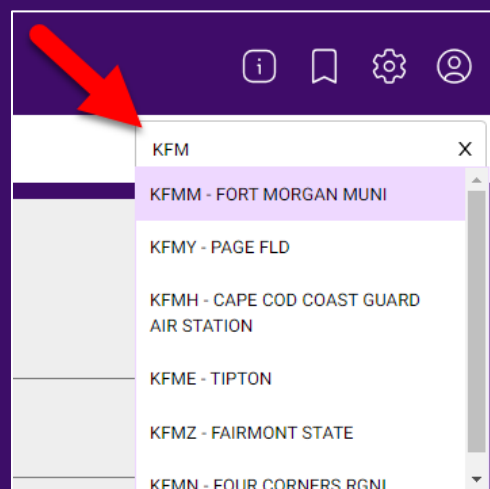
¹²⁶ This is more likely to happen for airports outside of the U.S.



at the end of the airport search field (see left) to clear the current entry. If you focus the cursor outside of this field and have yet to make a valid entry, the previous airport identifier will be restored.

After the field has been cleared, the cursor will be automatically focused in the

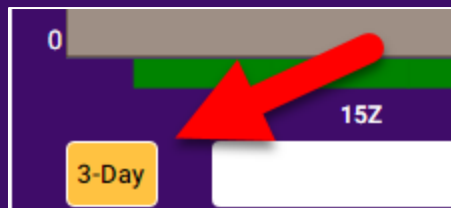
field to being entering the three-letter (FAA) or four-letter (ICAO) airport identifier you want to view. Similar to the airport selector, as characters are entered, a smart filter will show matching airports (to include the identifier followed by the name of the airport). Select one of the airport identifiers from the list or press the space bar to select the top identifier in the list. The message "Identifier not found" will 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.



There are **five** specific views within the Airport view to include the time-series Meteogram, most recent surface observations (METARs), terminal aerodrome forecasts (TAFs), area forecast discussion (Discussion) and the Skew-T log (p) diagram (temporarily removed). To change the view for the selected airport, press the Airport sitemap dropdown menu to reveal these five options. Pressing any of these options will switch to that particular view for the airport selected.

Meteogram

One of the advanced features of the **EZWxBrief** application is the Meteogram. This time-series graph depicts how the weather is expected to change at a particular airport over the next three days from the surface to 45,000 feet. The Meteogram can be viewed in a 1-Day (24 hours) or 3-Day (72 hours) format using a button located at the bottom-left of the Meteogram as shown to the right.

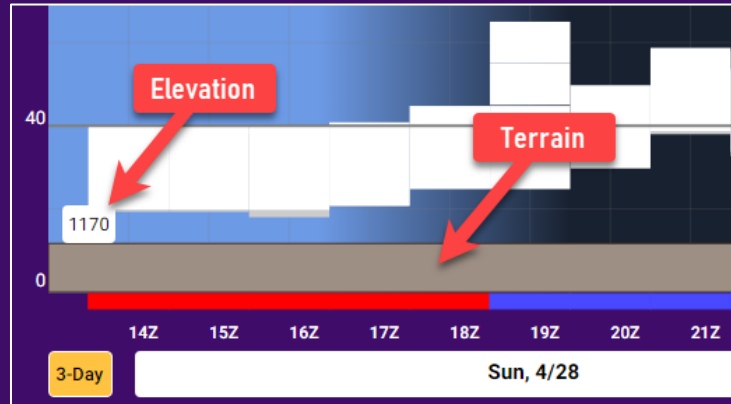


Whether viewing the Meteogram in the 1-Day or 3-Day instance, time increases from the left side of the diagram to the right with each column representing a specific forecast time. The first time presented on the left is always the top of the previous hour. For example, if the current time is 1418Z, the first left column will represent 1400Z.¹²⁷ For the 3-Day instance, columns are provided every three hours whereas they are shown at an hourly interval for the 1-Day instance. Press the “3-Days” button located in the lower-left corner of the **Airport** view to toggle the Meteogram between 1-Day and 3-Days.

The Meteogram is divided into five distinct sections. This includes the (1) viewport controls, (2) predominate weather icons, (3) main viewport area, (4) flight category bar and the (5) date-time bar. Within the main viewport area, the Meteogram consists of four time-series graphs to include (1) wind speed and direction, (2) clouds, (3) airframe icing and (4) turbulence all presented as a function of altitude. Given the amount of information presented, each section of the Meteogram will be discussed separately below.

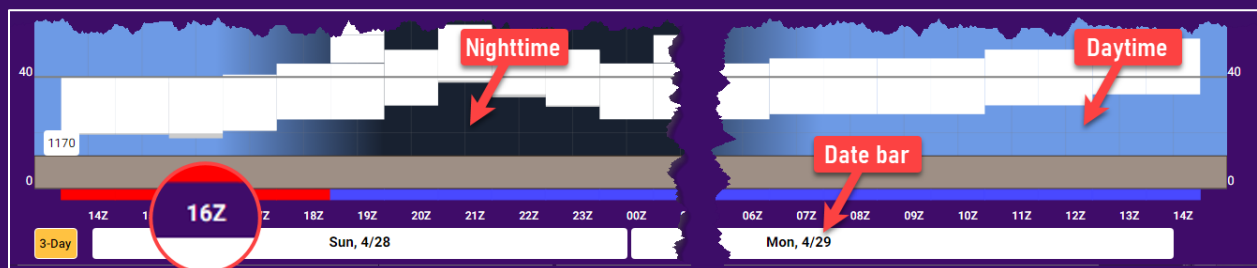
¹²⁷ Even though this is a time in the recent past, it is using the most recent forecast that is available for that time.

Terrain: The height of the terrain for the airport is presented as a brown-shaded region at the bottom of the Meteogram viewport area. The dark brown line at the top of the brown region represents the airport's elevation. The terrain depicted in **EZWxBrief** does not account for any other obstructions such as radio towers



or moored balloons near the airport. Please consult the latest VFR sectionals or other official FAA documentation for obstruction information. Any specific weather data below this elevation will be masked and not shown. When hovering the cursor over the terrain¹²⁸, a readout of the mean sea level height of the elevation at that point will be shown (in the example above, the elevation is 1,170 feet above sea level).

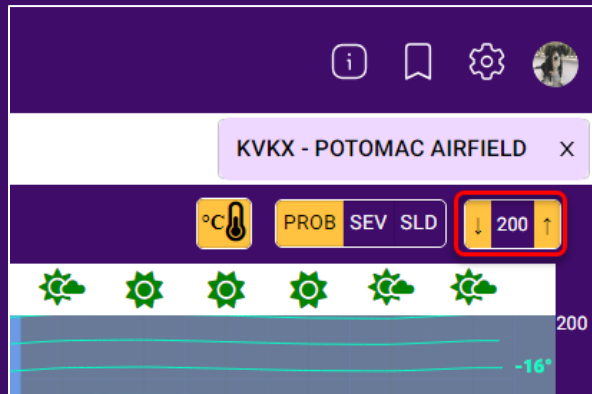
Time: At the bottom of the Meteogram you will see a presentation of the time window banner. Depending on what has been set in the Meteogram settings (1-Day vs 3-Day), this can be set to depict the weather over the next 24 hours or 72 hours (3 days), respectively. Each of these instances may look a bit different, but use the same conventions described below.



If a **Z** is present after the two-digit hour as in the example above (e.g., 16Z), this means the **Time Display** in the **General Settings** is set to use **Zulu** time. If no **Z** is present, the time shown is based on local (device) time. Similar to the Route Profile, to aid in the recognition of day and night, the background of the viewport shows light blue shading

¹²⁸ For touch screens, tapping on the light brown terrain area will show the same readout for that point.

to identify daylight hours (sunrise to sunset) and black shading denotes nighttime hours (sunset to sunrise).

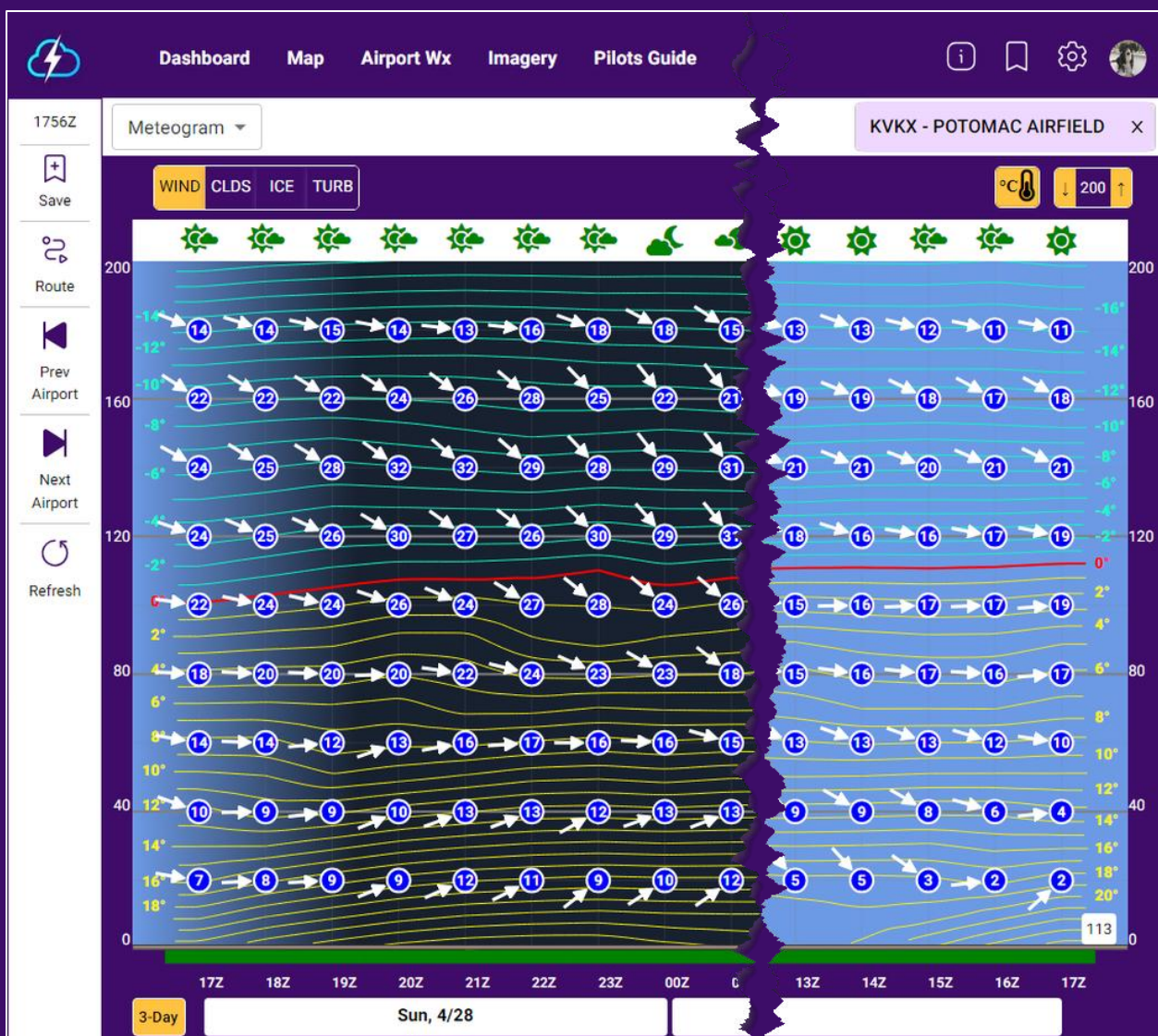


Additionally, the maximum altitude or flight level (FL) depicted for each of these four featured views can be set by pressing the up- or down-pointing arrow corresponding to 500 (FL500), 300 (FL300) or 200 (FL200). For example, as shown on the left, if 200 is selected, the top altitude on the Y-axis of the Meteogram will be 20,000 feet. Pressing on the up-arrow to the right of 200 will

change the maximum altitude to FL300. Pressing the up-arrow again will change it to FL500. This allows better vertical resolution of the display when flight planning for lower altitudes. However, it is strongly encouraged to always check the **FL500** level for clouds given that deeper weather systems are often more significant.

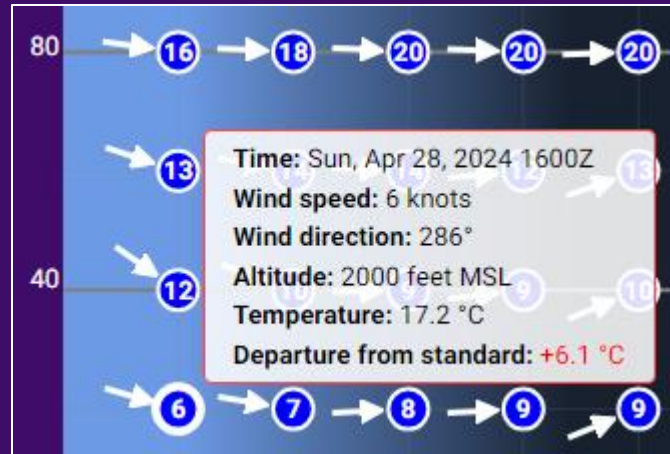
Winds & Temperature

This vertical profile (**WIND**) provides the forecast upper-level winds and temperatures from the surface to FL450 (45,000 feet MSL). Unlike the Route Profile view that has both a speed and head/tail option, only absolute wind speed is provided. At each valid time, a **blue** wind marker will provide the forecast wind speed and direction. The number in the **blue** marker is the magnitude of the wind in knots at the forecast time and altitude with the arrow providing the direction **the wind is blowing from** relative to true north.¹²⁹ For example, for the marker on the right, the wind is forecast to be 6 knots from the west-northwest.



¹²⁹ A "C" in the center of a black marker represents a calm wind and the arrow will be missing.

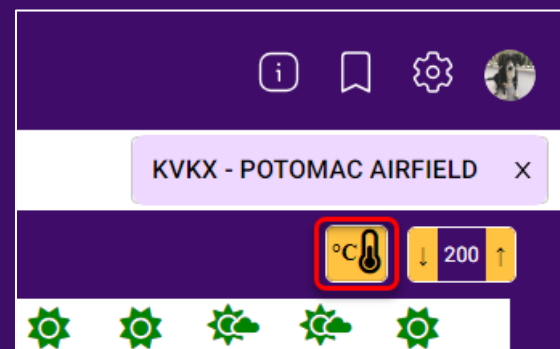
To get additional details, hover¹³⁰ your cursor over the marker. This will highlight the marker and provide a tabular reference (shown right) including the valid time, wind speed, wind direction, altitude, temperature and the departure from standard temperature. Departure from standard subtracts the forecast temperature from the temperature of a standard atmosphere for the respective altitude. A temperature below standard will be shown in blue and temperatures above standard will be shown as a positive number in red.



These wind markers are provided at predetermined altitudes. The table below defines the altitude levels (thousands of feet MSL) that corresponds to each row of winds for each of the three maximum altitude settings mentioned above.

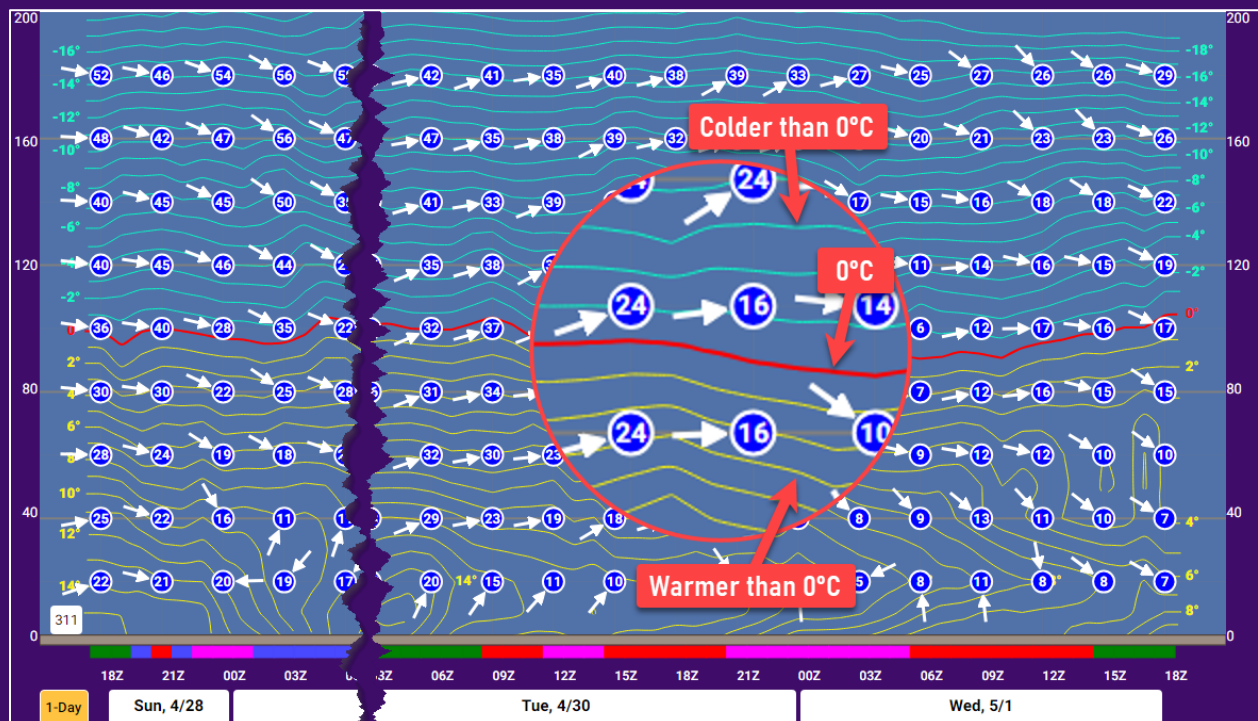
Max Alt	1 st Level	2 nd Level	3 rd Level	4 th Level	5 th Level	6 th Level	7 th Level	8 th Level	9 th Level
FL200	2K	4K	6K	8K	10K	12K	14K	16K	18K
FL300	3K	6K	9K	12K	15K	18K	21K	24K	27K
FL500	5K	10K	15K	20K	25K	30K	35K	40K	45K

On the **WIND** view, to show or remove the lines of constant temperature, also known as isotherms, press the button with a thermometer icon that is positioned to the immediate left of the maximum altitude button. This will show or remove the isotherms, from the **WIND** view. The button is labeled with a °C or °F depending on the current **Temperature** unit preference in the General Settings. A yellow/gold button means the isotherms are depicted in the viewport area with the wind markers overlaid.



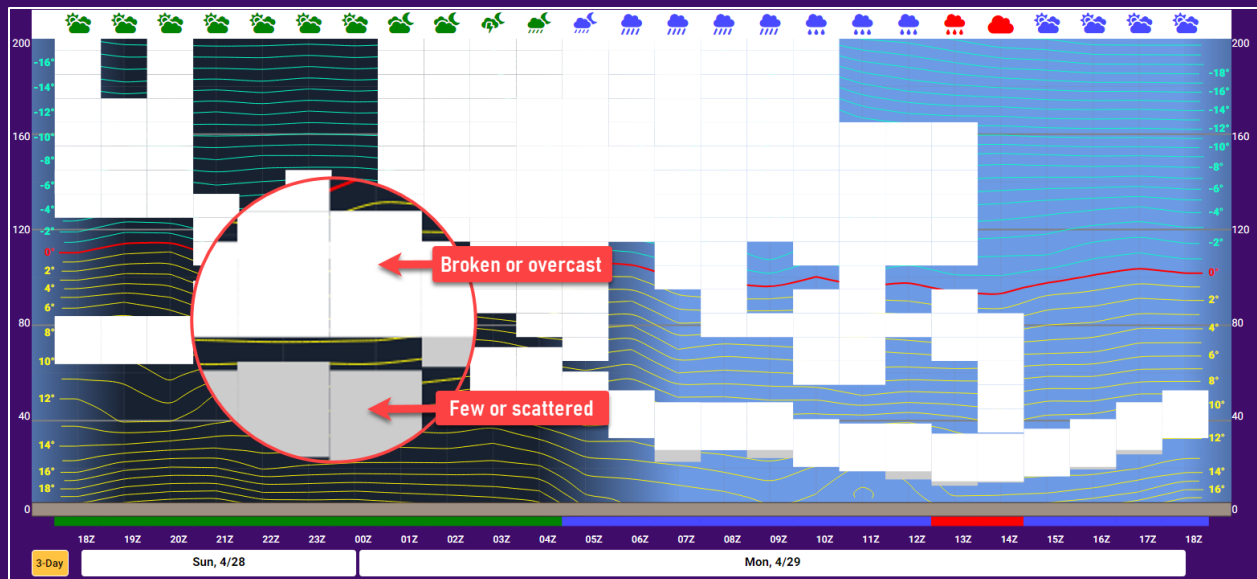
¹³⁰ For touch screens for handheld devices, tapping on the marker will show the tabular display.

The isotherms are depicted as solid-colored lines. In order to reduce clutter, they are separated by a 1°C interval for a maximum altitude setting of FL200, 2°C interval for a maximum altitude setting of FL300 and 5°C interval for a maximum altitude setting of FL500. Isotherms representing a temperature colder than 0°C (32°F) are depicted as a cyan line. Conversely, isotherms for a temperature warmer than 0°C are depicted as a solid yellow line. Lastly, the 0°C isotherm (melting level) is depicted as a bold red line. Although there are many exceptions, most icing encounters happen when the static air temperature (SAT) is between 0°C and -15°C when visible moisture is also present.



Clouds

This vertical profile (**CLDS**) contains a depiction of cloud cover and isotherms for the airport over the next 24 or 72 hours. Clouds are depicted as bright white or gray rectangles showing the height of the cloud layers. Bright white are those clouds that are expected to be **broken or overcast** at the valid time of the forecast. A light gray rectangle represents a **few or scattered** layer of clouds at the valid time of the forecast.

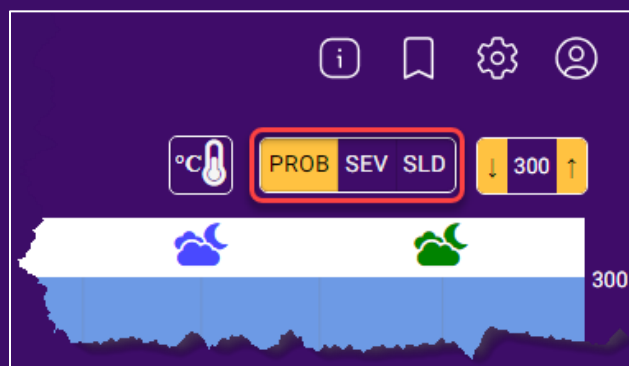
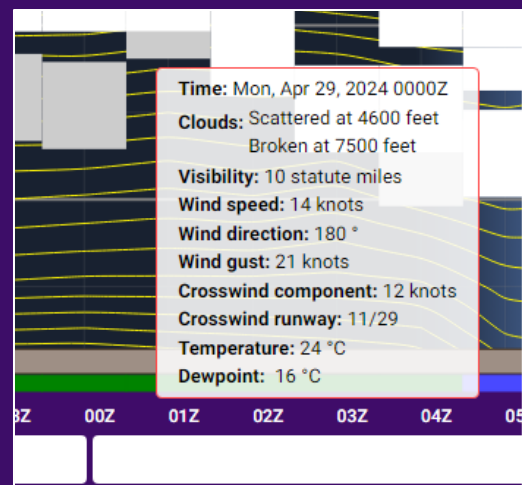


To determine the height of the bases of the clouds at a particular time, hover over the Flight Category Bar. This will show the details of the cloud heights and sky coverage of each layer in a tabular summary. In the example on the right at 00Z, the lowest layer is scattered at 4,600 feet AGL with a higher broken cloud layer at 7,500 feet AGL.

Icing

This vertical profile (**ICE**) depicts the threat of airframe icing for the airport over the next 24 or 72 hours. 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 an approximate lead time of 21 hours or less.

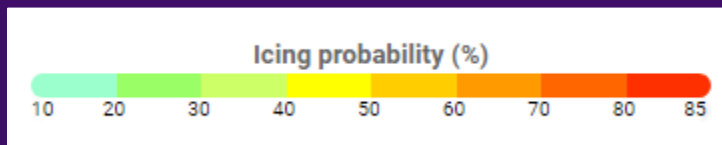


The featured **Airport** view for **ICE** provides the ability to filter the display for Probability (**PROB**), Severity (**SEV**) and **SLD**. The icing probability option is mutually exclusive with both the severity and SLD options. However, the severity

and SLD selections can be selected at the same time. The selected option(s) will have a yellow/gold background.

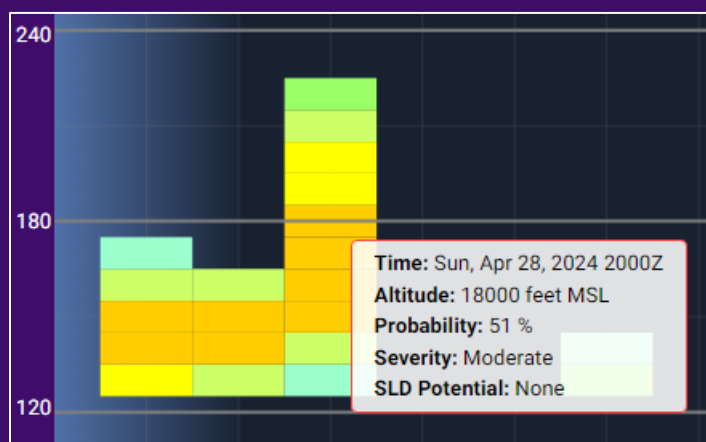
Icing probability

Icing probability (**PROB**) 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.

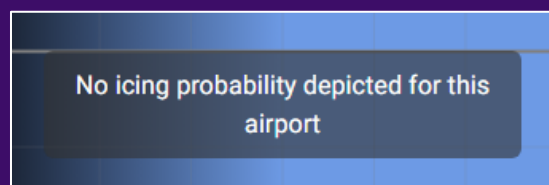


Note that this is a **calibrated** probability and the percentages will naturally decrease as lead time increases. In other words, an icing event that is two hours from the current time will have more certainty than one that is 21 hours in the future. Consequently, beyond the lead time of 12 hours it is rare to see a forecast probability of **more than**

50%. This is important when evaluating the Personal Minimums in the Settings for icing probability for longer lead times.

To see specific probability forecasts within the viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on location of interest. This will provide a tabular summary including the valid time of the forecast, altitude (feet above mean sea level), icing probability (%), categorical icing severity and SLD potential (%) at that altitude and valid time.

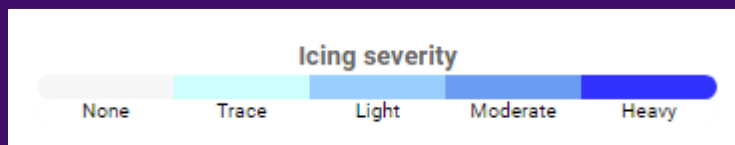
No icing probability depicted for this airport – this alert provides a visual confirmation in the viewport area when no icing probability is forecast over the next 24 or 72 hours for this airport.



Icing severity

Icing severity (**SEV**) provides a forecast for 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.

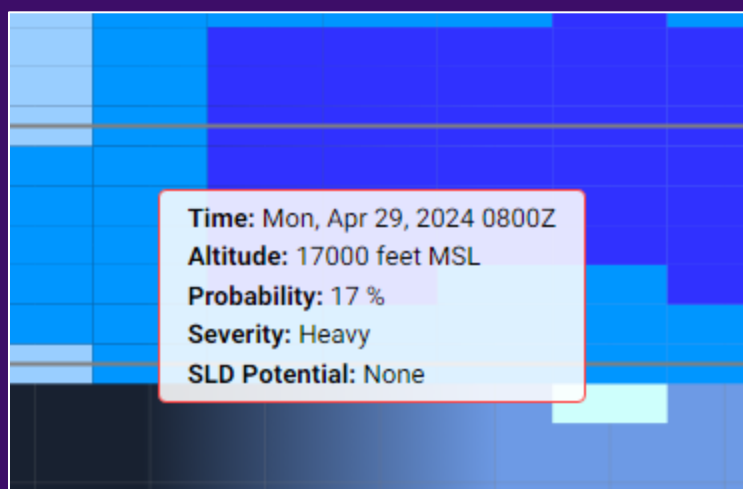


Icing severity is presented in the icing profile viewport as shades of **blue** with lighter shades of **blue** depicting lower intensity and darker shades of **blue** depicting higher intensity. The type of icing (e.g., rime) is not provided by this forecast. Below are the definitions of trace, light, moderate and severe icing from a reporting perspective as defined in the section 7-1-19 of FAA's [Aeronautical Information Manual \(AIM\)](#). Note that

Heavy is not defined in the AIM.

Therefore, it is not included in the definitions below.

To see specific categorical severity forecasts within the viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on location of interest as shown right. This will provide a tabular summary including the valid time of the forecast, altitude (feet above mean sea level), icing probability (%), categorical icing severity and SLD potential (%) at that altitude and valid time.



Trace – Ice becomes noticeable. The rate of accumulation is slightly greater than the rate of sublimation. A representative accretion rate for reference purposes is less than ¼ inch (6 mm) per hour on the outer wing. The pilot should consider exiting the icing conditions before they become worse.

Light – The rate of ice accumulation requires occasional cycling of manual deicing systems to minimize ice accretions on the airframe. A representative accretion rate for reference purposes is ¼ inch to 1 inch per hour on the unprotected part of the outer wing. The pilot should consider exiting the icing condition.

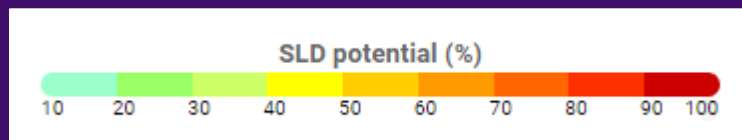
Moderate – The rate of ice accumulation requires frequent cycling of manual deicing systems to minimize ice accretions on the airframe. A representative accretion rate for reference purposes is 1 to 3 inches per hour on the unprotected part of the outer wing. The pilot should consider exiting the icing condition as soon as possible.

Severe – The rate of ice accumulation is such that ice protection systems fail to remove the accumulation of ice and ice accumulates in locations not normally prone to icing, such as areas aft of protected surfaces and any other areas identified by the manufacturer. A representative accretion rate for reference purposes is more than 3 inches per hour on the unprotected part of the outer wing. By regulation, immediate exit is required.

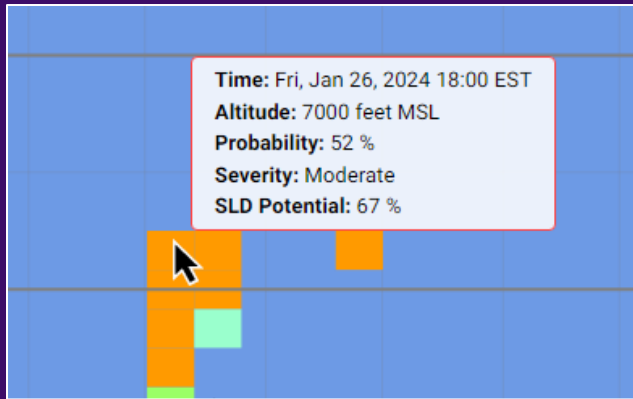
SLD

Icing probability (**SLD**) 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.



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.

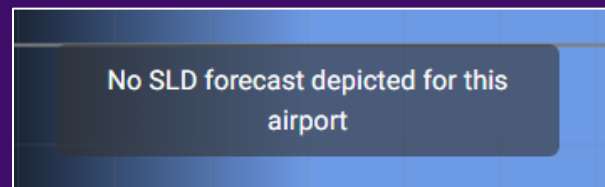


Note that the SLD forecast is **not** a calibrated probability, but an icing potential (i.e., likelihood) and the percentages will not necessarily decrease as time increases.

To see specific SLD forecasts within the viewport area, simply hover the mouse cursor over the desired region or for

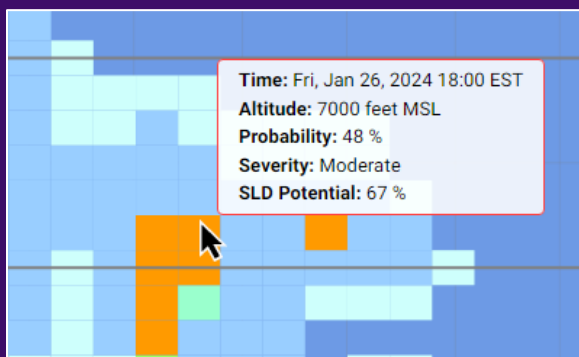
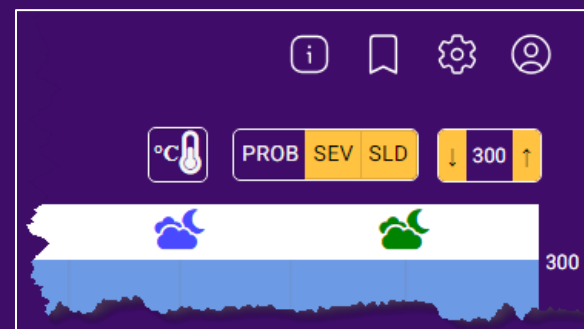
touch screens tap on location of interest. This will provide a tabular summary including the valid time of the forecast, altitude (feet above mean sea level), icing probability (%), categorical icing severity and SLD potential (%) at that altitude and valid time.

No icing SLD forecast depicted for this airport – this alert provides a visual confirmation in the viewport area when no icing severity is forecast over the next 24 or 72 hours for this airport.



Icing severity + SLD

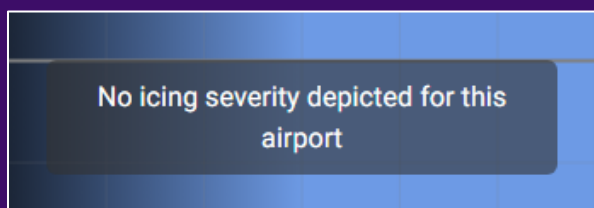
Lastly, the icing profile provides a combination of the icing severity and SLD forecasts by selecting the **SEV** and **SLD** options simultaneously as shown on the right. This simply repeats the icing severity forecast depicted in shades of blue and overlays the SLD potential as described above. To see SLD and severity forecast details



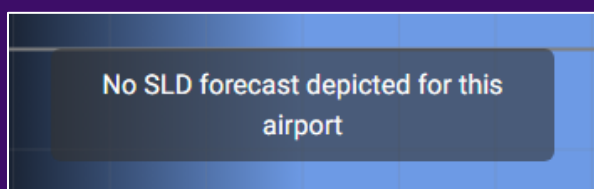
within the icing viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on the same location. This will provide a tabular summary of the valid time of the forecast, the icing severity forecast and the SLD potential (%) forecast at that altitude and location along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

One of three possible alert messages may be posted in the main icing profile viewport for the icing probability, severity or SLD forecasts.

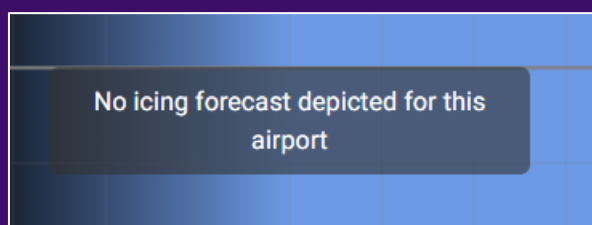
No icing severity depicted for this airport – this alert provides a visual confirmation in the viewport area when no icing severity is forecast over the next 24 or 72 hours for this airport.



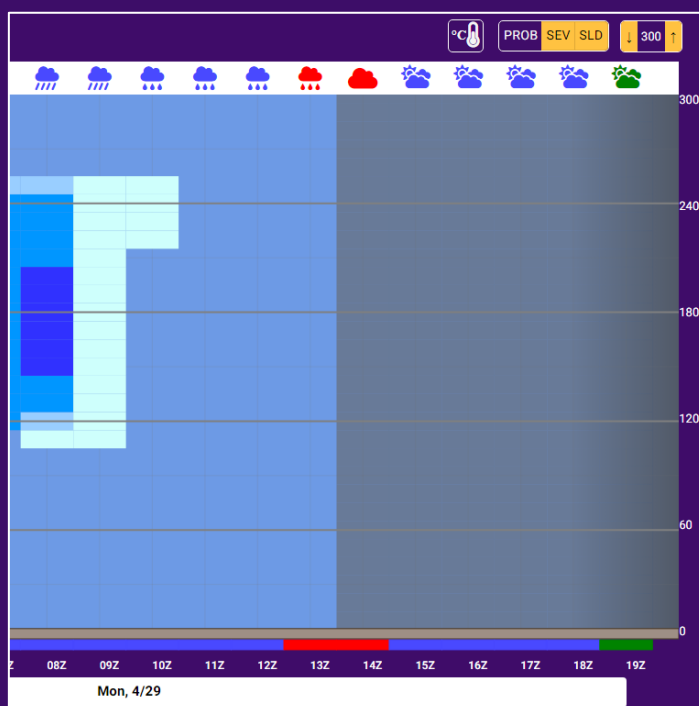
No icing SLD forecast depicted for this airport – this alert provides a visual confirmation in the viewport area when no icing severity is forecast over the next 24 or 72 hours for this airport.



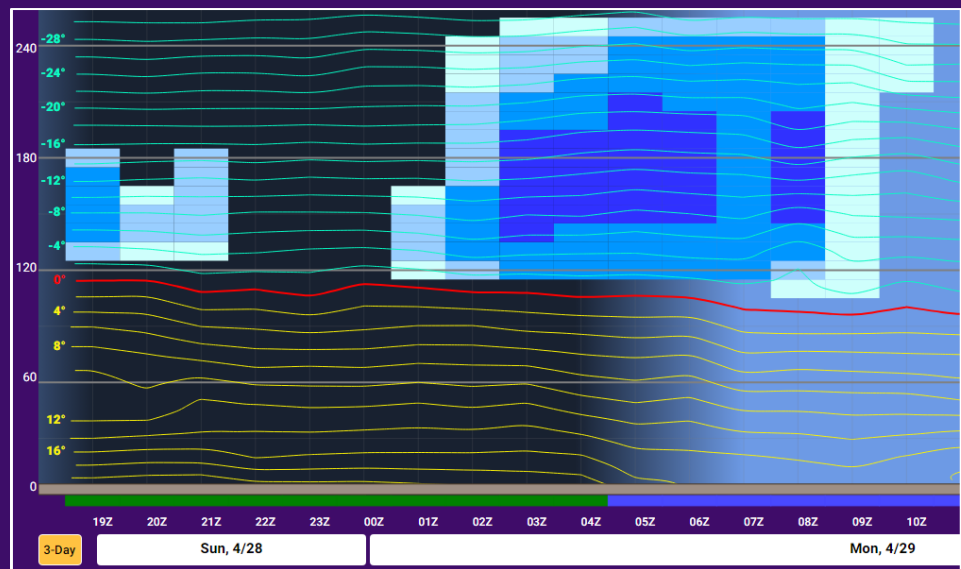
No icing forecast depicted for this airport – this alert provides a visual confirmation in the viewport area when no icing severity or SLD is forecast over the next 24 or 72 hours depending on the user's setting.



For some times, only part of the view will have an icing forecast available. In this case, a dark hatched region as shown on the right will cover the times where the icing forecast is not available. In this instance, times beyond 13Z do not have a forecast for icing.



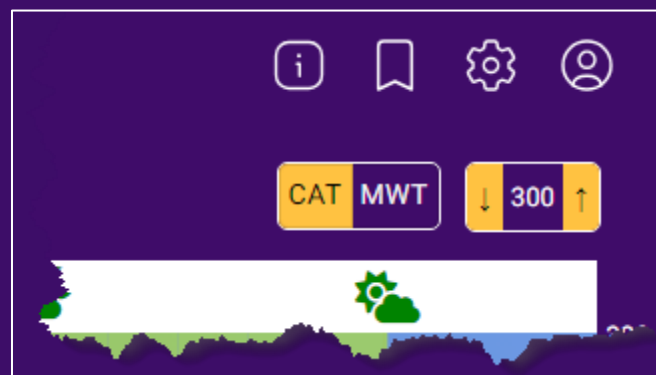
In addition to the icing probability, severity and SLD forecasts, the icing profile also includes the temperature forecast using lines of constant temperature or isotherms. The isotherms are depicted as solid-colored lines. In



order to reduce clutter, they are separated by a 1°C interval for a maximum altitude setting of FL200, 2°C interval for a maximum altitude setting of FL300 and 5°C interval for a maximum altitude setting of FL500. Isotherms representing a temperature colder than 0°C (32°F) are depicted as a cyan line. Conversely, isotherms for a temperature warmer than 0°C are depicted as a solid yellow line. Lastly, the 0°C isotherm (melting level) is depicted as a bold red line. Although there are many exceptions, most icing encounters happen when the static air temperature (SAT) is between 0°C and -15°C when visible moisture is also present.

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 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.



The featured **Airport** view for **TURB** provides the ability to filter the profile to render clear air turbulence (**CAT**) and mountain wave turbulence (**MTW**). These can be selected independently or together to create a combined forecast.

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.

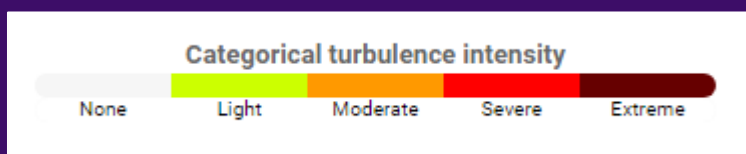
EDR has a range from 0.0 to 1.0 in units of m^2/s^3 . Therefore, the higher the EDR value, the higher the intensity of turbulence. Typically, EDR varies from close to 0, "smooth", to near 1, "extreme" for most aircraft types. **Note:** Actual EDR values in **EZWxBrief** are multiplied by 100 for ease 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 shown on the right are assigned to the various turbulence categories based on the aircraft weight class for Light (default), Medium and Heavy aircraft in the table above. This is chosen within the Settings under the **Aircraft Settings**.



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.

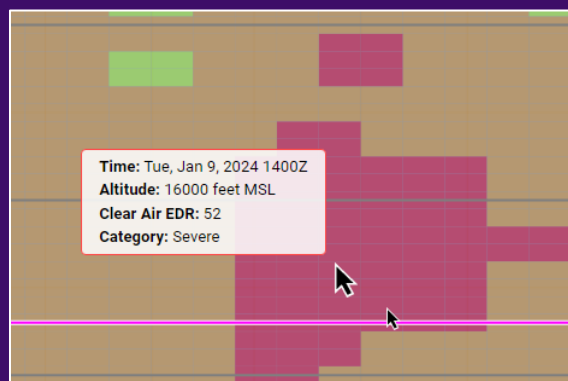
Mountain wave turbulence

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.

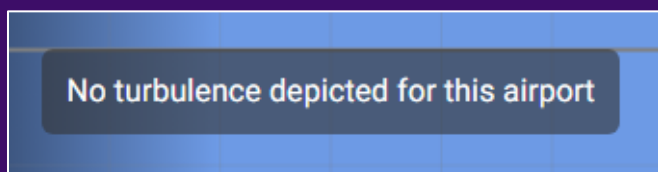
To see specific forecast for **CAT**, **MWT** (or combined) within the viewport area, simply hover the mouse cursor over the desired region or for touch screens tap on location of interest. This will provide a tabular summary including the valid time of the forecast, altitude (feet above mean sea level), clear air EDR and categorical turbulence at that altitude and location along the route of flight.



One of three possible alert messages may be posted in the main turbulence profile viewport for the clear air and mountain wave turbulence forecasts.

No turbulence depicted for this airport

– this alert provides a visual confirmation in the viewport area when no turbulence is forecast over the next 24 or 72 hours for this airport.

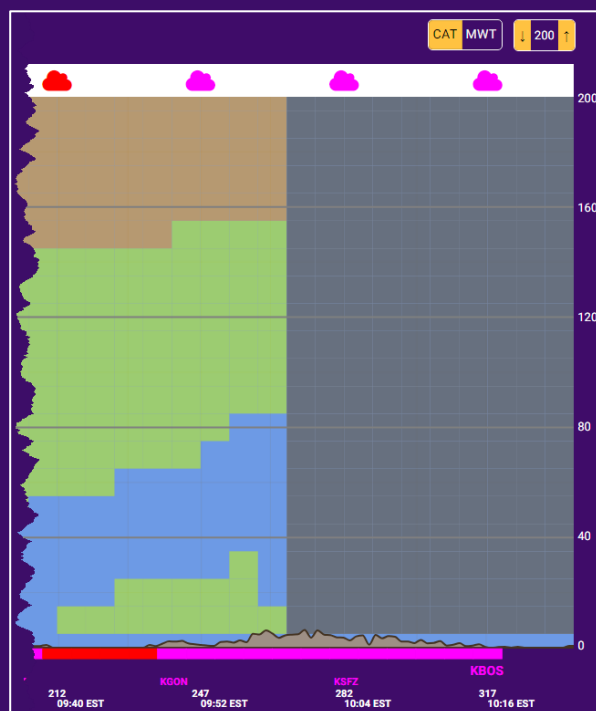


No clear air turbulence depicted for this airport – this alert provides a visual confirmation in the viewport area when no turbulence is forecast over the next 24 or 72 hours for this airport.

No clear air turbulence depicted for this airport

No mountain wave turbulence depicted for this airport – this alert provides a visual confirmation in the viewport area when no turbulence is forecast over the next 24 or 72 hours for this airport.

No mountain wave turbulence depicted for this airport



For some departure times, only part of the proposed route will have a turbulence forecast available. In this case, a dark hatched region as shown on the left will cover the location where the turbulence forecast is not available. In this instance, the arrival times for the latter part of the route are past the available lead time of the turbulence forecasts.

METARs

Choosing the **METARs** option from the Airport sitemap menu will show the latest twelve hours of coded¹³¹ surface observations for the selected station (airport) **beginning with the most recent** observation at the top. Depending on the airport, 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.¹³² 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 METARs available for this airport"** will be displayed.

The ceiling and visibility text are color-coded based on the categorical value shown in the table below. For the METAR below, KAPF is reporting 1/2SM visibility with fog (FG) which is in the Low IFR flight category for visibility and a vertical visibility (VV) of 500 feet which is in the red flight category for ceiling height. Visibility and fog are color-coded as magenta with the ceiling color-coded as red.

```
KAPF 270510Z AUTO 00000KT 1/2SM FG VV005 12/11 A3012
RMK AO2 T01200114
```

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

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.

```
KSGT 271556Z AUTO 33023G26KT 8SM RA BKN009 OVC070 07/07 A3000
RMK AO2 PK WND 01028/1529 SLP161 P0014 T00720067
```

¹³¹ At this point in time, there are no decoded METARs provided by EZWxBrief.

¹³² At this time, EZWxBrief does not label a surface observation with the SPECI tag to signify a special observation.

Additionally, the METAR code in the present weather field for showers and thunderstorms that includes **TS**, **VCTS**, **SHRA**, **VCSH** are highlighted in red to denote dangerous convective weather as well as freezing precipitation such as **FZRA** or **FZDZ**.

```
K1R8 271335Z AUTO 08004KT 5SM VCTS RA BR FEW007 BKN017 OVC070 17/17 A3000  
RMK A02 LTG DSNT NE-SE
```

TAFs

Choosing the **TAFs** option from the Airport sitemap menu will show the latest twelve hours of coded¹³³ terminal aerodrome forecasts (TAFs) for the selected airport **beginning with the most recent at the top**. 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 available for this airport"** will be displayed.

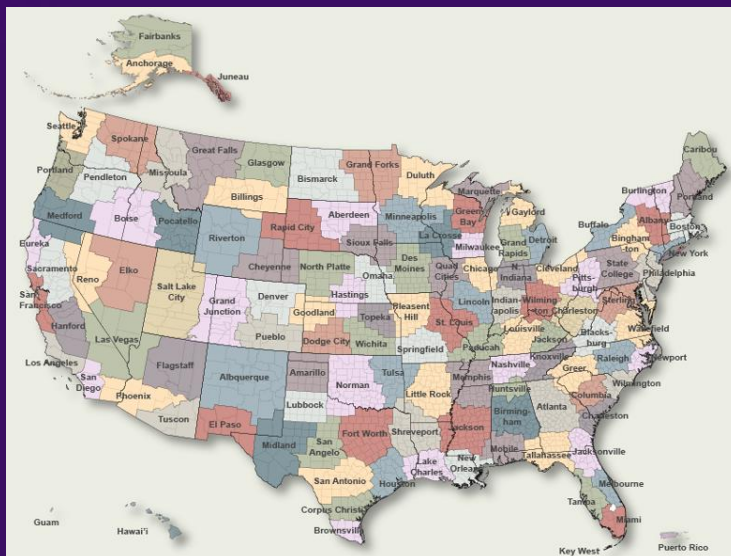
Similar to the METAR text, ceiling and visibility are color-coded based on the categorical values shown in the table above. The wind speed and wind gust will be color-coded as brown if the expected sustained wind speed is greater than 14 knots and/or the wind gust is forecast to be greater than 19 knots. Also highlighted in brown are forecasts for non-convective LLWS (e.g., WS020/15045KT). Additionally, the TAF code in the present weather field for showers and thunderstorms that includes TS, VCTS, SHRA and VCSH are highlighted in red to denote dangerous convective weather is expected as well as freezing precipitation such as **FZRA** or **FZDZ**.

```
KCLT 271600Z 2716/2818 06006KT 6SM -SHRA BR FEW007 SCT012 OVC030  
TEMPO 2716/2718 3SM -SHRA BR FEW004 BKN012 OVC030  
FM271800 07008KT 4SM -SHRA BR OVC007  
FM280200 15009KT 3SM -SHRA BR OVC004  
FM280600 19012G20KT 3SM -SHRA BR OVC004  
PROB30 2806/2810 2SM TSRA BR OVC002CB  
FM281400 25014G22KT P6SM SCT050
```

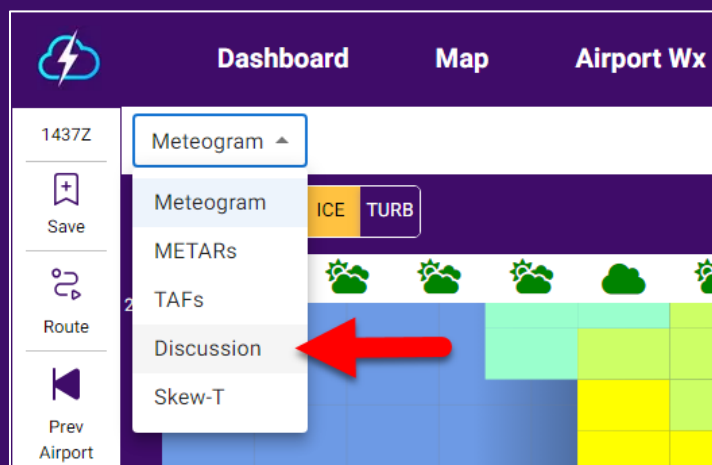
¹³³ At this point in time, there are no decoded TAFs provided by EZWxBrief.

Discussion

The Area Forecast Discussion (AFD)¹³⁴ is plain English text issued by meteorologists located at the 123 National Weather Service (NWS) local Weather Forecast Offices (WFOs) throughout the United States and its territories (shown right). The same meteorologist at the WFO that issues the terminal aerodrome forecast (TAFs) for their county warning area (CWA) is also responsible, in part, for issuing the corresponding AFD. Each AFD describes the weather expected to occur within the bounds of each the 123 corresponding CWAs. The CWA defines the geographic “area” or boundary they are discussing.



Choosing the **Discussion** option (shown right) from the Airport sitemap dropdown menu shows the most recent **AFD** valid for the airport being rendered in the view. Essentially, using the airport's identifier, **EZWxBrief** determines what CWA the airport falls within and displays the associated AFD. Given that these CWAs are only in regions throughout the U.S., **AFDs are not available for airports located outside of the United States**. For those airports outside of the U.S. the message, “**There are no forecast discussions available for this airport**” will be rendered.



¹³⁴ To be clear, the AFD is not a discussion describing the legacy area forecast (FA) that was retired on October 10, 2017.

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. The AFD also provides the forecaster a vehicle 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.

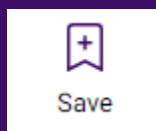
The AFD was originally created to enhance communication between forecasters at neighboring WFOs. Even though it is written in plain English, it can be quite technical at times and contain a lot of jargon. Even so, it can be extremely useful to pilots. Typically, the discussion starts out with a synopsis 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 AFD text. This section is specifically created to address the terminal forecasts that fall within the 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 00Z, 06Z, 12Z and 18Z. 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. However, the specific times the AFD is issued is highly dependent on each WFO.

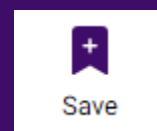
.AVIATION /15Z SATURDAY THROUGH WEDNESDAY/...

At KCLT and elsewhere: IFR restrictions from fog will dissipate as showers move in from the SE. Cigs then expected to drop through MVFR to IFR as the showers become more steady and widespread, with vsby becoming MVFR to IFR. Wind becomes NE as the showers move in, S at KAVL. MVFR vsby and LIFR cigs expected by evening as a round of heavier showers, and possibly a TSRA, move in. Wind turns S and becomes gusty as the associated cold front moves through. Vsby improves toward daybreak with MVFR cigs and gusty SW wind.

Outlook: Gusty NW winds are expected Sunday, as dry air moves in behind the departing cold front and helps scour out low clouds and fog. Dry high pressure returns early next week bringing VFR conditions back to the area. An upper low may bring precip and restrictions on Wednesday.

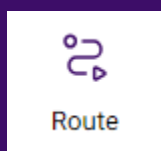


Whether viewing the Meteogram, METARs, TAFs, Discussion or Skew-T (temporarily removed) for an airport within the Airport Wx view, the option to add the airport to your list of Saved



Items is available by pressing the **Save** button as shown on the left. If the icon is filled in (shown right), this implies that the airport is currently stored in one or more custom folders or the **EZWxBrief** root folder.

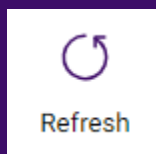
In either case, pressing the **Save** button will display the **Save airport** selector (shown right). This provides the capability to add the current airport to an existing custom folder or to the **EZWxBrief** root folder. The **Name** field is defaulted to the official name of the airport but can be changed to any name you choose. This is the name that will appear in your Saved Items list. Moreover, if the airport is currently saved, the ribbon icon to the left of the name field will be filled solid. From this selector, you can select the **Destination Folder**, **Delete** the saved airport from all custom folders and **EZWxBrief** root folder or create a **New Folder**. Pressing the Destination Folder dropdown will list the **EZWxBrief** root folder and all of the available custom folders (including any new folders just added) that can be chosen.



From the **Airport Wx** view, you can press the Route button (shown left) to open the route editor. If an active route exists, the departure airport, destination airport, optional route of flight and altitude will be populated automatically within the route editor. If no active route exists, the route editor fields will be set to their default values to plan a new route.



Whether viewing the Meteogram, METARs, TAFs, Discussion or Skew-T (temporarily removed) for an airport, the **Prev Airport** and **Next Airport** buttons (shown left) provide the ability to cycle through the airports that are contained within the active route.¹³⁵ This will also include airports in the order listed within the optional route of flight field.¹³⁶ For example, if you are viewing the METARs for the departure airport, pressing the **Next Airport** button will cycle to the METARs for the next airport in the route of flight or the destination airport. If no active route exists, the **Prev Airport** and **Next Airport** buttons will cycle through the most recent airports visited up to and including a maximum of ten.



Pressing the **Refresh** button (shown left) will cause the Airport Wx view to completely rebuild. For example, if you are viewing the surface observations (METARs) for an airport and a new observation becomes available shortly thereafter, the **Refresh** option will rebuild the METARs display and include any new observations.

¹³⁵ This is done in a round-robin fashion such that when reaching the destination airport or the last most recent route, it will loop back around to the departure airport or most recent airport viewed.

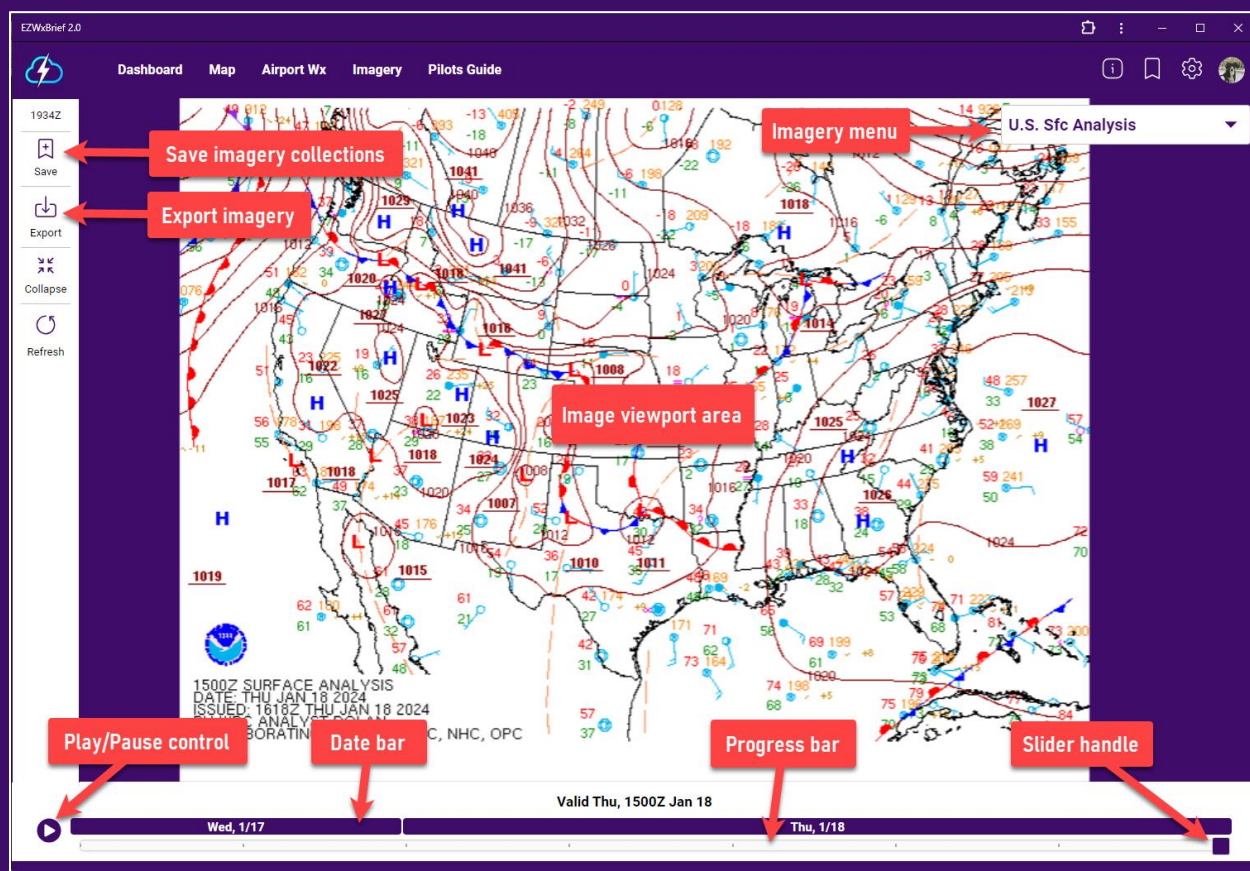
¹³⁶ Waypoints that may be listed in the optional route of flight field are skipped since only airports can be viewed in the Airport Wx view.

Imagery view

The **EZWxBrief** static imagery view contains the most comprehensive weather guidance available online. To view the static imagery, find the Imagery selection from the main menu¹³⁷. Pressing this selection will open the **EZWxBrief** imagery view. The imagery view can also be launched from the **Dashboard** through the Recent Imagery or from the Saved Items panel.



The imagery view consists of the image viewport area, imagery menu, play/pause control, date bar, progress bar, slider handle and other features to include exporting images to your local device and saving imagery collections.



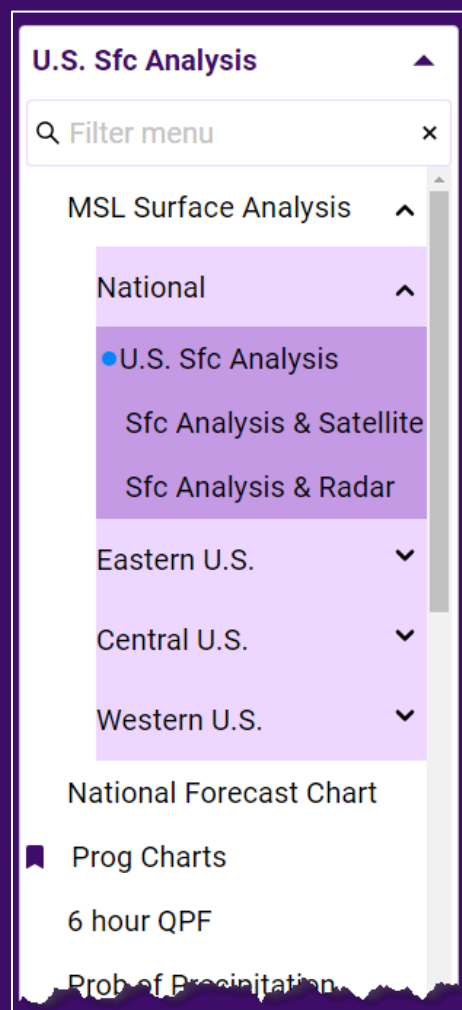
Imagery collections – The static imagery is organized into weather product collections. Many of these collections may be further subdivided into folders that are organized by

¹³⁷ For handheld devices, the Imagery selection will be contained within the hamburger menu located in the masthead.

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, press the imagery menu located on the top-right side of the imagery view. This will open up the full imagery menu hierarchy. This menu can be scrolled to view all of the collections available. For collections that are subdivided into groups, a down-pointing caret will be present to the right of the collection group name. Pressing on the name will expand the group to reveal the imagery collections or other encapsulated groups. Collection names containing the animated imagery will not have a caret to the right of the name. Imagery collections that are found in one or more saved item folders or the EZWxBrief root folder will have a purple ribbon in front of the collection name. To view the images within the collection, press on this name to open it in the imagery viewport area.

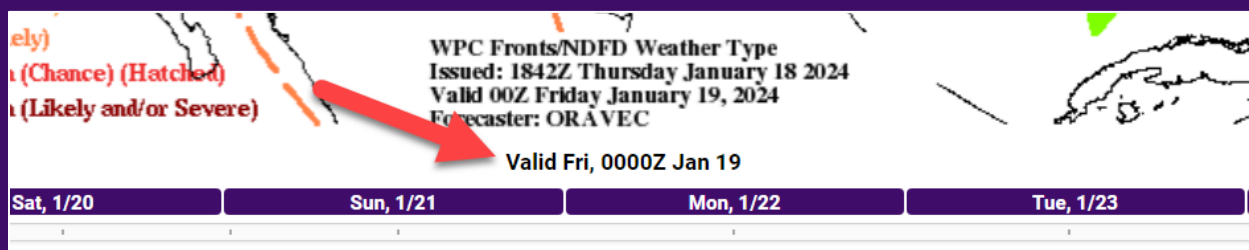
Note: EZWxBrief stores the last imagery collection viewed and will default to this collection (if defined) in the viewport when returning to the Imagery view.



Animation – A play/pause button is provided at the bottom-left of the imagery viewer to animate the images contained in the collection. 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 or slider handle that defines the relative location within the animation. Pressing any location on the progress bar will advance the handle to that point and display the image that is represented by that location (time) within the loop. Alternatively, pressing and sliding the handle right and left will seamlessly animate the imagery forward and backward displaying the respective images in the viewport. For some collections, this

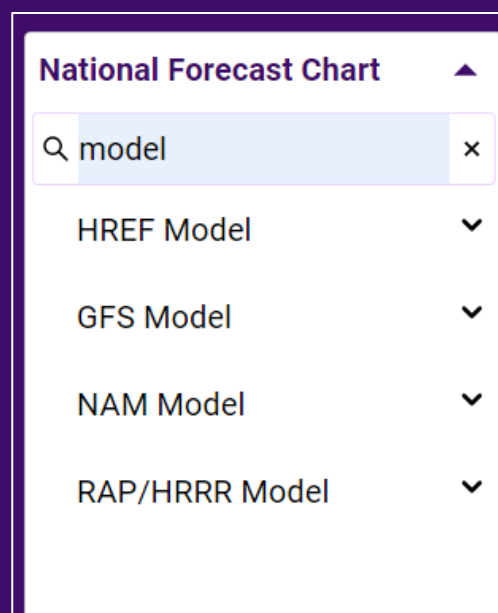
feature allows you to quickly visualize the movement and trends of weather in time. Lastly, on devices with a keyboard, using the left and right arrow keys will increment or decrement the progress bar time as well.

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 “Please reference time stamps on image.”

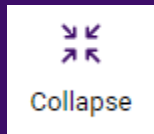


For time-ordered collections, they are ordered from oldest to newest for observational data or from earliest lead time to a lead time furthest in the future for forecast data. Collections based on observational data such as surface analysis charts and MRMS composite reflectivity, contain imagery valid in the recent past. When viewing these collections, the image with the most recent valid time will be displayed and the handle 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 handle positioned on the far left of the progress bar.

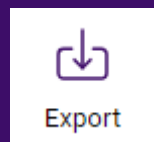
Smart filter – The imagery menu contains a smart filter that allows you to enter a string of characters to search for a particular imagery collection. In the search field enter the text you would like to search for and the imagery menu will be filtered as you type to leave only collections with names that contain that string. For example, if you want to show only collections that contain the word **model**, type “model” (without quotes) into the search field and it will filter the menu to leave those collections or group names that have “model” in the name.



The filtered menu will continue to persist until the search field is cleared by pressing on the **X** at the end of the search field.



Pan and zoom – When viewing any image, you can zoom in and out and pan the image in all directions. To zoom in simply double-click with a mouse on the image. This will zoom in on the image at the point where the cursor is located. A second double-click will zoom out to the maximum level. Alternatively, using a wheel on a mouse will cause the image to zoom in and out at the point where the cursor is located. On a touch screen device such as an iPad, the zoom in/out function is accomplished using a two-finger pinch gesture. When any image is zoomed, the **Collapse** button (shown left) can be used to quickly bring a zoomed image back to a maximum zoomed out level. A press and drag action will pan the zoomed image¹³⁸. On a touch screen, a single finger press and drag can be used to pan the image. Lastly, you can also animate a zoomed or panned image using the player controls or by sliding the progress bar handle. The image will remain zoomed during any animation.



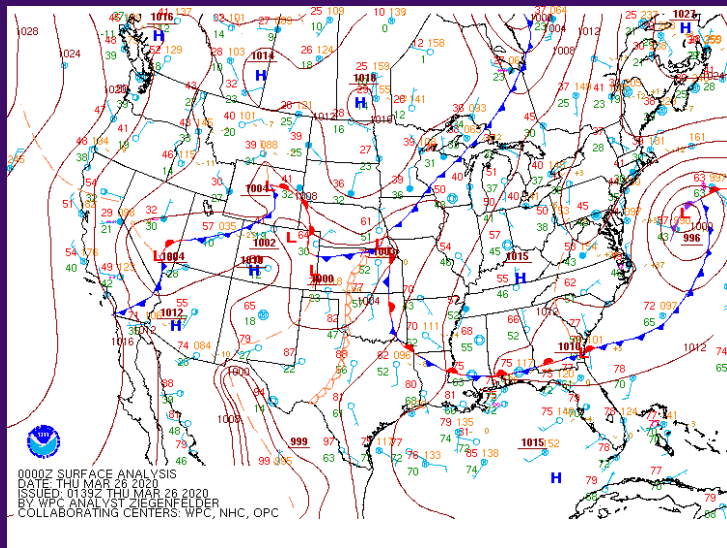
Export an image – Any image in a collection can be saved to your local device whether you are on a desktop, laptop or handheld. Simply tap or click on the **Export** button (shown left) and the current image in the viewport area will be downloaded to your device via your browser.

Freshness of imagery – While there is an attempt to keep all of the imagery up to date, please understand that some imagery collections are scraped 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.

¹³⁸ The pan operation is only available when the image is zoomed.

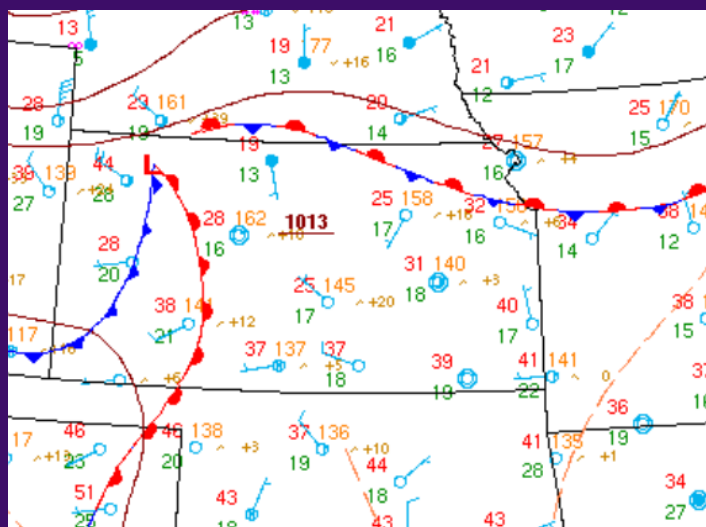
MSL surface analysis

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 a weather briefing. It will help 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 (observations) 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.

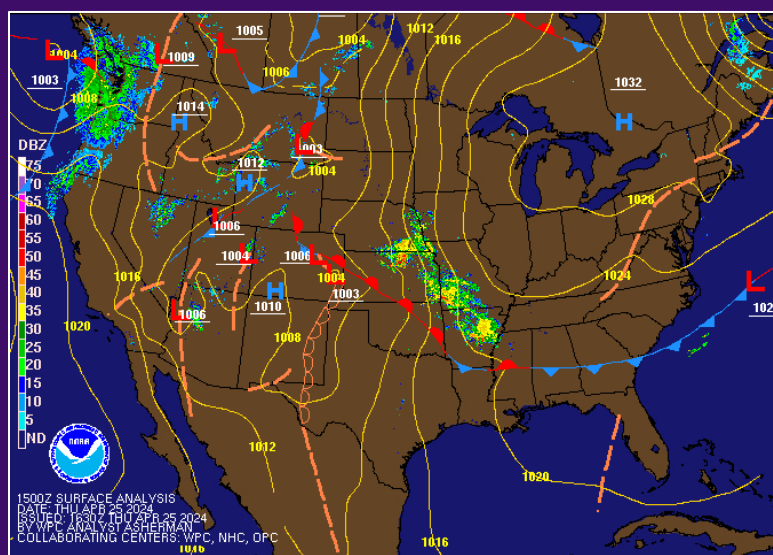
The surface analysis chart depicts an isobaric analysis of pressure in millibars adjusted to a single height, that is, mean sea level¹³⁹.



¹³⁹ Also referred to as a constant height chart.

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 shown¹⁴⁰. 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.

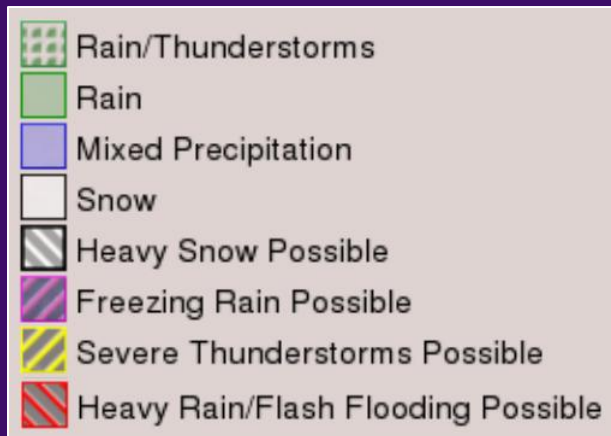
¹⁴⁰ The loop control will begin on the far right.

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

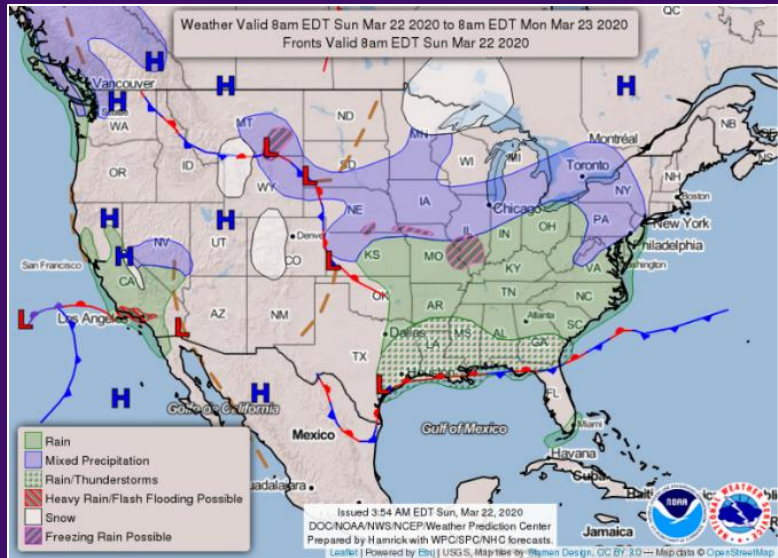
National forecast chart

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.

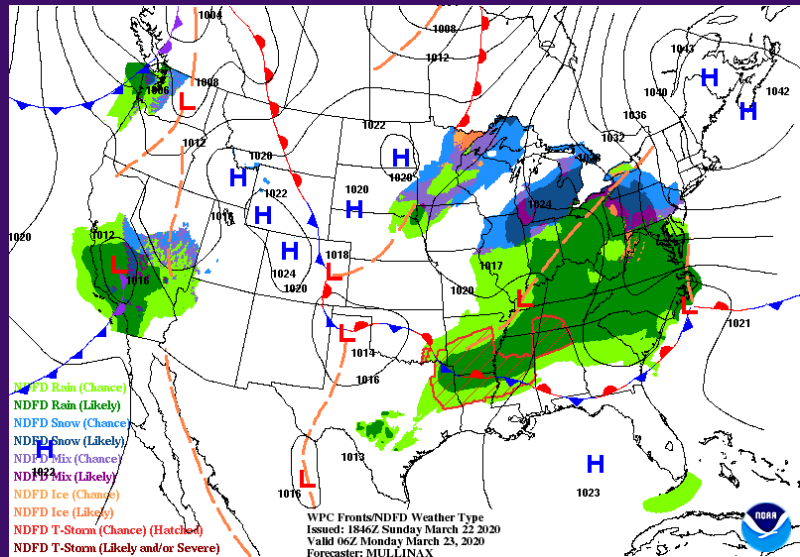


The current day's chart is updated twice each day, once in the early morning (by 1000Z), and again in the afternoon (by 2200Z). The charts for Days 2 and 3 are currently updated daily at 1000Z, but can be updated more frequently as conditions warrant.

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 six hours to seven days.

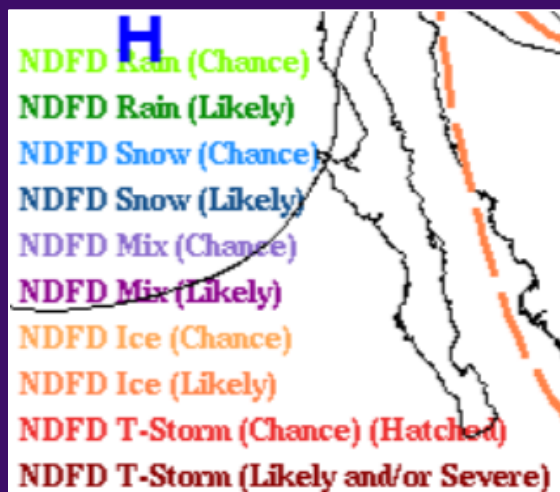


These short-range forecasts are issued twice a day and include the expected surface pressure patterns (isobars), circulation centers (highs and lows) and fronts with a lead time of 6, 12, 18, 24, 36, 48 and 60 hours. A color mosaic depicting the type, coverage (extent) and likelihood of precipitation 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 weather type forecasts

depicted on these charts is strictly limited to the conterminous U.S. and immediate 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 weather 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.

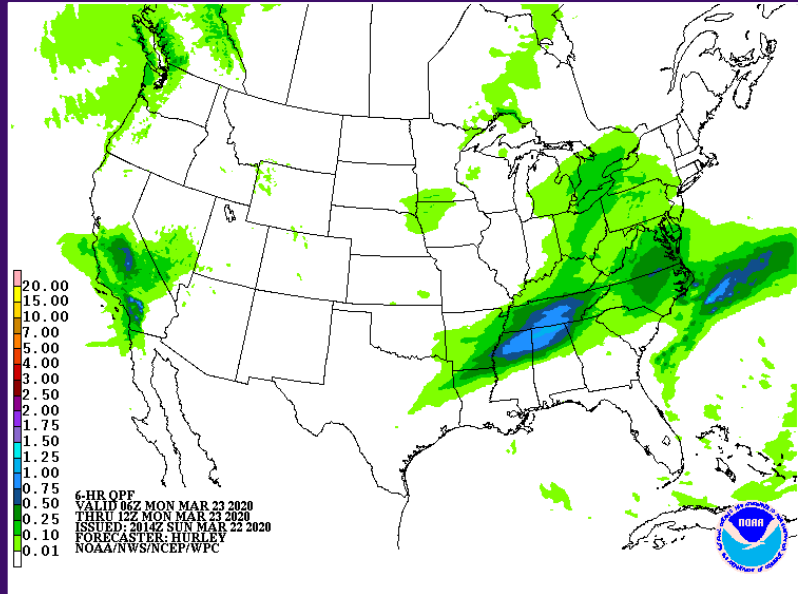
Extended range forecasts are also issued by forecasters at the WPC. Surface pressure patterns (isobars), circulation centers and fronts are depicted with a lead time of 72 hours (Day 3) through 168 hours (Day 7) and is valid on each day at 1200Z.¹⁴¹ Unlike the precipitation on the short-range prog charts, weather type areas are 6-hour probability forecasts (also depicted using two colors). Dark colors depict regions with the highest

¹⁴¹ 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.

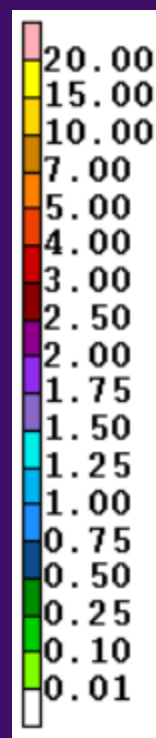
probability of rain, snow, ice or thunderstorm. The weather type for the extended-range forecast is valid from 18Z to 00Z and is issued by meteorologists at the WPC.

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, drizzle, snow, ice pellets) nor does it tell you if the



precipitation is the result of deep, moist convection or thunderstorms. Solid-filled color contours are drawn based on the scale shown on the left side of the chart. 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.

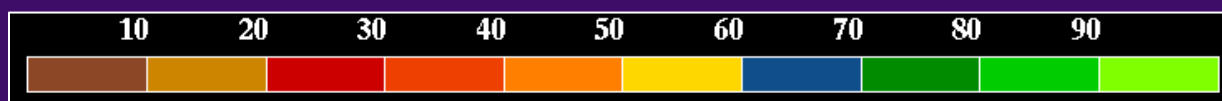
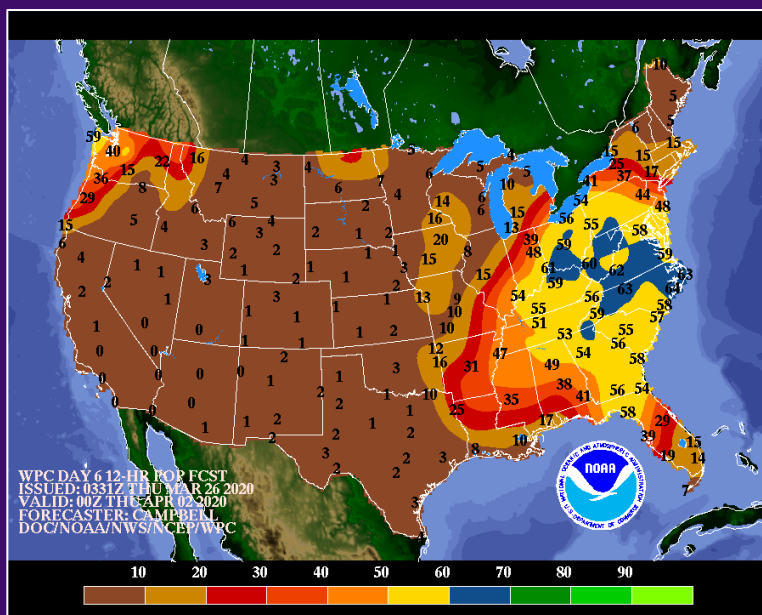
Probability of precipitation

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. Moreover, this forecast does not distinguish the precipitation type or whether the precipitation will be convective. These forecasts should always be used in conjunction with the extended range prog charts from the WPC.

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. Conversely, lower numbers denote high forecaster confidence that measurable precipitation will not reach the surface within the valid forecast period.



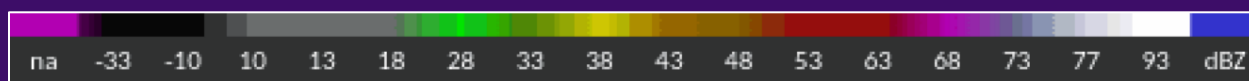
MRMS composite reflectivity

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 and anomalous propagation typically located around the various radar sites especially at night or early morning.

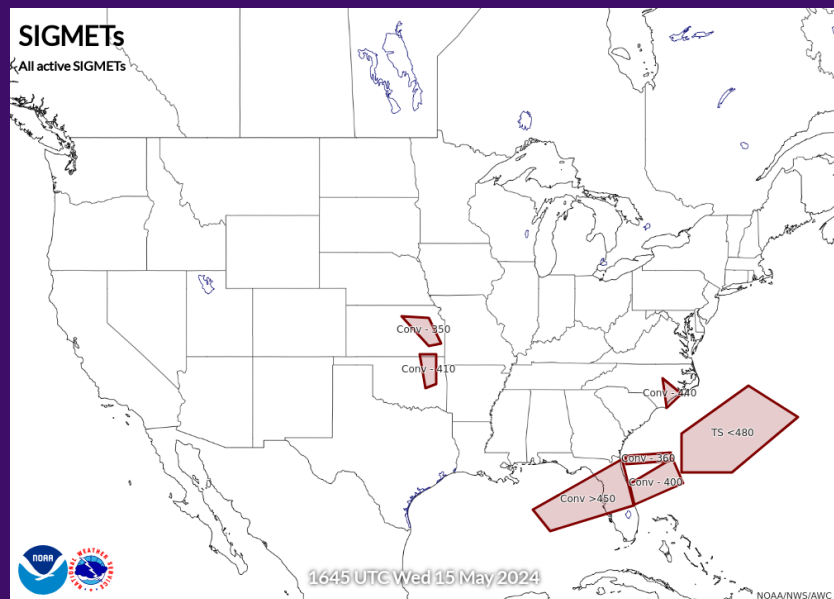
Images in this collection are generated at 4- to 6-minute intervals spanning the previous **two** hours in total. When this imagery collection is rendered, the cursor is initially placed on the most recent image. It's important to understand that it takes time to produce these images and the even the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

SIGMETs

SIGMETs are en route advisories for (**SIGN**ificant **MET**eorological information). These are issued on an as-needed basis by highly trained meteorologists at the Aviation Weather Center (AWC) in Kansas City, Missouri. 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. 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-type thunderstorm¹⁴² 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 include 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

¹⁴² Colloquially known as an air mass thunderstorm.

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 Weather Forecast Office (WFO) as severe. Keep in mind, 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**.

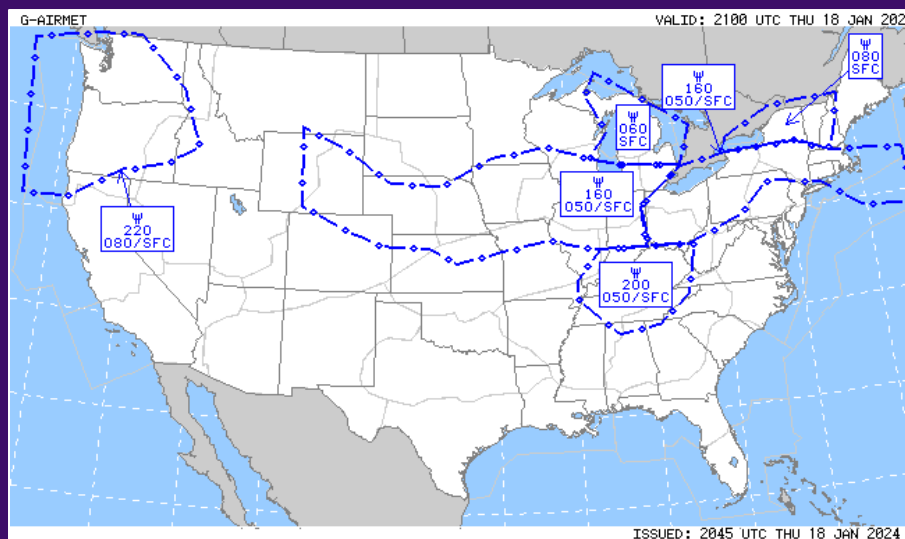
Additionally, meteorologists at the AWC issue a convective outlook that will appear on the convective SIGMET chart as an orange-colored polygon. These polygons are forecast, not advisories that depict regions where convection is expected to reach convective SIGMET criteria over the next two to six hours.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

The first image in the loop contains the latest SIGMETs (including international SIGMETs) that have been recently issued. This includes both convective and non-convective SIGMETs. The next four images in the SIGMETs collection include convective SIGMETs, non-convective SIGMETs for severe airframe icing, non-convective SIGMETs for severe or extreme turbulence and SIGMETs for IFR conditions (dust storm and sandstorms). Given that volcanic ash SIGMETs are rare, there isn't a separate chart for that SIGMET. Instead, look for volcanic ash SIGMETs to appear on the first chart in the collection that includes all SIGMETs.

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),

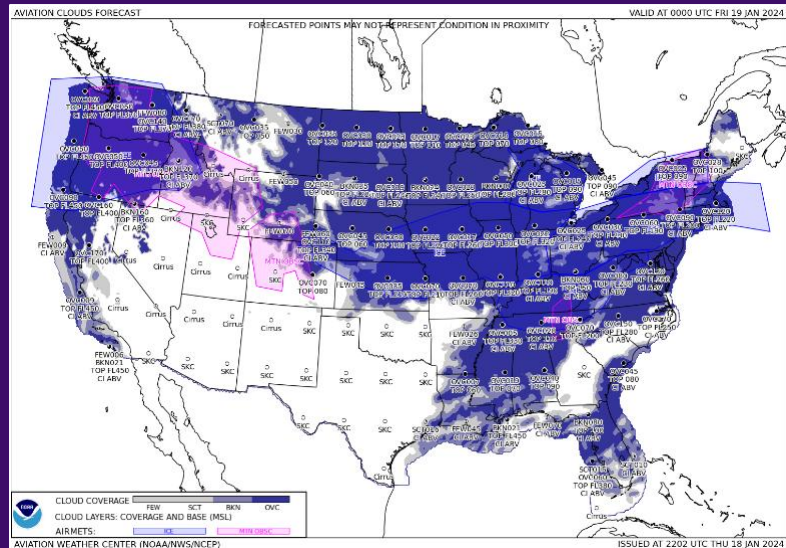
widespread strong sustained surface winds greater than 30 knots, widespread non-convective low level wind shear (LLWS) below 2,000 feet AGL and widespread IFR conditions and



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.

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.



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.

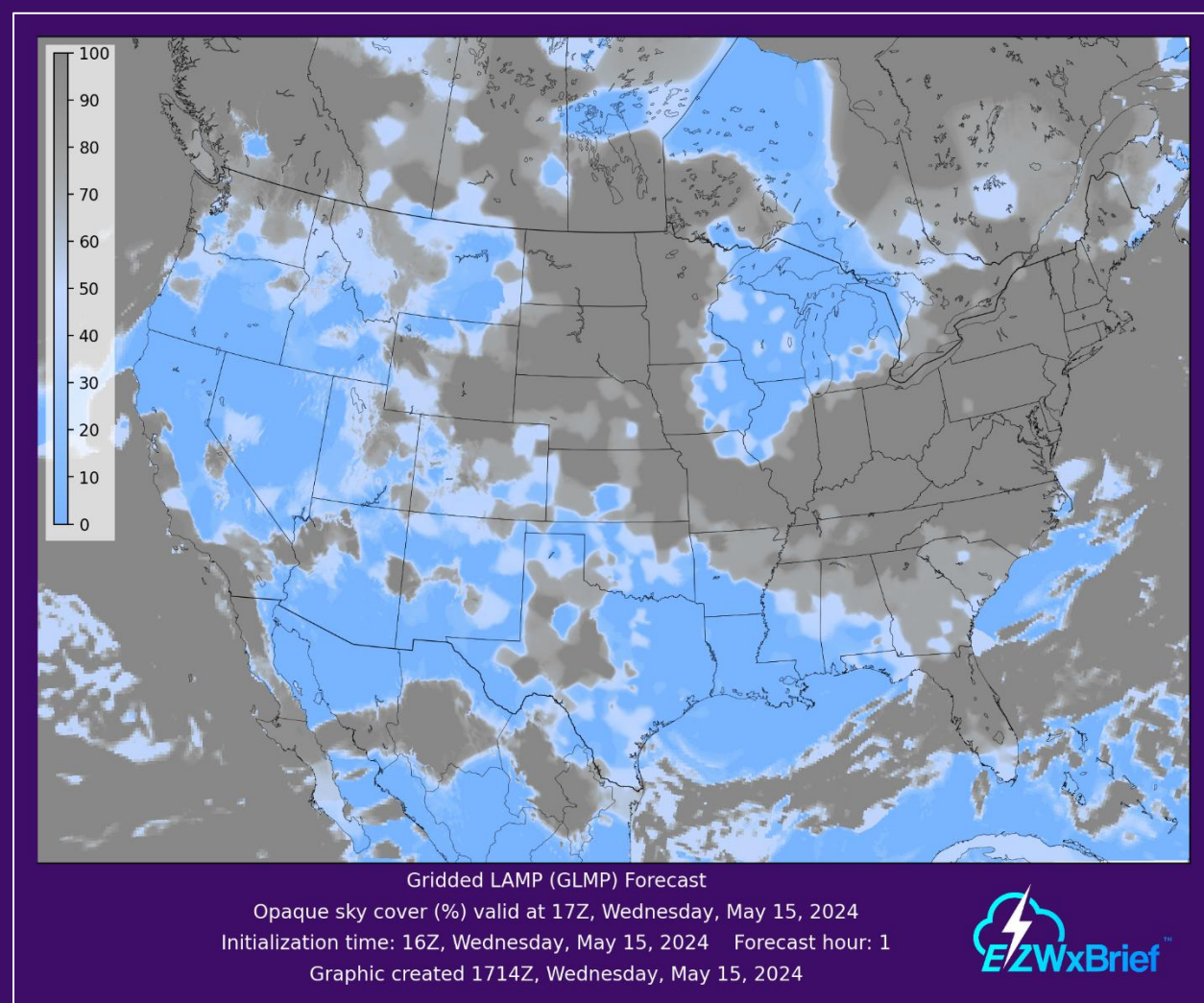
The Gridded Local Aviation MOS program (LAMP) is updated **hourly** and provides an **hourly** forecast for sky cover, ceiling height, surface visibility, wind speed and direction, wind gusts, convective and lightning probability and convective and lightning potential.

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.

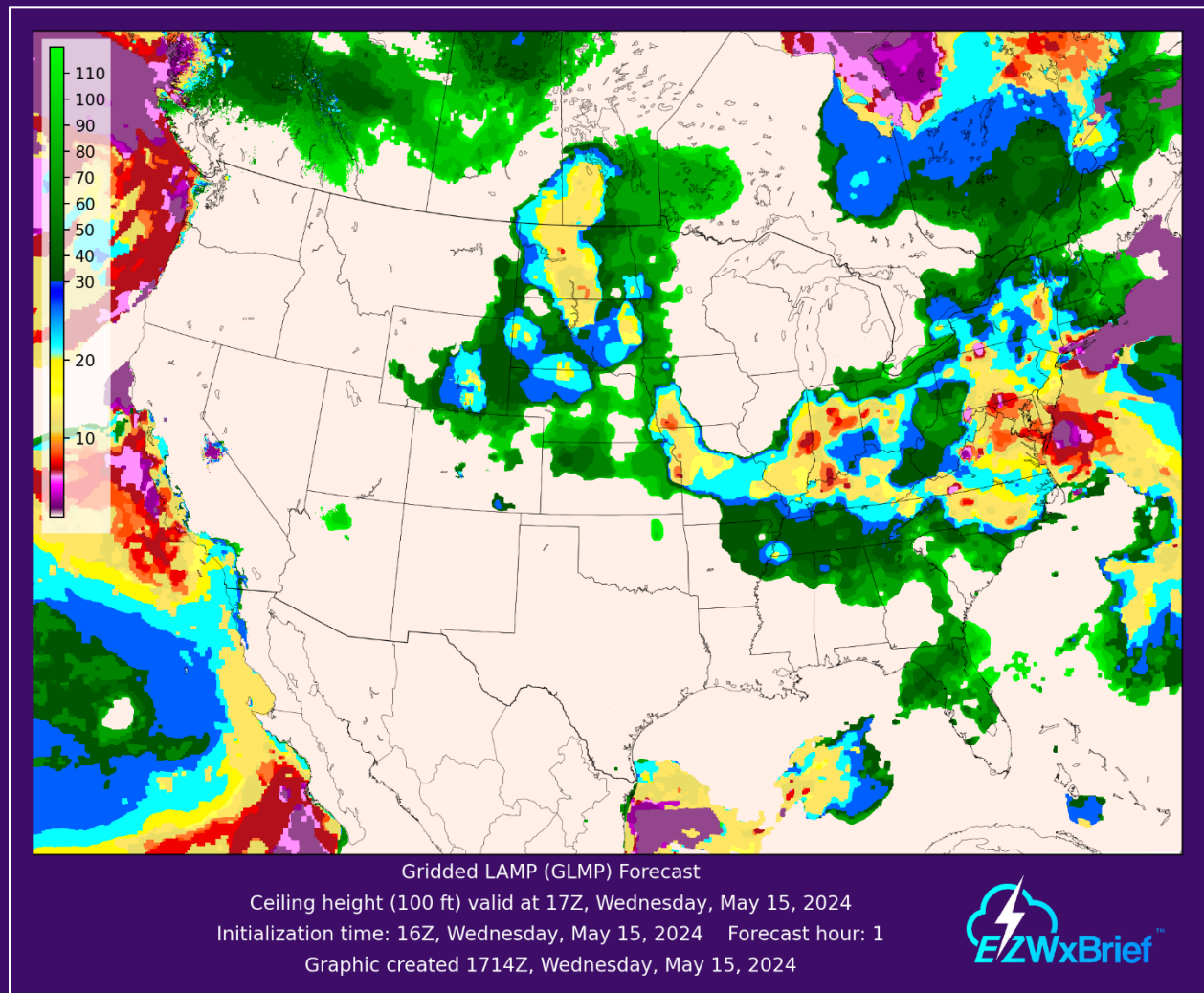
Category	Cloud cover (oktas)	Percentage
Clear	Zero cloud coverage	< 12.5
Few	1/8 – 2/8	12.5 to 25
Scattered	3/8 – 4/8	25 to 50
Broken	5/8 – 7/8	50 to 87.5
Overcast	8/8 cloud coverage	> 87.5



As shown in the legend at the top of the image above, 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 or cloud tops. 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



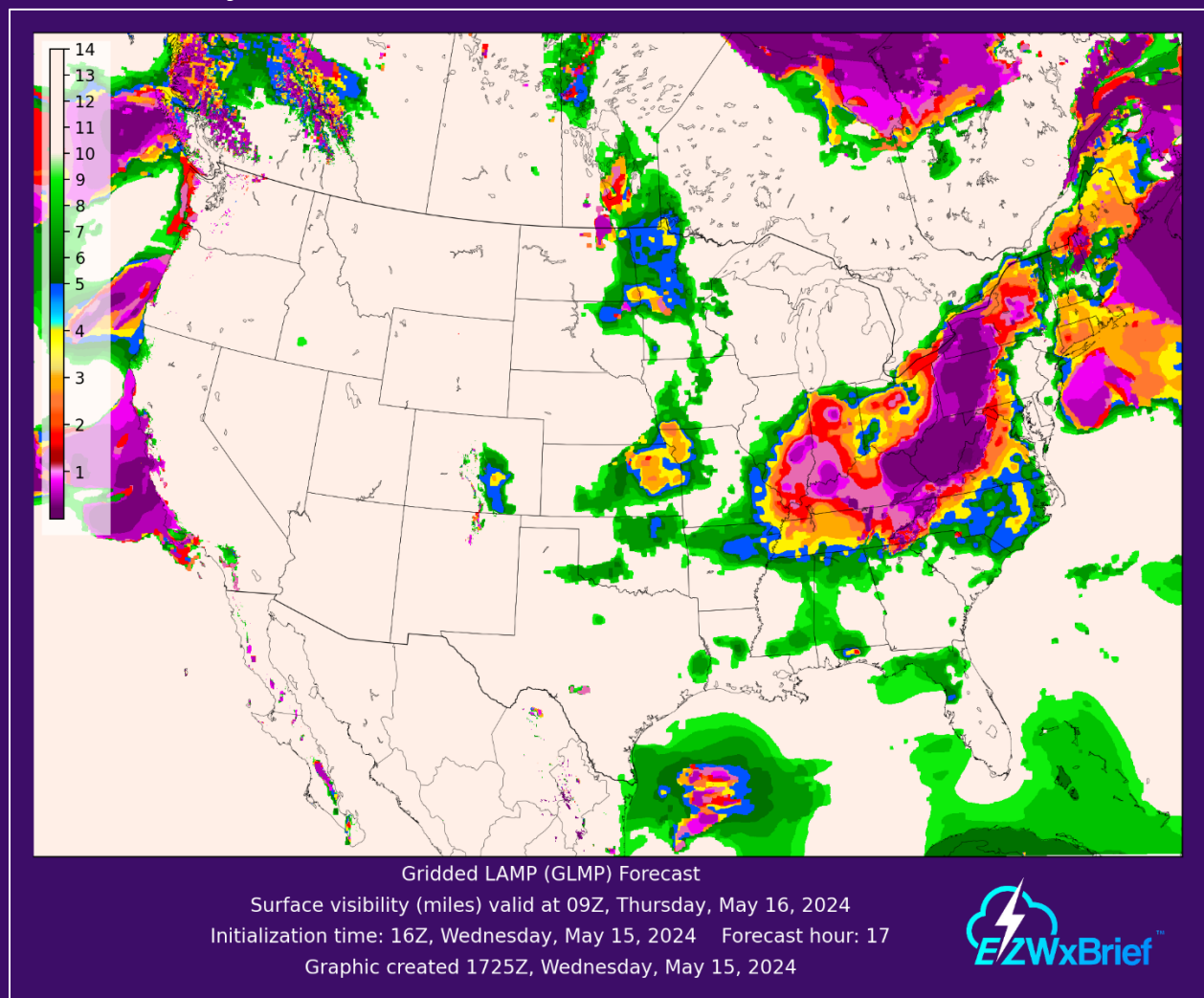
The LAMP gridded forecast provides an hourly forecast of ceiling height (height above the ground) for the conterminous U.S. and coastal waters, southern Canada and northern Mexico with a maximum lead time of 25 hours. **This forecast takes into account the height of terrain.**

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 above, 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).

Surface visibility

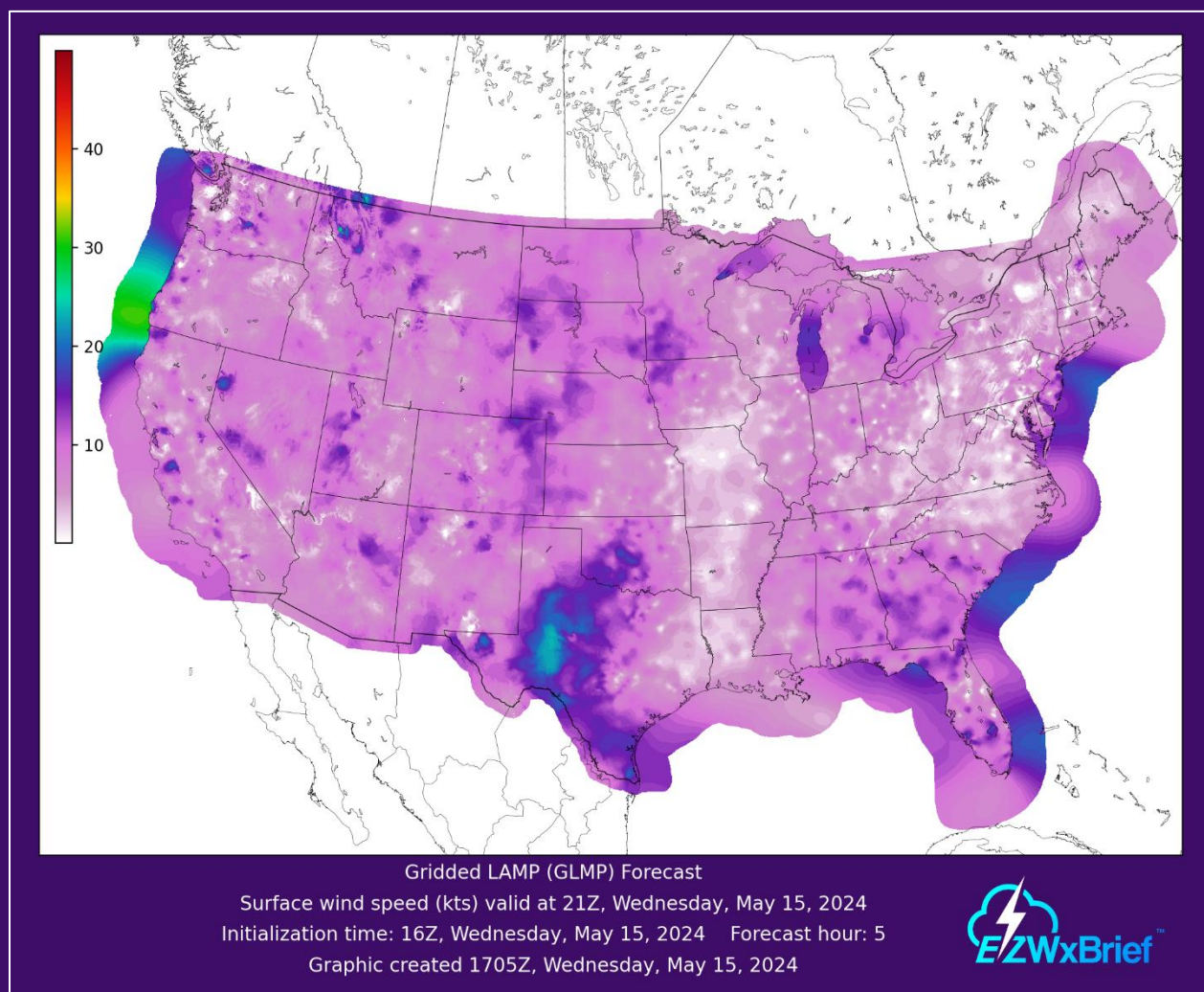


The LAMP gridded forecast provides an hourly forecast of surface visibility (statute miles) for the conterminous U.S. and coastal waters, southern Canada and northern Mexico with a maximum lead time of 25 hours.

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 above, 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.

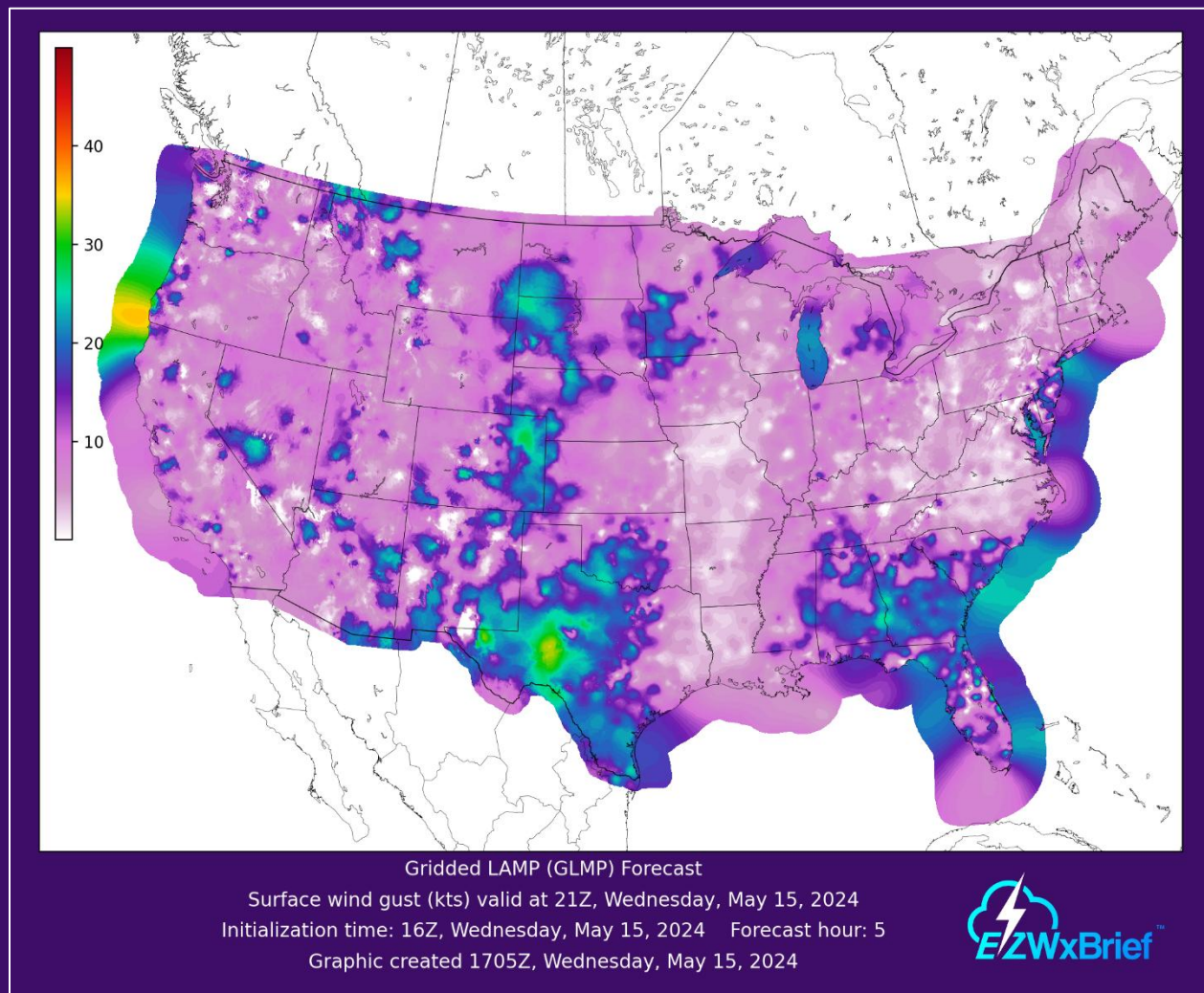


Wind speed and direction are depicted using both colors for the magnitude of the wind and a random low-resolution grid of wind barbs to depict both wind speed and direction. As shown in the legend at the top of the image above, prevailing wind speeds

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 gusts

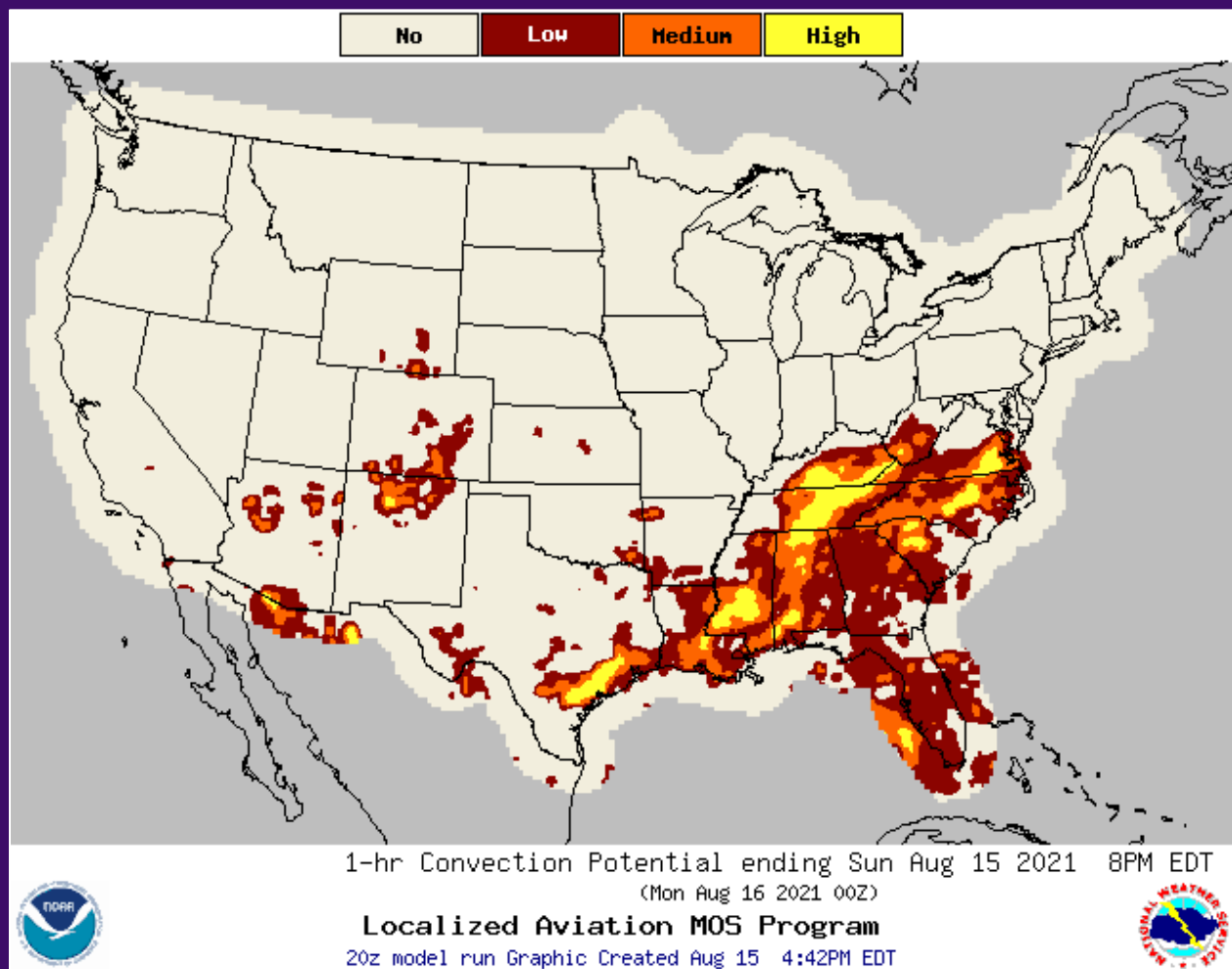
The LAMP gridded forecast provides an hourly forecast of surface wind gusts (knots) for the conterminous U.S. and coastal waters with a maximum lead time of 25 hours.



Wind gusts are depicted using colors for the magnitude of the wind gust. As shown in the legend at the top of the image above, 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.

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.



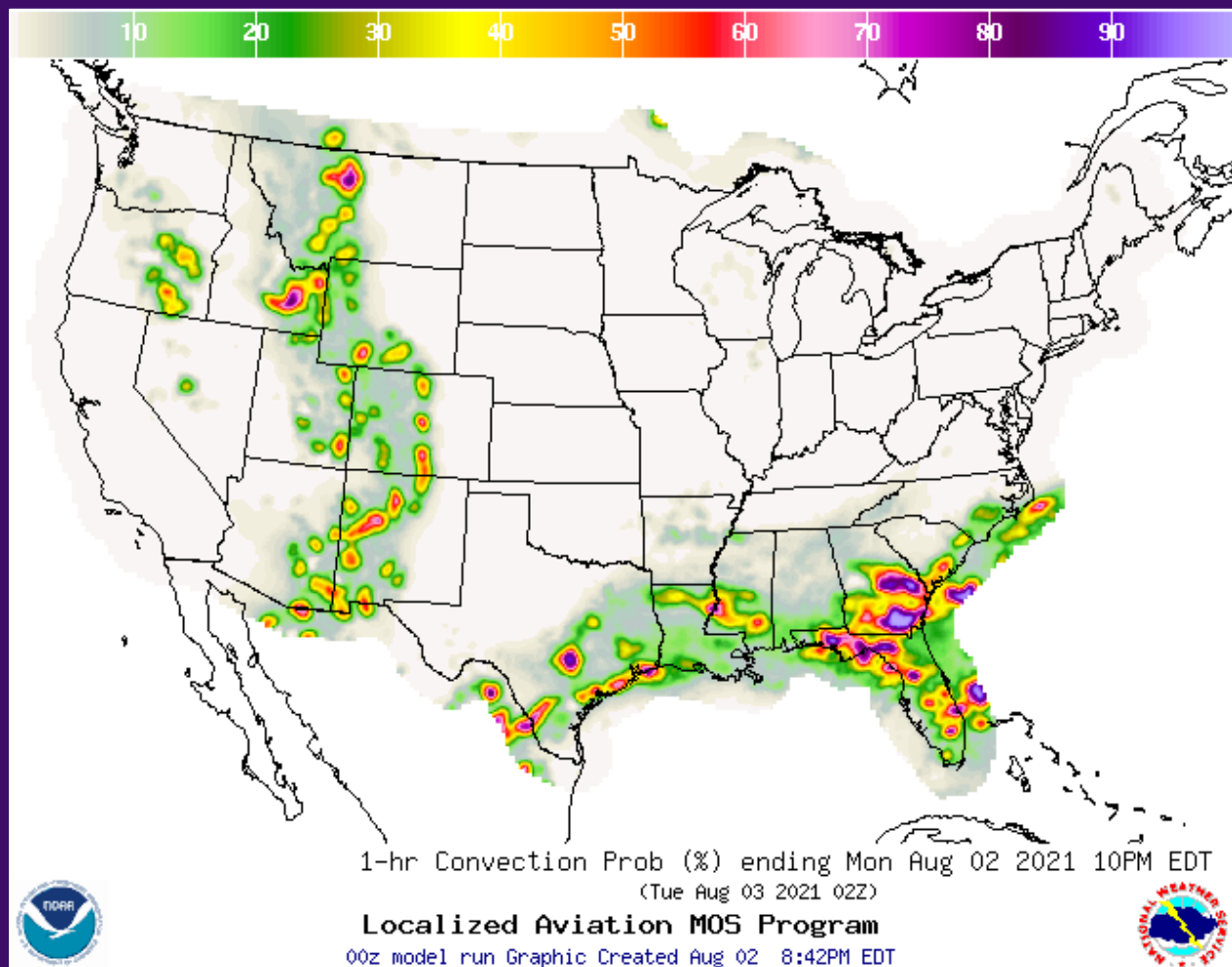
The convective potential describes the likelihood that deep, moist convection will occur within the hour **prior** to the valid time on the chart. Note that this is a convective potential, not a thunderstorm potential.¹⁴³ As shown in the legend at the top of the image above, this is accomplished through a derived (categorical) forecast rendition consisting of Low (**Red**), Medium (**Orange**) and High (**Yellow**). Note that the convective

¹⁴³ 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.¹⁴⁴

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 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.

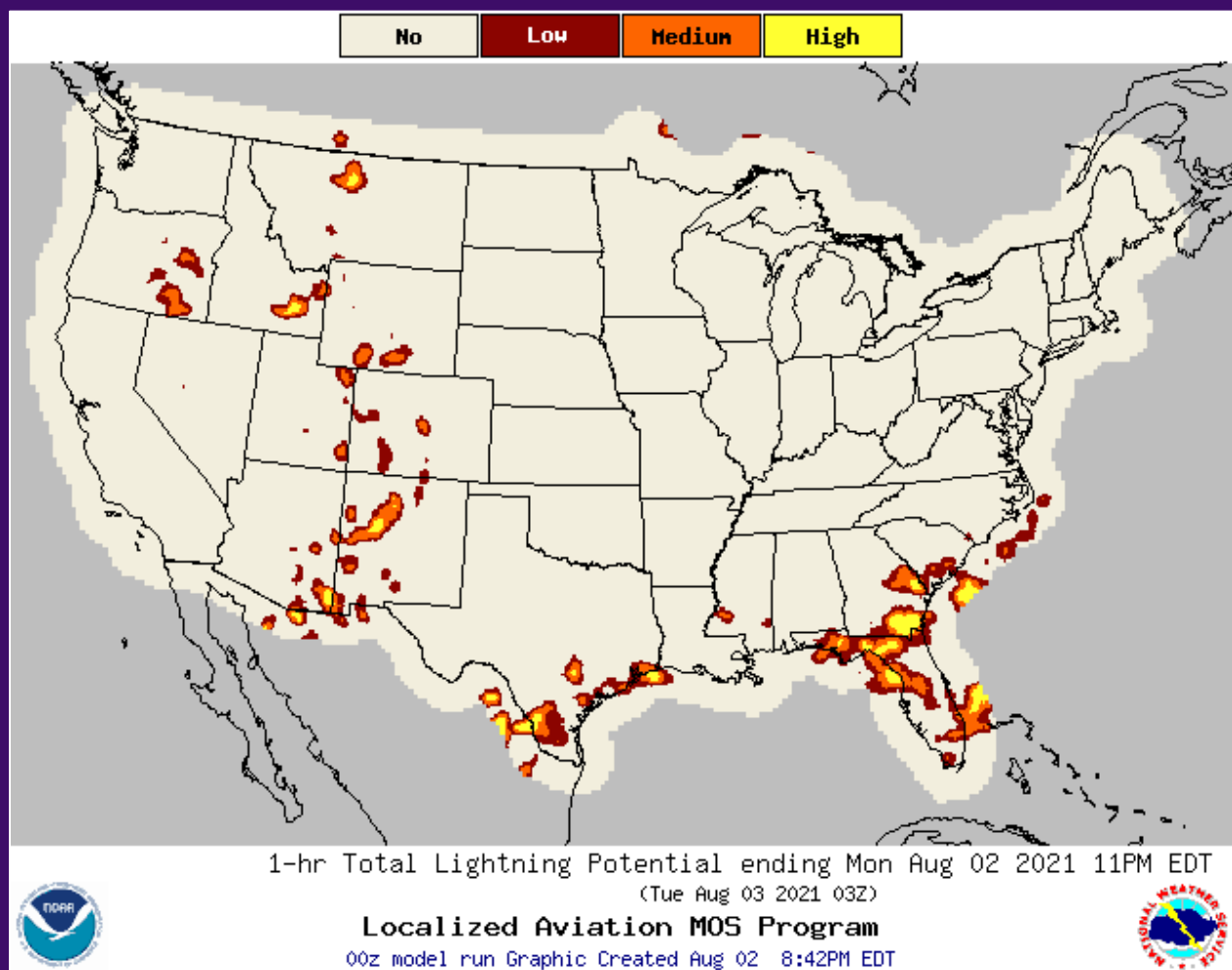


¹⁴⁴ This convective potential is similar to the convective potential personal weather minimum and the convective potential for the meteogram time series, except that this only has four categorical values whereas the personal minimum and meteogram has a higher resolution at six.

Lightning potential

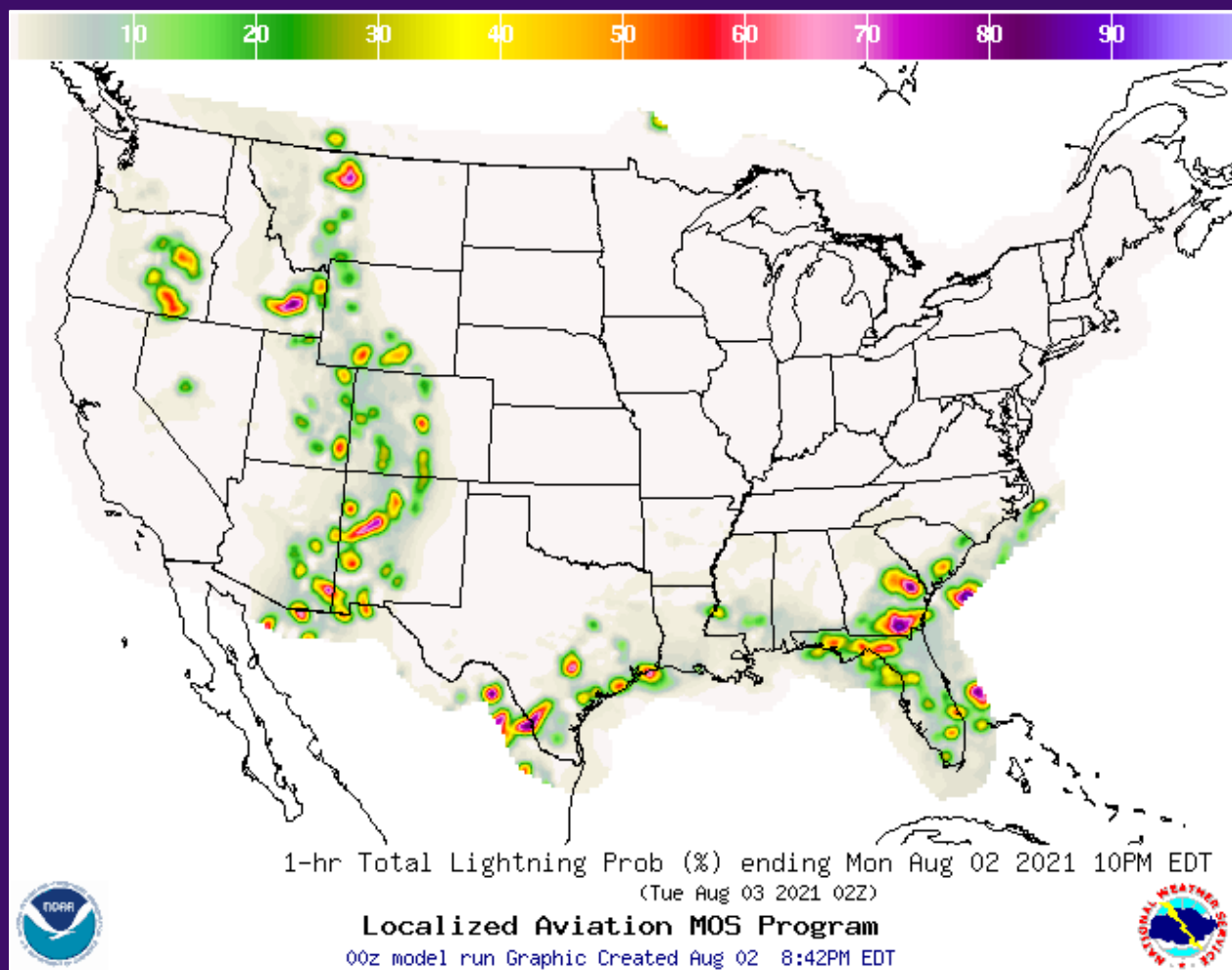
The LAMP gridded forecast provides an hourly forecast of the lightning potential for the conterminous U.S. and coastal waters, extreme southern Canada and extreme northern Mexico with a maximum lead time of 25 hours.

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.



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 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.



HREF model

The High Resolution Ensemble Forecast (HREF) ARW (HRW) member aggregates existing high-resolution models, and produces probability, mean and probability-matched mean fields for a number of parameters that 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.

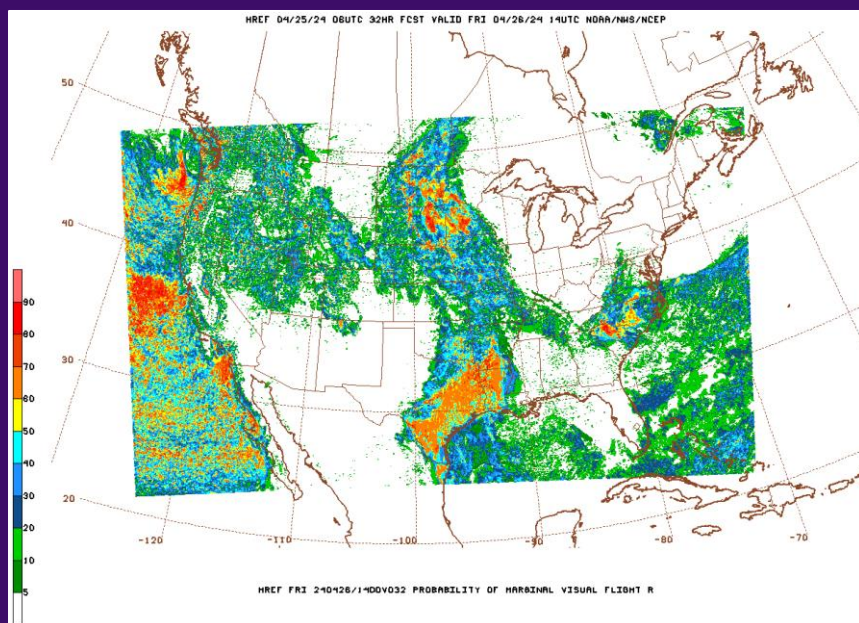
Simulated reflectivity (forecast radar) and 1-hour thunder probability guidance is updated twice each day also with a lead time of 48 hours and hourly time steps in the animation.

This includes probability forecasts for flight category and ceiling.

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. As shown in the legend, red- and purple-shaded regions are indicative of high chances whereas shaded green regions are low chances. No shaded color indicates the probability is below 10%.

Included are three collections that represent guidance for the probability of a marginal VFR (MVFR), IFR and low IFR (LIFR) flight category. Shown above is the probability that a MVFR flight category will occur at the valid time on the chart. A flight category takes into consideration both the ceiling and visibility as shown in the table below.



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

Keep in mind, 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 states that MVFR conditions are most likely to occur based on a probability of 70%-80%.

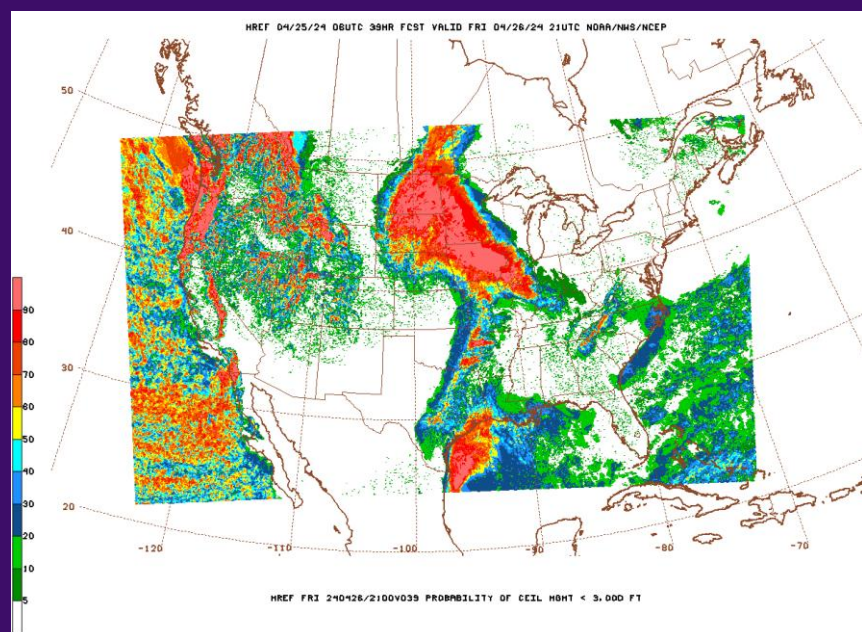
In addition, there are three collections that depict the probability for ceilings below 3,000 feet, 2,000 feet and 1,000 feet. Shown above is the probability the ceiling will be below 3,000 feet at the valid time on the chart. Using the same legend as above, this is simply a probability that ceilings will be below that respective ceiling 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 the given 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. This is indicative of dangerous convective turbulence. This also may help pilots who are flying into the flight levels to choose the best route.

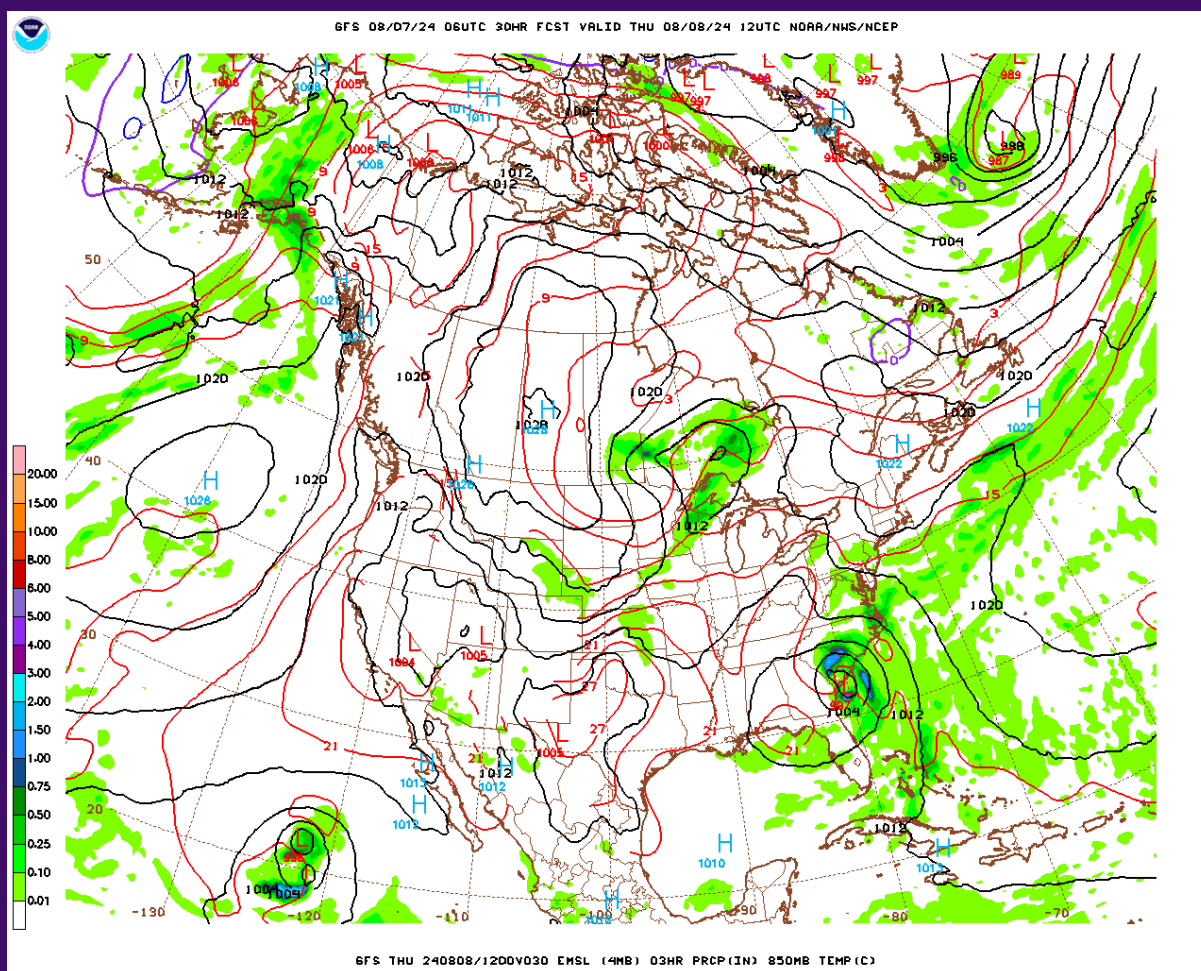
In addition, the simulated reflectivity forecast from the HREF model is also an hourly interval with a lead time of 48 hours. It is run twice a day at 0000 and 1200 UTC. It will



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

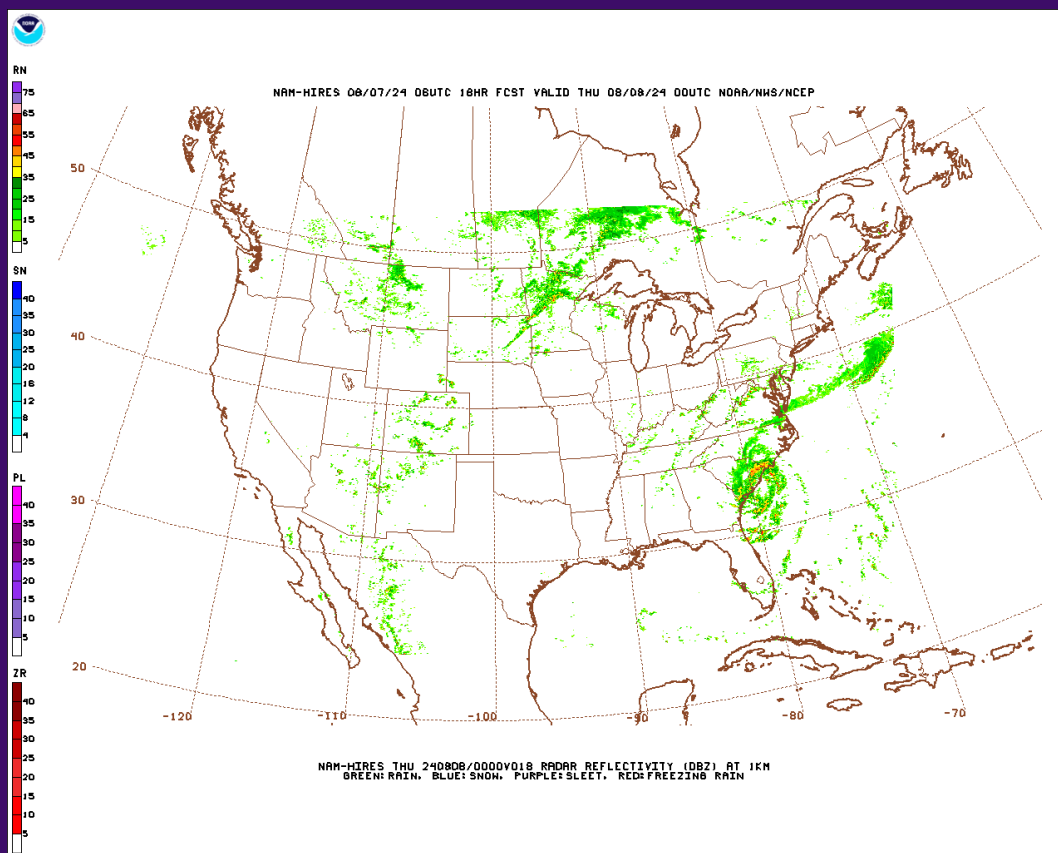
Forecasts generated by the Global Forecast System (GFS) numerical weather prediction model are provided for the latest execution cycles to include 0000, 0600, 1200 and 1800 UTC. In addition to the analysis for the latest cycle, forecasts are provided through 132 hours (5.5 days) for all GFS guidance. This includes a forecast for MSL pressure, 850 mb temperature (degrees Celsius) and 6-hour accumulated precipitation (shown below). 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), 300 mb (~30,000 feet MSL), 250 mb (~34,000 feet MSL) and 200 mb (~39,000 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) for all NAM guidance. 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), 300 mb (~30,000 feet MSL), 250 mb (~34,000 feet MSL) and 200 mb (~39,000 feet MSL) are also available. Lastly, composite reflectivity guidance is available to provide a forecast radar depiction for instantaneous precipitation valid at the time on the chart.

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.



HRRR model

Forecasts generated by the High Resolution Rapid Refresh (HRRR) numerical weather prediction model are provided for the latest execution cycle. The HRRR forecasts are issued hourly with forecast lead time of 18 hours. The forecast and analysis are provided for the conterminous U.S. (CONUS) as well as for six different U.S. regions. This includes a forecast for MSL pressure that also includes the 1000-500 mb thickness and 1-hour accumulated precipitation. Precipitation forecasts are valid during the one hour 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 250 mb (~34,000 feet MSL) are also available.

This is the simulated reflectivity forecast from the High Resolution Rapid Refresh (HRRR) model. The HRRR is run hourly and produces forecasts out to 18 hours using one hour and 30-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.

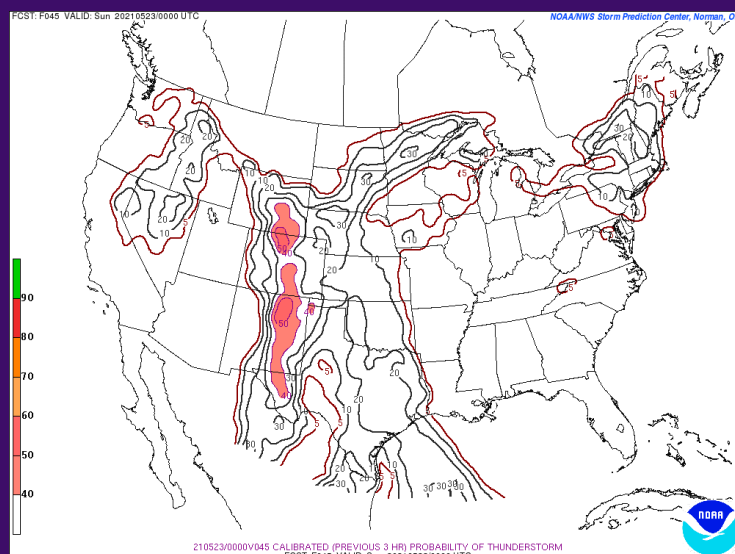
Storm prediction center

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.

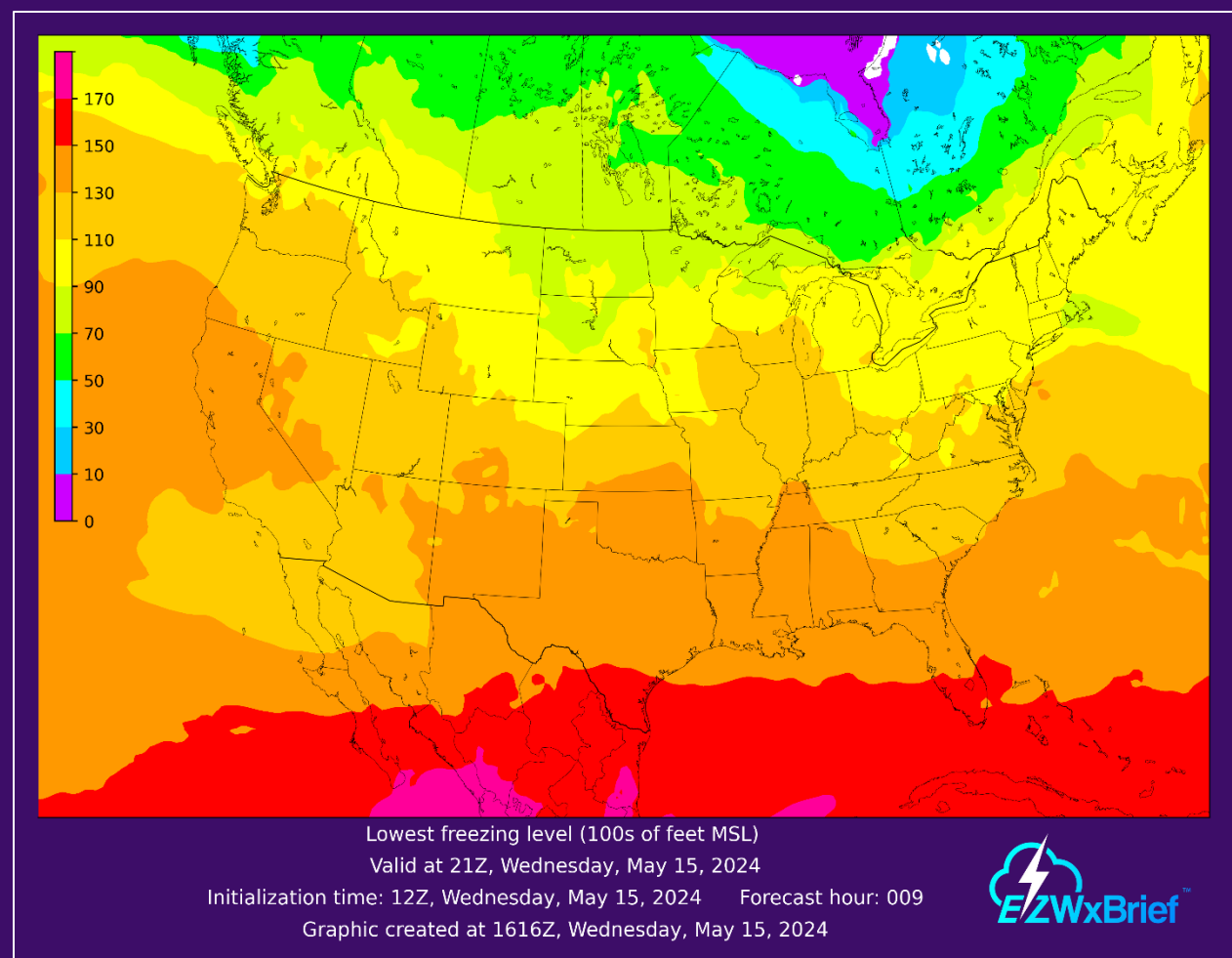
The 3-hour calibrated thunderstorm probability and 3-hour severe thunderstorm probability forecasts provide guidance through 84 hours. Each image in the collection shifts the time window by a 3-hour period, whereas each image in the 1-hour and 4-hour collections shift the time window by 1 hour with forecast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

Lowest freezing level

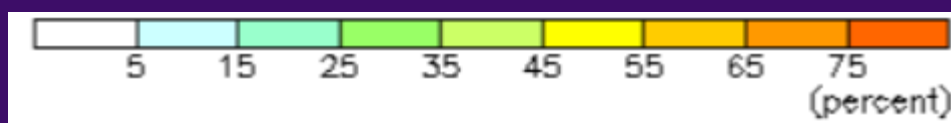
This is a forecast of the **lowest** freezing level from the Global Forecast System (GFS) model. The forecast is updated every six hours. This collection provides forecasts with a lead time from 4 to 39 hours at hourly time intervals.

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 on the left of the chart. Areas depicted in white consist of regions where the entire temperature profile above the surface is below 0°C. Areas where multiple freezing levels may exist are not shown on this lowest freezing level forecast.



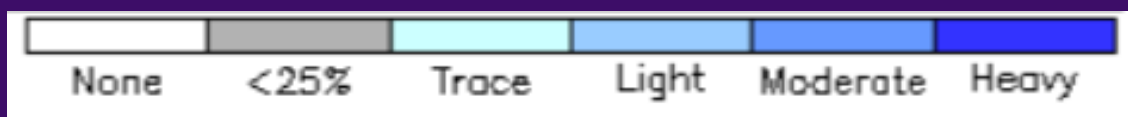
Icing probability forecast by altitude

This is the diagnostic tools from the Rapid Refresh model for icing probability with a vertical resolution of 2,000 feet. The loop starts with the latest Current Icing Product (CIP) analysis which is followed by the Forecast Icing Product (FIP) to include lead times of 2, 3, 6, 9, 12, 15 and 18 hours. This represents a calibrated probability in percent from 5% to 85% show using the legend below.



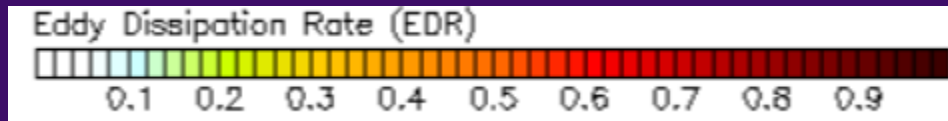
Icing severity forecast by altitude

This is the diagnostic tools from the Rapid Refresh (**RAP**) model for icing **severity** with a vertical resolution of 2,000 feet. The loop starts with the latest Current Icing Product (CIP) analysis which is followed by the Forecast Icing Product (FIP) to include lead times of 2, 3, 6, 9, 12, 15 and 18 hours. This is a categorical forecast with a 25% probability mask to include Trace, Light, Moderate and Heavy shown using the legend below. Any areas shown in gray represents icing probability less than 25%.



Turbulence forecast by altitude

This is the diagnostic tools from the Graphical Turbulence Guidance (GTG) product for turbulence intensity to include Clear Air Turbulence, Mountain Wave Turbulence and Combined Turbulence with a vertical resolution of 2,000 feet. The loop starts with the GTG analysis which is followed by GTG forecast to include lead times of 1, 2, 3, 6, 9, 12, 15 and 18 hours. This forecast uses the variable eddy dissipation rate (EDR) shown in the legend below.



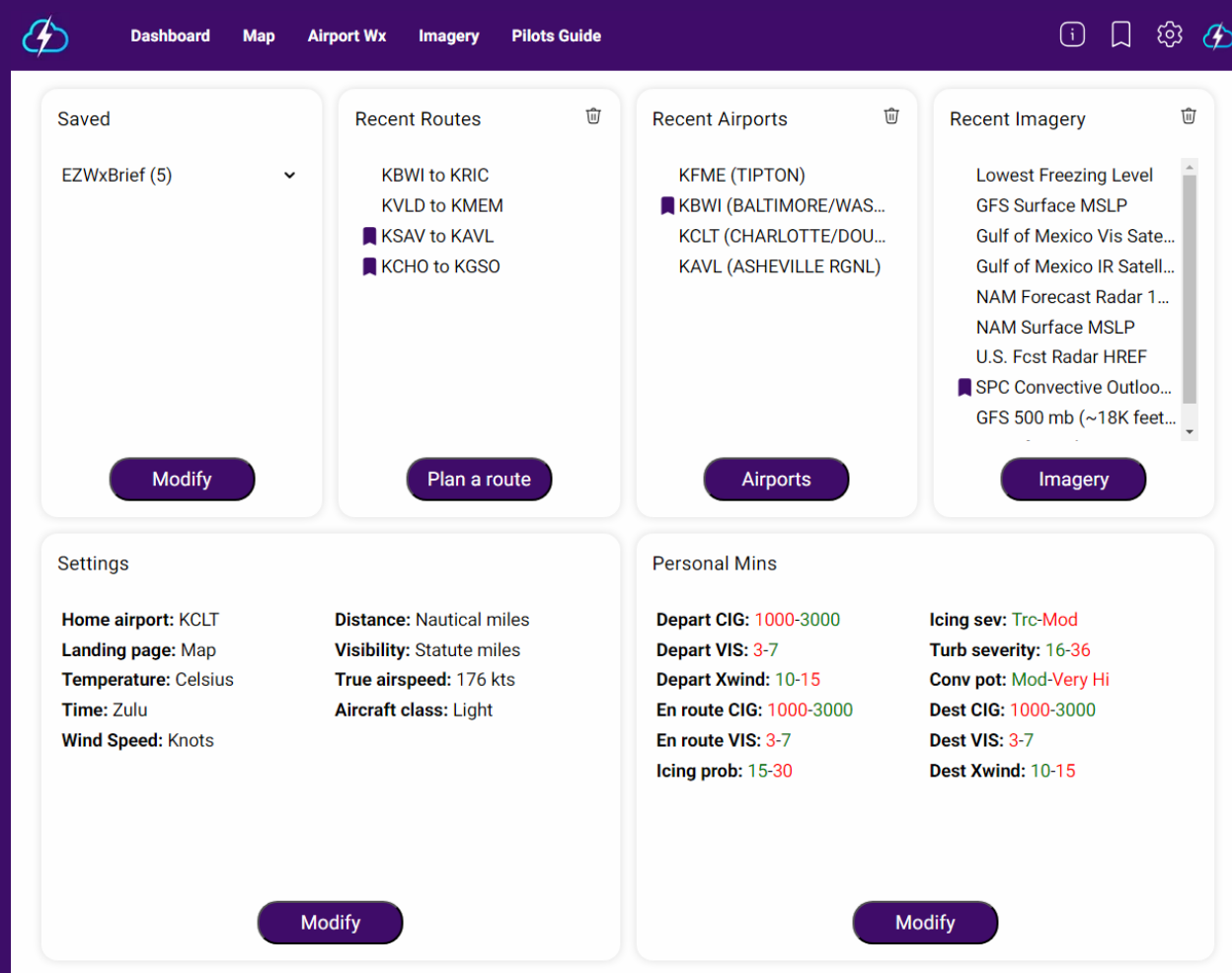
EDR has a range from 0.0 to 1.0 in units of m^2/s^3 . Therefore, the higher the EDR value, the higher the intensity of turbulence. Typically, EDR varies from close to 0, "smooth", to near 1, "extreme" for most aircraft types. Heavier aircraft (Boeing 787) will experience the same EDR value of turbulence 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			
	Light	Moderate	Severe	Extreme
Light (default)	0.13	0.16	0.36	0.64
Medium	0.15	0.20	0.44	0.79
Heavy	0.17	0.24	0.54	0.96

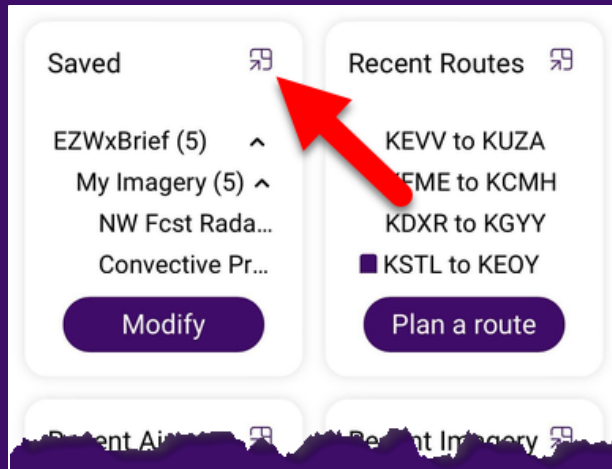
Dashboard

The **EZWxBrief** Dashboard is one of two primary portals into the app.¹⁴⁵ It is designed to provide a birds-eye view of your current preflight weather planning by providing access to recent routes, recent airports and recent imagery. You can also access Saved Items and see all of the general and aircraft settings as well as all of the values for personal weather minimum settings. From the Dashboard a new route can also be planned. The Dashboard can be chosen as the primary landing page with each sign in. The landing page can be modified in the General settings. The Dashboard menu selection is reachable from any main menu including the **EZWxBrief** Home page.¹⁴⁶



¹⁴⁵ Saved Items is the second portal into the app.

¹⁴⁶ The Dashboard is only available for users who have authenticated and have an active membership that has not expired.

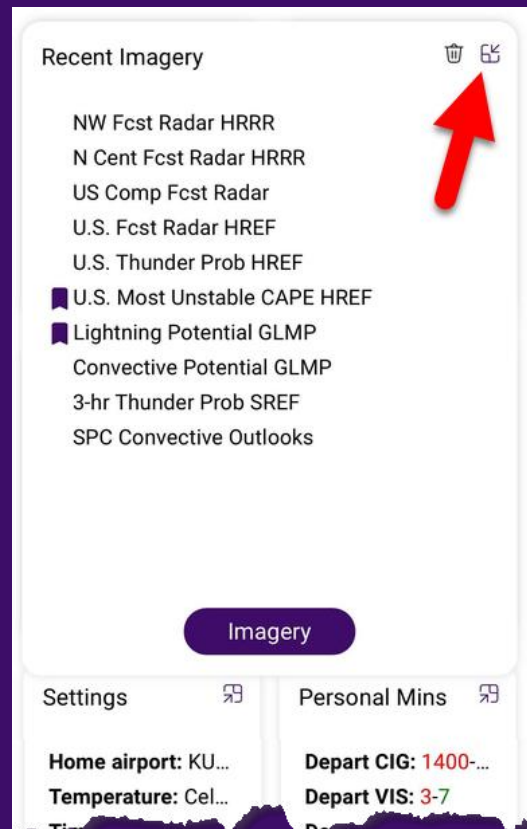


To support small handheld portable devices such as an iPhone, each section of the **Dashboard** can be “popped out” by pressing the expand button in the upper-right corner (shown left). This will cause that section to expand (shown below) to fill the full width of the display. Press the same button a second time while expanded to collapse the specific section to restore it back to its original size. This can be done for each section shown in the Dashboard.

Saved items

This section within the Dashboard lists all of the user’s “favorites” or what are called Saved Items. This will match those folders and items that are also present in the Saved Items panel. This includes all custom folders and specific items such as airports, imagery and routes. Each folder may be expanded or collapsed to see or hide the contents. A down-pointing caret symbol shown to the right of each folder means the folder is collapsed. Press the down-pointing caret symbol to expand and view its contents. Conversely, press the up-pointing caret symbol to collapse the folder to hide its contents.

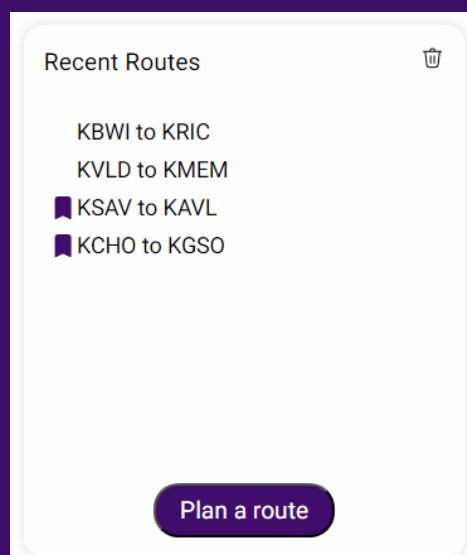
Pressing on any saved imagery item will open up the **Imagery** view and display that imagery collection. Pressing on a saved airport item will open up the **Airport Wx** view to display the weather for that airport (e.g., meteogram, METAR, TAF, etc.). Lastly, pressing on a saved route item, will open up the route editor for the route as it was saved (i.e., departure airport, destination airport, route of flight and altitude). Then in the route editor the route can optionally be changed and then opened in the **Map** or **Profile** view accordingly. If desired, pressing on the **Modify** button below



the list of saved items and folders will open up the Saved Items panel to delete, duplicate, rename, move or view any of the saved items or custom folders. Please note that custom folders and saved items cannot be deleted, duplicated, renamed or moved within the Dashboard.

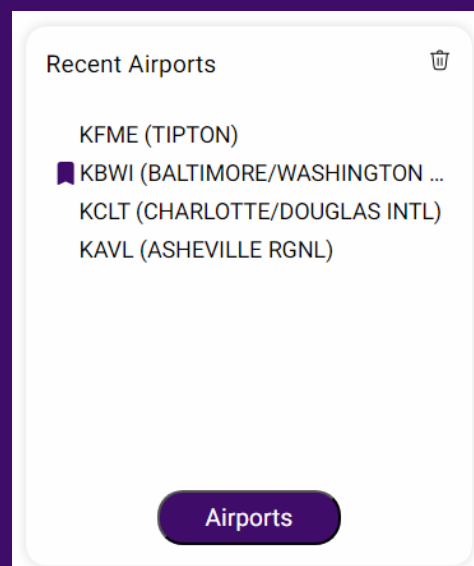
Recent routes

This section within the Dashboard lists the **ten** most recent active routes.¹⁴⁷ The list is ordered by time of recency with the most recent route shown at the top. If the route has been previously saved in one or more custom folders or in the **EZWxBrief** root folder, a purple ribbon icon will be listed before the route. Pressing on a recent route, will open up the route editor for the route when it was activated (i.e., departure airport, destination airport, route of flight and altitude). Then in the route editor the route can optionally be changed and then opened in the Map or Profile view accordingly. Pressing on the **Plan a route** button will open up the route editor to begin planning a new route from scratch.



Recent airports

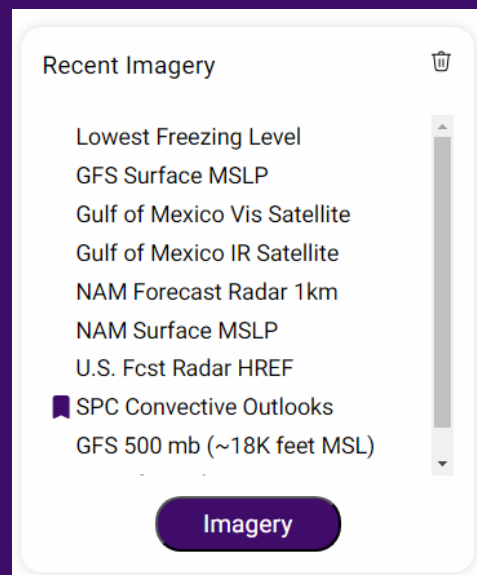
This section within the Dashboard lists the **ten** most recent airports visited in the Airport Wx view. The list is ordered by time of recency with the most recent airport identifier shown at the top. If the airport has been previously saved in one or more custom folders or in the **EZWxBrief** root folder, a purple ribbon icon will be listed before the airport identifier. Pressing on a recent airport, will open up the **Airport Wx** view for this airport (i.e., meteogram, METAR, TAF, etc.). Pressing on the **Airports** button will open up the Airport Wx view using the most recent airport viewed.



¹⁴⁷ Each route is listed with the departure airport identifier “to” the destination airport identifier. Note that this may not match the name given for saved items.

Recent imagery

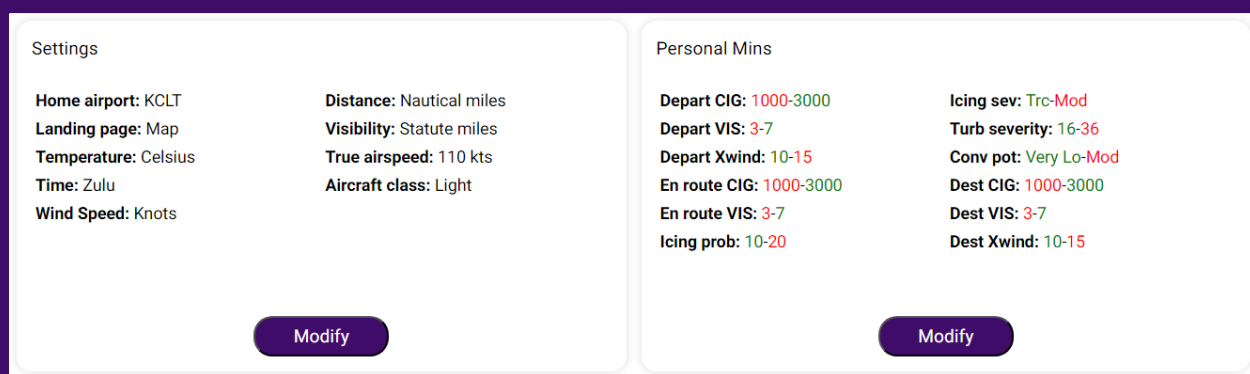
This section within the Dashboard lists the **ten** most recent imagery collections visited in the Imagery view. The list is ordered by time of recency with the most recent imagery collection shown at the top of the list. If the imagery collection has been previously saved in one or more custom folders or in the **EZWxBrief** root folder, a purple ribbon icon will be listed before the saved imagery collection name. Pressing on a recent imagery collection name, will open up the **Imagery** view for this collection. Alternatively, pressing on the **Imagery** button will open up Imagery view and display the most recent imagery collection or other default when no recent imagery collections exist.



Note that once the number of items in the list exceeds the vertical capacity of the display area,¹⁴⁸ the list becomes scrollable with a mouse or single finger gesture on touch screen devices.

Settings

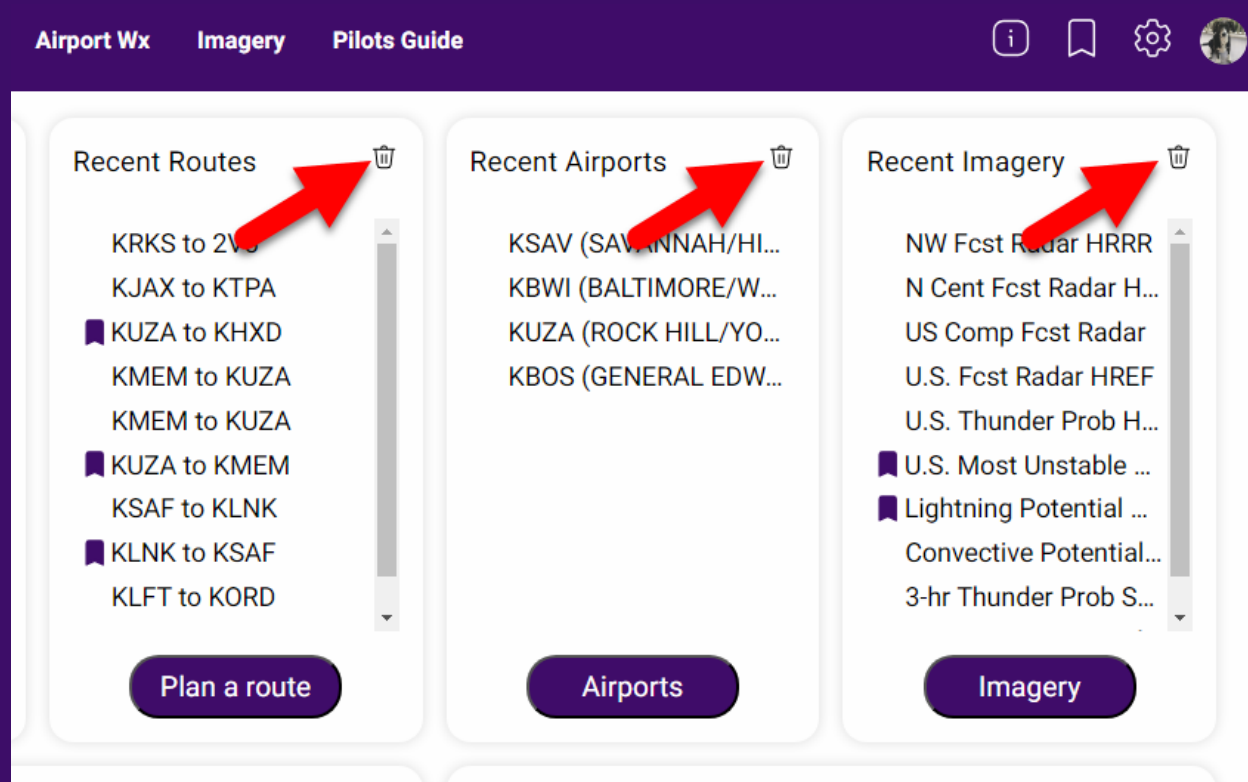
For the Dashboard, these are divided into two sections to include the **General and Aircraft** settings and a section listing all of the **Personal Mins** settings as shown below. Each of the settings is shown with its specific value or default setting. The Personal Mins section provides the user's personal weather minimums.



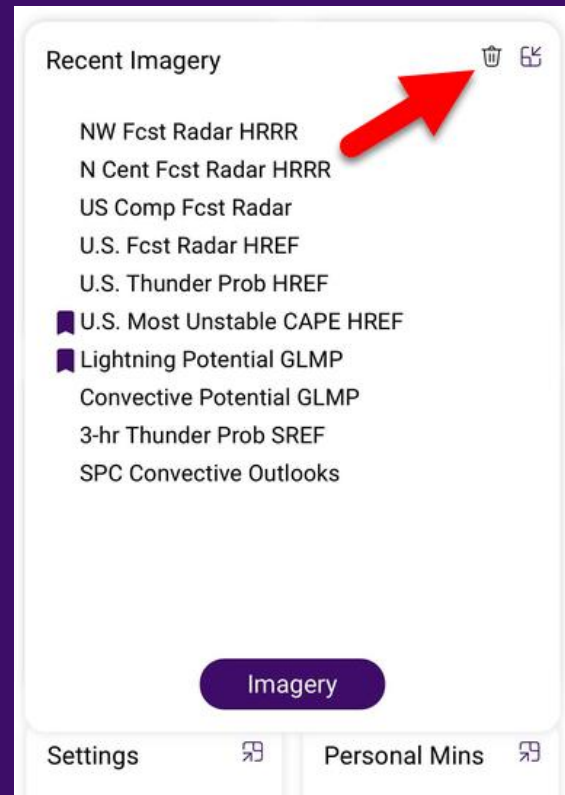
¹⁴⁸ This often occurs on smaller portable devices such as the iPhone.

Each possible setting is listed and color-coded based on the personal minimum (**red**) and conservative personal minimum (**green**). Pressing **Modify** opens up the respective Settings panel to make any changes to these General and Aircraft settings and the Personal Minimum settings.

As mentioned above, the Dashboard displays the most recent ten routes, ten airports and ten imagery collections with the most recent item shown at the top. If desired, recent routes, recent airports and recent imagery can be deleted from the Dashboard. To delete all of the recent items in a specific list, locate the trash can icon at the top-right of each of the recent list as shown below. Pressing on this icon will first confirm that you wish do delete all of the recent items in that associated list. Once confirmed, all recent items in the list will be permanently removed. The only exception is for recent routes. In this case, if there is an active route (one currently rendered on the Map), it will delete all recent routes listed except for the active route.

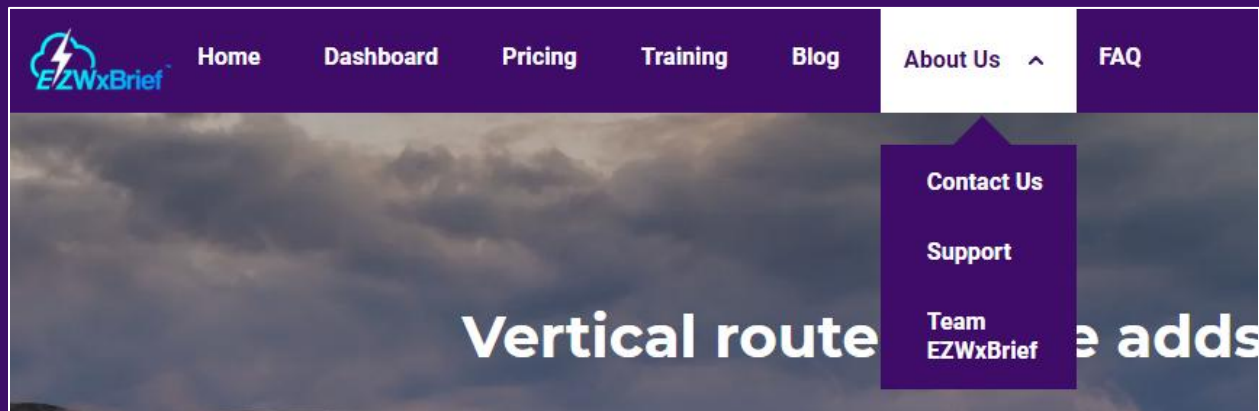


For portable devices such as the iPhone, the trash can icon will only appear when the recent list has been expanded as shown on the right. Pressing this icon will allow you to delete any recent items in this particular list. Once removed, they can no longer be recovered.



Getting support with EZWxBrief

To receive support with the **EZWxBrief** progressive web app, visit the **EZWxBrief** Home page and select **About Us** from the main menu¹⁴⁹. This provides a menu that includes **Contact Us**, **Support** and **Team EZWxBrief**.



Next, select the **Support** option from this menu. This support page provides details about the **EZWxBrief** application that includes the latest **EZWxBrief** version number. The support page also provides a link to the latest **EZWxBrief** [release notes](#) as well as details on how to learn more about the **EZWxBrief** progressive web app.

To send a message to the **EZWxBrief** support team select the **Contact Us** option under the **About Us** menu. This page provides a form (shown right) to enter your email address, subject and description of the problem or feedback you'd like to provide. Please include your name in the message. Also provided is the capability to upload an image. Our support team can be also reached via email at support@ezwxbrief.com. When sending comments, questions, feedback or bug reports to our awesome support team, please include the **EZWxBrief**

A screenshot of the 'Help & Support' contact form on the EZWxBrief website. The form is white with a light blue header. It includes a text area for the message, a 'Requester' field, a 'Subject' field, and a 'Send Feedback' button. The form also includes a small disclaimer at the top: 'Please provide your contact information below so we can provide an awesome support experience. Details are often important, so please give us all of the gory details. Be assured that any personal information you provide stays private and we never share that information without your permission.' The form is titled 'Help & Support' and includes a 'Send Feedback' button.

¹⁴⁹ For smaller handheld devices such as the iPhone, this option is contained within the hamburger menu located in the left-most position of the masthead.

version number as well as the device and operating system version you are using. 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>).

EZWxBrief will issue a new release once every one to two months on average. Depending on the extensiveness of the changes in the release, a new pilots guide may be released as well. For the best experience and to enjoy the simplicity of **EZWxBrief**, we recommend that you always reference the latest version of this pilots guide as it becomes available.

Most pilots are weatherwise, but some are otherwise.™

Scott Dennstaedt, Ph.D.

CFI & former NWS meteorologist
Weather Systems Engineer
Founder of EZWxBrief
Author, **The Skew-T log (p) and Me: A Primer for Pilots**
(<https://avwxtraining.com/skewt>)
Co-author, **Pilot Weather: From Solo to the Airlines**
(<https://avwxtraining.com/pilotweatherbook>)