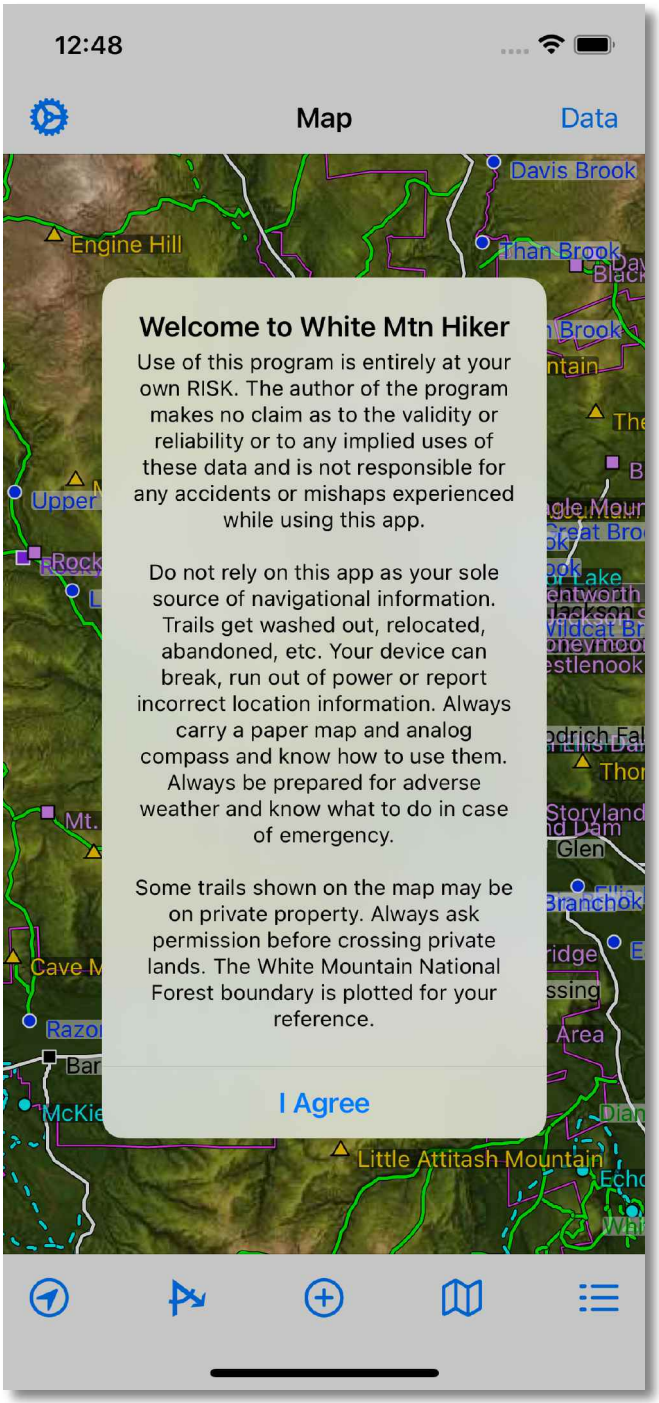
White Mountain Hiker v. 1.0

User's Manual



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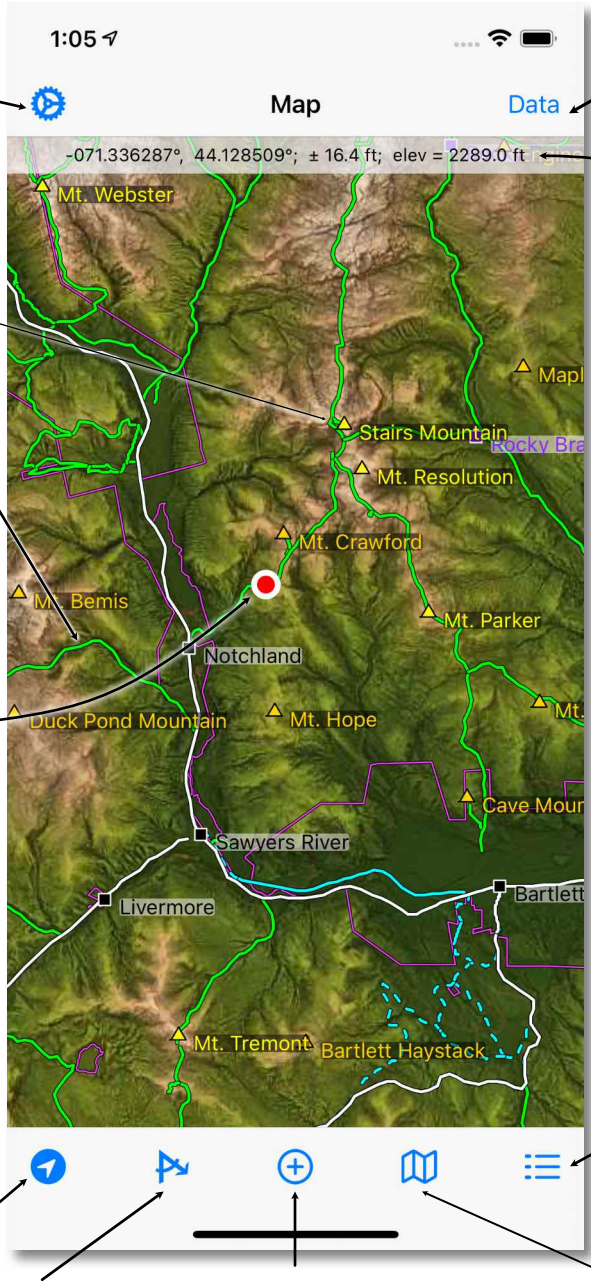
The Map Screen



Go to the Settings screen

Go to the Data List screen

Tap a POI so see details about the POI or get the weather for the POI

Your current longitude, latitude, position uncertainty, and elevation, displayed when the GPS is on.

Tap a trail to see details for the trail or to plot a topo profile along the trail

Tap the text to prevent the screen from sleeping and keep it centered on your current position. This mode drains your battery more quickly

Your current position on the map

Labels of all POIs are only displayed at zoom levels greater than or equal to 13

Map Legend
Show/hide

GPS toggle on/off (it is currently on)

Measure/record/draw tool. When flashing, tap again to terminate the selected action

Add POI button. POIs can be added (a) at your current location; (b) by tapping the map; or (c) from latitude, longitude text on your clipboard

Apple Maps Show/hide (needs an Internet connection)

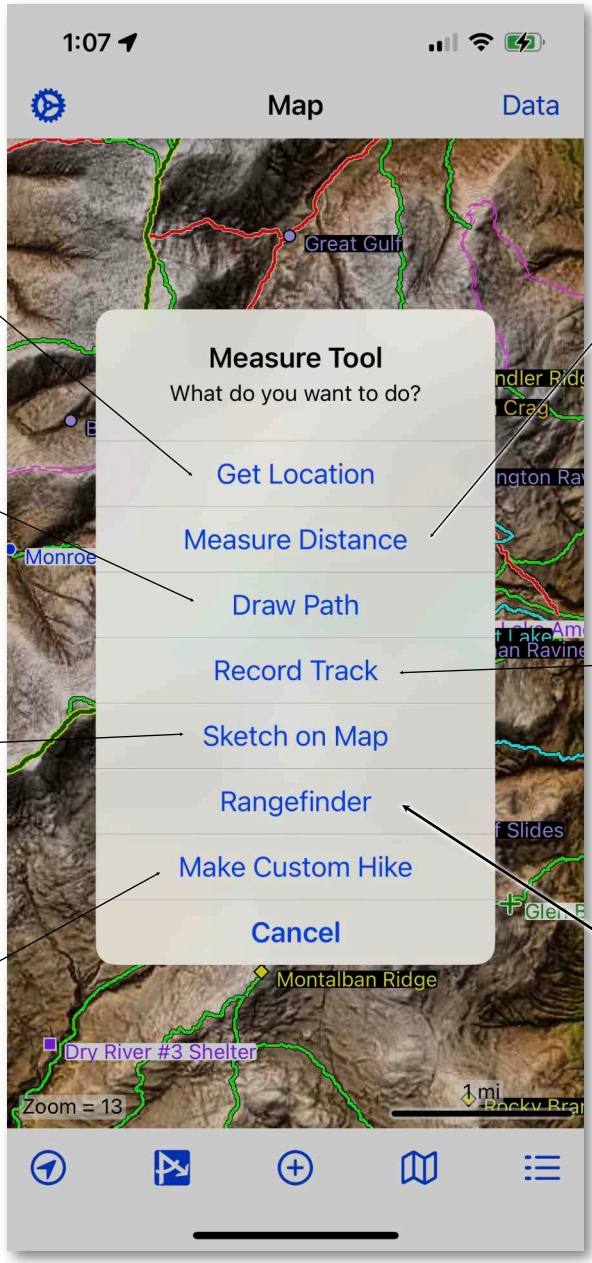
The Measure Tool Options

See the Latitude, Longitude, position uncertainty, and elevation by tapping any point on the map

Draw a freehand path. Just tap and drag the pointer along the path you want to follow

Make an ephemeral freehand sketch on the map. Leave sketching mode by tapping the flashing toolbar icon and the sketch will disappear.

Define a custom hike composed of segments of several different trails (or just part of a single trail). Described in detail, below.



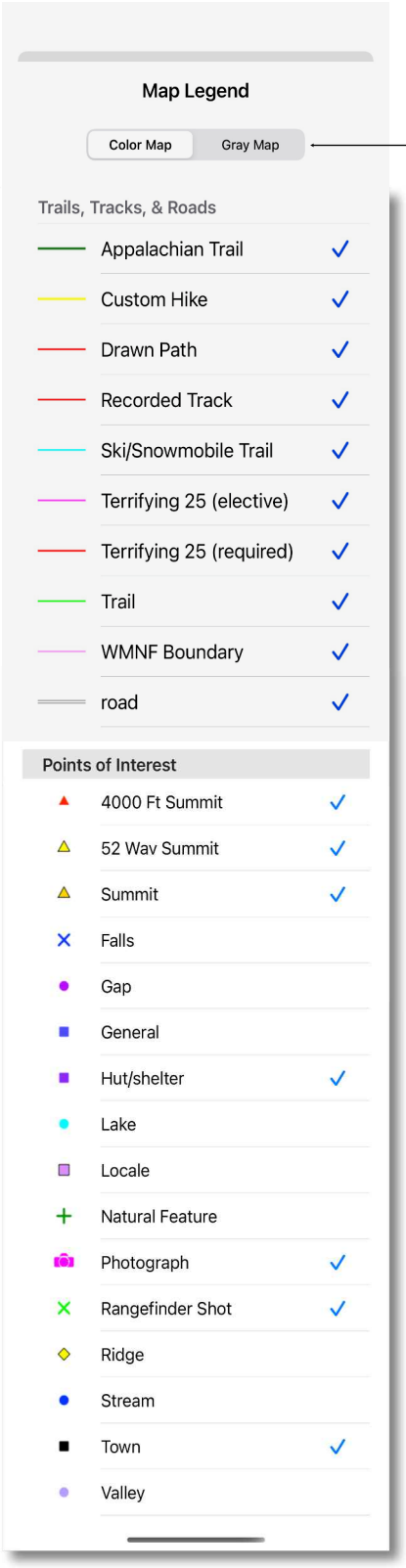
Measure straight line distance, bearing, and slope. Tap once to set the starting point, then tap and drag to get the distance.

Record a GPS track as you walk along. ***Your device will not go to sleep and will remain centered at your location***. Turn off this mode by tapping the flashing toolbar icon. Set the point spacing in the Settings Screen before selecting this option.

Access the Rangefinder Screen

Recording a GPS Track can run down your device battery quickly. You should only record a long hike when you have a backup battery with you!

The Map Legend Screen



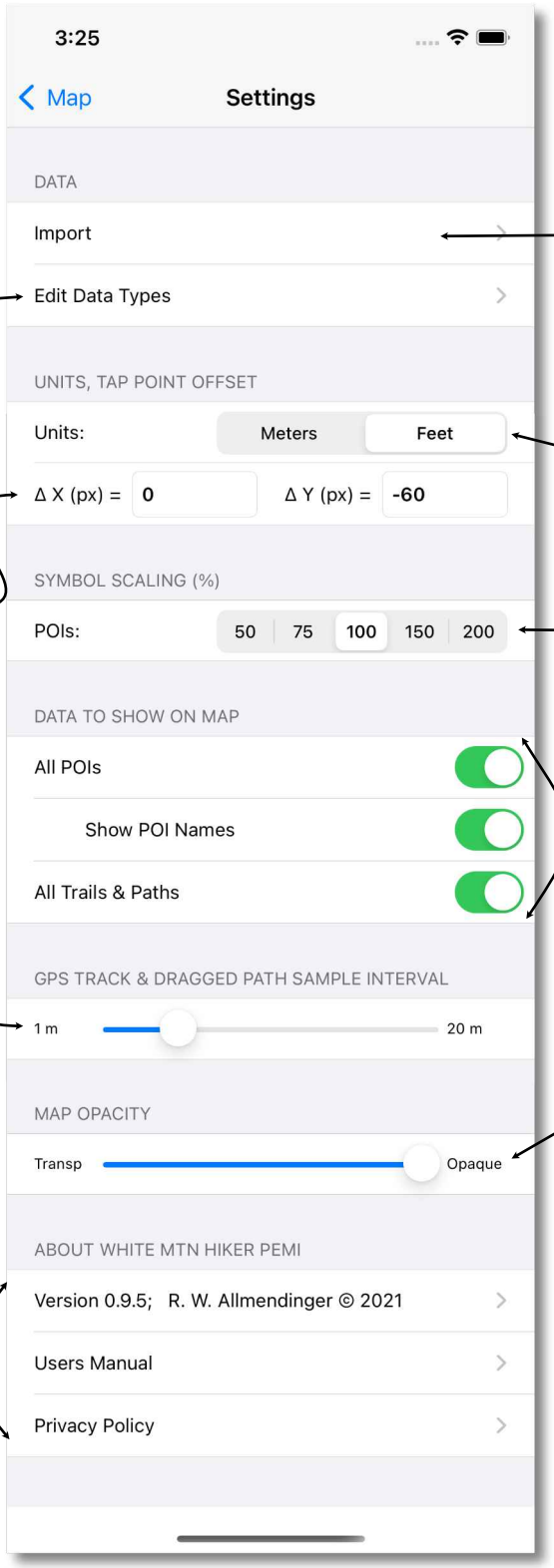
Select the map you want to use for a base map. Both maps have the same resolution and 40 ft contours

The checkmarks show which elements are currently displayed on the map.

Tap any row to show or hide that element

When you have made your selection, simply swipe down to dismiss the screen and return to the map

The Settings Screen



You can edit the color or symbol of any element shown on the screen, including the builtin ones

Tap to import a GPX file that you might have received from another user

Choose feet or meters for the length unit. The default is feet

Set the offset of the hot point from your finger tap. If you are using an Apple Pencil, you might want to set this to 0 and 0. For ΔY, a negative number moves the hotpoint higher on the screen (i.e., above your finger)

A scaling factor for the POI symbols used, in %

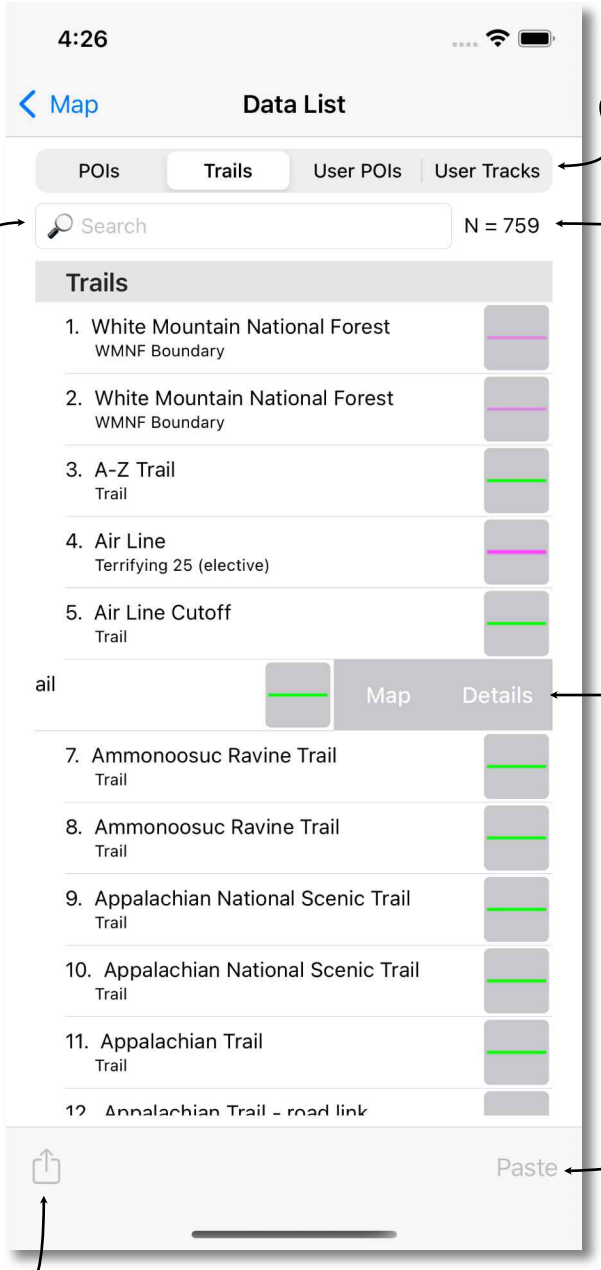
Toggle on or off the display of POIs and Trails

Adjust the interval between sampled points in tracks and drawn paths. The current sample interval is displayed to the right. Always in meters

Make the map more transparent or opaque. Trails and POIs will show up better with some map transparency

Information about this app, including reading the user's manual you are currently reading

The Data List Screen



Tap to select the type of data to show in the data list table

Type a name to narrow your search to just those elements containing the typed phrase. Only the found elements will be displayed on the map

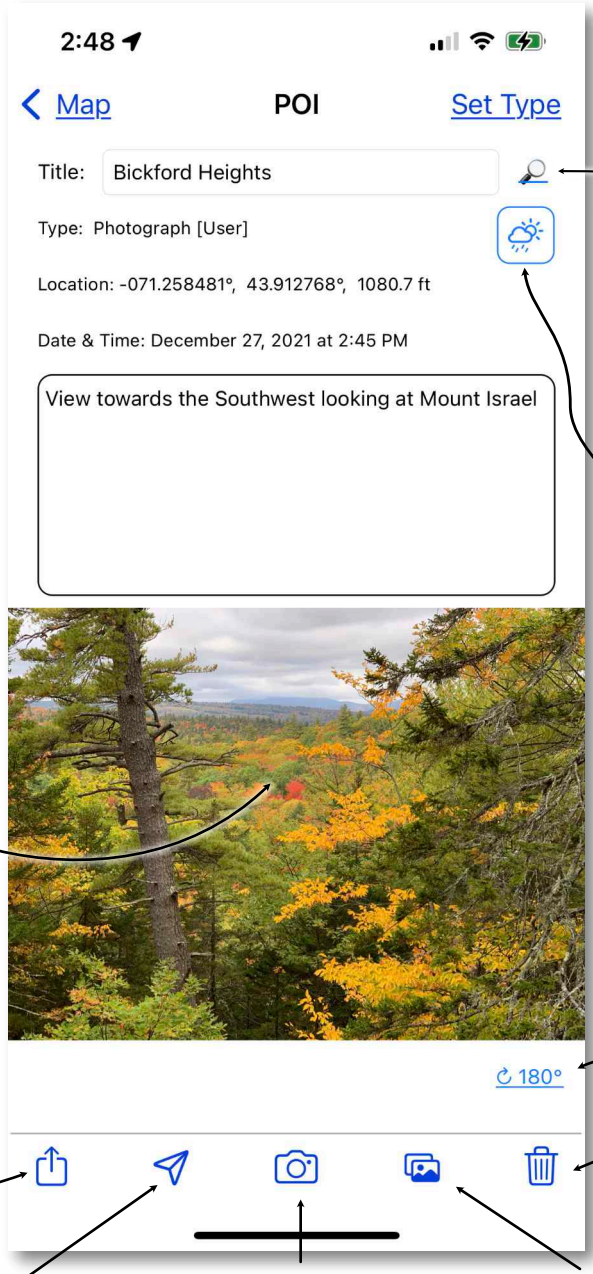
The number of elements containing the typed phrase

Swipe left on any entry for additional buttons. User POIs and Tracks include a Delete button

Show the sharing panel enabling you to export a GPX file of your data. Only enabled for user POIs and tracks

Paste GPX data on the system clipboard (er… pasteboard). Only enabled when the User POIs or User Tracks tab is selected

The POI Details Screen



Return to the Map Screen. Changes to the POI are saved automa-tically

Show the type-picker screen

Go to the web browser and carry out a search for the terms in the Title text box. This works especially well for the builtin POIs

Get the weather for the POI

Tap the photo to display it in a new screen where it can by zoomed and/or annotated

Display the sharing panel from which you can share the text or photo in the POI

Rotate the photo by 180°

Delete the POI (user POIs only)

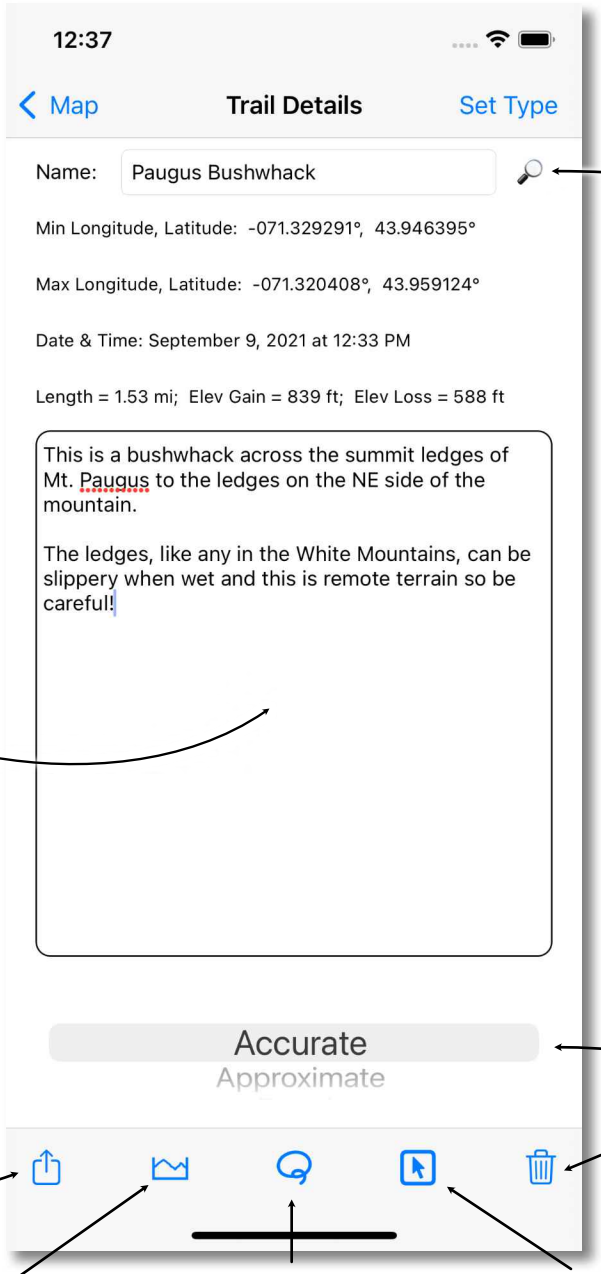
Set up an email that contains both the text and the photo for the POI

Opens the device camera to take a picture to attach to the POI. A copy of the photo will be placed in the Photos Library

Select an already taken photo from the device library to attach to this POI.

[Many of the toolbar buttons are disabled when a builtin POI is displayed]

The Trails Details Screen



Return to the Map Screen. Changes to the trail are saved automatically

Show the type-picker screen

Go to the web browser and carry out a search for the terms in the Title text box. This works especially well for the builtin trails

Freeform notes field where you can enter anything you want. You can also use dictation, even while offline!

Specify how well located the trail or track is. Accurate produces a solid line on the map, Approximate a dashed line, and Rough a dotted line

Display the sharing panel from which you can share a GPX file containing the trail

Delete the trail (user POIs only)

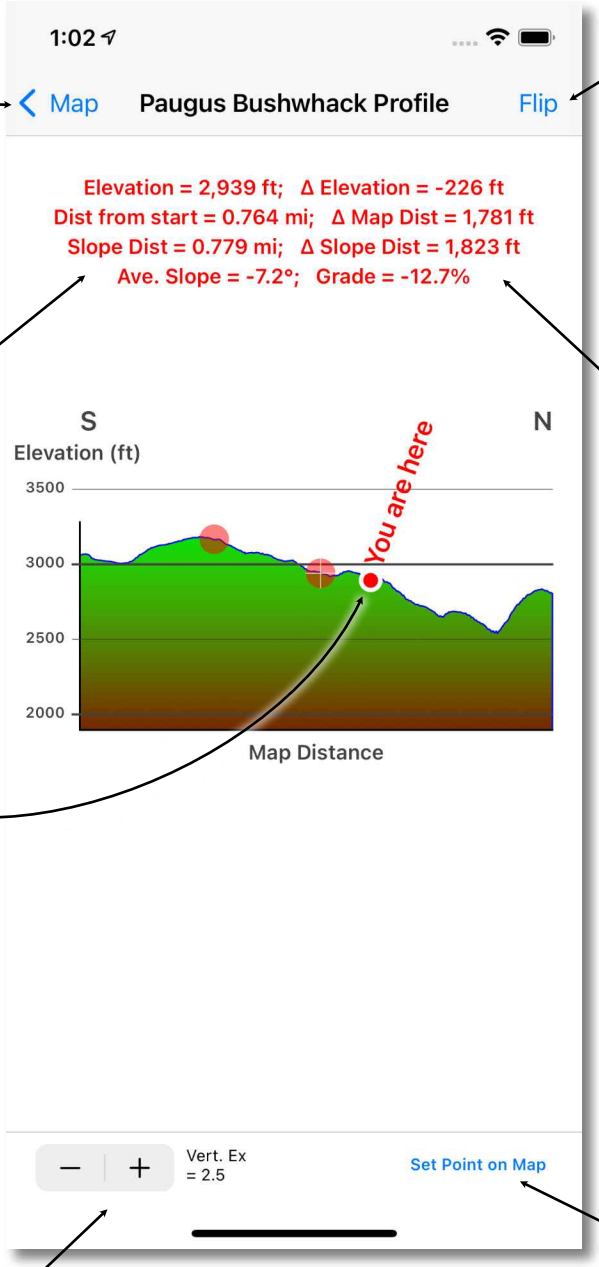
Show a topographic profile of the trail or track

Allows you to edit a user entered track or trail by lassoing the vertices

Allows you to edit a user entered track or trail by clicking and dragging on a vertex in the map screen

[Many of the toolbar buttons are disabled when a builtin trail is displayed]

The Topo Profile Screen



Return to the Trail Details or Map Screen.

Flip the profile on the screen which you might want to do if it was plotted with, say, east on the left

Data for the current position of your finger or pointer on the profile. Start is measured from the left edge of the profile (unless flipped)

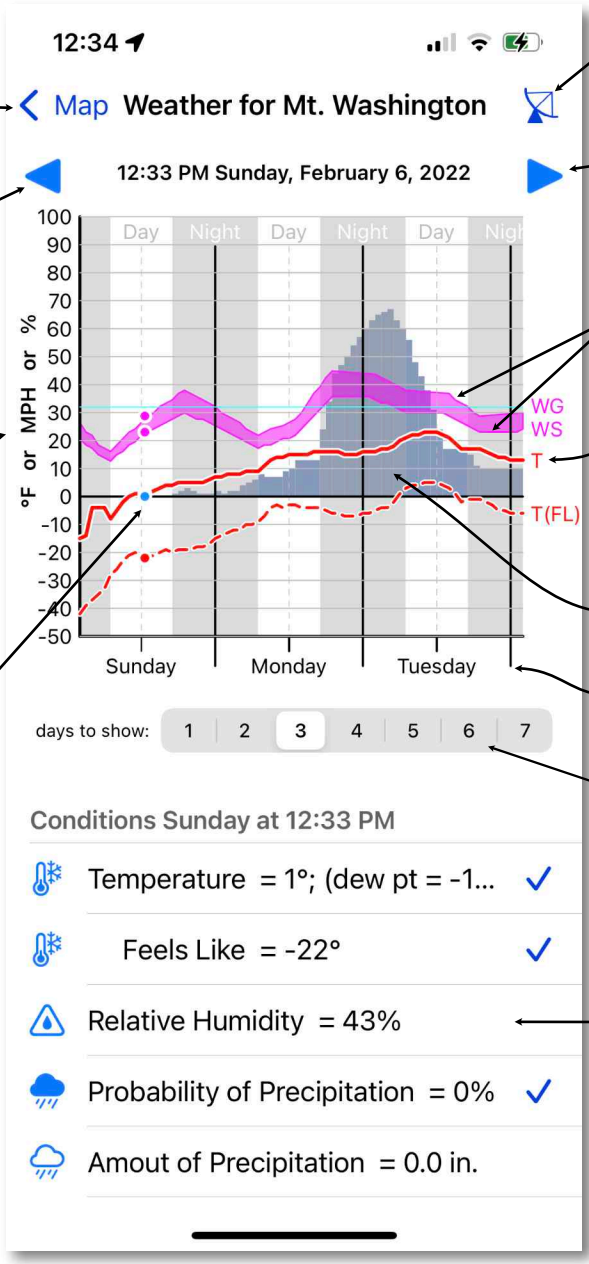
Topo data for the interval between where you initially tapped the profile and where your finger currently is (red dot with white cross)

Your current position and any POIs on the profile are plotted

If there is an interesting spot on the profile, you can mark it by setting a POI that will be displayed on the map. The POI will initially be named “Pt on Profile” but you can change that to whatever you want.

Adjust the vertical exaggeration of the topographic profile. The default value is usually 5.0

The Weather Screen



Return to the Map Screen.

Scroll the weather graph backwards by the number of days to show

The vertical scale of the graph shows temperature in °F or miles per hour for wind speed or wind gusts or probability for precipitation (bar graph) or relative humidity

Tap and drag your finger on the graph to see the forecast conditions for that time and date in the table below

The conditions at the time and date tapped on the graph are displayed in this scrolling table. Some icons change with conditions (e.g., wind direction)

Download weather radar images from the NWS and display on the map

Scroll the weather graph forwards by the number of days to show

Wind gusts (WG) and wind speed (WS)

Temperature (T) and "feels like" temperature, T(FL)

Bar graph shows probability of precipitation

Tap here to see a narrative forecast for the day or night

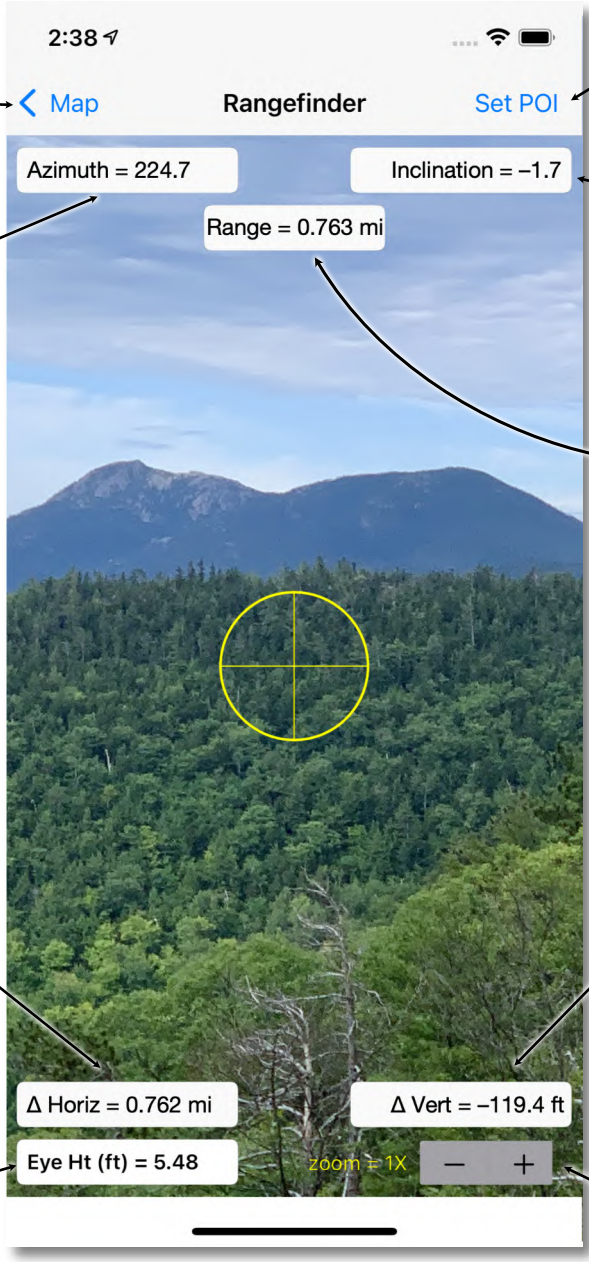
Set the number of days to display on the graph

Tap an entry in the table to show or hide that measurement on the graph. Relative humidity is not shown because it does not have a check mark next to it. Some measurements cannot be shown on the graph (e.g., wind direction)

Tap the date and time text between the forward and backward arrows at the top of the screen to display the current forecast conditions.

Weather is only available when you have an Internet (e.g., cellular data or wireless) connection! The weather forecast from NOAA/NWS is provided on a 2.5×2.5 km^2 grid that contains the latitude and longitude of the POI.

The Rangefinder Screen



Return to the Map Screen.

Set a POI at the position of the target on the map

The compass bearing (from true north) to the target

The vertical angle (negative downwards) to the target

The straight-line distance to the target

The horizontal distance to the target (usually very similar to the range)

The difference in elevation between you and the target

The height of your eye above the ground. You can change this value by selecting the number to the right of the equals sign and typing in a new value

Increase (+) or decrease (–) the zoom of the camera. Zooming in is frequently helpful

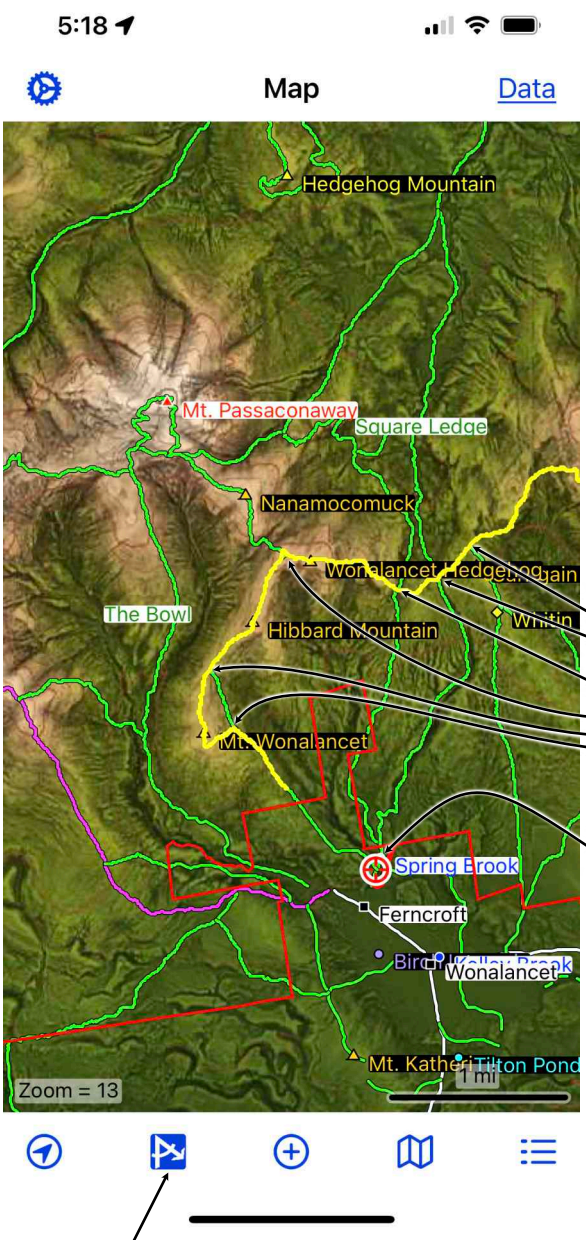
Do NOT depend on these values. Your device compass is less accurate than an analog compass. You can improve your device compass reading by waving it in a figure-8 pattern. Small errors in azimuth over long distances result in LARGE errors in position. So, the farther away the target, the less accurate its position is likely to be.

Creating a Custom Hike

Because many hikes involve more than one trail, custom hikes allow you to define a new trail which links together all of the segments so you can determine exactly how long the hike will be. You can also see topo profiles for your actual hike.

When you save a custom hike as a trail it remains in the user database until you delete it.

If you want to see the topo profile for just one segment of a trail, define a custom hike which includes just that segment of the trail and then choose show profile.



A custom hike in yellow

Custom hikes can only include segments of the built-in trails, not new user entered trails

Tap each trail intersection in the order that you will do the hike

Positioning the target to tap the end point of the hike. The point is set when you lift your finger from the screen

Tap measure tool again to finish defining the hike. You will then be given the option of saving it as a trail or just seeing the topo profile. If you select topo profile, the custom hike is not saved!

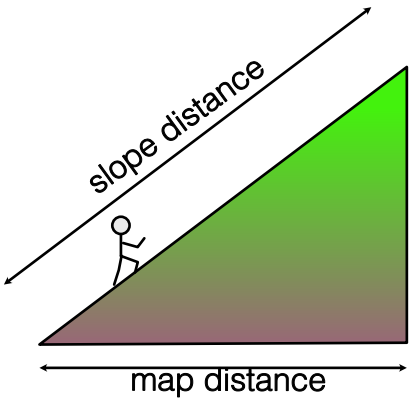
Technically, you do not have to tap ***every*** trail intersection, only those where you will change from one named trail to the next. However, it is sometimes difficult to determine exactly where one trail ends and the next one starts so it doesn't hurt to tap each intersection!

Map, Slope, & Walked Distance

You may notice that White Mountain Hiker reports different distances than trail signage, your step counting device, or those which you determine by putting a ruler on a map. That is because ***WMH shows you slope distances which are calculated from the digitized points in the polygon that defines the trail***. This page attempts to explain these different values.

Map Distance

Maps are a projection onto a horizontal surface so map distance only include the horizontal distance, as shown in the cartoon cross section.

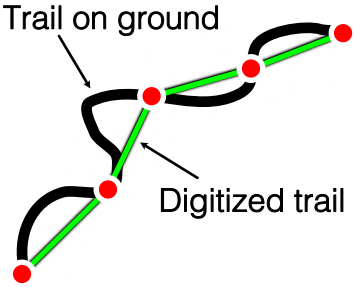


Slope Distance

The slope distance includes both the horizontal and vertical distance along a trail. It is the distance that you actually walk and is always larger than the map distance. The difference between the two is usually relatively small because slope angles are usually low.

Walked Distance

Digitized trails in WMH are sample every 10 meters (in the WMNF) to 30 meters (~33 to 100 feet) with straight line segments in between the digitized points in order to make the app more memory efficient. Of course, when you are hiking, your trajectory is much more winding, both because the trail is more winding and because, within the width of the trail you step around boulder and trees, etc. Thus the distance you walk is actually farther than the calculated slope distance that WMH shows you. How much further? That is impossible to say, but ***a good rule of thumb is to add about ~5-10% to the displayed trail length***. So, if WMH says a trail is 4 miles long, you can estimate that you will probably walk about 4.2 - 4.4 miles.



Acknowledgments

This software would not be nearly as polished without the beta testing prowess of Pen Hallowell as well as the testers of my GMDE Lite app on which this is based: Sara Carena, Paul Karabinos, Nathan Niemi and others.

Jason King provided key insight into how to implement the true north reference frame for using the device orientation to make measurements possible. The Sighting View also uses code from his iOSKit. Jeremie Leroy and Jason Ash also helped to implement various features in the app.

The original Python code can be found at: https://www.maptiler.com/google-maps-coordinates-tile-bounds-projection/.