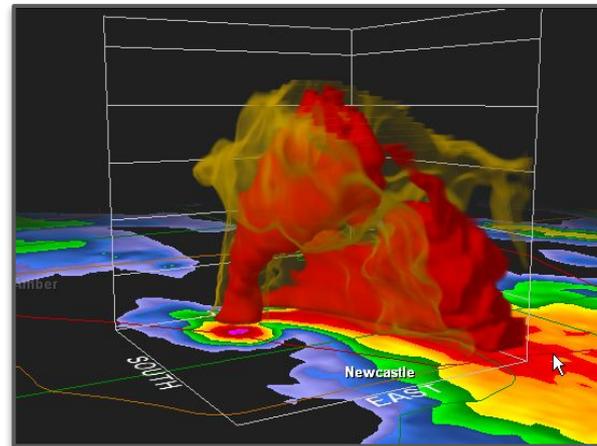


An Introduction to the Gibson Ridge 2 Analyst Program

Updated for GR2A **3.2.1.1**
January 2024



NWS Central Region Convective Warning Improvement Project



This is an introduction/refresher to the Gibson Ridge 2 Analyst (GR2A) program. It doesn't cover every single feature, but hits on those that are the most useful. This manual was made for **GR2A 3.2.1.1**. Previous versions of GR2A 1/2.x, GR2, and GR3 have similar interfaces, but differ substantially.

Hopefully you can glean some new information and tricks on using GR2A. With the right setup, GR2A is a powerful program.

Just want to know what is new with Version 3? Jump to...

[User Defined Products \(UDP\)](#)

[Maximum Value Trails](#)

[Storm Following Mode](#)

[PTDS Product](#)

[New Warning Layers](#)

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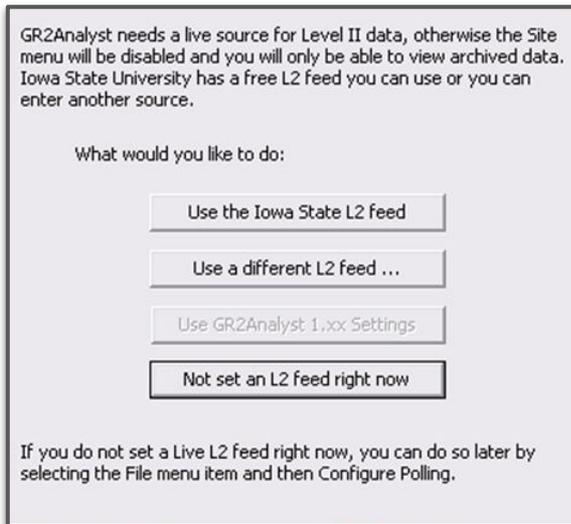
Editing Settings - *Customizing overlays, animation settings, logos & loading environmental data*

Setting up Level II Data Feed

First Time Use
& Updating

If you are opening GR2A for the very first time, a pop-up box appears asking which Level II data feed to use.

Unless you have a different feed to use, it is easiest to choose the Iowa State L2 feed (first option). You can always change these settings later in the *File* → *Configure Polling* menu item.



Importing Old Settings

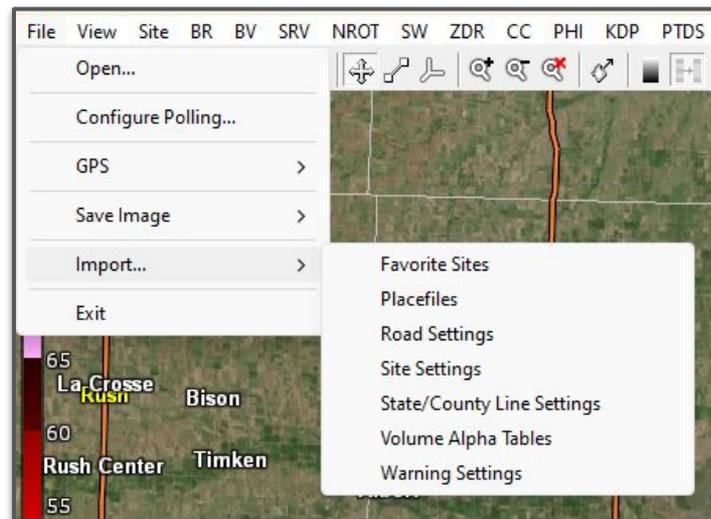
First Time Use & Updating

GR2A can import settings from older versions of the program installed on your computer.

In the Menu Bar at the top of the program, click *File* → *Import...* and then choose which items you wish to import.

Note: GR2A does not import color tables. These need to be manually configured.

[See how to quickly do this!](#)



Activating & Updating GR2A 3.x

First Time Use & Updating

To activate GR2A, open *Help* → *About* and enter the key you received at the time of purchase.

GR2A displays a  icon on the top right corner of the program when a program update is available. Click the icon to download and install the update.

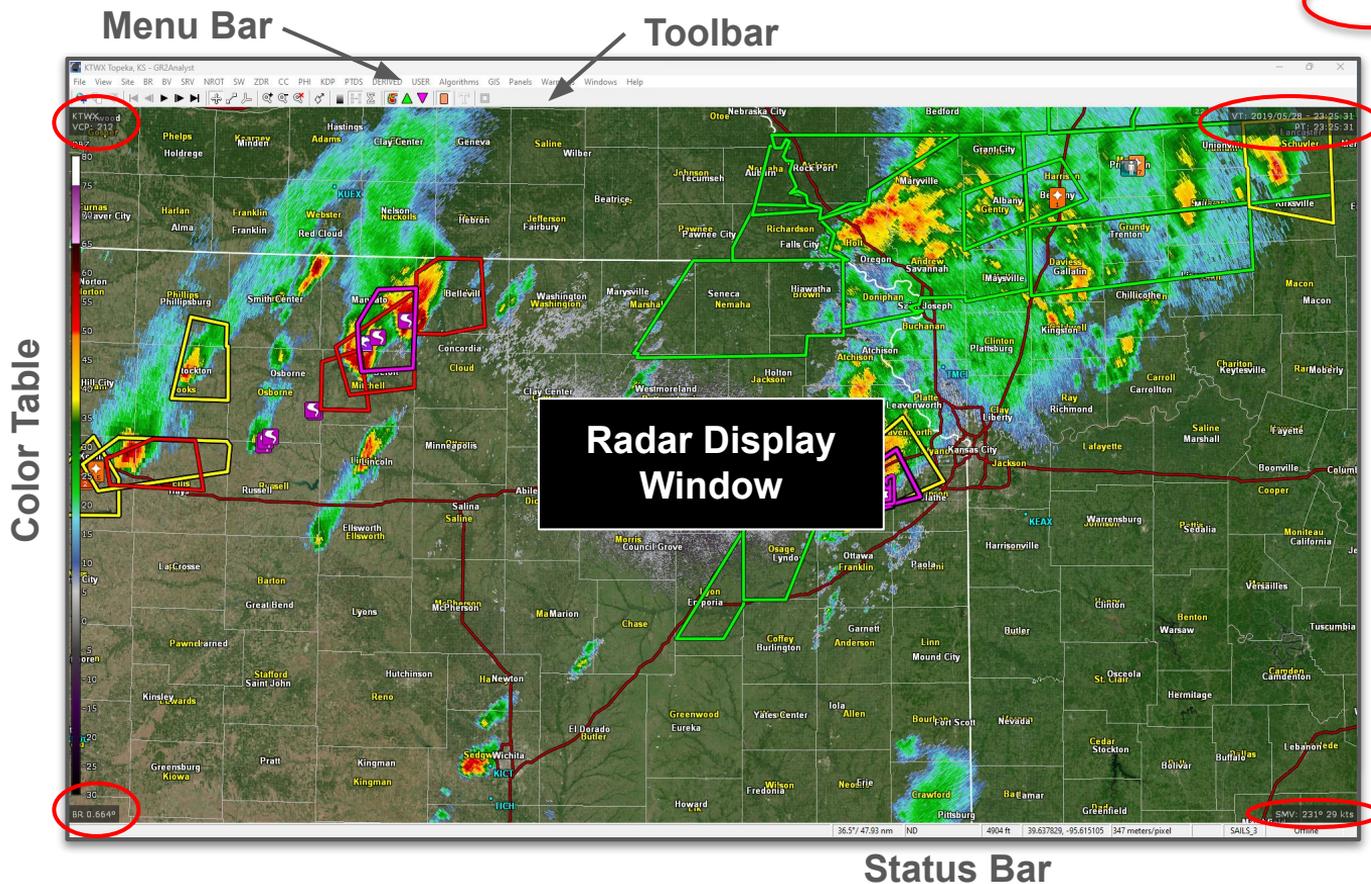
Otherwise, the latest update for GR2A can be downloaded [here](#).

It is highly recommended that all GR2A owners join the [GRLevelX Owners Forum](#) to receive product support and update notifications.

Default Layout

Product Information

Program Layout



Menu Bar

Toolbar

Color Table

Radar Display Window

Status Bar



Component Descriptions

Program
Layout

→ Menu Bar

Access to nearly all of the settings for GR2A.

→ Toolbar

Shortcuts for common options. Mousing over a button gives its description.

→ Color Table

Scale for the currently displayed or selected product.

→ Radar Display Window

Displays the currently loaded data.

→ Status Bar

Shapefile Data @ Cursor (ex. Road Name)	Cursor Azimuth & Range from Marker /Radar	Cursor Readout / Max Unambiguous Velocity (V/SRV only)	Radar Beam Height @ Cursor (ARL)	Cursor Coordinates	Radar Display Window Resolution	AVSET enabled?	MESO-SAILS or MRLE scans	Live Data Polling Status & Update Time Turns Red if Data is not Available
U30	302.4° / 33.77 nm	18.0 dbz	2447 ft	42.030590, -94.363426	145 meters/pixel	AVSET	SAILS_1	Next Update: 0:25

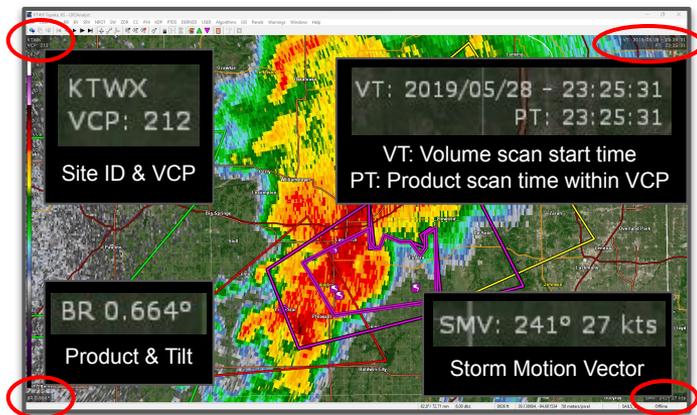
[Table of Contents](#)

Four Corners Layout

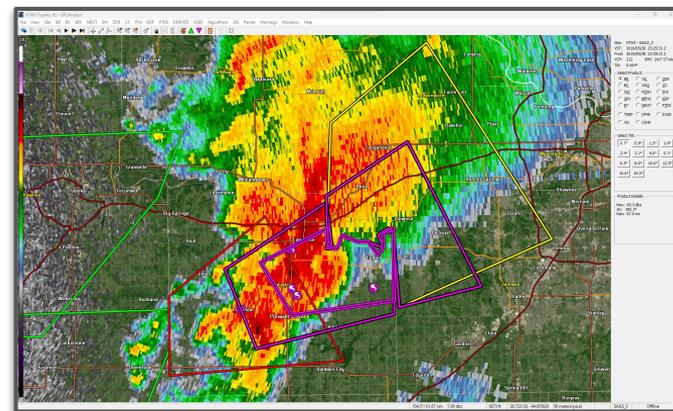
The Product/Tilt Window can be toggled on & off by going to *Windows* → *Show Product /Tilt Window....*

The window shows the available radar tilts and other valuable VCP information in one place. When toggled off, much of this info shifts to small boxes placed in the four corners of the Radar Display Window.

Program
Layout



Product/Tilt Window Toggled **OFF**
"Four Corners Layout"



Product/Tilt Window Toggled **ON**
(Right Side of Window)

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Description of the Product/Tilt Window on the [Next Page](#)

Product/Tilt Window

Program Layout

Site: KTWX - AVSET SAILS_3
VST: 2019/05/28 23:37:44 Z
Prod: 2019/05/28 23:41:56 Z
VCP: 212 SMV: 232° 30 kts
Tilt: 0.659°

Select Product:

<input checked="" type="radio"/> BR	<input type="radio"/> VIL	<input type="radio"/> ZDR
<input type="radio"/> BV	<input type="radio"/> VILD	<input type="radio"/> CC
<input type="radio"/> SW	<input type="radio"/> PQSH	<input type="radio"/> PHI
<input type="radio"/> SRV	<input type="radio"/> MEHS	<input type="radio"/> KDP
<input type="radio"/> ET	<input type="radio"/> NROT	<input type="radio"/> PTDS
<input type="radio"/> TDEF	<input type="radio"/> CP30	<input type="radio"/> CP40
<input type="radio"/> VII	<input type="radio"/> CG40	<input type="radio"/> D100

Select Tilt:

0.7°	0.9°	1.3°	1.8°
2.4°	3.2°	4.0°	5.1°
6.5°	8.0°	10.0°	12.5°

Product Details:

Max: 67.5 dbz
Az: 84.7°
Ran: 52.8 nm

Site ID & scanning strategy in use, start time of the volume scan & product scan time, VCP, storm motion, and current tilt.

Available products to choose from, both [Level II base & derived products](#).

[User defined products](#) (UDPs) are loaded at the bottom of this list.

Available tilts to choose from. If a * appears next to the tilt, the data is from the previous volume scan. Some derived and user defined products will not have any tilts listed.

Miscellaneous details of the currently displayed/selected product such as the location of the maximum and minimum values.

Scanning Strategy (MESO-SAILS, MRLE, & AVSET) Notes

MESO-SAILS :

When GR displays the text "SAILS_x", x is the number of additional 0.5° slices being scanned. This number ranges from 1 to 3.

MRLE :

"MRLE_x", x is the number of additional low-level tilts being scanned midway through a volume scan.

MRLE_2 = 0.5°, 0.9°

MRLE_3 = 0.5°, 0.9°, 1.4°

MRLE_4 = 0.5°, 0.9°, 1.4°, 1.8°

MESO-SAILS & MRLE cannot be used concurrently.

AVSET :

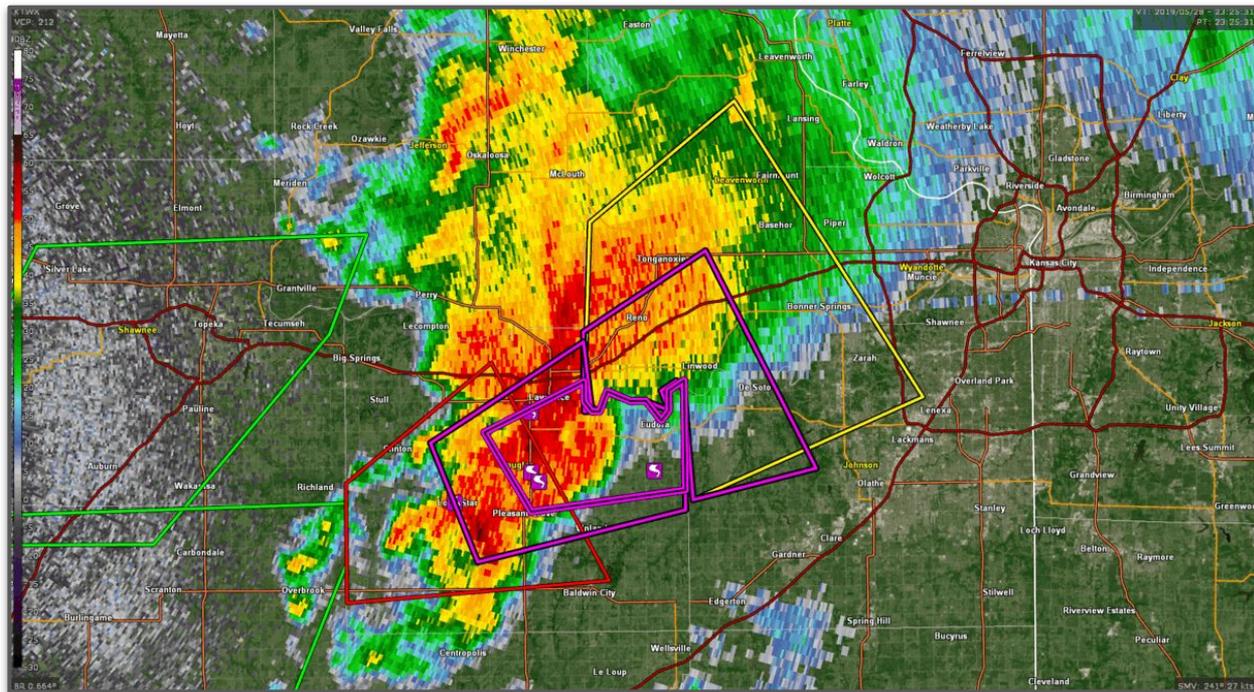
If "AVSET" is displayed, the radar is truncating the volume scan below 19.5° due to a lack of echoes. Note that AVSET is displayed in the status bar if the strategy is active, even if the radar is executing a complete volume scan.

If no text is displayed, no scanning strategy is being used.

Panels

Radar data can be viewed in 1, 2, or 4 panels in the Radar Display Window. To change the panel layout, go to *Panels* and select *One Panel*, *Two Panels*, or *Four Panels*.

Program
Layout



Loop going through the one, two, and four panel layouts.

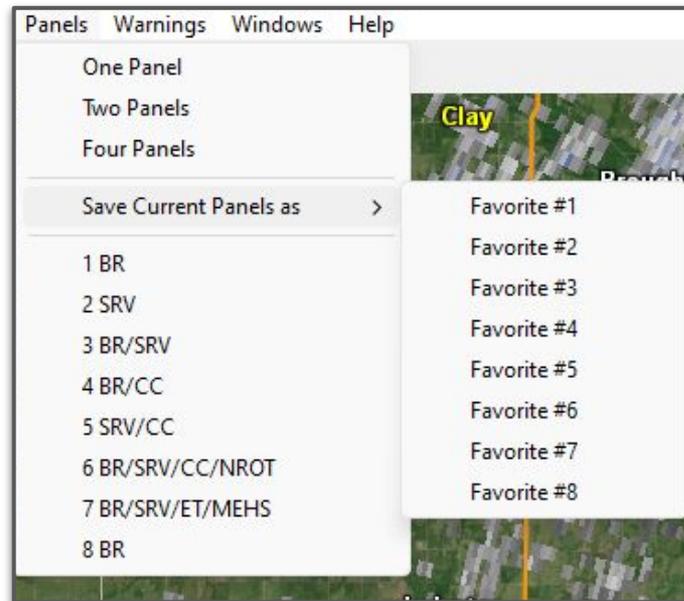
Panel Editing & Saving

Program Layout

To add a product to each panel in the two or four panel layout, click the panel—it becomes highlighted with a thin black box—and choose the desired product and elevation from the Product/Tilt Window or Menu Bar.

Pre-built panels are also under the *Panels* menu. Up to 8 different layouts can be edited and saved using the *Panels* → *Save Current Panels as* menu option.

Each panel is numbered 1-8. To open a panel, choose it from the list under the *Panels* menu or select the corresponding number from the keyboard/keypad.



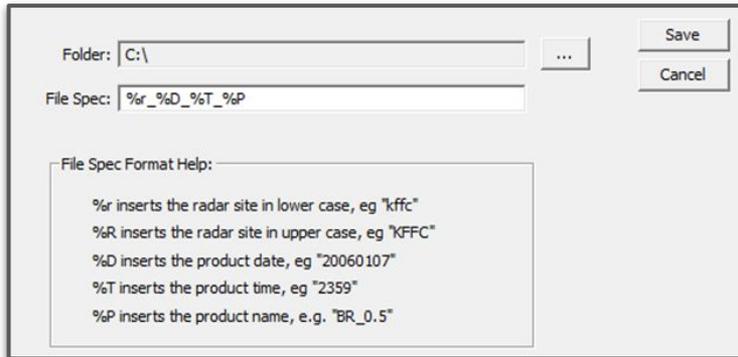
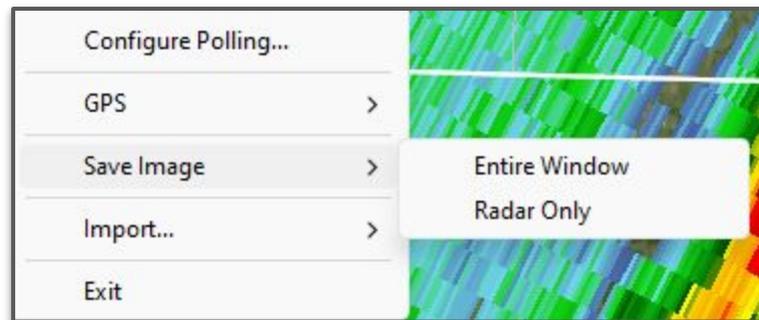
Saving Images

Program Layout

Go to *File* → *Save Image* and select one of two options:

Entire Window: Captures the whole screen

Radar Only: Captures only the Radar Display Window



GR2A can insert certain variables (site ID, date, product time, and product name) into the image filename, as well as any user-desired words/characters at any location in the filename.

Changing Current & Startup Sites

Radar Site Settings

To change the current site, go to [Site](#) → [Select...](#)

- Choose your site from the list that opens and click **OK**. Sites that begin with the letter “T” are TDWR sites.
- You can also change to a nearby site by clicking on the radar ID in the Radar Display Window.

Site:	KTWX	Latitude:	38.997	OK
Office:	KTOP	Longitude:	-96.232	Cancel
		Elevation:	431	
Location: Topeka, KS				
Site	State	City		
PHWA	HI	South Shore		
KDMX	IA	Des Moines		
KDVN	IA	Quad Cities		
KCBX	ID	Boise		
KSPX	ID	Pocatello		
KLOT	IL	Chicago		
KILX	IL	Lincoln		
KVVX	IN	Evansville		
KTVX	IN	Fort Wayne		
KIND	IN	Indianapolis		
KDCC	KS	Dodge City		
KGLD	KS	Goodland		
KTWX	KS	Topeka		
KICT	KS	Wichita		

To change the startup site

- Go to [Site](#) → [Settings...](#)
- In the Startup Site box, click **Change** and select the site from the provided list
- To have GR2A begin polling this site at startup, check the **Automatically connect at startup** box.
- Click **OK** once done

Startup Site:		Change	OK
KDMX Des Moines, IA			
<input type="checkbox"/> Automatically connect at startup			
Favorite Sites:			
KARX	La Crosse, WI	Add	
KDMX	Des Moines, IA		
KDVN	Quad Cities, IA		
KEAX	Kansas City, MO		
KFSD	Sioux Falls, SD		
KMPX	Minneapolis, MN		
KMVX	Grand Forks, ND		
KOAX	Omaha, NE	Remove	

Favorite Sites

User-defined favorite radars are displayed in the *Site* menu

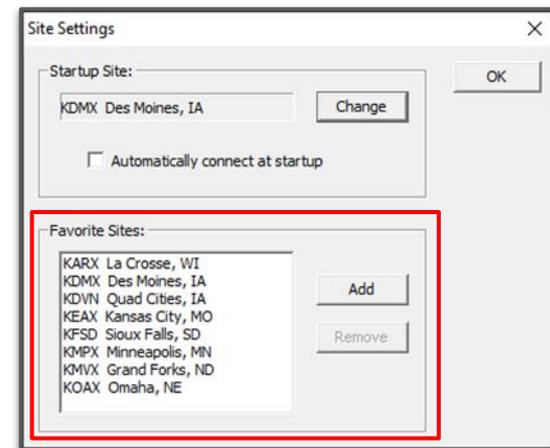
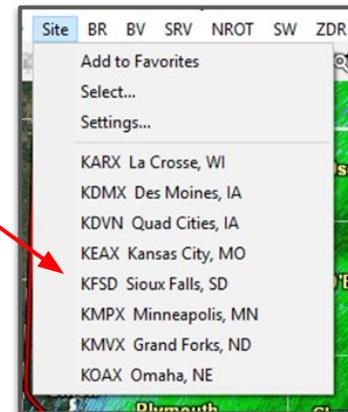
→ Sites are displayed in alphabetical order by site ID

To configure Favorites:

- Go to *Site* → *Settings...*
- In the Favorite Sites box, click *Add*
- Select the site from the list and click *OK*
(You have to do this for each site)

To remove a site from your favorites, select the site from your list and click *Remove*.

To add the currently displayed radar site as a favorite, go to *Site* → *Add to Favorites...*



Radar Site
Settings

Live Data

To start downloading live data

- Click the Start Polling button  on the Toolbar.
- Note: A polling site must be configured beforehand, either when the program was first set up or via the [Configure Polling](#) setting.

To load previous volume scans

- Click the Download Recent Data button  on the Toolbar.
- To configure how many volume scans GR2A downloads and how often it polls for data, see the [Configure Polling](#) section.

To stop live polling without shutting GR2A down

- Click the Stop Polling button  on the Toolbar.

Configure Polling

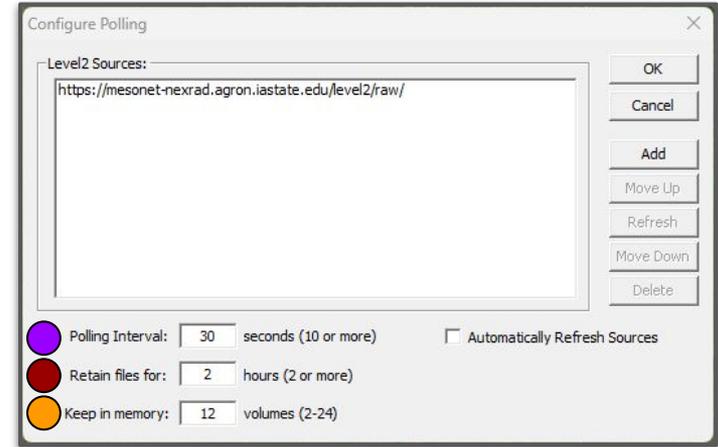
Navigate to *File*→*Configure Polling...*

(You cannot be downloading live data while changing these options)

The window that opens up displays the sources of Level II data. The buttons on the right allow you to add/remove new sources and change their priority (top source is used first).

There are three configurable options:

- **Polling Interval:** How often GR2A checks for new radar data.
- **Retain files for:** How long GR2A keeps the files it downloads before discarding them.
- **Keep in memory:** How many scans GR2A keeps in memory that are available for animating.



The *Automatically Refresh Sources* checkbox is useful if new radars are added in the future. It is disabled by default.

Archived Data

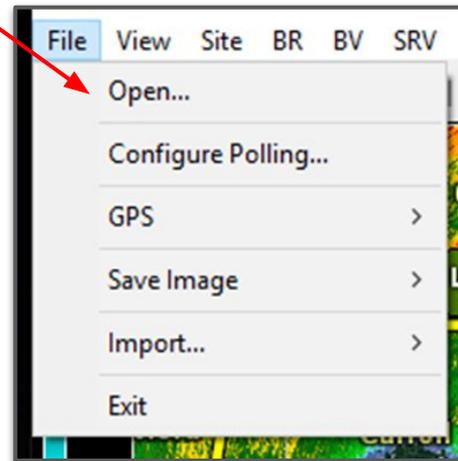
Loading Radar Imagery

In Menu Bar go to *File*→*Open...*

- Navigate to the folder containing the data, use the shift key to highlight the desired time range, then click open.

You can also drag & drop radar files you wish to load directly from the File Browser into GR2A.

A maximum of **24 radar files** can be loaded into the program at one time.



Depending on the size of the radar files and the computer hardware, the dataset may take over a minute to load. This is especially true for files containing MESO-SAILS or MRLE data!

Radar Products

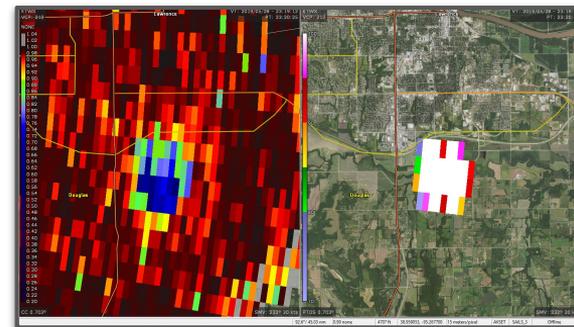
Navigating Radar Data

Level II Products Ingested by GR2A	Calculated Products within GR2A
Base Reflectivity (BR) Base Velocity (BV) Spectrum Width (SW) Differential Reflectivity (ZDR) Correlation Coefficient (CC) Not Available w/ Phase Shift (PHI) TDWR Data Differential Phase Shift (KDP)	Storm Relative Velocity (SRV) Echo Tops (ET) Vertically Integrated Liquid (VIL/VILD) Probability of Severe Hail (POSH) Maximum Estimated Hail Size (MEHS) Normalized Rotation (NROT) Probability of Tornadic Debris Signature (PTDS)

Product Notes:

PHI is an extra dual-pol product is available in GR2A that is not viewable elsewhere. This is the differential phase shift before a distance derivative is applied.

PTDS (right image) is the weighted sum of various products (BR, CC, ZDR, PHI, SW, and NROT) for ascertaining the presence of a TDS. See [Help](#) → [User Guide...](#) for more information.



CC (left) and PTDS (right)

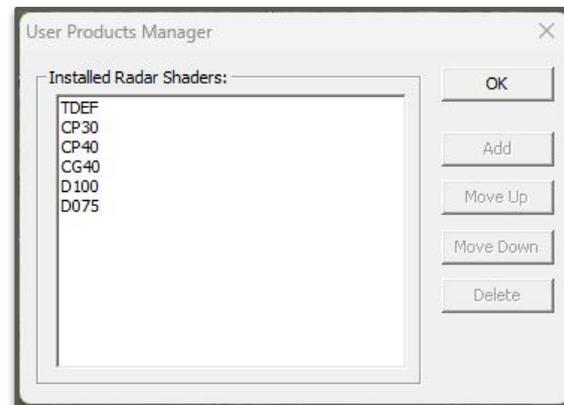
User Defined Products

The User Defined Product (UDP) feature of GR2A allows one to calculate new products using baselined products in the program and RAP environmental data. This opens the door for the creation of dozens of new products!

Two Ways To Load a UDP

1. Drag and drop the file (.rsl or .rsl.txt) into the Radar Display Window.
2. Open [Algorithms](#) → [User Products](#), click the [Add](#) button, and navigate to the file.

The User Products Manager (right image) is also used to arrange the order of UDPs and remove them.

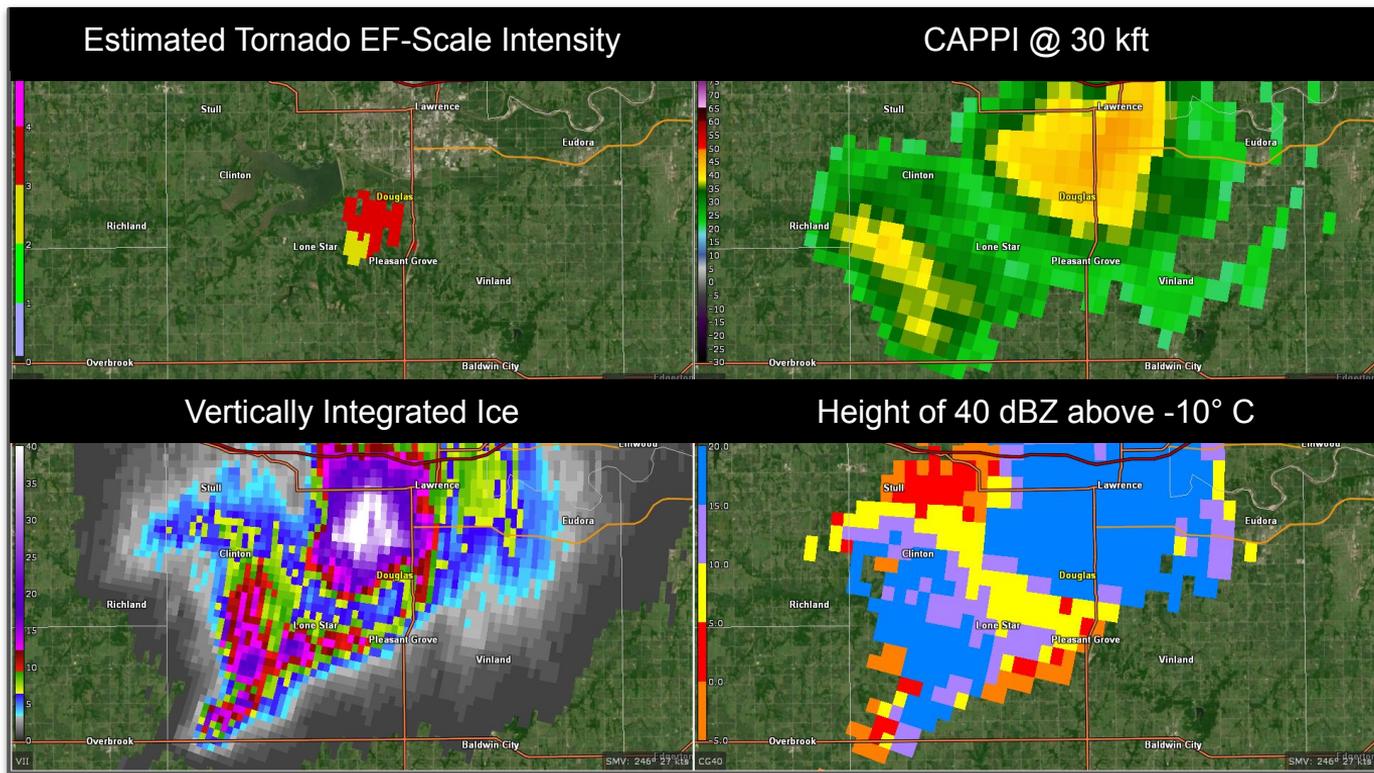


You can only have 6 UDPs loaded into GR2A at a time.

To display a UDP, click on it from the Product/Tilt Window or from the [USER](#) menu. *When polling live data, UDPs are calculated after the completion of a volume scan.*

Examples of User Defined Products

Navigating Radar Data



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Visit the [GR Owners Forum](#) for UDP examples and [Help](#) → [User Defined Products...](#) for information on creating a UDP.

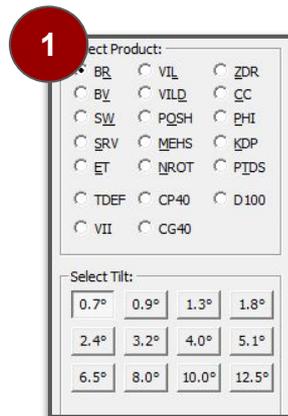
Changing Products & Elevation Angles

Using the Program:

Chose the desired product & tilt in the **Product/Tilt Window** ¹ or the **Menu Bar** ². If a * appears next to the tilt, the data is from the previous volume scan.



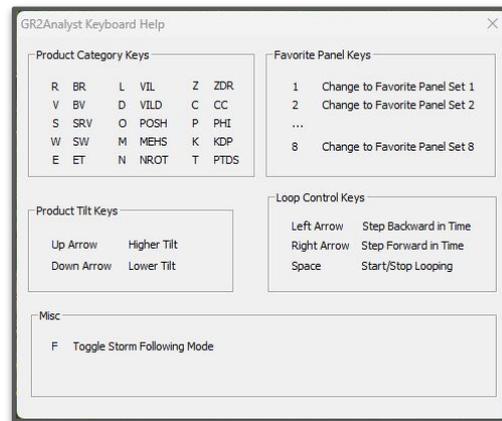
BR BV SRV NROT SW ZDR CC PHI KDP PTDS DERIVED USER



Using Keyboard Shortcuts:

- **Tilt:** The up/down keys move vertically through the tilts in a volume scan.
- **Product:** The keys that correspond to each product are underlined in the Product Information panel.

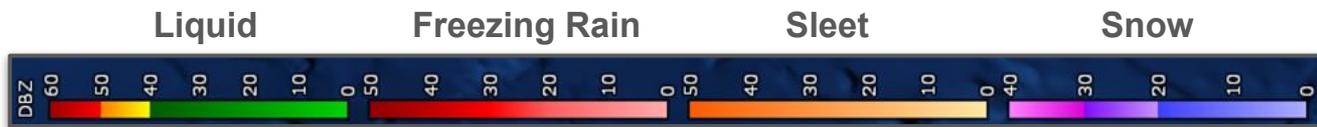
A reference guide under [Help](#) → [Keyboard Help](#) also contains these shortcuts (image to right).



Precipitation Type

GR2A calculates the expected type of precipitation reaching the ground in areas with radar echoes using RAP model data (surface observations not used).

Selecting the  button on the Toolbar colorizes the base reflectivity imagery by four p-types:



To view the raw base reflectivity data again, deselect the  button.

Product Notes:

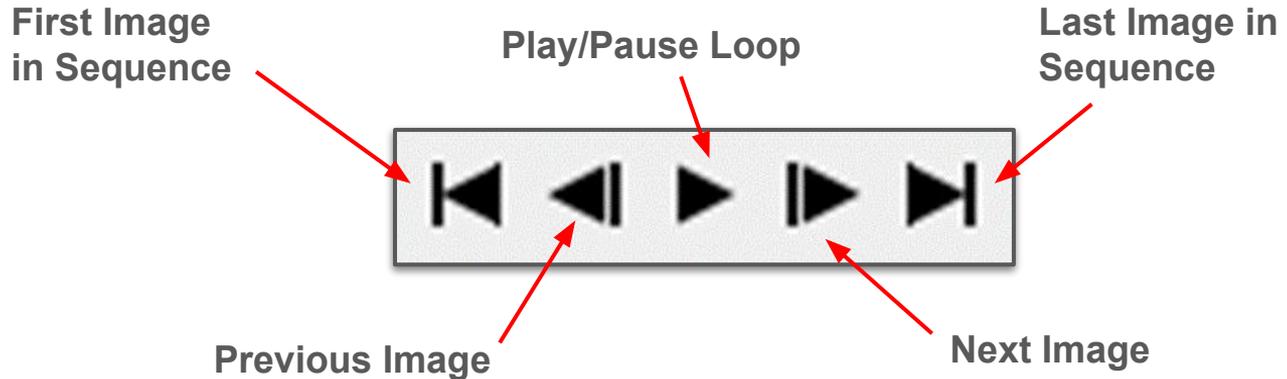
Precipitation type is only calculated for **CONUS**, **real-time** radar viewing (not archived data).

This is not a hydrometeor classification algorithm (HCA) product. The HCA calculates the characteristics of the precipitation sampled by the radar beam at each elevation angle, while the Precipitation Type algorithm calculates the expected precipitation type at ground level.

Animation

Use the **Left** and **Right Arrows** on the keyboard to step through the data.
The **Spacebar** activates/stops looping.

The toolbar also contains animation controls:



To control looping speeds, see the [Animation Settings](#) section.

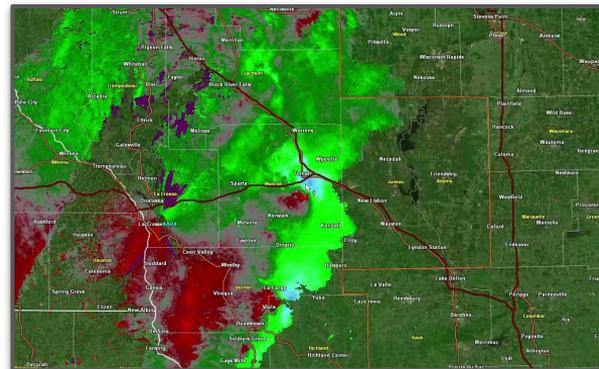
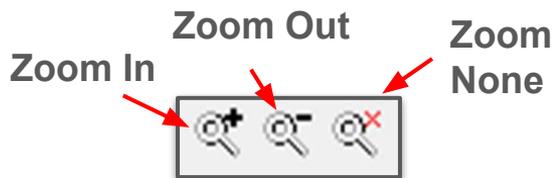
Zooming & Panning

There are 3 ways to zoom in/out:

Use your scroll wheel to zoom into wherever your mouse is located on the Radar Display Window.

Right-click & hold on an area in the Radar Display Window and drag outwards, forming a box that GR2A zooms in to.

Use the zoom controls on the toolbar.

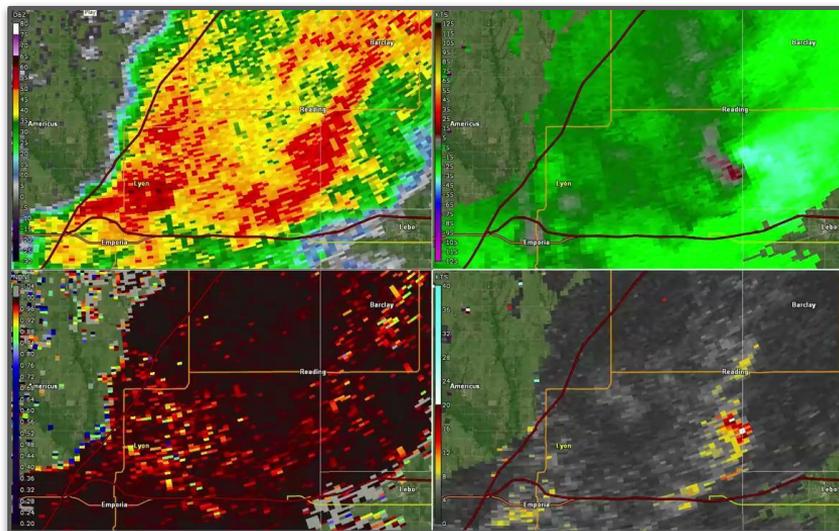


Panning: Click the  button on the Toolbar, then click and drag within the Radar Display Window to move the viewing screen around. You need to select this option when exiting from [Cross Section](#) or [Volumetric](#) mode.

Storm Following Mode

Once a [Storm Motion](#) is set, selecting the “F” key invokes the Storm Following Mode. This shifts the radar viewing window at the same pace as the storm motion when using the animation functions, ideally keeping the storm centered in the screen.

Select the “F” key again to turn off this feature.



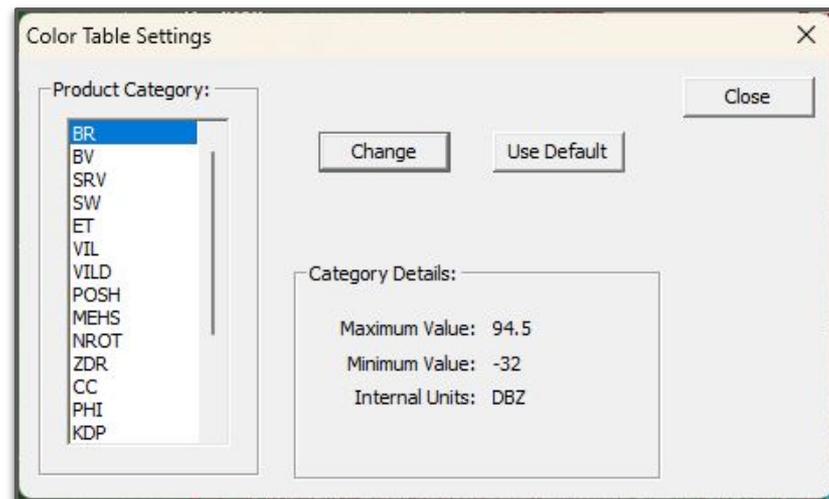
Changing Color Tables

Viewing Options

Drag and drop color tables (.pal files) from a file browser into the Radar Display Window. You don't even have to be on the matching product in GR2A to load them!

Changing using the Menu:

- Navigate to [View→ Color Table Settings...](#)
- Choose the product you wish to set on the left side of the screen.
- Click [Change](#) and select the color table file from the file browser.
- Repeat for each product you wish to change.



For help in creating a color table from scratch, visit [Help→ Color Tables](#).

Markers

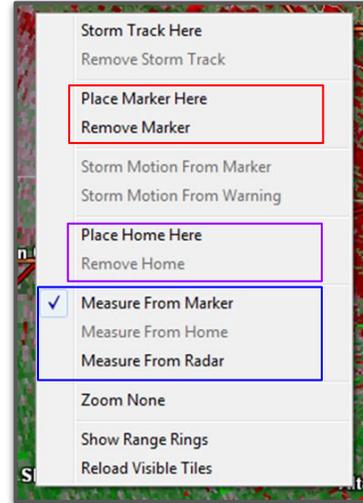
Viewing Options

Markers are useful for setting the [storm motion](#) and measuring distances between points.

Setting a Marker

(Erased when GR2A is closed)

- Right-click on the Radar Display Window where you want to place the marker.
- From the pop-up menu, select [Place Marker Here](#).
- To remove the marker, select [Remove Marker](#) from the same menu.



Setting a Home Marker

(Remembered by GR2A)

- Right-click on the Radar Display Window where you want to place the home marker.
- From the pop-up menu, select [Place Home Here](#).
- To remove the marker, select [Remove Home](#) from the same menu.

GR2A shows the distance from a radar or active marker in the [Status Bar](#). You can force GR2A to measure from certain points.

Right-click the Radar Display Window and choose one of the three [Measure From...](#) options in the pop-up menu. The selected point turns **red** on the Radar Display Window while the other options turn yellow.

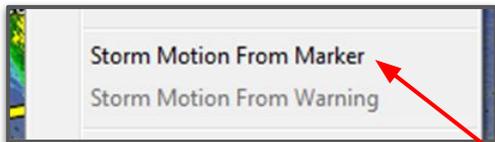
Setting Storm Motion

Viewing Options

If you have warnings available, right click the polygon and from the pop-up menu select *Storm Motion From Warning*.



Manually calculate storm motion:

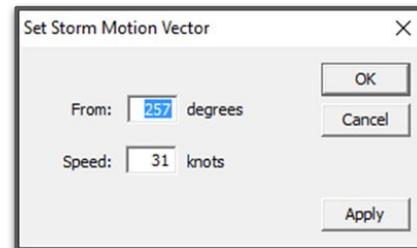


1. Right click on a feature and set a [marker](#).
2. Advance several frames forward or backward.
3. Right-click on the same feature and from the pop-up menu select *Storm Motion From Marker*.

Manually enter storm motion:

Click the  icon in the Toolbar. A window pops up allowing you to enter the storm's motion and speed.

NOTE: Storm motion is the direction the storm is **COMING** from.



Storm Track

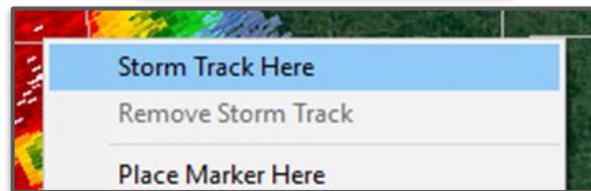
Viewing Options

GR2A can show a one hour predicted storm track based on the set [storm motion](#) in 15 minute increments.

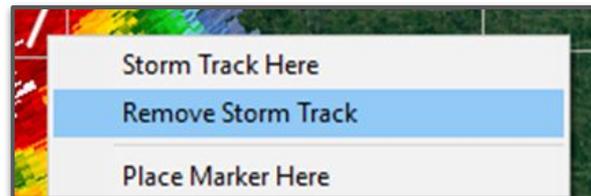
Note that this is a static track and does not automatically update as new radar data arrives.



To Add: Right click on storm and from the pop-up menu select *Storm Track Here*.



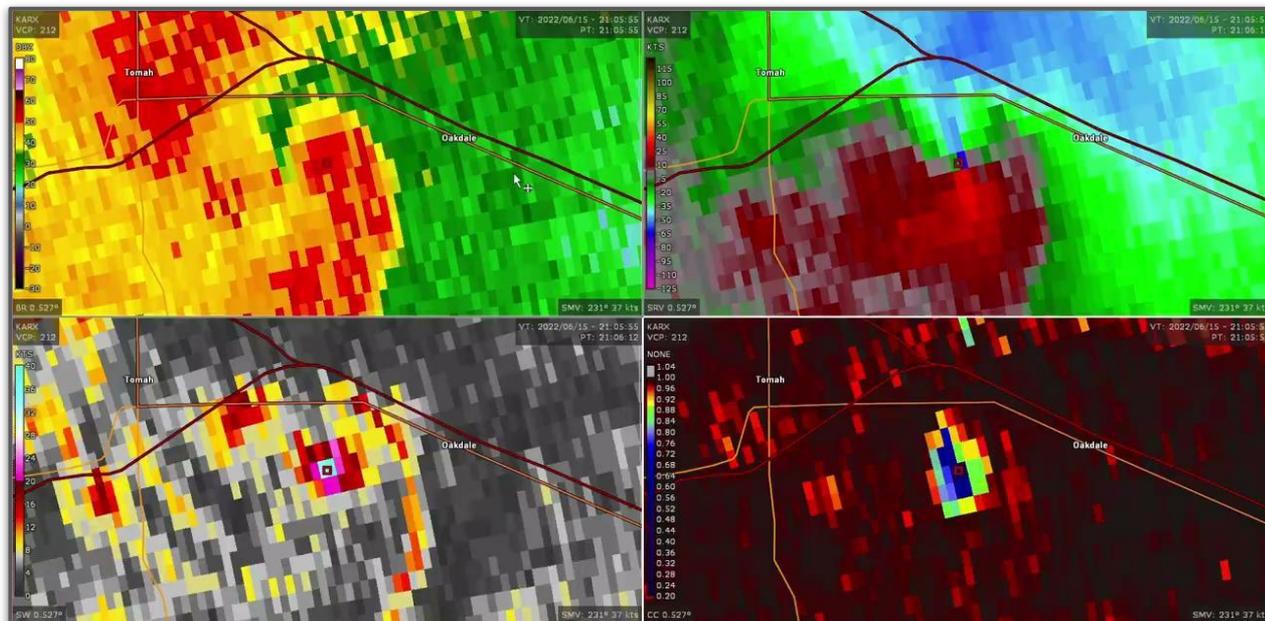
To Remove: Right click and from the pop-up menu select *Remove Storm Track*.



Show Panel Center

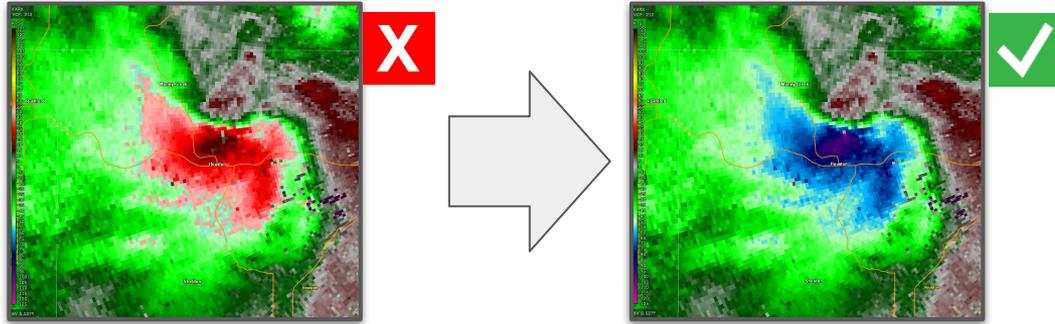
Viewing Options

Clicking the  button when in a 2 or 4-panel viewing mode places that icon in the center of each pane. Very useful for checking the alignment of radar signatures (like TDSs).



Dealiasing

BV/SRV dealiasing can be toggled on & off with the  button on the Toolbar (must be viewing a BV/SRV image to have the button active).



To Fix Bad Velocity Data:

Open the [View -> Dealias Settings...](#) and toggle on/off the [Use Wind Profile](#) checkbox. This often improves the data, but likely won't fully resolve the issue.

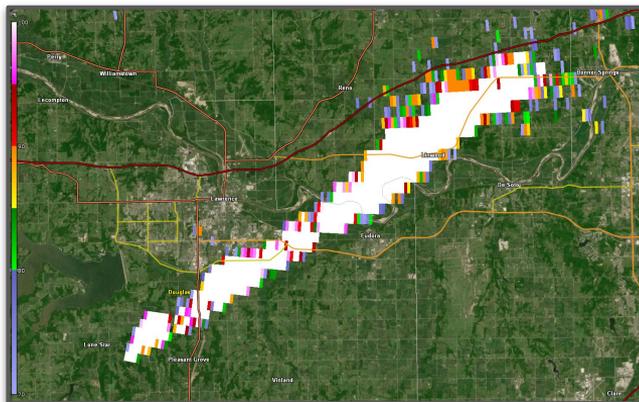
Pro Tip: Deselect [Convert Unresolved to ND](#) so that all velocity data is shown, even if GR cannot properly display it. This alerts you to try the above fix versus GR simply showing no data.



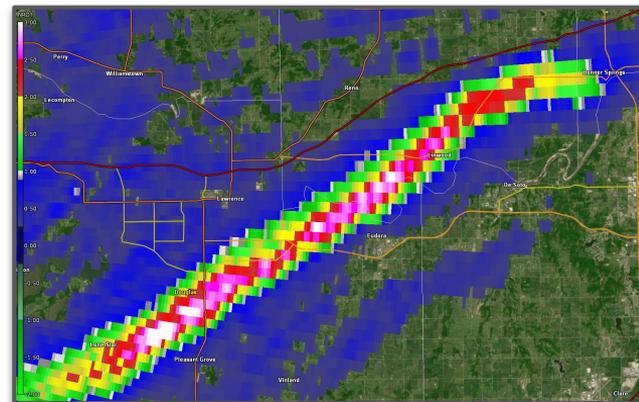
Maximum Value Trails

Activating the  button on the Toolbar shows the maximum values for a selected product/tilt at all times loaded into GR2A. Clicking the button again deactivates the feature.

This is useful for BR or other derived and UDP products, but is more limited for velocity products or those in which you might want to see a summation of the lowest values (such as ZDR & CC).



PTDS Maximum Value Trail



NROT Maximum Value Trail

Product Sampling

Viewing
Options

Hold down the CTRL key while mousing over radar data to view an active readout of the data and expected beam height (above radar level) next to the cursor.



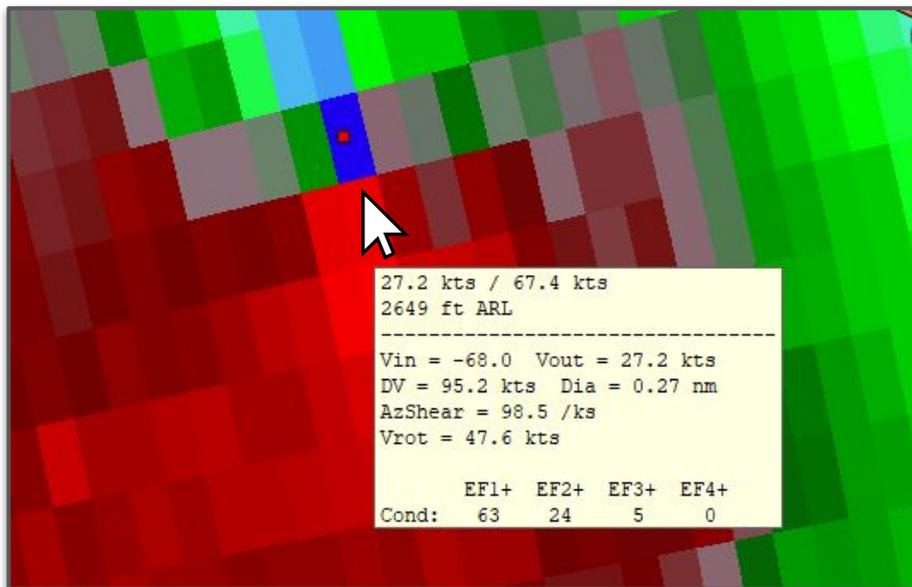
This same active readout (without needing to hold the CTRL key) is available in the [Status Bar](#) below the Radar Display Window.

For BV/SRV, the second value after the "/" is the [maximum unambiguous velocity](#) that the current PRF supports before velocity folding begins.

Rotational Information

Viewing
Options

After setting a marker on one side of a circulation, hold down the CTRL key on the other side of the circulation to view V_{rot} , EF-Scale probabilities, and other data about the circulation.



Window Components

Sampled Velocity / [Max Unambiguous Velocity](#) (kts)

Sampled Beam Height (ARL)

Velocity Inbound (kts) Velocity Outbound (kts)

Velocity Difference (kts) Diameter of Couplet (nm)

[Azimuthal Shear](#) ($0.001 * s^{-1}$)

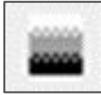
Rotational Velocity ($(|V_{in}|+|V_{out}|)/2$) (kts)

[Conditional Tornado EF-Scale Probability](#) using V_{rot} values in case studies from 2009-2013. Please read the article to use this technique properly!

Toolbar Buttons & Units

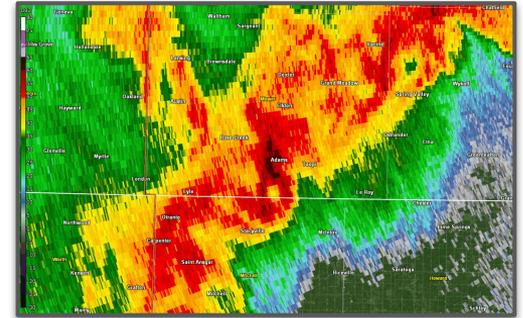


Show Radar Data: Toggles radar data in the display window.

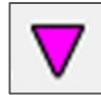


Smoothing: Toggles smoothing for non-velocity products.

To configure smoothing settings, navigate to [View--> Smoothing Settings...](#) These settings normally do not need changing.



Show Hail Icons: Toggles GR2A calculated hail size icons.

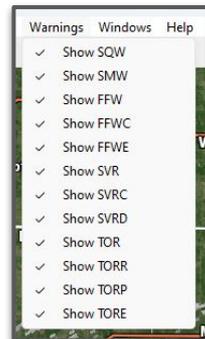


Show MDA Icons: Toggles GR2A calculated TVS/Meso icons.

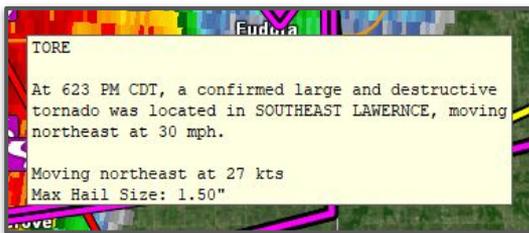
To view distances in metric units, enable the menu item [View--> Show Metric Units](#). Use the same menu item to switch back to imperial units.

Warnings & Storm Reports

NWS warnings are toggled on/off using the [Warnings](#) menu option. [Warning Types](#).



Overlays



Mousing over a warning polygon in the Radar Display Window displays basic information about the warning, such as the IBW hazards, & storm location/movement.

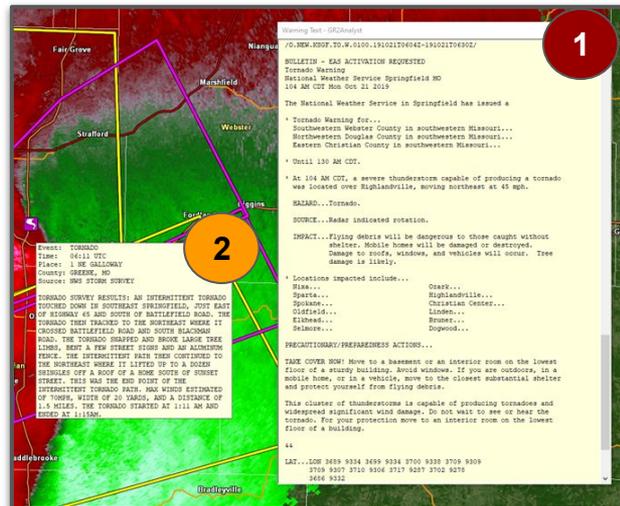
Clicking on a **Warning Polygon** 1 opens the full warning text & follow-up statements.

Active CONUS warning data only can also be accessed from the [Windows](#) → [Show Warnings Window](#) pop-up box.



Show LSR Icons: Toggles NWS Local Storm Reports (LSRs) valid for the last hour. **Mousing over an LSR icon** 2 allows you to view the full LSR text.

GR2A downloads historical NWS warnings (since 2006) and LSRs (since 2003) with archived radar data. These appear and disappear as though it were real time.



Warning Types & Abbreviations

NWS tornado, severe thunderstorm, and flash flood warnings are styled based on Impact-based warning tags that are appended to the bottom of the warning text. Some of the GR2A warning tag verbiage differs from the official tag text and is clarified in the table below. [See how to change warning colors.](#)

Overlays

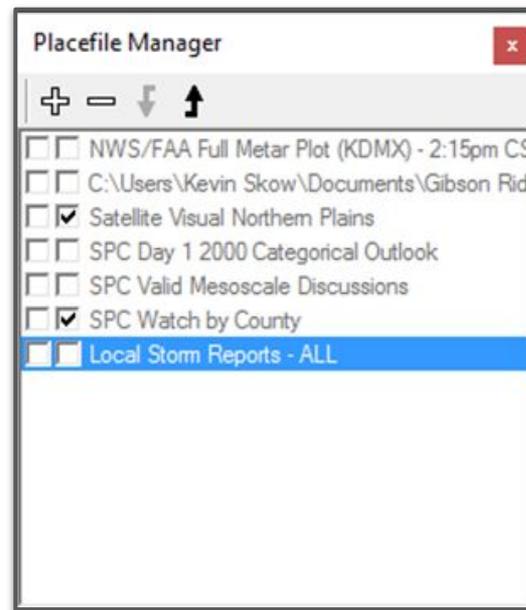
Tornado	Severe Thunderstorm	Flash Flood
TOR - No Tags	SVR - No Tags	FFW - No Tags
TORR - Reported (Tag: Observed)	SVRC - Considerable (70 mph wind and/or 1.75" hail)	FFWC - Considerable
TORP - PDS (Tag: Considerable)	SVRD - Destructive (80 mph wind and/or 2.75" hail)	FFWE - Emergency (Tag: Catastrophic)
TORE - Emergency (Tag: Catastrophic)		
SMW - Special Marine		
SQW - Snow Squall		

Placefiles: Introduction

Placefiles are custom text files developed by third parties that are specifically designed for GR products.

These can be static files (CWA outlines, wind farms locales, spotter residences) or dynamically updated on a server (surface observations, SPC outlooks and watches, webcam images).

To load either type of placefile, make sure the *Windows* → *Show Placefile Manager* option is checked. When it is checked, a small window opens on the screen.



Overlays

Placefiles: Loading

Click the  button on the Placefile Manager to open the window below.



To load a static (saved) placefile, click the  button and navigate to the file on the computer.

To load a placefile located on the Internet, simply paste the address to the placefile in the text field.

Click **OK** when done.

Repeat this process for every placefile you wish to load.

Overlays

Placefiles: Managing

Overlays

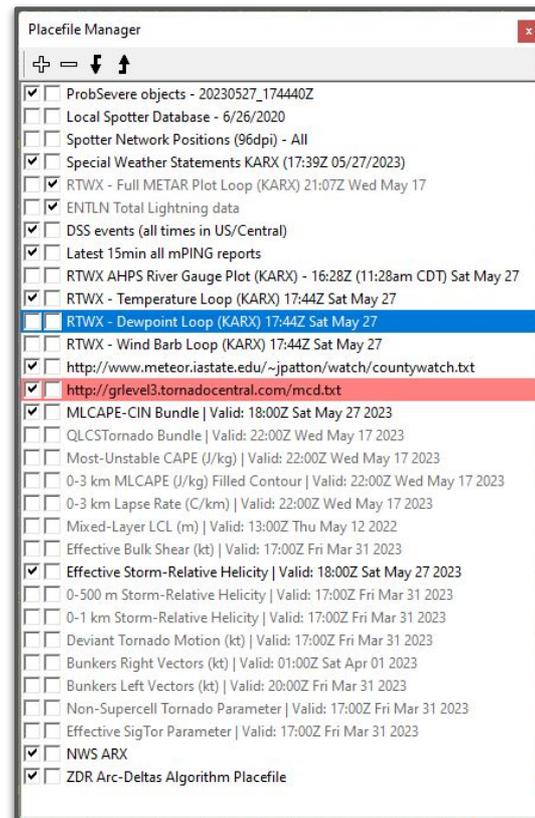
To reorder the placefiles, select the placefile in the manager and click either the  or  buttons.

Note: The Placefile Manager list is a drawing order, not layer order. The placefiles higher on the list are “drawn” before those farther down the list. If you wish for a placefile to be shown above another placefile, ensure it is lower on the list.

If a placefile cannot be loaded, it is **highlighted red**. To remove a placefile, select the placefile and click the  button.

The **left checkbox** next to each placefile toggles whether the placefile is loaded into the program.

The **right checkbox** toggles whether the placefile is visible **above** (unchecked) or **below** (checked) the radar image.



Placefiles: Locations

Overlays

Below is a list of online placefiles (non-exhaustive and not endorsed by the NWS). Please note that the reliability of these third-party placefiles is not guaranteed.

[Red Team Wx](#): A wide array of surface obs & outlooks.

[CIMSS](#): ProbSevere & LightningCast.

[Iowa Environmental Mesonet](#): Iowa surface obs (all networks), webcam images, NEXRAD Level 3 attributes, warning information.

[Spotter Network](#): Spotter Network locations and reports.

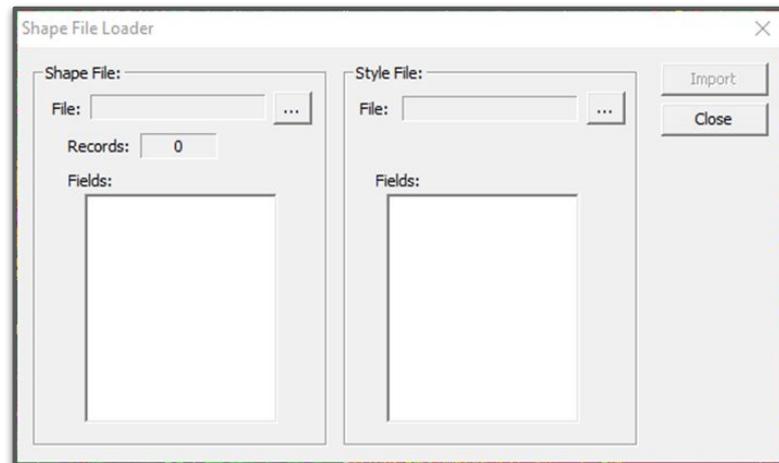
[WxJoe](#): mPING and NWS Spot requests.



Shapefiles

Shapefiles are static GIS files created by third parties that are supplemental to the overlays already provided in GR2A. Shapefiles require both a “shape file” (data) and a “style file” (modifies look of data).

- To load, go to [GIS](#) → [Load ShapeFile](#).
- In the left hand box, click the  button and select the **.shp** file.
- In the right hand box, click the  button and select the **.sty** file.
- Once both of these are loaded, click the [Import](#) button.



To remove a shapefile, go to [GIS](#) → [Unload ShapeFile](#) and chose the file you wish to remove.

Overlays

GIS Data, Range Rings & GPS Data

Overlays

All overlays in GR2A can be toggled on or off by clicking the corresponding item in the **GIS** menu.

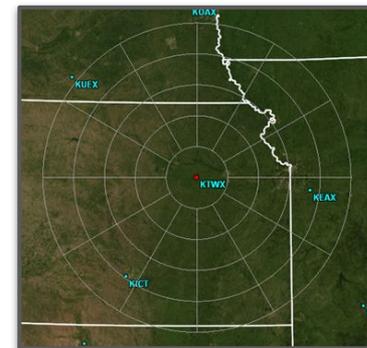
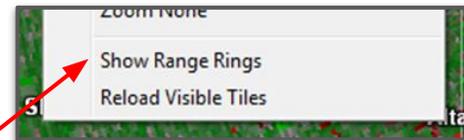
- ✓ Show ShapeFiles
- ✓ Show Places

- ✓ Show Base Roads
- ✓ Show Base Counties
- ✓ Show Base States
- ✓ Show Background

- ✓ Show County Names
- ✓ Show City Names
- ✓ Show Radar Sites

To show/hide range rings (25 nm increments), right click the Radar Display Window and from the pop-up menu toggle the **Show Range Rings** option.

By default, range rings are centered on a radar location, but can be centered on both **markers & home markers** if GR2A is set to measure distances from these points.



If you have a GPS attached to your computer, you can display your location using the **File→GPS→Start** menu item. To deactivate the GPS, select **File→GPS→Stop**.

A GPS monitor window opens up when a GPS is active and can be turned off using the **Windows→Show GPS Monitor** option.

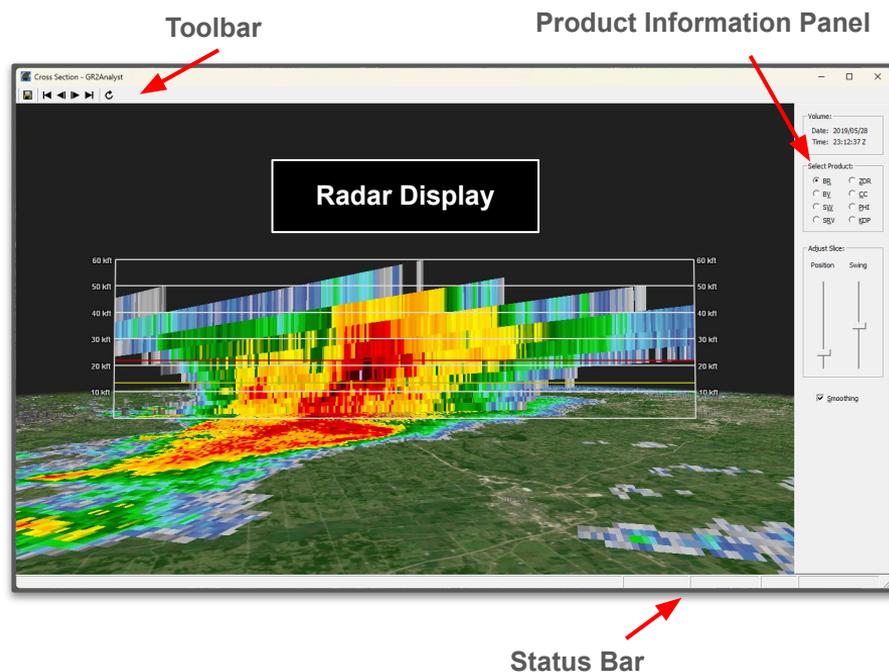
Introduction to Cross Sections

Cross sections can be made from all Level II products and SRV.

Cross
Section
Mode

To Create a Cross Section

- Click the  button on the Toolbar to activate the cross section tool.
- Click & drag your mouse across the area you wish to take a cross section.
- Release the mouse button when finished and a separate window opens.



Window Components

Cross Section Mode

Product Information Panel

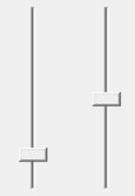
Volume:
Date: 2019/05/28
Time: 23:12:37 Z

Select Product:

BR ZDR
 BV CC
 SW PHI
 SRV KDP

Adjust Slice:

Position Swing



Smoothing

Product date & time.

Products to load as a cross section.

Position: Moves the cross section back & forth in the horizontal on a line tangential to its orientation.

Swing: Pivots the cross section on its left axis by about 30° in either direction.

Toggles product smoothing. Only works if [smoothing](#) is enabled in the main window.

Toolbar



[Save Image](#)

[Animation Controls](#)

Can also use left/right arrow keys

Refresh w/
Main Window

Status Bar

Ready	266°/ 75.5 nm	56.0 dbz	13991 ft	38.908241, -97.846443
-------	---------------	----------	----------	-----------------------

Program Status

Azimuth/Range
from Radar or
Marker

Sampled
Product
Value

Sampled
Product
Altitude

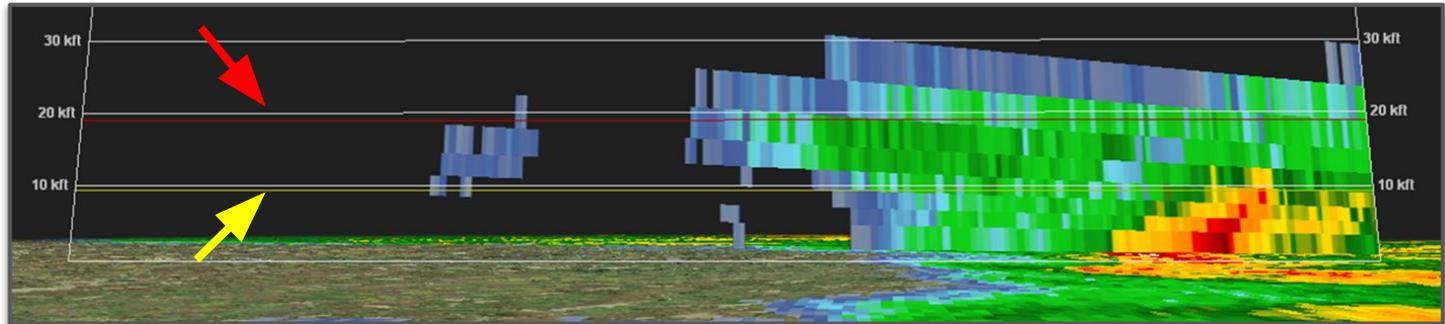
Coordinates if Mouse is
over Background Map

Data Viewing & Environmental Overlays

Cross
Section
Mode

Rotating & Tilting: Clicking & dragging with your mouse around the cross section window allows you to rotate the image in the horizontal and tilt the image from 0° to 90° in the vertical.

If [environmental data](#) are available, GR2A plots the 0° C and -20° C levels on the cross section as **yellow** and **red** lines, respectively.



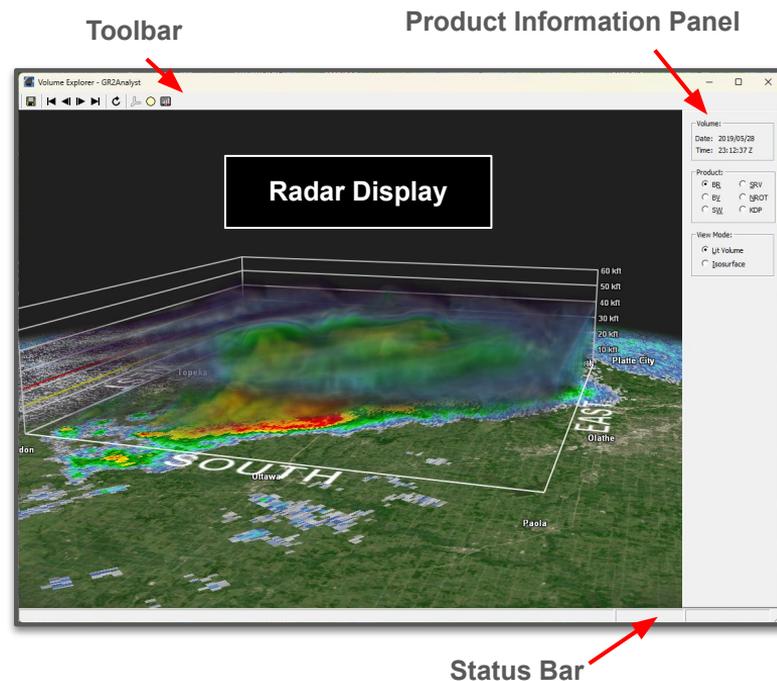
Introduction to Volumetric Mode

Volumetric displays provide a three dimensional look at a storm and are available for BR, BV, SRV, SW, KDP, and NROT.

Volumetric Mode

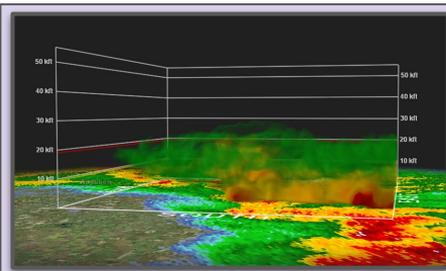
To Create a Volumetric Window:

- Click the  Toolbar button to activate the volumetric mode.
- Center your mouse in the middle of the area of interest then click & drag outward. A box grows outward with your cursor showing the area to be analyzed.
- Releasing the mouse button opens the volumetric display in a new window.



Window Components

Volumetric Mode



Radar Display

Shows a smoothed, 3D volumetric image overlaying its 0.5° product.

Click & drag your mouse on the display to rotate/tilt the image. As with cross sections, the [0° and -20° C levels](#) are shown if available.

Product Information Panel

Volume:
Date: 2019/05/28
Time: 23:12:37 Z
Product:
<input checked="" type="radio"/> BR <input type="radio"/> SRV
<input type="radio"/> BV <input type="radio"/> NROT
<input type="radio"/> SW <input type="radio"/> KDP
View Mode:
<input checked="" type="radio"/> Lit Volume
<input type="radio"/> Isosurface

Volume scan start date & time.

Products to load.

Lit Volume: Displays data using [user-configured transparent layers](#).

Isosurface: Only display data of a [certain value](#).

Toolbar

Volume Display Settings:
Sampling resolution & sky color

Light Settings: Change the ambient light and light angle.



[Save Image](#)

[Animation Controls](#)

Can also use left/right arrow keys

Refresh w/ Main Window

[Volume Alpha Settings](#)

Status Bar

131° / 56.4 nm

Azimuth/Range from Radar

43.206680, -90.210503

Cursor Coordinates

Volume Alpha Editing

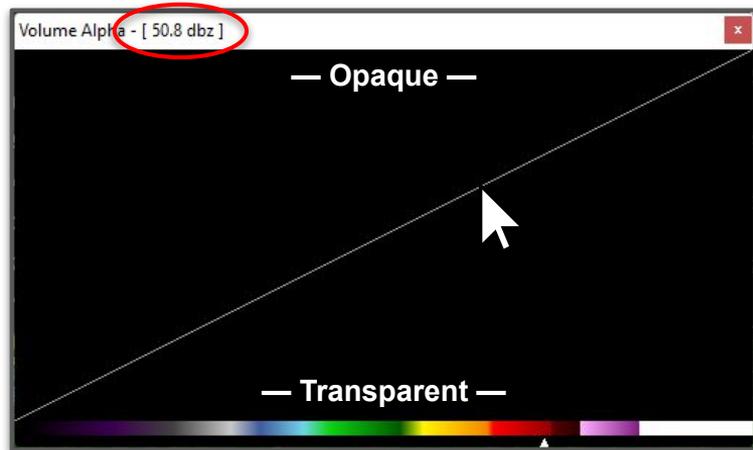
Volumetric Mode

In Lit Volume mode, choose the product you wish to edit from the Product Information Panel, then click the  Toolbar icon to open the Volume Alpha window.

The product color scale is oriented along the bottom of the window with a line stretching from the left to right side of the black window.

This line **controls the opacity** of the colors on the scale under it. The closer the line is to the top of the window, the more opaque the color.

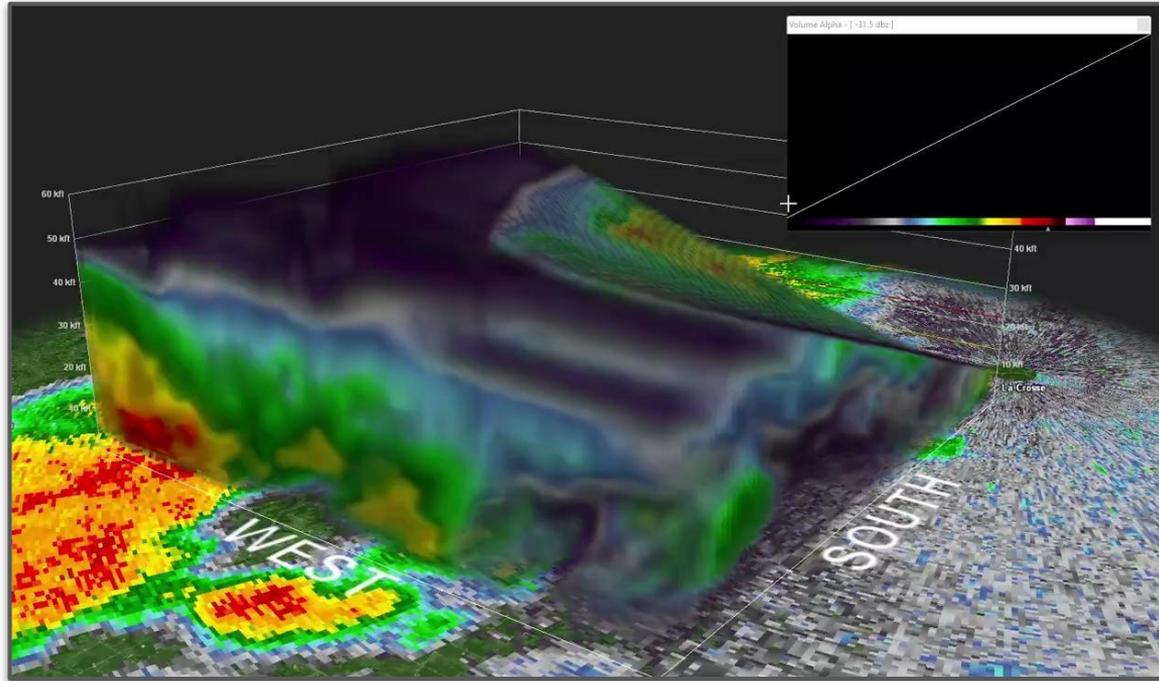
A series of [click & drags with the mouse](#) in the window edits the color transparency.



Tip: When editing the transparency curve, the exact value of your cursor is displayed at the top of the window (**red circle**).

Volume Alpha Editing Example

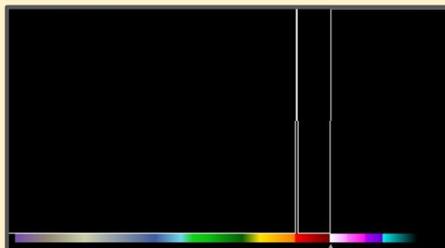
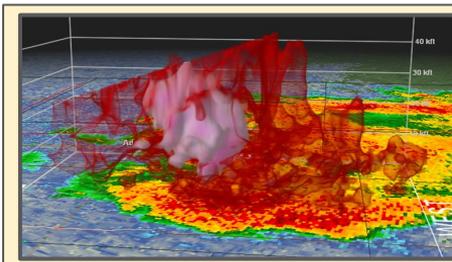
Volumetric
Mode



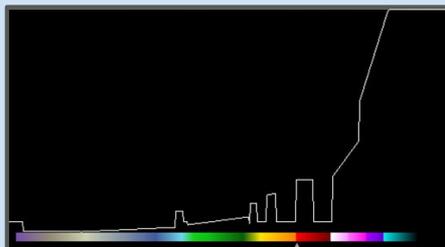
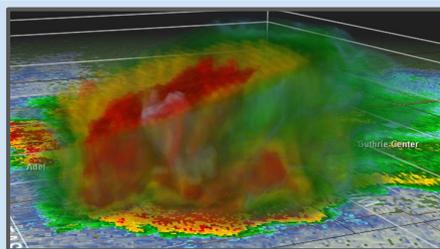
In the above video, the Volume Alpha is adjusted from its defaults so we can observe the core of a thunderstorm and still see details of the outer storm structure. The original adjustments are also edited to further lessen the opacity of the lower reflectivity values.

Volume Alpha Examples

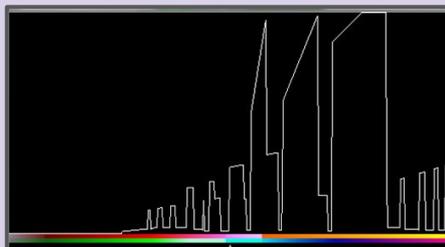
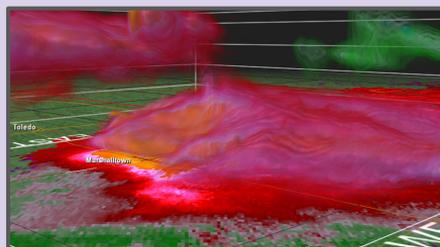
Volumetric
Mode



Ideal Use:
Hail Detection



Ideal Use:
Viewing All Levels



Velocity

Note that transparency effects
are applied to both inbound &
outbound values.

[Table of Contents](#)

Isosurface Editing

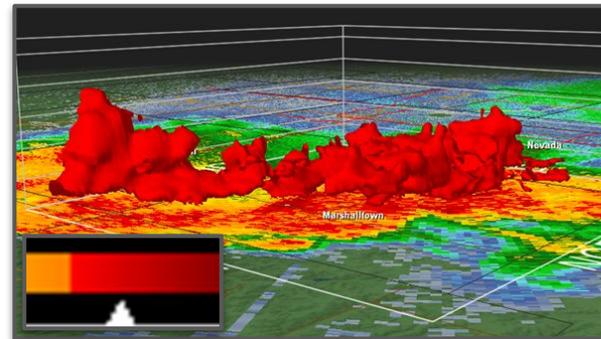
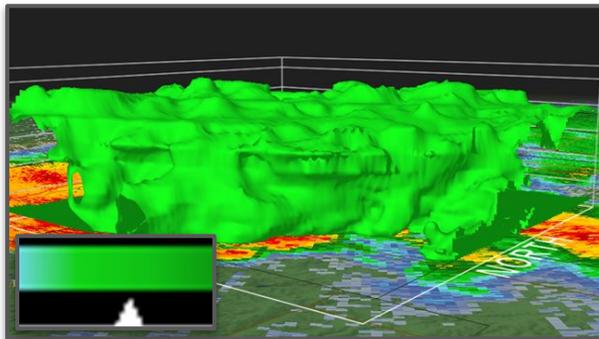
Isosurfaces are 3D plots of contiguous product values.

To change isosurface values:

- Choose the applicable radar product and isosurface radio button from the Product Information Panel.
- Select the  Toolbar icon to open the Volume Alpha Settings.
- Click & drag the **triangle** under the color table.



Examples



Volumetric
Mode

Saving Settings

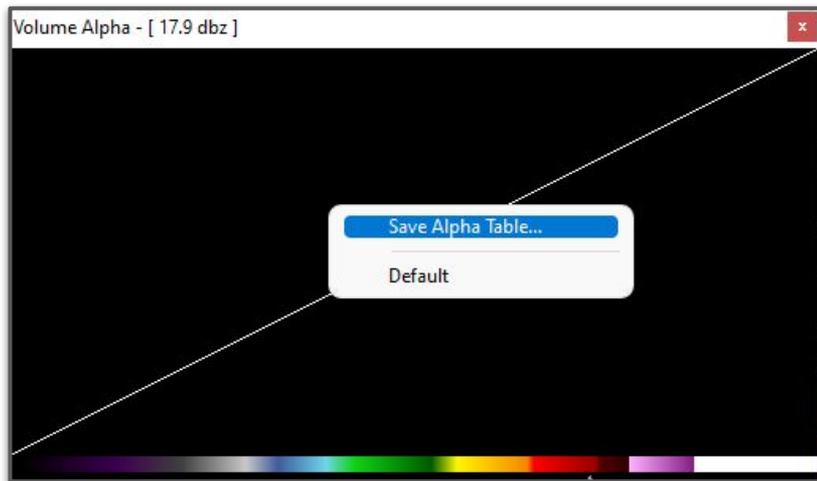
Volumetric
Mode

To save volume alpha or isosurface settings:

- Right-click the editing window and select *Save Alpha Table...*
- Enter a name for the color table and click *OK*.

To load your settings, right-click the editing window and choose it from the same pop up menu.

“Default” is a saved setting in the example to the right.



You can only load saved settings on the product for which they were created for (i.e. you cannot load the saved settings for a reflectivity product on a velocity product).

Backgrounds

Editing Settings

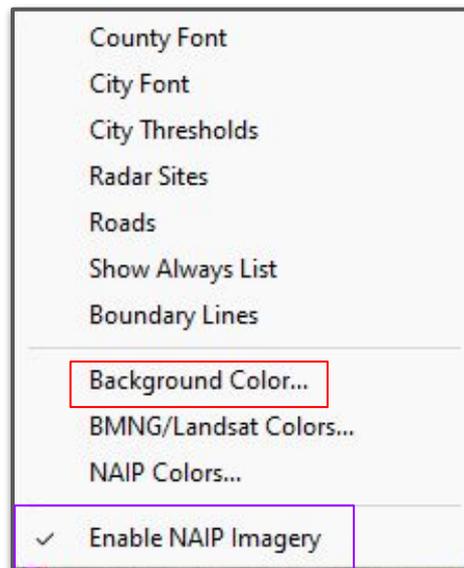
GR2A automatically downloads aerial imagery to use for a background image. You can toggle this imagery off and use a single color instead.

To change this color, go to *GIS* → *Settings* → *Background Color...* and set the color.

The *BMNG/Landsat Colors...* & *NAIP Colors...* menu items configure the aerial data and shouldn't need to be modified.

To turn off high-resolution aerial data, uncheck the *GIS* → *Settings* → *Enable NAIP Imagery* box.

To reload the background imagery, right-click the Radar Display Window and from the pop-up menu select *Reload Visible Tiles*.



GIS Icons

Editing Settings

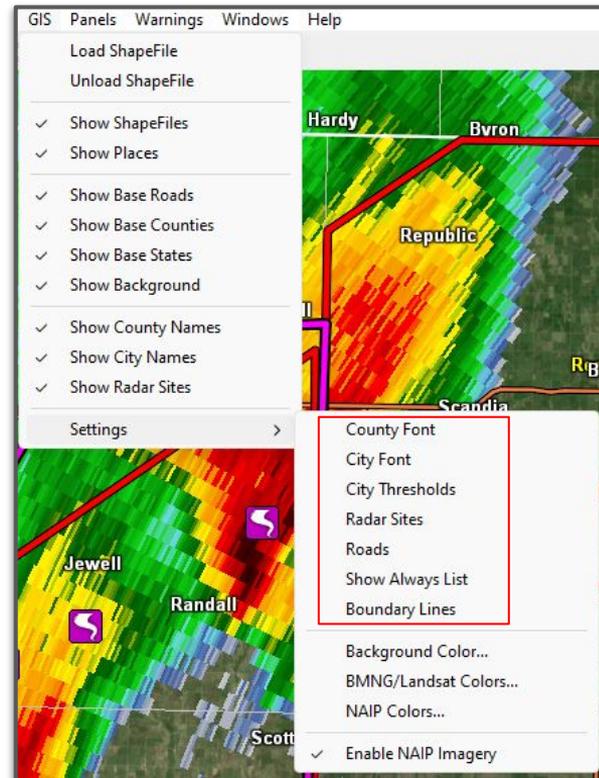
Overlays in GR2A can be customized under *GIS* → *Settings*. This includes:

County, city, and radar site names: font color/style
Road & boundary lines: color & size

City Thresholds defines the types of cities shown at a particular zoom level.

Roads also defines the types of roads shown at a particular zoom level in addition to their color/line thickness.

Show Always List defines what cities are always shown regardless of the zoom level.



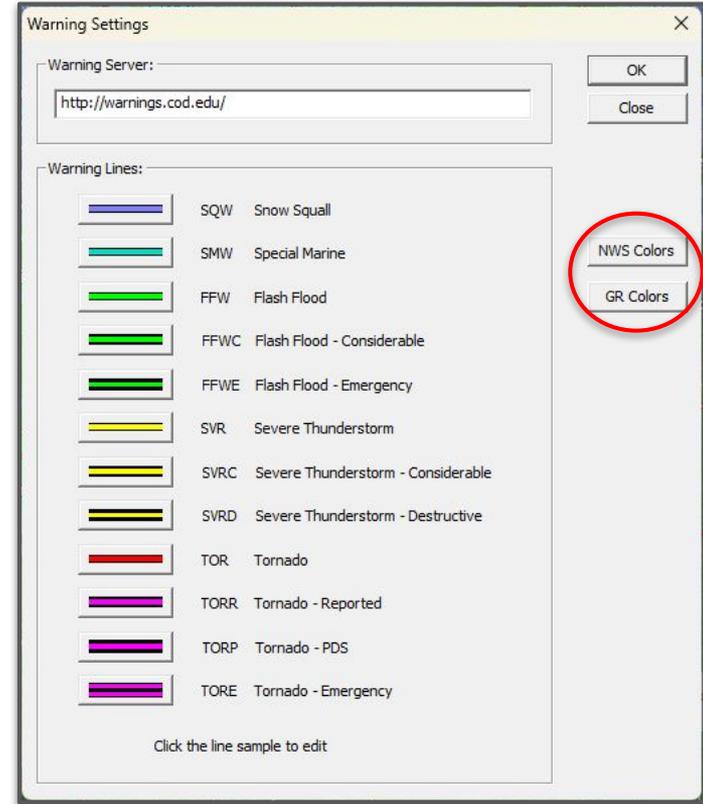
Warning Colors

To customize the look of warnings, go to [View--> Warning Settings...](#)

The warning server shouldn't need to be modified (<http://warnings.cod.edu/>).

Click the colorized line next to a warning label to change line color(s), style, and width.

To toggle between default NWS colors and GR2A colors, click the appropriate button on the right side of the window (red circle).

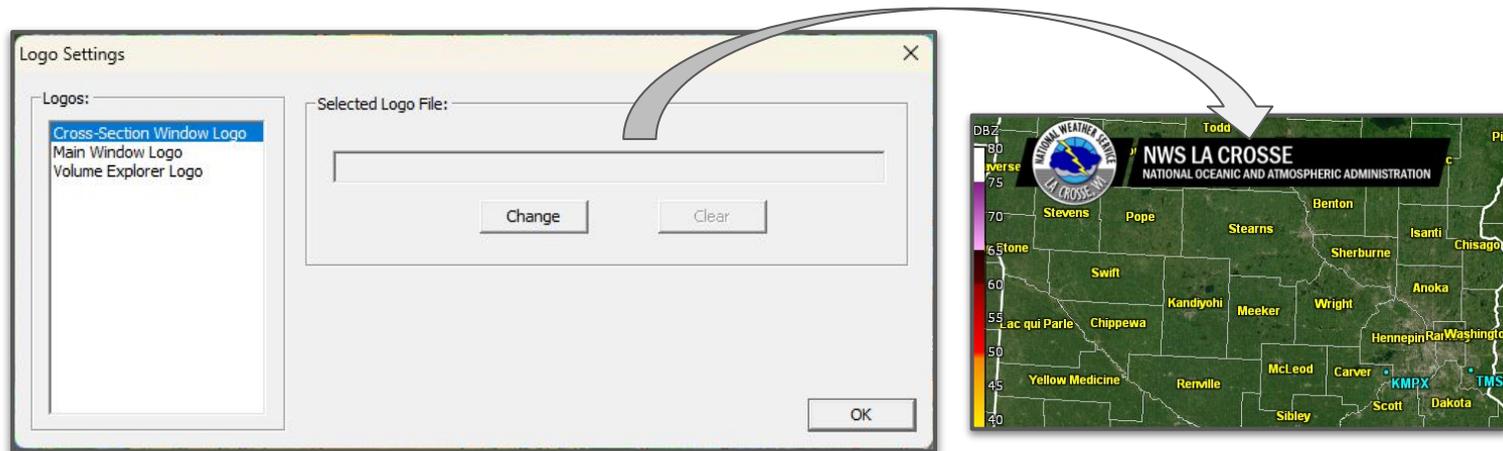


Logo

To set a custom logo on the top left corner of a viewing window, open *View*→ *Logo Settings*....

You can set different logos for the three viewing window options within GR2A (cross section, main, and volume explorer).

Click the *Change* button to load the logo file from your file browser and the *Clear* button to remove it from a particular window.



Editing
Settings

Animation Settings

Editing Settings

These settings are very useful for controlling zoom & looping speeds

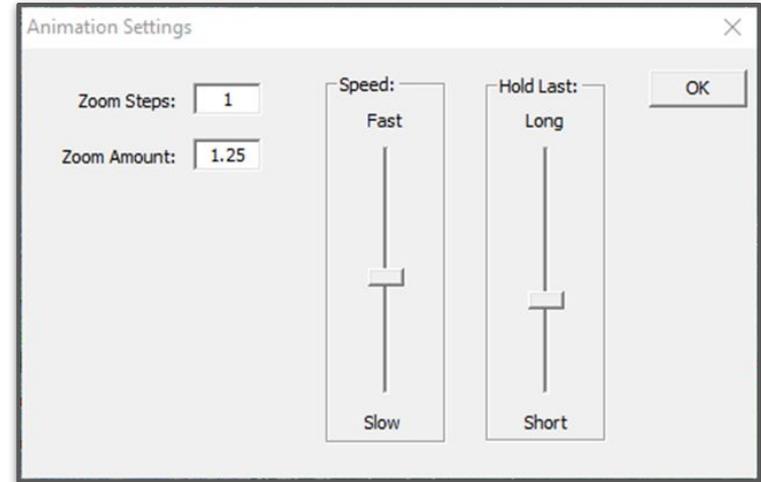
Go to [View→Animation Settings...](#)

Zoom Steps: Smoothness of the zooming. Higher numbers = smoother, but slower.

Zoom Amount: The degree which the program zooms in or out with each button click or turn of the mouse wheel. The default value of 1.25 is a good starting point.

Speed: How fast the images loop.

Hold Last: How long GR2A holds the last image in a loop.



Algorithms

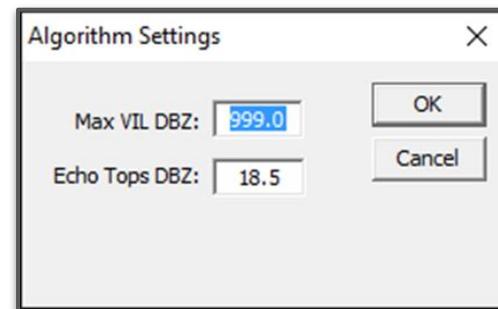
Editing
Settings

VIL & Echo Tops Calculations

[Algorithms](#) → [Algorithm Settings...](#)

Max VIL DBZ: Maximum reflectivity to be used in calculating VIL.

Echo Tops DBZ: Lowest reflectivity value to be used in calculate ET.



Algorithm Settings

Max VIL DBZ: 999.0

Echo Tops DBZ: 18.5

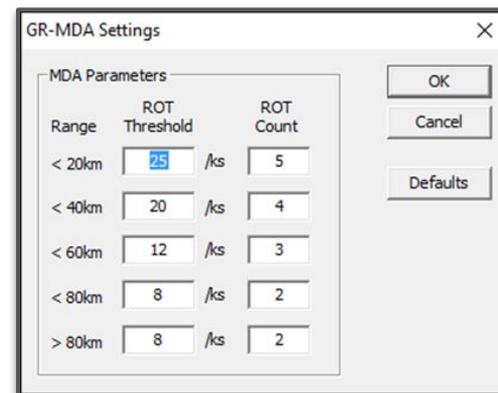
OK

Cancel

MDA Threshold Settings

[Algorithms](#) → [MDA Settings...](#)

Can change the ROT threshold and count at certain ranges from the radar (probably won't need to change).



GR-MDA Settings

MDA Parameters

Range	ROT Threshold	/ks	ROT Count
< 20km	25	/ks	5
< 40km	20	/ks	4
< 60km	12	/ks	3
< 80km	8	/ks	2
> 80km	8	/ks	2

OK

Cancel

Defaults

Environmental Data

Editing
Settings

GR2A downloads RAP model soundings when polling live radar data in order to calculate hail sizes and for use in UDPs.

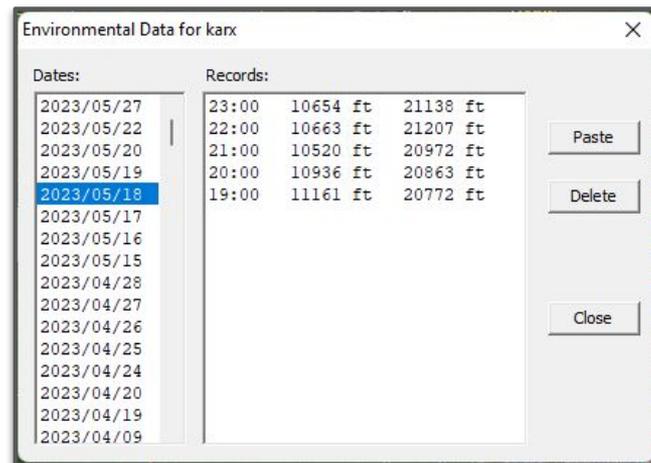
These soundings can be found in [Algorithms](#) → [Environment Settings...](#)

Dates that contain data are are viewable on the left column.

Once the date is selected, the data for each hour is viewable as a row in the window (0° and -20° C heights also shown).

To add past sounding data:

- Go to [NOAA RUC Soundings](#).
- Choose **RAOBs** as the data source.
- Select the date.
- Type the ID of the closest RAOB site.
- Click the Ascii text (GSL format) button.
- Copy the entire text sounding data and click [Paste](#) in the Environmental Data window.
- GR2A confirms that the data was added.



The screenshot shows a window titled "Environmental Data for karx". It has two main sections: "Dates:" and "Records:". The "Dates:" section is a list box containing dates from 2023/05/27 down to 2023/04/09. The date 2023/05/18 is selected and highlighted in blue. The "Records:" section is a table with three columns: time, distance in feet, and another distance in feet. The data for the selected date is as follows:

Time	Distance 1 (ft)	Distance 2 (ft)
23:00	10654 ft	21138 ft
22:00	10663 ft	21207 ft
21:00	10520 ft	20972 ft
20:00	10936 ft	20863 ft
19:00	11161 ft	20772 ft

On the right side of the window, there are three buttons: "Paste", "Delete", and "Close".

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