AGUACEROWX IN-DEPTH GUIDE

# NEXRAD radar in depth

NEXRAD radar shows every WSR-88D and TDWR site with all of its tilts, Level II moments and Level III products, plus national radars across Europe, Canada, Mexico and overseas France, and your own Level II servers. This guide covers loading a site, every product and tilt, every radar layer setting from color tables to storm-relative velocity, the site markers, multiple sites, loops and live updates, readouts and the storm tracker. Use it to build a clean velocity view for warning decisions, an on-air radar loop, or a multi-radar view of a squall line.


01 Load NEXRAD radar
02 Choose a product: Level II and Level III
03 Change the tilt
04 TDWR, test-bed and international radars
05 Show and style the radar site markers
06 Load several sites on one layer
07 Add custom radar sites
08 Color tables for each product
09 Smooth the gates and blend frames
10 Velocity and storm-relative velocity
11 Add a drop shadow and broadcast sweep
12 Loop length and the newest scan
13 Read values, storm tracks and rotation
14 Track a storm and the towns in its path
15 Style the storm track and its readout
16 Radar defaults and where settings are saved
17 Recipe: a clean velocity couplet view with SRV
18 Recipe: an on-air radar loop
19 Recipe: follow a squall line across several radars
20 Common questions


October 2026 · AguaceroWx 6.10 · aguacerowx.com/guide/nexrad

BEFORE YOU START

- Radar is a layer in your bundle. Add it with **Add Layer** → **Radar** on the **Edit Layers** tab, click a radar site on the map, or right-click the map and choose **Nearest NEXRAD**.
- Single-click **NEXRAD sites** on the toolbar to open the **RADAR** panel (site markers, multiple sites, custom sites and the broadcast sweep). Double-click it to show or hide the sites on the map.
- Every product, tilt, storm-relative velocity, smoothing and the storm tracker are on every plan. Loops hold up to 1 hour on Free, 4 hours on Enthusiast and 12 hours on Professional. **Load multiple sites**, custom radar sites and **Frame Blending** need Professional, and the radar **Shadow** needs Creator.
- Layer settings such as the product, tilt, colors, smoothing and storm motion belong to the bundle on that panel; click **Save Bundle** to keep them. Site marker styles, the broadcast sweep, custom sites, storm tracker settings and your **Settings** → **Data** → **Radar** defaults save to your account when you are signed in.

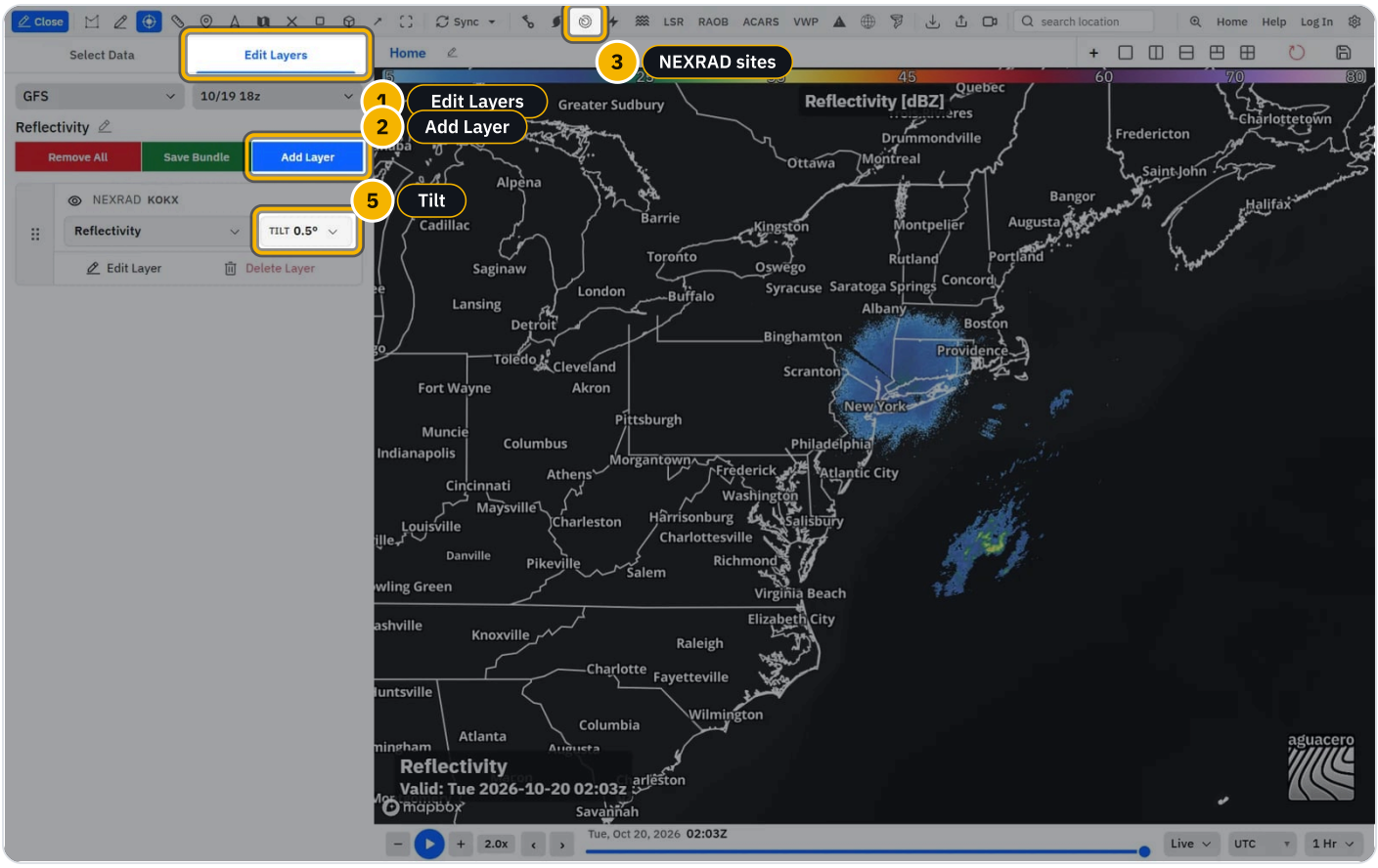
## 01 Load NEXRAD radar

Put a radar site on the map, pick a tilt and play the loop.

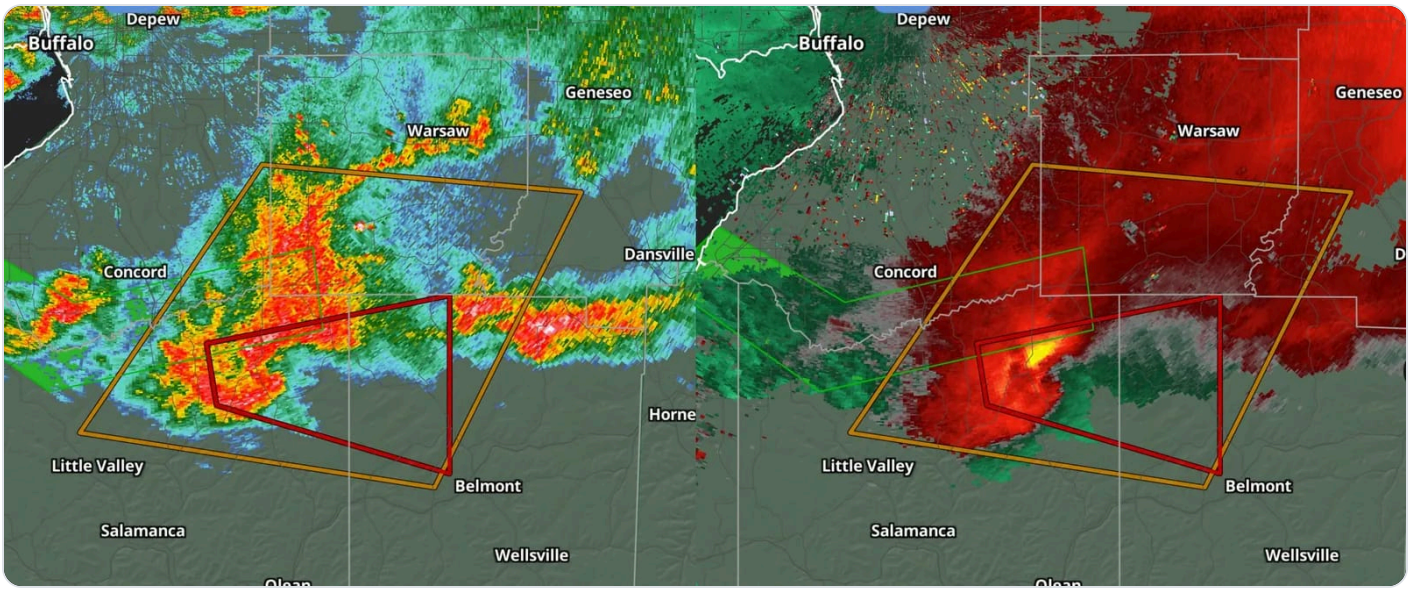
1. In the sidebar, click the **Edit Layers** tab.
2. Click **Add Layer**, then **Radar**, then a group such as **Reflectivity**, and click a product. The new layer uses the radar already on your board, else the last site you picked, else KOKX.
3. Double-click **NEXRAD sites** on the toolbar. Each radar shows as a label on the map.
4. Click a site to move the radar layer there. The newest scan draws first, then the rest of the loop fills in.
5. Click **Tilt** on the radar layer row and pick an elevation angle, or press `↑` and `↓`.
6. Press `Space` to play the loop, or `←` and `→` to step one scan at a time.

TIPS

- With the sites showing and no radar layer on the panel, clicking a site adds a **Reflectivity** layer for you.
- Right-click the map and choose **Nearest NEXRAD** to load the closest working WSR-88D. Sites that are down are skipped. If the panel already has a radar layer, it moves to that site and keeps its product. In **Settings** → **Context menu** you can change its product or add more entries, such as **Nearest NEXRAD · Velocity**.
- Click **Radar** in the data type filter on **Select Data** to load a ready-made radar bundle.
- Click the product name on the layer row to switch products, or **Edit Layer** for colors, smoothing and the other settings in this guide.




A radar layer on the Edit Layers tab, with the Add Layer button, the NEXRAD sites button and the Tilt menu.




Reflectivity and velocity side by side with warning polygons.

## 02 Choose a product: Level II and Level III

Level II is the radar's full volume: reflectivity, velocity, spectrum width and dual-pol moments at every tilt. Level III adds NWS products such as storm-relative velocity, hydrometeor classes, echo tops, VIL and rainfall totals.

You don't choose between Level II and Level III. Each product comes from the feed that has it. Reflectivity and velocity use the quick Level III images for the lowest tilts and Level II for the tilts above, so every tilt is available and the low tilts arrive fast.

1. Click the product name on the radar layer row. In **Edit Layer**, the product name at the top opens the same list.
2. Point at a group such as **Velocity** and click a product. The tilt moves to the closest one the new product has.
3. Or press a product key while a NEXRAD layer is on the map (see the keys below).

| PRODUCTS, BY MENU GROUP | |
|---|---|
| **Reflectivity** | Group **Reflectivity**. Base reflectivity in dBZ at every tilt. |
| **Long Range Reflectivity** | Group **Reflectivity**, TDWR sites only. One 225 nmi scan with coarser gates than the regular TDWR tilts. Fixed elevation. |

| | |
|---|---|
| **Velocity** | Group **Velocity**. Base radial velocity toward or away from the radar, at every tilt. Dealiased automatically. |
| **Spectrum Width** | Group **Velocity**. How much the velocities spread inside each gate, from Level II. |
| **Storm Relative Velocity** | Group **Velocity**. Velocity with the storm's motion taken out, at every tilt. Not on TDWR. See "Velocity and storm-relative velocity". |
| **Correlation Coefficient** | Group **Dual-polarization**. Level II, every tilt. Low values in a hook can mark debris. |
| **Differential Phase Shift** | Group **Dual-polarization**. Level II, every tilt, in degrees. |
| **Differential Reflectivity** | Group **Dual-polarization**. ZDR in dB, Level II, every tilt. |
| **Specific Differential Phase** | Group **Dual-polarization**. KDP in °/km from Level III, on the low tilts Level III publishes. |
| **Hydrometeor Classification** | Group **Hydrometeor classification**. A class for each gate, such as Light rain, Graupel or Large hail, on the low tilts Level III publishes. Fixed class colors, no smoothing. |
| **Hybrid Hydrometeor Classification** | Group **Hydrometeor classification**. One combined classification grid. Fixed elevation. |
| **1-Hour Precipitation** | Group **Precipitation**. Radar-estimated rainfall over the past hour, in inches. Fixed elevation; has a Point tab to print values. |
| **3-Hour Precipitation** | Group **Precipitation**. Estimated rainfall over the past three hours. Fixed elevation; Point tab. |
| **Storm Total Precipitation** | Group **Precipitation**. Estimated rainfall since the precipitation began. Fixed elevation; Point tab. |
| **Enhanced Echo Tops** | Group **Derived**. Echo top height in kft. Fixed elevation. |
| **Vertically Integrated Liquid** | Group **Derived**. VIL in kg/m². Fixed elevation. |

SHORTCUTS

| | |
|---|---|
| R | Reflectivity |
| V | Base velocity |
| S | Storm-relative velocity |
| W | Spectrum width |
| Z | Differential reflectivity (ZDR) |
| C | Correlation coefficient |
| P | Differential phase |
| K | Specific differential phase (KDP) |
| E | Echo tops |
| L | Vertically integrated liquid (VIL) |

TIPS

- The product keys work while a NEXRAD layer is on the map, and not while you type in a box, while a window such as the upgrade dialog is open, or while a sounding is open.
- Hydrometeor classification, the hybrid classification and the three rainfall totals have no key by default. Give them one in **Settings** → **Keyboard shortcuts** → **NEXRAD radar**, where you can also change the keys above.
- In the add menu the products sit under their groups. The product menu inside **Edit Layer** lists the same products in one list, in group order.

## 03 Change the tilt

Step up through the storm one elevation angle at a time. The angles listed are the ones that site is scanning right now.

1. Click **Tilt** on the radar layer row and click an angle.
2. Or click **Edit Layer**: the **Fill** tab lists the site's angles as buttons under a heading named for the site, such as **KTLX elevations**.
3. Or press ↑ for the next higher tilt and ↓ for the next lower one.

### SETTINGS

| | |
|---|---|
| **Tilt** | Shows the current angle, such as 0.5°. The list comes from the site's current scan strategy, so it differs between sites and changes when the radar changes modes. Angles less than 0.1° apart share one entry. Products with one fixed elevation show their angle with no menu. |
| **KTLX elevations** | The same angles as buttons on the **Fill** tab of **Edit Layer**. The heading uses your site's ID. |
| **Greyed-out angle** | That angle has no scan inside your loop window, or its newest scan is older than the window. Hover it to read "No sweep in this radar time window (empty or stale listing)." "Listing still loading…" means the app is still checking. The arrow keys skip greyed-out angles. |

### SHORTCUTS

| | |
|---|---|
| <kbd>↑</kbd> / <kbd>↓</kbd> | Raise or lower the tilt of the NEXRAD layer on the active panel |
| <kbd>←</kbd> / <kbd>→</kbd> | Step back or forward one scan while a NEXRAD layer is on the map |

### TIPS

- If you are on the newest scan when you change tilt or product, the map jumps to the newest scan of the new tilt instead of an older one at the same clock time.
- **Specific Differential Phase** and **Hydrometeor Classification** come only from Level III, which publishes the lowest few tilts. Higher angles aren't listed for them.
- The tilt keys do nothing while the 3D volume or the radar cross section is open; those use the whole volume.
- With several map panels, **Sync Radar Tilts** in **Sync** keeps the same tilt on every panel.

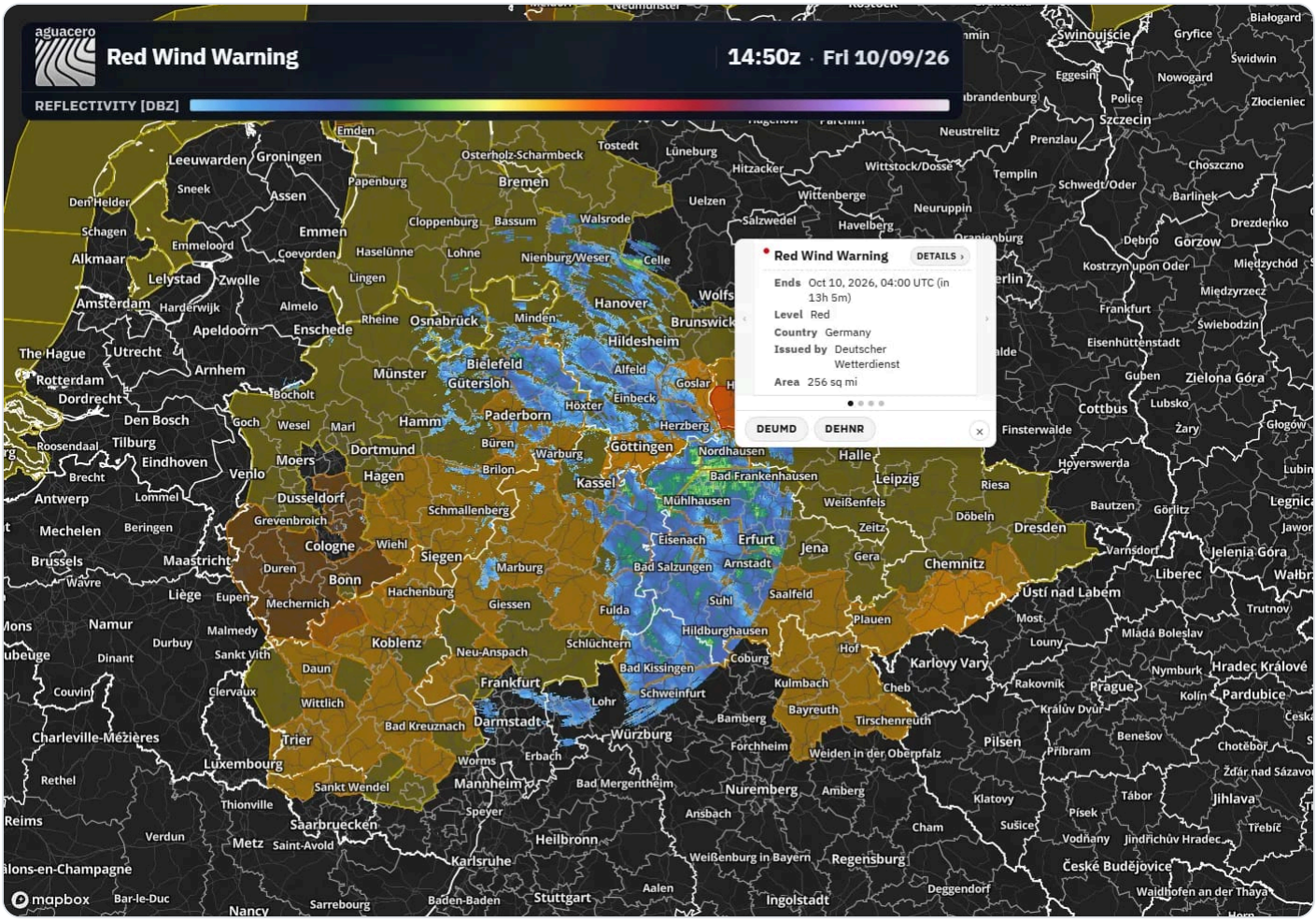
## 04 TDWR, test-bed and international radars

Terminal Doppler Weather Radars, a few test-bed sites and national radars from Europe, Canada, Mexico and overseas France load like any NEXRAD site, with the products their feeds carry.

| SITE TYPES | |
|---|---|
| **TDWR** | Airport radars whose IDs start with T, such as TDFW (TJUA is a WSR-88D). Products: **Reflectivity** (the three lowest tilts from Level III, higher tilts from Level II), **Long Range Reflectivity**, **Velocity** (base velocity only), **Spectrum Width** and **Vertically Integrated Liquid**. No dual-pol, storm-relative velocity, echo tops, hydrometeor classes or rainfall totals. |
| **Test-bed sites** | MZZU, KCRI, FWLX, GAWX, WILU, KULM and FUSA have no Level III feed. They offer **Reflectivity**, **Velocity**, **Spectrum Width** and the Level II dual-pol moments, with no storm-relative velocity or Level III products. |
| **European and Canadian radars** | National radars from feeds across Europe, including Hungary, Cyprus and Iceland's mobile radar, and Canada's 32 S-band sites. Each site lists what its weather service publishes: **Reflectivity**, **Unfiltered Reflectivity** (before clutter filtering), **Velocity**, **Spectrum Width** and the dual-pol moments, including **Specific Differential Phase**. Every tilt comes from the volume itself; there are no Level III products. Hármashegy and ISX02 publish reflectivity only. |
| **Mexican radars** | Servicio Meteorológico Nacional radars at Sabancuy, Guasave, Catedral, Los Cabos, Cancún and Altamira. SMN keeps only the last few hours online, so loops are short. |
| **Météo-France radars** | Le Moule (Guadeloupe), Le Diamant (Martinique), Colorado and Piton Villers (Réunion), Nouméa and Lifou (New Caledonia), plus Noyal-Pontivy, Saint-Rémy, Moucherotte, Mont Maurel and Mont Colombis in mainland France. **Reflectivity** and **Velocity** every 5 minutes, posted every 15 minutes, so the newest scan is often about 15 minutes old. |

TIPS

- If you click a site that doesn't have the layer's product, for example a TDWR while you are on **Correlation Coefficient**, the layer switches to **Reflectivity**.
- European velocity has three cleanup switches in **Settings** → **Data** → **Radar**: **International radar dealiasing**, **Dual-PRF error filter** and **Velocity noise filter**. All three are on by default.
- Pan the map to Europe, Canada, Mexico, the eastern Caribbean, Réunion or New Caledonia with **NEXRAD sites** on to see those radar labels.




A European radar composite with a wind warning outlined over Germany.

## 05 Show and style the radar site markers

Choose how radar sites look on the map: text labels, circles or 3D domes, with your own colors and fonts, and a highlight for the site you are viewing.

1. Single-click **NEXRAD sites** on the toolbar. The **RADAR** panel opens.

2. Tick **Enable Radar sites**. The display settings appear below it.
3. Under **Display**, click **Text**, **Circle** or **Dome**.
4. Set the colors, font and sizes. The map updates as you go.

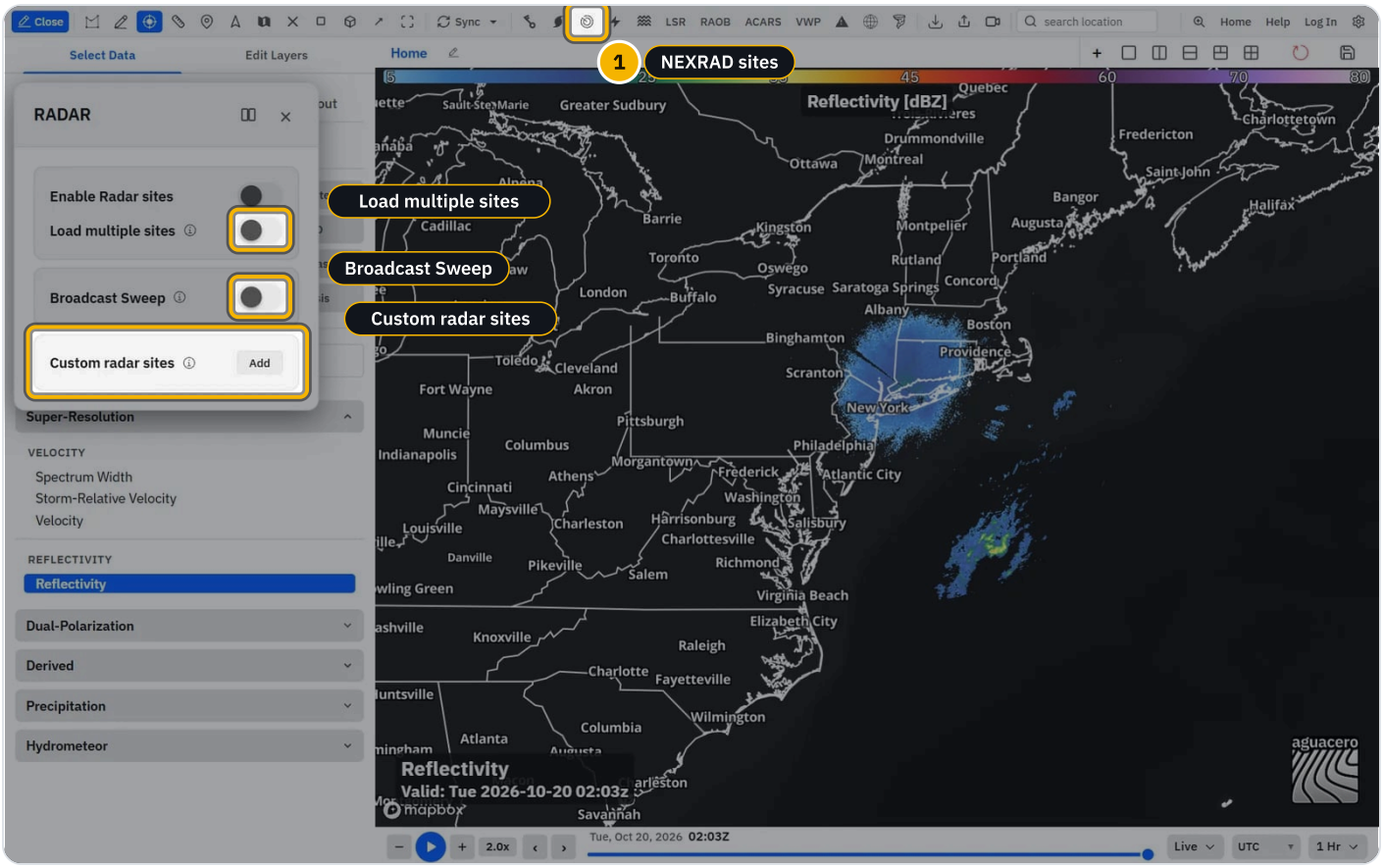
| RADAR PANEL | |
|---|---|
| **Enable Radar sites** | Shows the radar sites on the active panel. The same as double-clicking **NEXRAD sites**. Saved with the panel's bundle. With **Sync Radar Site Tags** on, it applies to every panel on the board. |
| **Display** | **Text** (default) draws each site's ID. **Circle** draws a dot. **Dome** draws a small 3D radome. |
| **Selected site** | The color for the site tied to the radar layer you are viewing: **Text highlight** for plain text, **Pill background** when **Text background** is on, or **Circle fill** / **Dome fill**. Default blue (#3b82f6). |

| TEXT DISPLAY | |
|---|---|
| **Text color** | The site ID color. Default white. |
| **Text outline** | A halo around the letters. Default on, with **Outline color** black and **Outline width** 0–4 px (default 1.25). |
| **Font** | Any font in the font list. Default Open Sans. |
| **Bold text** | Uses the bold weight. Default off. |
| **Font size** | 8–24 px, default 13. |
| **Text background** | Draws a pill behind each ID. Default on. Then set **Background color** (default dark blue #1e3a5f), **Background opacity** (0–100%), **Outline color** (default white) and **Background outline** (default on) with its **Outline width**, 0–4 px (default 1). |

| CIRCLE AND DOME DISPLAY | |
|---|---|
| **Circle size** | **Dome size** in Dome mode. 10–50 px, default 20. |
| **Circle color** | **Dome color** in Dome mode. Default gray (#6b7280). |
| **Circle outline** | Circle mode only. Default on, with **Outline color** white and **Outline width** 0–4 px (default 1.5). |

### TIPS

- A red site has sent no data for 20 minutes or more (30 minutes for radars outside the US, 45 for Cyprus) and is probably down. Radars outside the US are checked every few minutes while they are in view. **Nearest NEXRAD** skips red sites.
- The same panel is in **Settings** → **NEXRAD sites**, where the display settings show even with the sites turned off.
- Click **Mount in map UI** in the panel header to dock the panel in the map area instead of floating it.
- You can give **Toggle NEXRAD sites** and **NEXRAD sites** (open the panel) their own keys in **Settings** → **Keyboard shortcuts**.




The RADAR panel with multiple sites, the broadcast sweep and custom radar sites.

## 06 Load several sites on one layer PROFESSIONAL

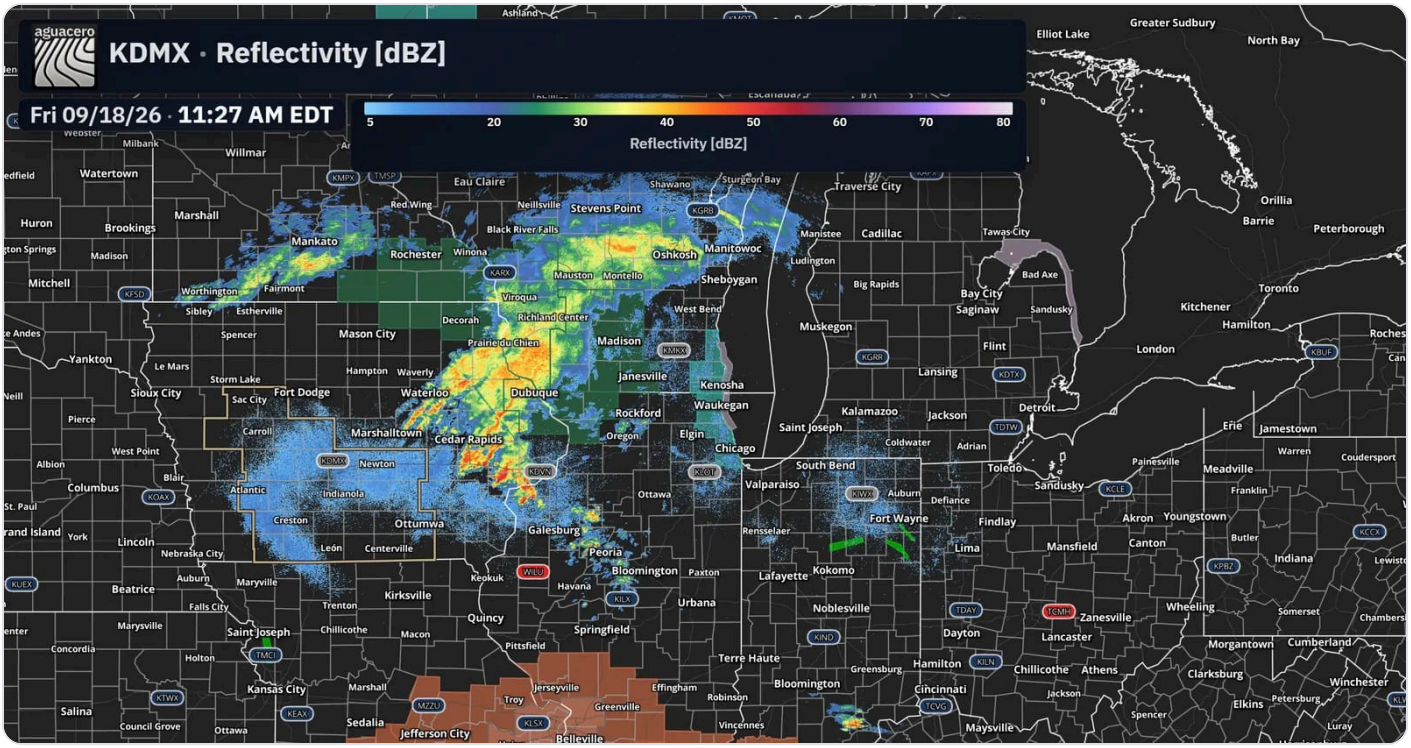
Show up to 5 radars on one layer with the same product, tilt and colors. Where their coverage overlaps, the closest site is drawn.

1. Load a NEXRAD layer and show the sites (double-click **NEXRAD sites**).
2. Single-click **NEXRAD sites** and turn on **Load multiple sites**.
3. Click sites on the map to add them. Click a site again to remove it.
4. Change the product or tilt as usual; every site follows.

| SETTINGS | |
|---|---|
| **Load multiple sites** | Professional and up; a lock shows on lower plans and the switch opens the upgrade window. Up to 5 sites; turning on a sixth turns off the oldest. Turning the switch off keeps only the first site. Your choice and your last sites are remembered on your account. |

TIPS

- The layer row lists every site on the layer, such as **KDMX, KDVN, KARX**.
- Readouts use the closest site too, so the value under the cursor matches what you see.
- In **Save Bundle**, **Always open to saved NEXRAD site(s)** pins all the sites.
- On a downgrade to a plan below Professional, extra sites are dropped and the first site stays.




Reflectivity from several NEXRAD sites at once across Iowa and Illinois.

## 07 Add custom radar sites PROFESSIONAL

Add Level II radars from GR2Analyst-style polling servers, such as private X-band networks and research radars. They show and load like NEXRAD sites.

1. Single-click **NEXRAD sites** on the toolbar to open the **RADAR** panel.
2. Under **Custom radar sites**, click **Add**.
3. Click **MRRL** to fill **Polling URL** and **Site file link (optional)** with that feed, then click **Link site file**. For another server, paste its address into **Polling URL**, the same URL you would give GR2Analyst.
4. Load a GR2Analyst site file: click **Load GR2Analyst site file (.gis)** and pick the file.

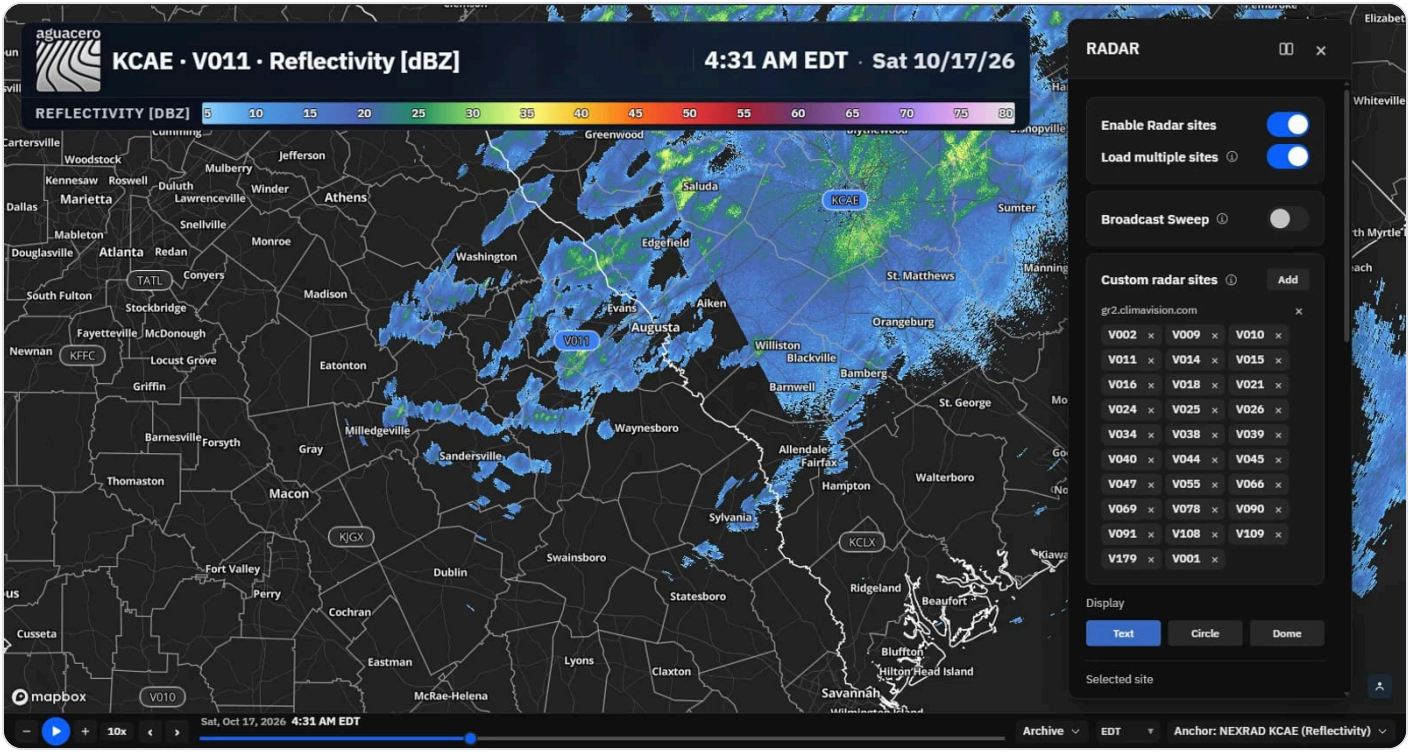
5. If the server publishes its site file online, paste that address into **Site file link (optional)** and click **Link site file** instead. The app reads the file again every 5 minutes, so new radars appear and mobile radars move without you doing anything.
6. Leave **Site ID (optional)** empty and click **Show 233 sites on the map** (the count matches the file). The sites appear as radar sites. Click one to load its data.
7. Without a site file, click **Find sites**, pick the ones you want, and click **Add 3 sites** (the count matches your picks).
8. To add one site, type its **Site ID**, optionally a **Name (optional)**, and click **Add site**.

| SETTINGS | |
|---|---|
| **Polling URL** | The server address. The app reads the server's site list (grlevel2.cfg) and each site's volume list (dir.list). |
| **Site file link (optional)** | The web address of a GR2Analyst site file the server publishes. Every radar in it goes on the map. The app reads the file again every 5 minutes: new radars appear, mobile radars move, and radars taken out of the file go away. The link is listed under the server with the file name and site count; its **×** unlinks it. Removing one of its sites hides that site until you click **Restore 1 removed** (the count matches). |
| **MRRL** | Fills **Polling URL** and **Site file link (optional)** with the MRRL worldwide feed. Then click **Link site file**. The app reads that file again every 5 minutes. |
| **Load GR2Analyst site file (.gis)** | A .gis, .txt or .csv site file up to 2 MB. It places every radar it lists on the map, including ones that are offline, and names sites you already added. Unlike a site file link, it is read once. Click **×** next to the file name to remove it. |
| **Site ID (optional)** | Empty: the button reads **Find sites** and lists every site on the server. With an ID: the button reads **Add site** and checks that one site. Press `Enter` to submit. |
| **Name (optional)** | A display name for a single site. Only available once you type a site ID. |

| | |
|---|---|
| **All** | Selects every site in the server list. Servers with 40 or fewer new sites start with all selected; bigger servers start with none. |
| **Add site** | Checks the newest volumes and saves the site, for example “Added KXYZ: VCP 212, 12 volumes, newest 3 min ago.” |
| **Cancel** | Closes the form and stops any check in progress. |
| **Remove** | The × on a site chip removes that site. The × next to a server name (shown when it has more than one site) removes every site from that server. |

TIPS

- A site file puts the radars on the map without asking the server for each volume. Click a site to load its latest scan. About once a minute the app checks for a newer scan. **Load past scans** also downloads earlier volumes in the radar loop.
- Without a site file, select the sites you want, then add them. Sites are checked one at a time. If the server limits requests, the ones still waiting stay selected so you can add them again.
- “has no grlevel2.cfg site list … Enter a site ID.” means the server can’t list its sites; type a site ID instead. “dir.list lists no radar volumes for this site.” means the site has no data yet.
- Custom sites save to your account and follow you to other browsers and the desktop app. On a plan below Professional, saved sites stay listed but don’t load, and **Add** opens the upgrade window.




A private X-band radar near Augusta, Georgia, loaded from its polling server next to NEXRAD KCAE.

## 08 Color tables for each product

Every product starts with a built-in color table. Edit it, load a saved or shared one, import a GR2Analyst or RadarScope palette, and make it your default.

1. On the **Edit Layers** tab, click **Edit Layer** on the radar layer. The **Fill** tab opens.
2. Pick **Units** if the product has more than one, before you change colors.
3. Set **Colormap Type** to **custom colormap** to edit stops, or **single color** to paint every gate one color.
4. Click a swatch to change a color, or click **Load Colormap** for saved colormaps and **Import .pal file** for GRLevelX, GR2Analyst, Wx Tools and RadarScope palettes.
5. Click **Set as default colormap** so new layers of this product start with it.

FILL TAB ON A RADAR LAYER

| | |
|---|---|
| **Enabled** | The switch at the top of the tab. Click it to read **Disabled** and hide the radar without removing the layer. |

| | |
|---|---|
| **Units** | Shown when the product has more than one unit. Velocity and storm-relative velocity offer m/s, mph, kts and km/h; the stops convert with it. |
| **Colormap Type** | **custom colormap** or **single color**. |
| **Interpolate Colors** | On by default: colors fade between stops. Off draws hard bands. Hidden on the hydrometeor classification products, which use fixed class colors. |
| **Data Range** | Two handles that hide values below or above them, for example reflectivity under 20 dBZ. Readouts skip hidden values too. |
| **Opacity** | With a custom colormap, the Opacity panel lower on the tab fades the whole radar or only some values, 5–100%. In **single color** mode it is one slider, 0.05–1. |

TIPS

- Some products share a built-in table with related data: **Reflectivity** with model and MRMS reflectivity, and **Storm Relative Velocity** with **Velocity**. Your default colormaps are kept per data type, so a radar default doesn't change model layers.
- A .pal file's values are used as written. Set **Units** to the palette's units first (kts for most velocity tables).
- A Wx Tools color table link applies the table to every matching radar layer: reflectivity, base velocity, correlation coefficient or spectrum width.
- The three rainfall totals add a **Point** tab that prints values on the map.

## 09 Smooth the gates and blend frames PROFESSIONAL

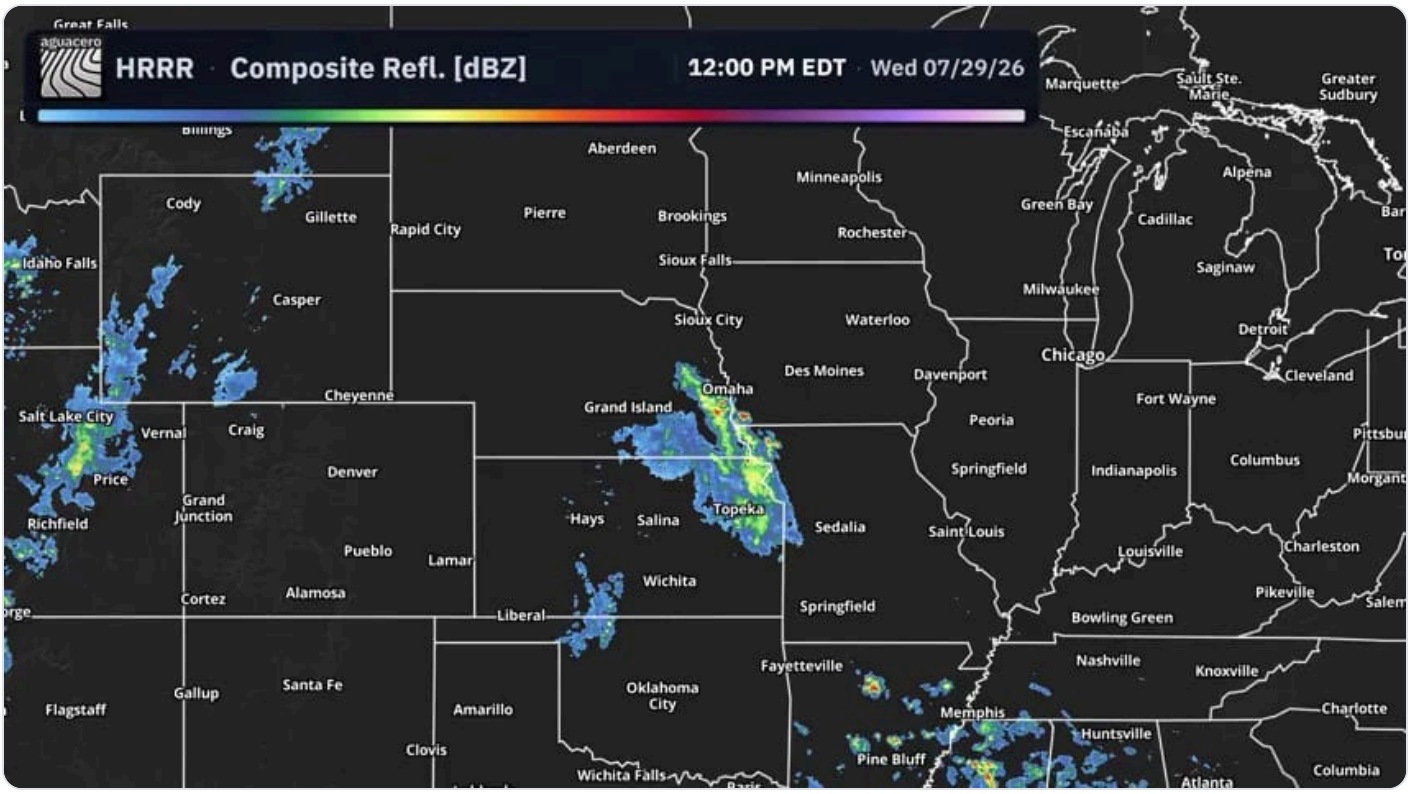
Show the raw radar gates or soften them, and cross-fade between scans so storms move smoothly in a loop.

1. Open **Edit Layer** on the radar layer.
2. Drag **Smoothing** right to soften the gates, or all the way left for **Off**.
3. Tick **Frame Blending**, then press `Space` to play the loop.

| SETTINGS | |
|---|---|
| **Smoothing** | Five steps: **Off**, 0.25, 0.50, 0.75 and 1.00. **Off** draws each gate as the radar measured it. 0.25 blends between neighboring gates; higher steps blur more. A new radar layer starts at your **Settings** → **Data** → **Radar** amount, or **Off**. Each product on the layer keeps its own amount when you switch away and back. Shows **n/a** and is locked on the hydrometeor classification products. |
| **Frame Blending** | Professional. Cross-fades between one scan and the next as the loop plays, so storms morph instead of jumping. Default off. Not used in Trend or Compare view. On lower plans, ticking it opens the upgrade window. |

### TIPS

- In Performance mode (**Settings** → **Performance**) **Smoothing** becomes a single checkbox that uses the 0.25 step. Switch back to get the slider.
- With smoothing on, mouse readouts read between gates like the image does.
- To set one smoothing amount or turn blending on for every radar product, use **Settings** → **Data** → **Radar**.




A composite reflectivity loop with frame blending.

## 10 Velocity and storm-relative velocity

Storm-relative velocity removes the storm's own motion so rotation stands out. Take the motion from the radar, from an NWS warning, or type it in.

1. With a NEXRAD layer on the map, press `S`, or pick **Storm Relative Velocity** from the product menu.
2. Open **Edit Layer**. Under **Storm-relative motion**, click **Level III**, **NWS alert** or **Manual**.
3. For **NWS alert**, click a tornado warning, severe thunderstorm warning, special weather statement or marine warning on the map that lists storm motion. The hint reads "Using Tornado Warning motion." (with that alert's name).
4. For **Manual**, type the **Storm speed** and set **From (°)**, the direction the storm is coming from.

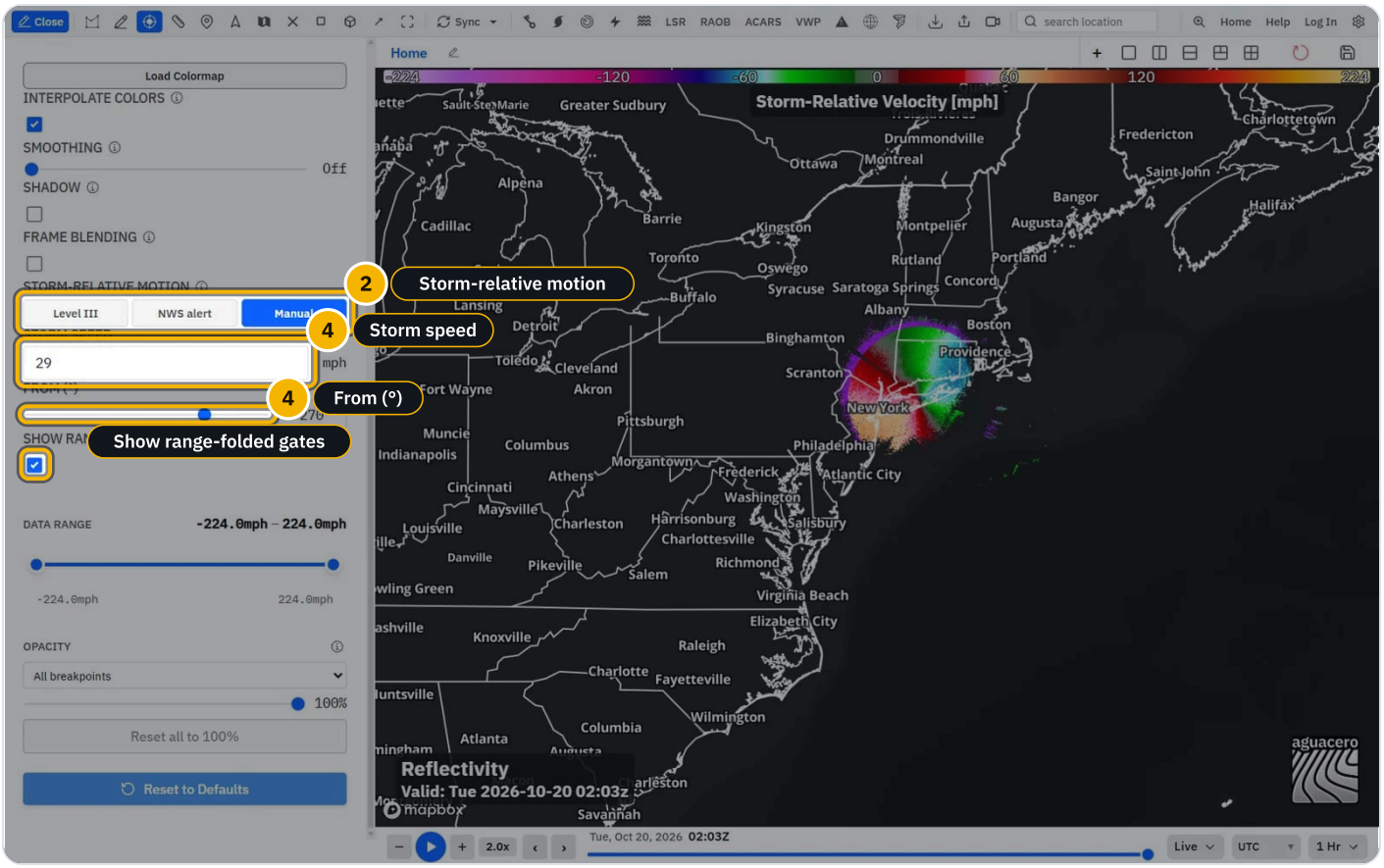
| STORM-RELATIVE MOTION | |
|---|---|
| **Level III** | Default. Uses the radar's own storm-motion estimate for each scan. |

| | |
|---|---|
| **NWS alert** | Keeps Level III motion until you click a convective alert whose text gives storm speed and direction. Then it uses that motion; click another alert to replace it, or edit the values below. |
| **Manual** | Always uses the speed and direction you type. |
| **Storm speed** | Shown for **Manual**, and for **NWS alert** once an alert is applied. In the layer's velocity unit: m/s, mph, kts or km/h. Default 25 kts; 0 or more, in steps of 1 (0.1 in m/s). |
| **From (°)** | A 0–360° slider and a number box. Meteorological from-direction, the same as NWS warnings: 270° means the storm comes from the west. Default 270°. |

| ALL VELOCITY PRODUCTS | |
|---|---|
| **Show range-folded gates** | On **Velocity**, **Spectrum Width** and **Storm Relative Velocity**. Range-folded gates are targets beyond the radar's unambiguous range, whose velocity can't be trusted. On (default) draws them; off hides them. One account-wide setting for every velocity layer. |
| **Units** | m/s, mph, kts or km/h. The storm speed box follows it. |

NEXRAD velocity is dealiased automatically when the scan carries its Nyquist velocity; there is no switch for it. Archived Level II velocity is dealiased too. European radars have their own **International radar dealiasing** switch in **Settings** → **Data** → **Radar**.

**Storm Relative Velocity** isn't offered on TDWR, test-bed or international sites, or in an archive window older than the Level III record. **Storm-relative motion** only shows on a storm-relative velocity layer.




Storm-relative velocity settings in Edit Layer, set to Manual motion.

## 11 Add a drop shadow and broadcast sweep CREATOR

Give the radar depth with a hard drop shadow, and animate a rotating radar beam over the newest scan for on-air use.

1. Open **Edit Layer** on the radar layer and tick **Shadow**.
2. Drag **Shadow direction** to where the shadow should fall and **Shadow size** for how far.
3. Single-click **NEXRAD sites** on the toolbar and turn on **Broadcast Sweep** in the **RADAR** panel.
4. Set **Seconds per rotation** and **Sweep color**.

| SHADOW (EDIT LAYER, CREATOR) | |
|---|---|
| **Shadow** | A hard black drop shadow under the radar gates so the radar stands out from the basemap. Default off. Below Creator, ticking it opens the upgrade window. |

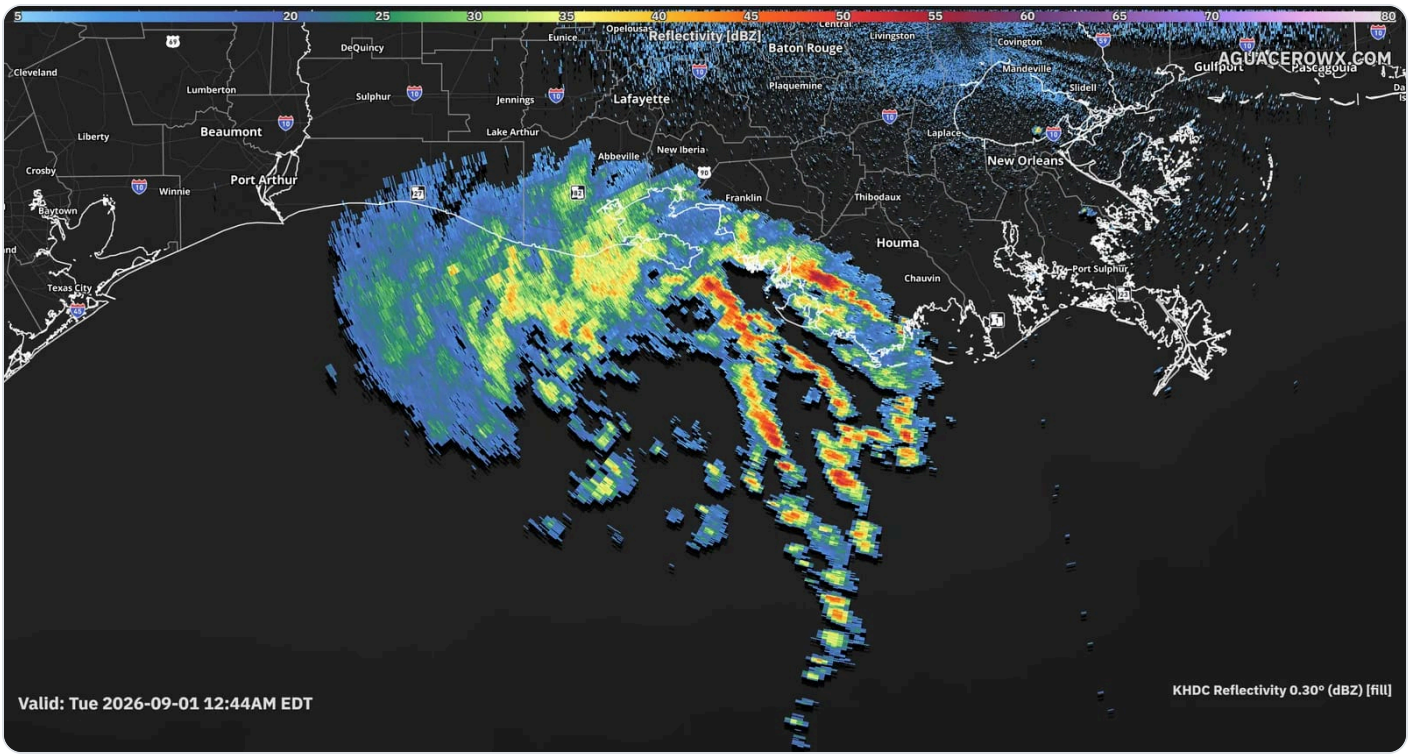
| | |
|---|---|
| **Shadow direction** | Where the shadow sits: 0° is above the echoes, increasing clockwise (90° right, 180° below). 0–360° in steps of 5, default 0°. |
| **Shadow size** | 0–100, default 28. Stays in proportion as you zoom. |

### BROADCAST SWEEP (RADAR PANEL)

| | |
|---|---|
| **Broadcast Sweep** | A rotating beam over the latest scan, on every plan. Default off. Off, new scans appear at once. |
| **Only on new scan** | Plays the sweep only when a new volume scan arrives, not all the time. Default off. |
| **Sync beams** | Off (default), each radar's beam keeps spinning from the moment that radar started, so sites turn independently. On locks every beam to the same angle. |
| **Seconds per rotation** | 5–90 s, default 30. |
| **Sweep color** | Default white. |
| **Different color on new scan** | Uses a second color while a new scan is revealed. Hidden when **Only on new scan** is on. Default off; **New scan color** defaults to yellow (#ffeb3b). |

### TIPS

- The shadow is drawn only for Creator and Commercial accounts. A bundle saved with a shadow opens without it on other plans.
- Performance mode (**Settings** → **Performance**) turns the sweep off, and a hidden radar layer has no beam.
- **Settings** → **Data** → **Radar** has the sweep switches and a **Shadow** row that turns the shadow on or off for every radar product.




NEXRAD reflectivity with a gate drop shadow.

## 12 Loop length and the newest scan

Choose how far back the loop goes, and learn how new scans arrive and when the map moves to them.

1. Open the duration menu on the time slider, next to the time zone. It reads the current length, such as **1 Hr**.
2. Pick a length. Locked lengths show a lock and open the upgrade window.
3. Press `Space` to play. The thumb stays on parts of the track that are highlighted, which have data loaded.

| RADAR LOOP LENGTH | |
|---|---|
| **30 Min** | Every plan. |
| **1 Hr** | Every plan. The default. |
| **2 Hrs** | Enthusiast and up. |
| **4 Hrs** | Enthusiast and up. |

| | |
|---|---|
| **12 Hrs** | Professional and up. |

The loop holds every scan the radar sent in that window. Level II scans arrive as each tilt finishes; Level III products are checked every 20 seconds. If the slider is on the newest frame when a scan arrives, it moves to the new one. If you are looking at an older frame, it stays put.

TIPS

- With MRMS, satellite, RTMA or Mesoscale Analysis on the same board, one combined **Duration** menu lists only the lengths they all allow.
- When the board has several time sources, the anchor menu on the slider picks which one drives it. A radar layer anchors the slider to its own scans.
- While a loop plays, it waits up to 3 seconds on a frame that is still loading before moving on.
- The **Live** / **Archive** menu on the slider switches to past events. There is no duration menu in archive mode; the event window sets the loop.

SHORTCUTS

| | |
|---|---|
| `Space` | Play or pause the loop |
| `←` / `→` | Step one scan while a NEXRAD layer is on the map |
| `,` / `.` | Step the time back or forward |

## 13 Read values, storm tracks and rotation

Hover the radar for the value under the cursor and the beam height, and turn on Level III storm tracks with hail, rotation and TVS details.

1. Double-click **Mouse readouts** on the toolbar to turn readouts on.
2. Hover the radar. The readout shows the product's short name, the value and its unit, such as **REF 52.5 dBZ**, and **Beam Height**.
3. Click the map to pin a readout there (with **Pin on click** on).

| RADAR READOUTS | |
|---|---|
| **Value** | One decimal, in the layer's units. Hydrometeor classification shows the class name, such as **Graupel**. |
| **Beam Height** | The radar beam's height above the radar at the cursor, in kft, or km with metric units. Turn it off with **NEXRAD beam height** in the Mouse readouts settings. |
| **Which radar** | With several radar layers or sites, the closest radar to the cursor answers. |
| **Missing value** | No readout when the cursor is beyond the radar's range, the value is outside the layer's **Data Range**, or the layer is hidden or fully faded. |

**Storm tracks** draws the radar's Level III storm cells with their forecast tracks. **Rotation & TVS** (under Storm tracks) adds mesocyclone and tornado vortex markers. Storm tracks are set per product in your account defaults and are off for every product to start.

1. Open **Settings** → **Data** and click the **Radar** tab.
2. Click a radar product in the list, such as **Reflectivity**.
3. Tick **Storm tracks**. Every layer of that product now shows storm tracks. Tick **Rotation & TVS** for mesocyclone and TVS markers, or leave it off for tracks and plain cell dots only.
4. Click a storm cell on the map. Its popup lists **Motion**, **Hail** and **POSH**, and **Rotation** / **TVS** when those markers are on and the radar reports them.

TIPS

- **Storm tracks** needs you to be signed in. It works on WSR-88D sites, not on TDWR or international radars.
- Press `Backspace` to close the newest pinned readout or the storm-track popup, or click its **×**.
- Mouse readouts pause while a sounding or meteogram covers the map. They keep working with the radar cross section open.

## 14 Track a storm and the towns in its path

Draw a storm’s motion to get its speed and direction, a cone or corridor ahead of it, and arrival times for the towns in the way. Keep one track or many.

1. Click **Storm tracker** on the toolbar. The tool turns on and its settings open. Closing the settings turns the tool off.
2. Under **Draw mode**, click **Cell track** for one storm or **Line track** for a line of storms.
3. Under **Storm speed**, choose **Auto**, **Distance Speed** or **Manual**.
4. For a cell track, drag from the storm’s current position in the direction it is moving, or click twice. A longer drag gives a steadier speed and direction.
5. For a line track, click each point along the line and double-click to finish (on a touch screen, tap **Finish line**). Move the mouse ahead of the line to set the corridor, then click. Speed and direction run from the line to the corridor edge.
6. Read the speed, direction and town arrival times in the readout on the map. Drag the readout to move it.

| MOTION | |
|---|---|
| **Draw mode** | **Cell track** (default) draws one segment with an optional cone. **Line track** draws a multi-point line with an optional corridor band. |
| **Tracks** | **One track** (default) replaces the old track when you draw again. **Multiple** keeps every finished track; the list shows each one with **Edit** and **Remove**, and **Add another track** starts the next. Switching back to **One track** keeps the track you are editing. |
| **Auto** | The track must start inside a warning polygon. Speed and direction come from the warning’s storm motion (tornado warnings first, then severe thunderstorm, flash flood and marine warnings). With no alert motion there, a NEXRAD storm-track cell under the start point is used. If it can’t start, a hint offers **Distance Speed** or **Manual**. |
| **Distance Speed** | Default. Speed is the drawn length (for a line track with its band, the corridor width) divided by **Storm motion window**, as in AWIPS. |
| **Manual** | Uses the **Speed** you type, 1–200 in the speed unit (default 30 kts). The track length only sets the path and arrival times. |

| | |
|---|---|
| **Speed unit** | **kts** (default), **mph**, **m/s** or **km/h**. |
| **Storm motion window** | Distance Speed only. How much time the drawn track covers: 15 min, 30 min, 45 min, 1 hour (default), 1h 30m, 2, 3, 4 or 6 hours, or **Custom**, 5–720 minutes in steps of 5. |
| **Direction wording** | **Moving toward** (default) gives the heading, such as 45° NE. **Coming from** gives the from-direction. |

SHORTCUTS

| | |
|---|---|
| `T` + drag | Draw a storm track with your saved settings, without the toolbar |
| `Delete` | Remove the selected track |
| `Esc` | Cancel a line track you are drawing |

TIPS

- Drag a track's handles to adjust it after drawing. The readout and arrival times update as you move it.
- The readout's red **×** removes the track. In **Multiple**, the readout also has the track list and **Add track**.
- Towns come from a US places list inside the cone or corridor, not from the map labels.
- The storm tracker is on every plan. Its settings save to your account when you are signed in.

## 15 Style the storm track and its readout

Choose what the readout lists, how it looks, and how the cone, corridor, center line and time ticks are drawn.

CITY READOUT

| | |
|---|---|
| **City impacts** | Lists towns in the path with arrival times. Default on. |
| **Speed & direction** | Shows the storm speed, heading in degrees and compass point. Default on. |

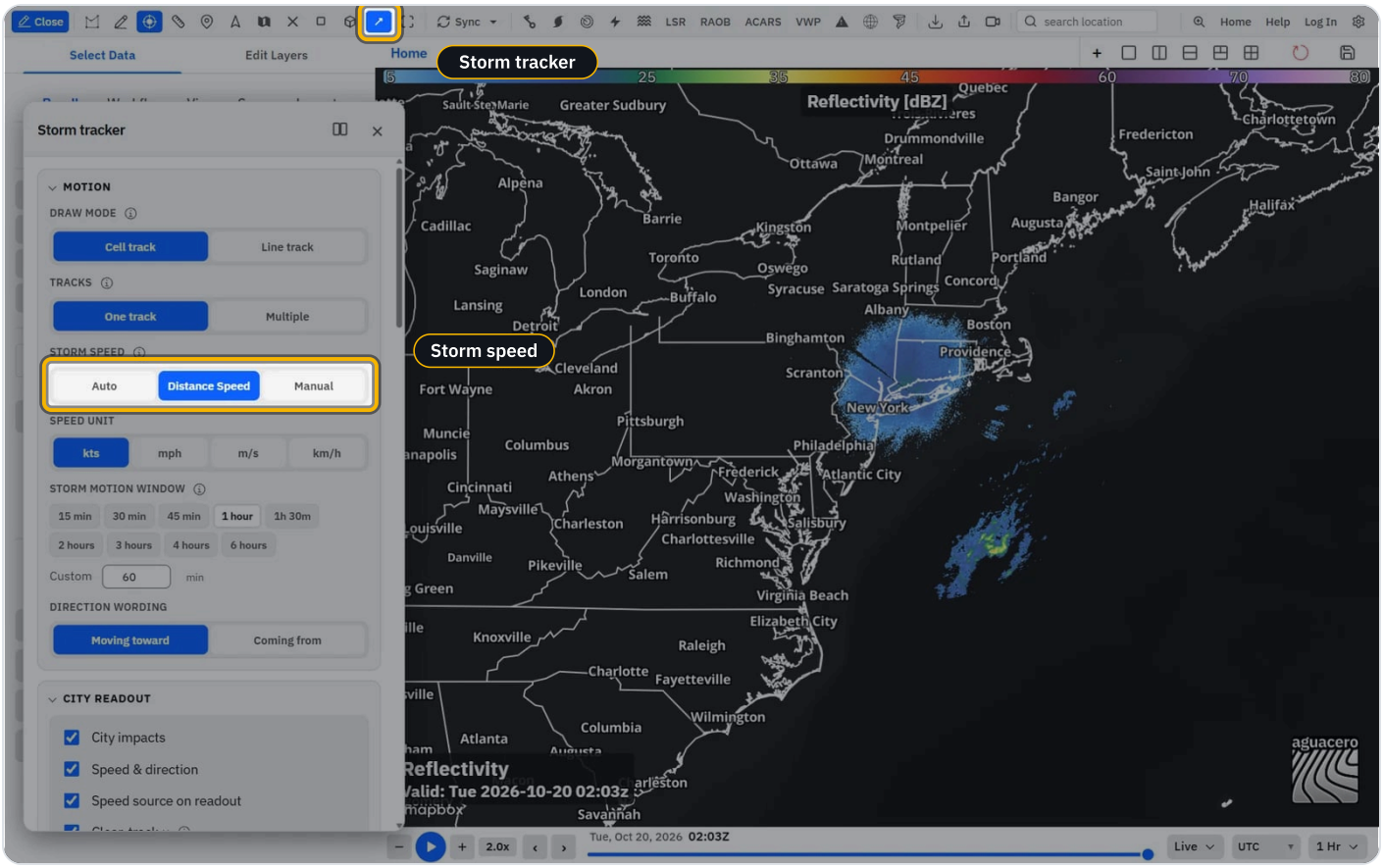
| | |
|---|---|
| **Speed source on readout** | Adds where the speed came from when it isn't from an NWS warning or your drawing: NEXRAD, a SiteWarn alert or manual. With **Auto** and no warning motion it reads "no NWS speed". Default on. |
| **Clear-track ×** | The red × on the readout that removes the track. Default on. |
| **Max places listed** | 1–25, default 5. With more towns in the path, larger towns spread along the track are kept, then listed by arrival time. |
| **City impact time** | **Minutes to impact** (default) or **Time of impact**, a clock time in the board's time zone. |

| READOUT GRAPHIC | |
|---|---|
| **Font** | Any font in the font list. Default IBM Plex Sans, with **Bold** on and **Italic** off. |
| **Speed size** | 8–48 px, default 13. **City size** defaults to 12 and **Time size** to 11. |
| **Line height** | 0.9–2.4, default 1.25. **Row spacing** is 0–16 px, default 4. |
| **Speed color** | Default white. **City color** defaults to light gray and **Time color** to gray. |
| **Text outline** | Default off. **Outline color** and **Outline width**, 0.25–8. |
| **Background** | Default on. **Solid** or **Gradient** (with **Color 1**, **Color 2** and **Angle**), **Opacity** 0–100% (default 88%), **Backdrop blur** (on), **Popup outline** (on, white, 1 px), **Corner radius** 0–32 (default 10), **Padding** 0–32 (default 12) and **Drop shadow** (on). |
| **Reset readout graphic** | Puts the readout's look back to the defaults. |

| CONE | |
|---|---|
| **Center line** | The line down the middle of the track. Default on. **Middle line color** (white), **Middle line width** 1–10 px (default 3) and **Outline around middle line** (off) with its color and width. |
| **Start / end dots** | The round handles at each end. Default off; dragging still works without them. **Origin size** 2–14 px, default 5. |
| **Quarter ticks** | Tick marks at each quarter of the track. Default on. |
| **Times on map ticks** | Prints arrival times at 25%, 50%, 75% and the end. Default on. **Tick time format**: **Time of impact** (default) or **Minutes to impact**. **Tick time position**: **Center** (default), **Top**, **Bottom**, **Left** or **Right**. |
| **Cone of uncertainty** | Cell tracks only. Default on. **Rounded leading edge** (on), **Cone fill** (white, **Fill opacity** 28%), **Cone outline** (white, 0.5–8 px, default 2) and **Cone width**, 25–1000% of the base cone (default 300%). |
| **Show fill band** | Line tracks only. The corridor between the line and its edge. Default on. **Band fill** (light blue, **Fill opacity** 35%) and **Band outline** (white, 0.5–8 px, default 2). |
| **Fill under radar & data** | Draws the cone or band fill below the radar and other fills; the line and handles stay on top. Default off. |
| **Reset storm tracker to defaults** | Resets every storm tracker setting and removes saved tracks. |

TIPS

- Cone, band and outline colors can be **Solid** or **Gradient**, with two colors and an angle.
- Tick time labels are white with a black outline, sized like your mouse readouts.




The Storm tracker settings: draw mode, tracks, storm speed and the city readout.

## 16 Radar defaults and where settings are saved

Settings → Data → Radar sets the sweep, the international velocity filters, smoothing, blending, shadow, storm tracks and color tables for every radar layer you open.

1. Open **Settings** → **Data** and click the **Radar** tab.
2. Set the switches in the **Radar** section at the top.
3. Under **Layer styles** → **Fill**, set **Smoothing**, **Frame blending** and **Shadow** for every radar product.
4. Click a product in the list to edit its colormap and layer settings, or click **Colormap groups** to edit a shared palette once.

| SETTINGS → DATA → RADAR | |
|---|---|
| **Broadcast sweep** | The same switch as in the **RADAR** panel; **Only on new scan** and **Sync beams** appear when it is on. |

| | |
|---|---|
| **International radar dealiasing** | Unfolds aliased velocity on European radars. Some national feeds dealias before publishing, many don’t. Off shows velocity as the feed sends it. Default on. |
| **Dual-PRF error filter** | Fixes scattered gates that are off by a fixed amount on radars that alternate two pulse rates, and leaves real shear such as couplets alone. Runs only on scans that report two pulse rates. Default on. |
| **Velocity noise filter** | Hides European velocity that looks like noise. Some sparse weak-echo velocity disappears. Default on. |
| **Interpolate colors** | Under **Layer styles** → **Fill**. Turns color blending on or off for every radar product at once. |
| **Opacity** | Under **Layer styles** → **Fill**. One fill opacity for every radar product, 5–100%. |
| **Smoothing** | **Custom** applies one slider amount to every radar product; **Bundle/Variable** leaves each layer as it is. |
| **Frame blending** | **On**, **Off** or **Bundle/Variable** for every radar product. On needs Professional. |
| **Shadow** | **On**, **Off** or **Bundle/Variable** for every radar product. On needs Creator. |
| **Storm tracks** | In a product’s editor. Turns Level III storm tracks on for that product. **Rotation & TVS** under it shows or hides mesocyclone and TVS markers. |
| **Reset customizations** | Clears your saved radar defaults after you confirm. |

Where each setting lives:

TIPS

- In the bundle (save it to keep them): the radar layer's product, site or sites, tilt, colors, units, data range, smoothing, shadow, frame blending and storm-relative motion, plus whether the sites and multiple sites are on for that panel.
- In your account when signed in, on every device: the site marker style, broadcast sweep, custom radar sites, your last site and multi-site choice, **Show range-folded gates**, storm tracks per product, the international velocity filters, storm tracker settings and everything in **Settings** → **Data**.
- Signed out, account settings last until you reload, and **Settings** → **Data** can't save.
- Reloading the page opens your start view; unsaved layers are gone.

## 17 Recipe: a clean velocity couplet view with SRV

Set up storm-relative velocity on a warned storm so a rotation couplet reads clearly, with reflectivity beside it.

1. Right-click near the storm and choose **Nearest NEXRAD**.
2. Press S for **Storm Relative Velocity**, then ↓ until **Tilt** shows the lowest angle.
3. Double-click **Alerts** on the toolbar so the warning polygons show, then open **Edit Layer** on the radar layer.
4. Under **Storm-relative motion**, click **NWS alert**, then click the tornado or severe thunderstorm warning polygon. The hint names the warning whose motion is in use.
5. Set **Units** to **kts** and **Smoothing** to **Off** so each gate stands on its own.
6. Turn off **Show range-folded gates** if they clutter the view.
7. Add a second map panel with the same site on **Reflectivity**; with **Sync Radar Sites** on, both panels stay on the same radar.
8. Double-click **Mouse readouts** and hover each side of the couplet to read the inbound and outbound speeds and the beam height.
9. Press ↑ to step up through the tilts and see how deep the rotation goes.

TIPS

- If the warning has no storm motion, use **Manual** and type the speed and direction from a storm tracker readout set to **Coming from**.
- Compare with base velocity by pressing `V`, then `S` to come back.

## 18 Recipe: an on-air radar loop CREATOR

A polished reflectivity loop with a drop shadow, smooth frames, a sweeping beam and a storm track with arrival times.

1. Load **Reflectivity** on your market's radar and set the loop to **2 Hrs**.
2. In **Edit Layer**, set **Smoothing** to **0.50**, tick **Shadow** with **Shadow direction** 135° and **Shadow size** 40, and tick **Frame Blending**.
3. Drag the left **Data Range** handle up to 20 dBZ to drop light returns and clutter.
4. In the **RADAR** panel, turn on **Broadcast Sweep**, set **Seconds per rotation** to 20 and turn on **Different color on new scan**.
5. Set **Display** to **Dome**, or uncheck **Enable Radar sites** for a clean map.
6. Click **Storm tracker**, choose **Auto**, and draw a cell track inside the warning. Set **City impact time** to **Time of impact** and **Max places listed** to 4.
7. Click **Save Bundle** so the look comes back next time.

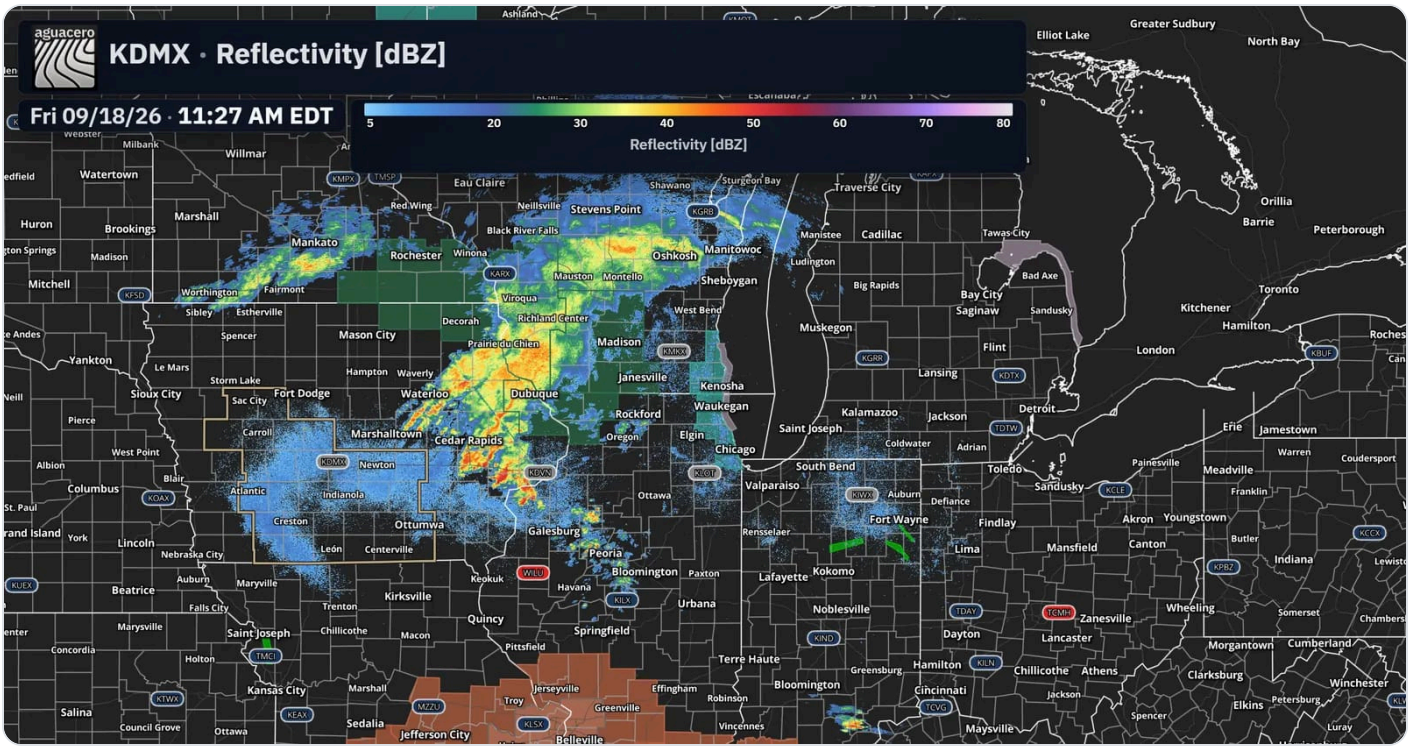
**Shadow** needs Creator, **Frame Blending** Professional and the 2-hour loop Enthusiast. The sweep and storm tracker are on every plan.

## 19 Recipe: follow a squall line across several radars PROFESSIONAL

Show a long line of storms from several radars at once and draw a corridor with arrival times along it.

1. Load **Reflectivity** and double-click **NEXRAD sites**.
2. Single-click **NEXRAD sites** and turn on **Load multiple sites**, then click three or four sites along the line.
3. Keep the tilt at the lowest angle and set the loop to **4 Hrs**.

4. Click **Storm tracker**, choose **Line track** and **Distance Speed**, and set **Storm motion window** to **1 hour**.
5. Click points along the leading edge and double-click to finish. Move the mouse ahead of the line by the distance it covers in an hour, then click. The corridor width divided by the window gives the speed.
6. Read arrival times for the towns in the corridor, and drag the readout clear of the storms.
7. In **Save Bundle**, turn on **Always open to saved NEXRAD site(s)** to keep all the sites.




Several NEXRAD sites on one layer.

## 20 Common questions

Answers to the radar questions people ask most.

### Why isn’t the newest scan showing?

If you moved the slider back, it stays where you put it; drag it to the right end and it follows new scans again. Level III products are checked every 20 seconds and Level II tilts arrive as the radar finishes them, so a scan can take a minute to appear. A red site label means that radar has sent nothing for 20 minutes.

### Why is a tilt greyed out or missing?

The list comes from the angles the site is scanning now, so a radar in a clear-air mode lists fewer angles than one in a storm mode. A greyed-out angle has no scan inside your loop window. **Specific Differential Phase** and **Hydrometeor Classification** only have the low Level III tilts, and the rainfall totals, echo tops, VIL, hybrid classification and TDWR long-range reflectivity have one fixed elevation.

### Why isn’t Storm Relative Velocity, or a dual-pol product, in the menu?

TDWR sites have no storm-relative velocity or dual-pol, test-bed sites and international radars have no storm-relative velocity, and an archive window shows only what existed then: dual-pol from 2011 and Level III from its own start dates.

### Why does the radar look blocky?

New radar layers start with **Smoothing Off**, which draws each gate as measured. Raise it to 0.25 or 0.50 in **Edit Layer**. Level III rainfall totals and TDWR **Long Range Reflectivity** are coarser grids, and hydrometeor classes are never smoothed. In Performance mode smoothing is a single checkbox.

### Why can I only loop back an hour?

Free loops go back 1 hour. Enthusiast adds **2 Hrs** and **4 Hrs**, Professional adds **12 Hrs**. With other observed data on the board, the combined **Duration** menu shows only lengths that every dataset allows.

### Why does Load multiple sites, Add or Frame Blending open an upgrade window?

Multiple sites, custom radar sites and frame blending need Professional, and **Shadow** needs Creator. A lock beside **Load multiple sites** and **Custom radar sites** marks them.

### A shared bundle should have a radar shadow, but I don’t see it.

The shadow only draws for Creator and Commercial accounts. The setting stays on the layer and shows again for a Creator account.

### Why don’t the R, V and S keys work?

They work only while a NEXRAD layer is on the map and the cursor isn’t in a text box. They are off while a sounding is open or a dialog has focus. Check **Settings** → **Keyboard shortcuts** → **NEXRAD radar** in case they were changed.

### Why is there no radar value in my readout?

Turn readouts on by double-clicking **Mouse readouts**. There is no value beyond the radar's range, outside the layer's **Data Range**, or on a hidden or fully faded layer. With several radars, the closest one answers.

### My imported velocity palette has the wrong colors.

Palette values are used as written. Set the layer's **Units** to the palette's units, usually kts, then import it again.

### Why did my layer switch to Reflectivity when I clicked a site?

That site doesn't have the product you were on, for example dual-pol on a TDWR or a Level III product on a test-bed site, so the layer falls back to **Reflectivity**.

### Why did the other map panel change radar too?

**Sync Radar Sites** is on in **Sync**, so a site change on one panel applies to every panel. Turn it off to keep a different radar on each panel.

### How do I get mesocyclone and TVS markers?

Open **Settings** → **Data** → **Radar**, click the product (for example **Reflectivity** or **Velocity**), tick **Storm tracks**, then tick **Rotation & TVS**. Click a storm cell for its motion, hail, rotation and TVS.

### The broadcast sweep doesn't spin.

Check that **Broadcast Sweep** is on and **Only on new scan** is off, that the radar layer is visible, and that Performance mode is off in **Settings** → **Performance**.

### Auto storm speed won't start my track.

With **Auto**, the track has to start inside a warning polygon whose text gives storm motion. Show the alerts and start inside the warning, or switch **Storm speed** to **Distance Speed** or **Manual** to draw anywhere.