AGUACEROWX IN-DEPTH GUIDE

Map style: basemaps, cities, boundaries and polygons

The Map Style window controls everything under your weather data: the basemap, which place names, borders, roads and overlays show, how they look and at which zoom levels. Use it to build a clean broadcast basemap, dim everything outside your viewing area, draw your own shapes and placefiles, or load a style you designed in Mapbox Studio, then save the look and share it.

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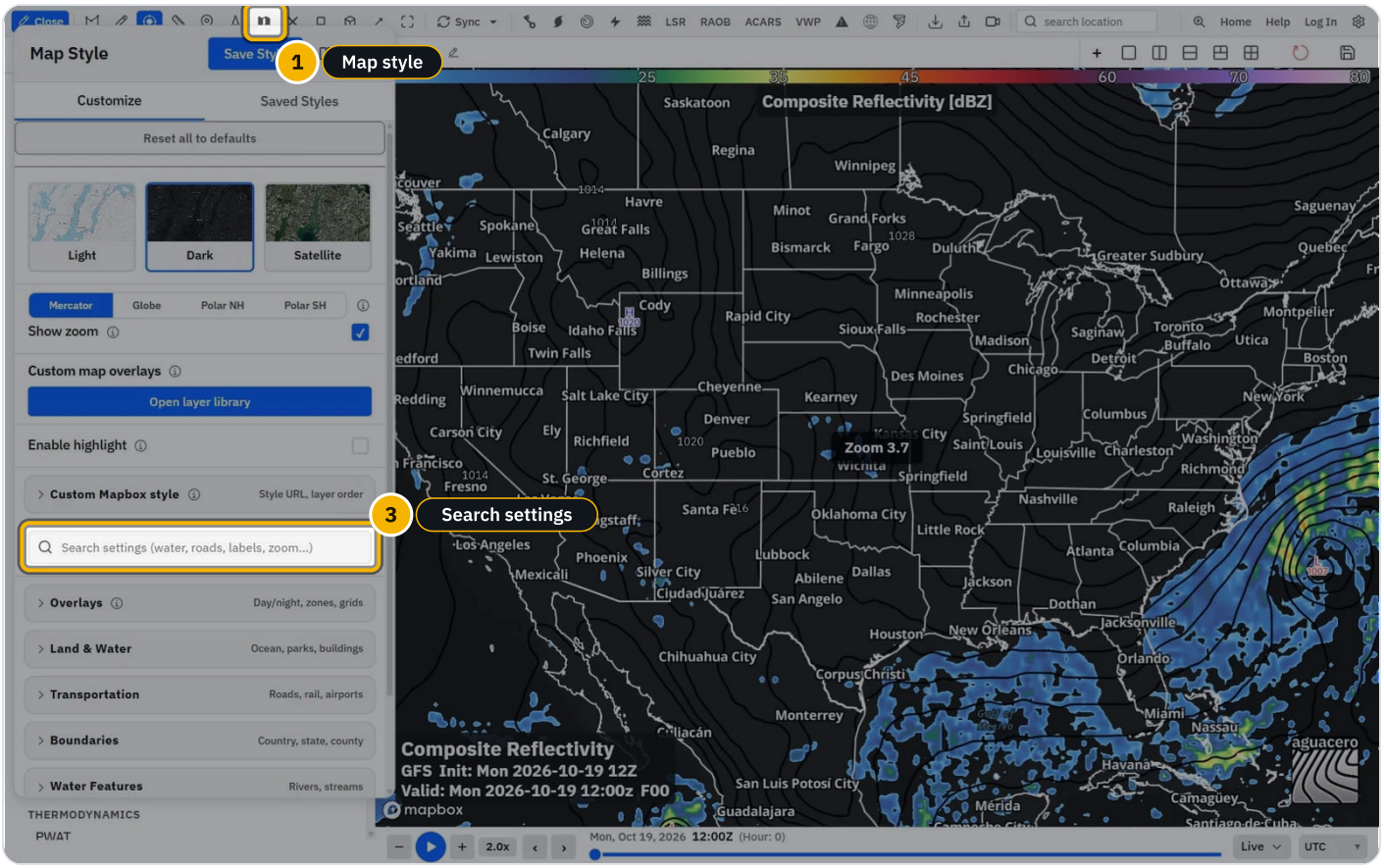
BEFORE YOU START

- Click the **Map style** button on the toolbar (the map icon). The same window is in **Settings** → **Map**.
- The window works on every plan. **Enable highlight**, **Custom map overlays**, placefiles and **Custom Mapbox style** need Professional or above.
- Signed in, every change saves to your account as you make it and loads on your other devices. Signed out, changes last until you reload.
- **Save Style** keeps a named copy you can reload, favorite or share. Free saves 1 style; Enthusiast and up save as many as you like.
- There is one map style for the whole app. Every board and panel draws it, unless a bundle, workflow or scene step brings its own.

01 Open the Map Style window

The Map Style window has two tabs. **Customize** holds every basemap setting; **Saved Styles** holds your named styles, favorites and public styles.

1. Click the **Map style** button on the toolbar. The **Map Style** window opens on the **Customize** tab.
2. Click a basemap card: **Light**, **Dark** or **Satellite**.
3. Click a section title such as **Labels** or **Boundaries** to open it, or type in the search box, for example “county” or “city”.
4. Change a setting. The map updates as you go.
5. To keep a named copy, click **Save Style**, type a **Style Name** and click **Save Style** again.



The Map style button, the Customize tab and the settings search.

The **Customize** tab runs top to bottom: **Reset all to defaults**, the basemap cards, the projection buttons and **Show zoom**, **Custom map overlays**, **Enable highlight**, **Custom Mapbox style**, the search box, then the sections **Overlays**, **Satellite imagery** (Satellite basemap only), **Land & Water**, **Transportation**, **Boundaries**, **Water Features**, **Labels** and **Terrain**. Each section stays closed until you click its title.

WINDOW CONTROLS	
Customize	The tab with every basemap setting. The window opens here.
Saved Styles	Your saved styles, favorites and the public style search. Needs an account: clicking it while signed out opens the sign-in dialog.
Reset all to defaults	Puts every setting back to the current basemap's defaults, including the projection. It also removes your custom map overlays, clears the highlight area and drops a custom Mapbox style. It applies at once, with no confirmation, and the basemap stays the same.

Save Style	Opens the save dialog for a named style. See “Save, load and share map styles” below.
Mount in map UI	Desktop. Docks the window in the panel beside the map instead of floating over it.
Search customization settings	The search box above the sections. Every word you type must match the start of one of a setting’s keywords. Matching sections open by themselves and everything else hides. Clear the box to see all sections again.

TIPS

- Search words that work well: “city”, “county”, “dots”, “cwa”, “fire”, “marine”, “grid”, “shadow”, “background”, “3d”, “hillshade”, “interstate” and “caps”.
- The search filters the projection buttons and the sections below the search box. **Custom map overlays**, **Enable highlight** and **Custom Mapbox style** always stay visible.
- On a desktop, drag the window by its title to move it. On a phone it opens as a sheet; tap the arrow in its header to expand it.
- You can bind a key to **Map style settings** in **Settings** → **Keyboard shortcuts** to open this window. It has no key by default.

NEXRAD reflectivity on a custom basemap with 3D building outlines.

02 Choose a basemap and tune satellite imagery

Start from the Light, Dark or Satellite basemap. Each has its own default colors, and Satellite adds sliders for the imagery.

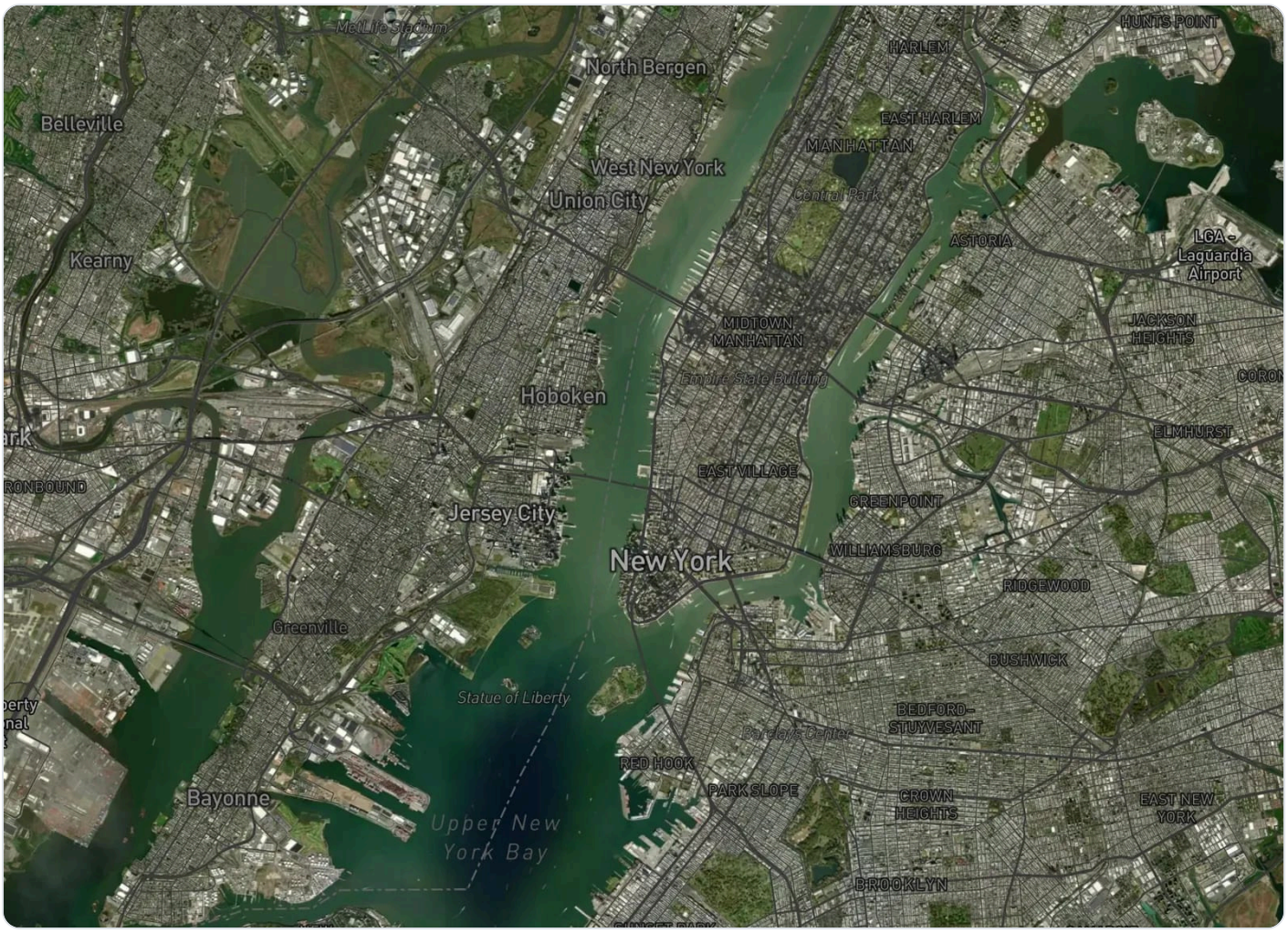
1. On the **Customize** tab, click **Light**, **Dark** or **Satellite**.
2. For Satellite, open **Satellite imagery** and drag the sliders until your data stands out.

New accounts start on **Dark**. The basemaps differ in their defaults: Dark draws white borders and white names with black outlines; Light draws black borders and black names with white outlines; Satellite turns off road signs, road names, national parks and building footprints, and has no **Land Color** because the imagery is the land.

> Switching basemaps resets labels, borders, roads, water, terrain and overlays to the new basemap's defaults. Your custom map overlays, highlight area, satellite imagery sliders and projection carry over. Save a style first if you want to come back to your current look.

SATELLITE IMAGERY	
Saturation	−1 to 1 in steps of 0.05, default 0. Negative values wash the imagery toward gray; positive values strengthen its colors.
Contrast	−1 to 1 in steps of 0.05, default 0.
Shadow lift	0 to 1 in steps of 0.05, default 0. Raises the darkest parts of the imagery.
Highlight ceiling	0 to 1 in steps of 0.05, default 1. Lower it to tone down the brightest parts, such as clouds, snow and desert, so colored data reads better on top.

Satellite imagery only appears while the **Satellite** basemap is active and no custom Mapbox style is loaded.



Satellite imagery basemap over New York City.

03 Change the projection and the globe's look

Show the map flat, as a 3D globe, or as a north or south polar chart, and give the globe an atmosphere and stars.

1. Under the basemap cards, click **Mercator**, **Globe**, **Polar NH** or **Polar SH**.
2. On **Globe**, open the **Globe** section and turn on **Atmosphere** or **Stars**.

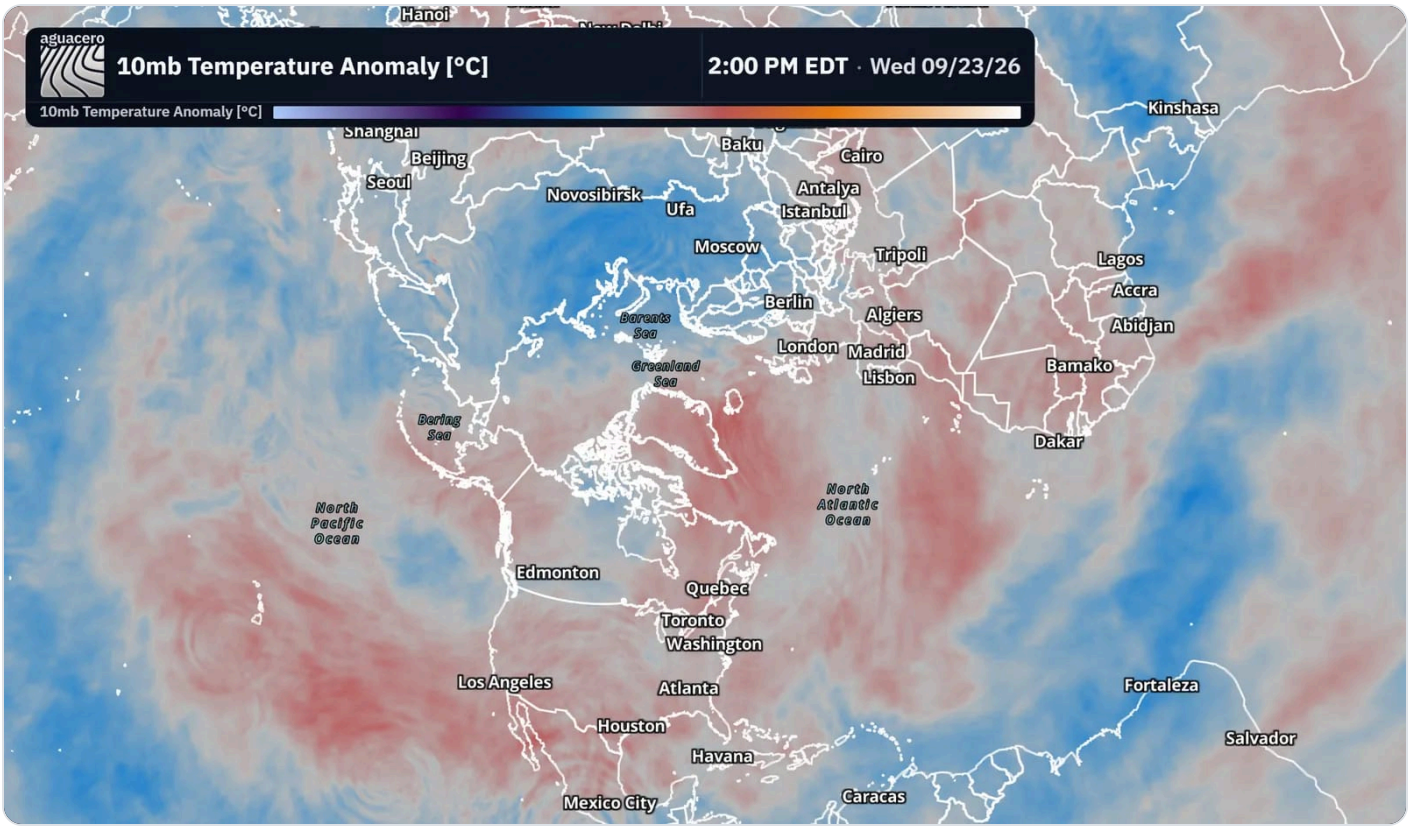
PROJECTION	
Mercator	The usual flat web map. Default.
Globe	Wraps the Earth on a sphere. As you zoom in, the view flattens.

Polar NH	North polar chart, with every longitude around the North Pole.
Polar SH	South polar chart, with every longitude around the South Pole.
Show zoom	While the Map Style window is open, shows the current map zoom in the middle of the map. Handy when you set zoom ranges. On by default, and saved to your account.

GLOBE (GLOBE PROJECTION ONLY)	
Atmosphere	A glow around the edge of the globe. Off by default.
Atmosphere strength	0–100%, default 10%. Shown while **Atmosphere** is on.
Stars	A star field behind the globe. Off by default.
Star intensity	0–100% in steps of 5, default 60%. Shown while **Stars** is on.
Background color	The space color behind the globe. Default black.

TIPS

- Bind a key to **Toggle map projection** in **Settings** → **Keyboard shortcuts** to switch projections without opening this window.
- The **Globe** section also appears when a custom Mapbox style is loaded.



10 mb temperature anomaly on a polar stereographic projection.

04 Set zoom ranges and zoom-based line widths

Most features have a Zoom range, so they only draw between the zooms you pick. Line widths and opacities can also change as you zoom.

1. Turn on **Show zoom** under the projection buttons, so the map shows its current zoom while you work.
2. Under a feature, type a **Min** and a **Max** in its **Zoom range** row.
3. For a line, tick **By zoom** next to **Width** or **Opacity**.
4. Drag the slider on each zoom stop, or type a new zoom in the box beside it.
5. Click **+ Add zoom** to add a stop at the current map zoom.

ZOOM CONTROLS	
Zoom range	The feature draws only between **Min** and **Max**, from 0 to 24 in steps of 0.1. Clear a box to go back to the basemap's own limit.

Min	Can’t go below the zoom where the basemap starts drawing that feature. If you type a lower value, a **Zoom range** message tells you the lowest zoom allowed and the field snaps to it.
Max	Can’t go above the zoom where the basemap stops drawing that feature.
By zoom	On line **Width** and **Opacity** rows. Off keeps one value at every zoom. On replaces the slider with zoom stops, and the map blends between them as you zoom. It starts with two stops at the ends of the feature’s zoom range, or at zoom 4 and 14.
+ Add zoom	Adds a stop at the current map zoom, or at the next free zoom from 4, 6, 8 up to 18. Up to 8 stops. The footer shows **Map zoom** with the active panel’s zoom.

TIPS

- Click × on a stop to remove it. Going below 2 stops turns **By zoom** off and keeps the value at the current zoom.
- Fixed limits: **County Labels** 7–16, **NWS forecast areas (CWA)** 3–12, **NWS public zones** and **NWS fire weather zones** 4–16, **NWS coastal marine zones** 3–16 and **Time zone boundaries** 2–8.
- Road classes can start as low as zoom 3, so you can show Interstates on a national view.
- Typical use: thin county lines when zoomed out and thicker ones when zoomed in, or state borders that fade out as you zoom into a city.

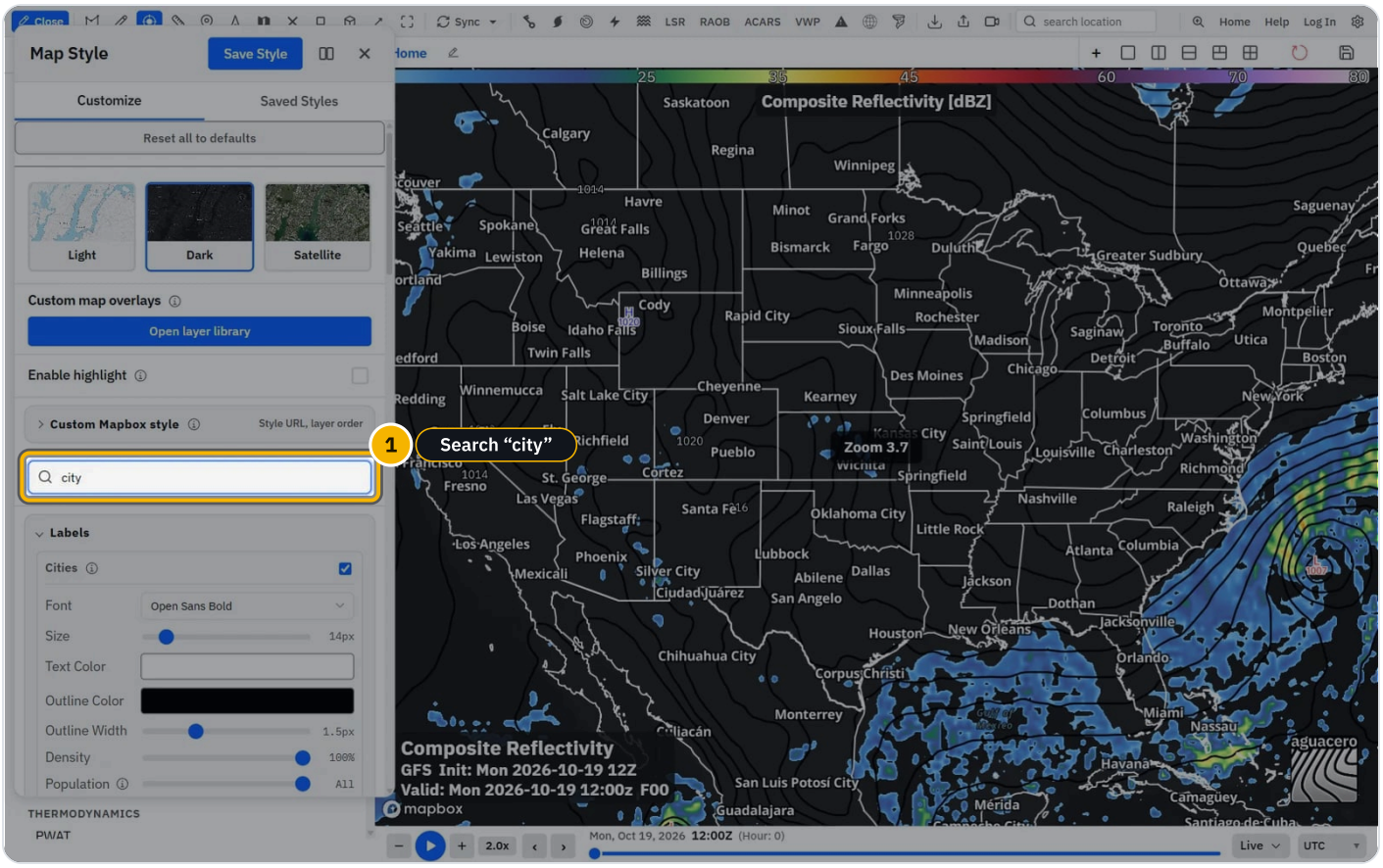
05 Style city names and city dots

Place names come in four tiers: Cities, Towns, Villages and Hamlets. Each tier has its own font, size, colors, outline, background, shadow, density, population cutoff, zoom range and dots.

The tiers follow how prominent a place is in the Mapbox map data, not its legal status. **Cities** are the most prominent places, then **Towns**. **Villages** and **Hamlets** are small places; **Hamlets** also takes suburbs, quarters and isolated dwellings. Neighborhoods stay under **Subdivision Labels**.

1. Open **Labels**, or type “city” in the search box.
2. Find **Cities**, **Towns**, **Villages** or **Hamlets**. The checkbox beside the name shows or hides that whole tier.

3. Pick a **Font** and drag **Size**.
4. Set **Text Color**, **Outline Color** and **Outline Width**.
5. Use **Density** and **Population** to control how many names show.
6. Set the tier's **Zoom range**, then tick **City dots** if you want a dot at each place.



Searching "city" opens the Labels section on the four place tiers.

PLACE TIERS	
Cities	On by default. Size 14 px, from zoom 2.
Towns	On by default. Size 12 px, from zoom 2. Takes cities that miss the **Cities** population cutoff.
Villages	On by default. Size 11 px, from zoom 9. Takes what Towns leaves.
Hamlets	On by default. Size 10 px, from zoom 11. Takes what Villages leaves.

EACH TIER'S NAME SETTINGS	
Font	Any map font, plus fonts you uploaded in **Settings** → **Fonts**. Default Open Sans Bold.
Size	6–80 px.
Text Color	Default white on Dark and Satellite, black on Light.
Outline Color	The halo around each letter. Default black on Dark and Satellite, white on Light.
Outline Width	0–5 px in steps of 0.5, default 1.5. 0 removes the halo.
Density	0–100%. Lower values add space around each name, so fewer names fit and crowded ones drop out. Defaults are close to 100%: Cities 100%, Towns 99%, Villages and Hamlets 98%.
Population	A prominence cutoff from 1 (largest metros) to 19 (all sizes). Default 19, shown as **All**. See the next section.
Text background	A box behind each name. See "Label backgrounds and drop shadows" below.
Drop shadow	A soft shadow under the text, or under the box when **Text background** is on.
Zoom range	Where the tier draws. Defaults: Cities and Towns from zoom 2, Villages from 9, Hamlets from 11.

CITY DOTS (PER TIER)	
City dots	Draws a dot at each place in the tier, with the name beside it. Off by default.
Dot color	Default white on Dark and Satellite, black on Light.
Outline Color	The ring around each dot. Default black on Dark and Satellite, white on Light.

Outline Width	0–4 px in steps of 0.25, default 1.
Size	Dot radius, 1–8 px in steps of 0.5. Defaults: Cities 3.5, Towns 3, Villages 2.5, Hamlets 2.
Name offset	The gap between the dot and the name, 0–32 px, default 4.
Drop shadow	A shadow under each dot, with **Shadow color**, **Shadow opacity**, **Shadow blur**, **Shadow distance** and **Shadow angle**.

TIPS

- Give Cities bigger dots and type than Towns for a classic TV map. Each tier keeps its own settings.
- **Hide all labels** turns off names and dots together.
- Turn on **All Caps (map labels)** for uppercase names.
- To put one font on every map label at once, open **Settings** → **Appearance**, pick a **Default font** and click **Apply**.
- Your own name markers always draw above these labels.

06 Filter places with the Population sliders

Each tier’s Population slider decides which tier a place is drawn in. A place that misses one tier’s cutoff moves down to the next tier instead of vanishing.

Mapbox doesn’t include census headcounts, so **Population** is a prominence rank: 1 is the largest metros and 19 is every size. The value beside the slider reads **All** at 19, a cutoff such as **≤5** in between, and **Rest** when it is at 19 but a tier above it has a cutoff.

How the cascade works: **Cities** picks first. At **All**, every place Mapbox calls a city draws as a city. With a cutoff, only places ranked at or under it draw as cities, and that includes prominent towns and villages, which get promoted. Whatever Cities doesn’t take passes to **Towns**, then **Villages**, then **Hamlets**, and each tier can set its own cutoff. Every place is drawn by exactly one tier.

Unticking a tier hides every place it claims. That is how you trim the map: set a cutoff on **Cities**, then untick the tiers below, and the places that missed the cutoff land in a hidden tier.

1. To show only the biggest cities, open **Labels** and find **Cities**.

2. Drag **Population** to about 5. It reads **≤5**.
3. Drag **Size** up, for example to 20 px.
4. Untick **Towns**, **Villages** and **Hamlets**.
5. Pan around. Only the most prominent places stay, all in the Cities style.

TIPS

- To give more places the city look, raise the Cities cutoff, for example to 10. Prominent towns move up into the Cities style.
- Leave a slider at **All** or **Rest** to keep whatever the tiers above didn't take.
- Population only decides the tier. Whether a name fits still depends on **Density**, the tier's **Zoom range** and the labels around it.

07 Label backgrounds and drop shadows

Put names on a rounded box with an outline, and add a soft drop shadow to text or boxes, so labels read over busy radar and satellite data.

Text background and **Drop shadow**: **Road Names**, **Country Labels**, **State Labels**, **County Labels** and the four place tiers. **Drop shadow** only: **Continent Labels**, **Airport Labels**, **Points of Interest**, **Subdivision Labels**, **Water Labels** and **Natural Feature Labels**. **Road Signs** have neither.

1. Under a label group, tick **Text background**.
2. Pick a **Background color** and drag **Background opacity**, **Background size** and **Corner radius**.
3. Leave **Background outline** on for a border around the box, and set its **Outline color** and **Outline width**.
4. Tick **Background drop shadow** and set the shadow. Without a background, the same switch reads **Drop shadow** and shades the text.

TEXT BACKGROUND

Text background	A box behind each label. Off by default.
Background color	Default black.

Background opacity	0–100% in steps of 5, default 75%.
Background size	Padding around the text, 0.5–3.0× in steps of 0.1, default 1.0×.
Corner radius	0–16 px, default 8. 0 gives square corners.
Background outline	A border around the box. On by default.
Outline color	Border color, default white.
Outline width	0–4 px in steps of 0.25, default 1.

DROP SHADOW

Drop shadow	A soft shadow under the text. Off by default. Called **Background drop shadow** when **Text background** is on, and then it shades the box.
Shadow color	Default black.
Shadow opacity	0–100% in steps of 5, default 55%.
Shadow blur	0–16 px in steps of 0.5, default 3.
Shadow distance	0–16 px in steps of 0.5, default 2.
Shadow angle	0–360° in steps of 5, default 45°. 0° casts the shadow to the right and 90° straight down.

TIPS

- With a background on, set **Outline Width** to 0 for a cleaner, TV-style label.
- The same shadow controls appear on city dots and on the highlight area’s outline.

08 Country, state, county, road and other labels

Show, hide and style every other kind of map label: continents, countries, states, counties, airports, points of interest, neighborhoods, water, natural features, road names and highway shields.

1. Open **Labels**.
2. Tick the box beside a label group to show it. **Country Labels**, **State Labels** and **County Labels** are off by default.
3. Set **Font**, **Size**, **Text Color**, **Outline Color** and **Outline Width**.
4. Set the group's **Zoom range**.

WHOLE MAP	
Hide all labels	Turns off every basemap label: road signs, place names, city dots and the rest. Untick it to go back to the switches on each group. Off by default.
All Caps (map labels)	Uppercase city, county, state, road and other place labels. Off by default.
Fade labels in and out	Labels fade as they appear and disappear while you zoom or as the map gets crowded. Turn it off for instant pop-in and pop-out. On by default.

LABEL GROUPS	
Continent Labels	On. Size 12–80 px, default 16. **Outline Width** 0–3 px, default 1.5. Drop shadow.
Country Labels	Off by default. Size 8–80 px, default 14. **Outline Width** 0–3 px, default 1. Background and drop shadow.
State Labels	Off by default. Size 8–80 px, default 12. **Outline Width** 0–5 px, default 1. Background and drop shadow.

County Labels	Off by default. Font Open Sans Regular, Size 6–24 px, default 10. **Outline Width** 0–3 px. Background and drop shadow. Draws only from zoom 7 to 16.
Airport Labels	On. Size 6–80 px, default 11. **Outline Width** 0–5 px. Drop shadow.
Points of Interest	On. Named points of interest. Size 6–80 px, default 10. **Outline Width** 0–1.5 px. Drop shadow.
Subdivision Labels	On. Neighborhood and subdivision names. Size 6–80 px, default 11. **Outline Width** 0–1.5 px. Drop shadow.
Water Labels	On. Oceans, seas, lakes and rivers. Font Open Sans Italic, Size 6–80 px, default 10. **Outline Width** 0–1.5 px. Drop shadow.
Natural Feature Labels	On. Names of natural features such as mountains. Font Open Sans Italic, Size 6–80 px, default 10. **Outline Width** 0–1.5 px. Drop shadow.
Road Names	Street and highway names along the road. On (off on Satellite). **Size** is a multiplier, 0.5–5× in steps of 0.1, default 1×. **Outline Width** 0–5 px. **Density** default 99%. Background and drop shadow.
Road Signs	Highway shields. On (off on Satellite). **Size** 0.5–5×, default 1×. **Density** default 80%. No font or color controls.
Sign types	Under **Road Signs**: **Interstates**, **U.S. Highways**, **State Routes**, **Other** and **Exits**. Untick any you don't want. All on by default.

TIPS

- Every group except **Road Signs** has a **Font** picker, and every group has its own **Zoom range**.
- Lower **Density** on **Road Signs** to space shields out on busy interstates.
- With a custom Mapbox style loaded, the **Labels** section is gone. **Fade labels in and out**, **County Labels** and **All Caps** move under **Overlays**; the style's other labels come from Mapbox Studio.

09 Draw borders, counties, CWAs and NWS zones

Country, state and county borders come with the basemap. NWS forecast areas, public, fire weather and marine zones, and time zone lines are overlays that also draw on a custom Mapbox style.

1. Open **Boundaries** for country, state and county lines, or **Overlays** for NWS and time zone lines.
2. Tick the box beside a boundary to show it.
3. Pick a **Color** and a **Line Type**: **Solid**, **Dashed** or **Dotted**.
4. Drag **Width** and **Opacity**, or tick **By zoom** to change them with zoom.
5. Set a **Zoom range** if the lines should only show at some zooms.

BOUNDARIES SECTION	
Country Borders	On by default. **Width** 0.5–5 px in steps of 0.5, default 1.5. White on Dark, black on Light and Satellite.
State Borders	On by default. **Width** 0.5–3 px in steps of 0.5, default 1.5.
County Borders	On by default. **Width** 0.1–3 px in steps of 0.1, default 1.2. Gray.
Color	The line color. Click the swatch to open the color picker.
Line Type	**Solid** (default), **Dashed** or **Dotted**.
Opacity	0–100% in steps of 5, default 100%.

OVERLAYS SECTION	
NWS forecast areas (CWA)	County Warning Area outlines from NOAA, one per NWS Weather Forecast Office. Off by default. **Width** 0.5–4 px, default 1.2. Purple. Zoom 3–12.
NWS public zones	NWS public forecast zones. They match counties in much of the country and split large counties, Alaska boroughs and census areas in the West and Alaska. Off by default. **Width** default 1. Zoom 4–16.

NWS fire weather zones	Fire weather forecast zones, used for planning forecasts and fire weather warnings. Often finer than counties in the West. Off by default. Zoom 4–16.
NWS coastal marine zones	Coastal and Great Lakes marine zones, including Alaska and Hawaii. Off by default. **Width** default 1.2. Zoom 3–16.
Time zone boundaries	Lines where two current time zones meet. Coastlines aren't drawn. Off by default. **Width** default 1.2. Zoom 2–8.

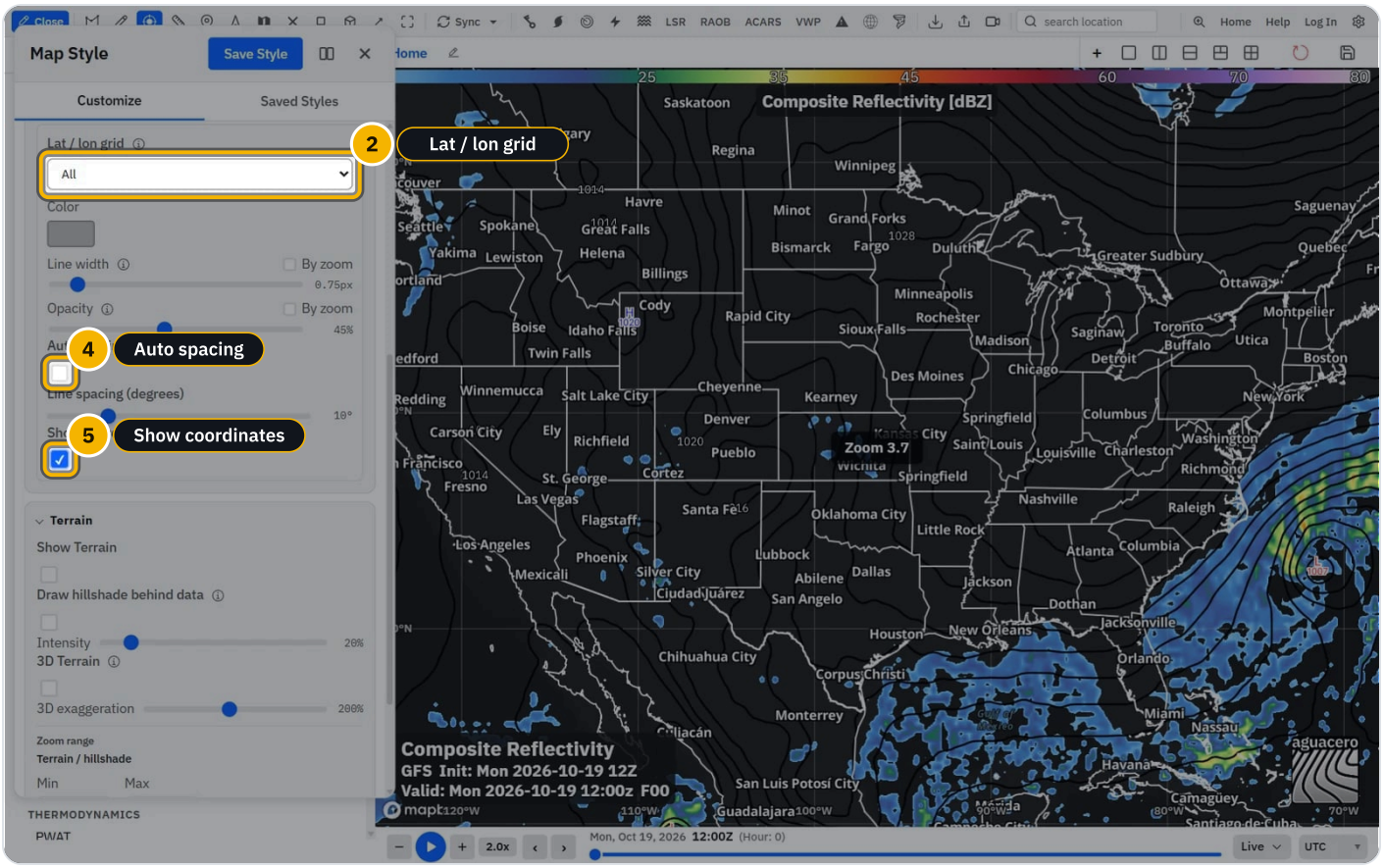
TIPS

- Overlay lines take **Width** from 0.5 to 4 px in steps of 0.1 and have the same **Color**, **Line Type**, **Opacity** and **Zoom range** controls.
- Dashed county lines under solid, thicker state lines read well on TV maps.
- To dim everything outside a state or a group of counties, use **Enable highlight** instead.

10 Add a lat/lon grid, edge coordinates and day/night shading

Draw meridians and parallels with coordinates along the edges, like a tropical chart, and shade the night side of the Earth.

1. Open **Overlays**, or type "grid" in the search box.
2. Set **Lat / lon grid** to **All** or **Ocean only**.
3. Pick a **Color** and drag **Line width** and **Opacity**.
4. Leave **Auto spacing (zoom)** on, or untick it and set **Line spacing (degrees)**.
5. Tick **Show coordinates** to label the map edges.
6. For day and night, tick **Day / night cycle** and set **Night intensity**.



The lat/lon grid controls in the Overlays section.

LAT / LON GRID	
Lat / lon grid	**Off** (default), **All** for lines over land and water, or **Ocean only** to hide the lines where they cross land.
Color	Default light gray on Dark, gray on Light, white on Satellite.
Line width	0.25–6 px in steps of 0.25, default 0.75. Has **By zoom**.
Opacity	Default 45% on Dark, 50% on Light, 35% on Satellite. Has **By zoom**.
Auto spacing (zoom)	On by default. Adds lines as you zoom in and removes them as you zoom out, so the grid stays readable.
Line spacing (degrees)	Shown when **Auto spacing (zoom)** is off. 0.5–45° in steps of 0.5, default 10°.

Show coordinates	Shown while the grid is on. Labels latitude along the left edge and longitude along the bottom edge, for example 30°N and 165°W. Off by default.

DAY / NIGHT	
Day / night cycle	Shades the night side of the Earth, darkening through twilight into night. It follows the time slider while a forecast or radar loop is showing; otherwise it uses the current time. Off by default.
Night intensity	15–100% in steps of 5, default 75%.
Map only	On puts the shading under radar, satellite, model and other data, so only the basemap darkens. Off covers the whole map, data included. Off by default.

11 Style roads, railroads and airports

Turn road classes on or off one at a time, from Interstates down to alleys, and give each its own color, width, opacity, casing and zoom range.

1. Open **Transportation**, or type “road” in the search box.
2. Leave **Roads** ticked; it is the master switch for every road class.
3. Under **Road styles**, use each class’s color swatch and checkbox.
4. Set **Width** and **Opacity**, and tick **Outline** for a casing along both sides.
5. Set a **Zoom range** per class.

ROAD STYLES	
Roads	Shows or hides every road class at once. On by default.
Interstates	Motorways. From zoom 5 by default.
Major Highways	Trunk roads. From zoom 5.

State Highways	Primary roads. From zoom 6.
County & Regional	Secondary roads. From zoom 8.
Local (Paved)	Paved tertiary roads. From zoom 10.
Local (Unpaved)	Unpaved tertiary roads. From zoom 13.
Residential & Minor	Streets. From zoom 11.
Alleys & Service	Minor and service roads. From zoom 14.
Width	0.1–4 px in steps of 0.1. Default 0.5 on Dark and Satellite, 0.7 on Light. Has **By zoom**.
Opacity	0–100%, default 100%. Has **By zoom**.
Outline	A casing along each side of the road. Off by default.
Outline color	Casing color, default black.
Outline width	0.2–4 px in steps of 0.1, default 1.0.

RAILROADS AND AIRPORTS

Airports	Airport runways. On by default. **Color**, **Width** 0.1–5 px (default 0.6 on Dark and Satellite, 0.7 on Light) and **Zoom range**. No opacity control.
Railroads	On by default. **Color**, **Width** 0.1–5 px (default 0.7 on Dark, 0.8 on Light and Satellite), **Opacity** and **Zoom range**.

TIPS

- A broadcast basemap often keeps only **Interstates** and **Major Highways**, a little brighter than the land.
- Road names and highway shields are under **Labels** → **Road Names** and **Road Signs**.

12 Land, water, buildings and terrain

Recolor land and water, clip data at the coastline, add parks and 3D buildings, and shade the terrain or raise it in 3D.

1. Open **Land & Water** and set **Land Color** and **Water Color**.
2. To clip a field at the coast, tick **Put Ocean Over Added Layers** or **Put Land Over Added Layers**, then choose what it covers under **Apply overlay to**.
3. Open **Terrain** and tick **Show Terrain** for hillshade, or **3D Terrain** for raised mountains.
4. Tilt the map to see 3D terrain and 3D buildings.

LAND & WATER	
Land Color	Hidden on the Satellite basemap. Default dark gray on Dark, light gray on Light.
Water Color	Oceans, lakes and other water areas.
Put Ocean Over Added Layers	Draws ocean water on top of your weather layers, so data over water is cut off at the coastline. Off by default. Turning it on turns off the land option.
Put Land Over Added Layers	Draws land on top of your weather layers, so ocean-only data such as sea-surface temperature shows only over water. Off by default. Only one of the two can be on.
Apply overlay to	Shown while one of the two is on. Which data the ocean or land covers: **Fill** (default; model and satellite color fields), **Line / contours**, **Point values**, **Wind barbs**, **Grid raster** and **Satellite**. One always stays ticked. With **Point values** ticked, readouts are hidden on the covered side of the coastline.

Plot as normal	Products that ignore the overlay and stack as usual, for example radar over the ocean while temperatures stay under it. Type to search model, MRMS, RTMA, satellite, NEXRAD, NOAA or Nadocast products, click to add, and click a chip to remove it. NOAA data also keeps NWS watches, warnings and advisories above the overlay.
Show Water Depth	Depth shading in oceans and lakes. On by default, with **Water Depth Color** and a **Zoom range**.
National Parks	Park areas. On (off on Satellite), with **Color** and **Zoom range**.
Building Footprints	Flat building outlines when zoomed in. On for Light and Dark, off for Satellite, with **Color**.
3D Buildings	Raised buildings, easiest to see with the map tilted. They appear from zoom 15 and stay off on the globe below zoom 6. Footprints hide while 3D is on. City names stay, but hide behind walls when you are zoomed in and tilted. Off by default.
3D height	25–400% in steps of 25, default 100%.

TERRAIN	
Show Terrain	Hillshade relief. Off by default, so elevation tiles only download once you turn it on.
Draw hillshade behind data	Off by default, which paints hillshade on top of models, radar and satellite. On keeps it visible but under them.
Intensity	10–100% in steps of 10. Default 20% (15% on Light).
3D Terrain	Raises the map with elevation so mountains and valleys show when you tilt. Weather fills and radar drape onto the surface. On the globe it turns on at zoom 6, when the view flattens. Off by default.
3D exaggeration	25–400% in steps of 25, default 200%.

Zoom range	Where the hillshade draws.
Shadow Color	Color of slopes facing away from the light.
Highlight Color	Color of slopes facing the light.
Accent Color	Color that picks out rugged terrain such as cliffs and gorges.

SHORTCUTS

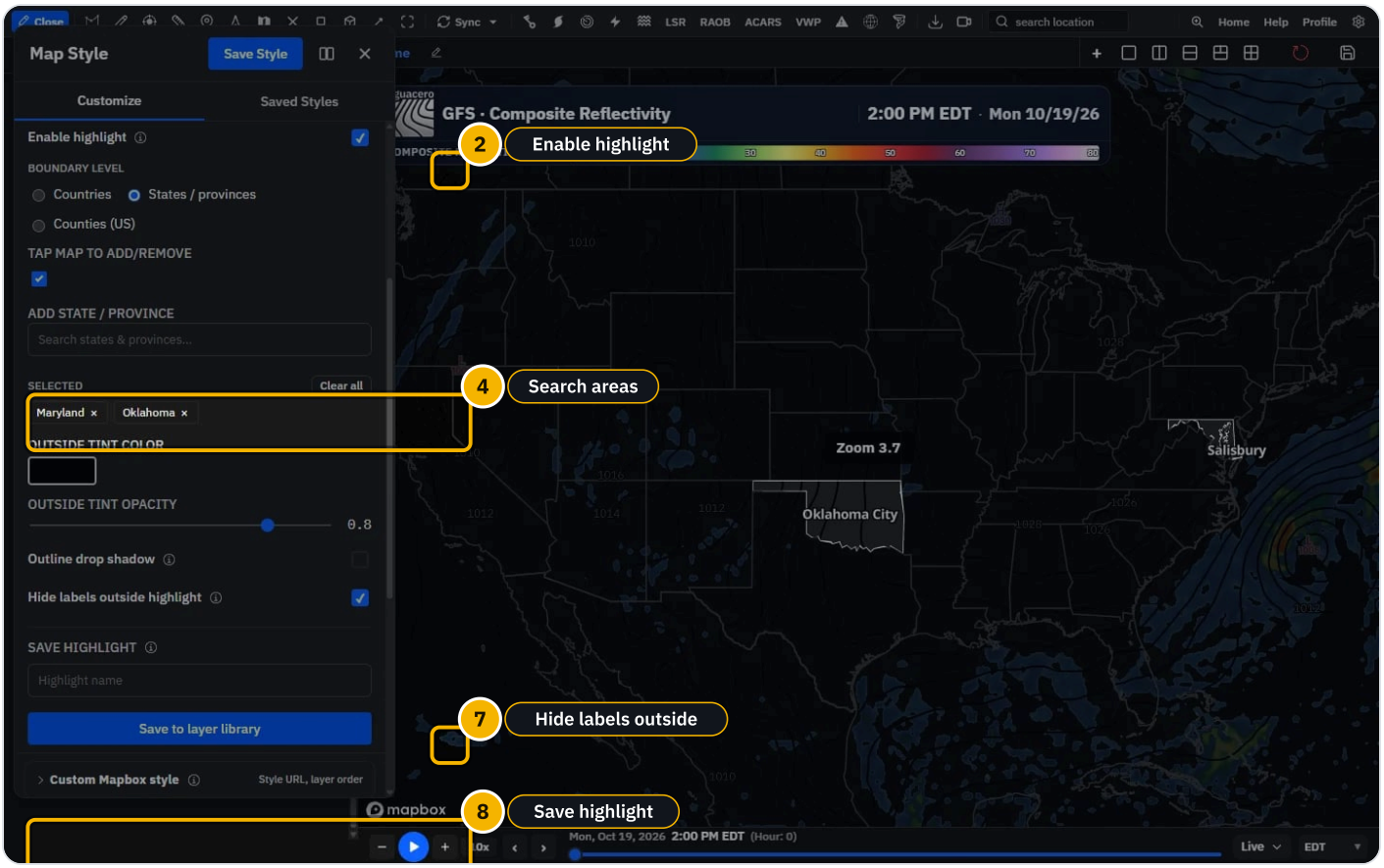
Right-click + drag	Tilt the map to see 3D terrain and buildings
Two-finger drag	Tilt the map on a touch screen

Land & Water, **Transportation**, **Boundaries**, **Water Features**, **Labels** and **Terrain** only show for the Light, Dark and Satellite basemaps. With a custom Mapbox style, those parts of the map come from your style.

13 Highlight an area and dim the rest PROFESSIONAL

Pick countries, states and provinces, or US counties to keep clear, tint everything outside them, data included, add a drop shadow along the edge, and hide labels outside.

1. Click the **Map style** button on the toolbar.
2. Tick **Enable highlight**. **Tap map to add/remove** turns on with it.
3. Under **Boundary level**, choose **Countries**, **States / provinces** or **Counties (US)**.
4. Click areas on the map to add them, and click again to remove them. Or type a name in the search field and click a match.
5. Set **Outside tint color** and **Outside tint opacity**.
6. Tick **Outline drop shadow** for a shadow along the edge.
7. Tick **Hide labels outside highlight** to drop names, markers and readouts outside the area.
8. Type a name under **Save highlight** and click **Save to layer library** to reuse it.



Highlight area controls with Oklahoma selected.

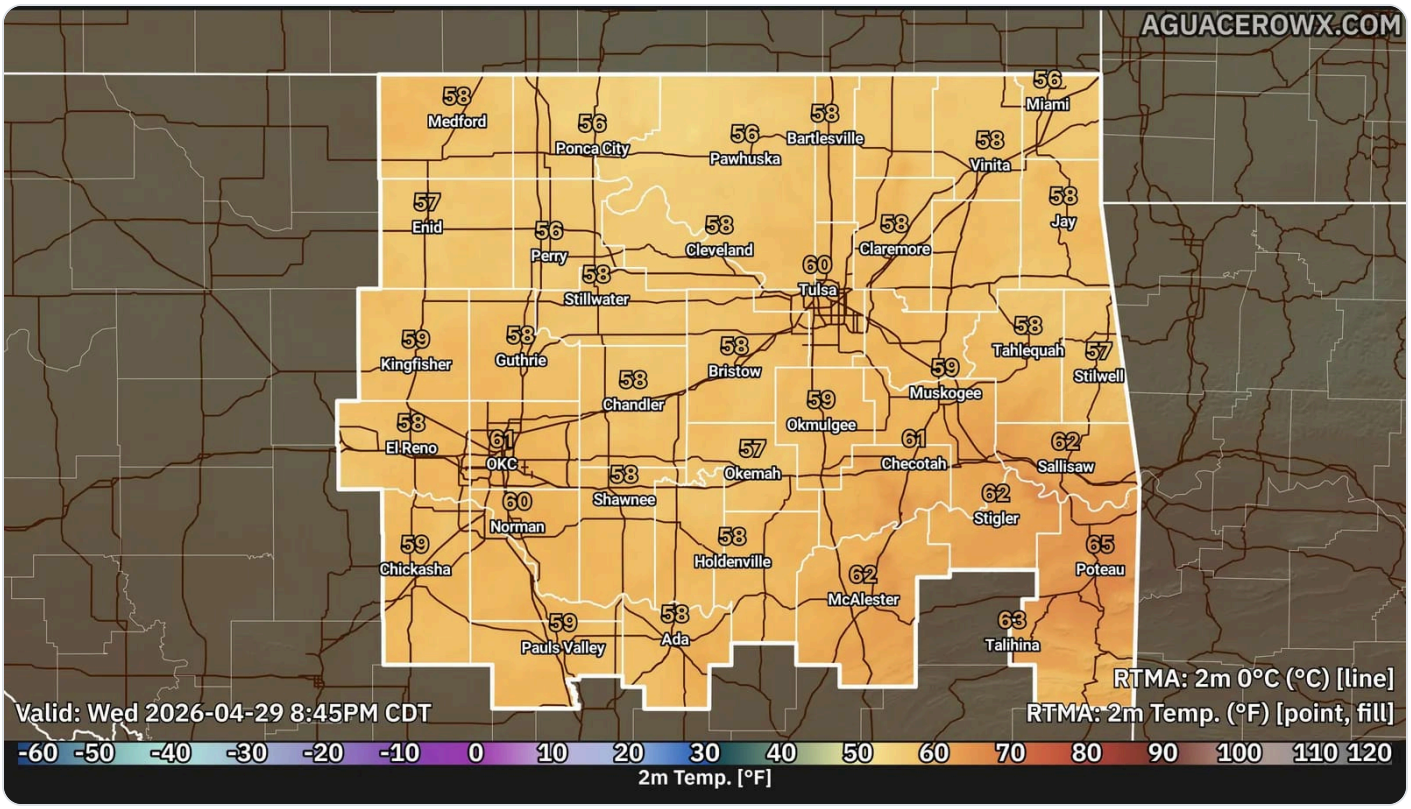
HIGHLIGHT AREA	
Enable highlight	Turns the highlight on. Off by default.
Boundary level	**Countries**; **States / provinces** (default), which covers US states, Canadian provinces, Mexican states and first-level regions worldwide; or **Counties (US)**. Changing the level clears your selection.
Tap map to add/remove	While it is on and the Map Style window is open, clicking the map adds or removes the area under the pointer, and map clicks don't open popups. Closing the window stops picking; the highlight stays.
Add state / province	Search by name and click a match to add it. Reads **Add country** or **Add county** for the other levels. Shows up to 80 matches. Counties read like "Autauga, AL" and provinces like "Ontario, Canada".

Selected	One chip per area; click × to remove it. Removing the last area turns the highlight off.
Clear all	Removes every area and turns off the highlight and picking.
Outside tint color	The color laid over everything outside. Default black.
Outside tint opacity	0–1 in steps of 0.05, default 0.5. 1 hides everything outside.
Outline drop shadow	A soft shadow along the edge of the highlight. Off by default. Then **Shadow color** (black), **Shadow opacity** (0–100%, 55%), **Shadow blur** (0–16 px, 3), **Shadow distance** (0–16 px, 2) and **Shadow angle** (0–360°, 45°).
Hide labels outside highlight	Removes city labels, road signs, points of interest, name markers and point readouts outside the area. Street names stay. Pinned readouts and feature popups are always hidden outside while the highlight is on. Off by default.
Save highlight	Type a name, then click **Save to layer library**. Available once the highlight is on with at least one area. The preset is listed in your layer library with a **Highlight** badge.

Professional and above, signed in. On other plans, ticking **Enable highlight** opens an upgrade dialog.

TIPS

- To bring back a saved highlight, click **Open layer library** under **Custom map overlays** and click **Load** on it. Its areas, tint, shadow and **Hide labels outside highlight** setting come back as saved.
- To make a highlight part of one bundle instead of your map, add the saved preset with **Add Layer** → **Custom Layer** in that bundle.
- Scene steps can switch highlights as a scene plays.



RTMA 2 m temperature with Oklahoma highlighted and county values plotted.

14 Add your own shapes: custom map overlays PROFESSIONAL

Upload GeoJSON or shapefiles, or link to a file that keeps changing, and draw them as part of the map so they show under every bundle.

You can use a custom layer in two places. Added under **Custom map overlays** here, it becomes part of your map style and shows on every bundle and panel until you remove it. Added with **Add Layer** → **Custom Layer** in the sidebar, it belongs to that bundle. Both use the same layer library.

1. Under **Custom map overlays**, click **Open layer library** (**Add from layer library** once you have overlays). The **Custom layer library** opens.
2. On **Upload file**, drop a file on the box or click it to choose one.
3. Or open **Live link**, paste the file's URL and click **Continue**.
4. Type a name under **Name this layer**. For a live link, choose how often to **Download again**.
5. Click **Save & Load**. **Save** only adds it to your library.
6. Back in the Map Style window, pick it under **Active overlay** and style it.

CUSTOM LAYER LIBRARY	
Upload file	GeoJSON (.geojson or .json), a zipped shapefile (.zip), a .shp selected together with its .dbf (and .prj), or a placefile (.txt, .plr). Up to 50 MB.
Live link	A link to GeoJSON, a zipped shapefile or a GRLevelX placefile. The layer downloads it again on a schedule, so it stays current without re-uploading.
Watch file	Desktop app only. Click **Choose file...** and pick a GeoJSON or shapefile on your computer. When you save changes to the file, the layer updates on the map and its library copy updates for your other devices and shared bundles.
Download again	For live links: every 1, 2, 5 (default), 10, 15 or 30 minutes, or every hour.
Save & Load	Saves to your library and puts the layer on the map. **Save** only saves it; **Back** returns to the upload step.
Save map highlight preset	Saves your current highlight area as a reusable layer, with **Save** and **Save & load**.
Saved layers	Everything in your library, with **Highlight**, **Placefile** and **Live** badges. Click **Load** to add one, or the pencil and trash icons to rename or delete it.

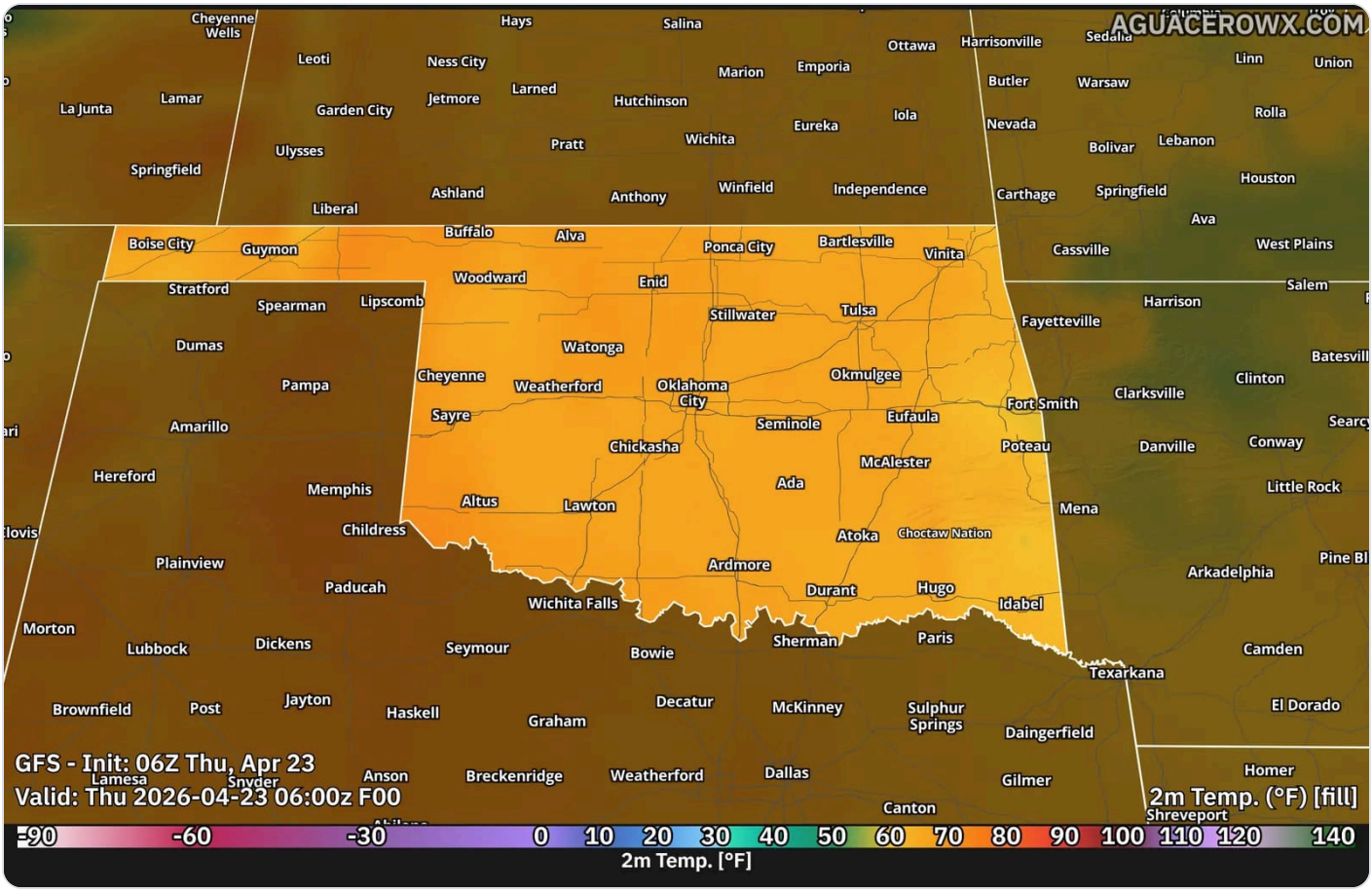
OVERLAY SETTINGS IN THE MAP STYLE WINDOW	
Active overlay	Which overlay the controls below edit. The newest overlay is listed first.
Remove selected	Takes the selected overlay off the map style. It stays in your library.
Show fill shading	Fills polygons. On by default.
Show outline	Draws the shape edges. On by default.

Show shapefile labels	Writes an attribute value on each shape, for example zone numbers. Greyed out when the file has no attribute fields.
Label field	The attribute to print.
Label size	8–32, default 14.
Label color	Default white.
Label halo	A halo around the label text. On by default, with **Halo color**.
Fill over other fill layers	Off keeps this overlay’s fill under model, radar and satellite fills. On draws it above them. Outlines always draw above the fill. Off by default.
Zoom range	**Min** and **Max** from 0 to 24, whole numbers. Default 0–24.
Enable Reverse Mask	Dims everything outside the shape, with **Mask Color** (default black), **Mask Opacity** (0–1, default 0.5) and **Hide labels outside shape**, which removes city labels, points of interest, name markers and readouts outside it.
Fill	Tab with **Color** and **Opacity** (5–100%). Shown while fill shading is on.
Line	Tab with **Color**, **Width** (0.1–10) and **Line Style**: **Solid**, **Dashed**, **Dotted** or **Dash-Dot**. Shown while the outline is on.
Color mode	Shown when the file carries its own colors, such as “fill” and “stroke” properties in GeoJSON. **From file** keeps them, with a color per group; **Single color** uses one color.

Professional and above, signed in. Custom layers draw polygons and lines. An upload with point features fails with “Point data detected. Please use the Marker Manager on the toolbar for point datasets.” On live links, points are skipped and counted. KML isn’t supported; convert it to GeoJSON first.

TIPS

- Shapefiles in other coordinate systems are reprojected from their .prj file. Without the .dbf there are no attribute fields, so labels aren’t available.
- A live overlay shows its link or watched file, its status and **Refresh now** (or **Check now**), and a **Refresh** menu for the interval.
- Rename or delete library files any time in **Settings** → **Custom layers**.
- Public styles never include your custom overlays.
- In a bundle, custom layers don’t count toward the limit of 8 data layers.



GFS 2 m temperature with a custom Oklahoma layer.

15 Load placefiles PROFESSIONAL

Load GRLevelX-style placefiles, such as spotter feeds, from a file or a live URL, on the map style or in a bundle.

1. Open the layer library: **Open layer library** under **Custom map overlays**, or **Add Layer** → **Custom Layer** in a bundle.
2. Upload a .txt or .plr file on **Upload file**, or paste the placefile URL on **Live link** and click **Continue**.
3. Check the summary under the name, for example the number of icons, labels, lines and shapes and how often it refreshes.
4. Name it and click **Save & Load**.
5. Pick it under **Active overlay** (or click **Edit Layer** on its bundle row) and set its look.

PLACEFILE SETTINGS	
Live placefile	Or **Static placefile** for an uploaded file. Shows the placefile's title, its URL, the item count, when it last updated and how often it refreshes.
Refresh now	Downloads a live placefile again right away.
Show placefile	Map Style only; in a bundle use the row's visibility toggle. On by default.
Opacity	0–100% in steps of 5, default 100%.
Icon size	25–300% in steps of 5, default 100%.
Text size	25–300% in steps of 5, default 100%.
Show icons	On by default.
Show text	On by default.
Show lines, polygons & images	On by default.

Use placefile zoom thresholds	Placefiles can hide items until you zoom in (their Threshold: lines, in nautical miles across the view). GRLevelX applies that around one radar; on a national map most items would disappear, so it is off by default.
Refresh	Live placefiles only. **Placefile default** uses the file's own refresh time; or pick every 15 s, 30 s, 1 min, 2 min, 5 min or 10 min.
Zoom range	Minimum and maximum zoom, 0–24.

TIPS

- Placefile servers that pick data by location get the current map center, the way GRLevelX sends its radar site.
- Timestamps in a placefile's title are dropped from the suggested name.
- Saved placefiles carry a **Placefile** badge in the library.
- "File does not look like a valid GR Placefile." means the upload isn't a placefile; "No drawable items were found in this placefile." means it parsed but had nothing to draw.

16 Use your own Mapbox style PROFESSIONAL

Load a style you designed in Mapbox Studio as the basemap, and choose where your weather layers slot into it.

1. In Mapbox Studio, copy your style URL. It starts with mapbox://styles/ or https://api.mapbox.com/styles/v1/.
2. In the Map Style window, open **Custom Mapbox style** and paste the URL.
3. If the style is private or uses your own tilesets, add a **Mapbox access token**.
4. Click **Load style**. The app reads the style's layers, fills in the anchors and switches the map.
5. If data draws above labels or under the land, change the anchors below.
6. Click **Save Style** to keep it in a named style.

CUSTOM MAPBOX STYLE	
Custom Mapbox style	The style URL, for example mapbox://styles/yourname/styleid.
Mapbox access token	Optional. Prefer a public pk. token or a temporary one. A secret sk. token stays in this browser session only and is never saved to your account. A pk. token is saved with the style, and the style must then stay private.
Load style	Appears after you type a new URL. Reads the style's layer list and applies it.
Fills / rasters insert before	Model fills, radar and satellite draw directly under this style layer. Picked for you on load. Greyed out while ocean or land over layers is on.
Lines / symbols insert before	Contours, barbs and point values draw directly under this layer. Greyed out the same way.
Ocean layer id	The style's water layer, used by **Put ocean over layers**.
Land layer id	The style's land or landcover layer, used by **Put land over layers**. Guessed for you when possible.
Put ocean over layers	Draws ocean water on top of weather layers so data over water is clipped by the coastline. Only one of the two can be on.
Put land over layers	Draws land on top of weather layers so data over land is clipped, for sea-surface fields.
Apply overlay to	Which data the ocean or land covers, as in **Land & Water**.
Plot as normal	Products that ignore the ocean or land overlay, as in **Land & Water**.
City label layers (point / barb readouts)	Which style layers hold place names, for point and barb readouts plotted at cities. Filled in from the style when possible; pick one or more.
Clear custom style	Removes the custom style and goes back to the Light, Dark or Satellite basemap.

SHORTCUTS

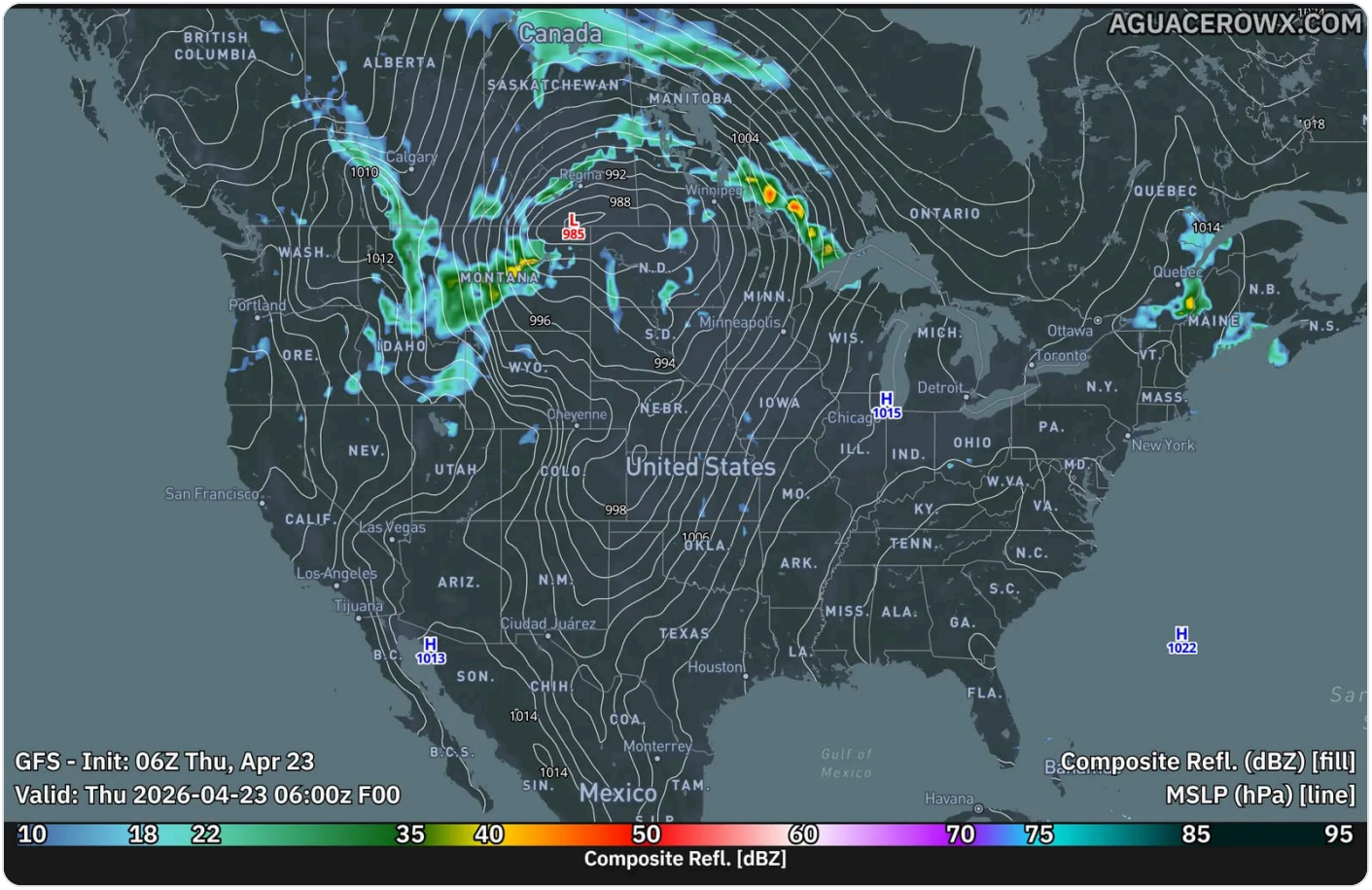
`Enter` or `,`	Add the typed layer id in a multi-select list
`Backspace`	Remove the last chip when the field is empty
`Esc`	Close the layer id list

Mapbox Standard styles (mapbox://styles/mapbox/standard and standard-satellite) are built from slots, so the anchor lists offer only roads for fills and poi-label for lines.

Professional and above, signed in. Map loads are billed to the token’s Mapbox account, which is why a style with a pk. token can’t be public. Only styles in Mercator, Globe or Lambert conformal conic projection work under weather overlays; others show “This style uses the … projection.”

TIPS

- While a custom style is on, the preset basemap cards are dimmed. Click one to leave the custom style.
- On top of a custom style, your custom map overlays, the highlight area, **Overlays** and **Globe** still apply. Land, roads, borders, labels and terrain come from your style.
- “Style request failed (401)” or “(403)” usually means the style is private and needs your token.



GFS reflectivity and pressure on a custom Mapbox basemap.

17 Save, load and share map styles

Keep named versions of your map, switch between them, star favorites, and find other users' public styles.

1. Click **Save Style** at the top of the window.
2. If you loaded one of your own styles, choose **Update existing** or **Save as new** under **Save destination**.
3. Type a **Style Name**.
4. Tick **Private map style?** to keep it to yourself. New styles start public.
5. Click **Save Style** (or **Update Style**).
6. Later, open **Saved Styles**, pick **My**, **Favorites** or **Advanced**, and click **Load** on a style. The window returns to **Customize**.

SAVE DIALOG	
Save destination	Shown after you load one of your own styles. **Update existing** replaces it and doesn't use a new save slot; **Save as new** keeps the original.
Style Name	Required. `Enter` saves.
Private map style?	Off for a new style, so it is public and others can find and load it. On keeps it to you. Locked on when the style includes a Mapbox access token.
Copy share link	Shown when you update a public style. Copies a link to it; recipients must be signed in.

SAVED STYLES TAB	
My	Your styles, newest first, each with a **Private** or **Public** badge.
Favorites	Styles you starred, yours or other users'.
Advanced	Search Public Styles: fill in **Style name**, **Username** or both and click **Search** (`Enter` works too). Your own styles are left out.
Search saved styles	The search box on **My** and **Favorites**. Matches the style name, basemap, custom style URL or author.
Add to favorites	The star on each row. Click again to remove it.
Load	Replaces your current map with the style. Greyed out when the style needs a plan you don't have.
Delete this style	The trash icon on your own styles. Asks you to confirm; it can't be undone.
Copy map style link	Right-click a row. Private styles show **Make public to copy share link** instead.

Saving needs an account. Free saves 1 map style; at the limit, **Save Style** opens an upgrade dialog unless you are updating a style you loaded. Enthusiast and up save as many as you like. A style with a custom Mapbox style, custom overlays or a highlight area needs Professional to load.

TIPS

- Other users' public styles never bring their custom overlays; the row says "Custom overlays not included".
- **Reset all to defaults** forgets which style you loaded, so the next save is a new style.

18 Where your map style is saved

Your current map is an account setting. Saved styles, bundles, workflows and scene steps can each carry their own copy.

Your current map: signed in, your map saves to your account as you go: sliders when you let go, colors when the color picker closes, and everything again when you close the window. It loads on your other devices. Signed out, nothing is saved, and a reload brings back the Dark defaults.

Saved styles: named snapshots on the **Saved Styles** tab. Loading one replaces your current map, and that becomes your new current map.

Bundles and workflows: when you save a bundle with **Include map (basemap, customizations, custom Mapbox style)** on, opening that bundle applies its map. Workflows have the same switch, **Include map (basemap, customizations, custom Mapbox style) in this workflow**. Both are off by default, and then the bundle or workflow leaves your map alone.

Scenes: a scene step can switch to one of your saved map styles, and can apply custom overlays and highlights as it plays.

Boards, panels and layouts don't store a map style. Every panel draws the same map.

TIPS

- Switching between Light, Dark and Satellite resets most settings to that basemap's defaults. Save a style before you switch.
- Secret sk. Mapbox tokens stay in the browser session and must be entered again in a new session.

19 Recipe: a clean broadcast basemap with big city names and county outlines

A dark, uncluttered map with large uppercase city names on dots, bold state lines and soft county outlines, ready for radar or a forecast field.

1. Open **Map style** and click the **Dark** basemap card.
2. In **Transportation**, untick every class under **Road styles** except **Interstates**, and untick **Railroads** and **Airports**.
3. In **Labels**, untick **Road Signs**, **Road Names**, **Points of Interest**, **Airport Labels** and **Subdivision Labels**, and tick **All Caps (map labels)**.
4. In **Cities**, set **Population** to about 6, **Size** to 20 and **Outline Width** to 2, then tick **City dots** with **Size** 4 and **Name offset** 6.
5. Untick **Villages** and **Hamlets**. Leave **Towns** on with **Size** 13 for smaller places, or untick it for the biggest cities only.
6. For a box behind each city name, tick **Text background** under **Cities**, set **Background opacity** to 60% and **Outline Width** to 0.
7. In **Boundaries**, set **State Borders Width** to 2.5. Leave **County Borders** on, set its **Opacity** to 50% and **Line Type** to **Dashed**.
8. Tick **County Labels** if you will zoom in to zoom 7 or closer.
9. Click **Save Style**, name it, for example “Broadcast Dark”, and save.

TIPS

- Turn on **By zoom** for **County Borders Width**: 0.5 at zoom 5 and 1.5 at zoom 9 keeps the regional view clean.
- Add **NWS forecast areas (CWA)** in **Overlays** for a forecast-office view.
- Save your bundle with **Include map (basemap, customizations, custom Mapbox style)** to tie this look to it.

20 Recipe: highlight your viewing area and dim the rest PROFESSIONAL

Keep your market's counties bright, darken everything else, and plot city names and readouts only inside the area.

1. Open **Map style** and tick **Enable highlight**.
2. Under **Boundary level**, choose **Counties (US)**.
3. Click each county in your viewing area on the map, or type county names in the **Add county** field.
4. Leave **Outside tint color** black and set **Outside tint opacity** to 0.65.
5. Tick **Outline drop shadow** and set **Shadow blur** to 6 and **Shadow distance** to 3 so the area lifts off the map.
6. Tick **Hide labels outside highlight**.
7. Under **Save highlight**, type "Viewing area" and click **Save to layer library**.
8. Close the window to stop picking, then load your data. Readouts and city names only show inside the area.
9. Click **Save Style** to keep the whole look as a named style.

TIPS

- Turn on **County Borders** with a light color so the counties inside the area stay readable.
- For a state-wide view, choose **States / provinces** instead and click the state.
- Use a scene to switch between saved highlights for different regions.

21 Recipe: a tropical chart with lat/lon edge labels

A dark ocean chart with a 5° grid over water, coordinates along the edges and capitalized country names, for hurricane tracks and sea-surface data.

1. Open **Map style** and click **Dark**.
2. In **Overlays**, set **Lat / lon grid** to **Ocean only**.
3. Untick **Auto spacing (zoom)** and set **Line spacing (degrees)** to 5°.
4. Set the grid **Color** to white, **Line width** to 0.5 and **Opacity** to 35%.

5. Tick **Show coordinates**. Latitudes appear on the left edge and longitudes along the bottom.
6. In **Land & Water**, set **Water Color** to a deep navy and **Land Color** to a dark gray.
7. In **Labels**, tick **Country Labels** and **All Caps (map labels)**, and untick **Road Signs**, **Road Names** and **Points of Interest**.
8. Click **Save Style** and name it, for example “Tropical Chart”.

TIPS

- For sea-surface temperature, tick **Put Land Over Added Layers** so the field stops at the coast.
- Add **NWS coastal marine zones** in **Overlays** for a marine forecast view.
- Turn on **Day / night cycle** with **Map only** to see where it is night without darkening the data.

22 Common questions

Answers to the questions we hear most about map styles, city labels, highlights and custom layers.

Why isn’t a city showing?

Check, in order: that its tier (**Cities**, **Towns**, **Villages** or **Hamlets**) is ticked; that you are inside the tier’s **Zoom range** (Villages start at zoom 9 and Hamlets at 11); that a **Population** cutoff hasn’t moved it into a tier you turned off; that **Density** isn’t too low; and that **Hide all labels** and **Hide labels outside highlight** are off. On a custom Mapbox style, city labels come from your style.

Why do labels overlap, disappear or flicker as I zoom?

Map labels avoid each other, so a name drops out when it would collide with another label or a shield. Raise **Density** on the tier or group you care about, lower it on the others, or turn off groups you don’t need, such as **Road Signs** and **Points of Interest**. Untick **Fade labels in and out** if you want labels to pop in and out instead of fading.

Why won’t it let me set a lower minimum zoom?

The basemap only has data for each feature from a certain zoom, and the **Zoom range** can’t go below it. A message tells you the lowest zoom allowed. County names, for example, start at zoom 7, and NWS public zones at zoom 4. Road classes can go down to zoom 3.

I switched to Light or Satellite and lost my changes. Why?

Each basemap card loads that basemap's defaults for labels, borders, roads, water, terrain and overlays. Only custom overlays, the highlight area, the satellite imagery sliders and the projection carry over. Load a saved style to get your look back.

Why didn't my style save?

Signed out, nothing is saved and a reload resets the map. Signed in, your current map saves on its own, but a named style needs **Save Style**. On Free you can keep 1 named style; delete it or update it instead of saving a new one. A style with a custom Mapbox style needs Professional. If the server rejects the save, an error says it could not save the map style; try again.

My map changed when I opened a bundle. Why?

That bundle (or workflow) was saved with **Include map (basemap, customizations, custom Mapbox style)** on, so it brings its own basemap and settings. Load your saved style again, or re-save the bundle with the switch off.

How do map styles relate to bundles, boards and layouts?

One map style covers the whole app: every board and panel draws it, and layouts don't store one. A bundle or workflow can carry a map if you save it with **Include map (basemap, customizations, custom Mapbox style)** on, and a scene step can switch to a saved style.

Why does Enable highlight, Custom Mapbox style or Open layer library show an upgrade dialog?

Highlight areas, custom overlays, placefiles and custom Mapbox styles are Professional features. Everything else in the window works on every plan.

Why don't I see Land & Water, Labels or Terrain?

A custom Mapbox style is loaded, so those come from your style; only **Overlays** and **Globe** apply. Click a basemap card or **Clear custom style** to get them back. Also, **Satellite imagery** shows only on the Satellite basemap, **Land Color** is hidden on Satellite, and **Globe** shows only in Globe projection. If you typed in the search box, clear it.

Clicking the map doesn’t open popups while the Map Style window is open. Why?

Tap map to add/remove is on, so clicks add or remove highlight areas. Untick it, or close the window.

What files can I upload as a custom layer?

GeoJSON (.geojson or .json), a zipped shapefile, a .shp with its .dbf (and .prj), or a GRLevelX placefile (.txt or .plr), up to 50 MB. Shapes must be polygons or lines; for points, use name markers. KML isn’t supported.

Why must my style stay private?

It includes a public pk. Mapbox access token, which is saved with the style. If the style were public, other users’ map loads would be billed to your Mapbox account, so **Private map style?** is locked on. A secret sk. token is never saved with the style.

Why is someone’s public style missing their shapes?

Custom overlays are never shared with public styles. The row reads “Custom overlays not included”.

Hillshade is covering my radar. How do I fix it?

Open **Terrain** and tick **Draw hillshade behind data**, or lower **Intensity**.

What is the number in the middle of the map?

The current zoom, shown while the Map Style window is open so you can set zoom ranges. Untick **Show zoom** to hide it.