AGUACEROWX USER GUIDE

# Observations and hydrology

Surface stations, storm reports, river gauges and precipitation analyses draw on the same map as models and radar. Station overlays come from the toolbar. Gridded analyses come from the sidebar.


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BEFORE YOU START

- The **Surface obs**, **LSR** and **Stream gauges** toolbar buttons work the same way: single-click opens the settings, double-click turns the overlay on or off.
- RTMA, Stage IV and sea surface temperature are data types in the sidebar. Open **Select Data**, then click the data type above the bundle list.
- To add one field to the map you already have, open **Edit Layers** and click **Add Layer**.
- The National Water Model is in the model picker, and flash flood guidance is in the **NOAA data** menu.

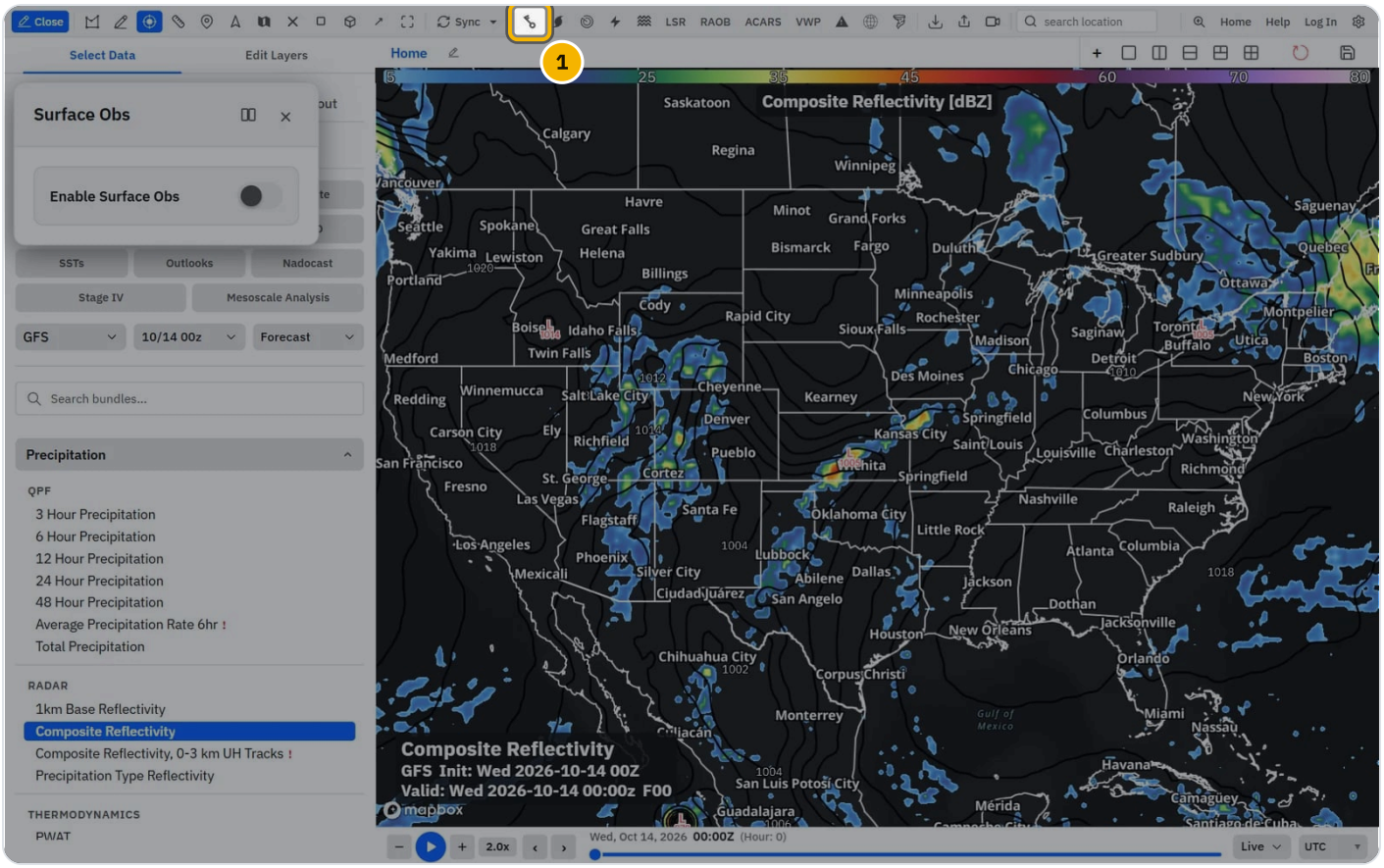
## 01 ASOS and METARs

Surface station plots with raw METARs, wet bulb and relative humidity, RAWS and Japan AMeDAS stations and your own colormaps.

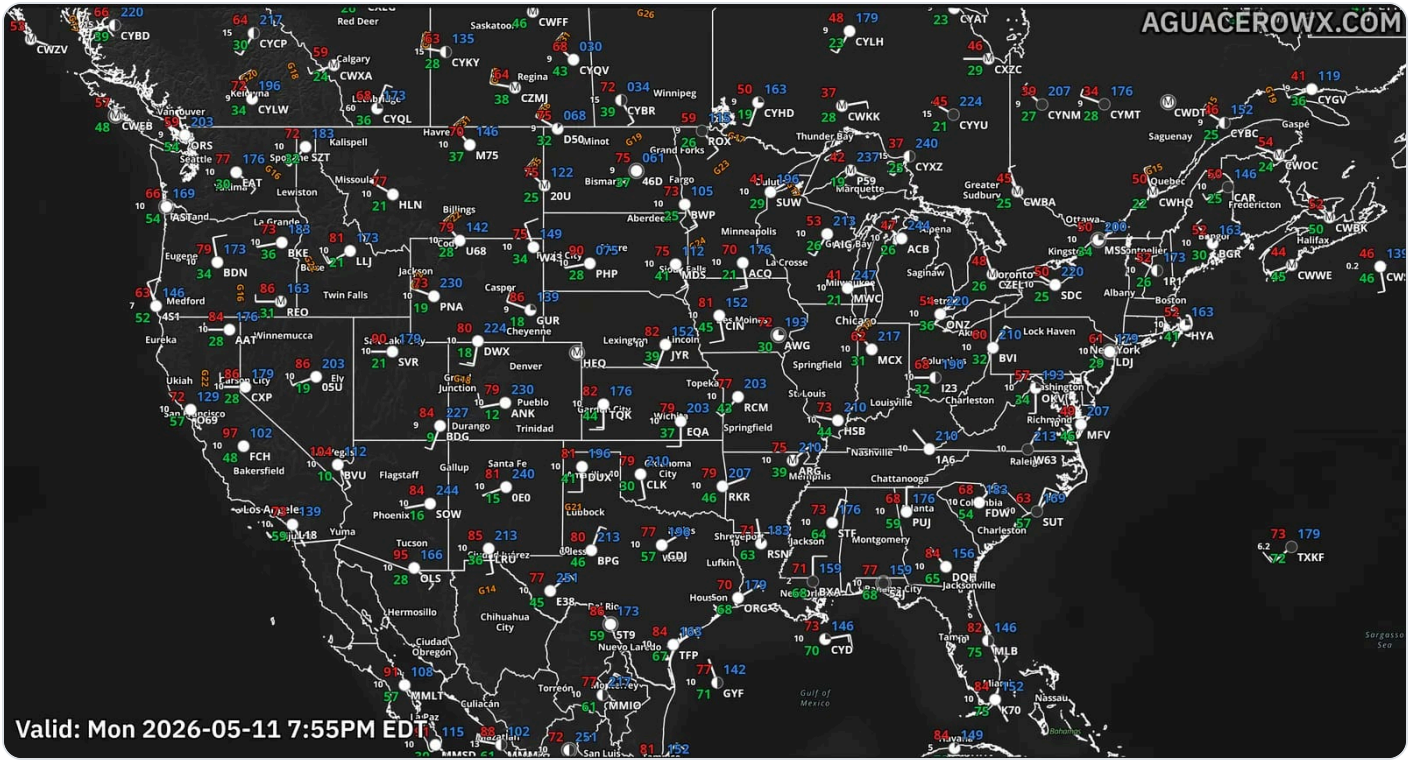
1. Single-click **Surface obs** on the toolbar.
2. Turn on **Enable Surface Obs**.
3. Under **Networks**, pick **All**, **ASOS**, **RAWS** or **AMeDAS** (Japan).
4. Under **Display Mode**, keep **Station Plots** or pick one variable, such as **Wet Bulb** or **Relative Humidity**.
5. For a single variable, click **Load Colormap** to color the stations with your own colormap.
6. Hover a station for the report closest to the time slider. Click it for an **ASOS Meteogram** of about the last 24 hours.

TIPS

- Turn on **Raw METAR** under **Popup fields** to show the raw report when you hover a station.
- Raise **Station Spacing** to thin out crowded stations when you zoom out.
- Double-click **Surface obs** to turn the stations on or off without opening the settings.




The Surface obs button and its settings.




ASOS station plots across the United States.

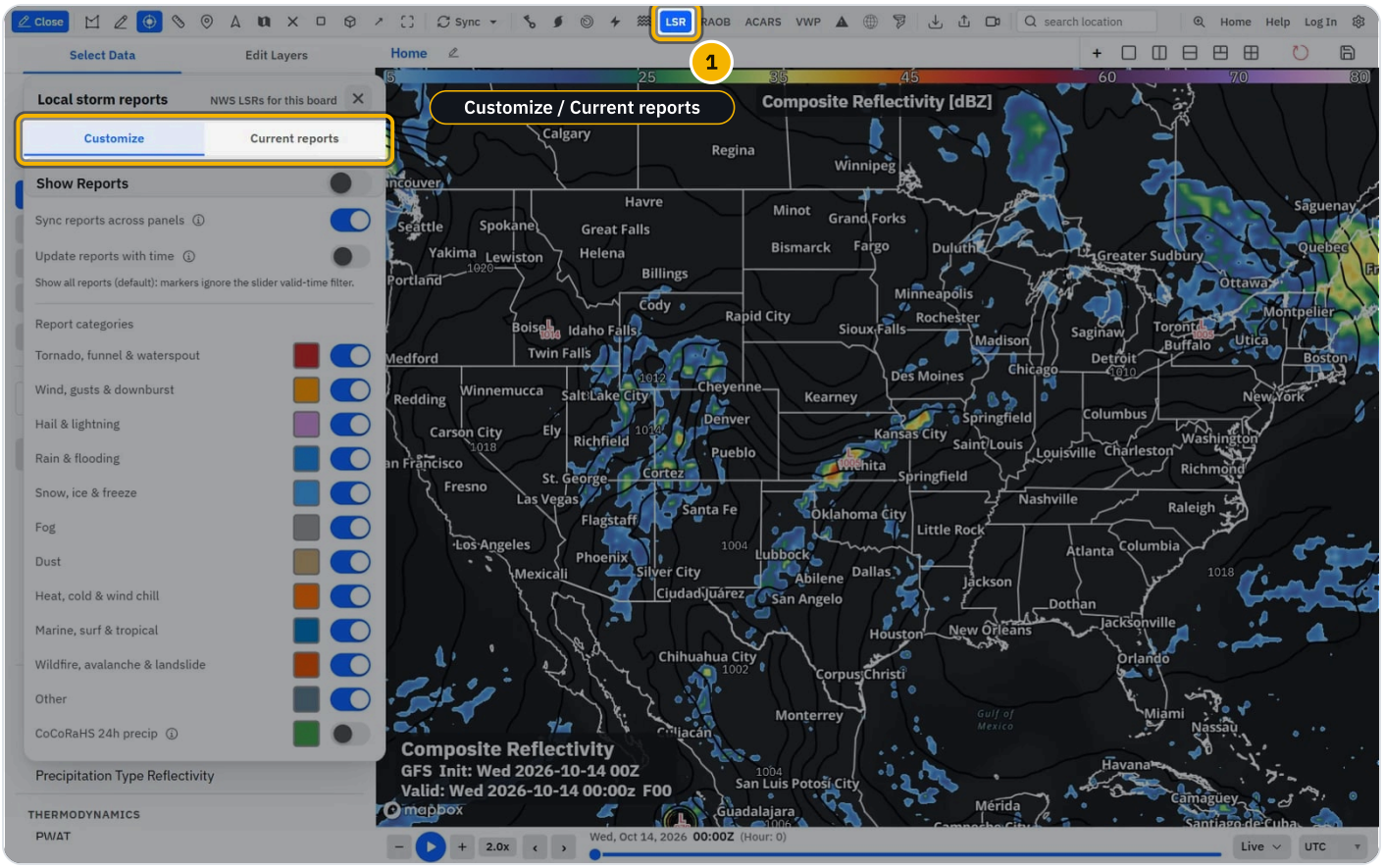
## 02 Local storm reports

Hail, wind, tornado, flood and snow reports from the NWS, plus CoCoRaHS rain gauges.

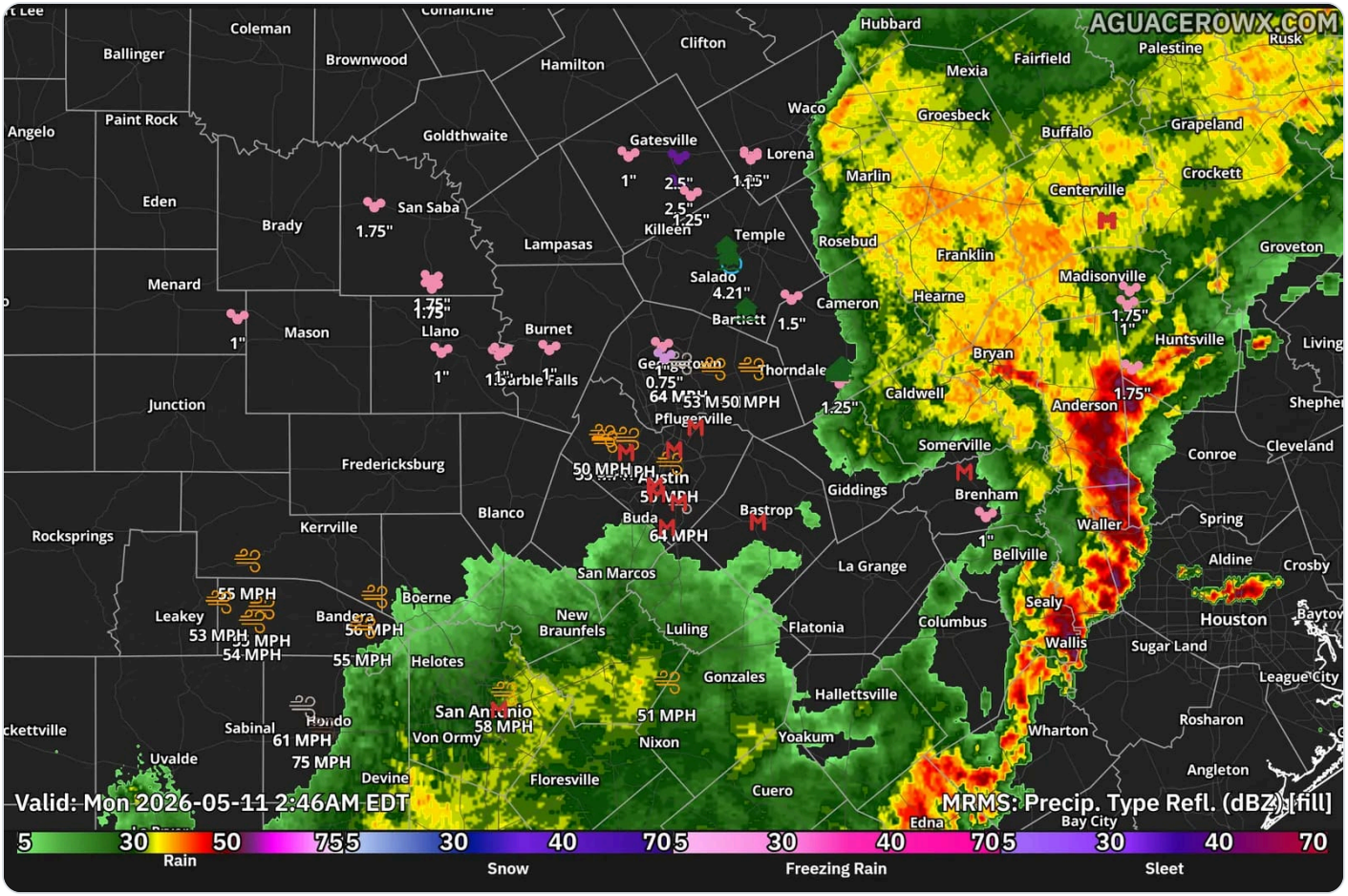
1. Single-click **LSR** on the toolbar.
2. Turn on **Show Reports**.
3. Pick a **Time window**, from **15 minutes** to **All reports**.
4. Under **Report categories**, turn categories on or off. Turn on **CoCoRaHS 24h precip** to add the gauges.
5. Pick a **Marker style** and set the **Marker density**.
6. Click a report on the map for its magnitude, location and remarks.

TIPS

- The **Current reports** tab lists every report. Search it, then click a report to fly to it.
- Turn on **Update reports with time** to show each report only once the time slider reaches it.




The LSR button and the Local storm reports menu.




Hail and wind reports over MRMS reflectivity in Texas.

The **Custom** marker style, which uses your own icons, needs Professional.

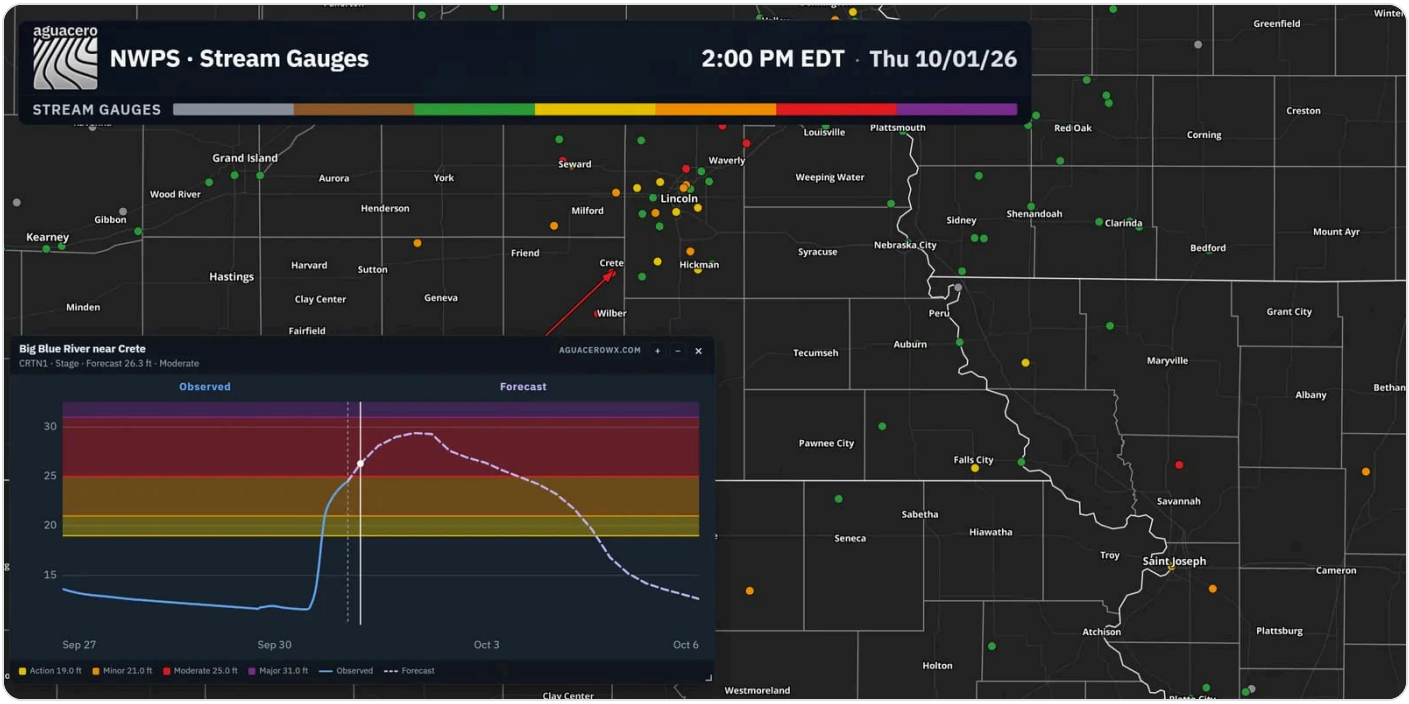
## 03 River and stream gauges

NWPS river and tide gauges colored by flood category. Click one for its observed and forecast hydrograph.

1. Single-click **Stream gauges** on the toolbar.
2. Turn on **Enable stream gauges**.
3. Under **Time**, choose **Current observations**, or **Follow slider** to color gauges by the stage at the slider time, including the forecast.
4. Under **Flood categories**, turn off the categories you want to hide.
5. Click a gauge to open its hydrograph.

TIPS

- Scroll to zoom the hydrograph and drag to pan. Click **Reset** to zoom back out.
- Right-click the hydrograph to copy or download it.

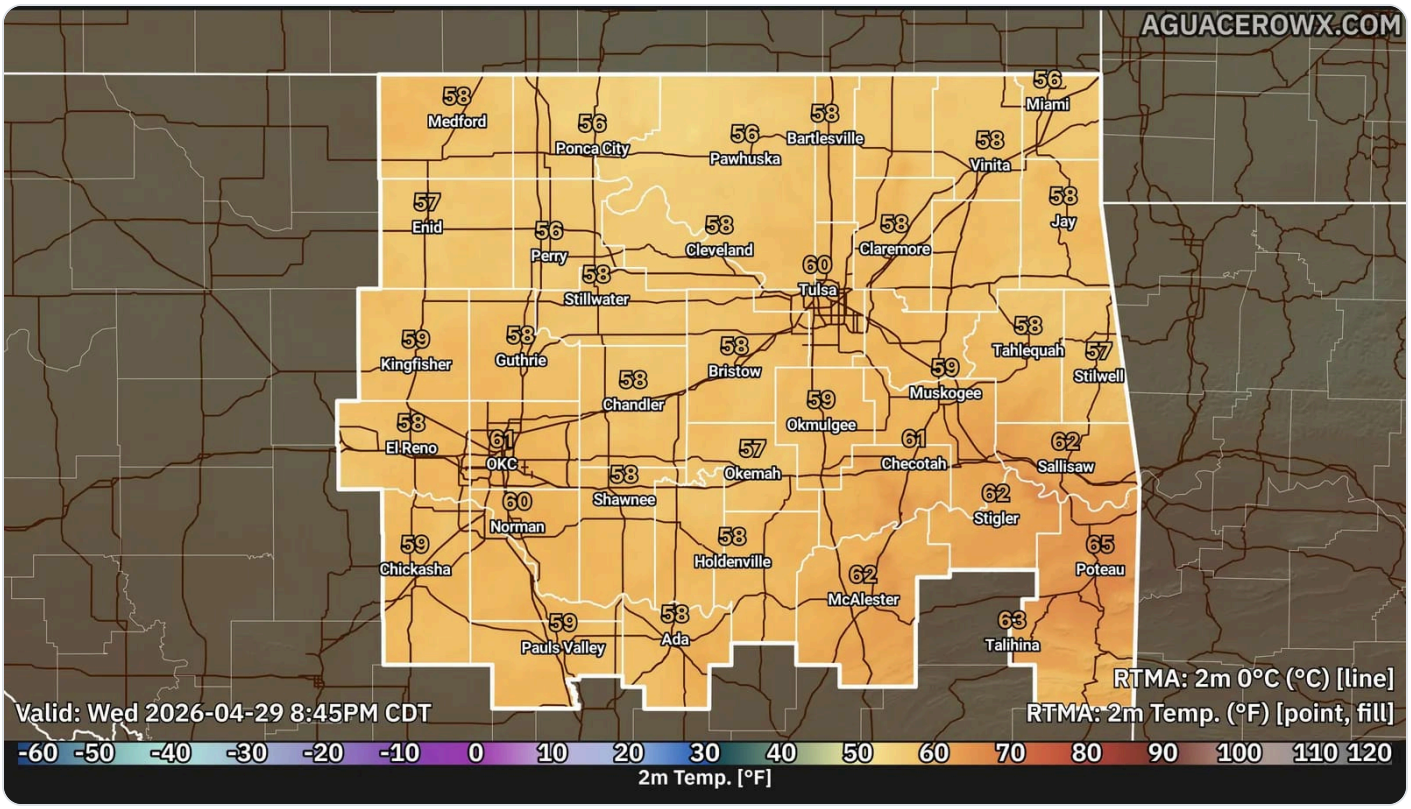



Stream gauges with an observed and forecast hydrograph.

## 04 RTMA

Real-Time Mesoscale Analysis surface fields, such as temperature, dew point, wind gusts and fire weather indices.

1. Open the sidebar on **Select Data**.
2. Click **RTMA** in the data type filter.
3. Click a bundle in the list to load it.
4. To add one field instead, open **Edit Layers**, click **Add Layer**, then **RTMA**, and pick a product such as **2m Temperature**.



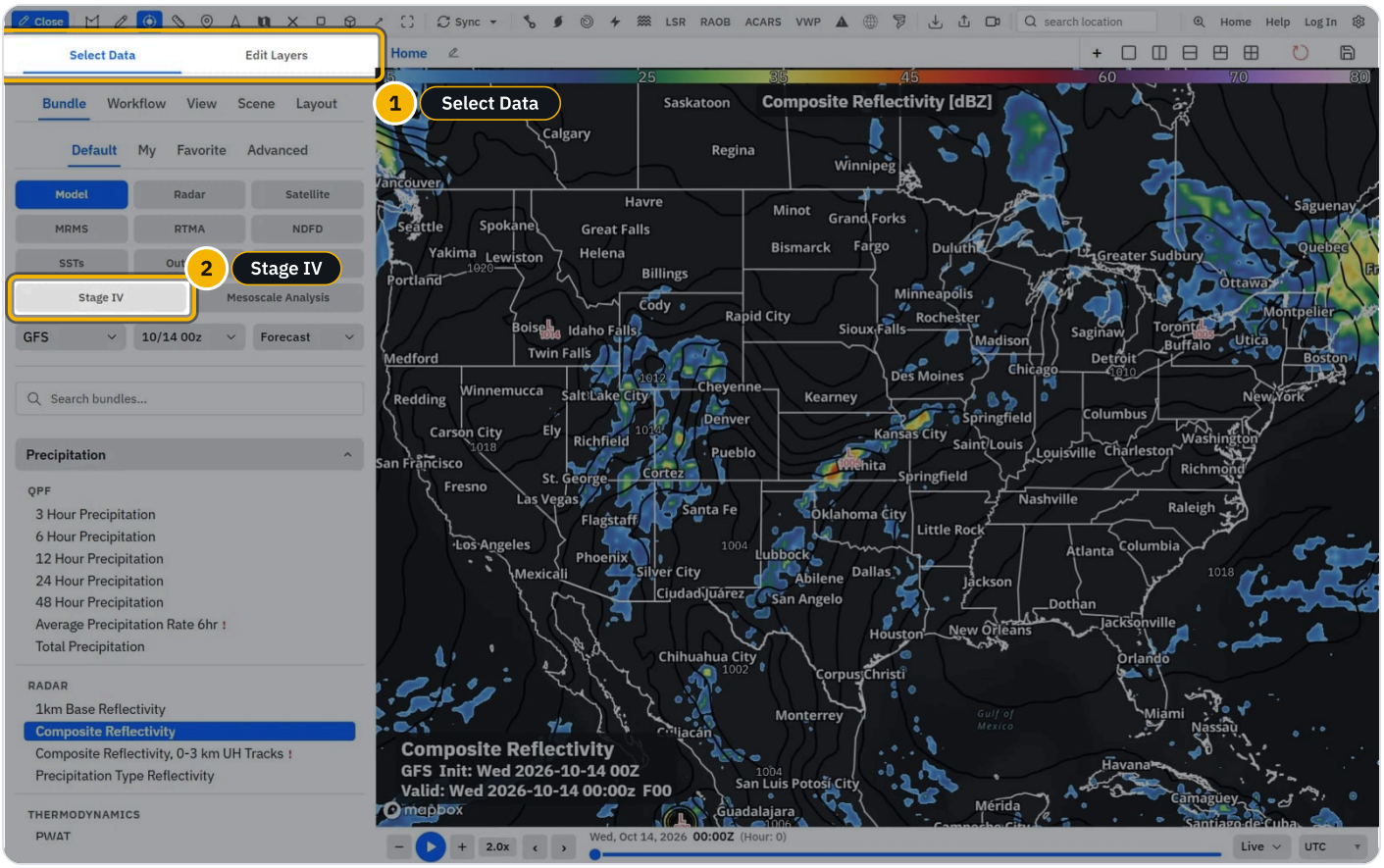

RTMA 2 m temperature with county values.

Every RTMA product is on every plan. Free loops 1 hour of RTMA, and longer loops need a paid plan.

## 05 Stage IV precipitation

NCEP multisensor precipitation at about 4.8 km, with totals from 1 hour to a week.

1. Open the sidebar on **Select Data**.
2. Click **Stage IV** in the data type filter.
3. Click a bundle in the list to load it.
4. To change the total, open **Edit Layers**, click the layer's field name and pick another, such as **24 Hour Precipitation** or **1 Week Precipitation**.




The Stage IV data type in the sidebar.

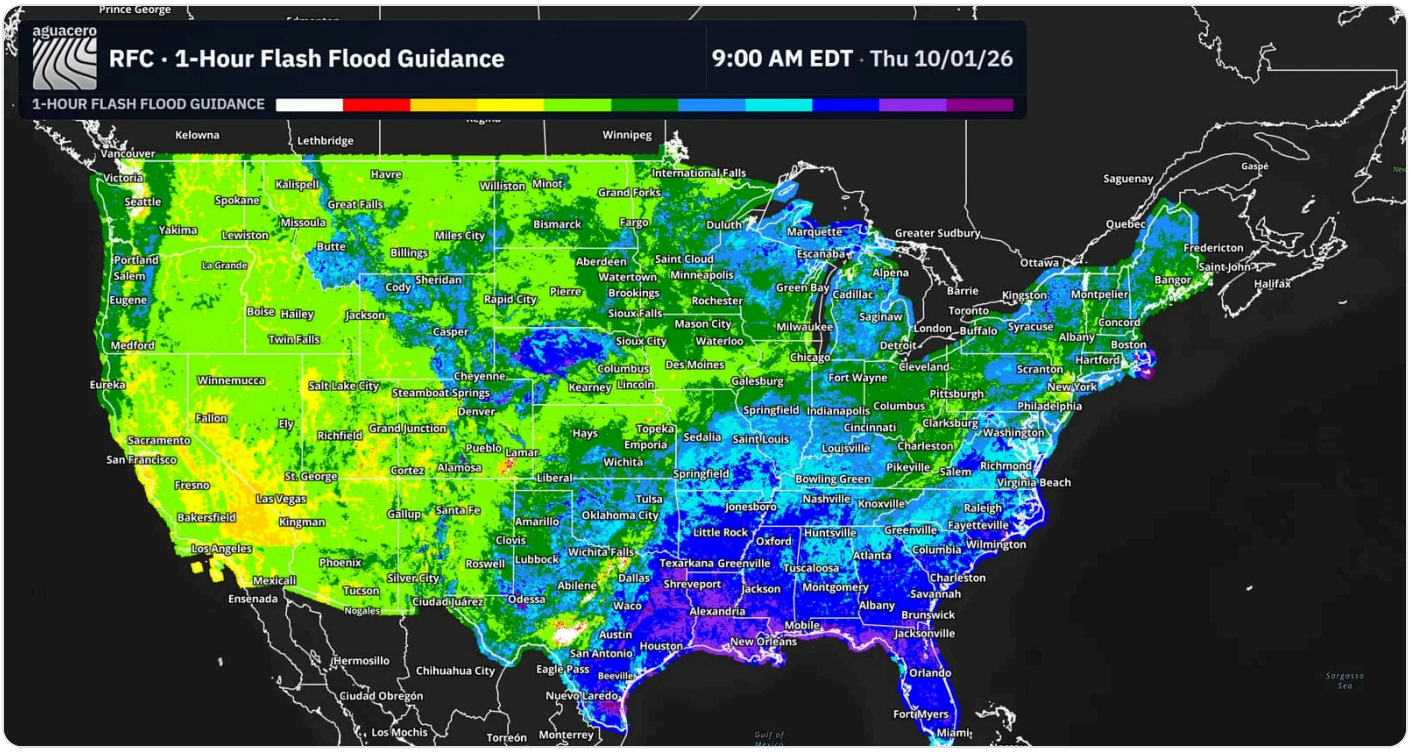
## 06 Flash flood guidance

River Forecast Center guidance: how much rain it takes to cause flash flooding, for 1, 3 and 6 hours across CONUS and 12 hours in the Mid-Atlantic.

1. Click **NOAA data** on the toolbar to open **Forecast Products**.
2. Click the **RFC** tab.
3. Under **Flash Flood Guidance**, turn on **1 Hour**, **3 Hour**, **6 Hour** or **12 Hour**.
4. Click the map to read the guidance at a point.

TIPS

- The **Outlooks** data type in the sidebar has the same picker. A product picked there replaces the layers on the panel.




One-hour flash flood guidance across the United States.

## 07 National Water Model ENTHUSIAST

Short-, medium- and long-range streamflow, soil, snow and runoff for 2.7 million river reaches.

1. In the sidebar, click the model menu, which shows the current model's name, to open the model picker.
2. Type **NWM** in **Search models...**.
3. Pick **NWM Short Range**, **NWM Medium Range** or **NWM Long Range**.
4. Open **Edit Layers**, click **Add Layer**, then **Model** and **Hydrology**.
5. Pick a field, such as **Streamflow**, **Snow Water Equivalent** or **Top-Layer Soil Saturation**.

Short range is an 18-hour hourly forecast. Medium-range streamflow is hourly out to 10 days, and long-range streamflow is every 6 hours out to 30 days. The NWM models are not in the Free model list.

## 08 Sea surface temperature

Sea surface temperature, its anomaly and change, and tropical cyclone heat potential from three ocean analyses.

1. Open the sidebar on **Select Data**.
2. Click **SSTs** in the data type filter.
3. Pick a source: **CRW** (NOAA Coral Reef Watch), **CDAS** or **ARMOR3D**.
4. Click a bundle in the list to load it.
5. To add one field instead, use **Add Layer**, then **SSTs**, and pick a product such as **7-Day SST Change** or **Tropical Cyclone Heat Potential**.

TIPS

- Draw a cross section over an SST layer to slice the ocean below the surface. See the Soundings guide.

## 09 Common questions

Answers to the questions we hear most about observations and hydrology.

### How often do surface observations update?

The app reloads the station feed every 5 minutes while surface obs are on. The feed holds about the last 24 hours, and each station shows its report closest to the time on the slider.

### Why is a station missing or showing an old report?

Each station shows its report closest to the slider time, within 90 minutes. A station with no report in that window isn't drawn, so move the slider to the current time for the latest data. Stations are also hidden by **Station Spacing** when plots crowd, by a **Station Filters** range they fall outside or a value they don't report, and by your **Networks** choice.

### Why do different stations appear when I zoom or move the slider?

**Station Spacing** keeps a minimum gap between plots, so where stations crowd together only some are drawn. Which ones are drawn can change as you zoom or as new reports come in. Zoom in, or drag **Station Spacing** toward **Dense**, to see more.

### What units do surface obs use?

They follow **Units** in Settings under **Data**. **Imperial** shows °F, mph, miles and inches, and **Metric** shows °C, km/h, kilometers and millimeters. With **Units** set to **Bundle/Variable**, the **Surface Obs** settings get their own **Units** choice. Pressure is in millibars, and on a station plot it's the standard three-digit code, so 132 means 1013.2 mb. Wind barbs are in knots.

### What does METAR (built) mean in a station popup?

Some reports, such as 1-minute data, arrive without METAR text. The popup then shows the station's last METAR from up to 2 hours earlier. If there isn't one, it builds a METAR-style line from the readings and labels it **METAR (built)**.

### Why can't I see storm reports from a past day?

The live feed holds the last 24 hours of reports. For older ones, switch the time bar from **Live** to **Archive**, set your dates in the Archive Builder, turn on **Storm Reports** under **Overlays** and click **Load**. Archived reports start in 2003.

### Why do storm reports disappear when I move the slider?

The **Time window** counts back from the time on the slider, so on a model forecast hour a short window can be empty. Pick **All reports**, or move the slider back to the current time. With **Update reports with time** on, each report also waits until the slider reaches its time.

### Why don't I see CoCoRaHS gauges?

They're off by default. Single-click **LSR**, then under **Report categories** turn on **CoCoRaHS 24h precip**. Gauges that reported zero stay off, and the **Time window** applies to them too.

### What do the stream gauge colors mean?

**Major**, **Moderate**, **Minor** and **Action** are the NWS flood stages for that gauge, and **No flooding** is below all of them. **Low water** is at or below the gauge's low-water threshold. **No category** covers gauges with no flood stage, no current reading or that are out of service. Change any color under **Flood categories**.

### Why are most stream gauges gray?

With **Time** set to **Follow slider**, the default, each gauge takes the color of its stage at the slider time. Many gauges have no forecast, so once the slider is more than about 12 hours from their latest reading they have no stage and use the **No category** color. Pick **Current observations** to color every gauge by its latest reading.

### How often do stream gauges update, and how far ahead do forecasts go?

NOAA refreshes the latest readings about every 15 minutes, and the app reloads them every 11 minutes. On the map, forecast stages come in daily steps out to 14 days. Click a gauge for its full observed and forecast hydrograph.

### How often does RTMA update, and how far back can I loop it?

RTMA is a new analysis every 15 minutes. The RTMA duration menu on the time slider sets the loop: **1 Hr** on Free, up to **4 Hrs** on Enthusiast and up to **24 Hrs** on Professional.

### What period does a Stage IV total cover?

Each total ends at the time on the slider, so **24 Hour Precipitation** at 12Z covers 12Z the day before through 12Z. Stage IV comes in hourly, and the longer totals add up those hours.

### Why can't I find Tropical Cyclone Heat Potential?

Only ARMOR3D has it. Under **SSTs**, pick **ARMOR3D** as the source. With **CRW** or **CDAS** picked, bundles with products that source doesn't have are hidden.

### Why does 12-hour flash flood guidance cover only part of the map?

Only the Middle Atlantic River Forecast Center issues 12-hour guidance. **1 Hour**, **3 Hour** and **6 Hour** cover CONUS. The map always shows the latest guidance, which WPC updates every hour for 1, 3 and 6 hours and every 6 hours for 12 hours.