AGUACEROWX IN-DEPTH GUIDE

Meteograms in depth

A meteogram follows one point through a forecast run: temperature, wind, precipitation and anything else the model has, plotted against time. The app draws model, NDFD and ensemble meteograms in layouts you pick or build, compares models and earlier runs, scores runs against observations, and shows every ensemble member as box plots, plumes, heatmaps and chances. This guide covers every mode, layout, plot type and setting, the layout editor, saving layouts to your library, observations, normals and export, with recipes and common questions.

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BEFORE YOU START

- Right-click the map (press and hold on a touch screen) and use the **Meteograms** group on the right side of the menu: **Model**, **NDFD** and, when the map shows an ensemble with member data, **Ensemble**.
- The meteogram opens over the board and its controls open in the sidebar. On desktop you can dock it under the map or float it in a window.
- Meteograms, layouts, the layout editor, Members mode and observations are on every plan. **Compare**, **Trend** and **Verify** need Professional or Creator. Premium models (such as ECMWF EPS and ECMWF AIFS EPS) need Enthusiast or higher; ECMWF, GDPS, RGEM, NBM and NDFD are free.
- Sign in to keep your layout, days, precipitation, snow ratio, observation, normals and theme choices on every device, and to save your own layouts to the library.

01 Open a meteogram

Right-click any point for a meteogram from the model on the map, the NWS NDFD forecast or every member of an ensemble.

1. Load a model bundle on the map, for example the GFS or HRRR.
2. Right-click the map where you want the forecast. On a touch screen, press and hold.
3. Under **Meteograms**, click **Model**. The meteogram opens over the board and its controls open in the sidebar.
4. Under **Layout**, pick what to plot, such as **Forecast card** or **Default**.
5. Under **Days**, pick how much of the run to show.
6. Click **×** (**Close meteogram**) in the corner of the chart to close it.

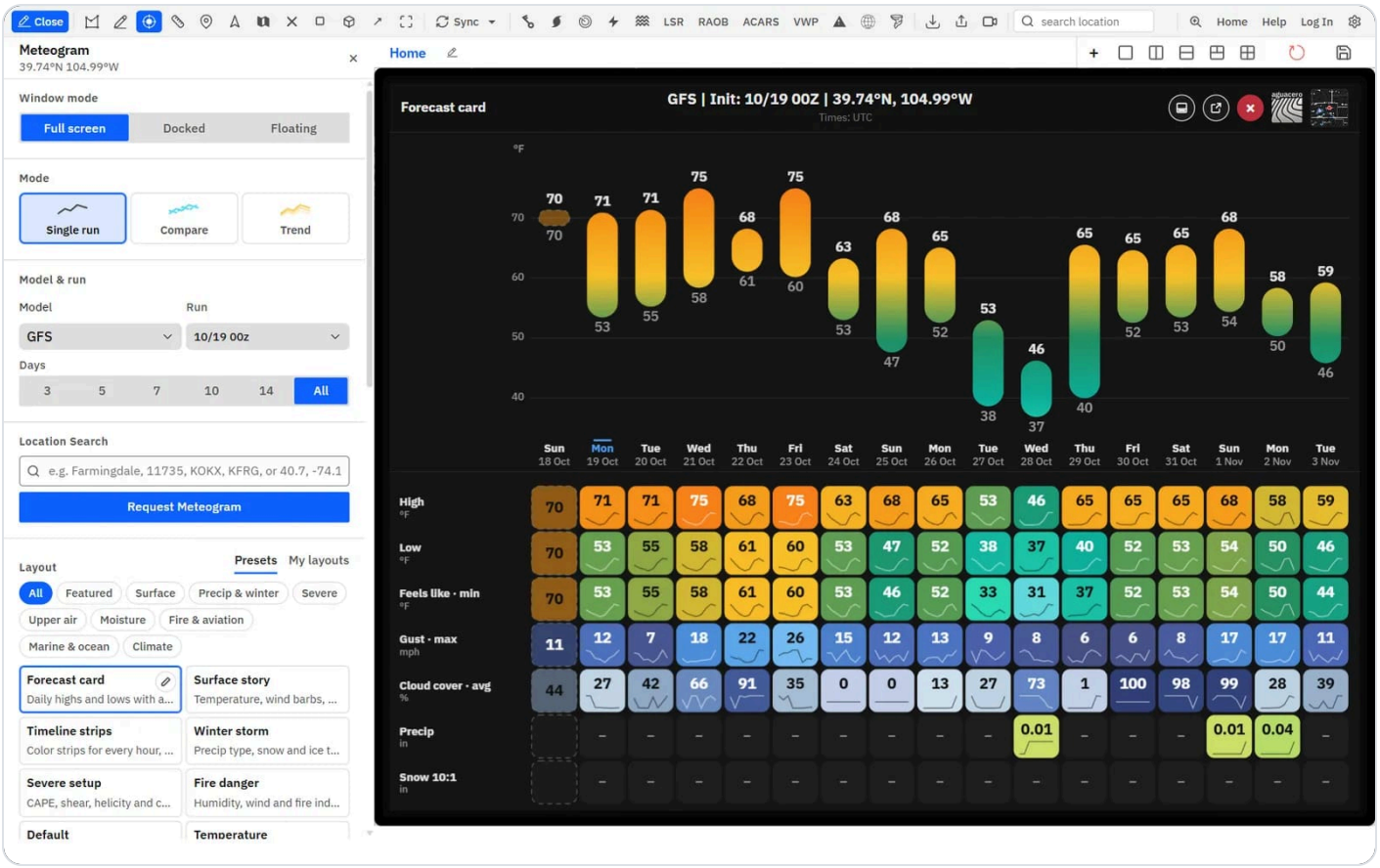
THE METEOGRAMS GROUP OF THE RIGHT-CLICK MENU

Model	A meteogram from the model on the map. If the point is outside that model's area, the app says so. On GEFS, AI GEFS, GEPS, ECMWF EPS, ECMWF AIFS EPS and REFS it opens in **Members** mode.

NDFD	The National Weather Service NDFD forecast at the point, whatever the map shows. The map keeps its own model.
Ensemble	Shown when the panel shows GEFS, AI GEFS, GEPS, ECMWF EPS, ECMWF AIFS EPS or REFS fields. Opens the meteogram in **Members** mode: every member of that ensemble.

TIPS

- Clicking one of your saved meteogram layouts in the library also opens a meteogram. Once one is open, **Location Search** in the controls moves it to a place you type.
- The meteogram items leave the right-click menu in archive mode, while the Archive Builder has an archive loaded.
- You can hide or reorder the right-click items in Settings under **Context menu**.



A Forecast card meteogram for Denver: daily highs and lows over a day-by-day grid.

02 The meteogram controls, top to bottom

Every section of the controls panel and what it does, in the order the panel shows them.

SETTINGS	
Window mode	**Full screen**, **Docked** (under the map) or **Floating** (a window over the map). Desktop only.
Mode	**Single run**, **Compare**, **Trend**, **Verify** and, on ensembles and the NBM, **Members**. See **Pick a mode**.
Model & run	**Model** and **Run** menus. The heading reads **Primary model & run** in Compare mode and **NDFD Issuance** on an NDFD meteogram.
Days	**3**, **5**, **7**, **10**, **14** or **All** calendar days of the run.
Dates	**First day shown** and **Last day shown** menus, and **Clear dates**. Hidden in Members mode.
Mode panel	The settings of the mode you picked: models to compare, earlier runs, verify hours, or ensembles and models to add.
Location Search	Type a place, zip code, airport or coordinates and click **Request Meteogram**.
Layout	**Presets** and **My layouts** tabs, with topic chips and a tile per layout.
Edit layout / New layout	Open the layout editor on the current layout or a blank one.
Display	**Precipitation**, **Snow ratio**, **Observations**, **Normals**, **Hide partial days** and **Mouse readouts**. All but **Mouse readouts** show only when the layout and mode can use them.
Appearance	Theme tiles, **Font** and **Customize**. They apply to every meteogram.

While the layout editor is open, it replaces the rest of the panel. Click **‹** at its top to come back.

03 Change the model, run or point

Switch models and runs, or move the meteogram to a place you type, without going back to the map.

1. Under **Model & run**, open **Model** and pick a model. Only models that cover the point and have a run listed are offered.
2. Open **Run** to pick an older run.
3. Under **Location Search**, type a city, zip code, airport or station code, or coordinates such as 40.7, -74.1.
4. Click **Request Meteogram**. The meteogram moves there and the map recenters on it.

SETTINGS

Model	Also switches the map panel to that model and loads its latest run, except for NDFD, which leaves the map alone. Premium models show a lock on Free. Hurricane models aren't listed.
Run	The run the meteogram reads. On NDFD it lists the issuances.
Location Search	Moves the point. An airport code puts the airport in the header, and observations then use that airport.

TIPS

- A new point, model or run clears any models you were comparing. Trend and Verify runs reload for the new point.
- Right-click somewhere else on the map and click **Model** again to move the meteogram with the mouse.
- Product models such as air quality, marine and climate models switch to a layout made for them, unless one of your own layouts is up.

04 NDFD meteograms

The official National Weather Service forecast grids at a point, as a meteogram, whatever model the map shows.

1. Right-click the map and click **NDFD** under **Meteograms**. Or pick **NDFD** in the meteogram's **Model** menu.
2. Under **NDFD Issuance**, open **Run** to pick an issuance.
3. Pick a layout, such as **Forecast card** or **Default**.
4. To go back to the map's model, pick it in **Model**.

TIPS

- The hourly NDFD issuances reach about 3 days ahead. The 00Z issuance reaches 7 days: pick it under **Run** for days 4 to 7.
- On a **Day range** or **Day grid**, NDFD highs and lows come from its own daily maximum and minimum temperature forecasts, which catch the afternoon peak that its 6-hourly steps after day 3 miss. This needs **Day starts at** 00:00.
- NDFD can be compared with other models in **Compare** mode.

NDFD is free. If no issuance is listed yet, or the point is outside the NDFD area, the app says so.

05 Pick a mode

One run, several models, earlier runs, runs scored against observations, or every ensemble member.

MODE	
Single run	The meteogram's model and run. Every layout works.
Compare	Other models drawn over the first one. Professional.
Trend	Earlier runs of the same model, fading with age. Professional.

Verify	Earlier runs scored against the last hours of observations. Professional.
Members	Every member of an ensemble, or the NBM's published percentiles. Offered on GEFS, AI GEFS, GEPS, ECMWF EPS, ECMWF AIFS EPS, REFS and the NBM.

TIPS

- Compared, trend and verify runs draw on line plots only. Entering one of those modes with a layout that has none, such as **Forecast card**, shows **Default** instead, and your layout comes back when you return to **Single run**.
- Members mode has its own layouts. Switching in and out keeps each mode's last layout.
- Ensembles with members open in **Members** mode for every new point and model. Switching to the NBM opens **Single run**; click **Members** for its percentiles.
- A spinner on the mode card means its runs or members are still loading.

Compare, **Trend** and **Verify** show a lock on Free and Enthusiast, and clicking one opens the upgrade dialog.

06 Pick a layout

Layouts set which plots the meteogram draws: built-in presets by topic, and the layouts you saved.

1. Under **Layout**, stay on **Presets**.
2. Click a topic chip: **All**, **Featured**, **Surface**, **Precip & winter**, **Severe**, **Upper air**, **Moisture**, **Fire & aviation**, **Air quality**, **Marine & ocean** or **Climate**. Only topics with a layout for this model show.
3. Hover a tile for its description, and click it to redraw the chart.
4. Click the pencil on a tile (**Customize this layout**) to open it in the editor.
5. Click **My layouts** for the layouts you saved.

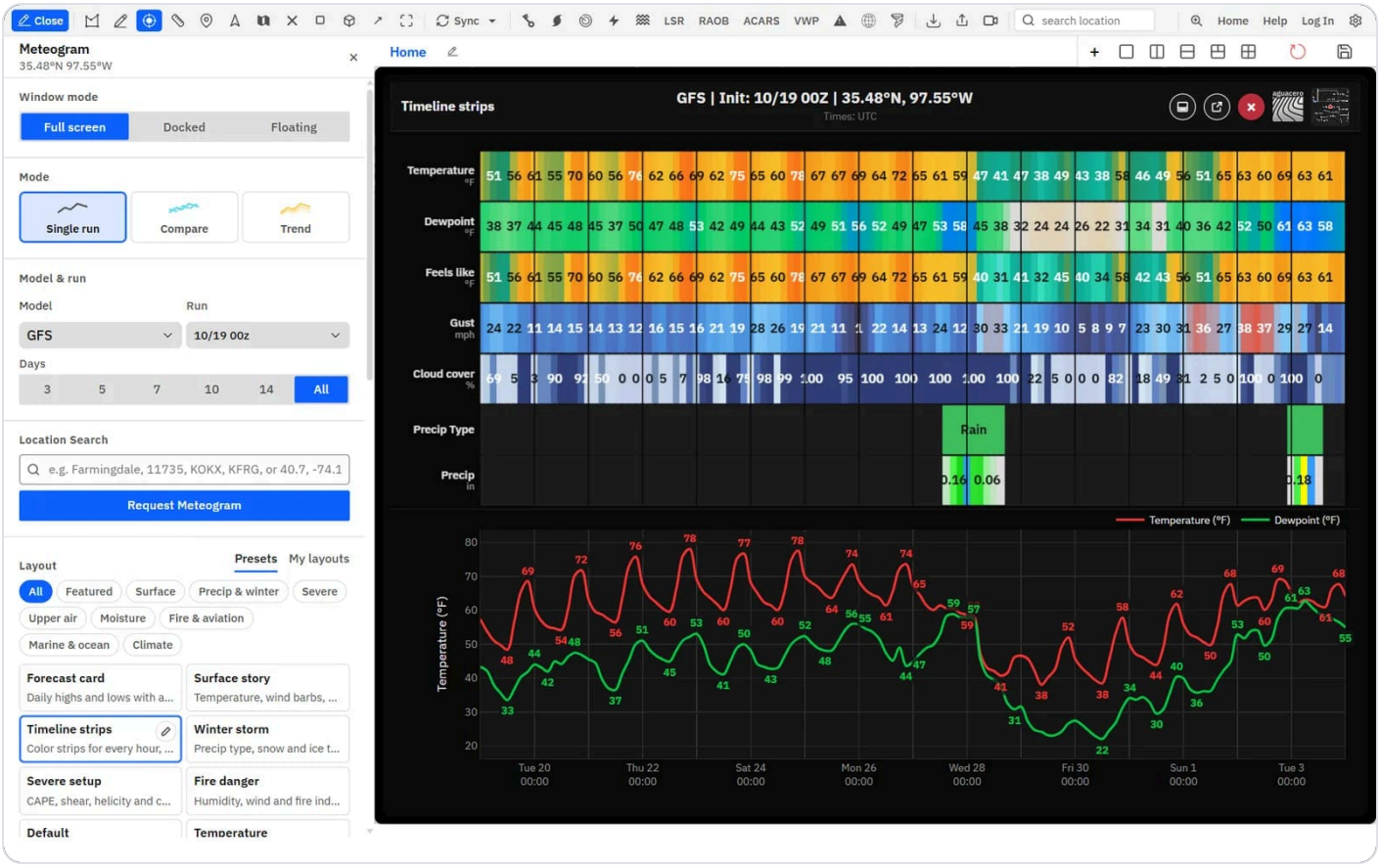
FEATURED LAYOUTS (SINGLE RUN)	
Forecast card	Daily highs and lows as a day range, over a day grid of high, low, feels-like low, peak gust, cloud cover, precipitation and snow.
Surface story	Temperature, dew point and feels-like, wind with barbs and gusts, humidity and clouds, and precipitation.
Timeline strips	An hourly color strip for temperature, dew point, feels-like, gusts, clouds, precip type and precipitation, over the temperature lines.
Winter storm	Temperature with a freezing line, precip type strips, snow and ice totals and a daily grid. Offered on models with snow or ice fields.
Aviation forecast	Ceiling, visibility and cloud base strips, ceiling and cloud base with a 1000 ft line, visibility, clouds, wind, and on the NBM low-level wind shear and IFR chances.
Severe setup	CAPE, bulk shear, helicity, composite strips (STP, SHIP, supercell, EHI) and daily maximum CAPE and shear.
Fire danger	Temperature and humidity, wind, fire index strips and a daily grid.
Snowfall	On **Precip & winter**: snow totals and amounts, temperature, and on the NBM its snow ratio and precip type chances.

OTHER PRESET TOPICS	
Surface	**Default** (temperature, wind, pressure, precipitation), **Temperature** (2 m to 500 mb) and two cloud layouts.
Precip & winter	**Snowfall**, **Precipitation**, **Winter**, **Blizzard** and **Dendritic Growth Zone**.
Severe	**Composite 1**, **Composite 2**, **Severe Thermals**, **CAPE**, **ECAPE/DCAPE**, **Energy Helicity Index**, **Wind Shear** and **Storm Relative Helicity**.

Upper air	**Upper Air Wind**, **Omega**, **Lapse Rates** and their combined versions.
Moisture	**Moisture** and **Relative Humidity** layouts.
Fire & aviation	**Fire Weather** and **Aviation**.
Air quality / Marine & ocean / Climate	**Air Quality**, **Aerosol / Dust**, **Smoke**, **Greenhouse Gas**, **Waves**, **Storm Surge**, **Ocean** and **Climate**, on the models that carry those fields.

TIPS

- Layouts the model can’t draw are hidden. A plot whose variables the model lacks says so on the chart.
- In Compare, Trend and Verify, only layouts with a line plot are listed.
- The app remembers your last layout for Single run and for Members mode separately.



Timeline strips for Oklahoma City: an hourly color strip for each field over the temperature and dew point.

07 Winter, snowfall and aviation layouts

What Winter storm, Snowfall and Aviation forecast draw, and the extra fields the NBM and HRRR add.

These layouts draw what each model has and leave out plots it has no fields for. Most models give snow and ice from their precipitation-type totals (10:1 and Kuchera snow, freezing rain, sleet). The NBM adds its own fields: snowfall with its 10th and 90th percentiles, ice accretion, snow ratio, precip type chances, ceilings, cloud base, low-level wind shear and the chance of low ceilings and visibility. The HRRR family adds ceiling and cloud base.

SETTINGS	
Winter storm	Temperature, dew point and wet bulb with a freezing line; precip type strips (on the NBM, its likeliest type); snow and ice lines; and a daily grid of snow, ice and the low.
Snowfall	Snow totals (NBM snowfall with dashed 10th and 90th percentiles, Kuchera and 10:1), snowfall amounts as bars, temperature and wet bulb, the NBM snow ratio, its rain, snow, freezing rain and sleet chances, and daily totals.
Aviation forecast	Strips for ceiling, visibility, cloud base and gust; ceiling and cloud base with a 1000 ft reference line; visibility; total and low cloud; wind; NBM low-level wind shear with its height; and **IFR chances** (ceiling under 1000 and 3000 ft, visibility under 3 and 1 mi).

TIPS

- Ceilings are in feet in both unit systems, like on the map.
- The NBM also has Members-mode layouts for its percentiles: **Winter**, **Snowfall** and **Aviation**. See **NBM percentiles in Members mode**.
- **Snow ratio** under **Display** switches every 10:1 or Kuchera series in these layouts at once.

08 Days, dates and partial days

Show a set number of days, a range of dates you pick, and leave out days the run covers only in part.

1. Under **Days**, click **3**, **5**, **7**, **10**, **14** or **All**. Day one is the calendar day of the run's first hour.

2. For a set range, open **First day shown** and **Last day shown** under **Dates** and pick the days.
3. Click **Clear dates**, or any **Days** button, to go back to **Days**.
4. Under **Display**, turn on **Hide partial days** to leave out a first or last day the run covers only in part.

SETTINGS

Days	Calendar days in the chart's time zone. Buttons longer than the run are greyed out. Single-run meteograms open on **All**, Members mode on **10**. Your pick is remembered.
First day shown / Last day shown	Each day of the run by weekday and date, with **partial** after days the run covers only in part. If you pick a last day before the first, the other end moves along.
Clear dates	Shows while a date range is set.
Hide partial days	A day with less than about 21 hours of data counts as partial: usually the run's first and last day. While it is on, partial days are greyed out in the date menus.

TIPS

- Run totals start again at the first day shown, so day sums and total lines match the days on screen.
- A date range lasts for this session only, since dates go stale; **Days** and **Hide partial days** are saved.
- A date range that misses the run you switch to is ignored, and **Days** applies.
- On a **Day range**, a partial day's bar has a dashed outline.

Dates and **Hide partial days** are hidden in Members mode and on runs that fit in one day.

09 Read, zoom and pan the chart

Hover for exact values, pin a time, zoom in on hours or values, and click a day to zoom to it.

The header names the layout, the model and run, and the point: the airport you searched for or the nearest town, with its coordinates under it. It also shows the time zone the chart uses (**Times:**) and notes for the mode,

observations and normals. Plots share one time axis. Weekday labels, midnight lines and night shading come from **Appearance**.

SHORTCUTS

Hover a plot	Read every line at that time; the date shows in the header
Click	Pin the readout; click again to let it go
Scroll over a plot	Zoom in or out in time around the cursor
Scroll over the left axis	Zoom the plot's values
Drag	Pan in time; every plot follows
Drag the left axis	Move the plot's values up or down
Click a day	On a Day range or Day grid: zoom every time plot to that day
Tap / drag (touch)	Tap to show and pin a readout; drag to pan

TIPS

- Click ↺ **Reset** at the top of the plots to go back to the view the chart opened on.
- Hover a day on a **Day range** or **Day grid** for its values and the times of the high and low.
- Turn off **Mouse readouts** under **Display** to hide the hover values.
- With **Min / max badge** on in **Customize**, each plot shows the lowest and highest value in view.
- Times follow the time zone menu on the time bar.

10 Compare models PROFESSIONAL

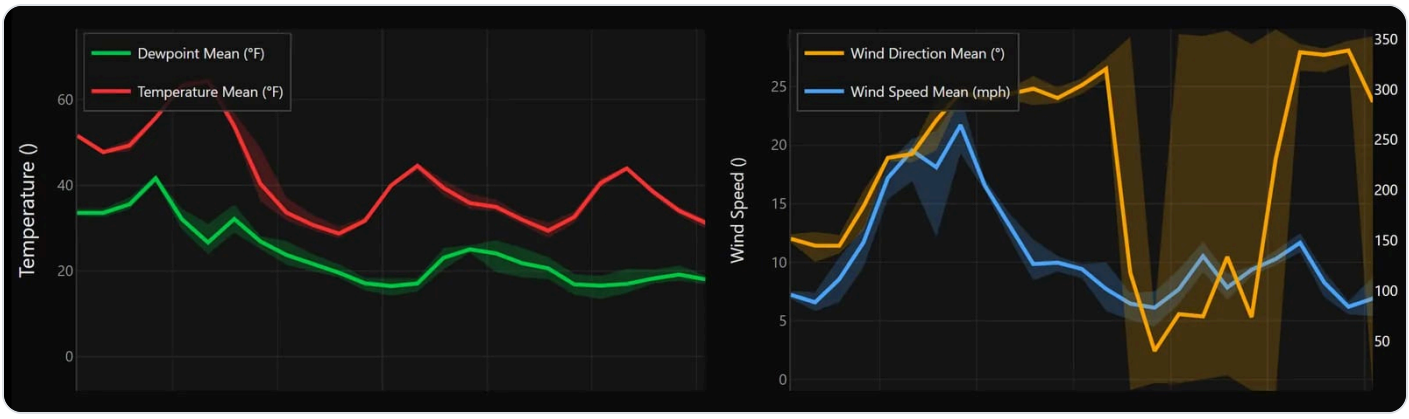
Draw other models over the meteogram's model at the same point, as lines, a plume or box plots.

1. Open a meteogram with a line layout, such as **Default**.
2. Under **Mode**, click **Compare**.
3. Open **Add model to compare** and pick a model. Add as many as you like.
4. Under **Display Mode**, pick **Lines**, **Plume** or **Box**.
5. Click **Single run** to go back.

SETTINGS	
Add model to compare	Models that cover the point, NDFD included. Picking a model already in the list adds its previous run.
Same run time as primary	Lists only models with a run at the same date and hour as the primary, and adds that run.
Color swatch	**Change model color**.
Model name	Click it (**Click to change model run**) to pick another run of that model.
Eye	**Hide Model** or **Show Model**.
×	Removes the model.
Display Mode	**Lines** draws each model; **Plume** shades the range of all models with their mean line; **Box** draws a box plot of the models at each time. Shows once a compared model is visible.

TIPS

- Compared models draw on line plots only. Strips, day ranges and day grids show the primary model.
- The header shows **Compare · N models**.
- A new point, primary model or run clears the list.



A multi-model meteogram: mean temperature, dew point and wind with their spread.

Needs Professional or Creator.

11 Trend earlier runs PROFESSIONAL

Draw the runs just before the current one, so you can see how the forecast has changed.

1. Open a meteogram with a line layout.
2. Under **Mode**, click **Trend**.
3. Under **Earlier runs**, pick **1** to **6**.
4. Read the list under it: each run with its age, such as −6 h. Older runs draw fainter.

TIPS

- Trend uses the runs right before the one under **Run**. Pick an older **Run** to trend from there.
- **Display Mode** works here too: a plume or box plots of the runs.
- Runs load three at a time; the panel shows **Loading runs N of M…**.
- The header shows **Trend · N runs**.

12 Verify runs against observations PROFESSIONAL

Score earlier runs of the meteogram's model against the last hours of observations, to see which runs did best here.

1. Open a meteogram with a line layout, such as **Default**.
2. Under **Mode**, click **Verify**.
3. Under **Observations**, pick **ASOS** or **RTMA**.
4. Under **Last**, pick **12 h**, **24 h** or **48 h**, and under **Earlier runs** pick **1** to **6**.
5. Read the scores in the table, and on each plot.

SETTINGS	
ASOS	Reports of the nearest ASOS station (last 24 hours), or the airport you searched for.
RTMA	The RTMA analysis at the point, updated every 15 minutes (last 48 hours). US only.
Last	The hours scored, back from now. **48 h** needs RTMA; with ASOS it is greyed out.
Earlier runs	How many runs to score besides the current one. They are spread across the hours scored, so an hourly model shows runs about 6 hours apart, not the last few hours.
Run / Hrs / MAE / Bias	The table under **Scores vs …**: each run, the hours it was scored on, its mean absolute error, and its bias (forecast minus observed). The lowest error is highlighted. With several variables, chips pick which one the table shows.

TIPS

- A positive temperature bias means the run was too warm.
- A run is scored only on the hours it covers, so a newer run may have fewer hours.
- Verify always draws lines and draws the observations itself, so **Display Mode** and the **Observations** switch are hidden.
- The header shows **Verify · N runs · H h**.

Needs Professional or Creator.

13 Members mode: every ensemble member

Every member of an ensemble at one point as box plots, percentile bands, plumes, member heatmaps and chances, beside other ensembles and models.

1. Switch the map to GEFS, AI GEFS, GEPS, ECMWF EPS, ECMWF AIFS EPS or REFS.

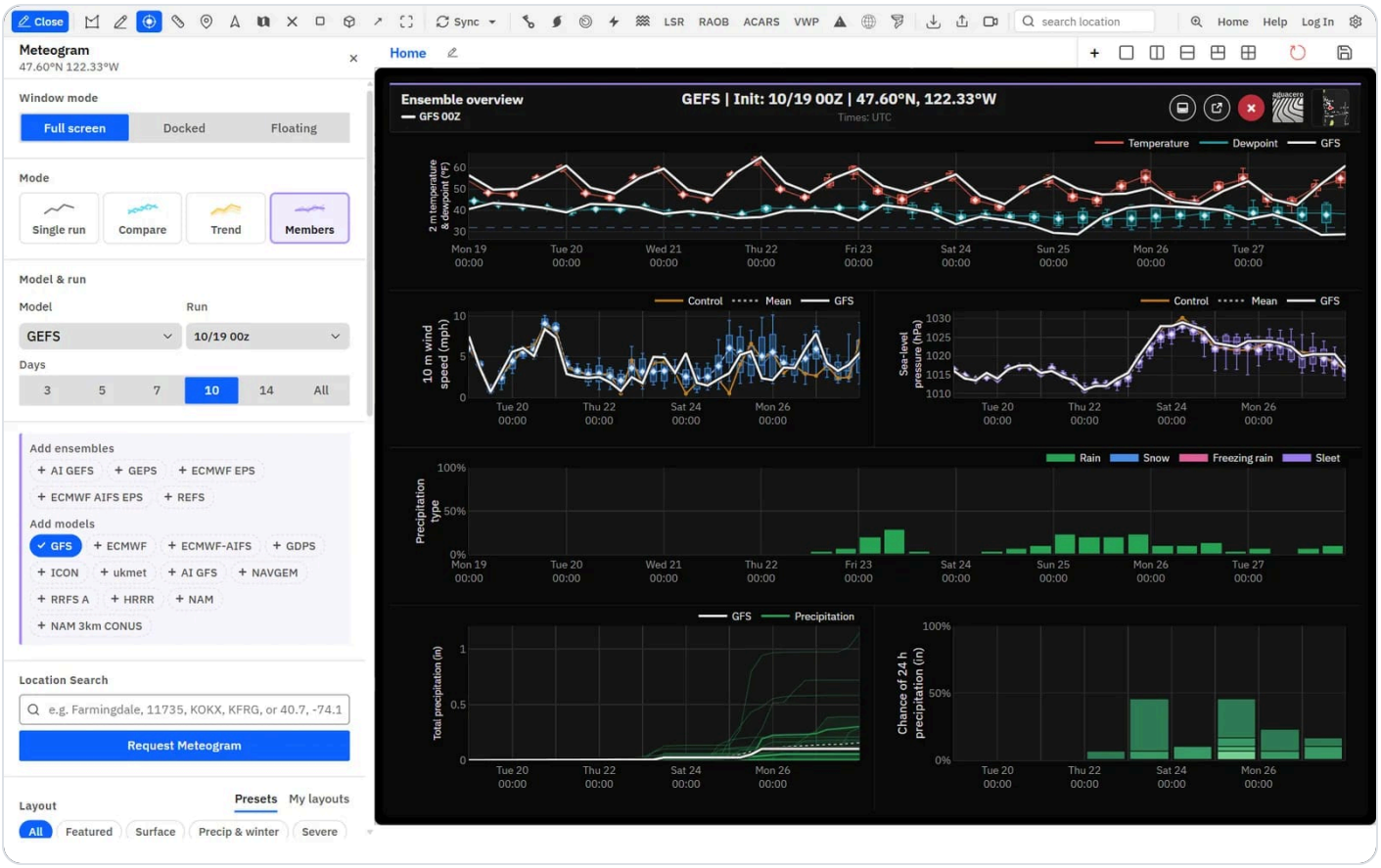
2. Right-click the map and click **Ensemble** under **Meteograms** (or **Model**).
3. Under **Layout**, pick a Members layout, such as **Ensemble overview**.
4. Under **Add ensembles**, click up to 2 other ensembles to draw beside it.
5. Under **Add models**, click up to 4 models to draw as lines. The ensemble's own run, such as the GFS for the GEFS, has its own chip and is on from the start.
6. Hover a plot for the median, mean, range and member count at that time.

MEMBERS LAYOUTS

Featured	**Ensemble overview** (temperature, wind, pressure, precip type, precipitation and its chances), **Plumes**, **Member heatmaps** and **Forecast spread**.
Surface	**Temperature**, **Wind** and **Pressure & storms**.
Precip & winter	**Precipitation**, **Winter**, **Snowfall**, the member snow, ice and sleet grids, and **Ice & sleet**.
Severe	**Severe** (CAPE, shear, helicity, STP), and **Storm timing** (reflectivity by member) on REFS only.
Upper air	**Upper air** and **Pattern change**.
Fire & aviation	**Aviation**: wind and gusts, direction, cloud cover, LCL height, 850 hPa wind and precip type.

TIPS

- Box plots span the 25th to 75th percentiles, with whiskers at the 10th and 90th, a median line and a mean diamond. On one-variable box plots, the control member is a line and the mean a dotted line.
- Ensembles take fixed colors. Added models are drawn in the text color: the ensemble's own run solid, the others dashed, dotted and so on, named in the legend.
- Hover a heatmap cell for that member's value and its rank among the members.
- AI GEFS has no ice, sleet or severe fields, so those layouts aren't offered for it.
- Click **Single run** to see the ensemble's mean fields as an ordinary meteogram.



GEFS Ensemble overview for Seattle: member box plots with the GFS, control and mean lines, precipitation type, member totals and 24-hour chances.

GEFS, GEPS, AI GEFS, REFS and the NBM are on the Free plan. ECMWF EPS, ECMWF AIFS EPS and premium models under **Add models** show a lock on Free and need Enthusiast or higher.

14 Members plot types and amounts

How each Members plot draws the members, and how accumulation windows work for precipitation, snow and ice.

DISPLAY (MEMBERS PLOTS)	
Box & whisker	A box per time: 25th to 75th percentile box, 10th and 90th percentile whiskers, median and mean.
Percentiles	Shaded 10–90 and 25–75 percentile bands with the median and mean.

Plumes	One thin line per member, the control heavier, with the median and mean on top.
Heatmap	One row per member (the added models and the mean on top), one column per time or window, in the map's colors. **Show values** prints the numbers.
Chances	The share of members reaching each threshold per window. Precipitation uses 0.01, 0.1, 0.25, 0.5 and 1 in (0.25 to 25 mm); snow uses 1, 2, 4, 6, 8 and 12 in (2.5 to 30 cm).
Shares	Precip type only: the share of members with rain, snow, freezing rain or sleet, stacked to 100%.

AMOUNTS (PRECIPITATION, SNOW AND ICE PLOTS)

Run total	The amount since the run started. Box, percentile and plume plots use it unless you pick a window.
3 h / 6 h / 12 h / 24 h	Back-to-back windows.
12 h, every 6 h / 24 h, every 6 h	Overlapping windows that end every 6 hours, like the 24-hour snow grids. Not for chances.
Follow precipitation setting	Heatmaps and chances only: use the **Precipitation** amount picked under **Display** on single-run meteograms.

TIPS

- Wind direction draws only as member dots (plumes), and precip type only as **Shares** or a heatmap.
- Plot titles say the window first, such as "24 h precipitation by member", so a run total never looks like a 24-hour amount.

15 Snow and ice by member

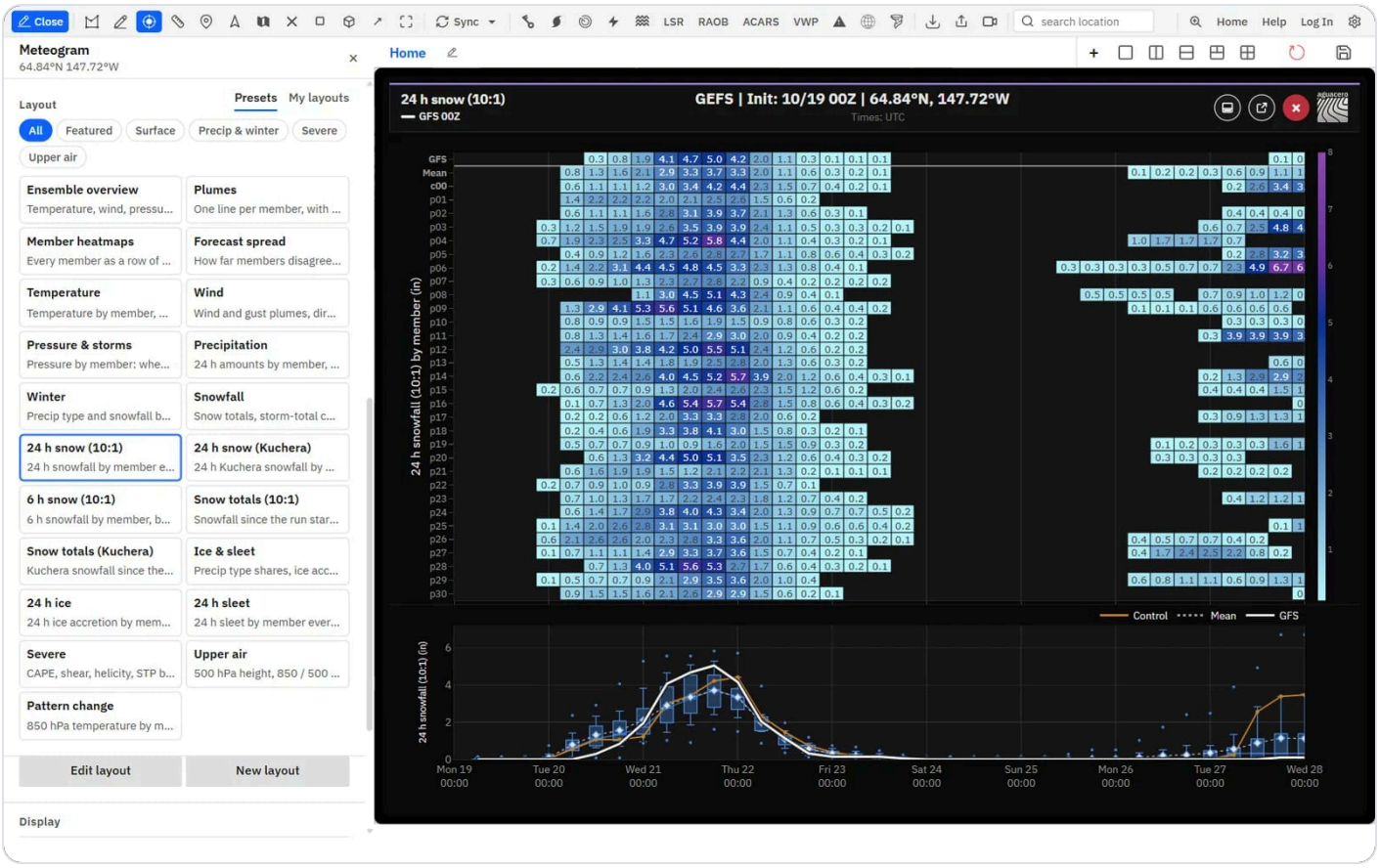
A grid of snow, ice or sleet for every member with a box and whisker underneath, to see how many members bring a storm and when.

1. Open a meteogram in Members mode at the place you want.
2. Under **Layout**, click **Precip & winter**.
3. Pick a grid layout (see the table).
4. Read the grid: one row per member, the added models and the mean on top, and the amount printed in each cell.
5. Read the box and whisker below for the spread on the same windows.

SETTINGS	
24 h snow (10:1) / 24 h snow (Kuchera)	24-hour snowfall by member in windows ending every 6 hours.
6 h snow (10:1)	6-hour snowfall by member.
Snow totals (10:1) / Snow totals (Kuchera)	Snowfall since the run started, by member.
24 h ice / 24 h sleet	24-hour ice accretion or sleet by member, every 6 hours. Not offered for AI GEFS.
Snowfall	Kuchera plumes, storm-total snow chances, and 10:1 against Kuchera box plots.
Winter / Ice & sleet	Precip type by member with snowfall, or precip type shares with ice and sleet plumes and chances.

TIPS

- The 24-hour columns overlap: each one ends 6 hours after the last. On the first day they start at the run time.
- If an ensemble has no Kuchera snowfall, the plot shows 10:1 snow and its title says (10:1).
- Ice uses ice accretion where the ensemble has it, else the freezing rain amount.



GEFS 24-hour snow (10:1) at Fairbanks, Alaska: every member every 6 hours over a box and whisker.

ECMWF EPS has no control member, so its box plots show the mean line only.

16 Snow ratio: 10:1, Kuchera or each layout's own

Switch every snowfall series on the chart between 10:1 and Kuchera snow with one setting.

1. Open a layout with snowfall, such as **Forecast card**, **Winter storm** or the Members **Winter** layout.
2. Under **Display**, find **Snow ratio**.

3. Click **Layout**, **Kuchera** or **10:1**.

SETTINGS	
Layout	Each layout's own snow ratio, as it was built. The default.
Kuchera	Kuchera snowfall: a snow ratio from the temperature aloft. Cold air aloft gives fluffier snow and more of it; air near freezing gives wetter snow and less.
10:1	10:1 snowfall: snow depth 10 times the liquid amount, whatever the temperature.

TIPS

- Layouts named for a ratio, such as **24 h snow (Kuchera)**, and plots that show both ratios side by side stay as they are.
- A series stays as built when the model doesn't have the other ratio.
- The setting changes what draws, not your saved layouts, and it is remembered for every meteogram.

Snow ratio shows only when the layout has a 10:1 or Kuchera snowfall series.

17 NBM percentiles in Members mode

The National Blend of Models publishes percentiles instead of members. Members mode draws them as box plots, bands, heatmaps and chances.

1. Open a meteogram on the NBM. It opens in **Single run**.
2. Under **Mode**, click **Members**.
3. Under **Layout**, pick a percentile layout (see the table).
4. Hover a plot for the median, mean and range at that time.

NBM MEMBERS LAYOUTS	
NBM percentiles	Featured: temperature and dew point bands, humidity, wind and gust, 6-hour precipitation and its chances, and 24-hour precipitation.
Temperature	A temperature heatmap by percentile, box plots, and feels-like bands.
Wind	Wind and gust bands and a gust heatmap by percentile.
Precipitation	6-hour amounts by percentile, 6- and 24-hour chances, and 24-hour box plots.
Winter	Temperature bands, 6-hour snowfall and ice box plots, total snowfall bands and the snow ratio.
Snowfall	A 6-hour snowfall heatmap by percentile, total snowfall bands, storm-total chances and the snow ratio.
Aviation	Wind and gust bands, a gust heatmap, temperature and dew point spread and humidity.

TIPS

- Heatmap rows are the published percentiles, with the mean on top.
- There are no members to draw, so plumes and precip type aren’t offered, and other ensembles can’t be added.
- Precipitation comes in the windows the NBM publishes. In the editor, **Amounts** offers **6 h**, **12 h** and **24 h**.
- When the percentiles come from an earlier NBM run than the one shown, the chart says **Percentiles from** and that run.

18 Climate normals on temperature plots

The 1991–2020 normal high and low at the nearest climate station, drawn beside the forecast temperature.

1. Open a layout with a 2 m temperature plot, such as **Default** or **Forecast card**.
2. Under **Display**, turn on **Normals**.
3. Read the header: the normal high and low for the first day shown, then the station name and its distance.

HOW NORMALS DRAW	
Lines	One dashed **Normal** line in the axis label color: a typical day built from the normal low near sunrise and the normal high about 2 hours after solar noon.
Day range	Dashed red (normal high) and blue (normal low) lines across the days.
Day grid	A **Normal** row under the temperature row, with each day's normal high and low.
Members plots	Dashed **Normal high** and **Normal low** lines on temperature box, percentile and plume plots.

TIPS

- Normals come from NOAA's U.S. Climate Normals in the US and GHCN-Daily stations elsewhere.
- With no station within 60 km (37 mi), the header says so and nothing draws.
- The normals give only each day's high and low, so the Lines curve is an estimate of a normal day, not an hourly normal.
- Your choice is remembered.

Normals shows only when the layout has a 2 m temperature plot it can draw on (not wind barbs, member heatmaps or chances).

19 Observations on the chart

Hourly observations drawn as rings over the forecast, so you can see how the run is doing so far.

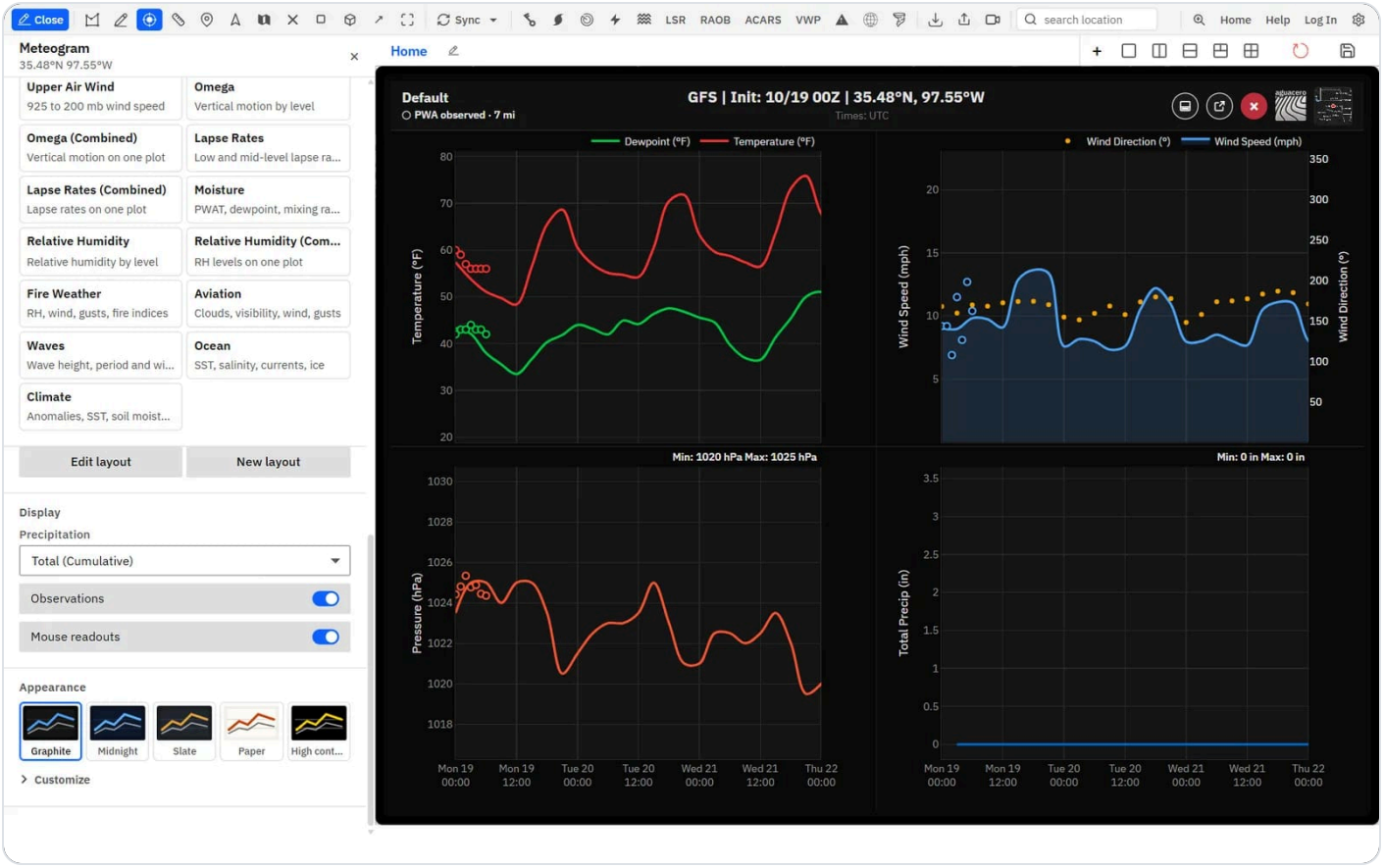
1. Open a layout with a line plot, such as **Default**, or a Members layout with box, percentile or plume plots.
2. Under **Display**, turn on **Observations**.
3. Under **Observed by**, pick **ASOS** or **RTMA**.
4. Read the rings: one per hour, in the color of the line they match. The header names the station and its distance, or the analysis.

SETTINGS

ASOS	The airport you searched for, else the nearest ASOS station within 30 km (19 mi). Reports reach back 24 hours and refresh every 20 minutes.
RTMA	The analysis read at the point itself, so it works away from airports (US only). It reaches back to the earliest run drawn, up to 48 hours, and refreshes every 15 minutes. Its last ring is the newest 15-minute analysis. It has no visibility.

TIPS

- Temperature, dew point, feels-like, humidity, wet bulb, wind, gusts, pressure and visibility get rings. Stations above 750 m get no pressure.
- When nothing draws, the header says why, for example no ASOS station within 19 mi or no reports in the last day.
- Hover a time to read the observed values with the forecast.



A GFS meteogram for Oklahoma City with the reports from Wiley Post Airport (PWA) drawn as rings.

Observations shows only when the layout has a plot it can draw on, and not in Verify mode, which draws observations itself.

20 Precipitation amounts

Choose whether precipitation, snow and ice lines show the total since the run started or the amount over the last hours.

1. Open a layout with precipitation, such as **Default**.
2. Under **Display**, open **Precipitation**.
3. Pick **Total (Cumulative)** or an amount from **1-hour** to **72-hour**.

SETTINGS	
Total (Cumulative)	The amount since the run started (or since the first day shown). The line only climbs while precipitation falls.
1-hour … 72-hour	The amount over the last 1, 3, 6, 12, 24, 48 or 72 hours at each time. Only amounts that fit the run's time step and length are listed.

TIPS

- A saved amount the run can't show, such as 1-hour on a 6-hourly ensemble, falls back to **Total (Cumulative)**.
- Your choice is remembered for every meteogram.
- Members heatmaps and chances set to **Follow precipitation setting** use this amount too.

Precipitation shows only when the layout has an amount that adds up, such as precipitation, snow or ice.

21 Build a layout in the editor

Pick the plots, variables, colors and axes yourself. The chart redraws with every change.

1. Open a meteogram and click **Edit layout** to start from the current layout, or **New layout** for a blank one.
2. Type a **Name**.
3. Click a plot card to open it, and pick its type: **Lines**, **Strips**, **Day range** or **Day grid**.
4. Click **+ Add variable**, search, and pick a variable.
5. Click **+ Add plot** for another plot. With two or more plots, pick **One column** or **Two columns**.
6. Click **‹** (**Done editing**) when you're done, or save the layout to your library.

SETTINGS	
Name	The layout's name, up to 60 characters. It shows in the chart header.
Columns	**One column** stacks every plot full width; **Two columns** lets plots sit side by side.
Plot card tools	**Move up**, **Move down**, **Duplicate plot** and **Remove plot**.
Plot type	**Lines** (time series), **Strips** (an hourly color band per variable), **Day range** (each day's high and low) or **Day grid** (a table of daily values). Members layouts have their own displays instead.
Plot title	Blank uses the variable names. Up to 48 characters.
Width	**Half** or **Full**, with **Two columns**.
Height	**1×**, **2×** or **3×** rows.
+ Add variable	A searchable list grouped by topic. Variables the model lacks are greyed out (**Not available for** the model).
+ Add plot	Adds a plot of the type you click. In Members mode: **Box & whisker**, **Percentiles**, **Plumes**, **Heatmap**, **Chances** or **Precip type**.

TIPS

- Changing a plot's type keeps the variables that type can show.
- If you made no changes, **‹** goes back to the layout you started from. Otherwise the layout stays on the chart as **Unsaved**, with **Save** and **Discard** in the layout picker.
- **Discard changes** in the editor goes back to where you started.

A layout holds up to 12 plots, and a plot up to 8 variables.

22 Variables: color, style, axis and order

Each variable row in a plot card has its own color, style or daily value, axis and place in the order.

A VARIABLE ROW	
Grip	**Hold and drag to reorder**, or focus it and press ↑ or ↓. Later variables draw on top; in day grids the order is the row order.
Swatch	**Change color**.
Style (Lines)	**Line**, **Area**, **Bars**, **Steps** or **Dots**, plus **Barbs** for wind speeds. Wind direction offers **Arrows** or **Dots**.
L / R (Lines)	Draw on the left or right axis.
Daily value (Day range, Day grid)	**High / low**, **Max**, **Min** or **Average**. Amounts that add up always use **Total**.
×	**Remove** the variable.

TIPS

- Add the same variable twice to a day grid for separate high and low rows, each with its own color.
- Members heatmaps, chances and precip type show one variable; their button reads **Change variable**.

23 Plot settings by type

The extra settings each plot type has: reference lines, bar fills and colormaps, outlines, day starts and more.

LINES	
Label highs / lows	Callouts on the plot's highs and lows. Off follows **Label highs / lows** in **Customize**.

Freezing line	A dashed 32 °F (0 °C) line. On plots with 2 m temperature or dew point.
Reference line	A dashed line at a value you type, in the units on screen. Blank for none.

STRIPS	
Show values	Print the value in each strip.

DAY RANGE	
Bar fill	**Gradient** runs the colormap along each bar, **By value** fills each bar with one colormap color for its value (a high / low bar uses the middle of its range), and **Solid** uses the variable's swatch.
Colormap	One per variable: **Map default…** or **Custom…**. Saved with the layout, not as your map default. **×** resets it.
Align to bottom	Grow every non-range column from zero, so a max and min sit side by side.
Bar outlines	On by default with several bars or a solid fill. **Outline** sets 0.5 to 6 px and its color (blank: each variable's color).
Bar width	40% to 160% of the usual width.
Show values / Hourly trace	Print the values on the bars, and draw the hourly values across each high / low bar.
Day starts at	The hour a day starts, 00:00 to 23:00, in the chart's time zone.

DAY GRID	
Colormap	One per row: **Map default…** or **Custom…**, saved with the layout.
Show values	Print each day's value in its cell.

Hourly trace	A small trace of the hourly values under each value. On by default.
Day starts at	The hour a day starts, 00:00 to 23:00.

MEMBERS PLOTS

Display	**Box & whisker**, **Percentiles**, **Plumes**, **Heatmap** or **Chances**; precip type offers **Shares** or **Heatmap**.
Amounts	The accumulation window for precipitation, snow and ice. See **Members plot types and amounts**.
Show values	Heatmaps: print the value in each cell.

TIPS

- The rounding of day range bars and day grid cells is set for every meteogram by **Corners** in **Customize**.
- A colormap picked here belongs to this layout only. Your map colormaps don't change.

24 Save layouts to your library

Keep a layout you built, and open it from the meteogram or from the library like a bundle.

1. In the layout editor, click **Save to library**.
2. Type a **Layout name**. Pick a **Category** (**Meteograms** to start) and **Subcategory** (**General**), or type new ones.
3. Click **Save layout**. Saved layouts are private: only you can see them.
4. Find it on the **My layouts** tab, grouped by category and subcategory.

SETTINGS

Save	When you are editing a saved layout: overwrite it (the form's button reads **Update layout**).

Save as new	Save a copy as a new layout.
Pencil (Edit layout)	On **My layouts**: open the layout in the editor.
× (Delete layout)	Click it, then click **×** again (**Click × again to delete**).
+ New layout	The last tile on **My layouts**: a blank layout in the editor.

TIPS

- Your layouts also show in **Select Data** under **My**, in their category. Click one there to switch the meteogram to it, or to open a meteogram at your last meteogram point (or the map center).
- A Members layout opens the meteogram in Members mode. In Compare, Trend and Verify, only your layouts with a line plot are listed.
- The theme isn't saved with a layout: **Appearance** applies to every meteogram.

Saving needs an account. Saved layouts count toward your bundle limit: 10 on Free, 20 on Enthusiast and unlimited on Professional and up.

25 Themes and Customize

Pick a theme for every meteogram, and fine-tune its colors, text, lines, spacing, corners and header.

1. Scroll the controls to **Appearance**.
2. Click a theme tile.
3. Pick a **Font**, or click **Upload your own font** to add one in Settings.
4. Click **Customize** for the rest. It reads **Customize (edited)** once you change something.

THEMES

Graphite	Near-black with a blue highlight. The default.
Midnight	Navy with night shading and gaps between plots.

Slate	Charcoal with an amber highlight, dashed gridlines, straight lines and gaps.
Paper	Light, with dotted gridlines and night shading.
High contrast	Black and white with a yellow highlight, thicker lines, larger text and high / low labels.

CUSTOMIZE	
Colors	**Background**, **Plot area**, **Gridlines**, **Text**, **Axis labels**, **Highlight** and **Night shade**.
Gridlines	**Solid**, **Dashed**, **Dotted** or **Off**.
Curves	**Smooth** or **Straight** lines.
Header	**Compact**, **Standard** or **Large**.
Text size	80% to 160%.
Line width	50% to 250%.
Plot spacing	0 to 16 px between plots. 0 leaves thin dividers.
Corners	The rounding of day range bars and day grid cells, from square (0%) to fully round (100%). **Auto** (the default) rounds bars and cells a little and high / low capsules fully; **Back to Auto** returns to it.
Switches	**Shade night**, **Midnight lines**, **Weekday labels**, **Time gridlines**, **Label highs / lows**, **Min / max badge** and **Map inset**.
Reset to Graphite	Shows once you have edited the theme. Your font stays.

TIPS

- **Map inset** also decides whether copied and downloaded images include the map. The AguaceroWx logo can’t be turned off.
- The theme saves to your account; the newest change wins across devices.

26 Copy or download the chart image

Save the meteogram as a PNG or copy it to paste into a post or message.

1. Right-click the chart. On a touch screen, press and hold.
2. Click **Copy Meteogram Image** to copy it, or **Download Meteogram Image** to save it.

TIPS

- The image is the chart as you see it, header included, at twice screen resolution. The cursor line and readouts are left out.
- Downloads are PNG files named with the model and run.
- Turn off **Map inset** under **Customize** to leave it off. The map inset is also left out when the point is outside the map’s view.
- For a bigger image, make the chart **Full screen** first.

27 Chart windows and phones

Keep the map in view with a docked or floating meteogram, and what changes on a phone-sized screen.

WINDOW MODE	
Full screen	Cover the whole board.
Docked	Dock under the map. Drag its top edge to change its height.
Floating	A smaller window over the map: drag the title bar to move it, and the edges to resize it.

TIPS

- The dock and pop-out buttons on the chart do the same, and the app remembers the last mode you used.
- On a phone-sized screen, the meteogram opens full screen without the controls panel. A strip at the bottom has **Model**, **Run**, **Layout** and, when the layout can use them, **Observations** (with its source) and **Normals**.
- The chart on a phone uses the theme and the days, snow ratio and other choices you saved on a larger screen.

Docked and floating windows are on desktop only.

28 Station (ASOS) meteograms

An observed meteogram of about the last 24 hours at a surface station, in the same chart and with station layouts.

1. Turn on surface stations (**Surface obs** on the toolbar).
2. Click a station on the map. Its observed meteogram opens.
3. Under **Layout**, pick **ASOS Observations**, **Winter weather**, **Fire Weather** or a model layout that observations can fill.
4. Click another station on the map to switch.

TIPS

- The header shows **Latest:** and the time of the newest report.
- Station meteograms keep their own last layout, separate from model meteograms. The editor lists only what stations report.
- A library layout clicked while a station meteogram is open applies to it.
- The controls show the station code in place of the mode, model, days and location search.

29 Plans, and what the app remembers

Which meteogram tools need a plan, and which choices are saved to your account.

BY PLAN	
Free	Single run and Members meteograms on the free models (including ECMWF, GDPS, RGEM, NBM, NDFD, GEFS, GEPS, AI GEFS and REFS), every layout, the editor, observations, normals and export. Up to 10 saved bundles and layouts.
Enthusiast	Every model, including ECMWF EPS and ECMWF AIFS EPS in Members mode and premium models under **Add models**. Up to 20 saved bundles and layouts.
Professional and Creator	**Compare**, **Trend** and **Verify**, and unlimited saved bundles and layouts.

SAVED TO YOUR ACCOUNT	
Remembered	The last layout for Single run, Members mode and station meteograms; **Days**; **Hide partial days**; **Snow ratio**; **Precipitation**; **Observations** and **Observed by**; Verify's **Last**; **Normals**; the ensembles and models added in Members mode; and the theme.
Not saved	**Dates**, the mode, the compared models, the number of earlier runs and **Mouse readouts** aren't saved to your account.

30 Recipe: a 7-day forecast card for a city

A clean daily forecast graphic with normals, ready to post.

1. Load the GFS or ECMWF, right-click the map and click **Model** under **Meteograms**.
2. Type the city under **Location Search** and click **Request Meteogram**.
3. Under **Layout**, click **Forecast card**.

4. Under **Days**, click **7**, and under **Display** turn on **Hide partial days** and **Normals**.
5. Under **Appearance**, pick **Paper** or **Midnight**, and set **Corners** under **Customize** to taste.
6. Make the chart **Full screen**, then right-click it and click **Download Meteogram Image**.

31 Recipe: how many members bring snow?

Check when and how much snow the ensembles agree on at one place.

1. Switch the map to the GEFS, right-click the town and click **Ensemble** under **Meteograms**.
2. Under **Layout**, click **Precip & winter**, then **24 h snow (Kuchera)**.
3. Count the members with snow in each column, and read the box and whisker for the spread.
4. Under **Add ensembles**, click **GEPS** to put its members beside the GEFS.
5. Switch to **Snowfall** for storm-total chances, and set **Snow ratio** to **10:1** to compare the fixed-ratio totals.

32 Recipe: an airport aviation briefing

Ceilings, visibility, wind and shear at an airport, checked against the latest reports.

1. Load the NBM or HRRR, right-click the map and click **Model** under **Meteograms**.
2. Type the airport code, such as KSFO, under **Location Search** and click **Request Meteogram**.
3. Under **Layout**, click **Aviation forecast**.
4. Under **Days**, click **3**, then pick the flight day under **Dates** if you want only that day.
5. Under **Display**, turn on **Observations** with **ASOS** to see the airport's reports over the forecast.
6. On the NBM, read **IFR chances** and the low-level wind shear plot.

33 Common questions

Answers to the meteogram questions we hear most.

Why are Compare, Trend and Verify locked?

They need Professional or Creator. On other plans the mode cards show a lock and open the upgrade dialog. Members mode, observations and normals are on every plan.

Why can’t I find a layout for this model?

The picker hides layouts the model has no fields for, such as **Winter storm** on a model without snow or ice, or **Aviation forecast** without ceilings or visibility. Compare, Trend and Verify list only layouts with a line plot, Members mode has its own layouts, the NBM’s Members mode takes only its percentile layouts, **Storm timing** is REFS only, and AI GEFS has no ice, sleet or severe layouts.

Why does the NDFD meteogram show only about 3 days?

The hourly NDFD issuances reach about 3 days ahead. Under **NDFD Issuance**, open **Run** and pick the 00Z issuance for the full 7 days.

Why don’t observations appear?

The **Observations** switch shows only for layouts with a line plot (or Members box and plume plots) of an observed field, and not in Verify mode. With **ASOS**, there must be a station within 30 km (19 mi) with reports in the last 24 hours; try **RTMA**, which reads the analysis at the point (US only). The chart header says why nothing draws.

Why is there no control line on ECMWF EPS?

ECMWF EPS has no control member in its member data, so its box plots show the mean line only, and its heatmap rows are numbered members. GEFS, AI GEFS and GEPS have a control member.

Why does a Kuchera snow plot say 10:1?

Some ensembles have no Kuchera snowfall. The plot then shows 10:1 snow and says so in its title.

Should I use 10:1 or Kuchera?

10:1 assumes 10 inches of snow per inch of liquid, which is simple and easy to compare. Kuchera sets the ratio from the temperature aloft, so it gives more snow in very cold storms and less in storms near freezing. Compare both with the Members **Snowfall** layout, or switch the whole chart with **Snow ratio**.

Why does precipitation look flat?

With **Total (Cumulative)**, the line shows the amount since the run (or the first day shown) started, so it stays flat through dry hours. Pick a window such as **6-hour** under **Precipitation** to see each period's amount. Only windows that fit the run's time step are listed.

Why are Dates and Hide partial days missing?

They are hidden in Members mode and when the run fits in one day. In Members mode, use **Days**.

Why did my date range go away?

A date range lasts for the session, and a **Days** button or **Clear dates** removes it. It is also ignored on a run that doesn't reach those days.

Why did my layout change when I clicked Compare?

Compared runs draw on line plots only, so a layout without one, such as **Forecast card**, is set aside and **Default** is shown. It comes back when you click **Single run**.

Why are the normals missing?

Normals shows only for layouts with a 2 m temperature plot. If no climate station is within 60 km (37 mi), the header says so and nothing draws.

Why can't I save my layout?

Saving needs you to be signed in. Saved layouts count toward your bundle limit (10 on Free, 20 on Enthusiast); at the limit, the app offers an upgrade. Editing a layout you already saved and clicking **Save** doesn't use another slot.

Why are the meteogram controls missing?

On a phone-sized screen the meteogram opens full screen with a strip of controls at the bottom instead of the panel. On desktop, the controls are in the sidebar while the chart covers the board, or in a panel beside it when docked or floating.