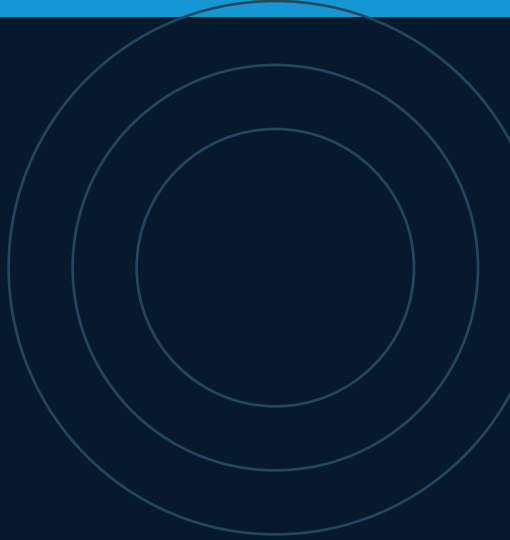




Clear Sky Confidence

User Guide

Multi-model cloud forecasting for astrophotography planning

DOCUMENT INFORMATION

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Product identification

Product: Clear Sky Confidence

Software version: 1.0.0

User guide version: 1.0

Developer identity: erhAstro

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Clear Sky Confidence

A user guide for reading the forecast and changing the location.

Clear Sky Confidence looks at three weather models and turns their cloud forecasts into one night-by-night answer: clear, uncertain, or cloudy. The standalone program opens on Dark Sky New Mexico. The location line at the top lets you point it at any other site, and that site is remembered the next time the program opens.

The pictures in this guide were taken on the evening of October 6, 2026, for Dark Sky New Mexico. Your numbers, times, and verdict will follow the forecast for the site you choose.

In this guide

- Open the program
- A tour of the window
- Change the location
- Read the summary cards
- Choose a night and read the hourly table
- Use the four tabs
- How a night is scored
- What is saved on the computer
- When the forecast does not load

1. Open the program

You receive one file, **ClearSkyConfidence.exe**. Double-click it. There is nothing to install.

The program needs an internet connection the first time it scores a site, and again whenever you click **Refresh** or **Use location**. It downloads the forecast from Open-Meteo. You do not sign in, and you do not open a browser.

The first time it runs, Windows may ask you to confirm the file. If you trust the person who sent it, allow it to run.

Where it starts. With no saved site yet, the window opens on Dark Sky New Mexico: latitude 31.94668, longitude -108.89948. After you choose a different site, that new site is what opens next time.

2. A tour of the window

Everything you need for a go or no-go decision is on one screen. The top is the site. The cards are the decision. The table is the evidence. The tabs explain the models, the history, and the score.

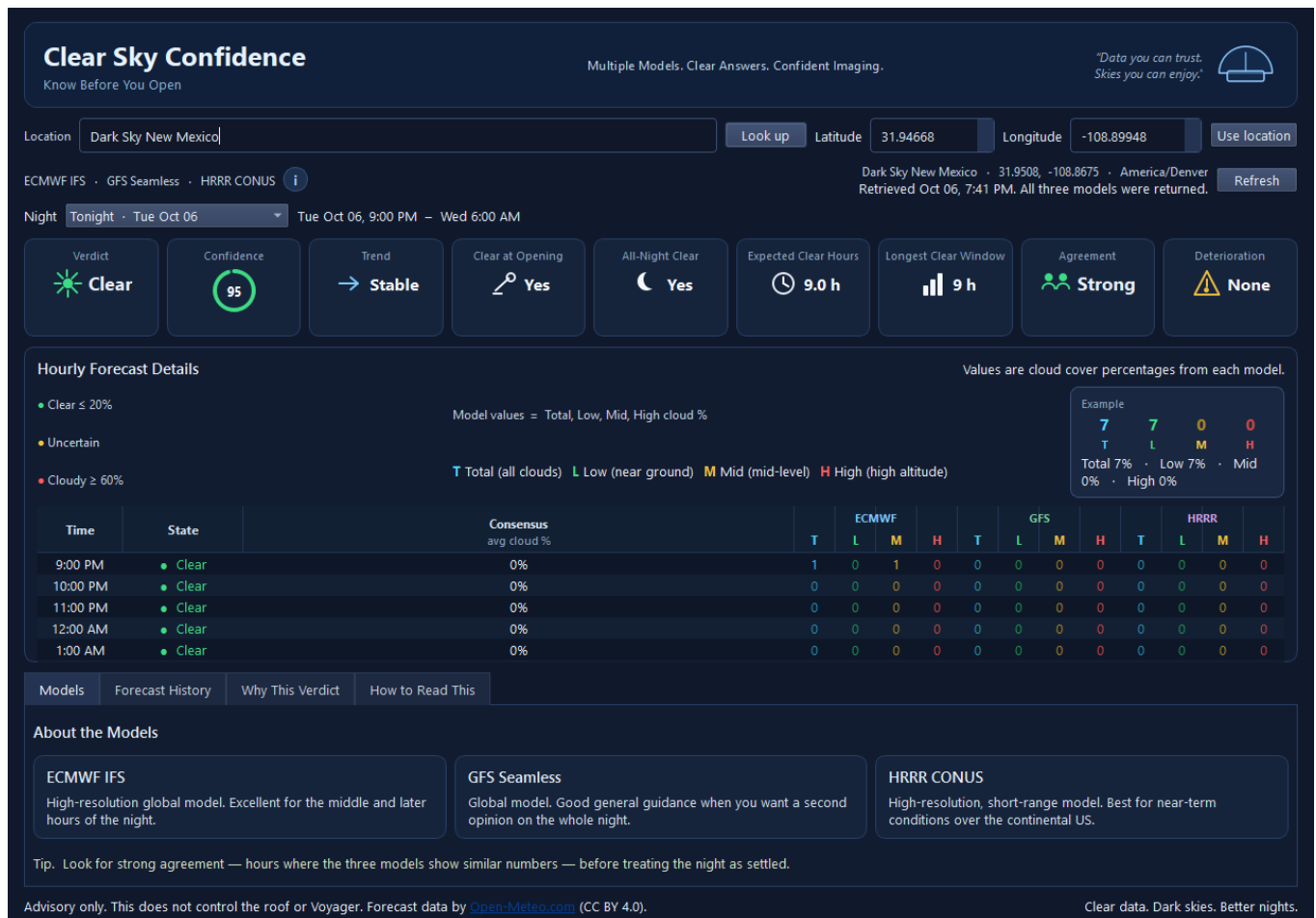


Figure 1. Clear Sky Confidence on Dark Sky New Mexico, the evening of October 6, 2026. Tonight scored Clear, with strong agreement and a stable trend.

Part of the window	What it is for
Location, Look up, Latitude, Longitude, Use location	Choose the site. This line is on the standalone program. Inside Observatory Monitor, Clear Sky stays on the monitor's own site.
ECMWF IFS · GFS Seamless · HRRR CONUS	The three models. The small i button restates what each one is best at.
Site line and status, on the right	The place name, the coordinates the forecast actually used, the local time zone, and when the forecast was retrieved.
Refresh	Downloads a new forecast for the site already on screen and adds a row to Forecast History.
Night	Switches among the nights inside this download. Tonight, tomorrow night, and the night after that.
Summary cards	The decision for the night selected in the Night menu.
Hourly Forecast Details	Cloud-cover percent, hour by hour, from each model.
Models, Forecast History, Why This Verdict, How to Read This	Background, earlier downloads for this same site, and the exact scoring for the night on screen.

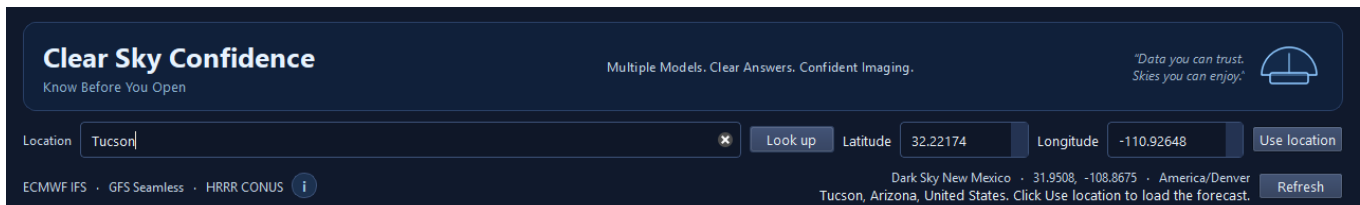
The footer is part of the product: the window is advisory. It does not open the roof, and it does not talk to Voyager.

3. Change the location

The forecast follows latitude and longitude. The words in the Location box are the label you will see next to those coordinates. Looking up a city fills both the label and the coordinates. Typing coordinates yourself is how you keep an exact observatory site.

Look up a city or town

- 1 Click the Location box. Type a city or place name. Two letters are enough to start a search; a full city name is easier to match.
- 2 Click **Look up**, or press Enter.
- 3 When one place matches, its name, latitude, and longitude fill in. The status line on the right tells you to click **Use location**. The forecast on screen is still the previous site until you do.
- 4 Click **Use location**. The program saves the site and loads its forecast. The site line changes to the new place.



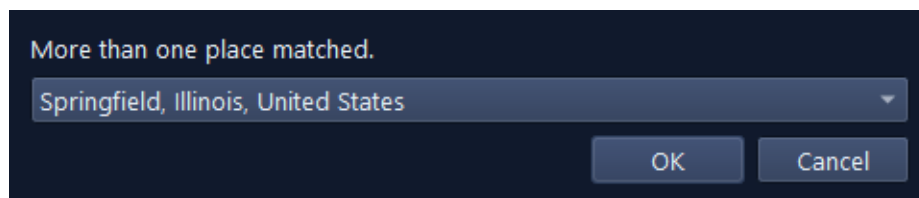
The screenshot shows the 'Clear Sky Confidence' application interface. At the top, it says 'Clear Sky Confidence' and 'Know Before You Open'. Below this, there's a 'Location' input field containing 'Tucson'. To the right of the input field is a 'Look up' button. Further right are fields for 'Latitude' (32.22174) and 'Longitude' (-110.92648), followed by a 'Use location' button. At the bottom, there's a status line that reads: 'Dark Sky New Mexico - 31.9508, -108.8675 - America/Denver Tucson, Arizona, United States. Click Use location to load the forecast.' There is also a 'Refresh' button on the far right.

Figure 2. Tucson has been looked up. The coordinates are filled in, and the status line says to click Use location. The site line still shows Dark Sky New Mexico because Use location has not been clicked yet.

You can edit the Location name before you click **Use location**. “Tucson”, “Backyard”, or “North pad” are all labels. The forecast uses the latitude and longitude.

When several places match

A common name opens a short list. Pick the city you mean and click **OK**. **Cancel** leaves the coordinates as they were.



The screenshot shows a dialog box titled 'More than one place matched.' It contains a dropdown menu with 'Springfield, Illinois, United States' selected. Below the dropdown are two buttons: 'OK' and 'Cancel'.

Figure 3. Searching “Springfield” offers more than one city. The list shows the city, the state or region, and the country.

Type the coordinates yourself

Use this for a site that is not a city, including a return to the Dark Sky New Mexico observatory.

- 1 Type the label you want in Location. If you leave it blank, the program saves the label “Custom site”.
- 2 Set Latitude. The allowed range is -90 to 90 . Southern latitudes are negative.
- 3 Set Longitude. The allowed range is -180 to 180 . Longitudes in the Americas are negative. Dark Sky New Mexico is about -108.9 .
- 4 Click **Use location**.

Back to the default observatory. The label “Dark Sky New Mexico” is a name stored in the program. A city search for that phrase may not land on the observatory. To restore it, set Latitude to **31.94668**, Longitude to **-108.89948**, put Dark Sky New Mexico in the Location box, and click **Use location**.

The coordinates on the right can differ slightly from the numbers you typed. The forecast comes back for the nearest model grid point, and the site line shows that grid point, plus the time zone Open-Meteo assigned to it.

The next time you open **ClearSkyConfidence.exe**, the saved site is already filled in and its forecast starts loading. You look a place up once.

4. Read the summary cards

The cards describe the night selected in the Night menu. On October 6, tonight at Dark Sky New Mexico looked like this.

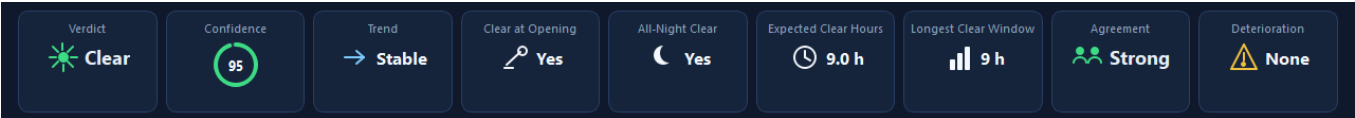


Figure 4. The decision row. Green, amber, and red mean the same thing on the cards and in the hourly table.

Card	How to read it
Verdict	Clear, Uncertain, or Cloudy. This is the night’s decision. Section 7 explains the rule that produces it.
Confidence	A score from 5 to 95. The ring is green at 75 or above, amber from 45 through 74, and red below 45. The example night is 95.
Trend	First Run until this site has an earlier saved forecast. After that: Stable, Improving, or Deteriorating, compared with the previous download for this same site. A new location starts over at First Run.
Clear at Opening	Yes when the first hour of astronomical night is clear.
All-Night Clear	Yes when every scored hour of the night is clear.
Expected Clear Hours	A clear hour counts as 1. An uncertain hour counts as 0.5. Cloudy hours count as 0.
Longest Clear Window	The longest unbroken run of clear hours, in whole hours.
Agreement	Strong, Moderate, Weak, or Insufficient. Strong means the models are within about 15 cloud-cover points of each other, on average. Moderate extends to about 30. Wider than that is Weak.
Deterioration	The local time when a clear stretch first turns uncertain or cloudy. None means the night stays clear. A dash means the night never had a clear stretch to lose.

5. Choose a night and read the hourly table

The Night menu lists the astronomical nights inside this download, in the site’s local time. The text beside it is the span of that night. On the example screen it reads **Tue Oct 06, 9:00 PM – Wed 6:00 AM**, which is nine hours.

Astronomical night, for this program, is every hour when the Sun is at or below -18° . Twilight hours stay out of the score.

If the download runs out before dawn, the span adds “forecast ends during this night.” A night that would otherwise be Clear is shown as Uncertain in that case, because the program has not seen the whole night.

The hourly table

Each row is one hour. The values are cloud-cover percentages.



Figure 5. The color legend, the four cloud layers, a worked example, and the first hours of the night.

Column	Meaning
Time	Local time at the site. A gray time has already passed.
State	Clear at or below 20% consensus cloud. Uncertain when the hour is reported but neither clearly clear nor clearly cloudy. Cloudy at or above 60%.
Consensus	The weighted average cloud percent for that hour. See the weights below.
T, L, M, H under ECMWF, GFS, and HRRR	T is total cloud, all levels together. L is low cloud, near the ground. M is mid-level cloud. H is high cloud. A bright number is cloud that is present. A dim 0 is a reported zero. A dash means that model did not report the hour. The dash stays blank.

The example box on the right of the table is a reading key. The numbers 7, 7, 0, 0 under T, L, M, H mean total cloud 7%, low cloud 7%, mid cloud 0%, and high cloud 0%.

Point at any hour for a tooltip with that hour's full T, L, M, and H from each model.

Who counts in the average. In the next 18 hours, HRRR is 45%, ECMWF is 30%, and GFS is 25%. From 18 to 36 hours, the weights are HRRR 35%, ECMWF 35%, and GFS 30%. After 36 hours, HRRR stays on screen and drops out of the average: ECMWF is 55% and GFS is 45%. If a model is missing for that hour, the remaining models share the average.

HRRR is a continental-United-States model. Outside that area, HRRR cells are dashes. That is expected. ECMWF and GFS still score the night.

6. Use the four tabs

Models

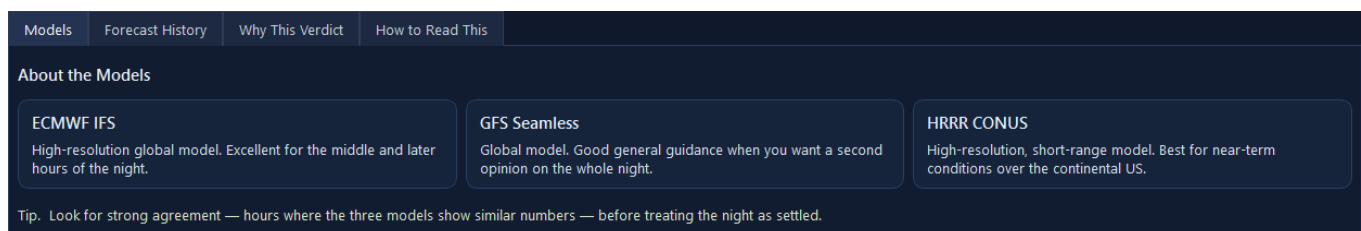


Figure 6. The Models tab. The same three descriptions are behind the i button at the top of the window.

- ECMWF IFS is a high-resolution global model. It carries the most weight from the middle of the night onward, and after 36 hours it is the lead model.
- GFS Seamless is the second global model, used as a check on the whole night.

- HRRR CONUS is a high-resolution short-range model. It carries the most weight in the next 18 hours over the continental United States.

Hours where the three models show similar numbers are the hours to trust. A wide spread is why Agreement falls from Strong to Moderate or Weak.

Forecast History

Each **Refresh**, and each **Use location**, saves a row for that site. The newest row is on top. History for one site stays with that site. Changing location starts a separate list.

Models	Forecast History		Why This Verdict		How to Read This		
Retrieved	Verdict	Confidence	Agreement	Trend	Clear hours	Window	Data
Oct 06, 7:41 PM	Clear	95	Strong	Stable	9.0	9 h	complete
Oct 06, 1:41 PM	Clear	95	Strong	First Run	9.0	9 h	complete

Figure 7. Two retrievals of the same site. The earlier row is the first run. The later row can say Stable, Improving, or Deteriorating.

Trend becomes Deteriorating when consensus cloud has risen by about 8 points or more, or when cloud arrives at least an hour earlier than it did on the previous run. It becomes Improving when cloud has fallen by about 8 points or more, or when the cloudy hours have moved at least an hour later. Otherwise a later run is Stable.

The Data column is complete when all three models reported the night, partial when some hours or a model are missing, degraded when only one model has data, and missing when none do.

Why This Verdict

Models	Forecast History	Why This Verdict	How to Read This
Tonight looks clear, and the models support treating the night as clear through the window. No model shows a cloud increase through this night. The clear stretch runs through the whole night, not only the opening. Model agreement is strong. Recent runs are stable. The verdict and confidence are calculated in the app. This explanation does not change them. Hour rules A clear hour needs consensus cloud at or below 20%, no scoring model above 25% total cloud, no scoring model above 40% high cloud, and at least 2 models reporting. A cloudy hour needs consensus cloud at or above 60%. Every other reported hour is Uncertain. A missing model is never filled in from another model. Night window:			

Figure 8. The top paragraph is the night in plain language. Under it, the tab lists the hour rules, the model weights, and the confidence steps for the night on screen. Scroll to read the rest.

This tab explains the score. It does not change the score. If you want the short version of those rules, use the next section of this guide. If you want the arithmetic for the night you are looking at, scroll this tab.

How to Read This

Models	Forecast History	Why This Verdict	How to Read This
Summary cards are the decision. Verdict, confidence, and whether the opening and the whole night are clear stay in front. The icons match the words. Colors mean the same thing everywhere. Green is Clear (consensus cloud at or below 20%, no model above 25% total cloud, and no model above 40% high cloud). Amber is Uncertain (the hour is reported, but it is not clearly clear or clearly cloudy). Red is Cloudy (consensus cloud at or above 60%). Each model has four numbers. T is total cloud, all levels together. L is low cloud, near the ground. M is mid-level cloud. H is high cloud. A dash means that model did not report the hour. The blank is never filled from another model. Consensus is the weighted average of the models that reported that hour. HRRR carries more weight in the next 18 hours. After 36 hours it stays on screen but drops out of the average. Forecast History is earlier retrievals of this same site, so you can see whether the night is holding, improving, or deteriorating. Why This Verdict is the exact scoring for the night on screen.			

Figure 9. The same color rules live inside the program, on the How to Read This tab, so a new user can read them without this guide.

7. How a night is scored

The program scores hours first, then the night.

One hour

- **Clear** needs all of these: consensus cloud at or below 20%, no scoring model above 25% total cloud, no scoring model above 40% high cloud, and at least two models reporting.
- **Cloudy** needs consensus cloud at or above 60%.
- **Uncertain** is every other hour that was reported.
- An hour with nothing to average is Missing.

The whole night

- About 55% or more of the hours cloudy, with little clear time: Cloudy.
- Clear for every scored hour, and agreement Strong or Moderate: Clear.
- At least 75% of hours clear, almost no cloudy hours, and agreement Strong or Moderate: Clear.
- A clear opening that lasts at least 3 hours, while the rest of the night is not settled: Uncertain. The opening may still be usable. The card Clear at Opening is there so you can see that separately.
- A large cloudy share with little clear time: Cloudy.
- Anything left over: Uncertain.
- A Clear night whose forecast ends before dawn is shown as Uncertain.

Confidence starts at 78 for Clear, 74 for Cloudy, and 58 for Uncertain. Strong agreement adds points. Weak or missing data subtracts points. A deteriorating trend subtracts points. The result is kept between 5 and 95. The Why This Verdict tab lists the additions and subtractions for the night on screen.

The sentence under the cards, on the Why This Verdict tab, is written from those same results. A clear night that stays clear all the way through says so. A night with a short clear stretch names the length of that stretch and whether the opening itself is clear.

8. What is saved on the computer

The program keeps its own folder. On Windows that folder is:

%APPDATA%\ClearSkyConfidence

In File Explorer you can paste that into the address bar. It is usually under **C:\Users\<your name>\AppData\Roaming\ClearSkyConfidence**.

File	What it stores
location.json	The location name, latitude, and longitude. This is why the same site comes back the next time you open the program.
clear_sky.sqlite	Forecast History for each site you have loaded.
error.log	Written only if the program hits an unexpected error. The window also shows a short message.

Deleting **location.json** returns the next launch to Dark Sky New Mexico. Deleting **clear_sky.sqlite** clears Forecast History and makes the next retrieval a First Run again. The program file itself can sit anywhere. Moving **ClearSkyConfidence.exe** does not move these saved files.

9. When the forecast does not load

What you see	What to do
Type at least two letters of a city or place name.	The Location box needs at least two letters before Look up will search.
No place matched that name. Enter the latitude and longitude instead.	The search is for cities and towns. Type the coordinates, then click Use location.
Could not look up that place. Check the network connection.	Look up needs the internet. The coordinates can still be typed by hand.
Could not reach Open-Meteo. Check the network connection.	Click Refresh once the connection is back. If a forecast was already on screen, it stays there and the status line says the last saved run is still on screen.
Missing from the response: HRRR.	Normal outside the continental United States, and occasionally when that model is absent. Dashes mark the missing hours. The other models still score.
No astronomical night was in the window.	The download did not include a night at that latitude. Check the coordinates, then click Use location again.
The status line is red.	The latest download failed. Read the message on that line. A previous successful run, when one exists, remains on screen.

A short decision path

- 1 Confirm the site line. If it is the wrong place, look up a city or type coordinates, then click **Use location**.
- 2 Read Verdict, Confidence, Agreement, and All-Night Clear.
- 3 If the opening matters more than the whole night, read Clear at Opening, Longest Clear Window, and Deterioration.
- 4 Scan the hourly table for hours where the three models diverge, and for high cloud (the H columns) even when total cloud looks low.
- 5 Open Forecast History. A deteriorating trend means the night is getting cloudier, or cloud is arriving earlier, than the last time you looked.
- 6 Click Refresh before you commit to the night. The cards update from the new download.

What the score is made of. The program scores cloud cover from ECMWF, GFS, and HRRR. Wind, humidity, smoke, transparency, and seeing are outside this window. The verdict is a cloud decision for astronomical night at the site on the screen.

Clear Sky Confidence is part of Observatory Monitor. Forecast data by Open-Meteo.com, CC BY 4.0. Advisory only. This program does not control the roof or Voyager. Clear data. Dark skies. Better nights.