

Cleaned Historical Observations

Atmospheric G2

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Welcome!

Welcome to the Atmospheric G2 Cleaned Historical API! We hope this answers any questions you have and allows you to get to work quickly with our global, versatile datasets. If you have any questions, please reach out to your AG2 account manager.

Getting Started

The method which may be used to access the AG2 global data sets programmatically is via a REST web services data request. First, establish an account with AG2 where a unique key will be created and provided. You may have multiple accounts. Each key is configured to allow up to X number of calls per year which was discussed and agreed upon in conversations with your AG2 account manager. The definition of a call is below.

Call Definition	Call Volume	Call Exceedance	Disclaimer
An API call is defined as 7 days or less of data. For example, if you request 14 days of data it would be counted as 2 calls against your annual call allowance.	The API call volume limit is a maximum of 250 API calls per minute . Exceeding this limit will result in an error message being returned and the client being unable to retrieve data for a minute.	Client's access to the Cleaned Historical API will be disabled once the Client's annual entitlement is exceeded .	There is a max of 1 year of historical data allowed per request . If you request more than 1 year of data your end date will be shortened. You would receive data from your start date to 1 year out.

As is standard in URIs, all parameters are separated using the ampersand (&) character. Certain parameters are required to initiate a weather request. The list of required and optional parameters and their possible values are in tables below for station and gridded data. If no weather fields are specified, default fields will be returned based on the units requested or defaulted.

Station Data: Hourly, Daily, & Monthly

Data can be requested for either a specific station or from the nearest point on the global observation grid. Data updates 4x per day. Use the following API call to retrieve the complete list of global stations for which data is available:

https://cleanedobservations.atmosphericg2.com/v3/hourlystation/stationlist?userKey=XXXXXXXXXXXXXXXXXX

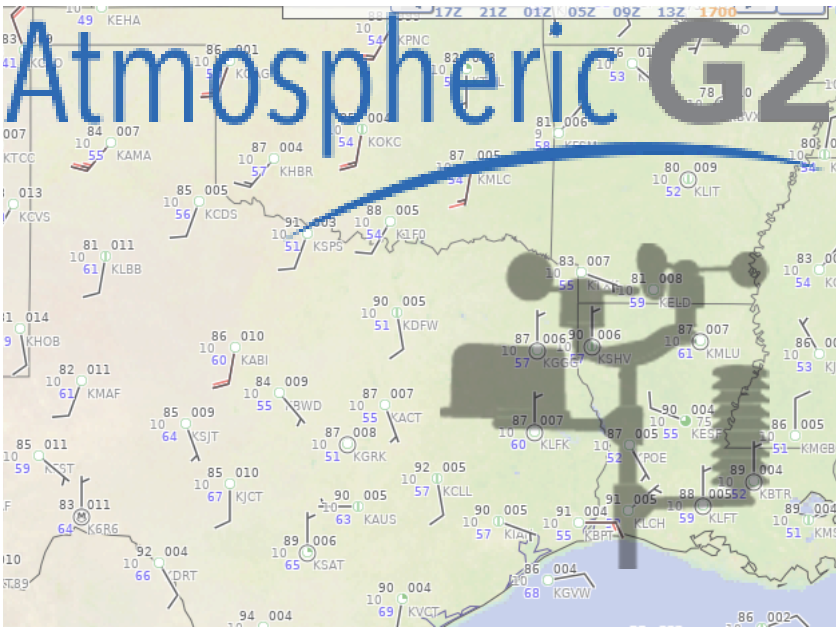
Start all calls with the following Endpoint: https://cleanedobservations.atmosphericg2.com/v3/hourlystation? After this, you will define your parameters.

Required Station Parameters (each separated by &, see examples on next page):

- **userKey** — this unique client identifier is assigned by AG2
- **location** – Can be either a Latitude/Longitude pair or a Station ID
 - Lat/Lon are coordinates of a location – The distance is calculated and data is returned from the closest station; no data is returned if location is more than 50 miles from the nearest station
 - eg: **latitude=42.303&longitude=-99.062**
 - Station ID can be one of the following:
 - Enhanced ID – A 15 character string containing with 4-letter leading identifier and lat/lon following eg: **station=SYNPN3861E02743**
 - ICAO Code – 4-letter station code eg: **station=KBOS**
- **startDate** — “mm/dd/yyyy” Indicates the starting date for weather request (Start date is first hour of requested date)
 - For gap-filled data (see below), the value could be any date from 1/1/1950 to today
 - For formatted data (see below), the value could be any date from station start to today
- **endDate** — “mm/dd/yyyy” indicates the ending date for weather request
 - For gap-filled data (see below), the value could be any date from 1/2/1950 to today
 - For formatted data (see below), the value could be any date from station start (+1 day) to tomorrow
 - The end date is excluded from the data return (i.e. an end date of 1/4/2020 will return data through 1/3/2020)

Optional Station Parameters (separated by &):

- **data** – The desired type of data to be requested
 - **gapfilled - Default**
 - Can provide data from 1/1/1950 to the present day for all global sites
 - Contains source term for each variable
 - Contains a separate “finalizedData” field you must include in your call if specifying any weather fields
 - **formatted**
 - Will only provide raw data from the station start date to the present day
 - Has “orgSource” variable instead of “finalizedData”



Gap Filled
Weather station data gaps are filled with modeled or re-analysis data. “finalizedData” field must be called and will be **true** once gapfilling and QC are applied (1-2 month latency), and will be **false** until then.

Formatted
This is the raw METAR weather station data that may have missing data and is not QCed, but will be formatted for consistent units. “orgSource” can be METAR, Synop, ISD, & Environment Canada

Optional Station Parameters, Continued (separated by &):

- **interval** — The desired temporal resolution of the data being retrieved. Nearly all variables are available for hourly, daily and monthly intervals. The only exceptions are the variable precipitation type and present weather. Accepted values are:
 - **hourly - Default**
 - **daily**
 - **monthly** (time must be set to lwt, see “time” parameter below)
- **units** — The desired units in which to express the data being retrieved. Accepted values are:
 - **metric - Default**
 - **imperial**
- **format** — The desired format in which to return the data being retrieved. Accepted values are:
 - **json - Default**
 - **xml**
 - **csv**
- **time** – Specify the time unit the requested data is returned in. Daily data is available in both GMT and LWT, Monthly data is only available in LWT. Accepted values are:
 - **gmt** (Greenwich mean time) – **Default**
 - **lwt** (local wall time)
- **fields** - Specify the specific set of variables to return in the data being retrieved. Accepted values when requesting hourly and daily data are listed in the tables that [begin on page 6](#).
 - You can specify more than one variable by separating each value by a comma, i.e. **fields=windSpeed,surfaceTemperature**. If no fields are specified, the [Default Fields](#) listed in the table on page 6 will be returned based on the value entered for the “units” parameter. Fields can be set to ‘all’ and all available parameters are returned.

Examples to Retrieve Station Data

Sample {Lat/Lon} URL request to return data with no gaps (Only Requested Fields Specified):

<https://cleanedobservations.atmosphericg2.com/v3/hourlystation?data=GAPFILLED&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&time=lwt&fields=surfaceTemperature,relativeHumidity,windSpeed,downwardSolarRadiation&latitude=42.303&longitude=-99.062&userKey=99999999999999999999999999999999>

Sample {METAR Code} URL request to return data with no gaps (All Default Fields Returned):

[illegible]

Sample {Enhanced ID Code} URL request to return raw observations which could contain gaps (All Default Fields Returned):

<https://cleanedobservations.atmosphericg2.com/v3/hourlystation?data=FORMATTED&station=SYNPN3861E02743&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&userIdKey=99999999999999999999999999999999>

Gridded Data: Hourly, Daily, & Monthly

Data can be requested for either a lat/lon coordinate, grid cell, or zipcode on the global observation grid. Data resolution is 15x15 km or 9.3 x 9.3 miles and is updated 4x per day. ERA5 data is only available up to 7 days prior to present, to bridge the gap between ERA5 availability (7 day latency) and real time, provisional data is provided primarily from GFS.

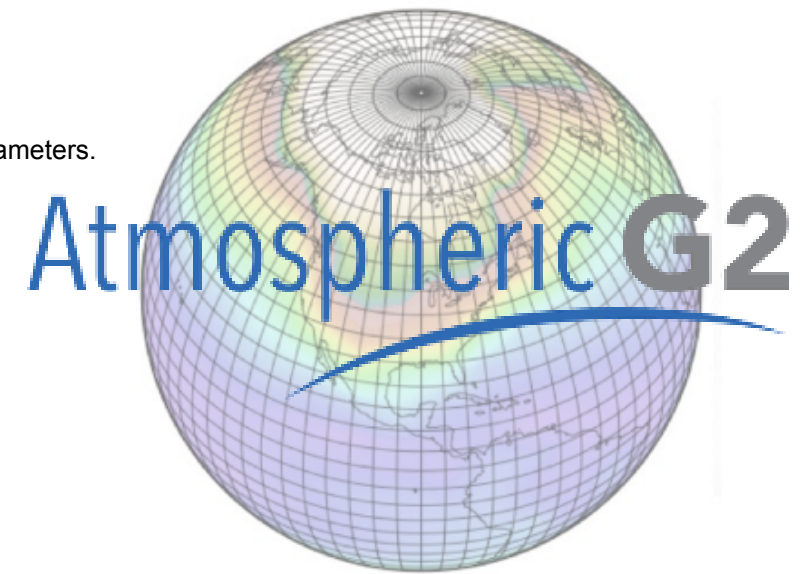
Start all calls with the following endpoint : <https://cleanedobservations.atmosphericg2.com/v3/gridded/15km?> After this, you will define your parameters.

Required Gridded Parameters (each separated by &, see examples on next page):

- **userKey** — this unique client identifier is assigned by AG2
- **location** — Can be either a Lat/Lon pair, Site or Zipcode
 - Latitude/Longitude are coordinates of a location
 - Site is the 10-digit number representing the grid cell
 - Zipcode represents a U.S. zipcode
- **startDate** — “mm/dd/yyyy” Indicates the starting date for weather request (Start date is first hour of requested date)
 - Can be any date from 1/1/1991 to today
- **endDate** — “mm/dd/yyyy” indicates the ending date for weather request
 - Can be any date from 1/1/1991 to today
 - The end date is excluded from the data return (i.e. an end date of 1/4/2020 will return data through 1/3/2020)

Optional Gridded Parameters (separated by &):

- **interval** — The desired temporal resolution of the data being retrieved. Nearly all variables are available for hourly, daily and monthly intervals. The only exceptions are the variable precipitation type and present weather. Accepted values are:
 - **hourly - Default**
 - **daily**
 - **monthly**
- **units** — The desired units in which to express the data being retrieved. Accepted values are:
 - **metric - Default**
 - **imperial**
- **format** — The desired format in which to return the data being retrieved. Accepted values are:
 - **json - Default**
 - **xml**
 - **csv**
- **time** — Specify the time unit the requested data is returned in. Daily data is available in both GMT and LWT, Monthly data is only available in LWT. Accepted values are:
 - **gmt** (Greenwich mean time) – **Default**
 - **lwt** (local wall time)
- **fields** — Specify the specific set of variables to return in the data being retrieved. Accepted values when requesting hourly and daily data are listed in the tables that [begin on page 6](#). You can specify more than one variable by separating each value by a comma, i.e. **fields=windSpeed,surfaceTemperature**. *If no fields are specified, the [Default Fields](#) listed in the table on page 6 will be returned based on the value entered for the “units” parameter. Fields can be set to ‘all’ and all available parameters are returned.*



Examples to Retrieve Gridded Data

Sample {Lat/Long} URL request (All Default Fields Returned):

<https://cleanedobservations.atmosphericg2.com/v3/gridded/15km?startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&latitude=42.303&longitude=-99.062&userKey=99999999999999999999999999999999>

Sample {Lat/Long} URL request (Only Requested Fields Specified):

<https://cleanedobservations.atmosphericg2.com/v3/gridded/15km?startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&time=lwt&fields=surfaceTemperature,relativeHumidity,windSpeed,downwardSolarRadiation&latitude=42.303&longitude=-99.062&userKey=99999999999999999999999999999999>

Sample {Zipcode} URL request (Only Requested Fields Specified):

<https://cleanedobservations.atmosphericg2.com/v3/gridded/15km?zipcode=01810&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&time=lwt&fields=surfaceTemperature,relativeHumidity,windSpeed,downwardSolarRadiation&userKey=99999999999999999999999999999999>

Sample {Grid Cell ID} URL request (Only Requested Fields Specified):

<https://cleanedobservations.atmosphericg2.com/v3/gridded/15km?site=2268975643&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&time=lwt&station=metar&fields=surfaceTemperature,relativeHumidity,windSpeed,downwardSolarRadiation&userKey=99999999999999999999999999999999>

Default Weather Fields

The tables that [begin on page 6](#) below outline all possible weather fields that can be requested for Station and Gridded data. Note that if no weather fields are defined, default values will be returned. To return “Min, Max, Avg, or Sum” fields, request the variables of interest and ‘daily’ format.

^	Default fields if none are specified in the API call
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Response Messages

HTTP Status Code	Reason
200	OK
204	No Content
400	Bad Request
401	Unauthorized
403	Forbidden
404	Not Found
429	Too many requests
500	Failed to process request

Weather Fields

API Variable Name	Metric Units	Imperial Units	Standard variable name	Gridded	Station	Data Definition
dataSource	ERA5 or GFS	ERA5 or GFS	Data Source	Gridded		Indicates if the source data is from ERA5 (1) or GFS (2)
finalizedData	True of False	True of False	Gap Filled Data		Station	Weather station data gaps are filled with modeled or re-analysis data. “finalizedData” field must be called and will be true once gapfilling and QC are applied (1-2 month latency), and will be false until then.
orgSource	METAR, Synop, ISD, or Environment Canada.	METAR, Synop, ISD, or Environment Canada.	Source of raw METAR Weather Station Data		Station	This is the raw METAR weather station data that may have missing data and is not QCed, but will be formatted for consistent units. “orgSource” can be METAR, Synop, ISD, & Environment Canada.
cloudCoverage	Percent	Percent	Cloud Coverage (%)	Gridded	Station^	Total cloud cover all layers through vertical atmospheric column. Average for previous hour, percentage (%).
diffuseHorizontalRadiation	Wsqm	Wsqm	Diffuse Horizontal Radiation (Wsqm)	Gridded^	Station	Solar radiation reaching the surface of the earth along an indirect path, Watts per square meter (Wpm^2).
directNormalIrradiance	Wsqm	Wsqm	Direct Normal Irradiance (Wsqm)	Gridded^	Station	Solar radiation reaching the surface of the earth along a direct path, Watts per square meter (Wpm^2).
downwardSolarRadiation	Wsqm	Wsqm	Downward Solar Radiation (Wsqm)	Gridded^	Station	Total solar radiation reaching the surface of the earth, Watts per square meter (Wpm^2).
totalCloudCoverHigh	Percent	Percent	Total Cloud Cover High (%)	Gridded	Station	Total cloud above 20,000 feet. Average for previous hour, percentage (%).
totalCloudCoverLow	Percent	Percent	Total Cloud Cover Low (%)	Gridded	Station	Total cloud cover up to 6,000 feet. Average for previous hour, percentage (%).
totalCloudCoverMiddle	Percent	Percent	Total Cloud Cover Middle (%)	Gridded	Station	Total cloud cover between 6,000 feet and 20,000 feet. Average for previous hour, percentage (%).
totalColumnLiquidCloud	Kgsqm	Kgsqm	Total Column Liquid Cloud (Kgsqm)	Gridded		The total amount of liquid water within an atmospheric column, kilograms per square meter (kgpm^2)
totalColumnSuperCoolLiquidCloud	Kgsqm	Kgsqm	Total Column Super Cool Liquid Cloud (Kgsqm)	Gridded		The total amount of liquid water below zero Celsius within an atmospheric column, kilograms per square meter (kgpm^2)
albedo	Percent	Percent	Albedo (%)	Gridded		Percentage of solar radiation reflected by the Earth's surface (%)

API Variable Name	Metric Units	Imperial Units	Standard variable name	Gridded	Station	Data Definition
cloudBaseHeight	meters	Feet	Cloud Base Height (meters)	Gridded		Height of the base of the lowest cloud, meters (m)
downwardThermalRadiation	Wsqm	Wsqm	Downward Thermal Radiation (Wsqm)	Gridded	Station	Thermal radiation reaching the surface of the earth from all directions, Watts per square meter (Wpm^2)
netSolarRadiation	Wsqm	Wsqm	Net Solar Radiation (Wsqm)	Gridded		Solar radiation reaching the surface of the Earth minus the amount reflected by the Earth's surface, Watts per square meter (Wpm^2)
netThermalRadiation	Wsqm	Wsqm	Net Thermal Radiation (Wsqm)	Gridded		Thermal radiation reaching the surface of the Earth minus the amount moving upwards from the surface, Watts per square meter (Wpm^2)
horizontalDirectNormalIrradianceSurface	Wsqm	Wsqm	Horizontal Direct Normal Irradiance Surface (Wsqm)	Gridded	Station	The horizontal component of the solar radiation reaching the surface along a direct path, Watts per square meter (Wpm^2).
latentHeatFlux	Wsqm	Wsqm	Latent Heat Flux (Wsqm)	Gridded		The transfer of heat between the Earth's surface and atmosphere due to water phase changes, Watts per square meter (Wpm^2)
precipitationPreviousHour	Millimeters	Inches	Precipitation (in or mm)	Gridded^	Station^	Liquid equivalent for types: warm rain, freezing rain, sleet, snow. Total accumulated previous hour, inches (in) or centimeters (cm).
snowPreviousHour	Centimeters	Inches	Snow Previous Hour (in or cm)	Gridded^	Station^	A measurement of the depth of snow on the ground since the previous observation, inches (in) or centimeters (cm).
precipitationType	See Data Definition	See Data Definition	Precipitation Type	Gridded	Station	Integer code describing precipitation type - 0 none, 1 rain, 2 snow, 4 freezing rain, 8 ice pellets. If more than one type then integers are added e.g. 3 rain & snow.
rainPreviousHour	Millimeters	Inches	Rain Previous Hour (in or mm)	Gridded	Station	Total accumulated rain in the previous hour, inches (in) or millimeters (mm).
snowDepth	Meters	Feet	Snow Depth (meters)	Gridded		The depth of snow on the ground, meters (m).
snowMeltPreviousHour	Meters	Feet	snow Melt Previous Hour (meters)	Gridded		A measure of the snow on the ground which has melted in the last hour, meters (m).
icePelletPreviousHour	Millimeters	Inches	Ice Pellet Previous Hour (in or mm)	Gridded	Station	Total accumulated ice pellets in the previous hour, inches (in) or millimeters (mm).
relativeHumidity	Percent	Percent	Surface Relative Humidity (%)	Gridded^	Station^	Percent of water vapor in the air relative to its saturation point at 2 meters. Instantaneous reading at time shown, percentage (%).

API Variable Name	Metric Units	Imperial Units	Standard variable name	Gridded	Station	Data Definition
surfaceDewpointTemperature	Celsius	Fahrenheit	Surface Dew Point Temperature (°F or °C)	Gridded^	Station^	Atmospheric humidity metric (temperature at which dew will form) at 2 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
surfaceWetBulbTemperature	Celsius	Fahrenheit	Surface Wet-bulb Temperature (°F or °C)	Gridded^	Station	Atmospheric humidity metric (evaporative cooling potential of moist surface) at 2 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
totalColumnWaterVapor	Kgsqm	Kgsqm	Total Column Water Vapor (Kgsqm)	Gridded		The total amount of water vapor within an atmospheric column, kilograms per square meter (kgpm^2)
waterMixing100meter	Gkg	Gkg	Water Mixing 100 meter (Gkg)	Gridded	Station	Ratio between the mass of water vapor in grams against the mass of dry air in kilograms within a unit volume of air at 100m, grams per kilogram (gkg).
waterMixing80meter	Gkg	Gkg	Water Mixing 80 meter (Gkg)	Gridded	Station	Ratio between the mass of water vapor in grams against the mass of dry air in kilograms within a unit volume of air at 80m, grams per kilogram (gkg).
dewpointTemperature100meter	Celsius	Fahrenheit	Dewpoint Temperature 100 meter (°F or °C)	Gridded	Station	Atmospheric humidity metric (temperature at which dew will form) at 100 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
dewpointTemperature80meter	Celsius	Fahrenheit	Dewpoint Temperature 80 meter (°F or °C)	Gridded	Station	Atmospheric humidity metric (temperature at which dew will form) at 80 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
freezingRainPreviousHour	Millimeters	Inches	Freezing Rain Previous Hour (in or mm)	Gridded	Station	Total accumulated freezing rain in the previous hour, inches (in) or millimeters (mm).
meanEvaporation	Kgsqm	Kgsqm	Mean Evaporation (Kgsqm)	Gridded		A measure of the mean evaporation across the cell, including transpiration, kilograms per square meter (kgpm^2)
potentialEvaporation	Kgsqm	Kgsqm	Potential Evaporation (Kgsqm)	Gridded		Maximum possible evaporation given surface conditions, kilograms per square meter (kgm^2)
relativeHumidity100meter	Percent	Percent	Relative Humidity 100 meter (%)	Gridded	Station	Percent of water vapor in the air relative to its saturation point at 100 meters. Instantaneous reading at time shown, percentage (%).
relativeHumidity80meter	Percent	Percent	Relative Humidity 80 meter (%)	Gridded	Station	Percent of water vapor in the air relative to its saturation point at 80 meters. Instantaneous reading at time shown, percentage (%).
surfaceWaterMixing	Gkg	Gkg	Surface Water Mixing (Gkg)	Gridded	Station	Ratio between the mass of water vapor in grams against the mass of dry air in kilograms within a unit volume of air at 2 meters, grams per kilogram (gkg).
specificHumidity100meterRatio	Ratio	Ratio	Specific Humidity 100 meter	Gridded	Station	Ratio between the mass of water vapor in kilograms against the mass of air in kilograms within a unit volume of air at 100m, dimensionless.
specificHumidity80meterRatio	Ratio	Ratio	Specific Humidity 80 meter	Gridded	Station	Ratio between the mass of water vapor in kilograms against the mass of air in kilograms within a unit volume of air at 80m, dimensionless.

API Variable Name	Metric Units	Imperial Units	Standard variable name	Gridded	Station	Data Definition
specificHumidityRatio	Ratio	Ratio	Specific Humidity	Gridded	Station	Ratio between the mass of water vapor in kilograms against the mass of air in kilograms within a unit volume of air at 2 meters, dimensionless.
mslPressure	kPa	mb	Mean Sea Level Pressure (mb or kPa)	Gridded^	Station^	Surface pressure adjusted to mean sea-level, millibars (mb) or kiloPascals (kPa).
surfaceAirPressure	Kpa	mb	Surface Pressure (mb or kPa)	Gridded^	Station^	Atmospheric pressure at the surface. Instantaneous reading at time shown, millibars (mb) or kiloPascals (kPa).
airDensity100meter	Kgcbm	Kgcbm	Air Density 100 meter (Kgcbm)	Gridded	Station	Mass of air per unit volume at 100 meters, Kilograms per Cubic Meter (kgpm^3).
airDensity80meter	Kgcbm	Kgcbm	Air Density 80 meter (Kgcbm)	Gridded	Station	Mass of air per unit volume at 80 meters, kilograms per cubic meter (kgpm^3).
convectiveAvailablePotentialEnergy	JoulesPerKilogram	JoulesPerKilogram	Convective Available Potential Energy (JoulesPerKilogram)	Gridded		Convective available potential energy, a measure of the total excess buoyancy of air parcels within a column, Joules per kilogram (Jpkg)
convectiveInhibition	JoulesPerKilogram	JoulesPerKilogram	Convective Inhibition (JoulesPerKilogram)	Gridded		Convective inhibition, a measure of the energy required for convection to commence, Joules per kilogram (Jpkg)
frictionVelocitySurface	Mps	Mps	Frictional Velocity (Mps)	Gridded	Station	Magnitude of stress at the surface, expressed as a velocity, kilometers per hour (kph) or miles per hour (mph)..
lightningFlashRate	SqKmh	Sqkmh	Lightning Flash Rate (Sqkmh)	Gridded		Total area of lightning flash per hour, square kilometers per hour (km^2ph)
planetaryBoundaryLayerHeight	meters	meters	Planetary Boundary Layer Height (meters)	Gridded		A measure of the depth of air next to the Earth's surface which is most affected by resistance of the transfer of heat, moisture or momentum, meters (m)
surfaceAirDensity	Kgcbm	Kgcbm	Surface Air Density (Kgcbm)	Gridded	Station	Mass of air per unit volume at 2 meters, kilograms per cubic meter (kgpm^3).
surfaceGeopotentialHeight	Meters	Feet	Surface Geopotential Height (meters)	Gridded		A measure of work needed to lift a unit mass from sea level to the surface divided by the gravitational acceleration, meters (m)
totalOzone	Kgsqm	Kgsqm	Total Ozone (Kgsqm)	Gridded		The total amount of ozone in an atmospheric column, kilograms per square meter (kgpm^2)
visibility	Kilometers	Miles	Visibility (mi or km)	Gridded	Station	The greatest distance at which it is just possible to see and identify with the naked eye at the surface, miles (mi) or kilometers (km).
zeroDegreesHeight	meters	Feet	Zero Degrees Height (meters)	Gridded		The height above the surface of the Earth where the temperature is zero Celsius, meters (m)

API Variable Name	Metric Units	Imperial Units	Standard variable name	Gridded	Station	Data Definition
sealceCoverage	Percent	Percent	Sea Ice Coverage (%)	Gridded		Percentage of cell covered by ice (%)
sealceThickness	meters	Feet	Sea Ice Thickness (meters)	Gridded		Thickness of sea ice, meters (m)
sensibleHeatFlux	Wsqm	Wsqm	Sensible Heat Flux (Wsqm)	Gridded		The transfer of heat between the Earth's surface and atmosphere, excluding water phase changes, Watts per square meter (Wpm^2)
presentWeather			Present Weather		Station	Instantaneous observed weather types, text.
pressure100meter	kPa	mb	Pressure 100 meter (mb or kPa)	Gridded	Station	Atmospheric pressure at 100m. Instantaneous reading at time shown, millibars (mb) or kilopascals (kPa).
pressure80meter	kPa	mb	Pressure 80 meter (mb or kPa)	Gridded	Station	Atmospheric pressure at 80m. Instantaneous reading at time shown, millibars (mb) or kilopascals (kPa).
surfaceTemperature	Celsius	Fahrenheit	Surface Temperature (°F or °C)	Gridded^	Station^	A measure of atmospheric sensible heat content at 2 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
windChillTemperature	Celsius	Fahrenheit	Wind Chill Temperature (°F or °C)	Gridded^	Station	Air temperature that includes impact of wind at 10 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
apparentTemperature	Celsius	Fahrenheit	Apparent Temperature (°F or °C)	Gridded^	Station	Air temperature that includes impact of wind and humidity at 10 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
heatIndex	Celsius	Fahrenheit	Heat Index (°F or °C)	Gridded^	Station	Air temperature that includes impact of relative humidity at 2 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
maxInstantaneousSurfaceTemperature	Celsius	Fahrenheit	Maximum Instantaneous Surface Temperature (°F or °C)	Gridded		A measure of atmospheric sensible heat content at 2 meters. Maximum reading in hour previous to time shown, Fahrenheit (°F) or Celsius (°C).
minInstantaneousSurfaceTemperature	Celsius	Fahrenheit	Minimum Instantaneous Surface Temperature (°F or °C)	Gridded		A measure of atmospheric sensible heat content at 2 meters. Minimum reading in hour previous to time shown, Fahrenheit (°F) or Celsius (°C).
skinTemperatureSST	Celsius	Fahrenheit	Skin Temperature SST (°F or °C)	Gridded		Over land a measure of the temperature of the land surface, over sea a measure of the sea surface temperature. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
temperature100meter	Celsius	Fahrenheit	Temperature 100 meter (°F or °C)	Gridded	Station	A measure of atmospheric sensible heat content at 100 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
temperature80meter	Celsius	Fahrenheit	Temperature 80 meter (°F or °C)	Gridded	Station	A measure of atmospheric sensible heat content at 80 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).

API Variable Name	Metric Units	Imperial Units	Standard variable name	Gridded	Station	Data Definition
groundHeatFlux	Wsqm	Wsqm	Ground Heat Flux (Wsqm)	Gridded		Heat conducted through the surface of the Earth, Watts per square meter (Wpm^2)
leafAreaIndexHigh	See Data Definition	See Data Definition	Leaf Area Index High	Gridded		The fraction of the cell that is covered with 'hi' vegetation (0-1)
leafAreaIndexLow	See Data Definition	See Data Definition	Leaf Area Index Low	Gridded		The fraction of the cell that is covered with 'low' vegetation (0-1)
soilMoisture0to289cm	Percent	Percent	Soil Moisture 0-289cm (%)	Gridded		Ratio between the volume of water in meters cubed against the total volume in meters cubed between a depth of 2.89m and the surface of the Earth, dimensionless.
soilMoisture0to7cm	Percent	Percent	Soil Moisture 0-7cm (%)	Gridded		Ratio between the volume of water in meters cubed against the total volume in meters cubed between a depth of 7cm and the surface of the Earth, dimensionless.
soilMoisture100to289cm	Percent	Percent	Soil Moisture 100-289cm (%)	Gridded		Ratio between the volume of water in meters cubed against the total volume in meters cubed between a depth of 2.89cm and 1m below the surface of the Earth, dimensionless.
soilMoisture28to100cm	Percent	Percent	Soil Moisture 28-100cm (%)	Gridded		Ratio between the volume of water in meters cubed against the total volume in meters cubed between a depth of 1m and 28cm below the surface of the Earth, dimensionless.
soilMoisture7to28cm	Percent	Percent	Soil Moisture 7-28cm (%)	Gridded		Ratio between the volume of water in meters cubed against the total volume in meters cubed between a depth of 28cm and 7cm below the surface of the Earth, dimensionless.
soilTemperature0to289cm	Celsius	Fahrenheit	Soil Temperature 0-289cm (°F or °C)	Gridded		A measure of mean soil sensible heat content between a depth of 2.89m and the surface of the Earth. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
soilTemperature0to7cm	Celsius	Fahrenheit	Soil Temperature 0-7cm (°F or °C)	Gridded		A measure of mean soil sensible heat content between a depth of 7cm and the surface of the Earth. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
soilTemperature100to289cm	Celsius	Fahrenheit	Soil Temperature 100-289cm (°F or °C)	Gridded		A measure of mean soil sensible heat content between depths of 2.89m and 1m below the surface of the Earth. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
soilTemperature28to100cm	Celsius	Fahrenheit	Soil Temperature 28-100cm (°F or °C)	Gridded		A measure of mean soil sensible heat content between depths of 1m and 28cm below the surface of the Earth. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
soilTemperature7to28cm	Celsius	Fahrenheit	Soil Temperature 7-28cm (°F or °C)	Gridded		A measure of mean soil sensible heat content between depths of 28cm and 7cm below the surface of the Earth. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
surfaceRoughness	meters	Feet	Surface Roughness (meters)	Gridded		A measure of surface roughness in meters (m)
surfaceRunoff	Kgsqm	Kgsqm	Surface Runoff (Kgsqm)	Gridded		A measure of the liquid draining over the surface, kilograms per square meter (kgpm^2)

API Variable Name	Metric Units	Imperial Units	Standard variable name	Gridded	Station	Data Definition
windDirection	Degrees	Degrees	Surface Wind Direction (degrees)	Gridded^	Station^	Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 10 meters. Two-minute average up-wind direction at time shown, degrees.
windSpeed	Kph & Mps	Mph & Kts	Surface Wind Speed	Gridded^	Station^	Instantaneous wind speed at 10 meters for the time shown
surfaceWindGust	Kph & Mps	Mph & Kts	Surface Wind Gusts		Station^	
surfaceWindGusts	Kph & Mps	Mph & Kts	Surface Wind Gusts	Gridded^		Maximum three second wind speed burst at 10 meters during previous hour. Instantaneous reading at time shown
windDirection100meter	Degrees	Degrees	Wind Direction 100 meter (degrees)	Gridded	Station	Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 100 meters. Two-minute average up-wind direction at time shown, degrees.
windDirection80meter	Degrees	Degrees	Wind Direction 80 meter (degrees)	Gridded	Station	Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 80 meters. Two-minute average up-wind direction at time shown, degrees.
windSpeed100meter	Kph & Mps	Mph & Kts	Wind Speed 100 meter	Gridded	Station	Instantaneous wind speed at 100 meters for the time shown, miles per hour (mph) or kilometers per hour (kph).
windSpeed80meter	Kph & Mps	Mph & Kts	Wind Speed 80 meter	Gridded	Station	Instantaneous wind speed at 80 meters for the time shown
windUComponent	Kph & Mps	Mph & Kts	Surface U Wind Component	Gridded		U wind component at 10 meters for the time shown
windUComponent100meter	Kph & Mps	Mph & Kts	100 meter U Wind Component	Gridded		U wind component at 100 meters for the time shown, miles per hour (mph) or kilometers per hour (kph).
windUComponent80meter	Kph & Mps	Mph & Kts	80 meter U Wind Component	Gridded		U wind component at 80 meters for the time shown
windVComponent	Kph & Mps	Mph & Kts	Surface V Wind Component	Gridded		V wind component at 10 meters for the time shown
windVComponent100meter	Kph & Mps	Mph & Kts	100 meter V Wind Component	Gridded		V wind component at 100 meters for the time shown, miles per hour (mph) or kilometers per hour (kph).
windVComponent80meter	Kph & Mps	Mph & Kts	80 meter V Wind Component	Gridded		V wind component at 80 meters for the time shown

^	Default fields if none are specified in the API call
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Usage Tracking:

API can be used to track calls made to the Cleaned Historical API and monitor the number of calls left on the contract.

Required Usage Tracking Parameters (each separated by &):

- **userKey** - this unique client identifier is assigned by AG2
 - **startDate** - “mm/dd/yyyy” Indicates the starting date for the usage request
- Note: The start date cannot be earlier than 12 months prior to the current date*

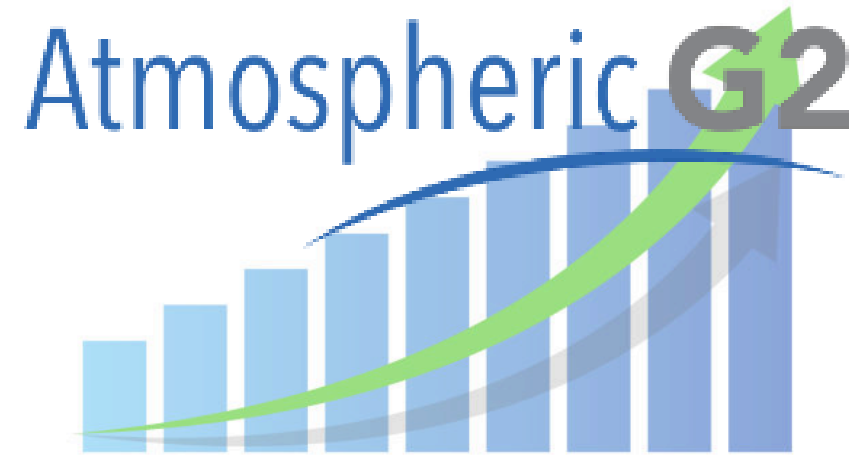
Optional Usage Tracking Parameters (separated by &):

- **endDate** - “mm/dd/yyyy” indicates the ending date for the usage request

No End Date

Requests **without** an end date will return all usage information up to the present. Use this information to determine how many calls have been made over the duration of the contract and how many calls remain.

- **userKey** – confirms and restates the API key
- **callsUsed** – returns the total number of API calls that have been used since the start date of the request
- **callsRemainingInCurrentContract** – this will return the number of calls left in the contract right now
 - This parameter is independent of the start date of the request and will always show the calls left in the active contract.
- **daysUntilExpiration** – returns the number of days from present until the end date of the contract
- **contractEndDate** – returns the end date of the contract in MM/DD/YYYY format



Request without an end date

<https://cleanedobservations.atmosphericg2.com/v3/usage?startDate=05/01/2015&userKey=99999999999999999999999999999999>

Defined End Date

Requests **with** an end date will return usage information between the two dates specified in the request. Use this information to determine how many calls were made between those two dates. Additional information about the number of calls remaining on the contract will be returned.

- **userKey** – confirms and restates the API key
- **callsUsedOverRequestedTimePeriod** – returns the number of API calls that were used between the start date and end date of the request
- **callsRemainingOnRequestedEndDate** – returns the number of calls left in the contract on the requested end date. This parameter is only returned if the requested end date does not precede the most recent contract start date.
 - o This is the only parameter with that is not guaranteed to be returned (i.e. it depends on the input information)

- **callsRemainingInCurrentContract** – this will return the number of calls left in the contract right now
 - Again, this parameter is independent of the start and end date of the request and will always show the calls left in the active contract.
- **daysUntilExpiration** – returns the number of days from present until the end date of the contract
- **contractEndDate** – returns the end date of the contract in MM/DD/YYYY

Request with an end date

<https://cleanedobservations.atmosphericg2.com/v3/usage?startDate=05/01/2015&endDate=06/01/2015&userKey=99999999999999999999999999999999>

September 2025 Changes Summarized

As of Q2 2025, National Oceanic and Atmospheric Administration's (NOAA) Climate Forecast System Reanalysis (CFSR) dataset has been retired and replaced by the European Centre for Medium-Range Weather Forecasts (ECMWF) ERA5 (Reanalysis v5).

ERA5 is the fifth generation of global atmospheric and climate data reanalysis produced by the Copernicus Climate Change Service (C3S) at the ECMWF. It provides hourly global estimates of atmospheric, land, and ocean wave variables using a combination of historical observations and advanced modeling.

A summary of the major changes are below:

- The gridded endpoint is changing from 'gridded' to 'gridded/15km'. This new endpoint now returns data based on ERA5
 - Gridded data is now available back to Jan 1, 1991 instead of Jan 1, 1979
 - As ERA5 data is only available up to 7 days prior to present, to bridge the gap between ERA5 availability (7 day latency) and real time, provisional data is provided primarily from the Global Forecast System (GFS), a numerical weather prediction model created by the National Centers for Environmental Prediction (NCEP)
- The units are no longer part of the variable name that is placed in the 'fields' parameter. The units now appear in the name of the variables returned, which is based on what the 'units' parameter is set to
 - For example, requesting 'fields=surfaceTemperature' and setting 'units=metric' will return surfaceTemperatureCelsius
- For both the 'hourlystation' and 'gridded/15km' endpoints, fields can be set to 'all' and all available parameters are returned.
- Nearly all variables are available for hourly, daily and monthly intervals. The only exceptions are the variable *precipitation type* and *present weather* which are only available hourly.
- Daily data is available in both GMT and LWT. Monthly data is only available in LWT.

For more details on the ERA5 dataset, please see the [AG2 ERA5 Data Updates](#) document.

