Atmospheric G2 (AG2) Cleaned Historical Observations

Quick Links:

AG2 Global Data Sets

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 noted below.

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.

Documentation for the previous version of this product can be found Here:

Hourly/Daily/Monthly Station Data

Data can be requested for either a specific station or from the nearest point on the global observation grid.

Certain parameters are required to initiate a weather request. As is standard in URIs, all parameters are separated using the ampersand (**&**) character. The list of parameters and their possible values are enumerated below. Each API key is provisioned to provide data for a specific set of Weather Variables. The specific set of variables can be found in tables listed below.

Individual Station Details:

Endpoint: ***https://cleanedobservations.atmosphericg2.com/v3/hourlystation***

Required Parameters:

- **userKey** — this unique client identifier is assigned by AG2
- location – Can be either a Lat/Lon 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: **lat=42.303&lon=-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, the value could be any date from 1/1/1950 to today
    - For formatted data, 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, the value could be any date from 1/2/1950 to today
    - For formatted data, 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 Parameters:

- **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 “isfinalized” variable
    - **formatted**
        - Will only provide data from the station start date to the present day
        - Has “primarySource” variable instead of “isFinalized”
- **interval** — The desired temporal resolution of the data being retrieved. 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. 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 table provided below.
  - You can specify more than one variable by separating each value by a comma, i.e. **fields=windSpeedMph,surfaceTemperatureFahrenheit.**
  - *If no fields are specified, the will be returned based on the value entered for the "units" parameter*

Station Data Inventory

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=XXXXXXXXXXXXXXX

Station Data – Default Gridded Variables

Parameter Name – Hourly	Description
dateHrGmt	Greenwich Mean Time (GMT) date-time (also known as Universal Time)
dateHrLwt	Valid local date-time (Local wall time {includes daylight savings time})
surfaceTemperatureFahrenheit	Surface air (dry bulb) temperature at 2 meters
surfaceDewpointTemperatureFahrenheit	Atmospheric humidity metric (temperature at which dew will form)
relativeHumidityPercent	Percent of water vapor in the air relative to its saturation point
surfaceAirPressureMillibars	Atmospheric pressure at the Surface
mslPressureMillibars	Mean Sea Level Pressure
cloudCoveragePercent	Percentage of the sky covered by clouds
windSpeedMph	Unobstructed wind speed at 10 meters

windDirectionDegrees	Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 10 meters
surfaceWindGustMph	Unobstructed wind gusts at 10 meters
precipitationPreviousHourInches	Liquid equivalent for types: warm rain, freezing rain, sleet, snow over the past Hour
snowPreviousHourInches	Total snowfall over the past Hour
surfaceTemperatureCelsius	Surface air (dry bulb) temperature at 2 meters
surfaceDewpointTemperatureCelsius	Atmospheric humidity metric (temperature at which dew will form)
surfaceAirPressureKilopascals	Atmospheric pressure at the Surface
mslPressureKilopascals	Mean Sea Level Pressure
windSpeedKph	Unobstructed wind speed at 10 meters
surfaceWindGustKph	Unobstructed wind gusts at 10 meters
precipitationPreviousHourMillimeters	Liquid equivalent for types: warm rain, freezing rain, sleet, snow over the past Hour
snowPreviousHourMillimeters	Total snowfall over the past Hour
Station Data - Additional Variables	
apparentTemperatureFahrenheit	Air temperature that includes impact of wind and humidity at 10 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
windChillTemperatureFahrenheit	Air temperature that includes impact of wind at 10 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
heatIndexFahrenheit	Air temperature that includes impact of relative humidity at 2 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).

surfaceWetBulbTemperatureFahrenheit	Atmospheric humidity metric (evaporative cooling potential of moist surface) at 2 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
specificHumidityRatio	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.
surfaceWaterMixingGkg	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).
surfaceAirDensityKgcbm	Mass of air per unit volume at 2 meters, kilograms per cubic meter (kgpm^3).
windDirection80meterDegrees	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.
windSpeed80meterMph	Instantaneous wind speed at 80 meters for the time shown, miles per hour (mph) or kilometers per hour (kph).
temperature80meterFahrenheit	A measure of atmospheric sensible heat content at 80 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
dewpointTemperature80meterFahrenheit	Atmospheric humidity metric (temperature at which dew will form) at 80 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
relativeHumidity80meterPercent	Percent of water vapor in the air relative to its saturation point at 80 meters. Instantaneous reading at time shown, percentage (%).
specificHumidity80meterRatio	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.
waterMixing80meterGkg	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).
airDensity80meterKgcbm	Mass of air per unit volume at 80 meters, kilograms per cubic meter (kgpm^3).
windDirection100meterDegrees	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.
windSpeed100meterMph	Instantaneous wind speed at 100 meters for the time shown, miles per hour (mph) or kilometers per hour (kph).
temperature100meterFahrenheit	A measure of atmospheric sensible heat content at 100 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
dewpointTemperature100meterFahrenheit	Atmospheric humidity metric (temperature at which dew will form) at 100 meters. Instantaneous reading at time shown, Fahrenheit (°F) or Celsius (°C).
relativeHumidity100meterPercent	Percent of water vapor in the air relative to its saturation point at 100 meters. Instantaneous reading at time shown, percentage (%).
specificHumidity100meterRatio	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.
waterMixing100meterGkg	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).
airDensity100meterKgcbm	Mass of air per unit volume at 100 meters, Kilograms per Cubic Meter (kgpm^3).
precipitationType	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.
rainPreviousHourInches	Total accumulated rain in the previous hour, inches (in) or millimeters (mm).
icePelletPreviousHourInches	Total accumulated ice pellets in the previous hour, inches (in) or millimeters (mm).
freezingRainPreviousHourInches	Total accumulated freezing rain in the previous hour, inches (in) or millimeters (mm).
downwardSolarRadiationWsqm	Total solar radiation reaching the surface of the earth (GHI), Watts per square meter (Wpm^2).
directNormalIrradienceWsqm	Solar radiation reaching the surface of the earth along a direct path, Watts

	per square meter (Wpm^2).
diffuseHorizontalRadiationWsqm	Solar radiation reaching the surface of the earth along a direct path, Watts per square meter (Wpm^2).
totalCloudCoverLowPercent	Total cloud cover up to 6,000 feet. Average for previous hour, percentage (%).
totalCloudCoverMiddlePercent	Total cloud cover between 6,000 feet and 20,000 feet. Average for previous hour, percentage (%).
totalCloudCoverHighPercent	Total cloud above 20,000 feet. Average for previous hour, percentage (%).
visibilityMiles	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).
presentWeather	Instantaneous observed weather types, text.
frictionVelocitySurfaceMps	Magnitude of stress at the surface, expressed as a velocity, meters per second (mps).
pressure80meterMillibars	Atmospheric pressure at 80m. Instantaneous reading at time shown, millibars (mb) or kilopascals (kPa).
pressure100meterMillibars	Atmospheric pressure at 100m. Instantaneous reading at time shown, millibars (mb) or kilopascals (kPa).
horizontalDirectNormalIrradianceSurfaceWsqm	The horizontal component of the solar radiation reaching the surface along a direct path, Watts per square meter (Wpm^2).
apparentTemperatureCelsius	Surface air (dry bulb) temperature at 2 meters
windChillTemperatureCelsius	Atmospheric humidity metric (temperature at which dew will form)
heatIndexCelsius	Percent of water vapor in the air relative to its saturation point
surfaceWetBulbTemperatureCelsius	Atmospheric pressure at the Surface
windSpeed80meterKph	Instantaneous wind speed at 80 meters for the time shown, miles per hour

	(mph) or kilometers per hour (kph).
temperature80meterCelsius	Unobstructed wind gusts at 10 meters
dewpointTemperature80meterCelsius	Liquid equivalent for types: warm rain, freezing rain, sleet, snow over the past Hour
windSpeed100meterKps	Instantaneous wind speed at 100 meters for the time shown, miles per hour (mph) or kilometers per hour (kph).
temperature100meterCelsius	Unobstructed wind gusts at 10 meters
dewpointTemperature100meterCelsius	Liquid equivalent for types: warm rain, freezing rain, sleet, snow over the past Hour
rainPreviousHourMillimeters	Total accumulated rain in the previous hour, inches (in) or millimeters (mm).
icePelletPreviousHourMillimeters	Total accumulated ice pellets in the previous hour, inches (in) or millimeters (mm).
freezingRainPreviousHourMillimeters	Total accumulated freezing rain in the previous hour, inches (in) or millimeters (mm).
visibilityKilometers	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).
pressure80meterKilopascals	Atmospheric pressure at 80m. Instantaneous reading at time shown, millibars (mb) or kilopascals (kPa).
pressure100meterKilopascals	Atmospheric pressure at 100m. Instantaneous reading at time shown, millibars (mb) or kilopascals (kPa).

Examples to Retrieve Station Data

Sample {Lat/Lon} URL request to return data with no gaps (All Input Parameters 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=surfaceTemperatureFahrenheit,relativeHumidityPercent,windSpeedMph,downwardSolarRadiationWsqm&lat=42.303&lon=-99.062&userKey=99999999999999999999999999999999

Sample {METAR Code} URL request to return data with no gaps (Only Required Parameters Specified):
https://cleanedobservations.atmosphericg2.com/v3/hourlystation?data=GAPFILLED&station=KBOS&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&userKey=99999999999999999999999999999

Sample {Enhanced ID Code} URL request to return raw observations which could contain gaps (Only Required Parameters Specified):
https://cleanedobservations.atmosphericg2.com/v3/hourlystation?data=FORMATTED&station=SYNPN3861E02743&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&userKey=99999999999999999999999999999999

Hourly/Daily/Monthly Gridded Data

Gridded Data Details:

Endpoint: ***https://cleanedobservations.atmosphericg2.com/v3/gridded***

Required Parameters:

- **userKey** — this unique client identifier is assigned by AG2
- **location** – Can be either a Lat/Lon pair, Site or Zipcode
  - Lat/Lon 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)
  - Could be any date from 1/1/1979 to today
- **endDate** — “mm/dd/yyyy” indicates the ending date for weather request
  - Could be any date from 1/2/1979 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 Parameters:

- **interval** — The desired temporal resolution of the data being retrieved. 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. 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 are in the table provided below. You can specify more than one variable by separating each value by a comma, i.e. **fields=windSpeedMph,surfaceTemperatureFahrenheit.** *If no fields are specified, the Default Variables listed in the table below will be returned based on the value entered for the "units" parameter*

NOTE: A system maintenance window is reserved between 7AM-9AM Eastern Time each Tuesday where API responses may be limited or curtailed.

Hourly Data - Default Gridded Variables

Name	Description
dateHrGmt	Greenwich Mean Time (GMT) date-time (also known as Universal Time)
dateHrLwt	Valid local date-time (Local wall time {includes daylight savings time})
surfaceTemperatureFahrenheit	Surface air (dry bulb) temperature at 2 meters
surfaceDewpointTemperatureFahrenheit	Atmospheric humidity metric (temperature at which dew will form)
surfaceWetBulbTemperatureFahrenheit	Atmospheric humidity metric (evaporative cooling potential of moist surface)
apparentTemperatureFahrenheit	Air temperature that includes impact of wind and humidity
windChillTemperatureFahrenheit	Air temperature that includes impact of wind
heatIndexFahrenheit	Air temperature that includes the impact of humidity

relativeHumidityPercent	Percent of water vapor in the air relative to its saturation point
precipitationPreviousHourInches	Liquid equivalent for types: warm rain, freezing rain, sleet, snow
snowfallInches	Total Snowfall
surfaceAirPressureMillibars	Atmospheric pressure at the Surface
mslPressureMillibars	Mean Sea Level Pressure
cloudCoveragePercent	Percentage of the sky covered by clouds
windSpeedMph	Unobstructed wind speed at 10 meters
windDirectionDegrees	Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 10 meters
surfaceWindGustsMph	Unobstructed wind gusts at 10 meters
diffuseHorizontalRadiationWsqm	Diffuse (indirect) solar radiation flux on a plane parallel to the Earth's surface
directNormalIrradianceWsqm	Direct solar radiation flux on a surface 90 deg to the sun
downwardSolarRadiationWsqm	Total solar radiation flux on a plane parallel to the Earth's surface
surfaceTemperatureCelsius	Surface air (dry bulb) temperature at 2 meters
surfaceDewpointTemperatureCelsius	Atmospheric humidity metric (temperature at which dew will form)
surfaceWetBulbTemperatureCelsius	Atmospheric humidity metric (evaporative cooling potential of moist surface)
apparentTemperatureCelsius	Air temperature that includes impact of wind and humidity
windChillTemperatureCelsius	Air temperature that includes impact of wind
heatIndexCelsius	Air temperature that includes the impact of humidity
snowfallCentimeters	Total Snowfall

precipitationPreviousHourCentimeters	Liquid equivalent for types: warm rain, freezing rain, sleet, snow
surfaceAirPressureKilopascals	Atmospheric pressure
mslPressureKilopascals	Mean Sea Level Pressure
surfaceWindGustsKph	Unobstructed wind gusts at 10 meters
windSpeedKph	Unobstructed wind speed at 10 meters
referenceEvapotranspirationInches	Reference Evapotranspiration (inches/hour)
referenceEvapotranspirationMillimeters	Reference Evapotranspiration (millimeters/hour)
Hourly Data - Additional Variables	
potentialEvapotranspirationMicrometersPerHour	Maximum evaporation rate possible (sum of evaporation and plant transpiration)
surfaceWaterRunOffMillimeters	Precipitation in previous hour expected to run off (not be absorbed)
surfaceWaterRunOffInches	Precipitation in previous hour expected to run off (not be absorbed)
zeroToTenLiquidSoilMoisturePercent	Layer-average by volume
zeroToTenSoilTemperatureFahrenheit	Layer-average
zeroToTenSoilTemperatureCelsius	Layer-average
tenToFortyLiquidSoilMoisturePercent	Layer-average by volume
fortyToOneHundredLiquidSoilMoisturePercent	Layer-average by volume
tenToFortySoilTemperatureFahrenheit	Layer-average
tenToFortySoilTemperatureCelsius	Layer-average
fortyToOneHundredSoilTemperatureFahrenheit	Layer-average

fortyToOneHundredSoilTemperatureCelsius	Layer-average
seaSurfaceTemperatureFahrenheit	Ground or Sea Surface Temperature
seaSurfaceTemperatureCelsius	Ground or Sea Surface Temperature
downwardTerrestrialRadiationWsqm	Long-wave radiation flux incident on a plane parallel to the Earth's surface (w/m^2)
directNormalInfraredRadiationWsqm	Same as DirectNormalIrradianceWsqm
netRadiationWsqm	Sum of incoming/outgoing solar and terrestrial radiation (w/m^2)
albedoPercent	Fraction of radiation reflected at the surface (percent)
specificHumidity	Daily water vapor content at 2m (kg/kg)
surfaceGeopotenitalHeightMeters	Surface height at mean sea-level pressure (m)
surfaceGeopotenitalHeightFeet	Surface height at mean sea-level pressure (ft)
surfaceSensibleHeatFluxWsqm	Rate of sensible heat energy transfer at the surface. Average or accumulated energy for previous hour (w/m^2)
surfaceLatentHeatFluxWsqm	Rate of latent heat energy transfer at the surface. Average or accumulated energy for previous hour (w/m^2)
oneHundredMeterWindSpeedKph	Wind speed at 100m (Kph)
oneHundredMeterWindSpeedMph	Wind speed at 100m (Mph)
precipitationRateMillimetersPerHour	Hourly measure of precipitation intensity. Average for previous hour (mm/hr)
categoricalFreezingRain	Indicator of precipitation falling as freezing rain (1=yes; 0=no) Not available in daily or monthly increments. Instantaneous reading at time shown (index)
categoricalRain	Indicator of precipitation falling as rain (1=yes; 0=no) Not available in daily or monthly increments. Instantaneous reading at time shown (index)
categoricalSnow	Indicator of precipitation falling as snow (1=yes; 0=no) Not available in daily or monthly increments. Instantaneous reading at time shown

	(index)
categoricalIcePellet	Indicator of precipitation falling as ice/graupel (1=yes; 0=no) Not available in daily or monthly increments. Instantaneous reading at time shown (index)
snowCoverPercent	Percentage of surface covered with snow. Average for previous hour (percent)
totalCloudCoverMiddlePercent	Cloud percent at multiple pressure levels (middle altitudes). Average for previous hour (percent)
totalCloudCoverLowPercent	Cloud percent at multiple pressure levels (low altitudes). Average for previous hour (percent)
convectiveAvailablePotentialEnergyJulesPerKilogram	Energy available for convective (storm) development in boundary layer. Average for previous hour (J/kg)
totalOzoneDobsonUnits	Atmospheric column ozone density. Average for previous hour (DU = Dobson Units)
planetaryBoundaryLayerHeightMeters	The depth of the lowest layer of the atmosphere. In this layer, friciton affects the wind speed and direction. Depth, meters.
bareSoilEvaporationWsqm	Water movement and evaporation through vegetation (w/m^2)
zeroToTwoHundredLiquidSoilMoisturePercent	Layer-average by volume (percent)
vegetationCoveragePercent	Percent of surface covered by vegetation. Not available in Daily or Monthly increments (percent)
vegetationType	Categorized description of vegetation content at the surface. Not available in Daily or Monthly increments, Vegetation Type Index (SiB analysis)
soilType	Categorized description of soil content. Not available in Daily or Monthly increments, Soil Type Index (Zobler Analysis)
surfaceSlopeType	Categorized description of the change in surface height. Not available in Daily or Monthly increments (index)
surfaceRoughnessMeters	Descriptor of surface texture (i.e. an indicator for the strength of frictional drag). Not available in Daily or Monthly increments
surfaceRoughnessFeet	Descriptor of surface texture (i.e. an indicator for the strength of frictional drag). Not available in Daily or Monthly increments
groundHeatFluxWsqm	Rate of heat energy transfer at the surface. Average or accumulated energy for previous hour (w/m^2)
snowDepthMeters	Calculated snow depth at the surface

snowDepthFeet	Calculated snow depth at the surface
iceCover	Surface ice coverage (index)
iceThicknessMeters	Depth of ice on the surface
iceThicknessFeet	Depth of ice on the surface
dateHrGmt	Greenwich Mean Time (GMT) date-time (also known as Universal Time)

Daily Data - Variables

Name	Description
MinSurfaceTemperatureFahrenheit or MinSurfaceTemperatureCelsius	Surface air (dry bulb) temperature at 2 meters
MaxSurfaceTemperatureFahrenheit or MaxSurfaceTemperatureCelsius	Surface air (dry bulb) temperature at 2 meters
AvgSurfaceTemperatureFahrenheit or AvgSurfaceTemperatureCelsius	Surface air (dry bulb) temperature at 2 meters
MinSurfaceDewpointFahrenheit or MinSurfaceDewpointCelsius	Atmospheric humidity metric (temperature at which dew will form)
MaxSurfaceDewpointFahrenheit or MaxSurfaceDewpointCelsius	Atmospheric humidity metric (temperature at which dew will form)
AvgSurfaceDewpointFahrenheit or AvgSurfaceDewpointCelsius	Atmospheric humidity metric (temperature at which dew will form)
MinWetBulbTemperatureFahrenheit or MinWetBulbTemperatureCelsius	Atmospheric humidity metric (evaporative cooling potential of moist surface)
MaxWetBulbTemperatureFahrenheit or MaxWetBulbTemperatureCelsius	Atmospheric humidity metric (evaporative cooling potential of moist surface)
AvgWetBulbTemperatureFahrenheit or AvgWetBulbTemperatureCelsius	Atmospheric humidity metric (evaporative cooling potential of moist surface)
MinRelativeHumidityPercent	Percent of water vapor in the air relative to its saturation point
MaxRelativeHumidityPercent	Percent of water vapor in the air relative to its saturation point

AvgRelativeHumidityPercent	Percent of water vapor in the air relative to its saturation point
MinSurfaceAirPressureMillibars or MinSurfaceAirPressureKilopascals	Atmospheric pressure at the Surface
MaxSurfaceAirPressureMillibars or MaxSurfaceAirPressureKilopascals	Atmospheric pressure at the Surface
AvgSurfaceAirPressureMillibars or AvgSurfaceAirPressureKilopascals	Atmospheric pressure at the Surface
MinMslPressureMillibars or MinMslPressureKilopascals	Mean Sea Level Pressure
MaxMslPressureMillibars or MaxMslPressureKilopascals	Mean Sea Level Pressure
AvgMslPressureMillibars or AvgMslPressureKilopascals	Mean Sea Level Pressure
MinCloudCoveragePercent	Percentage of the sky covered by clouds
MaxCloudCoveragePercent	Percentage of the sky covered by clouds
AvgCloudCoveragePercent	Percentage of the sky covered by clouds
MinWindChillTemperatureFahrenheit or MinWindChillTemperatureCelsius	Air temperature that includes impact of wind
MaxWindChillTemperatureFahrenheit or MaxWindChillTemperatureCelsius	Air temperature that includes impact of wind
AvgWindChillTemperatureFahrenheit or AvgWindChillTemperatureCelsius	Air temperature that includes impact of wind
MinApparentTemperatureFahrenheit or MinApparentTemperatureCelsius	Air temperature that includes impact of wind and humidity
MaxApparentTemperatureFahrenheit or MaxApparentTemperatureCelsius	Air temperature that includes impact of wind and humidity
AvgApparentTemperatureFahrenheit or AvgApparentTemperatureCelsius	Air temperature that includes impact of wind and humidity
MinHeatIndexFahrenheit or MinHeatIndexCelsius	Air temperature that includes impact of humidity
MaxHeatIndexFahrenheit or MaxHeatIndexCelsius	Air temperature that includes impact of humidity
AvgHeatIndexFahrenheit or AvgHeatIndexCelsius	Air temperature that includes impact of humidity

MinWindSpeedMph or MinWindSpeedKph	Unobstructed wind speed at 10 meters
MaxWindSpeedMph or MaxWindSpeedKph	Unobstructed wind speed at 10 meters
AvgWindSpeedMph or AvgWindSpeedKph	Unobstructed wind speed at 10 meters
MinSurfaceWindGustsMph or MinSurfaceWindGustsKph	Unobstructed wind gusts at 10 meters
MaxSurfaceWindGustsMph or MaxSurfaceWindGustsKph	Unobstructed wind gusts at 10 meters
AvgSurfaceWindGustsMph or AvgSurfaceWindGustsKph	Unobstructed wind gusts at 10 meters
MinWindDirectionDegrees	Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 10 meters
MaxWindDirectionDegrees	Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 10 meters
AvgWindDirectionDegrees	Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 10 meters
MinPrecipitationPreviousHourInches or MinPrecipitationPreviousHourCentimeters	Liquid equivalent for types: warm rain, freezing rain, sleet, snow
MaxPrecipitationPreviousHourInches or MaxPrecipitationPreviousHourCentimeters	Liquid equivalent for types: warm rain, freezing rain, sleet, snow
AvgPrecipitationPreviousHourInches or AvgPrecipitationPreviousHourCentimeters	Liquid equivalent for types: warm rain, freezing rain, sleet, snow
SumPrecipitationPreviousHourInches or SumPrecipitationPreviousHourCentimeters	Liquid equivalent for types: warm rain, freezing rain, sleet, snow
MinSnowfallInches or MinSnowfallCentimeters	Total Snowfall
MaxSnowfallInches or MaxSnowfallCentimeters	Total Snowfall
AvgSnowfallInches or AvgSnowfallCentimeters	Total Snowfall
SumSnowfallInches or SumSnowfallCentimeters	Total Snowfall
MinDownwardSolarRadiationWsqm	Total solar radiation flux on a plane parallel to the Earth's surface
MaxDownwardSolarRadiationWsqm	Total solar radiation flux on a plane parallel to the Earth's surface

AvgDownwardSolarRadiationWsqm	Total solar radiation flux on a plane parallel to the Earth's surface
SumDownwardSolarRadiationWsqm	Total solar radiation flux on a plane parallel to the Earth's surface
MinDiffuseHorizontalRadiationWsqm	Diffuse (indirect) solar radiation flux on a plane parallel to the Earth's surface
MaxDiffuseHorizontalRadiationWsqm	Diffuse (indirect) solar radiation flux on a plane parallel to the Earth's surface
AvgDiffuseHorizontalRadiationWsqm	Diffuse (indirect) solar radiation flux on a plane parallel to the Earth's surface
SumDiffuseHorizontalRadiationWsqm	Diffuse (indirect) solar radiation flux on a plane parallel to the Earth's surface
MinDirectNormalIrradienceWsqm	Direct solar radiation flux on a surface 90 deg to the sun
MaxDirectNormalIrradienceWsqm	Direct solar radiation flux on a surface 90 deg to the sun
AvgDirectNormalIrradienceWsqm	Direct solar radiation flux on a surface 90 deg to the sun
SumDirectNormalIrradienceWsqm	Direct solar radiation flux on a surface 90 deg to the sun
ReferenceEvapotranspirationInches or ReferenceEvapotranspirationMillimeters	Reference Evapotranspiration (inches/hour)

Monthly Data - Variables

Name	Description
SurfaceTemperatureFahrenheit or SurfaceTemperatureCelsius	Daily Minimum Surface air (dry bulb) temperature at 2 meters
SurfaceDewpointFahrenheit or SurfaceDewpointCelsius	Daily Minimum Atmospheric humidity metric (temperature at which dew will form)
WetBulbTemperatureFahrenheit or WetBulbTemperatureCelsius	Daily Minimum Atmospheric humidity metric (evaporative cooling potential of moist surface)
RelativeHumidityPercent	Daily Minimum Percent of water vapor in the air relative to its saturation point
SurfaceAirPressureMillibars or MinSurfaceAirPressureKilopascals	Atmospheric pressure at the Surface

CloudCoveragePercent	Percentage of the sky covered by clouds
WindSpeedMph or WindSpeedKph	Unobstructed wind speed at 10 meters
WindDirectionDegrees	Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 10 meters
PrecipitationPreviousHourInches or PrecipitationPreviousHourCentimeters	Liquid equivalent for types: warm rain, freezing rain, sleet, snow
netRadiationWsqm	Total solar radiation flux on a plane parallel to the Earth's surface
directNormalIrradianceWsqm	Direct solar radiation flux on a surface 90 deg to the sun
diffuseHorizontalRadiationWsqm	Diffuse (indirect) solar radiation flux on a plane parallel to the Earth's surface
downwardSolarRadiationWsqm	Total solar radiation flux on a plane parallel to the Earth's surface
potentialEvapotranspirationMicrometersPerHour	Reference Evapotranspiration (inches/hour)

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

Disclaimer

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.

Examples to Retrieve Gridded Data

Sample {Lat/Long} URL request (All Input Parameters Specified):
https://cleanedobservations.atmosphericg2.com/v3/gridded?startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&time=lwt&station=metar&fields=surfaceTemperatureFahrenheit,relativeHumidityPercent,windSpeedMph,downwardSolarRadiationWsqm&latitude=42.303&longitude=-99.062&userKey=99999999999999999999999999999999
Sample {Lat/Long} URL request (Only Required Parameters Specified):
https://cleanedobservations.atmosphericg2.com/v3/gridded?startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&latitude=42.303&longitude=-99.062&userKey=99999999999999999999999999999999
Sample {Zipcode} URL request (All Input Parameters Specified):
https://cleanedobservations.atmosphericg2.com/v3/gridded?zipcode=01810&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&time=lwt&station=metar&fields=surfaceTemperatureFahrenheit,relativeHumidityPercent,windSpeedMph,downwardSolarRadiationWsqm&userKey=99999999999999999999999999999999
Sample {Grid Cell ID} URL request (All Input Parameters Specified):
https://cleanedobservations.atmosphericg2.com/v3/wsi/metar/station/2268975643?startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&time=lwt&station=metar&fields=surfaceTemperatureFahrenheit,relativeHumidityPercent,windSpeedMph,downwardSolarRadiationWsqm&userKey=99999999999999999999999999999999

Degree Day Data

Certain parameters are required to initiate a weather request. As is standard in URIs, all parameters are separated using the ampersand (**&**) character. The list of parameters and their possible values are enumerated below.

Endpoint: ***https://cleanedobservations.atmosphericg2.com/v3/degreeday***

- userKey (*required*) — this unique client identifier is assigned by AG2
- lat/long *(required)* – latitude/longitude for which data is being requested for
- startDate (*required*) — “mm/dd/yyyy” Indicates the starting date for weather request (Start date is first hour of requested date)
- endDate (*required*) — “mm/dd/yyyy” indicates the ending date for weather request (End date is first hour of date requested, Data will be returned between the first hour of start date and first hour of end

date. Make end date an extra day if you would like data for that day.)

- units (*required)* — The desired units in which to express the data being retrieved. Accepted values are:
    - Imperial
    - metric
- format (*required)* — The desired format in which to return the data being retrieved. Accepted values are:
    - json
    - xml
    - csv

- crop – Specific to Growing Degree Days and Killing Degree Days. Currently accepted values are:
    - Corn - Default
    - Wheat
    - Potato
    - Cotton
    - Peanut

- basetemp – The base temperature to be used in the Growing/Killing Degree Day calculation. The value can be provided in either Fahrenheit or Celsius but needs to be consistent with the value used for the “units” parameter. If both the “crop” and “basetemp” parameters are not provided a Default value of 50F is used. Otherwise, the default basetemp for the entered crop will be used which are listed below within the Definitions section.

Definitions

Cooling Degree Days - Difference of average daily temperature and 65 F / 18 C. If positive, equals the difference. Else is 0.
Heating Degree Days - Difference of 65 F / 18 C and average daily temperature. If positive, equals the difference. Else is 0.
Growing/Killing Degree Days - Difference from average daily temperature from base temperature of a crop (base temperature is defined by crop). Equals 0 if average daily temperature is below 32 F / 0 C or above 86 F / 30 C.

Default basetemp based on crop:
Corn: 50 F / 10 C
Wheat: 40 F / 4 C
Cotton: 60 F / 16 C
Peanut: 56 F / 13 C
Potato: 45 F / 7 C

Date Range Restriction

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.

Examples:

Heating/Cooling Degree Days
https://cleanedobservations.atmosphericg2.com/v3/degreeday/[42.134,-78.132]?startDate=05/01/2015&endDate=05/02/2015&units=imperial&format=json&userKey=[userKey]

Growing/Killing Degree Days for Corn with a basetemp of 55F:
https://cleanedobservations.atmosphericg2.com/v3/degreeday/[42.134,-78.132]?startDate=05/01/2015&endDate=05/02/2015&units=imperial&crop=corn&basetemp=55&format=json&userKey=[userKey]

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.

- userKey (*required*) — this unique client identifier is assigned by AG2
- start (*required*) — “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*
- end (*optional*) — “mm/dd/yyyy” indicates the ending date for the usage request

Request without an end date
https://cleanedobservations.atmosphericg2.com/v3/usage?start=05/01/2015&userKey=99999999999999999999999999999999

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 with an end date
https://cleanedobservations.atmosphericg2.com/v3/usage?start=05/01/2015&end=06/01/2015&userKey=99999999999999999999999999999999

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.
    - 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