CLEANED OBSERVATION API DOCUMENTATION

OCTOBER 2016

TWC Global Data Sets

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

1.) Standard/Premium Weather Variables

2.) Degree Day Variables

1. STANDARD/PREMIUM WEATHER VARIABLES

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 Standard Weather Variables. In addition, your key can be provisioned for access to a special set of 6 Premium Weather Variables. The specific set of Standard and Premium Variables can be found in tables listed below.

- **userKey** (***required***) — this unique client identifier is assigned by WSI
- **lat/long** or **zipcode** ***(required)*** – Data can be requested either by latitude/longitude or zip code. Currently searching by zip code is only supported for US zip codes.
- **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.)

- **interval (*required*)** — The desired temporal resolution of the data being retrieved. Accepted values are:
    - **hourly**
    - **daily**
    - **monthly**
- **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**
- **version –** The specific version of the API to be utilized. Currently accepted values are:
    - **2**
- **station** – The specific data source to use for the requested location.
    - **cfsr** – Use the closest virtual grid point to the requested location. You are guaranteed to have data returned for the entire time frame requested when using this value - **Default**
    - **metar** – Will conduct a nearest neighbor search and chooses a METAR station if it is 17.5 km or less from the requested location. If a METAR station is used, you are not guaranteed to have data returned for the entire time frame requested. METAR data is only returned for the period of the requested time period in which it is available. **Premium Weather Variables are not available when using this option.**

- **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, all parameters will be returned.

- **time –** Specify the time unit the requested data is returned in. Accepted values are:
    - **lwt (local wall time)**
    - **gmt (Greenwich mean time) - Default**

- **delivery –** Specify how the data is returned. Accepted values are:
    - **stream** – Data is delivered directly to the browser or the application that makes the API call
    - **file** – Data is delivered in a file that is downloaded to your system **– Default**

TWC GLOBAL DATA SETS

Available Standard Weather Variables	
Name	**Description**
SiteId	Site / location identifier (either Virtual Grid Square ID or METAR ID)
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)
relativeHumidity	Percent of water vapor in the air relative to its saturation point
apparentTemperatureFahrenheit	Air temperature that includes impact of wind and humidity
windChillTemperatureFahrenheit	Air temperature that includes impact of wind
precipitationPreviousHourInches	Liquid equivalent for types: warm rain, freezing rain, sleet, snow
surfaceAirPressureMillibars	Atmospheric pressure at the Surface
MslPressureMillibars	Mean Sea Level Pressure
cloudCoverage	Percentage of the sky covered by clouds
windSpeedMph	Unobstructed wind speed at 10 meters
windDirection	Upwind direction (e.g., wind from east = 270, from south = 180, etc.) at 10 meters
diffuseHorizontalRadiation	Diffuse (indirect) solar radiation flux on a plane parallel to the Earth's surface
directNormalIrradiance	Direct solar radiation flux on a surface 90 deg to the sun
downwardSolarRadiation	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
precipitationPreviousHourCentimeters	Liquid equivalent for types: warm rain, freezing rain, sleet, snow
surfaceAirPressureKilopascals	Atmospheric pressure
MslPressureKilopascals	Mean Sea Level Pressure
windSpeedKph	Unobstructed wind speed at 10 meters

Available Premium Weather Variables	
Name	**Description**
potentialEvapotranspiration	Maximum evaporation rate possible (sum of evaporation and plant transpiration)
surfaceWaterRunOff	Precipitation in previous hour expected to run off (not be absorbed)
zeroToTenLiquidSoilMoisture	Layer-average by volume
zeroToTenSoilTemperatureFahrenheit	Layer-average
tenToFortyLiquidSoilMoisture	Layer-average by volume
tenToFortySoilTemperatureFahrenheit	Layer-average

Response Messages

HTTP Status Code	Reason
400	Bad Request
401	Unauthorized
403	Forbidden
404	Not Found
429	Too many requests

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 to Retrieve Standard Parameters

Sample {Lat/Long} URL request (Required Parameters)

http://cleanedobservations.wsi.com/CleanedObs.svc/GetObs?version=2&lat=42.134&long=-78.132&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&userKey=99999999999999999999999999999999

Sample {Lat/Long} URL request (All Parameters)

http://cleanedobservations.wsi.com/CleanedObs.svc/GetObs?version=2&lat=42.303&long=99.062&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&fields=surfaceTemperatureFahrenheit,relativeHumidity,windSpeedMph,downwardSolarRadiation&delivery=file&userKey=99999999999999999999999999999999

Sample {Zipcode} URL request (Required Parameters)

http://cleanedobservations.wsi.com/CleanedObs.svc/GetObs?version=2&zipcode=01810&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&userKey=99999999999999999999999999999999

Sample {Zipcode} URL request (All Parameters)

http://cleanedobservations.wsi.com/CleanedObs.svc/GetObs?version=2&zipcode=01810&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&fields=surfaceTemperatureFahrenheit,relativeHumidity,windSpeedMph,downwardSolarRadiation&delivery=stream&userKey=99999999999999999999999999999999

Examples to Retrieve Standard & Premium Parameters

Sample {Lat/Long} URL request (Required Parameters)

http://cleanedobservations.wsi.com/CleanedObs.svc/premium?version=2&lat=42.134&long=-78.132&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&userKey=99999999999999999999999999999999

Sample {Lat/Long} URL request (All Parameters)

http://cleanedobservations.wsi.com/CleanedObs.svc/premium?version=2&lat=42.303&long=99.062&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&fields=TenToFortyLiquidSoilMoisture&delivery=file&userKey=99999999999999999999999999999999

Sample {Zipcode} URL request (Required Parameters)

http://cleanedobservations.wsi.com/CleanedObs.svc/premium?version=2&zipcode=01810&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&userKey=99999999999999999999999999999999

Sample {Zipcode} URL request (All Parameters)

http://cleanedobservations.wsi.com/CleanedObs.svc/premium?version=2&zipcode=01810&startDate=05/01/2015&endDate=05/02/2015&interval=hourly&units=imperial&format=json&fields=TenToFortyLiquidSoilMoisture&delivery=file&userKey=99999999999999999999999999999999

2. DEGREE DAY VARIABLES

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.

- **userKey (*required*)** — this unique client identifier is assigned by WSI
- **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**
- **delivery –** Specify how the data is returned. Accepted values are:
    - **stream** – Data is delivered directly to the browser or the application that makes the API call
    - **file** – Data is delivered in a file that is downloaded to your system **– Default**
- **version –** The specific version of the API to be utilized. Currently accepted values are:
    - **2**
- **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

Response Messages

HTTP Status Code	Reason
400	Bad Request
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403	Forbidden
404	Not Found
429	Too many requests

ABOUT THE WEATHER COMPANY

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

Calculate Growing/Killing Degree Days for Corn with a basetemp of 55F

http://cleanedobservations.wsi.com//CleanedObs.svc/GetDegreeDay?lat=42.134&long=-78.132&startDate=05/01/2015&endDate=05/02/2015&station=metar&units=imperial&crop=corn&basetemp=55&format=xml&userKey=99999999999999999999999999&delivery=stream

Calculate Growing/Killing Degree Days for Wheat with a basetemp of 10C

http://cleanedobservations.wsi.com//CleanedObs.svc/GetDegreeDay?lat=42.134&long=-78.132&startDate=05/01/2015&endDate=05/02/2015&station=metar&units=metric&crop=wheat&basetemp=10&format=xml&userKey=99999999999999999999999999&delivery=stream

About The Weather Company

The Weather Company, an IBM Business, is the world's largest private weather enterprise, helping people make informed decisions – and take action – in the face of weather. The company offers the most accurate, personalized and actionable weather data and insights to millions of consumers and thousands of businesses via Weather's API, its business solutions division, and its own digital products from The Weather Channel (weather.com) and Weather Underground (wunderground.com).

The company delivers up to 26 billion forecasts daily. Its products include a top weather app on all major mobile platforms globally; the world's largest network of personal weather stations; a top-20 U.S. website; the seventh most data-rich site in the world; one of the world's largest IoT data platforms; and industry-leading business solutions. Weather Means Business™. The world's biggest brands in aviation, energy, insurance, media, and government rely on The Weather Company for data, technology platforms and services to help improve decision-making and respond to weather's impact on business.

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