CLEANED OBSERVATION
API DOCUMENTATION

UPDATED: APR 13, 2018
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**

3.) **Hi-Resolution Precipitation**

**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**
## Available Standard Weather Variables

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiteId</td>
<td>Site / location identifier (either Virtual Grid Square ID or METAR ID)</td>
</tr>
<tr>
<td>dateHrGmt</td>
<td>Greenwich Mean Time (GMT) date-time (also known as Universal Time)</td>
</tr>
<tr>
<td>dateHrLwt</td>
<td>Valid local date-time (Local wall time {includes daylight savings time})</td>
</tr>
<tr>
<td>surfaceTemperatureFahrenheit</td>
<td>Surface air (dry bulb) temperature at 2 meters</td>
</tr>
<tr>
<td>surfaceDewpointTemperatureFahrenheit</td>
<td>Atmospheric humidity metric (temperature at which dew will form)</td>
</tr>
<tr>
<td>surfaceWetBulbTemperatureFahrenheit</td>
<td>Atmospheric humidity metric (evaporative cooling potential of moist surface)</td>
</tr>
<tr>
<td>relativeHumidityPercent</td>
<td>Percent of water vapor in the air relative to its saturation point</td>
</tr>
<tr>
<td>apparentTemperatureFahrenheit</td>
<td>Air temperature that includes impact of wind and humidity</td>
</tr>
<tr>
<td>windChillTemperatureFahrenheit</td>
<td>Air temperature that includes impact of wind</td>
</tr>
<tr>
<td>heatIndexFahrenheit</td>
<td>Air temperature that includes the impact of humidity</td>
</tr>
<tr>
<td>precipitationPreviousHourInches</td>
<td>Liquid equivalent for types: warm rain, freezing rain, sleet, snow</td>
</tr>
<tr>
<td>snowfallInches</td>
<td>Total Snowfall</td>
</tr>
<tr>
<td>surfaceAirPressureMillibars</td>
<td>Atmospheric pressure at the Surface</td>
</tr>
<tr>
<td>mslPressureMillibars</td>
<td>Mean Sea Level Pressure</td>
</tr>
<tr>
<td>cloudCoveragePercent</td>
<td>Percentage of the sky covered by clouds</td>
</tr>
<tr>
<td>windSpeedMph</td>
<td>Unobstructed wind speed at 10 meters</td>
</tr>
<tr>
<td>windDirectionDegrees</td>
<td>Upwind direction (e.g., wind from east = 90, from south = 180, etc.) at 10 meters</td>
</tr>
<tr>
<td>surfaceWindGustsMph</td>
<td>Unobstructed wind gusts at 10 meters</td>
</tr>
<tr>
<td>diffuseHorizontalRadiationWsq</td>
<td>Diffuse (indirect) solar radiation flux on a plane parallel to the Earth's surface</td>
</tr>
<tr>
<td>directNormalIrradianceWsq</td>
<td>Direct solar radiation flux on a surface 90 deg to the sun</td>
</tr>
<tr>
<td>downwardSolarRadiationWsq</td>
<td>Total solar radiation flux on a plane parallel to the Earth's surface</td>
</tr>
<tr>
<td>surfaceTemperatureCelsius</td>
<td>Surface air (dry bulb) temperature at 2 meters</td>
</tr>
<tr>
<td>surfaceDewpointTemperatureCelsius</td>
<td>Atmospheric humidity metric (temperature at which dew will form)</td>
</tr>
<tr>
<td>surfaceWetBulbTemperatureCelsius</td>
<td>Atmospheric humidity metric (evaporative cooling potential of moist surface)</td>
</tr>
<tr>
<td>apparentTemperatureCelsius</td>
<td>Air temperature that includes impact of wind and humidity</td>
</tr>
<tr>
<td>windChillTemperatureCelsius</td>
<td>Air temperature that includes impact of wind</td>
</tr>
</tbody>
</table>
### TWC GLOBAL DATA SETS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>heatIndexCelsius</td>
<td>Air temperature that includes the impact of humidity</td>
</tr>
<tr>
<td>snowfallCentimeters</td>
<td>Total Snowfall</td>
</tr>
<tr>
<td>precipitationPreviousHourCentimeters</td>
<td>Liquid equivalent for types: warm rain, freezing rain, sleet, snow</td>
</tr>
<tr>
<td>surfaceAirPressureKilopascals</td>
<td>Atmospheric pressure</td>
</tr>
<tr>
<td>mslPressureKilopascals</td>
<td>Mean Sea Level Pressure</td>
</tr>
<tr>
<td>surfaceWindGustsKph</td>
<td>Unobstructed wind gusts at 10 meters</td>
</tr>
<tr>
<td>windSpeedKph</td>
<td>Unobstructed wind speed at 10 meters</td>
</tr>
</tbody>
</table>

### Available Premium Weather Variables

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>potentialEvapotranspirationMicrometersPerHour</td>
<td>Maximum evaporation rate possible (sum of evaporation and plant transpiration)</td>
</tr>
<tr>
<td>surfaceWaterRunOffMillimeters</td>
<td>Precipitation in previous hour expected to run off (not be absorbed)</td>
</tr>
<tr>
<td>zeroToTenLiquidSoilMoisturePercent</td>
<td>Layer-average by volume</td>
</tr>
<tr>
<td>zeroToTenSoilTemperatureFahrenheit</td>
<td>Layer-average</td>
</tr>
<tr>
<td>zeroToTenSoilTemperatureCelsius</td>
<td>Layer-average</td>
</tr>
<tr>
<td>tenTo FortyLiquidSoilMoisturePercent</td>
<td>Layer-average by volume</td>
</tr>
<tr>
<td>fortyToOneHundredLiquidSoilMoisturePercent</td>
<td>Layer-average by volume</td>
</tr>
<tr>
<td>tenTo FortySoilTemperatureFahrenheit</td>
<td>Layer-average</td>
</tr>
<tr>
<td>tenTo FortySoilTemperatureCelsius</td>
<td>Layer-average</td>
</tr>
<tr>
<td>fortyToOneHundredSoilTemperatureFahrenheit</td>
<td>Layer-average</td>
</tr>
<tr>
<td>fortyToOneHundredSoilTemperatureCelsius</td>
<td>Layer-average</td>
</tr>
</tbody>
</table>

### Response Messages

<table>
<thead>
<tr>
<th>HTTP Status Code</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>Bad Request</td>
</tr>
<tr>
<td>401</td>
<td>Unauthorized</td>
</tr>
<tr>
<td>403</td>
<td>Forbidden</td>
</tr>
<tr>
<td>404</td>
<td>Not Found</td>
</tr>
<tr>
<td>429</td>
<td>Too many requests</td>
</tr>
</tbody>
</table>
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=9999999999999999999999999999999999999999

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=9999999999999999999999999999999

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=9999999999999999999999999999999

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
• csv

• 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

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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=9999999999999999999999999999&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=99999999999999999999999999999&delivery=stream

3. Hi-Resolution Precipitation

Our standard datasets provide precipitation data at 30km resolution but we now provide access to a higher resolution suite of precipitation data. Data can be retrieved for locations in the Continental United
States at both 1km and 4km resolution. Data is available globally at 8km resolution between 60 degrees N and 60 degrees S. Temporal availability for each resolution is outlined below.

1km: June 1, 2015 to Present
4km: January 1, 2002 to Present
8km: December 1, 2015 to Present

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)
- **interval** *(required)* — The desired temporal resolution of the data being retrieved. Accepted values are:
  - hourly
  - daily
  - monthly
- **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
- **time** — Specify the time unit the requested data is returned in. Accepted values are:
  - lwt (local wall time)
  - gmt (Greenwich mean time) – Default
• **peril (required)** — The parameter type desired. Accepted values are:
  • precipitation
  • rain
  • snow
  • freezingrain

• **resolution (required)** — The desired spatial resolution
  • 1km (Data only available over the Continental United States)
  • 4km (Data only available over the Continental United States)
  • 8km (Data available globally between 60°N and 60°S)

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

• **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 Value**

• **version** — The specific version of the API to be utilized. Currently accepted values are:
  • 1 — **Default Value**
Date Range Restriction:

There is a max of 30 days of historical data allowed per request with one exception. You can request up to 1 year of data when setting the “peril” parameter to “precipitation”. For the other 3 “peril” values, if you request more than 30 days of data, your end date will be shortened and you would receive data from your start date to 30 days out.

Examples

Retrieve 8km hourly rainfall data in a CSV file

http://cleanedobservations.wsi.com//CleanedObs.svc/precip?version=1&lat=42.134&long=-78.132&startDate=02/11/2017&endDate=02/12/2017&peril=rain&interval=hourly&units=imperial&time=gmt&format=csv&userKey=999999999999999999999999999&delivery=file&resolution=8km

Retrieve 4km hourly rainfall data in XML format displayed in your browser and streamed directly to your custom software

http://cleanedobservations.wsi.com//CleanedObs.svc/precip?version=1&lat=42.134&long=-78.132&startDate=02/11/2017&endDate=02/12/2017&peril=rain&interval=hourly&units=imperial&time=gmt&format=xml&userKey=999999999999999999999999999&delivery=stream&resolution=4km

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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