# Station Data API Service

AgWeatherNet

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**Version 3**

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# Contents

# Station Data API Service

## Server Information

| Environment | Server |
|---|---|
| **Test** | http://weather.prosser.wsu.edu/webservice/stationdata |
| **Production** | http://weather.wsu.edu/webservice/stationdata |

## Description

Station Data API delivers station data records at a 15 minute resolution to authorized users identified by IP address. All parameters that are sent as filters will be applied, so if you don't get the data back you would expect, check your request. Please note for the stability of the service it is recommended that if you are requesting data for ALL STATIONS (i.e. no STATION_ID parameter is set) that you either omit the START/END parameters (resulting in the single most current record for each station being returned) or limit your date range (START/END) to a small window, perhaps as small as 2 hours. While larger time ranges may result in a valid response during time of low server load, queries with run time exceeding 30 seconds are terminated.

## Request Model

| Parameter | Data Type | Required | Description |
|---|---|---|---|
| **STATION_ID** | Int | No | You may supply a single station id value if you would like metadata for a specific station. |
| **INSTALLATION_DATE** | Date | No | If supplied, only stations installed before the date will be returned. Dates should be in YYYYmmdd format. |
| **STATE** | Char(2) | No | If supplied, only stations that match the two character state abbreviation will be returned. |
| **COUNTY** | Char(20) | No | If supplied, only stations that match the county will be returned. |
| **START** | Char(19) | No | If supplied, data records beginning with the START will be supplied. START should be sent in format of YYYY-mm-dd hh:ii:ss. (YYYY=year, mm=month, dd=day, hh=hour,ii=minute,ss=second). Remember that data records are timestamp at the end of the 15 minute period of observation (4 times per hour). Each hour has a possible timestamp ending in (hh:ii) 15:00, 30:00, 45:00, or 00:00. Timestamps are interpreted and delivered as the UTC-8. |
| **END** | Char(19) | No | If supplied, data records ending with the END will be supplied. END should be sent in format of YYYY-mm-dd hh:ii:ss. (YYYY=year, mm=month, dd=day, hh=hour,ii=minute,ss=second). Remember that data records are timestamp at the end of the 15 minute period of observation (4 times per hour). Each hour has a possible timestamp ending in (hh:ii) 15:00, 30:00, 45:00, |

| | | | |
|---|---|---|---|
| | | | or 00:00. Timestamps are interpreted and delivered as the UTC-8. |
| **FORMAT** | Char(4) | No | If supplied, specifies the format of the output. Valid options are JSON which is also the default if the parameter is not included. |
| **AT** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have an air temperature sensor (Y=Yes, N=No). |
| **RH** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have a relative humidity sensor (Y=Yes, N=No). |
| **P** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have a precipitation sensor (Y=Yes, N=No). |
| **WS** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have a wind speed sensor (Y=Yes, N=No). |
| **WD** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have a wind direction sensor (Y=Yes, N=No). |
| **LW** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have a leaf wetness sensor (Y=Yes, N=No). |
| **SR** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have a solar radiation sensor (Y=Yes, N=No). |
| **ST2** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have a soil temperature sensor at 2 inch depth (Y=Yes, N=No). |
| **ST8** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have a soil temperature sensor at 8 inch depth (Y=Yes, N=No). |
| **SM8** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have a soil moisture sensor at 8 inch depth (Y=Yes, N=No). |
| **MSLP** | Char(1) | No | If supplied, valid values are "Y" or "N". Stations will be filtered on whether or not they have an air pressure sensor (Y=Yes, N=No). |

## Example Requests

A sample request to return the most recent data record for all stations from the test environment would be:

http://weather.prosser.wsu.edu/webservice/stationdata

A sample request to return the most recent data record for all stations which have a soil moisture sensor at 8 inch depth from the test environment would be:

http://weather.prosser.wsu.edu/webservice/stationdata/?SM8=Y

A sample request to return data records for all stations which have a soil temperature sensor at 2 inch depth between the times of 2015-10-01 00:15:00 and 2015-10-02 00:15:00 would be:

http://weather.prosser.wsu.edu/webservice/stationdata/?ST2=Y&START=2015-10-01+00:15:00&END=2015-10-02+00:15:00

# JSON Response Models

There are three possible response models.

## Error Response

An invalid request will generate an error response:

| Parameter | Data Type | Description |
|---|---|---|
| **status** | Int | Status of -1, indicating error |
| **message** | String | A message associated with the response. |

## Default Response

The default successful response is JSON encoded data defined by the following parameters.

| Parameter | Data Type | Description |
|---|---|---|
| **status** | Int | Status of 1, indicating success |
| **message** | Array | An array of records with each entry representing a single station. |

## Message/Station Data

The message payload of a successful response is an array of station records, with each record in the array representing a single weather station and containing information defined by parameters listed below. .

| Parameter | Data Type | Description |
|---|---|---|
| **STATE** | Char(2) | The 2 letter abbreviation of the state (political entity) where the weather station resides. |
| **COUNTY** | Char(20) | The county (secondary political entity) where the the weather station resides. |
| **CITY** | Char(25) | The nearest identified population center to the station, if available. This may be null or an empty string. |
| **ZIPCODE** | Char(20) | The zip code where the weather station resides, if available. This may be null or an empty string. |
| **LATITUDE_DEGREE** | Float | The latitude of the physical location of the weather station, in degrees |
| **LONGITUDE_DEGREE** | Float | The longitude of the physical location of the weather station, in degrees. |
| **ELEVATION_FEET** | Int | The elevation compared to sea level of the base of the weather station. |
| **INSTALLATION_DATE** | Date | The installation date of the weather station. Data is available from the installation date through present. The installation date is returned in YYYY-mm-dd format. |
| **STATION_ID** | Int | The unique station identifier assigned by the AgWeatherNet program to the weather station. |
| **STATION_NAME** | Varchar(100) | The current common name of the weather station. This may change without notice and is intended as a friendly reference to the station. |

| | | |
|---|---|---|
| **STATION_SPONSOR** | Text | Acknowledgements of support or contributions to the location, installation or maintenance of a weather station. |
| **DATA** | Array | An array of 0 or more weather observation records, defined below |

## Data/Weather Observation Records

The DATA payload of the message resulting from a successful request is an array that can contain 0 (empty) or more weather observation records as defined below.

| Parameter | Data Type | Description |
|---|---|---|
| **TIMESTAMP_PST** | Timestamp | The UTC-8 (PST) time at the end of the weather observation. The weather observations are sums, averaged, or maximum values over the 15 minutes preceding the timestamp |
| **AT_F** | Decimal | If the weather station has an air temperature sensor installed that reports in Degrees Fahrenheit, then the value will be the air temperature observed at 1.5 meters above the ground in degrees Fahrenheit to 1 decimal of precision. If no sensor is installed, then the value will be NA. |
| **RH_PCNT** | Decimal | If the weather station has a relative humidity sensor installed that reports in Percent, then the value will be relative humidity observed at 1.5 meters above the ground to 1 decimal of precision. If no sensor is installed, then the value will be NA. |
| **P_INCHES** | Decimal | If the weather station has a precipitation sensor installed that reports in Inches, then the value will be the observed sum of precipitation for the 15 minute period in inches to 2 decimals of precision. If no sensor is installed, then the value will be NA. |
| **WS_MPH** | Decimal | If the weather station has a wind speed sensor installed that reports in Miles Per Hour, then the value will be the average observed wind speed at 1.5 meters above the ground for the 15 minute period in miles per hour to 1 digit of precision. If no sensor is installed, then the value will be NA. |
| **WS_MAX_MPH** | Decimal | If the weather station has a wind speed sensor installed that reports in Miles Per Hour, then the value will be the maximum observed wind speed at 1.5 meters above the ground for the 15 minute period in miles per hour to 1 digit of precision. If no sensor is installed, then the value will be NA. |
| **WD_DEGREE** | Decimal | If the weather station has a wind direction sensor installed that reports in Compass Degrees, then the value will be the wind direction observed at 1.5 meters above the ground in degrees with 0 digits of precision. If no sensor is installed, then the value will be NA. |
| **LW_UNITIY** | Decimal | If the weather station has a leaf wetness sensor installed that reports in Unity (values between 0 and 1, 0.4 considered wet), then the value will be the average leaf wetness observed at 1.5 meters for the 15 minute record to 2 digits of precision. If no sensor is installed, then the value will be NA. |

| | | |
|---|---|---|
| **SR_WM2** | Decimal | If the weather station has a solar radiation sensor installed that reports in Watts per Meter Squared, then the value will be the W/M^2 observed at 2 meters with 0 digits of precision. If no sensor is installed, then the value will be NA. |
| **ST2_F** | Decimal | If the weather station has a soil temperature sensor installed at a 2 inch depth that reports in Degrees Fahrenheit, then the value will be the average observed soil temperature at a depth of 2 inches below ground level in degrees Fahrenheit to 1 digit of precision. If no sensor is installed, then the value will be NA. |
| **ST8_F** | Decimal | If the weather station has a soil temperature sensor installed at a 8 inch depth that reports in Degrees Fahrenheit, then the value will be the average observed soil temperature at a depth of 8 inches below ground level in degrees Fahrenheit to 1 digit of precision. If no sensor is installed, then the value will be N. |
| **STM8_PCNT** | Decimal | If the weather station has a soil moisture sensor installed at a 8 inch depth that reports in Percent Volumetric Water Content, then the value will be the average observed soil moisture (volumetric water content) at a depth of 8 inches below ground level in reported as a percent to 0 digits of precision. If no sensor is installed, then the value will be NA. |
| **MSLP_HPA** | Decimal | If the weather station has a barometric pressure sensor installed that reports in hPa (hecto pascals), then the value will be the average observed mean sea level pressure (i.e. adjusted for elevation) reported in hPa to 0 digits of precision. If no sensor is installed, then the value will be N. |

## Example Request/Response

A request to the test environment to find the most recent weather observation data for weather stations in Benton County, Washington which have an air pressure sensor and a soil moisture probe at 8 inch depth:

http://weather.prosser.wsu.edu/webservice/stationdata/?&STATE=WA&COUNTY=Benton&MSLP=Y&SM8=Y

JSON encoded results similar to the following:


```
{"status":1,"message":[{"STATE":"WA","COUNTY":"Benton","CITY":"","ZIPCODE":""
,"LATITUDE_DEGREE":"46.27573","LONGITUDE_DEGREE":-
119.45448,"ELEVATION_FEET":"682","INSTALLATION_DATE":"1995-07-
14","STATION_ID":"100114","STATION_NAME":"Benton
City","STATION_SPONSOR":"","DATA":[{"TIMESTAMP_PST":"2015-10-15
15:00:00","AT_F":"71.4","RH_PCNT":"27.8","P_INCHES":"0.00","WS_MPH":"
5.4","WS_MAX_MPH":" 8.5","WD_DEGREE":" 340","LW_UNITY":"0.02","SR_WM2":"
257","ST2_F":"75.1","ST8_F":"63.9","SM8_PCNT":"
2","MSLP_HPA":"1020"}]},{"STATE":"WA","COUNTY":"Benton","CITY":"Wallula","ZIP
CODE":"99363","LATITUDE_DEGREE":"45.97662","LONGITUDE_DEGREE":-
119.03159,"ELEVATION_FEET":"552","INSTALLATION_DATE":"2015-01-
22","STATION_ID":"300215","STATION_NAME":"Wallula
West","STATION_SPONSOR":"This station was made possible through the generous
financial support provided by Quilceda Creek Vintners,
Inc.","DATA":[{"TIMESTAMP_PST":"2015-10-15
15:00:00","AT_F":"65.8","RH_PCNT":"43.0","P_INCHES":"0.00","WS_MPH":"10.6","W
S_MAX_MPH":"13.9","WD_DEGREE":"  62","LW_UNITY":"0.00","SR_WM2":"
285","ST2_F":"70.1","ST8_F":"66.9","SM8_PCNT":"
4","MSLP_HPA":"1020"}]},{"STATE":"WA","COUNTY":"Benton","CITY":"Benton
City","ZIPCODE":"99320","LATITUDE_DEGREE":"46.29916","LONGITUDE_DEGREE":-
119.44228,"ELEVATION_FEET":"1145","INSTALLATION_DATE":"2015-09-
30","STATION_ID":"300253","STATION_NAME":"Red Mountain
North","STATION_SPONSOR":"","DATA":[{"TIMESTAMP_PST":"2015-10-15
15:00:00","AT_F":"66.8","RH_PCNT":"31.6","P_INCHES":"0.00","WS_MPH":"10.1","W
S_MAX_MPH":"13.2","WD_DEGREE":"  10","LW_UNITY":"0.00","SR_WM2":"
241","ST2_F":"67.9","ST8_F":"62.0","SM8_PCNT":"   6","MSLP_HPA":"1021"}]}]}
```

### PHP Station Data Retrieval Example:

A simple example in PHP to retrieve and echo results from the metadata service:

```
<?php
	$json = file_get_contents(
		"http://weather.prosser.wsu.edu/webservice/stationdata/"
	);
	$jsonIterator = new RecursiveIteratorIterator(
		new RecursiveArrayIterator(json_decode($json, TRUE))
		, RecursiveIteratorIterator::SELF_FIRST
	);
	foreach ($jsonIterator as $key => $val) {
		if(is_array($val)) {
			echo "$key:\n";
		} else {
			echo "$key => $val\n";
		}
	}
?>
```