# Cli-DAP: Climate Data Access Portal
## Web Services for Retrieving Climate Data

Cli-DAP web services allows users to gain access to a sub-daily database created in a partnership between the Western and Midwestern Regional Climate Centers. The web services currently allows users to retrieve ASOS/AWOS and CRN station metadata as well as the raw data in its initial time step. Users can also obtain calculations derived from the raw data, such as means, maximums, and minimums at hourly, daily, monthly, or yearly time steps.

**Main URL and Request Builder:** https://cli-dap.mrcc.purdue.edu/

Click on the type of data you are interested in: county (station metadata for all stations in a county), state (station meatdata for all stations in a state), station (metadata for a particular station), and station data (retrieve the data for a single station). Click on the link on the right side of the box. This expands each box and allows the user to input data and see the request as well as the output of the data.

### 1. Metadata and Station Locator

These web service calls allow users to obtain metadata information about a specific station as well as locating stations in specific states or counties.

#### a. *Retrieve a station's metadata*

The metadata for a single station is returned when a Cli-DAP id is used as the *stationId*. Metadata includes the station's Cli-DAP id, the state, county, station name, latitude, longitude, elevation, climate division, and start and end date.

**https://cli-dap.mrcc.purdue.edu/station/*stationId***

**Example:**
https://cli-dap.mrcc.purdue.edu/station/kmdw

```
[{"weabaseid": "KMDW", "statecode": "IL", "county": "COOK", "stationname":
"CHICAGO MIDWAY AP", "stationlatitude": 41.7861, "stationlongitude": -
87.7522, "stationelevation": 612, "statename": "Illinois",
"climatedivisionnumber": "02", "fips": 17031, "porstartdate": "1948-01-01",
"porenddate": "9999-12-31"}]
```

#### b. *Retrieve the metadata for all the stations within a state*

The metadata for all the stations within a state are returned when a two letter US state abbreviation is used in place of the *ST* below.

**https://cli-dap.mrcc.purdue.edu/state/*ST***

Example:
https://cli-dap.mrcc.purdue.edu/state/MO

Provides a list of metadata for each station in that state.

[{"weabaseid": "KBBG", "statecode": "MO", "county": "Taney County", "stationname": "BRANSON AIRPORT", "stationlatitude": 36.5319, "stationlongitude": -93.2006, "stationelevation": 1302, "statename": "Missouri", "climatedivisionnumber": "04", "fips": 29213, "porstartdate": "2014-01-01", "porenddate": "9999-12-31"}, {"weabaseid": "KCDJ", "statecode": "MO", "county": "LIVINGSTON", "stationname": "CHILLICOTHE AGRI-SCI", "stationlatitude": 39.8233, "stationlongitude": -93.5792, "stationelevation": 769, "statename": "Missouri", "climatedivisionnumber": "01", "fips": 29117, "porstartdate": "1998-05-01", "porenddate": "9999-12-31"}, {"weabaseid": "KCGI", "statecode": "MO", "county": "SCOTT", "stationname": "CAPE GIRARDEAU MUNI AP", "stationlatitude": 37.2253, "stationlongitude": -89.5706, "stationelevation": 336, "statename": "Missouri", "climatedivisionnumber": "05", "fips": 29201, "porstartdate": "1972-12-01", "porenddate": "9999-12-31"}, …]

### c. Retrieve the metadata for all the stations in a county

The metadata for all the stations within a county are returned when a FIPS code is used in place of *FIPS* below. FIPS codes for specific counties can be found here:
https://www.census.gov/library/reference/code-lists/ansi.html

**https://cli-dap.mrcc.purdue.edu.edu/county/*FIPS***

Example:
https://cli-dap.mrcc.purdue.edu/county/21059

[{"weabaseid": "KOWB", "statecode": "KY", "county": "DAVIESS", "stationname": "OWENSBORO DAVIESS CO RGNL AP", "stationlatitude": 37.75, "stationlongitude": -87.1667, "stationelevation": 403, "statename": "Kentucky", "climatedivisionnumber": "1", "fips": 21059, "porstartdate": "2005-11-01", "porenddate": "9999-12-31"}]

## 2. Station Data

### a. Retrieve data for a station

The data for a station between a start date and an end date for specified variables can be returned by replacing *stationId* with a Cli-DAP id, and adding any number of variables to the request. To see variable codes

**https://cli-dap.mrcc.purdue.edu/station/*stationId*/data/
?start=*YYYYMMDD*&end=*YYYYMMDD*&elem=*EL1*&elem=*EL2***

Example:

Listed by year-month-day-hour-
minute (YYYYMMDDHHMM)

Requested Variable Data. Also
returns year, day and time.

{"201701010000": {"AVR": 74, "DAY": 1, "YRR": 2017.0, "AVA": -1, "TIM": 0},
"201701010100": {"AVR": 75, "DAY": 1, "YRR": 2017.0, "AVA": -1, "TIM": 100},
"201701010200": {"AVR": 82, "DAY": 1, "YRR": 2017.0, "AVA": -2, "TIM": 200},
"201701010300": {"AVR": 81, "DAY": 1, "YRR": 2017.0, "AVA": -3, "TIM": 300},
"201701010400": {"AVR": 85, "DAY": 1, "YRR": 2017.0, "AVA": -4, "TIM": 400},
"201701010500": {"AVR": 85, "DAY": 1, "YRR": 2017.0, "AVA": -4, "TIM": 500},
"201701010600": {"AVR": 85, "DAY": 1, "YRR": 2017.0, "AVA": -4, "TIM": 600},
"201701010700": {"AVR": 81, "DAY": 1, "YRR": 2017.0, "AVA": -4, "TIM": 700},
"201701010800": {"AVR": 85, "DAY": 1, "YRR": 2017.0, "AVA": -4, "TIM": 800},
"201701010900": {"AVR": 81, "DAY": 1, "YRR": 2017.0, "AVA": -3, "TIM": 900},
"201701011000": {"AVR": 82, "DAY": 1, "YRR": 2017.0, "AVA": -1, "TIM": 1000},
"201701011100": {"AVR": 73, "DAY": 1, "YRR": 2017.0, "AVA": 2, "TIM": 1100},
"201701011200": {"AVR": 67, "DAY": 1, "YRR": 2017.0, "AVA": 4, "TIM": 1200},
"201701011300": {"AVR": 68, "DAY": 1, "YRR": 2017.0, "AVA": 6, "TIM": 1300},
"201701011400": {"AVR": 63, "DAY": 1, "YRR": 2017.0, "AVA": 7, "TIM": 1400},
"201701011500": {"AVR": 60, "DAY": 1, "YRR": 2017.0, "AVA": 7, "TIM": 1500},
"201701011600": {"AVR": 63, "DAY": 1, "YRR": 2017.0, "AVA": 7, "TIM": 1600},
"201701011700": {"AVR": 65, "DAY": 1, "YRR": 2017.0, "AVA": 6, "TIM": 1700},
"201701011800": {"AVR": 73, "DAY": 1, "YRR": 2017.0, "AVA": 4, "TIM": 1800},
"201701011900": {"AVR": 73, "DAY": 1, "YRR": 2017.0, "AVA": 4, "TIM": 1900},
"201701012000": {"AVR": 85, "DAY": 1, "YRR": 2017.0, "AVA": 2, "TIM": 2000},
"201701012100": {"AVR": 89, "DAY": 1, "YRR": 2017.0, "AVA": 2, "TIM": 2100},
"201701012200": {"AVR": 86, "DAY": 1, "YRR": 2017.0, "AVA": 3, "TIM": 2200},
"201701012300": {"AVR": 82, "DAY": 1, "YRR": 2017.0, "AVA": 4, "TIM": 2300},
"201701020000": {"AVR": 79, "DAY": 2, "YRR": 2017.0, "AVA": 4, "TIM": 0},
"201701020100": {"AVR": 79, "DAY": 2, "YRR": 2017.0, "AVA": 5, "TIM": 100},
"201701020200": {"AVR": 82, "DAY": 2, "YRR": 2017.0, "AVA": 5, "TIM": 200},
"201701020300": {"AVR": 86, "DAY": 2, "YRR": 2017.0, "AVA": 5, "TIM": 300},
"201701020400": {"AVR": 89, "DAY": 2, "YRR": 2017.0, "AVA": 4, "TIM": 400},
"201701020500": {"AVR": 89, "DAY": 2, "YRR": 2017.0, "AVA": 3, "TIM": 500},
"201701020600": {"AVR": 93, "DAY": 2, "YRR": 2017.0, "AVA": 4, "TIM": 600},
"201701020700": {"AVR": 96, "DAY": 2, "YRR": 2017.0, "AVA": 5, "TIM": 700},
"201701020800": {"AVR": 96, "DAY": 2, "YRR": 2017.0, "AVA": 5, "TIM": 800},
"201701020900": {"AVR": 96, "DAY": 2, "YRR": 2017.0, "AVA": 6, "TIM": 900},
"201701021000": {"AVR": 93, "DAY": 2, "YRR": 2017.0, "AVA": 6, "TIM": 1000},
"201701021100": {"AVR": 93, "DAY": 2, "YRR": 2017.0, "AVA": 7, "TIM": 1100},
"201701021200": {"AVR": 93, "DAY": 2, "YRR": 2017.0, "AVA": 7, "TIM": 1200},
"201701021300": {"AVR": 89, "DAY": 2, "YRR": 2017.0, "AVA": 9, "TIM": 1300},
"201701021400": {"AVR": 83, "DAY": 2, "YRR": 2017.0, "AVA": 11, "TIM": 1400},
"201701021500": {"AVR": 83, "DAY": 2, "YRR": 2017.0, "AVA": 11, "TIM": 1500},
"201701021600": {"AVR": 83, "DAY": 2, "YRR": 2017.0, "AVA": 11, "TIM": 1600},
"201701021700": {"AVR": 83, "DAY": 2, "YRR": 2017.0, "AVA": 11, "TIM": 1700},
"201701021800": {"AVR": 83, "DAY": 2, "YRR": 2017.0, "AVA": 11, "TIM": 1800},

```
"201701021900": {"AVR": 96, "DAY": 2, "YRR": 2017.0, "AVA": 10, "TIM": 1900},
"201701022000": {"AVR": 96, "DAY": 2, "YRR": 2017.0, "AVA": 11, "TIM": 2000},
"201701022100": {"AVR": 96, "DAY": 2, "YRR": 2017.0, "AVA": 11, "TIM": 2100},
"201701022200": {"AVR": 100, "DAY": 2, "YRR": 2017.0, "AVA": 11, "TIM":
2200}, "201701022300": {"AVR": 100, "DAY": 2, "YRR": 2017.0, "AVA": 11,
"TIM": 2300}}
```

### b. Retrieve statistics for a station

The data for a station between a start and end date for specified variables can be selected and statistics can be provided for reduced time periods such as daily, monthly or yearly.  Hourly time step statistics are also available for sub-hourly sites.
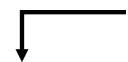
**https://cli-dap.mrcc.purdue.edu/station/*stationId*/data/**
**?start=*YYYYMMDD*&end=*YYYYMMDD*&elem=*EL1*&interval=*timestep*&reduction=*statistic***

*timestep:* hly, dly, mly, yly

*statistic:* see Table 3 below

Example:
https://cli-dap.mrcc.purdue.edu/station/kjot/data/?
start=20170101&end=20170110&elem=AVA&interval=dly&reduction=avg

A mean, maximum or minimum is returned for the interval selected.  The date returned is matched to the interval.

```
{"20170101": {"AVA": -1.7}, "20170102": {"AVA": 2.8}, "20170103": {"AVA":
2.9}, "20170104": {"AVA": -9.2}, "20170105": {"AVA": -11.5}, "20170106":
{"AVA": -14.8}, "20170107": {"AVA": -11.8}, "20170108": {"AVA": -11.0},
"20170109": {"AVA": -2.4}, "20170110": {"AVA": 4.3}}
```

**Table 1: Web Service ASOS/AWOS Variable Abbreviations**

| Variable | Web Service Abbreviation | Units |
|---|---|---|
| YEAR (rounded) | YRR | |
| Day of Year (rounded) | DAY | |
| Time of Day (rounded) | TIM | HHMM |
| Observation Year | YR2 | |
| Observation Day of Year | DA2 | |
| Observation Time | TI2 | HHMM |
| Mean Wind Speed | MWS | mph |
| Mean Wind Direction | MWD | Degree |
| Average Air Temperature | AVA | °F |
| Average Relative Humidity | AVR | % |
| Precipitation | PRE | in |
| Visibility | VIS | mi |
| Dew Point Temp | DEW | °F |
| Maximum Wind Gust | MXW | mph |
| CLOUD LAYER 1  ft./100 | CL1 | ft/100 |
| CLOUD LAYER 2  ft./100 | CL2 | ft/100 |
| CLOUD LAYER 3  ft./100 | CL3 | ft/100 |
| Barometric Pressure | ATM | mb/hPa |
| Sea Level Pressure | SLL | mb/hPa |
| Altimeter reading | ALT | mb/hPa |
| Precipitation Assignment | PAS | 0=no precip, 1=trace precip, 2=measureable precip |

## Table 2: Web Service CRN Variable Abbreviations

| Variable | Web Service Abbreviation | Units |
|---|---|---|
| YEAR (rounded) | YRR | |
| Day of Year (rounded) | DAY | |
| Time of Day (rounded) | TIM | HHMM |
| 5-min Air Temperature | CTA | °F |
| 5-min Precipitation | PRE | in |
| 5-min Solar Radiation | RAD | kW/m2 |
| 5-min Surface Temperature | IRT | °F |
| 5-min Relative Humidity | CTR | % |
| 5-min 5cm Soil Moisture | CM2 | VWC |
| 5-min 5cm Soil Temperature | CT2 | °F |
| 5-min Wetness | W01 | % |
| 5-min Wind Speed – 1.5m | W15 | mph |
| Hourly Air Temperature | AVA | °F |
| Hourly Max Air Temperature | MXA | °F |
| Hourly Min Air Temp | MNA | °F |
| Hourly Precipitation | PHR | in |
| Hourly Solar Radiation | RST | kW/m2 |
| Hourly Max Solar Radiation | RDX | kW/m2 |
| Hourly Min Solar Radiation | RDN | kW/m2 |
| Hourly Surface Temperature | IRC | °F |
| Hourly Max Surface Temperature | IRX | °F |
| Hourly Min Surface Temperature | IRN | °F |
| Hourly Ave Relative Humidity | AVR | % |
| Hourly 5cm Soil Moisture | M02 | VWC |
| Hourly 10cm Soil Moisture | M04 | VWC |
| Hourly 20cm Soil Moisture | M08 | VWC |
| Hourly 50cm Soil Moisture | M20 | VWC |
| Hourly 100cm Soil Moisture | M40 | VWC |
| Hourly 5cm Soil Temperature | K02 | °F |
| Hourly 10cm Soil Temperature | K04 | °F |
| Hourly 20cm Soil Temperature | K08 | °F |
| Hourly 50cm Soil Temperature | K20 | °F |
| Hourly 100cm Soil Temperature | K40 | °F |

**Table 3: Statistical Reductions Available**

| Statistical Calculation | Code to Use |
|---|---|
| Mean, Average | mean, avg |
| Maximum | max |
| Minimum | min |
| Sum | sum, total |
| Standard Deviation | sd, stdev |
| Median | med, median |