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.illinois.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.illinois.edu/station/*stationId*

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

Example:

https://cli-dap.mrcc.illinois.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/geo/reference/codes/cou.html

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

Example:

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

Example:

https://cli-dap.mrcc.illinois.edu/station/kind/data/?start=20170101&end=20170102&elem=AVA&elem=AVR

==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.illinois.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.illinois.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