

Programmatic Access to Hourly and Daily AZMet Data with a Web API

February 6, 2024

AZMet collects, processes, and stores hourly and daily data from its network of 28 automated stations. Although access to these data is still possible through the [legacy website](#), a new application programming interface (API) is now available to access data from January 1, 2021 to the present. For R users, the [R package “azmetr”](#) provides simplified programmatic access to the AZMet API. For non-R users, the following information shows how to build a URL with the endpoint and corresponding parameters for AZMet API use in other programming environments.

Hourly Data

Hourly AZMet data for the most recent past hour are available through the API at approximately 8 minutes after the current hour. In the event of a network or hardware failure, there are subsequent tries every 30 minutes thereafter. Data not collected due to a failure will be available through the API on the next successful run of the collection process.

Access

The endpoint to retrieve hourly AZMet data is:

```
api.azmet.arizona.edu/v1/observations/hourly/{stationID}/{startDate}/{timeInterval}
```

where parameters enclosed in `{ }` are the following variables:

{stationID}: a valid AZMet station ID

{startDate}: the first datetime, inclusive, of data to return

{timeInterval}: the time duration of data to return

***{stationID}* parameter** A list of valid entries for the *{stationID}* parameter is in Table 1 of the Appendix. Use of “*” for this parameter will return data for all AZMet stations. Depending on the date, returned data when using “*” may include the “Test” station, station ID “az99”, which is adjacent to the “Tucson” station, station ID “az01”, and used to test equipment and sensors before field installation.

***{startDate}* parameter** Entries for the *{startDate}* parameter are a valid ISO 8601 datetime without a time zone offset, of the form:

```
YYYY-MM-DDTHH:MM
```

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where YYYY is a four-digit year, MM is a two-digit calendar month, DD is a two-digit day of the specified month, T is the start of the time designation, HH is a two-digit hour between 00 and 23, and MM is a two-digit minute between 00 and 59

Use of “*” for the *{startDate}* parameter will result in a default date for hourly data, which for the AZMet API is set to yesterday, the most recent date with 24 hourly observations. Please see en.wikipedia.org/wiki/ISO_8601 for more information regarding this date-time data standard.

{timeInterval} parameter Entries for the *{timeInterval}* parameter are a valid ISO 8601 duration, of the form:

PT[h]H

where P, for period, is a duration designator, T is a time designator preceding values for, in the case of the AZMet API, only an hourly time component, [h] is a non-negative integer value of the number of hours, and H is the hour designator that follows the value for the number of hours

Use of “*” for this parameter defaults to 24 hours of hourly data.

Although ISO 8601 durations have a period designator, P, at the start of the duration representation and that can precede values for year, month, week, and day, the AZMet API conveniently requires a date specification in only the *{startDate}* parameter. Please see en.wikipedia.org/wiki/ISO_8601#Durations for more information regarding the format of this parameter.

Example

Using January 1, 2021 as an example date and “Tucson” as an example AZMet station, access to hourly data on this day is through a URL like this:

<https://api.azmet.arizona.edu/v1/observations/hourly/az01/2021-01-01T00:00/PT24H>

The *{stationID}* parameter is “az01” (Appendix Table 1). The *{startDate}* parameter is “2021-01-01T00:00”, with YYYY-MM-DD set to “2021-01-01” and HH:MM set to “00:00”. The *{timeInterval}* parameter is “PT24H”, with the number of hours, [h], set to “24”.

As the *{timeInterval}* parameter represents a duration, this example data request returns any hourly data that is recorded at an individual AZMet station starting with a timestamp at “00:00”

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and ending 24 hours later. Since the timestamp for hourly data summaries occurs at the top of every hour, or “HH:00”, except for midnight, Arizona time, which has a timestamp of “23:59:59”, data returned in this example would start with those from the 0100 hour and end with those from the 2400 hour. There is no 0000-hour representation of midnight in the new AZMet database and API. Each hourly summary of measured and derived variables represents conditions over the previous 60 minutes.

Daily Data

Daily AZMet data for the most recent past date are available through the API at approximately 8 minutes after midnight, Arizona time. In the event of a network or hardware failure, there are subsequent tries every 30 minutes thereafter. Data not collected due to a failure will be available through the API on the next successful run of the collection process.

Access

The endpoint to retrieve daily AZMet data is:

```
api.azmet.arizona.edu/v1/observations/daily/{stationID}/{startDate}/{timeInterval}
```

where parameters enclosed in *{}* are the following variables:

{stationID}: a valid AZMet station ID

{startDate}: the first datetime, inclusive, of data to return

{timeInterval}: the time duration of data to return

{stationID} parameter A list of valid entries for the *{stationID}* parameter is in Table 1 of the Appendix. Use of “*” for this parameter will return data for all AZMet stations. Depending on the date, returned data when using “*” may include the “Test” station, station ID “az99”, which is adjacent to the “Tucson” station, station ID “az01”, and used to test equipment and sensors before field installation.

{startDate} parameter Entries for the *{startDate}* parameter are a valid ISO 8601 datetime without a time zone offset, of the form:

```
YYYY-MM-DDTHH:MM
```

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where YYYY is a four-digit year, MM is a two-digit calendar month, DD is a two-digit day of the specified month, T is the start of the time designation, HH is a two-digit hour between 00 and 23, and MM is a two-digit minute between 00 and 59

Use of “*” for the *{startDate}* parameter will result in a default date for daily data, which for the AZMet API is set to yesterday, the most recent date with 24 hourly observations. Please see en.wikipedia.org/wiki/ISO_8601 for more information regarding this date-time data standard.

{timeInterval} parameter Entries for the *{timeInterval}* parameter are a valid ISO 8601 duration, of the form:

P[d]T[h]H

where P, for period, is a duration designator, [d] is a non-negative integer value of the number of days, T is a time designator preceding values for, in the case of the AZMet API, only an hourly time component, [h] is a non-negative integer value of the number of hours, and H is the hour designator that follows the value for the number of hours

Use of “*” for this parameter defaults to one day of daily data.

Although ISO 8601 durations have a period designator, P, at the start of the duration representation and that can precede values for year, month, week, and day, the AZMet API conveniently requires a date specification in only the *{startDate}* parameter. Please see en.wikipedia.org/wiki/ISO_8601#Durations for more information regarding the format of this parameter.

Example

Using January 1, 2021 as an example date and “Tucson” as an example AZMet station, access to daily data on this day is through a URL like this:

<https://api.azmet.arizona.edu/v1/observations/daily/az01/2021-01-01T00:00/P0DT0H>

The *{stationID}* parameter is “az01” (Appendix Table 1). The *{startDate}* parameter is “2021-01-01T00:00”, with YYYY-MM-DD set to “2021-01-01” and HH:MM set to “00:00”. The *{timeInterval}* parameter is “P0DT0H”, with the number of days, [d], set to “0” and the number of hours, [h], set to “0”.

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As the *{timeInterval}* parameter represents a duration, this example data request returns any daily data that is recorded at an individual AZMet station starting with a date of “2021-01-01” and ending zero days later, or in other words, that same date. If, for instance, data for the entire month, or 31 days, of January 2021 instead were of interest, one would set [d] to 30.

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Appendix

Table 1. There currently are 30 AZMet stations in operation and with data available through the API, not including a test station adjacent to the “Tucson” station.

| Name | Symbol | ID |
|------------------|--------|------|
| Tucson | TUC | az01 |
| Yuma Valley | YUV | az02 |
| Safford | SAF | az04 |
| Coolidge | COO | az05 |
| Maricopa | MAC | az06 |
| Aguila | AGU | az07 |
| Parker | PAR | az08 |
| Bonita | BON | az09 |
| Phoenix Greenway | PGR | az12 |
| Yuma North Gila | YUG | az14 |
| Phoenix Encanto | PEN | az15 |
| Paloma | GIB | az19 |
| Mohave | MOH | az20 |
| Queen Creek | QCR | az22 |
| Harquahala | HAR | az23 |
| Roll | ROL | az24 |
| Buckeye | BUC | az26 |
| Desert Ridge | DES | az27 |
| Mohave-2 | MO2 | az28 |
| Payson | PAY | az32 |
| Bowie | BOW | az33 |
| Parker-2 | PA2 | az35 |
| Yuma South | YUS | az36 |
| San Simon | SAN | az37 |
| Sahuarita | SAH | az38 |
| Willcox Bench | WIB | az39 |
| Ft Mohave CA | MOC | az40 |
| Salome | SAL | az41 |
| Wellton ETo | WEL | az42 |
| Yuma Valley ETo | YUE | az43 |
| Test | ZZZ | az99 |

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