

FEMS Climatology API External User Guide

Introduction

The climatology API utilizes GraphQL to send and receive weather, fire danger, and station information to the FEMS application. External users can use these same endpoints for their own needs, however they are limited to read-only API calls.

Getting Started

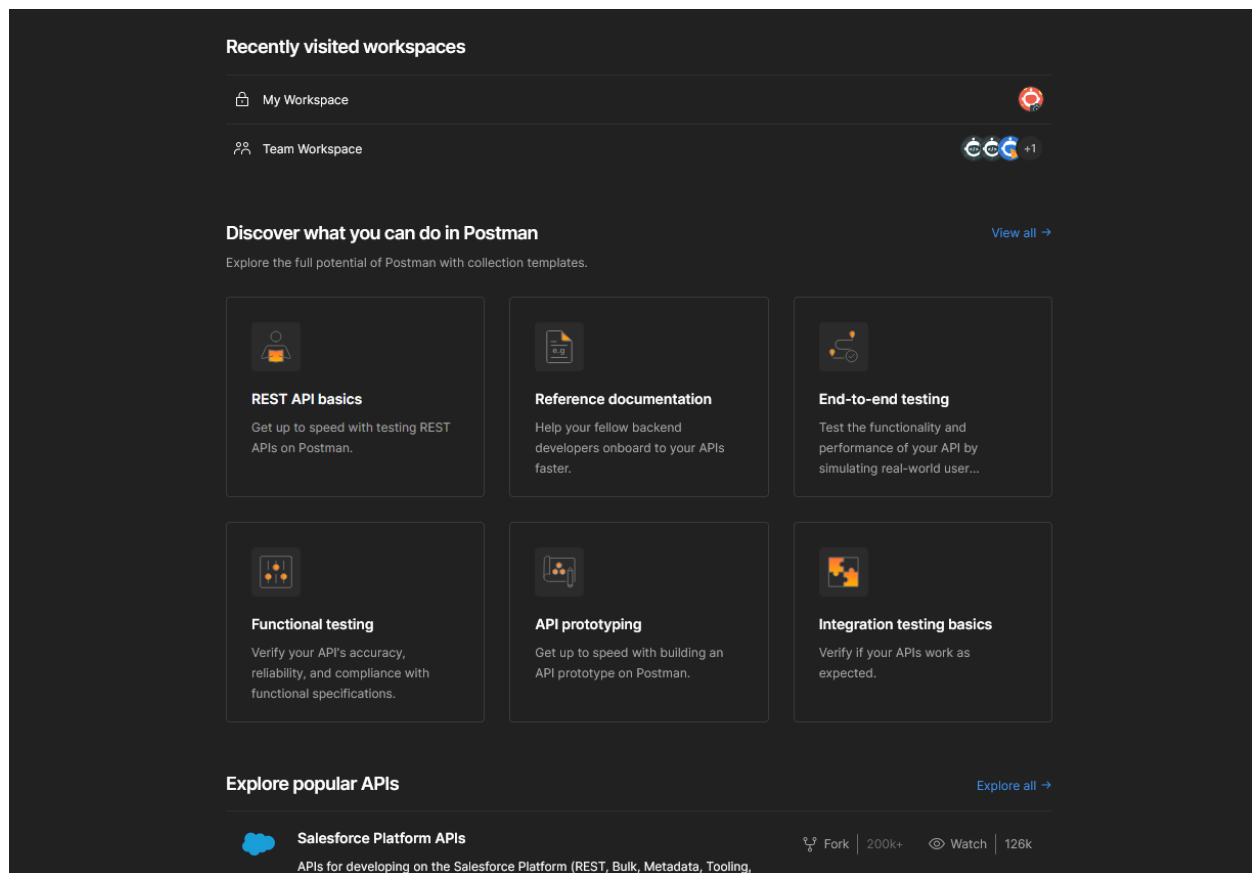
Postman Setup

We recommend setting up Postman so that users can test the API calls to ensure they meet their needs, before committing time to writing any code. Users can sign up for a free postman account on their website: <http://postman.com/>

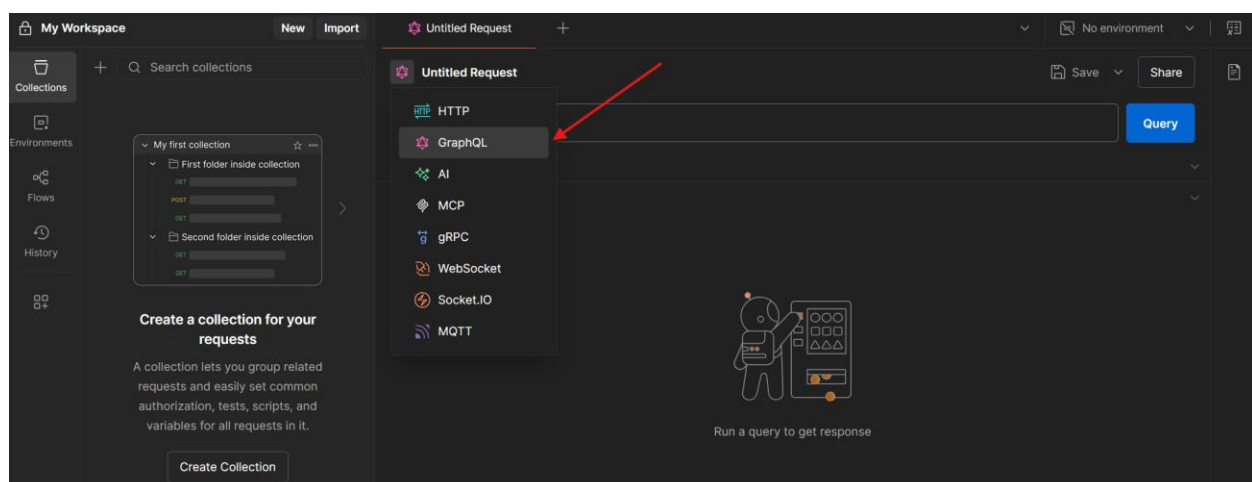
Postman can be installed as a desktop application or used from a web browser.

Creating an API Call in Postman

1. When starting Postman for the first time users may be greeted by the workspace screen. Begin by selecting *My Workspace* or by creating a new one.

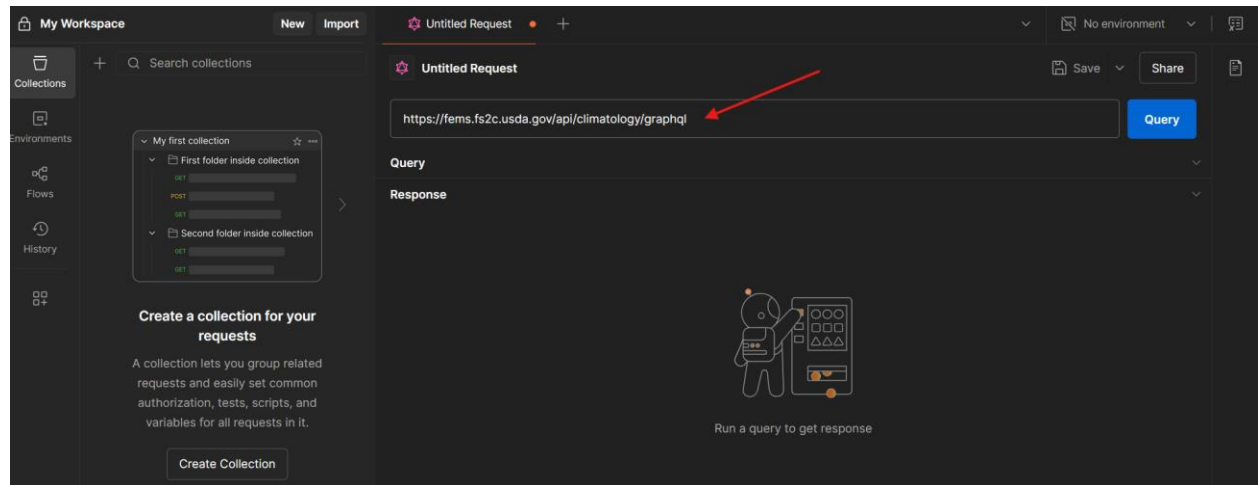


2. Start a new Api call by pressing the plus sign in the upper left corner. Requests can be saved to the workspace, so they are easier to come back to later.
3. Change the request type from *HTTP* to *GraphQL* as seen below by clicking on the little icon next to the name of the request – which is *Untitled Request* by default.

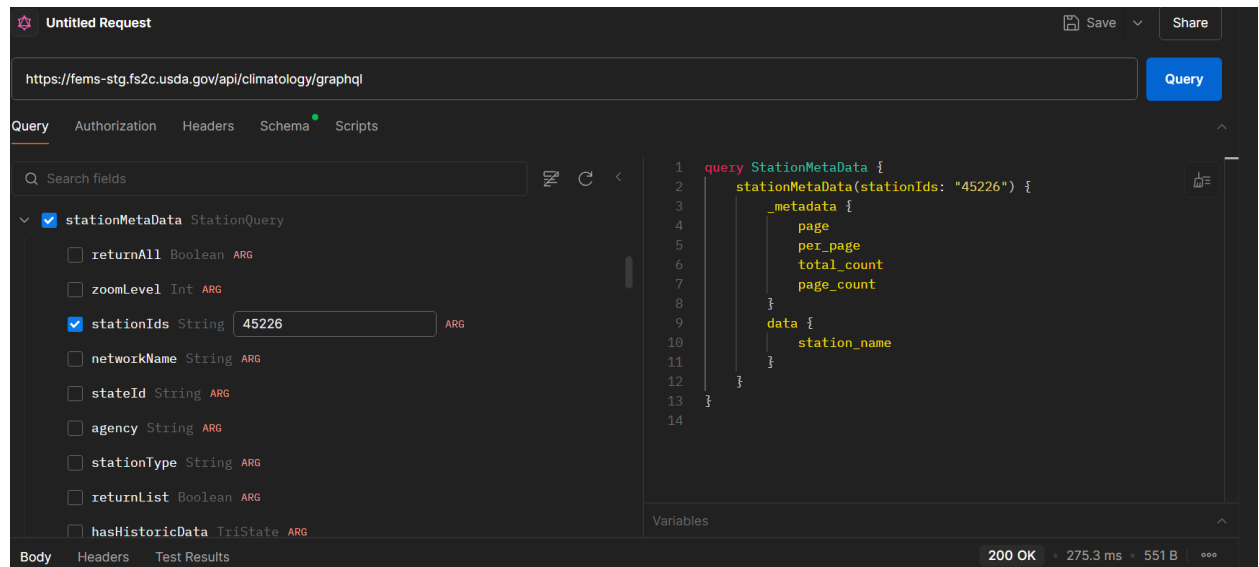


4. Enter the API URL into the address bar:

<https://fems.fs2c.usda.gov/api/climatology/graphql>

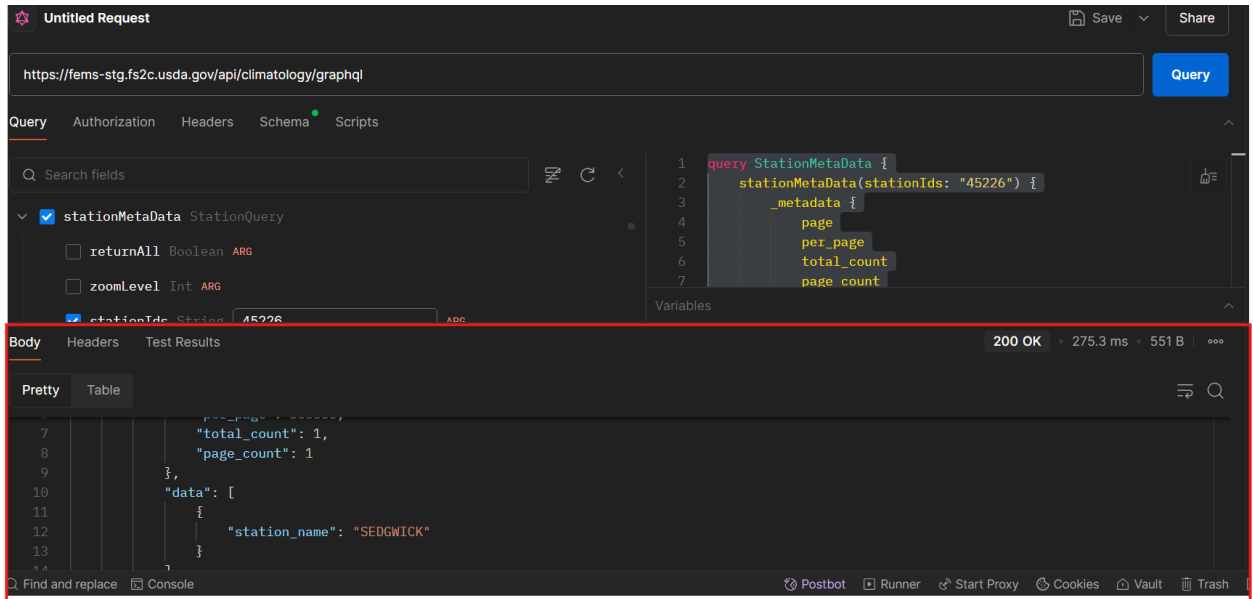


5. This is where having postman installed as a desktop app has the advantage. The desktop application will show every API call available, along with available parameters, and return data that users can request making it very beginner friendly.



If that is not an option, users can copy example queries from this guide and paste them into the right hand textbox as seen above.

6. Once the query has been constructed in the text box, click the *Query* button in the upper right corner and the response body will become populated with a JSON object in the bottom window.



Available Api Queries

StationMetadata Query

Request Payload

Request Payload

```
stationMetadata(  
  returnAll: Boolean  
  zoomLevel: Int  
  stationIds: String  
  networkName: String  
  stateId: String  
  agency: String  
  stationType: String  
  returnList: Boolean  
  hasHistoricData: TriState  
  sortBy: StationMetadataSortBy  
  sortOrder: sortOrder  
  page: Int  
  per_page: Int  
  zoomLevel: Int  
)
```

Request parameter data definition

Attribute Name	Description	Data Type	Expected Values	Mandatory	Default

returnAll	Overrules other parameters and returns all stations	Boolean	True or False	No	False
stationIds	A list of station Ids to query for.	Comma separated integers	None for all or a list of station Ids e.g. "1,2,3,4,..."	No	all stationIds will be returned
networkName	Filter results based on the network the station is from. Leave blank for all.	String	"RAWS", "ASOS", more to be added...	No	All
stateId	Filter results based on state.	String	"CA", "PA", etc...	No	All
agency	Filter results based on agency	String	"USFS", "S&PF", etc...	No	All
stationType	Deprecated				
returnList	Deprecated				
hasHistoricData					
zoomLevel	Filter results based on zoom level – Used in rendering FEMS map	Integer	0 to 5	No	5

sortBy	Sorts the results based on the value passed in.	Enum: StationMetadataSortBy	station_name, network_name, agency, state	No	station_name
sortOrder	Sorts the results in ascending or descending order based on sortBy.	Enum: SortOrder	Asc, Desc	No	Asc
page	Filter results based on page for pagination	Integer		No	0
per_page	Filter results based on number of results per page	Integer		No	20

Sample Request Payload

Sample Request Payload

```

query StationMetaData {
  stationMetaData(stationIds: "44731") {
    _metadata {
      page
      per_page
      total_count
      page_count
    }
    data {
      fems_station_id
      station_id
      wims_id
      nesdis_id
      wrcc_id
      station_name
      state
      county_name
      latitude
      longitude
      elevation
    }
  }
}

```

```

        slope
        aspect
        aspect_direction
        aspect_degree
        kbdi_threshold
        init_kbdi
        avg_annual_precip
        annual_maintenance_date_time
        period_record_start
        period_record_stop
        station_status
        class
        network_id
        network_name
        agency
        region
        unit
        sub_unit
        ownership_type
        goes
        tx_frequency
        obs_frequency
        site_description
        maintenance_standard
        reg_scheduled_observation_time
        time_zone
        time_zone_offset
        zoom_level
        transmit_time
        modified_time
        modified_by
        created_time
        created_by
        first_observation
        last_observation
        site
        observing_agency
        gsi_parameter_catalog_id
        station_type
        nfdr_visibility
    }
}
}

```

Response Payload

Example Response

```

{
  "data": {
    "stationMetaData": {
      "_metadata": {
        "page": 0,
        "per_page": 300000,
        "total_count": 1,

```

```

    "page_count": 1
  },
  "data": [
    {
      "fems_station_id": 55521297,
      "station_id": 44731,
      "wims_id": "44731",
      "nesdis_id": "CA229522",
      "wrcc_id": "CFOU",
      "station_name": "FOUNTAIN SPRINGS",
      "state": "CA",
      "county_name": "Tulare",
      "latitude": 35.89116,
      "longitude": -118.91559,
      "elevation": 794,
      "slope": 1,
      "aspect": "2",
      "aspect_direction": "E",
      "aspect_degree": "101",
      "kbdi_threshold": 800,
      "init_kbdi": 100,
      "avg_annual_precip": 9.91,
      "annual_maintenance_date_time": "2024-03-
25T00:00:00.000Z",
      "period_record_start": "2005-01-01T00:00:00.000Z",
      "period_record_stop": "2022-12-31T00:00:00.000Z",
      "station_status": "A",
      "class": "Permanent",
      "network_id": 2,
      "network_name": "RAWS",
      "agency": "S&PF",
      "region": "CALIFORNIA",
      "unit": "CDF",
      "sub_unit": "TULARE UNIT",
      "ownership_type": "FIRE",
      "goes": "West",
      "tx_frequency": 60,
      "obs_frequency": 60,
      "site_description": null,
      "maintenance_standard": "Yes",
      "reg_scheduled_observation_time": 0,
      "time_zone": "PST",
      "time_zone_offset": -8,
      "zoom_level": null,
      "transmit_time": "00:00:50",
      "modified_time": "2025-03-13T22:40:42.600Z",
      "modified_by": "WXx Service",
      "created_time": null,
      "created_by": "EA",
      "first_observation": "2005-01-01",
      "last_observation": "2025-07-24",
      "site": null,
      "observing_agency": null,
      "gsi_parameter_catalog_id": null,
      "station_type": 4,
      "nfd_r_visibility": "True"
    }
  ]
}

```



```

    }
  }
}

```

Response Data Definition

Attribute	Description	Data Type	Sample Value	Nullable
fems_station_id	FEMS internal id for stations	Integer	50661	FALSE
station_id	Station Id used for querying/lookup	Integer	44731	TRUE
wims_id	Legacy ID used by WIMS	String	44731	TRUE
nesdis_id	Nesdis Id	String	CA229522	TRUE
wrcc_id	WRCC Id	String	CFOU	TRUE
station_name	Station Name	String	FOUNTAIN SPRINGS	TRUE
state	State Id/State 2 letter abbreviation	String	CA	TRUE
county_name	County The Station Resides In	String	Tulare	TRUE
latitude	Station Latitude	Float	35.89115906	TRUE
longitude	Station Longitude	Float	-118.9155884	TRUE
time_zone	Time Zone	String	PST	TRUE
time_zone_offset	Hour Offset that the local station time has from UTC	Integer	-8	TRUE
zoom_level	Zoom Level	Integer	null	TRUE
elevation	Station Elevation	Integer	794	TRUE

slope	Slope	Integer	null	TRUE
aspect	aspect 0 is flat. 1-8 corresponds to a cardinal direction	String	0	TRUE
aspect_direction	aspect cardinal direction	String	Flat	
aspect_degree	aspect direction in degrees	String	null	
transmit_time	transmit_time	Interval	"00:00:50"	TRUE
tx_frequency	tx_frequency	Integer	60	TRUE
obs_frequency	obs_frequency	Integer	60	TRUE
agency	agency	String	S&PF	TRUE
region	region	String	CALIFORNIA	TRUE
unit	unit	String	CDF	TRUE
sub_unit	sub_unit	String	TULARE UNIT	TRUE
ownership_type	ownership_type	String	FIRE	TRUE
annual_maintenance_date_time	annual_maintenance_date_time	DateTime	null	TRUE
period_record_start_date_time	period_record_start_date_time	DateTime	"2005-01-01T07:00:00.000Z"	TRUE
period_record_stop_date_time	period_record_stop_date_time	DateTime	"2022-12-31T07:00:00.000Z"	TRUE
site_description	description	String	null	TRUE
last_observation	latest observation received from that station	DateTime	"2025-02-05"	TRUE

first_observation	first observation received from that station	DateTime	"2005-01-01"	TRUE
maintenance_standard	maintenance_standard	String	Yes	TRUE
station_status	status	String	A	TRUE
class	class	String	Permanent	TRUE
network_id	network_id	Integer	2	TRUE
network_name	network_name	String	RAWS	TRUE
goes	goes	String	WEST	TRUE
annual_precipitation_total	annual_precipitation_total	Integer	10	TRUE
reg_scheduled_observation_time	reg_scheduled_observation_time	Integer	0	TRUE
modified_time	modified_time	DateTime	"2025-01-17T19:41:29.307Z"	TRUE
modified_by	modified_by	String	WXx Service	TRUE
created_time	created_time	DateTime	null	TRUE
created_by	created_by	String	EA	TRUE
fuel_models	An array of associated fuel models	[Fuel_Model]	See Fuel_Model	TRUE

HTTP Return Statuses

200	Ok
4XX	Default Response: Not Handled
5XX	Default Response: Not Handled

WeatherObs Query

Request Payload

Request Payload

```
weatherObs(  
  attribute: String  
  startDateTimeRange: DateTime!  
  endDateTimeRange: DateTime!  
  stationIds: String  
  stationType: String  
  timeZone: String  
  zoomLevel: Int  
  page: Int  
  per_page: Int  
)
```

Request parameter data definition

Attribute Name	Description	Data Type	Expected Values	Mandatory	Default
attribute	What is the type of weather observation that is expected in the results	String	"temperature", "relative_humidity", "hourly_precip", "peak_gust_speed", "wind_speed", "sol_rad", "snow_flag"	No	temperature
startDateTimeRange	Start time for observation range	Date Time w/ Timezone Offset	TimestampTz (yyyy-mm-ddThh:mm:ssZ) or (yyyy-mm-ddThh:mm:ss+00)	Yes	
endDateTimeRange	End time for observation range	Date Time w/ Timezone Offset	TimestampTz (yyyy-mm-ddThh:mm:ssZ) or (yyyy-mm-ddThh:mm:ss+00)	Yes	

stationIds	A list of station Ids to query for	Com ma separ ated integ ers	None for all or a list of station Ids e.g. "1,2,3,4,..."	No	all station Ids will be return ed
stationType	station type to filter results. Our dataset currently only has RAWs (SAT NFDRS) in our system To be deprecated	Com ma separa ted String	"Manual (non-NFDRS)", "Manual NFDRS" , "RAWS (SAT non- NFDRS)", "RAWS (SAT NFDRS)", "RAWS (non-SAT non- NFDRS)", "RAWS (non-SAT NFDRS)", "Historic Non-Active",	No	All station types will be return ed
timeZone	Formats response observation_time to the desired timezone from the TZ Identifier column in the chart found here: https://en.wikipedia.org/wiki/List_of_tz_database_time_zones	String	Example: "America/New_York"	No	UTC
zoomLevel	Filter results based on the station's designated zoom level	Intege r	1-5	No	
page	Filter results based on page for pagination	Intege r		No	0
per_page	Filter results based on number of results per page	Intege r		No	20

Sample Request Payload

Sample Request Payload

```
query WeatherObs {
  weatherObs (
    startDateTimeRange: "2024-10-08T00:30:00Z"
    endDateTimeRange: "2024-10-08T01:29:59Z"
```

```

        attribute: "temperature"
        stationIds: "10402,10702"
        timeZone: "America/New_York"
        zoomLevel: 5
    ) {
        _metadata {
            page
            per_page
            total_count
            page_count
        }
        data {
            station_id
            wrcc_id
            station_name
            latitude
            longitude
            elevation
            zoom_level
            station_type
            observation_time
            observation_time_lst
            observation_time_offset
            display_hour
            display_hour_lst
            display_hour_offset
            display_date
            temperature
            relative_humidity
            hourly_precip
            hr24Precipitation
            hr48Precipitation
            hr72Precipitation
            wind_speed
            wind_direction
            peak_gust_speed
            peak_gust_dir
            sol_rad
            snow_flag
            observation_type
            hex
        }
    }
}

```

Response Payload

Response Payload

```

{
  "data": {
    "weatherObs": {
      "_metadata": {
        "page": 1,
        "per_page": 20,
        "total_count": 2,
        "page_count": 1
      }
    }
  }
}

```

```

},
"data": [
  {
    "station_id": 10402,
    "wrcc_id": "ABRB",
    "station_name": "BROWNSBORO",
    "latitude": 34.74067,
    "longitude": -86.43503,
    "elevation": 663,
    "zoom_level": 4,
    "station_type": "RAWS (SAT NFDRS)",
    "observation_time": "2024-10-08T01:25:44.000Z",
    "observation_time_lst": "2024-10-07T19:25:44-06:00",
    "observation_time_offset": "2024-10-07T21:25:44-04:00",
    "display_hour": "2024-10-08T01:00:00.000Z",
    "display_hour_lst": "2024-10-07T19:00:00-06:00",
    "display_hour_offset": "2024-10-07T21:00:00-04:00",
    "display_date": "2024-10-07",
    "temperature": 58,
    "relative_humidity": 72,
    "hourly_precip": 0,
    "hr24Precipitation": null,
    "hr48Precipitation": null,
    "hr72Precipitation": null,
    "wind_speed": 0,
    "wind_direction": 74,
    "peak_gust_speed": 3,
    "peak_gust_dir": 244,
    "sol_rad": 0,
    "snow_flag": "N",
    "observation_type": "O",
    "hex": "#4abddd"
  },
  {
    "station_id": 10702,
    "wrcc_id": "ABAN",
    "station_name": "BANKHEAD",
    "latitude": 34.34417,
    "longitude": -87.3375,
    "elevation": 970,
    "zoom_level": 3,
    "station_type": "RAWS (SAT NFDRS)",
    "observation_time": "2024-10-08T00:37:09.000Z",
    "observation_time_lst": "2024-10-07T18:37:09-06:00",
    "observation_time_offset": "2024-10-07T20:37:09-04:00",
    "display_hour": "2024-10-08T01:00:00.000Z",
    "display_hour_lst": "2024-10-07T19:00:00-06:00",
    "display_hour_offset": "2024-10-07T21:00:00-04:00",
    "display_date": "2024-10-07",
    "temperature": 65,
    "relative_humidity": 51,
    "hourly_precip": 0,
    "hr24Precipitation": null,
    "hr48Precipitation": null,
    "hr72Precipitation": null,
    "wind_speed": 2,
    "wind_direction": 220,
  }
]

```

```
        "peak_gust_speed": 5,  
        "peak_gust_dir": 274,  
        "sol_rad": 0,  
        "snow_flag": "N",  
        "observation_type": "O",  
        "hex": "#0c9687"  
    }  
]  
}  
}
```

Response Data Definition

Attribute	Description	Data Type	Sample Value	Nullable
station_id	Primary Key of Station Information	Integer	10702	No
wrcc_id	WRCC Id	String	ABAN	No
station_name	Station Name	String	BANKHEAD NF	No
latitude	Station Latitude	Float	34.3441667	No
longitude	Station Longitude	Float	-87.3375	No
elevation	Station Elevation	Float	970	No
zoom_level	Station Zoom Level	Integer	3	Yes
station_type	Station Type	String	RAWS (SAT NFDRS)	Yes
observation_time	Time of observation	DateTime	2024-10-08T00:37:09.000Z	No
observation_time_offset	Time of observation taking into account the offset based on the user's input for the timeZone parameter	DateTime	2024-10-07T20:37:09-04:00	Calculated

display_hour	Rounds the observation time to the nearest whole hour in UTC. This call result helps populate the map in FEMS to work in conjunction with the time slider	DateTime	2024-10-08T01:00:00.000Z	Calculated
display_hour_offset	Rounds the observation time to the nearest hour with the offset based on the user's input for the timeZone parameter . This call result helps populate the map in FEMS to work in conjunction with the time slider	DateTime	2024-10-07T21:00:00-04:00	Calculated
display_date	Extracts the observation date UTC from the observation_time column. If an observation occurs after 23:30:00Z, then the display date rounds up.	Date	2024-10-08	Calculated
temperature	Observation temperature	Integer	65	Yes
relative_humidity	Observation relative humidity	Integer	51	Yes
hourly_precip	Observation hourly precipitation	Float	1.2	Yes
peak_gust_speed	Observation peak gust speed	Int	5	Yes
wind_speed	Observation wind speed	Int	2	Yes
sol_rad	Observation solar radiation	Float	0	Yes
snow_flag	Observation snow flag: 'Y' for yes, 'N' for no	String	N	Yes
hex	The hexideximal color value associated with the value of the measured attribute. These color values come from the Colors table.	String	#2ba9b2	No

hr24Precipitation	<i>To be deprecated</i>			
hr48Precipitation	<i>To be deprecated</i>			
hr72Precipitation	<i>To be deprecated</i>			
wind_direction	Observation wind direction, measured in degrees	Int	220	Yes
peak_gust_dir	Observation peak gust direction, measured in degrees	Int	274	Yes
observation_type	Observation Type: O for observation F for forecast	String	O	No
t_flag	Temperature QC flag, with value 0, 1, or 2 0 = Original value retained (was present and fulfilled QC validation) 1 = Original value was missing and has been replaced with an estimated value 2 = Original value was deemed “suspicious” (failed QC validation)	String	1	Yes
rh_flag	Relative humidity QC flag, with value 0, 1, or 2 0 = Original value retained (was present and fulfilled QC validation) 1 = Original value was missing and has been replaced with an estimated value 2 = Original value was deemed “suspicious” (failed QC validation)	String	1	Yes

pcp_flag	Precipitation QC flag, with value 0, 1, or 2 0 = Original value retained (was present and fulfilled QC validation) 1 = Original value was missing and has been replaced with an estimated value 2 = Original value was deemed “suspicious” (failed QC validation)	String	1	Yes
ws_flag	Wind speed QC flag, with value 0, 1, or 2 0 = Original value retained (was present and fulfilled QC validation) 1 = Original value was missing and has been replaced with an estimated value 2 = Original value was deemed “suspicious” (failed QC validation)	String	1	Yes
wa_flag	Wind azimuth QC flag, with value 0, 1, or 2 0 = Original value retained (was present and fulfilled QC validation) 1 = Original value was missing and has been replaced with an estimated value 2 = Original value was deemed “suspicious” (failed QC validation)	String	1	Yes

sr_flag	Solar radiation QC flag, with value 0, 1, or 2 0 = Original value retained (was present and fulfilled QC validation) 1 = Original value was missing and has been replaced with an estimated value 2 = Original value was deemed “suspicious” (failed QC validation)	String	1	Yes
gs_flag	Wind gust speed QC flag, with value 0, 1, or 2 0 = Original value retained (was present and fulfilled QC validation) 1 = Original value was missing and has been replaced with an estimated value 2 = Original value was deemed “suspicious” (failed QC validation)	String	1	Yes
ga_flag	Wind gust azimuth QC flag, with value 0, 1, or 2 0 = Original value retained (was present and fulfilled QC validation) 1 = Original value was missing and has been replaced with an estimated value 2 = Original value was deemed “suspicious” (failed QC validation)	String	1	Yes

HTTP Return Statuses

Status Code	Message
200	Ok

4XX	Default Response: Not Handled
5XX	Default Response: Not Handled

NfdrObs Query

Request Payload

Request Payload

```
nfdrsObs(  
  stationIds: String  
  fuelModels: String!  
  startDateRange: Date  
  startHour: Int  
  endHour: Int  
  endDateRange: Date  
  zoomLevel: Int  
  page: Int  
  per_page: Int  
  zoomLevel: Int  
)
```

Request Parameter Data Definition

Attribute Name	Description	Data Type	Expected Values	Mandatory	Default
stationIds	A list of station Ids to filter for, separated by comma	String		No	All
fuelModels	Fuel model type to filter for	String	V, W, X, Y, Z	Yes	

nfdType	A filter option for either forecast or observation. Appended will filter out forecasts before the current moment and append any forecasts. Leave blank for all, e.g. observations and forecasts for the entire queried time frame.	String	"O" or "F" or "Appended"	No	O and F
zoomLevel	A filter used by FEMS when rendering the map. Not necessary for external users – leave blank for all.	Integer	0 to 5	No	All
startDateRange	Starting date for the query selection	Date	Date Format yyyy-mm-dd		Current date minus 10 days
endDateRange	Ending date for the query selection	Date	Date Format yyyy-mm-dd		Current date plus 10 days
startHour	Starting hour for each day across the date range, based on 24 hour clock	Int	0 through 24		If start hour and end hour are left null, then all 24 hours across each day of the date range will be queried

endHour	Ending hour for each day across the date range, based on 24 hour clock	Int	0 through 24		If start hour and end hour are left null, then all 24 hours across each day of the date range will be queried
dateTimeFormat	Sets whether the results will be in UTC or local station time	Enum: DateTimeFormat	UTC or LocalStationTime	No	UTC
hasHistoricData	Filters results based on whether the data should have historic data.	Enum: Tristate	True, False, All	No	True
sortBy	Sorts the results based on the value passed in.	Enum: NfdrMinMaxSortBy	station_name, station_id, summary_date	No	station_id, summary Date
sortOrder	Sorts the results in ascending or descending order based on sortBy.	Enum: SortOrder	Asc, Desc	No	Asc
page	Filter results based on page for pagination	Int			0
per_page	Filter results based on number of results per page	Int			20
zoomLevel	Filter results based on zoom level	Int	3, 4, 5, null		null

Sample Request Payload

Sample Request Payload

```
query NfdrsObs {
  nfdrsObs(
    fuelModels: "y"
    nfdrType: "O"
    startDateRange: "2005-01-01"
    endDateRange: "2005-01-14"
    startHour: 12
    endHour: 12
    page: 0
    per_page: 200
    zoomLevel: 3
    stationIds: null
  ) {
    _metadata {
      page
      per_page
      total_count
      page_count
    }
    data {
      station_id
      observation_time
      observation_time_lst
      display_hour_lst

      nfdr_date
      nfdr_time
      nfdr_type
      fuel_model
      fuel_model_version
      kbdi
      one_hr_tl_fuel_moisture
      ten_hr_tl_fuel_moisture
      hun_hr_tl_fuel_moisture
      thou_hr_tl_fuel_moisture
      ignition_component
      spread_component
      energy_release_component
      burning_index
      herbaceous_lfi_fuel_moisture
      woody_lfi_fuel_moisture
      gsi
      observation_type
    }
  }
}
```

Response Payload

Example Response

```
{
```



```

"data": {
  "nfdrsObs": {
    "_metadata": {
      "page": 1,
      "per_page": 20,
      "total_count": 20,
      "page_count": 1
    },
    "data": [
      {
        "station_id": 80802,
        "observation_time": null,
        "nfdr_date": "2024-10-08",
        "nfdr_time": 9,
        "nfdr_type": "O",
        "fuel_model": "Y",
        "fuel_model_version": 4,
        "kbdi": 100,
        "one_hr_tl_fuel_moisture": 23.73,
        "ten_hr_tl_fuel_moisture": 29.22,
        "hun_hr_tl_fuel_moisture": 30,
        "thou_hr_tl_fuel_moisture": 30,
        "ignition_component": 0,
        "spread_component": 0.15,
        "energy_release_component": 0,
        "burning_index": 0,
        "herbaceous_lfi_fuel_moisture": 60,
        "woody_lfi_fuel_moisture": 30,
        "gsi": 0,
        "observation_type": null
      },...
      {
        "station_id": 80802,
        "observation_time": null,
        "nfdr_date": "2024-10-09",
        "nfdr_time": 13,
        "nfdr_type": "O",
        "fuel_model": "Y",
        "fuel_model_version": 4,
        "kbdi": 110,
        "one_hr_tl_fuel_moisture": 22.52,
        "ten_hr_tl_fuel_moisture": 28.91,
        "hun_hr_tl_fuel_moisture": 30,
        "thou_hr_tl_fuel_moisture": 30,
        "ignition_component": 0.12,
        "spread_component": 0.46,
        "energy_release_component": 0,
        "burning_index": 0,
        "herbaceous_lfi_fuel_moisture": 60,
        "woody_lfi_fuel_moisture": 30,
        "gsi": 0,
        "observation_type": null
      }
    ]
  }
}

```

Response Data Definition

Attribute	Description	Data Type	Sample Value	Nullable
station_id	Station Id	Integer	80802	No
observation_time	DateTime the observation occurred	DateTime	null	Yes
nfd_r_date	Date the of the nfd_r observation occurred	DateTime	2024-10-09	Yes
nfd_r_time	Hour of the nfd_r observation occurred	Integer	13	No
nfd_r_type	Observation type of the nfd_r observation. O for Observation F for Forecast	String	O	No
fuel_model	Fuel model type	String	Y	No
fuel_model_version	Fuel model version	Float	4	No
kbdi	Kbdi value	Integer	110	No
one_hr_tl_fuel_moisture	One hour tl fuel moisture value	Float	22.52	No
ten_hr_tl_fuel_moisture	One hour tl fuel moisture value	Float	28.91	No
hun_hr_tl_fuel_moisture	One hour tl fuel moisture value	Float	30	No
thou_hr_tl_fuel_moisture	One hour tl fuel moisture value	Float	30	No
ignition_component	ignition component	Float	0.12	No
spread_component	spread component	Float	0.46	No
energy_release_component	energy release component value	Float	0	No
burning_index	burning index value	Float	0	No

herbaceous_lfi_fuel_moisture	herbaceous lfi fuel moisture	Float	60	No
woody_lfi_fuel_moisture	woody lfi fuel moisture	Float	30	No
gsi	gsi	Float	0	No
observation_type	Observation type. O for Observation F for Forecast	String	null	Yes

HTTP Return Statuses

Status Code	Message
200	Ok
4XX	Default Response: Not Handled
5XX	Default Response: Not Handled

WxMinMax Query

Request Payload

Request Payload

```

wxMinMax(
    stationIds: String
    startDate: Date!
    endDate: Date!
    zoomLevel: Int
    hasHistoricData: TriState
    per_pag: Int
    page: Int
)

```

Request Parameter Data Definition

Attribute Name	Description	Data Type	Sample Values	Mandatory	Default
startDate	Start date of request data in YYYY-mm-dd format	Date	2020-01-01	No	10

endDate	End date of request data in YYYY-mm-dd format	Date	2024-10-16	No	20
stationIds	A list of station Ids to query for, separated by commas. Leave blank for all.	String	45801, 100407	No	All
zoomLevel	A filter used by FEMS when rendering the map. Not necessary for external users – leave blank for all.	Integer	0 to 5	No	All
hasHistoricData	Filters results based on whether the data should have historic data.	Enum: Tristate	True, False, All	No	True
page	Filter results based on page for pagination.	Int		No	0
per_page	Filter results based on number of results per page.	Int		No	20

Sample Request Payload

Sample Request Payload

```
query WxMinMax {
  wxMinMax(
    startDate: "2024-09-01"
    endDate: "2024-09-02"
    page: 0
    per_page: 30000
  ) {
    data {
      station_id
      wrcc_id
      summary_date
      observation_type
      temperature_min
      temperature_max
      relative_humidity_min
      relative_humidity_max
      wind_speed_min
      wind_speed_max
      peak_gust_speed_min
      peak_gust_speed_max
      peak_wind_gust_direction
      peak_wind_gust_time
      solar_radiation_max
      daily_precipitation_total
      snow_flag
    }
  }
}
```

```
}
```

Response Payload

Example Response

```
{
  "data": {
    "wxMinMax": {
      "data": [
        {
          "station_id": 291002,
          "wrcc_id": "XBAR",
          "summary_date": "2024-09-01",
          "observation_type": "O",
          "temperature_min": 45,
          "temperature_max": 71,
          "relative_humidity_min": 23,
          "relative_humidity_max": 90,
          "wind_speed_min": 0,
          "wind_speed_max": 7,
          "peak_gust_speed_min": 0,
          "peak_gust_speed_max": 20,
          "peak_wind_gust_direction": 96,
          "peak_wind_gust_time": "15",
          "solar_radiation_max": 891,
          "daily_precipitation_total": 0,
          "snow_flag": "N"
        },
        {
          "station_id": 291002,
          "wrcc_id": "XBAR",
          "summary_date": "2024-09-02",
          "observation_type": "O",
          "temperature_min": 43,
          "temperature_max": 70,
          "relative_humidity_min": 26,
          "relative_humidity_max": 89,
          "wind_speed_min": 0,
          "wind_speed_max": 6,
          "peak_gust_speed_min": 0,
          "peak_gust_speed_max": 16,
          "peak_wind_gust_direction": 122,
          "peak_wind_gust_time": "12",
          "solar_radiation_max": 923,
          "daily_precipitation_total": 0,
          "snow_flag": "N"
        },
        {
          "station_id": 290305,
          "wrcc_id": "XBLM",
          "summary_date": "2024-09-01",
          "observation_type": "O",
          "temperature_min": 55,
          "temperature_max": 86,
          "relative_humidity_min": 13,
```

```
    "relative_humidity_max": 86,
    "wind_speed_min": 0,
    "wind_speed_max": 14,
    "peak_gust_speed_min": 3,
    "peak_gust_speed_max": 23,
    "peak_wind_gust_direction": 85,
    "peak_wind_gust_time": "20",
    "solar_radiation_max": 849,
    "daily_precipitation_total": 0,
    "snow_flag": "N"
  },
  {
    "station_id": 290305,
    "wrcc_id": "XBLM",
    "summary_date": "2024-09-02",
    "observation_type": "O",
    "temperature_min": 51,
    "temperature_max": 84,
    "relative_humidity_min": 14,
    "relative_humidity_max": 65,
    "wind_speed_min": 0,
    "wind_speed_max": 11,
    "peak_gust_speed_min": 4,
    "peak_gust_speed_max": 22,
    "peak_wind_gust_direction": 206,
    "peak_wind_gust_time": "22",
    "solar_radiation_max": 893,
    "daily_precipitation_total": 0,
    "snow_flag": "N"
  },
  {
    "station_id": 290401,
    "wrcc_id": "XCIM",
    "summary_date": "2024-09-01",
    "observation_type": "O",
    "temperature_min": 45,
    "temperature_max": 69,
    "relative_humidity_min": 17,
    "relative_humidity_max": 89,
    "wind_speed_min": 2,
    "wind_speed_max": 8,
    "peak_gust_speed_min": 3,
    "peak_gust_speed_max": 20,
    "peak_wind_gust_direction": 50,
    "peak_wind_gust_time": "13",
    "solar_radiation_max": 925,
    "daily_precipitation_total": 0,
    "snow_flag": "N"
  }
]
}
}
```

Response Data Definition

Attribute	Definition	Data Type	Sample Value	Nullable
station_id	Station Id	Integer	45801	No
summary_date	The date for which the calculated min/max occurred	Date	"2020-11-03"	No
nfd_r_type	The observation type. O for observation. F for forecast	String	"O"	No
fuel_model	Fuel Model	String	"Y"	No
one_hr_tl_fuel_moisture_min	One HourT Fuel Moisture Min	Float	4.06	Yes
one_hr_tl_fuel_moisture_min_time	One HourT Fuel Moisture Min Time	String	"15"	Yes
ten_hr_tl_fuel_moisture_min	Ten Hour TL Fuel Moisture Min	Float	5.88	Yes
ten_hr_tl_fuel_moisture_min_time	Ten Hour TL Fuel Moisture Min Time	String	"00"	Yes
hun_hr_tl_fuel_moisture_min	Hundred Hour TL Fuel Moisture Min	Float	8.11	Yes
hun_hr_tl_fuel_moisture_min_time	Hundred Hour TL Fuel Moisture Min Time	String	"18"	Yes
thou_hr_tl_fuel_moisture_min	Thousand Hour TL Fuel MoistureMin	Float	10.42	Yes
thou_hr_tl_fuel_moisture_min_time	Thousand Hour TL Fuel Moisture Min Time	String	"20"	Yes
ignition_component_max	Ignition Component Max	Float	53.22	Yes
ignition_component_max_time	Ignition Component Max Time	String	"14"	Yes
spread_component_max	Spread Component Max	Float	3.31	Yes

spread_component_max_time	Spread Component Max Time	String	"14"	Yes
energy_release_component_max	Energy Release Component Max	Float	70.81	Yes
energy_release_component_max_time	Energy Release Component Max Time	String	"16"	Yes
burning_index_max	Burning Index Max	Float	36.84	Yes
burning_index_max_time	Burning Index Max Time	String	"14"	Yes
herbaceous_lfi_fuel_moisture	Herbaceous LFI Fuel Moisture	Float	30	Yes
woody_lfi_fuel_moisture	Woody LFI Fuel Moisture	Float	60	Yes
gsi	GSI	Float	0.32894	Yes
kbdi	KDBI	Float	772	Yes

HTTP Return Statuses

Status Code	Message
200	Ok
4XX	Default Response: Not Handled
5XX	Default Response: Not Handled

NfdrMinMax Query

Request Payload

Request Payload

```

nfdrMinMax(
  startDate: Date,
  endDate: Date,
  stationIds: String,
  fuelModels: String,
  nfdrType: String,
  zoomLevel: Integer,
  hasHistoricData: TriState,

```



```
        sortBy: NfdrMinMaxSortBy,  
        sortOrder: SortOrder,  
        Page: Integer,  
        per_page: Integer  
    )
```

Request Parameter Data Definition

Attribute Name	Description	Data Type	Sample Values	Mandatory	Default
startDate	Time in HH format to query for across each day.	Date	2020-01-01	No	10
endDate	Time in HH format to query for across each day.	Date	2024-10-16	No	20
stationIds	A list of station Ids to query for, separated by commas. Leave blank for all.	String	45801, 100407	No	<i>All</i>
fuelModels	A list of fuel models to query for, separated by commas. Leave blank for all.	String	"X" or "X,Y,Z"	No	<i>All</i>
nfdrType	A filter option for either forecast or observation. Leave blank for an appended result set of historic observations and forecasts.	String	"O" or "F"	No	<i>O and F</i>
zoomLevel	A filter used by FEMS when rendering the map. Not necessary for external users – leave blank for all.	Integer	0 to 5	No	<i>All</i>

hasHistoricData	Filters results based on whether the data should have historic data.	Enum: Tristate	True, False, All	No	<i>True</i>
sortBy	Sorts the results based on the value passed in.	Enum: NfdrMinMaxSortBy	station_name, station_id, summary_date	No	station_id, summary Date
sortOrder	Sorts the results in ascending or descending order based on sortBy.	Enum: SortOrder	Asc, Desc	No	Asc
page	Filter results based on page for pagination.	Int		No	0
per_page	Filter results based on number of results per page.	Int		No	20

Sample Request Payload

Sample Request Payload

```
query NfdrMinMax {
  nfdrMinMax(startDate: "2020-01-01", endDate: "2024-01-01", stationIds:
"45801") {
    _metadata {
      page
      per_page
      total_count
      page_count
    }
    data {
      station_id
      summary_date
      nfdr_type
      fuel_model
      one_hr_tl_fuel_moisture_min
      one_hr_tl_fuel_moisture_min_time
      ten_hr_tl_fuel_moisture_min
      ten_hr_tl_fuel_moisture_min_time
      hun_hr_tl_fuel_moisture_min
      hun_hr_tl_fuel_moisture_min_time
      thou_hr_tl_fuel_moisture_min
      thou_hr_tl_fuel_moisture_min_time
      ignition_component_max
      ignition_component_max_time
    }
  }
}
```

```

        spread_component_max
        spread_component_max_time
        energy_release_component_max
        energy_release_component_max_time
        burning_index_max
        burning_index_max_time
        herbaceous_lfi_fuel_moisture
        woody_lfi_fuel_moisture
        gsi
        kbdi
    }
}
}

```

Response Payload

Example Response

```

{
  "data": {
    "nfdRMinMax": {
      "_metadata": {
        "page": 1,
        "per_page": 1,
        "total_count": 20,
        "page_count": 1
      },
      "data": [
        {
          "station_id": 45801,
          "summary_date": "2020-10-31",
          "nfdR_type": "O",
          "fuel_model": "X",
          "one_hr_tl_fuel_moisture_min": 3.82,
          "one_hr_tl_fuel_moisture_min_time": "17",
          "ten_hr_tl_fuel_moisture_min": 6.18,
          "ten_hr_tl_fuel_moisture_min_time": "00",
          "hun_hr_tl_fuel_moisture_min": 9.31,
          "hun_hr_tl_fuel_moisture_min_time": "23",
          "thou_hr_tl_fuel_moisture_min": 11.51,
          "thou_hr_tl_fuel_moisture_min_time": "23",
          "ignition_component_max": 50.99,
          "ignition_component_max_time": "17",
          "spread_component_max": 59.51,
          "spread_component_max_time": "17",
          "energy_release_component_max": 112.62,
          "energy_release_component_max_time": "17",
          "burning_index_max": 173.23,
          "burning_index_max_time": "17",
          "herbaceous_lfi_fuel_moisture": 30,
          "woody_lfi_fuel_moisture": 60,
          "gsi": 0.335739,
          "kbdi": 772
        }, ...
        {
          "station_id": 45801,
          "summary_date": "2020-11-03",

```

```

    "nfd_r_type": "O",
    "fuel_model": "Y",
    "one_hr_tl_fuel_moisture_min": 4.06,
    "one_hr_tl_fuel_moisture_min_time": "15",
    "ten_hr_tl_fuel_moisture_min": 5.88,
    "ten_hr_tl_fuel_moisture_min_time": "00",
    "hun_hr_tl_fuel_moisture_min": 8.11,
    "hun_hr_tl_fuel_moisture_min_time": "18",
    "thou_hr_tl_fuel_moisture_min": 10.42,
    "thou_hr_tl_fuel_moisture_min_time": "20",
    "ignition_component_max": 53.22,
    "ignition_component_max_time": "14",
    "spread_component_max": 3.31,
    "spread_component_max_time": "14",
    "energy_release_component_max": 70.81,
    "energy_release_component_max_time": "16",
    "burning_index_max": 36.84,
    "burning_index_max_time": "14",
    "herbaceous_lfi_fuel_moisture": 30,
    "woody_lfi_fuel_moisture": 60,
    "gsi": 0.32894,
    "kbdi": 772
  }
}
}
}
}

```

Response Data Definition

Attribute	Definition	Data Type	Sample Value	Nullable
station_id	Station Id	Integer	45801	No
summary_date	The date for which the calculated min/max occurred	Date	"2020-11-03"	No
nfd_r_type	The observation type. O for observation. F for forecast	String	"O"	No
fuel_model	Fuel Model	String	"Y"	No
one_hr_tl_fuel_moisture_min	One HourT Fuel Moisture Min	Float	4.06	Yes
one_hr_tl_fuel_moisture_min_time	One HourT Fuel Moisture Min Time	String	"15"	Yes
ten_hr_tl_fuel_moisture_min	Ten Hour TL Fuel Moisture Min	Float	5.88	Yes

ten_hr_tl_fuel_moisture_min_time	Ten Hour TL Fuel Moisture Min Time	String	"00"	Yes
hun_hr_tl_fuel_moisture_min	Hundred Hour TL Fuel Moisture Min	Float	8.11	Yes
hun_hr_tl_fuel_moisture_min_time	Hundred Hour TL Fuel Moisture Min Time	String	"18"	Yes
thou_hr_tl_fuel_moisture_min	Thousand Hour TL Fuel MoistureMin	Float	10.42	Yes
thou_hr_tl_fuel_moisture_min_time	Thousand Hour TL Fuel Moisture Min Time	String	"20"	Yes
ignition_component_max	Ignition Component Max	Float	53.22	Yes
ignition_component_max_time	Ignition Component Max Time	String	"14"	Yes
spread_component_max	Spread Component Max	Float	3.31	Yes
spread_component_max_time	Spread Component Max Time	String	"14"	Yes
energy_release_component_max	Energy Release Component Max	Float	70.81	Yes
energy_release_component_max_time	Energy Release Component Max Time	String	"16"	Yes
burning_index_max	Burning Index Max	Float	36.84	Yes
burning_index_max_time	Burning Index Max Time	String	"14"	Yes
herbaceous_lfi_fuel_moisture	Herbaceous LFI Fuel Moisture	Float	30	Yes
woody_lfi_fuel_moisture	Woody LFI Fuel Moisture	Float	60	Yes
gsi	GSI	Float	0.32894	Yes
kbdi	KDBI	Float	772	Yes

HTTP Return Statuses

Status Code	Message
200	Ok
4XX	Default Response: Not Handled
5XX	Default Response: Not Handled

PercentileAvgMinMax Query

Request Payload

Request Payload

```
percentileAvgMinMax(  
    stationIds: String!  
    fuelModel: FuelModelTypes!  
    climatology: {  
        startYear: ClimatologyYear  
        endYear: ClimatologyYear  
        startMonthDay: ClimatologyMonthDay  
        endMonthDay: ClimatologyMonthDay  
        startHour: TimeHour  
        endHour: TimeHour  
    }  
    page: Int  
    per_page: Int  
)
```

Request Parameter Data Definition

Attribute Name	Description	Data Type	Sample Values	Mandatory	Default
stationIds	A list of station ids separated by commas to query for	String		Yes	

fuelModel	Fuel model type. Allowed values below: • V • W • X • Y • Z	Single Character String	Y	Yes	
climatology.startYear	The starting year to query	String	2023	No	1990
climatology.endYear	The ending year to query	String	2024	No	Current year
climatology.startMonthDay	Date in MM-DD format to filter results across the start and end year	String	01-01	No	04-01
climatology.endMonthDay	Date in MM-DD format to filter results across the end and end year	String	12-31	No	10-31
climatology.startHour	Time in HH format to query for across each day	Integer	10	No	10
climatology.endHour	Time in HH format to query for across each day	Integer	20	No	20
page	Filter results based on page for pagination	Int		No	0
per_page	Filter results based on number of results per page	Int		No	20

Sample Request Payload

Sample Request Payload

```

query PercentileAvgMinMax {
  percentileAvgMinMax (
    stationIds: "104007,240107"
    fuelModel: Y
    climatology: {
      startYear: "2023"
      endYear: "2023"
      startMonthDay: "01-01"
    }
  )
}

```

```

        endMonthDay: "01-05"
        startHour: "10"
        endHour: "20"
    }
) {
  _metadata {
    page
    per_page
    total_count
    page_count
  }
  data {
    station_id
    day
    kbdi {
      min
      max
      avg
      stddev
    }
    woody_lfi_fuel_moisture {
      min
      max
      avg
      stddev
    }
    herbaceous_lfi_fuel_moisture {
      min
      max
      avg
      stddev
    }
    burning_index {
      min
      max
      avg
      stddev
    }
    energy_release_component {
      min
      max
      avg
      stddev
    }
    spread_component {
      min
      max
      avg
      stddev
    }
    ignition_component {
      min
      max
      avg
      stddev
    }
    thou_hr_tl_fuel_moisture {

```



```

        min
        max
        avg
        stddev
    }
    hun_hr_tl_fuel_moisture {
        min
        max
        avg
        stddev
    }
    ten_hr_tl_fuel_moisture {
        min
        max
        avg
        stddev
    }
    one_hr_tl_fuel_moisture {
        min
        max
        avg
        stddev
    }
}
}
}
}

```

Response Payload

Example Respons

```

{
  "data": {
    "percentileAvgMinMax": {
      "_metadata": {
        "page": 1,
        "per_page": 20,
        "total_count": 1,
        "page_count": 1
      },
      "data": [
        {
          "station_id": 240107,
          "day": "01-01",
          "kbdi": {
            "min": 135,
            "max": 136,
            "avg": 135.72727272727272,
            "stddev": 0.4670993664969138
          },
          "woody_lfi_fuel_moisture": {
            "min": 110.08,
            "max": 157.6,
            "avg": 123.04,
            "stddev": 22.196561895933343
          },
          "herbaceous_lfi_fuel_moisture": {

```

```

        "min": 108.69,
        "max": 183.37,
        "avg": 129.05727272727273,
        "stddev": 34.88298068998952
    },
    "burning_index": {
        "min": 0,
        "max": 0,
        "avg": 0,
        "stddev": 0
    },
    "energy_release_component": {
        "min": 14.23,
        "max": 17.02,
        "avg": 14.94,
        "stddev": 0.9012213934433647
    },
    "spread_component": {
        "min": 0,
        "max": 0,
        "avg": 0,
        "stddev": 0
    },
    "ignition_component": {
        "min": 0,
        "max": 0,
        "avg": 0,
        "stddev": 0
    },
    "thou_hr_tl_fuel_moisture": {
        "min": 17.44,
        "max": 17.74,
        "avg": 17.631818181818183,
        "stddev": 0.13189527526171527
    },
    "hun_hr_tl_fuel_moisture": {
        "min": 14.25,
        "max": 14.39,
        "avg": 14.285454545454545,
        "stddev": 0.04344275229854489
    },
    "ten_hr_tl_fuel_moisture": {
        "min": 20.15,
        "max": 21.73,
        "avg": 21.28272727272727,
        "stddev": 0.5340241737803807
    },
    "one_hr_tl_fuel_moisture": {
        "min": 25.74,
        "max": 32.44,
        "avg": 30.816363636363636,
        "stddev": 2.1371910196670427
    }
},...
{
    "station_id": 240107,
    "day": "01-05",

```

```
"kdbi": {
  "min": 136,
  "max": 136,
  "avg": 136,
  "stddev": 0
},
"woody_lfi_fuel_moisture": {
  "min": 60,
  "max": 60,
  "avg": 60,
  "stddev": 0
},
"herbaceous_lfi_fuel_moisture": {
  "min": 30,
  "max": 30,
  "avg": 30,
  "stddev": 0
},
"burning_index": {
  "min": 6.44,
  "max": 15.07,
  "avg": 8.994545454545454,
  "stddev": 2.915854467000586
},
"energy_release_component": {
  "min": 18.42,
  "max": 20.46,
  "avg": 18.882727272727273,
  "stddev": 0.6588336802120989
},
"spread_component": {
  "min": 0.28,
  "max": 1.62,
  "avg": 0.63,
  "stddev": 0.44530888156424636
},
"ignition_component": {
  "min": 0,
  "max": 0.37,
  "avg": 0.04,
  "stddev": 0.11144505372604026
},
"thou_hr_tl_fuel_moisture": {
  "min": 17.14,
  "max": 17.15,
  "avg": 17.143636363636364,
  "stddev": 0.00504524979109513
},
"hun_hr_tl_fuel_moisture": {
  "min": 16.12,
  "max": 16.18,
  "avg": 16.147272727272727,
  "stddev": 0.01954016841836789
},
"ten_hr_tl_fuel_moisture": {
  "min": 17.13,
  "max": 17.39,
```

```
        "avg": 17.33909090909091,  
        "stddev": 0.07660999222745626  
    },  
    "one_hr_tl_fuel_moisture": {  
        "min": 19.99,  
        "max": 24.8,  
        "avg": 23.669090909090908,  
        "stddev": 1.5653654815758176  
    }  
}  
]  
}  
}
```

Response Data Definition

Attribute	Description	Data Type	Sample Value	Nullable
station_id	Station Id	Int	240107	No
day	Day for the calculated values	ClimatologyMonthDay	01-01	No

kbdi	Calculations min, max, average and standard deviation for KBDI. Below is the sql used: Code Logic <pre>select distinct station_id, to_char("nfdr_date", 'MM-DD') as "day", min(kbdi) over (partition by to_char("nfdr_date", 'MM-DD')) as "kbdi_min", max(kbdi) over (partition by to_char("nfdr_date", 'MM-DD')) as "kbdi_max", avg(kbdi) over (partition by to_char("nfdr_date", 'MM-DD')) as "kbdi_avg", stddev(kbdi) over (partition by to_char("nfdr_date", 'MM-DD')) as "kbdi_stddev" from "fire_danger"."nfdr" as "NFDR" where ("NFDR"."station_id" in (240107) and date_part('year', "nfdr_date") between 2023 and 2023 and date_part('doy', "nfdr_date") between 1 and 5 and "NFDR"."nfdr_time" between 10 and 20 and "NFDR"."fuel_model" = 'Y') group by "station_id",</pre>	StatsCalc	<pre>"kbdi": { "min": 136, "max": 136, "avg": 136, "stddev": 0 }</pre>	Calculated
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	to_char("nfdr_date", 'MM-DD'), "kbdi"			
one_hr_tl_fuel_moisture	Calculations min, max, average and standard deviation for one_hr_tl_fuel_moisture. Code logic in KBDI description	StatsCalc	"one_hr_tl_fuel_moisture": { "min": 19.99, "max": 24.8, "avg": 23.669090909090908, "stddev": 1.5653654815758176 }	Calculated
ten_hr_tl_fuel_moisture	Calculations min, max, average and standard deviation for ten_hr_tl_fuel_moisture. Code logic in KBDI description	StatsCalc	"ten_hr_tl_fuel_moisture": { "min": 17.13, "max": 17.39, "avg": 17.33909090909091, "stddev": 0.07660999222745626 }	Calculated
hun_hr_tl_fuel_moisture	Calculations min, max, average and standard deviation for ten_hr_tl_fuel_moisture. Code logic in KBDI description	StatsCalc	"hun_hr_tl_fuel_moisture": { "min": 16.12, "max": 16.18, "avg": 16.14727272727273, "stddev": 0.01954016841836789 }	Calculated

thou_hr_tl_fuel_moisture	Calculations min, max, average and standard deviation for thou_hr_tl_fuel_moisture. Code logic in KBDI description	StatsCalc	"thou_hr_tl_fuel_moisture": { "min": 17.14, "max": 17.15, "avg": 17.143636363636364, "stddev": 0.00504524979109513 }	Calculated
ignition_component	Calculations min, max, average and standard deviation for ignition_component. Code logic in KBDI description	StatsCalc	"ignition_component": { "min": 0, "max": 0.37, "avg": 0.04, "stddev": 0.11144505372604026 }	Calculated
spread_component	Calculations min, max, average and standard deviation for spread_component. Code logic in KBDI description	StatsCalc	"spread_component": { "min": 0.28, "max": 1.62, "avg": 0.63, "stddev": 0.44530888156424636 }	Calculated

energy_release_component	Calculations min, max, average and standard deviation for energy_release_component. Code logic in KBDI description	StatsCalc	"energy_release_component": { "min": 18.42, "max": 20.46, "avg": 18.8827272727273, "stddev": 0.6588336802120989 }	Calculated
burning_index	Calculations min, max, average and standard deviation for burning_index. Code logic in KBDI description	StatsCalc	"burning_index": { "min": 6.44, "max": 15.07, "avg": 8.994545454545454, "stddev": 2.915854467000586 }	Calculated
herbaceous_lfi_fuel_moisture	Calculations min, max, average and standard deviation for herbaceous_lfi_fuel_moisture. Code logic in KBDI description	StatsCalc	"herbaceous_lfi_fuel_moisture": { "min": 30, "max": 30, "avg": 30, "stddev": 0 }	Calculated

woody_lfi_fuel_moisture	Calculations min, max, average and standard deviation for woody_lfi_fuel_moisture. Code logic in KBDI description	StatsCalc	"woody_lfi_fuel_moisture": { "min": 60, "max": 60, "avg": 60, "stddev": 0 }	Calculated
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HTTP Return Statuses

Status Code	Message
200	Ok
4XX	Default Response: Not Handled
5XX	Default Response: Not Handled

PercentileLevels Query

Request Payload

Request Payload

```
percentileLevels(
  stationIds: String!
  fuelModel: FuelModelTypes!
  climatology: {
    startYear: ClimatologyYear
    endYear: ClimatologyYear
    startMonthDay: ClimatologyMonthDay
    endMonthDay: ClimatologyMonthDay
    startHour: TimeHour
    endHour: TimeHour
  }
  percentileLevels: String
  page: Int
  per_page: Int
)
```

Request Parameter Data Definition

Attribute Name	Description	Data Type	Sample Values	Mandatory	Default
stationIds	A list of station ids, separated by commas to query for	String		Yes	
fuelModel	Fuel model type. Allowed values below: • V • W • X • Y • Z	Single Character String	Y	Yes	
climatology.startYear	The starting year to query	String	2023	No	Current Year Minus 30 Years
climatology.endYear	The ending year to query	String	2024	No	Current Year
climatology.startMonthDay	Date in MM-DD format to filter results across the start and end year	String	01-01	No	04-01
climatology.endMonthDay	Date in MM-DD format to filter results across the end and end year	String	12-31	No	10-31
climatology.startHour	Time in HH format to query for across each day	Integer	10	No	10
climatology.endHour	Time in HH format to query for across each day	Integer	20	No	20

percentileLevels	A list of percentiles to calculate, separated by commas	String	35,45,65	No	60,70,80,90,97
page	Filter results based on page for pagination	Int		No	0
per_page	Filter results based on number of results per page	Int		No	20

Sample Request Payload

Sample Request Payload

```
{
  percentileLevels(
    stationIds: "104007,240107"
    fuelModel: Y
    percentileLevels: "60,70,80,90,97"
    climatology: {
      startYear: "2023"
      endYear: "2023"
      startMonthDay: "01-01"
      endMonthDay: "12-31"
      startHour: "10"
      endHour: "20"
    }
  ) {
    _metadata {
      page
      per_page
      total_count
      page_count
    }
    data {
      station_id
      kbdi
      energy_release_component
      one_hr_tl_fuel_moisture
      ten_hr_tl_fuel_moisture
      hun_hr_tl_fuel_moisture
      thou_hr_tl_fuel_moisture
      ignition_component
      spread_component
      burning_index
      herbaceous_lfi_fuel_moisture
      woody_lfi_fuel_moisture
    }
  }
}
```

```
}
```

Response Payload

Example Response

```
{
  "data": {
    "percentileLevels": {
      "_metadata": {
        "page": 1,
        "per_page": 20,
        "total_count": 2,
        "page_count": 1
      },
      "data": [
        {
          "station_id": 104007,
          "kbdi": {
            "60th": 100,
            "70th": 100,
            "80th": 100,
            "90th": 100,
            "97th": 101
          },
          "energy_release_component": {
            "60th": "14.12",
            "70th": "14.41",
            "80th": "14.79",
            "90th": "25.30",
            "97th": "34.17"
          },
          "one_hr_tl_fuel_moisture": {
            "60th": "19.58",
            "70th": "19.64",
            "80th": "19.70",
            "90th": "19.82",
            "97th": "20.50"
          },
          "ten_hr_tl_fuel_moisture": {
            "60th": "19.58",
            "70th": "19.64",
            "80th": "19.70",
            "90th": "19.82",
            "97th": "20.51"
          },
          "hun_hr_tl_fuel_moisture": {
            "60th": "19.57",
            "70th": "19.63",
            "80th": "19.69",
            "90th": "19.79",
            "97th": "20.34"
          },
          "thou_hr_tl_fuel_moisture": {
            "60th": "19.57",
            "70th": "19.63",
            "80th": "19.69",
```

```

        "90th": "19.78",
        "97th": "20.23"
    },
    "ignition_component": {
        "60th": "1.03",
        "70th": "1.19",
        "80th": "1.41",
        "90th": "2.18",
        "97th": "8.37"
    },
    "spread_component": {
        "60th": "1.65",
        "70th": "1.86",
        "80th": "2.15",
        "90th": "2.62",
        "97th": "3.37"
    },
    "burning_index": {
        "60th": "13.10",
        "70th": "14.02",
        "80th": "15.36",
        "90th": "17.44",
        "97th": "22.61"
    },
    "herbaceous_lfi_fuel_moisture": {
        "60th": "30.00",
        "70th": "30.00",
        "80th": "40.48",
        "90th": "239.28",
        "97th": "250.00"
    },
    "woody_lfi_fuel_moisture": {
        "60th": "60.00",
        "70th": "60.00",
        "80th": "66.67",
        "90th": "193.18",
        "97th": "200.00"
    }
},
{
    "station_id": 240107,
    "kbdi": {
        "60th": 112,
        "70th": 115,
        "80th": 131,
        "90th": 136,
        "97th": 140
    },
    "energy_release_component": {
        "60th": "16.91",
        "70th": "19.17",
        "80th": "21.69",
        "90th": "25.08",
        "97th": "28.17"
    },
    "one_hr_tl_fuel_moisture": {
        "60th": "22.07",

```

```

        "70th": "24.06",
        "80th": "26.58",
        "90th": "31.30",
        "97th": "34.41"
    },
    "ten_hr_tl_fuel_moisture": {
        "60th": "19.65",
        "70th": "19.89",
        "80th": "21.39",
        "90th": "25.09",
        "97th": "29.39"
    },
    "hun_hr_tl_fuel_moisture": {
        "60th": "18.77",
        "70th": "20.00",
        "80th": "20.00",
        "90th": "20.00",
        "97th": "21.37"
    },
    "thou_hr_tl_fuel_moisture": {
        "60th": "18.77",
        "70th": "19.97",
        "80th": "20.00",
        "90th": "20.00",
        "97th": "20.16"
    },
    "ignition_component": {
        "60th": "1.40",
        "70th": "2.15",
        "80th": "3.65",
        "90th": "6.32",
        "97th": "11.02"
    },
    "spread_component": {
        "60th": "1.98",
        "70th": "2.12",
        "80th": "2.31",
        "90th": "2.53",
        "97th": "2.83"
    },
    "burning_index": {
        "60th": "14.43",
        "70th": "15.30",
        "80th": "16.25",
        "90th": "18.89",
        "97th": "22.05"
    },
    "herbaceous_lfi_fuel_moisture": {
        "60th": "30.00",
        "70th": "30.00",
        "80th": "30.00",
        "90th": "84.87",
        "97th": "250.00"
    },
    "woody_lfi_fuel_moisture": {
        "60th": "60.00",
        "70th": "60.00",

```

```

    "80th": "60.00",
    "90th": "94.92",
    "97th": "200.00"
  }
}
]
}
}
}
```

Response Data Definition

Attribute	Description	Data Type	Sample Value	Nullable
station_id	Station Id	Integer	104007,240107	No

kbdi	A JSON object containing data for the requested kbdi percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Example query used to calculated the 60,70,80,90,97 percentile for KBDI Code Logic <pre>select "station_id", percentile_disc(0.6) within group(order by kbdi) as "kbdi_60", percentile_disc(0.7) within group(order by kbdi) as "kbdi_70", percentile_disc(0.8) within group(order by kbdi) as "kbdi_80", percentile_disc(0.9) within group(order by kbdi) as "kbdi_90", percentile_disc(0.97) within group(order by kbdi) as "kbdi_97" from "fire_danger"."nfdr" as "NFDR" where ("NFDR"."station_id" = 104007 and date_part('year',"nfdr_d ate") between 2023 and 2023</pre>	JSON	<pre>"kbdi": { "60th": 112, "70th": 115, "80th": 131, "90th": 136, "97th": 140 }</pre>	Calculated
------	--	------	--	------------

	<pre> and date_part('doy',"nfdr_date") between 1 and 365 and "NFDR"."nfdr_time" between 10 and 20 and "NFDR"."fuel_model" = 'Y') group by "station_id" </pre>			
one_hr_tl_fuel_moisture	A JSON object containing data for the requested ten_hr_tl_fuel_moisture percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre> "one_hr_tl_fuel_moisture": { "60th": "22.07", "70th": "24.06", "80th": "26.58", "90th": "31.30", "97th": "34.41" } </pre>	Calculated
ten_hr_tl_fuel_moisture	A JSON object containing data for the requested ten_hr_tl_fuel_moisture percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre> "ten_hr_tl_fuel_moisture": { "60th": "19.65", "70th": "19.89", "80th": "21.39", "90th": "25.09", "97th": "29.39" } </pre>	Calculated

hun_hr_tl_fuel_moisture	A JSON object containing data for the requested hun_hr_tl_fuel_moisture percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre>"hun_hr_tl_fuel_moisture": { "60th": "18.77", "70th": "20.00", "80th": "20.00", "90th": "20.00", "97th": "21.37" }</pre>	Calculated
thou_hr_tl_fuel_moisture	A JSON object containing data for the requested thou_hr_tl_fuel_moisture percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre>"thou_hr_tl_fuel_moisture": { "60th": "18.77", "70th": "19.97", "80th": "20.00", "90th": "20.00", "97th": "20.16" }</pre>	Calculated
ignition_component	A JSON object containing data for the requested ignition_component percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre>"ignition_component": { "60th": "1.40", "70th": "2.15", "80th": "3.65", "90th": "6.32", "97th": "11.02" }</pre>	Calculated

spread_component	A JSON object containing data for the requested spread_component percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre>"spread_component": { "60th": "1.98", "70th": "2.12", "80th": "2.31", "90th": "2.53", "97th": "2.83" }</pre>	Calculated
energy_release_component	A JSON object containing data for the requested energy_release_component percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre>"energy_release_component": { "60th": "16.91", "70th": "19.17", "80th": "21.69", "90th": "25.08", "97th": "28.17" }</pre>	Calculated
burning_index	A JSON object containing data for the requested burning_index percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre>"burning_index": { "60th": "14.43", "70th": "15.30", "80th": "16.25", "90th": "18.89", "97th": "22.05" }</pre>	Calculated

herbaceous_lfi_fuel_moisture	A JSON object containing data for the requested herbaceous_lfi_fuel_moisture percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre>"herbaceous_lfi_fuel_moisture": { "60th": "30.00", "70th": "30.00", "80th": "30.00", "90th": "84.87", "97th": "250.00" }</pre>	Calculated
woody_lfi_fuel_moisture	A JSON object containing data for the requested woody_lfi_fuel_moisture percentiles. Percentile calculations are based on a discrete distribution of the column values. The result is equal to a specific column value. Sample logic in KBDI Description	JSON	<pre>"woody_lfi_fuel_moisture": { "60th": "60.00", "70th": "60.00", "80th": "60.00", "90th": "94.92", "97th": "200.00" }</pre>	Calculated

HTTP Return Statuses

Status Code	Message
200	Ok
4XX	Default Response: Not Handled
5XX	Default Response: Not Handled