READY Web API User Guide

March 31, 2026

Change history

Version	Date	Description
0.0.1	Feb 26, 2021	Initial release
0.0.2	Aug 23, 2021	Add additional meteorological datasets beside GFS.
0.1.0	Dec 4, 2024	Include potential temperatures in the sounding profile diagnostics.
0.2.0	Apr 23, 2025	Add endpoints for HYSPLIT trajectory runs.
0.3.0	Jul 22, 2025	Add endpoints for HYSPLIT dispersion runs. Minor text changes.
0.4.0	Jul 24, 2025	Sounding API to support GDAS1.
0.5.0	Sep 3, 2025	Add text/plain response. The reply field supports more than one email address.
0.5.1	Mar 31, 2026	Update the temporal coverage of GDAS1.

The READY Web Application Programming Interface (API) provides a set of web accessible endpoints for automated programs to obtain READY products.

Access to the API is granted through a unique key issued upon registration. This key serves as an authentication method. There is a daily limit of 250 API calls per user, based on Eastern Time. This limit is subject to change without prior notice to prevent system overload.

All READY Web API endpoints are accessed by prepending the base URL, https://apps.arl.noaa.gov/ready2, to the specific endpoint. For example, to access the /api/v1/sounding endpoint, the full URL would be https://apps.noaa.gov/ready2/api/v1/sounding.

1. Sounding

Endpoint	POST /api/v1/sounding	
Authentication	required	Use your API key. Users receive a document on authentication upon registration.
Request format	json or xml	Use the “Content-Type” header with application/json or application/xml.

Response format	text/plain	Use the “Accept” header with text/plain. No other format is supported at this time.

Input fields:

Name	Data Type	Description
meteorologicalData	string	Name of the meteorological data set. Must be GFS, GFS0p25, HRRR, NAN (or NAM12), NAMS (or NAMHUS), NAMSAK (or NAMHAK), NAMSHI (or NAMHHI), CONUS (or NAMCNEST), or GDAS1 (or ARCH). Data set descriptions are available in Section A. Note FIREWX is not supported by the sounding API.
latitude	number	Latitude of profile. Must be between -90 and 90 degrees, inclusively.
longitude	number	Longitude of profile. Must be between -180 and 180 degrees, inclusively.
elevation	number	Elevation of profile location in meters for labeling purposes. Use 0 if it is unknown.
fullSounding	boolean	Use true for full sounding or false for sounding up to 400 hPa.
startDate	date	Start year, month, and day. Must be of the YYYY-MM-DD format.
startHour	integer	Start hour. Must be between 0 and 23, inclusively.
duration	integer	Number of hours. Use 0 for the default value.
includeDiagnostics	boolean	true or false. If true, potential temperatures are included.

A sample request body file in XML (soundingRequest.xml):

```
<?xml version="1.0" encoding="UTF-8"?>
<soundingRequest>
  <meteorologicalData>GFS</meteorologicalData>
  <latitude>40.12</latitude>
  <longitude>-82.00</longitude>
  <elevation>0</elevation>
  <fullSounding>false</fullSounding>
  <startDate>2020-10-28</startDate>
  <startHour>6</startHour>
  <duration>0</duration>
```

```
  <includeDiagnostics>false</includeDiagnostics>
</soundingRequest>
```

The same request body file in JSON (soundingRequest.json):

```
{
  "meteorologicalData": "GFS",
  "latitude": 40.12,
  "longitude": -82.00,
  "elevation": 0,
  "fullSounding": false,
  "startDate": "2020-10-28",
  "startHour": 6,
  "duration": 0,
  "includeDiagnostics": false
}
```

2. HYSPLIT trajectory

2.1 Requesting a HYSPLIT trajectory calculation

To run a trajectory simulation, use this API endpoint. The simulation results, optionally including graphics, will be sent via email to the address provided in the reply field.

Endpoint	POST /api/v1/traj	
Authentication	required	Use your API key. Users receive a document on authentication upon registration.
Request format	json or xml	Use the “Content-Type” header with application/json or application/xml.
Request body	required	Input fields in json or in xml. See examples below after the Input fields table.
Response format	json, xml, or text/plain	Use the “Accept” header with application/json, application/xml, or text/plain.
Response body		Returns the UUID, which can be used to check the run status and download the results as a zip file. The response includes the number of API calls and the daily limit. An example in JSON is as follows: `{"uuid":"5fd8a9d7-5dc7-4184-a0aa-06f2f517e8c4", "message":"Your request for HYSPLIT trajectory was successfully submitted.`

		Using the UUID provided above, you can monitor the status of your run while it is in progress. Once the run is complete, the results can be downloaded as a zip file. Please refer to the user guide for instructions on how to check the run status or download the results.", "dailyCounts":{"limit":250,"calls":15}}

Input fields for a HYSPLIT trajectory calculation are shown in the table below.

Name	**Data Type**	**Description**
model (or meteorologicalData)	string	Name of the meteorological data set. See Section A below for supported options. If the trajectory start location is within Alaska or Hawaii with model NAMS (or NAMHUS), then the NAMSAK or NAMSHI model will be automatically used. If unspecified, GFS is assumed. When FIREWX is employed and the chosen latitude-longitude is out of the FIREWX domain, the user is notified of the center latitude and longitude of the FIREWX domain. Current FIREWX domain maps can be accessed at https://www.ready.noaa.gov/ready2-bin/domain_fw.pl
direction	string	Must be forward or backward. If omitted, forward is assumed.
duration	integer	The duration of the calculation in hours is up to 120. It is a positive number for both forward and backward trajectories. If unspecified, a value of 96 is assumed.
motion	string	Vertical motion. Options include: actual (uses actual dp/dt fields), isobaric, isosigma, isentropic, or spatial_avg. The spatial_avg may be useful for finer-scale meteorology (e.g. FIREWX). If unspecified, actual is assumed.
latitude	number	The latitude (degrees and fraction) of the trajectory origin. The North is positive. Must be between -90 and 90 degrees. If unspecified, a value of 40.0 degrees is assumed.
longitude	number	The longitude (degrees and fraction) of the trajectory origin. The West is negative. Must be between -180 and 180 degrees. If unspecified, a

		value of -90.0 degrees is assumed.
levels (or level)	number(s)	The starting height of the trajectory in meters above ground level (agl). May request one, two, or three trajectory start heights. See request examples below on how to specify multiple heights using a list. Note a list must be used even for a single height. If unspecified, a value of 1500 is assumed.
startDate	date	Start year, month, and day in the YYYY-MM-DD format. If unspecified, the start date will be the beginning of the meteorology data file for a forward trajectory and will be the end of the meteorology data file for a backward trajectory.
startHour	integer	Start hour. The range of startHour depends whether startDate is specified or not. If startDate is specified, the start hour must be between 0 and 23. If the startDate is unspecified, the start hour is relative and it ranges from 0 to 72. For example, for a forward trajectory with start hour 12, the trajectory starts 12-hours after the first time period of the first file. For a backward trajectory with start hour 12, the trajectory starts 12-hours before the last time period.
mode	string	HYSPLIT run mode. Two options are available: std (standard) and ens (ensemble). If unspecified, std is assumed.
endpointInterval	integer	Trajectory endpoint interval in minutes. It must be 1, 2, 3, 4, 5, 10, 15, 30, or 60. If it is unspecified or if it is not one of the listed values, 60 is used.
graphic	string(s)	Specifies the graphic conversion applied to the model output file. The options are none (no graphics), gif (image file named hysplit.gif), kmz (Google Earth file named hysplit.kmz), and shp (GIS shapefiles named gis.zip). May request one, two, or three graphics. See request examples below on how to specify multiple graphic options using a list. Note a list must be used even if you are requesting one graphic option. If unspecified, none is assumed.
verticalPlot	string	Vertical coordinate. Two options are available: agl and pressure. If unspecified, agl is assumed.
application	string	The options are none and volcano. The volcano option creates 7 trajectories starting at specific heights and it has a volcanic ash disclaimer.

		Altitude units are in feet. If unspecified, none is assumed.
reply	email	Optional. Email address trajectory along with graphics is sent to. Use an array if the email needs to be sent to two or more addresses. See the example below.
includeDiagnostics	boolean	true or false.

Below is a sample request body in JSON format. Note how it specifies three release heights (or levels) using an array. Authorized users receive a separate document with their API key that describes user authentication for the web API, including how to submit a JSON request in Python.

```
{
  "meteorologicalData": "NAM12",
  "latitude": 40.12,
  "longitude": -82.00,
  "levels":[500,1000,1500],
  "startDate": "2025-03-25",
  "startHour": 6,
  "graphic":["gif","kmz"],
  "reply":["some.body@some.where","some.body@some.planet"],
  "includeDiagnostics": false
}
```

Requests can also be submitted in XML format.:

```
<?xml version="1.0" encoding="UTF-8"?>
<soundingRequest>
  <meteorologicalData>NAM12</meteorologicalData>
  <latitude>40.12</latitude>
  <longitude>-82.00</longitude>
  <levels>
    <value>500</value>
    <value>1000</value>
    <value>1500</value>
  </levels>
  <startDate>2025-03-25</startDate>
  <startHour>6</startHour>
  <graphic>
    <value>gif</value>
    <value>kmz</value>
  </graphic>
```

```
  <reply>
    <value>some.body@some.where</value>
    <value>some.body@some.planet</value>
  </reply>
  <includeDiagnostics>false</includeDiagnostics>
</soundingRequest>
```

2.2 Check the status of a HYSPLIT trajectory calculation

This endpoint allows users to check the status of a trajectory simulation. Note that each API call for checking run status will count toward your daily limit.

Endpoint	GET /api/v1/traj/status/{***UUID***}	
Authentication	required	Use your API key. Users receive a document on authentication upon registration.
Request		Replace {***UUID***} in the endpoint with the UUID that you received after making an API call to start a trajectory calculation.
Request body	not used	
Response format	json, xml, or text/plain	Use the “Accept” header with application/json, application/xml, or text/plain.
Response body		The job status may be QUEUED, RUNNING, CRASHED, GRAPHICS_RUNNING, GRAPHICS_FAILED, COMPLETED, and EXPIRED. The number of API calls and the daily limit are also included in the response.

An example output in the json format is shown below. The run status is COMPLETED, indicating the trajectory calculation is finished.

```
{
  "uuid":"5fd8a9d7-5dc7-4184-a0aa-06f2f517e8c4",
  "jobStatus":"COMPLETED",
  "dailyCounts":{
    "limit":250,
    "calls":17
  }
}
```

2.3 Downloading output files of a HYSPLIT trajectory calculation

Upon successful completion of a trajectory calculation, a zip file containing the results is automatically created. The zip file includes tdump (a trajectory dump file), SETUP.CFG and CONTROL (which are HYSPLIT input files), and MESSAGE (a HYSPLIT diagnostics file). If graphics are created for the run, they are added to the zip file as hysplit.gif, hysplit.kmz, and/or gis.zip. See the graphic input field in Sec. 2.1. Note that each API call for downloading a zip file will count toward your daily limit.

Endpoint	GET /api/v1/traj/download/{***UUID***}	
Authentication	required	Use your API key. Users receive a document on authentication upon registration.
Request		Replace {***UUID***} in the endpoint with the UUID that you received after making an API call for a trajectory calculation.
Request body	not used	
Response format	zip	The response format is fixed to application/zip and it cannot be changed.
Response body		Returns the content of the zip file.

3. HYSPLIT dispersion

3.1 Requesting a HYSPLIT dispersion calculation

To run a dispersion simulation, use the following API endpoint. The simulation results, optionally including graphics, will be sent via email to the address provided in the reply field.

Endpoint	POST /api/v1/disp	
Authentication	required	Use your API key. Users receive a document on authentication upon registration.
Request format	json or xml	Use the “Content-Type” header with application/json or application/xml.
Request body	required	Input fields in json or in xml. See examples below after the Input fields table.
Response format	json, xml, or text/plain	Use the “Accept” header with application/json, application/xml, or text/plain.

Response body		Returns the UUID, which can be used to check the run status and download the results as a zip file. The response includes the number of API calls and the daily limit. An example in JSON is as follows: {"uuid":"5fd8a9d7-5dc7-4184-a0aa-06f2f517e8c4", "message":"Your request for HYSPLIT dispersion was successfully submitted. Using the UUID provided above, you can monitor the status of your run while it is in progress. Once the run is complete, the results can be downloaded as a zip file. Please refer to the user guide for instructions on how to check the run status or download the results.", "dailyCounts":{"limit":250,"calls":15}}

Input fields for a HYSPLIT dispersion calculation are shown in the table below.

Name	**Data Type**	**Description**
model (or meteorologicalData)	string	Name of the meteorological data set. See Section A below for supported options. If the dispersion start location is within Alaska or Hawaii with model NAMS (or NAMHUS), then the NAMSAK or NAMSHI model will be automatically used. If unspecified, GFS is assumed. When FIREWX is employed and the chosen latitude-longitude is out of the FIREWX domain, the user is notified of the center latitude and longitude of the FIREWX domain. Current FIREWX domain maps can be accessed at https://www.ready.noaa.gov/ready2-bin/domain_fw.pl
startDate	date	Start year, month, and day in the YYYY-MM-DD format. If unspecified, the start date will be the beginning of the meteorology data file.
startTime	integer	Start hour and minute in the HH:MM format. The start hour must be between 0 and 23 and the start minute between 0 and 59. If the startDate is unspecified, the start hour and the start minutes are relative. For example, for a dispersion with start hour 12, the dispersion starts 12-hours after the first time period of the first file (archive for NAM and GFS).

latitude	number	The latitude (degrees and fraction) of the dispersion origin. The North is positive. Must be between -90 and 90 degrees. If unspecified, a value of 40.0 degrees is assumed.
longitude	number	The longitude (degrees and fraction) of the dispersion origin. The West is negative. Must be between -180 and 180 degrees. If unspecified, a value of -90.0 degrees is assumed.
releaseTop	integer	The top height of the pollutant line source in meters above ground level (agl). If unspecified, a value of 50 is assumed.
releaseBottom	integer	The bottom height of the pollutant line source in meters above ground level (agl). If unspecified, a value of 0 is assumed.
releaseDuration	number	The release duration is given in minutes up to 24 hours. Define the duration to be the same as the Total Duration in the runtime parameters section for a continuous pollutant release. The release rate is assumed to be constant during this period. If unspecified, a value of 10 (minutes) is assumed.
totalDuration	integer	The duration of the calculation in hours up to 24 in the increment of 1 hour. If unspecified, a value of 1 hour is assumed.
averagingPeriod	number	The averaging period is the time period over which concentrations are averaged during the simulation (also called the sampling interval). This interval is defined in hours. For example, a 24-hour simulation with a 6-hour averaging period will result in 4 output maps; one for each 6 hour period. If output units of exposure were chosen, then this is the number of hours to multiply the concentration by to obtain units of mass x time / cubic meters. It must be 0.25, 0.50, 0.75, 1, 2, 3, 4, 5, 6, 8, 12, or 24 hours. If unspecified or not one of the listed values, 1 is used.
averagedLayerTop	integer	The Web API version of HYSPLIT can only calculate a layer-average above the model terrain. Therefore, enter the top of the layer (meters above model terrain) to average the concentration between the surface and that level. The top of the layer should be set to greater than or equal to 100 meters. If unspecified, 100 is used for generic dispersions and 1000 is used for prescribed burns.

graphic	string(s)	Specifies the graphic conversion applied to the model output file. The options are gif (image file named hysplit.gif), kmz (Google Earth file named hysplit.kmz), and shp (GIS Shapefiles). May request one to three graphics. See request examples below on how to specify multiple graphic options using a list. Note a list must be used even if only one graphics option is employed. If unspecified, gif is assumed.
application	string	The options are none (for generic dispersions) and prescribedBurn (for prescribed burns). If unspecified, none is assumed.
burnArea	number	Specifies the area of prescribed burns in acres. If unspecified, 100 acres is assumed. Applicable only when application is set to prescribedBurn.
flamingBurnDuration	integer	Specifies the duration of flaming burn in hours. A value from 1 through 12 is valid. If unspecified, 8 will be used. Applicable only when application is set to prescribedBurn.
reply	email	Optional. Email address dispersion along with graphics is sent to. Use an array if the email needs to be sent to two or more addresses. See the example below.
includeDiagnostics	boolean	true or false.

Below is a sample request body in JSON format. Note how it specifies three release heights (or levels) using an array. Authorized users receive a separate document with their API key that describes user authentication for the web API, including how to submit a JSON request in Python.

```
{
  "meteorologicalData": "NAM12",
  "latitude": 40.12,
  "longitude": -82.00,
  "startDate": "2025-03-25",
  "startTime": "06:30",
  "graphic":["gif","kmz"],
  "reply":["some.body@some.where","some.body@some.planet"],
  "includeDiagnostics": false
}
```

Alternatively, requests can be in XML format:

```
<?xml version="1.0" encoding="UTF-8"?>
<soundingRequest>
  <meteorologicalData>NAM12</meteorologicalData>
  <latitude>40.12</latitude>
  <longitude>-82.00</longitude>
  <startDate>2025-03-25</startDate>
  <startHour>06:30</startHour>
  <graphic>
    <value>gif</value>
    <value>kmz</value>
  </graphic>
  <reply>
    <value>some.body@some.where</value>
    <value>some.body@some.planet</value>
  </reply>
  <includeDiagnostics>false</includeDiagnostics>
</soundingRequest>
```

3.2 Check the status of a HYSPLIT dispersion calculation

The status of a dispersion simulation can be checked using this endpoint. Note that each API call for checking run status will count toward your daily limit.

Endpoint	GET /api/v1/disp/status/{***UUID***}	
Authentication	required	Use your API key. Users receive a document on authentication upon registration.
Request		Replace {***UUID***} in the endpoint with the UUID that you received after making an API call for a dispersion calculation.
Request body	not used	
Response format	json, xml, or text/plain	Use the “Accept” header with application/json, application/xml, or text/plain.
Response body		The job status may be QUEUED, RUNNING, CRASHED, GRAPHICS_RUNNING, GRAPHICS_FAILED, COMPLETED, and EXPIRED. The number of API calls and the daily limit are also included in the response.

An example output is shown below. The run status is COMPLETED, indicating the trajectory calculation is finished.

```
{
  "uuid":"5fd8a9d7-5dc7-4184-a0aa-06f2f517e8c4",
  "jobStatus":"COMPLETED",
  "dailyCounts":{
    "limit":250,
    "calls":17
  }
}
```


3.3 Downloading output files of a HYSPLIT dispersion calculation

Upon successful completion of a calculation, a zip file containing the results is automatically created. The zip file includes cdump (a concentration dump file), SETUP.CFG and CONTROL (which are HYSPLIT input files), and MESSAGE (a HYSPLIT diagnostics file). If graphics files are created, they are added to the zip file as hysplit.gif, hysplit.kmz, and/or gis.zip. See the graphic input field in Sec. 3.1. Note that each API call for downloading a zip file will count toward your daily limit.

Endpoint	GET /api/v1/disp/download/{***UUID***}	
Authentication	required	Use your API key. Users receive a document on authentication upon registration.
Request		Replace {***UUID***} in the endpoint with the UUID that you received after making an API call for a dispersion calculation.
Request body	not used	
Response format	zip	The response format is fixed to application/zip and it cannot be changed.
Response body		Returns the content of the zip file.

A. Supported meteorology

The following meteorological data files are supported by the API. Note that the names are case-insensitive. For example, GFS, Gfs, and gfs are equivalent.

Name	**Description**	**Update frequency**
GFS	1 degree, 384 h, 3 hourly, global, pressure; The long range model is included.	4 times a day
GFS0p25	0.25 degree, 84 h, 3 hourly, global, sigma-pressure	4 times a day

	hybrid	
HRRR	3 km, 18 h, 1 hourly, CONUS, sigma	every hour
NAM12 (aka NAM)	12 km, 84 h, 3 hourly, CONUS, pressure	4 times a day
NAMHUS (aka NAMS)	12 km, 48 h, 1 hourly, CONUS, pressure-sigma hybrid	4 times a day
NAMHAK (aka NAMSAK)	12 km, 48 h, 1 hourly, Alaska, pressure-sigma hybrid	4 times a day
NAMHHI (aka NAMSHI)	2 km, 48 h, 1 hourly, Hawaii, pressure-sigma hybrid	4 times a day
NAMCNEST (aka CONUS)	3 km, 48 h, 1 hourly, CONUS, pressure-sigma hybrid	4 times a day
FIREWX	1 km, 36 h, 1 hourly, Spatial domain may vary from run to run. Current firewx domain maps at https://www.ready.noaa.gov/ready2-bin/domain_fw.pl. Note FIREWX is not available for the sounding API.	4 times a day
GDAS1 (aka ARCH)	1 degree, December 2004 to current week, 3 hourly, global.	-