



## COVE API User's Guide

The Committee on Earth Observation Satellites (CEOS) Visualization Environment (COVE) application programming interface (API) is a suite of endpoints for executing tasks and retrieving results for a collection of COVE tools.

All tasks created using the COVE API will be available in the COVE UI, and all tasks create in the COVE UI will be available in the COVE API.

A valid COVE username and password are required for all requests. A COVE login may be created in the COVE UI by clicking on the Log In/Register link in the upper right corner.

COVE tool API sets are throttled to help reduce system overload. Throttle limits are subject to change if the need arises. The throttle limits will be detailed in each tool section below, and will be updated in this document as changes are made.

To submit a request to the service, include the appropriate JSON payload into the body of a POST request to the endpoint. Requests should include the trailing slash in the url. Examples using curl with each type of request are provided in each section below.

All responses will either be a JSON response or a binary file. All failed responses will be in JSON format, and will include a status (standard HTTP status code).

Execution start in all task status responses are in UTC time.

For CSV files use unicode UTF-8.

Please refer to the [COVE UI User's Guide](#) for more information on the usage of each COVE tools.

The COVE tools with COVE API endpoints include:

- **Acquisition Forecaster** – A set of endpoints which provides users with the ability to execute a task in the Acquisition Forecaster tool, and retrieve results of the task (status, CSV, PNG).

- **Coverage Analyzer** – A set of endpoints which provides users with the ability to execute a task in the Coverage Analyzer tool, and retrieve results of the task (status, CSV, PNG, GeoTiff, and NetCDF).
- **Revisits Calculator** – A set of endpoints which provides users with the ability to execute a task in the Revisits Calculator tool, and retrieve results of the task (status, JSON, CSV, PNG).
- **Coincident Calculator** – A set of endpoints which provides users with the ability to execute a task in the Coincident Calculator Tool (Forecasted or Archived), retrieve results of the task (status, JSON, PNG), and includes endpoints which lists details of constellations available (archived or forecasted).
- **Data Browser** – A set of endpoints which provides users with the ability to execute a task in the Data Browser tool, and retrieve results of the task (status, count, CSV, PNG).
- **Country Coverage** – A set of endpoints which provides users with the ability to execute a task in the Country Coverage tool, and retrieve results of the task (status, PDF, CSV, and PNG).
- **Utilities** – A set of endpoints for access to COVE utilities.

Other COVE API endpoints included in this document are:

- **Missions**
  - **forecasted** – An endpoint for Acquisition Forecaster, Coincident Calculator, and Revisits Calculator which lists details on forecasted missions available.
  - **archived** – An endpoint for Coverage Analyzer, Coincident Calculator, and Data Browser which lists details on archived missions available.
- **Custom Missions** – An endpoint for Acquisition Forecaster, Coincident Calculator, and Revisits Calculator which lists details on custom missions available.
- **Regions** – A set of endpoints which provides users with the ability to list, retrieve, and create a custom region of interest which may be used in Acquisition Forecaster, Coincident Calculator, Coverage Analyzer, Revisits Calculator, and Data Browser.

## Acquisition Forecaster

Acquisition Forecaster is tool that provides users with the ability to predict when a satellite has the ability to image a region of interest. Users may send requests for a task history, submit a new task, get a task status, retrieve a CSV with scene metadata, and retrieve a PNG map image of the task results.

Acquisition Forecaster throttle limits:

- POST: 5 requests per hour
- GET: 25 requests per hour

### Retrieve task history

Lists all Acquisition Forecaster tasks in COVE for the user. The results includes task ids which will allow users to retrieve results for existing tasks.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/acquisition\\_forecaster/](https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/)

URL Parameters: None

Response Example:

```
[
  {
    "task_id": "<TASK ID>",
    "missions": [
      {
        "mission": "Sentinel-1A",
        "instrument": "C-SAR",
        "mode": "IWS"
      }, {
        "mission": "Sentinel-2A",
        "instrument": "MSI",
        "mode": ""
      }
    ],
    "custom_missions": [{
      "mission": "MissionA",
```

```

        "instrument": "BeamA"
    }],
    "start_date": "2019-01-01",
    "end_date": "2019-01-08",
    "region": "Ghana"
}
]

```

## Submit a task

### Task Input Parameters for Acquisition Forecaster:

Parameter Name	Data Type	Required	Description
start_date	DateString	Yes	Range: mission launch date to three month from the latest TLE date. Valid dates may be found by submitting a COVE API request for the Missions forecasted list. Refer to the Special Data Types section for more information on DateString.
end_date	DateString	Yes	Range: mission launch date to three month from the latest TLE date. Valid dates may be found by submitting a COVE API request for the Missions forecasted list. Refer to the Special Data Types section for more information on DateString.
region_folder	String	Yes	Valid folder names may be found by requesting the Regions list.
region	String	Yes	Valid region names may be found by submitting a COVE API request for the Regions list.
custom_missions	CustomMissionsFilter[]	No	Custom missions may be created in the COVE UI. See the COVE UI User's Guide for more information. Valid custom missions may be found by submitting a COVE API request for the Custom Missions list. Refer to the Special Data Types section for more information on CustomMissionsFilter.
missions	MissionsFilter[]	No	Valid missions may be found by submitting a COVE API request for

Parameter Name	Data Type	Required	Description
			the Missions forecasted list. Refer to the Special Data Types section for more information on MissionsFilter.

Request Data Example:

```
{
  "start_date": "2020-01-01",
  "end_date": "2020-01-31",
  "region_folder": "Africa",
  "region": "Kenya",
  "custom_missions": [{
    "mission": "MissionA",
    "instrument": "BeamA"
  }],
  "missions": [{
    "mission": "Sentinel-1A",
    "instrument": "C-SAR",
    "mode": "IWS"
  }]
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/acquisition\\_forecaster/](https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/)

URL Parameters: None

Response Examples:

Example successful response from request where the results are not ready to retrieve:

```
{"status": 202, "message": "Acquisition Forecaster task as been submitted. Please wait for the results.", "id": "<TASK ID>"}
```

Example successful response from a request where the results are ready to retrieve:

```
{"status": 200, "message": "Acquisition Forecaster results are ready", "id": "<TASK ID>"}
```

Failed Response Examples:

```
{"status": 400, "message": "<Error Message>"}
```

```
{"status": 417, "message": "<Error Message>"}
```

## Retrieve task status

Once a task has been submitted, users should periodically check the task status.

Status codes:

- 200: task has completed
- 202: task is still running
- 417: task has terminated in an error

If the status code is 200 and success is true, it indicates the task has predicted scenes.

If a status code 200 is received, users may send a request for CSV or PNG results.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/acquisition\\_forecaster/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/<TASK_ID>)

URL Parameters: None

Response Example:

```
{
  "execution_start": "2020-09-16 18:19:19",
  "execution_time": "00:01:34",
  "start_date": "2017-01-01",
  "end_date": "2017-01-08",
  "modes": "MSI - Sentinel-2A,IWS - C-SAR - Sentinel-1A,BeamA - MissionA",
  "region": "Ghana",
  "complete": true,
  "status": 200,
  "message": "Task successfully completed.",
  "success": true
}
```

## Retrieve CSV file

The CSV file (binary) will contain the predicted scene metadata generated for the task. The CSV file contains the columns: name, acquisition\_time, tle\_epoch, final\_prediction, db\_insert\_date, center\_latitude, center\_longitude, orbit\_direction, scene\_coords.

Request Method: GET

Request URL:

https://ceos-cove.org/en/api/v1\_0/acquisition\_forecaster/csv/<TASK ID>/

URL Parameters: None

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

### Retrieve PNG map image

The PNG image file is a map image which outlines scenes on a map of the requested region of interest within the start date and end date for the task.

Request Method: GET

Request URL:

https://ceos-cove.org/en/api/v1\_0/acquisition\_forecaster/png/<TASK ID>/

URL Parameters:

Parameter Name	Data Type	Required	Description
orbit_direction	String	No	Values: ascending or descending. No orbit_direction will return results for both ascending and descending.

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

### Example API requests using curl

Request user history:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/acquisition_forecaster/
```

Request for Acquisition Forecaster task:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"start_date": "2017-01-01", "end_date": "2017-01-08", "region_folder": "Africa", "region": "Ghana", "custom_missions": [{"mission": "MissionA", "instrument":
```

```
"InstA"}], "missions": [{"mission": "Sentinel-1A", "instrument": "C-SAR", "mode": "IWS"}, {"mission": "Sentinel-2A", "instrument": "MSI"}]}' https://ceos-cove.org/en/api/acquisition_forecaster/
```

Request task status:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/acquisition_forecaster/<TASK ID>/
```

Request CSV results:

```
curl -u username:password https://ceos-cove.org/en/api/acquisition_forecaster/csv/<TASK ID>/ -o filename.csv
```

Request PNG map image (orbit direction: all):

```
curl -u username:password https://ceos-cove.org/en/api/acquisition_forecaster/png/<TASK ID>/ -o filename.png
```

Request PNG map image (orbit direction: ascending):

```
curl -u username:password https://ceos-cove.org/en/api/acquisition_forecaster/png/<TASK ID>/?orbit_direction=ascending -o filename.png
```

Request PNG map image (orbit direction: descending):

```
curl -u username:password https://ceos-cove.org/en/api/acquisition_forecaster/png/<TASK ID>/?orbit_direction=descending -o filename.png
```



# Coverage Analyzer

Coverage Analyzer is a tool that provides users with the ability to analyze the historical satellite coverage of a region of interest. Users may send requests for a task history, submit a new task, get a task status, retrieve a CSV with scene metadata, retrieve a PNG map image of the task results, retrieve a GeoTiff file, and retrieve a NetCDF file.

Coverage Analyzer throttle limits:

- POST: 5 requests per hour
- GET: 25 requests per hour

## Retrieve user history

Lists all Coverage Analyzer tasks in COVE for the user. The results includes task ids which will allow users to retrieve results for existing tasks.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coverage\\_analyzer/](https://ceos-cove.org/en/api/v1_0/coverage_analyzer/)

URL Parameters: None

Response Example:

```
[
  {
    "task_id": "<TASK ID>",
    "missions": [
      {
        "mission": "Sentinel-2A",
        "instrument": "MSI",
        "mode": ""
      }
    ],
    "start_date": "2019-01-01",
    "end_date": "2019-01-08",
    "region": "Ghana"
    "filter_options": {}
  },
]
```

## Submit a task

### Task Input Parameters for Coverage Analyzer:

Parameter Name	Data Type	Required	Description
start_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions archived list. Refer to the Special Data Types section for more information on DateString.
end_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions archived list. Refer to the Special Data Types section for more information on DateString.
region_folder	String	Yes	Valid folder names may be found by requesting the Regions list.
region	String	Yes	Valid region names may be found by submitting a COVE API request for the Regions list.
missions	MissionsFilter[]	Yes	Valid missions may be found by submitting a COVE API request for the Missions archived list. Refer to the Special Data Types section for more information on MissionsFilter.
discretization	DiscretizationFilter	Yes	Refer to the Special Data Types section for more information on DiscretizationFilter.
filters	MetadataFilter	No	Refer to the Special Data Types section for more information on MetadataFilter.

### Request Data Example:

```
{
  "start_date": "2020-01-01",
  "end_date": "2020-01-31",
  "region_folder": "South America",
  "region": "Argentina",
  "missions": [{
    "mission": "Sentinel-1A",
    "instrument": "C-SAR",
    "mode": "IWS"
  }
]
```

```
  }],
  "discretization": {
    "type": "",
    "size": 1.0,
    "unit": "deg",
    "include_overlap": false
  },
  "filters": {
    "cloud_cover": null,
    "day_night": "",
    "orbit_direction": "",
    "processing_level": ""
  }
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coverage\\_analyzer/](https://ceos-cove.org/en/api/v1_0/coverage_analyzer/)

URL Parameters: None

Response Examples:

Example successful response from request where the results are not ready to retrieve:

```
{"status": 202, "message": "Coverage Analyzer task as been submitted. Please wait for the results.", "id": "<TASK ID>"}
```

Example successful response from a request where the results are ready to retrieve:

```
{"status": 200, "message": "Coverage Analyzer results are ready", "id": "<TASK ID>"}
```

Failed Response Examples:

```
{"status": 400, "message": "<Error Message>"}
```

```
{"status": 417, "message": "<Error Message>"}
```

## Retrieve task status

Once a task has been submitted, users should periodically check the task status.

Status codes:

- 200: task has completed
- 202: task is still running
- 417: task has terminated in an error

If the status code is 200 and success is true, it indicates the task has scene data.

If a status code 200 is received, users may send a request for CSV, PNG, NetCDF, or GeoTIFF results.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coverage\\_analyzer/<TASK\\_ID>/](https://ceos-cove.org/en/api/v1_0/coverage_analyzer/<TASK_ID>)

URL Parameters: None

Response Example:

```
{
  "execution_start": "2020-09-18 11:56:42",
  "execution_time": "00:01:02",
  "start_date": "2019-01-01",
  "end_date": "2019-01-08",
  "modes": "IWS - C-SAR - Sentinel-1A",
  "region": "Africa: Ghana",
  "discretization": "0.5 deg",
  "filter_options": {},
  "complete": true,
  "status": 200,
  "message": "Task successfully completed.",
  "success": true
}
```

## Retrieve CSV results

The CSV file (binary) will contain the scene metadata for the task. The CSV file contains the columns:

- Landsat:  
name, acquisition\_date, browse\_url, order\_url, land\_cloud\_cover, day\_night\_indicator, scene\_coords
- Sentinel-1:  
name, acquisition\_date, browse\_url, order\_url, processing\_level, orbit\_direction, scene\_coords

- Sentinel-2:  
name, acquisition\_date, browse\_url, order\_url, orbit\_direction, cloud\_cover\_full,  
scene\_coords

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coverage\\_analyzer/csv/<TASK\\_ID>/](https://ceos-cove.org/en/api/v1_0/coverage_analyzer/csv/<TASK_ID>)

URL Parameters: None

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

### **Retrieve PNG results**

The PNG image file shows the discretized region of interest on a map where the color of each block in the discretized region reflects the number of scenes intersecting the block for the start date and end date and for the missions requested in the task.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coverage\\_analyzer/png/<TASK\\_ID>/](https://ceos-cove.org/en/api/v1_0/coverage_analyzer/png/<TASK_ID>)

URL Parameters: None

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

### **Retrieve GeoTIFF results**

The file exported will be in GeoTIFF format (file extension .tif).

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coverage\\_analyzer/geotiff/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/coverage_analyzer/geotiff/<TASK ID>)

URL Parameters: None

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## Retrieve NetCDF results

The file exported will be in NetCDF format (file extension .nc).

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coverage\\_analyzer/netcdf/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/coverage_analyzer/netcdf/<TASK ID>)

URL Parameters: None

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## Example API requests using curl

Request user history:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/coverage_analyzer/
```

Request for Coverage Analyzer task:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"start_date": "2019-01-01", "end_date": "2019-01-08", "region_folder": "Africa", "region": "Ghana", "missions": [{"mission": "Sentinel-1A", "instrument": "C-SAR", "mode": "IWS"}], "discretization": {"type": "", "size": 1.0, "unit": "deg"}, "filters": {"cloud_cover": null, "day_night": "", "orbit_direction": "", "processing_level": ""}}' https://ceos-cove.org/en/api/coverage_analyzer/
```

Request task status:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-
```

cove.org/en/api/coverage\_analyzer/<TASK ID>/

Request CSV File:

```
curl -u username:password https://ceos-cove.org/en/api/coverage_analyzer/csv/<TASK ID>/ -o filename.csv
```

Request PNG map image:

```
curl -u username:password https://ceos-cove.org/en/api/coverage_analyzer/png/<TASK ID>/ -o filename.png
```

Request GeoTIFF File:

```
curl -u username:password https://ceos-cove.org/en/api/coverage_analyzer/geotiff/<TASK ID>/ -o filename.tif
```

Request NetCDF File:

```
curl -u username:password https://ceos-cove.org/en/api/coverage_analyzer/netcdf/<TASK ID>/ -o filename.nc
```

## Revisits Calculator

Revisits Calculator is a tool which allows users to analyze estimated satellite coverage and revisits for a region of interest. Users may send requests for a task history, submit a new task, get a task status, retrieve JSON results, retrieve a CSV with scene metadata, and retrieve a PNG map image of the task results.

Revisits Calculator throttle limits:

- POST: 5 requests per hour
- GET: 25 requests per hour

### Retrieve user history

Lists all Revisits Calculator tasks in COVE for the user. The results includes task ids which will allow users to retrieve results for existing tasks.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/revisits\\_calculator/](https://ceos-cove.org/en/api/v1_0/revisits_calculator/)

URL Parameters: None

Response Example:

```
[
  {
    "task_id": "<TASK ID>",
    "missions": [
      {
        "mission": "Sentinel-1A",
        "instrument": "C-SAR",
        "mode": "IWS"
      }, {
        "mission": "Sentinel-2A",
        "instrument": "MSI",
        "mode": ""
      }
    ],
    "custom_missions": [{
      "mission": "MissionA",
```



```

        "instrument": "BeamA"
    }],
    "start_date": "2019-01-01",
    "end_date": "2019-01-08",
    "region": "Ghana"
}
]

```

## Submit a task

### Task Input Parameters for Revisits Calculator:

Parameter Name	Data Type	Required	Description
start_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions forecasted list. Refer to the Special Data Types section for more information on DateString.
end_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions forecasted list. Refer to the Special Data Types section for more information on DateString.
region_folder	String	Yes	Valid folder names may be found by requesting the Regions list.
region	String	Yes	Valid region names may be found by submitting a COVE API request for the Regions list.
custom_missions	CustomMissionsFilter[]	No	Custom missions may be created in the COVE UI. See the COVE UI User's Guide for more information. Valid custom missions may be found by submitting a COVE API request for the Custom Missions list. Refer to the Special Data Types section for more information on CustomMissionsFilter.
missions	MissionsFilter[]	No	Valid missions may be found by submitting a COVE API request for the Missions forecasted list. Refer to the Special Data Types section

Parameter Name	Data Type	Required	Description
discretization	DiscretizationFilter	Yes	for more information on MissionsFilter. Refer to the Special Data Types section for more information on DiscretizationFilter.

Request Data Example:

```
{
  "start_date": "2020-01-01",
  "end_date": "2020-01-31",
  "region_folder": "Africa",
  "region": "Botswana",
  "custom_missions": [],
  "missions": [{
    "mission": "Sentinel-2A",
    "instrument": "MSI",
    "mode": ""
  }],
  "discretization": {
    "type": "S2Tiling",
    "size": null,
    "unit": ""
  }
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/revisits\\_calculator/](https://ceos-cove.org/en/api/v1_0/revisits_calculator/)

URL Parameters: None

Response Examples:

Example successful response from request where the results are not ready to retrieve:

```
{"status": 202, "message": "Revisits Calculator task as been submitted. Please wait for the results.", "id": "<TASK ID>"}
```

Example successful response from a request where the results are ready to retrieve:

```
{"status": 200, "message": "Revisits Calculator results are ready", "id": "<TASK ID>"}
```

### Failed Response Examples:

```
{"status": 400, "message": "<Error Message>"}
```

```
{"status": 417, "message": "<Error Message>"}
```

## **Retrieve task status**

Once a task has been submitted, users should periodically check the task status.

Status codes:

- 200: task has completed
- 202: task is still running
- 417: task has terminated in an error

If the status code is 200 and success is true, it indicates the task has scene data.

If a status code 200 is received, users may send a request for JSON, CSV, or PNG results.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/revisits\\_calculator/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/revisits_calculator/<TASK ID>)

URL Parameters: None

Response Example:

```
{
  "execution_start": "2020-09-17 22:27:20",
  "execution_time": "00:00:07",
  "start_date": "2019-01-02",
  "end_date": "2019-01-03",
  "modes": "IWS - C-SAR - Sentinel-1A",
  "region": "Africa: Ghana",
  "discretization": "1.0 deg",
  "complete": true,
  "status": 200,
  "message": "Task successfully completed.",
  "success": true
}
```

## Retrieve JSON results

The JSON results will contain a list of coordinates for each discretized block in the region of interest. In each discretized block, it will show a title, count of scenes in the block, mean time between revisits, median time between revisits, maximum time between revisits, and minimum time between revisits in the block for ascending orbit, descending orbit, or both.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/revisits\\_calculator/json/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/revisits_calculator/json/<TASK_ID>)

URL Parameters: None

Response Example:

```
{
  "0.0,5.0,0.0,6.0,1.0,6.0,1.0,5.0,0.0,5.0": {
    "title": "Region Discretization Longitude 0.0, Latitude 5.0",
    "revisits": 2,
    "minimum": "12:23:00",
    "median": "12:23:00",
    "mean": "12:23:00",
    "maximum": "12:23:00",
    "desc_revisits": 1,
    "desc_minimum": "0:00:00",
    "desc_median": "0:00:00",
    "desc_mean": "0:00:00",
    "desc_maximum": "0:00:00",
    "count": 2,
    "asc_revisits": 1,
    "asc_minimum": "0:00:00",
    "asc_median": "0:00:00",
    "asc_mean": "0:00:00",
    "asc_maximum": "0:00:00"
  },
  (JSON RESULTS TRUNCATED)
}
```

## Retrieve CSV results

The CSV file (binary) will contain the scene metadata for the task. The CSV file contains the columns: name, acquisition\_time, tle\_epoch, final\_prediction, db\_insert\_date, center\_latitude,

center\_longitude, orbit\_direction, scene\_coords.

Request Method: GET

Request URL:

https://ceos-cove.org/en/api/v1\_0/revisits\_calculator/csv/<TASK ID>/

URL Parameters: None

Failed Response Examples:

```
{"status": 400, "message": "<Error Message>"}
```

```
{"status": 417, "message": "<Error Message>"}
```

### Retrieve PNG results

The PNG image file shows the discretized region of interest on a map where the color of each block in the discretized region reflects the number of times missions/custom missions intersect the block within the start date and end date for the task.

Request Method: GET

Request URL:

https://ceos-cove.org/en/api/v1\_0/revisits\_calculator/png/<TASK ID>/

URL Parameters:

Parameter Name	Data Type	Required	Description
orbit_direction	String	No	Values: ascending or descending. No orbit_direction will return results for both ascending and descending.

Failed Response Examples:

```
{'status': 404, 'message': 'File not found.'}
```

## Example API requests using curl

### Request user history:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/revisits_calculator/
```

### Request for Revisits Calculator task:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"start_date": "2019-01-01", "end_date": "2019-01-08", "region_folder": "Africa", "region": "Ghana", "custom_missions": [], "missions": [{"mission": "Sentinel-1A", "instrument": "C-SAR", "mode": "IWS"}], "discretization": {"type": "", "size": 1.0, "unit": "deg"}}' https://ceos-cove.org/en/api/revisits_calculator/
```

### Request task status:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/revisits_calculator/<TASK ID>/
```

### Request JSON File:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/revisits_calculator/json/<TASK ID>/
```

### Request CSV File:

```
curl -u username:password https://ceos-cove.org/en/api/revisits_calculator/csv/<TASK ID>/ -o filename.csv
```

### Request PNG map image:

```
curl -u username:password https://ceos-cove.org/en/api/revisits_calculator/png/<TASK ID>/ -o filename.png
```

### Request PNG map image (orbit direction: ascending):

```
curl -u username:password https://ceos-cove.org/en/api/revisits_calculator/png/<TASK ID>/?orbit_direction=ascending -o filename.png
```

### Request PNG map image (orbit direction: descending):

```
curl -u username:password https://ceos-cove.org/en/api/revisits_calculator/png/<TASK ID>/?orbit_direction=descending -o filename.png
```

## Coincident Calculator

Coincident Calculator is a tool which allows users to determine the coincidence of satellite instrument modes and/or custom constellations observing a location in the same day within a region of interest using historical (archived) or predicted (forecasted) scene data. Users may send requests for a task history, submit a new task, get a task status, retrieve JSON results, and retrieve a PNG map image of the task results.

Coincident Calculator throttle limits:

- POST: 5 requests per hour
- GET: 25 requests per hour

## Forecasted Task

### Retrieve forecasted constellations list

Lists all custom forecasted constellations in Coincident Calculator in COVE for the user.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coinincident\\_calculator/forecasted/constellations/](https://ceos-cove.org/en/api/v1_0/coinincident_calculator/forecasted/constellations/)

URL Parameters: None

Response Example:

```
{
  "constellations": {
    "Landsat 7/8": {
      "missions": [
        "Landsat 7 - ETM",
        "Landsat 8 - TIRS"
      ],
      "custom_missions": []
    },
    "CBERS4_SatA": {
      "missions": [
        "CBERS-4 - MUXCam"
      ]
    }
  }
}
```

```

    ],
    "custom_missions": [
      "SatA - BeamA"
    ]
  }
}
}

```

## Retrieve user history

Lists all forecasted Coincident Calculator tasks in COVE for the user. The results includes task ids which will allow users to retrieve results for existing tasks.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/forecasted/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/)

URL Parameters: None

Response Example:

```

[
  {
    "task_id": "<TASK ID>",
    "missions": [
      {
        "mission": "Sentinel-1A",
        "instrument": "C-SAR",
        "mode": "IWS"
      }, {
        "mission": "Sentinel-2A",
        "instrument": "MSI",
        "mode": ""
      }
    ],
    "custom_missions": [],
    "constellations": [],
    "start_date": "2019-01-01",
    "end_date": "2019-01-08",
    "region": "Ghana"
  },
]

```



## Submit a task

### Task Input Parameters for Coincident Calculator (Forecasted):

Parameter Name	Data Type	Required	Description
start_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions forecasted list. Refer to the Special Data Types section for more information on DateString.
end_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions forecasted list. Refer to the Special Data Types section for more information on DateString.
region_folder	String	Yes	Valid folder names may be found by requesting the Regions list.
region	String	Yes	Valid region names may be found by submitting a COVE API request for the Regions list.
constellations	ConstellationsFilter[]	No	Constellations may be created in the COVE UI. See the COVE UI User's Guide for more information. Refer to the Special Data Types section for more information on ConstellationsFilter.
custom_missions	CustomMissionsFilter[]	No	Custom missions may be created in the COVE UI. See the COVE UI User's Guide for more information. Valid custom missions may be found by submitting a COVE API request for the Custom Missions list. Refer to the Special Data Types section for more information on CustomMissionsFilter.
missions	MissionsFilter[]	No	Valid missions may be found by submitting a COVE API request for the Missions forecasted list. Refer to the Special Data Types section for more information on MissionsFilter.
discretization	DiscretizationFilter	Yes	Refer to the Special Data Types

Parameter Name	Data Type	Required	Description
coincidence_days	integer	No	section for more information on DiscretizationFilter. Range: 0 to 5, defaults to 0.

Request Data Example:

```
{
  "start_date": "2020-01-01",
  "end_date": "2020-01-31",
  "region_folder": "North America",
  "region": "Canada",
  "constellations": [],
  "custom_missions": [],
  "missions": [
    {
      "mission": "Sentinel-1A",
      "instrument": "C-SAR",
      "mode": "IWS"
    }, {
      "mission": "Sentinel-2A",
      "instrument": "MSI",
      "mode": ""
    }
  ],
  "discretization": {
    "size": 1.0,
    "unit": "deg"
  },
  "coincidence_days": 0
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/forecasted/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/)

URL Parameters: None

Response Examples:

Example successful response from request where the results are not ready to retrieve:

```
{"status": 202, "message": "Coincident Calculator task as been submitted. Please wait for the results.", "id": "<TASK ID>"}
```

Example successful response from a request where the results are ready to retrieve:

```
{"status": 200, "message": "Coincident Calculator results are ready", "id": "<TASK ID>"}
```

#### Failed Response Examples:

```
{"status": 400, "message": "<Error Message>"}
```

```
{"status": 417, "message": "<Error Message>"}
```

## **Retrieve task status**

Once a task has been submitted, users should periodically check the task status.

Status codes:

- 200: task has completed
- 202: task is still running
- 417: task has terminated in an error

If the status code is 200 and success is true, it indicates the task has scene data.

If a status code 200 is received, users may send a request for JSON or PNG results.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/forecasted/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/<TASK ID>)

URL Parameters: None

Response Example:

```
{
  "execution_start": "2020-09-14 12:38:34",
  "execution_time": "00:00:04",
  "start_date": "2019-01-01",
  "end_date": "2019-01-08",
  "modes": "IWS - C-SAR - Sentinel-1A, MSI - Sentinel-2A",
  "constellations": "",
  "region": "Ghana",
  "discretization": "1.0 deg",
  "coincidence_days": 0,
  "complete": true,
  "status": 200,
  "message": "Task successfully completed.",
}
```

```
"success": true
}
```

## Retrieve JSON results

The JSON results will contain a list of coordinates for each discretized block in the region of interest. In each discretized block, it will show a title, coincidence dates, scene (acquisition) metadata, coincidence count, coincidence (dates and count) where scenes are ascending, coincidence where scenes are descending.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/forecasted/json/<TASK\\_ID>/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/json/<TASK_ID>)

URL Parameters: None

Response Example:

```
{
  "0.0,8.0,0.0,9.0,1.0,9.0,1.0,8.0,0.0,8.0": {
    "title": "Region Discretization Longitude 0.0, Latitude 8.0",
    "coincidence": "2019-01-06",
    "acquisitions": [
      {
        "name": "Landsat 8 - TIRS",
        "acquisition_time": "2019-01-06 10:20:30",
        "tle_epoch": "2019-01-06 02:58:25",
        "final_prediction": false,
        "db_insert_date": "2020-09-18",
        "center_latitude": 10.27,
        "center_longitude": -0.57,
        "orbit_direction": "Descending",
        "scene_coords": "0.6660363424876055,11.962612495110209,-
1.014522933011194,12.203808739278776,-1.7926181561449557,8.578126402975682,-
0.13054000602536892,8.339640664025538,0.6660363424876055,11.962612495110209"
      },
      {
        "name": "CBERS-4 - MUXCam",
        "acquisition_time": "2019-01-06 22:05:30",
        "tle_epoch": "2019-01-06 22:03:25",
        "final_prediction": false,
        "db_insert_date": "2020-09-18",
        "center_latitude": 7.42,
        "center_longitude": -0.39,
        "orbit_direction": "Ascending",
        "scene_coords": "-
0.5336858426123086,5.553900730294913,0.5330482808132545,5.710459991383701,-
```

```

0.24584157033903395,9.280660729314569,-1.320750071368642,9.12287381737216,-
0.5336858426123086,5.553900730294913"
    }
  ],
  "coincidence_asc": "",
  "coincidence_desc": "",
  "coincidence_count": 1,
  "coincidence_asc_count": 0,
  "coincidence_desc_count": 0
},
(JSON RESULTS TRUNCATED)
}

```

## Retrieve PNG results

The PNG image file shows the discretized region of interest on a map where the color of each block in the discretized region reflects the number of pairs of missions/custom missions/constellations intersecting the block within the start date and end date for the task.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/forecasted/png/<TASK\\_ID>/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/png/<TASK_ID>)

URL Parameters:

Parameter Name	Data Type	Required	Description
orbit_direction	String	No	Values: ascending or descending. No orbit_direction will return results for both ascending and descending.

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## Example API requests using curl

Request user history:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/coincident_calculator/forecasted/
```

Request for Forecasted Coincident Calculator task:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d
```

```
'{"start_date": "2019-01-01", "end_date": "2019-01-08", "region_folder": "Africa",  
"region": "Ghana", "constellations": [], "custom_missions": [], "missions":  
[{"mission": "Sentinel-1A", "instrument": "C-SAR", "mode": "IWS"}, {"mission":  
"Sentinel-2A", "instrument": "MSI"}], "discretization": {"size": 1.0, "unit":  
"deg"}, "coincidence_days": 0}' https://ceos-  
cove.org/en/api/coincident_calculator/forecasted/
```

#### Request forecasted custom constellations list:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-  
cove.org/en/api/coincident_calculator/forecasted/constellations/
```

#### Request task status:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-  
cove.org/en/api/coincident_calculator/forecasted/<TASK ID>/
```

#### Request JSON File:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-  
cove.org/en/api/coincident_calculator/forecasted/json/<TASK ID>/
```

#### Request PNG map image:

```
curl -u username:password https://ceos-cove.org/en/api/coincident_calculator/  
forecasted/png/<TASK ID>/ -o filename.png
```

#### Request PNG map image (orbit direction: ascending):

```
curl -u username:password https://ceos-cove.org/en/api/coincident_calculator/  
forecasted/png/<TASK ID>/?orbit_direction=ascending -o filename.png
```

#### Request PNG map image (orbit direction: descending):

```
curl -u username:password https://ceos-cove.org/en/api/coincident_calculator/  
forecasted/png/<TASK ID>/?orbit_direction=descending -o filename.png
```

## Archived Task

### Retrieve archived constellations list

Lists all custom archived constellations in Coincident Calculator in COVE for the user.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/archived/constellations/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/constellations/)

URL Parameters: None

Response Example:

```
{
  "constellations": {
    "L7/8": [
      "Landsat 7 - ETM",
      "Landsat 8 - OLI/TIRS"
    ],
    "S1": [
      "Sentinel-1A - C-SAR - EW",
      "Sentinel-1A - C-SAR - IWS",
      "Sentinel-1A - C-SAR - SM",
      "Sentinel-1A - C-SAR - WV",
      "Sentinel-1B - C-SAR - EW",
      "Sentinel-1B - C-SAR - IWS",
      "Sentinel-1B - C-SAR - SM",
      "Sentinel-1B - C-SAR - WV"
    ]
  }
}
```

## Retrieve user history

Lists all archived Coincident Calculator tasks in COVE for the user. The results includes task ids which will allow users to retrieve results for existing tasks.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/archived/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/)

URL Parameters: None

Response Example:

```
[
  {
    "task_id": "<TASK ID>",
    "missions": [
```

```

    {
      "mission": "Sentinel-1A",
      "instrument": "C-SAR",
      "mode": "IWS"
    }, {
      "mission": "Landsat 8",
      "instrument": "OLI/TIRS",
      "mode": ""
    }
  ],
  "constellations": [],
  "start_date": "2019-01-01",
  "end_date": "2019-01-08",
  "region": "Ghana"
}
]

```

## Submit a task

### Task Input Parameters for Coincident Calculator (Archived):

Parameter Name	Data Type	Required	Description
start_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions archived list. Refer to the Special Data Types section for more information on DateString.
end_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions archived list. Refer to the Special Data Types section for more information on DateString.
region_folder	String	Yes	Valid folder names may be found by requesting the Regions list.
region	String	Yes	Valid region names may be found by submitting a COVE API request for the Regions list.
constellations	ConstellationsFilter[]	No	Constellations may be created in the COVE UI. See the COVE UI User's Guide for more information. Refer to the Special Data Types section for more information on ConstellationsFilter.



Parameter Name	Data Type	Required	Description
missions	MissionsFilter[]	Yes	Valid missions may be found by submitting a COVE API request for the Missions archived list. Refer to the Special Data Types section for more information on MissionsFilter.
discretization	DiscretizationFilter	Yes	Refer to the Special Data Types section for more information on DiscretizationFilter.
coincidence_days	integer	No	Range: 0 to 5, defaults to 0.

Request Data Example:

```
{
  "start_date": "2020-01-01",
  "end_date": "2020-01-31",
  "region_folder": "Oceania",
  "region": "Australia",
  "constellations": [],
  "missions": [],
  "discretization": {
    "size": 1.0,
    "unit": "deg"
  },
  "coincidence_days": 1
}
```

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/archived/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/)

URL Parameters: None

Response examples:

Example successful response from request where the results are not ready to retrieve:

```
{"status": 202, "message": "Coincident Calculator task as been submitted. Please wait for the results.", "id": "<TASK ID>"}
```

Example successful response from a request where the results are ready to retrieve:

```
{"status": 200, "message": "Coincident Calculator results are ready", "id": "<TASK ID>"}
```

### Failed Response Examples:

```
{"status": 400, "message": "<Error Message>"}
```

```
{"status": 417, "message": "<Error Message>"}
```

## **Retrieve task status**

Once a task has been submitted, users should periodically check the task status.

Status codes:

- 200: task has completed
- 202: task is still running
- 417: task has terminated in an error

If the status code is 200 and success is true, it indicates the task has scene data.

If a status code 200 is received, users may send a request for JSON or PNG results.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/archived/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/<TASK ID>)

URL Parameters: None

Response Example:

```
{
  "execution_start": "2020-09-14 12:31:41",
  "execution_time": "00:01:02",
  "start_date": "2019-01-01",
  "end_date": "2019-01-08",
  "modes": "IWS - C-SAR - Sentinel-1A, MSI - Sentinel-2A, OLI/TIRS - Landsat 8",
  "constellations": "",
  "region": "Africa: Ghana",
  "discretization": "5.0 deg",
  "coincidence_days": 0,
  "complete": true,
  "status": 200,
  "message": "Task successfully completed.",
  "success": true
}
```

## Retrieve JSON results

The JSON results will contain a list of coordinates for each discretized block in the region of interest. In each discretized block, it will show a title, coincidence dates, scene (acquisition) metadata, coincidence count, coincidence (dates and count) where scenes are ascending, coincidence where scenes are descending.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/archived/json/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/json/<TASK ID>)

URL Parameters: None

Response Example:

```
[
  "-4.0,11.0, -4.0,12.0, -3.0,12.0, -3.0,11.0, -4.0,11.0": {
    "title": "Region Discretization Longitude -4.0, Latitude 11.0",
    "coincidence": "2019-01-03",
    "acquisitions": [
      {
        "mission": "Sentinel-2A - MSI",
        "name": "6718341",
        "acquisition_date": "2019-01-03",
        "browse_url": <BROWSE JPG URL>,
        "order_url": <ORDER URL>,
        "sun_azimuth": 150.134493948532,
        "granule_name": "L1C_T30PVT_A018452_20190103T104928",
        "sun_elevation": 39.3260813690852,
        "scene_stop_time": "2019-01-03T11:00:14.693Z",
        "cloud_cover_full": 0.0,
        "scene_start_time": "2019-01-03T10:49:28.901Z",
        "scene_center_latitude": 11.2632574,
        "scene_center_longitude": -3.4135721,
        "orbit_direction": "Descending",
        "scene_coords": "-3.9181409,11.7585667, -2.9104213,11.76003, -
2.910728,10.7670169, -3.914998,10.7656802, -3.9181409,11.7585667"
      },
      {
        "mission": "Sentinel-1A - C-SAR - IWS",
        "name":
"S1A_IW_SLC__1SDV_20190103T182746_20190103T182813_025317_02CD19_622F",
        "acquisition_date": "2019-01-03",
        "browse_url": <BROWSE JPG URL>,
        "order_url": <ORDER URL>,

```

```

    "path": 45,
    "frame": 32,
    "orbit": 25317,
    "scene_end_time": "2019-01-03T18:28:13.000000",
    "center_latitude": 11.562,
    "center_longitude": -3.8554,
    "processing_level": "SLC",
    "scene_start_time": "2019-01-03T18:27:46.000000",
    "sending_polarization": "VV",
    "receiving_polarization": "VH",
    "orbit_direction": "Ascending",
    "scene_coords": "-2.560575,10.969422,-4.81989,10.522881,-
5.154573,12.152341,-2.8816349999999997,12.594698,-2.560575,10.969422"
  }
],
"coincidence_asc": "",
"coincidence_desc": "",
"coincidence_count": 1,
"coincidence_asc_count": 0,
"coincidence_desc_count": 0
}
(JSON RESULTS TRUNCATED)
]

```

## Retrieve PNG results

The PNG image file shows the discretized region of interest on a map where the color of each block in the discretized region reflects the number of pairs of missions/constellations intersecting the block within the start date and end date for the task.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/coincident\\_calculator/archived/png/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/png/<TASK ID>)

URL Parameters:

Parameter Name	Data Type	Required	Description
orbit_direction	String	No	Values: ascending or descending. No orbit_direction will return results for both ascending and descending.

### Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## **Example API requests using curl**

### Request user history:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/coincident_calculator/archived/
```

### Request for Archived Coincident Calculator task:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"start_date": "2019-01-01", "end_date": "2019-01-08", "region_folder": "Africa", "region": "Ghana", "constellations": [], "missions": [{"mission": "Sentinel-1A", "instrument": "C-SAR", "mode": "IWS"}, {"mission": "Sentinel-2A", "instrument": "MSI"}, {"mission": "Landsat 8", "instrument": "OLI/TIRS"}], "discretization": {"size": 5.0, "unit": "deg"}, "coincidence_days": 0}' https://ceos-cove.org/en/api/coincident_calculator/archived/
```

### Request archived custom constellations list:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/coincident_calculator/archived/constellations/
```

### Request task status:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/coincident_calculator/archived/<TASK ID>/
```

### Request JSON File:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/coincident_calculator/archived/json/<TASK ID>/
```

### Request PNG map image:

```
curl -u username:password https://ceos-cove.org/en/api/coincident_calculator/archived/png/<TASK ID>/ -o filename.png
```

### Request PNG map image (orbit direction: ascending):

```
curl -u username:password https://ceos-cove.org/en/api/coincident_calculator/archived/png/<TASK ID>/?orbit_direction=ascending -o filename.png
```

### Request PNG map image (orbit direction: descending):

```
curl -u username:password https://ceos-cove.org/en/api/coincident_calculator/
```

archived/png/<TASK ID>/?orbit\_direction=descending -o filename.png

## Data Browser

Data Browser is a tool that allows users to view the satellite image archives from multiple CEOS missions. Users may send requests for a task history, submit a new task, get a task status, retrieve a scene count for the task, retrieve CSV results of scene metadata, and retrieve a PNG map image of the task results.

Data Browser throttle limits:

- POST: 5 requests per hour
- GET: 25 requests per hour

### Retrieve user history

Lists all Data Browser tasks in COVE for the user. The results includes task ids which will allow users to retrieve results for existing tasks.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/data\\_browser/](https://ceos-cove.org/en/api/v1_0/data_browser/)

URL Parameters: None

Response Example:

```
[
  {
    "task_id": "<TASK ID>",
    "missions": [
      {
        "mission": "Sentinel-1A",
        "instrument": "C-SAR",
        "mode": "IWS"
      }, {
        "mission": "Sentinel-2A",
        "instrument": "MSI",
        "mode": ""
      }
    ],
    "start_date": "2019-01-01",
```

```

    "end_date": "2019-01-08",
    "region": "Ghana",
    "filter_options": {}
  }
]

```

## Submit a task

### Task Input Parameters for Data Browser:

Parameter Name	Data Type	Required	Description
start_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions archived list. Refer to the Special Data Types section for more information on DateString.
end_date	DateString	Yes	Range: mission launch date to the latest acquisition date. Valid dates may be found by submitting a COVE API request for the Missions archived list. Refer to the Special Data Types section for more information on DateString.
region_folder	String	Yes	Valid folder names may be found by requesting the Regions list.
region	String	Yes	Valid region names may be found by submitting a COVE API request for the Regions list.
missions	MissionsFilter[]	Yes	Valid missions may be found by submitting a COVE API request for the Missions archived list. Refer to the Special Data Types section for more information on MissionsFilter.
filters	MetadataFilter	No	Refer to the Special Data Types section for more information on MetadataFilter.

### Request Data Example:

```

{
  "start_date": "2020-01-01",
  "end_date": "2020-01-31",
  "region_folder": "Europe",
  "region": "Spain",

```



```
"missions": [],
"filters": {
  "cloud_cover": null,
  "day_night": "",
  "orbit_direction": "",
  "processing_level": ""
}
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/data\\_browser/](https://ceos-cove.org/en/api/v1_0/data_browser/)

URL Parameters: None

Response Examples:

Example successful response from request where the results are not ready to retrieve:

```
{"status": 202, "message": "Data Browser task as been submitted. Please wait for the results.", "id": "<TASK ID>"}
```

Example successful response from a request where the results are ready to retrieve:

```
{"status": 200, "message": "Data Browser results are ready", "id": "<TASK ID>"}
```

Failed Response Examples:

```
{"status": 400, "message": "<Error Message>"}
```

```
{"status": 417, "message": "<Error Message>"}
```

## Retrieve task status

Once a task has been submitted, users should periodically check the task status.

Status codes:

- 200: task has completed
- 202: task is still running
- 417: task has terminated in an error

If the status code is 200 and success is true, it indicates the task has scene data.

If a status code 200 is received, users may send a request for JSON or PNG results.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/data\\_browser/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/data_browser/<TASK ID>)

URL Parameters: None

Response Example:

```
{
  "execution_start": "2020-09-14 12:31:41",
  "execution_time": "02:38:58",
  "start_date": "2019-01-01",
  "end_date": "2019-01-08",
  "modes": "OLI/TIRS - Landsat 8,IWS - C-SAR - Sentinel-1A,MSI - Sentinel-2A",
  "region": "Ghana",
  "filter_options": {},
  "complete": true,
  "status": 200,
  "message": "Task successfully completed.",
  "success": true
}
```

## **Retrieve scene count**

Returns the number of scenes in the task results.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/data\\_browser/count/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/data_browser/count/<TASK ID>)

URL Parameters: None

Response Example:

```
{
  "status": 200,
  "count": 130
}
```

## Retrieve CSV results

The CSV file (binary) will contain the scene metadata for the task. The CSV file contains the columns: name, acquisition\_date, browse\_url, order\_url, processing\_level, orbit\_direction, scene\_coords.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/data\\_browser/csv/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/data_browser/csv/<TASK_ID>)

URL Parameters: None

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## Retrieve PNG results

The PNG image file is a map image which outlines scenes on a map of the requested region of interest within the start date and end date for the task.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/data\\_browser/png/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/data_browser/png/<TASK_ID>)

URL Parameters: None

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## Example API requests using curl

Request user history:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/data_browser/
```

### Request for Data Browser task:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d
'{"start_date": "2019-01-01", "end_date": "2019-01-08", "region_folder": "Africa",
"region": "Ghana", "missions": [{"mission": "Sentinel-1A", "instrument": "C-SAR",
"mode": "IWS"}], "filters": {"cloud_cover": null, "day_night": "",
"orbit_direction": "asc", "processing_level": ""}}' https://ceos-
cove.org/en/api/data_browser/
```

### Request task status:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-
cove.org/en/api/data_browser/<TASK ID>/
```

### Request scene count:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-
cove.org/en/api/data_browser/count/
```

### Request CSV File:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-
cove.org/en/api/data_browser/csv/<TASK ID>/ -o filename.csv
```

### Request PNG map image:

```
curl -u username:password https://ceos-cove.org/en/api/data_browser/png/<TASK ID>/
-o filename.png
```

## Country Coverage

Country Coverage is a tool that allows users to generate and view GFOI Country Coverage reports for over 70 countries and 3 constellations. Users may send requests for a constellations list, a countries list, a daily history, submit a new task, get a task status, retrieve JSON results, retrieve PDF results, retrieve CSV results of scene metadata, retrieve a PNG bar graph, and retrieve ZIP archive file of the reports from the task results.

Country Coverage throttle limits:

- POST: 1 Country Coverage task running in COVE at a time
- GET: 25 requests per hour

### Retrieve constellations list

Lists all constellations and the missions associated with each constellation. These constellations are only applicable to the Country Coverage tool and API.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/country\\_coverage/constellations/](https://ceos-cove.org/en/api/v1_0/country_coverage/constellations/)

URL Parameters: None

Response Example:

```
{
  "constellations": {
    "Landsat": [
      "Landsat 5 - TM",
      "Landsat 7 - ETM",
      "Landsat 8 - OLI/TIRS"
    ],
    "Sentinel-1": [
      "Sentinel-1A - C-SAR - EW",
      "Sentinel-1A - C-SAR - IWS",
      "Sentinel-1A - C-SAR - SM",
      "Sentinel-1A - C-SAR - WV",
      "Sentinel-1B - C-SAR - EW",
      "Sentinel-1B - C-SAR - IWS",
      "Sentinel-1B - C-SAR - SM",
      "Sentinel-1B - C-SAR - WV"
    ]
  }
}
```

```
    ],
    "Sentinel-2": [
        "Sentinel-2A - MSI",
        "Sentinel-2B - MSI"
    ]
}
}
```

## Retrieve countries list

Lists over 70 countries available for generating Country Coverage reports in COVE.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/country\\_coverage/countries/](https://ceos-cove.org/en/api/v1_0/country_coverage/countries/)

URL Parameters: None

Response Example:

```
{
  "countries": [
    "Algeria",
    "Argentina",
    "Australia",
    "Bangladesh",
    "Belize",
    (COUNTRIES LIST TRUNCATED)
  ]
}
```

## Retrieve daily history

Lists all existing and generating Country Coverage reports in COVE for the current day.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/country\\_coverage/reports/](https://ceos-cove.org/en/api/v1_0/country_coverage/reports/)

URL Parameters: None

Response Example:

```
{
  "existing": {
    "Algeria": [
      "Landsat",
      "Sentinel-1",
      "Sentinel-2"
    ],
    "Argentina": [
      "Landsat",
      "Sentinel-1"
    ],
    "Australia": [
      "Landsat"
    ]
  },
  "generating": {
    "Argentina": [
      "Sentinel-2",
    ],
    "Australia": [
      "Sentinel-1",
      "Sentinel-2",
    ]
  }
}
```

### Submit a task

Country Coverage tasks have a size limit. The limit is the number of constellations times the number of countries requested in the task.

Task Input Parameters for Country Coverage:

Parameter Name	Data Type	Required	Description
constellations	ConstellationsFilter[]	Yes	Refer to section Retrieve constellations list for a list of constellations. Refer to the Special Data Types section for more information on ConstellationsFilter.
countries	CountriesFilter[]	Yes	Refer to section Retrieve countries list for a list of valid countries. Refer to the Special Data Types section for more information on

Parameter Name	Data Type	Required	Description
			CountriesFilter.

Request Data Example:

```
{
  "constellations": [
    "Landsat",
    "Sentinel-1",
    "Sentinel-2"
  ],
  "countries": [
    "Algeria",
    "Argentina",
    "Australia",
    "Bangladesh",
    "Belize"
  ]
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/country\\_coverage/reports/](https://ceos-cove.org/en/api/v1_0/country_coverage/reports/)

URL Parameters: None

Response Examples:

Example successful response from request where the results are not ready to retrieve:

```
{"status": 202, "message": "Country Coverage reports task as been submitted. Please wait for the results.", "id": "<TASK ID>"}
```

Example successful response from a request where the results are ready to retrieve:

```
{"status": 200, "message": "Country Coverage reports results are ready", "id": "<TASK ID>"}
```

Failed Response Examples:

```
{"status": 429,
  "message": "Another country coverage task is currently running. Please try again later."}
{"status": 400, "message": "<Error Message>"}
{"status": 417, "message": "<Error Message>"}
```



## Retrieve task status

Once a task has been submitted, users should periodically check the task status.

Status codes:

- 200: task has completed
- 202: task is still running
- 417: task has terminated in an error

If the status code is 200 and success is true, it indicates the task has scene data.

If a status code 200 is received, users may send a request for JSON or PNG results.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/country\\_coverage/reports/<TASK\\_ID>/](https://ceos-cove.org/en/api/v1_0/country_coverage/reports/<TASK_ID>)

URL Parameters: None

Response Example:

```
{
  "execution_start": "2020-09-18 14:11:21",
  "execution_time": "03:05:07",
  "constellations": "Landsat",
  "countries": "Benin",
  "complete": true,
  "status": 200,
  "message": "Your task has completed successfully.",
  "completed": {
    "Benin": [
      "Landsat"
    ]
  }
}
```

## Retrieve JSON results

The JSON results will contain scene counts for every year since mission launch for all missions in all constellations and all countries in a task request. If a URL parameter is included in the request URL, the results will be filtered by the parameter(s) provided.

Request Method: GET

Request URL:

https://ceos-cove.org/en/api/v1\_0/country\_coverage/json/<TASK ID>/

URL Parameters:

Parameter Name	Data Type	Required	Description
constellation	String	No	Refer to section Retrieve constellations list.
country	String	No	Refer to section Retrieve countries list.

Response Example:

```
{
  "Sentinel-1": {
    "Benin": [
      {
        "year": 2014,
        "Sentinel-1A": 0,
        "Sentinel-1B": 0
      },
      {
        "year": 2015,
        "Sentinel-1A": 442,
        "Sentinel-1B": 0
      },
      {
        "year": 2016,
        "Sentinel-1A": 575,
        "Sentinel-1B": 0
      }
    ],
    (RESULTS TRUNCATED)
  ]
}
```

## Retrieve PDF results

The PDF file will contain a chart with the totals of scenes for the country and mission in the constellation requested for each year since launch. It will also contain a bar graph of the totals for each year. Reports for Sentinel-1 include an additional bar graph where values are separated by processing level. If the task associated with the task id only requests one constellation and one country, no URL parameters are needed.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/country\\_coverage/pdf/<TASK\\_ID>/](https://ceos-cove.org/en/api/v1_0/country_coverage/pdf/<TASK_ID>)

URL Parameters:

Parameter Name	Data Type	Required	Description
constellation	String	No	The constellation parameter is only required if multiple constellations are associated with the task. Refer to section Retrieve constellations list.
country	String	No	The country parameter is only required if multiple countries are associated with the task. Refer to section Retrieve countries list.

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## Retrieve CSV results

The CSV file (binary) will contain the scene metadata. The CSV file contains the columns:

- Landsat:  
Date Acquired, Year, Mission, Path, Row, Scene Cloud Cover, Processing Level, Tier, Product ID, Scene ID
- Sentinel-1:  
Date Acquired, Year, Mission, Path, Frame, Processing Level, Orbit Direction, Granule Name
- Sentinel-2:  
Date Acquired, Year, Mission, Scene Center Latitude, Scene Center Longitude, Scene Cloud Cover, Scene ID

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/country\\_coverage/csv/<TASK\\_ID>/](https://ceos-cove.org/en/api/v1_0/country_coverage/csv/<TASK_ID>)

URL Parameters:

Parameter Name	Data Type	Required	Description
constellation	String	No	The constellation parameter is only required if multiple constellations are associated with the task. Refer to section Retrieve constellations list.
country	String	No	

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

### Retrieve PNG results

The PNG image file is a bar graph which shows the number of scenes for each year for each mission for the country and constellation parameter specified in the request. If the task associated with the task id only requests one constellation and one country, no URL parameters are needed.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/country\\_coverage/png/<TASK ID>](https://ceos-cove.org/en/api/v1_0/country_coverage/png/<TASK ID>)

URL Parameters:

Parameter Name	Data Type	Required	Description
constellation	String	No	The constellation parameter is only required if multiple constellations are associated with the task. Refer to section Retrieve constellations list.
country	String	No	

### Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## **Retrieve ZIP results**

The ZIP archive file will contain all PDF and CSV files for all constellations and countries in the task request.

Request Method: GET

### Request URL:

[https://ceos-cove.org/en/api/v1\\_0/country\\_coverage/zip/<TASK ID>/](https://ceos-cove.org/en/api/v1_0/country_coverage/zip/<TASK ID>)

URL Parameters: None

### Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## **Example API requests using curl**

### Request Constellations List:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/country_coverage/constellations/
```

### Request Countries List:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/country_coverage/countries/
```

### Request Country Coverage daily history:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/country_coverage/reports/
```

### Request for Country Coverage task:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"constellations": [<CONSTELLATION>], "countries": [<COUNTRY>]}' https://ceos-cove.org/en/api/country_coverage/reports/
```

#### Request task status:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/country_coverage/reports/<TASK ID>/
```

#### Request JSON results for all countries and constellations in task:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/country_coverage/reports/json/<TASK ID>/
```

#### Request JSON results for all constellations for a country in task:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/country_coverage/reports/json/<TASK ID>/?country=<COUNTRY>
```

#### Request JSON results for all countries for a constellation in task:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/country_coverage/reports/json/<TASK ID>/?constellation=<CONSTELLATION>
```

#### Request JSON results for a country and a constellation in task:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/country_coverage/reports/json/<TASK ID>/?country=<COUNTRY>&constellation=<CONSTELLATION>
```

#### Request PDF report:

```
curl -u username:password https://ceos-cove.org/en/api/dcountry_coverage/reports/csv/<TASK ID>/?country=<COUNTRY>&constellation=<CONSTELLATION> -o filename.pdf
```

#### Request CSV File:

```
curl -u username:password https://ceos-cove.org/en/api/country_coverage/reports/csv/<TASK ID>/?country=<COUNTRY>&constellation=<CONSTELLATION> -o filename.csv
```

#### Request PNG Bar Chart:

```
curl -u username:password https://ceos-cove.org/en/api/country_coverage/reports/png/<TASK ID>/?country=<COUNTRY>&constellation=<CONSTELLATION> -o filename.png
```

#### Request ZIP File:

```
curl -u username:password https://ceos-cove.org/en/api/country_coverage/reports/zip/<TASK ID>/ -o filename.zip
```

## Utilities

Utilities is a collection of calculators to provide users with a means of estimating various parameters of interest about CEOS satellite missions. There are two collections of calculators in utilities repeating orbit and swath calculators. Repeating orbit calculators available are ground track interval, period/velocity, and sun synchronous orbit. Swath calculators available are incidence to pointing, fov from swath width, swath width from fov, swath from incidence, and swath/off-nadir.

Utilities throttle limits:

- POST: 25 requests per hour

## Repeating Orbit

### Ground Track Interval

Input parameters:

Parameter Name	Data Type	Required	Description
altitude	Float	Yes	Range: 200 to 1500
days_to_repeat	Float	Yes	Greater than 0
latitude	Float	Yes	Range: 0 to 90
revs_to_repeat	Float	No	Greater than 0; Calculated if not provided.

Request Data Example:

```
{
  "altitude": 800,
  "days_to_repeat": 16,
  "latitude": 0,
  "revs_to_repeat": 228
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/utilities/repeating\\_orbit/ground\\_track\\_interval/](https://ceos-cove.org/en/api/v1_0/utilities/repeating_orbit/ground_track_interval/)

URL Parameters: None

Response Example:

```
{
  "altitude": 800.0,
  "days_to_repeat": 16.0,
  "latitude": 0.0,
  "revs_to_repeat": 228.0,
  "fundamental_interval_deg_long": 25.2632,
  "fundamental_interval_km": 2812.3,
  "subinterval_deg_long": 1.5789,
  "subinterval_km": 175.8
}
```

## Period/Velocity

Input parameters:

Parameter Name	Data Type	Required	Description
altitude	Float	Yes	Range: 200 to 1500

Request Data Example:

```
{
  "altitude": 800
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/utilities/repeating\\_orbit/period\\_velocity/](https://ceos-cove.org/en/api/v1_0/utilities/repeating_orbit/period_velocity/)

URL Parameters: None

Response Example:

```
{
  "altitude": 800.0,
  "period": 100.87,
  "velocity": 7.45
}
```



## Sun Synchronous Orbit

### Input parameters:

Parameter Name	Data Type	Required	Description
altitude	Float	Yes	Range: 200 to 1500
revs_to_repeat	Float	Yes	Greater than 0; Calculated if not provided.
days_to_repeat	Float	No	Greater than 0

### Request Data Example:

```
{  
  "altitude": 800,  
  "revs_to_repeat": 16,  
  "days_to_repeat": 1  
}
```

Request Method: POST

### Request URL:

[https://ceos-cove.org/en/api/v1\\_0/utilities/repeating\\_orbit/sun\\_synchronous\\_orbit/](https://ceos-cove.org/en/api/v1_0/utilities/repeating_orbit/sun_synchronous_orbit/)

URL Parameters: None

### Response Example:

```
{  
  "altitude": 800.0,  
  "revs_to_repeat": 16.0,  
  "days_to_repeat": 1.0,  
  "estimated_altitude": 268.1315,  
  "estimated_inclination": 96.5607  
}
```

# Swath Calculator

## Incidence To Pointing

Input parameters:

Parameter Name	Data Type	Required	Description
altitude	Float	Yes	Range: 200 to 1500
incidence_angle	Float	Yes	Range: 0 to 90

Request Data Example:

```
{  
  "altitude": 800,  
  "incidence_angle": 15  
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/utilities/swath\\_calculator/incidence\\_to\\_pointing/](https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/incidence_to_pointing/)

URL Parameters: None

Response Example:

```
{  
  "altitude": 800.0,  
  "incidence_angle": 15.0,  
  "off_nadir_angle": 13.3  
}
```

## FOV from Swath Width

Input parameters:

Parameter Name	Data Type	Required	Description
altitude	Float	Yes	Range: 200 to 1500
swath_width	Float	Yes	Greater than 0

Request Data Example:

```
{  
  "altitude": 800,  
  "swath_width": 15  
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/utilities/swath\\_calculator/fov\\_from\\_swath\\_width/](https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/fov_from_swath_width/)

URL Parameters: None

Response Example:

```
{  
  "altitude": 800.0,  
  "swath_width": 210.9,  
  "fov": 15.0,  
  "half_fov": 7.5  
}
```

## Swath Width from FOV

Input parameters:

Parameter Name	Data Type	Required	Description
altitude	Float	Yes	Range: 200 to 1500
fov	Float	Yes	Greater than 0

Request Data Example:

```
{  
  "altitude": 800,  
  "fov": 15  
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/utilities/swath\\_calculator/swath\\_width\\_from\\_fov/](https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/swath_width_from_fov/)

URL Parameters: None

Response Example:

```
{  
  "altitude": 400.0,  
  "swath_width": 105.4,  
  "fov": 15.0,  
  "half_fov": 7.5  
}
```

Failed Response Example:

```
{"status": 400, "message": "math domain error"}
```

## Swath From Incidence

Input parameters:

Parameter Name	Data Type	Required	Description
altitude	Float	Yes	Range: 200 to 1500
min_incidence_angle	Float	Yes	Range: 0 to 90
max_incidence_angle	Float	Yes	Range: 0 to 90

Request Data Example:

```
{  
  "altitude": 800,  
  "min_incidence_angle": 0,  
  "max_incidence_angle": 16  
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/utilities/swath\\_calculator/swath\\_from\\_incidence/](https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/swath_from_incidence/)

URL Parameters: None

Response Example:

```
{  
  "altitude": 800.0,  
  "min_incidence_angle": 0.0,  
  "max_incidence_angle": 16.0,  
  "off_nadir_angle": 7.09,  
  "fov": 14.177,  
  "half_fov": 7.088,  
}
```

```
    "swath_width": 202.94
}
```

## Swath/Off-Nadir

Input parameters:

Parameter Name	Data Type	Required	Description
altitude	Float	Yes	Range: 200 to 1500
off_nadir_angle	Float	Yes	Range: 0 to 90
fov	Float	Yes	Range: 0 to 90

Request Data Example:

```
{
  "altitude": 800,
  "off_nadir_angle": 25,
  "fov": 5
}
```

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/utilities/swath\\_calculator/swath\\_off\\_nadir/](https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/swath_off_nadir/)

URL Parameters: None

Response Example:

```
{
  "altitude": 800.0,
  "off_nadir_angle": 25.0,
  "fov": 5.0,
  "swath_width": 88.93
}
```

## Example API requests using curl

Calculator: Repeating Orbit: Ground Track Interval:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d
'{"altitude": <ALTITUDE>, "days_to_repeat": <DAYS TO REPEAT>, "latitude":
<LATITUDE>, "revs_to_repeat": <REVOLUTIONS TO REPEAT>}' https://ceos-
cove.org/en/api/utilities/repeating_orbit/ground_track_interval/
```

Calculator: Repeating Orbit: Period/Velocity:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"altitude": <ALTITUDE>}' https://ceos-cove.org/en/api/utilities/repeating_orbit/period_velocity/
```

Calculator: Repeating Orbit: Sun Synchronous Orbit:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"altitude": <ALTITUDE>, "revs_to_repeat": <REVOLUTIONS TO REPEAT>, "days_to_repeat": <DAYS TO REPEAT>}' https://ceos-cove.org/en/api/utilities/repeating_orbit/sun_synchronous_orbit/
```

Calculator: Swath Calculator: Incidence To Pointing:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"altitude": <ALTITUDE>, "incidence_angle": <INCIDENCE ANGLE>}' https://ceos-cove.org/en/api/utilities/swath_calculator/incidence_to_pointing/
```

Calculator: Swath Calculator: FOV From Swath Width:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"altitude": <ALTITUDE>, "swath_width": <SWATH WIDTH>}' https://ceos-cove.org/en/api/utilities/swath_calculator/fov_from_swath_width/
```

Calculator: Swath Calculator: Swath Width From FOV:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"altitude": <ALTITUDE>, "fov": <FOV>}' https://ceos-cove.org/en/api/utilities/swath_calculator/swath_width_from_fov/
```

Calculator: Swath Calculator: Swath From Incidence:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"altitude": <ALTITUDE>, "min_incidence_angle": <MINIMUM INCIDENCE ANGLE>, "max_incidence_angle": <MAXIMUM INCIDENCE ANGLE>}' https://ceos-cove.org/en/api/utilities/swath_calculator/swath_from_incidence/
```

Calculator: Swath Calculator: Swath/Off-Nadir:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"altitude": <ALTITUDE>, "off_nadir_angle": <OFF-NADIR ANGLE>, "fov": <FOV>}' https://ceos-cove.org/en/api/utilities/swath_calculator/swath_off_nadir/
```

## Missions

Missions is a list of forecasted or archived missions. Forecasted missions are used in Acquisition Forecaster, Revisits Calculator, and Coincident Calculator. Archived missions are used in Data Browser, Coverage Analyzer, and Coincident Calculator. The missions results will help users determine correct mission, instrument, and mode names as well as determine valid start and end dates when creating tasks.

Missions throttle limits:

- GET: 25 requests per hour

### Retrieve forecasted list

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/missions/forecasted/](https://ceos-cove.org/en/api/v1_0/missions/forecasted/)

URL Parameters: None

Response Example:

```
[
  {
    "mission": "ALOS",
    "norad_id": "28931",
    "launch_date": "2006-01-24",
    "decommissioned_date": "2011-04-22",
    "earliest_tle_date": "2006-01-25",
    "latest_tle_date": "2011-07-20",
    "status": "deactivated",
    "instrument_modes": [
      {
        "instrument": "PRISM",
        "mode": "Nadir"
      }, {
        "instrument": "AVNIR-2",
        "mode": "Standard"
      }, {
        "instrument": "AVNIR-2",
        "mode": "Full Accessible"
      }, {
        "instrument": "PALSAR",
        "mode": ""
      }
    ]
  }
]
```

```
    },  
    (MISSIONS LIST TRUNCATED)  
]
```

## Retrieve archived list

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/missions/archived/](https://ceos-cove.org/en/api/v1_0/missions/archived/)

URL Parameters: None

Response Example:

```
[  
  {  
    "mission": "Landsat 5",  
    "launch_date": "1984-03-01",  
    "decommissioned_date": "2013-06-05",  
    "latest_acquisition_date": "2012-05-05",  
    "status": "deactivated",  
    "instrument_modes": [  
      {  
        "instrument": "TM",  
        "mode": ""  
      }  
    ]  
  },  
  (MISSIONS LIST TRUNCATED)  
]
```

## Example API requests using curl

Forecasted missions list:

```
curl -H 'Accept: application/json; indent=4' -u username:password https://ceos-cove.org/en/api/missions/forecasted/
```

Archived missions list:

```
curl -H 'Accept: application/json; indent=4' -u username:password https://ceos-cove.org/en/api/missions/archived/
```



## Custom Missions

The Custom Missions feature in the COVE UI allows users to create notional or proposed missions. Custom Missions in the COVE API is a list of custom missions a user has created in the COVE UI. Custom Missions may be used in Acquisition Forecaster, Revisits Calculator, and Coincident Calculator to submit tasks.

Custom Missions throttle limits:

- GET: 25 requests per hour

### Retrieve custom missions list

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/custom\\_missions/](https://ceos-cove.org/en/api/v1_0/custom_missions/)

URL Parameters: None

Response Example:

```
{
  "custom_missions": [{
    "custom_mission_name": "Mission_A",
    "orbit_type": "Sun Synchronous",
    "revolutions_per_day_revs": 14.56,
    "altitude_km": 705.0,
    "revolutions_to_repeat_revs": 233.0,
    "local_time": "11:10",
    "direction": "ascending",
    "instruments": [{
      "custom_instrument_name": "Beam_A",
      "field_of_view_deg": 5.0,
      "pointing_angle_deg": 5.0
    }]
  }]
}
```

### Example API requests using curl

Custom missions list:

```
curl -H 'Accept: application/json; indent=4' -u username:password https://ceos-cove.org/en/api/custom_missions/
```

## Regions

Regions allows users to create custom regions of interest. Regions are used in Acquisition Forecaster, Coverage Analyzer, Revisits Calculator, Coincident Calculator, and Data Browser. Users may send requests for a regions list, details of a region, import a region by KML string KML binary file, or Shapefile, export a region by KML file or Shapefile, and retrieve a PNG map image of the region.

Regions throttle limits:

- POST: 5 requests per hour
- GET: 25 requests per hour

### Retrieve regions list

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/regions/](https://ceos-cove.org/en/api/v1_0/regions/)

URL Parameters: None

Response Example:

```
[
  {
    "folder": "Africa",
    "region": "Algeria"
  }, {
    "folder": "Africa",
    "region": "Angola"
  }, {
    "folder": "Africa",
    "region": "Benin"
  }, {
    "folder": "Africa",
    "region": "Botswana"
  },
  (REGIONS LIST TRUNCATED)
]
```

## Retrieve region details

### Input parameters:

Parameter Name	Data Type	Required	Description
region_folder	String	No	Default folder is User Folder.
region	String	Yes	Region Name

### Request Data Example:

```
{  
  "region_folder": "Africa",  
  "region": "Ghana"  
}
```

### Request Method: POST

### Request URL:

[https://ceos-cove.org/en/api/v1\\_0/regions/](https://ceos-cove.org/en/api/v1_0/regions/)

### URL Parameters: None

### Response Example:

```
{  
  "status": 200,  
  "region_folder": "Africa",  
  "region": "Ghana",  
  "id": 171  
}
```

## Import region KML string

### Input parameters:

Parameter Name	Data Type	Required	Description
region	String	Yes	Region name
data	String	Yes	KML file passed as a string.

### Request Data Example:

```
{  
  "region": "Barekese Dam",  
  "data": "<?xml version='1.0' encoding='UTF-8'?><kml  
xmlns='http://www.opengis.net/kml/2.2'><Placemark><Polygon><outerBoundaryIs><Linear  
Ring><coordinates>-1.722,6.844,0 -1.721,6.844,0 -1.722,6.843,0 -1.721,6.839,0
```

```

-1.723,6.837,0 -1.721,6.836,0 -1.723,6.832,0 -1.721,6.832,0 -1.72,6.831,0
-1.718,6.83,0 -1.716,6.827,0 -1.716,6.83,0 -1.715,6.832,0 -1.712,6.83,0
-1.707,6.825,0 -1.707,6.827,0 -1.71,6.831,0 -1.713,6.834,0 -1.713,6.837,0
-1.71,6.838,0 -1.707,6.837,0 -1.707,6.837,0 -1.708,6.839,0 -1.707,6.84,0
-1.704,6.839,0 -1.703,6.841,0 -1.703,6.842,0 -1.706,6.845,0 -1.705,6.846,0
-1.706,6.849,0 -1.7,6.85,0 -1.697,6.852,0 -1.695,6.85,0 -1.695,6.85,0
-1.695,6.852,0 -1.694,6.855,0 -1.693,6.855,0 -1.69,6.855,0 -1.688,6.856,0
-1.686,6.854,0 -1.684,6.854,0 -1.684,6.856,0 -1.687,6.858,0 -1.686,6.861,0
-1.687,6.863,0 -1.692,6.86,0 -1.697,6.858,0 -1.701,6.861,0 -1.707,6.86,0
-1.701,6.861,0 -1.697,6.858,0 -1.701,6.855,0 -1.705,6.855,0 -1.707,6.854,0
-1.71,6.855,0 -1.712,6.854,0 -1.712,6.852,0 -1.713,6.85,0 -1.712,6.847,0
-1.715,6.843,0 -1.716,6.844,0 -1.716,6.842,0 -1.716,6.842,0 -1.718,6.841,0
-1.721,6.841,0
-1.722,6.844,0</coordinates></LinearRing></outerBoundaryIs></Polygon></Placemark></
kml>"
}

```

**Request Method:** POST

**Request URL:**  
[https://ceos-cove.org/en/api/v1\\_0/regions/](https://ceos-cove.org/en/api/v1_0/regions/)

**URL Parameters:** None

**Failed Response Example:**  

```
{'status': 415, 'message': 'Unable to parse KML string.'}
```

## Import region KML file

**Input parameters:**

Parameter Name	Data Type	Required	Description
file	KML (binary)	Yes	Region name will be the name of the file received. If the file name is unable to be determined, the default name is User Region.

**Request Method:** POST

**Request URL:**  
[https://ceos-cove.org/en/api/v1\\_0/regions/upload/](https://ceos-cove.org/en/api/v1_0/regions/upload/)

URL Parameters: None

Failed Response Example:

```
{'status': 415, 'message': '<Error Message>'}
```

### **Import region shapefile**

Input parameters:

<b>Parameter Name</b>	<b>Data Type</b>	<b>Required</b>	<b>Description</b>
file	Shapefile	Yes	Region name will be the name of the file received. If the file name is unable to be determined, the default name is User Region.

Request Method: POST

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/regions/upload/](https://ceos-cove.org/en/api/v1_0/regions/upload/)

URL Parameters: None

Failed Response Example:

```
{'status': 415, 'message': '<Error Message>'}
```

### **Export region KML file**

The KML (Keyhole Markup Language) is an XML formatted file, and is was developed for use with GoogleEarth. It contains polygon coordinates of the region of interest.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/regions/kml/](https://ceos-cove.org/en/api/v1_0/regions/kml/)

URL Parameters: None

## Export region shapefile

The shapefile file exported (ZIP) is used in geographic information systems (GIS) and contains polygon coordinates of the region of interest.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/regions/shapefile/](https://ceos-cove.org/en/api/v1_0/regions/shapefile/)

URL Parameters: None

## Retrieve region PNG

The PNG image file shows a map of the region of interest, and allows users to view existing and imported regions.

Request Method: GET

Request URL:

[https://ceos-cove.org/en/api/v1\\_0/regions/png/<REGION\\_ID>/](https://ceos-cove.org/en/api/v1_0/regions/png/<REGION_ID>/)

URL Parameters: None

Failed Response Example:

```
{'status': 404, 'message': 'File not found.'}
```

## Example API requests using curl

Request region list:

```
curl -H "Accept: application/json; indent=4" -u username:password https://ceos-cove.org/en/api/regions/
```

Request region information:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"region_folder":"Africa", "region":"Ghana"}' https://ceos-cove.org/en/api/regions/
```

#### Import region KML string:

```
curl -H "Content-Type: application/json" -X POST -u username:password -d '{"region": "RegionA", "data": "<KML STRING>"}' https://ceos-cove.org/en/api/regions/
```

#### Import region KML file:

```
curl -H "Content-Type: multipart/form-data" -X POST -u username:password -F file=@region_name.kml https://ceos-cove.org/en/api/regions/upload/
```

#### Import region shapefile:

```
curl -H "Content-Type: multipart/form-data" -X POST -u username:password -F file=@region_name.zip https://ceos-cove.org/en/api/regions/upload/
```

#### Export region PNG map image:

```
curl -u username:password https://ceos-cove.org/en/api/regions/png/<REGION ID>/ -o region.png
```

#### Export region KML file:

```
curl -u username:password https://ceos-cove.org/en/api/regions/kml/<REGION ID>/ -o region.kml
```

#### Export region shapefile:

```
curl -u username:password https://ceos-cove.org/en/api/regions/shapefile/<REGION ID>/ -o region.zip
```

## Version Information

In future versions of the COVE API, the default base URL will always point to the most recent version, and older versions may be deprecated. If COVE API endpoints are integrated into custom applications, please use the versioned URL. Users may refer to this document for version information or by sending a request to the request URL below.

COVE API details:

- Current version: v1\_0
- Default base url: <https://ceos-cove.org/en/api/>
- Versioned base url: [https://ceos-cove.org/en/api/v1\\_0/](https://ceos-cove.org/en/api/v1_0/)

### Retrieve version details

Request Method: GET

Request URL:

<https://ceos-cove.org/en/api/>

URL Parameters: None

Response Example:

```
{
  "current_version": "v1_0",
  "default_version": "v1_0",
  "supported_versions": [
    "v1_0"
  ],
  "deprecated_versions": []
}
```



## Special Data Types

### **ConstellationsFilter**

A list of constellation name strings. Used in Coincident Calculator and Country Coverage.

Input Parameters:

Parameter Name	Data Type	Required	Description
name	string	No: Coincident Calculator  Yes: Country Coverage	Coincident Calculator: Filter optional.  Refer to section Retrieve forecasted constellations list or Retrieve archived constellations list to submit a request for a valid list of countries.  Country Coverage: At least one constellation required.  Refer to section Retrieve countries list to submit a request for a valid list of countries.

Filter example for request:

["Landsat", "Sentinel-1", "Sentinel-2"]

### **CustomMissionsFilter**

A list of dictionaries of custom mission names, and custom instrument names. Used in Acquisition Forecaster, Revisits Calculator, and Coincident Calculator.

Input Parameters:

Parameter Name	Data Type	Required	Description
mission	string	Yes	Valid custom missions (mission and instrument) may be found by submitting a COVE API request for the Custom Missions list.
instrument	string	Yes	

Filter example for request:

```
[  
  {  
    "mission": "Satellite_A",  
    "instrument": "Beam_A"  
  }, {  
    "mission": "Satellite_B",  
    "instrument": "Beam_A"  
  }  
]
```

### **CountriesFilter**

A list of country names. Used in Country Coverage.

Input Parameters:

Parameter Name	Data Type	Required	Description
name	string	Yes	Refer to section Retrieve countries list to submit a request for a valid list of countries.

Filter example for request:

```
["Algeria", "Argentina", "Australia", "Bangladesh", "Belize"]
```

### **DateString**

Date string format YYYY-MM-DD. Example: 2020-01-31

## DiscretizationFilter

A dictionary values used to divide a region of interest into blocks. of Used in Coverage Analyzer, Revisits Calculator, and Coincident Calculator.

Input Parameters:

Parameter Name	Data Type	Required	Description
type	string	No	<p>Landsat WRS: wrsdata S2 Tiling Scheme: s2tiling</p> <p>Coverage Analyzer: Value: s2tiling, wrsdata. Revisits Calculator: Value: s2tiling, wrsdata. Coincident Calculator: Invalid parameter.</p>
size	float	No	<p>Size parameter should be null or omitted if type parameter is specified.</p> <p>Size parameter required if unit parameter is specified.</p> <p>Coverage Analyzer: Value (deg): between 5.0 to 0.1 Value (km): between 12 to 555 Revisits Calculator: Value (deg): between 5.0 to 0.1 Value (km): between 12 to 555 Coincident Calculator: Value (deg): between 1.0 to 0.1 Value (km): between 12 to 555</p>
unit	string	No	<p>Unit parameter should be an empty string or omitted if type parameter is specified.</p> <p>Unit parameter required if size parameter is specified.</p> <p>Value: deg, km.</p>
include_overlap	boolean	No	<p>Coverage Analyzer: Value should only be true if type is s2tiling and missions is Sentinel-2A or Sentinel-2B. Value: true, false. Revisits Calculator:</p>

Parameter Name	Data Type	Required	Description
			Invalid parameter. Coincident Calculator: Invalid parameter.

Filter example for request for Coverage Analyzer:

```
{
  "type": "s2tiling",
  "size": null,
  "unit": "",
  "include_overlap": true
}
```

Filter example for request for Revisits Calculator:

```
{
  "type": "",
  "size": 5.0,
  "unit": "deg"
}
```

Filter example for request for Coincident Calculator:

```
{
  "size": 0.25,
  "unit": "deg"
}
```

## **MetadataFilter**

Used in Coverage Analyzer, and Data Browser.

Input Parameters:

Parameter Name	Data Type	Required	Description
cloud_cover	float	No	Cloud cover filter only applies to Landsat 5, Landsat 7, Landsat 8, Sentinel-2A, and Sentinel-2B.  Values: between 0 and 100
day_night	string	No	Day/Night filter only applies to Landsat 5, Landsat 7, and Landsat 8.

Parameter Name	Data Type	Required	Description
			Values: day, night
orbit_direction	string	No	Orbit direction filter only applies to Sentinel-1A, Sentinel-1B, Sentinel-2A, and Sentinel-2B.  Ascending: asc Descending: desc  Values: asc, desc
processing_level	string	No	Processing level filter only applies to Sentinel-1A, and Sentinel-1B.  Values: GRD, SLC

Filter example for request:

```
{
  "cloud_cover": null,
  "day_night": "",
  "orbit_direction": "ascending",
  "processing_level": ""
}
```

## **MissionsFilter**

Used in Acquisition Forecaster, Coverage Analyzer, Revisits Calculator, Coincident Calculator, and Data Browser.

Input Parameters:

Parameter Name	Data Type	Required	Description
mission	string	Yes	Acquisition Forecaster: Valid mission, instrument, and mode may be found by submitting a COVE API request for the Missions forecasted list.  Coverage Analyzer: Valid mission, instrument, and mode may be found by submitting a COVE API request for the Missions archived list.  Revisits Calculator: Valid mission, instrument, and mode
instrument	string	Yes	
mode	string	Yes	

Parameter Name	Data Type	Required	Description
			<p>may be found by submitting a COVE API request for the Missions forecasted list.</p> <p>Coincident Calculator (Forecasted): Valid mission, instrument, and mode may be found by submitting a COVE API request for the Missions forecasted list.</p> <p>Coincident Calculator (Archived): Valid mission, instrument, and mode may be found by submitting a COVE API request for the Missions archived list.</p> <p>Data Browser: Valid mission, instrument, and mode may be found by submitting a COVE API request for the Missions archived list.</p>

Filter example for request:

```
{
  "mission": "Sentinel-2A",
  "instrument": "MSI",
  "mode": ""
}
```

## COVE API Endpoints Summary

Request Method	Request Type	Request URL
<b>Acquisition Forecaster</b>		
GET	User History	<a href="https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/">https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/</a>
POST	Task	<a href="https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/">https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/</a>
GET	Status	<a href="https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/&lt;TASK ID&gt;/</a>
GET	CSV	<a href="https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/csv/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/csv/&lt;TASK ID&gt;/</a>
GET	PNG	<a href="https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/png/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/png/&lt;TASK ID&gt;/</a>
GET	PNG	<a href="https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/png/&lt;TASK ID&gt;/?orbit_direction=ascending">https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/png/&lt;TASK ID&gt;/?orbit_direction=ascending</a>
GET	PNG	<a href="https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/png/&lt;TASK ID&gt;/?orbit_direction=descending">https://ceos-cove.org/en/api/v1_0/acquisition_forecaster/png/&lt;TASK ID&gt;/?orbit_direction=descending</a>
<b>Coverage Analyzer</b>		
GET	User History	<a href="https://ceos-cove.org/en/api/v1_0/coverage_analyzer/">https://ceos-cove.org/en/api/v1_0/coverage_analyzer/</a>
POST	Task	<a href="https://ceos-cove.org/en/api/v1_0/coverage_analyzer/">https://ceos-cove.org/en/api/v1_0/coverage_analyzer/</a>
GET	Status	<a href="https://ceos-cove.org/en/api/v1_0/coverage_analyzer/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/coverage_analyzer/&lt;TASK ID&gt;/</a>
GET	CSV	<a href="https://ceos-cove.org/en/api/v1_0/coverage_analyzer/csv/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/coverage_analyzer/csv/&lt;TASK ID&gt;/</a>
GET	PNG	<a href="https://ceos-cove.org/en/api/v1_0/coverage_analyzer/png/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/coverage_analyzer/png/&lt;TASK ID&gt;/</a>
GET	NetCDF	<a href="https://ceos-cove.org/en/api/v1_0/coverage_analyzer/netcdf/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/coverage_analyzer/netcdf/&lt;TASK ID&gt;/</a>
GET	GeoTiff	<a href="https://ceos-cove.org/en/api/v1_0/coverage_analyzer/geotiff/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/coverage_analyzer/geotiff/&lt;TASK ID&gt;/</a>

Request Method	Request Type	Request URL
<b>Revisits Calculator</b>		
GET	User History	https://ceos-cove.org/en/api/v1_0/revisits_calculator/
POST	Task	https://ceos-cove.org/en/api/v1_0/revisits_calculator/
GET	Status	https://ceos-cove.org/en/api/v1_0/revisits_calculator/<TASK ID>/
GET	JSON	https://ceos-cove.org/en/api/v1_0/revisits_calculator/json/<TASK ID>/
GET	CSV	https://ceos-cove.org/en/api/v1_0/revisits_calculator/csv/<TASK ID>/
GET	PNG	https://ceos-cove.org/en/api/v1_0/revisits_calculator/png/<TASK ID>/
GET	PNG	https://ceos-cove.org/en/api/v1_0/revisits_calculator/png/<TASK ID>/?orbit_direction=ascending
GET	PNG	https://ceos-cove.org/en/api/v1_0/revisits_calculator/png/<TASK ID>/?orbit_direction=ascending
<b>Coincident Calculator</b>		
GET	User History	https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/
POST	Task	https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/
GET	Constellations List	https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/constellations/
GET	Status	https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/<TASK ID>/
GET	JSON	https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/json/<TASK ID>/
GET	PNG	https://ceos-cove.org/en/api/v1_0/coincident_calculator/forecasted/png/<TASK ID>/
GET	User History	https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/



Request Method	Request Type	Request URL
POST	Task	https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/
GET	Constellations List	https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/constellations/
GET	Status	https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/<TASK ID>/
GET	JSON	https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/json/<TASK ID>/
GET	PNG	https://ceos-cove.org/en/api/v1_0/coincident_calculator/archived/png/<TASK ID>/
<b>Data Browser</b>		
GET	User History	https://ceos-cove.org/en/api/v1_0/data_browser/
POST	Task	https://ceos-cove.org/en/api/v1_0/data_browser/
GET	Status	https://ceos-cove.org/en/api/v1_0/data_browser/<TASK ID>/
GET	Scene Count	https://ceos-cove.org/en/api/v1_0/data_browser/count/<TASK ID>/
GET	CSV	https://ceos-cove.org/en/api/v1_0/data_browser/csv/<TASK ID>/
GET	PNG	https://ceos-cove.org/en/api/v1_0/data_browser/png/<TASK ID>/
GET	PNG	https://ceos-cove.org/en/api/v1_0/data_browser/png/<TASK ID>/?orbit_direction=ascending
GET	PNG	https://ceos-cove.org/en/api/v1_0/data_browser/png/<TASK ID>/?orbit_direction=descending
<b>Country Coverage</b>		
GET	Countries List	https://ceos-cove.org/en/api/v1_0/country_coverage/countries/
GET	Constellations List	https://ceos-cove.org/en/api/v1_0/country_coverage/constellations/
GET	Daily History	https://ceos-cove.org/en/api/v1_0/country_coverage/reports/

Request Method	Request Type	Request URL
POST	Task	<a href="https://ceos-cove.org/en/api/v1_0/country_coverage/reports/">https://ceos-cove.org/en/api/v1_0/country_coverage/reports/</a>
GET	Status	<a href="https://ceos-cove.org/en/api/v1_0/country_coverage/reports/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/country_coverage/reports/&lt;TASK ID&gt;/</a>
GET	JSON	<a href="https://ceos-cove.org/en/api/v1_0/country_coverage/reports/json/&lt;TASK ID&gt;/">https://ceos-cove.org/en/api/v1_0/country_coverage/reports/json/&lt;TASK ID&gt;/</a>
GET	JSON	<a href="https://ceos-cove.org/en/api/v1_0/country_coverage/reports/json/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;&amp;constellation=&lt;CONSTELLATION&gt;">https://ceos-cove.org/en/api/v1_0/country_coverage/reports/json/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;&amp;constellation=&lt;CONSTELLATION&gt;</a>
GET	JSON	<a href="https://ceos-cove.org/en/api/v1_0/country_coverage/reports/json/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;">https://ceos-cove.org/en/api/v1_0/country_coverage/reports/json/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;</a>
GET	JSON	<a href="https://ceos-cove.org/en/api/v1_0/country_coverage/reports/json/&lt;TASK ID&gt;/?constellation=&lt;CONSTELLATION&gt;">https://ceos-cove.org/en/api/v1_0/country_coverage/reports/json/&lt;TASK ID&gt;/?constellation=&lt;CONSTELLATION&gt;</a>
GET	PDF	<a href="https://ceos-cove.org/en/api/v1_0/country_coverage/reports/pdf/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;&amp;constellation=&lt;CONSTELLATION&gt;">https://ceos-cove.org/en/api/v1_0/country_coverage/reports/pdf/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;&amp;constellation=&lt;CONSTELLATION&gt;</a>
GET	CSV	<a href="https://ceos-cove.org/en/api/v1_0/country_coverage/reports/csv/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;&amp;constellation=&lt;CONSTELLATION&gt;">https://ceos-cove.org/en/api/v1_0/country_coverage/reports/csv/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;&amp;constellation=&lt;CONSTELLATION&gt;</a>
GET	ZIP	<a href="https://ceos-cove.org/en/api/v1_0/country_coverage/reports/zip/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;&amp;constellation=&lt;CONSTELLATION&gt;">https://ceos-cove.org/en/api/v1_0/country_coverage/reports/zip/&lt;TASK ID&gt;/?country=&lt;COUNTRY&gt;&amp;constellation=&lt;CONSTELLATION&gt;</a>
<b>Utilities</b>		
POST	Calculator	<a href="https://ceos-cove.org/en/api/v1_0/utilities/repeating_orbit/ground_track_interval/">https://ceos-cove.org/en/api/v1_0/utilities/repeating_orbit/ground_track_interval/</a>
POST	Calculator	<a href="https://ceos-cove.org/en/api/v1_0/utilities/repeating_orbit/period_velocity/">https://ceos-cove.org/en/api/v1_0/utilities/repeating_orbit/period_velocity/</a>
POST	Calculator	<a href="https://ceos-cove.org/en/api/v1_0/utilities/repeating_orbit/sun_synchronous_orbit/">https://ceos-cove.org/en/api/v1_0/utilities/repeating_orbit/sun_synchronous_orbit/</a>
POST	Calculator	<a href="https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/incidence_to_pointing/">https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/incidence_to_pointing/</a>
POST	Calculator	<a href="https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/fov_from_swath_width/">https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/fov_from_swath_width/</a>

Request Method	Request Type	Request URL
POST	Calculator	<a href="https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/swath_width_from_fov/">https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/swath_width_from_fov/</a>
POST	Calculator	<a href="https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/swath_from_incidence/">https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/swath_from_incidence/</a>
POST	Calculator	<a href="https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/swath_off_nadir/">https://ceos-cove.org/en/api/v1_0/utilities/swath_calculator/swath_off_nadir/</a>
<b>Missions</b>		
GET	List	<a href="https://ceos-cove.org/en/api/v1_0/missions/forecasted/">https://ceos-cove.org/en/api/v1_0/missions/forecasted/</a>
GET	List	<a href="https://ceos-cove.org/en/api/v1_0/missions/archived/">https://ceos-cove.org/en/api/v1_0/missions/archived/</a>
<b>Custom Missions</b>		
GET	List	<a href="https://ceos-cove.org/en/api/v1_0/custom_missions/">https://ceos-cove.org/en/api/v1_0/custom_missions/</a>
<b>Regions</b>		
GET	List	<a href="https://ceos-cove.org/en/api/v1_0/regions/">https://ceos-cove.org/en/api/v1_0/regions/</a>
POST	Region Details	<a href="https://ceos-cove.org/en/api/v1_0/regions/">https://ceos-cove.org/en/api/v1_0/regions/</a>
POST	Import KML String	<a href="https://ceos-cove.org/en/api/v1_0/regions/">https://ceos-cove.org/en/api/v1_0/regions/</a>
POST	Import KML File	<a href="https://ceos-cove.org/en/api/v1_0/regions/upload/">https://ceos-cove.org/en/api/v1_0/regions/upload/</a>
POST	Import Shapefile	<a href="https://ceos-cove.org/en/api/v1_0/regions/upload/">https://ceos-cove.org/en/api/v1_0/regions/upload/</a>
GET	Export KML File	<a href="https://ceos-cove.org/en/api/v1_0/regions/kml/&lt;REGION ID&gt;/">https://ceos-cove.org/en/api/v1_0/regions/kml/&lt;REGION ID&gt;/</a>
GET	Export Shapefile	<a href="https://ceos-cove.org/en/api/v1_0/regions/shapefile/&lt;REGION ID&gt;/">https://ceos-cove.org/en/api/v1_0/regions/shapefile/&lt;REGION ID&gt;/</a>
GET	Export PNG	<a href="https://ceos-cove.org/en/api/v1_0/regions/png/&lt;REGION ID&gt;/">https://ceos-cove.org/en/api/v1_0/regions/png/&lt;REGION ID&gt;/</a>

## Contact Us

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Send a message via the Contact Us page with details of any issues and the COVE team will attempt to rectify the situation in a timely manner.

Refer to the [COVE UI User's Guide](#) for more information on the usage of each COVE tools.