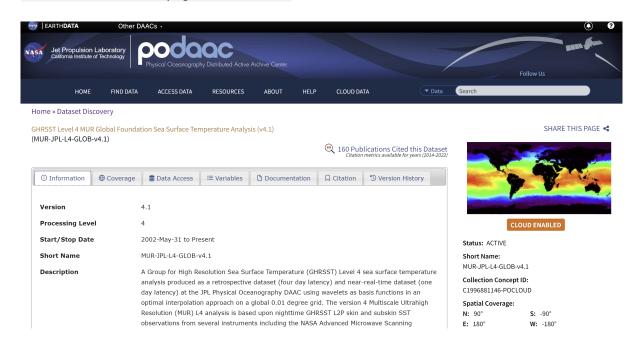# Manual for download data from PODAAC using MATLAB (with specific Area and Period)

How to write the MATLAB Script for download data?

1. Access the Product webpage in the **PODAAC**

2. Click `Data Access`

DIRECT ACCESS

- HTTPS endpoint for data browse and download
  - https://cmr.earthdata.nasa.gov/virtual-directory/collections/C1996881146-POCLOUD
- Search Granules
  - https://search.earthdata.nasa.gov/search/granules?p=C1996881146-POCLOUD

3. `DIRECT ACCESS` > access `HTTPS Link`

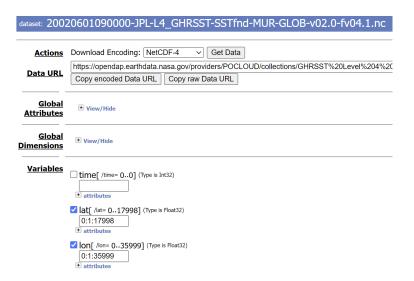GHRSST Level 4 MUR Global Foundation Sea Surface Temperature Analysis (v4.1)

Sort By	File Count
Temporal	8161

4. You have to "Sign In" and Choose 'sample day' for get the longitude, latitude information.

GHRSST Level 4 MUR Global Foundation Sea Surface Temperature Analysis (v4.1) › temporal › 2002 › 05 › **31**

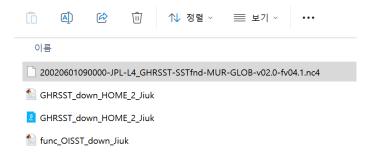| Granule Download	Other Links
20020601090000-JPL-L4_GHRSST-SSTfnd-MUR-GLOB-v02.0-fv04.1	OPeNDAP

5. Click the `Opendap` and set the option like below

   a. Download Encoding : `NetCDF-4`

   b. add the Variables : " `lat` " and " `lon` "

6. Click `Get Data`

7. Make new folder for MATLAB Workspace.

   Move the nc file in the new folder

   (You can change the name of nc file)

8. Open the new MATLAB script and read the longitude, latitude information of the NC file.

```
%% read 'lon', 'lat' data from NC file
clc; clear;

fnm = 'sample_lonlat_20020601_MUR_41.nc4';
ncdisp(fnm)

lon = ncread(fnm, 'lon');
lat = ncread(fnm, 'lat');
```

9. Find the index of region where you want to download

```
Spatial_area = [24, 35, 121, 132];

idlat(1) = findnearpoint(lat, Spatial_area(1));
idlat(2) = findnearpoint(lat, Spatial_area(2));
idlon(1) = findnearpoint(lon, Spatial_area(3));
idlon(2) = findnearpoint(lon, Spatial_area(4));

function id = findnearpoint(base, target)
% find nearest point of "target" from "base"
[~, id] = min(abs(base-target));
end
```

10. Prepare the period information with proper format

```
period = [2014, 1, 1; 2014, 1, 5];
period2 = datetime(period);
period3 = period2(1):days(1):period2(2);
```

11. Back to the website - Add the Variables (time and variables you want) - `Copy raw Data Link`

ataset: 20020601090000-JPL-L4_GHRSST-SSTfnd-MUR-GLOB-v02.0-fv04.1.nc

Actions Download Encoding: [NetCDF-4 ▾] [Get Data]

Data URL https://opendap.earthdata.nasa.gov/providers/POCLOUD/collections/GHRSST%20Level%204%20MUR%
[Copy encoded Data URL] [Copy raw Data URL]

Global Attributes ⊞ View/Hide

Global imensions ⊞ View/Hide

Variables

☑ time[/time= 0..0] (Type is Int32)
`0:1:0`
⊟ attributes
  ○ **long_name:** reference time of sst field (Type is String)
  ○ **standard_name:** time (Type is String)
  ○ **axis:** T (Type is String)
  ○ **units:** seconds since 1981-01-01 00:00:00 UTC (Type is String)
  ○ **comment:** Nominal time of analyzed fields (Type is String)

☑ lat[/lat= 0..17998] (Type is Float32)
`0:1:17998`
⊞ attributes

☑ lon[/lon= 0..35999] (Type is Float32)
`0:1:35999`
⊞ attributes

☑ analysed_sst[/time= 0..0] [/lat= 0..17998] [/lon= 0..35999] (Type is Int16)
`0:1:0` `0:1:17998` `0:1:35999`
⊞ attributes

12. If the url is like this,

> https://opendap.earthdata.nasa.gov/providers/POCLOUD/collections/GHRSST Level 4 MUR Global Foundation Sea Surface Temperature Analysis (v4.1)/granules/20020601090000-JPL-L4_GHRSST-SSTfnd-MUR-GLOB-v02.0-fv04.1.dap.nc4?dap4.ce=/time[0:1:0];/lat[0:1:17998];/lon[0:1:35999];/analysed_sst[0:1:0][0:1:17998][0:1:35999]

Then, you can split this link into like this

1. https://opendap.earthdata.nasa.gov/providers/POCLOUD/collections/GHRSST Level 4 MUR Global Foundation Sea Surface Temperature Analysis (v4.1)/granules/

2. 20020601

3. 090000-JPL-L4_GHRSST-SSTfnd-MUR-GLOB-v02.0-fv04.1.dap.nc4?dap4.ce=

4. /time[0:1:0];/lat[0:1:17998];/lon[0:1:35999];/analysed_sst[0:1:0][0:1:17998][0:1:35999]

Then, you should change the "2" and "4" in the MATLAB.

13. The example is like this.

```
%% load data with URL

% If the downloaded file has the SAME NAME, INCREASE the value of lag_time
lag_time = 3; % seconds between download each files
```

```
for loop = 1:length(period3)
    period4 = period3(loop); period5 = datevec(period4); period5 = period5(1:3
    period6 = sprintf("%d%02.0f%02.0f", period5);

    url1 = "https://opendap.earthdata.nasa.gov/providers/POCLOUD/collections/"
        "GHRSST%20Level%204%20MUR%20Global%20Foundation%20Sea%20Surface%20Temp
        "/granules/";

    url2 = period6;

    url3 = "090000-JPL-L4_GHRSST-SSTfnd-MUR-GLOB-v02.0-fv04.1.dap.nc4?dap4.ce=

    url4 = sprintf("/time[0:1:0];/lat[%d:1:%d];/lon[%d:1:%d];/analysed_sst[0:1
        idlat(1)-1, idlat(2)-1, idlon(1)-1, idlon(2)-1, ...
        idlat(1)-1, idlat(2)-1, idlon(1)-1, idlon(2)-1);

    url5 = strcat(url1, url2, url3, url4);
    web(url5)

    pause(lag_time);
end
```

Finally, you can automatically download the data!