

Download TRMM Precipitation Data in NetCDF (Network Common Data Form) (*.nc4) using Wget and a software
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1. Introduction

To download: Daily data (Follow same process for Monthly data)

Website: <https://disc.gsfc.nasa.gov/>

(Change the following data as per requirement)

Start Date: 2007-01-01

End Date: 2007-12-31

Latitude Limit: [20, 35] °N

Longitude Limit: [75, 84] °E

Data version: TRMM_3B42_Daily_7

3 → Level

B → Sensor Side (A or B)

42 → 40 – Series (42 for daily data and 43 for Monthly data)

2. Steps to choose data and create link

2.1. Go to Data website

Go to Website: <https://disc.gsfc.nasa.gov/>

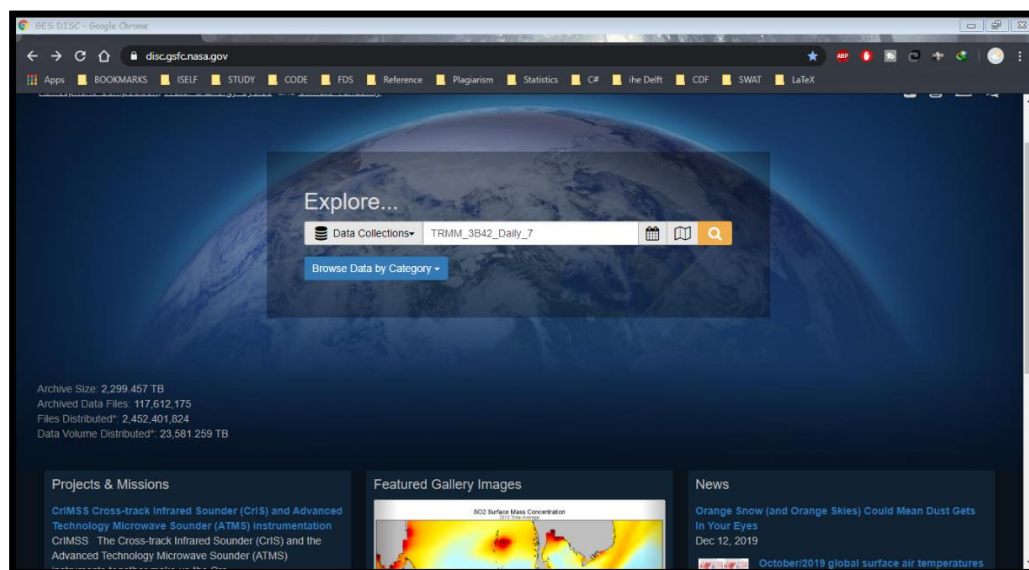


Figure 1: Website to download TRMM Data

2.2. Select Date Range

Select date range as follows-

Start Date: 2007-01-01

End Date: 2007-12-31

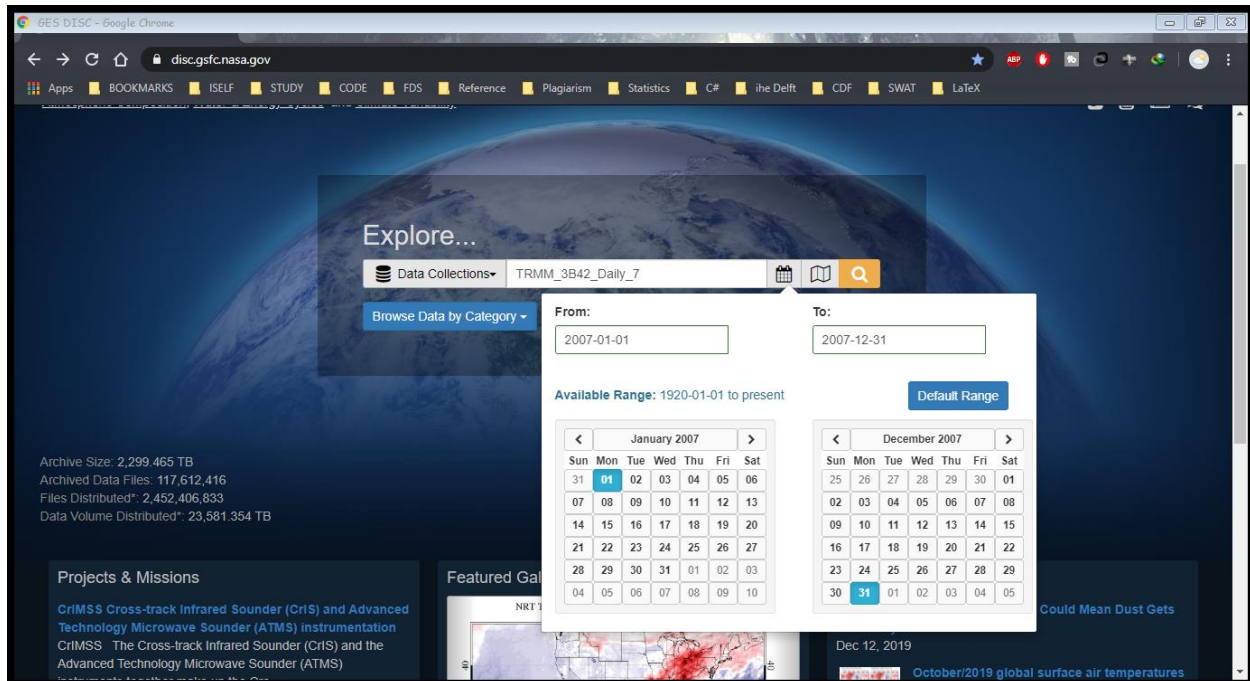


Figure 2: Select Date Range

2.3. Enter Spatial Range (Lat Long)

Select Latitude and Longitude of rectangle of area of interest as below-

Latitude Limit: [20, 35] ON

Longitude Limit: [75, 84] °E

Lat and Long should be entered in format: 75,20,84,35

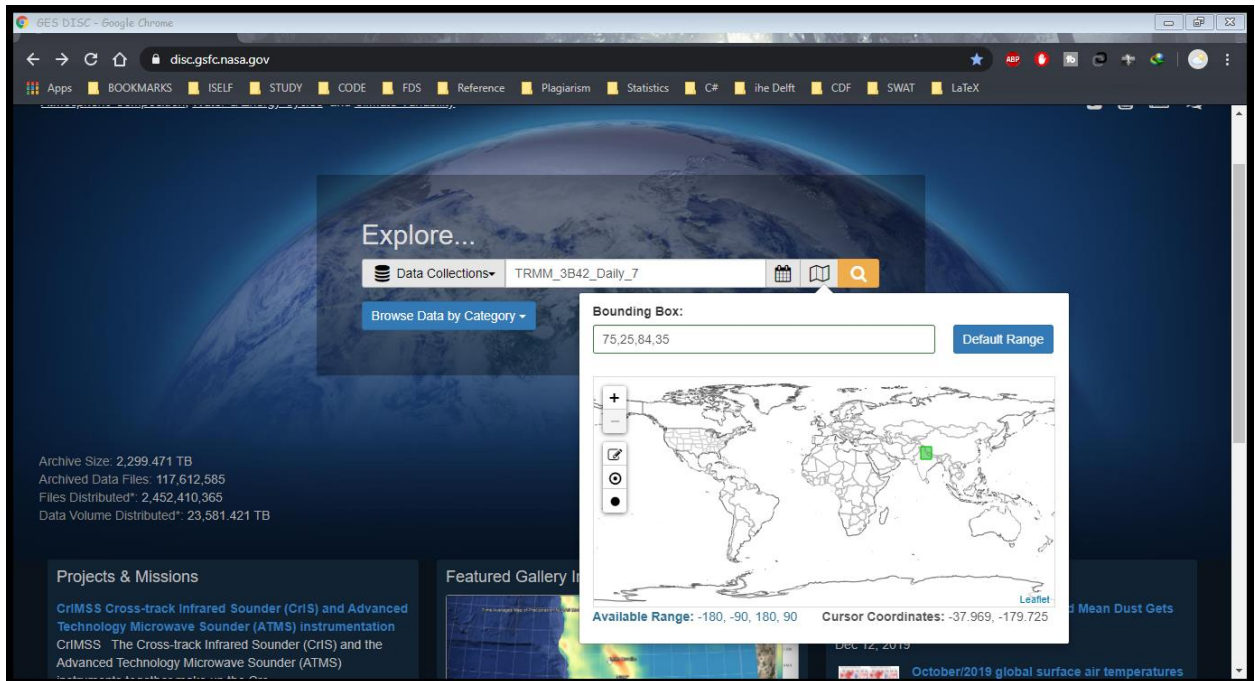


Figure 3: Enter Latitude and Longitude (Spatial Range)

2.4. Click on Search

Click on Subset/Get Data

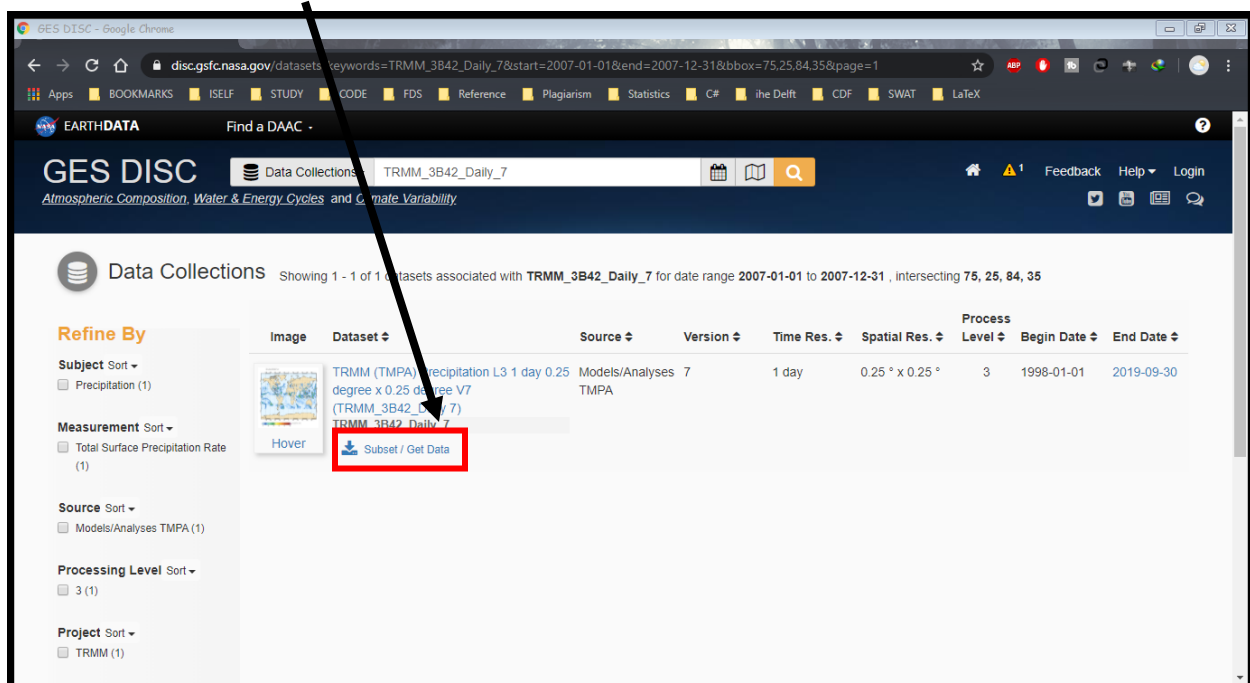


Figure 4: Search Result

2.5. Subset/Get Data

After clicking Subset/Get Data, expand Variables and check on “Precipitation”. You can also choose “IRPrecipitation” or “HQPrecipitation”. If no option is chosen, all variables will be downloaded.

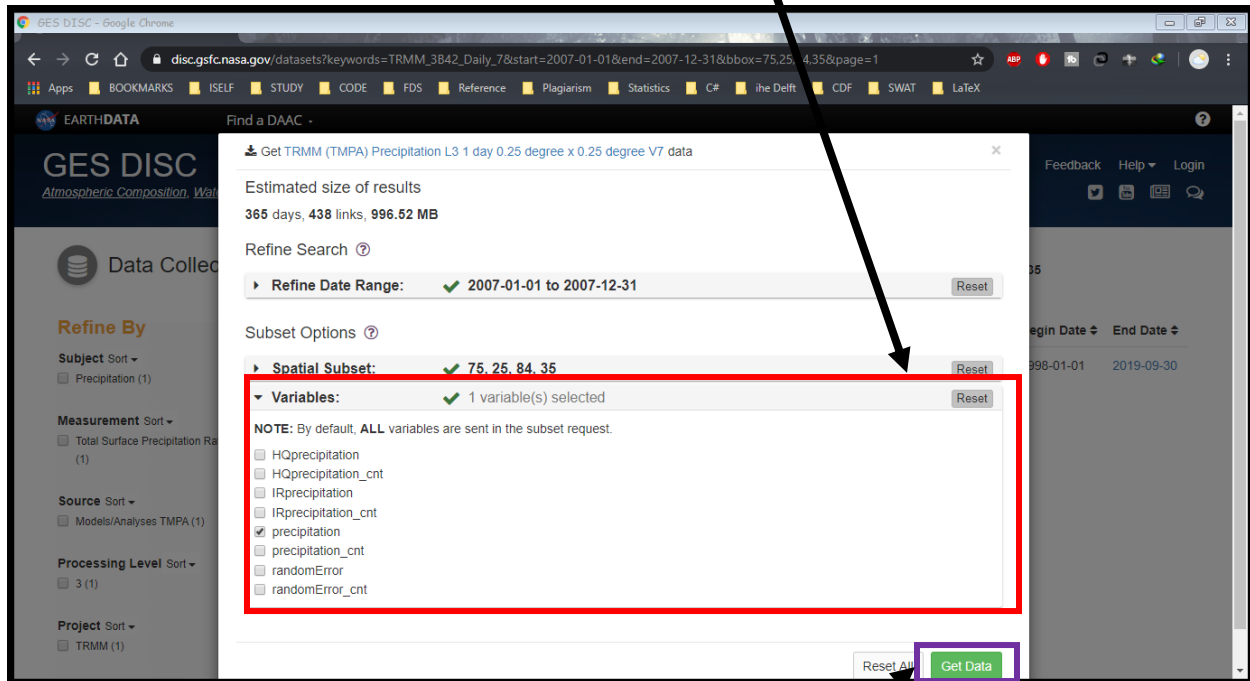


Figure 5: Subset/ Get Data and choose variable

After choosing variables, click on **Get Data**.

If necessary, you can modify date range or latitude longitude limits.

2.6. Get Data and Download Link List in text file Format

Click on the **Download Link List**. You can get **instruction for downloading**.

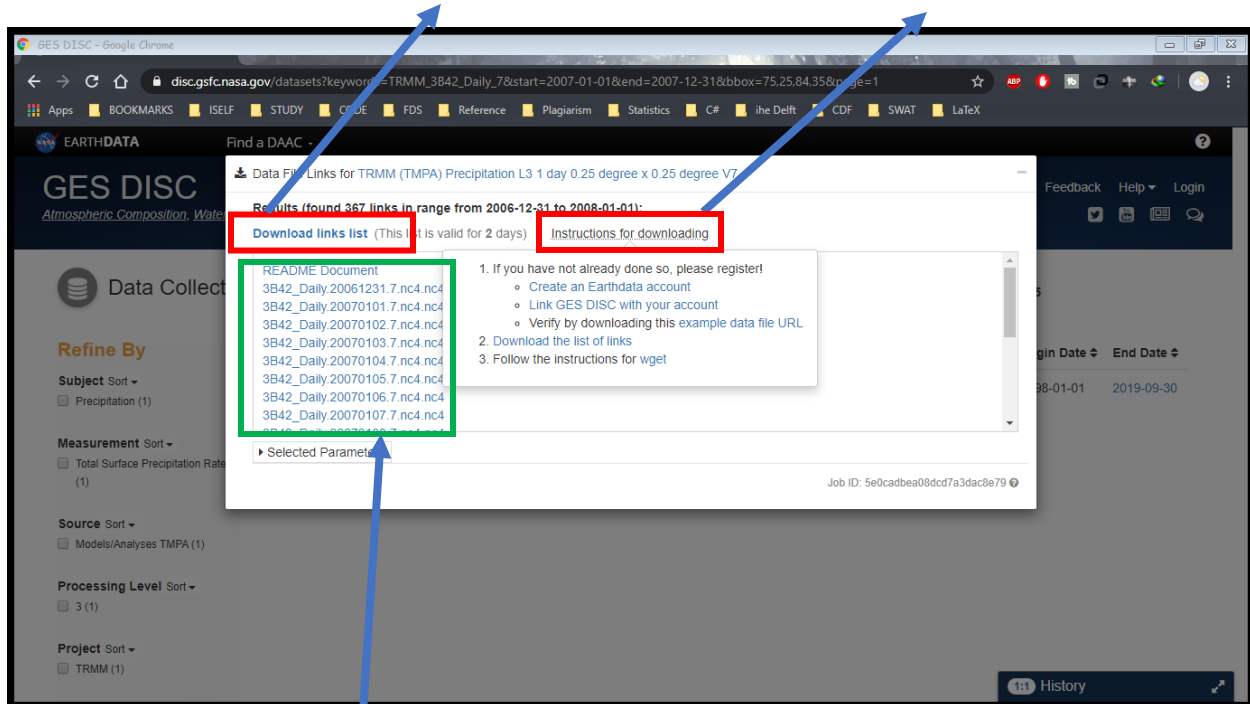


Figure 6: Get data and download link list

You can **download individual file** by clicking on each file (which is tedious and time consuming).

We will see how to automate the download process in next section. For now, only download link list.

2.7. Download link list File

You will get text file with name:

subset_TRMM_3B42_Daily_7_20200101_144425.txt

Rename the file to ***myfile.txt***

Save the file in known location

e.g. **F:\AY\SWAT\Manual\TRMM\Link_Lists**

This text file looks like in the Figure 7.

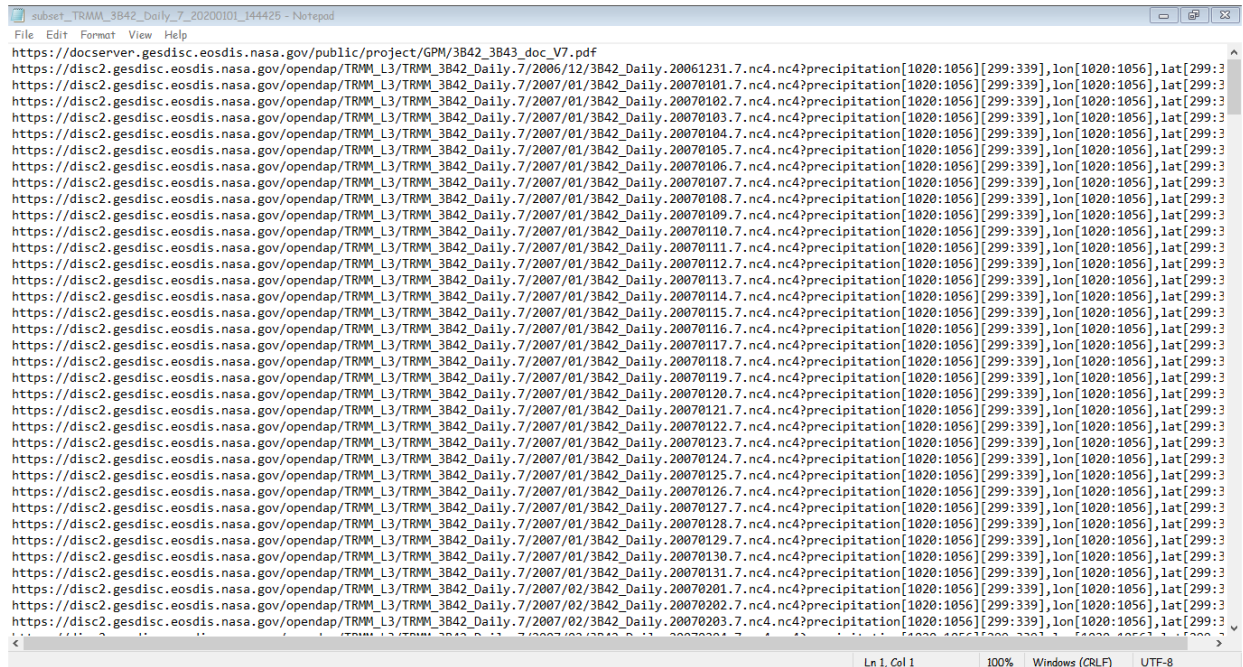


Figure 7: Text file containing list of all link of *.nc4 file and readme file in .pdf

3. Create Earthdata account

Go to link: <https://urs.earthdata.nasa.gov/users/new>

Figure 8: Register in EarthData

Enter username, password, your name, Country, etc.

e.g. username = ajay
password = trmmData123
country = Nepal, etc.

Then click on “Register for EarthData Login”

You will be asked to verify through email address.

After email verification, verify your Login by going to link:

<https://urs.earthdata.nasa.gov/home>

4. Download Wget

Wget is a free software using which you can download files from any website.

Download Wget from link: <https://eternallybored.org/misc/wget/>

Download the .exe file 32-bit or 64-bit as per your requirement.

The screenshot shows the website eternallybored.org/misc/wget/. It features a table of Windows binaries for GNU Wget. A green arrow points to the '32-bit' column header. The table lists various versions of Wget, their dependencies (like OpenSSL, ZLib, GPGME, PCRE2, LIBPSL), and links to download the 32-bit (ZIP, EXE) and 64-bit (ZIP, EXE) versions. A 'Warning' section mentions that some antivirus tools might flag the file as potentially dangerous due to debugging symbols. A 'Scripts' sidebar on the right lists tools like Gifsicle, NetCat, and PCI Utilities. A 'Donate' button is also visible.

Version	32-bit	64-bit	Notes
1.20.3	ZIP EXE	ZIP EXE	OpenSSL 1.1.1b, ZLib 1.2.11, gpgme-1.13.0, pcre2 10.32, libpsl 0.20.2, taskbar progressbar , Windows certificate store support , manual ; the binaries have been updated and now work fine with SSL connections
1.20	ZIP EXE	ZIP EXE	OpenSSL 1.1.1a, ZLib 1.2.11, gpgme-1.12.0, pcre2 10.32, libpsl 0.20.2, taskbar progressbar , Windows certificate store support , manual ; XP support dropped
1.19.4	ZIP EXE	ZIP EXE	OpenSSL 1.1.0g, ZLib 1.2.11, gpgme-1.10.0, taskbar progressbar , Windows certificate store support , manual
1.19.3	ZIP EXE	ZIP EXE	OpenSSL 1.1.0f, ZLib 1.2.11, gpgme-1.10.0, taskbar progressbar , Windows certificate store support , manual
1.19.2	ZIP EXE	ZIP EXE	OpenSSL 1.1.0f, ZLib 1.2.11, taskbar progressbar , Windows certificate store support , manual
1.19.1	ZIP	-	OpenSSL 1.1.0e, ZLib 1.2.11, taskbar progressbar , Windows certificate store support , manual
1.18	ZIP	-	OpenSSL 1.0.2h, ZLib 1.2.8, taskbar progressbar , Windows certificate store support , manual
1.17.1	ZIP	-	OpenSSL 1.0.2e, ZLib 1.2.8, taskbar progressbar , Windows certificate store support , man page
1.17	ZIP	-	OpenSSL 1.0.2d, ZLib 1.2.8, taskbar progressbar , man page
1.16.3	ZIP	-	OpenSSL 1.0.2a, ZLib 1.2.8, taskbar progressbar , man page
1.16.2	ZIP	-	OpenSSL 1.0.2, ZLib 1.2.8, taskbar progressbar , man page
1.16.1	ZIP	-	OpenSSL 1.0.1j, ZLib 1.2.8, taskbar progressbar , man page
1.16	ZIP	-	OpenSSL 1.0.1j, ZLib 1.2.8, taskbar progressbar , man page
1.15	ZIP	-	OpenSSL 1.0.1f, ZLib 1.2.8
1.13.4	ZIP	-	OpenSSL 1.0.0f, ZLib 1.2.5
1.13	ZIP	-	OpenSSL 1.0.0d, ZLib 1.2.5

[Source code](#)

Figure 9: Download Wget

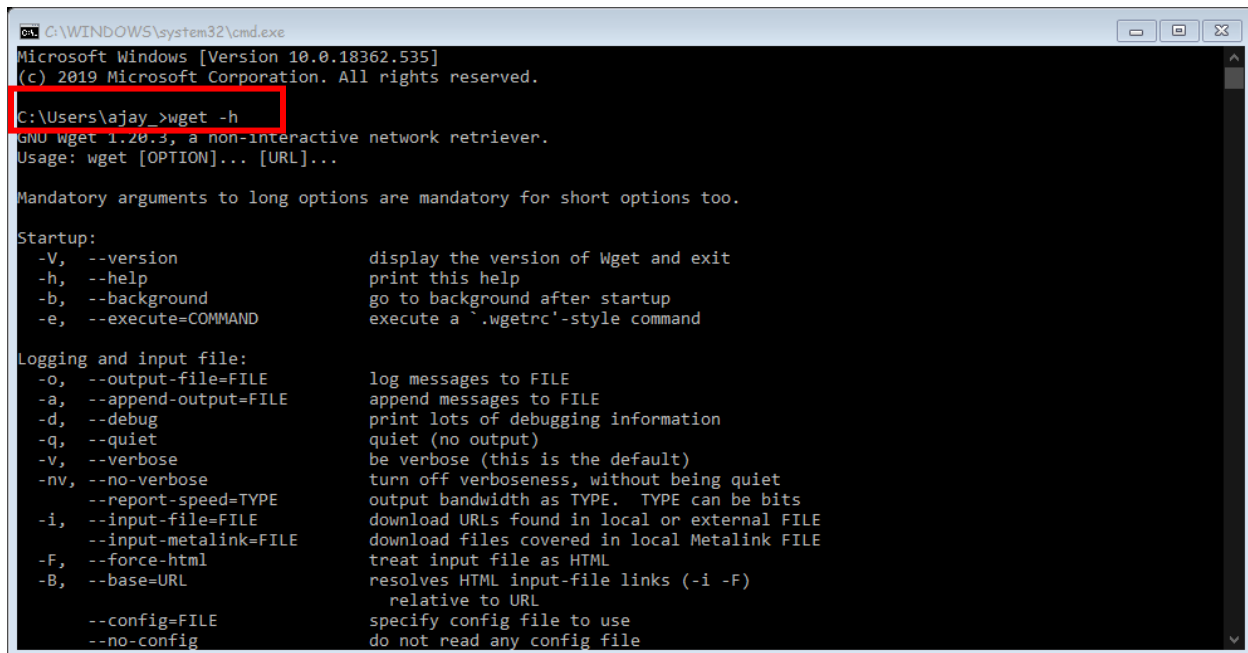
After downloading Wget.exe, copy the file and paste into location-

C:\Windows\System32

Pasting into this location will allow you to run Wget from any Drive. To check whether Wget is working or not follow the process-

- ✓ Press **Windows Key + R**
- ✓ Type “**cmd**” and press enter
- ✓ Type **Wget -h**

You will get as in Figure 10.



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.18362.535]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\ajay> wget -h
GNU Wget 1.20.3, a non-interactive network retriever.
Usage: wget [OPTION]... [URL]...

Mandatory arguments to long options are mandatory for short options too.

Startup:
  -V, --version           display the version of Wget and exit
  -h, --help              print this help
  -b, --background        go to background after startup
  -e, --execute=COMMAND   execute a '.wgetrc'-style command

Logging and input file:
  -o, --output-file=FILE  log messages to FILE
  -a, --append-output=FILE append messages to FILE
  -d, --debug             print lots of debugging information
  -q, --quiet             quiet (no output)
  -v, --verbose           be verbose (this is the default)
  -nv, --no-verbose       turn off verbosity, without being quiet
  --report-speed=TYPE     output bandwidth as TYPE.  TYPE can be bits
  -i, --input-file=FILE   download URLs found in local or external FILE
  --input-metalink=FILE   download files covered in local Metalink FILE
  -F, --force-html        treat input file as HTML
  -B, --base=URL          resolves HTML input-file links (-i -F)
                        relative to URL
  --config=FILE           specify config file to use
  --no-config            do not read any config file
```

Figure 10: Test Run for Wget

Now you have got everything required to automate the download process.

5. Creating Cookies

Open **cmd.exe** and go to the folder (Directory) you want to create the cookies in.

To change drive type **drive name** followed by **colon**

e.g. **C:\> F:** results in **F:\>**

To go to required folder use command **cd** (change directory)

e.g. **F:\>cd AY** results in **F:\AY>**

To list directories and files, use command **dir** and it will list all directory.

After navigating to the required directory, enter **NUL > .urs_cookies**

e.g. **F:\AY\SWAT\Manual\TRMM\TRMM_COOKIES>NUL > .urs_cookies**

This will create. **urs_cookies** file in the folder **TRMM_COOKIES**.

You may get “Access Denied” error. Ignore this error but ensure that the cookie is created in the chosen folder.

6. Download TRMM Data in NetCDF using Wget

Open **cmd.exe** and go to the folder (Directory) you want to download the TRMM Data in NetCDF (*.nc4) file.

e.g. **F:\AY\SWAT\Manual\TRMM\TRMM_2007>**

Now, we will use the following code:

```
wget --load-cookies C:\.urs_cookies --save-cookies C:\.urs_cookies --auth-no-challenge=on --keep-session-cookies --user=<your username> --ask-password --content-disposition -i <url.txt>
```

You need to change only the colored portion of the above code.

C: will be changed to the folder where you created the cookies, which is

F:\AY\SWAT\Manual\TRMM\TRMM_COOKIES

<your username> will be changed to your username created in section **3 Create Earthdata account**, which is

ajay

--ask-password will be changed to your password created in section **3 Create Earthdata account**, which is

--password=trmmData123

<url.txt> will be changed to the full file path of the text file downloaded, renamed and saved in section **2.7 Download link list File**, which is

F:\AY\SWAT\Manual\TRMM\Link_Lists

The final code will be:

```
wget --load-cookies F:\AY\SWAT\Manual\TRMM\TRMM_COOKIES\.urs_cookies  
--save-cookies F:\AY\SWAT\Manual\TRMM\TRMM_COOKIES\.urs_cookies --  
auth-no-challenge=on --keep-session-cookies --user=ajay --  
password=trmmData123 --content-disposition -i  
F:\AY\SWAT\Manual\TRMM\Link_Lists\myfile.txt
```

Now, paste the above code in **cmd.exe** after navigating to the folder where you want to download the files as given below-

```
F:\AY\SWAT\Manual\TRMM\TRMM_2007> wget --load-cookies  
F:\AY\SWAT\Manual\TRMM\TRMM_COOKIES\.urs_cookies --save-cookies  
F:\AY\SWAT\Manual\TRMM\TRMM_COOKIES\.urs_cookies --auth-no-  
challenge=on --keep-session-cookies --user=ajay --password=trmmData123 --  
content-disposition -i F:\AY\SWAT\Manual\TRMM\Link_Lists\myfile.txt
```

Note:

- ✓ *There shouldn't be any white space in the full path of any file path used here.*
- ✓ *There should be proper spacing before "--" in the above code*

7. Software to Download TRMM Data

7.1. Introduction to Software

Instead of downloading and writing codes in wget, you can download the software named **CSAY TRMM DATA DOWNLOADER**, where you need to input

- ✓ Username of EarthData account
- ✓ Password of EarthData account
- ✓ download link list file (*.txt or *.dat format) and
- ✓ project name (optional i.e. you may leave it blank)

When you click **Download TRMM Data**, a folder name entered in project name text box is created in the root directory in which this software is.

CSAY TRMM DATA DOWNLOADER VERSION 1.2020

Username of EarthData Account

Password of EarthData Account

Download Link Lists

Project Name (Optional)

Figure 11: CSAY TRMM DATA DOWNLOADER

7.2. Functions of Button

- ✓ **Register:** Clicking this software will open login page of EarthData.
- ✓ **Show:** This will show the password and turns into “**Hide**”. When you click “**Hide**”, it will again hide the password by character ‘*’.
- ✓ **Browse:** By clicking the button, you can navigate to the file containing list of download link as in Figure 7.
- ✓ **Open:** By default, it will open the folder containing this software. When project name is entered and TRMM Data has been downloaded, clicking it will open the folder containing the downloaded data. When project name is not entered, the software generates folder name in format-
TRMMData_yyMMddTHSS
- ✓ **Download TRMM Data:** This will download TRMM Data according to the download link in the *.txt or *.dat file.
- ✓ **Go To Data Website:** This will open web page from where, TRMM Data can be generated and link list file can be downloaded.
- ✓ **About:** This will open a window containing information about the software and its creator.
- ✓ **Exit:** This will close the program.