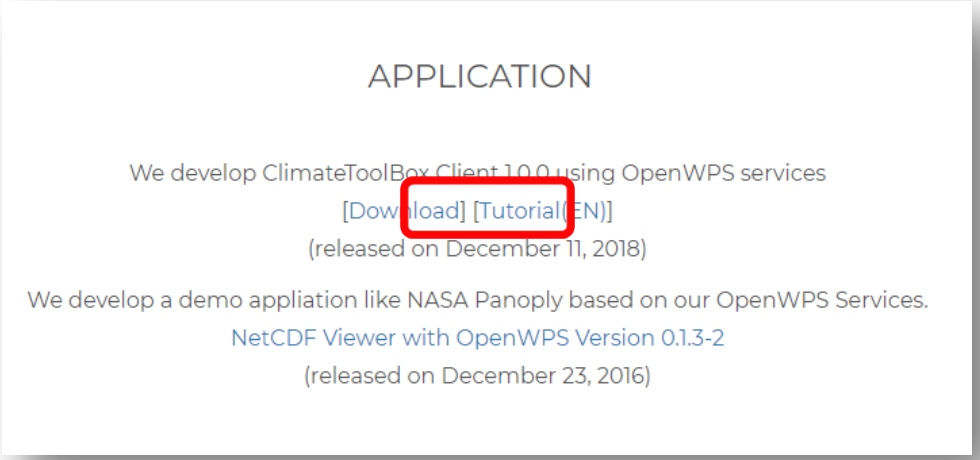
Version 1.0.0

ClimateToolBox Client Manual

APCC APEC CLIMATE CENTER

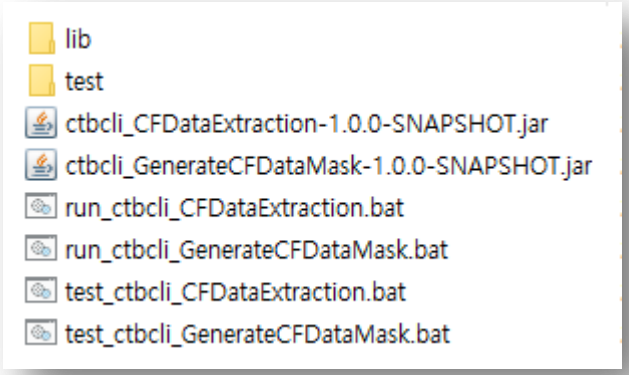
ClimateToolBox

(1) Connect to OpenWPS homepage (http://openwps.apcc21.org)



- **Program requirement**
  - **JRE: 1.5 or above**
  - **OS: Windows or Linux**

(2) Download and Extract download file (ClimateToolBox_Client_1.0.0.zip)



- lib folder: libraries for running the programs
- test folder: sample data for test
- run_ctbcli_CFDataExtraction.bat: ctbcli_CFDataExtraction program execution file
- run_ctbcli_GenerateCFDataMask.bat: ctbcli_GenerateCFDataMask program execution file
- test_ctbcli_CFDataExtraction.bat: ctbcli_CFDataExtraction program execution test file
- test_ctbcli_GenerateCFDataMask.bat: ctbcli_GenerateCFDataMask program test file

ctbcli_GenerateCFDataMask

- **Program: ctbcli_GenerateCFDataMask**
- **Version: 1.0.0**
- **Description: This program generates mask data using CF metadata and user-defined AOI (Area Of Interest) and and save it in netCDF format or CSV format**

Parameter	Description
i	An input filename or A folder saved input files
g	User-defined spatial data with GeoJSON format
m	Mask generation method using user-defined spatial data • RectInterPy, PtInExpMBR, PtInMBR, PtInPy **(Ref. to https://openwps.apcc21.org/)**
r	Spatial resolution if non-gridded climate data
f	Mask data save format • nc: NetCDF • csv: CSV
o	Save filename (if 'I' parameter is the folder, this option is ignore)
v	Variable name that you want to extract data) **(if this option is empty, this option would be set to the first variable expect the main variables such as lat, lon, time, etc.)**

DEMO: ctbcli_GenerateCFDataMask

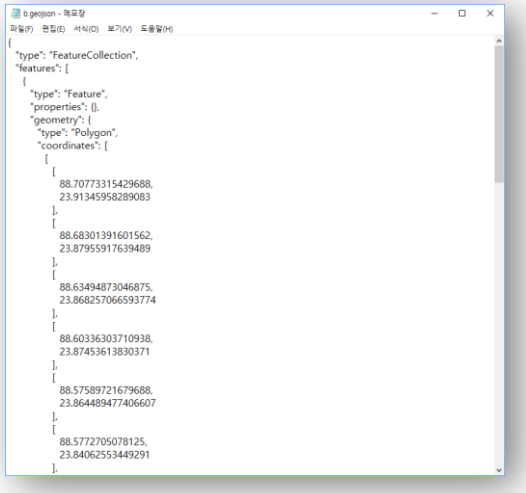
- **ctbcli_GenerateCFDataMask program test**

Parameter	Value
i	D:\merra2\data\prec.nc
g	D:\merra2\b.geojson
f	nc
o	d:\merra2\prec_mask.nc
r	3.5
m	RectInterPy
v	prec

User-defined AOI

http://geojson.io

b.geojson file



Execution screen

```
Processing D:\merra2\data\prec.nc

Making input parameter data (gClimateMaskJSON data, etc.)...
Connecting to OpenWPS server and sending input parameters...
Writing mask data to d:\merra2\prec_mask.nc...
Complete
```

DEMO: ctbcli_GenerateCFDataMask

- **Execution result file**

prec_mask.nc

```
dimensions:
   lat = 73
   lon = 144

variables:
   int mask(lat = 73, lon = 144)
      :_FillValue = 0

   float lon(lon = 144)
      :units = "degrees_east"
      :long_name = "longitude"
      :nlon = 144

   float lat(lat = 73)
      :units = "degrees_north"
      :long_name = "latitude"
      :nlat = 73

// global attributes:
:institution = "APEC Climate Center, Busan, Republic of Korea"
:institute_id = "APCC"
:contact = "Seongkyu Lee(geoslegend@apcc21.org)"
```

metadata

Dataset: prec_mask.nc
Variable: mask
Units:

lat (degrees_north) \ lon (degrees_east)	82.500	85.000	87.500	90.000	92.500	95.000	97.500
-7.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
-5.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
-2.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
0.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
5.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
7.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
10.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
12.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
15.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
17.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
20.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
22.500	NaN	NaN	1.0	1.0	NaN	NaN	NaN
25.000	NaN	NaN	1.0	1.0	NaN	NaN	NaN
27.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
30.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
32.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
35.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
37.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
40.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
42.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
45.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN
47.500	NaN	NaN	NaN	NaN	NaN	NaN	NaN
50.000	NaN	NaN	NaN	NaN	NaN	NaN	NaN

mask variable data

ctbcli_CFDataExtraction

- **Program: ctbcli_CFDataExtraction**
- **Version: 1.0.0**
- **Description: This program extracts climate data in user-defined AOI (Area Of Interest) from netCDF data created with CF metadata and saves it in CSV format**

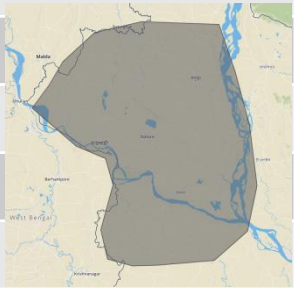
Parameter	Description
mmd	Masking data generation method using user-defined AOI (Area Of Interest) • always: mask data generation of each file through OpenWPS service • once: mask data generation through OpenWPS service when the first file will be processed
g	User-defined spatial data with GeoJSON format
m	Mask generation method using user-defined spatial data • RectInterPy, PtInExpMBR, PtInMBR, PtInPy **(Ref. to https://openwps.apcc21.org/)**
r	Spatial resolution if non-gridded climate data
tfmt	Time data output format • value: raw data • date(yyyy-MM-dd): data converted 'yyyy-MM-dd' data format • datetime(yyyy-MM-dd HH:mm:ss): data converted 'yyyy-MM-dd HH:mm:ss' data/time format
i	An input filename or A folder saved input files
o	Save filename (if 'I' parameter is the folder, this option is ignore)
v	Variable name that you want to extract data) **(if this option is empty, this option would be set to the first variable expect the main variables)**

DEMO: ctbcli_CFDataExtraction

- **ctbcli_CFDataExtraction program data**

Parameter	Value
mmd	always
g	D:\merra2\b.geojson
r	3.5
m	RectInterPy
tfmt	date
i	D:\merra2\data

User-defined AOI



* if v option is empty, this option will be set to the first variable expect the main variables (lat, lon, time, etc.)

*** File list in the input folder (d:\merra2\data)**

- MERRA2_0.5d_PREC_1980.nc (Non-CF metadata)
- MERRA2_PREC_2015.nc (Non-CF metadata)
- prec.nc (MME – GAUS, CF metadata)
- sst.mnmean.nc (NOAA Extended Reconstructed SST V3 , CF metadata)

실행 화면

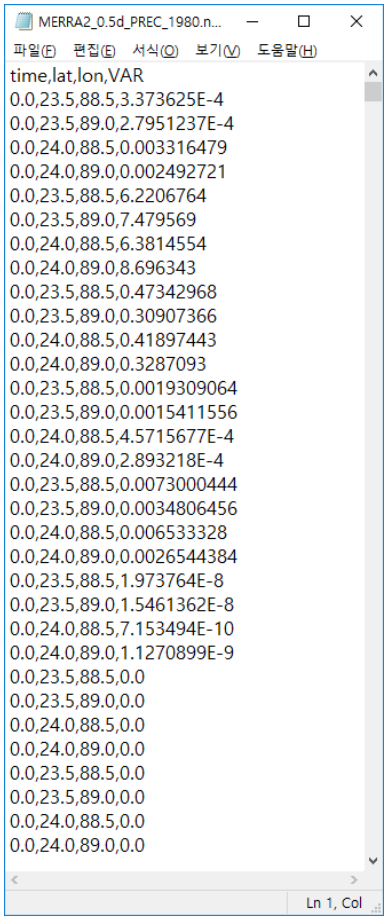
Error due to non-CF metadata

```
[1/4] Processing D:\merra2\data\MERRA2_0.5d_PREC_1980.nc

Finding the first variable...
Found the first variable: VAR
[ERROR] Unable to parse date string s %Y%m%d.%f
Connecting to OpenWPS server...
Making basis data...
Extracting and saving data in the user-defined region...

[2/4] Processing D:\merra2\data\MERRA2_PREC_2015.nc

Finding the first variable...
Found the first variable: VAR
[ERROR] Unable to parse date string s %Y%m%d.%f
Connecting to OpenWPS server...
Making basis data...
Extracting and saving data in the user-defined region...

[3/4] Processing D:\merra2\data\prec.nc

Finding the first variable...
Found the first variable: prec
Connecting to OpenWPS server...
Making basis data...
Extracting and saving data in the user-defined region...

[4/4] Processing D:\merra2\data\sst.mnmean.nc

Finding the first variable...
Found the first variable: sst
Connecting to OpenWPS server...
Making basis data...
Extracting and saving data in the user-defined region...

Complete
```

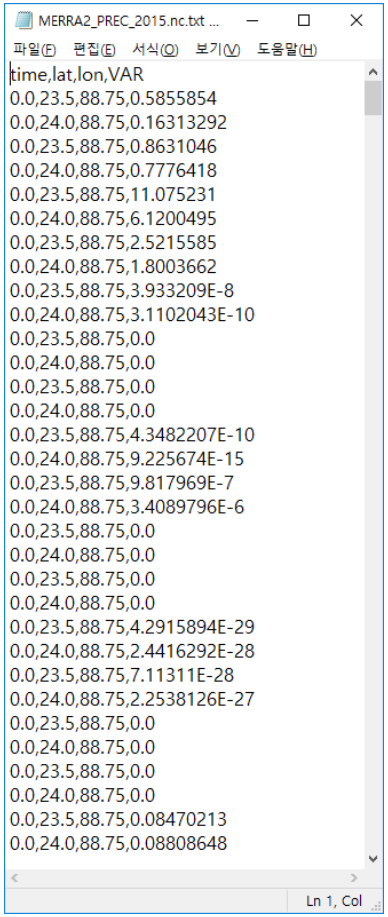
DEMO: ctbcli_CFDataExtraction

- **Execution result file**

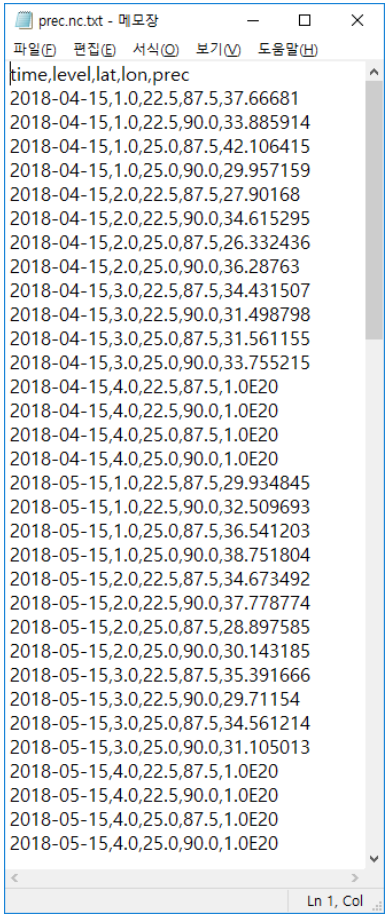
MERRA2_0.5d_PREC_1980.nc



MERRA2_PREC_2015.nc



prec.nc



sst.mnmean.nc