19 Training Program at APCC

CLimate Information Processing system

- What is the CLIPs
- How do we use CLIPs

- Climate Prediction Team, APCC
- Han, Jeongmin (goal@apcc21.org)

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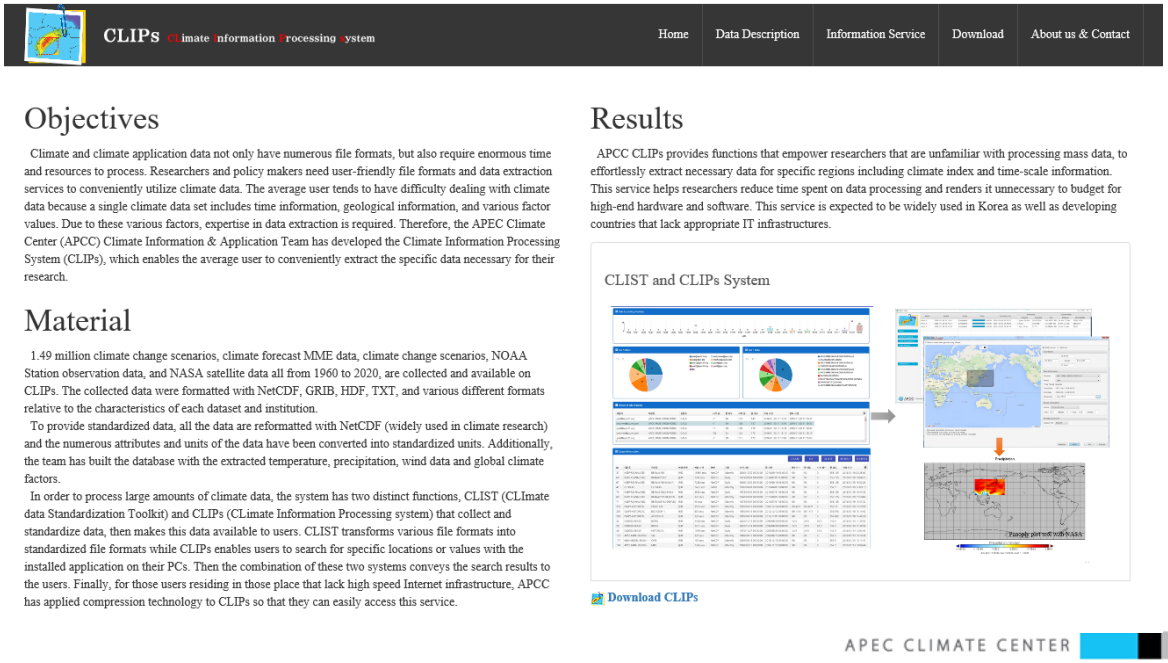
APCC APEC CLIMATE CENTER

Climate information processing system

- What is the CLIPs

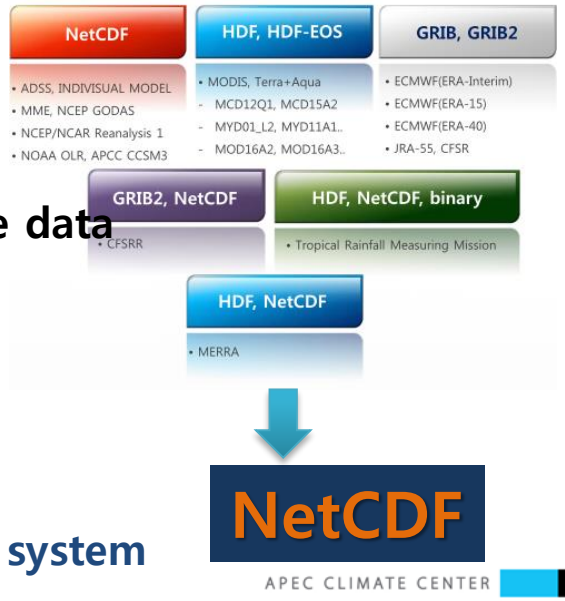
- Title : CLIPs (CLimate Information Processing system)
- URL : http://clips.apcc21.org
- Data type : Climate prediction, scenario, observation Data
- Amounts : about 1.49million
- Capacity : 57TB
- Period : 1960~2020
- File formats: NetCDF, GRIB, HDF, CSV, Png



Climate information processing system

- Why do you need to make CLIPs

- **Needs**
  - Climate and climate application data not only have numerous file formats, but also require enormous time and resources to process.
- **Purpose**
  - Development of collect-standard-distribute integrated system based on Climate Data
- **Developing plans**
  - Correlation analysis between application and climate data
    - Support to Indexes for correlation among the data
    - Appling the bigdata processing method
- **Final destination**
  - Construction of integrated knowledge management system
  - Data extraction + Visualization + Statistics + Correlation-ship



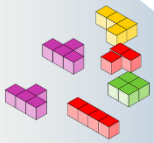
Climate information processing system

- System configuration of CLIPs

CLIST

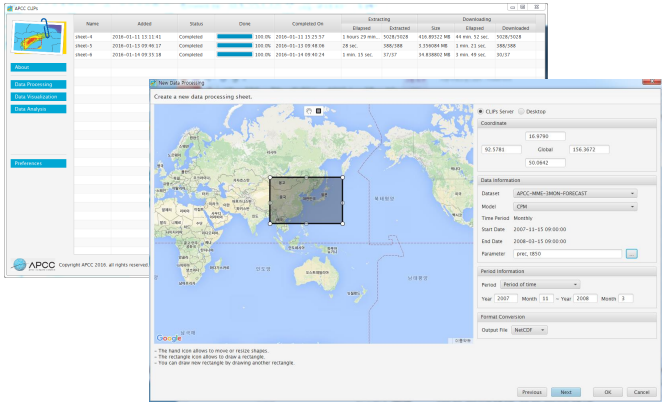
(data standadization to common format)

- about 1.50milion (1949~2020)
- capacity: 57TB



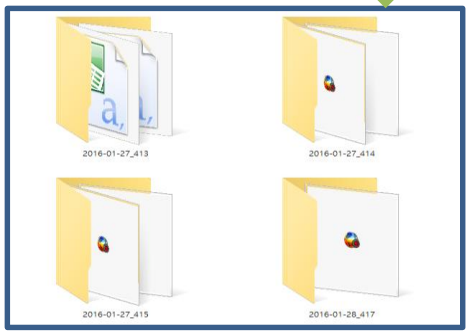
Clipping 모듈

CLIPs

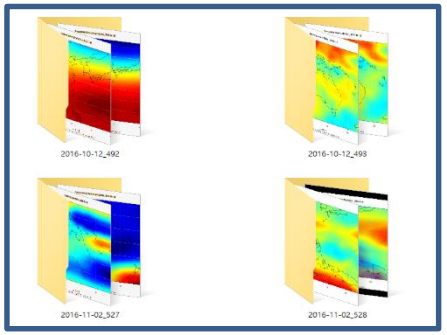


(data extraction who wants to get area)

Files



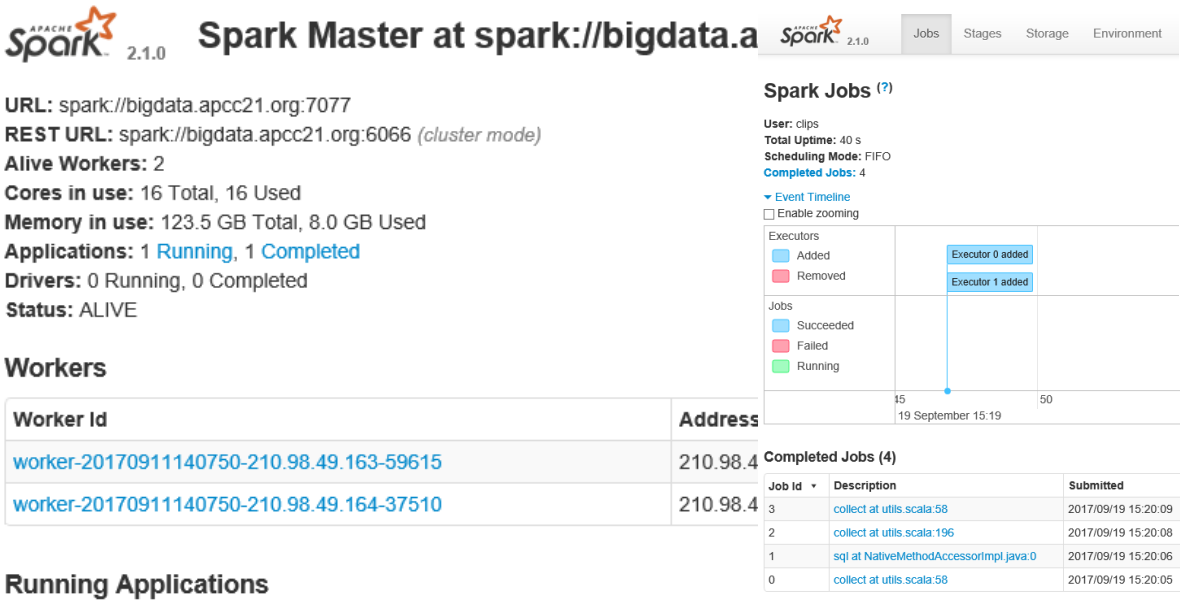
Images



Climate Information processing system. (CLIPs)

Climate information processing system

- Data distributed parallel processing



Spark 2.1.0 **Spark Master at spark://bigdata.a**

URL: spark://bigdata.apcc21.org:7077
REST URL: spark://bigdata.apcc21.org:6066 *(cluster mode)*
Alive Workers: 2
Cores in use: 16 Total, 16 Used
Memory in use: 123.5 GB Total, 8.0 GB Used
Applications: 1 Running, 1 Completed
Drivers: 0 Running, 0 Completed
Status: ALIVE

Workers

Worker Id	Address
worker-20170911140750-210.98.49.163-59615	210.98.4
worker-20170911140750-210.98.49.164-37510	210.98.4

Spark 2.1.0 Jobs Stages Storage Environment

Spark Jobs (?)

User: clips
Total Uptime: 40 s
Scheduling Mode: FIFO
Completed Jobs: 4

Event Timeline
Enable zooming

Executors
Added
Removed
Executor 0 added
Executor 1 added

Jobs
Succeeded
Failed
Running

15 19 September 15:19 50 55 0 19 September 15:20 5 10

collect

Completed Jobs (4)

Job Id	Description	Submitted	Duration	Stages: Succeeded/Total	Tasks (for all stages): Succeeded/Total
3	collect at utils.scala:58	2017/09/19 15:20:09	0.9 s	1/1	1/1
2	collect at utils.scala:196	2017/09/19 15:20:08	91 ms	2/2	2/2
1	sql at NativeMethodAccessorImpl.java:0	2017/09/19 15:20:06	2 s	2/2	2/2
0	collect at utils.scala:58	2017/09/19 15:20:05	1 s	1/1	1/1

Running Applications

Application ID	Name	Cores	Memory per Node	Submitted Time	User	State	Duration
app-20170919151944-0001 (kill)	sparklyr	16	4.0 GB	2017/09/19 15:19:44	clips	RUNNING	1.7 min

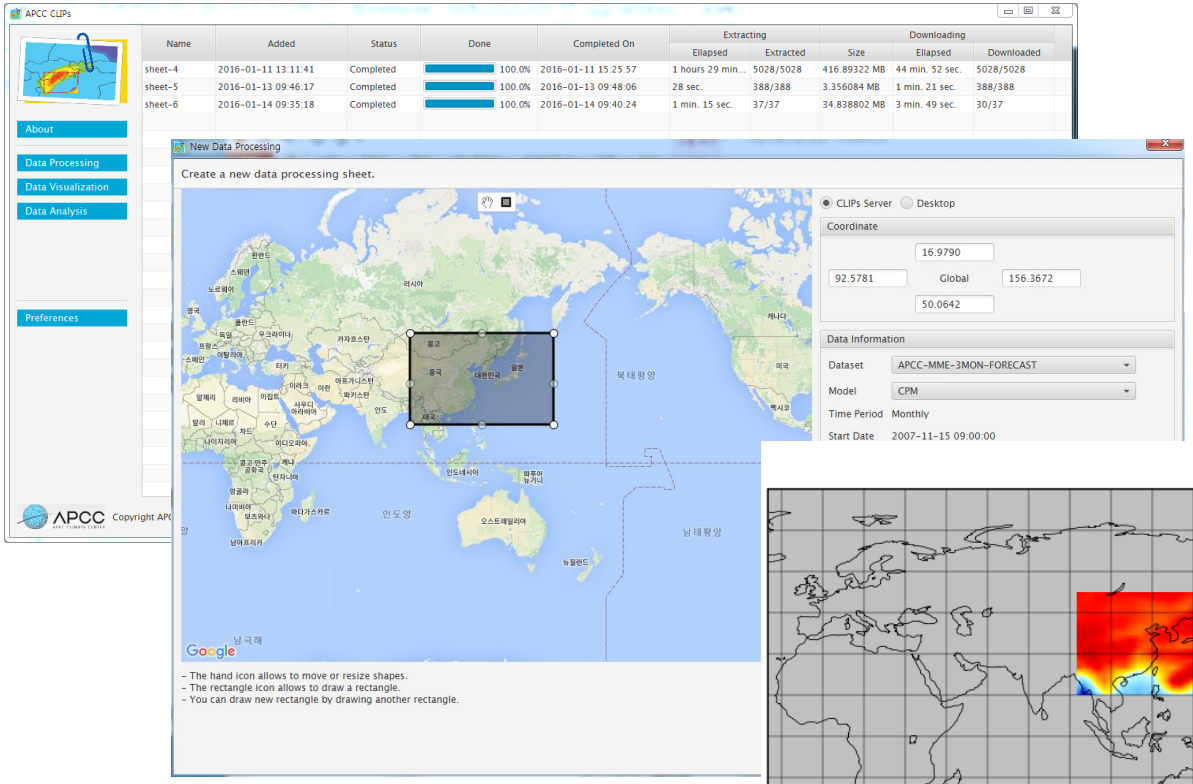
Completed Applications

Application ID	Name	Cores	Memory per Node	Submitted Time	User	State	Duration
app-20170911141307-0000	sparklyr	16	2.0 GB	2017/09/11 14:13:07	clips	FINISHED	3.7 h

Climate information processing system
- Main functions

- **Job Management**
  - History management of user's working (result, taking time, file amount, etc)
- **Search**
  - Searched list which including area , Time period
- **Data Extract**
  - Extracting the type of data and model, element of climate
  - Creating new file extracted from original Files
- **File Transfer**
  - Extracted data Transfer to personal computer
  - File format transformation to NetCDF, ASCII(txt), CSV
- **Reprocessing**
  - Re-extracting from made files in personal computer

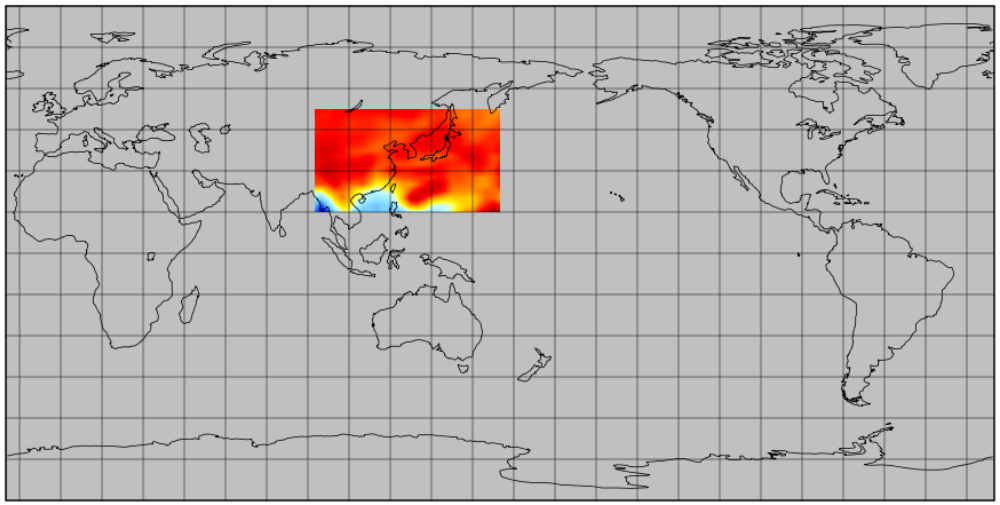
Climate information processing system
- User interface



CLIPs User Interface

NASA's Panoply Plot Tool

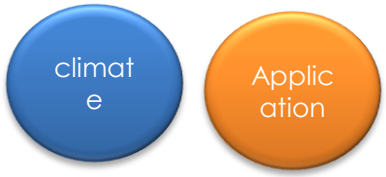
Precipitation

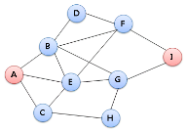


Climate information processing system
- CLIPs Data Analysis platform

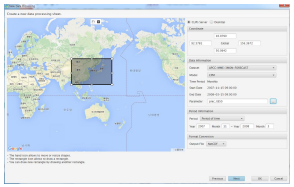
- **Development of correlation analysis algorithm**
  - Climate element + application element
  - Construction of data processing system to platform

Knowledge-Information



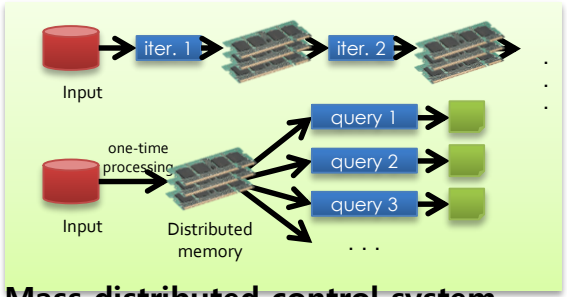


자료 상관 알고리즘

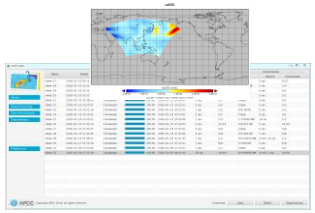


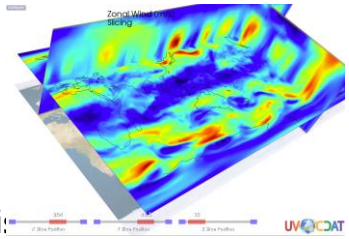
Regional climate data

Job scheduling



Mass distributed control system



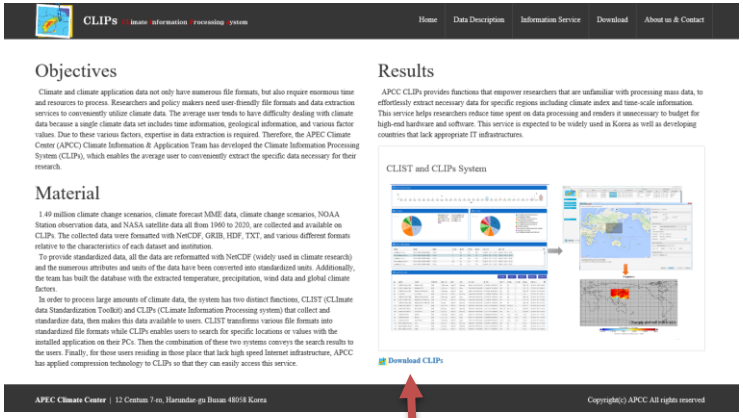


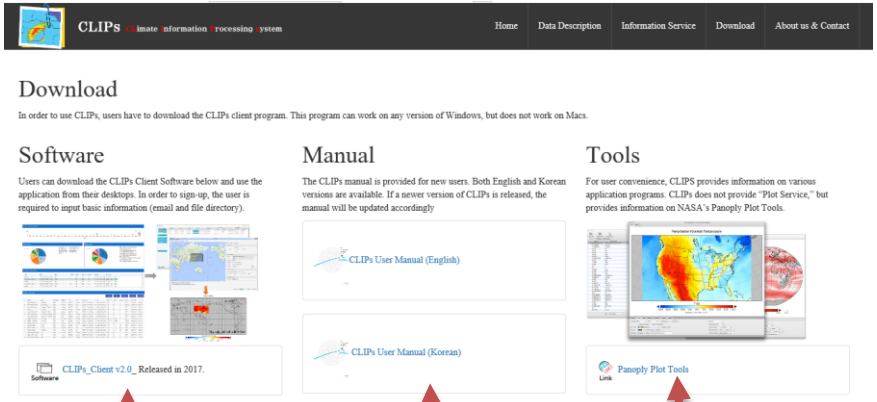
Collect +process + analysi

* **ETL:** Extraction, Transformation, Loading

Climate information processing system
- Utilization method

- **CLIPs Web Site: http://clips.apcc21.org**





Clips software

Clips software

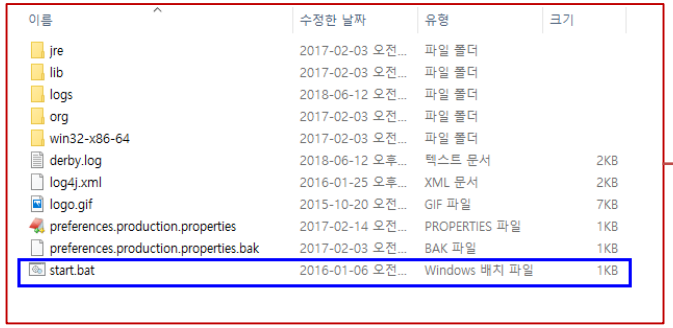
Plot tool

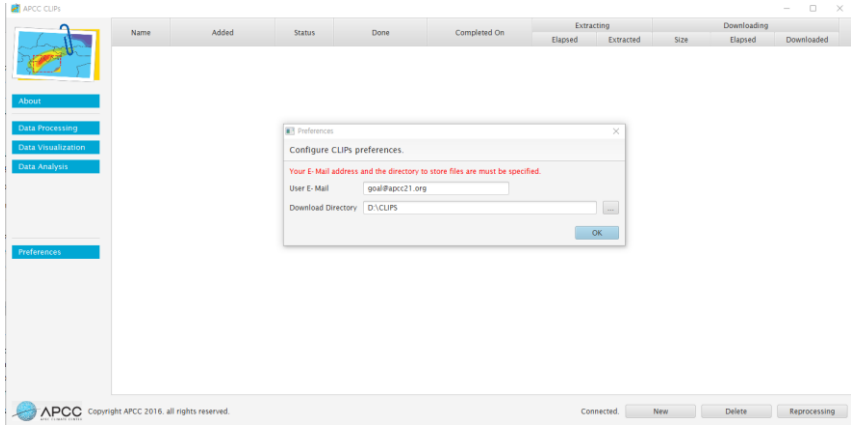
Manual(Kor, Eng)

Using it on personal computer

Climate information processing system
- Installation of CLIPs

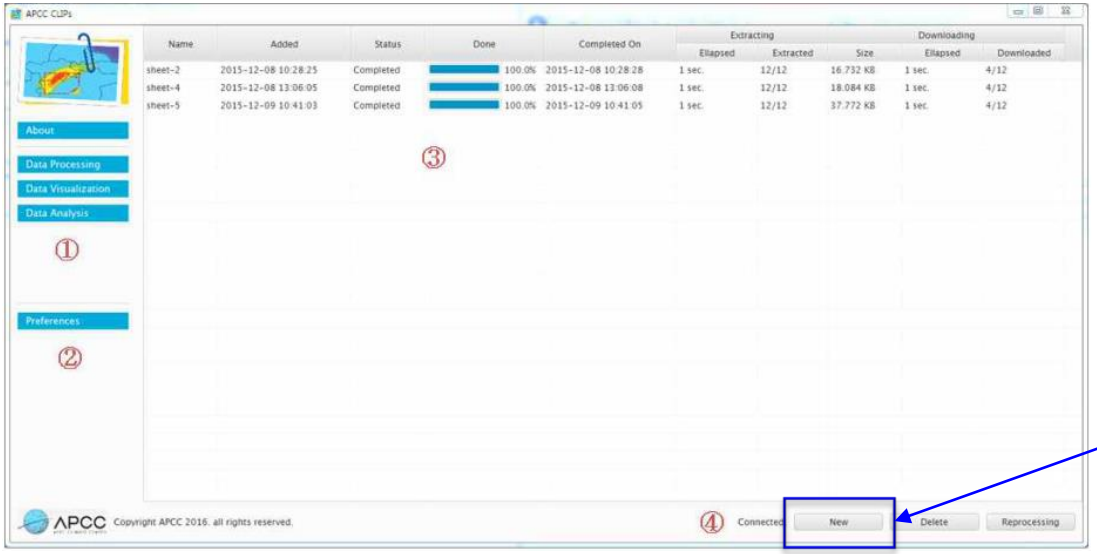
- **Setting to run**
  - **Download CLIPs SW from website(http://clips.apcc21.org)**
  - **Unzip the "CLIPs_Client" to everywhere**
  - **Double click the "start_bat" icon**
  - **input your email and local directory to save**





Climate information processing system
- Runs of CLIPs

- **Main user interface and how to Run**



① CLIPs about and submenu

② CLIPs system preference menu

③ Display of the current task progress and work history

④ Indication of the communication status between the CLIPs server and the user interface.

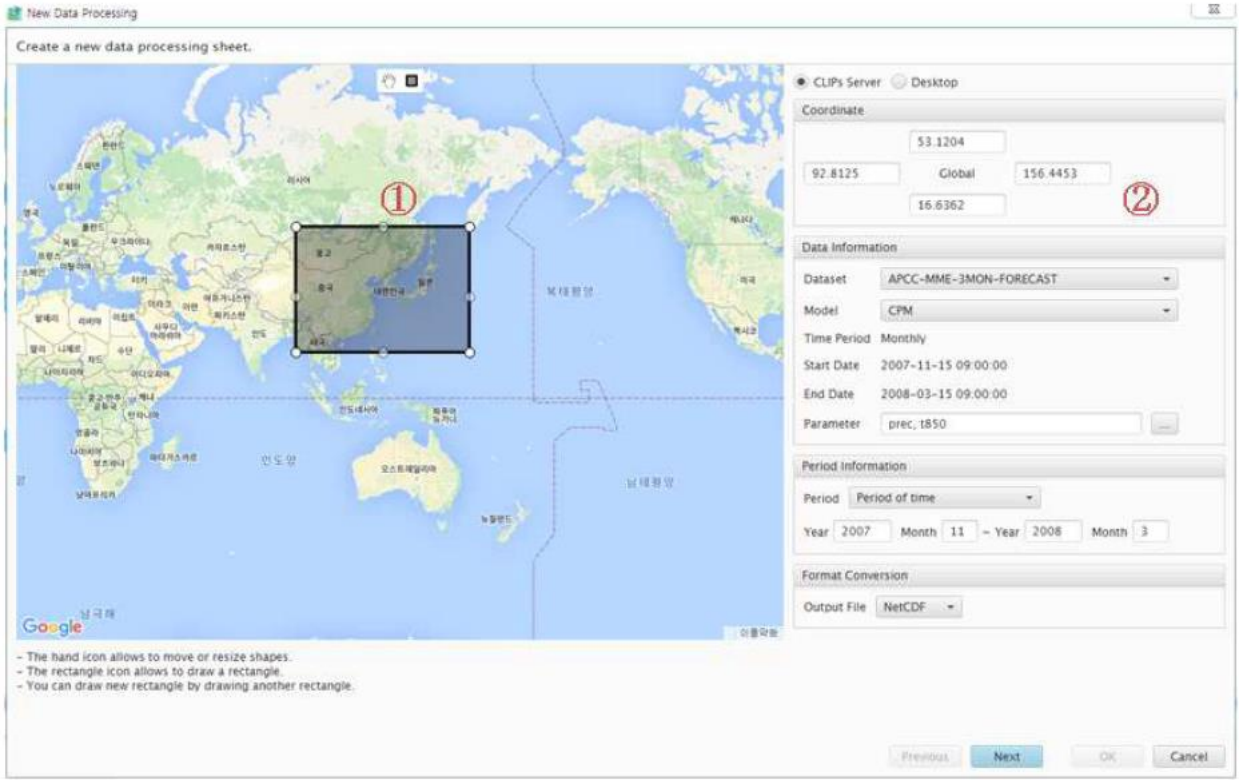
Climate information processing system

- Select of Data region on map

- **Select of region to want to get data**

① Drag and select your target region

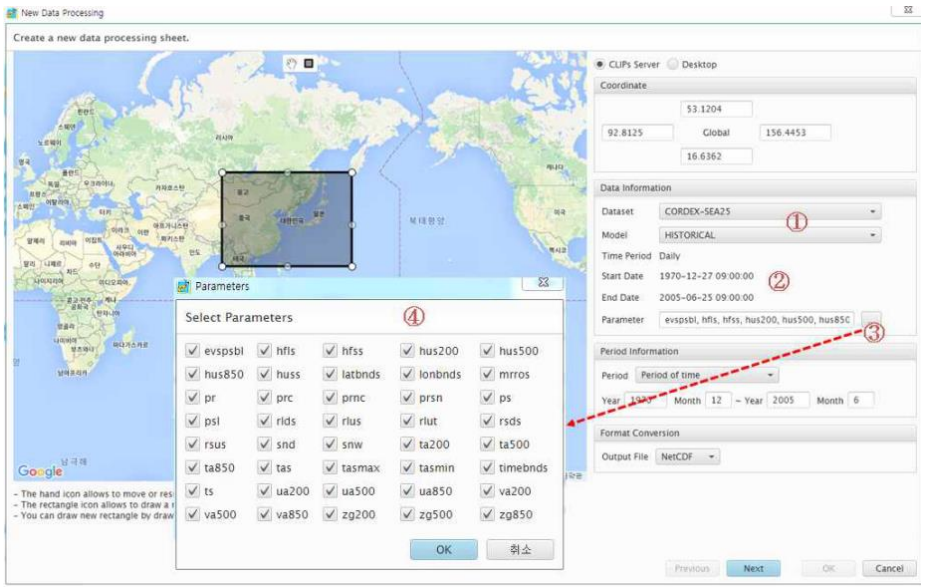
② Verify the coordinates of the selected area in the coordinates panel



Climate information processing system

- Select attributes on the tools

- **Select the Dataset, Model, parameters**



① Attributes of the dataset and the model.

② Find the time period for a specific model's data.

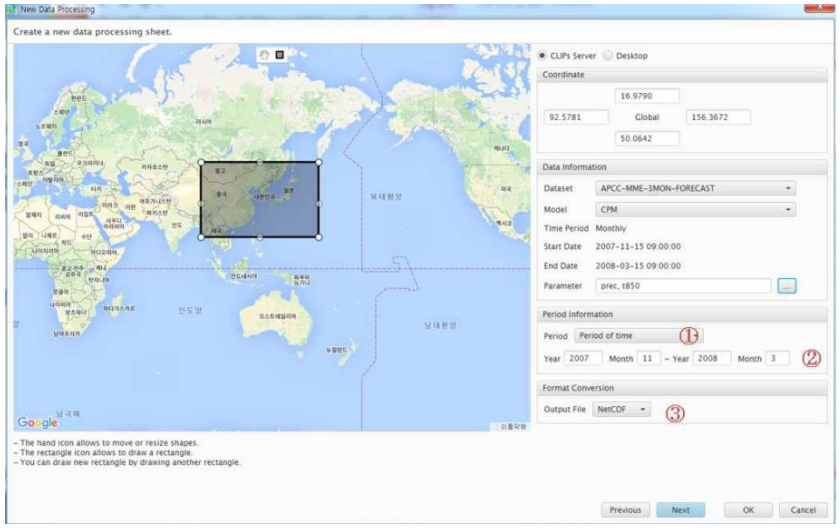
③ Click the button to find the parameter options for that specific model.

④ Select the parameters of your choice.

Climate information processing system

- Select period on the tools

- **Select a period option**



① Select a period option.

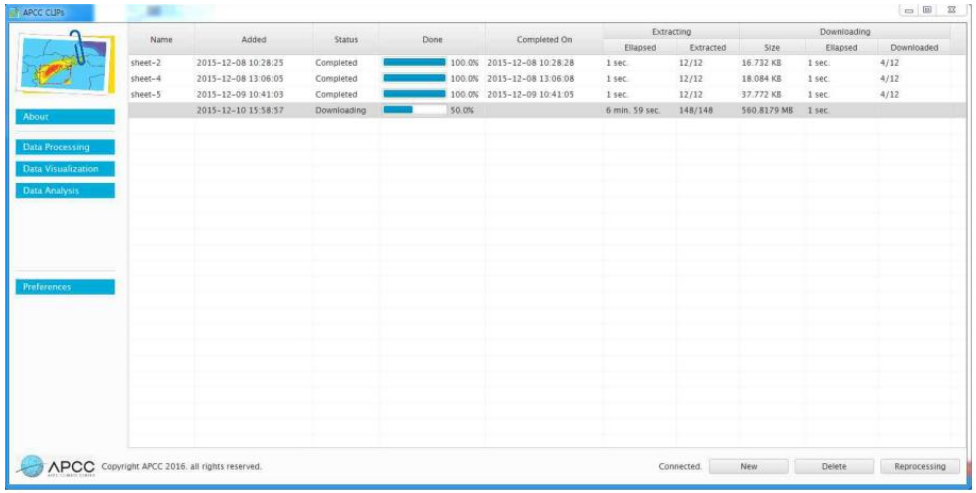
② Directly input the time values of the period.

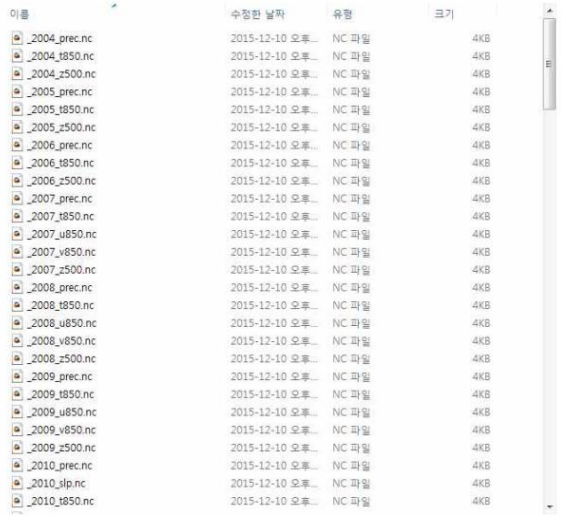
③ Select a file format for the extracted data. NetCDF and ASCII (txt) formats are provided by default, and the CSV format is provided when the data is from NOAA.

Climate information processing system

- Processed data

- **Data extraction and downloading progress indicator**





When you set the search conditions and run the program, it extracts the relevant data and transfers it to the directory you designated on your desktop.

Hands on CLIPs

Mission 1. Install the CLIPs in your computer

Mission 2. Extract the data using CLIPs

Question and Supports

- *If you need more help, feel free to email me*

  - **Climate Prediction Team at APCC**
  - **Dr, Han, Jeongmin**
  - **goal@apcc21.org**

Thank You

- *APEC Climate Center, Dr. jeongmin,Han*
- *Email: goal@apcc21.org*

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