



Panoply: a data visualization starter guide

29 JUL 2022, 13:00

KHOM ROOM (MELIÁ HOTEL INTERNATIONAL)

Software requirements

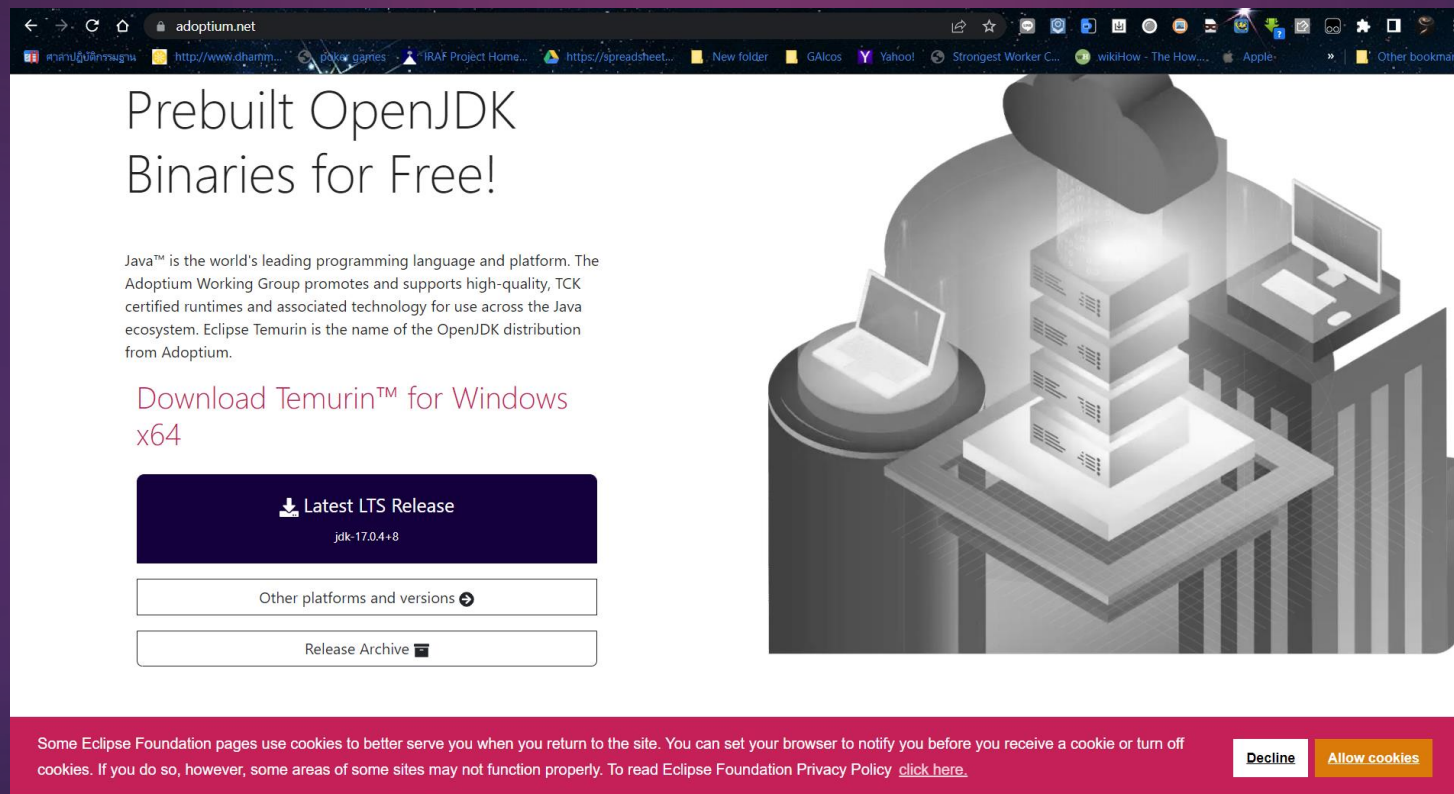
- ▶ Java version 11 or later
- ▶ Panoply via <https://www.giss.nasa.gov/tools/panoply/download>
 - ▶ Please elect the option that is compatible with your operation system
- ▶ Model data via:

<https://drive.google.com/drive/folders/1HKvR-XVKe33vPh-n53xA+2RXAIPzEIF?usp=sharing>

Download "wrfout_d01_2022-06-23_00_00_00.nc" to you preferred destination

Java installation

- ▶ We suggest downloading Java installation from <https://adoptium.net>
- ▶ On the home page, you can directly download the latest version of Java (Java 17 is compatible with Panoply)



The screenshot shows the Adoptium website's download page. The main heading is "Prebuilt OpenJDK Binaries for Free!". Below this, there is a paragraph explaining that Java is the world's leading programming language and platform, and that Adoptium promotes and supports high-quality, TCK certified runtimes. The page features a prominent blue button labeled "Latest LTS Release" with the version number "jdk-17.0.4+8" underneath. Below this button are two white buttons: "Other platforms and versions" and "Release Archive". To the right of the text is a stylized illustration of a hand holding a stack of server racks. At the bottom of the page, there is a cookie consent banner with "Decline" and "Allow cookies" buttons.

adoptium.net

Prebuilt OpenJDK Binaries for Free!

Java™ is the world's leading programming language and platform. The Adoptium Working Group promotes and supports high-quality, TCK certified runtimes and associated technology for use across the Java ecosystem. Eclipse Temurin is the name of the OpenJDK distribution from Adoptium.

Download Temurin™ for Windows x64

↓ Latest LTS Release
jdk-17.0.4+8

Other platforms and versions ↗

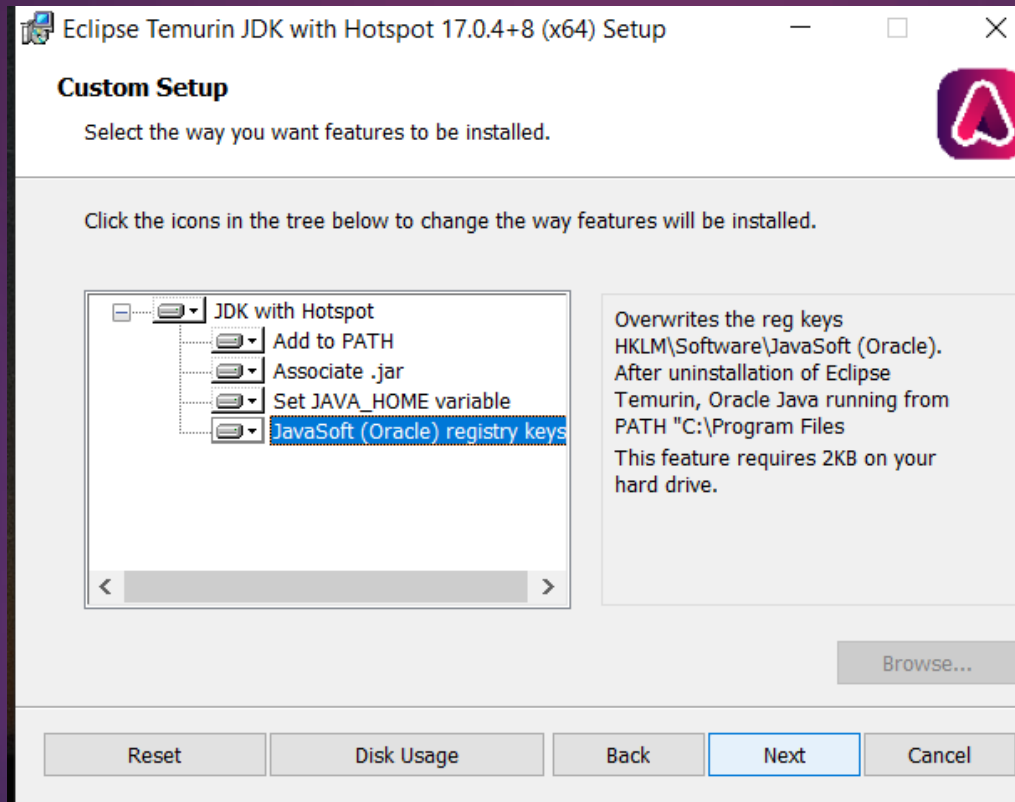
Release Archive 📁

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Decline Allow cookies

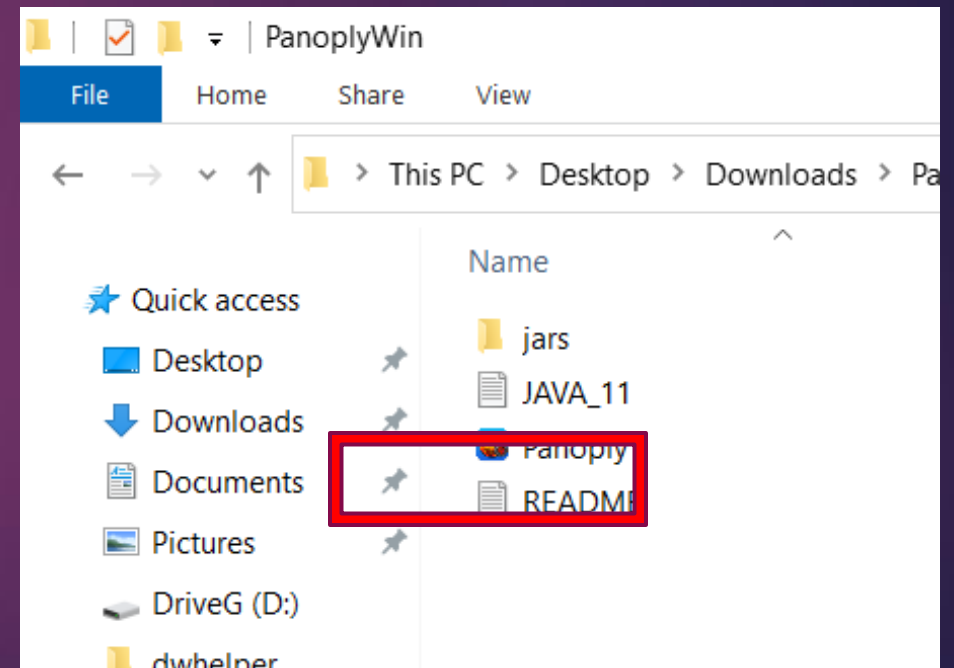
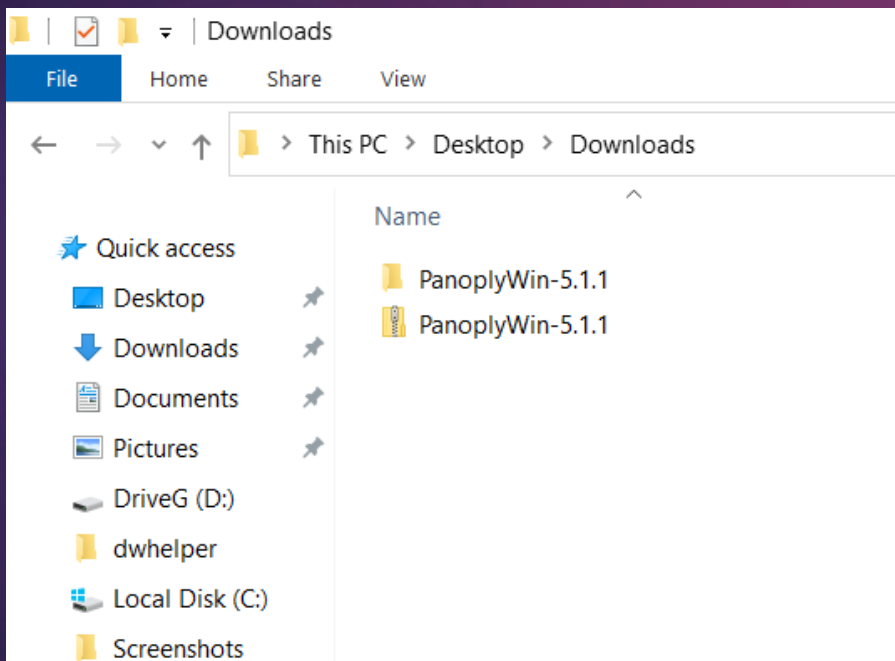
For Window users

- ▶ On the installation prompt, please select all the options available.



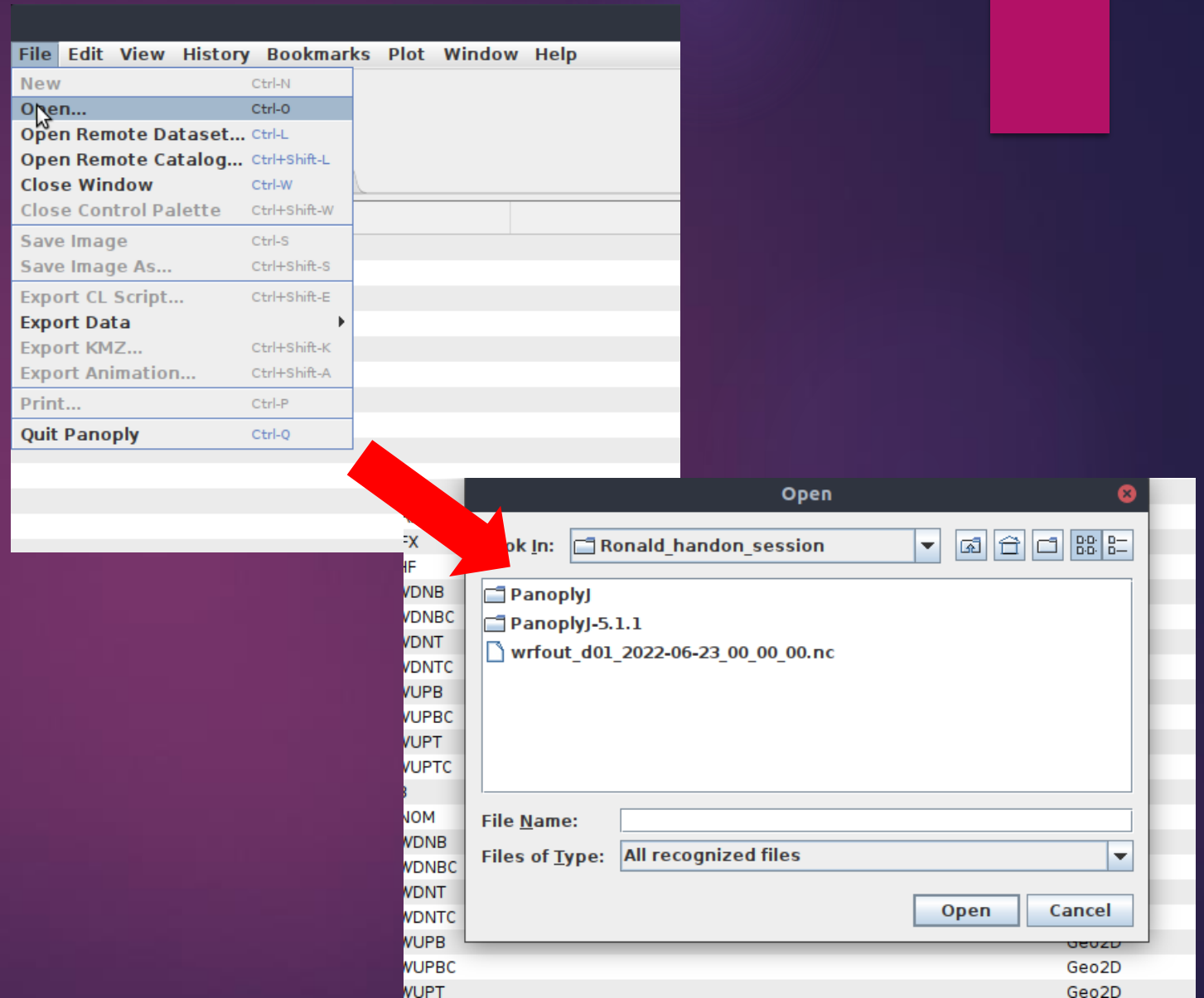
Using Panoply (for Window)

- ▶ Extract "PanoplyWin-5.1.1.zip" into your working directory
- ▶ Browse the directory "PanoplyWin-5.1.1" then go to "PanoplyWin"
- ▶ Run the file "Panoply.exe"



Open file

- ▶ Click "File" and select "Open"
- ▶ Select "wrfout_d01_2022-06-23_00_00_00.nc" from your download directory



Data tables are presented in the left panel.

The right panel contains the information of the selected table.

The screenshot shows a software interface with a menu bar (File, Edit, View, History, Bookmarks, Plot, Window, Help) and a toolbar with icons for 'Create Plot', 'Combine Plot', and 'Open'. Below the toolbar are tabs for 'Datasets', 'Catalogs', and 'Bookmarks'. The main area is divided into two panels. The left panel displays a list of datasets with columns for 'Name', 'Long Name', and 'Type'. The right panel shows the details for the selected dataset, including file type and netcdf file information.

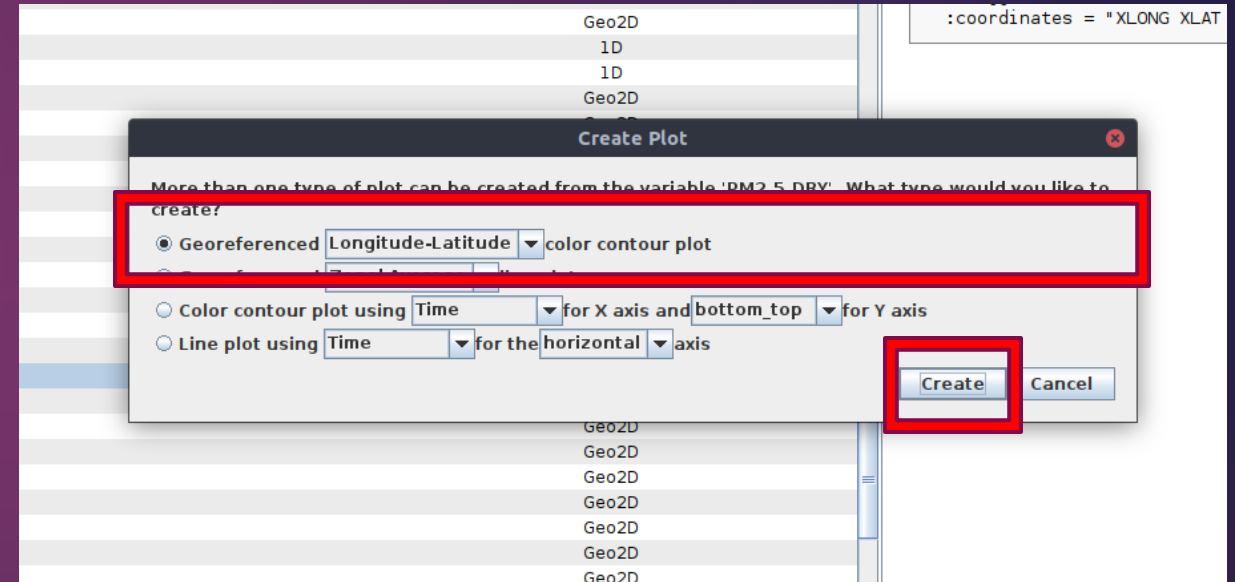
Name	Long Name	Type
wrfout_d01_2022-06-23_00_00_00.nc	OUTPUT FROM * PROGRAM:WRF-Chem V4.4 MODEL	Local File
acet	acet	Geo2D
aceto2	aceto2	Geo2D
acetol	acetol	Geo2D
acetp	acetp	Geo2D
ACGRDFLX	ACGRDFLX	Geo2D
ACHFX	ACHFX	Geo2D
ACLHF	ACLHF	Geo2D
ACLWDNB	ACLWDNB	Geo2D
ACLWDNBC	ACLWDNBC	Geo2D
ACLWDNT	ACLWDNT	Geo2D
ACLWDNTC	ACLWDNTC	Geo2D
ACLWUPB	ACLWUPB	Geo2D
ACLWUPBC	ACLWUPBC	Geo2D
ACLWUPT	ACLWUPT	Geo2D
ACLWUPTC	ACLWUPTC	Geo2D
aco3	aco3	Geo2D
ACSNOM	ACSNOM	Geo2D
ACSWDNB	ACSWDNB	Geo2D
ACSWDNBC	ACSWDNBC	Geo2D
ACSWDNT	ACSWDNT	Geo2D
ACSWDNTC	ACSWDNTC	Geo2D
ACSWUPB	ACSWUPB	Geo2D
ACSWUPBC	ACSWUPBC	Geo2D
ACSWUPT	ACSWUPT	Geo2D
ACSWUPTC	ACSWUPTC	Geo2D
AFWA_DUSTLOFT	AFWA_DUSTLOFT	Geo2D
ALBCK	ALBCK	Geo2D
ALBEDO	ALBEDO	Geo2D
ald	ald	Geo2D
alko2	alko2	Geo2D
alkooh	alkooh	Geo2D
AOD2D_OUT	AOD2D_OUT	Geo2D
AOD_OUT	AOD_OUT	Geo2D
AREA2D	AREA2D	Geo2D
ASYMPAR106	ASYMPAR106	Geo2D
ASYMPAR3	ASYMPAR3	Geo2D
ASYMPAR55	ASYMPAR55	Geo2D
ATOP2D_OUT	ATOP2D_OUT	Geo2D
BATHYMETRY_FLAG	BATHYMETRY_FLAG	1D
BC1	BC1	Geo2D
BC2	BC2	Geo2D
bigalk	bigalk	Geo2D
binona	binona	Geo2D

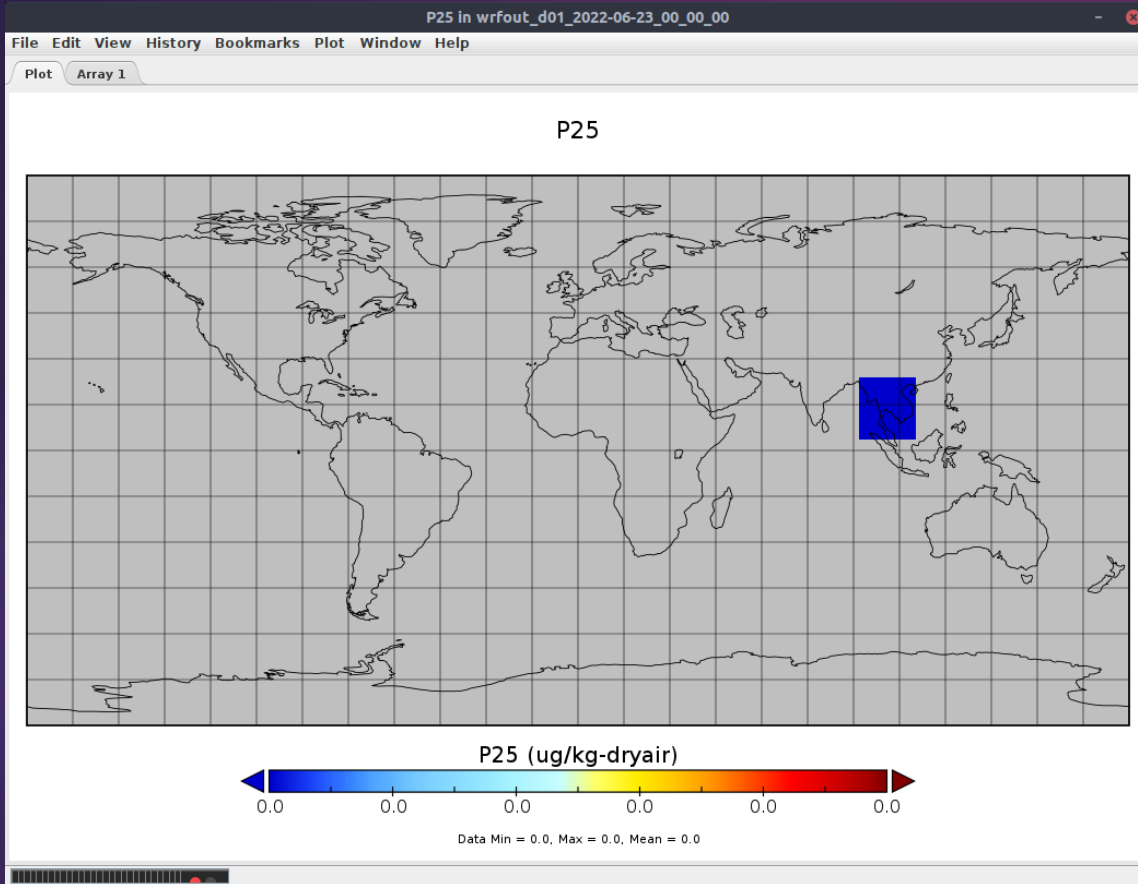
File "wrfout_d01_2022-06-23_00_00_00.nc"
File type: NetCDF-3/CDM

```
netcdf file:/home/rattanapong/DriveUbuntu/
dimensions:
  Time = UNLIMITED; // (20 currently)
  DateStrLen = 19;
  west_east = 199;
  south_north = 229;
  bottom_top = 38;
  bio_emissions_dimension_stag = 140;
  bottom_top_stag = 39;
  soil_layers_stag = 4;
  west_east_stag = 200;
  south_north_stag = 230;
  levsiz = 59;
  seed_dim_stag = 2;
variables:
  char Times(Time=20, DateStrLen=19);
  float AOD_OUT(Time=20, bottom_top=38,
:FieldType = 104; // int
:MemoryOrder = *XYZ*;
:description = *Aerosol Optical Dept
:units = **;
:stagger = **;
:coordinates = *XLONG XLAT XTIME*;
  float AOD2D_OUT(Time=20, south_north=2
:FieldType = 104; // int
:MemoryOrder = *XY *;
:description = *Aerosol Optical Dept
:units = **;
:stagger = **;
:coordinates = *XLONG XLAT XTIME*;
  float ATOP2D_OUT(Time=20, south_north=
:FieldType = 104; // int
:MemoryOrder = *XY *;
:description = *Aerosol Optical Dept
:units = **;
:stagger = **;
:coordinates = *XLONG XLAT XTIME*;
  float ICN_DIAG(Time=20, bottom_top=38,
:FieldType = 104; // int
:MemoryOrder = *XYZ*;
:description = *Some chem thing, ICN
```


Example: PM 2.5 plot

- ▶ In column "Name" search for "P2_5 Dry"
- ▶ Create plot by:
 - ▶ Double click on "P2_5 Dry" or
 - ▶ On menu bar, click "plot" then select "create plot" or
 - ▶ Right click on row "P2_5 Dry" then select "create plot"
- ▶ On pop-up window select "Georeferenced Longitude-Latitude color contour plot" (The 1st row) then "create"





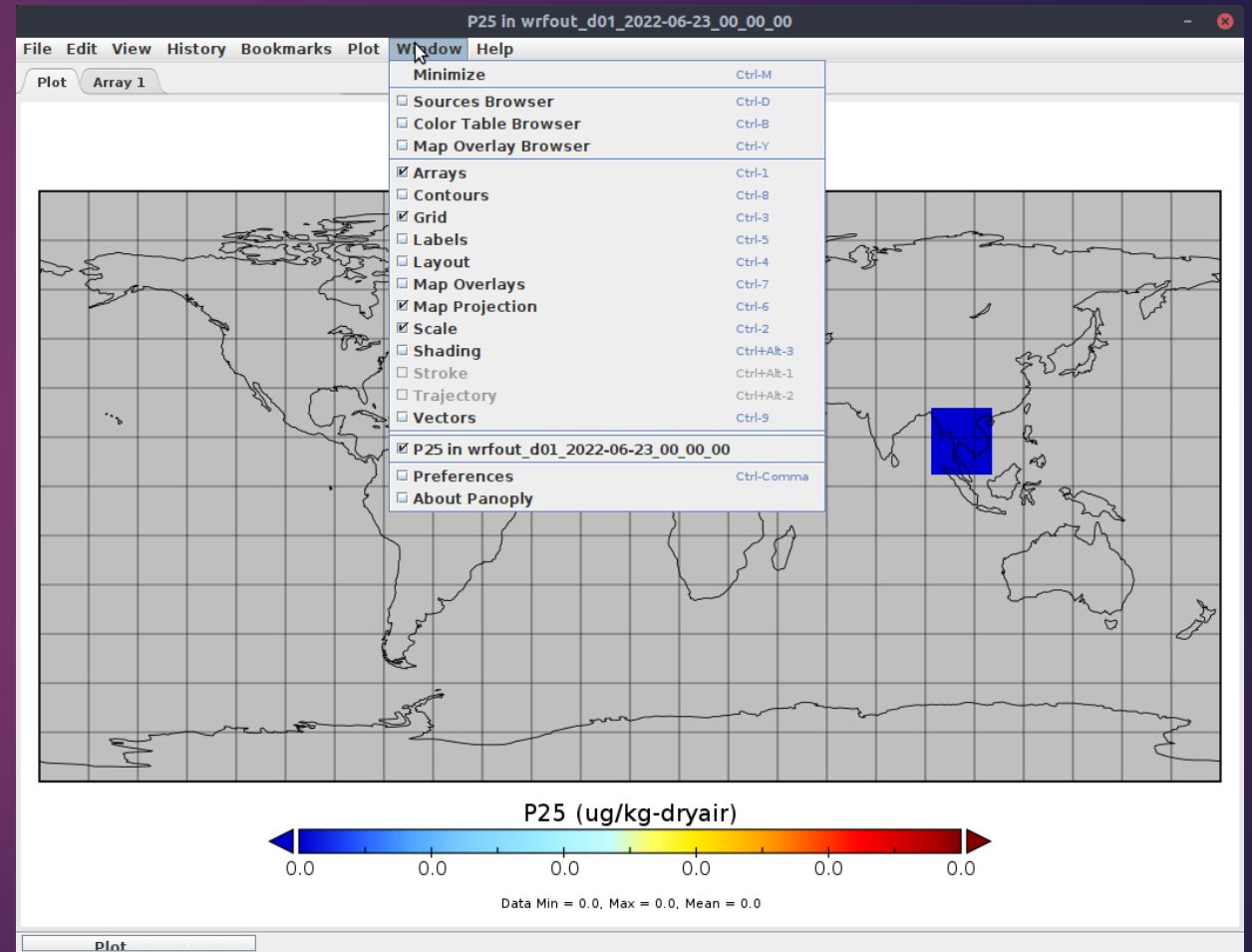
The area in blue is the region of interest

The coordinate;
Latitude: 14.10714 N
Longitude: 101.1672 E

You can center the plot by input the coordinate into "Map Projection" panel

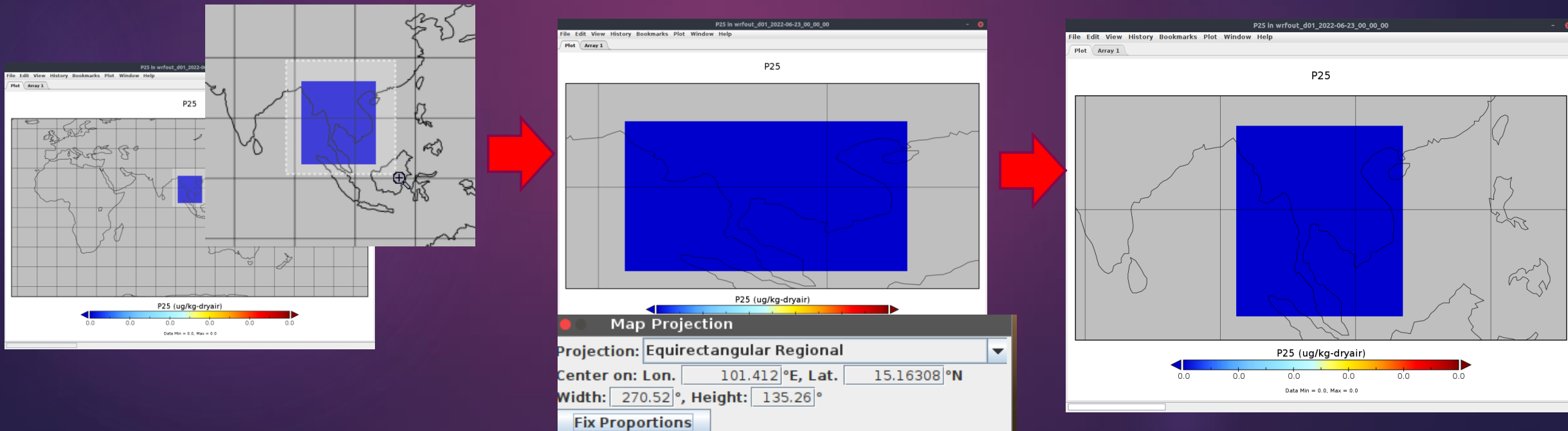
Window menu – plot manipulation

- ▶ Selecting options from "Window" tap in the menu bar.
- ▶ There are 4 windows in this example
 - ▶ Arrays – data selection
 - ▶ Scale – for plot manipulation: color scheme, data limit, tick length, etc.
 - ▶ Map projection -- change projection, map center
 - ▶ Grid – manipulate grid size, lines



Zoom – in and out

- ▶ On the plot window, hold "ctrl" button until the cursor changes into a magnifying glass, drag the mouse to cover an area of interest then release.
- ▶ Click "Fix Proportions" on "Map Projection" pop-up to correct image, you put in Latitude and Longitude to center the plot at the region of interest
- ▶ To Zoom-out, hold "ctrl + alt" then press minus key until zoom-out



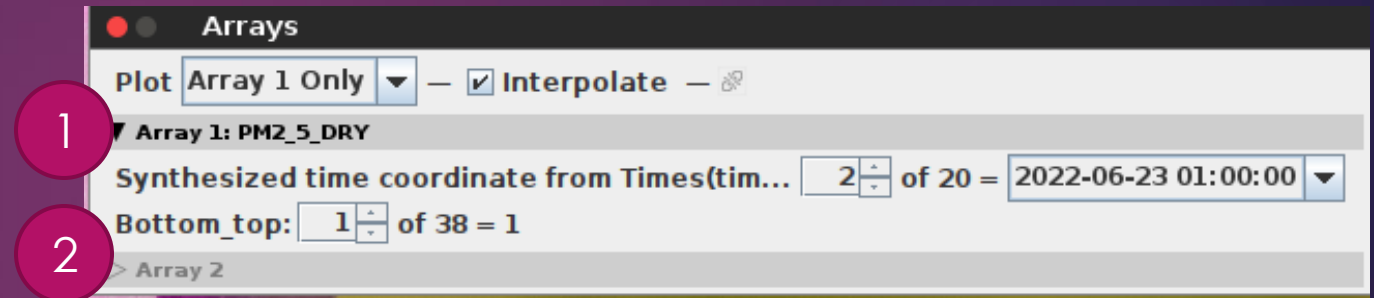
Zoom-in and out -- alternative

- ▶ Hold "ctrl + alt" keys then press
- ▶ "+" key to zoom-in the magnified region will center at the specified coordinate in the "Map Projection" panel
- ▶ "-" key to zoom-out, again, the scaled image is centered at the specified coordinate

Arrays and Scale panels

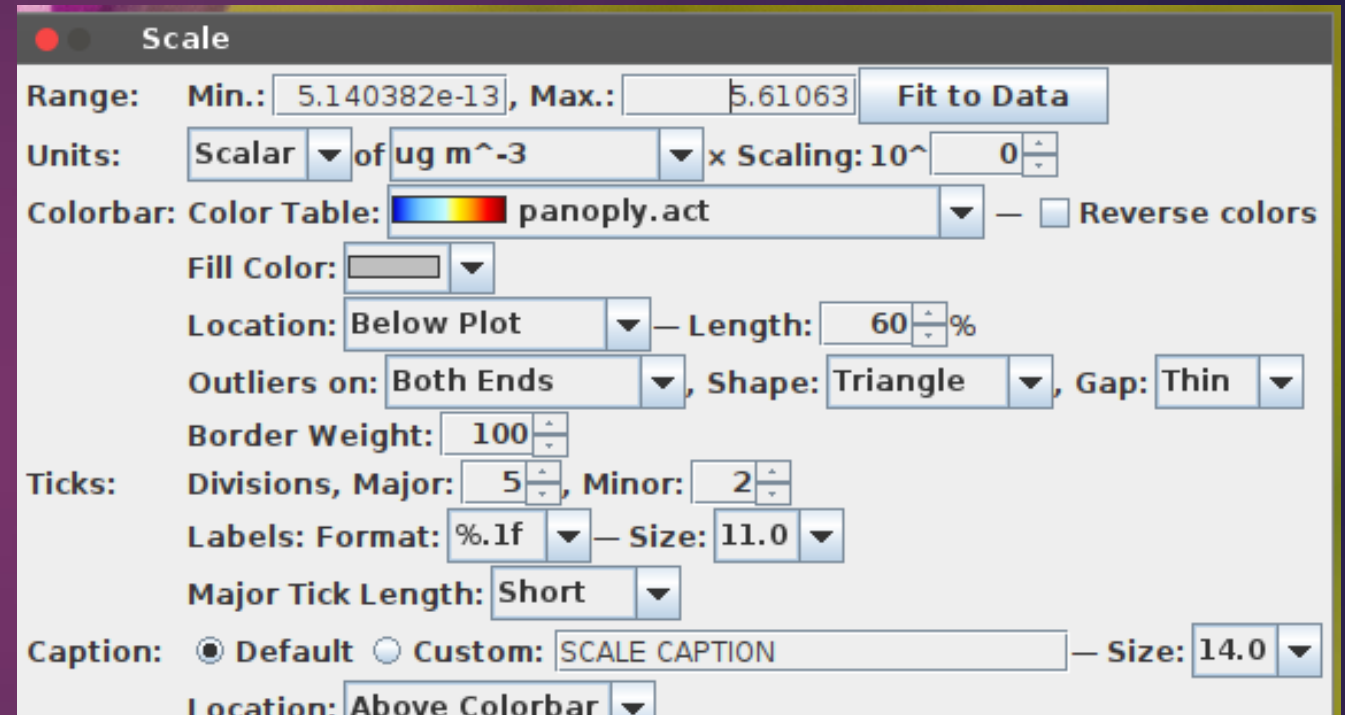
1. At "Synthesized time coordinate from Times", you can select the data at specific time bin.

2. Bottom_top is for selecting data at the nth slice (The data is divided by row into 38 sections)



Arrays and Scale panels

- ▶ Scale
- ▶ Range: adjust min-max range for data display. This parameter needs to be adjusted for correct display.
- ▶ A quick input is to click "Fit to Data" which will choose min-max value from the specified time-bin and table slice.
- ▶ The other options can be changed according to your preferences. Change the values and see the according results.



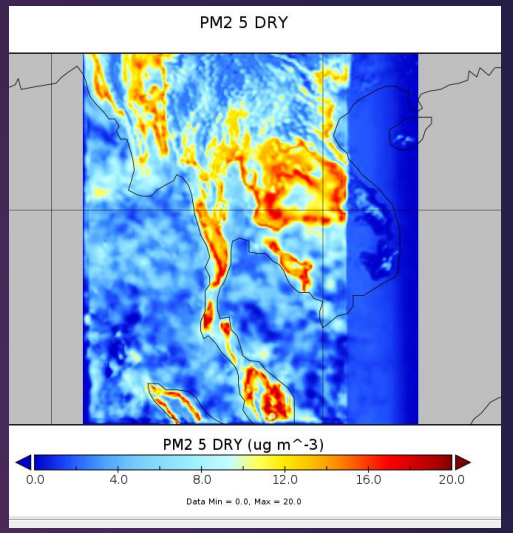
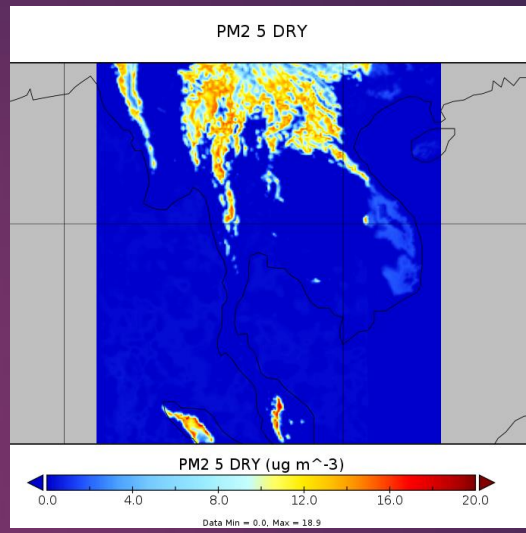
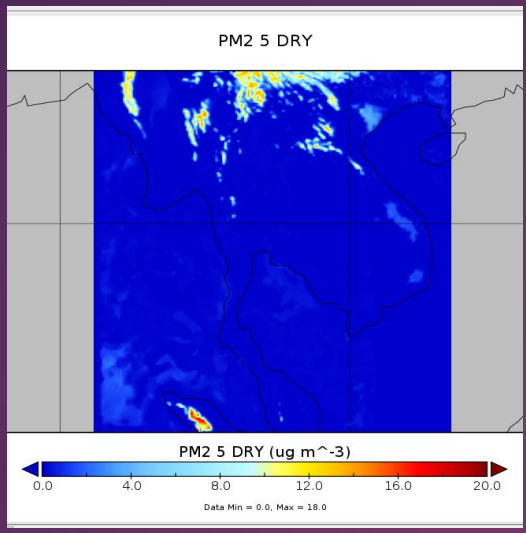
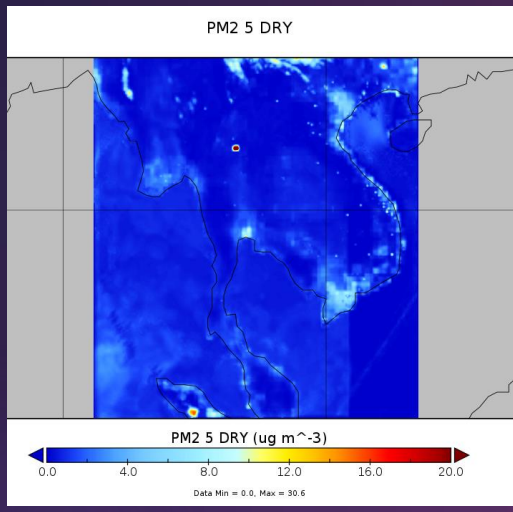
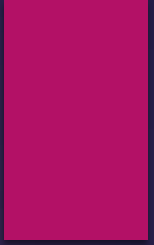
2022-06-23 01:00:00 -- bin2

Bottom_top: 1

10

20

27



2022-06-23 04:00:00 -- bin5

