

# part-3

December 5, 2019

## 1 Version Control with Git and quick viewing of datasets with Panoply

### 1.1 What is Git?

- A version control system for tracking changes in code
  - Coordinates work on source code with multiple programmers
  - Open source and free
- 

### 1.2 Creating a new git project

To initialize a repository, cd to your project and type:

```
git init
```

You need to specify which files are tracked. You can use the individual filenames, or \*.py to track changes to all files. So decide which files to include, and use the following command to add them:

```
git add [filename]
```

If you make small changes and want to back them up, use the git add command to 'update' the file. Once you make a major change and the code is in a state that you want to make a checkpoint, you'll want to 'commit' the change.

To save them to the repository, use the following command (-a option means 'all' files, but you can also only commit one file by specifying the filename)

```
git commit -a
```

A text editor screen will appear, prompting you to add a message regarding what has been changed in the code. We'll discuss this more in the "Style Guides" section.

That's it! You can now continue to make changes to the code, and when you're ready to save the current version of the project, use the 'commit' command. There are lots of good [cheat sheets](#) available online.

#### Exercise 1

- Create a new text file

- Add the file to a new repository
  - Commit the file
  - Challenge: make a change to the file. Type git status to read the log of commits.
- 

### 1.3 What is GitHub?

GitHub is an online remote repository specifically for version control using git.

Other options:

- **GitHub**: The most popular/visible. Private repositories free for .edu email addresses, otherwise you must pay.
- **BitBucket**: Free private repositories. A little more expensive but probably has the most bells and whistles.
- 

**1.4 GitLab: Cheapest for paid options. You can also self-host your own repository on your server for internal access only.**

#### 1.4.1 Getting set-up

**Creating and account** Steps are similar for all three online repositories \* Log into your account.

\* Create a new online repository: go to your GitHub page and click on the + button and select "Create new project." \* Pick a name for the repository and add an optional short description

The online repositories usually have code available for you to copy/paste into your terminal:

If you have no initialized code:

```
echo "# test" >> README.md
git init
git add README.md
git commit -m "first commit"
git remote add origin https://github.com/eviatarbach/test.git
git push -u origin master
```

If you have an existing project

```
git remote add origin https://github.com/eviatarbach/test.git
git push -u origin master
```

If you did this right, you should see your code in the online repo. You can navigate through previous commits, older versions of the code, and share with other group members (which we'll talk about next).

---

## 1.5 Style guide

### 1.5.1 Include a readme file

1. Include a README file (Here is a [good template](#)). I recommend using Markdown (a simple formatting syntax). A readme file should include the following sections, where applicable:
    - Project title
    - Getting started
      - Pre-requisites
      - Installation process
      - Required libraries
    - Usage
      - How to use or run the code
    - Author(s)
    - Resources or references
  2. Clean and clear code >> commenting (not that you shouldn't comment)
  3. Leave the code cleaner than you started
  4. Include detailed description of commits
- 

### 1.5.2 How to write an excellent commit message

	COMMENT	DATE
○	CREATED MAIN LOOP & TIMING CONTROL	14 HOURS AGO
○	ENABLED CONFIG FILE PARSING	9 HOURS AGO
○	MISC BUGFIXES	5 HOURS AGO
○	CODE ADDITIONS/EDITS	4 HOURS AGO
○	MORE CODE	4 HOURS AGO
○	HERE HAVE CODE	4 HOURS AGO
○	AAAAA	3 HOURS AGO
○	ADKFJSLKDFJSDKLFJ	3 HOURS AGO
○	MY HANDS ARE TYPING WORDS	2 HOURS AGO
○	HAAAAAAAANDS	2 HOURS AGO

AS A PROJECT DRAGS ON, MY GIT COMMIT MESSAGES GET LESS AND LESS INFORMATIVE.

Great commit messages follows the following rules: 1. Limit the subject line to 50 characters. 2. Capitalize the subject line and do not end the subject line with a period 3. Use the imperative mood in the subject line ("Applying this commit will ..."). Fix, add, or change are good starting words. 4. Separate subject from body with a blank line. 5. Manually wrap the body at about 72 characters. 6. Use the body to explain what and why, not how (the code is the "how").

Using formatting such as bulleted lists are okay.

## 1.6 Panoply

- Pronounced: Pan-OH-plee
- A netCDF, HDF, KMZ, and GRIB data viewer

- Free/open source for Linux, Mac, and Windows
- Developed and maintained by Dr. Robert B. Schmunk of NASA/GISS

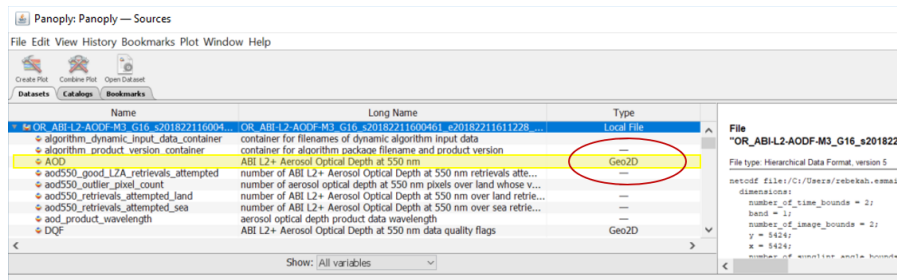
Other display tools:

- Free: HDFView, Ncview, QGIS, Explorer series
- Not free: ENVI/IDL, MATLAB, ArcMap

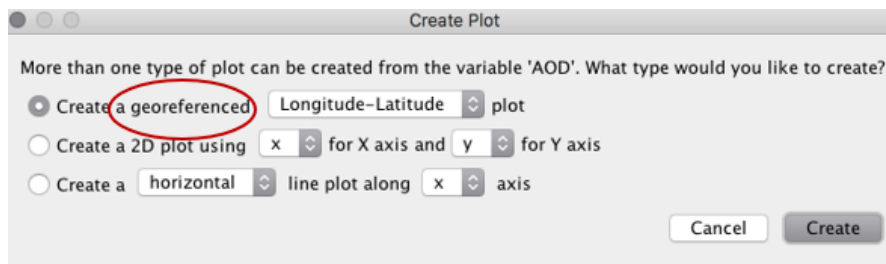
## Inspecting GOES-17 ABI files

1. Run Panoply
2. Navigate to “data/OR\_ABI-L2-AODC-M3\_G17\_s20182211612186\_e20182211614557\_c20182211615551.nc.”
3. To make a plot:

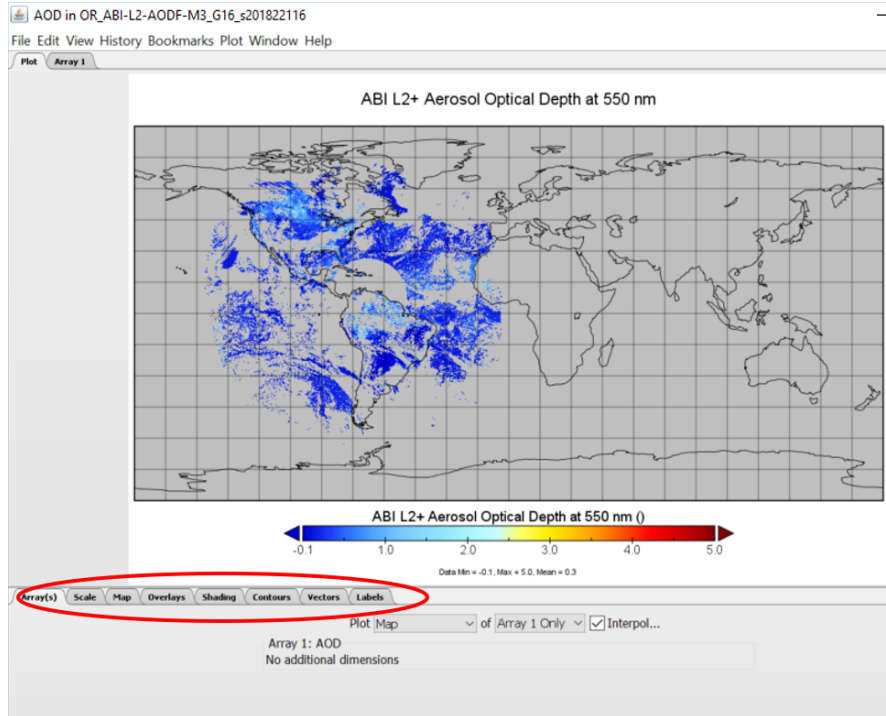
- Variables that have “Geo2D” or “2D” types can be made into plots
- Double click on AOD



- A window will pop up. Choose the first option and click “create”

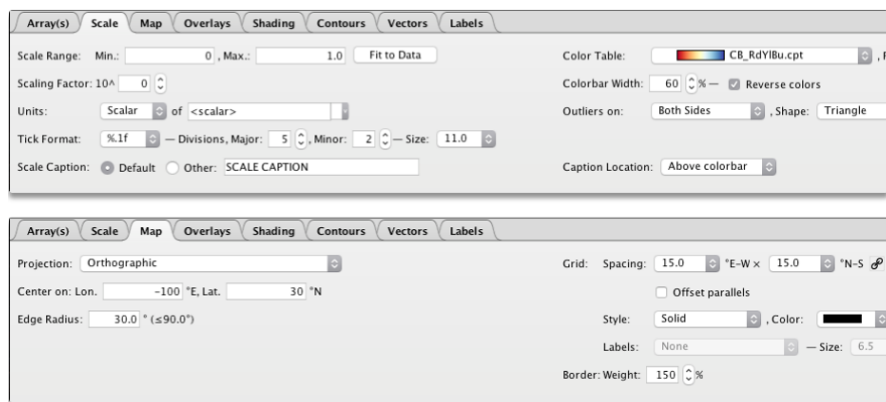


- Now we have a map of AOD, but we need to adjust it a little bit.
- Below the plot, there is a menu where you can change the look, projection, and scale of the plot



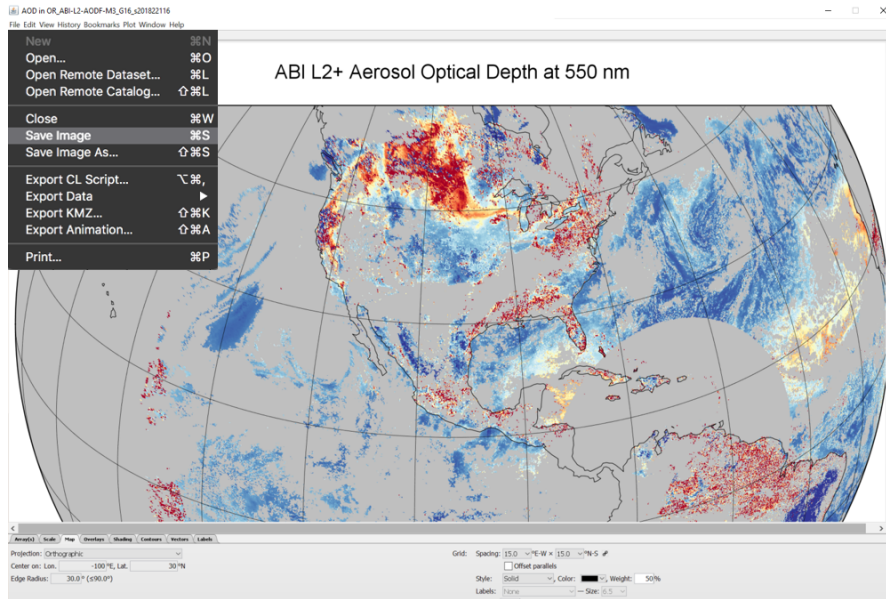
#### 4. Some formatting options:

- Zoom: Control + left click and hold to highlight region
- Scale tab:
  - Change Scale to 0-1
  - Change color table to another palette
  - Edit Captions
- Map tab:
  - Change map projection to orthographic



#### 5. Save Image

- If you're happy with the way it now looks File Save Image
- Note: If you want to reuse this template: Plot Save Plot Settings as Default



## 2 Closing up

- I hope you enjoyed this crash course in Python in Earth science applications!
- I am available [by email](#).

Thank you to Rebekah Esmaili, on whose previous workshops we heavily based this one.  
Thank you!