Using GOES-R and JPSS Remote Sensing Capabilities to Enhance Weather, Climate, Water and Environmental Security
2022 AMS Virtual Short Course
February 16-17, 2022
11:00AM - 3:00PM (EST)

ReadMe Instructions for Optional Python ABI & VIIRS AOD Script

For those participants interested in using Python to work with aerosol optical depth (AOD) data, we are providing an additional script in Jupyter Notebook format (.ipynb) to process and visualize ABI & VIIRS AOD files. This script will work with any ABI and/or VIIRS AOD data files!

Unfortunately, we don't have sufficient time during the live session to demonstrate this script, but it is similar to the script we used to process and visualize ABI and VIIRS Level 2 fire data files. Here are instructions to get you started. Feel free to email nesdis.star.aerosoltraining@noaa.gov if you have any questions!

1. Download the compressed AOD .zip file to your computer, open the file, and extract the contents.
    - To make things easy, I included 4 AOD data files for a wildfire event that occurred near Los Angeles, California on December 3, 2020. But don't forget that you can use the "abi_level2_download_files_aws.ipynb" script (that we used in the live session) to download any ABI Level 2 data files yourself, including AOD!

2. Upload the 1 .ipynb and 4 .nc files to Jupyter Notebook – to make things easy for yourself, put all the files in the same folder! You can make a brand new folder, or you can use the folder you made for the live training session.

3. Open the Python code file entitled, "viirs_abi_aod_level2_process_visualize.ipynb" and run the file one block at a time, sequentially.
    - After you run Block 13, the interactive menus will appear. Use them to select the data processing and plotting settings. The figure on Page 2 of this document shows the correct settings for the map domain and lat/lon ticks for the December 3 smoke event.
    - Then run Block 14 (the main function).
        - The map domain corners and lat/lon ticks will be displayed; check that they match the settings below and if they do, enter "yes" when asked if you want to proceed to make the AOD maps.
            - Domain corners (western lon, eastern lon, southern lat, northern lat): [-121, -117, 32, 35]
            - Longitude ticks (west to east): [-121, -120, -119, -118, -117]
            - Latitude ticks (south to north): [32, 33, 34, 35]
        - If you made a mistake entering the data processing and plotting settings, go back to the interactive menus and correct your mistake, and then re-run Block 14. **Do NOT re-run Block 13!** If you do, all of the interactive menu settings will be re-set to their defaults.
    - The script should make 4 image files: 3 ABI AOD figures and 1 VIIRS AOD figure. Examples of the figures are included on the training website as a reference.

Block 13 interactive menus settings for December 3, 2020 event

SELECT DIRECTORY where ABI/VIIRS data files are located

◉ Current Working Directory
○ Specify a Directory: (e.g., D://Data/)

This directory needs to match the location where you put the AOD data files!

[   ]

SELECT DIRECTORY where map image files will be saved

◉ Current Working Directory
○ Specify a Directory: (e.g., D://Data/)

[   ]

SELECT settings for AOD data visualization

AOD data quality: [High & Medium   ⌄]

AOD map image file format: [.jpg   ⌄]

These settings are a good place to start. Experiment by changing them and seeing the differences in the figures you create!

AOD map image file resolution (DPI): [300   ⌄] (low resolution = 150 DPI, very high resolution = 900 DPI)

SET DOMAIN OF MAP (enter lat/lon map corners using up/down arrows or type in value)

northern-most latitude: [35] (use negative values to indicate °S, e.g., 30 °S = -30)

western-most longitude: [-121]   eastern-most longitude: [-117] (use negative values to indicate °W, e.g., 100 °W = -100)

southern-most latitude: [32] (use negative values to indicate °S, e.g., 30 °S = -30)

SET LAT/LON TICK MARKS FOR MAP (use up/down arrows or type in value)

Enter range of longitude ticks: western-most longitude tick [-121]   eastern-most longitude tick [-117]

increment of °longitude between ticks (0.1-50°) [1]

Enter range of latitude ticks: northern-most latitude tick [35]

southern-most latitude tick [32]

increment of °latitude between ticks (0.1-60°) [1]