

Making Beautiful Images of NOAA Satellite Data using Python

2023 AMS Sponsored GOES-R/JPSS Short Course

Sunday, January 8, 2023, Denver CO

8:00 AM - 3:30 PM (MST)

Instructors: Dr. Rebekah Esmaili and Dr. Amy K. Huff

UPDATED Course Agenda

7:30 - 8:00 (30 min)	Attendee Check-In Python/Anaconda Troubleshooting and Assistance		
8:00 - 8:05 (5 min)	Welcome & Opening Remarks	Sherrie Morris & Gary McWilliams	
8:05 - 8:15 (10 min)	Course Overview	Rebekah Esmaili	
	Session	Application/ Package(s)	Lead Instructor
8:15 - 8:30 (15 min)	Topic 1: Getting Started with Jupyter Notebook	Jupyter Notebook	Rebekah Esmaili
	Python Hands-On #1: Take a tour of Jupyter Notebook and run simple Python code		
8:30 - 9:15 (45 min)	Topic 2: Downloading Satellite Data Files	S3Fs requests	Amy Huff
	Python Hands-On #2: Download satellite data files from the NOAA Open Data Dissemination (NODD) GOES-R & JPSS archives on Amazon Web Services (AWS) and the NOAA/NESDIS/STAR online archive		
9:15 - 9:45 (30 min)	Topic 3: Understanding the Structure & Contents of netCDF Data Files	xarray netCDF4	Amy Huff
	Python Hands-On #3: Open, read the metadata, and view data variables in NOAA netCDF4 data files		
9:45 - 10:00 (15 min)	Break		
10:00 - 10:45 (45 min)	Topic 4: Handling Data Arrays	NumPy xarray	Rebekah Esmaili
	Python Hands-On #4: Read NOAA netCDF4 data into arrays and perform array operations		

10:45 - 11:45 (60 min)	Topic 5: Making Composite (RGB) Images	Matplotlib	Rebekah Esmaili
	Python Hands-On #5: Create ABI true color (RGB) and Dust RGB images		
11:45 - 12:45 (60 min)	Lunch Break		
12:45 - 1:45 (60 min)	Topic 6: Working with Map Projections	Cartopy	Amy Huff
	Python Hands-On #6: Visualize NOAA satellite data on a variety of map projections (e.g., Plate Carree, Mollweide, Mercator)		
1:45 - 2:30 (45 min)	Topic 7: Adding Professional Touches to Images	Matplotlib Cartopy datetime	Amy Huff
	Python Hands-On #7: Add/format features to make a professional-looking image of NOAA satellite data (e.g., colormap, color bar, lat/lon tick marks & gridlines, coastlines & borders, ocean/land shading, automatic title with product & observation date/time)		
2:30 - 2:45 (15 min)	Break		
2:45 - 3:15 (45 min)	Topic 8: Creating Skew-T/Log-P Plots	MetPy	Rebekah Esmaili
	Python Hands-On #8: Visualize NUCAPS satellite sounding data on a Skew-T/Log-P plot		
3:15 - 3:25 (10 min)	Course Wrap-Up	Amy Huff	
3:25 - 3:30 (5 min)	Course Evaluations	Sherrie Morris & Gary McWilliams	