

Advances in Python for Community Multiscale Air Quality Analyses: A planet in the Cloud?

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2021-11-04

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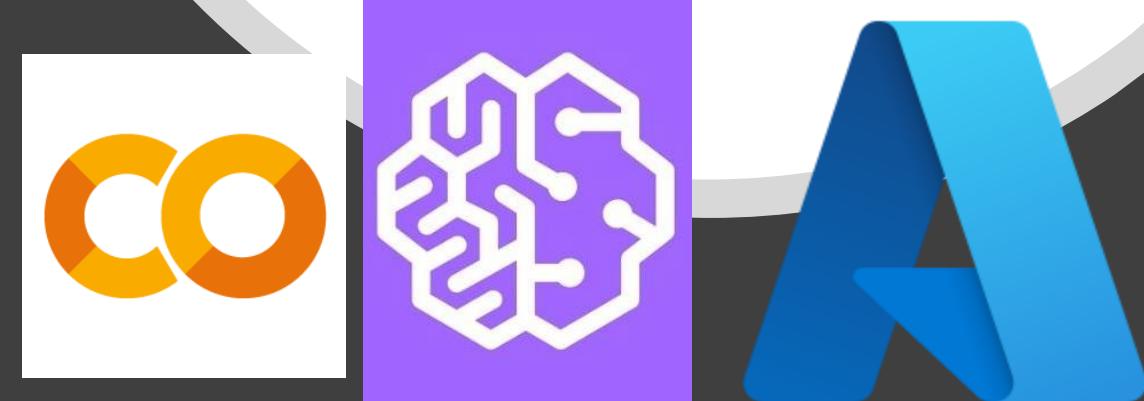
The CMAS community needs Jupyter Lab

- Jupyter Lab is a notebook with web-based file browser and terminals
 - Docs, code, results, and images
 - Reusable with a minimum effort
 - R, Python, Bash, even C
- Easy install windows, linux, mac
 - Use a python installer
 - run `pip install --user jupyterlab`
 - `jupyter lab` or `jupyter.exe lab` to get a web-based platform
- Jupyter Notebooks are a great way to share analysis systems.



Jupyter give anyone access to cloud computing services.

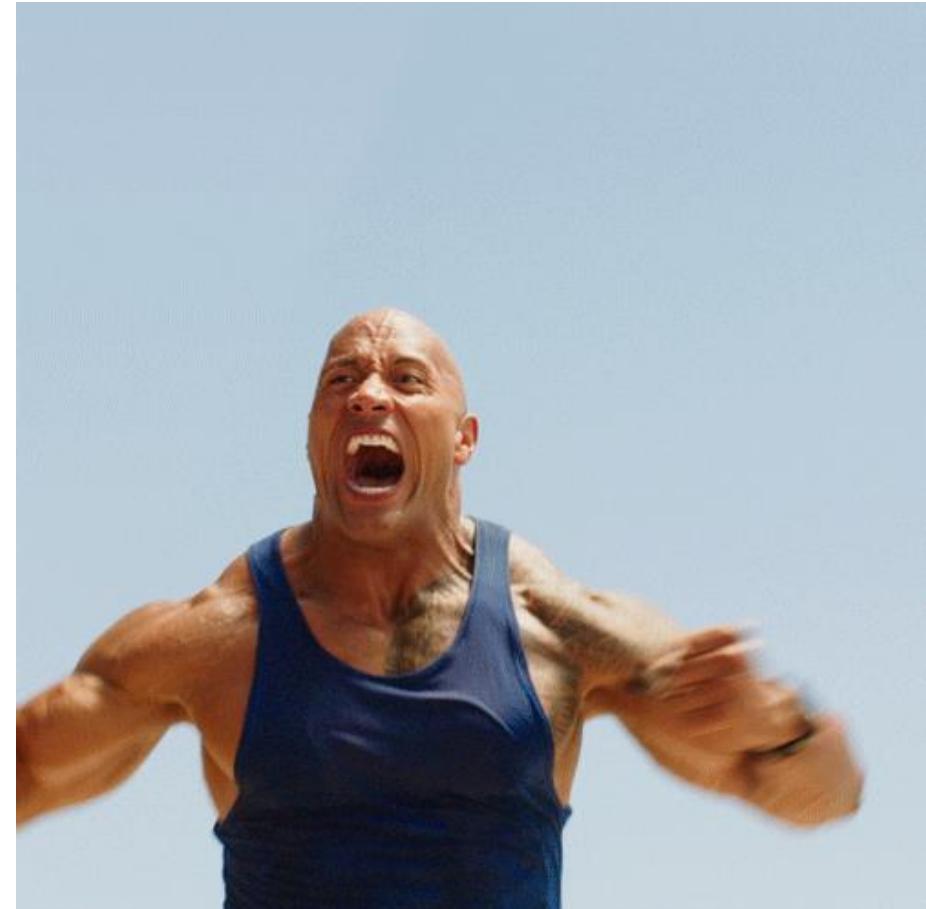
- Available all kinds of places
 - Google Colab (integrated GitHub)
 - Amazon SageMaker
 - Azure (recently dropped easy access)
 - Add it to any system (see last slide)
- The interface is the same in the cloud as on your machine...



Jupyter in the cloud means instant access to huge data resources!

Bring the creativity and POWER!

- <https://registry.opendata.aws/>
 - NOAA already has GOES
 - NASA already has OMI L3 data
 - GEOS-Chem emissions and meteorology
- <https://cloud.google.com/solutions/datasets>
 - NOAA: Rapid Refresh (RAP) Forecasts, monthly climate data (nclimgrid), GFS, HRRR, etc
 - USGS Landsat
 - EPA observations
- Much more to come!

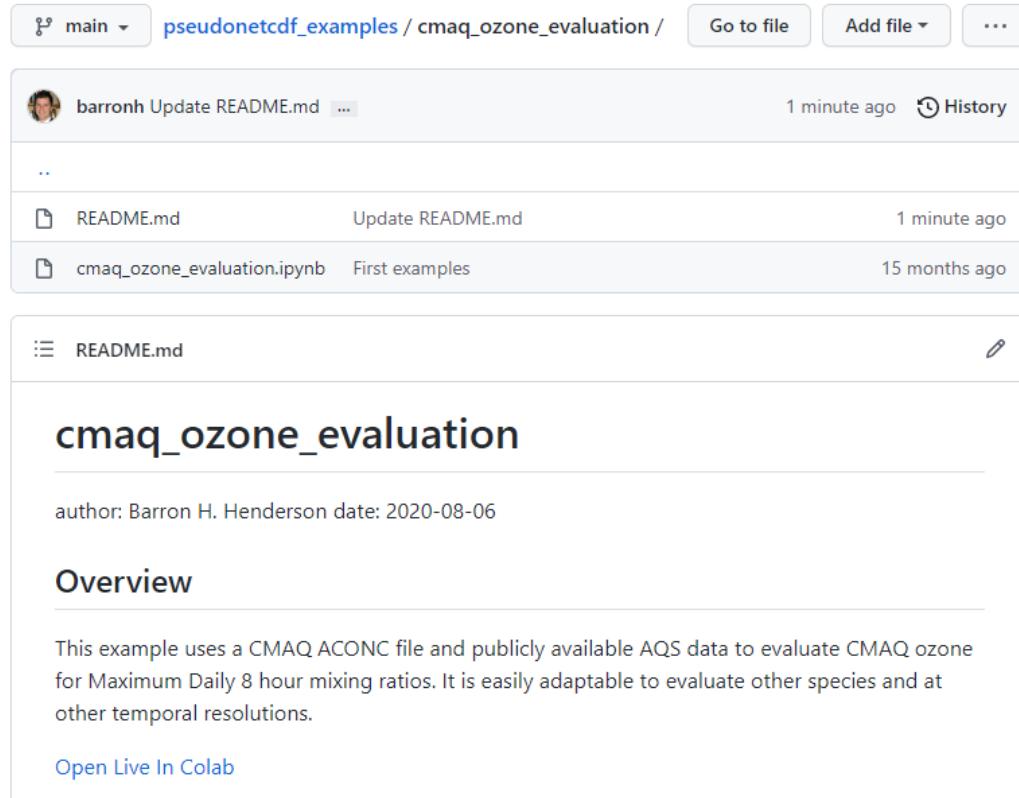


How can I get started?

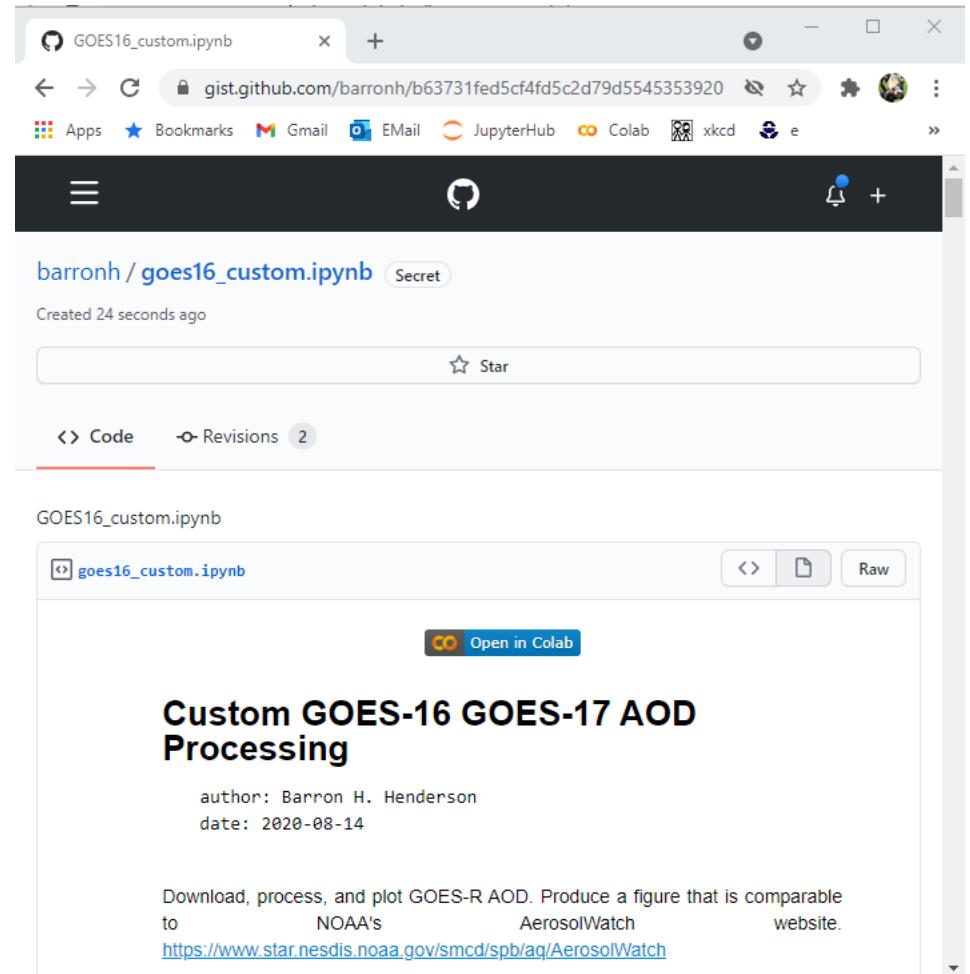
If you want to get started with geostationary satellite data and python but aren't sure how, try plotting GOES-16 AOD or TEMPO Synthetic NO2 data.

These are primers, and not targeted toward specific applications.

https://github.com/barronh/pseudonetcdf_examples



The screenshot shows a GitHub repository interface. The repository is named `pseudonetcdf_examples` and contains a subdirectory `cmaq_ozone_evaluation`. The README file is titled `cmaq_ozone_evaluation` and provides an overview of the example, mentioning CMAQ ACONC files and AQS data for ozone evaluation. It includes a link to "Open Live In Colab".



The screenshot shows a GitHub gist interface. The gist is titled `GOES16_custom.ipynb` and is marked as "Secret". It was created 24 seconds ago. The notebook content is titled "Custom GOES-16 GOES-17 AOD Processing" and describes the process of downloading, processing, and plotting GOES-R AOD data to produce a figure comparable to NOAA's AerosolWatch website. It includes a link to "Open in Colab".

<https://gist.github.com/barronh/b63731fed5cf4fd5c2d79d5545353920>

What could it look like?

- A repository of fully functional runnable code.
- Oriented toward solving our types of problems.
- Right now, the CMAS Forum Python Channel allows us to link to these sorts of things
 - cmascenter.org -> Help -> CMAS Forum -> Category Python
 - <https://forum.cmascenter.org/c/python/>

