

Preparing Key State and Local Health and Air Quality Agencies for Upcoming Earth Observations

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Health and Air Quality Applications
Program Review
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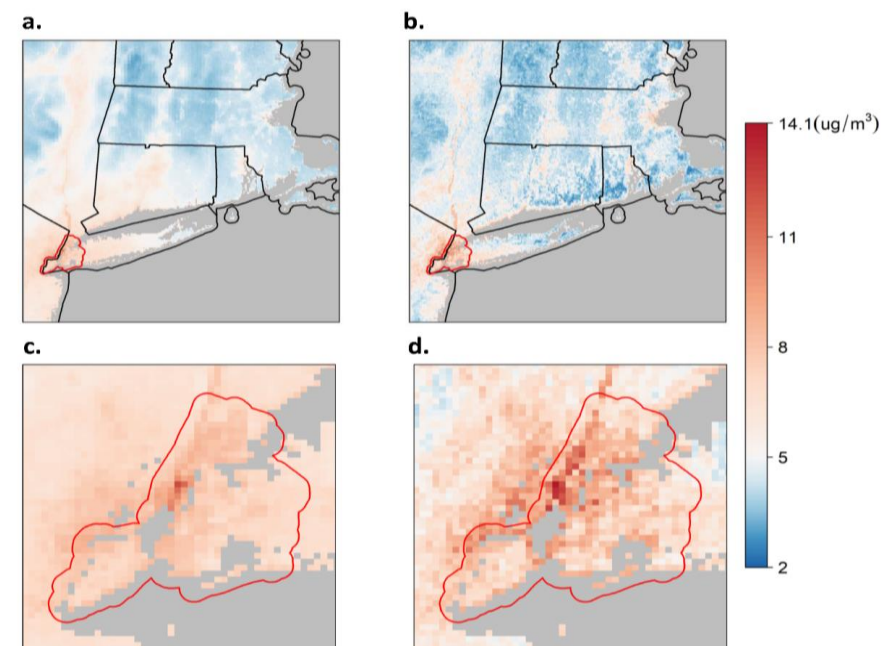
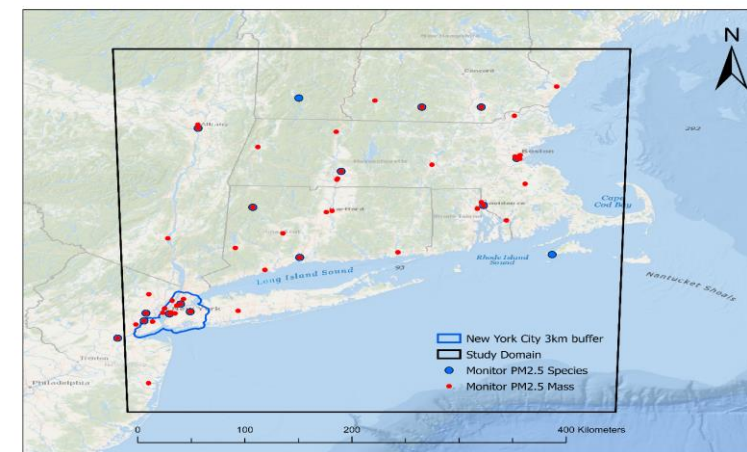
Project Goals

- Prepare air quality and public health stakeholders for data from the next-generation satellite instruments such as MAIA, TROPOMI, and GOES-R series
- Use actual or synthetic data of these instruments to demonstrate how the new information can enhance stakeholders' decision support activities
- Stakeholders: GA EPD, NYC Department of Health and Mental Hygiene
- Current ARL = 6, expected ARL = 8

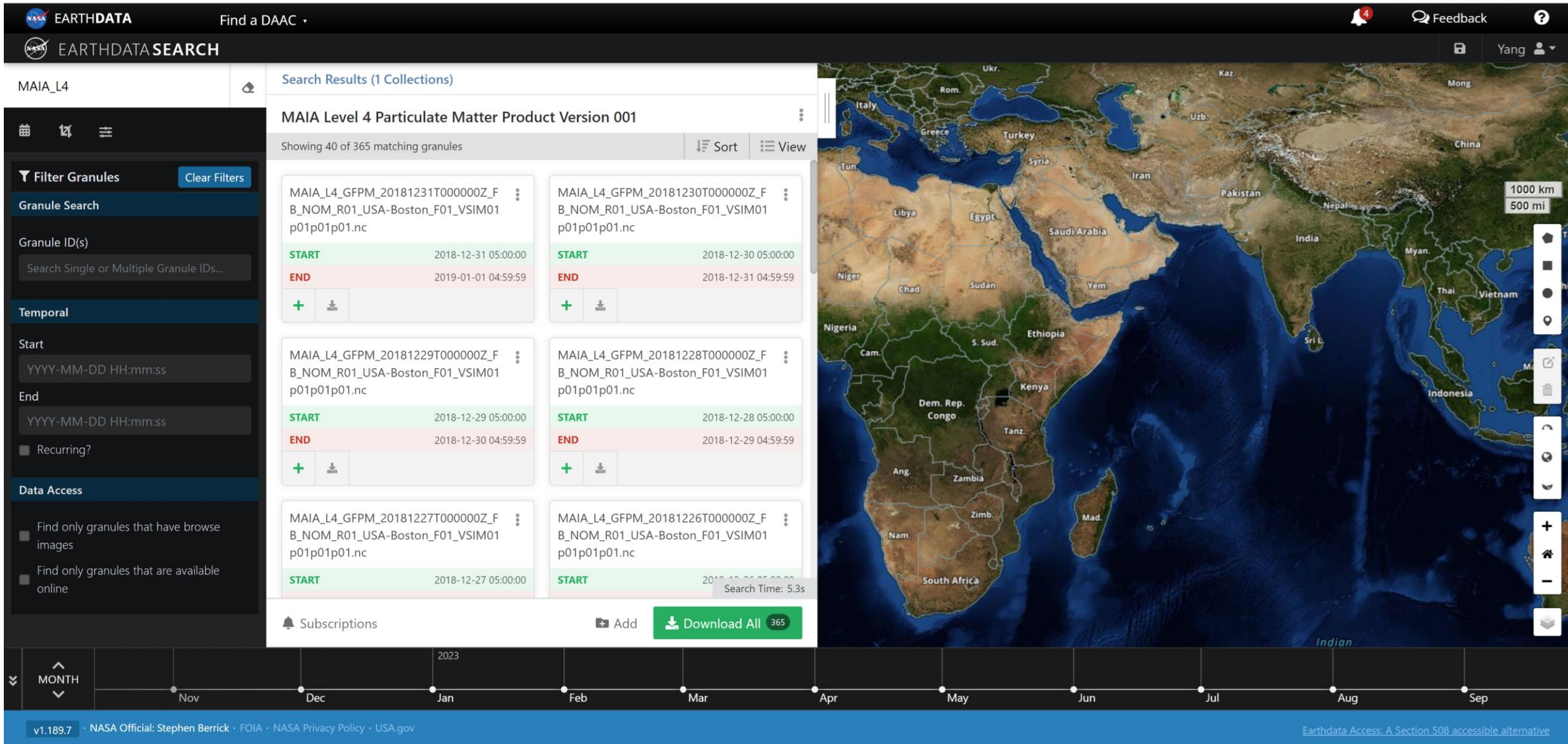


Project Updates - MAIA-like PM product for NYC

- Developed a MAIA-like L4 PM product for the NE US domain in 2018
- Model evaluation is complete
- A manuscript is being prepared
 - Key findings: MAIA's Bayesian statistics-based operational algorithm is robust and well suited to produce high-resolution PM_{2.5} speciation estimates with limited ground observations. Machine learning models might be under trained, therefore underperform.



NYC Simulated MAIA L4 PM data in NASA Earthdata



The screenshot displays the NASA Earthdata Search interface. The top navigation bar includes the NASA Earthdata logo, a search bar, and utility icons for feedback and user profile. The main content area is titled "MAIA L4" and shows search results for "MAIA Level 4 Particulate Matter Product Version 001". A sidebar on the left provides filtering options for granules, temporal ranges, and data access. The search results are presented in a grid of six granule cards, each showing the granule ID, start and end dates, and download options. A world map is visible on the right side of the interface, and a timeline at the bottom allows for navigating through the data by month.

Search Results (1 Collections)

MAIA Level 4 Particulate Matter Product Version 001

Showing 40 of 365 matching granules

Granule ID	START	END
MAIA_L4_GFPM_20181231T000000Z_F B_NOM_R01_USA-Boston_F01_VSIM01 p01p01p01.nc	2018-12-31 05:00:00	2019-01-01 04:59:59
MAIA_L4_GFPM_20181230T000000Z_F B_NOM_R01_USA-Boston_F01_VSIM01 p01p01p01.nc	2018-12-30 05:00:00	2018-12-31 04:59:59
MAIA_L4_GFPM_20181229T000000Z_F B_NOM_R01_USA-Boston_F01_VSIM01 p01p01p01.nc	2018-12-29 05:00:00	2018-12-30 04:59:59
MAIA_L4_GFPM_20181228T000000Z_F B_NOM_R01_USA-Boston_F01_VSIM01 p01p01p01.nc	2018-12-28 05:00:00	2018-12-29 04:59:59
MAIA_L4_GFPM_20181227T000000Z_F B_NOM_R01_USA-Boston_F01_VSIM01 p01p01p01.nc	2018-12-27 05:00:00	
MAIA_L4_GFPM_20181226T000000Z_F B_NOM_R01_USA-Boston_F01_VSIM01 p01p01p01.nc	2018-12-26 05:00:00	

Search Time: 5.3s

Subscriptions: Add Download All 365

Timeline: 2023 (Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep)

Footer: v1.189.7 · NASA Official: Stephen Berrick · FOIA · NASA Privacy Policy · USA.gov

Earthdata Access: A Section 508 accessible alternative

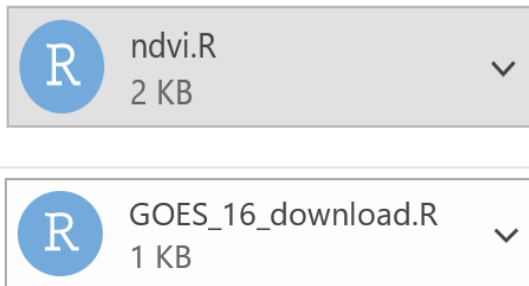
Technology Transfer to NYC



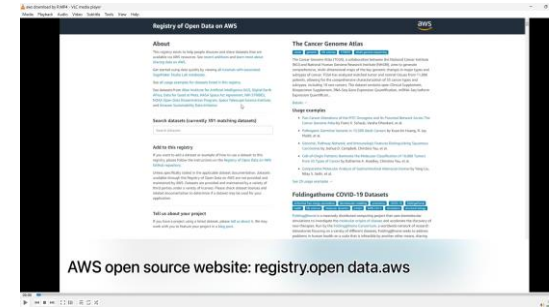
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Emory R code library



Emory test runs & video instructions



ASDC po-daac subscriber

Simple to Install/Use

1. Pip install `podaac-data-subscriber`
2. Get [Earthdata Login](#) (if you don't have already)
3. Create `.netrc` file for Earthdata Login info

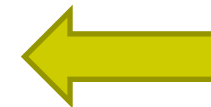
```
machine urs.earthdata.nasa.gov
login <your username>
password <your password>
```

4. Run `"podaac-data-subscriber -c MODIS_A-JPL-L2P-v2019.0 -d C:\Users\mstisdal\myData -sd 2023-02-23T09:00:00Z -p POCLLOUD"`
5. Can then be setup to run as a cron or through Windows Task Scheduler

In-person training if necessary

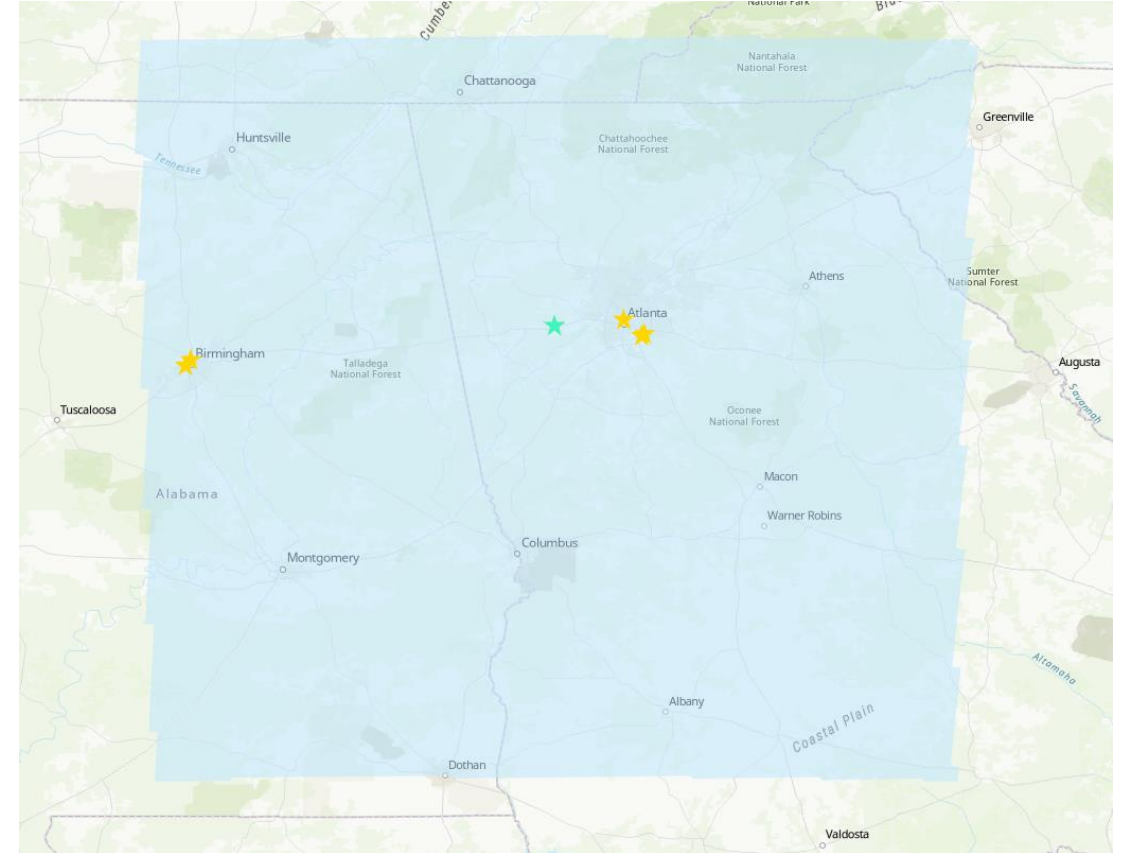


NYCTM
Health

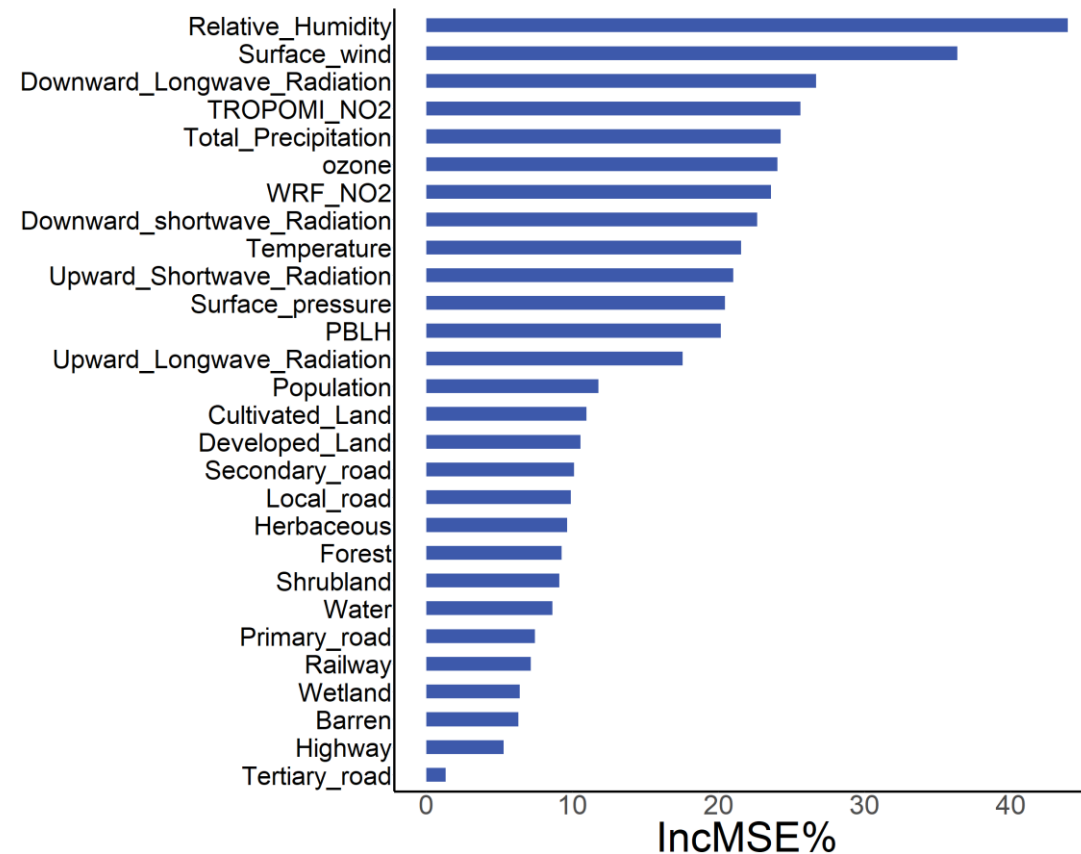
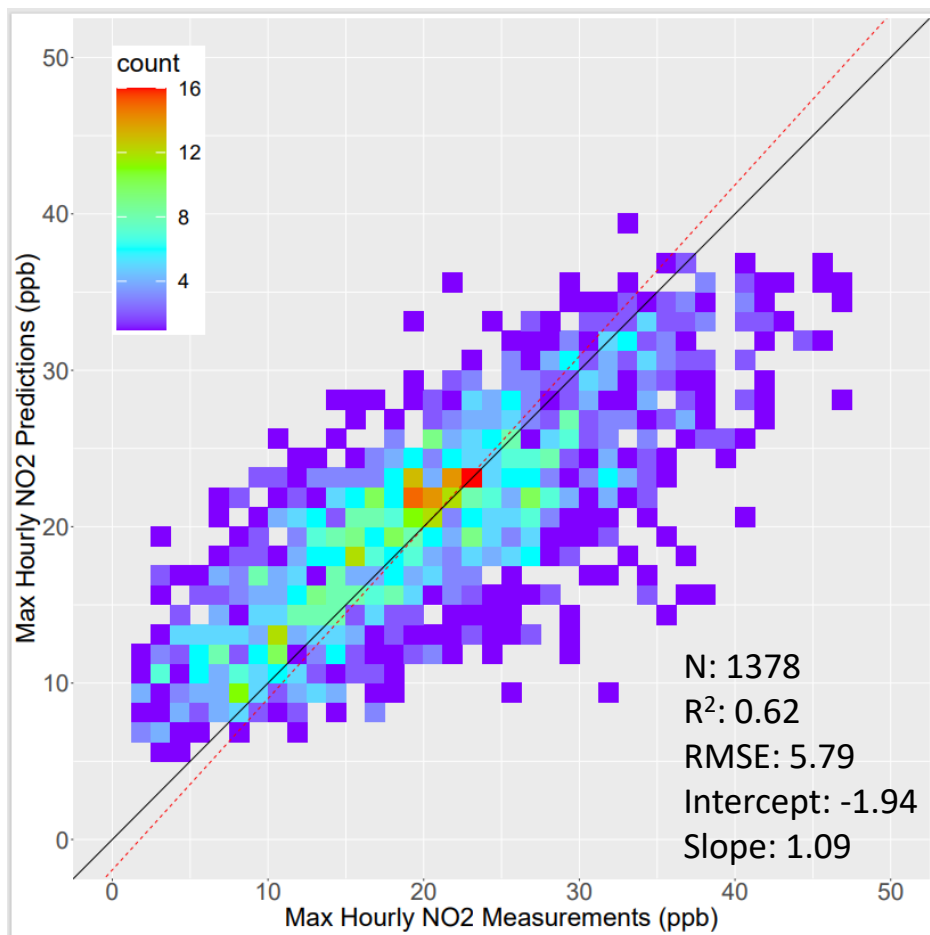


Project Updates - NO₂ model in Georgia with the latest TROPOMI data

- Goal: help GA EPD understand the spatial pattern of NO₂ in GA
- Input: TROPOMI NO₂ tropospheric column, WRF-Chem NO₂ simulations (4/2018-3/2019) and met fields, land use
- MDA1 and daily predictions made on the TEMPO 2.0 x 4.5 km grid



MDA1 Model



Scatter Plots for 10-fold CV

Red line is regression line and black line is 1:1 line.

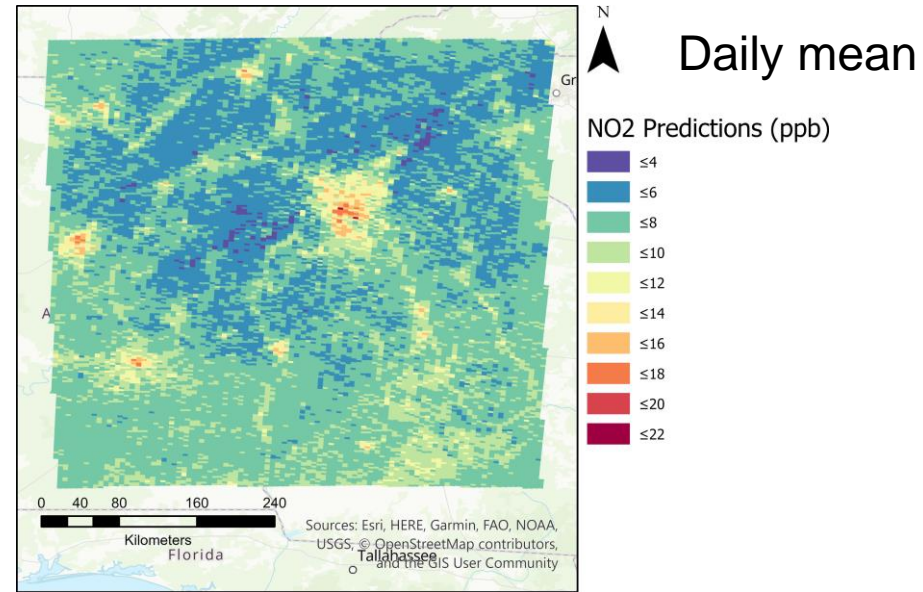
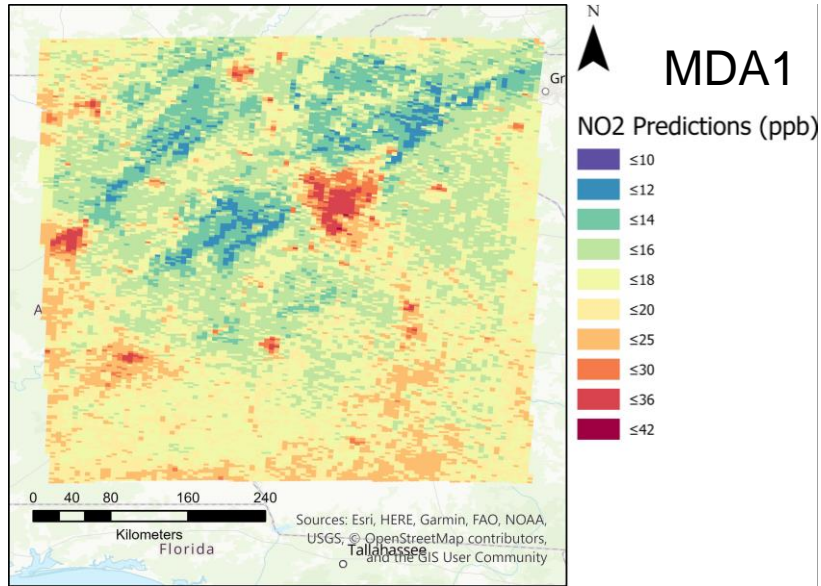
Variables Importance Rank

Prediction Maps on 06/05/2018

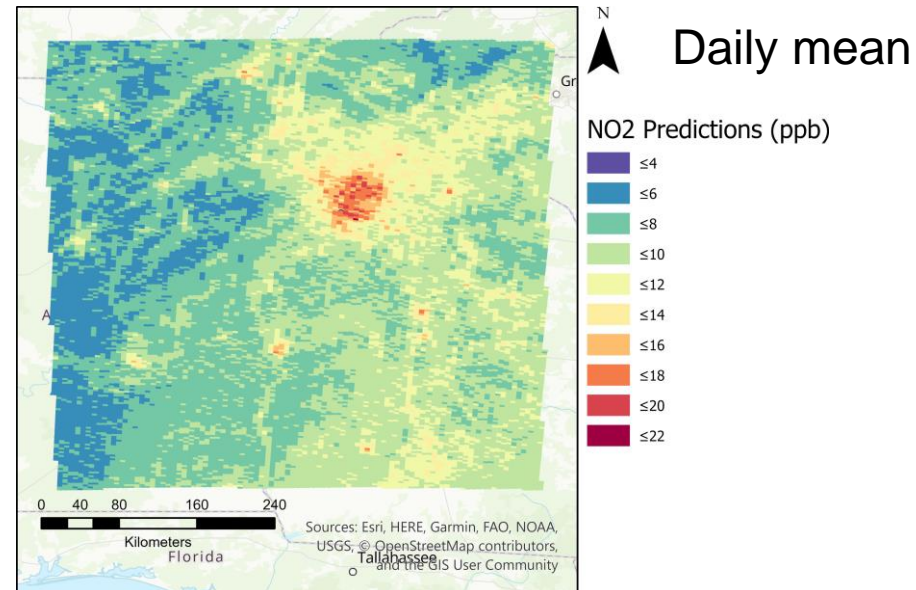
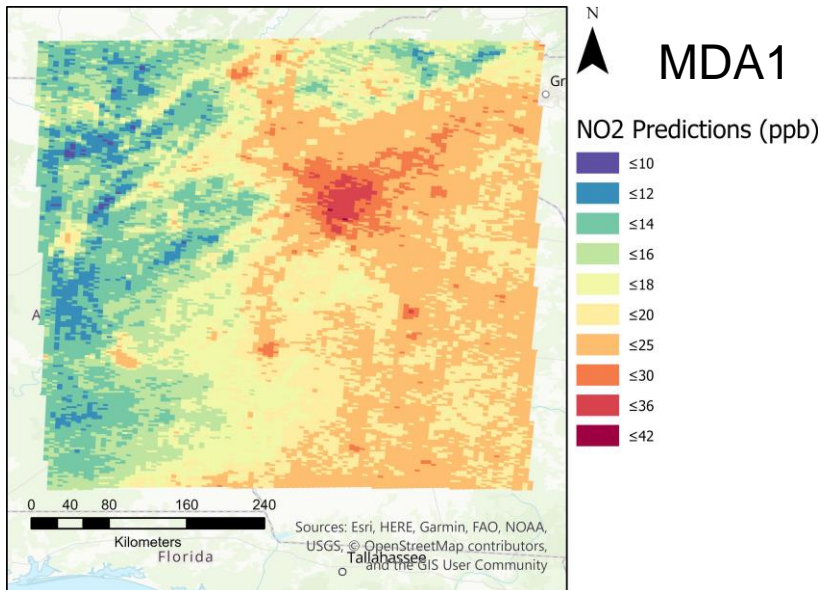


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Prediction Maps on 11/29/2018



Plan for the Rest of the NCE

- NYC
 - Make sure NYC can adopt model codes to generate their own PM2.5 mass concentration
 - Make sure NYC can pull MAIA data from NASA Earthdata seasonally
- GA EPD
 - Collaborate with GA EPD to assess the value of satellite data in monitoring NO2 levels in GA
 - Try TEMPO data?