



Connecticut Department of Energy and Environmental Protection



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

The Effect of Springtime Agricultural Burning and Wildfires on Forecasting Air Quality in the Northeast States.

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CTDEEP
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Connecticut Department of Energy and Environmental Protection

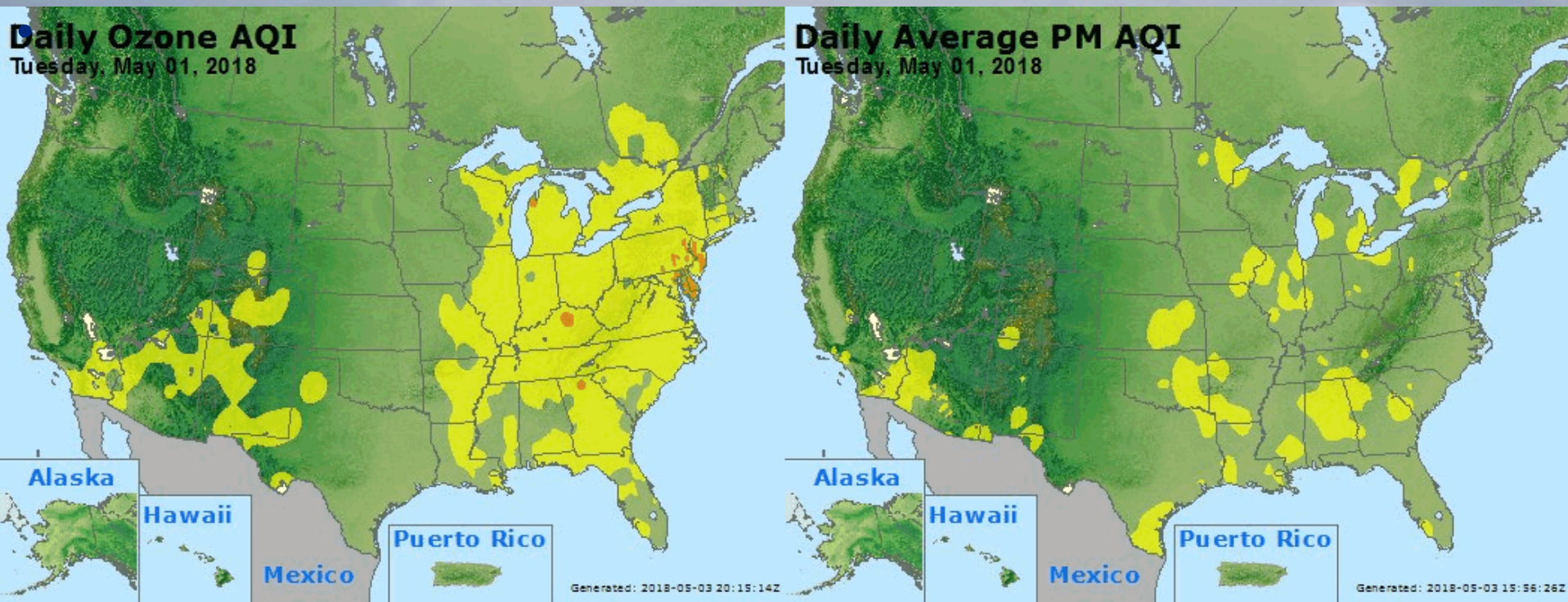
Introduction

- Ozone models have consistently under-estimated ground level ozone in the Northeast States from April – June;
- The NOAA operational model doesn't assimilate real-time gaseous emissions from fires, so this may be the largest source for the model error;
- We are seeing unusually high ozone events early in the season, which are difficult to explain and to forecast;
- These fires seem to be adding a background ozone level during this season.



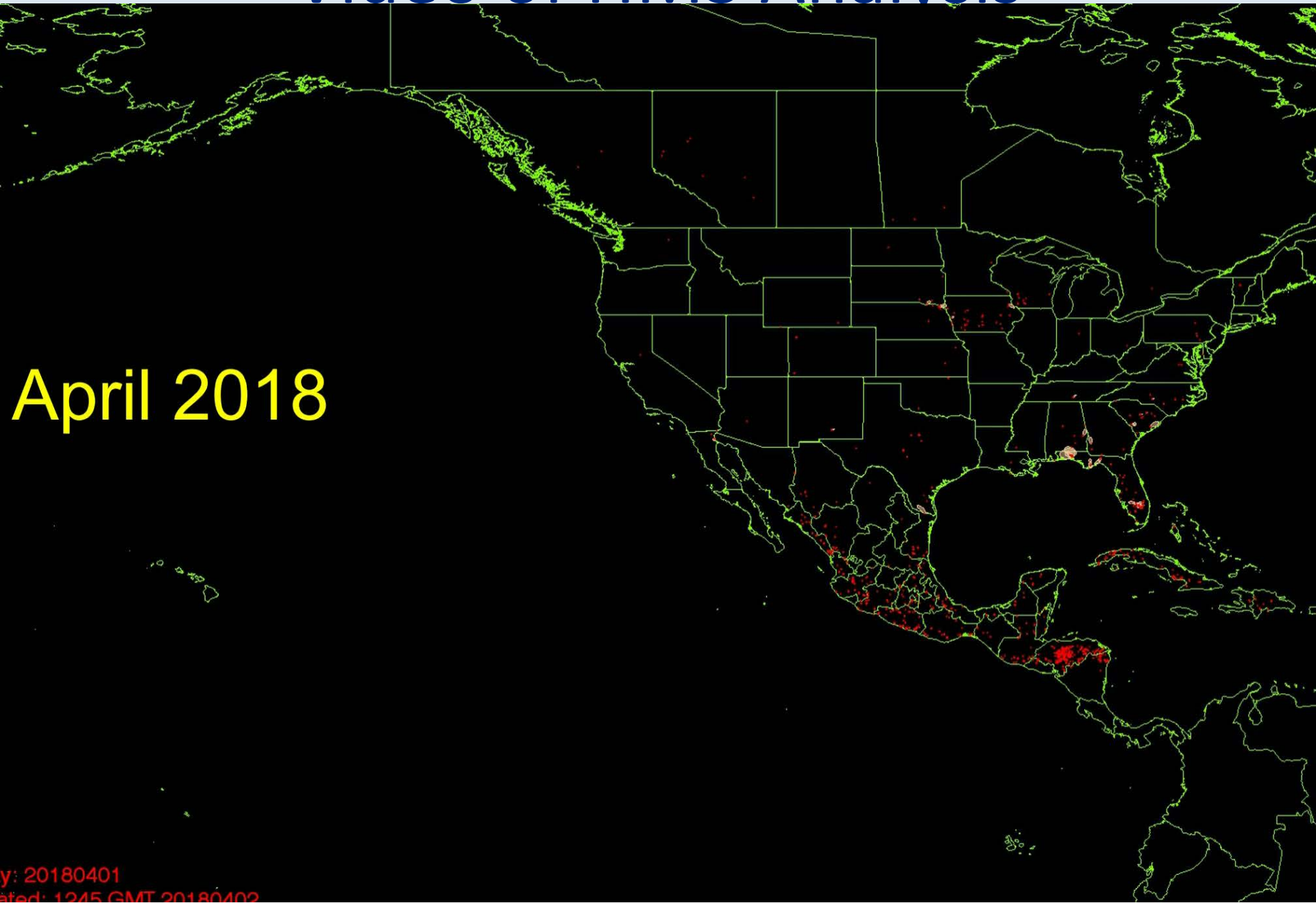
May 2018 Ozone/ PM2.5 Animation

- In the absence of fires, elevated PM2.5 levels generally occur near urban corridors;
- It has been often noticed that areas of rural elevated PM2.5 are collocated with elevated ozone;
- Smoke plumes aloft can enhance surface ozone levels, so surface PM2.5 levels generally do not reach USG without a 'major' wildfire.



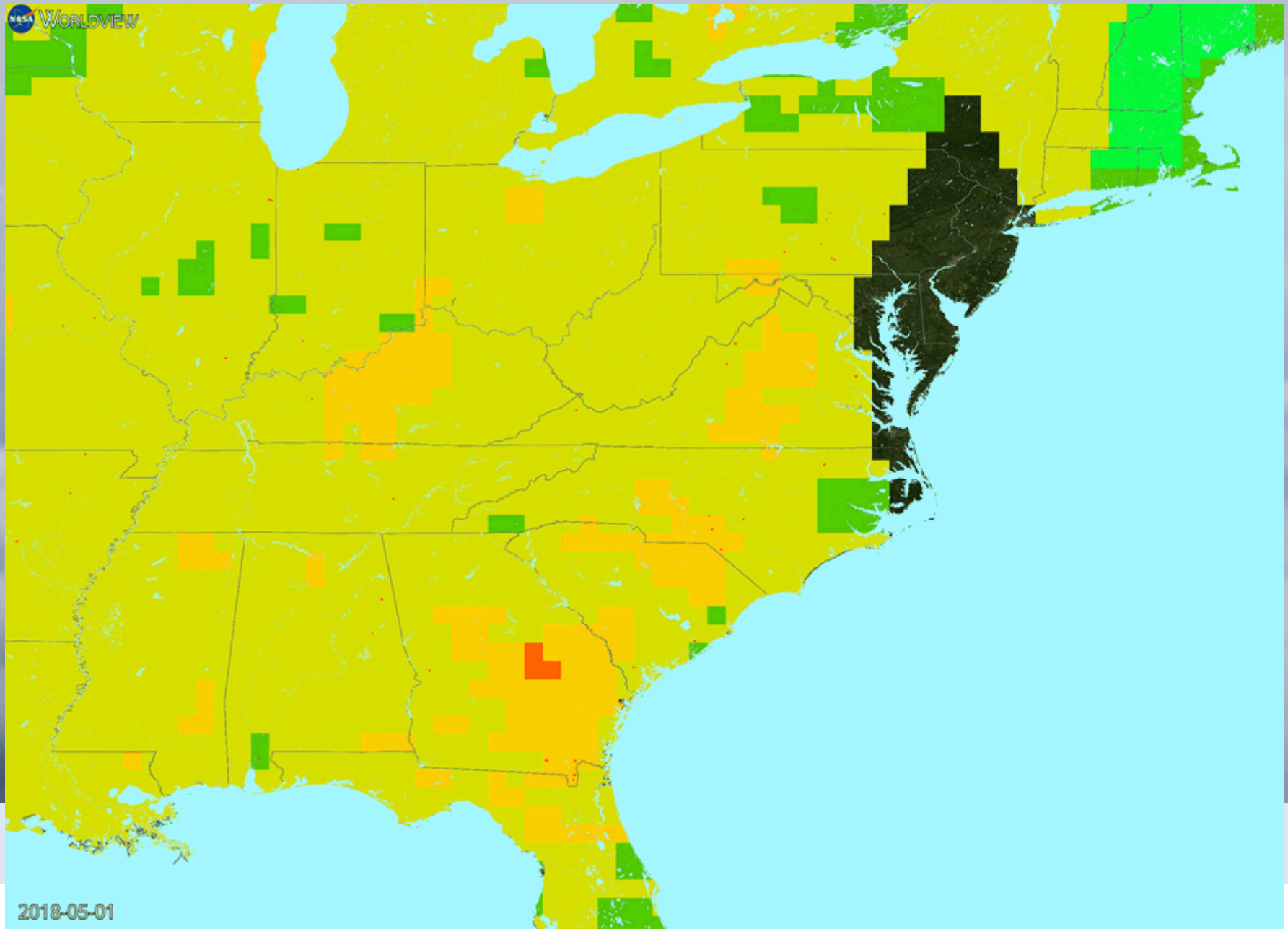
Video of HMS Analysis

April 2018



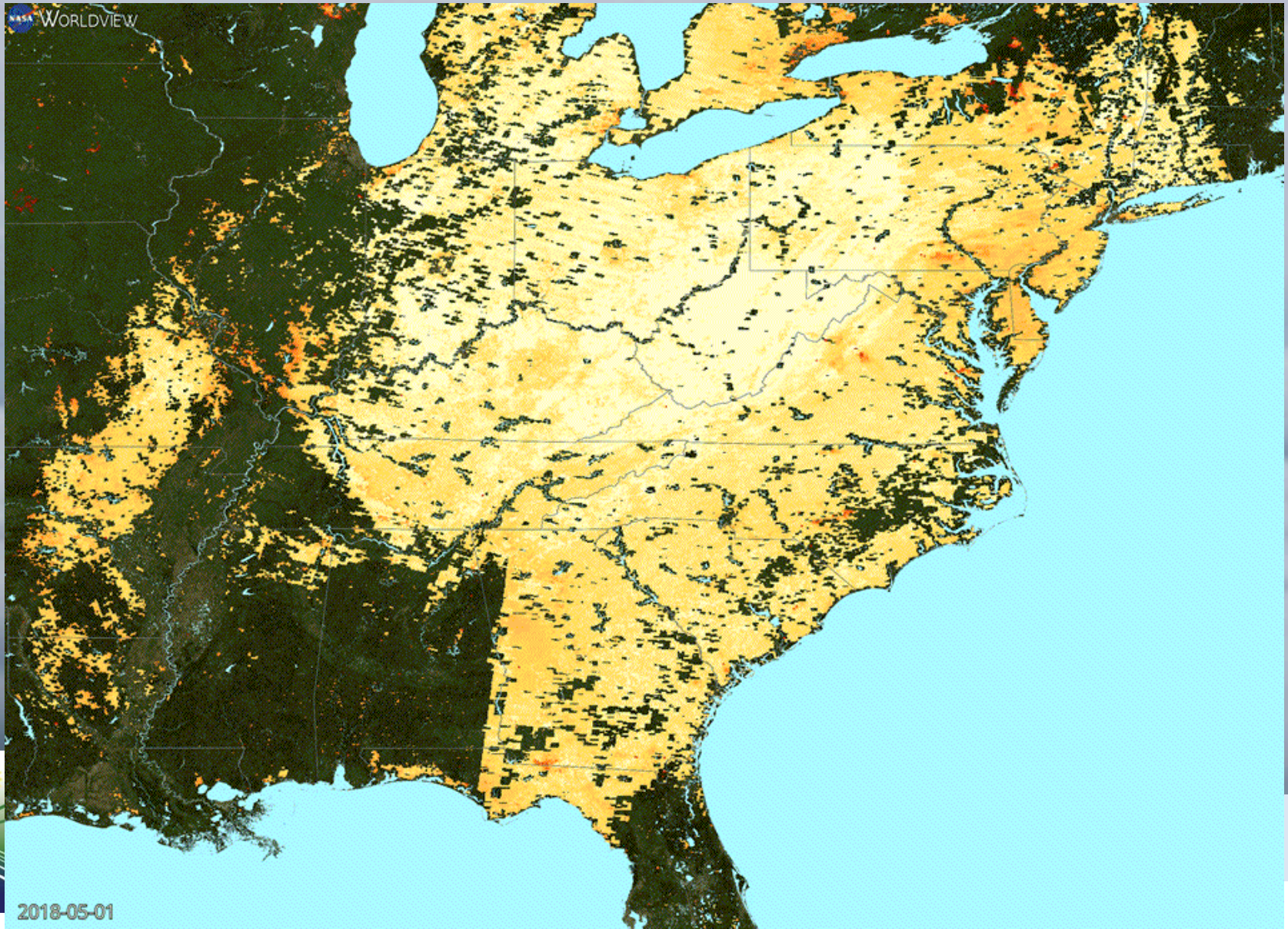
AIRS Carbon Monoxide (CO) Total Column (Day | Night) May 2018 Animation

(CO is often co-located above major fires)



Aerosol Optical Depth (3km) May 2018

- Clouds obstruct view, so clear areas are often not aerosol free.

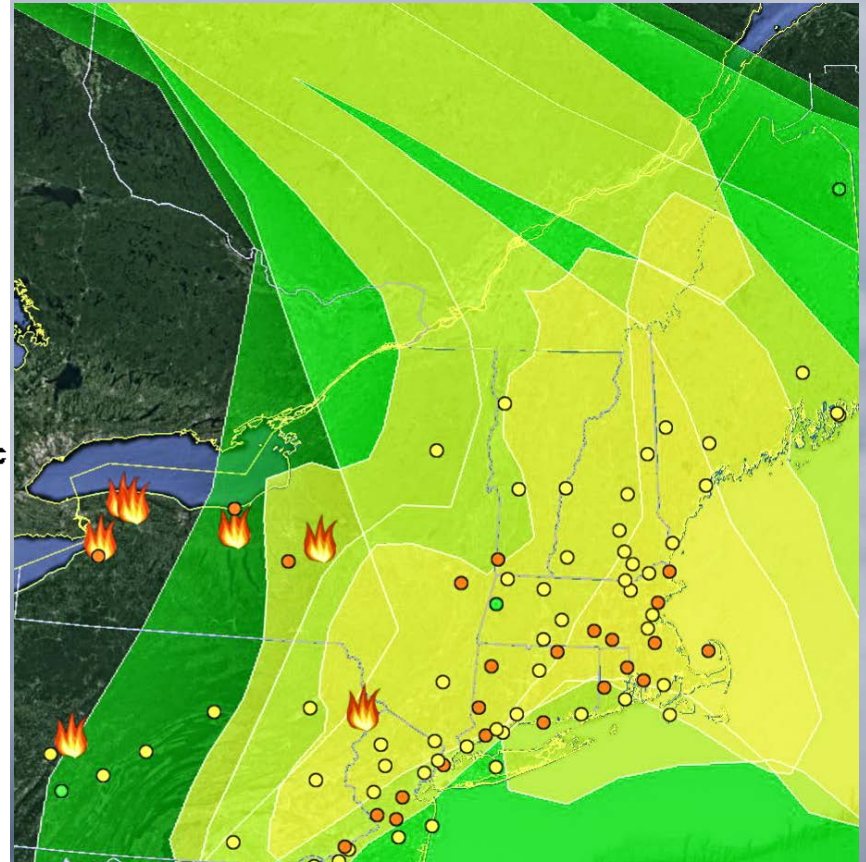
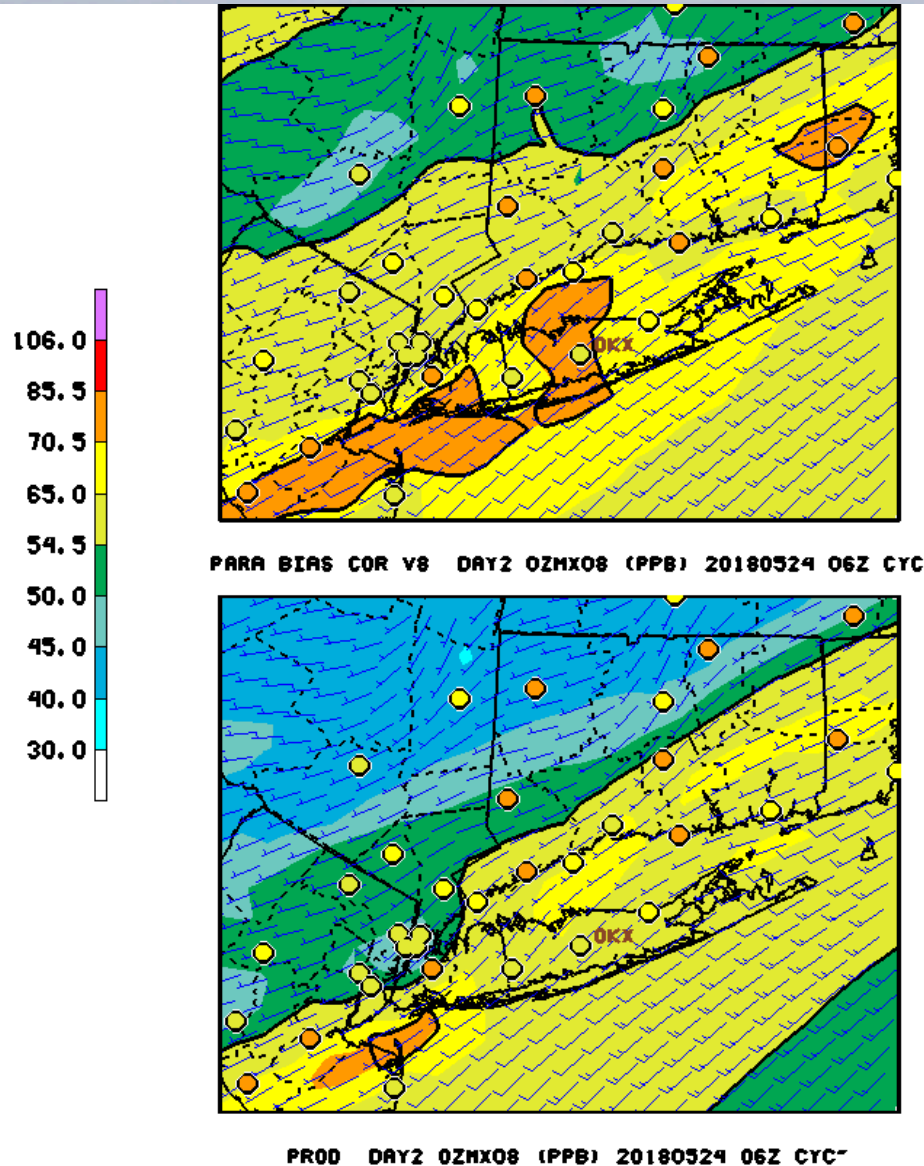


2018-05-01

May 25, 2018 NOAA Model vs. Smoke

Bias correction uses ozone, wind direction, wind speed, temperature, solar radiation, NO_x, NO_y and PBL height as parameters to identify analogs (but not smoke)

- Widespread smoke over the Northeast;
- Widespread moderate to USG ozone;
- Forecasters must rely on satellite images to predict model error.



- How much of this model under-prediction was due to smoke? NEI?
- 5, 10, 15 ppb?

Thank You HAQAST!



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