

Long Island Sound Tropospheric Ozone Study (LISTOS)

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NORTHEAST STATES FOR COORDINATED AIR USE MANAGEMENT (NESCAUM)

AMERICAN GEOPHYSICAL UNION FALL MEETING

WASHINGTON, DC

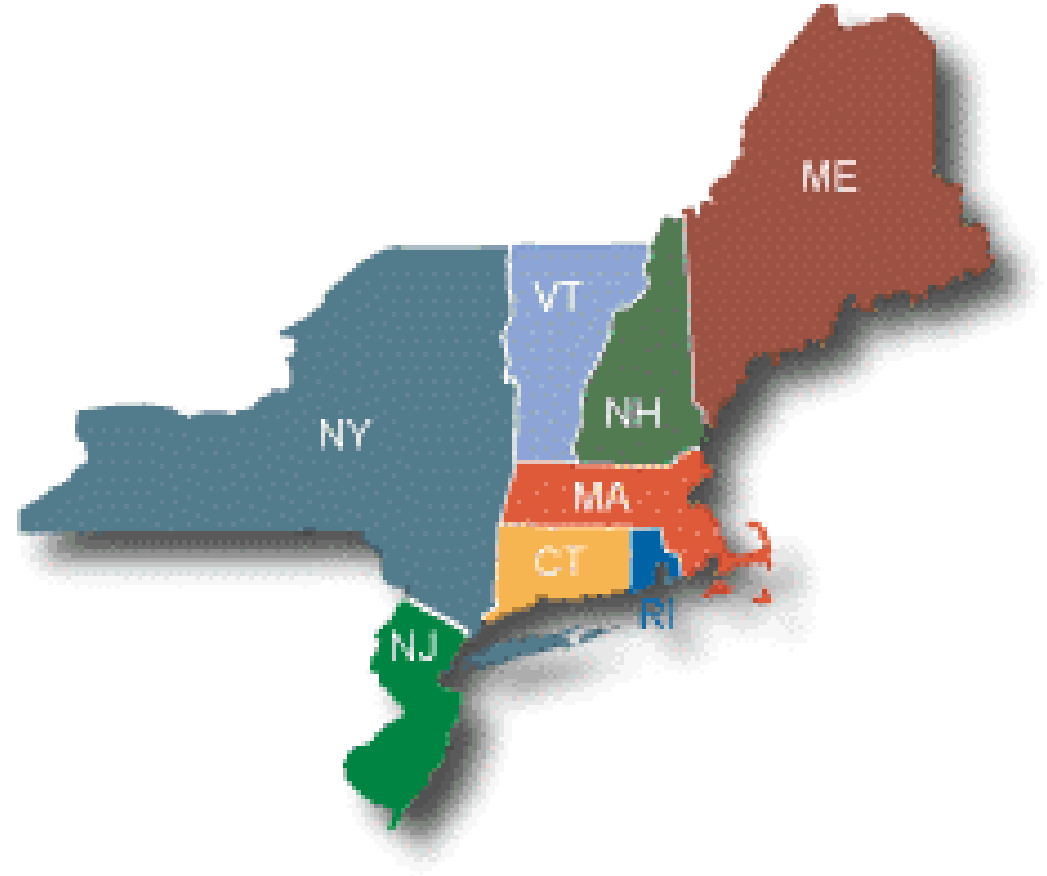
DECEMBER 12, 2018

Talk Outline

- Northeast U.S. ozone pollution problem
- LISTOS general overview
- LISTOS activities to date
- LISTOS data availability

Northeast States for Coordinated Air Use Management (NESCAUM)

- Eight NESCAUM states: ME, NH, VT, MA, RI, CT, NY and NJ
- NESCAUM directors are the eight state air agency chiefs
- NESCAUM provides technical & policy advice to our member states in support of their air quality and climate planning needs



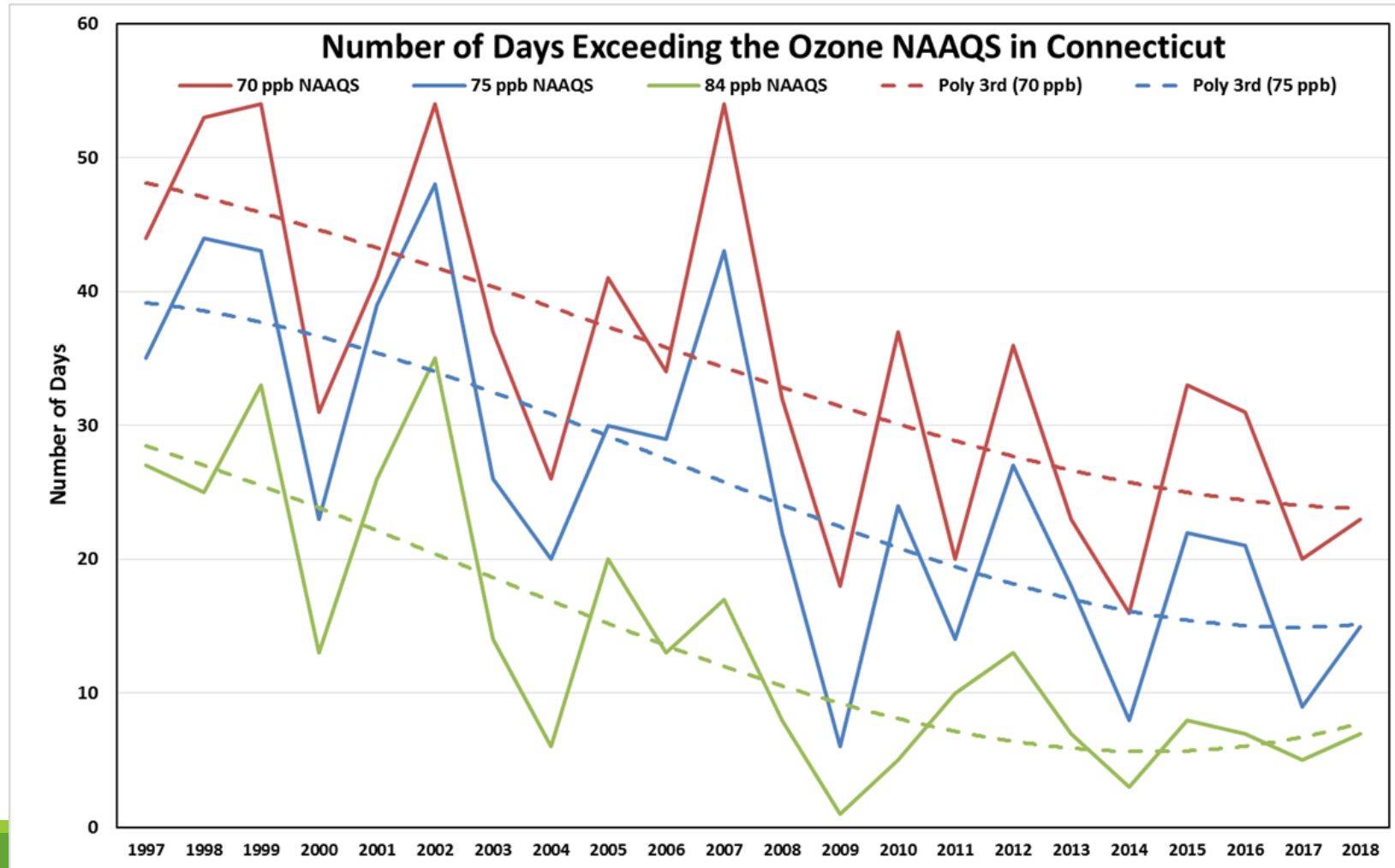
Northeast Ozone Nonattainment Areas 2015 8-hr NAAQS 0.070 ppm



Final designations announced April 30, 2018:

1. Moderate: New York-Northern New Jersey-Long Island, NY-NJ-CT
2. Marginal: Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE
3. Marginal: Greater Connecticut, CT
4. Marginal: Washington, DC-MD-VA

Connecticut 8-hr Ozone Trends



Workshop at Lamont-Doherty Earth Observatory, Columbia Univ.

- ❖ Convened research and policy experts in energy & air quality data gaps workshop, May 24-25, 2017
- ❖ Follow-up activities
 - Whitepaper with research recommendations as basis for future efforts
 - Monthly calls *ad hoc* research group

LISTOS Launched in 2018

- ❖ LISTOS – Long Island Sound Tropospheric Ozone Study
- ❖ <http://www.nescaum.org/documents/listos>



2018 LISTOS Participants & Activities

1. State AQI forecasters predicting ozone episodes to launch activities
2. NOAA-ESRL oxygenated/consumer product VOC mobile van measurements in NYC during March and July
3. Univ. Maryland 8-12 flights (depends on episodes, flight durations)
4. Maine DEP and NYS DEC labs VOC canister analysis
5. NASA GeoTASO 20-30 high altitude flights; ozonesondes at Rutgers, NJ
6. EPA Pandoras Long Island Sound (LIS) coastline, Rutgers PAMS, NYC; ozonesondes & continuous HCHO at Westport, CT
7. CCNY boat-based air pollution measurements in LIS
8. CCNY aerosol LIDAR in northern Manhattan
9. Stony Brook Univ. oxygenated VOC measurements at Flax Pond PAMS site (Long Island north shore) during summer
10. Stony Brook Univ. aircraft fine resolution wind field measurements over LIS
11. Univ. at Albany O₃, NO_x, VOC mobile measurements across Long Island south to north shore transects
12. Univ. at Albany ozonesondes from Long Island
13. NASA ozone LIDARs upwind at Rutgers Univ., NJ, and downwind on CT's LIS shoreline
14. CT DEEP ozone monitor on LIS ferry between Bridgeport, CT and Port Jefferson, NY
15. PAMS VOC measurements at Rutgers, NJ & the Bronx, with new NYS DEC PAMS site at Flax Pond, Long Island
16. Yale Univ. Coastal Field Station – VOCs on CT coast

Supporters



Funders

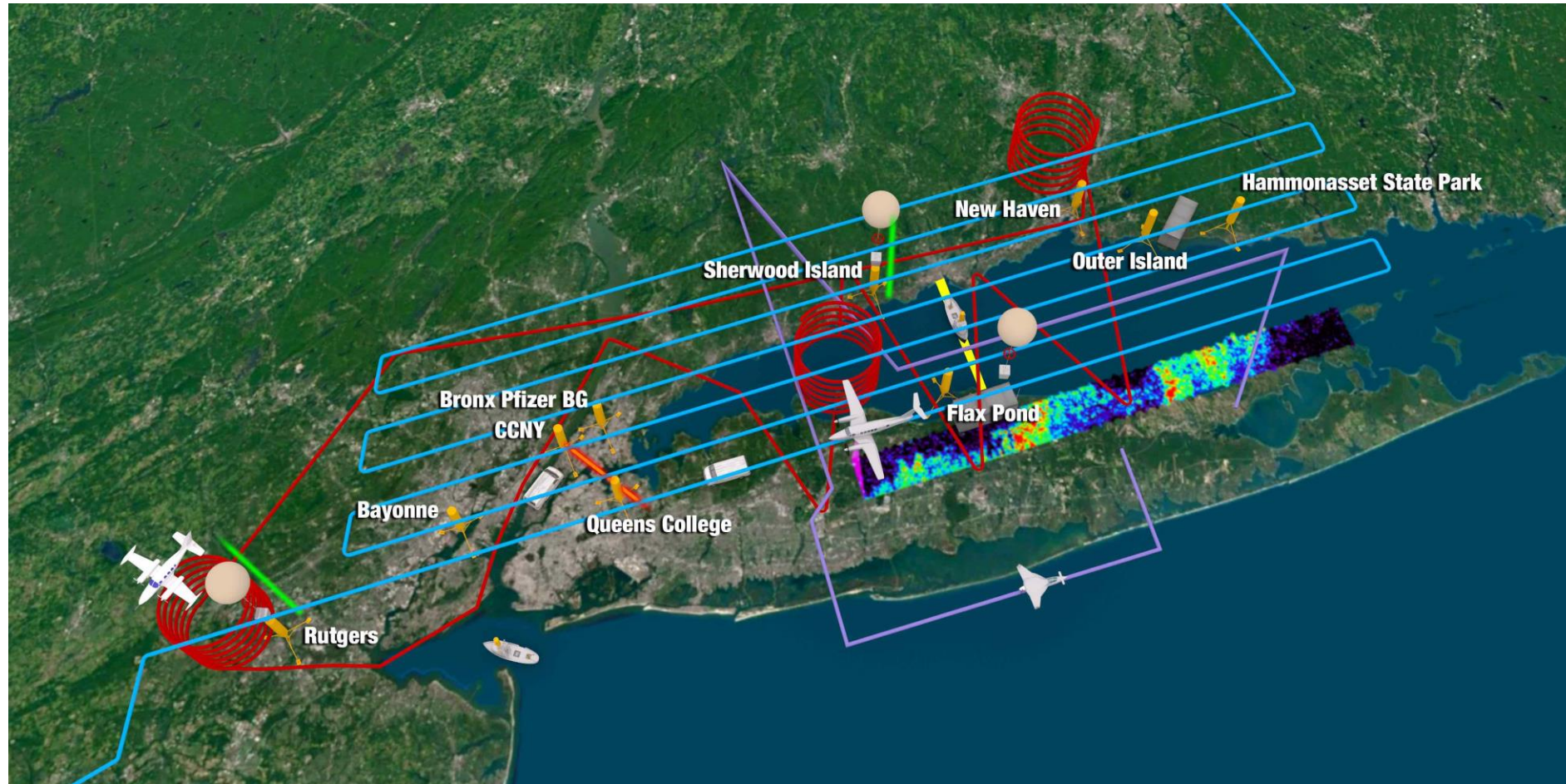
- NY State Energy Research & Development Authority (NYSERDA)
- CT DEEP
- NJ DEP
- NYS DEC
- National Fish & Wildlife Foundation



Federal collaborators with own funding

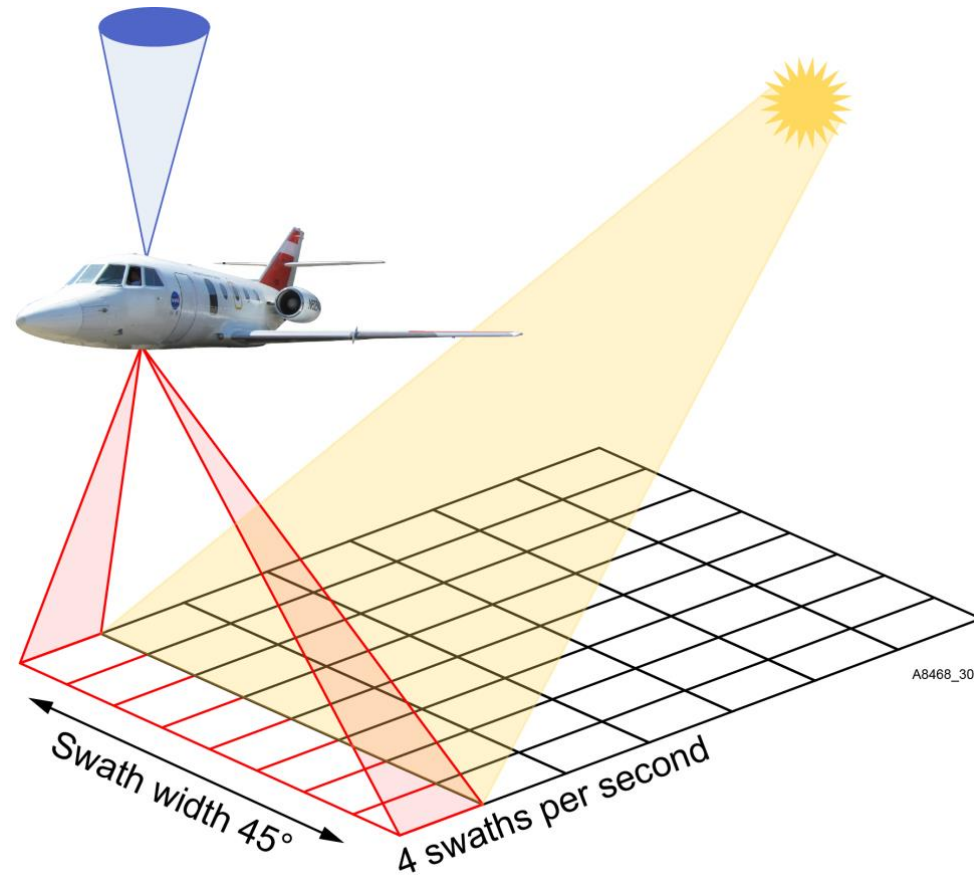
- NOAA
- NASA
- EPA

LISTOS in One Picture

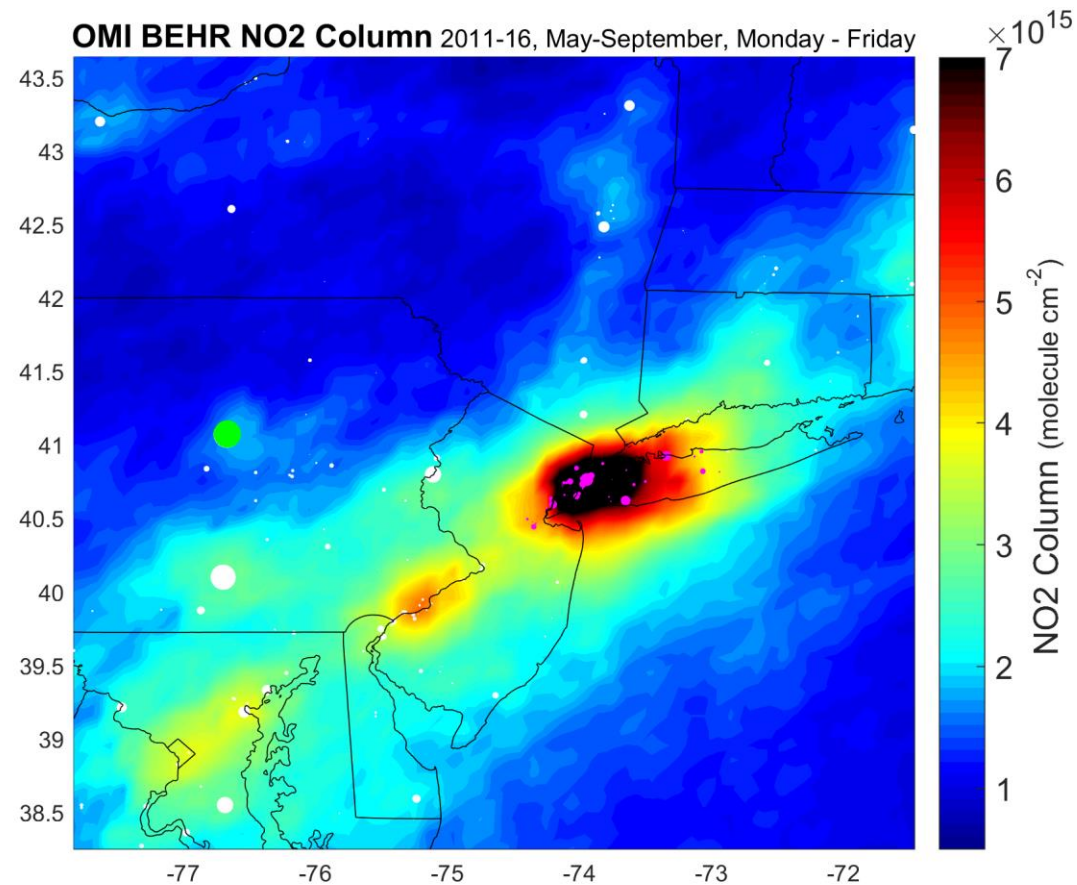


GeoTASO/GCAS Observations by NASA

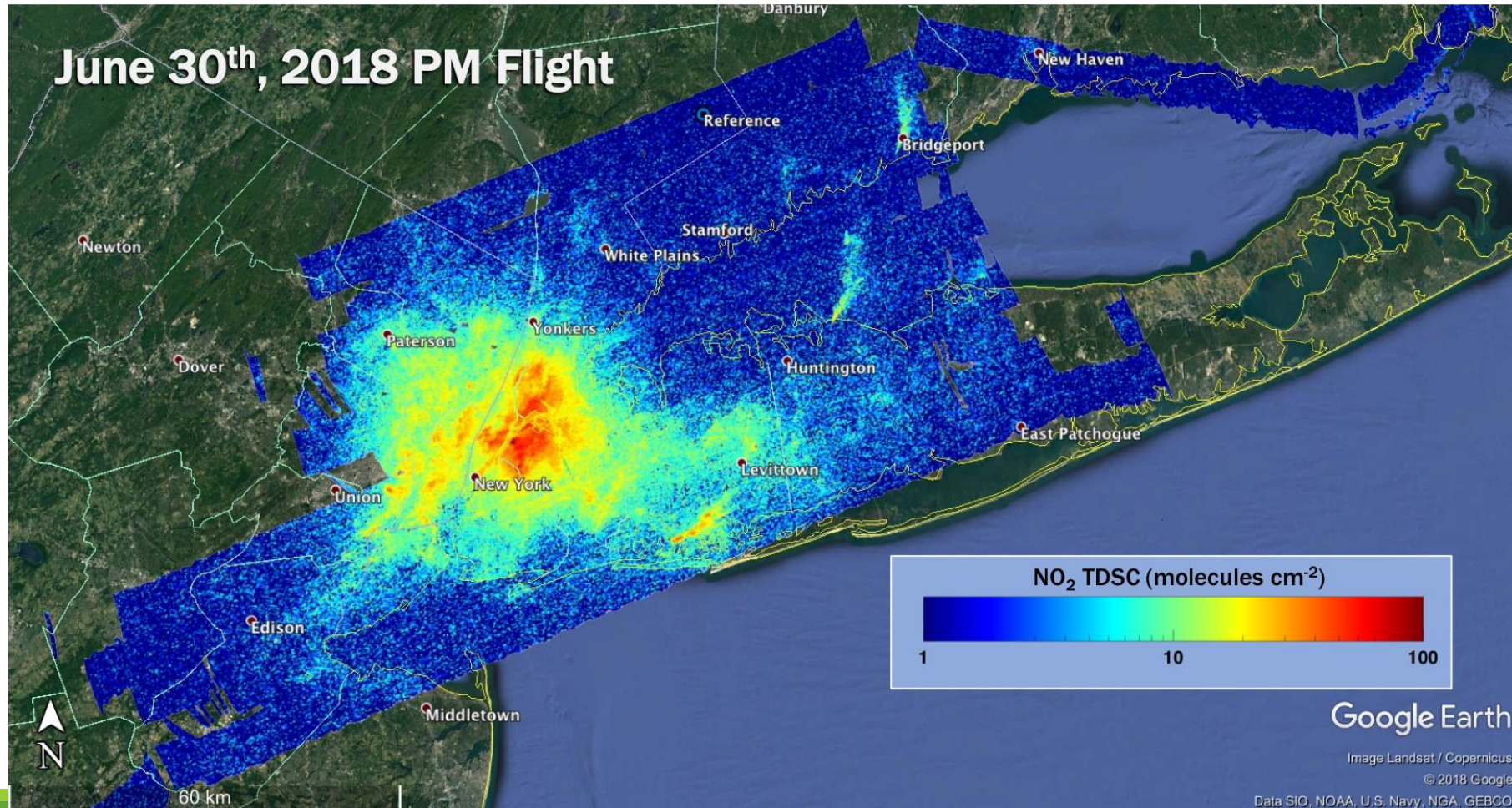
Airborne Test Bed for TEMPO Satellite



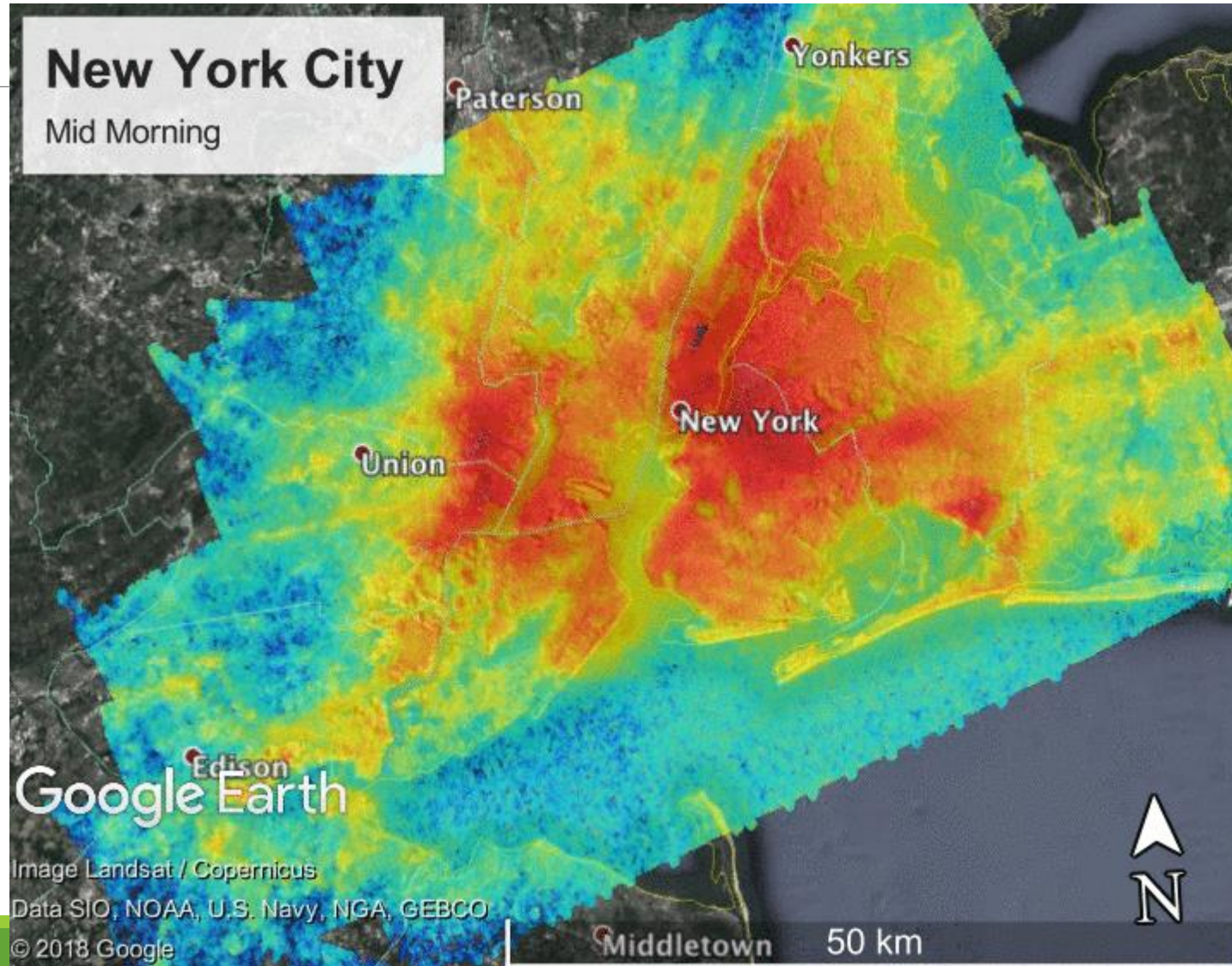
A NYC NO₂ “Volcano” – Low Resolution



June 30, 2018 NASA GeoTASO NO₂



June 20, 2018 – NO₂ over time in NYC



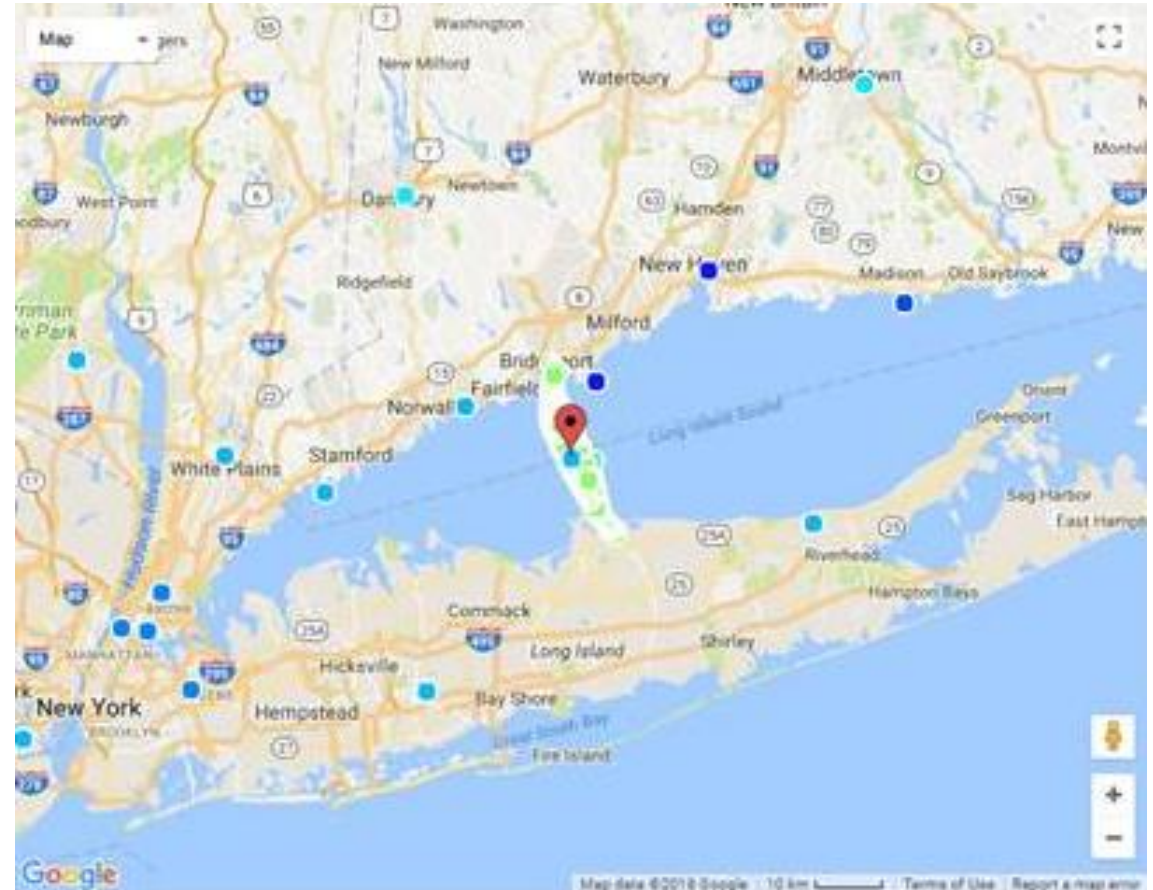
Pandora Ground-Based Spectrometer



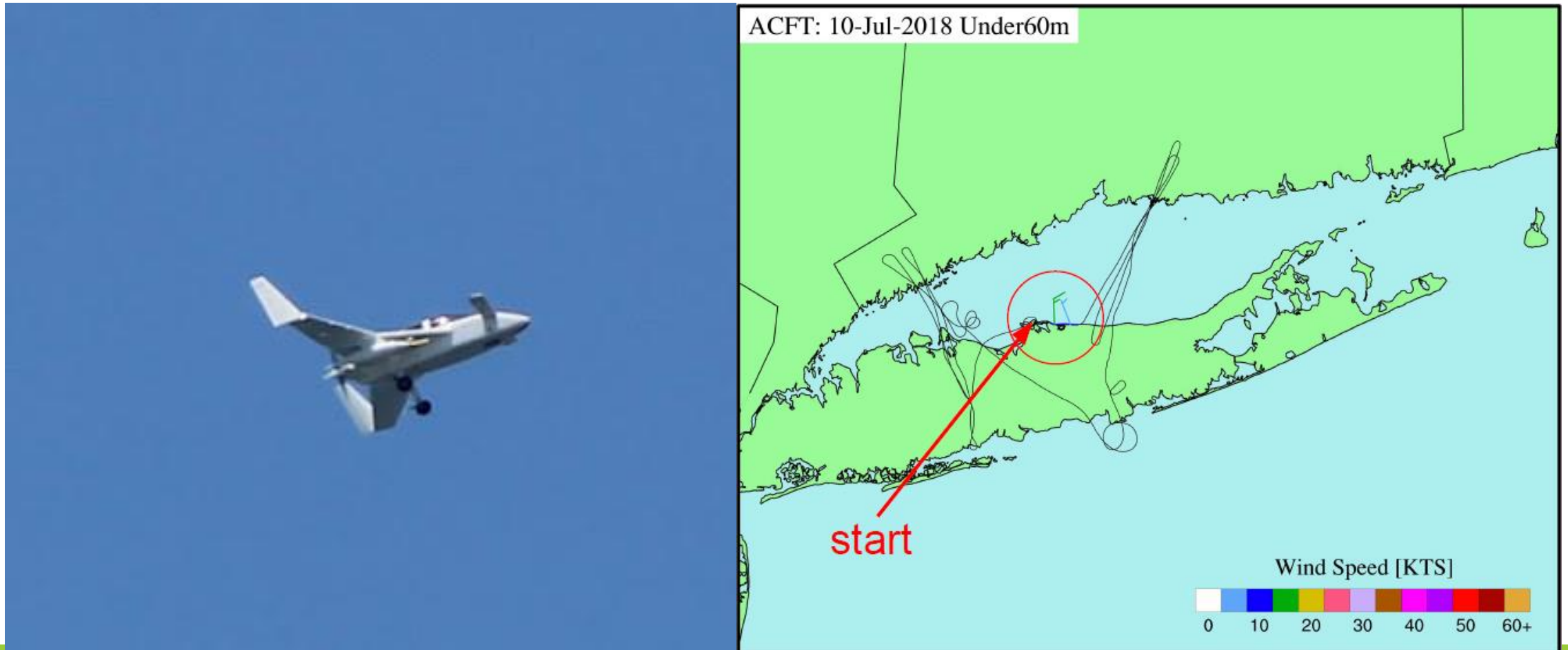
- Solar source spectrometer (280 - 525 nm: 0.6 nm resolution) – column NO_2 , O_3 , HCHO, and SO_2 every 80 sec.
- Developed as validation instrument for OMI measurements
- EPA working with NASA to site Pandoras at PAMS as research instrument to provide improved characterization of emissions and serve as a U.S. ground-based satellite validation network
- NO_2 /HCHO to assess of formaldehyde as a radical source (primary and secondary) and O_3 formation in an urban and downwind environment

CT DEEP: O3 Monitoring on LIS Ferry

M/V Park City: Bridgeport, CT – Port Jefferson, NY



Long Island Sound Wind Field Mapping



Ozonesondes



- Flax Pond PAMS, north coast Long Island, NY
- Rutgers PAMS, central NJ
- Sherwood Island, coastal CT

Early July 2018 Episode

July 2, 2018 Compared to Clean Day

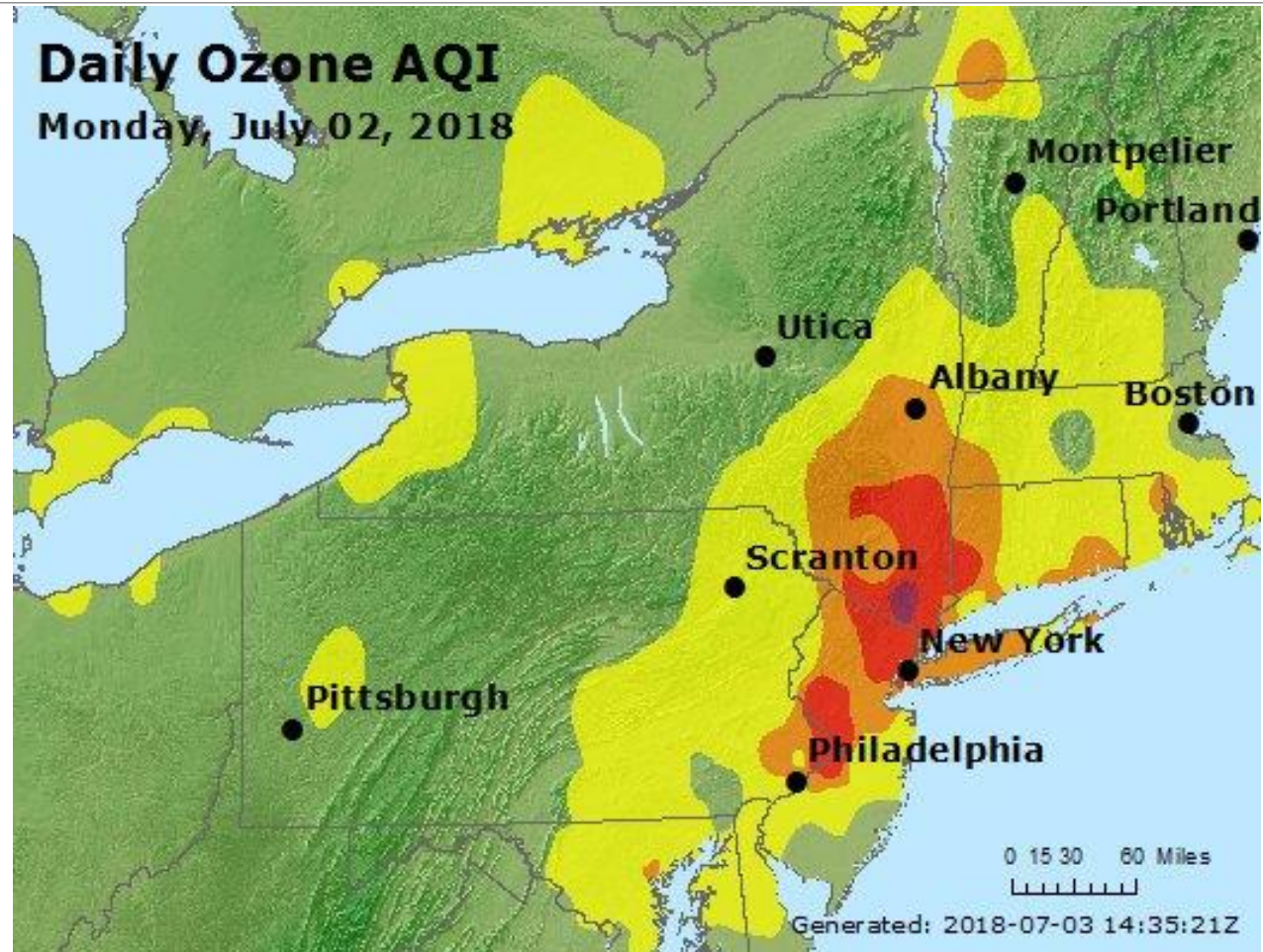


NYC Bad Air Day: July 2, 2018

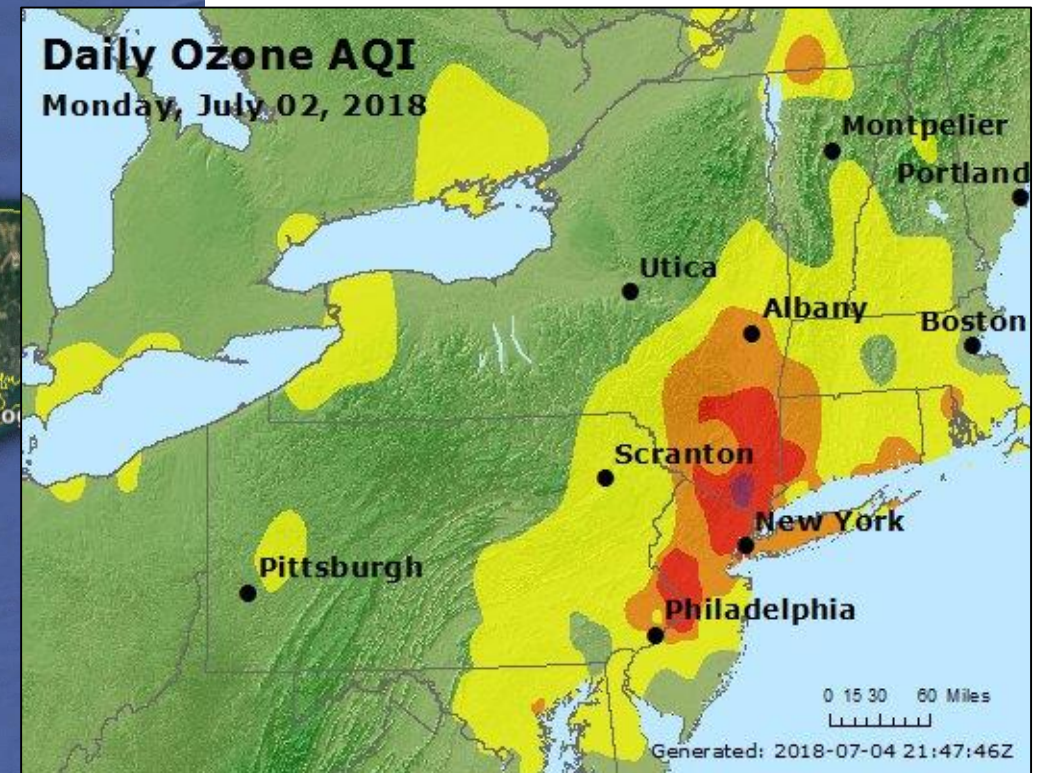
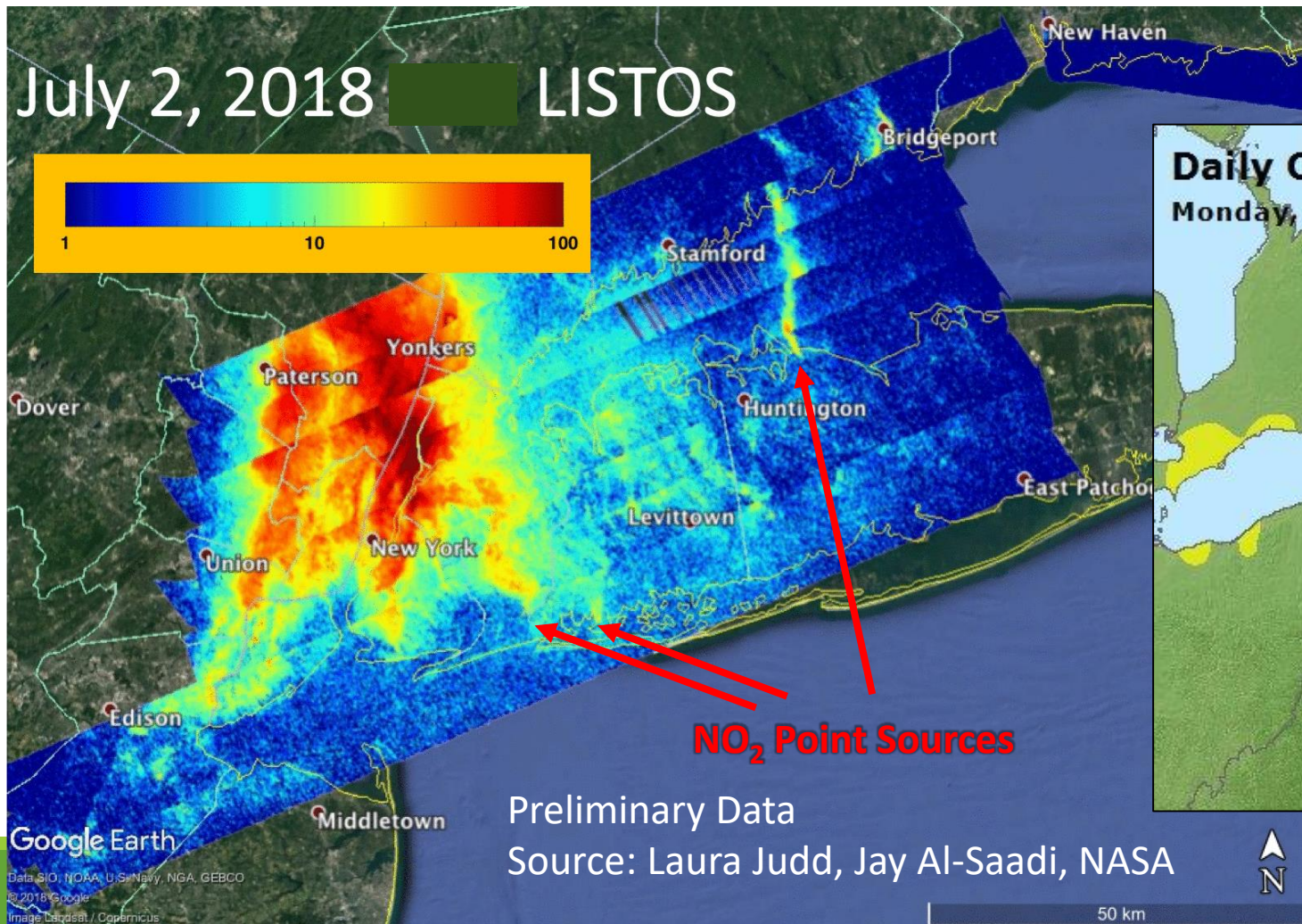
Highest ozone
since 2006:

8 hr: 115 ppb

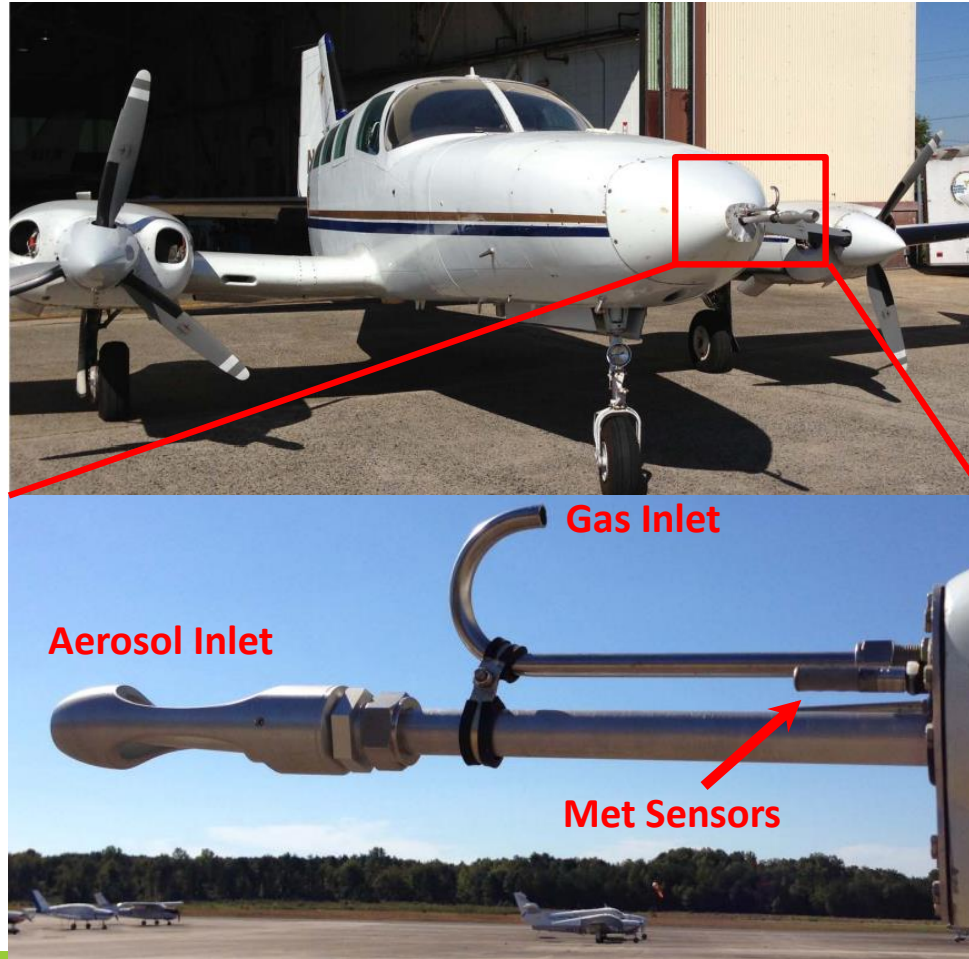
1 hr: 143 ppb



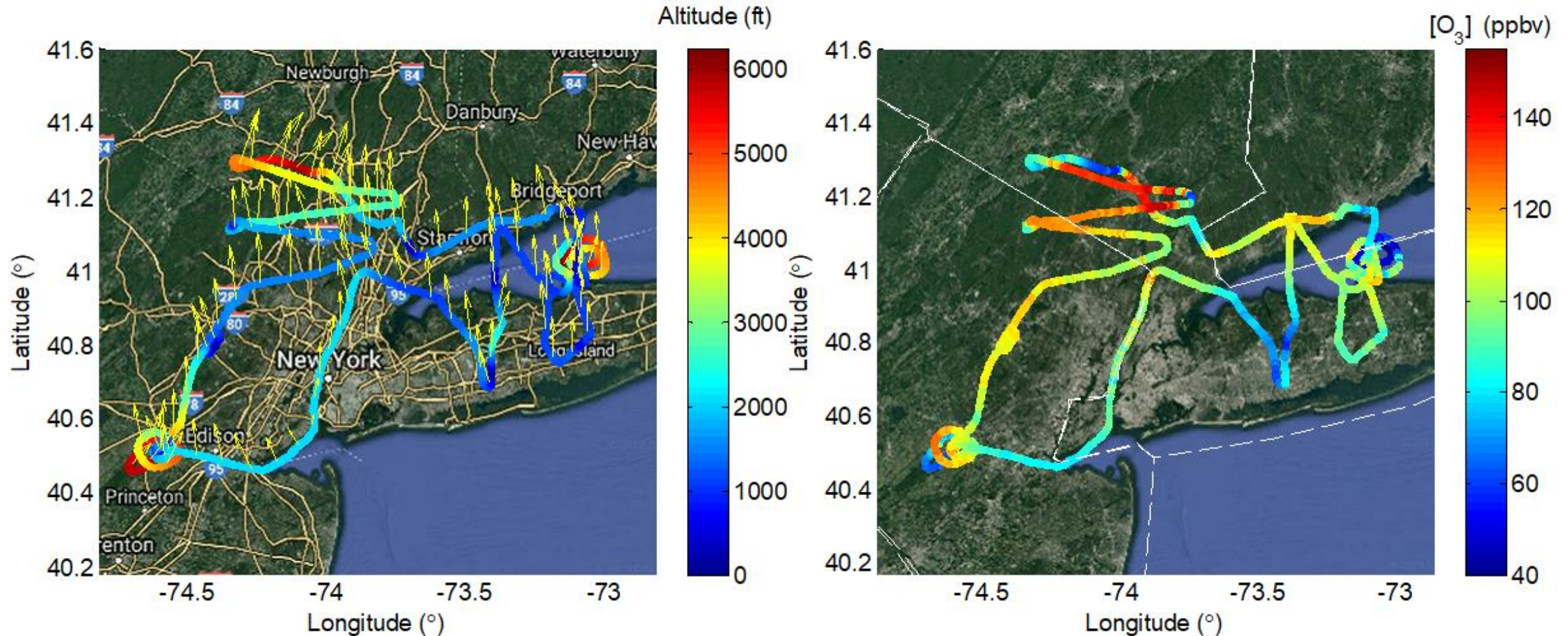
July 2, 2018 NASA GCAS NO₂



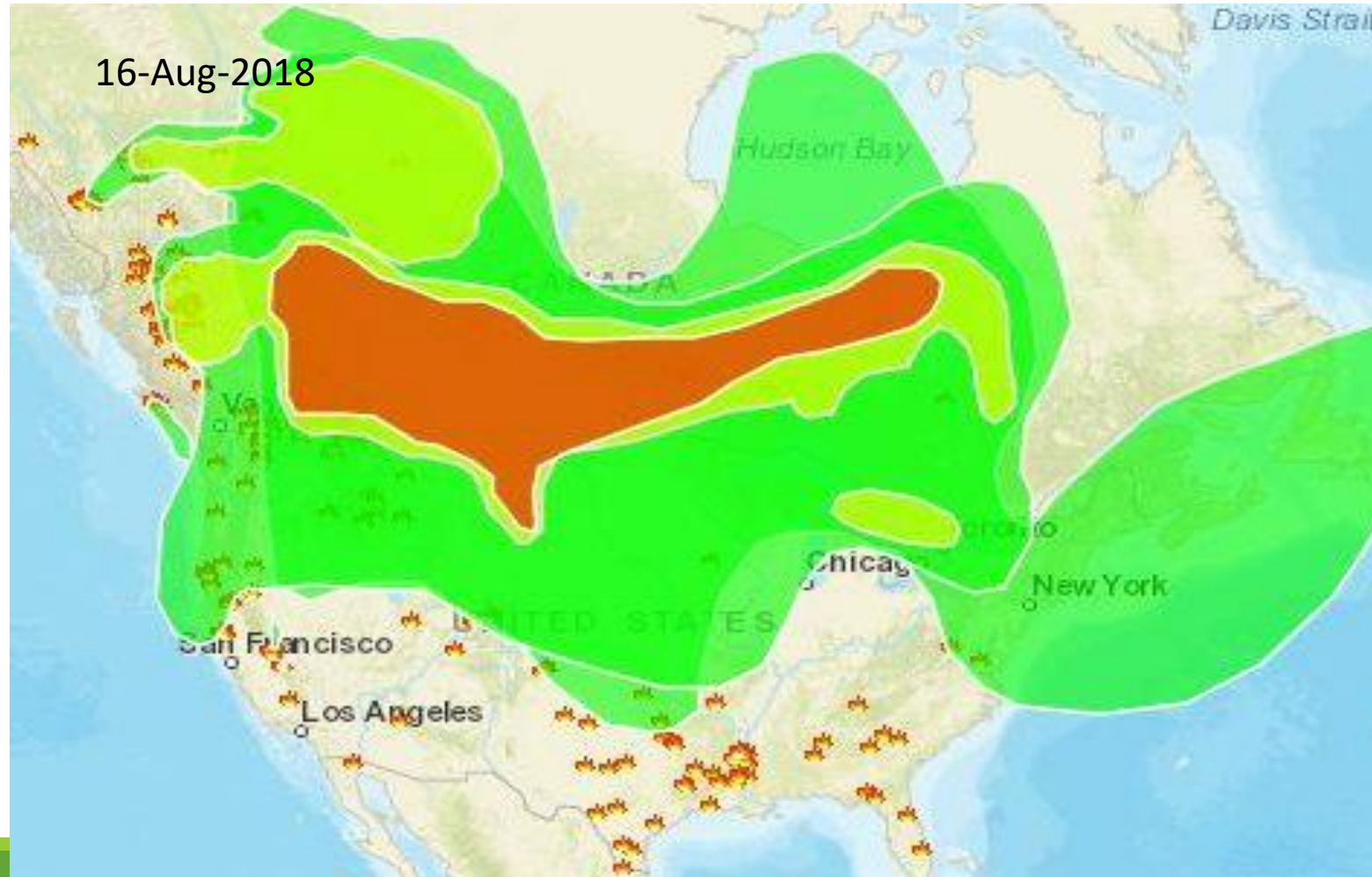
University of Maryland Aircraft




UMD Aircraft Flight Path July 2 afternoon



Western Smoke Plumes in Summer 2018



LISTOS Data Archive in Development


 NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION

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*Airborne Science Data
for Atmospheric Composition*

LISTOS – Long Island Sound Tropospheric Ozone Study 2018

[Data Archive: LISTOS 2018](#) 


Relevant Data / Links

[Quicklook Reports \[public\] :](#)
View / Upload Images & Data --
Aircraft, Ground, Mobile, etc.

[File Sharing \[private\]:](#) 
Forecasts, Telecons, Reports, etc.

[Forecast Products . . .](#)


[Meteorology Links . . .](#)


[AirNow](#) 

[ICARTT Data Format Document](#)

Data Upload Tools

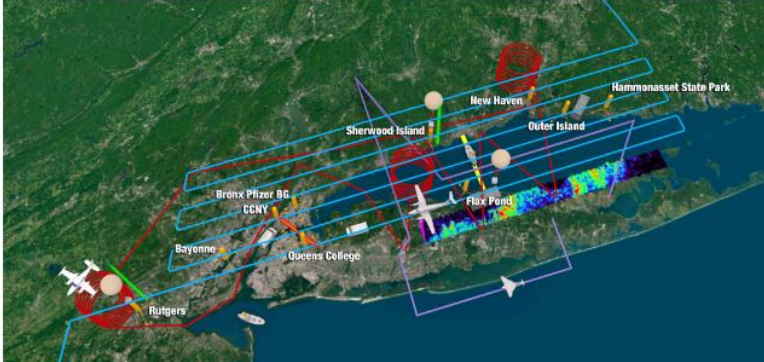
[Steps for submitting data to the Archive](#)

[Data Submittal / Scanning](#) 
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Mission Overview:

The Long Island Sound Tropospheric Ozone Study (LISTOS) is a multi-agency collaborative study focusing on Long Island Sound and the surrounding coastlines that continue to suffer from poor air quality exacerbated by land/water circulations. The primary measurement operations are planned between June-September 2018 and include, but not limited to, in situ and remotely sensing instrumentation integrated aboard three aircrafts, a network of ground sites, mobile vehicle and boat measurements.



The website is located at:

<https://www-air.larc.nasa.gov/missions/listos/index.html>

Thank you

Paul J. Miller

Executive Director

NESCAUM

617-259-2016

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