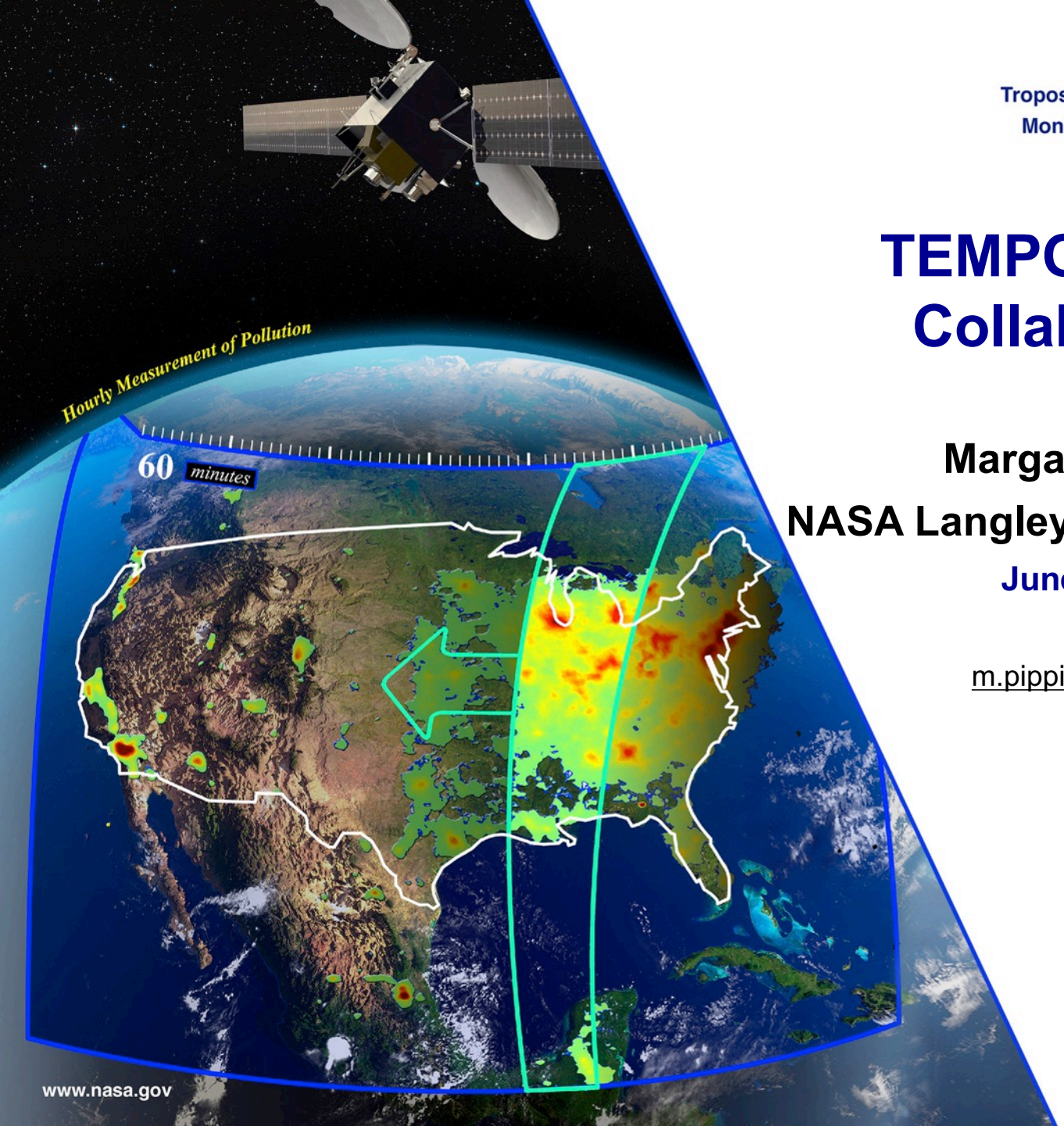


Tropospheric Emissions:
Monitoring of Pollution

TEMPO Student Collaboration

Margaret Pippin

NASA Langley Research Center

June 6, 2018

m.pippin@nasa.gov

Smithsonian

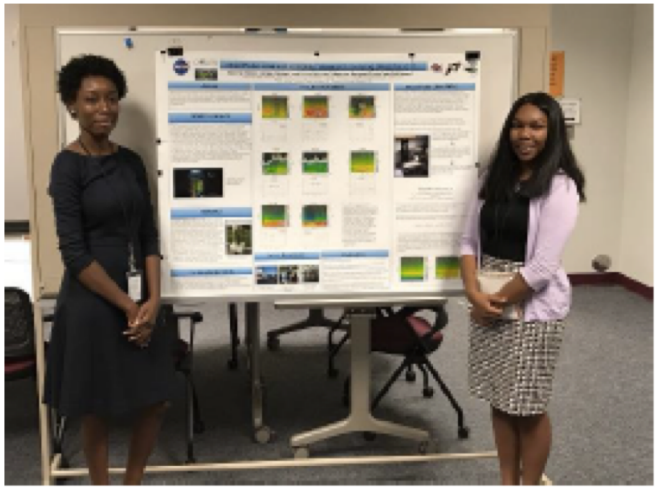
Student Collaboration participates in

OWLETS
Ozone Water Land Environmental Transition Study

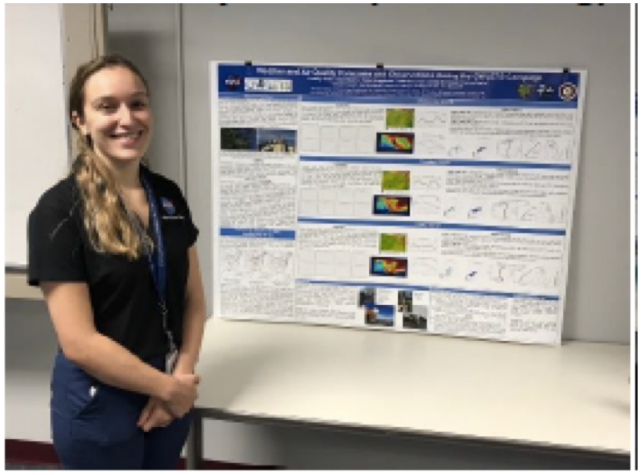
Pablo Sanchez & Jeremy Schroeder
Mobile ozone and UAV ozone



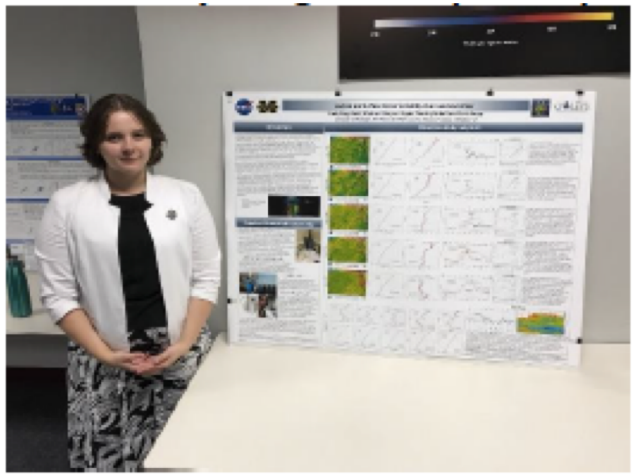
Desorae Davis & Angie Atwater - MPL



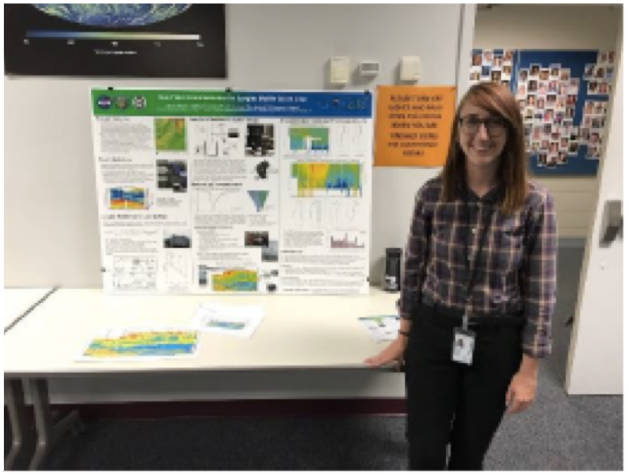
Lindsey Rodio - Forecasting



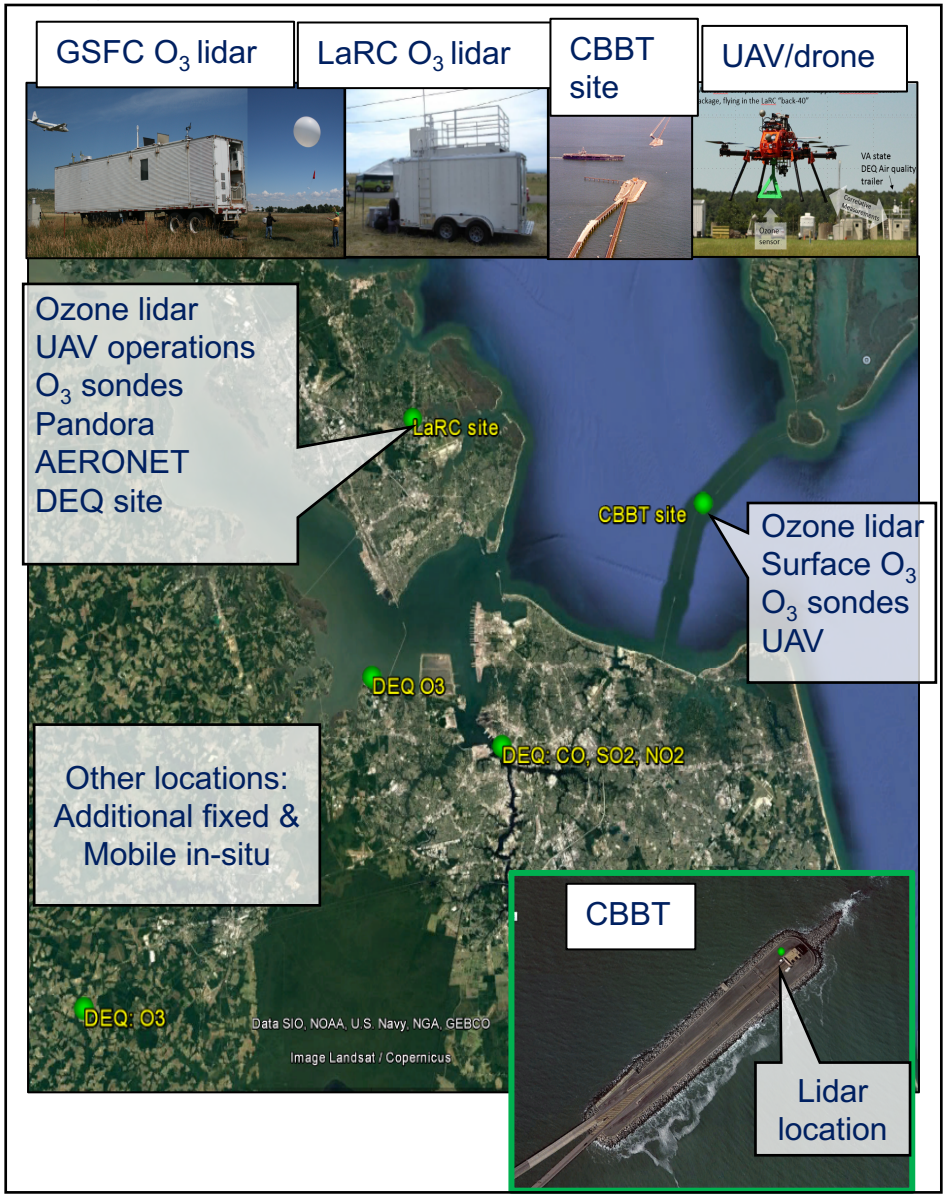
Emily Gargulinski – Ozonesondes

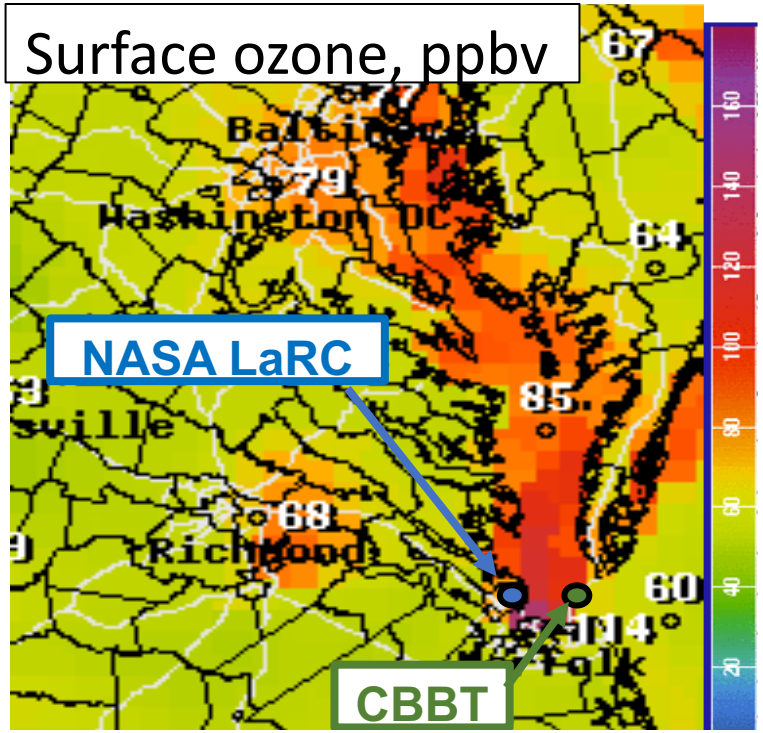


Betsy Farris - Ozone Lidar

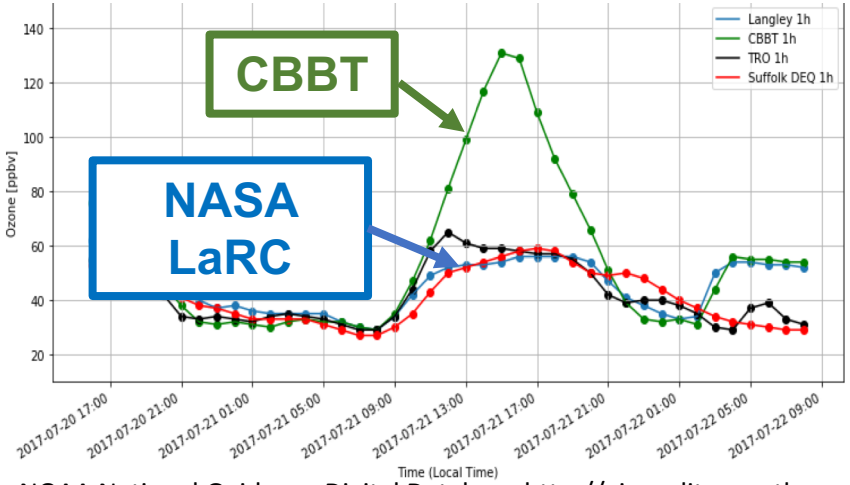


Map of Measurements & Forecast July 21, 2107





Surface ozone forecast 48 hr time series



NOAA National Guidance Digital Database http://airquality.weather.gov

Sullivan, J., et al., The Ozone Water-Land Environmental Transition Study (OWLETS): An Innovative Strategy for Understanding Chesapeake Bay Pollution Events, submitted to BAMS, March 2018.

Mobile car in-situ measurements

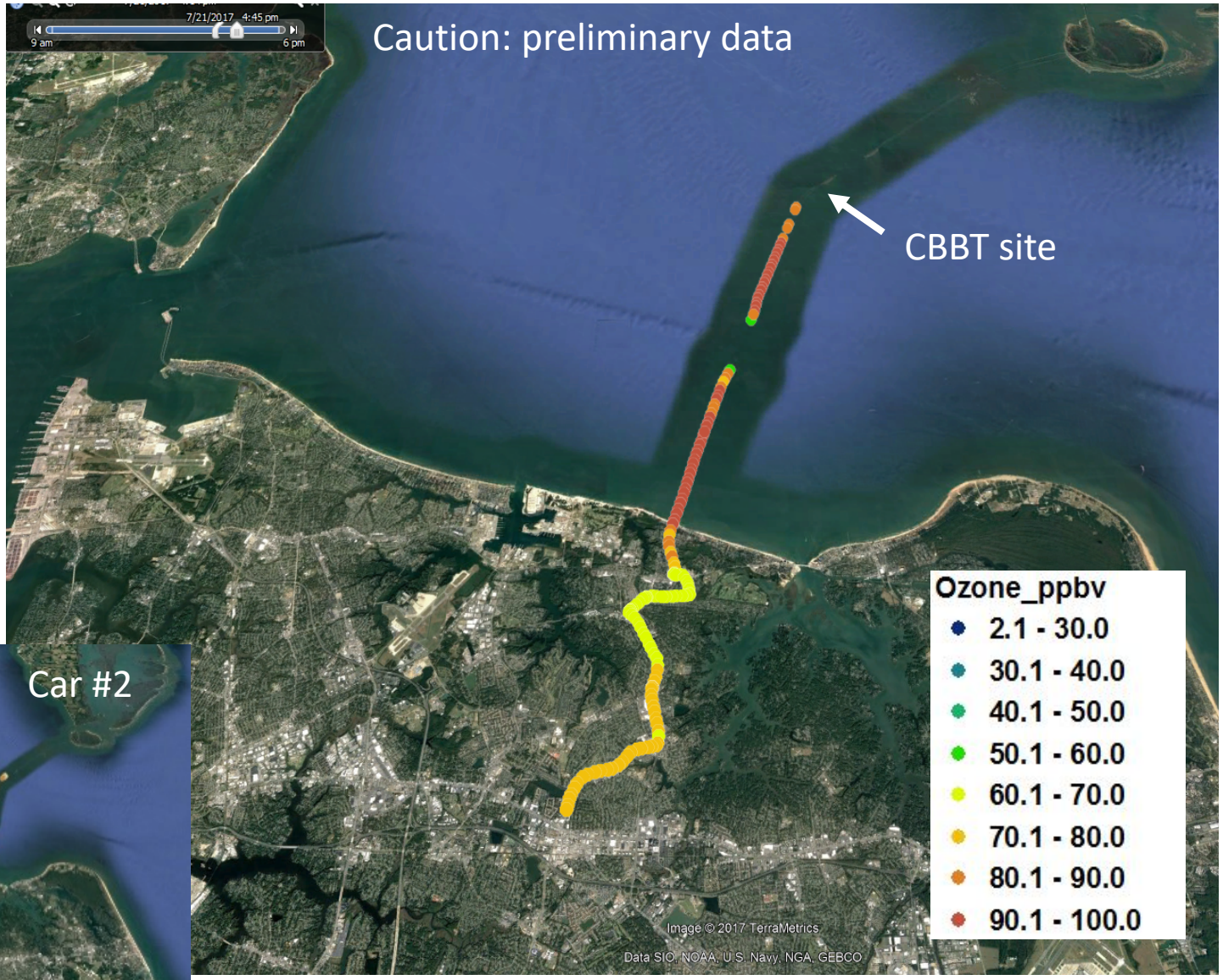
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Car in-situ ozone sensor configuration

Example car in-situ ozone sensor data segment from July 21



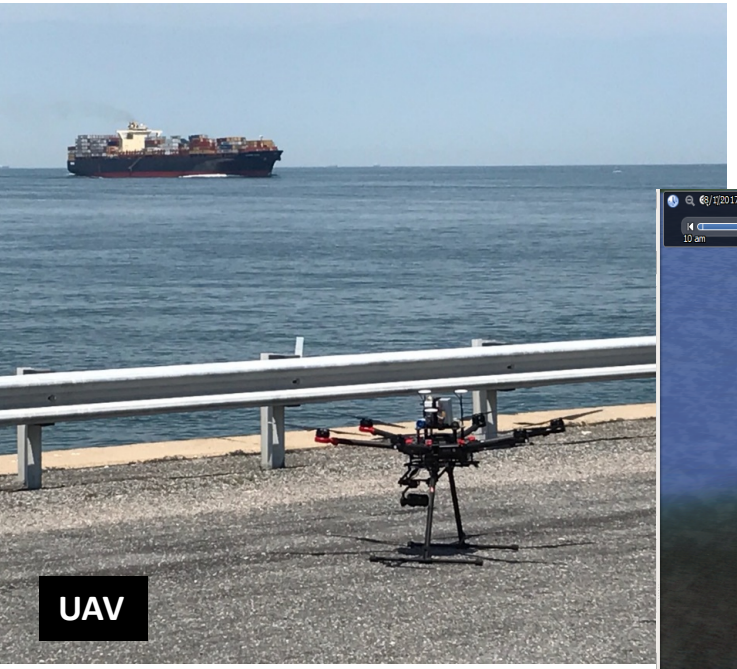


OWLETS activities supported by LaRC TEMPO Student Collaboration

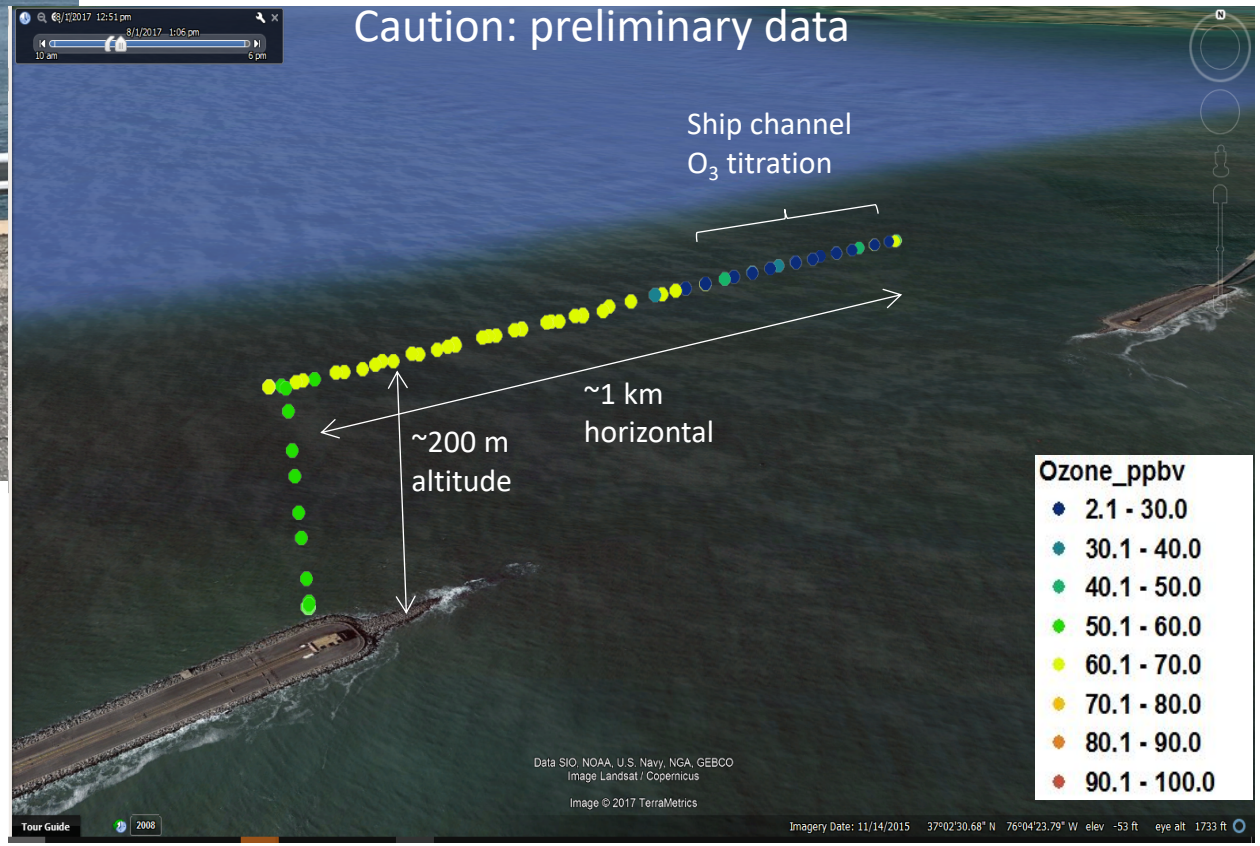
UAV in-situ ozone measurements

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CBBT site with UAV in foreground and a ship about to pass through channel



UAV August 1 flight from the CBBT third island



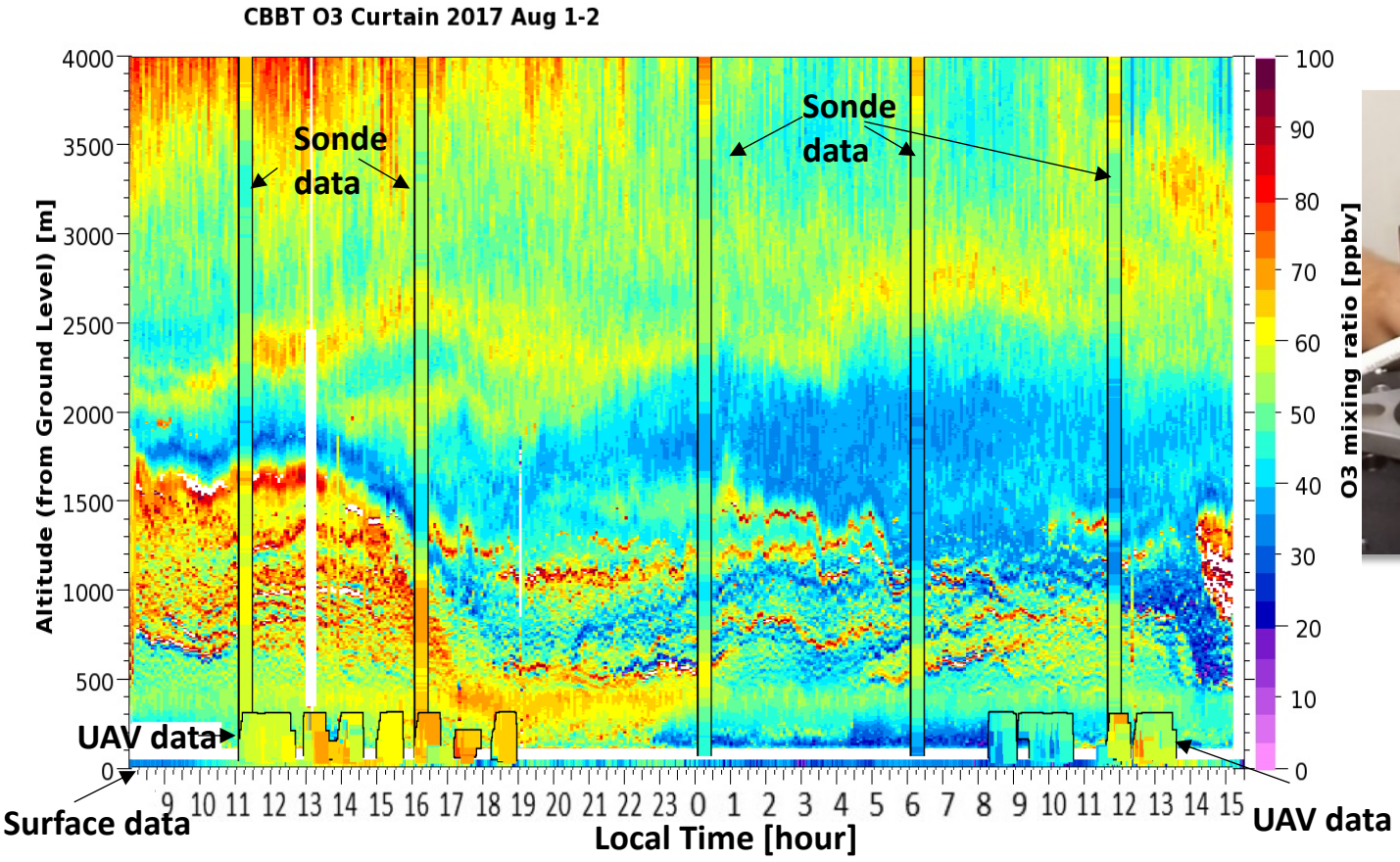
Gronoff, G., et al, A Method for Observing Near Range Point Source Induced O3 Titration Events Using Co-located Lidar and Pandora measurements, submitted to Atmospheric Measurement Techniques, April 2018.

OWLETS UAV/Drone activities supported by NASA's Science Innovation Fund and LaRC TEMPO Student Collaboration

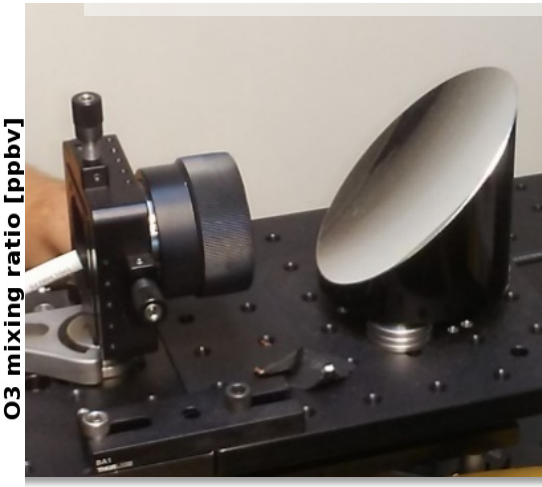
OWLETS
Ozone Water Land Environmental Transition Study

Validation of new near-field receiver (0.12 to 1.5 km)

Example data from LMOL during the OWLETS campaign



Small diameter Fiber coupled 90-deg off axis parabola





Farris, B., et al, Demonstration of an off-axis parabolic receiver for near-range retrieval of lidar ozone profiles, submitted to Atmospheric Measurement Techniques, June 2018

TEMPO Jr Scientists

