

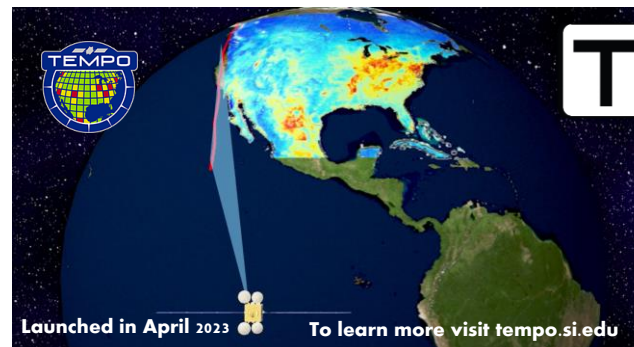
Synergistic TEMPO Air Quality Science

Science Questions

- How do TEMPO observations compare with airborne and ground-based measurements?
- What can we learn about the evolution of air quality events from a geostationary perspective?
- How do top-down emissions estimates compare to emission inventories?
- Are there knowledge gaps in air quality models that can be improved upon with TEMPO observations?
- How does pollution inequality vary vs. time of day and what are potential solutions to reduce inequalities?



satellite instruments view large areas with increasing detail to address more localized air quality challenges.

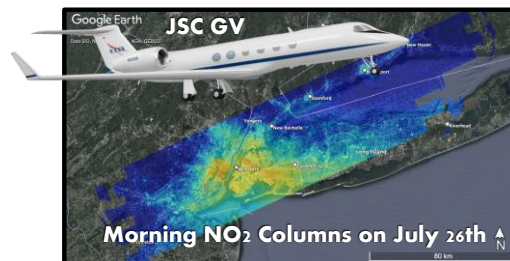


TEMPO measures air pollution each hour across most of North America. STAQS coincides with first light with the aim of evaluating and accelerating its use.

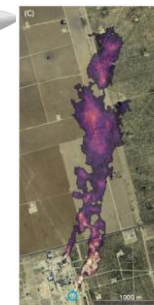
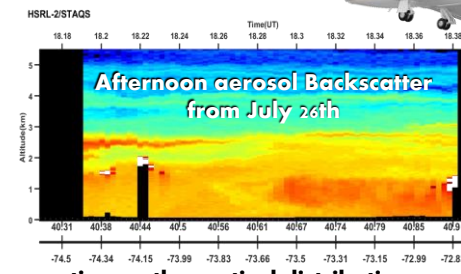


Airborne observations of air pollutants are collected from multiple planes.

NASA G-V is our TEMPO airborne proxy with measurements of ozone, aerosols, nitrogen dioxide, and formaldehyde



NASA G-III connects air pollution science with our goal of better understanding GHG emissions.



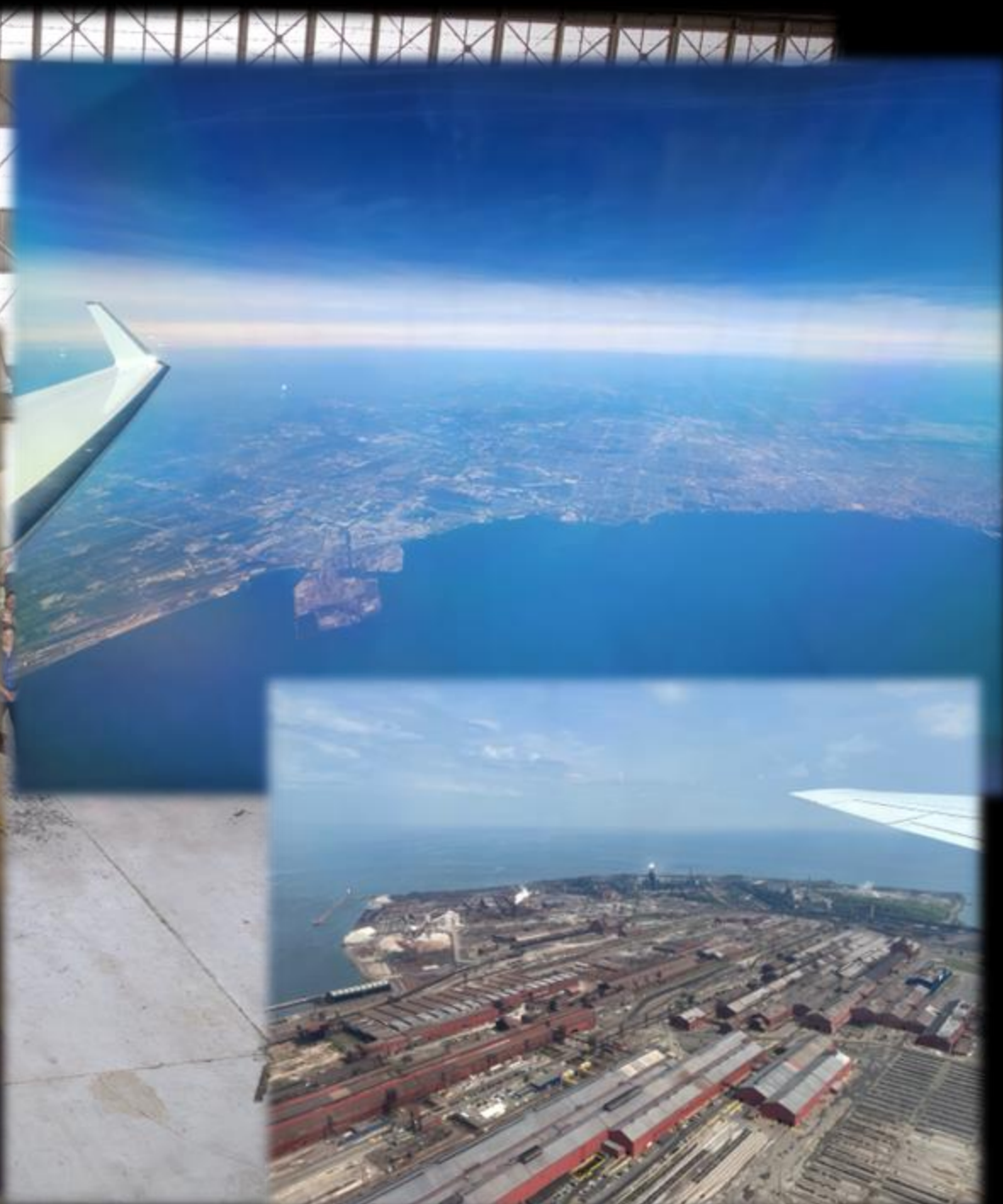
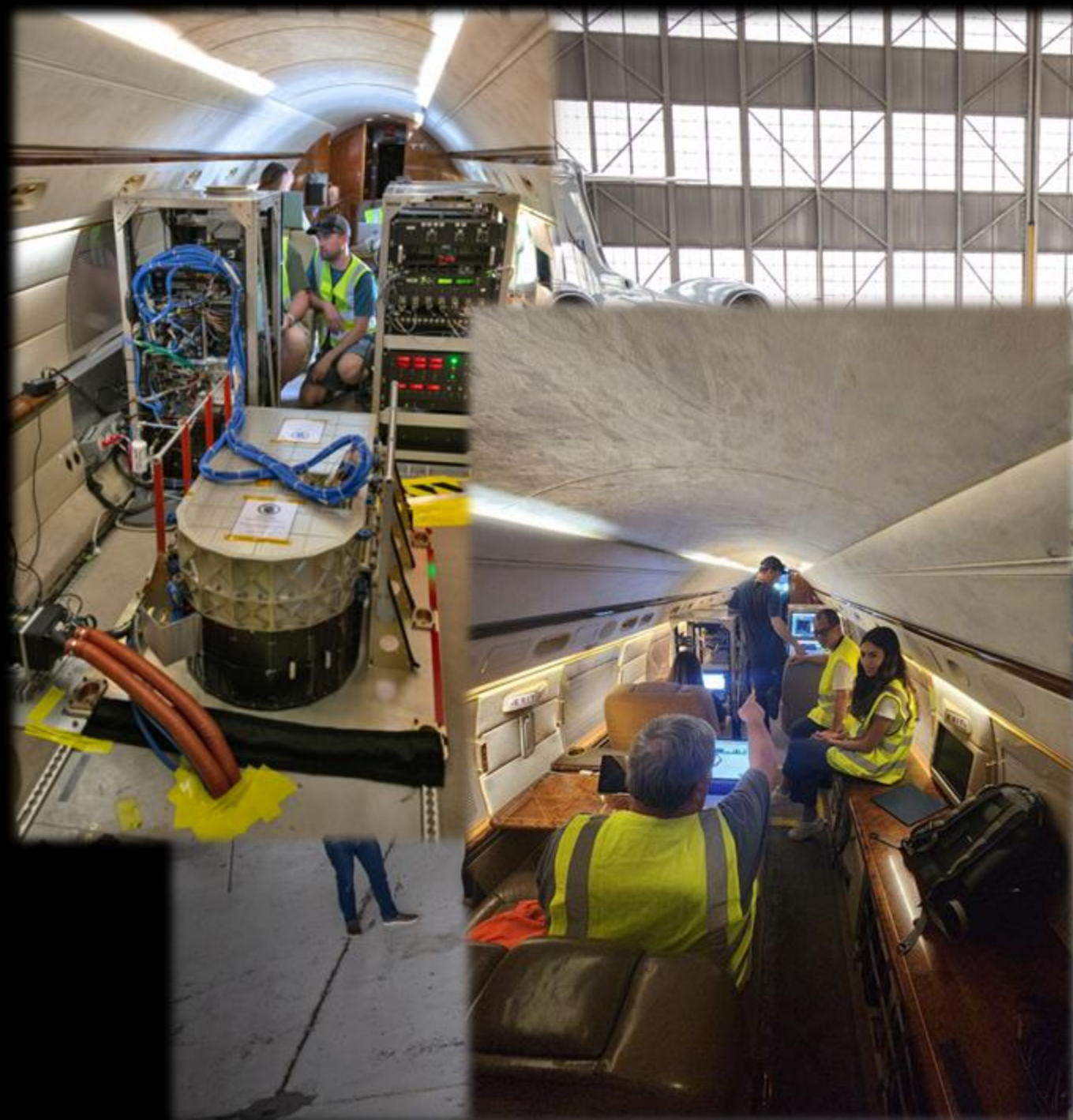
<https://doi.org/10.1021/acs.estlett.1c00173>

NOAA partnership provides perspective on the vertical distribution and a myriad of pollutant species from the NASA DC-8

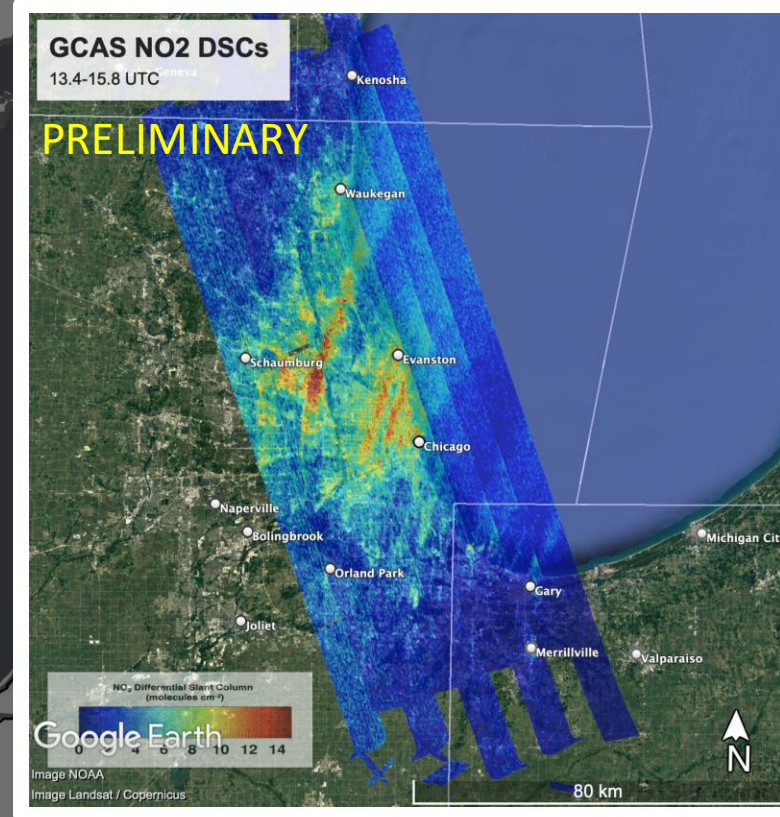


Surface monitors represent the air that we are breathing. Enhanced observations from TOLNet, PGN, and sondes will help connect satellite/airborne data with surface pollution.

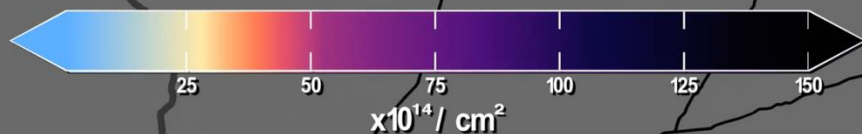




TEMPO First Light



02 Aug 2023 11:14 EDT
Nitrogen Dioxide Tropospheric Column Density



Additional
airborne
parameters:

- HCHO
- aerosols
- Ozone
- Methane
- mixed layer height

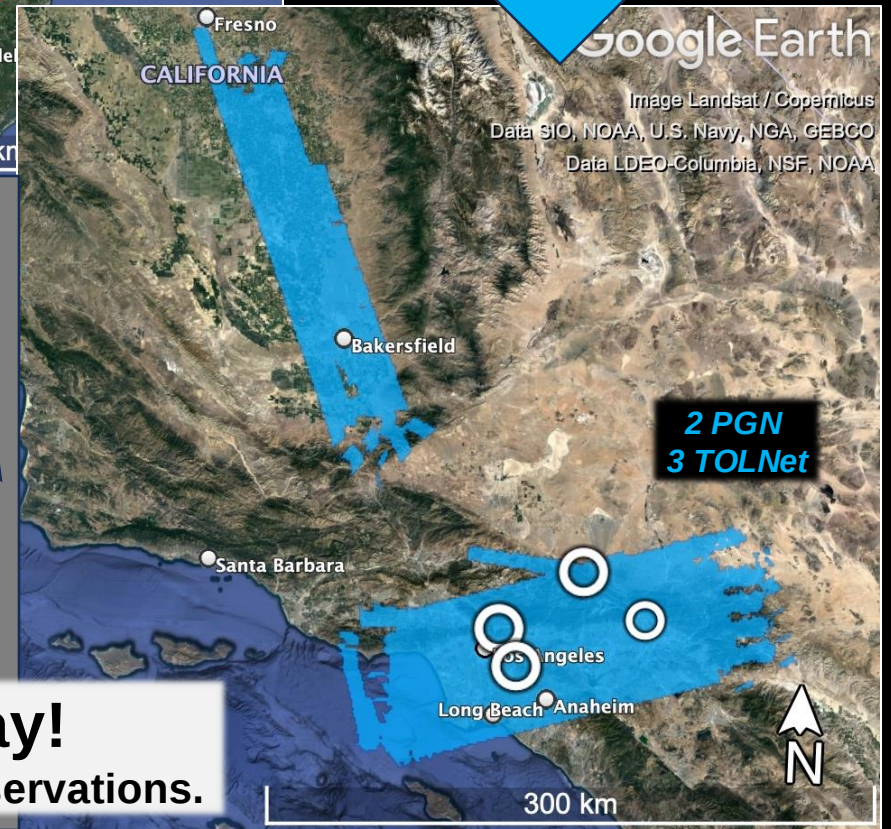
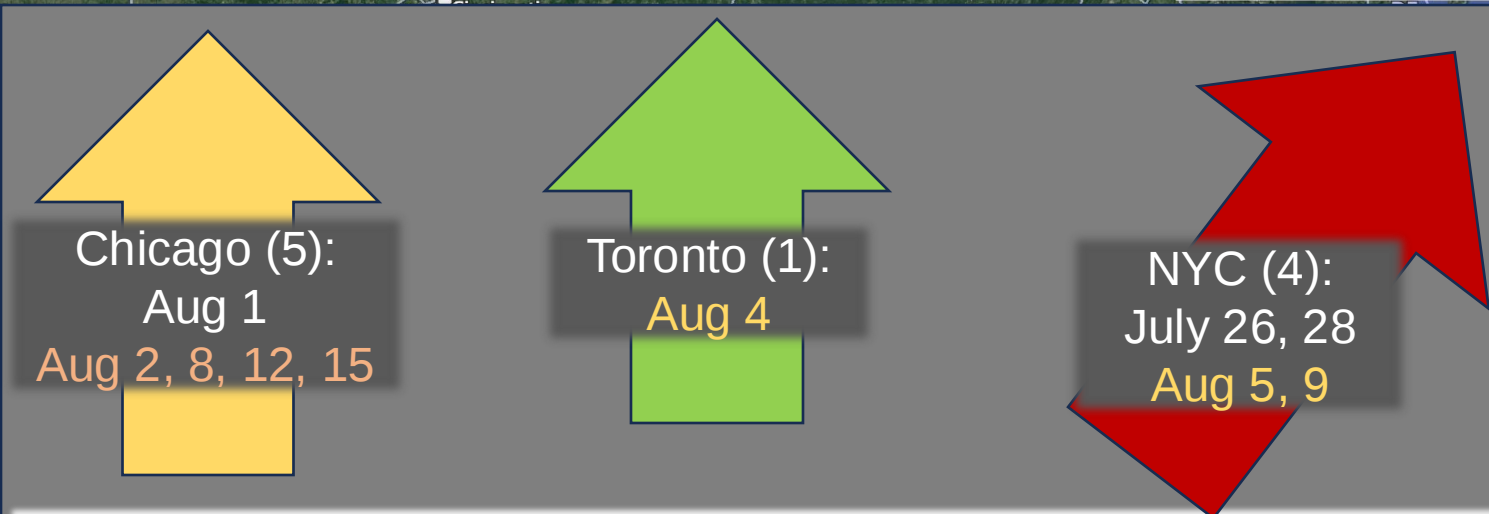
<https://svs.gsfc.nasa.gov/5142>





Maps show areas flown during STAQS by the TEMPO airborne proxy.

California dates (7):
June 26 (CV)
June 27-28 (LA)
Aug 22, 23, 25, 26
(LA)



Sampling Strategy: Mapping up to 3x in a day!

Focusing on overpassing ground-sites with PGN, TOLNet and other observations.