

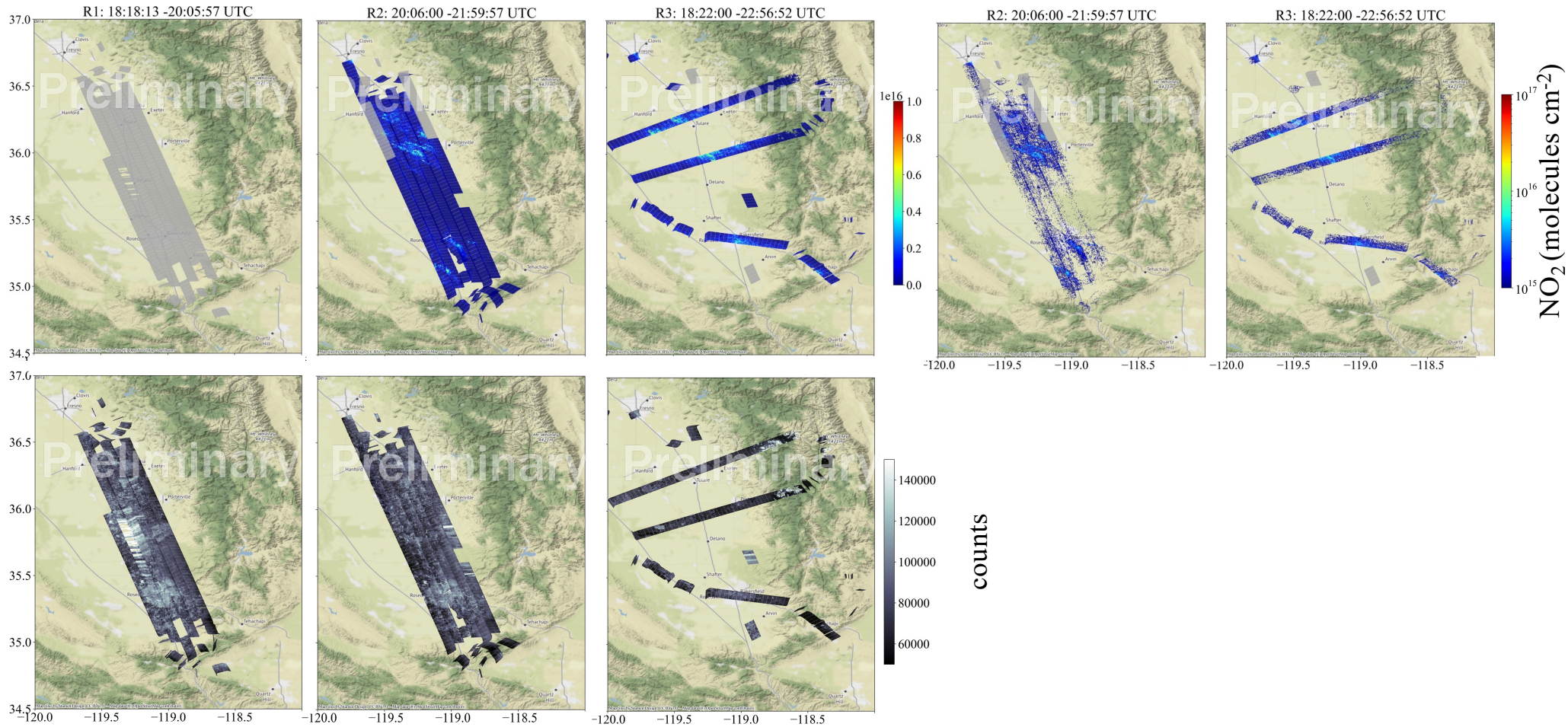
GCAS observations

(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector
(indication for bright surfaces and clouds)



Notes: R1 is all NaNs (gray) due to NO₂ retrieval noise related to issues with GCAS performance – cause to be explored in lab.
GCAS retrievals achieved sufficient quality after 20:18 UTC.

Daily AQI monitor readings from AirNow.gov

O₃ AQI: Good (0 – 50)

PM_{2.5} AQI: Good (0 – 50)

STAQS PI: laura.m.judd@nasa.gov

Quicklook: mary.a.demetillo@nasa.gov

GCAS PI: scott.j.janz@nasa.gov

GCAS observations

(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

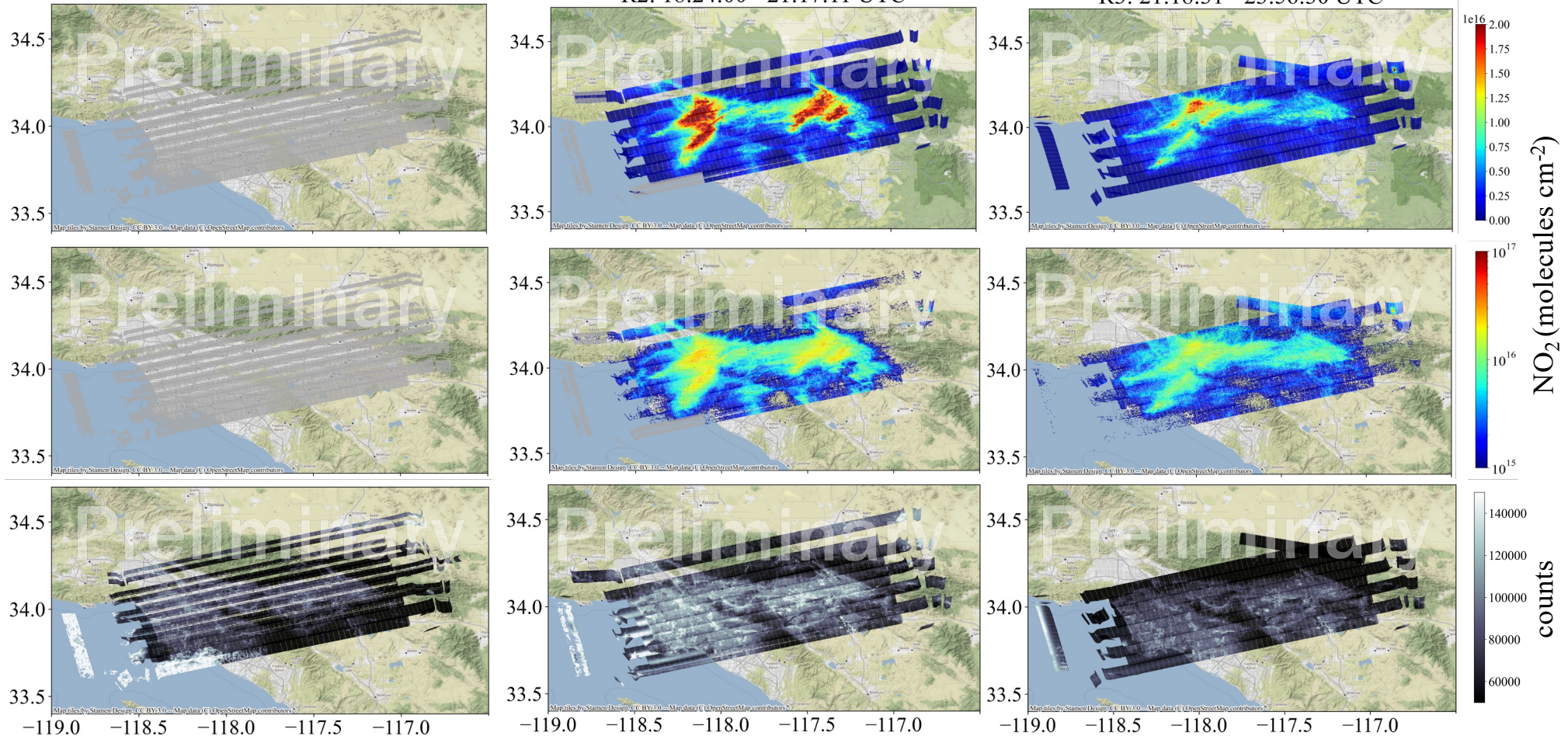
Bottom row: count rate in the NO₂ spectral window on detector
(indication for bright surfaces and clouds)

20230627 Tuesday SARP; Los Angeles, CA

R1: 15:36:00 - 18:23:58 UTC

R2: 18:24:00 - 21:17:11 UTC

R3: 21:18:31 - 23:56:30 UTC



Notes: R2 and R3 – fire in mountains. GCAS retrievals achieved sufficient quality after 18:36 UTC. NaNs are gray.

Daily AQI monitor readings from AirNow.gov

O₃ AQI: Good (0 – 50) in west and downtown LA, Moderate (51 – 100) near/in mountain region (Pasadena to Riverside)

PM_{2.5} AQI: Good (0 – 50) near coast and southern LA, Moderate (51 – 100) in downtown LA and Riverside regions.

STAQS PI: laura.m.judd@nasa.gov

Quicklook: mary.a.demetillo@nasa.gov

GCAS PI: scott.j.janz@nasa.gov

GCAS observations

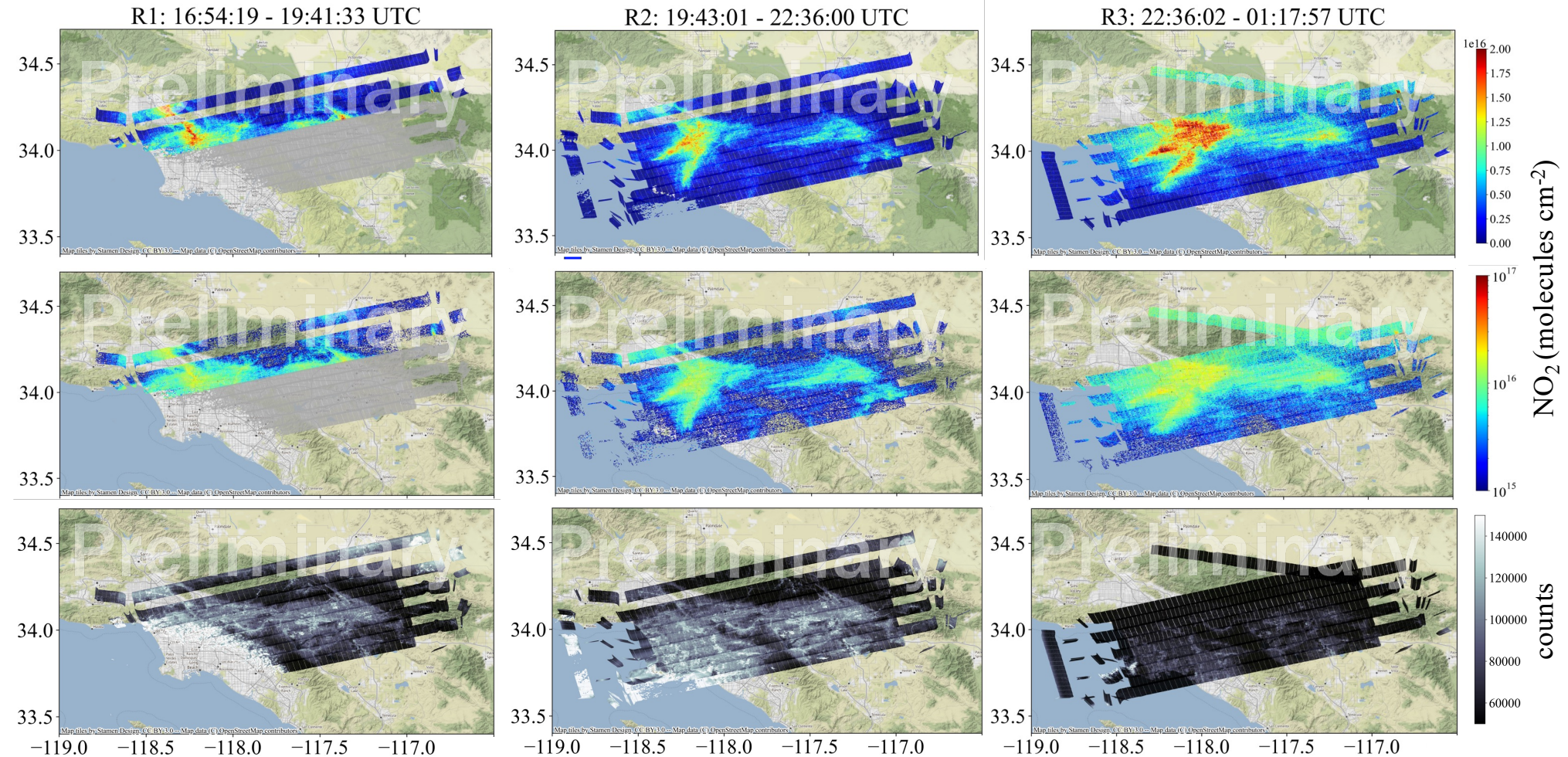
(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector
(indication for bright surfaces and clouds)

20230628 Wednesday SARP; Los Angeles, CA



Notes: South to North rasters this day. R1 – marine layer in the AM in the southwest. R2–Low patchy clouds near coast. GCAS retrievals achieved sufficient quality after 18:36 UTC. Gray data are NaN

Daily AQI monitor readings from AirNow.gov

O₃ AQI: Good (0 – 50) throughout LA, Moderate (51 – 100) near mountains by Riverside

PM_{2.5} AQI: Good (0 – 50) throughout LA except north of Riverside (Moderate, 51 – 100)

STAQS PI: laura.m.judd@nasa.gov

Quicklook: mary.a.demetillo@nasa.gov

GCAS PI: scott.j.janz@nasa.gov

GCAS observations

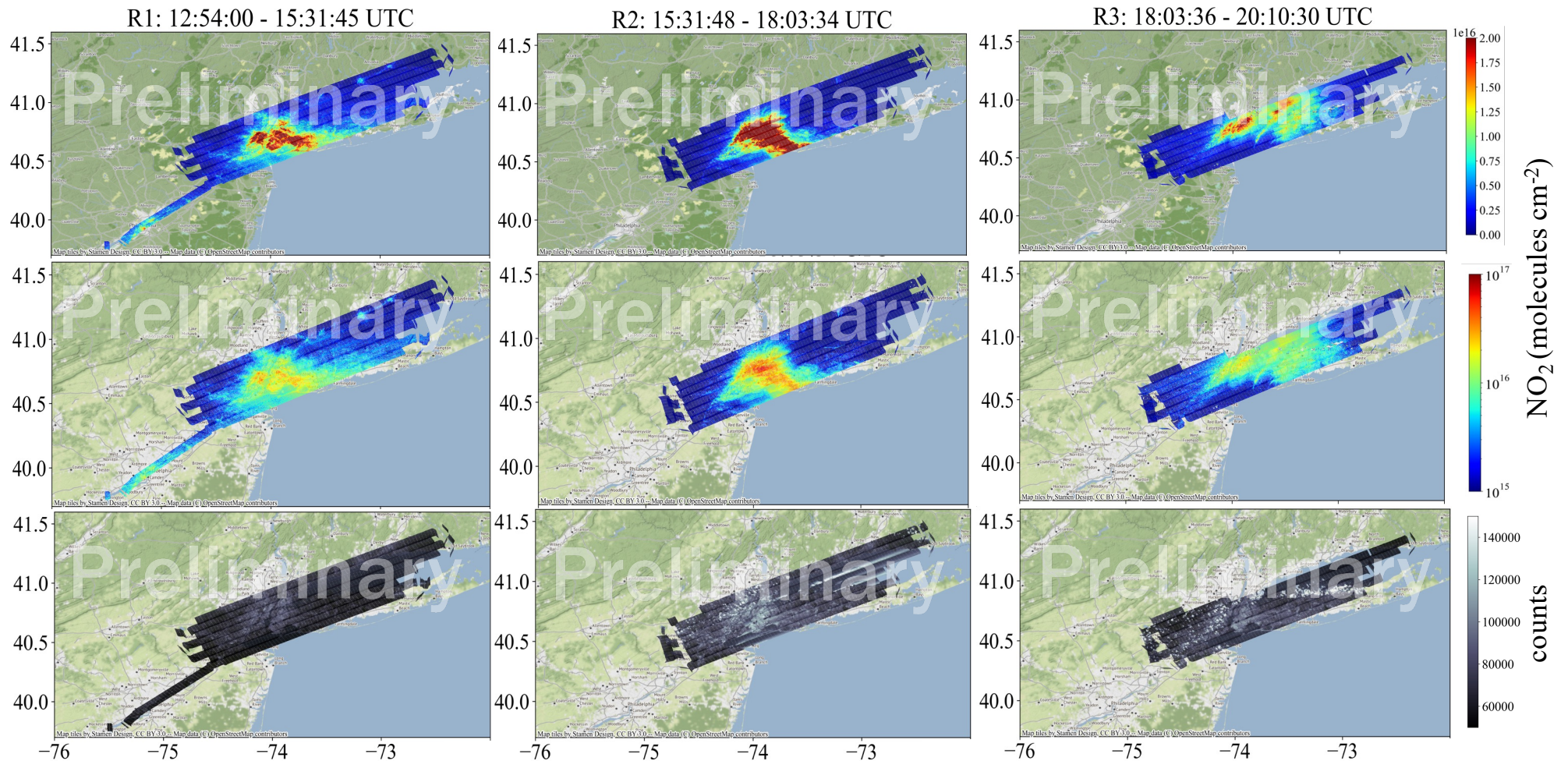
(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector
(indication for bright surfaces and clouds)

20230726 Wednesday NEW YORK CITY, NY; NEWARK, NJ; PHILADELPHIA, PA



Notes: R3 cut short due to fuel concerns and storms enroute to transit back to Ohio

Daily AQI monitor readings from AirNow.gov

O₃ AQI: Moderate (51 – 100) throughout central and Long Island Sound, except for Leonia monitor with Unhealthy for Sensitive Groups (AQ = 101 – 150)

PM_{2.5} AQI: Moderate (51 – 100) throughout NYC, Good (0 – 50) at CCNY and Morrisania sites

STAQS PI: laura.m.judd@nasa.gov

Quicklook: mary.a.demetillo@nasa.gov

GCAS PI: scott.j.janz@nasa.gov

GCAS observations

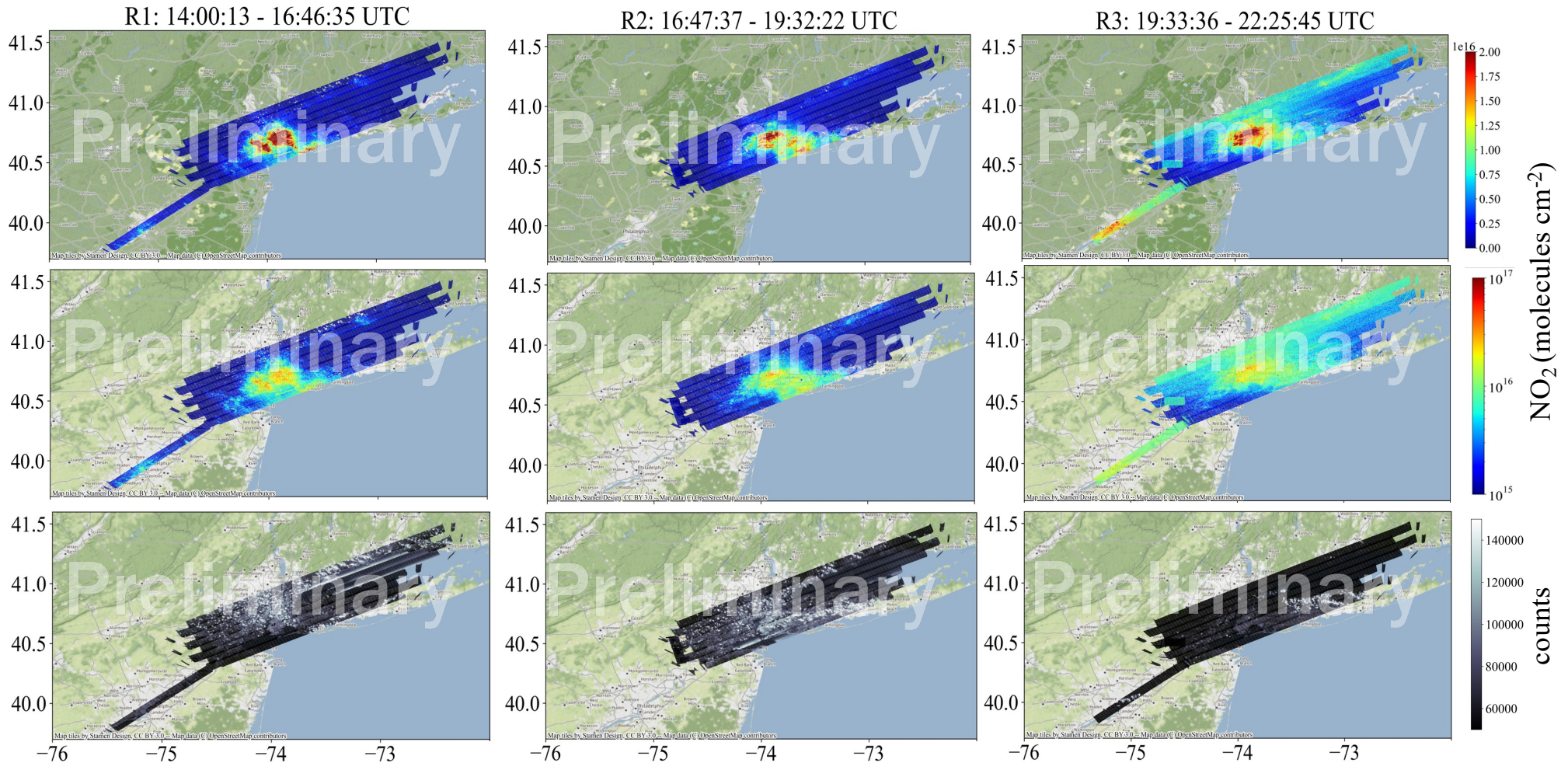
(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector
(indication for bright surfaces and clouds)

20230728 Friday NEW YORK CITY, NY; NEWARK, NJ; PHILADELPHIA, PA



Notes: Some cumulus clouds throughout flight. Increase in NO₂ on northside of R3 caused by large sun angles through stratospheric NO₂ layer

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50) in west (Newark and Western Philadelphia regions), Moderate (AQI: 51 – 100) in central NYC and northern coast of Long Island Sound, and Unhealthy for Sensitive Groups (AQI: 101 – 150) throughout center of Long Island Sound

PM_{2.5} AQI: Good (0 – 50) throughout NYC, except eastern Long Island where Holstville monitor read Moderate (AQI: 51 – 100)

STAQS PI: laura.m.judd@nasa.gov

Quicklook: mary.a.demetillo@nasa.gov

GCAS PI: scott.j.janz@nasa.gov

GCAS observations

(cloud filter not applied)

Top row: NO₂ column densities (linear scale)
Middle row: NO₂ column densities (log scale)
Bottom row: count rate in the NO₂ spectral
window on detector (indication for bright surfaces
and clouds)

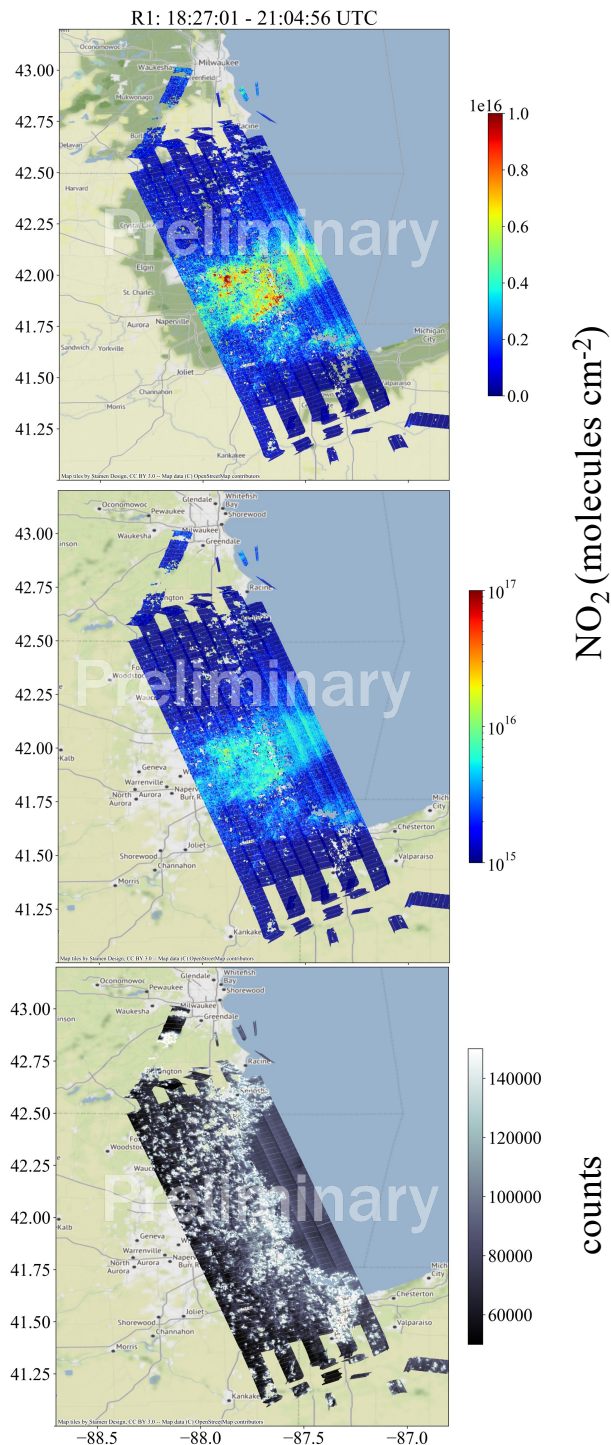
20230801 Tuesday Chicago, IL

Notes: Take off delayed due to clouds.
Large cumulus cover in flight

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Moderate (51 – 100)

PM_{2.5} AQI: Good (0 – 50)



GCAS observations

(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector (indication for bright surfaces and clouds)

20230802 Wednesday CHICAGO, IL

Notes:

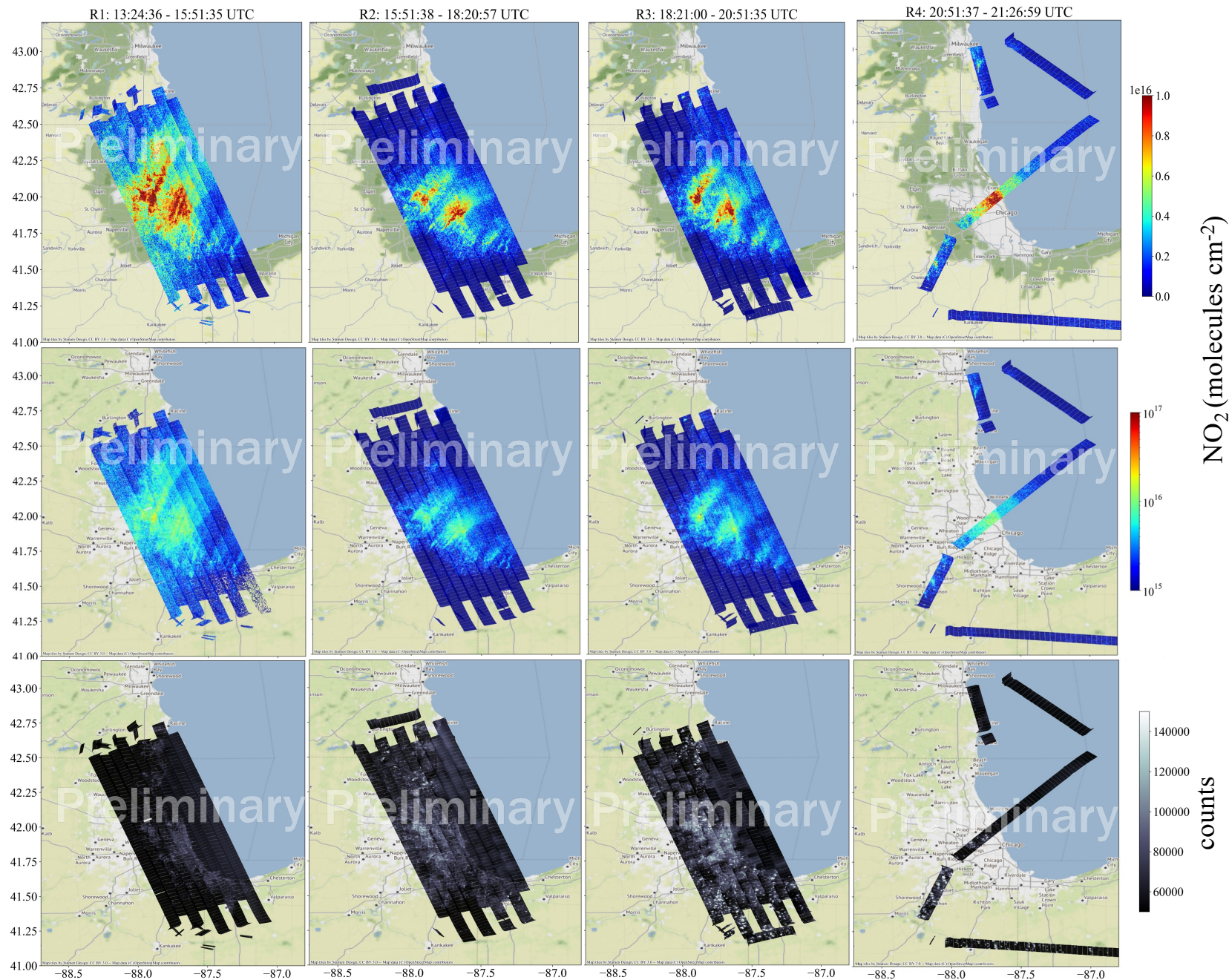
TEMPO first light.

Cirrus clouds above aircraft throughout most of the flight.

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Moderate (AQI: 51 – 100) throughout and Unhealthy for Sensitive Groups (AQI: 101 – 150) at North monitor NORTHBRK.

PM_{2.5} AQI: Good (0 – 50) in Central and South Chicago, Moderate (AQI: 51 – 100) in North Chicago



GCAS observations

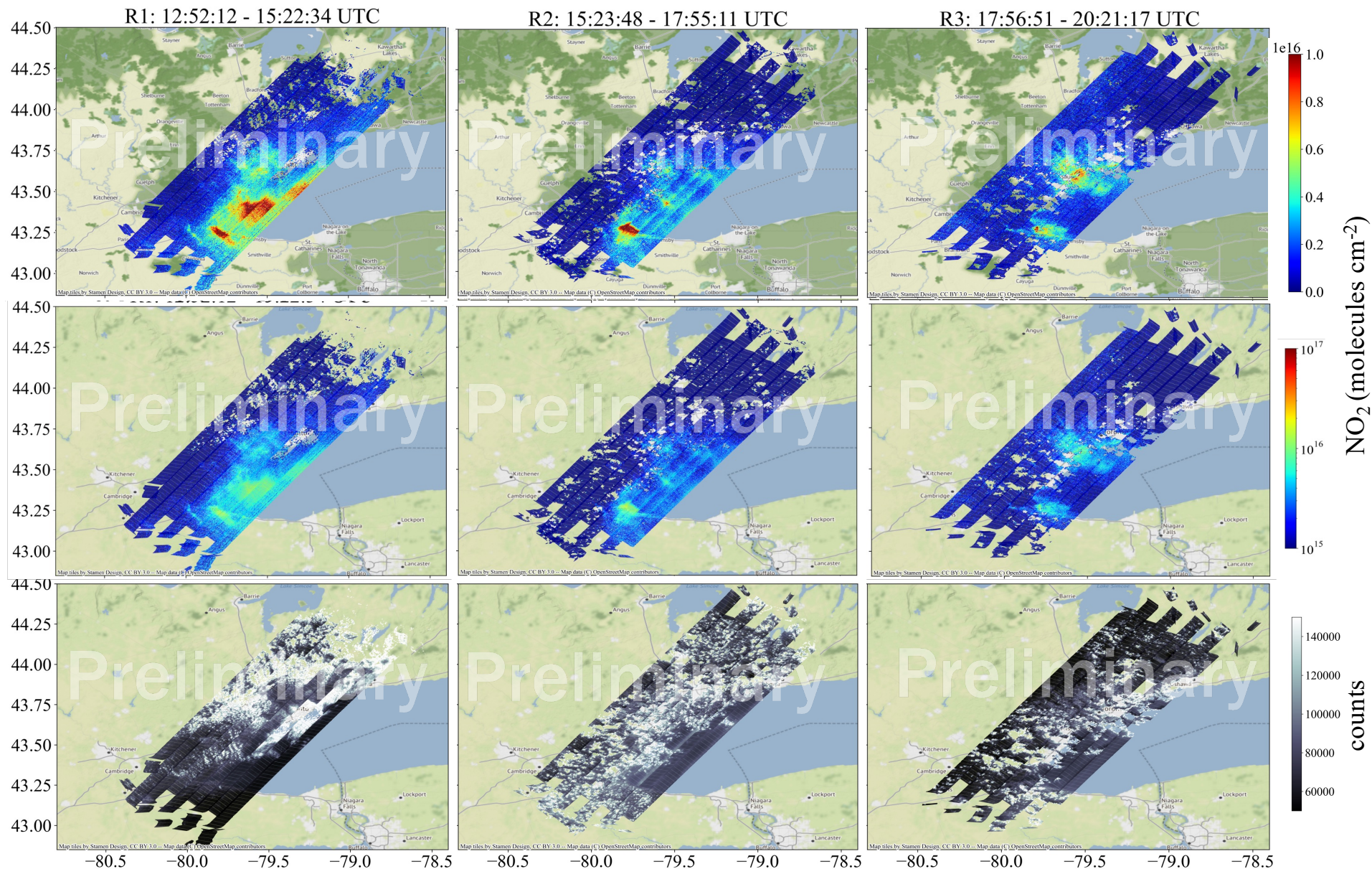
(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector (indication for bright surfaces and clouds)

20230804 Friday TORONTO, CANADA



R1: mostly cloudy on northside

Notes: R2 and R3: large cumulus cloud coverage throughout

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50)

PM2.5 AQI: Moderate (51 – 100)

GCAS observations

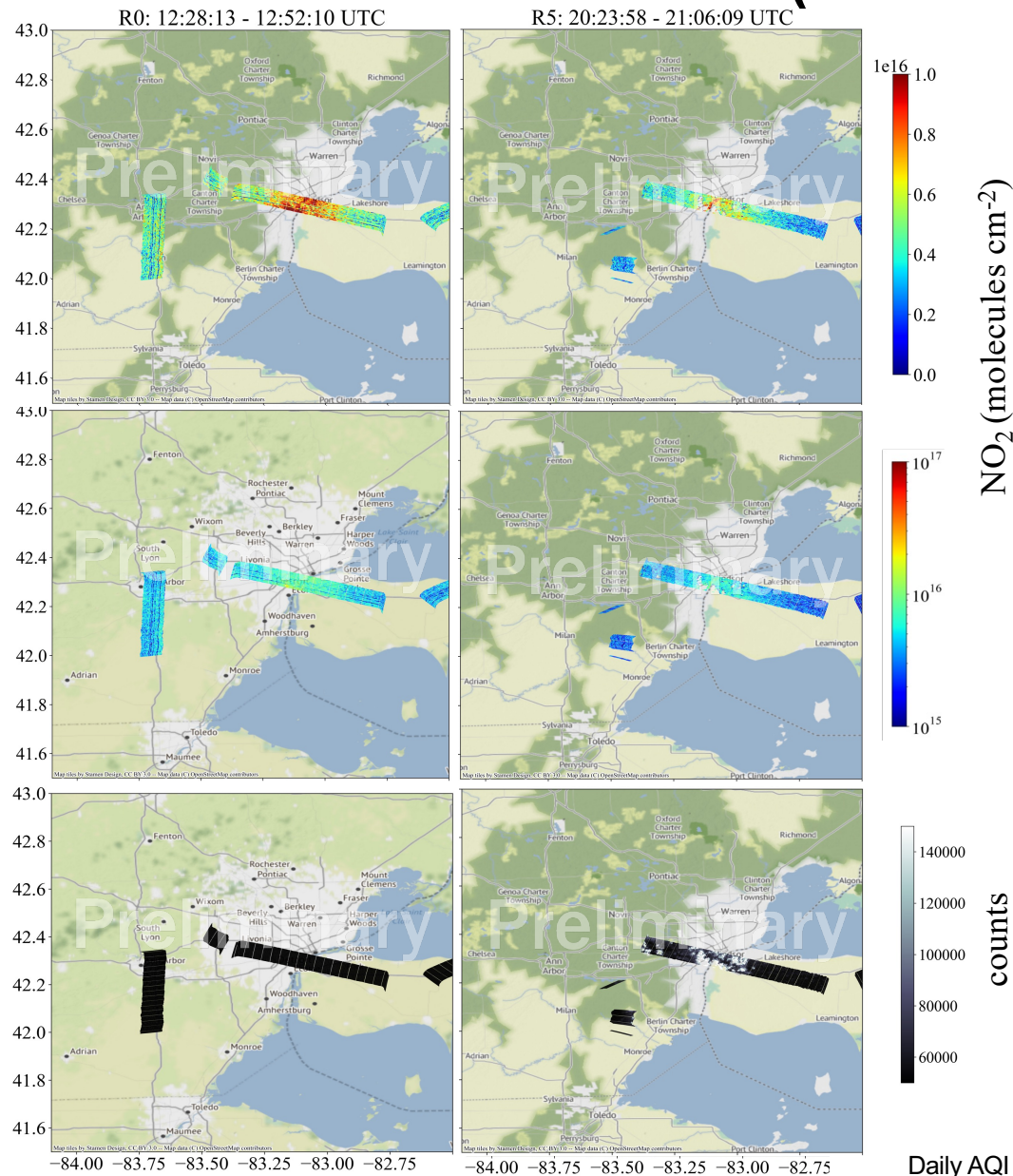
(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector
(indication for bright surfaces and clouds)

20230804 Friday TORONTO, CANADA (DETROIT, MI OVERPASS)



Notes:

Flight pass over Detroit
during transit to (R0) and
from (R5) Toronto,
Canada.

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50)

PM_{2.5} AQI: Moderate (51 – 100)

GCAS observations
(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

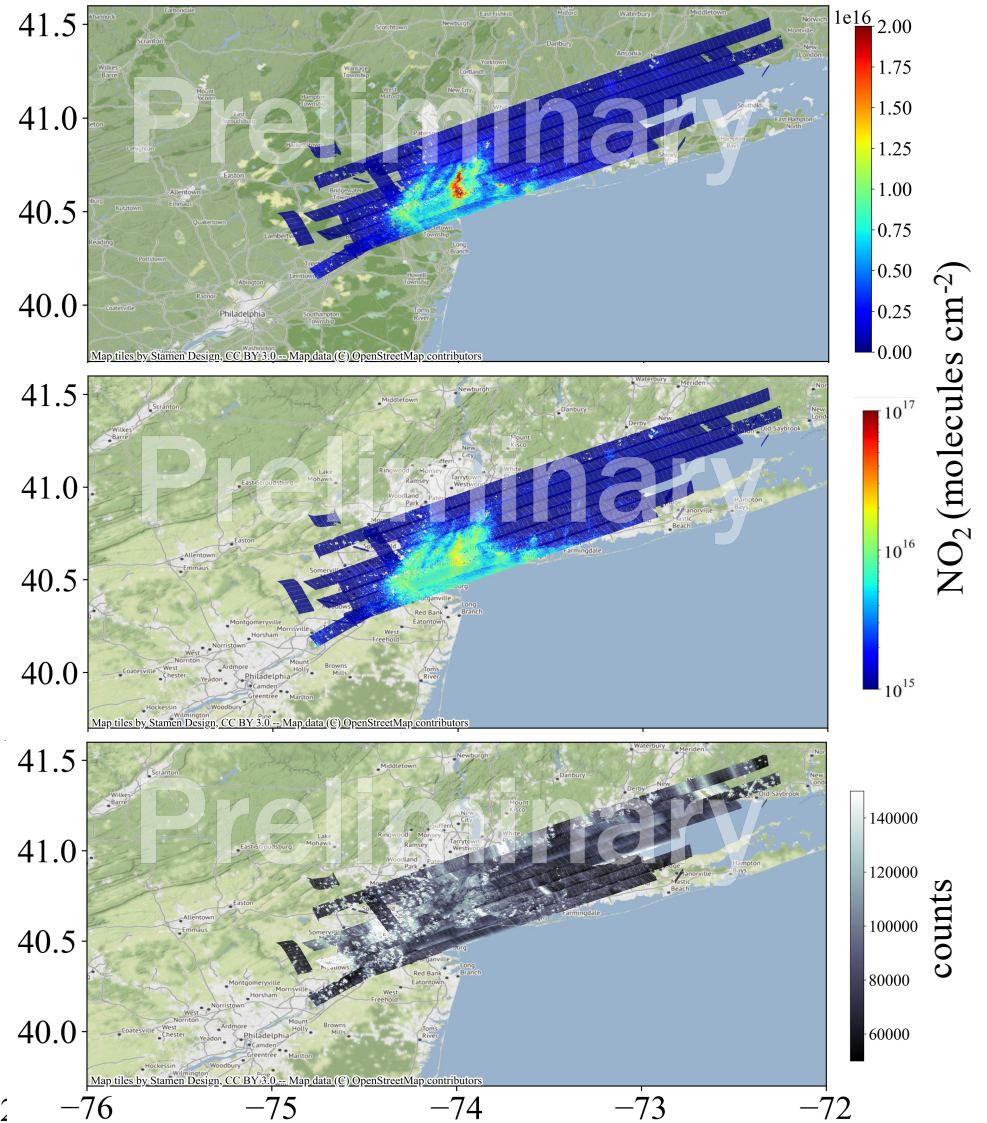
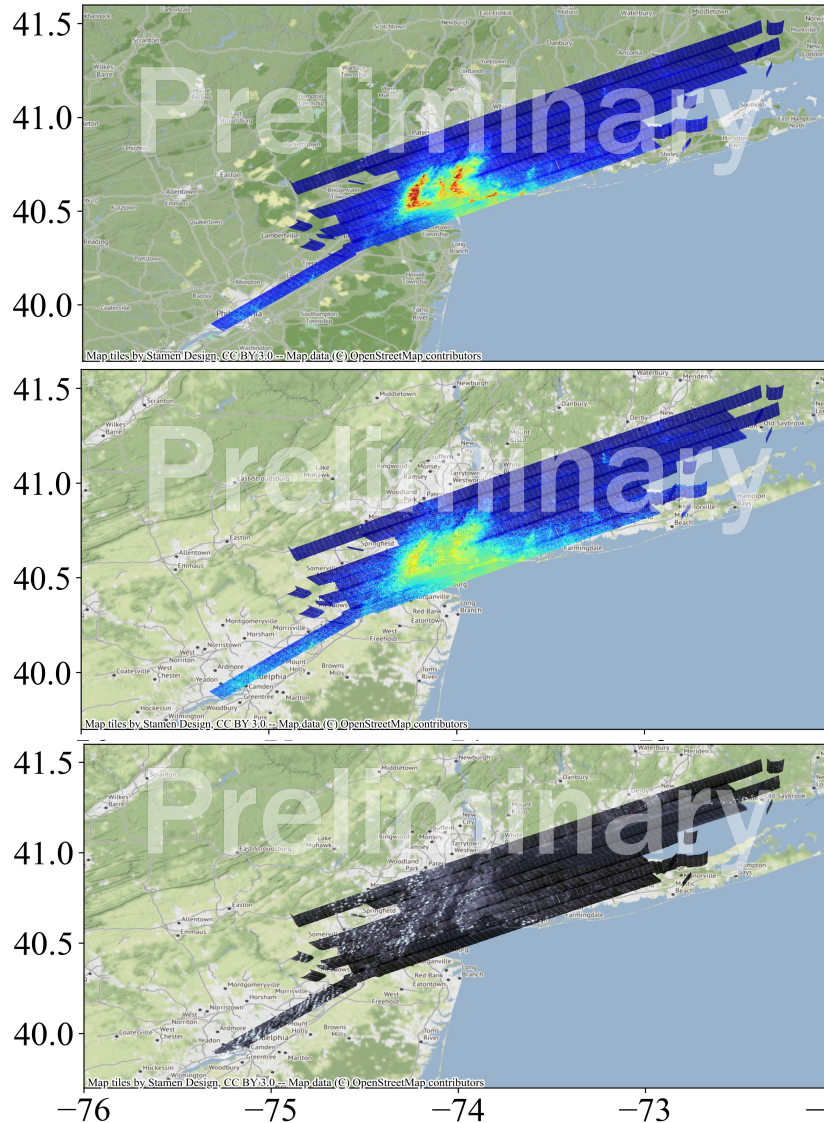
Bottom row: count rate in the NO₂ spectral window on detector
(indication for bright surfaces and clouds)

20230805 Saturday

NEW YORK CITY, NY; NEWARK, NJ; PHILADELPHIA, PA

R1: 13:15:37 - 15:46:29 UTC

R2: 15:47:38 - 18:26:22 UTC



Notes:

R3 was cut due to cirrus clouds entering from West

STAQS PI: laura.m.judd@nasa.gov

Quicklook: mary.a.demetillo@nasa.gov

GCAS PI: scott.j.janz@nasa.gov

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50) in North of Manhattan and central Long Island Sound, Moderate (51 – 100) in south NYC and eastern Long Island Sound

PM2.5 AQI: Moderate (51 – 100) except Good (0 – 50) at Holtsville in east Long Island Sound and Port Richmond

GCAS observations

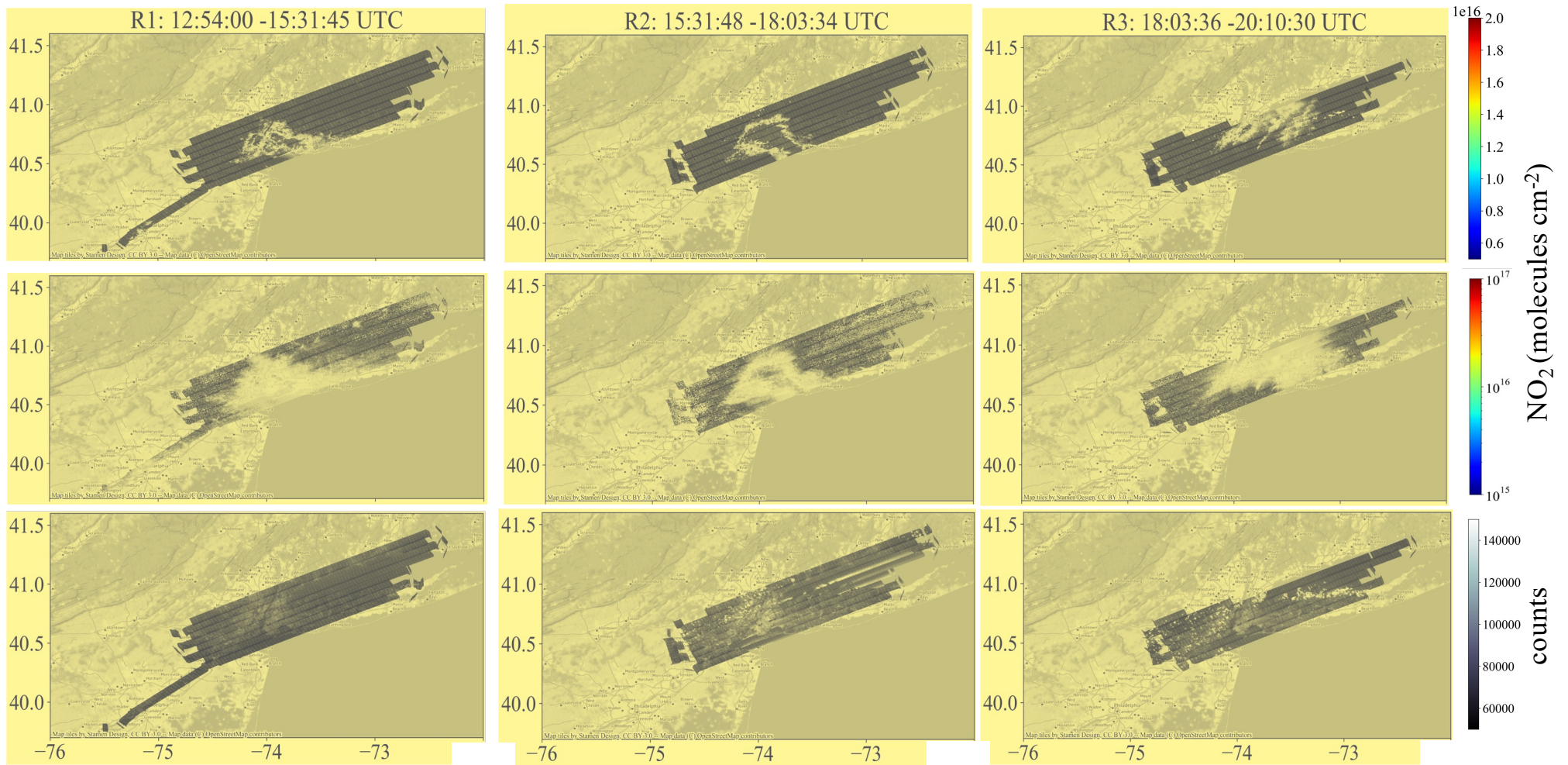
(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector

20230808 – Chicago, IL



Notes: Some cirrus (above GV) over lake in AM – minor turbulence throughout AM flight. 11:30 AM cloud thickness increasing over NE of raster (coastal lake). Patchy cumulus around NE of raster (Leg 9, raster 1 – 11:57 AM). Legs cut short near end of R2 for convection in the NW. R3 is a half raster due to encroaching convection. R3,L7 was repeated 3 times for HSRL2 reboot.

GCAS observations

(cloud filter not applied)

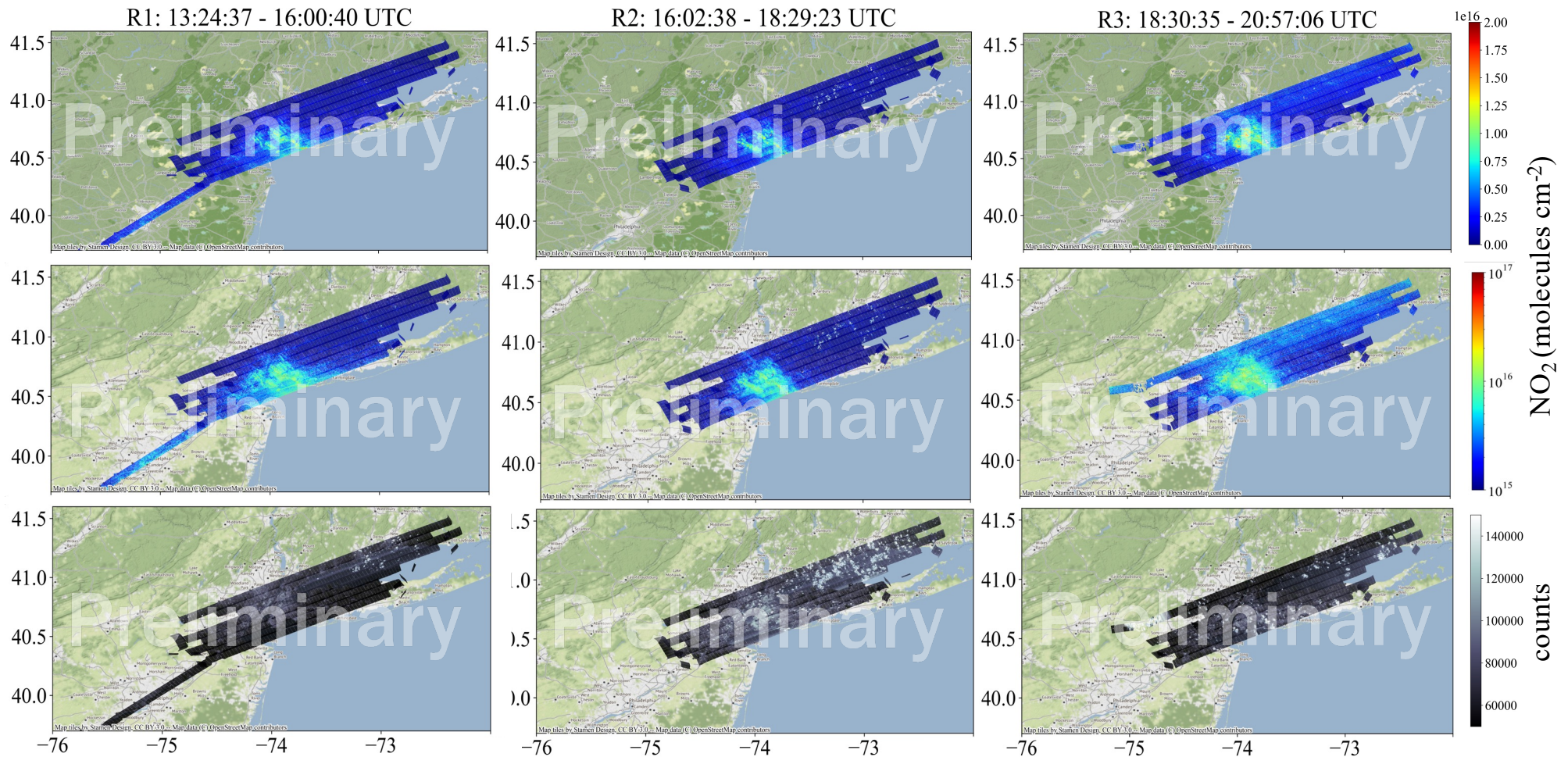
Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector
(indication for bright surfaces and clouds)

20230809 Wednesday

NEW YORK CITY, NY; NEWARK, NJ; PHILADELPHIA, PA



Notes: Sporadic cumulus throughout the day

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50)

PM_{2.5} AQI: Good throughout except Moderate (51 – 100) at Bklyn – PS 314 and Queens sites

STAQS PI: laura.m.judd@nasa.gov

Quicklook: mary.a.demetillo@nasa.gov

GCAS PI: scott.j.janz@nasa.gov

GCAS observations

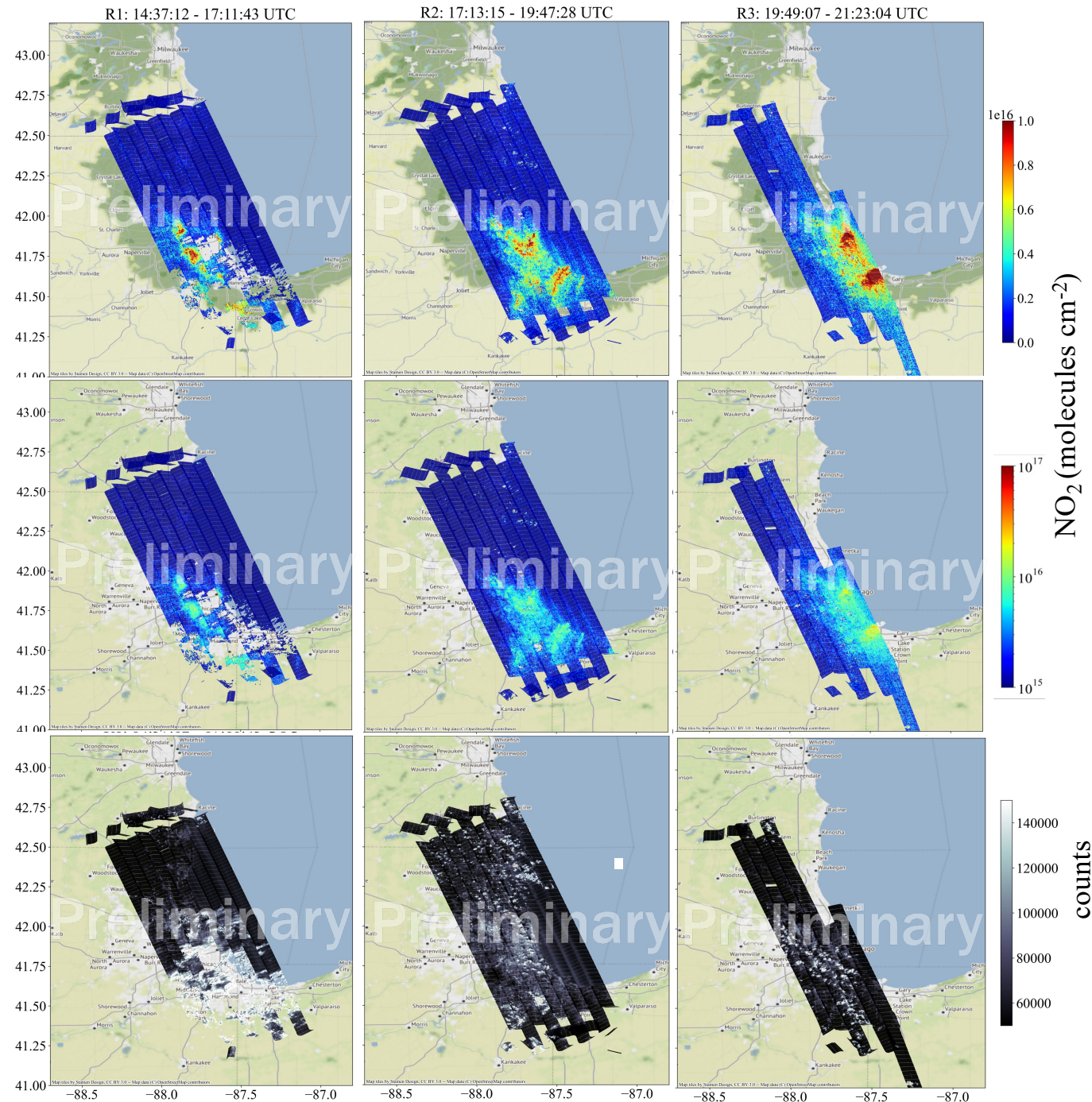
(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector

20230812 Saturday – CHICAGO, IL



Notes:

R1: Clouds over south half of raster. Intersected with DC8 (at least 3 times).

R2: Fair weather cumulus

R3: Fair weather cumulus on southside. RTB due to thunderstorm activity in Ohio.

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50)

PM_{2.5} AQI: Good (0 – 50)

STAQS PI: laura.m.judd@nasa.gov

Quicklook: mary.a.demetillo@nasa.gov

GCAS PI: scott.j.janz@nasa.gov

GCAS observations

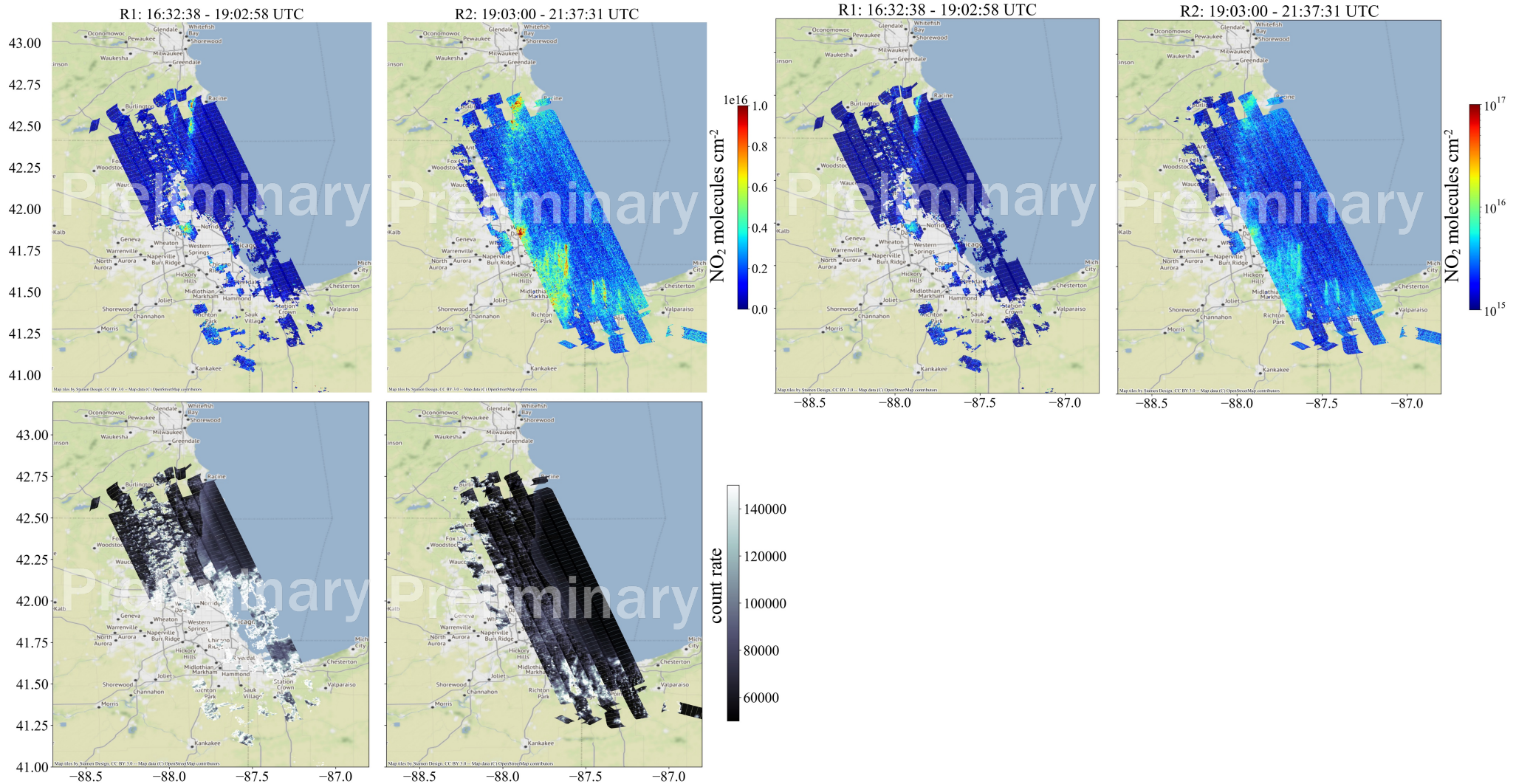
(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

Bottom row: count rate in the NO₂ spectral window on detector (indication for bright surfaces and clouds)

20230815 Tuesday CHICAGO, IL



Notes: Delayed take-off due to clouds in Chicago. Saturation from clouds largely masked in R1 and west-most leg of R2

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50)

PM2.5 AQI: Good (0 – 50) in central Chicago, Moderate (AQI: 51 – 100) in north and South Chicago

GCAS observations

(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

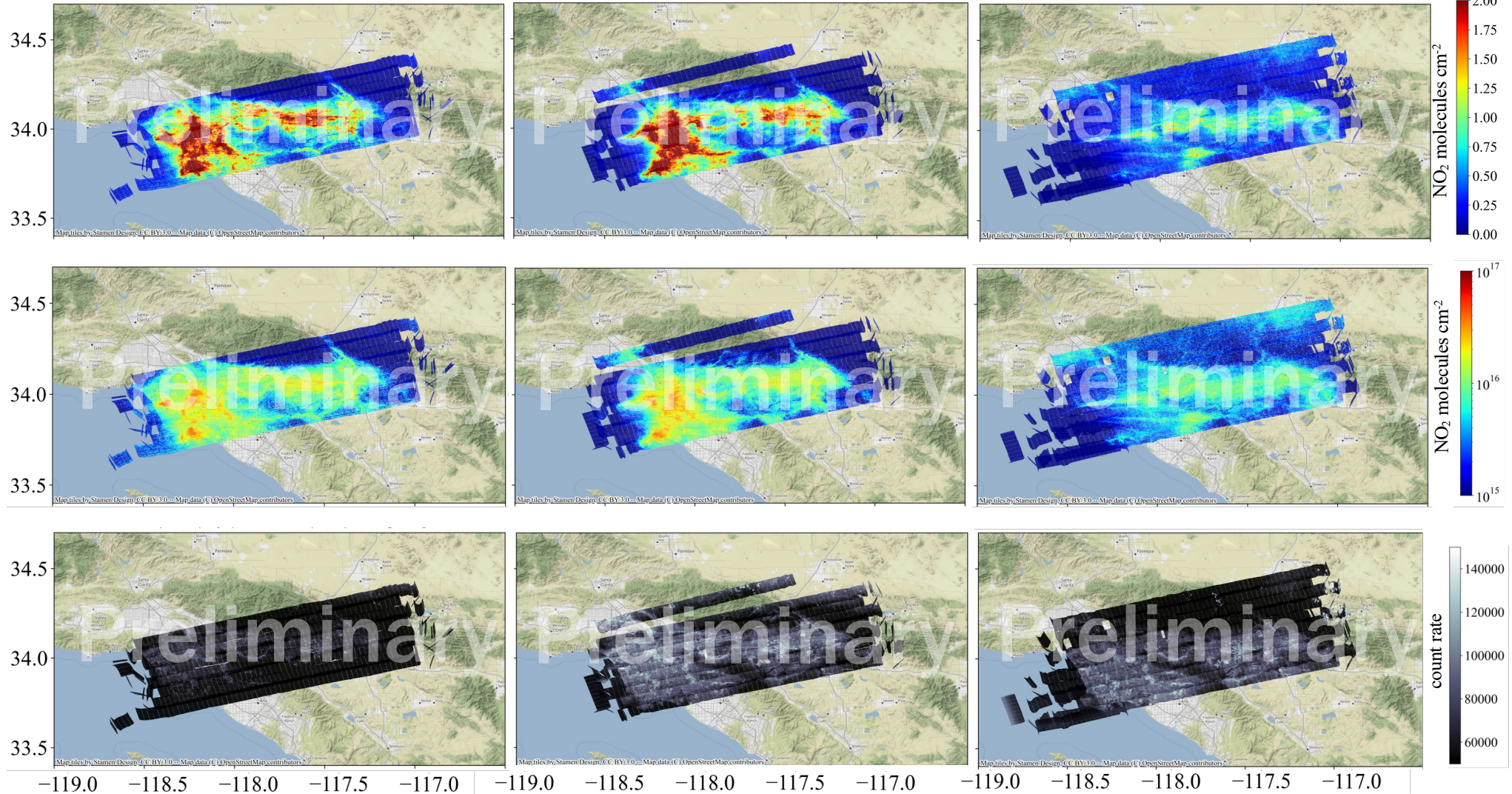
Bottom row: count rate in the NO₂ spectral window on detector (indication for bright surfaces and clouds)

20230822 Tuesday LOS ANGELES, CA

R1: 15:19:26 - 17:14:57 UTC

R2: 17:15:00 - 19:16:11 UTC

R3: 21:04:13 - 23:41:01 UTC



Notes: GCAS onboard LaRC G3 20230822 – 20230826.
G3 refueling in between R2 and R3

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50) throughout LA, Moderate (51 – 100) near mountains

PM2.5 AQI: Good (0 – 50)

GCAS observations

(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

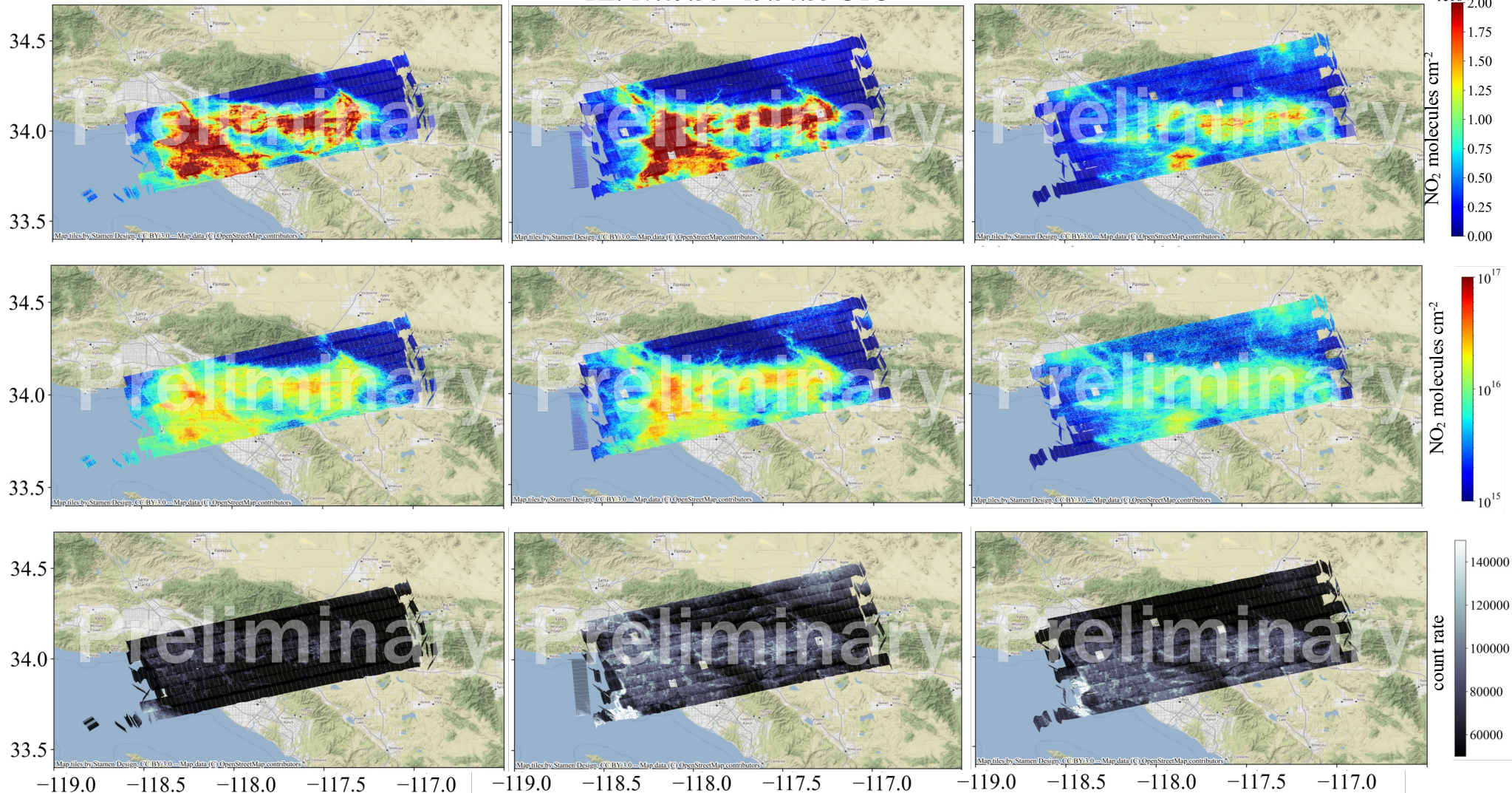
Bottom row: count rate in the NO₂ spectral window on detector (indication for bright surfaces and clouds)

20230823 Wednesday LOS ANGELES, CA

R1: 15:16:48 - 17:09:35 UTC

R2: 17:09:38 - 19:30:33 UTC

R3: 21:14:45 - 23:32:59 UTC



Notes: GCAS onboard LaRC G3 20230822 –
20230826. G3 refueling in between R2 and R3

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50) in west LA, Unhealthy for Sensitive Groups (101 – 150) around Riverside
PM_{2.5} AQI: Mostly good (0 – 50) except for Moderate (51 – 100) readings at Compton, Anaheim,
and Riverside-Rubidoux sites

GCAS observations

(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

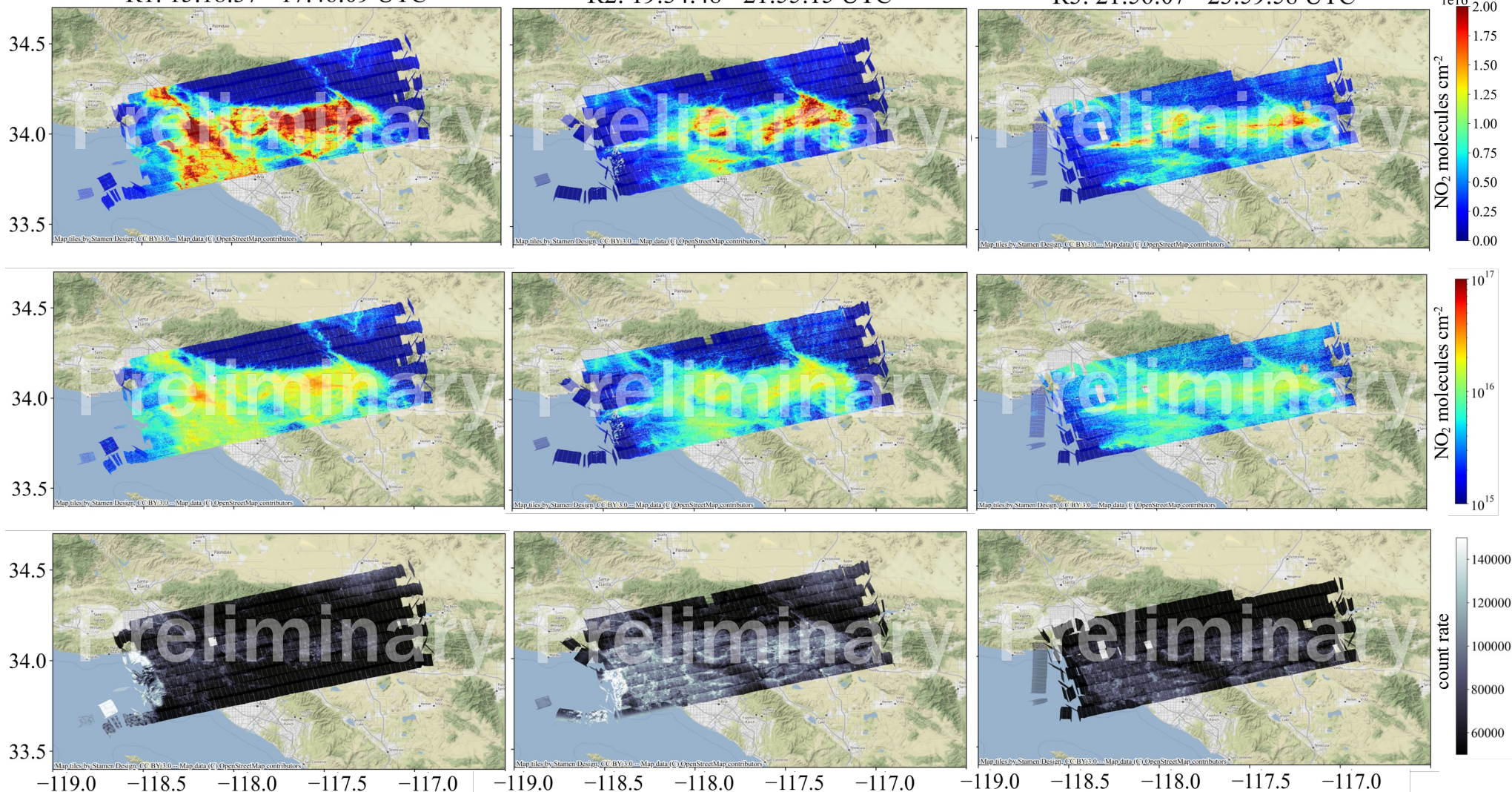
Bottom row: count rate in the NO₂ spectral window on detector (indication for bright surfaces and clouds)

20230825 Friday LOS ANGELES, CA

R1: 15:18:37 - 17:46:09 UTC

R2: 19:34:48 - 21:55:15 UTC

R3: 21:56:07 - 23:59:58 UTC



Notes: GCAS onboard LaRC G3 20230822 – 20230826. G3 refueling in between R1 and R2

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50) in west and central LA, Moderate (51 – 100) approaching

Riverside, Unhealthy for sensitive groups (101 – 150) around Riverside

PM2.5 AQI: Good (0 – 50) except for Moderate (51 – 100) at Riverside-Rubidoux and

Fontana – Arrow Highway sites

GCAS observations

(cloud filter not applied)

Top row: NO₂ column densities (linear scale)

Middle row: NO₂ column densities (log scale)

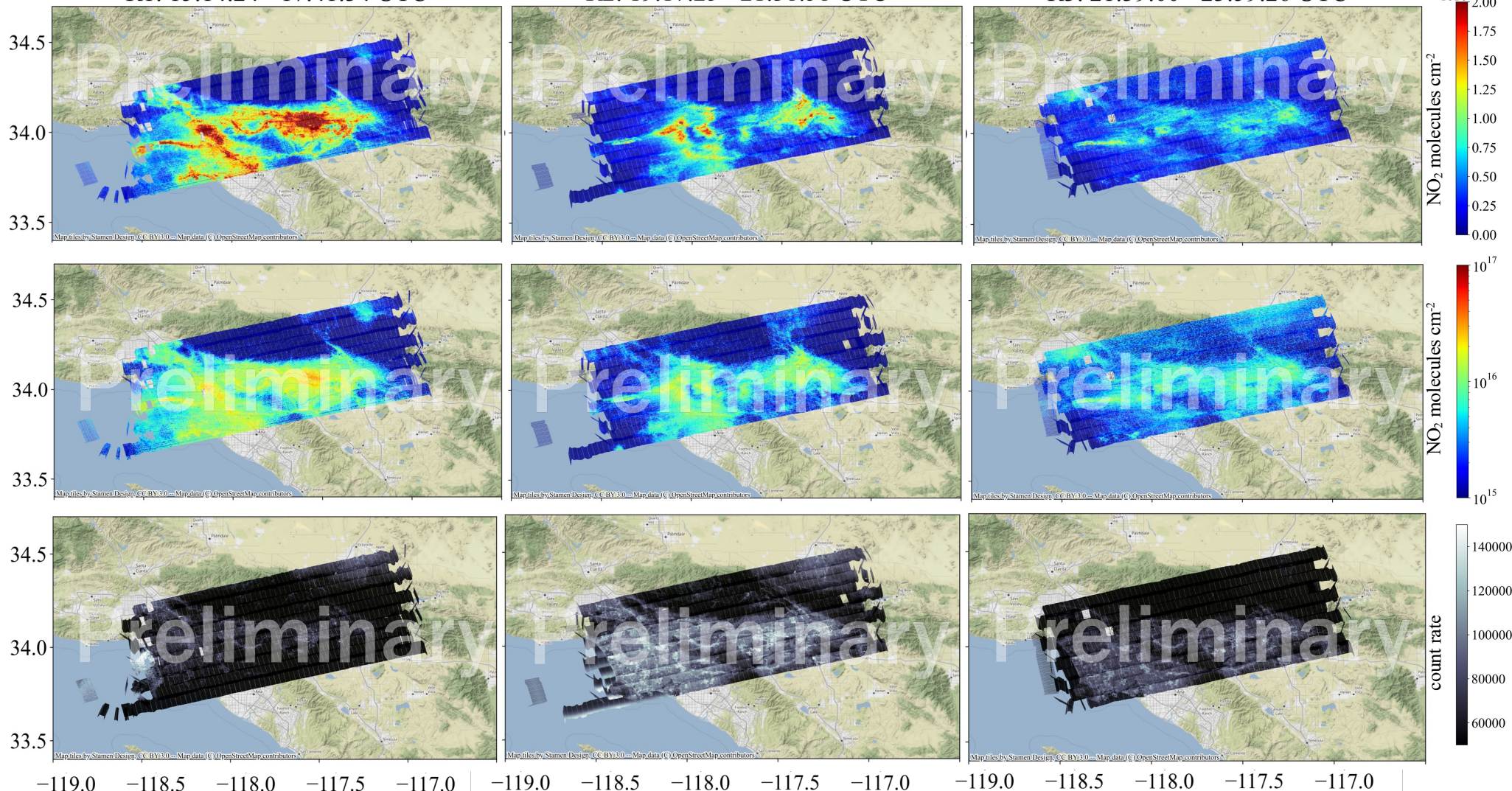
Bottom row: count rate in the NO₂ spectral window on detector (indication for bright surfaces and clouds)

20230826 Saturday LOS ANGELES, CA

R1: 15:14:24 - 17:41:34 UTC

R2: 19:17:25 - 21:38:58 UTC

R3: 21:39:00 - 23:59:26 UTC



Notes: GCAS onboard LaRC G3 20230822 – 20230826. G3 refueling in between R1 and R2

Daily AQI monitor readings from AirNow.gov:

O₃ AQI: Good (0 – 50) in downtown and throughout west LA, Moderate (51 – 100) approaching Riverside, and Unhealthy for sensitive groups (101 – 150) in eastern LA region around Riverside

PM2.5 AQI: Good (0 – 50) in Long Beach and east LA region around Riverside, Moderate (51 – 100) central LA