

The NOAA WP-3D is exploring 5 main topics:

- 1. Emissions verification**
- 2. Transport and mixing**
- 3. Chemical transformation**
- 4. Aerosol properties and radiative effects**
- 5. Regional Forecast model verification**

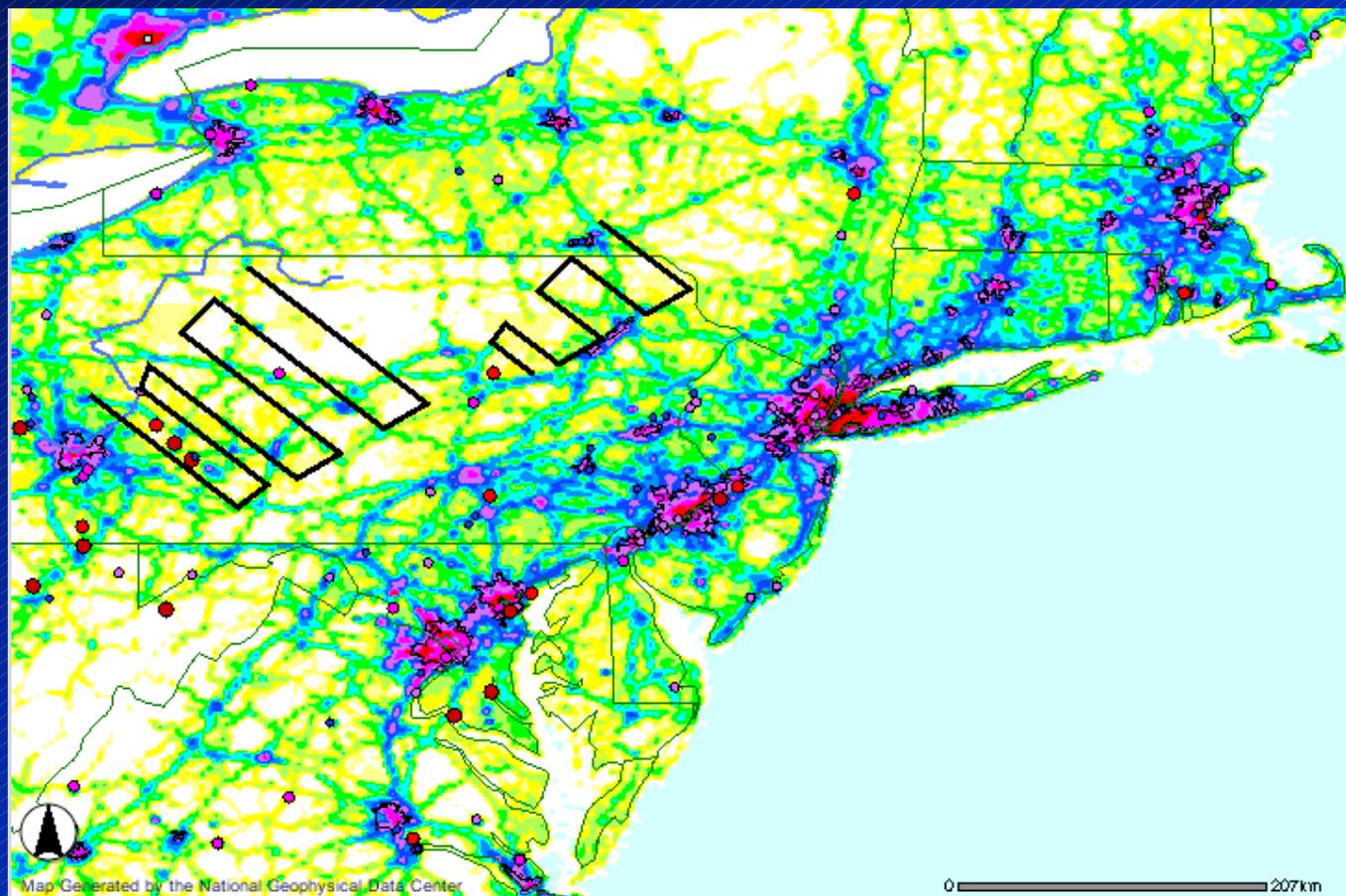
Emissions verification

Completed so far:

1. July 5 – pig farm study
2. July 9 – Fresh Boston plume during the day
3. July 11 – Fresh Boston plume at night
4. July 15, 20- Fresh NYC plumes
5. July 22 - Isoprene emission exploration along the coast of Maine

Future opportunities:

1. Day/night contrast
2. Weekday/weekend contrast
3. Target power plant plumes and urban plumes with clean in-flow conditions
4. Biomass emissions



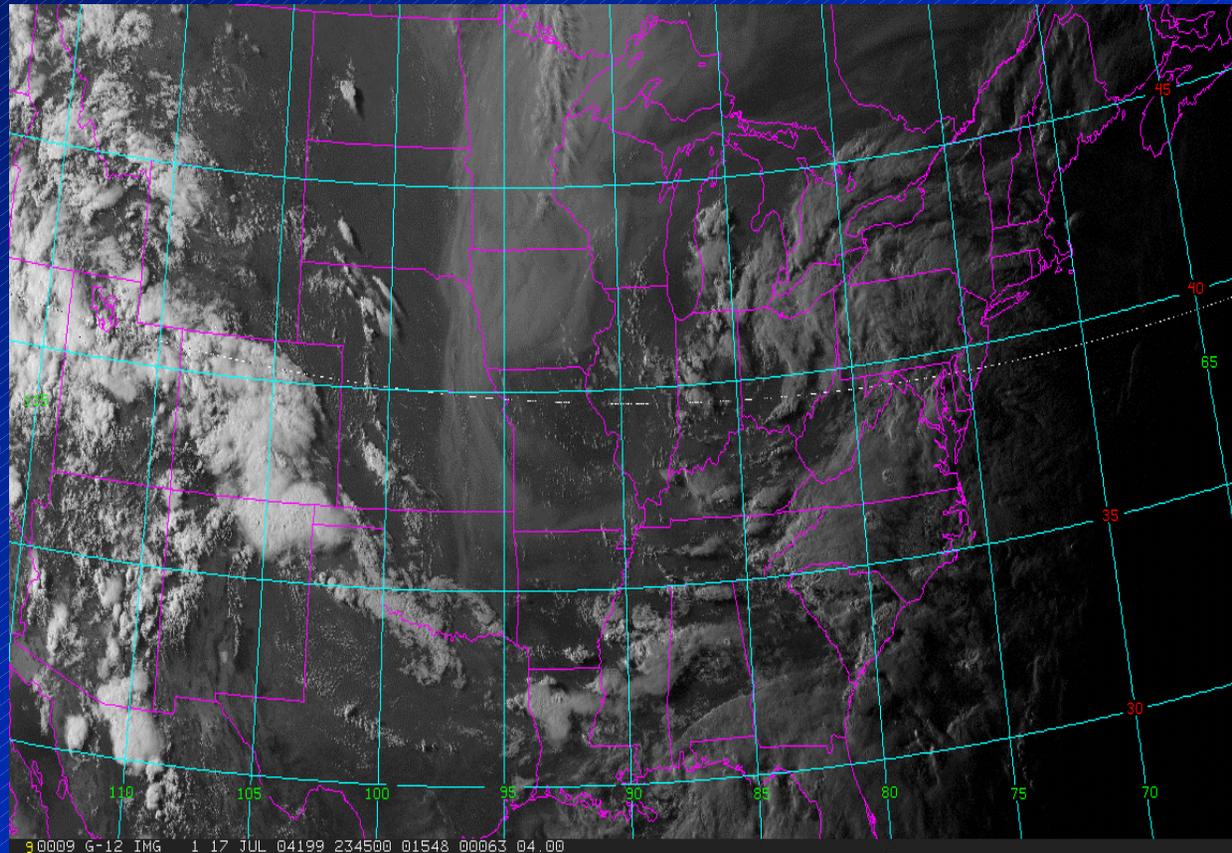
Transport and Mixing

Completed so far:

1. July 9, 11, 20, 21- Alaskan/Canadian biomass burning smoke over Quebec, Massachusetts, PA and Cape Cod
2. July 15 - Interception of an east coast plume south of Nova Scotia for the Lagrangian experiment.
3. July 20, 21 & 22- Fresh and aged NYC plumes for regional and trans-Atlantic Lagrangian studies.

Future opportunities:

1. Sample the inflow regions to warm conveyor belts for a trans-Atlantic Lagrangian study. (Lagrangian study will end by August 3 for the British aircraft and August 6 for the German aircraft.)
2. Study of the accumulation of pollutants under high pressure conditions over the continent.



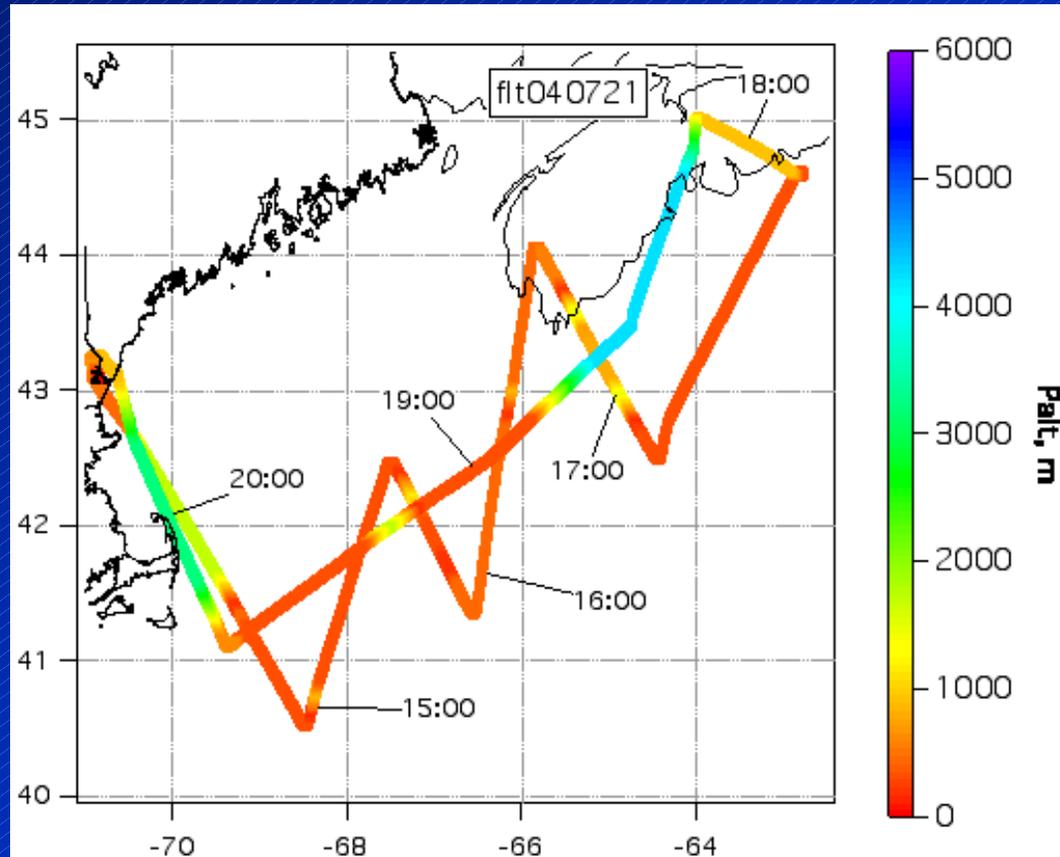
Chemical transformation

Completed so far:

1. July 9: aged emissions over the Gulf of Maine
2. July 11: Day-night chemical transformation within the Boston plume
3. July 15, 20 - Fresh NYC plume
4. July 21 & 22 - Aged NYC plume

Future opportunities:

1. Target power plant plumes and urban plumes with clean in-flow conditions
2. Day/night contrast is important to understand radical chemistry during the day and NO_3 & N_2O_5 chemistry at night.
3. Transition from day to night and from night to day.



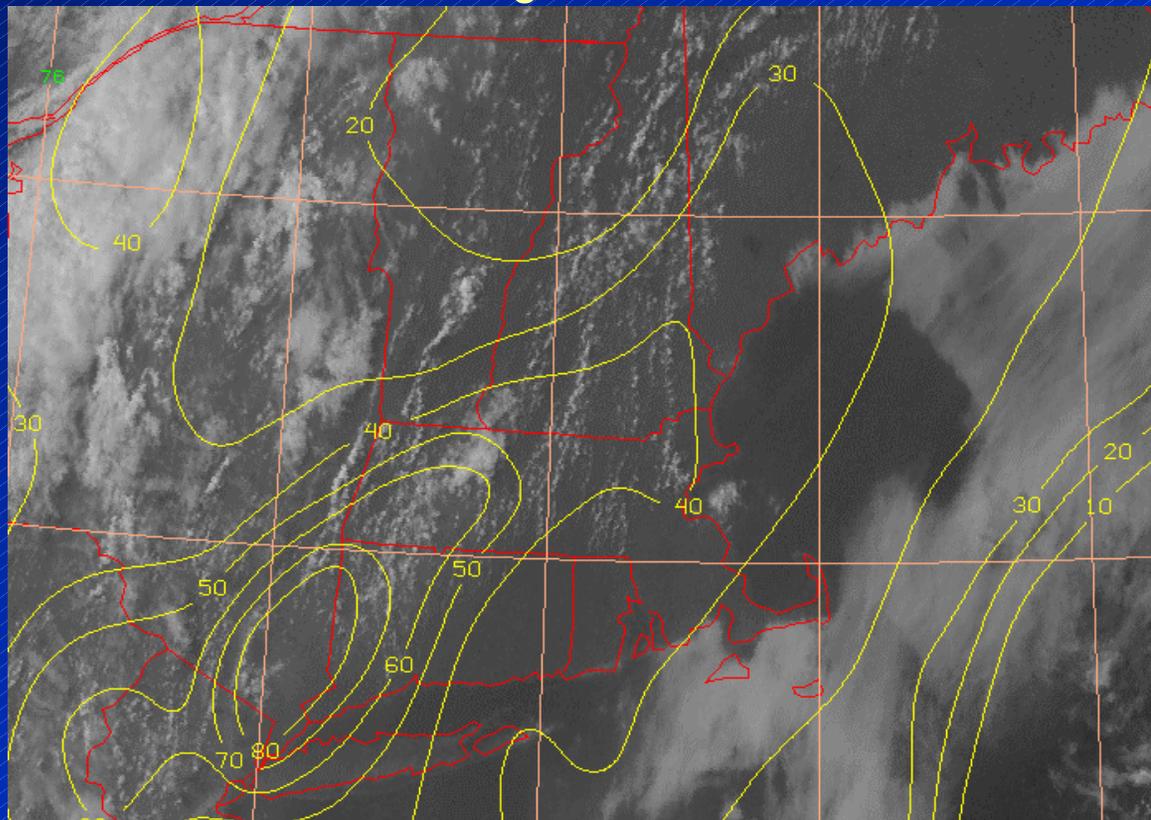
Aerosol properties and radiative effects

Completed so far:

1. July 5 – pig farm study
2. July 9 – Fresh Boston plume
3. July 9 - Radiation study above and within fog.
4. July 11 – Fresh Boston plume at night
5. July 15, 20-22 -NYC plumes
6. July 22 - Influence of aerosols on cloud droplet formation.
7. July 9, 11, 20 ,21 - Alaskan/Canadian biomass burning smoke

Future opportunities:

1. Study aerosol formation over the continent, exploring east coast/Midwest contrast.
2. Day/night contrast is important
3. Flights above, within and below clouds to study the indirect aerosol effect



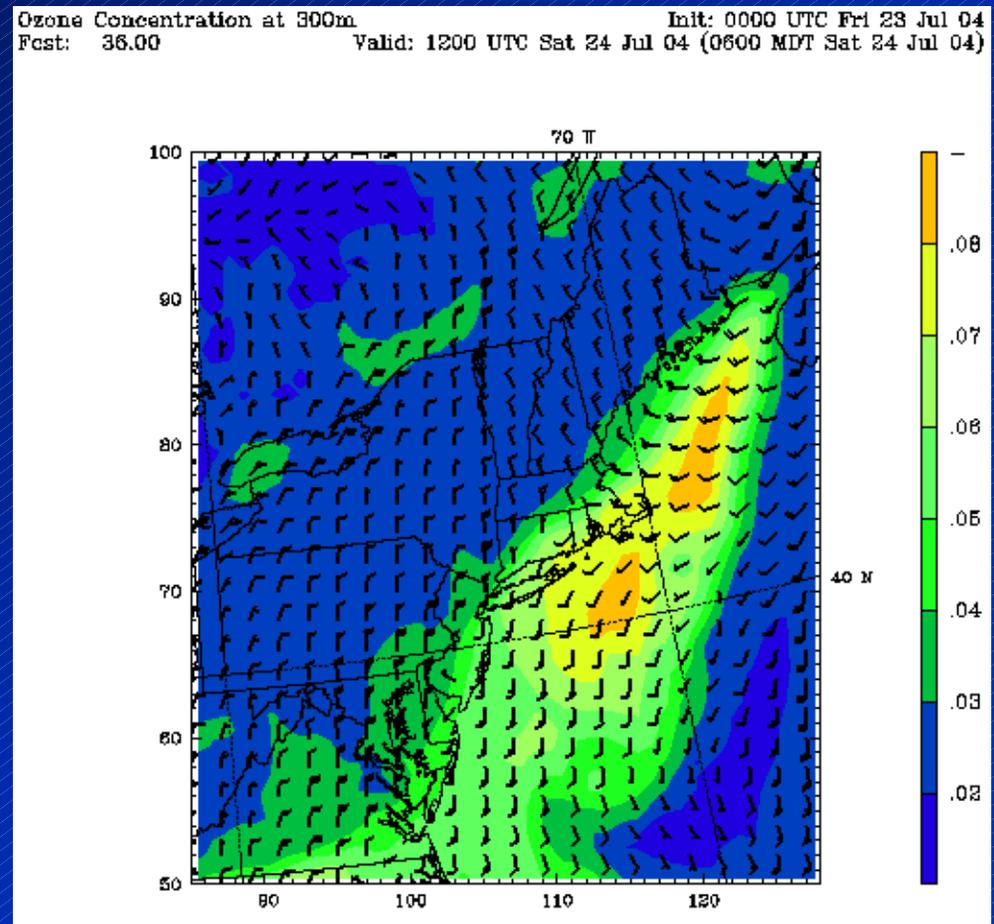
Regional Forecast model verification

Completed so far:

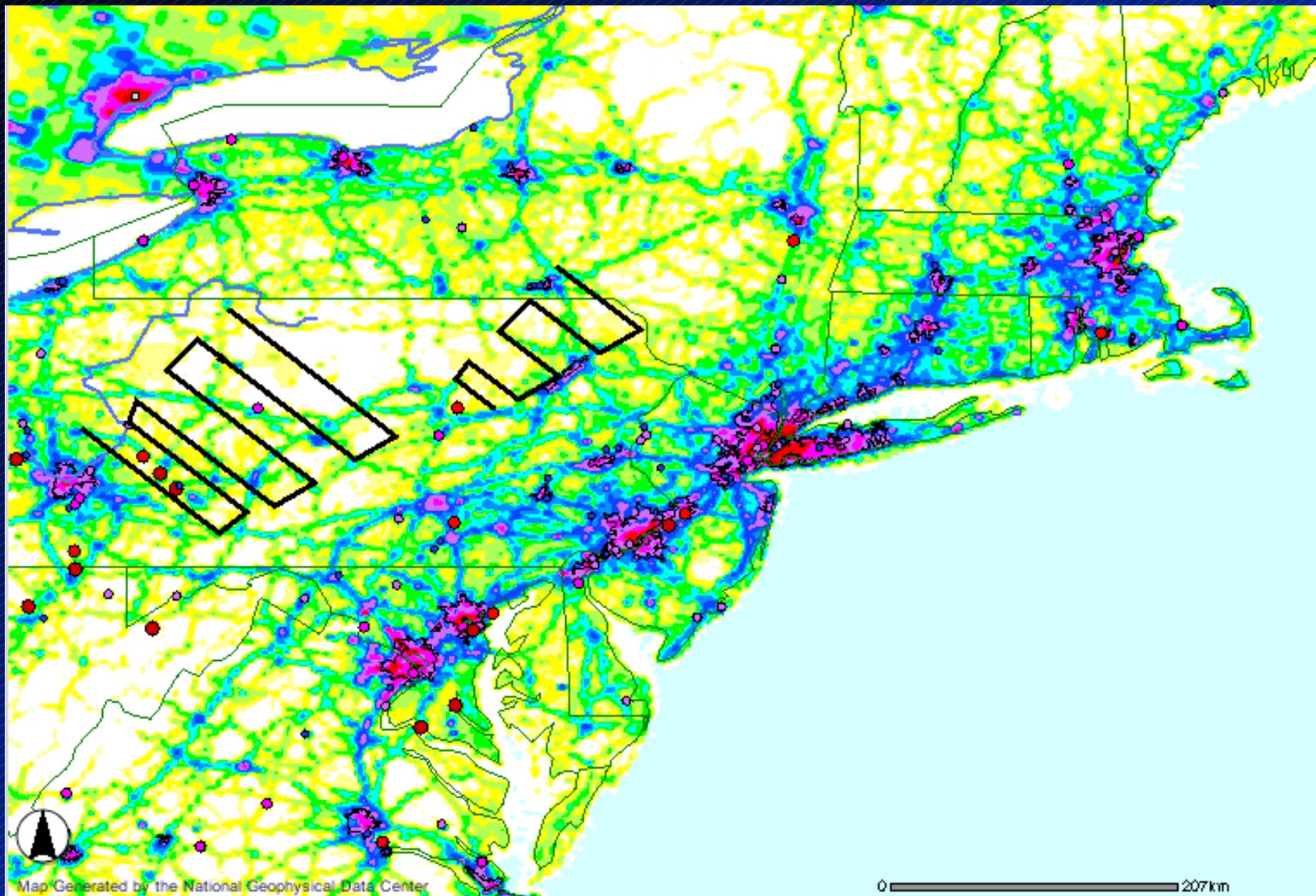
Several urban plume studies, but mainly over water.

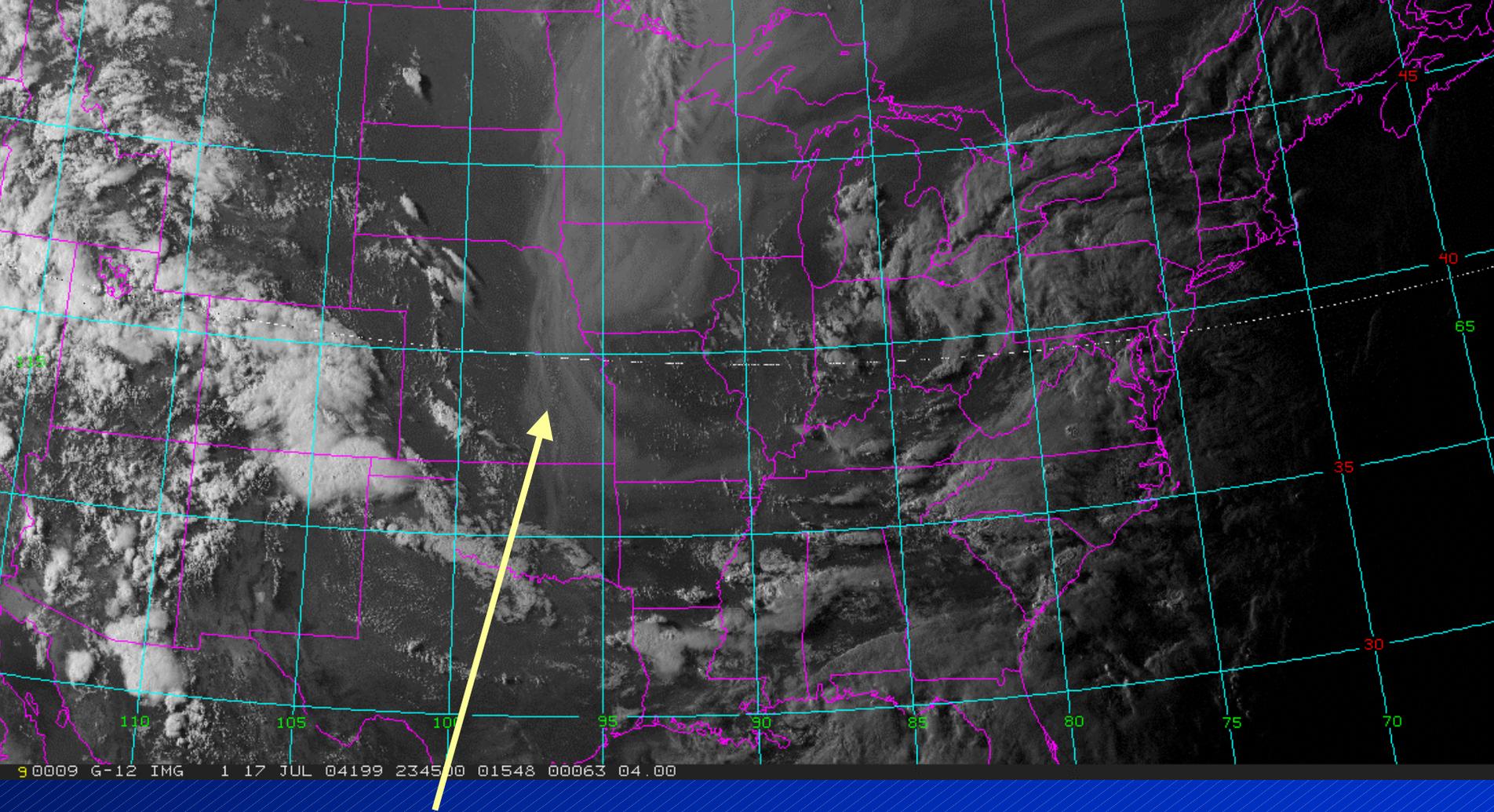
Future opportunities:

1. Regional background studies within the continental boundary layer.
2. Day/night contrast

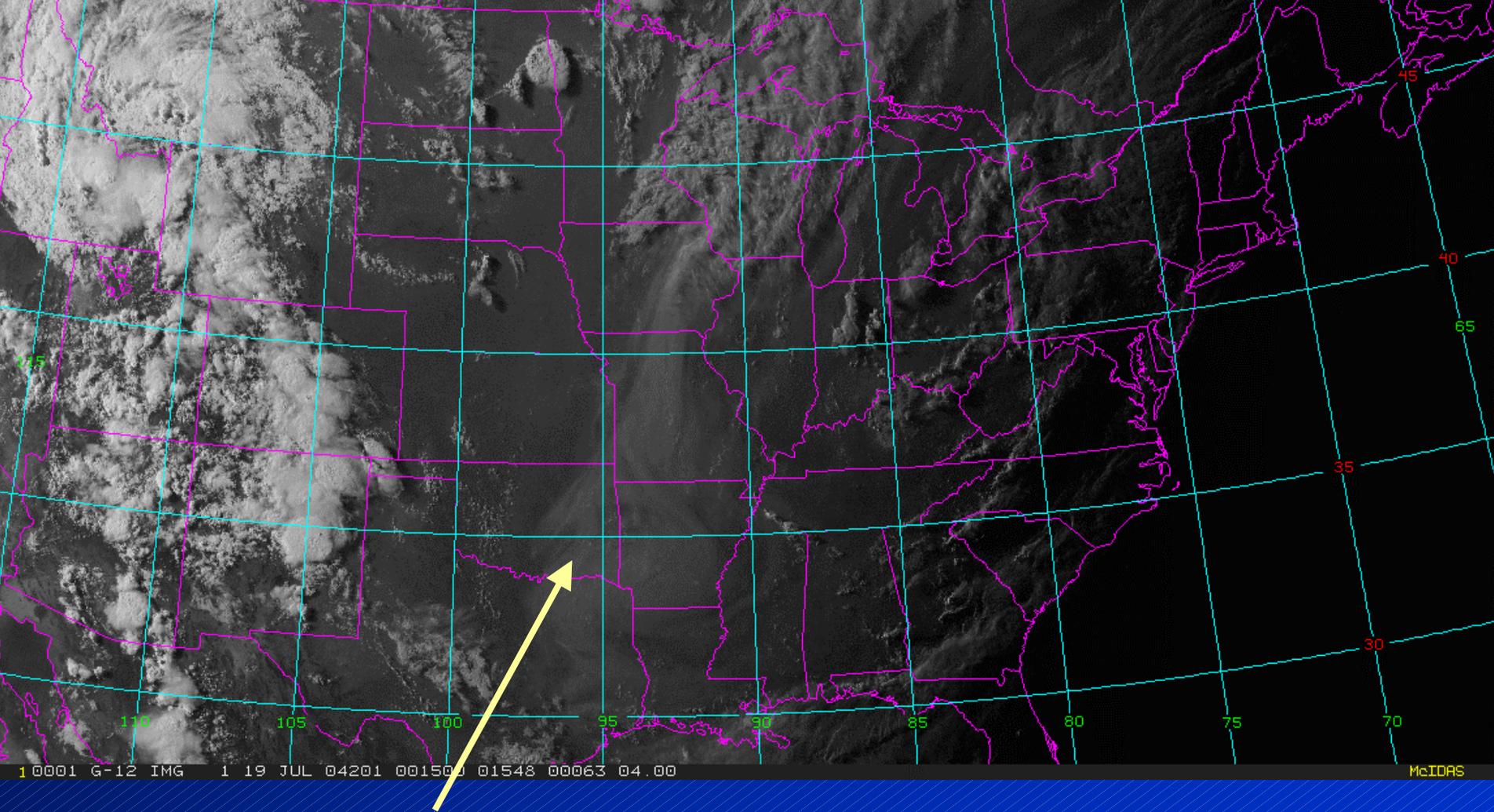


WRF/CHEM ozone forecast for this morning

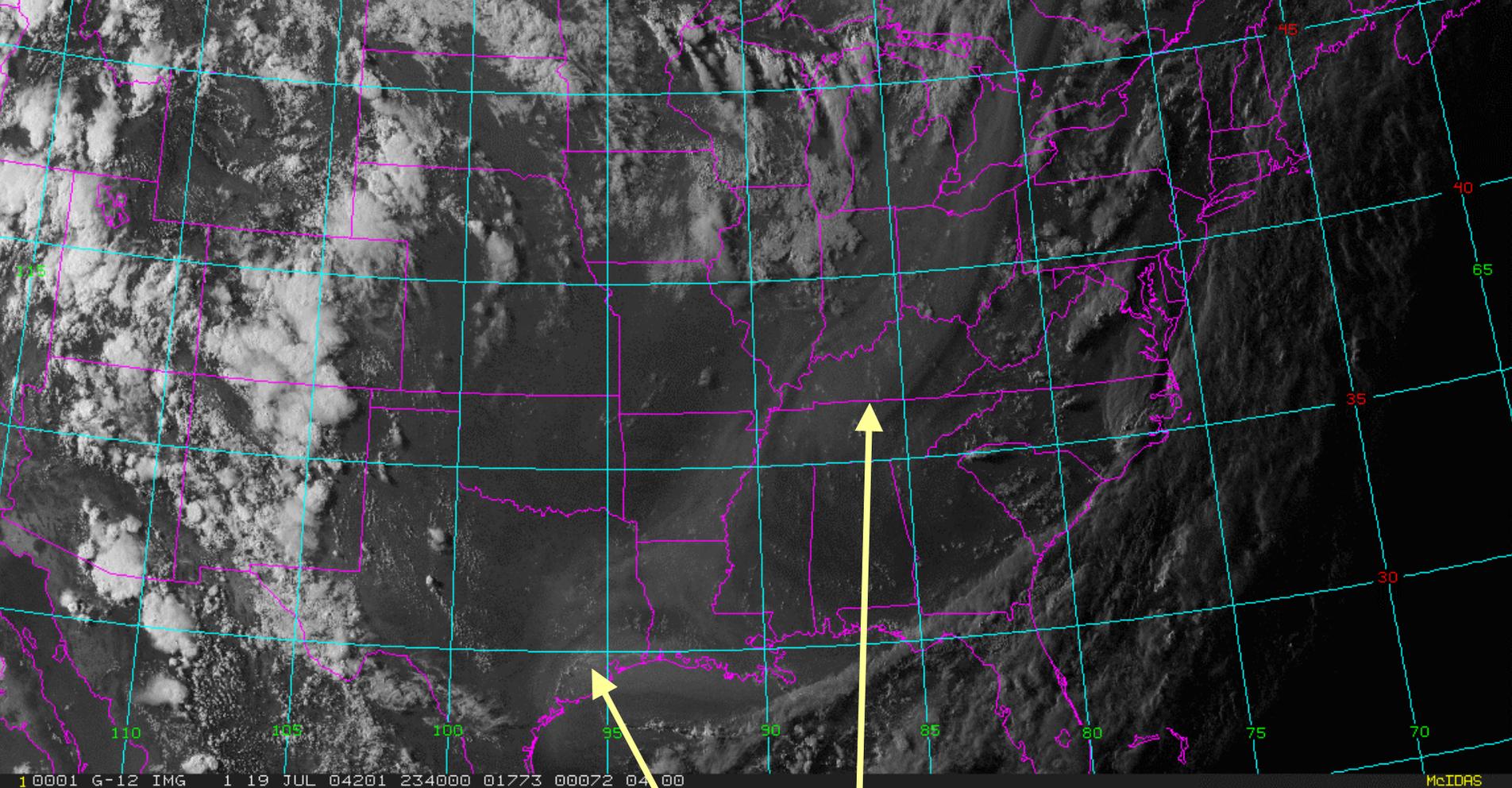




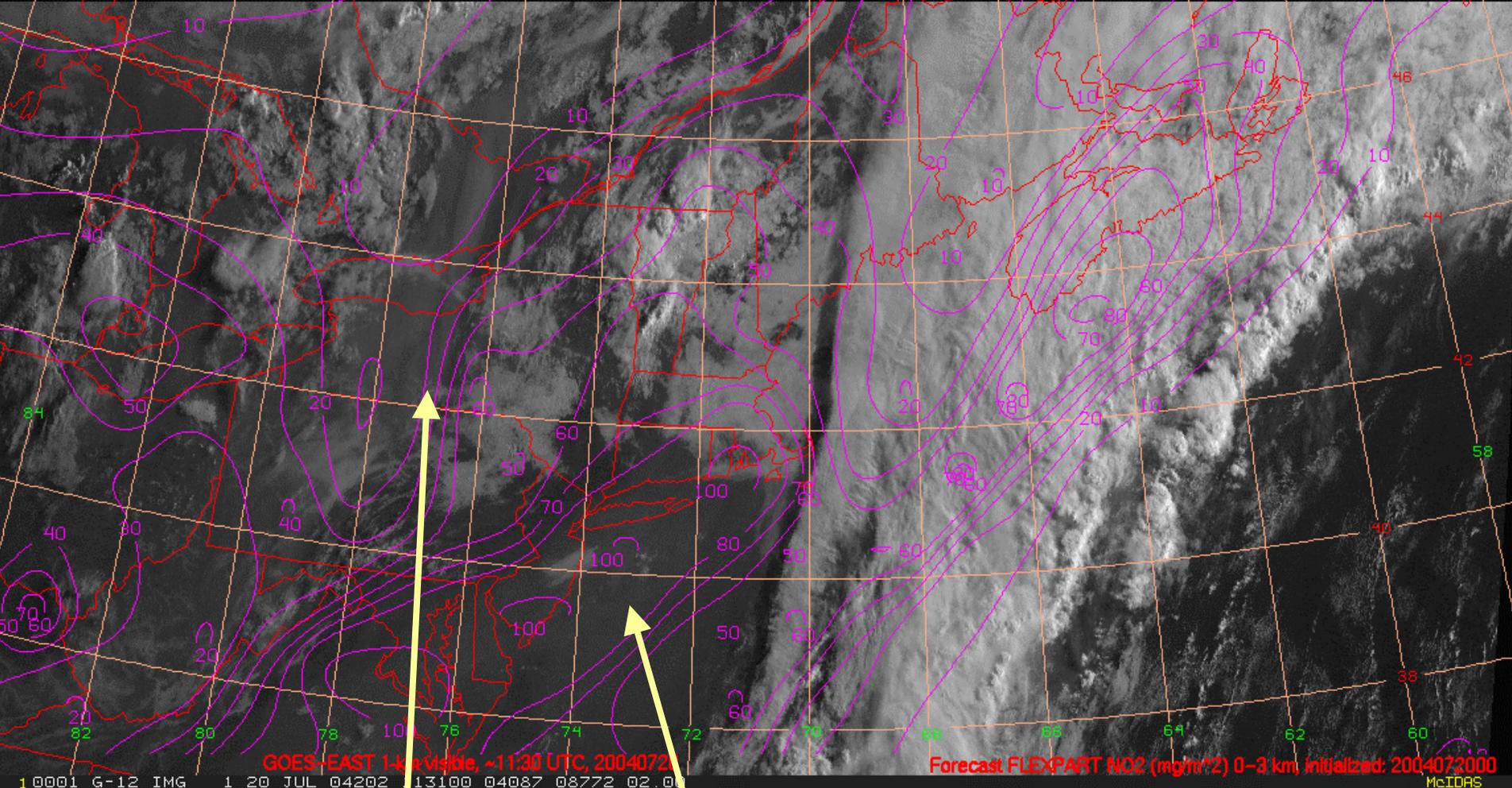
Alaskan/Canadian smoke plume at sunset on July 17.



Alaskan/Canadian smoke plume at sunset on July 18.

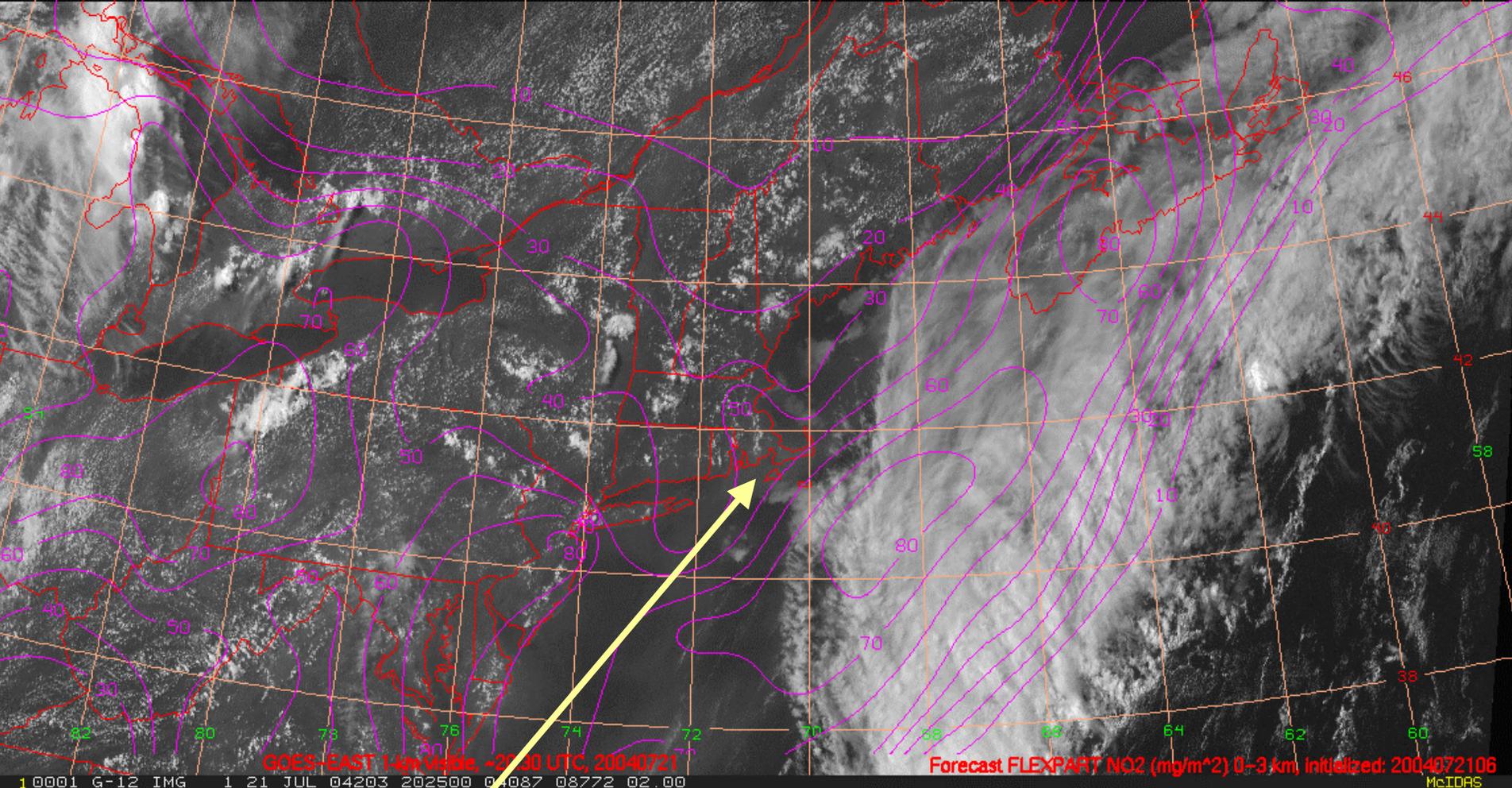


Alaskan/Canadian smoke
plume at sunset on July
19.



Anthropogenic haze

Alaskan/Canadian smoke plume at sunrise on July 20, and intercepted by the P3 a few hours later at 10,000 feet, CO ~ 450 ppbv.



Alaskan/Canadian smoke plume on the afternoon of July 20, and intercepted by the P3 at 10,000 feet, CO ~ 350 ppbv.