

Desired Future Application

GLM
Flashes



**Ground Flash Fraction
Retrieval Algorithm**
(see Koshak talk tomorrow)



Vital link

**MSFC LNOM
(lightning NOx)**



GLM
Ground
Flashes

GLM
Cloud
Flashes



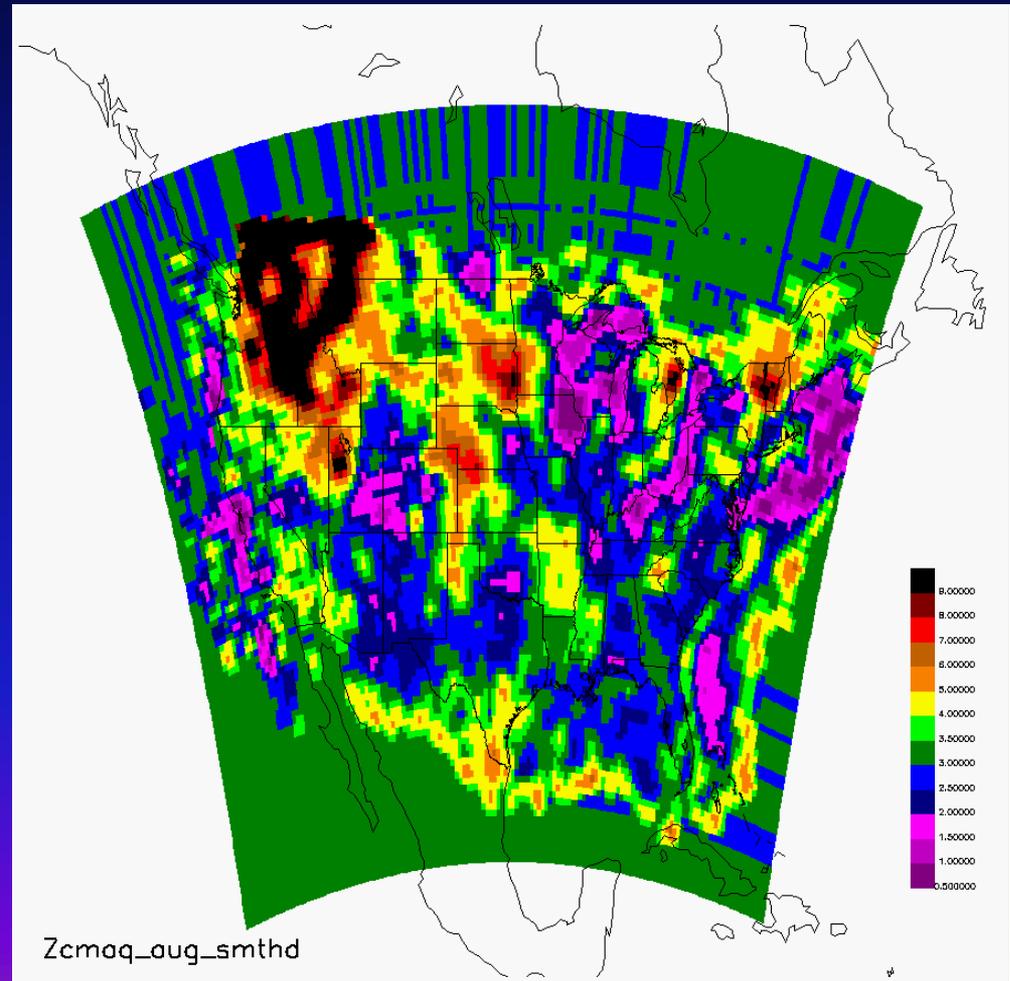
Air Quality Models (e.g. CMAQ)
Global Chemistry/Climate Models
(e.g. GISS Model E, Geos Chem)

CMAQ Domain

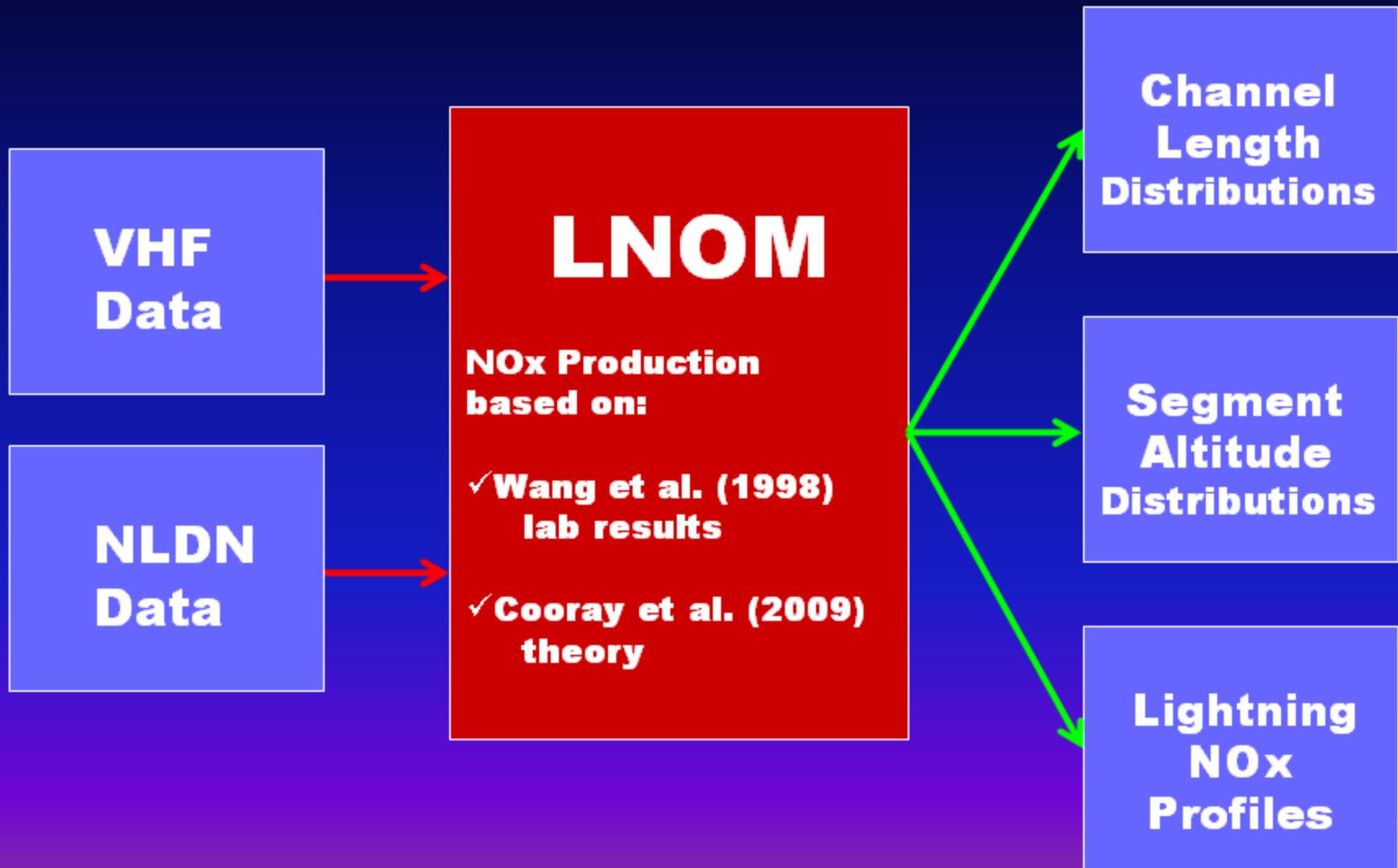
✓ GLM will provide **continuous total lightning** across much of CMAQ domain (GOES-E park).

✓ Colors are Z ratio for Aug 2006

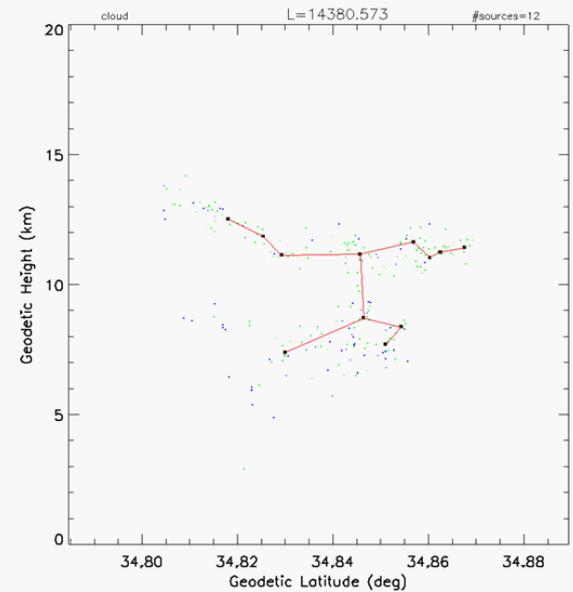
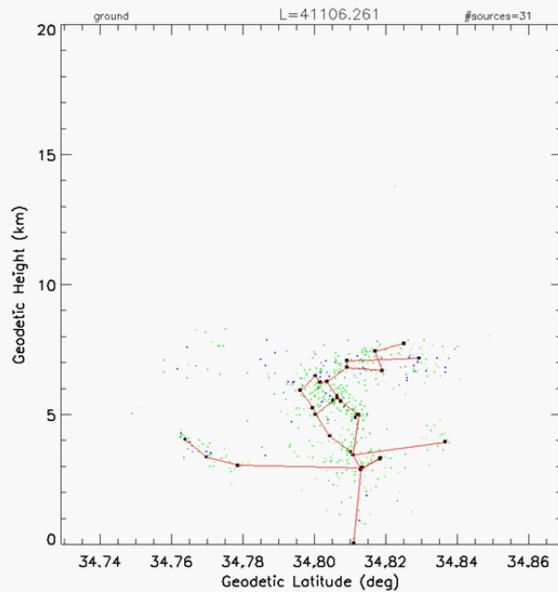
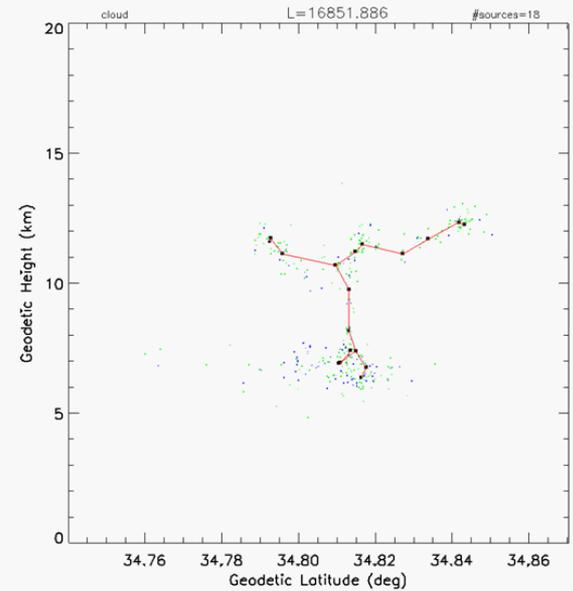
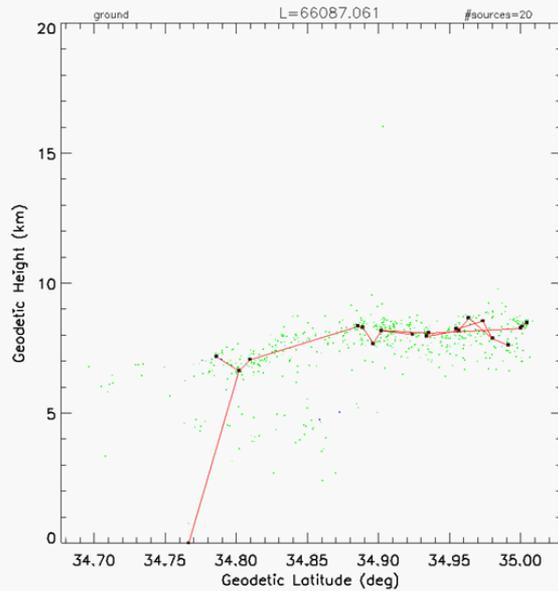
(based on Boccippio et al. 2001)



Overview of LNOM



Sample LNOM Channel Construction



LNOM NOx Profiles

- Based on Wang Lab results only
- Cooray nonreturn stroke processes to come!

$I_{cld} = 15 \text{ kA}$

All Flashes:
2.34 moles/km
($1.41 \times 10^{17} \text{ NO/J}$)

Ground Flashes:
9.79 moles/km
(3.72 moles/km)*

Cloud Flashes:
0.37 moles/km

*When subsequent stroke peak current is $\frac{1}{2}$ previous stroke's peak.

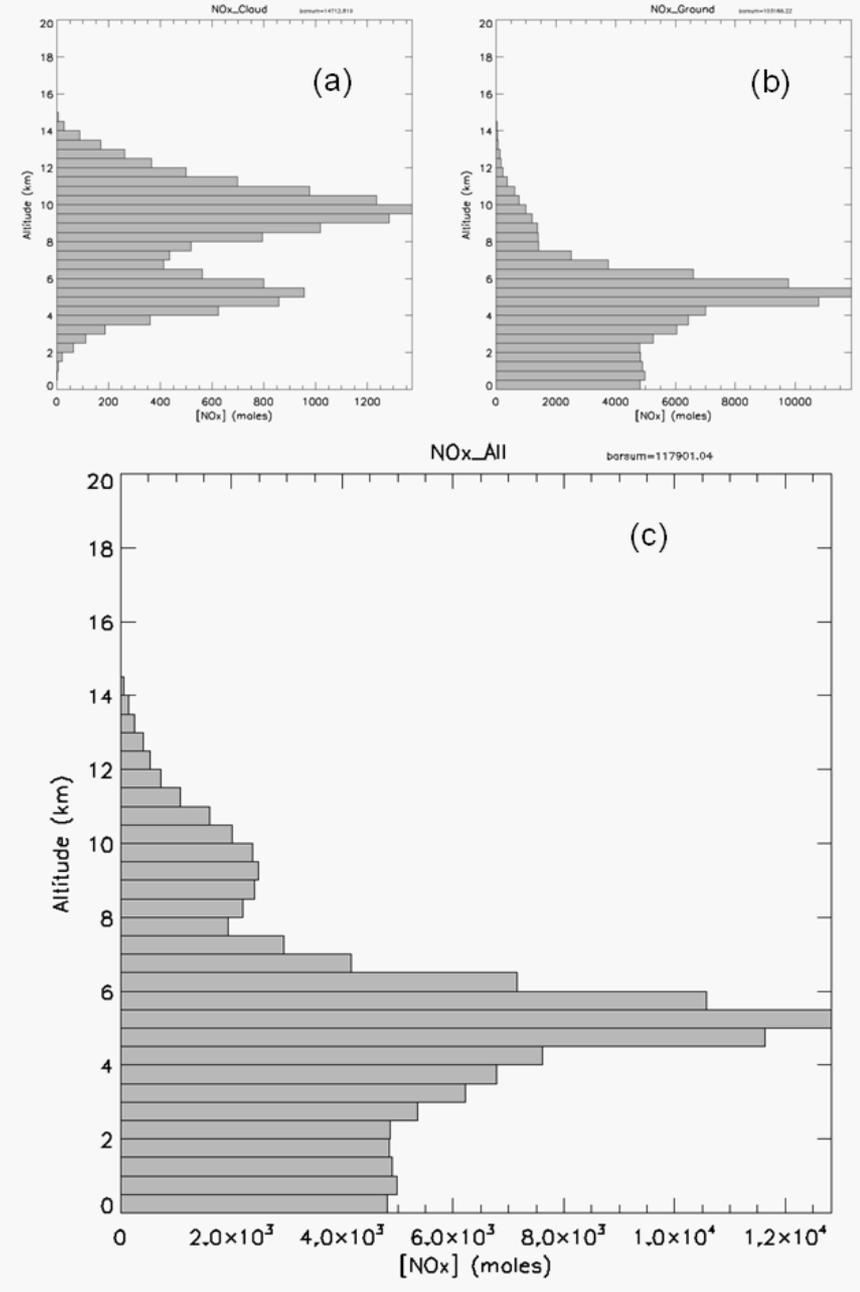


Figure 5. Lightning NOx Vertical Source Profile (VSP) for (a) cloud, (b) ground, and (c) all flashes. Cloud flash current is 15kA.