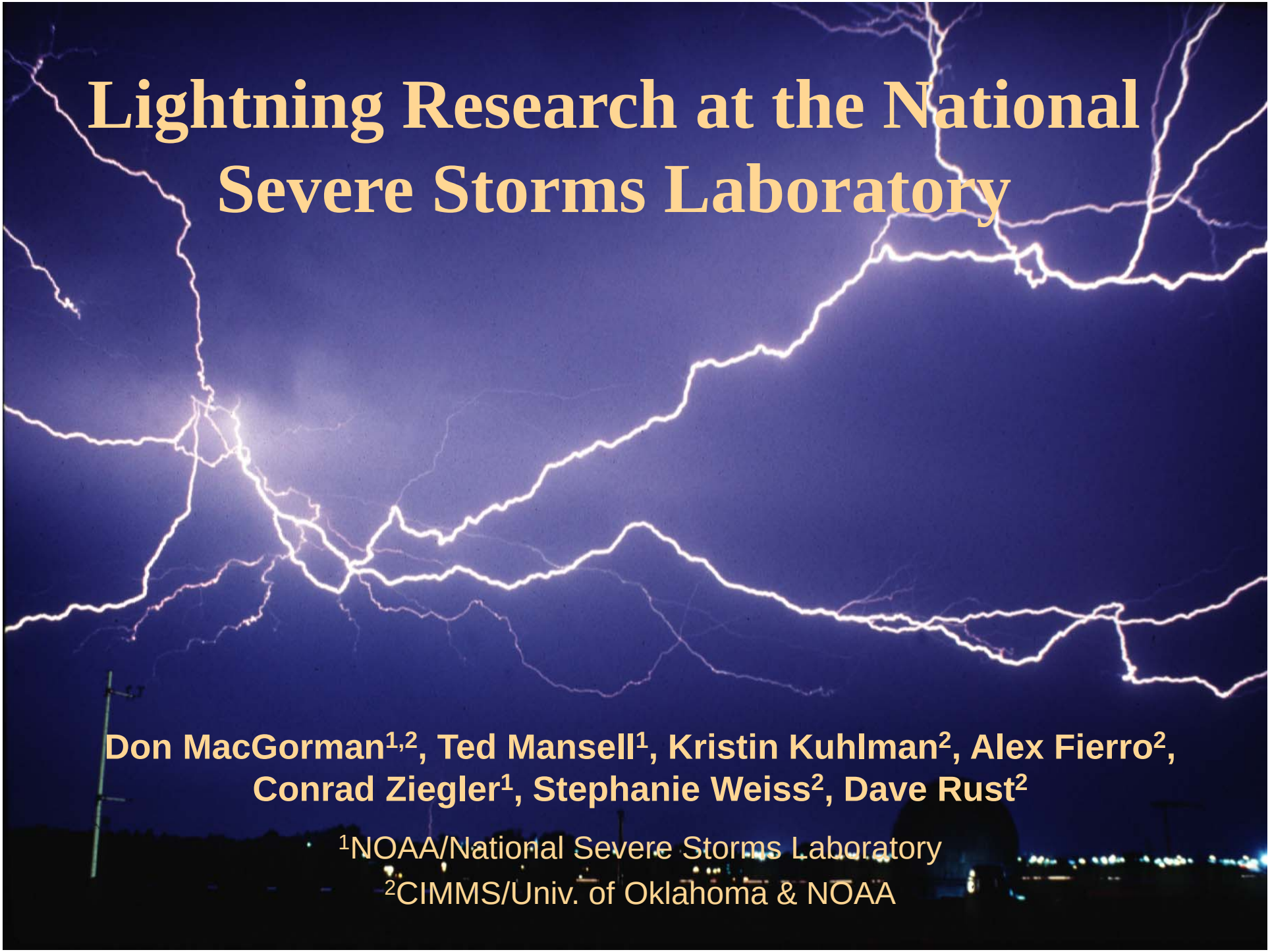


Lightning Research at the National Severe Storms Laboratory

Don MacGorman[1,2], Ted Mansell[1], Kristin Kuhlman[2], Alex Fierro[2], Conrad Ziegler[1], Stephanie Weiss[2], Dave Rust[2]

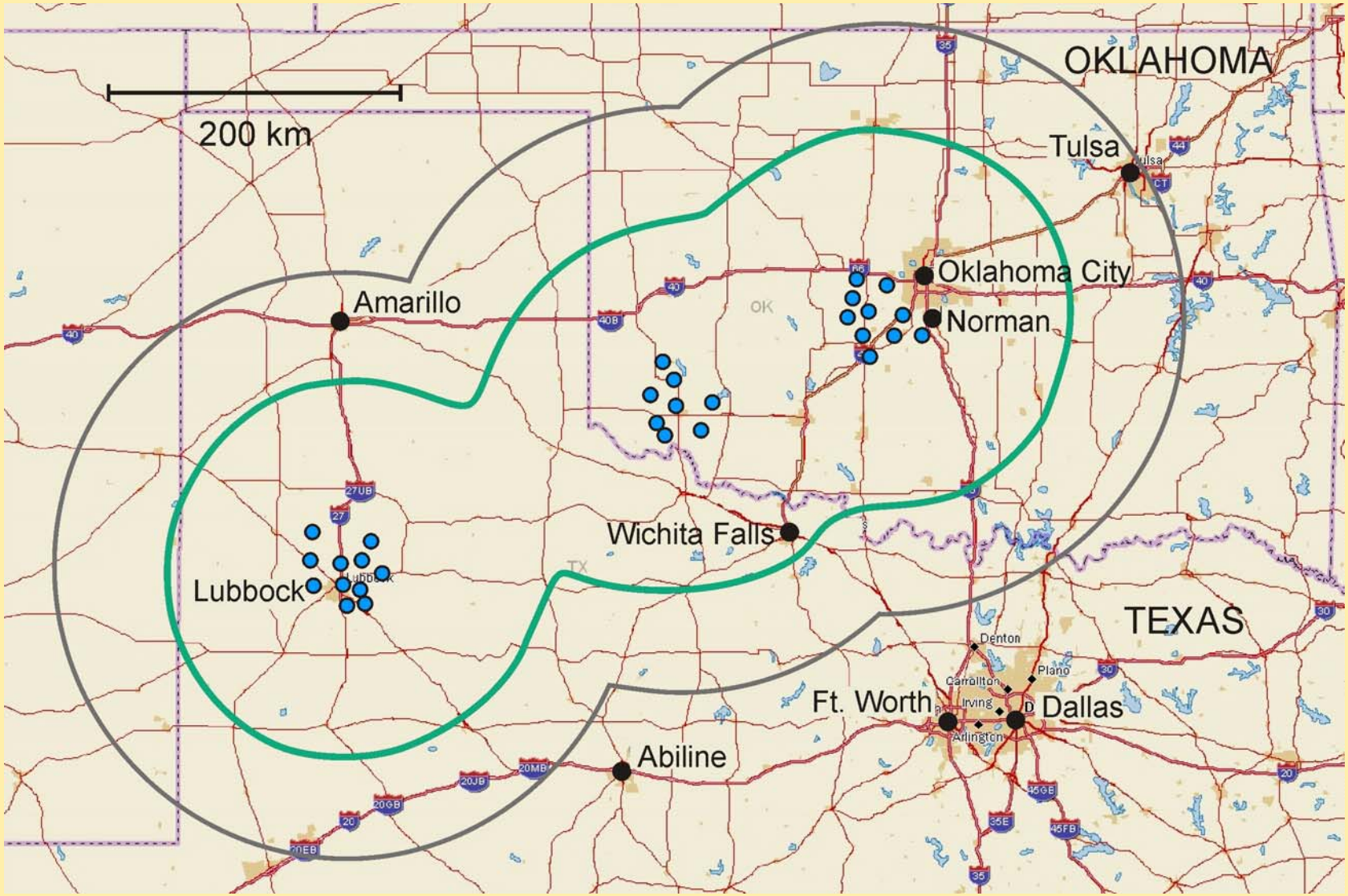
[1]NOAA/National Severe Storms Laboratory

[2]CIMMS/Univ. of Oklahoma & NOAA

NSSL/CIMMS Storm Electrification Research

- Storm electrification observations
  - Studies of OK-LMA data
  - Balloon-borne electric field & microphysics
- Applications for NWS operations
  - Storm tracking & trends by storm type
  - Lightning data assimilation
  - Lightning forecasts
- Lightning physics (initiation & attachment)
- Lightning climatology

OK-LMA + WT-LMA COVERAGE



DC3 OK-TX Ballooning & LMA Summary

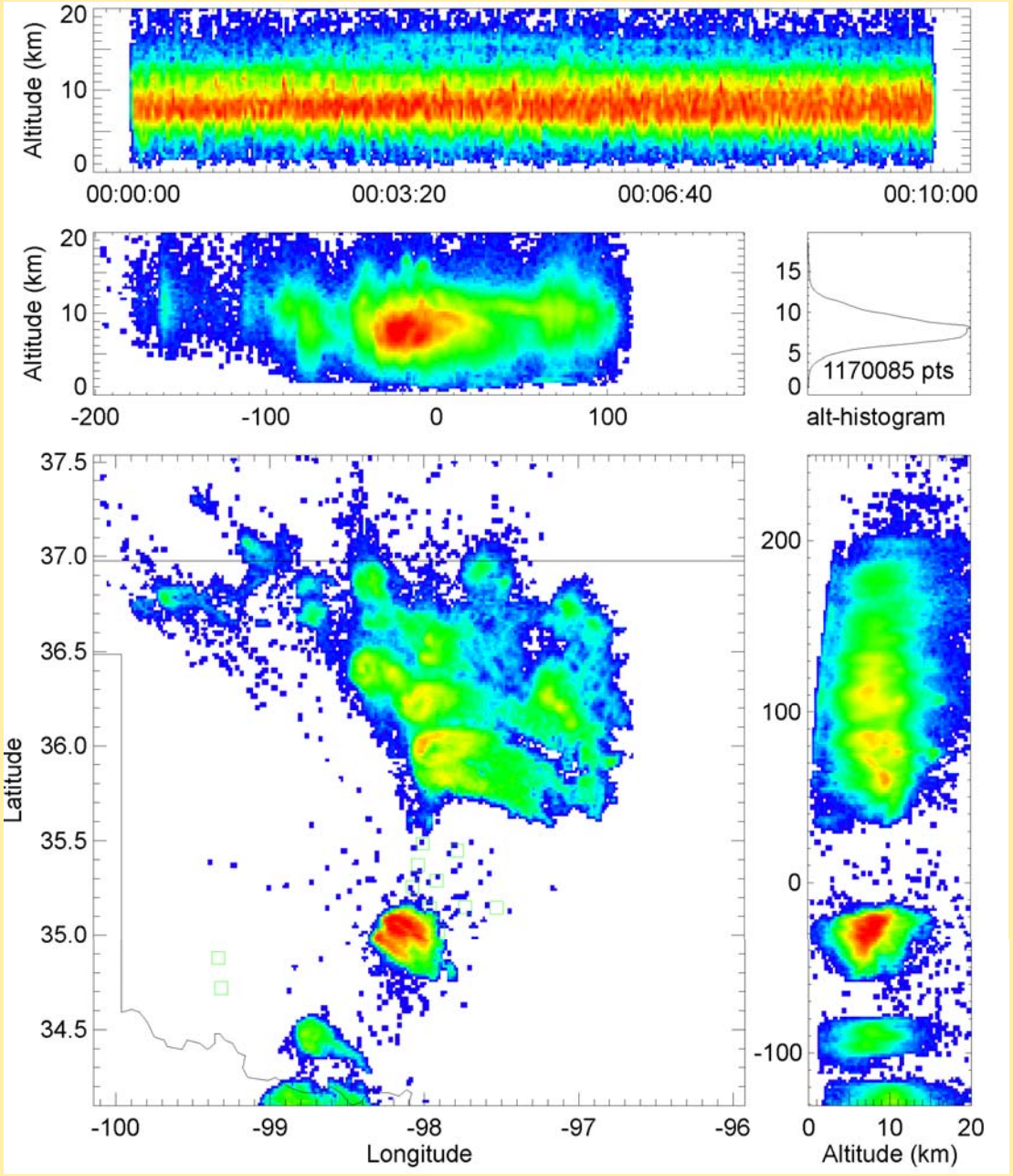
Environmental soundings:

39 on 13 days

In-storm soundings:

Good soundings on 7 days, 2 with Parsival

LMA data processed for central OK cluster, working on incorporating all stations with Texas stations

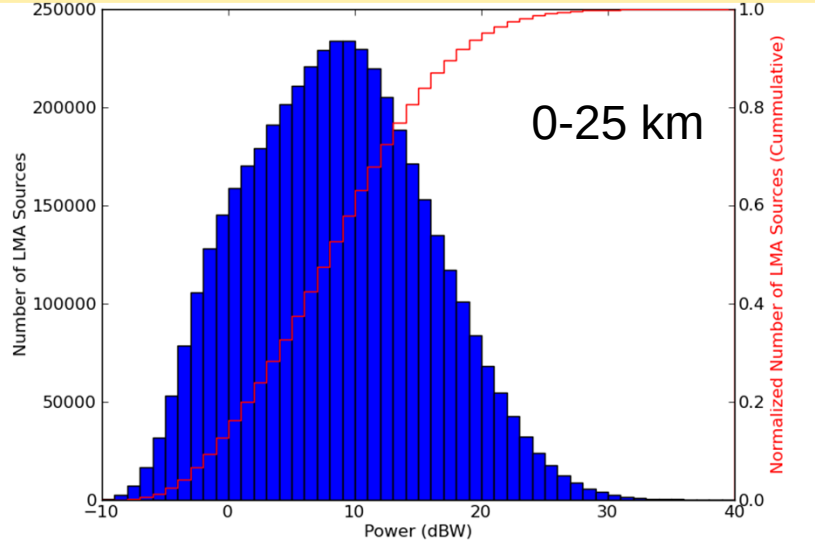


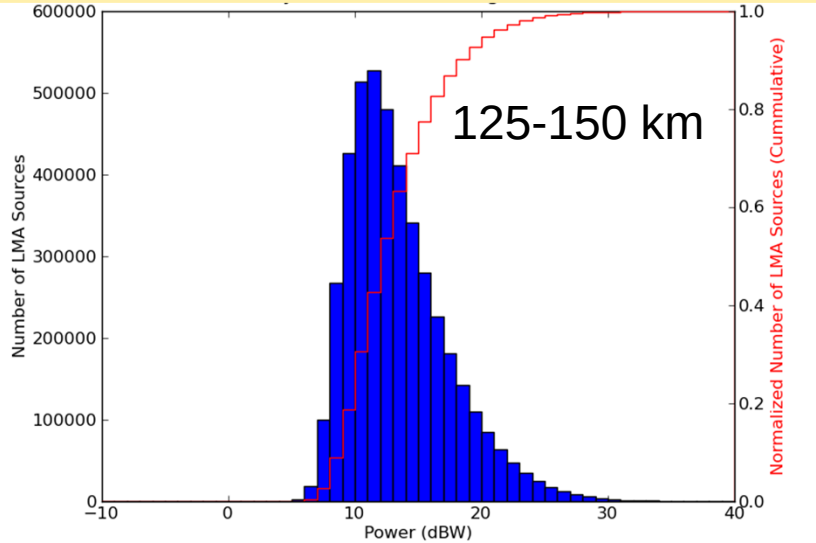
30 May 2012

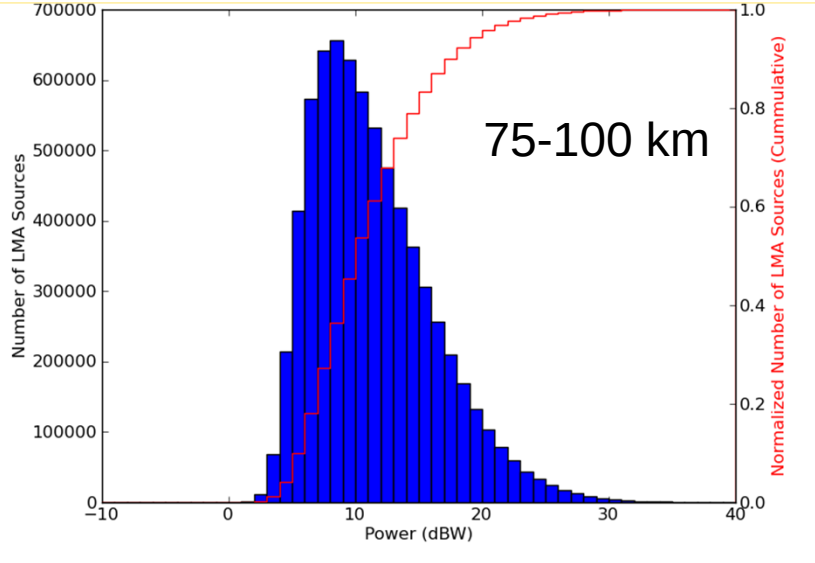
Tornadic Supercell

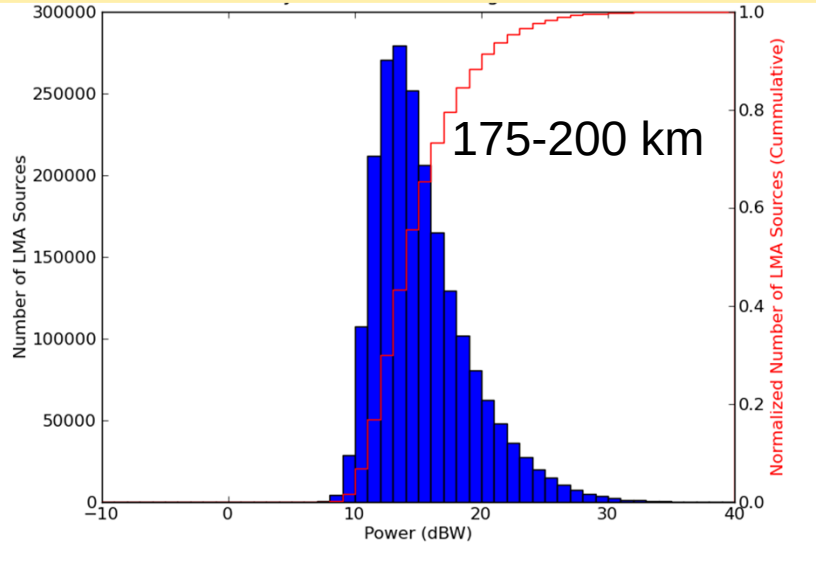
0000 – 0010 UTC

VHF Source Distribution vs Range

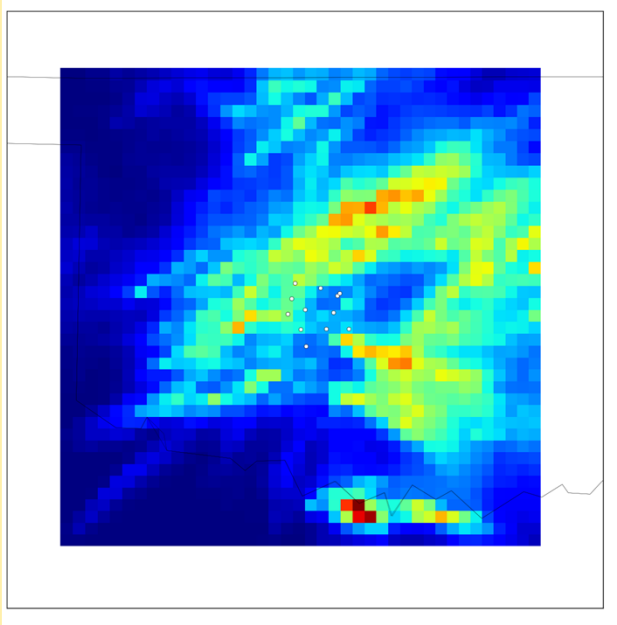






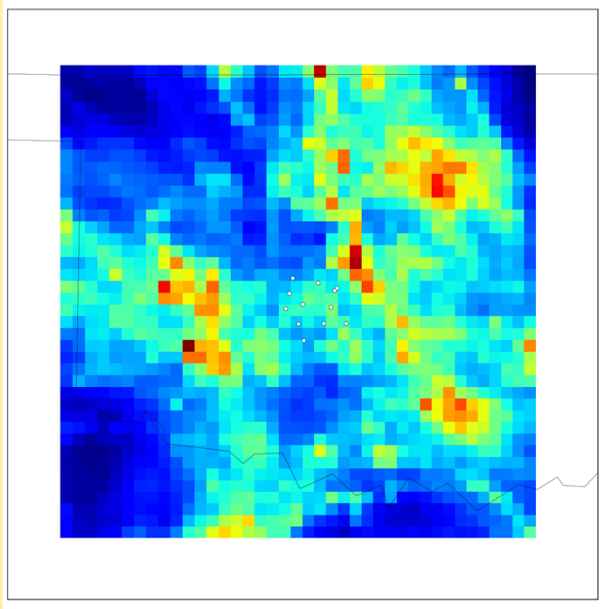


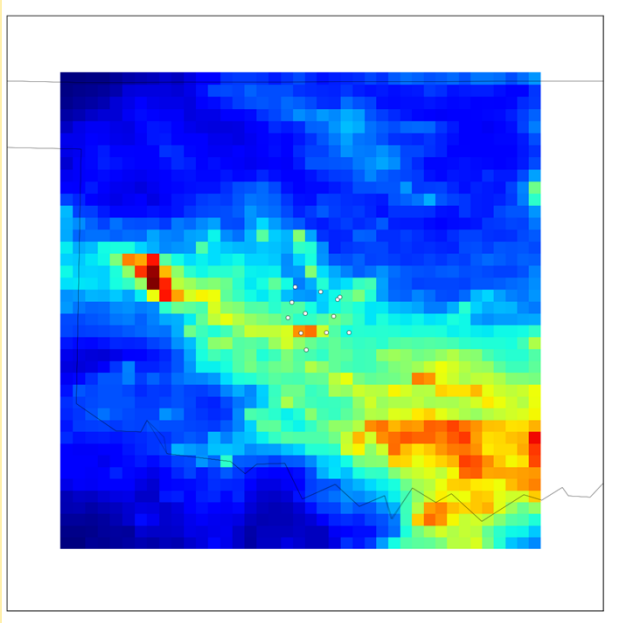
2009



March

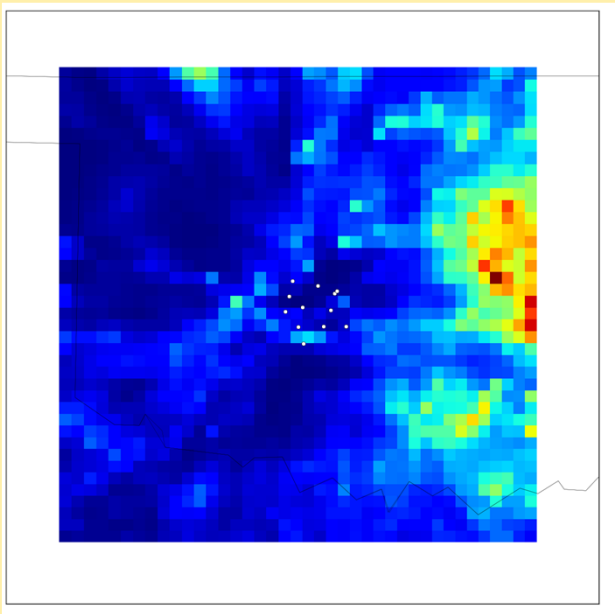
July



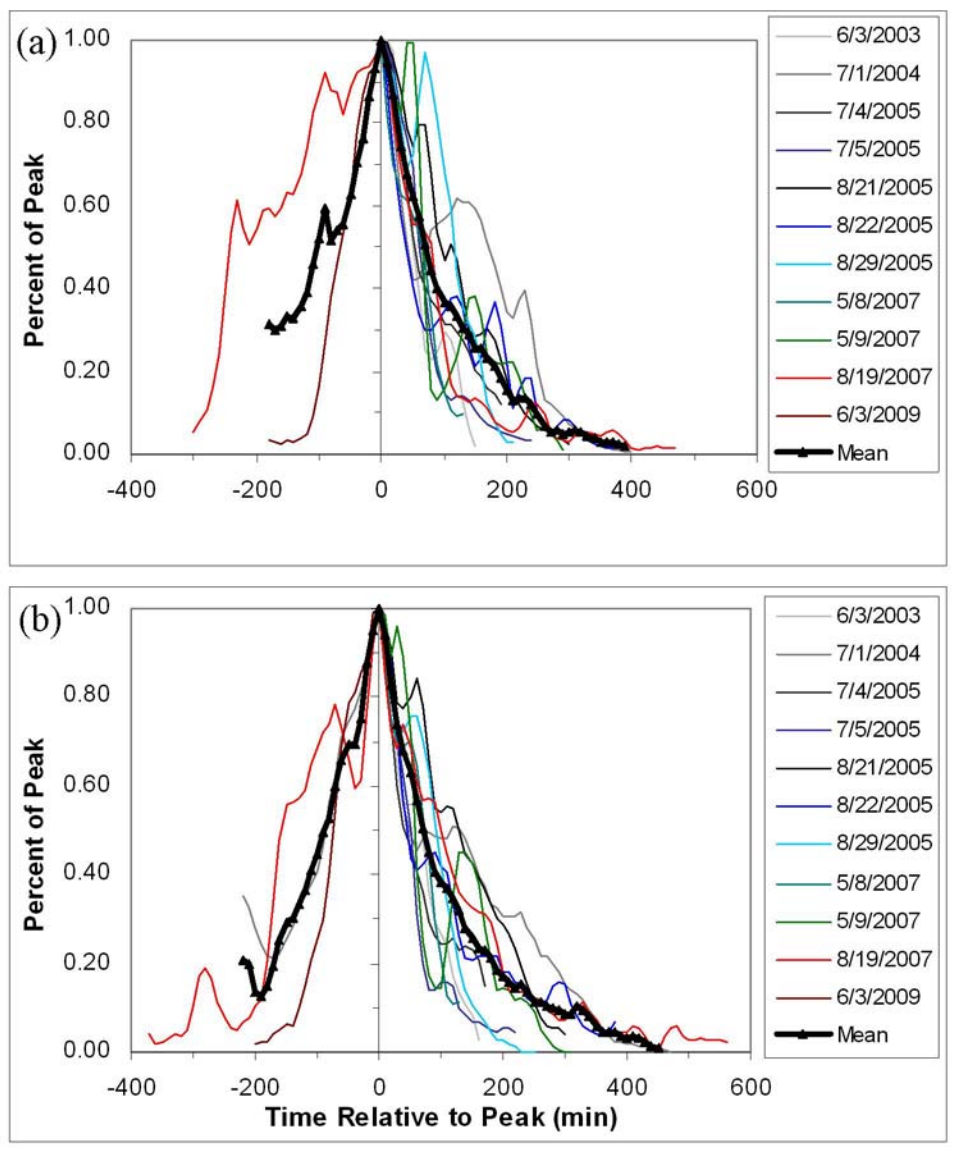


May

September



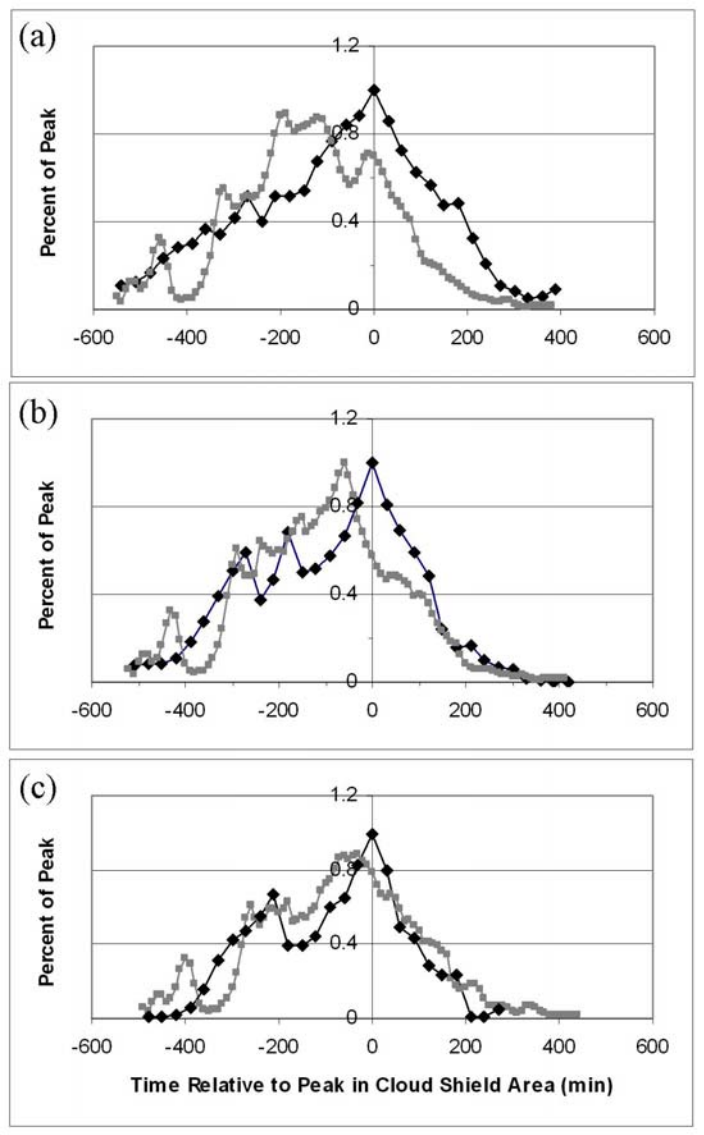
MCSs: Evolution of Flash Rates



Total Flash Rates

CG Flash Rates

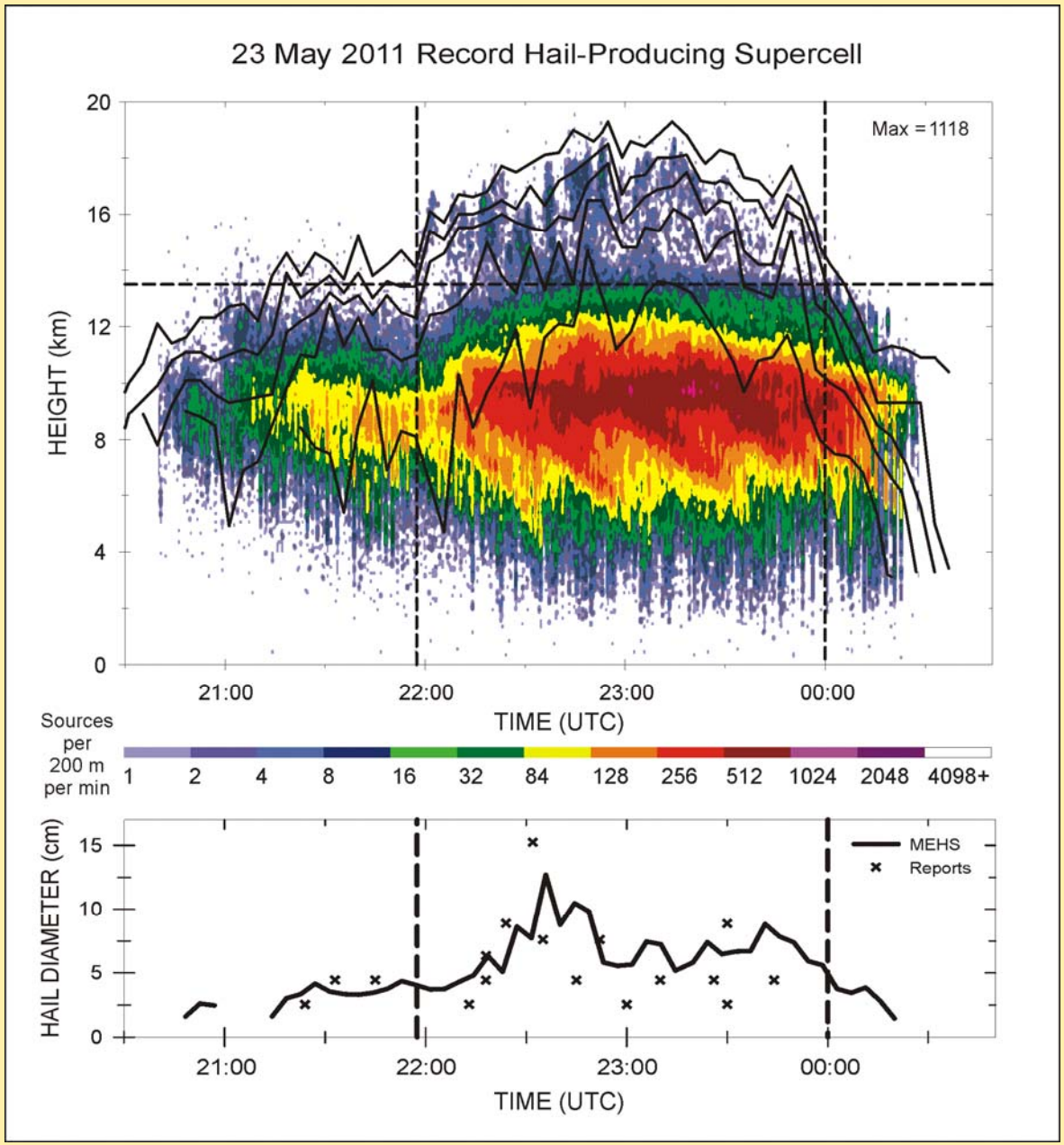
Peak in Total Flash Rate Relative to Peak in Brightness Temperature Area



-52°C: 11 MCSs

-60°C: 12 MCSs

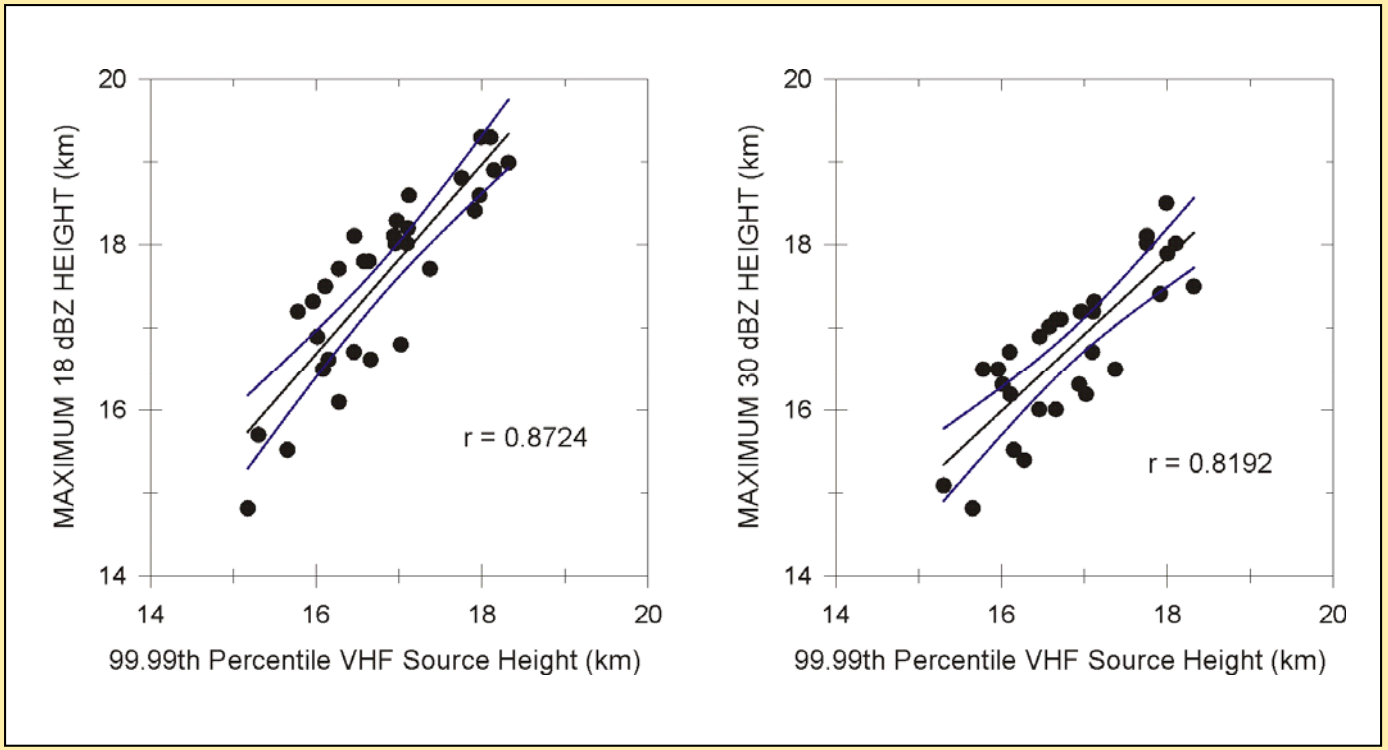
-66°C: 11 MCSs



Time-Height Plot of VHF Sources & Max Reflectivity Height

Maximum Estimated Hail Diameter

Correlation: Max VHF Source Height vs Max Reflectivity Height



Evolution of Flash Size