

A Total Lightning Climatology for the Tennessee Valley Region

E. W. McCaul Jr., S. J. Goodman, D. Buechler, R. Blakeslee, H. Christian, D. Boccippio, W. Koshak, J. Bailey, J. Hall, M. Bateman, W. Petersen,
Global Hydrology and Climate Center and NASA Marshall Space Flight Center 320
Sparkman Drive Huntsville, AL 35805

C. Darden, and T. Bradshaw
National Weather Service Forecast Office, Huntsville, AL

Climatological statistics derived from the first full year of operation of the North Alabama Lightning Mapping Array have been compiled. The LMA senses radiation from segments of lightning channels, and locates the position and time of each source, thus providing information about the total lightning activity generated by storm systems. The 10-sensor network reliably locates lightning events out to ranges of approximately 200 km. The North Alabama LMA began operations in November 2001, and has collected data on a wide variety of storm system types during its first year of operation, including outbreaks of tornadic and nontornadic supercells, squall lines, air-mass pulse storms, landfalling tropical cyclones, and elevated frontal convective systems.

The data are analyzed in terms of diurnal, seasonal, altitudinal and geographical patterns. Corrections are applied for known range and azimuth-dependent variations in network sensitivity caused by the specific layout of the network sensors. Intercomparisons with the local cloud-to-ground lightning climatology and with satellite-derived total lightning climatologies are also presented.