STUDIES OF LIGHTNING DATA IN CONJUNCTION WITH GEOSTATIONARY SATELLITE DATA

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Accomplishments in FY-84:

This study is not yet underway, but should begin shortly as funds are made available. Previous work on a related Center project has resulted in the archiving of Bureau of Land Management LLP data from the summer of 1983. There are also some geostationary three minute satellite images saved for this same period. These data are stored on magnetic tapes which can be processed and displayed on an interactive image processing system (McIDAS). The basic capabilities have also been developed for dial-in access to these data in real time as they become available from future storms.

Focus of Current Research Activities:

Over the next six months, much of our attention will go towards archiving a more complete data base upon which to perform our lightning studies. This effort will include:

(1) Continued archiving of Bureau of Land Management LLP, geostationary satellite, and NWS radar data, with special attention to suitable case study days; and,

(2) Expansion of the McIDAS real-time LLP access to other networks. Probable candidates for this expansion include the NSSL, NASA-Huntsville, and east coast SUNY networks.

At the same time, we will be developing additional processing tools for display and analysis of lightning location data in conjunction with geostationary satellite data. This effort will entail adapting existing McIDAS software to allow the production of statistical summaries and contouring of lightning characteristics over user defined areas or storms. We also want to be able to plot three-dimensional displays of lightning statisitics versus satellite and radar data; and to perform an error analysis of (and, if necessary, a correction algorithm for) lightning location data using overlapping regions of the BLM network.

Plans for FY-85:

Our effort in this period will be concentrated on relating satellite and radar observed storm features to lightning behavior. From satellite we can measure cloud top temperatures, anvil expansion, the locations of overshooting tops, and the evolution of all these characteristics over time. Radar adds additional information about rainfall intensity and cell structure. Using the data base and statistical techniques developed previously, we will be able to relate various measures of storm intensity and evolution to lightning location, frequency, flash multiplicity, and polarity.