

The Hazardous Weather Testbed: Moving Total Lightning Data from a Research Tool into Forecast and Warning Operations
Meteorological Applications of Lightning Data

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Until recently, the detection and monitoring of total lightning has been primarily utilized for research activity or for unique events such as space missions. Tools developed to monitor total lightning including the Lightning Mapping Array (LMA) and satellite-based Lightning Imaging Sensor (LIS) have been greatly employed by the research community during field programs and for case and climatology studies. The results from these studies have not only recapitulated the ties between lightning rates and storm intensity but have also sparked increased interest from the forecasting community for more data integration into operations. Meanwhile, private industry (e.g., Earth Networks and Vaisala) have developed ground-based sensors to monitor total lightning while the future also holds the additional promise of CONUS-wide, continuous, total lightning monitoring from geostationary satellites. Since 2010, the Hazardous Weather Testbed (HWT) in Norman, OK has been successfully utilized to provide forecasters with a first-hand look at the latest research concepts and products integrating total lightning data while educating lightning research scientists on the challenges, needs, and constraints of National Weather Service (NWS) warning forecasters. During the annual HWT Spring Experiment, NWS forecasters incorporated real-time total lightning data into their warning-decision process for various storm modes over multiple regions of the US. Specifically, products viewed by the forecasters have included: Flash Extent Density, Flash Initiation Density, Flash Size, and max and sum 30, 60, 120 min grids both at 1km and 8 km resolutions (to match the future GLM resolution) as well as total lightning storm trends and a lightning jump algorithm. In their evaluations, forecasters have noted that total lightning could be an incredibly useful situational awareness tool and may be able to provide additional guidance during a warning decision. Additionally, total lightning data shows promise from a storm safety and aviation forecasting perspective. This presentation will visit the recent history of total lightning use in warning operations as well as current and future plans for implementation, use, and training.