A Total Lightning Product Monitor
Intended for the Meteorological Applications of Lightning Data Session Topic

Steven J. Goodman (NOAA/National Environmental Satellite Data and Information Service, Code 417, NASA Goddard Space Flight Center, Greenbelt, MD, USA; steven.j.goodman@noaa.gov); M. Bateman, P. M. Bitzer, B. Carcione, K. M. Calhoun, K. L. Cummins, S. D. Rudlosky, and K. D. White

The National Weather Service has a requirement for total (in-cloud and cloud-to-ground) lightning observations on a global scale to support forecast services and warning decision-making. Science and application development along with pre-operational product demonstrations and evaluations at NWS forecast offices and NOAA testbeds are now preparing forecasters to use total lightning data. A key addition to the suite of observations will be total lightning from geostationary earth orbit. The first of these satellite lightning detectors will be the NOAA GOES-R Geostationary Lightning Mapper with a planned launch in late 2015. New applications will use GLM combined with ground-based networks to identify and locate cloud-to-ground (CG) lightning strikes and in-cloud (IC) lightning flashes over regional, continental, and near global scales with high temporal resolution and low latency. A variety of techniques and frequencies from radio to optical are used to quantify the lightning activity (type, location, rate, initiation, propagation, horizontal and vertical extent, polarity, amplitude, and energy). The lightning data may be viewed in the form of point data, gridded data, density maps, contours, histograms, or ratios (IC:CG). These data can be overlaid on numerical weather prediction model output, radar, or satellite imagery or with products derived from them. A challenge facing both the product developer and end user is how best to quantify, as well as merge, the different pieces of information about lightning that are derived from different observing systems, having different capabilities and limitations, into a coherent whole that best contributes to the decision process. In this paper we describe the capabilities desired of a lightning product monitor and show examples how this information might be used as an extension to the decision support systems that will be available to the forecaster.