Since the establishment of the first U.S. national-scale lightning detection networks in the late 1980’s, lightning information has steadily grown in value and use in meteorological applications. Today, this is exemplified by the broad use of multiple lightning datasets by industry and weather-service forecasters, as well as by hundreds of research scientists. The ultimate expression of the importance of this information is the inclusion of the Geostationary Lightning Mapper (GLM) as one of the central instruments on the GOES-R series of satellites, with the second-of-four being launched next month.

This presentation will provide a brief overview of the electrical nature of the thunderstorm lifecycle from the perspective of ground- and space-based lightning observations. Lightning locating systems will be reviewed in terms of detection methodology, performance characteristics, and spatial coverage. The complimentary nature of lightning information, when coupled with other remote-sensing observations, will be illustrated through examples of industrial, meteorological and climatological applications. Recent findings about the performance of GLM on GOES-16 will also be presented. The talk will conclude with a brief overview of the thunderstorm-driven electrical environment we live in, highlighting the value of the fair-weather electric field for monitoring the global nature and strength of deep convection.

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