

Identification and Forecasting of High Impact Weather with Total Lightning: Future Opportunities in the GLM Era

The launch of the Geostationary Lightning Mapper (GLM) on the GOES-R satellite will provide new opportunities relating total lightning information to storm intensity and severity (e.g., tornado, hail, thunderstorm winds). GLM will provide hemispheric coverage of total lightning (i.e., combination of the in-cloud and cloud-to-ground flashes in any given storm) building on the legacy of the optically based Lightning Imaging Sensor (LIS) on the TRMM satellite that has been observing lightning from low-earth orbit for nearly 16 years. GLM's increased geostationary coverage will allow operational functionality of total lightning like never before. Research over the last decade has further developed the utility of total lightning to aid in forecasting high impact weather. The rapid increase in a thunderstorm's lightning activity (i.e., a "lightning jump") has been shown to be related to storm intensity and the increased potential of severe weather because of the physical and dynamical ties between storm motions, precipitation development, and cloud electrification. This information can then be used by NWS forecasters to increase situational awareness during convective weather and to improve warning operations for severe storms. This presentation will provide an overview of total lightning and GLM, the connection between lightning and severe storm processes, the lightning jump in tornadic storms, and recent examples of the lightning jump being successfully tested by National Weather Service (NWS) forecasters in simulated warning operations during the Spring 2014 Hazardous Weather Testbed (HWT).