

THE GOES-R GEOSTATIONARY LIGHTNING MAPPER (GLM)

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ABSTRACT

The Geostationary Operational Environmental Satellite (GOES-R) is the next series to follow the existing GOES system currently operating over the Western Hemisphere. Superior spacecraft and instrument technology will support expanded detection of environmental phenomena, resulting in more timely and accurate forecasts and warnings. Advancements over current GOES capabilities include a new capability for total lightning detection (cloud and cloud-to-ground flashes) from the Geostationary Lightning Mapper (GLM), and improved storm diagnostic capability with the Advanced Baseline Imager. The GLM will map total lightning activity (in-cloud and cloud-to-ground lightning flashes) continuously day and night with near-uniform spatial resolution of 8 km with a product refresh rate of less than 20 sec over the Americas and adjacent oceanic regions. This will aid in forecasting severe storms and tornado activity, and convective weather impacts on aviation safety and efficiency. In parallel with the instrument development, a GOES-R Risk Reduction Team and Algorithm Working Group Lightning Applications Team have begun to develop the Level 2 algorithms, cal/val performance monitoring tools, and new applications. Proxy total lightning data from the NASA Lightning Imaging Sensor on the Tropical Rainfall Measuring Mission (TRMM) satellite and regional test beds are being used to develop the pre-launch algorithms and applications, and also improve our knowledge of thunderstorm initiation and evolution. In this paper we will report on new Nowcasting and storm warning applications being developed and evaluated at various NOAA Testbeds.