

The GOES-R Geostationary Lightning Mapper (GLM) and the Global Observing System for Total Lightning

Steven J. Goodman¹, R. J. Blakeslee², W. Koshak², D. Buechler³, L. Carey³, T. Chronis³, D. Mach⁴, M. Bateman⁴, H. Peterson⁴, E. W. McCaul Jr.⁴, G. T. Stano⁵, P. M. Bitzer³, S. D. Rudlosky¹, and K. L. Cummins⁶

¹NOAA, ²NASA-MSFC, ³University of Alabama-Huntsville, ⁴Universities Space Research Association, ⁵ENSCO, Inc., ⁶University of Arizona

The Geostationary Operational Environmental Satellite (GOES-R) series provides the continuity for the existing GOES system currently operating over the Western Hemisphere. New and improved instrument technology will support expanded detection of environmental phenomena, resulting in more timely and accurate forecasts and warnings. Advancements over current GOES include a new capability for total lightning detection (cloud and cloud-to-ground flashes) from the Geostationary Lightning Mapper (GLM), and improved temporal, spatial, and spectral resolution for the next generation Advanced Baseline Imager (ABI). The GLM will map total lightning continuously day and night with near-uniform spatial resolution of 8 km with a product latency 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 among a number of potential applications. The GLM will help address the National Weather Service requirement for total lightning observations globally to support warning decision-making and forecast services. Science and application development along with pre-operational product demonstrations and evaluations at NWS national centers, forecast offices, and NOAA testbeds will prepare the forecasters to use GLM as soon as possible after the planned launch and check-out of GOES-R in 2016. New applications will use GLM alone, in combination with the ABI, or integrated (fused) with other available tools (weather radar and ground strike networks, nowcasting systems, mesoscale analysis, and numerical weather prediction models) in the hands of the forecaster responsible for issuing more timely and accurate forecasts and warnings.