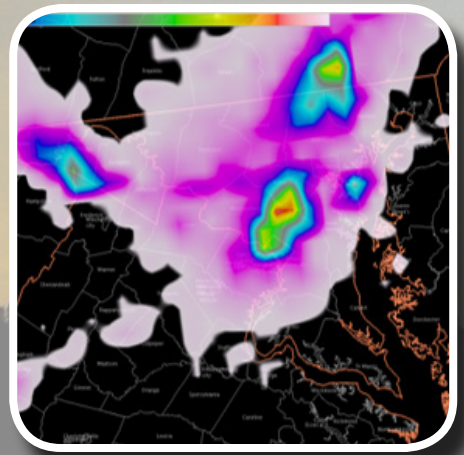




GOES-R

Geostationary Lightning Mapper (GLM)

Increased severe storm warning lead time
Earlier indication of impending lightning strikes to the ground
Total lightning detection



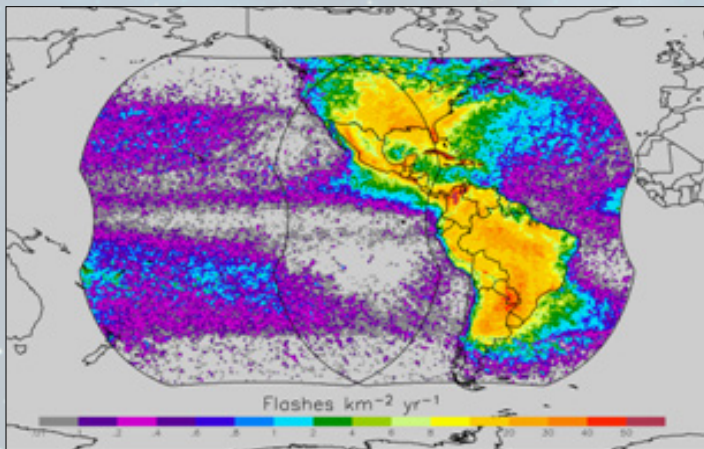
What is GLM?

The Geostationary Lightning Mapper (GLM), on board the Geostationary Operational Environmental Satellite – R Series (GOES-R) spacecraft, will be the first operational lightning mapper flown in geostationary orbit. GLM will measure total lightning, both in-cloud and cloud-to-ground, to aid in forecasting intensifying storms and severe weather events. GLM is unique both in how it operates and in the information it collects.

The instrument is sensitive to the in-cloud lightning that is most dominant in severe thunderstorms and provides nearly-uniform total lightning coverage over the region of interest.

How does it work?

GLM is a single-channel, near-infrared optical transient detector that can detect the momentary changes in an optical scene, indicating the presence of lightning. GLM will detect and map total lightning activity continuously over the Americas and adjacent ocean regions with near-uniform spatial resolution of approximately 10 kilometers. The instrument will collect information such as the frequency, location and extent of lightning discharges to identify intensifying storms, which are often accompanied by increased lightning activity.



Combined field-of-view of the GLM from GOES East and GOES West.



**Geostationary
Lightning
Mapper (GLM)**

What benefits will it provide?

Trends in total lightning that will be available with GLM have the promise of providing critical information to forecasters which will allow them to focus on developing severe storms much earlier than they can currently, and before these storms produce damaging winds, hail or even tornadoes. Such storms often exhibit a significant increase in total lightning activity, particularly in-cloud lightning, often many minutes before radar detects the potential for severe weather. Used in combination with radar, data from the GOES-R Advanced Baseline Imager instrument, and surface observations, GLM data has great potential to increase lead time for severe thunderstorm and tornado warnings. Data from the instrument will also be used to produce a long-term database to track decadal changes in lightning activity. This is important due to lightning's role in maintaining the electrical balance between Earth and its atmosphere and potential changes in extreme weather and severe storms under a changing climate.



The damage done to a tree that was struck by lightning.

- ✓ Increased tornado and other severe storm warning lead time
- ✓ Better detection of heavy rainfall and flash flooding
- ✓ Improved aviation flight route planning
- ✓ Early warning of ground strike hazards
- ✓ Data for long-term climate variability studies

Instrument Contractor

LOCKHEED MARTIN



Palo Alto, California

Learn more

<http://www.goes-r.gov/spacesegment/glm.html>

