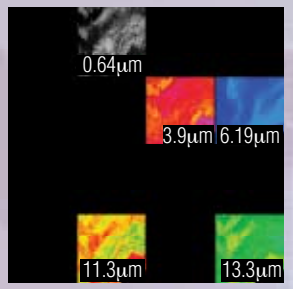
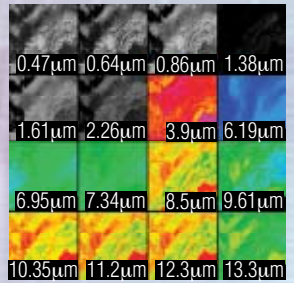
GOES-R Capabilities

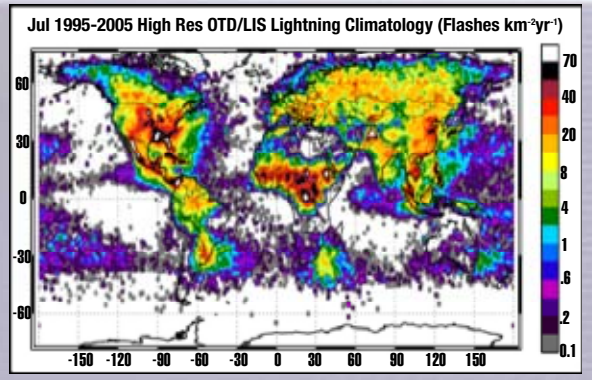
- Spectral, spatial, and temporal resolution improved by factors of 3, 4, and 5
- Lightning detection with real-time maps of all lightning activity in the Western Hemisphere
- Increased dynamic range, resolution, and sensitivity in monitoring solar X-ray flux to improve models of the ionosphere
- Real-time solar extreme ultraviolet movies in 6 channels will improve models of flares and coronal mass ejections
- Monitoring of low energy ionizing responsible for spacecraft charging
- Re-broadcast will provide 10 times more data than the current GOES Variable format

Current GOES (5 Channels)



Future GOES-R (16 Channels)





1995-2005 Mean Global Lightning Flash Density for the month of July courtesy of the NASA LIS Science Team

GOES-R Communications Mission:

Remote environmental sensing instruments comprise only part of the payload on the GOES-R Series satellites. In addition, there are several GOES-unique communications capabilities upon which thousands of users depend. These special-purpose "transponders" relay data directly to users to meet critical needs. They include:

HRIT/EMWIN – High Rate Information Transmission – A new high data rate combination of today's EMWIN and LRIT increasing data rate by factor of nearly 3 times the old rate

LRIT - Low Rate Information Transmission

EMWIN - Emergency Managers Weather Information Network

DCS - Data Collection System

SAR - Search and Rescue

GRB - GOES Re-Broadcast

Contact Information:

NOAA/NESDIS GOES-R Program Office located at:

NASA/GSFC
Code 417
Greenbelt, MD 20771
(301) 286-1355

Or contact us through our website:

www.GOES-R.gov www.NOAA.gov
www.NASA.gov

the next generation

GOES-R

the nation's weather satellite

The Geostationary Operational Environmental Satellite "R" series (GOES-R) program is a key element to meeting the National Oceanic and Atmospheric Administration's (NOAA) mission. The advanced spacecraft and instrument technology used on the GOES-R series will result in more timely and accurate weather forecasts. It will improve support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The first launch of the GOES-R series satellite is scheduled for 2015.

Photo: Bob Blankenship

GOES-R Instruments: Earth, Solar & Space Weather

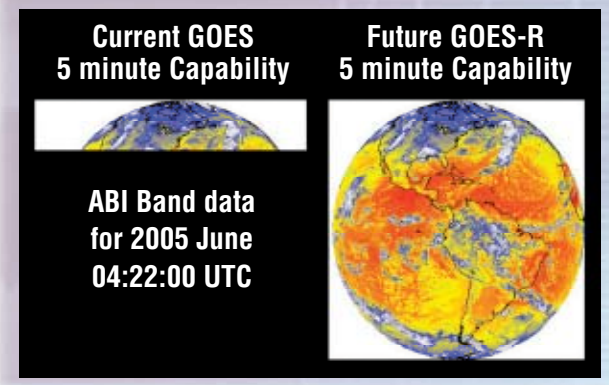



Photo: Daphne Zaras

ABI

The Advanced Baseline Imager (ABI) is a 16-channel, high-resolution imaging radiometer being designed for the GOES-R series of satellites covering visible, short, mid- and long-wavelength infrared (IR) spectral regions. ABI has improved spectral, spatial, and temporal image resolution by factors of 3, 4, and 5 respectively.

ABI covers the Earth approximately 5 times faster than the current imager.



ABI Capabilities

Parameter	Current	Future	Comments
Number of Visible Bands	1	2	Cloud cover, plant health and surface features during the day
Number of Near IR Bands	0	4	Cirrus clouds, low cloud/fog and fire detection
Number of IR Bands	4	10	Upper-level water vapor, clouds, sulfur dioxide (SO_2), sea surface temperature (SST)
Coverage Rate	25 min for Full Disk	5 min for Full Disk	5 times faster
Spatial Resolution of 0.6μm Band	1 km	0.5 km	At the sub-satellite point
Spatial Resolution of the IR Bands	4-8 km	2 km	At the sub-satellite point
On-Orbit Visible Calibration	No	Yes	Improved composite images

SEISS

Space Environmental In-Situ Suite (SEISS) is an ensemble of electron, proton and heavy ion detecting sensors. SEISS data drives the Solar Radiation Storm portion of NOAA's Space Weather Scales and other NOAA operational Alerts and Warnings.

EXIS

Extreme UV/X-ray Irradiance Sensor (EXIS) – Detects solar soft X-ray irradiance (XRS) and solar Extreme UltraViolet (EUVS) spectral irradiance in the 5-127 nm range. XRS monitors solar flares (and helps predict proton events) that can disrupt communications and degrade navigational accuracy. EUVS monitors solar variations that directly affect satellite drag/tracking and ionospheric changes, which impact communication and navigation operations.

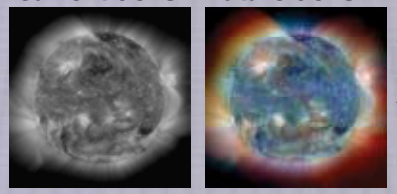
SUVI

Solar UV Imager (SUVI) will locate coronal holes, flares and coronal mass ejection source regions. SUVI data will also be used to characterize active region complexity, which will enable better forecasting of space weather and provide early warnings of possible impacts to the Earth environment.

Magnetometer

The magnetometer measures the time-varying field in the magnetosphere. It provides the only operational measure of the impact of geomagnetic storms at geosynchronous orbit, and it is key for interpreting solar radiation storm measurements by SEISS.

GOES-R will produce multi-band "color" images at the same rate as GOES N/P produces single bands.



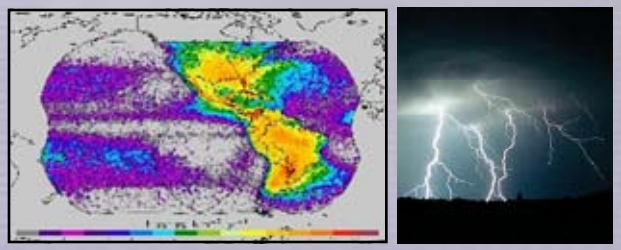
Images courtesy of Solar and Heliospheric Observatory Extreme Ultraviolet Imaging Telescope, a joint NASA/ESA program, and NOAA Space Weather Prediction Center

GLM

The Geostationary Lightning Mapper (GLM) is an optical transient detector and imager operating in the near-IR that will map all (in-cloud and cloud-to-ground) lightning flashes with near uniform spatial resolution of 8-12 km continuously day and night over the Americas and adjacent oceanic regions. GLM will provide:

- **Early indication of storm intensification and severe weather events**
- **Tornado warning lead time of 20 minutes or more**
- **Data for long-term climate variability studies**

Mean Annual Lightning Flash Density



Lightning Imaging Sensor (LIS)/Optical Transient Detector (OTD) observations within the GOES-R field of view courtesy of NASA LIS Science Team, Huntsville Alabama