Unique Payload Services

Remote environmental sensing is only part of the GOES-R mission. The satellites will also provide unique capabilities to relay data directly to users to meet critical needs.

Data Collection System (DCS)

Remote Automated Weather Stations transmitting to GOES

DCS is a satellite relay system used to collect information from Earth-based data collection platforms that transmit in-situ environmental sensor data from more than 20,000 platforms across the hemisphere.

GOES-R Rebroadcast (GRB)

GRB is the primary space relay of Level 1b products, replacing the GVAR (GOES VARiable) service. GRB will provide full resolution, calibrated, navigated, near real-time direct broadcast data.

High Rate Information Transmission/Emergency Managers Weather Information Network (HRIT/EMWIN)

EMWIN is a direct service that provides users with weather forecasts, warnings, graphics and other information directly from the National Weather Service (NWS) in near real-time. HRIT service is a new high data rate (400 Kpbs) version of today's LRIT (Low Rate Information Transmission), broadcasting GOES-R satellite imagery and selected products to remotely-located user terminals.

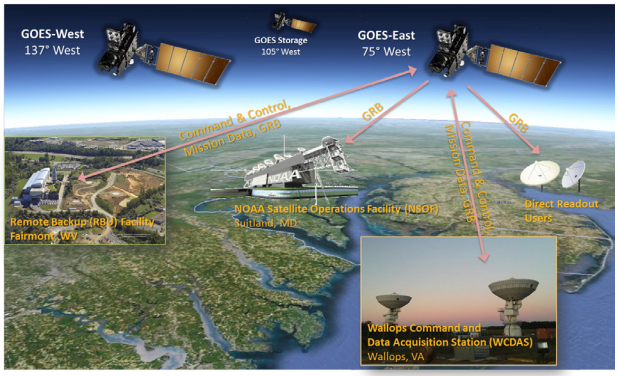
Search and Rescue Satellite Aided Tracking (SARSAT)

The SARSAT system detects and locates mariners, aviators and other recreational users in distress. GOES-R will continue the legacy function of the SARSAT system on board NOAA's GOES satellites. This system uses a network of satellites to quickly detect and locate signals from emergency beacons onboard aircraft, vessels and from handheld personal locator beacons. The GOES-R SARSAT transponder will operate with a lower uplink power than the current system (32 bBm), enabling GOES-R to detect weaker beacon signals.

Emergency Beacons

System Architecture

Ground support is critical to the GOES-R mission. The GOES-R ground system will operate the satellites, receive data from the spacecraft and generate and distribute real-time GOES-R data products. The ground system will operate from two primary locations: the NOAA Satellite Operations Facility (NSOF) in Suitland, Md., and the Wallops Command and Data Acquisition Center (WCDAS) at Wallops, Va. A third facility in Fairmont, W. Va. will serve as the Remote Backup Unit in case of a systems or communications failure at either or both NSOF and WCDAS.



The GOES-R Series Program is a collaborative development and acquisition effort between NOAA and NASA. The first satellite in the GOES-R series is scheduled to launch in early 2016.

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GOES-R

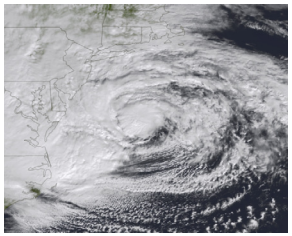
Geostationary Operational Environmental Satellite R-Series

The Nation's Next-Generation Weather Satellites

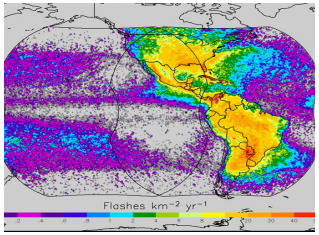
The GOES-R series will provide significant improvements in the detection and observations of meteorological phenomena that directly affect public safety, protection of property and our nation's economic health and prosperity.

Why GOES-R?

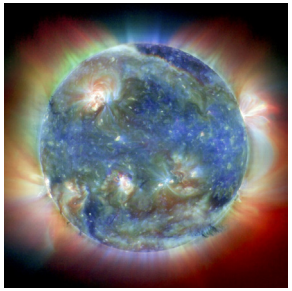
- √ To improve hurricane track & intensity forecasts
- √ To increase thunderstorm & tornado warning lead time
- √ To improve aviation flight route planning
- √ Better data for long-term climate variability studies
- √ To improve solar flare warnings for communications and navigation disruptions
- √ More accurate monitoring of energetic particles responsible for radiation hazards to humans and spacecraft
- √ Better monitoring of space weather to improve geomagnetic storm forecasting



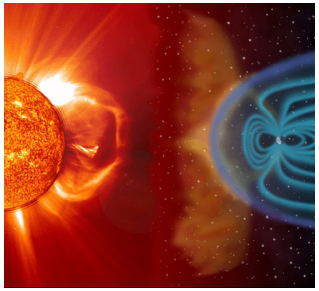
Visual and Infrared Imagery



Lightning Mapping



Solar Imaging



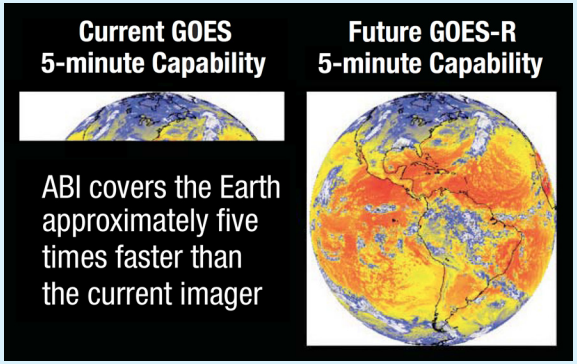
Space Weather Monitoring

The GOES-R series is a four-satellite program (GOES-R, S, T and U) that will extend the availability of the operational GOES satellite system through 2036.

GOES-R Instruments: Earth, Solar and Space Weather

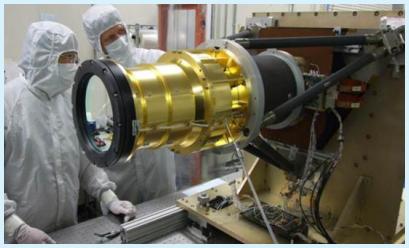
Advanced Baseline Imager (ABI)

ABI is the primary instrument on board GOES-R for imaging Earth's weather, climate, oceans and the environment. ABI will view the Earth with 16 spectral bands (compared to five on current GOES) and will provide three times more spectral information, four times the spatial resolution and more than five times faster coverage than the current system.



Geostationary Lightning Mapper (GLM)

GLM will be the first-ever operational lightning mapper flown from geostationary orbit. GLM maps total lightning (in-cloud and cloud-to-ground) activity continuously day and night over the Americas and adjacent ocean regions. Research and testing has demonstrated GLM's potential for improvement in tornado warning lead time and false alarm rate reduction.



Space Environment In-Situ Suite (SEISS)

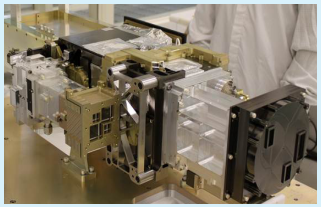
SEISS is an array of sensors that will monitor proton, electron and heavy ion fluxes at geosynchronous orbit. Information provided by SEISS will be used for assessing radiation hazards to astronauts and satellites and to warn of high flux events, mitigating damage to radio communication.

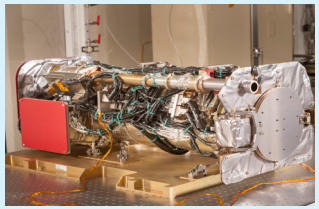
Magnetometer

The Magnetometer will provide measurements of the space environment magnetic field that controls charged particle dynamics in the outer region of the magnetosphere. These particles can be dangerous to spacecraft and human spaceflight. The geomagnetic field measurements will provide alerts and warnings to satellite operators and power utilities.

Extreme Ultraviolet and X-Ray Irradiance Sensors (EXIS)

EXIS detect and monitor solar irradiance in the upper atmosphere. The X-Ray Sensor monitors solar flares that can disrupt communications and degrade navigational accuracy, affecting satellites, astronauts, high latitude airline passengers and power grid performance. The Extreme Ultraviolet Sensor monitors solar variations that directly affect satellite drag/tracking and ionospheric changes, which impact communications and navigation operations.



Solar Ultraviolet Imager (SUVI)

SUVI is a telescope that observes and characterizes coronal holes, solar flares, and coronal mass ejection source regions. SUVI data enables improved forecasting of space weather and early warnings of possible impacts to the Earth environment, including disruption of power utilities and communication and navigation systems as well as possible damage to orbiting satellites and the International Space Station.