



Geostationary Operational Environmental Satellite R- Series (GOES-R)

GOES R Ground Segment Overview



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GOES-R Improvement Summary



Improvements over current capabilities

- **Imager (ABI)**
 - Better resolution (4X), faster coverage (5X), more bands (3.2X) and more coverage simultaneously
- **Lightning detection (GLM)**
 - Continuous coverage of total lightning flash rate over land and water
- **Solar/Space Monitoring (SUVI, EXIS, SEISS)**
 - Better Imager (UV over X-Ray)
 - Better Heavy Ion detection, adds low energy electrons and protons
- **Auxiliary Services**
 - Higher Data Rates for Environmental Data Relay
- The large increase in spatial, spectral, and temporal resolution of the ABI of GOES-R increases the data volume and drives a large increase in ground system processing requirements for product generation and for distribution of products to users.



Ground Segment Objectives



- Support the primary mission operations goals to safely launch and safely operate the GOES-R series spacecraft
- Design, develop, integrate and test the ground segment in a manner that minimizes the GOES-R ground segment and overall program costs
- Minimize the impact to existing users during the transition to GOES-R services
- Provide cost effective ground segment sustainment and maintenance once transitioned to government operations
- Provide cost effective and timely solutions to meet GOES-R evolving ground segment requirements through the application of open standards, modular, scalable, flexible system design and development and the application of industry standard system and software engineering practices
- Maintain compatibility with existing and enhanced versions of NOAA institutional systems required to support GOES-R series spacecraft



GOES-R Partners:

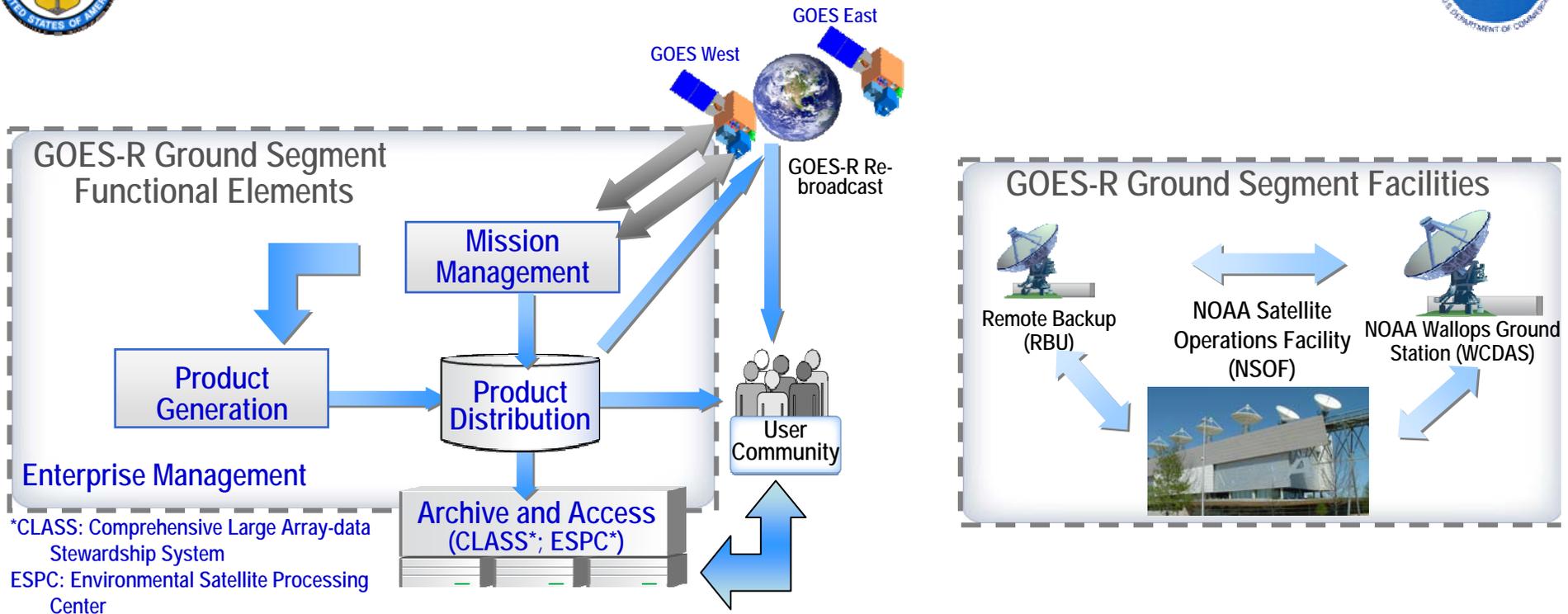
Organizations who play a role in Ground Segment solution

- GORWG – GOES-R Operational Requirements Working Group
 - Includes Representation from NOAA Line Offices and Goal Teams
 - Weather and Water
 - Climate
 - Commerce and Transportation
 - Ecosystems
 - Mission Support
- NWS – National Weather Service
- NESDIS – National Environmental Satellite, Data, and Information Services
- Review Teams
- COMET - Cooperative Program for Operational Meteorology, Education and Training





Notional Functional Overview



Mission Management

includes mission (satellite and instruments) operations (telemetry and command), mission scheduling, mission state-of-health trending, and satellite orbital analysis.

Product Generation

includes algorithm definition, processing raw data, processing to Level 1b (including calibration, & navigation and registration) for rebroadcast, and for creation of higher level data products (Level 2+) including operational formatted products.

Product Distribution

includes distribution of Level 1b GOES-Rebroadcast data (GRB), eGVAR, and distribution and access to Level 0, 1b, and 2+ data and formatted products to authorized users

Enterprise Management

Provides situational awareness of all functions of the GOES-R GS by monitoring and reporting the configuration of the security, networks, communications, and operational systems



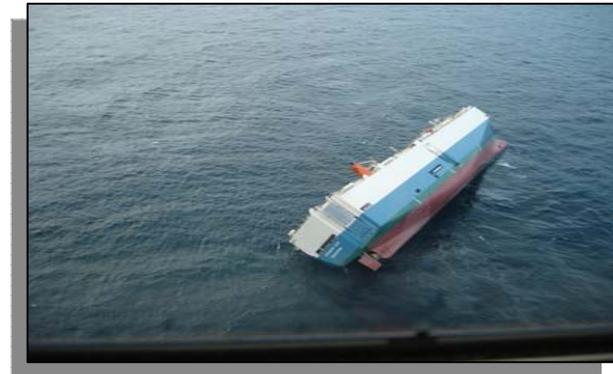
Unique Payload Services (UPS)



Additional capabilities include improved user services for direct readout users:

GOES-R services include:

- LRIT--Low Rate Information Transmission
- EMWIN--Emergency Managers Wx Information Network
- DCS--Data Collection System
- SARSAT--Search and Rescue
- GRB – GOES Rebroadcast
 - Follow on of L-Band GVAR



Higher Data Rates for LRIT, EMWIN, DCS, and GRB

Cougar Ace incident off of Alaska (24 rescued) was detected by GOES-11 at 830z (and NOAA-17 at 831z while it was within view of Hawaii). Figure courtesy of Thomas.M.Wrublewski.



User Impact Summary



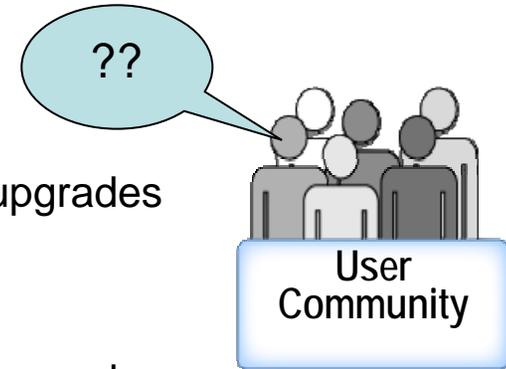
- **Direct Readout**

- GVAR to GRB

- Data rate increases and needs for ground ingest upgrades
 - Meets delivery of Level 1b data with low latency

- LRIT and EMWIN

- Data rate increases and needs for ground ingest upgrades



- **OSDPD access**

- Expected to be similar to today and within evolution of OSDPD's ESPC (Environmental Satellite Processing System) upgrades

- **AWIPS and NOAAPORT**

- Will need to change in order to accept and disseminate higher data rates

- **Web sites**

- OSDPD, Others

- Will need to change in order to display higher temporal, spatial, and spectral data

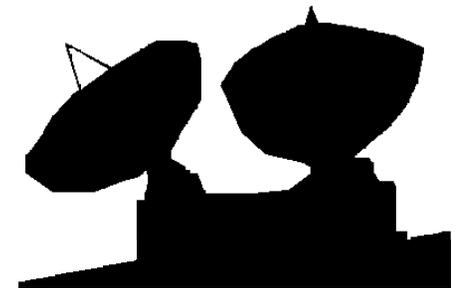
- GOES-R Ground Segment in development of a User Readiness Plan



Direct Readout- Changes



- **GRB – GOES Rebroadcast**
 - Follow on of L-Band GVAR
 - 31 Mbps vs today's 2.11 Mbps
 - (last GUC referenced 17 Mbps data rates)
 - Plans are to retransmit all Level 1b data within the GRB with in L band
 - Dual circular polarization at 1690 MHz
- **eGVAR – Emulated GVAR**
 - To aid in user transition from current GVAR to GRB data stream
 - Data to look like today's GVAR data stream
 - To use 5 'legacy' bands from ABI
 - Need an available legacy, non imaging spacecraft
 - Format
 - Current GVAR specifications
 - Analogous to analog to digital TV conversion with overlap of services





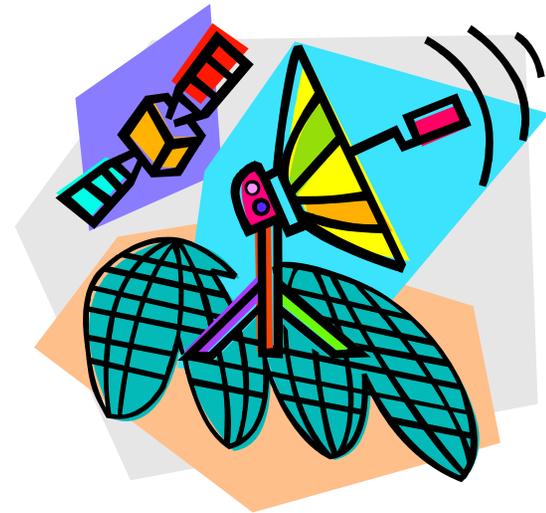
Upcoming Conferences

- ***National Weather Association***

- October 11-16 2008, Lexington, KY
- Expect focus on current and near term (i.e. GOES-13) GOES products and operations, and future GOES-R updates
- In planning stages

- ***Direct Readout Conference***

- Week of December 8, 2008, Miami, FL
- In planning stages by NESDIS/OSDPD
- Key importance for all GOES direct readout users
 - GVAR and future GRB users
 - LRIT
 - EMWIN
 - DCS

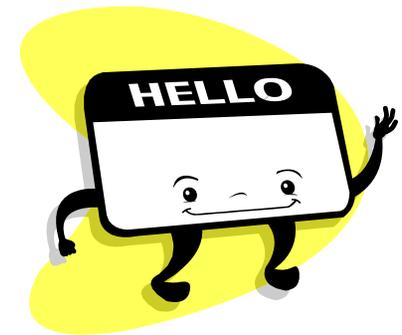


- ***American Meteorological Society annual meeting.***

- AMS Satellite Meteorology and Oceanography Conference
- Week of January 11, 2009, Phoenix, AZ

- ***6th GOES Users' Conference***

- Tentatively scheduled fall 2009





- **Ground acquisition**
 - RFP documents under final development
 - Draft RFP release currently planned for February 2008
 - Final RFP planned April 2008
- **GOES-R Launch Readiness Date**
 - December 2014
- **Information from FedBizOps Posted Dec 21, 2007**
<http://www.fedbizopps.gov/>
 - Ground: DG133E-08-RP-0068



Coming Soon!* A new one-stop source for all GOES-R information.

<http://www.GOES-R.gov>

A joint web site of NOAA and NASA (*pending final approval)