GOES-R Series Ground System

FACT SHEET

What is the GOES-R ground system?

Ground support is critical to the GOES-R mission. NOAA has developed a state-of-the-art ground system that will receive data from the GOES-R spacecraft and generate real-time data products. This is accomplished via a core set of functional elements which include space/ground communications, raw data processing, monitoring the satellite's health and safety, and commanding the spacecraft and instruments, as well as a new antenna system and a product access component.

NOAA Satellite Operations Facility

GOES-R Ground System Architecture

How do the ground system facilities and antennas support operations?

The GOES-R core ground system consists of two primary locations that will receive data from the GOES-R series satellites: NOAA Satellite Operations Facility (NSOF) in Suitland, Maryland, and Wallops Command and Data Acquisition Station (WCDAS) in Wallops, Virginia. A third operations facility in Fairmont, West Virginia, will serve as the Consolidated Backup (CBU).

NSOF will house the majority of GOES-R mission operations and science data production. Four 9.1-meter antennas at NSOF were upgraded for compatibility with GOES-R. These upgraded receive only antennas will maintain compatibility with existing GOES satellites and will operate continuously for the life of the GOES-R series satellites.

WCDAS will be the primary site for space-to-ground communications and command uplink. Some data will be processed at WCDAS to produce GOES Rebroadcast (GRB) data for satellite uplink. WCDAS will also provide uplink to the satellites to support certain Unique Payload Services, which consist of transponder payloads providing communications relay services in addition to the primary GOES mission data. Three new 16.4-meter antennas at WCDAS are designed to operate during a Category 2 hurricane with sustained winds of 110 mph and gusts of up to 150 mph. These antennas are compatible with existing GOES satellites and will operate continuously for the life of the GOES-R series.

The CBU will serve to support contingency operations and perform all of the critical functions of NSOF and WCDAS, if needed as a backup. Three new 16.4-meter antennas were constructed at the CBU which are compatible with existing GOES satellites and will operate continuously for the life of the GOES-R series.
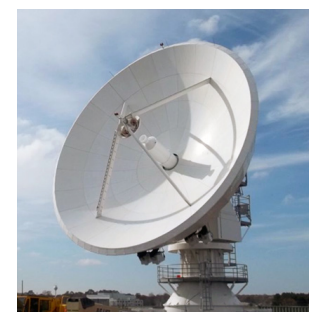
W-1 antenna at WCDAS

Consolidated Backup

Wallops Command and Data Acquisition Station

How will users obtain GOES-R data from the ground system?

Users will be able to access GOES-R data in a number of ways, depending on user type and data latency needs. These product distribution services include:

AWIPS – The **Advanced Weather Interactive Processing System** is a computer system that integrates meteorological and hydrological data, enabling meteorologists to prepare forecasts and issue warnings. The National Weather Service will be the primary operational user of GOES-R data and will receive key data directly from the GOES-R/AWIPS interface.

PDA – Real-time data will be available to authorized users via the **Product Distribution and Access** system which receives and stores real-time environmental satellite data and products.

GRB – GOES Rebroadcast will enable users with their own receivers to receive full resolution, calibrated, near real-time direct broadcast data products.

CLASS – GOES-R data will also be made available via the **Comprehensive Large Array-data Stewardship System**, which is a web-based data archive and distribution system for NOAA's environmental data to scientists, researchers, and academics to review archived products (older than seven days).

What data and products are available from the ground system?

The ground system will receive raw data from GOES-R series spacecraft and generate Level 1b and Level 2+ products. Level 1b data from each instrument and Level 2+ data from GLM will be distributed to direct readout users by means of spacecraft relay via GRB. Level 1b products and Level 2+ products will be provided to the PDA system, including the data archive centers via CLASS.

Data levels	
Level 0:	Unprocessed instrument data at full resolution
Level 1b:	Level 0 data with radiometric and geometric correction applied to produce parameters in physical units
Level 2+:	Derived environmental variables with spatial and temporal resolution comparable to Level 1 data

Learn more

- http://www.goes-r.gov/ground/overview.html
- http://www.goes-r.gov/users/user-systems.html
- https://www.harris.com/content/goes-r-ground-system