

GOES-P



GOES-P is the third and last spacecraft in the GOES N-P series of Geostationary Operational Environmental Satellites (GOES). Two operational GOES observe approximately 60 percent of the Earth, including the continental United States, providing weather monitoring as well as a reliable stream of environmental information important for severe weather warnings.

In a geostationary orbit, a satellite is always in the same position with respect to the rotating Earth. This orbit allows GOES to hover continuously over one position on Earth's surface. This way GOES can maintain a watch for the atmospheric conditions that can trigger severe weather such as tornadoes, flash floods, hail storms, and hurricanes.

GOES-P carries an imager, a sounder, and a collection of other space environment monitoring instruments.

The **imager** is an imaging radiometer. It uses data obtained from its five channels in the visible and infrared spectrum to produce continuous images of the Earth's surface, oceans, developing storms, cloud cover, cloud temperature and height, surface temperature, and water vapor. The imager on GOES-P, as on GOES-O before it, has improved resolution in the 13-micrometer band, allowing more accurate observation of clouds, winds, and volcanic ash.

The **sounder** gathers selected atmospheric data over an area from 60 degrees north to 60 degrees south latitude. This information allows meteorologists to deduce atmospheric temperature and moisture profiles, surface and cloud-top temperatures, and ozone distributions.

The **Space Environment Monitor (SEM)** includes:

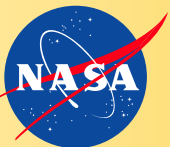
- (1) an **energetic particle sensor** package, which measures the energetic particles at geosynchronous orbit, including protons, electrons, and alpha particles.
- (2) two **magnetometer sensors** that measure the magnitude, direction, and variation of Earth's geomagnetic field, and provide alerts of solar wind shocks or sudden impulses that impact the magnetosphere.
- (3) a **solar x-ray sensor (XRS)** that observes and measures solar x-ray emissions in two bands. In real time, it measures the intensity and duration of solar flares in order to provide warnings of potential disruption of radio communications.
- (4) a **solar EUV sensor (EUVS)** that monitors solar extreme ultra-violet emissions to provide a measure of the solar impact on satellite orbit drag and radio communications. GOES-P has the same 5-channel configuration that flew on GOES-N/13.

The **Solar X-ray Imager (SXI)** uses a telescope assembly to observe the Sun's x-ray emissions and to provide early detection and location of solar disturbances. These observations allow space weather forecasters to monitor solar features and activities such as solar flares, loops, coronal holes, and coronal mass ejections--clouds of charged particles shooting toward Earth from the Sun.

GOES-P also carries:

A **data collection system (DCS)**, which uses the GOES spacecraft to relay data from remotely located in-situ sites at or near the Earth's surface.

The NOAA **Low-Rate Information Transmission (LRIT)** System, making the GOES data widely accessible by users with low-cost receivers.





GOES-P

Emergency Weather Information:

GOES is a vital part of the Emergency Managers' Weather Information Network (EMWIN) system, transmitting a live stream of weather and other critical emergency information. GOES also transmits the Processed Data Relay containing the GOES Variable Data Format Imager and Sounder data, Sensor Data Downlink, and the Multi-use Data Link, which includes the Solar X-ray Imager and other data.

GOES-P Search and Rescue:

GOES is also part of the COSPAS-SARSAT search and rescue system. Emergency signals transmitted from aircraft, marine vessels, or individual emergency locator transmitters are relayed to a mission control center, from which rescue efforts can be dispatched. Since its inception in 1982, COSPAS-SARSAT has initiated the rescue of over 26,800 people.

Launch:

Launch location: Cape Canaveral, FL
 Launch services: United Launch Alliance
 Launch vehicle: Boeing Delta IV
 Launch date: March 2010

GOES-P initial orbit target at rocket separation:

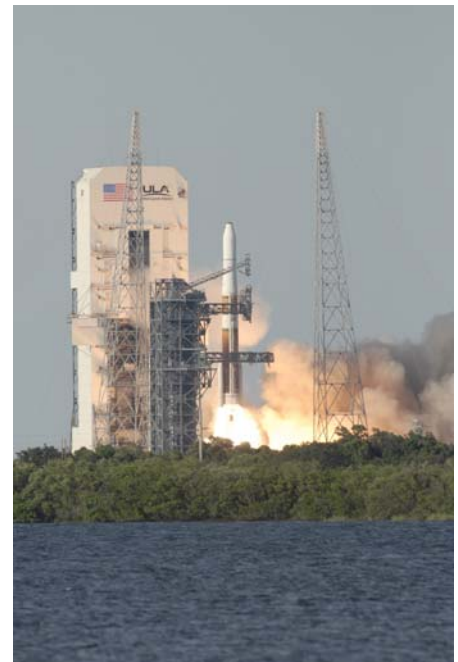
- Orbit apogee altitude* 35,177 km (21,858 mi)
- Orbit perigee altitude* 6,623 km (4,115 mi)
- Inclination 12.0 deg

The spacecraft then performs a series of maneuvers to finally achieve a geosynchronous orbit at 35,786 km (22,236 mi) above Earth's surface.

* Based on a 6,378-km (3,963-mi) Earth radius

NOAA and NASA Partnership:

NASA's Goddard Space Flight Center procures, develops, tests, and delivers the GOES to orbit. NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) manages, funds, and operates the GOES. NOAA is also responsible for processing, analyzing, disseminating, and archiving all operational data. These data are available for television broadcasts, government research, and environmental applications.



GOES-O lifted off on June 27, 2009, atop a Boeing Delta IV rocket (4-m fairing with 2 solid strap-on motors) at Cape Canaveral, FL.

