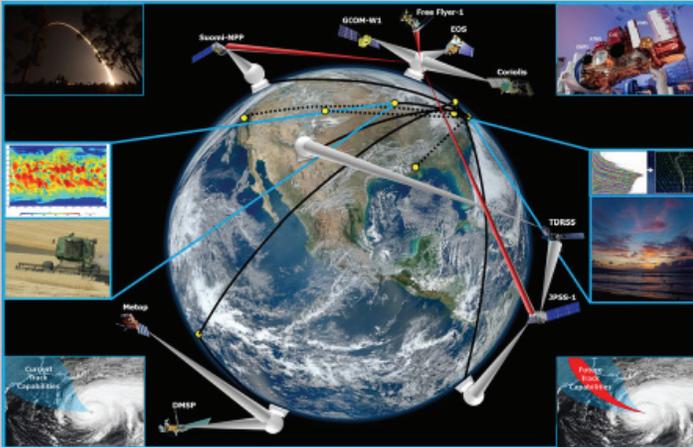


## Joint Polar Satellite System (JPSS) Common Ground System (CGS)



A flexible, cost-effective and multi-mission global common ground system designed to support current and future weather and environmental sensing satellite missions.

### Key Features and Benefits

- Flexible architecture designed to quickly adapt to evolving mission needs
- Unique integration of new and legacy technologies
- Available to support diverse civil, military and scientific environmental needs
- Fully integrated global ground system providing very low-latency data delivery
- Enterprise management ensures high system and data availability
- Extensive command & control system operational heritage provides proven reliability
- Flexible data-delivery subscription tailored to the user
- NIST 800-53 compliant security with defense in depth

The Joint Polar Satellite System (JPSS) Common Ground System (CGS) is a proven, secure solution for supporting operational weather and storm forecasting for civil, military and international partners, as well as environmental data related to weather for operational use and climate research. It features a flexible design that handles order-of-magnitude increases in data over legacy satellite ground systems' volumes and meets demanding science accuracy requirements.

Developed by Raytheon Intelligence, Information and Services for NOAA under contract to the National Aeronautics and Space Administration (NASA), the CGS provides the full JPSS common ground capability, from design and development through operations support and sustainment.

### Command, Control and Communications Segment

The Command, Control and Communications Segment (C3S) manages the operational mission including mission planning, resource scheduling, satellite command & control, active reception and accounting of mission data, global communications networks, enterprise management, anomaly resolution, system security and reliable delivery of data to and from central users. Key features of the C3S are unmanned polar ground stations that receive civilian and military mission data.

The receptors at these polar ground stations, linked with high-bandwidth commercial fiber, can quickly transport data to U.S. data processing centers. Most data will ultimately be completely processed and delivered to the National Oceanic and Atmospheric Administration

(NOAA) Satellite Operations Facility (NSOF) and partner agencies in less than 80 minutes from the time of collection.

### Mission Management Center

The Mission Management Center provides accurate, high-performance tools that precisely manage JPSS missions. The C3S tools give crews keen insight, comprehensive operational oversight, detailed mission planning capability, full control of space and ground assets, continuous monitoring and assessment of overall system performance and security.

### Interface Data Processing Segment

The Interface Data Processing Segment (IDPS) features high-speed, symmetric, multi-processing computers, capable of rapidly converting large streams of JPSS sensor data –100 times the volume of legacy data – providing

# Joint Polar Satellite System (JPSS) Common Ground System (CGS)

numerous Environmental Data Records (EDR) to NOAA's NSOF and partner agencies. These vital EDRs range from atmospheric to land and ocean surface products.

The EDRs detail cloud coverage, temperature, humidity and ozone distribution, as well as snow cover, vegetation, sea surface temperatures, and aerosols information. This wealth of information enables numerous users to monitor and predict changes in weather, climate and ocean conditions. JPSS products will also be available to the scientific community, helping expand knowledge of the environment.

## Direct Readout Capability

JPSS satellites will have the capability to broadcast data directly to terrestrial readout terminals. JPSS direct readout software and algorithms, adapted from and functionally equivalent to JPSS CGS IDPS software, permit worldwide terminals at scientific and educational institutions to receive and process the continuous broadcasts of JPSS sensed data as the satellites pass overhead.

## CGS Multi-Mission Capability

The JPSS CGS flies the joint NOAA-NASA Suomi National Polar-orbiting Partnership (Suomi NPP) mission now and NOAA's JPSS-1 and JPSS-2 missions in the future. Suomi NPP is the operational bridge/transition mission to JPSS-1 and beyond. But the CGS additionally provides data acquisition and routing for a number of other missions, such as the:

- DoD's Defense Meteorological Satellite Program (DMSP),
- European Organisation for the Exploitation of Meteorological

Satellites (EUMETSAT) Meteorological Operational (MetOp) satellites,

- Japan Exploration Agency (JAXA) Global Climate Observation Mission – Weather (GCOM-W1),
- NASA's Space Communications and Navigation Network (SCaN) (Terra, Aqua, and LandSat Data Continuity Mission (LDCM)),
- U.S. Navy WindSat/Coriolis, and
- National Science Foundation (NSF) U.S. Antarctic Program (USAP).

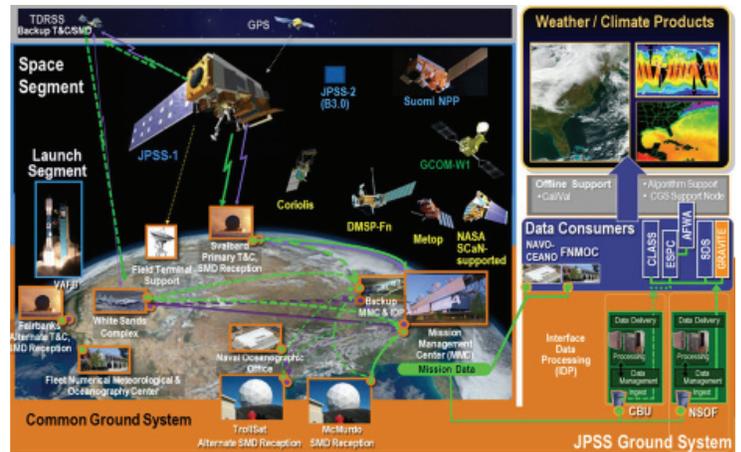
CGS has the capacity and flexibility to handle even more missions, each of which can benefit from its enhanced security posture.

## The JPSS Program Overview

The Joint Polar Satellite System (JPSS) is designed to monitor global environmental conditions in addition to collecting and disseminating data related to the weather, atmosphere, oceans and land. The new system represents a major upgrade to the existing Polar-orbiting Operational Environmental Satellites (POES), which have successfully served the operational weather forecasting community for more than 50 years. Operated by the National Oceanic and Atmospheric Administration (NOAA), the new JPSS supports NOAA's requirements by providing global environmental data for NOAA's missions to protect lives and property, support economic efficiency, monitor the earth, and manage resources.

## JPSS Top Level Architecture

The Joint Polar Satellite System (JPSS) is an "end-to-end"



**From Space to Ground, JPSS Turns Environmental Intelligence into Actionable Data for Users**

system that includes sensors, spacecraft, command, control and communications, data routing, and ground based processing. All spacecraft will carry improved sounding and imaging and sensors, increasing the NOAA and Department of Defense capabilities to monitor atmospheric, climatic, oceanic, and cryospheric phenomena and perform respective weather and oceanographic forecasting missions. The JPSS CGS employs an innovative data collection and processing system to accomplish the task.

The polar orbiters, which are able to monitor the entire planet and provide data for mid-range weather forecasts (3-7 days ahead of severe weather) and longer range climate forecasts (for phenomena like droughts and floods), will carry a complement of advanced imaging and sounding sensors that will acquire data at a much higher fidelity and frequency than heritage systems available today.

The JPSS CGS polar receptor architecture will provide frequent downlinks to maximize contact duration at low cost.

The Suomi National Polar-orbiting Partnership (Suomi NPP) mission has now become NOAA's primary operational polar satellite for the U.S. early afternoon orbit and the CGS was evolved to support it.

## JPSS and Related Organizations

NOAA is responsible for managing and operating the JPSS program, while NASA is responsible for developing, building and integrating the JPSS spacecraft, sensors and CGS system. NOAA, under the Department of Commerce, is the prime customer and funding agency for JPSS. As such, NOAA develops and approves the requirements for the JPSS program and requests JPSS funding from Congress. The NASA JPSS Program Office at Goddard Space Flight Center (GSFC), Greenbelt MD is the lead for acquisition, systems engineering and integration.

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