Joint Polar Satellite System (JPSS)
Common Ground System (CGS) Multimission Support

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NOAA and NASA are jointly acquiring the next-generation civilian operational weather and environmental satellite system: the Joint Polar Satellite System (JPSS). JPSS will contribute the afternoon orbit component and ground processing system to replace the current Polar-orbiting Operational Environmental Satellites (POES) managed by NOAA and the ground processing component of the POES. The JPSS satellites will carry a suite of sensors designed to collect meteorological, oceanographic, climatological, and solar-geophysical observations of the earth, atmosphere, and space. The ground processing system for JPSS, known as the Common Ground System (JPSS CGS), provides command, control, communications, data processing and product delivery. The CGS currently flies the Suomi National Polar-orbiting Partnership (S-NPP) satellite and acquires, routes and processes S-NPP mission data to provide Environmental Data Records (EDRs) to NOAA and DoD processing centers operated by the U.S. government, generating multiple terabytes per day across more than two dozen environmental data products. Beyond mission management and data processing for the Suomi NPP and JPSS missions, the CGS also provides global data routing support to seven additional missions and data acquisition to four of those missions. The CGS's flexible architecture allows for multimission capabilities that offer significant opportunities for cost reduction and improved information integration across missions.

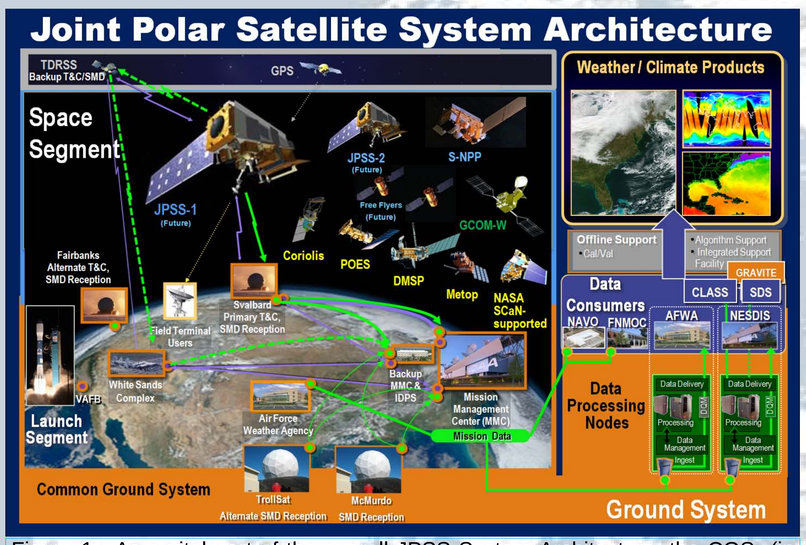

Figure 1. As a vital part of the overall JPSS System Architecture, the CGS (in orange) provides: (1) command, control, and data routing via a ground network of antennae, fiber-based WAN and Mission Management Centers, and (2) data processing at US Government Centrals.

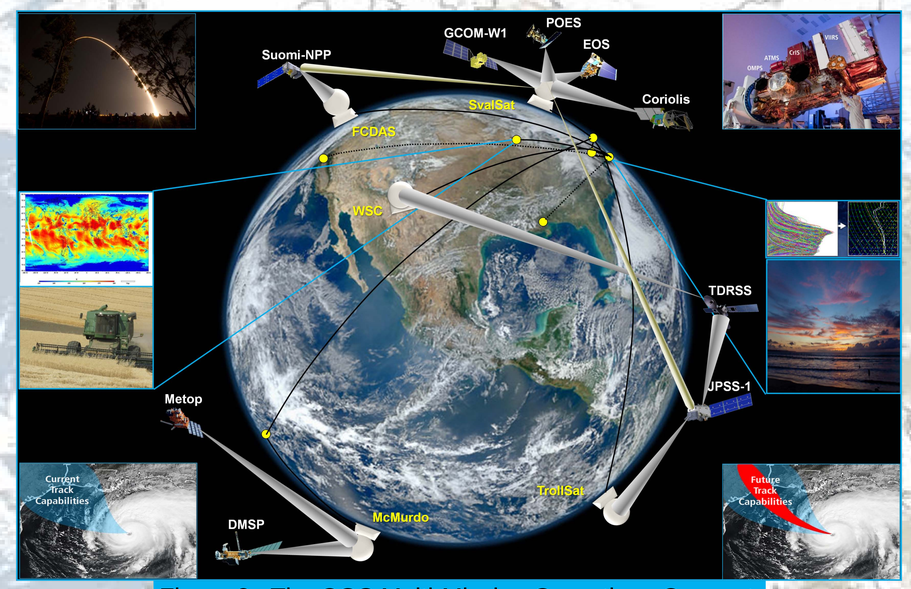

Figure 2: The CGS Multi-Mission Operations Concept

JPSS Ground System Supported and Operated Missions

JPSS Service & Mission Info.		JPSS-Supported Missions: Managed and operated by other agencies and supported by one or more JPSS services							JPSS-Managed Missions: Managed and operated by the JPSS Program				
		NSF USAP	Coriolis/ Wind-Sat	POES	SCaN-supported Missions	DMSP	Metop	GCOM-W1	S-NPP	JPSS		Free Flyers	
										J1	J2	FF1	FF2
Mission/Payload Type		Comm	MW	MW-IR-UV Vis-SEM	IR-Vis-O_3-UV-Chem	MW-IR-UV Vis-SEM	MW-IR-Vis-SEM	MW	MW-IR-UV Vis-O_3-ER	MW-IR-UV Vis-O_3-ER	MW-IR-UV Vis-O_3-ER	DCS-SAR-TSI	DCS-SAR-TSI
Number of Payloads Supported		N/A	1	10	15	6	7	1	5	5	5	3	3
Number of Supported Spacecraft	Now (13-15)	N/A	1	3 - 5	3	2	2	1	1	0	0	0	0
	Future (17)	N/A	1	0	4	2	3	2	1	1	1	1	1
Launch Date		N/A	Operational							2017	2021 (ready by 2019)	~+/- 6 mos of J1	TBD
Support Date		N/A	Current							2015	2018	TBD	TBD
Mission Planning		No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	TBD
Spacecraft Control		No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	TBD
Satellite Command & Telemetry		No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	TBD
Data Acquisition		No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	TBD
Data Routing		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
Data Processing & Distribution		No	No	No	No	No	No	RDR-level	xDR-level	xDR-level	xDR-level	No	TBD
Cal/Val		No	No	No	No	No	No	No	Yes	Yes	Yes	No	TBD
Field Terminal Support		No	No	No	No	No	No	No	Yes (in Block 2.0)	Yes	Yes	No	TBD

The JPSS CGS is a fielded and evolving multi-mission ground system

Figure 3. The CGS supports and/or manages 13-15 satellites now and 17 or more in the future. CGS's services include Mission Planning; Spacecraft Command & Control; Data Acquisition, Routing, Processing and Distribution; and Cal/Val.

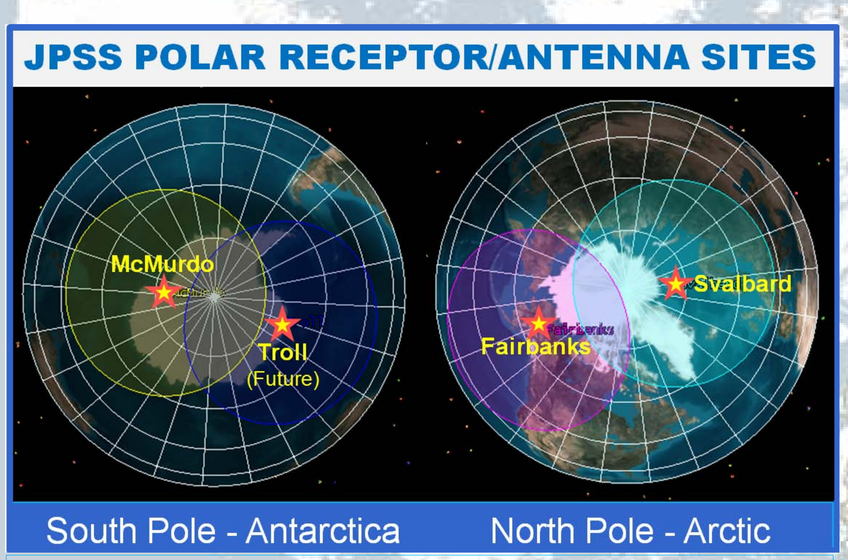

Figure 4. CGS supports four global ground stations, and TDRSS White Sands ground station, that can receive Suomi NPP and/or JPSS-1 mission data.

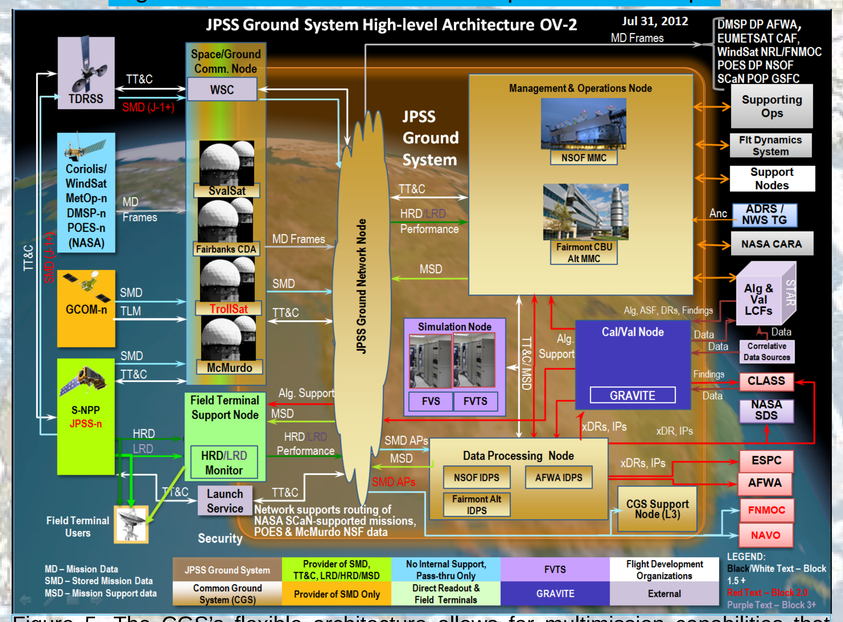

Figure 5. The CGS's flexible architecture allows for multimission capabilities that offer significant opportunities for cost reduction and improved information integration across missions.

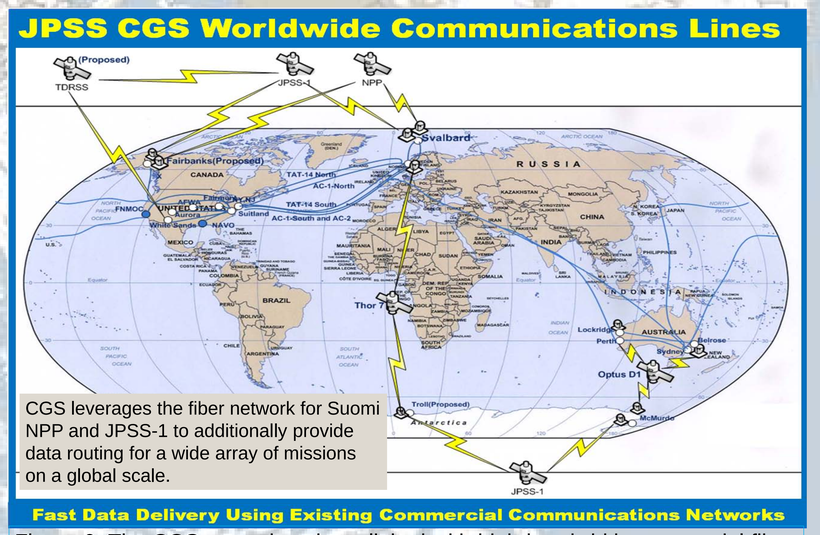

Figure 6. The CGS ground stations, linked with high-bandwidth commercial fiber, can quickly transport the data to the processing centers for environmental product generation and delivery.

Figure 7. The multimission capabilities of the CGS facilitate support to an array of missions beside S-NPP and JPSS.