

NOAA NESDIS

GOES Data Collection System

Spacecraft and Ground System Overview

May 2022 TWG



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GOES Spacecraft Constellation

- GOES-16: Prime East S/C @ 75.2° W Longitude
 - Replaced G13 18 Dec, 2017
- GOES-17: Prime West S/C @ 137.2° W Longitude
 - Replaced G15 15 Nov, 2018
- GOES-14: Storage @ 105° W Longitude
- GOES-13: Transferred to USSF to support the GOES IO mission
 - Became operational 9 Sep 2020, renamed EWS-G1 (Electro-optical Infrared Weather System Geostationary)
- GOES-15: Storage @ 128° W Longitude



GOES T (18) Launch – Spring 2022

- NASA launched the third spacecraft in the GOES R series on March 1st, 2022 from Cape Canaveral Space Launch Complex 41 (SLC-41)
- Post-launch testing (PLT) is ongoing. Following successful completion of PLT, GOES 18 will drift to a co-location position with GOES 17 in June 2022.
- Current NESDIS operational plans involve replacing GOES 17 as the operational GOES West satellite in January 2023.

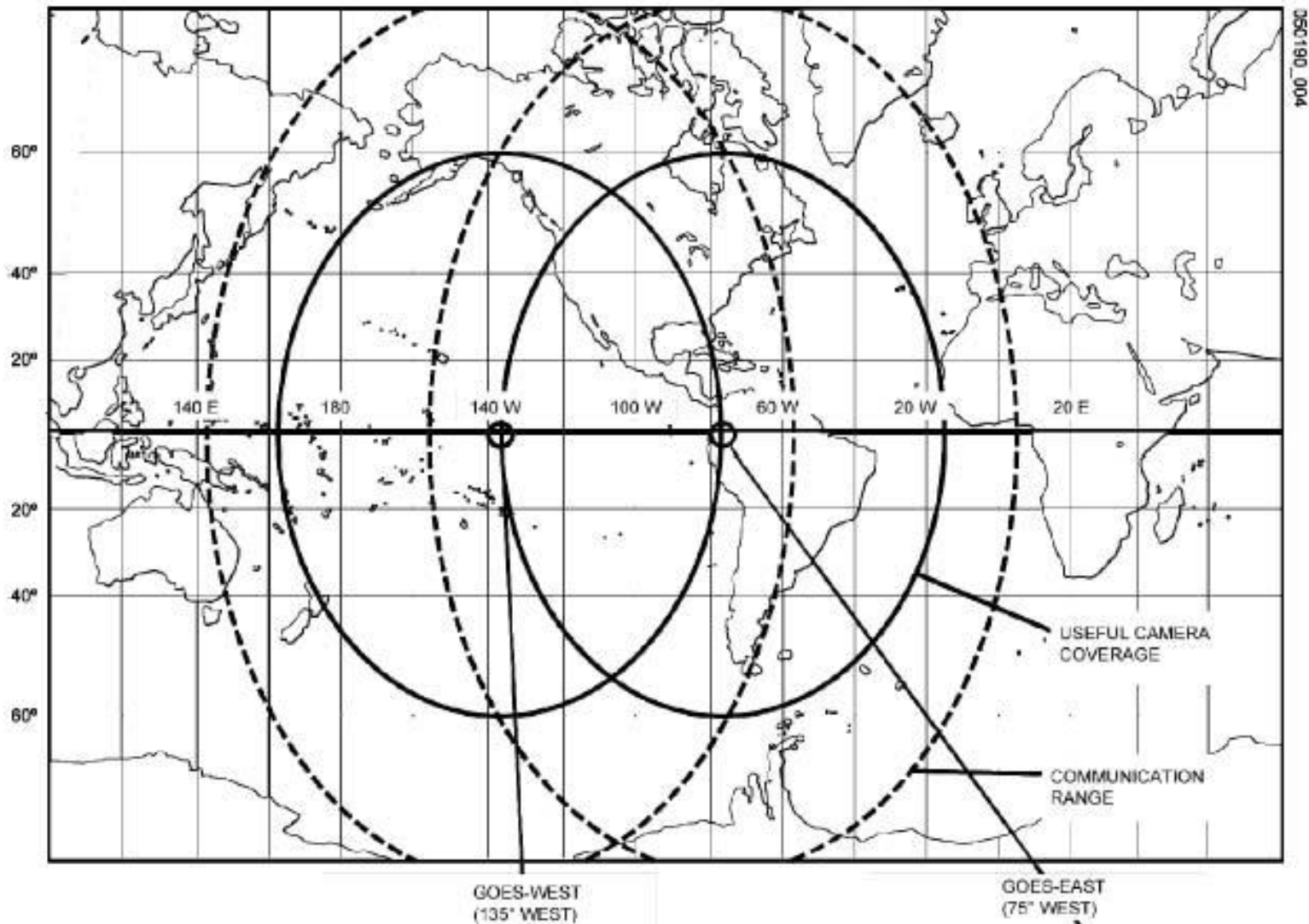


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Current GOES Series Footprints



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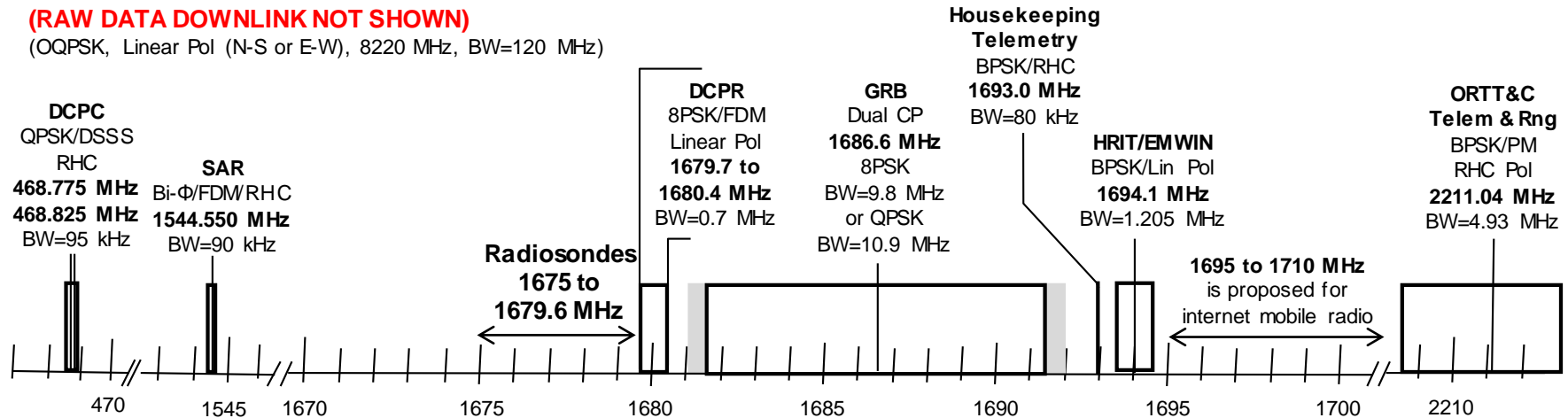


GOES R Frequency Plan

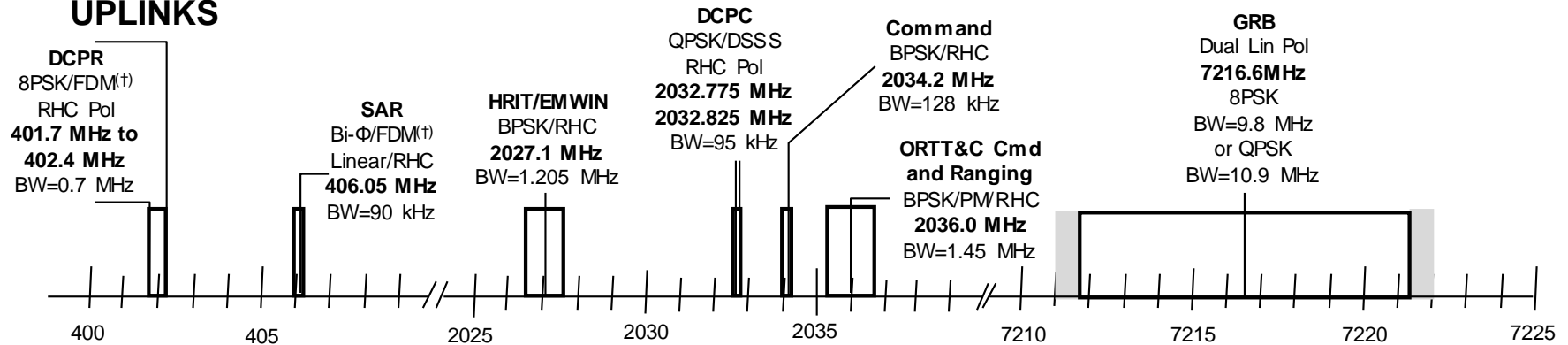
DOWNLINKS

(RAW DATA DOWNLINK NOT SHOWN)

(OQPSK, Linear Pol (N-S or E-W), 8220 MHz, BW=120 MHz)



UPLINKS



NOTES †: DCPR (8PSK) and SAR (Bi-Φ) are individual uplinks FDMed in the spacecraft transponder.

■: Indicates possible extra GRB bandwidth for QPSK modulation

Ground System Overview

NOAA Command and Data Acquisition Station, Wallops VA (WCDAS)



16.4m Hurricane Rated (HR) Parabolic Antenna

- Rx Capability
 - 1670-1695 MHz (L-band)
 - 2200-2240 MHz (S-band)
 - 8100-8350 MHz (X-band)
- Tx Capability
 - 2025-2050 MHz (S-band)
 - 7208-7225 MHz (X-band)
- There are currently three HR antennas at WCDAS (HR4, HR5, and HR6) and three at CBU (HR7, HR8, and HR9) capable of supporting the GOES R series spacecraft.
- Two legacy HR antennas at WCDAS (HR1 and HR2) are currently undergoing upgrades/enhancements to facilitate GOES R support. Upgrades currently scheduled for completion Spring/Summer 2022.



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DCS Primary Pilot Antennas – 401.85 MHz WCDAS



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NESDIS GOES Backup Sites

- GOES Consolidated Backup (CBU)
 - Located in the I-79 Technology Park in Fairmont, WV
 - Provides full mission backup capability for GOES 14-17 **with the exception of a DCS receive ground system.**
 - Provides the Backup DCS Pilot at 401.7 MHz
 - Installation of 3.8m Backup Pilot antennas in progress.
- NOAA Satellite Operation Facility (NSOF)
 - Located in Suitland, MD
 - Currently holds the backup DCS receive system, including DAMS-NT, DADDS, and LRGS.
 - Tentative plans to move all DCS backup ground equipment to CBU in late 2022.



NOAA Satellite Operations Facility, Suitland Md (NSOF)

- Four 9.1m parabolic antennas (N1, N2, N3 and N4) in support of the GOES R series spacecraft.
- Rx Capability
 - 1670-1710 MHz (L-band)
- L-band Rx-only capability provides limited support.



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NOAA Consolidated Backup (CBU), Fairmont WV



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Backup Pilot Antennas – 401.7 MHz CBU



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CBU Backup Pilot Antenna Upgrade



NOAA seeks to replace the omni-directional backup pilot uplink antenna currently installed on the roof of CBU with two 3.8m parabolic antennas similar to the primary pilot uplink antennas at WCDAS.



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CBU Backup Pilot Antenna Upgrade cont.

- Parabolic antennas provide increased signal stability and enhance system redundancy.
- Antenna and shelter installation was completed in March 2022.
- Operational implementation of the new antennas scheduled for June 2022.
- No DCS message traffic interruption expected during antenna transition.



Red "X"s indicate planned location of new backup pilot antennas.



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NOAA GOES DCS Data Services

NOAA/NESDIS provides both terrestrial and direct broadcast methods of GOES DCS message data dissemination from two facilities; the prime system is at the Wallops CDAS while the backup is at the NSOF. Wallops Operations monitors and controls both systems. The DCS supports the following dissemination services:

- **National Weather Service Telecommunication Gateway (NWSTG)**
 - WMO Header service from Wallops or NSOF DADDS
- **Local Readout Ground Station (LRGS)**
 - File sharing service from/with Wallops, EDDN & NSOF DAMS-NT
- **High Rate Information Transmission (HRIT)**
 - GOES R Series link, DCS data from Wallops or NSOF DADDS
- **DCS Administration and Data Distribution System (DADDS)**
 - Supports message ingest, processing and distribution and provides system administration functionality.



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DCS National Weather Service Telecommunication Gateway (NWSTG)

- DCS messages processed are embedded with a World Meteorological Organization (WMO) header and then sent to the NWSTG for distribution.
- WCDAS and NSOF systems are both providing DCS data to the Gateway. This, in theory, enables the Gateway to select which stream to disseminate, with the default being Wallops is Prime.
- Wallops DCS Operators are able to determine which site (WCDAS or NSOF) is actively providing message data based on operational needs.
- Data customers using the NWSTG are largely unknown.



Local Readout Ground System (LRGS)

- NOAA Wallops CDAS hosts 2 LRGS,
 - CDADATA:
 - LRGS Address ; cdadata.wcda.noaa.gov
 - DRGS input from Wallops East & West DAMS NT demodulator applications, Primary & Backup
 - DDS Primary is NLRGS1, DDS Backup is EDDN1
 - CDABACKUP:
 - LRGS Address ; cdabackup.wcda.noaa.gov
 - DRGS input from Wallops East & West DAMS NT demodulator applications, Primary & Backup
 - DDS Primary is CDADATA, DDS Backup is EDDN2
- NOAA Suitland NSOF hosts 2 LRGS,
 - NLRGS1:
 - LRGS Address ; nlrgs1.noaa.gov
 - DRGS input from NSOF East & West DAMS NT demodulator applications, Primary & Backup
 - DDS Receive Primary is NLRGS2, DDS Receive Backup is CDADATA
 - NLRGS2:
 - LRGS Address ; nlrgs2.noaa.gov
 - DRGS input from NSOF East & West DAMS NT demodulator applications, Primary & Backup
 - DDS Receive Primary is EDDN2, DDS Receive Backup is CDADATA



High Rate Information Transmission (HRIT)

- HRIT is a GOES R series broadcast that provides the following services:
 - Reduced resolution Imagery Data
 - Emergency Managers Weather Information Network (EMWIN)
 - Data Collection System (DCS) messages
- GOES East & West DCS data is provided by the DADDS for inclusion in the GOES East and West HRIT broadcasts.
- GOES HRIT coverage extends well beyond the CONUS coverage offered by DOMSAT.
- GOES HRIT services can be supported by a 1m to 1.2m receive antenna system.
- For more information on the GOES HRIT system:
 - https://noaasis.noaa.gov/GOES/HRIT/about_hrit.html
 - <https://www.goes-r.gov/users/hrit.html>





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DADDS Webservers <https://dcs1.noaa.gov/>

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DCS Administration and Data Distribution System (DADDS)
NOAA's System for Managing and Providing Access to Data from GOES DCS

DADDS DCS1
User Login

Email

Password

SIGN IN

- Need a Login? [Click here.](#)
- Forgotten Password? [Click here.](#)
- DCS Field Test? [Click here.](#)
- Need Help? [Click here.](#)
- 24/7 Technical Support: (757) 824-7450
-  [DCS Operational Notices RSS Feed](#)


Next TWG/STIWG Will Take Place Virtually on May 5-6, 2020

Certification Standard 2 Transition Period Ends on May 31, 2026, In 2224 Days

GOES DCS 1200 bps CS2 Test Channel

Discontinuation of 100 BPS DCS Message Distribution

Submit an Application for a GOES DCS SUA

 **Notice to Users**


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DADDS Webserver System Information

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DCS Administration and Data Distribution System (DADDS)
NOAA's System for Managing and Providing Access to Data from GOES DCS

Operational Notices
12/09/2019 16:54 UTC

Help Desk
24/7 Operations

System Information

Program Information

DADDS File Downloads
04/28/2020 15:01 UTC
pdfs_compressed.txt
chans_by_baud.txt

Walltops Webserver
des1.noaa.gov
des2.noaa.gov

NSOF Webserver
des1.noaa.gov
des4.noaa.gov

LRGS Status

LRGS Deadlines
Password Implementation:
August 3, 2016
SHA-256 Implementation:
August 17, 2016

Related Links

DCS System Information

- Frequently Asked Question (PDF) • 2012
- Web Interface User's Guide (PDF) • 2011
- DAPS Parameters & SHEF Codes (PDF) • 2005

DCS Channel Information

- GOES CS1 Channel Frequencies (PDF) • Mar 2000
- GOES CS2 Channel Frequencies (PDF) • Jun 2005
- International DCS Channel Definition (PDF) • Oct 2009
- GOES DCS Pilot System (PDF) • Jun 2013

Certification Information

- GOES DCS Certified Manufacturers List (PDF) • Feb 2014
- GOES DCS Certification Standard V2.0/CS2 (PDF) • Jun 2009
- GOES DCS Certification Standard V4.0B/C/S1 (PDF) • Mar 2009
- GOES DCS Certification Standard 100BPS - RETIRED (PDF) • Feb 2000
- International User Guide & Certification Standard (PDF) • Oct 2003
- NOAA Policy on Use of Certified Transmitters (PDF) • May 2011

Program Information

- GOES DCS Program Information • N/A
- GOES DCS TWG Meeting Minutes • N/A
- GOES DCS System Use Agreement (PDF) • N/A
- GOES DCS Policies and Procedures (PDF) • May 1998
- NOAA Technical Memo NESDIS 40 (PDF) • Mar 1994

System Diagrams

- NOAA DCS System Diagram (PDF) • Mar 2020
- GOES DCS Pilot System Diagram (PDF) • Apr 2018
- GOES HRIT (PDF) • Mar 2020

LRGS Information

- LRGS Client User's Guide (PDF) • Feb 2016
- LRGS Client Software Download • Feb 2016
- DCP Data Service (DDS) Protocol Specification • Feb 2016

HRIT Information

- HRIT Format Update Specifications (PDF) • Dec 2018
- HRIT Format Update Sample Files • #1 • #2 • #3 • Dec 2018
- HRIT Quarterly Meeting Slides 2018 (PDF) • Apr • Sept • Dec •

DAMS-NT Information

- DAMS-NT Interface Specification V8.2 • April 2020

General Information

- GOES 13/14 Frequency Offset Analysis (PDF) • Aug 2009
- Final DCS Filter Study Report, Rev. C (PDF) • Jan 2005
- GOES High Data Rate Transition Plan • Mar 2004
- GOES-13 DCPI and DCPR Technical Updates • 2006
- GOES DCS System Characterization Report (PDF) • Jun 1998
- GOES DCS Operations Plan (FCM-P28-1997) (PDF) • Aug 1997
- DAPS User's Telnet/Dail-in Manual • Sept 1990
- DROT User Manual • Apr 1991
- Old DROT Maintenance Manual • Apr 1991
- HDR Flyer-GOES DCS High Data Rate Transition Ended • May 2013

Website Help Information

- Online SUA Submission & DADDS Access • Mar 2018
- DADDS Website Training Presentation • Mar 2018
- How To: Updating PDT Records • Mar 2018
- How To: Create & Use Filters • Mar 2018
- How To: Pin Code Password Reset • Mar 2018

TWG Information

- TWG Meeting Information • April 2018
- Website Training Presentation • April 2019

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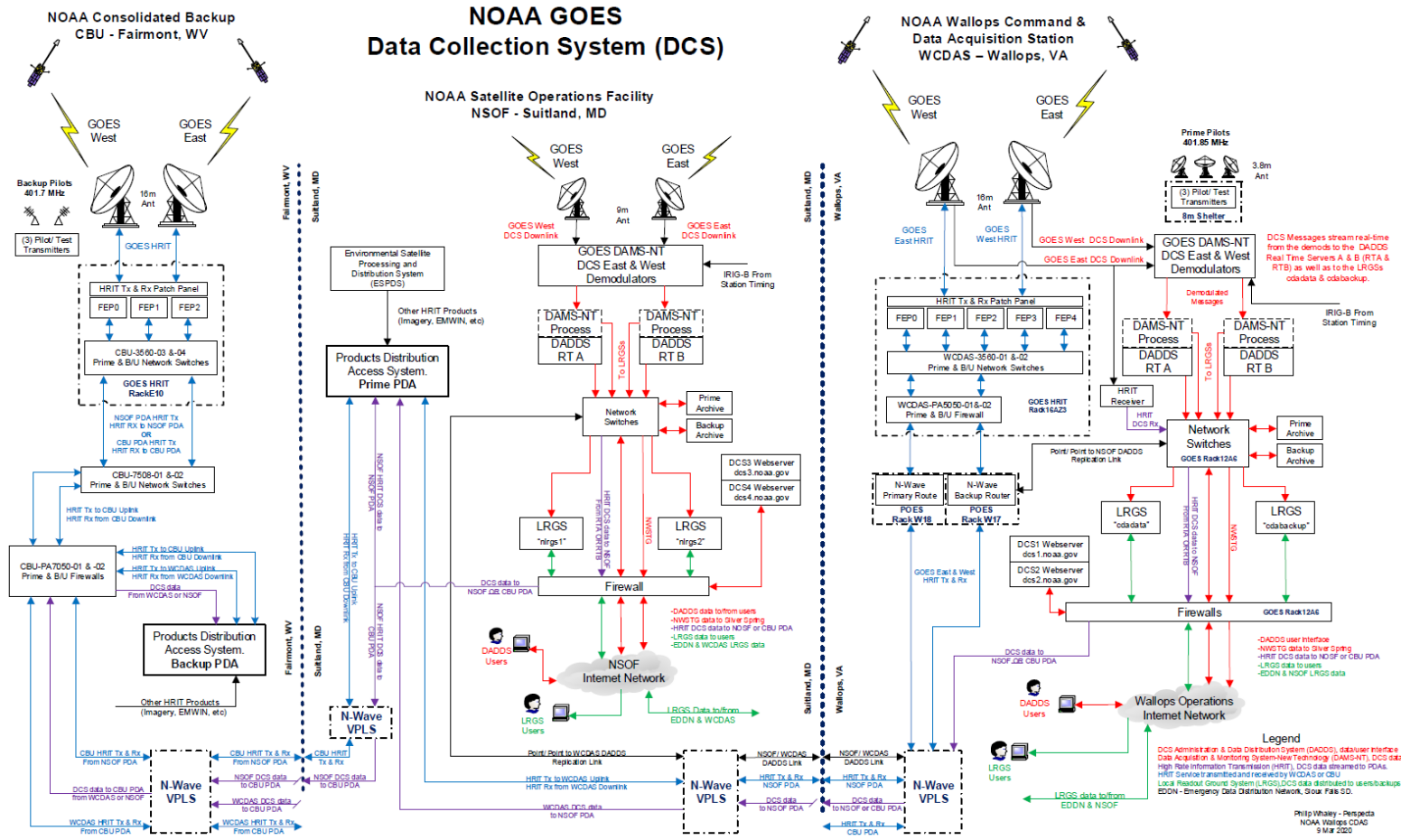


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NOAA DCS System Diagram



NOAA Wallops CDAS DCS Support Contacts

- Wallops Help Desk: 757-824-7450, wcdcs@noaa.gov
 - 24/7 Technical Support for DCS, LRGS, DADDS, HRIT
- Travis Thornton: 757-824-7316, joseph.t.thornton@noaa.gov
 - WCDAS Operations Shift Supervisor
 - DCS Operations Team Lead
- Matthew Sullivan: 757-824-7360, matt.g.sullivan@noaa.gov
 - DCS RF Systems Specialist
 - WCDAS Frequency Spectrum Manager



Acronyms

- **NOAA:** National Oceanic and Atmospheric Administration
 - Office/Agency of the Department of Commerce.
- **NESDIS:** National Environmental Satellite, Data, and Information Service
 - Line office of NOAA
- **OSPO:** Office of Satellite and Product Operations
 - Suitland MD, Wallops VA, Fairbanks AK, College Park MD
- **NSOF:** NOAA Satellite Operations Facility, Suitland, MD
- **WCDAS:** Wallops Command and Data Acquisition Station, VA
- **GOES:** Geostationary Operational Environmental Satellite
- **CBU:** Consolidated Backup Facility, Fairmont, WV
- **DADDS:** Data Collection System (DCS) Administration & Data Distribution System
- **DRGS:** Direct Readout Ground System
- **LRGS:** Local Readout Ground System
- **LRIT:** Low Rate Information Transmission, GOES 13, 14 & 15 broadcast
- **HRIT:** High Rate Information Transmission, GOES R Series (G16)
- **NWSTG:** National Weather Service Telecommunications Gateway



**Thank you for your
attention.**

Questions?



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