

NOAA NESDIS GOES Data Collection System Spacecraft and Ground System Overview April 2024 TWG



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GOES Spacecraft Constellation

GOES R Series

- GOES-16: Prime East S/C @ 75.2° W Longitude
 - GOES-18: Prime West S/C @ 137.0° W Longitude
 - GOES-17: Storage @ 105° W Longitude
 - G17 DCPR downlink was temporarily activated on Feb 5 to mitigate RFI being experienced on G16
-

GOES N Series

- GOES-14: Storage @ 108.2° W Longitude
- GOES-15: EWS-G2 (Electro-optical Infrared Weather System Geostationary)
 - Replaced G13 (EWS-G1) on September 8, 2023 as the operational EWS satellite for the USSF in the Indian Ocean theater.



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GOES U (19) Launch – Summer 2024

- NASA plans to launch GOES U, the fourth and final spacecraft in the GOES R series, on June 25, 2024 from the Kennedy Space Center.
- Following a successful launch, orbit-raising, and post-launch testing period, GOES U will be renamed GOES 19 and join NOAA's fleet of operational GOES satellites.
- The Geostationary Extended Observations (GEOXO) satellite series will replace the GOES series by the early 2030's.

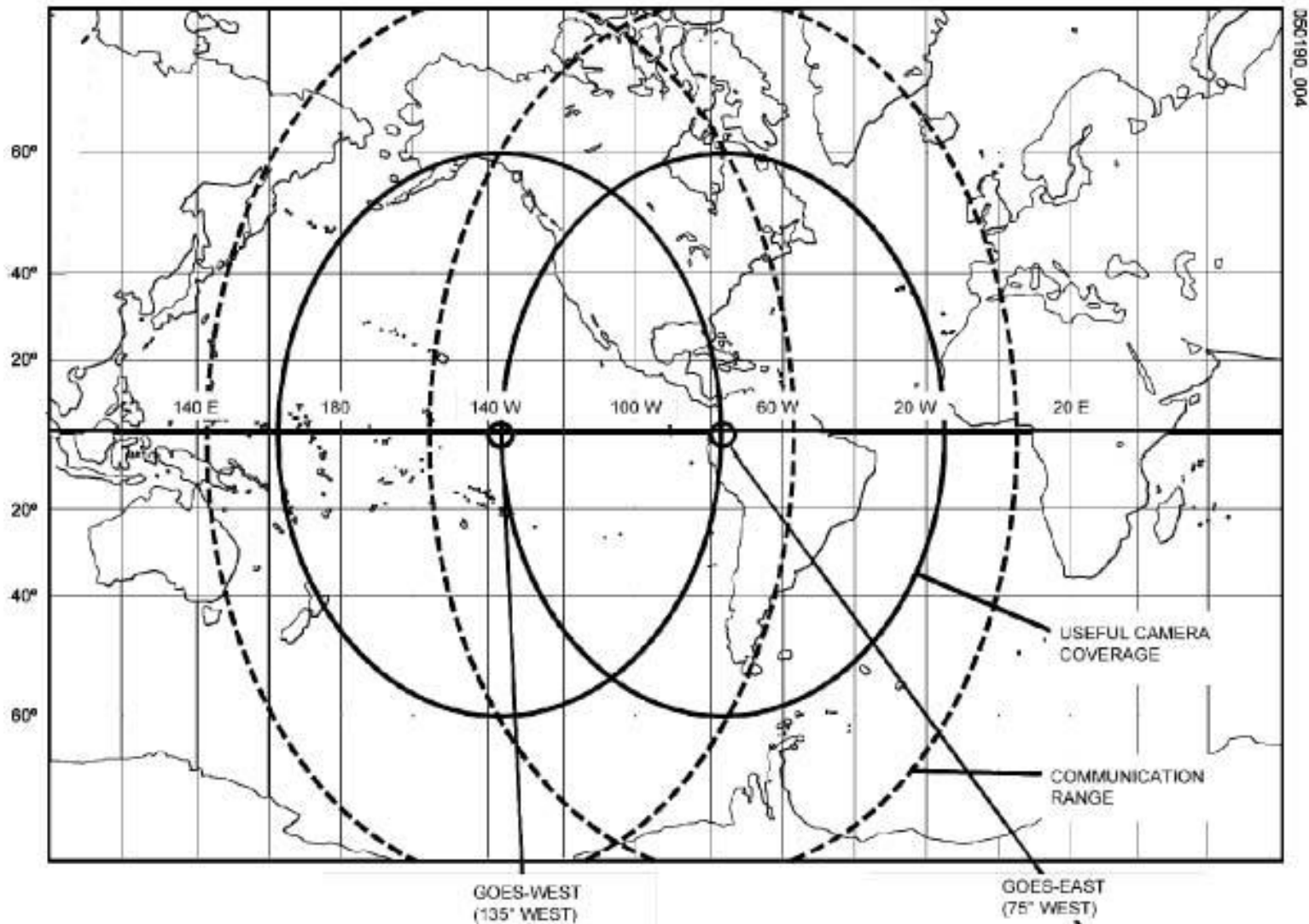


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Current GOES Series Footprints



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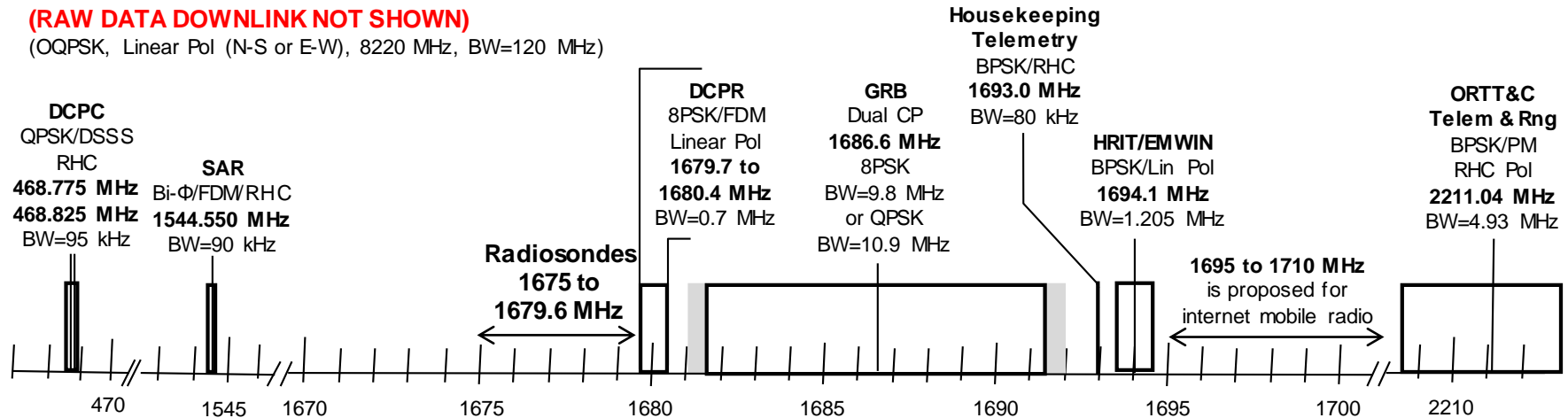


GOES R Frequency Plan

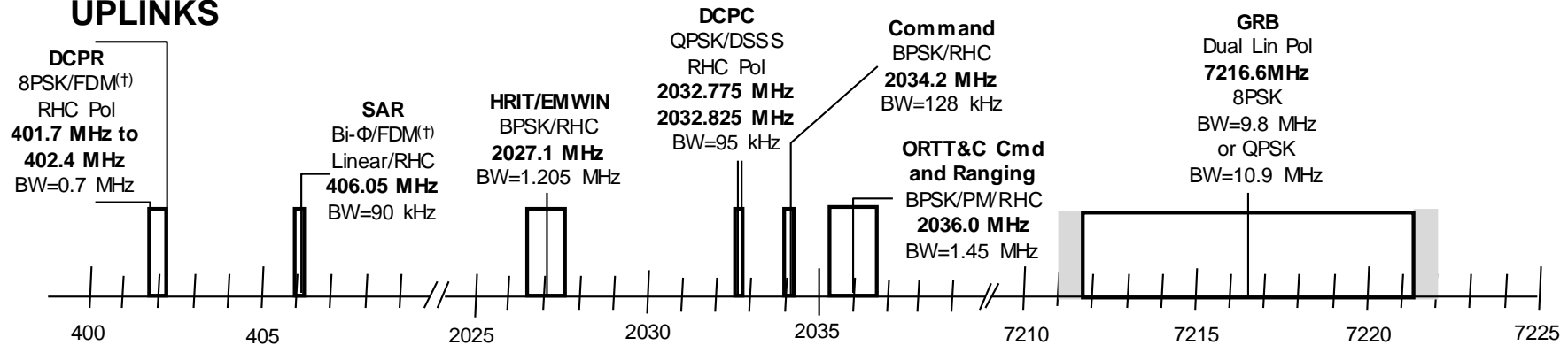
DOWNLINKS

(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)



16.4 meter 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) capable of supporting the GOES R series spacecraft.
- In addition to the primary HR antennas, WCDAS has the following legacy antennas capable of supporting the DCS:
 - HR1
 - HR2
 - 14.2 meter
 - 8 meter



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WCDAS 3.8 meter Pilot Uplink Antennas



- GOES East – Primary Pilot (401.85 MHz)
- GOES West – Primary Pilot (401.85 MHz)
- GOES 17 – Primary Pilot (401.85 MHz) and Backup Pilot (401.7 MHz)



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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 14-18 **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 completed in Sept 2022.
- 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 scheduled for 2024 following the GOES U launch.



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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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CBU 3.8 meter Pilot Uplink Antennas



GOES East – Backup Pilot (401.7 MHz)

GOES West – Backup Pilot (401.7 MHz)



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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)**
 - DCS message distribution service from/with Wallops, EDDN & NSOF utilizing the OpenDCS software in a client-server model.
- **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.



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 enables the Gateway to select which stream to disseminate, with the default being Wallops is Prime.
- Data customers using the NWSTG are largely unknown.



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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 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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DCS Administration and Data Distribution System (DADDS)

- Web-based platform that provides DCS users and administrators the various administrative functions necessary to maintain a properly functioning DCS .
- Detailed system performance statistics used by DCS operators and program staff to troubleshoot anomalies and track system metrics.
- Field test capability to aid users in the installation and testing of DCPs.
- Message data export functionality
- Accessed via the following links:
 - <https://dcs1.noaa.gov/>
 - <https://dcs2.noaa.gov/>
 - <https://dcs3.noaa.gov/>
 - <https://dcs4.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
dcs1.noaa.gov
dcs2.noaa.gov

NSOF Webserver
dcs1.noaa.gov
dcs4.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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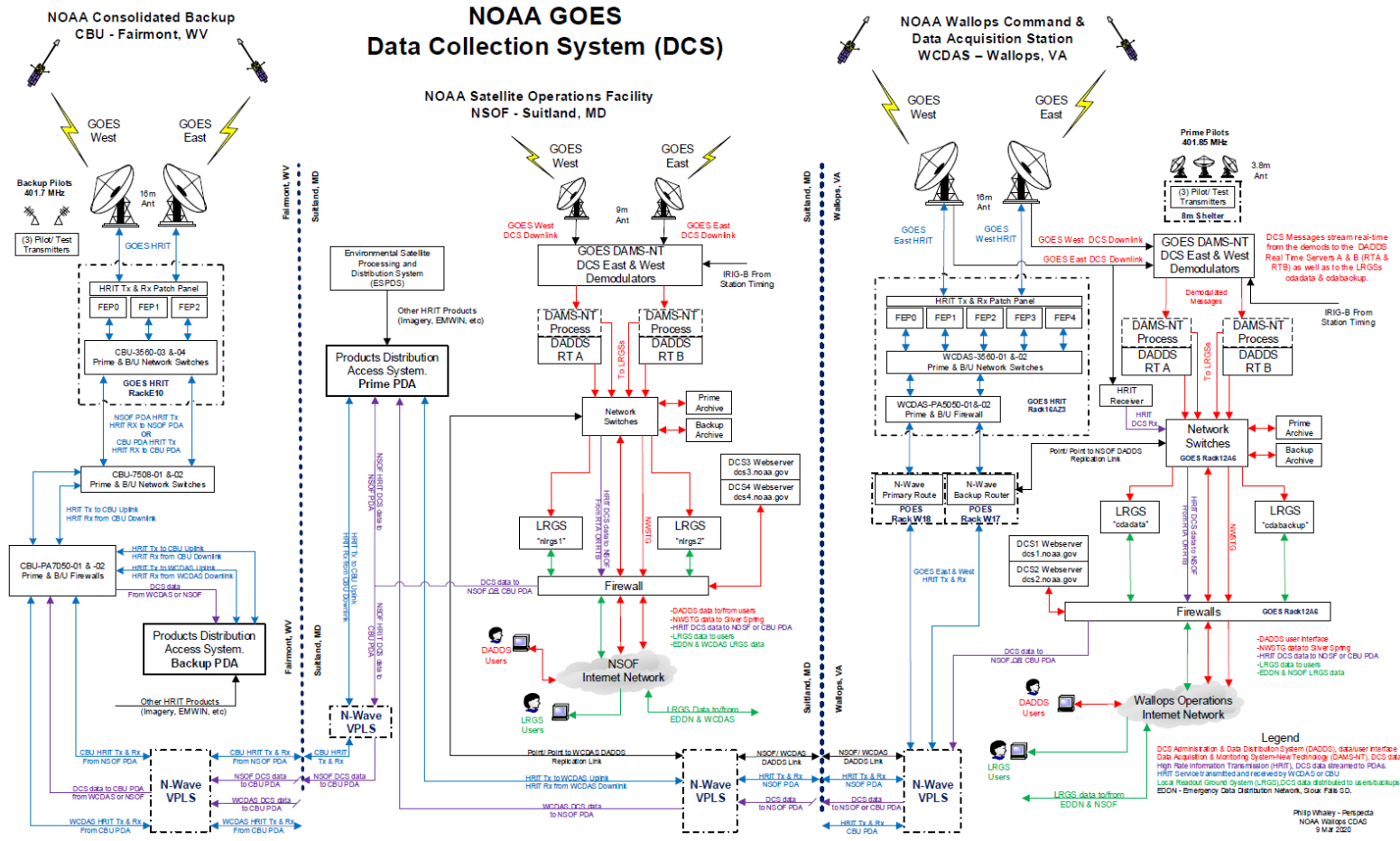


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NOAA DCS System Diagram



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
 - DCS Operations Supervisor
- Matthew Sullivan: 757-824-7360, matt.g.sullivan@noaa.gov
 - DCS Systems Engineer
- Christine Kuhner: 757-824-7450, christine.j.kuhner@noaa.gov
 - DCS Team Lead



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
- **GEOXO:** Geostationary Extended Operations
- **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
- **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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