NOAA Wallops CDA Station
GOES Data Collection System
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: Storage @ 60° W Longitude
• GOES-15: Storage @ 128° W Longitude
GOES 17

- NOAA’s newest geostationary satellite series replaced GOES 15 at 137.2° West, 15 Nov, 2018.

- **Reminder:** The GOES R satellite series frequency plan is different from the plan used by the GOES 13, 14 and 15 satellites. GOES DRGSs used to support the older GOES series satellites used DCS downlink in the frequency range of 1694.30 to 1694.70 MHz. The GOES R series satellites uses 1679.70 to 1680.10 MHz to support the DCS downlink.

- Note that the GOES 16 or 17 frequency plan changes do **NOT** affect the Data Collection Platform (DCP) UHF-Band uplink transmissions, only the L-Band downlink to NOAA and the DRGSs. There will also be NO frequency changes in the DCS DOMSAT Ku-Band service.

- [http://www.goes-r.gov](http://www.goes-r.gov)
GOES Footprints
DCPR Changes for GOES-R

- On the GOES-N/O/P satellites the DCPR downlink band is 1694.3 – 1694.7 MHz
  - The uplink Pilot at 401.85 MHz is translated to 1694.45 MHz in the existing downlink

- For the GOES-R series satellites the DCPR downlink band is 1679.7 – 1680.1 MHz
  - The uplink Pilot at 401.85 MHz will be translated to 1679.85 MHz in the new downlink

- No DCP uplink frequencies will change from the GOES-N to GOES-R satellites – only the downlinks
GOES R Frequency Plan

DOWNLINKS
(RAW DATA DOWNLINK NOT SHOWN)
(OQPSK, Linear Pol (N-S or E-W), 8220 MHz, BW=120 MHz)

DCPC
QPSK/DSSS
RHC
468.775 MHz
468.825 MHz
BW=95 kHz
BW=90 kHz

SAR
Bi-Φ/FDM/RHC
1544.550 MHz
BW=90 kHz

Radiosondes
1675 to 1679.6 MHz

DCPR
8PSK/FDM
Linear Pol
1679.7 to
1680.4 MHz
BW=0.7 MHz

GRB
Dual CP
1686.6 MHz
8PSK
BW=9.8 MHz
or QPSK
BW=10.9 MHz

HRIT/EMWIN
BPSK/Lin Pol
1693.0 MHz
BW=80 kHz

Housekeeping
Telemetry
BPSK/RHC
1693.0 MHz
BW=80 kHz

1695 to 1710 MHz
is proposed for
internet mobile radio

ORTT&C
Telem & Rng
BPSK/PM
RHC Pol
2211.04 MHz
BW=4.93 MHz

NOTES
†: DCPR (8PSK) and SAR (Bi-Φ) are individual uplinks FDM'ed in the spacecraft transponder.
†: Indicates possible extra GRB bandwidth for QPSK modulation

UPLINKS

DCPR
8PSK/FDM(†)
RHC Pol
401.7 MHz to
402.4 MHz
BW=0.7 MHz

SAR
Bi-Φ/FDM(†)
Linear/RHC
406.05 MHz
BW=90 kHz

HRIT/EMWIN
BPSK/RHC
2027.1 MHz
BW=1.205 MHz

DCPC
QPSK/DSSS
RHC
403.750 MHz
403.800 MHz
BW=90 kHz

Command
BPSK/RHC
2034.2 MHz
BW=128 kHz

ORTT&C Cmd
and Ranging
BPSK/PM/RHC
2036.0 MHz
BW=1.45 MHz

GRB
Dual Lin Pol
7216.6 MHz
8PSK
BW=9.8 MHz
or QPSK
BW=10.9 MHz
Wallops CDAS Backups

• CBU, Fairmont, WV
  – GOES 13-17 series backup for GOES East and West
  – Secondary DCS Pilot 401.7MHz transmits 24/7
• Fairbanks CDAS
  – GOES 13-15 series backup for GOES West
• Backup DADDS at NSOF Suitland, MD
• WBU, Goddard, MD is out of service and is transitioning to the GOES IO program.
NOAA CDA Station, Wallops VA
NOAA SOCC, Suitland Md
NOAA GOES DCS Data Services

The OSPO provides GOES DCS ground system support at three 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:

- **DOMSAT**
  - CONUS rebroadcast from Wallops or NSOF

- **NWSTG**
  - WMO Header service from Wallops or NSOF DADDS

- **LRGS**
  - File sharing service from/with Wallops, EDDN & NSOF DAMS-NT

- **HRIT**
  - GOES R Series link, DCS data from Wallops or NSOF DADDS
NOAA GOES DCS Data Services

• LRIT service termination
  – Wallops LRIT transmitter combiners were disabled on 12 Feb, 2019
  – High Rate Information Transmission (HRIT) is now the official replacement service for the GOES R series satellites
NOAA DCS DOMSAT

– DOMSAT service is scheduled to be discontinued on 14 May 2019.
– If DOMSAT is your primary source for data, please choose and implement a new data feed A.S.A.P.
DCS National Weather Service Telecommunication Gateway (NWSTG)

- Approximately 86% of the DCS messages processed are embedded with a WMO header and then sent to the NWSTG for distribution.

- Wallops 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.

- Recent changes to the Gateway have introduced delays in Wallops requests to have them select the desired data stream. NOAA is revisiting the original configuration that enabled Wallops to direct the desired site stream to the Gateway as opposed to requesting that they make configuration changes.

- Data customers using the NWSTG are largely unknown.
NOAA LRGS Configuration

- NOAA Wallops CDAS hosts 3 LRGS,
  - CDADATA:
    - LRGS Address: cdadata.wcda.noaa.gov
    - DRGS input from Wallops East & West DAMS NT demodulator applications, Primary & Backup
    - DDS Primary is CDABACKUP, DDS Backup is EDDN1 then NLRGS1
  - CDABACKUP:
    - LRGS Address: cdabackup.wcda.noaa.gov
    - DRGS input from Wallops East & West DAMS NT demodulator applications, Primary & Backup
    - DDS Primary is EDDN2, DDS Backup is EDDN 1 then NSOF LRGS 2
  - DROT: (DROT will be discontinued when DOMSAT service is terminated)
    - LRGS Address: cdadrot.wcda.noaa.gov
    - DOMSAT receive input from the 1.8m antenna system, useful for DOMSAT troubleshooting
    - No Backup ingests so that DOMSAT data outages can be monitored

- 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 EDDN1, 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 CDABACKUP, DDS Receive Backup is EDDN2
NOAA LRGS Support

• The Wallops CDAS monitors and maintains NOAA LRGS Network

• The LRGSs can be monitored through “LRGS Summary Status” web page, available through the DADDS webservers 1-4:

• The Emergency Data Distribution Network’s (EDDN) 3 LRGSs can also be monitored through the LRGS Summary Status:
## LRGS Summary Status

UTC: April 12, 2019 11:34:39 (Day 102)

<table>
<thead>
<tr>
<th>Host Name</th>
<th>Status Time</th>
<th>LRGS Status</th>
<th>Primary Downlink Status</th>
<th>Primary Quality Last Hour</th>
<th>Aggregate Quality Last Hour</th>
<th>Mgs This Hour</th>
<th>Num DDS Clients</th>
<th>Cove LRGS Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>edatas.wcda.noaa.gov</td>
<td>04/12 11:34:24</td>
<td>OK</td>
<td>DROG:Active</td>
<td>99.58%</td>
<td>99.58%</td>
<td>19766</td>
<td>107</td>
<td>9.1</td>
</tr>
<tr>
<td>edabkup.wcda.noaa.gov</td>
<td>04/12 11:34:23</td>
<td>OK</td>
<td>DROG:Active</td>
<td>99.58%</td>
<td>99.58%</td>
<td>19909</td>
<td>49</td>
<td>9.1</td>
</tr>
<tr>
<td>edadret.wcda.noaa.gov</td>
<td>04/12 11:34:19</td>
<td>OK</td>
<td>DMSAT:Active</td>
<td>90.67%</td>
<td>90.67%</td>
<td>19127</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td>nlrps1.noaa.gov</td>
<td>N/A</td>
<td>No Response</td>
<td>n/a (none)</td>
<td>0%</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>?</td>
</tr>
<tr>
<td>nlrps2.noaa.gov</td>
<td>N/A</td>
<td>No Response</td>
<td>n/a (none)</td>
<td>0%</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>?</td>
</tr>
<tr>
<td>lrgsdddd1.er.usgs.gov</td>
<td>04/12 11:34:39</td>
<td>OK</td>
<td>DDS:Active</td>
<td>99.59%</td>
<td>99.59%</td>
<td>20065</td>
<td>78</td>
<td>9.1</td>
</tr>
<tr>
<td>lrgsdddd2.er.usgs.gov</td>
<td>04/12 11:34:11</td>
<td>OK</td>
<td>DDS:Active</td>
<td>99.6%</td>
<td>99.6%</td>
<td>20776</td>
<td>70</td>
<td>9.2</td>
</tr>
<tr>
<td>lrgsdddd3.er.usgs.gov</td>
<td>04/12 11:34:39</td>
<td>OK</td>
<td>DDS:Active</td>
<td>99.59%</td>
<td>99.59%</td>
<td>20072</td>
<td>27</td>
<td>9.1</td>
</tr>
</tbody>
</table>
**LRGS Monitor Page**

**LRGS: cadata.wcdw.noaa.gov**

UTC: April 12, 2019 11:37:22 (Day 102)  
(Time reported by LRGS)  
System Status: Running  

### Archive Statistics

<table>
<thead>
<tr>
<th>Messages In Storage</th>
<th>Oldest Msg Time</th>
<th>Next Idx #</th>
</tr>
</thead>
<tbody>
<tr>
<td>66709412</td>
<td>01/01 00:00:00</td>
<td>385157</td>
</tr>
</tbody>
</table>

### Hourly Data Collection Statistics

<table>
<thead>
<tr>
<th>Hour</th>
<th>GOES DRGS (Good/ParErr)</th>
<th>DDS Receiv (Good/ParErr)</th>
<th>Archived (Good/ParErr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-5</td>
<td>67740 / 216</td>
<td>32893 / 119</td>
<td>32892 / 115</td>
</tr>
<tr>
<td>5-6</td>
<td>67739 / 232</td>
<td>32889 / 127</td>
<td>32886 / 123</td>
</tr>
<tr>
<td>6-7</td>
<td>67932 / 192</td>
<td>32949 / 103</td>
<td>32988 / 103</td>
</tr>
<tr>
<td>7-8</td>
<td>67746 / 216</td>
<td>32936 / 132</td>
<td>32899 / 126</td>
</tr>
<tr>
<td>8-9</td>
<td>67704 / 220</td>
<td>32841 / 119</td>
<td>32887 / 119</td>
</tr>
<tr>
<td>9-10</td>
<td>67814 / 212</td>
<td>32935 / 116</td>
<td>32842 / 114</td>
</tr>
<tr>
<td>10-11</td>
<td>67716 / 232</td>
<td>32884 / 124</td>
<td>32882 / 122</td>
</tr>
<tr>
<td>11-12</td>
<td>42983 / 157</td>
<td>21586 / 94</td>
<td>21587 / 91</td>
</tr>
</tbody>
</table>

### Downlink Statistics

<table>
<thead>
<tr>
<th>Downlink Name</th>
<th>Last Msg Rev Time</th>
<th>Last Seq Num</th>
<th>Link Status</th>
<th>Link Params</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRGS: Microcom-DRGS-BE</td>
<td>04/12 11:37:22</td>
<td>4514</td>
<td>Connected</td>
<td></td>
</tr>
<tr>
<td>DDS: EDDN1</td>
<td>04/12 11:37:21</td>
<td>-1</td>
<td>Real-Time</td>
<td>Primary</td>
</tr>
<tr>
<td>DDS: EDDN2</td>
<td>03/04 07:17:40</td>
<td>-1</td>
<td>Ready</td>
<td>Primary</td>
</tr>
<tr>
<td>DRGS: Microcom-DRGS-PE</td>
<td>04/12 11:37:22</td>
<td>81748</td>
<td>Connected</td>
<td></td>
</tr>
<tr>
<td>DRGS: Microcom-DRGS-BW</td>
<td>04/12 11:37:22</td>
<td>52875</td>
<td>Connected</td>
<td></td>
</tr>
<tr>
<td>DRGS: Microcom-DRGS-PW</td>
<td>04/12 11:37:22</td>
<td>35510</td>
<td>Connected</td>
<td></td>
</tr>
</tbody>
</table>

### Client Statistics

<table>
<thead>
<tr>
<th>Slot</th>
<th>Host Name</th>
<th>User</th>
<th>Msg Count</th>
<th>Last Activity Time</th>
<th>Last Msg Time</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>lgsmson</td>
<td>0</td>
<td>04/12 11:37:22</td>
<td>03/20 17:35:07</td>
<td>running</td>
</tr>
<tr>
<td>1</td>
<td>-</td>
<td>lgsmson</td>
<td>0</td>
<td>04/12 11:37:22</td>
<td>03/20 17:08:13</td>
<td>running</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>(unknown)</td>
<td>1</td>
<td>04/12 11:37:22</td>
<td>04/12 11:05:23</td>
<td>running</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>onthyd</td>
<td>0</td>
<td>04/12 11:37:22</td>
<td>04/12 10:34:13</td>
<td>running</td>
</tr>
</tbody>
</table>
High Rate Information Transmission (HRIT)

• 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.
GPS Roll Over

- GPS Week Rollover event occurred Saturday, April 6th at 0000 UTC
- The DCS program office sent multiple email alerts and posted bulletins to our web sites to the DCS user community to make folks aware of the event.
- Vendors worked with customers to mitigate service interruption.
- It appears that some users were affected initially, but the messages statistics are slowly coming back in range to what is normally expected.
GPS Roll Over

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>TYPE</th>
<th>HOST</th>
<th>LAST UPDATE</th>
<th>UP SINCE</th>
<th>STATUS</th>
<th>INGEST</th>
<th>STORE</th>
<th>PENDING</th>
<th>SEQUENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRTA MSG PROCESSOR</td>
<td>MSGPRC</td>
<td>NRTA2</td>
<td>19/102 16:48:42</td>
<td>19/101 14:24:15</td>
<td>ACTIVE</td>
<td>897412</td>
<td>897388</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REPORT</th>
<th>GOOD</th>
<th>INFORMATIONAL</th>
<th>MISSING</th>
<th>PARITY ERROR</th>
<th>TIME ERROR</th>
<th>CHANNEL ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>J 2019 - 102</td>
<td>554273</td>
<td>16013</td>
<td>9700</td>
<td>1689</td>
<td>4650</td>
<td>546</td>
</tr>
<tr>
<td>J 2019 - 101</td>
<td>705602</td>
<td>24146</td>
<td>15292</td>
<td>2460</td>
<td>6515</td>
<td>785</td>
</tr>
<tr>
<td>J 2019 - 100</td>
<td>729169</td>
<td>23175</td>
<td>14869</td>
<td>2467</td>
<td>6282</td>
<td>731</td>
</tr>
<tr>
<td>J 2019 - 099</td>
<td>772469</td>
<td>68773</td>
<td>59888</td>
<td>2535</td>
<td>6573</td>
<td>819</td>
</tr>
<tr>
<td>J 2019 - 098</td>
<td>762365</td>
<td>99619</td>
<td>90680</td>
<td>2144</td>
<td>6451</td>
<td>811</td>
</tr>
<tr>
<td>J 2019 - 097</td>
<td>818994</td>
<td>56292</td>
<td>39567</td>
<td>2191</td>
<td>14486</td>
<td>882</td>
</tr>
<tr>
<td>J 2019 - 096</td>
<td>842861</td>
<td>23526</td>
<td>14305</td>
<td>2261</td>
<td>6849</td>
<td>931</td>
</tr>
<tr>
<td>J 2019 - 095</td>
<td>837352</td>
<td>29965</td>
<td>21059</td>
<td>2404</td>
<td>6631</td>
<td>850</td>
</tr>
<tr>
<td>J 2019 - 094</td>
<td>751285</td>
<td>20633</td>
<td>12431</td>
<td>2381</td>
<td>6040</td>
<td>806</td>
</tr>
<tr>
<td>J 2019 - 093</td>
<td>842815</td>
<td>22680</td>
<td>13447</td>
<td>2486</td>
<td>6817</td>
<td>858</td>
</tr>
<tr>
<td>J 2019 - 092</td>
<td>842108</td>
<td>22560</td>
<td>12973</td>
<td>2583</td>
<td>6901</td>
<td>890</td>
</tr>
<tr>
<td>J 2019 - 091</td>
<td>842312</td>
<td>21545</td>
<td>12020</td>
<td>2611</td>
<td>6876</td>
<td>870</td>
</tr>
</tbody>
</table>
GPS Week Number Rollover Notification

GOES HRIT File Format Modification Testing

DOMSAT is scheduled to be discontinued on 14 May 2019

Submit an Application for a GOES DCS SUA

⚠️ Notice to Users

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**WARNING ** **WARNING ** **WARNING **

Register for Direct Readout and Services Notifications

Help us keep you up to date with changes and anomalies!
NOAA Wallops CDAS Support Phone Numbers

• Wallops Help Desk: 757-824-7450 or 757-824-7451
  ➢ 24/7 Technical Support for DCS, LRGS, LRIT, HRIT

• Albert McMath: 757-824-7316 (Retiring 30 May, 2019)
  ➢ Wallops CDAS Operations Branch Chief

• Travis Thornton: 757-824-7304
  ➢ Operations Shift Supervisor and DCS Operations Team Lead
  ➢ Acting Wallops CDAS Operations Branch Chief 01 June, 2019

• Philip Whaley: Retired 29 March, 2019
  ➢ Systems Engineering Branch support for GOES Systems
  ➢ NOAA DCPRS Certification Official
NOAA Wallops CDAS Support Phone Numbers

• Matt Sullivan:  757-824-7360
  – Calibration Laboratory, Systems Engineering Branch
  – Acting for Phillip Whaley
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
• **FCDAS**: Fairbanks Command and Data Acquisition Station, AK
• **WBU**: Wallops Backup, Goddard Space Flight Center, MD
• **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
DCP Test Channels

• GOES East
  – 300bps
    • 195E for CS1 & CS2 (401.99200 MHz)
  – 1200bps
    • A99 for CS1, 497 for CS2 (401.99575 MHz)
      – Incompatible with CS2-needs to move

• GOES West
  – 300bps
    • 196W for CS1 & CS2 (401.99350 MHz)
  – 1200bps
    • A100 for CS1, 499 for CS2 (401.99875 MHz)
Abnormal Response Messages (ARM)  
Or  
Information Messages (IM)

- 'G': Good Message - also transmitted with all messages except '?' and 'M'.
- '?': Parity Error(s).
- 'A': Correctable address
- 'N': PDT Incomplete
- 'T': Overlapping time error. A message was outside of, but overlapping its window.
- 'U': Non-overlapping time error. Message completely out of its defined window.
- 'W': Wrong channel
- 'M': A self-timed message was not received at all, received on wrong channel, not completely inside a window or an overlapping window.
- 'B': Non-correctable : Available on the DADDS Website message data. Messages with bad addresses are not disseminated.
- 'I': Invalid address. Available on the DADDS Website message data. Messages invalid addresses are not disseminated.
DCS Message Statistics

11083215414G48+2NN167EFF

- YYDDDDHHMMSS Time: YYDDDDHHMMSS (Frame Sync)
- T Type: G = Good, ? = Parity Errors (ARM)
- SS Signal Strength: dBm EIRP (assumes 47 dBmi Pilot)
  - 25 to 56 dBm nominal demod reception thresholds
- ±X Frequency: Sign & Digit (±F times 50 Hz)
- M Modulation Index (Phase): Normal, High, Low
- D Data Quality (Phase): Normal, Fair, Poor