



# GOES R

## GOES-West Transition Plan/User Readiness

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NOAA's Office of Satellite and Product Operations (OSPO)

The Joint Meeting of RA II WIGOS Project and RA V TT-SU for RA II and RA V NMHSs  
Jakarta, Indonesia  
*11 October 2018*



NOAA ~ NASA





# Outline

- Overview of NOAA satellites
- GOES Constellation Assignment
- GOES-West Transition Plan
- Science Product Readiness
- Distribution Readiness



# Office of Satellite and Product Operations (OSPO)

- Operates the Nation's 18 environmental satellites:
  - 4 Geostationary (GOES-13, -14, -15, -16) by NOAA
  - 3 Polar-Orbiting (NOAA-15, -18, -19) by NOAA
  - 1 Suomi National Polar-orbiting Partnership (NPP) by NOAA & NASA
  - 1 JPSS-1 (NOAA-20) by NOAA & NASA
  - 5 Defense Meteorological Satellite program (DMSP) operated by NOAA
  - 2 OSTM Jason-2 & Jason-3 (Ocean Surface Topography Mission) - Joint NOAA, NASA, CNES, EUMETSAT effort
  - 1 DSCOVR (Deep Space Climate Observatory) by NOAA
  - 1 COSMIC-1 (Constellation Observing System for Meteorology, Ionosphere and Climate)
- GOES-S, known and GOES-17 in orbit was successfully launched on March 1, 2018. It will become operational as the GOES-West satellite
- JPSS-1, known and NOAA-20 in orbit was successfully launched on November 18, 2017.



# GOES-S Road to Launch



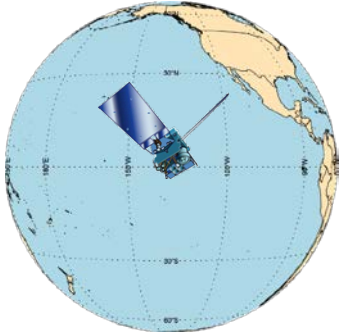


# GOES-S Launch

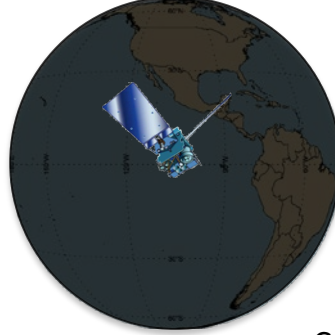


# GOES Constellation

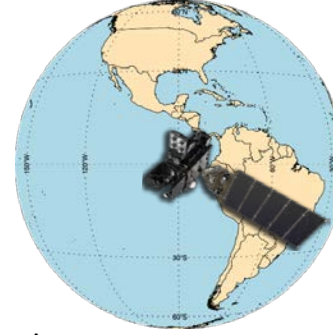
GOES-West  
GOES-15  
135° West



Standby  
GOES-14  
105° West



Checkout  
GOES-17  
89.5° West



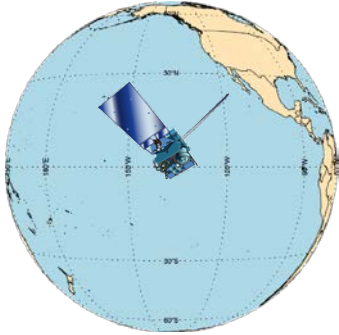
GOES-East  
GOES-16  
75.2° West



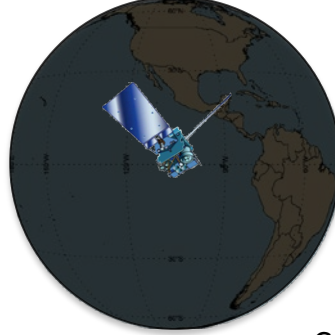
Current

# GOES Constellation

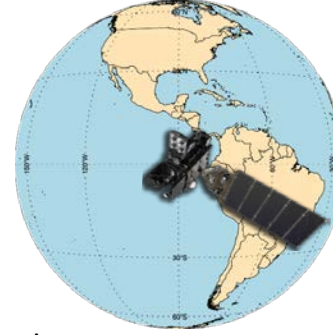
GOES-West  
GOES-15  
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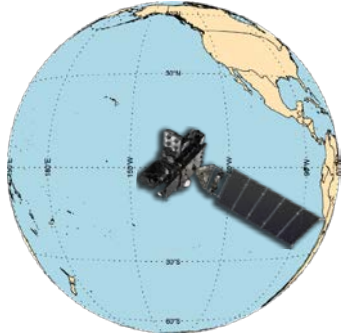


GOES-East  
GOES-16  
75.2° West

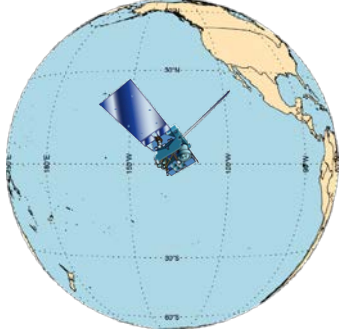


Current  
Late 2018

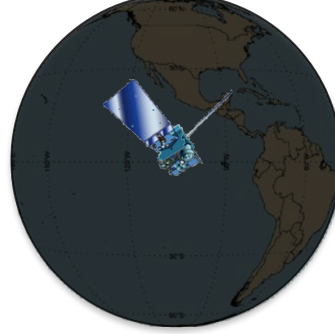
Tandem GOES-West  
GOES-17  
137° West



Tandem GOES-West  
GOES-15  
TBD



Standby  
GOES-14  
105° West

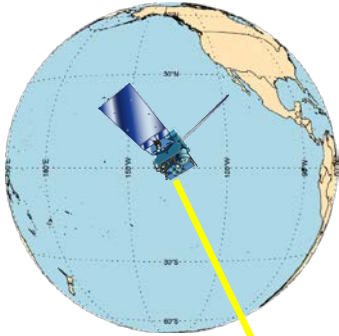


GOES-East  
GOES-16  
75.2° West



# GOES Constellation

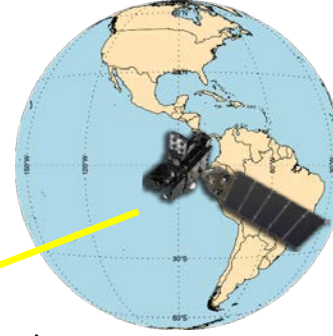
GOES-West  
GOES-15  
135° West



Standby  
GOES-14  
105° West



Checkout  
GOES-17  
89.5° West

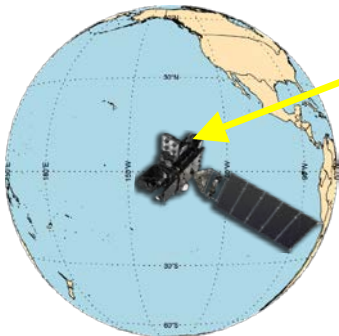


GOES-East  
GOES-16  
75.2° West

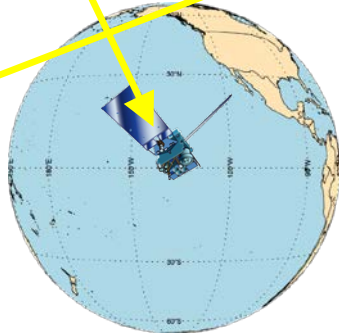


Current  
Late 2018

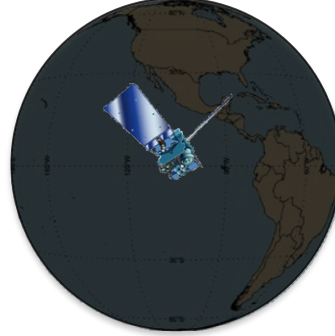
Tandem GOES-West  
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GOES-15  
TBD



Standby  
GOES-14  
105° West



GOES-East  
GOES-16  
75.2° West







The latest GOES-17 transition information is available at: <https://www.goes-r.gov/users/transitionToOperations17.html>

## GOES-West Transition Plan for Operationalization of GOES-17

Date	GOES-15		GOES-17	
	Location	Activity	Location	Activity
10/22/18	135°W (no change)	GVAR relaythrough GOES-14 begins	89.5°W (no change)	No change
10/23/18	Drift start at 0.88°/day moving eastward	All Instruments and Services remain on with nominal GVAR and LRIT distribution	89.5°W (no change)	No change
10/24/18	Still drifting	No change	Drift start at 2.5°/day moving westward	<ul style="list-style-type: none"> <li>Five instruments (ABI, EXIS, GLM, SUVI, SEISS) placed in safe or diagnostic modes with no data capture or distribution.</li> <li>Only MAG continues operating, but with data outages on days of drift start (10/24 &amp; 25) and drift stop (11/12 &amp; 13).</li> <li>Disable GRB RF, DCS, HRIT/EMWIN, SARSAT.</li> </ul>
11/1/18	Drift stop at 128°W	No change	Still drifting	No change
11/2/18	128°W (no change)	GVAR relaythrough GOES-14 ends, GOES-15 GVAR direct broadcast continues	Still drifting	No change
11/13/18	128°W (no change)	No change	Drift stop at 137°W	<ul style="list-style-type: none"> <li>ABI, EXIS, GLM, SEISS, SUVI commanded to nominal operation modes.</li> <li>ABI INR convergence begins.</li> <li>Still no GRB RF, DCS, HRIT/EMWIN, SARSAT.</li> </ul>
11/15/18	128°W (no change)	No change	137°W (no change)	<ul style="list-style-type: none"> <li>Data distribution resumes for SBN/AWIPS, PDA, GNC-A, CLASS. Activate GRB RF, DCS, HRIT/EMWIN, SARSAT. All data distribution services on for GOES-17.</li> <li>GOES-17 L2 products continue validation towards Provisional &amp; Full Validation Maturity levels.</li> </ul>
After 12/10/18 – May 2019	128°W (no change)	Simultaneous GOES-West (GOES-17) and GOES-15 operations	137°W (no change)	Simultaneous GOES-West (GOES-17) and GOES-15 operations

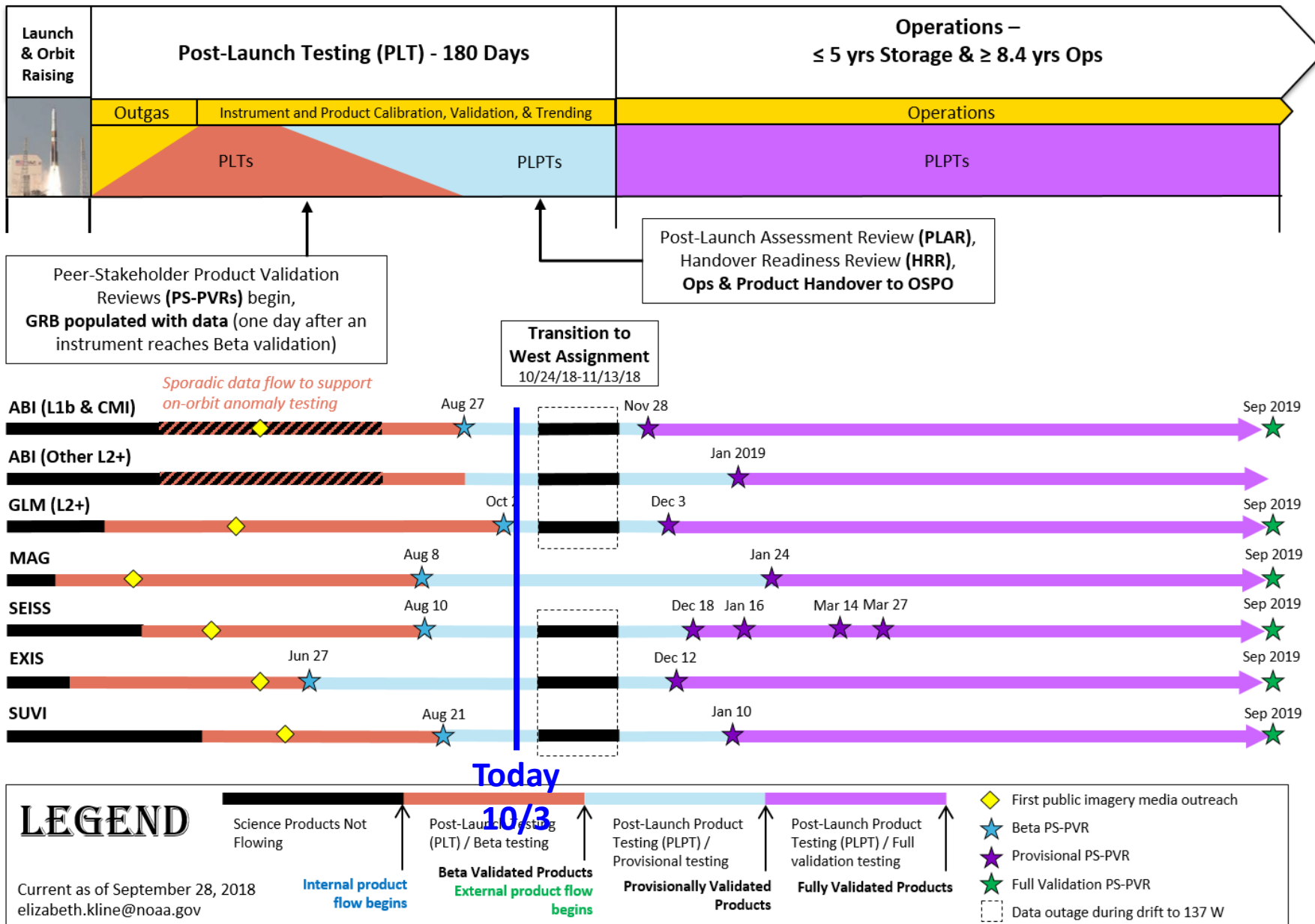
### Notes

- GOES-14 EMWIN and MDL (No SXI or XRS/EUV) remain enabled throughout entire time period.
- No planned maneuvers / special operations during Thanksgiving and Veteran's Day federal holidays. No GOES-West transition / interruption during CWDs.

Date of Draft: September 25, 2018

Legend: GOES-West Operational Satellite

# GOES-17 Post-Launch Science Product Validation Schedule



Note: All dates are coordinated with Flight/MOST PLT SOE group and are subject to change.



# GOES-17 L1b Science Product Validation Status

ABI L1b Product	Beta	Provisional	Full
Radiances	8/27/18	11/28/18	09/2019
<b>GLM L2 Product</b>			
Lightning: Events, Groups, Flashes	10/2/18	12/3/18	09/2019
<b>SEISS L1b Products</b>			
Energetic Heavy Ions	8/10/18	3/14/19	09/2019
Magnetospheric e <sup>-</sup> /p <sup>+</sup> : Low Energy	8/10/18	3/27/19	09/2019
Magnetospheric e <sup>-</sup> /p <sup>+</sup> : High Energy	8/10/18	12/18/18	09/2019
Solar & Galactic Protons	8/10/18	1/16/19	09/2019
<b>EXIS L1b Products</b>			
Solar Flux: EUV	6/27/18	12/12/18	09/2019
Solar Flux: X-ray Irradiance	6/27/18	12/12/18	09/2019
<b>SUVI L1b Product</b>			
Solar EUV Imagery	8/21/18	1/10/19	09/2019
<b>MAG L1b Product</b>			
Geomagnetic Field	8/8/18	1/24/19	09/2019

10/2/18

Validation Maturity Levels:

Not Validated	Beta Maturity	Provisional Maturity	Full Maturity
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# GOES-17 L2+ Product Validation Status

ABI L2+ Products	Beta	Prov	Full
Cloud and Moisture Imagery (CMI) and Sectorized CMI (KPP)	8/27/18	11/28/18	2019
Aerosol Detection (Smoke & Dust)	8/27/18	1/7/19	2019
Aerosol Optical Depth (AOD)	8/27/18	1/7/19	2019
Clear Sky Mask	8/27/18	1/7/19	2019
Cloud Optical Depth	8/27/18	1/7/19	2019
Cloud Particle Size Distribution	8/27/18	1/7/19	2019
Cloud Top Height	8/27/18	1/7/19	2019
Cloud Top Phase	8/27/18	1/7/19	2019
Cloud Top Pressure	8/27/18	1/7/19	2019
Cloud Top Temperature	8/27/18	1/7/19	2019
Derived Motion Winds	8/27/18	1/7/19	2019
Derived Stability Indices	8/27/18	1/7/19	2019

ABI L2+ Products	Beta	Prov	Full
Downward S/W Radiation: Surface	8/27/18	1/7/19	2019
Fire/Hot Spot Characterization	8/27/18	1/7/19	2019
Hurricane Intensity Estimation	8/27/18	1/7/19	2019
Land Surface Temperature	8/27/18	1/7/19	2019
Legacy Vertical Moisture Profile	8/27/18	1/7/19	2019
Legacy Vertical Temperature Profile	8/27/18	1/7/19	2019
Rainfall Rate/QPE	8/27/18	1/7/19	2019
Reflected S/W Radiation: TOA	8/27/18	1/7/19	2019
Sea Surface Temperature	8/27/18	1/7/19	2019
Snow Cover	TBD*	TBD*	TBD*
Total Precipitable Water	8/27/18	1/7/19	2019
Volcanic Ash: Detection and Height	8/27/18	1/7/19	2019

9/10/18

Validation Maturity Levels:

Not Validated	Beta Maturity	Provisional Maturity	Full Maturity
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\* Snow Cover has a waiver. It is dependent upon a non-baseline Albedo Product which is in development.



# Access to GOES-17

## Direct Readout (requires receiving system)

NWS SBN	Satellite Broadcast Network – serves AWIPS
GRB	GOES Rebroadcast (includes all bands of L1b ABI, L1b Space Wx, L2 GLM)
HRIT/EMWIN	High Resolution Information Transmission / Emergency Managers Weather Information Network (Full Disk CMI for 7 channels: 0.64, 3.9, 6.2, 6.9, 10.3, 11.2, 12.3 every 30 min; Mesoscale CMI for 3 bands 0.64, 3.9, 10.3 every 15 min)
GNC-A	GEONETCast Americas (Full Disk CMI for 7 channels: 0.64, 3.9, 6.2, 6.9, 10.3, 11.2, 12.3; 19 ABI Level 2 products will be added upon approval for dissemination)

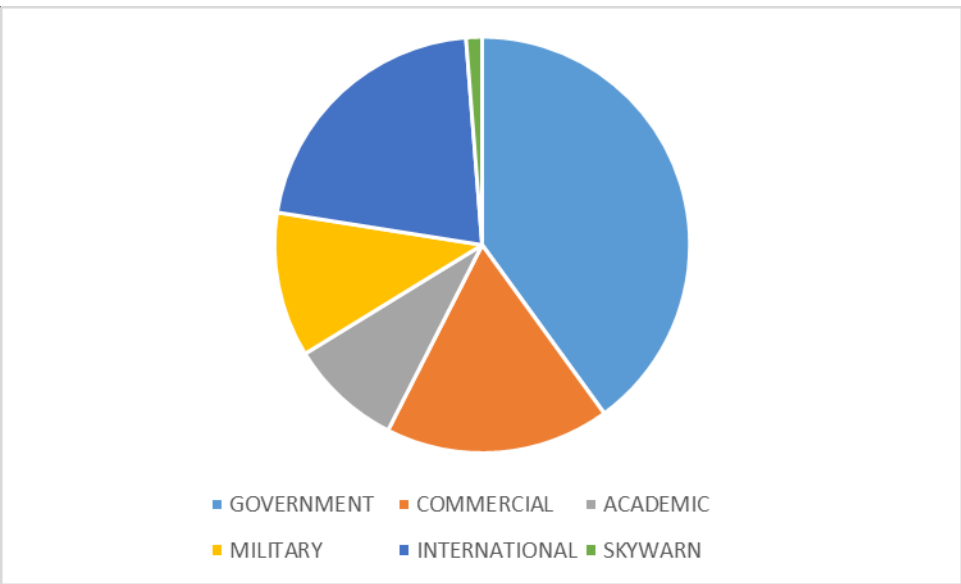
## Terrestrial Access

PDA	Product Distribution & Access <ul style="list-style-type: none"><li>Operational real-time users</li><li>Apply for access</li></ul>
CLASS	Comprehensive Large Array-data Stewardship Systems <ul style="list-style-type: none"><li>Request and setup access</li></ul>



# GRB Readiness

SECTOR	Nr. of GRB stations installed
GOVERNMENT	32
COMMERCIAL	14
ACADEMIC	7
MILITARY	9
INTERNATIONAL	17
SKYWARN	1
<b>Total</b>	<b>80</b>



*Note: A station consists of an antenna and receiver*

- Number of GRB stations that confirmed GOES-17 receipt: 15
- GRB User Group has 150 members -- 8 were direct participants in GOES-17 Post-launch Tests





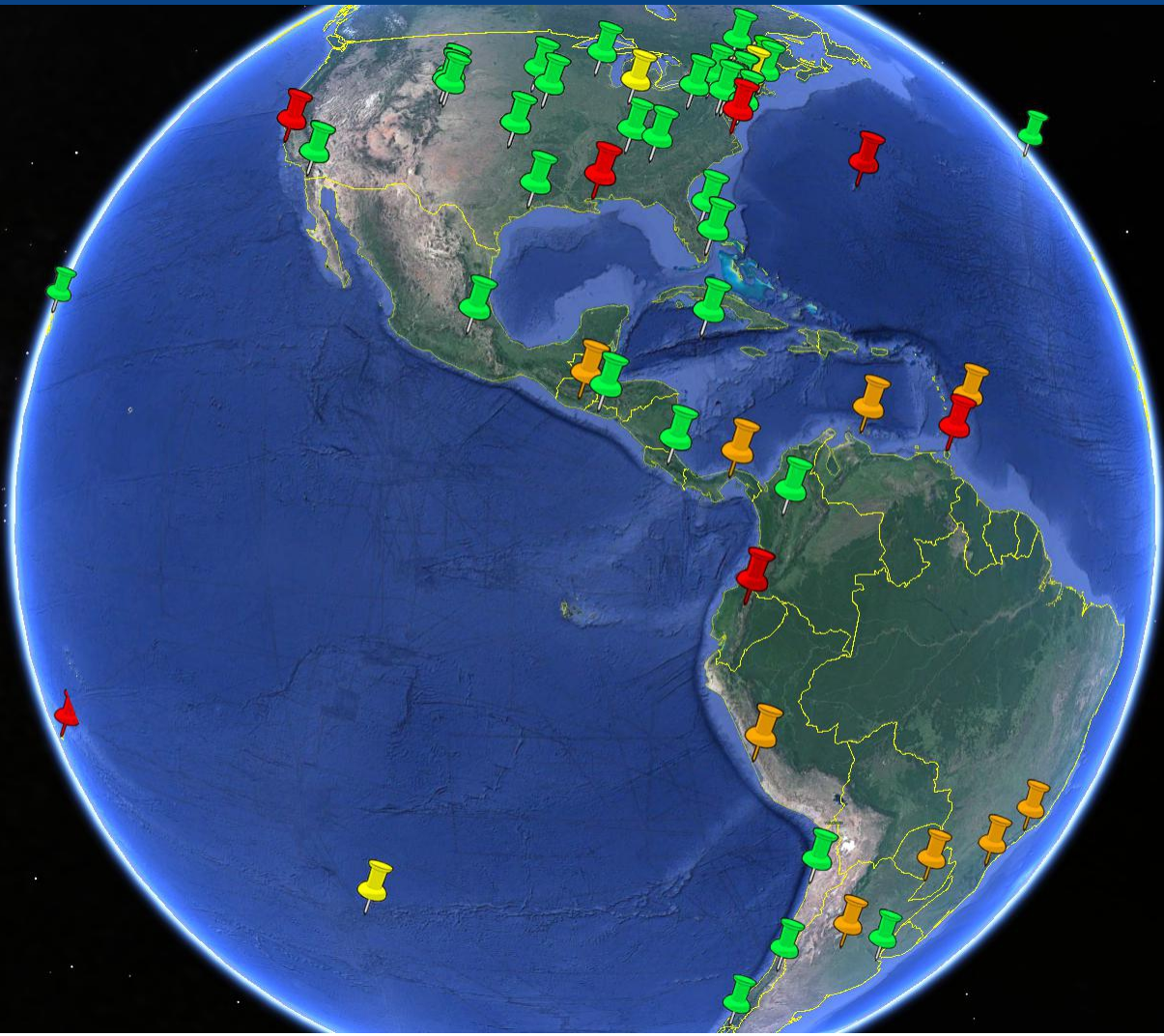
# GRB Site Status

## GRB Site Status

Updated on 5/22/18

**Legend**

- GRB planned
- GRB planned, receiving GNC-A
- GRB receiving GOES-16/17



Google Earth

US Dept of State Geographer  
©2018 Google  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat / Copernicus



View from Space (Altitude: 7845 mi)



# GOES-17 ABI

- NASA, NOAA Convene GOES-17 Mishap Investigation Board:  
<https://www.nesdis.noaa.gov/GOES-R-Series-Satellites>
- Press briefing: <https://www.nesdis.noaa.gov/press>
- Fact Sheet on GOES-17 loop heat pipe (LHP) subsystem:  
[https://www.nesdis.noaa.gov/sites/default/files/asset/document/NESDIS\\_factsheet\\_loopheatpipe.pdf](https://www.nesdis.noaa.gov/sites/default/files/asset/document/NESDIS_factsheet_loopheatpipe.pdf)





# GOES-17 Transition to Operations Web Site



GOES-17 POST-LAUNCH TESTING AND TRANSITION TO OPERATIONS

<https://www.goes-r.gov/users/transitionToOperations17.html>



# Training and User Education Materials



## Online Training Modules

- Cooperative Program for Operational Meteorology, Education, and Training (COMET): <https://www.meted.ucar.edu/>
- Satellite Hydrology and Meteorology for Forecasters (SHyMet): <http://rammb.cira.colostate.edu/training/shymet/>
- Short-term Prediction Research and Transition Center (SPoRT) product training modules: <http://weather.msfc.nasa.gov/sport/training/>
- Virtual Institute for Satellite Integration Training (VISIT) Training Resources: <http://rammb.cira.colostate.edu/training/visit/>

## Printed Materials

- ABI Bands Quick Information Guides
- GOES-R Fact Sheets
- User Readiness Plan
- GRB Downlink Specifications and Product Users' Guide
- Proving Ground Demonstration Final Reports and Annual Reports





# User Points of Contact for GOES-R Series

## Product Operations

Data Operations:	Matthew.Seybold@noaa.gov
User Services:	Kathryn.Mozer@noaa.gov
L2+ Products:	Thomas.Feroli@noaa.gov (Acting)

## Distribution

GOES Rebroadcast (GRB):	James.McNitt@noaa.gov
HRIT/EMWIN:	Seth.Clevenstine@noaa.gov
GNC-A:	Natalia.Donoho@noaa.gov
GOES-17 data in PDA:	Donna.McNamara@noaa.gov
GOES-17 data in CLASS:	Elizabeth.Kline@noaa.gov



Natalia.Donoho@noaa.gov



**Thank you**

For more information visit [www.goes-r.gov](http://www.goes-r.gov)

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