



NOAA IDP

NWS Ground Readiness Project

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IDP Ground Readiness Project

June 4, 2014

NOAA Satellite Proving Ground and User Readiness Meeting

NWS Ground Readiness Project Agenda

➤ IDP Ground Readiness Project Overview

➤ NWS Ground Readiness Projects

- GRB/H8 Broadcast Project
- Network Projects
 - Short-Term CONUS/OCNUS Network Project
 - Long-Term Enterprise Network Project
- SBN Expansion Project

➤ S-NPP Products in AWIPS

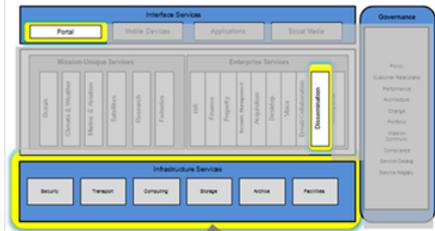
NOAA Integrated Dissemination Program

Ground Readiness Project Overview

- The NOAA Integrated Dissemination Program (IDP) plans to deliver NOAA Wide Dissemination Services in a phased approach
- In Phase 1, IDP's near-term focus is on executing against its 3 Program, Project and Activities (PPAs) requirements:
 - **NWS Ground Readiness Project (GRP),**
 - NWS Telecommunication Gateway (Re-architecture), and
 - NWS Next Generation IT Web Services
- Within the IDP, the GRP focus is on ensuring the readiness of the NWS IT infrastructure for JPSS, GOES-R, model/guidance, radar and other products

IDP/GRP Overview (continued)

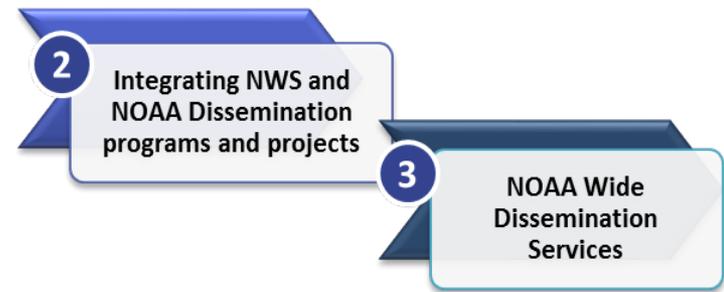
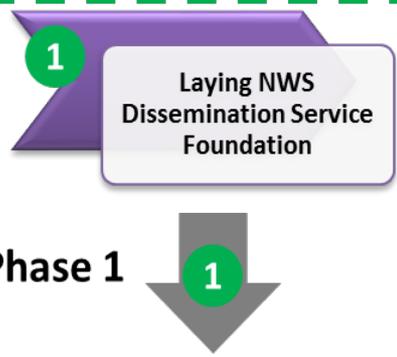
NOAA Enterprise Shared Services Model



National Weather Service Portfolios



IDP Long Term Approach (Phased Approach)



IDP Near Term Approach



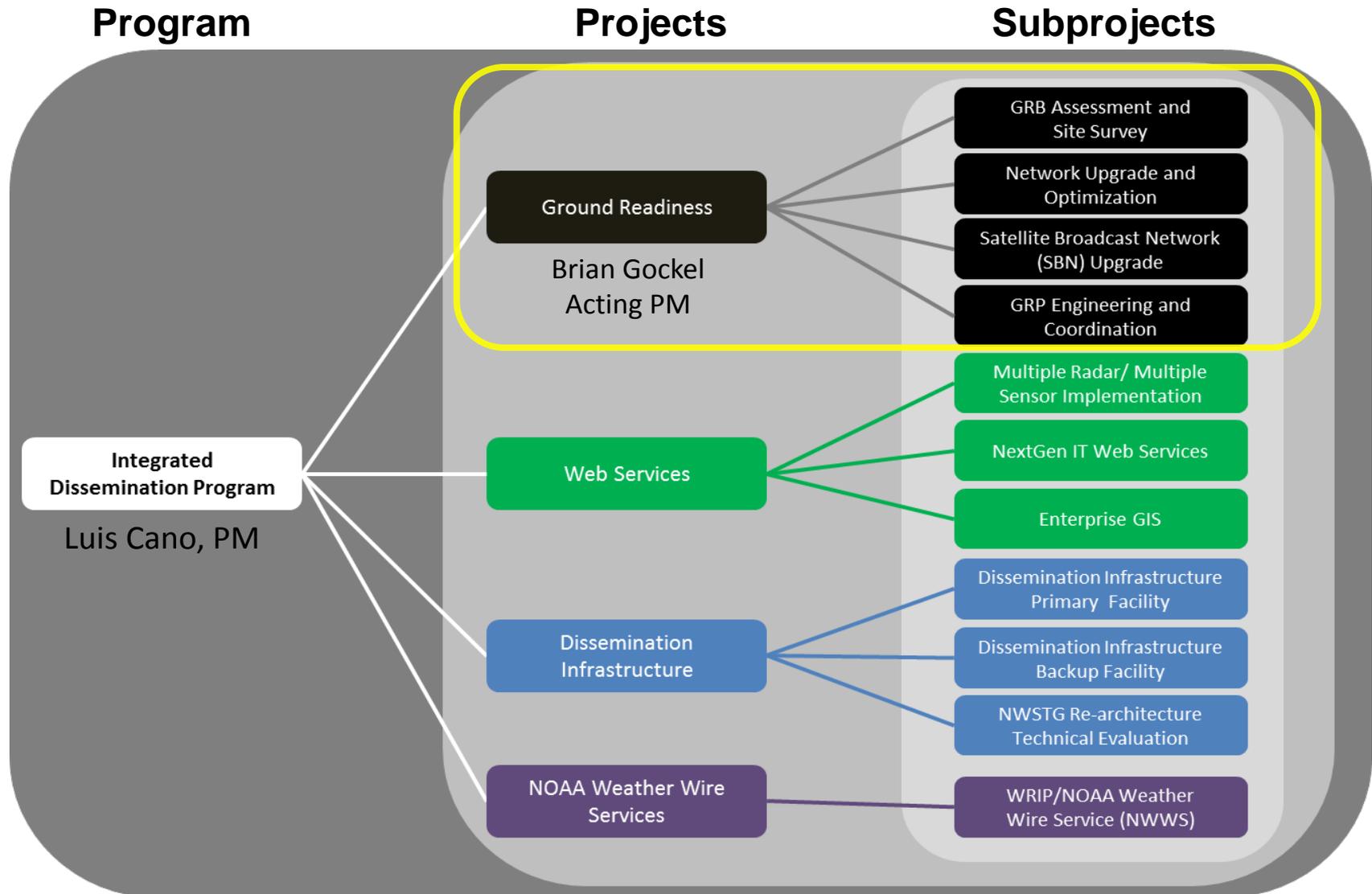
IDP three PPAs:

- NWS Ground Readiness Project
- NWS Telecommunication Gateway Re-architecture
- Next Generation (NextGen) IT Web Services

IDP project description:

- **Ground Readiness** focuses on NWS network upgrades and optimization In support of NWS ground readiness to ensure networks can support increased Data volumes (e.g. Satellite data, model data and radar data)
- **Dissemination Infrastructure** focuses on provisioning and supporting Dissemination capabilities
- **NextGen IT Web Services** focuses on access and discovery of data and information

IDP/GRP Overview (continued)

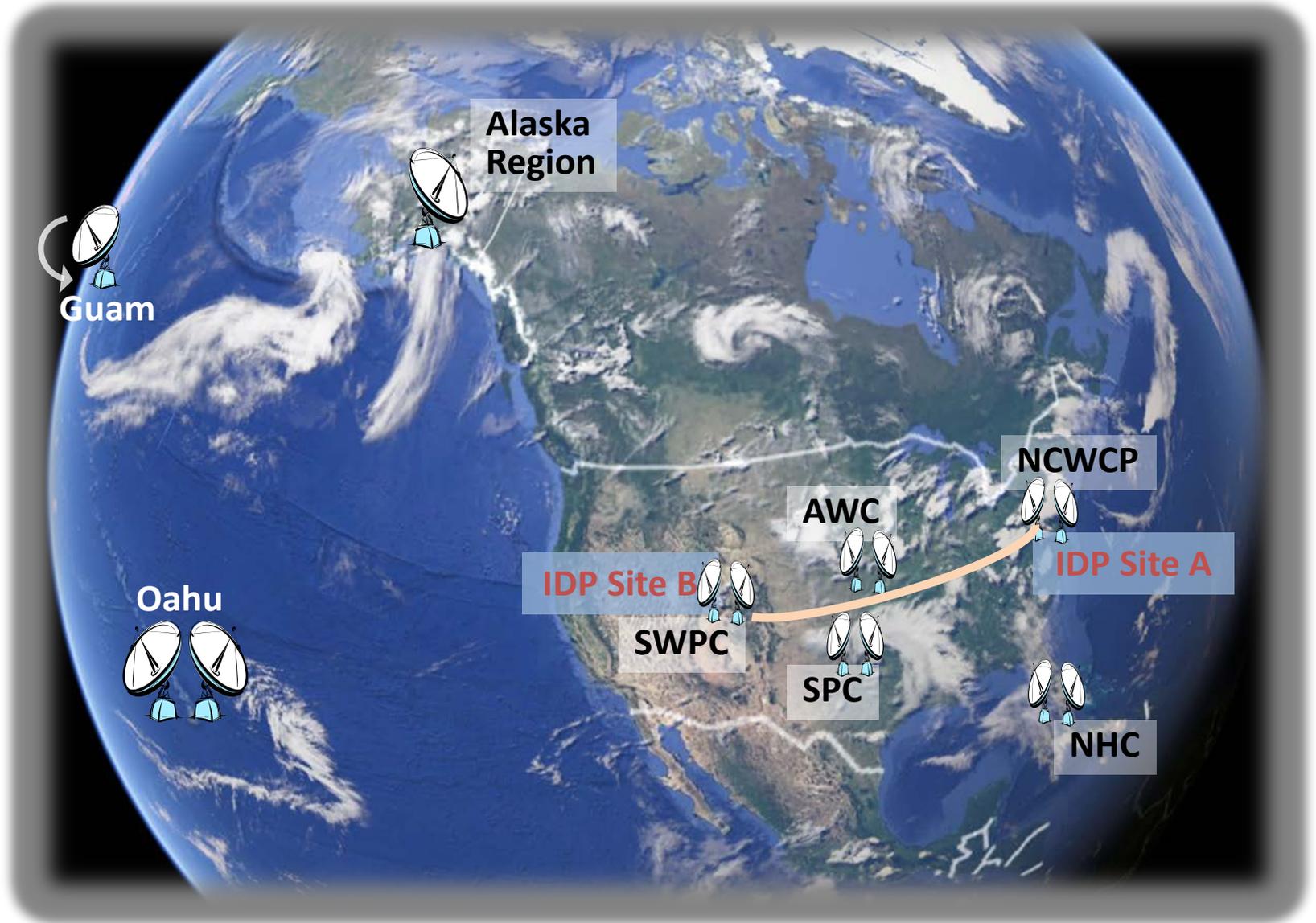


Illustrated above is a representation of IDPs projects and subprojects as of April 2014. As the Program evolves, additional projects/subprojects will be stood-up

NWS Ground Readiness Projects (and Project Managers)

1. GRB Assessment and Site Survey Project (Salim Leyva)
 - Updating NWS geostationary downlink antennas for GOES-R and Himawari (H-8); site survey for AK polar-sat direct readout project; leads into antenna build-out project
2. Network Upgrade and Optimization Project
 - Short/Medium-term Network Upgrades (Scott Denton/Bob Brauch)
 - Long-term project for improved networks (Christine Brunner)
3. SBN Expansion (Jami Casamento)
 - Increase Satellite Broadcast Network from 30 to 60+ Mbps
4. GRP Engineering and Coordination (Brian Gockel)
 - Supports all GRP projects
 - Across-project integration
 - Test planning and coordination, interface definitions, new product activations

GRP GRB/H8 Project: Sites



NWS Field Sites Receiving Geostationary-Weather-Satellite Antennas

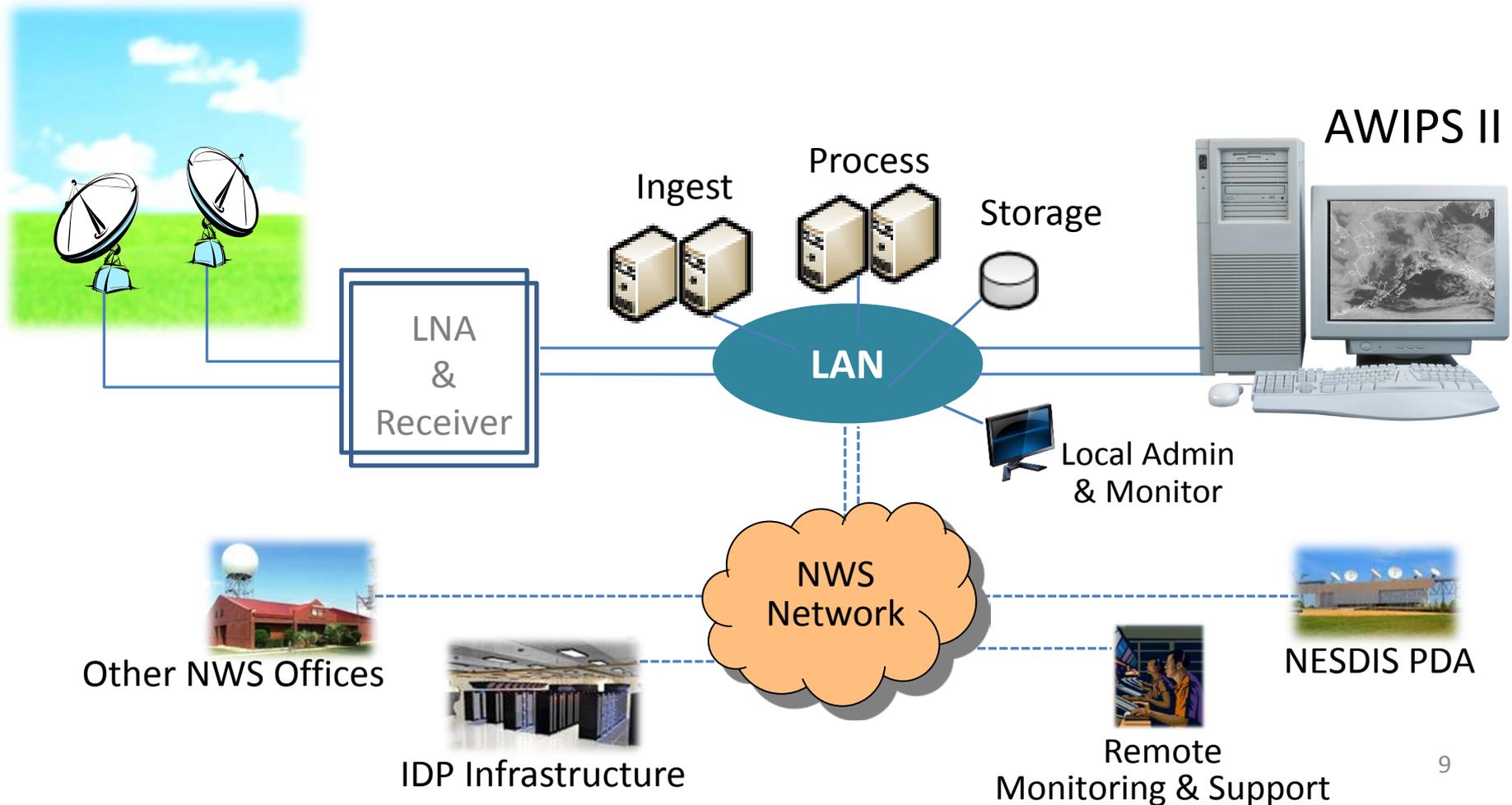
GRP GRB/H8 Project: Sites/Antennas

Site	Himawari	GOES West	GOES East
Guam			
Oahu (Pac. Reg.)			
Alaska Region			
SWPC			
SPC			
AWC			
NCWCP			
NHC			

- *Himawari antennas scheduled to be installed Spring 2015*
- *GOES Antennas scheduled to be installed Summer/Fall 2015*
- *Some project details acquisition sensitive*

GRP GRB/H8 Project

NWS Antenna System – High-Level View



GRP Network Projects

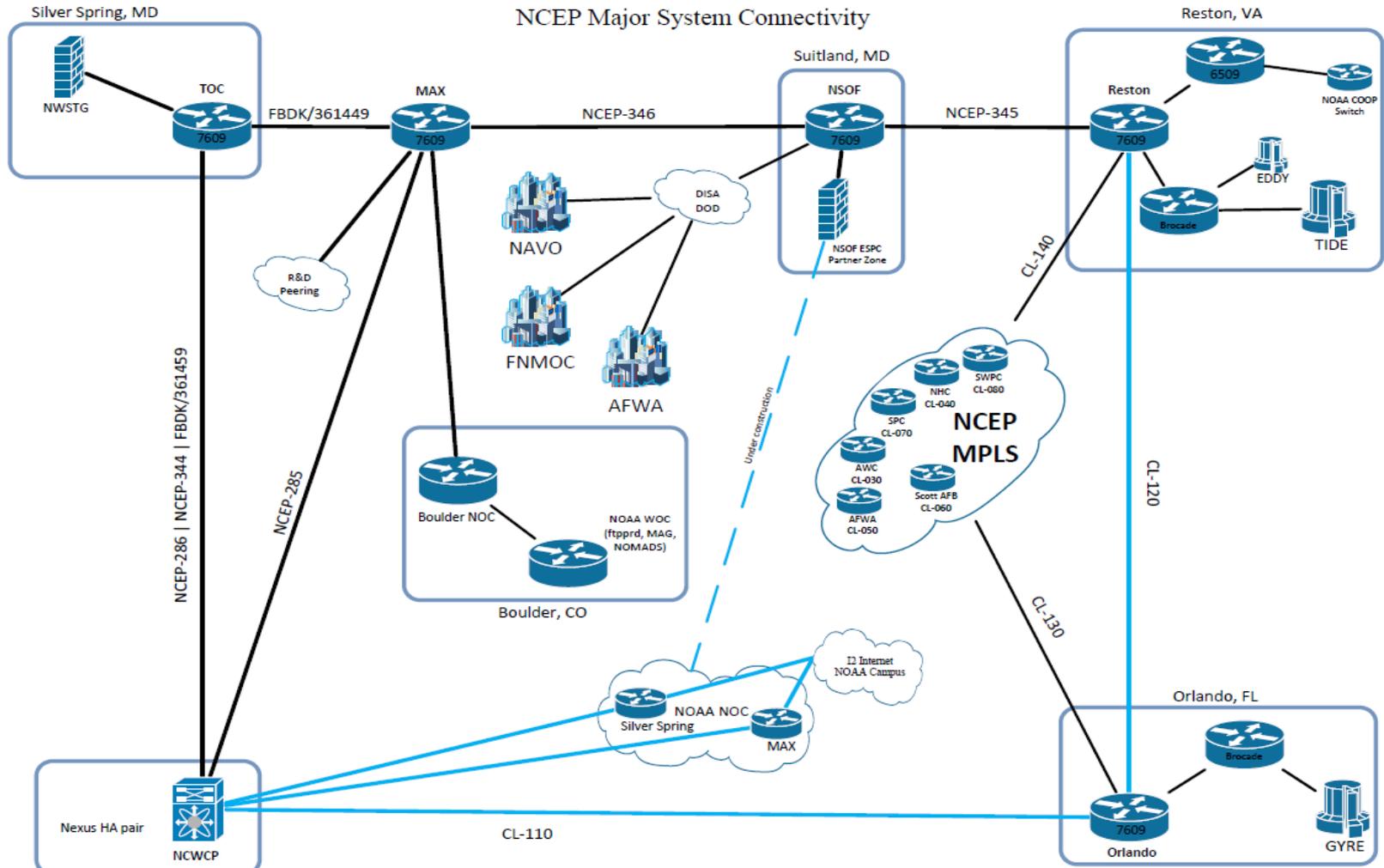
- Short/Medium-term Network Upgrades bringing increased bandwidth and TICAP compliance to . . .
 - OCONUS locations: January 2015 (e.g., in preparation for H-8, leveraging/expanding NCEP network)
 - CONUS locations: March 2015 and beyond

Preliminary bandwidth upgrade plans scheduled for review in Summer 2014.

- Long-term Network Consolidation and Optimization. . .
 - Circuit Inventory, planning, to-be network architecture
 - Target award date is Spring-Summer 2017 (e.g., under new GSA Enterprise Infrastructure Solutions vehicle)
 - Network transition (to new vehicle): 2017-2019
 - Increased bandwidth

GRP Network Projects

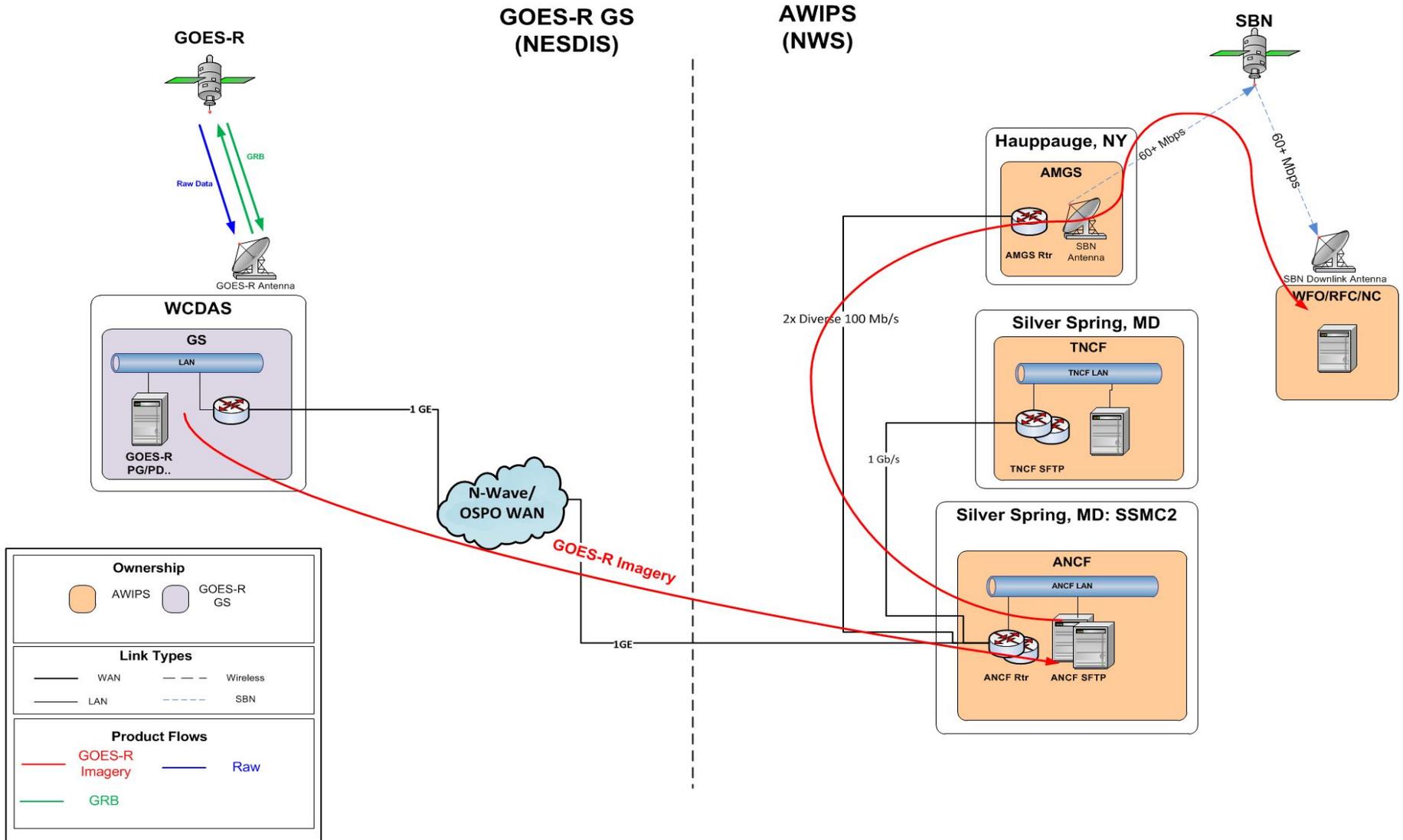
Leveraging Existing Networks



Change/Date:	Modified by:	Approved by:		Color	Weight	Speed	Color	Weight	Speed
Initial Design 9/30/2013	Anuj Uppal	Doug Fenderson			3 Pts	40Gbps		1 Pts	100 Mbps
10/1/2013	Anuj Uppal	Doug Fenderson		2 1/4 Pts	10Gbps		1/4 Pts	DS-3	
				2 1/4 Pts	10Gbps DF		1/4 Pts	10 Mbps	
				1 1/2 Pts	1 Gbps		1/4 Pts	T-1	
				1 Pts	OC 12				

GRP Network Projects

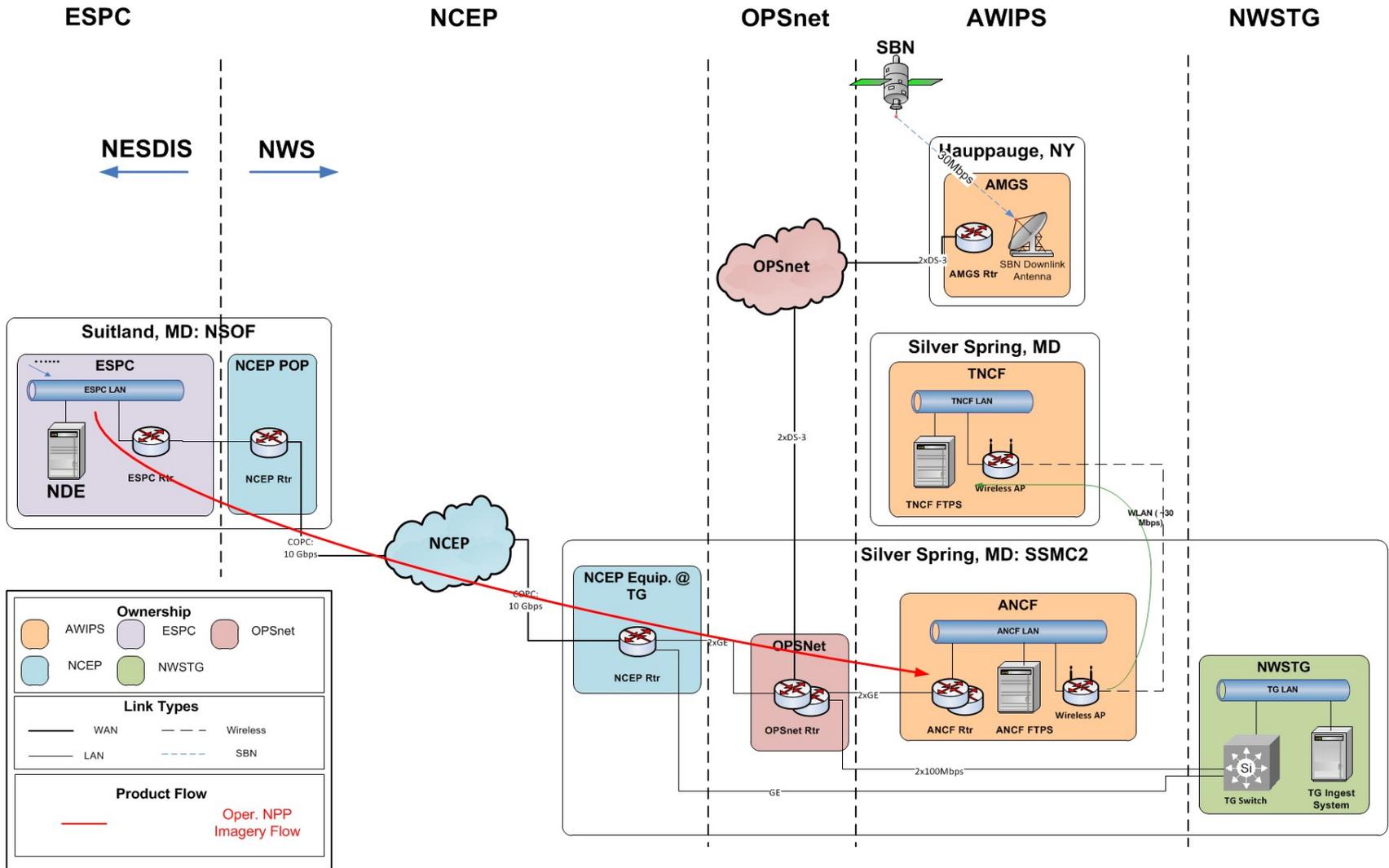
NESDIS-to-NWS Baseline GOES-R Imagery Data-Flow Plan*



* Only primary pathway is shown (backup path uses NESDIS Fairmont site and BNCF).

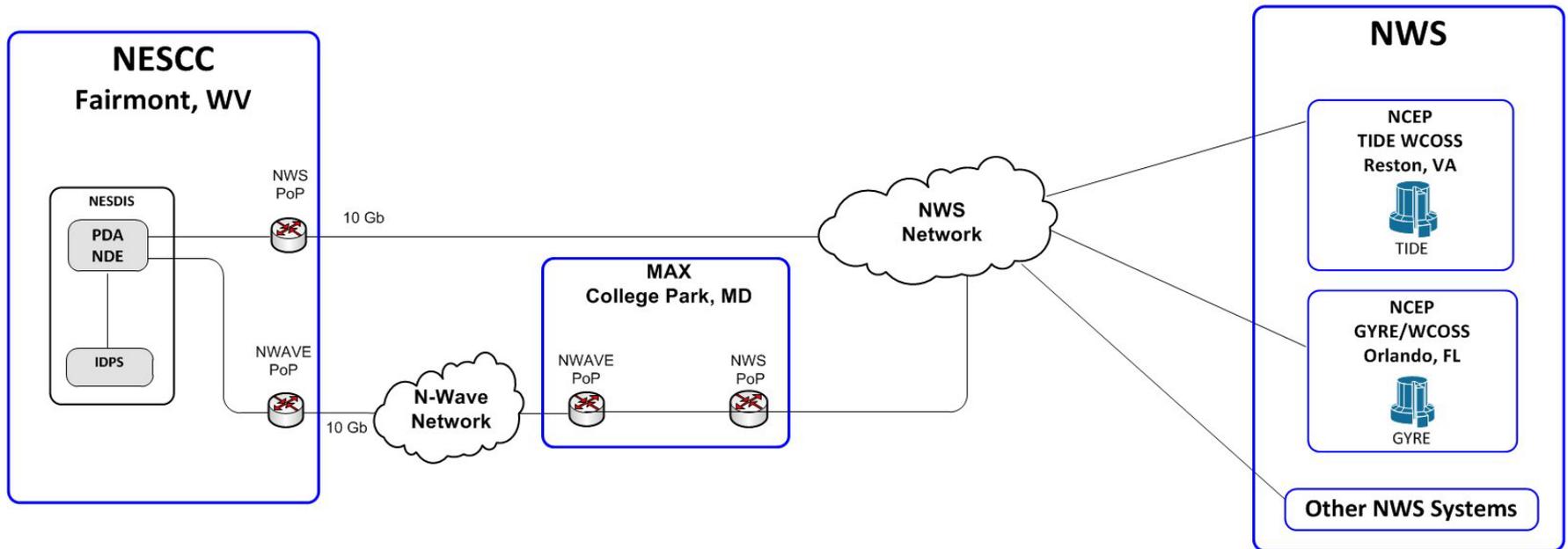
GRP Network Projects

NDE-to-NWS S-NPP VIIRS Imagery Data Flow



GRP Network Projects

Diverse N-Wave/NWS networks for Backup PDA Access*



* N-Wave connectivity in place for testing; additional NWS circuit planned for 2015

GRP Network Projects

Supporting Alaska Direct Broadcast Project

- Sandy Supplement is funding a gap-mitigation project to mitigate possible loss of VIIRS KPPs by building an operational-standards direct broadcast system in Alaska.

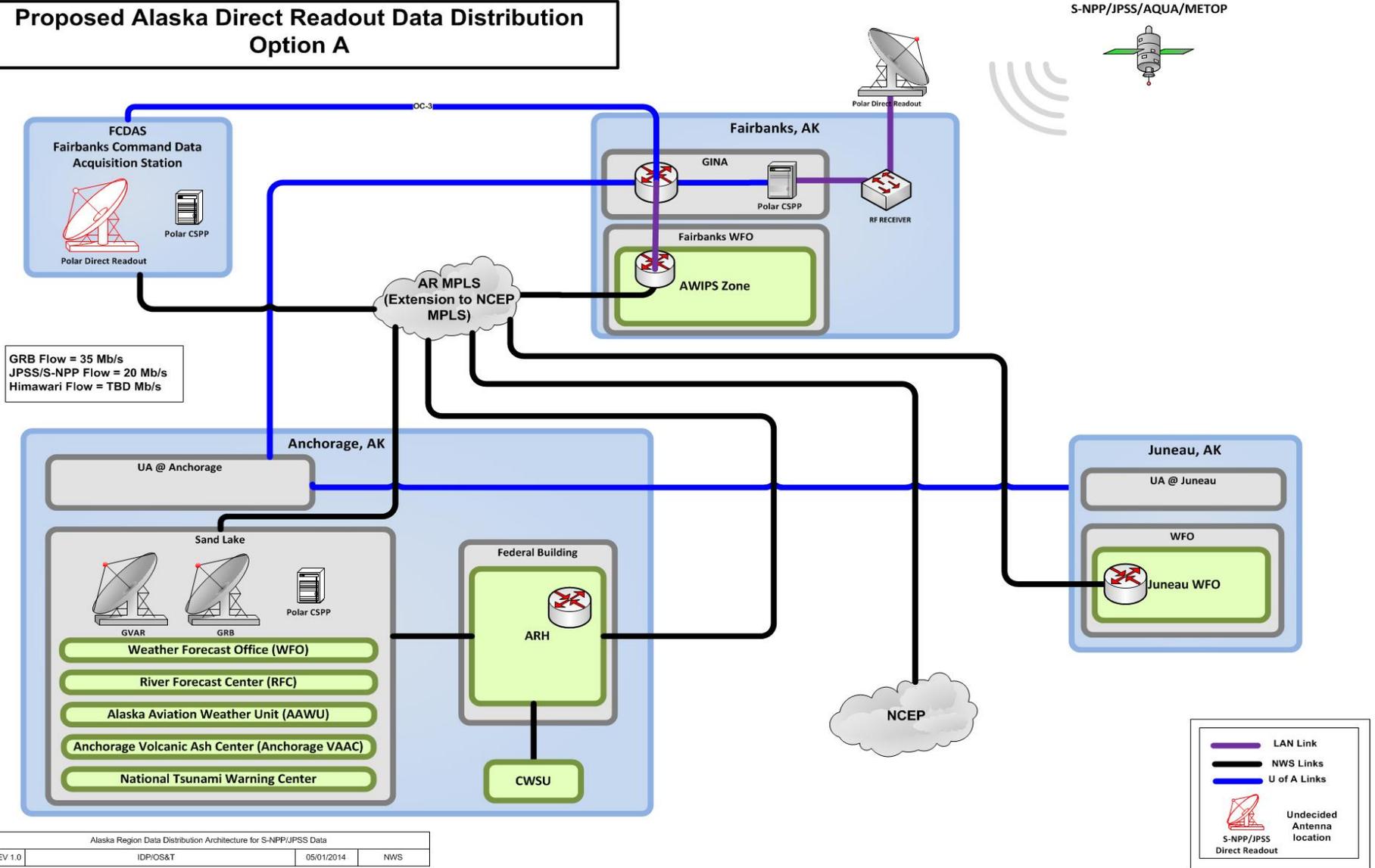
NWS Lead: Mike Johnson NWS Network Lead: Scott Denton

Project Goals / Expectations:

- Maximize polar imagery use from available satellites as gap mitigation to possible loss of SNPP imagery before JPSS launched.
- Use non-standard (landline versus satellite broadcast network- SBN) delivery to NWS AWIPS operations
- Come as close as possible to meeting availability requirements and significantly improve latency requirements (redundant communications, redundant antennas, contingency operations)
- Minimize future sustainment costs and provide operational system acceptable to the NWS / AR Director

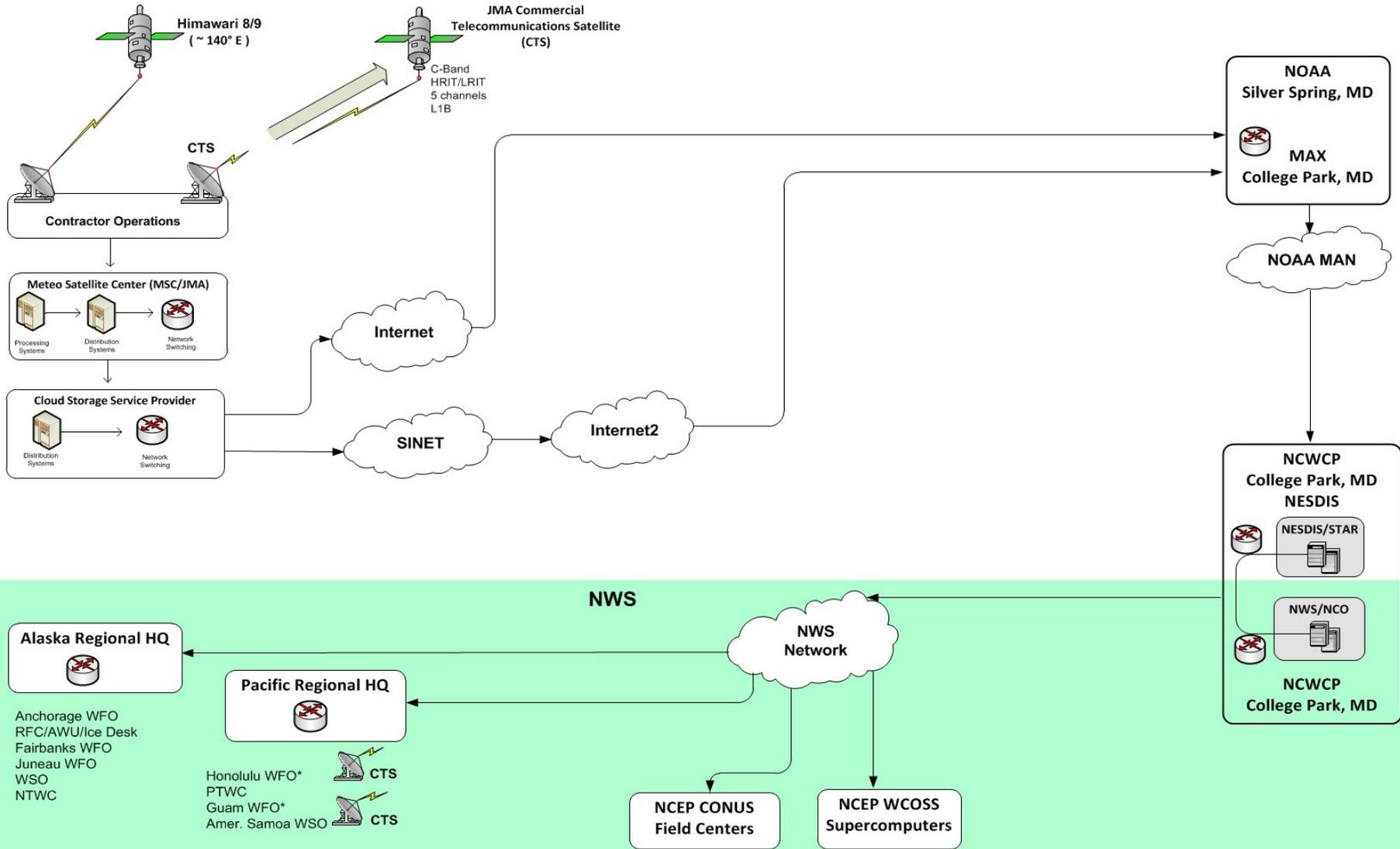
GRP Network Project: Supporting AK Direct Readout

Proposed Alaska Direct Readout Data Distribution Option A

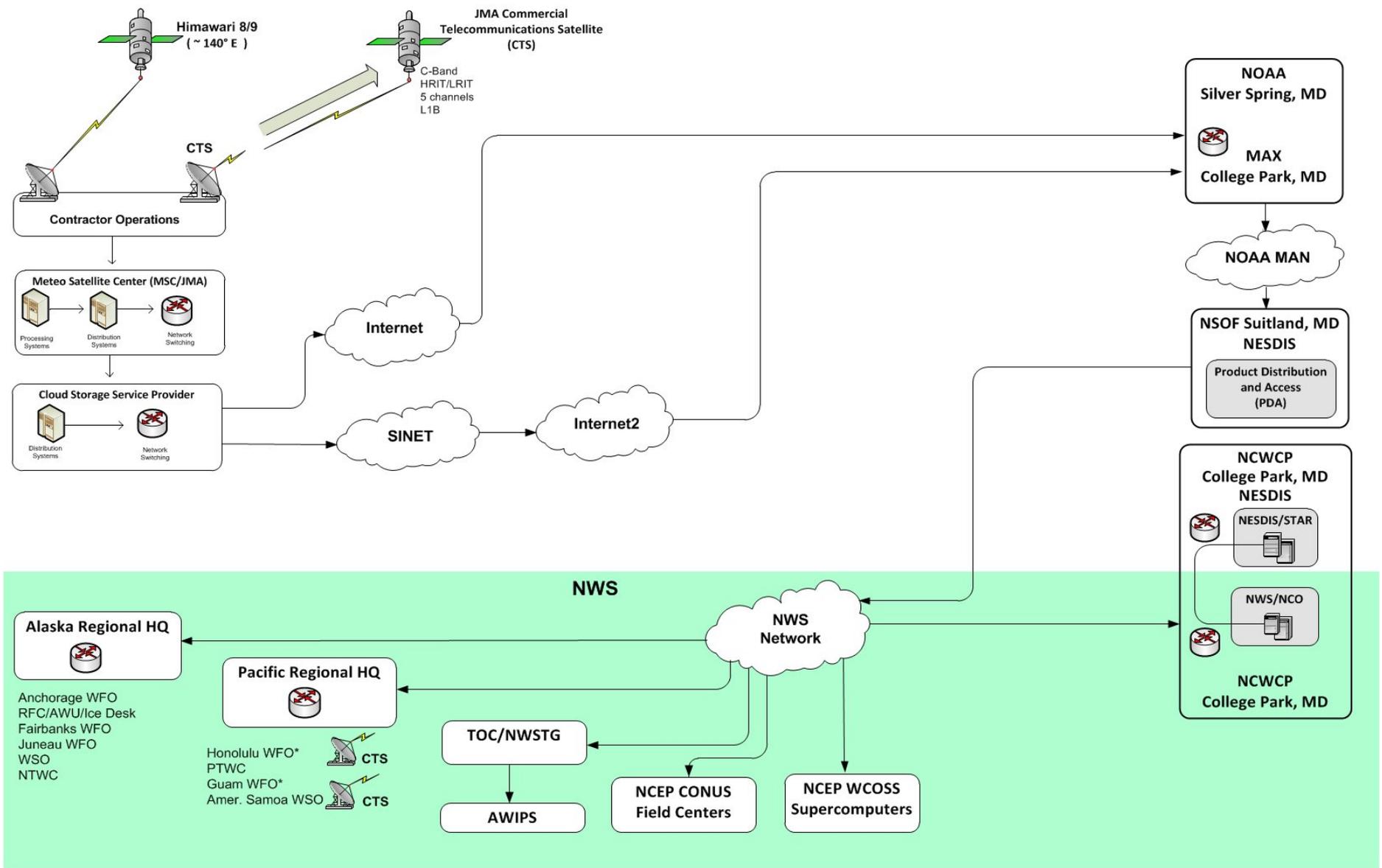


Alaska Region Data Distribution Architecture for S-NPP/JPSS Data			
REV 1.0	IDPI/OS&T	05/01/2014	NWS

Himawari Data Flow into NWS: 2015 (Pre-PDA Era)

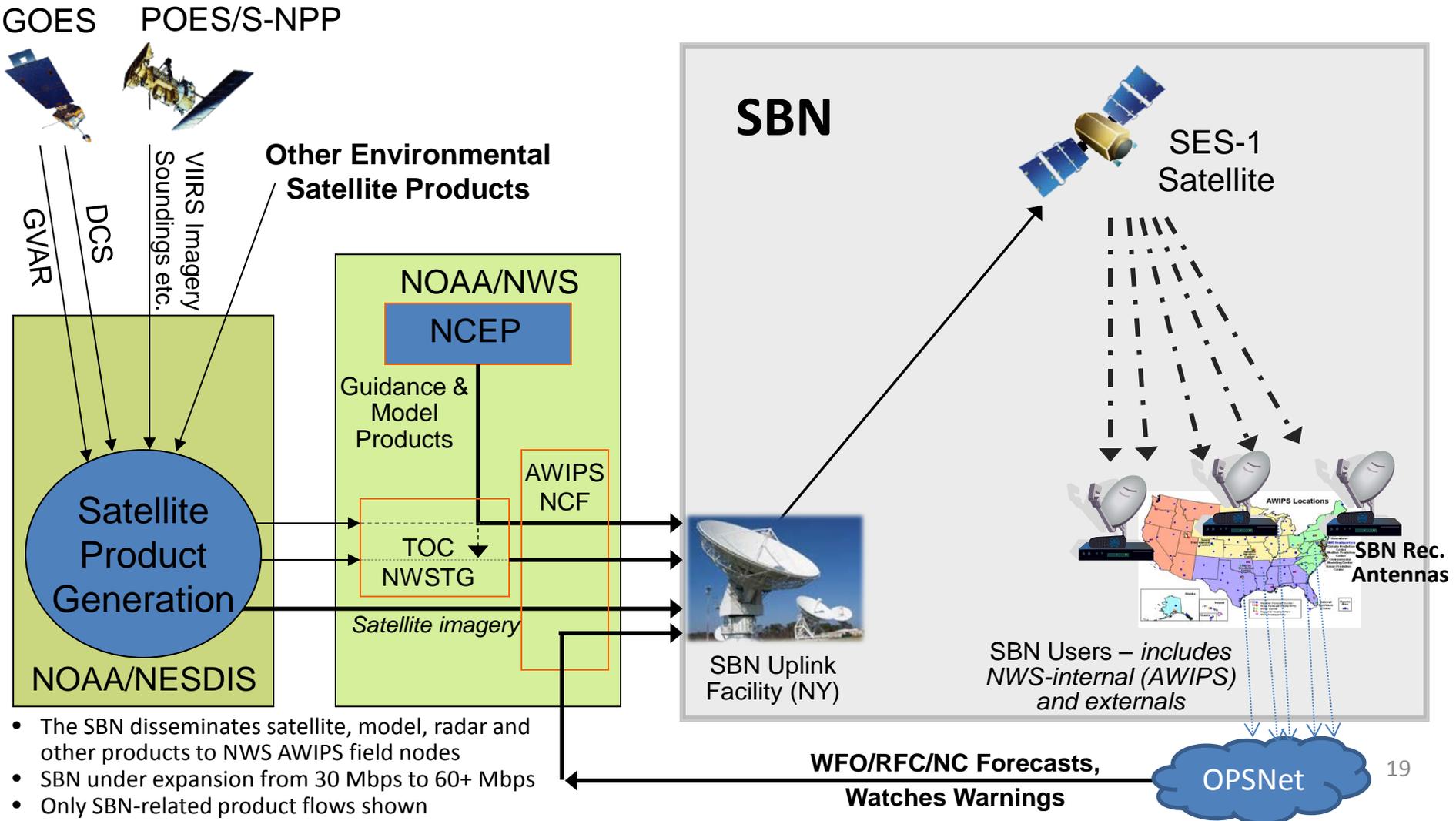


Himawari Data Flow into NWS: Post-2015 (PDA Era)



GRP/AWIPS SBN Expansion Project

Satellite Broadcast Network ~ "NOAAPort"



- The SBN disseminates satellite, model, radar and other products to NWS AWIPS field nodes
- SBN under expansion from 30 Mbps to 60+ Mbps
- Only SBN-related product flows shown

GRP/AWIPS SBN Expansion Project

Key-Points Slide

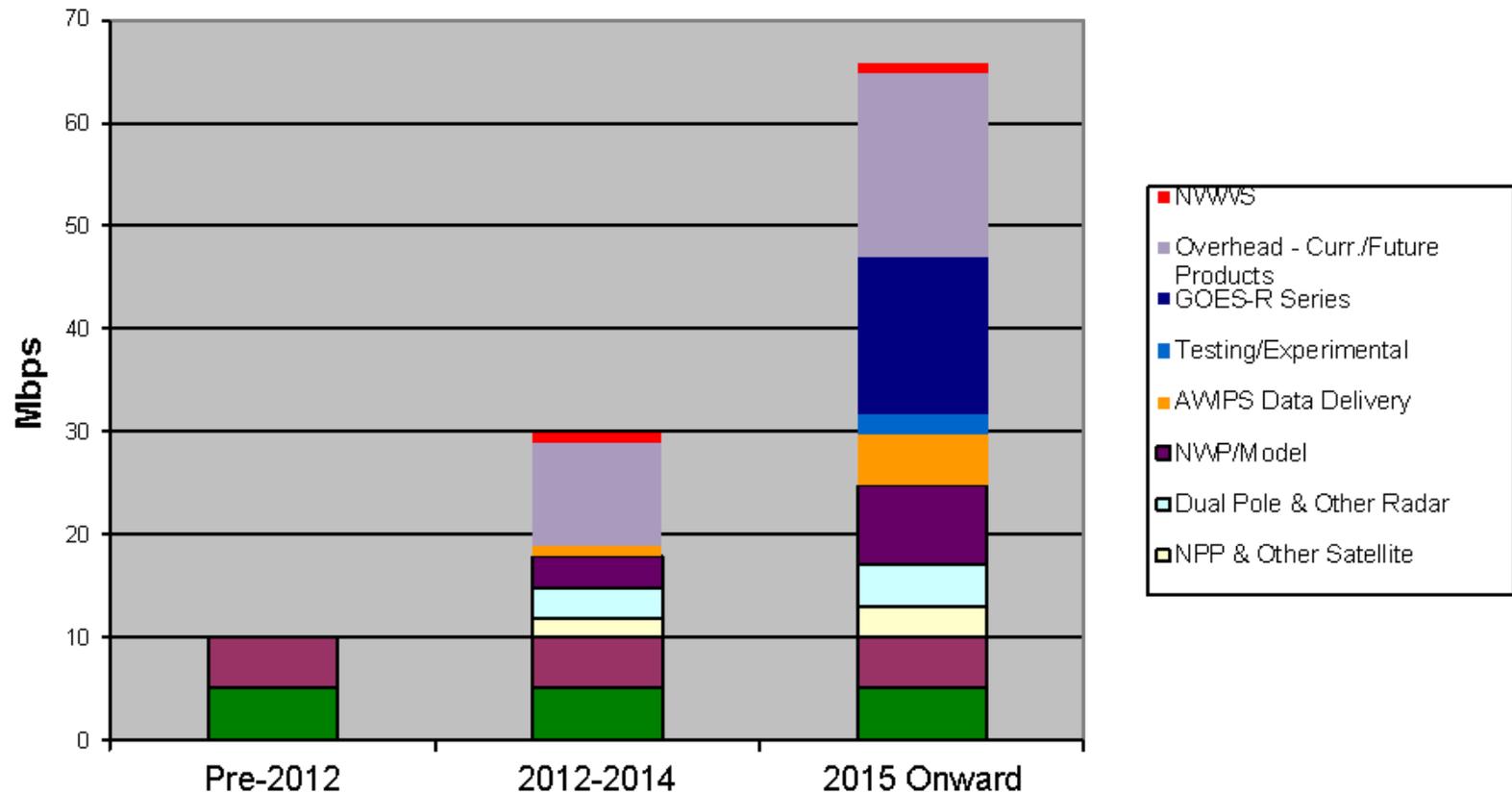
1. Main drivers are GOES-R and model products
2. Network bandwidth increasing from 30 to 60+ Mbps
 - Stress test to determine new bandwidth upper limit (?? Mbps)
3. Establishment of additional data channels
 - Facilitates data management
4. Dual illumination & field site cutover (Aug/Sep 2014)
5. Project nominal completion date: October 1, 2014
 - limited product additions to be scheduled for late CY 2014
6. Concomitant ANCF/BNCF/TNCF, AMGS/BMGS and network upgrades underway
7. Outreach to users (bulletins and web pages)

Table of Current/Future SBN Channels*

Channel Name	Current	Future	Basic Content
NMC/NWSTG	X	X	Watches/Warnings, Radar, GRIB1/grids, Satellite, Misc.
GOES/GINI	X	X	Legacy GOES Imagery (Mostly CONUS)
GOES-R West		X	GOES-R ABI Imagery (West)
GOES-R East		X	GOES-R ABI Imagery (East)
NMC2/NWSTG2	X	X	GRIB2 model/analysis/forecast grids
OCONUS	X	X	GRIB1 OCONUS Grids, Legacy OCONUS GOES Imagery, DCS
POLARSAT	X	X	S-NPP Imagery
ADD		X	AWIPS Data Delivery (delivery for group subscriptions)
EXP		X	Test/Experimental

* *NWWS channel not shown*

Post-SBN Expansion: Data-Type Allocations*

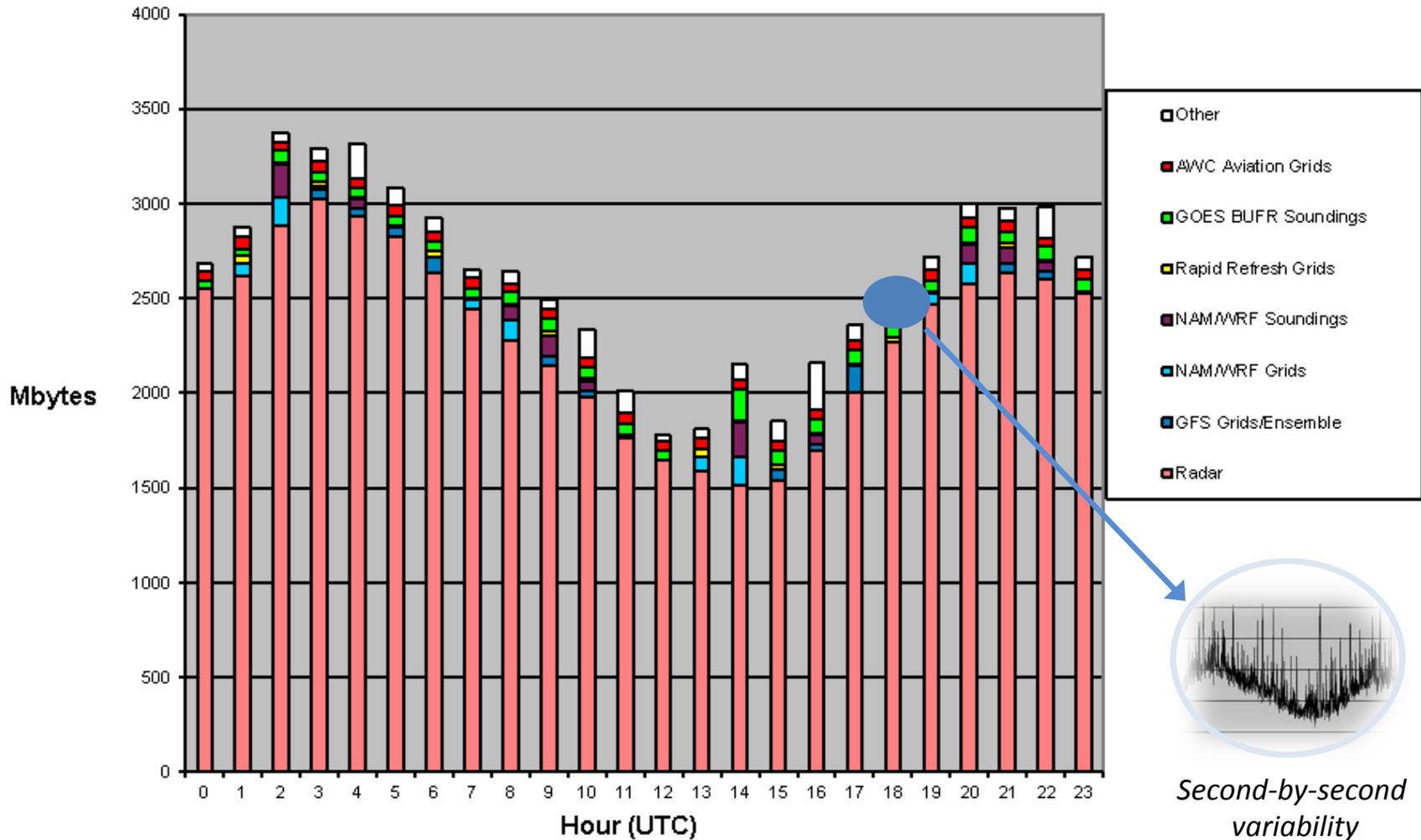


* Notes

1. Chart above is preliminary/notional only.
2. Stress testing of expanded SBN will determine new ceiling (65 Mbps? Higher?)
3. Largest products in near-term planning: GOES-R imagery and model (e.g., HRRR).

Post-SBN Expansion: Assessing Current Channel Utilizations

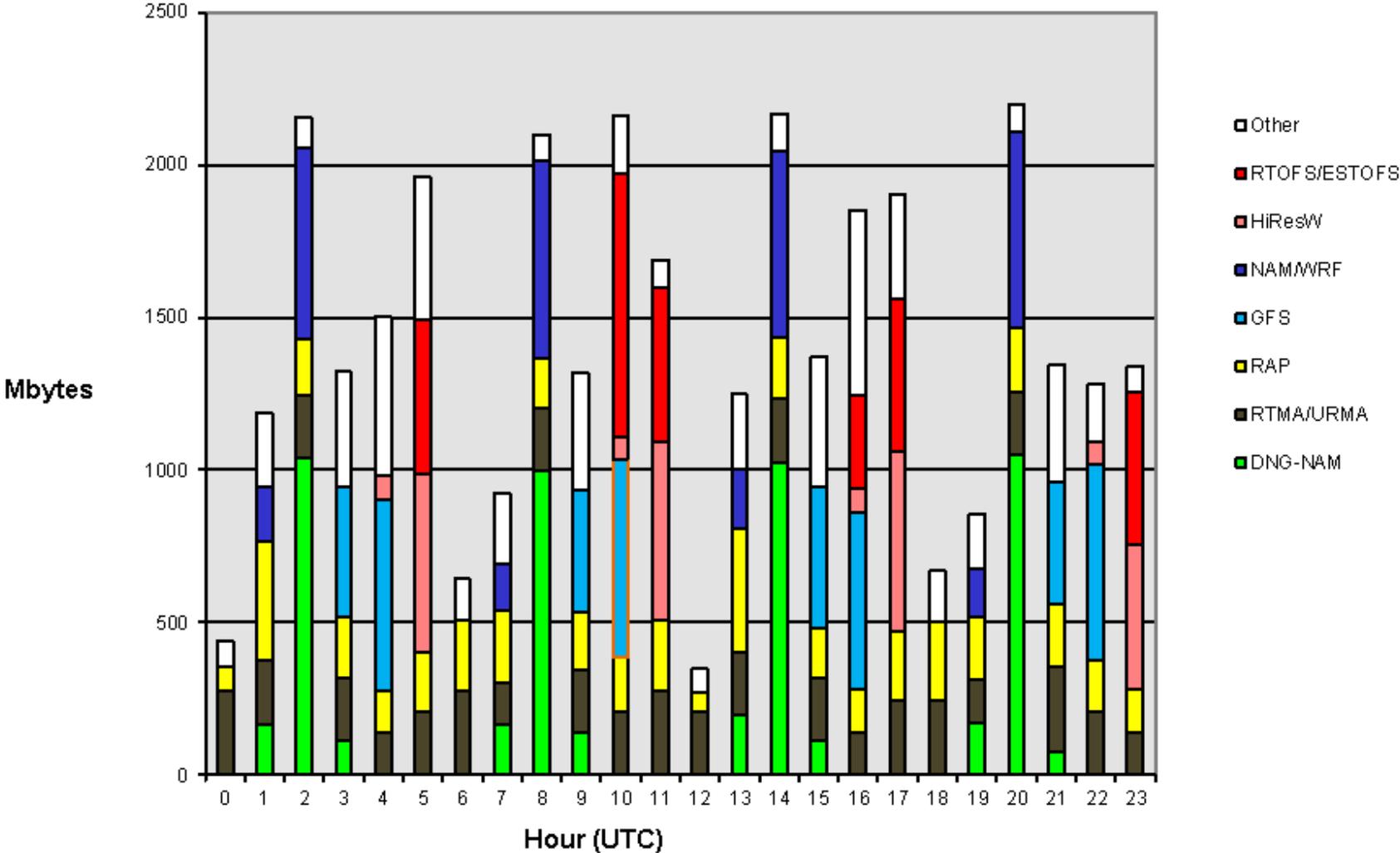
Hourly SBN TG Channel Data Volume



- Radar dominates, especially after dual pole upgrade/deployment
- Strong diurnal variability in radar data rate (though weather affects phasing, amplitude, etc.)

Post-SBN Expansion – Assessing Current Channel Utilizations

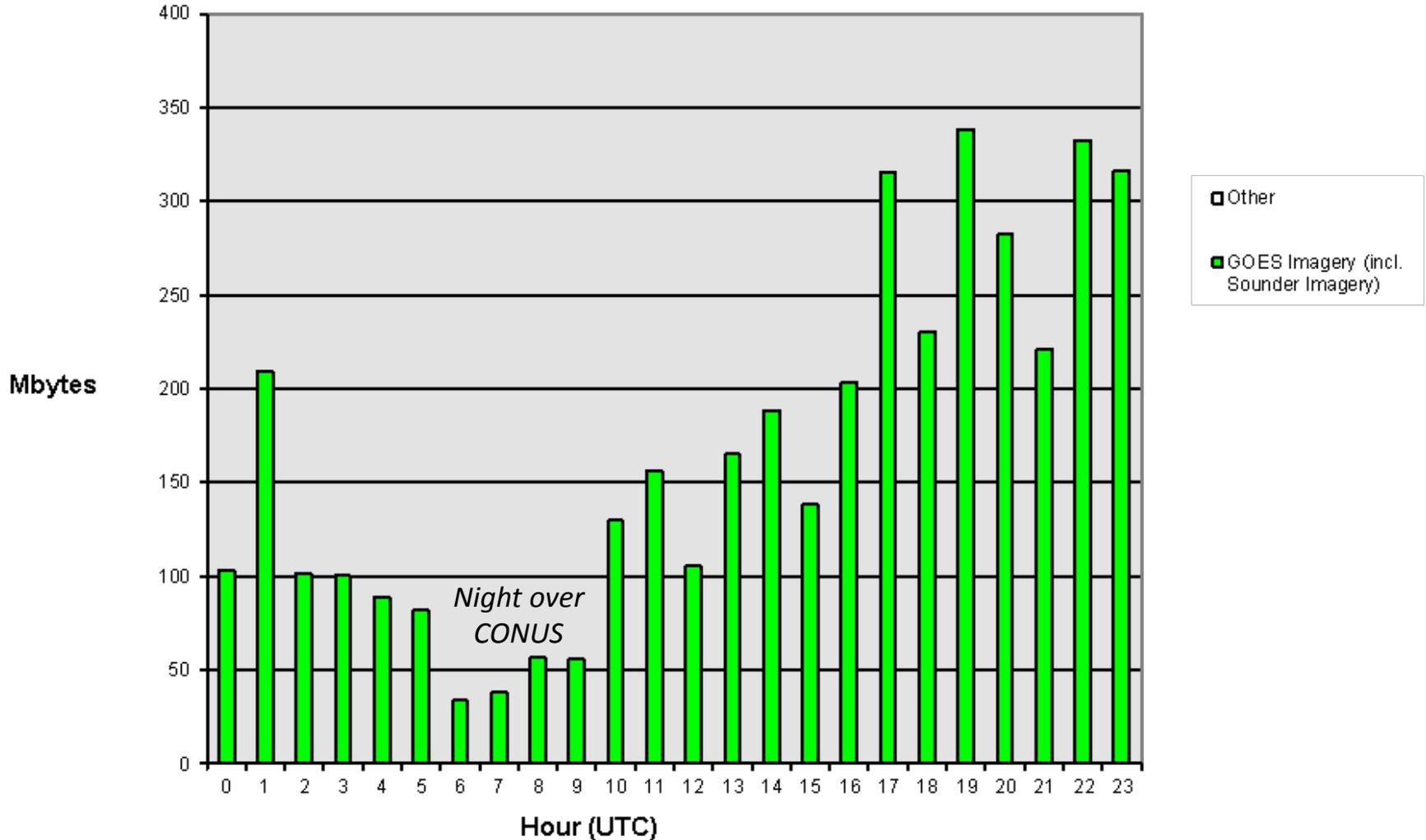
Hourly SBN TG2 Channel Data Volume



* The TG2 channel: traffic and opportunity

Post-SBN Expansion – Assessing Current Channel Utilizations

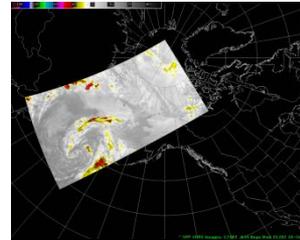
Hourly SBN GOES Channel Data Volume



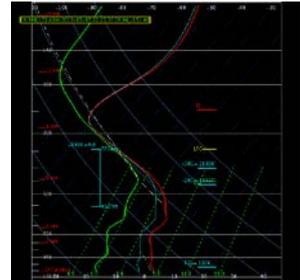
* Overnight/visible imagery suspension and compression; GOES East & West rapid-scan operations started around 1645UTC.

S-NPP/GCOM Products Planned for AWIPS Baseline

1. S-NPP - VIIRS Imagery (for AK for chans 1,4,5)* – **done** →



2. NUCAPS – **done** →



3. S-NPP VIIRS Near-Constant Contrast (NCC)
- sector to be added to SBN and AWIPS baseline
for all geographical areas (AK, Pacific, CONUS, and Puerto Rico)

4. GCOM - AMSR2 - Sea Surface Winds
from NESDIS ESPC DDS then PDA

5. S-NPP VIIRS 1.6 μm VIIRS imagery – likely for AK only (I3 channel)

6. S-NPP VIIRS-based Active Fires product

* Two dissemination options exist: local direct-readout-based ingest in NWS, AK Region and/or NDE generation followed by SBN dissemination.

Data Management and Data Distribution Options

Food for Thought for 2016-2019

1. Expanded SBN still won't accommodate "everything"
2. Another SBN upgrade in 2017 (GOES-S, more models, etc.)?
 - And/or invest in terrestrial/wireless/VSAT?
3. Balancing SBN standing subscriptions with AWIPS Data Delivery (PDA as data-provider system for satellite data)
4. Upgraded terrestrial networks as enabler for AWIPS DD
5. The future of the IDP Infrastructure in the NOAA enterprise
 - Data center consolidation
6. Redistribution of direct-readout satellite products from NWS sites with antennas to NWS field sites without antennas