WIDE-AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

Report #47

(Revised on 4/30/2014)

Reporting Period: October 1 to December 31, 2013

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Changes:

Changes are made to figures 2.9 to 2.12. The plots in those figures were misplaced in the previous report. The plots are now moved to the correction locations.

- The plot in Figure 2.9 is moved to its correct location, Figure 2.11.
- The plot in Figure 2.10 is moved to its correct location, Figure 2.12
- The plot in Figure 2.11 is moved to its correct location, Figure 2.9.
- The plot in Figure 2.12 is moved to its correct location, Figure 2.10

Executive Summary

Since 1999 the WAAS Test Team at the William J. Hughes Technical Center has reported GPS performance as measured against the GPS Standard Positioning Service (SPS) Signal Specification. These quarterly reports are known as the PAN (Performance Analysis Network) Report. In addition to that report, the WAAS Test Team reports on the performance of the Wide-Area Augmentation System (WAAS). This report, #47, covers WAAS performance during the period from October 1, 2013 to December 31, 2013.

The following table shows observations for accuracy and availability made during the reporting period for CONUS and Alaska sites. The international sites are excluded from this table, but are included in the body of the report. See the body of the report for additional results in accuracy, availability, safety index, range accuracy, WAAS broadcast message rates, and GEO ranging availability. LP service is available when the calculated Horizontal Protection Level (HPL) is less than 40 meters. LPV service is available when the calculated HPL is less than 40 meters and the Vertical Protection Level (VPL) is less than 50 meters. LPV 200 service is available when the calculated HPL is less than 40 meters and the VPL is less than 35 meters. The NSTB sites, Grand Forks, Atlantic City, and Arcata, are outliers due to receiver quality issues, not the WAAS signal in space quality.

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Washington D.C. 1.341 meters	Arcata 0.582 meters	Juneau 0.864 meters	Anchorage 0.666 meters
95% Vertical Accuracy (VPL <= 50 meters)	Houston 1.627 meters	Salt Lake City 0.888 meters	Barrow 1.739 meters	Bethel 0.945 meters
LP Availability (HPL <= 40 meters)	Multiple Sites 100%	Multiple Sites 100%	Bethel 100%	Barrow 99.98%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Multiple Sites 100%	Washington D.C 99.99%	Bethel 99.99%	Barrow 99.47%
LPV 200 Availability (HPL <= 40 meters & VPL < =35 meters)	Multiple Sites 100%	Arcata 98.66%	Anchorage 99.91%	Cold Bay 94.38%
99% HPL	Oakland 17.177 meters	Memphis 11.314 meters	Cold Bay 29.399 meters	Fairbanks 14.198 meters
99% VPL	Arcata 34.311 meters	Memphis 19.413 meters	Cold Bay 37.542 meters	Anchorage 23.875 meters

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1.0 INTRODUCTION

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The FAA monitors WAAS and GPS SPS performance in order to ensure the safe and effective use of the satellite navigation system in the National Airspace System (NAS). The Wide Area Augmentation System (WAAS) adds more timely integrity monitoring of GPS and improves position accuracy and availability of GPS within the WAAS coverage area.

Objectives of this report are:

a. To evaluate and monitor the ability of WAAS to augment GPS by characterizing important performance parameters.
b. To analyze the effects of GPS satellite operation and maintenance, and ionospheric activity on the WAAS performance.
c. To investigate any GPS and WAAS anomalies and determine their impact on potential users.
d. To archive performance of GPS and WAAS for future evaluations.

The WAAS data transmitted from Geostationary satellites (GEO) PRN#135 (CRW), PRN#138 (CRE) and PRN#133 (AMR) are used in the evaluation. CRE and CRW GEOs provide a precision approach (PA) ranging capability that supports all levels of WAAS service. AMR GEO provides only non-precision approach (NPA) ranging service.

The terms "PA" and "NPA" are used in this report to refer to the two modes of user equipment operation. PA and NPA are terms used in the original WAAS specification, FAA-E-2892. See Table 1-1 for a mapping of these terms to the user service levels.

Receivers in PA mode are required to: use all WAAS corrections, use only corrected satellites, not mix corrections from multiple GEOs, only use the designated Space Based Augmentation System (SBAS) for the published approach procedure, and not use ranging from a GPS or GEO satellite having a User Differential Range Error (UDRE) status of greater than 15 meters. Receiver in NPA mode may: mix corrected and uncorrected satellites, mix corrections from different GEOs or SBASs, use either the WAAS ionosphere corrections or the GPS Klobachar model for ionosphere corrections, and use ranging from a GPS or GEO satellite that have a UDRE status of greater than 15 meters. NPA mode receivers may also operate using Fault Detection / Fault Detection Exclusion (FD/FDE) in the absence of a SBAS. The data presented in this report does not take credit for the additional NPA mode availability and continuity provided by the use of FD/FDE, whether full FD/FDE or partial FD/FDE used to allow the mixing of corrected and uncorrected satellites. The NPA accuracy data presented in this report uses Klobachar ionosphere corrections in order to be conservative.

The results in this report are based on the application of the WAAS corrections to receiver data from the WAAS receiver network and receivers of the FAA's National Satellite Test Bed (NSTB) network and from analysis based on the correction data broadcast by WAAS. Table 1-2 lists the receivers used in the PA analyses. Table 1-3 lists the receivers used in the NPA analyses.

Table 1-1 WAAS Service Levels

User Service	NPA or PA	WAAS Protection Levels
RNP 0.3	NPA	HPL <= 0.3 nmi
RNP 0.1	NPA	HPL <= 0.1 nmi
LNAV	NPA	HPL <= 556 m
LNAV/VNAV	PA	HPL <= 556 m VPL <= 50 m
LP	PA	HPL <= 40 m
LPV	PA	HPL <= 40 m VPL <= 50 m
LPV200	PA	HPL <= 40 m VPL <= 35 m

Table 1-2 PA Evaluation Sites

	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	79	6783909
Atlantic City	92	7929489
Grand Forks	91	7875158
Oklahoma City	86	7472645
WAAS:		
Albuquerque	92	7948656
Anchorage	92	7948579
Atlanta	92	7948796
Barrow	92	7947529
Bethel	92	7948729
Billings	92	7937489
Boston	92	7948749
Chicago	92	7948799
Cleveland	92	7943587
Cold Bay	92	7941953
Dallas	92	7947780
Denver	92	7943815
Fairbanks	92	7945330
Gander	92	7943825
Goose Bay	92	7941116
Houston	92	7923099
Iqaluit	92	7932808
Jacksonville	92	7948747
Juneau	92	7937885
Kansas City	92	7948800
Kotzebue	92	7932703
Los Angeles	92	7948800
Memphis	92	7946245
Merida	92	7938310
Mexico City	92	7941589
Miami	92	7939430
Minneapolis	92	7948794
New York	92	7948739
Oakland	92	7947866
Puerto Vallarta	92	7931436
Salt Lake City	92	7948403
San Jose Del Cabo	92	7947681
Seattle	92	7947342
Washington DC	92	7948728
Winnipeg	92	7946338

Table 1-3 NPA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
Albuquerque	92	7941407
Anchorage	92	7908161
Atlanta	92	7943075
Barrow	92	7942780
Bethel	92	7940328
Billings	92	7929035
Boston	92	7938109
Cleveland	92	7943066
Cold Bay	92	7927573
Fairbanks	86	7437209
Gander	92	7939764
Honolulu	92	7935654
Houston	92	7943111
Iqaluit	92	7925562
Juneau	92	7930926
Kansas City	92	7934495
Kotzebue	86	7405538
Los Angeles	92	7943059
Merida	92	7929444
Miami	92	7932400
Minneapolis	92	7939635
Oakland	92	7942177
Salt Lake City	92	7939850
San Jose Del Cabo	92	7935888
San Juan	92	7942809
Seattle	92	7917416
Tapachula	89	7719391
Washington DC	92	7942944

The report is divided in the performance categories listed below.

1. WAAS Position Accuracy
2. WAAS Operational Service Availability
3. Coverage
4. Integrity
5. WAAS Range Domain Accuracy
6. GEO Ranging Performance
7. WAAS Airport Availability
8. WAAS CNMP Analysis
9. WAAS Antenna Survey Validation
10. SQM Analysis
11. GPS Broadcast Orbit vs. NGA Precise Orbits Analysis and URA Bounding Analysis

Table 1-4 lists the performance parameters evaluated for the WAAS in this report. Please note that these are the performance parameters associated with the WAAS system. These requirements are extracted from the FAA Specification FAA-E-2892C and FAA Specification FAA-E-2976, as applicable.

Table 1-4 WAAS Performance Parameters

Performance Parameter	Expected WAAS Performance
LPV Accuracy Horizontal	≤ 1.5m error 95% of the time
LPV Accuracy Vertical	≤ 2m error 95% of the time
LNAV Accuracy Horizontal	≤ 36m error 95% of the time
Availability LPV CONUS	99% availability of 100% of CONUS
Availability LPV Alaska	95% availability of 75% of Alaska
Availability LNAV CONUS	99.99% availability with HPL < 556m
Availability LNAV Alaska	99.9% availability with HPL < 556m
Availability En route OCONUS	99.9% availability with HPL < 2nmi
Probability of Hazardously Misleading Information (HMI)	< 10e-7 per approach

1.1 Event Summary

Table 1-5 lists events that affected WAAS performance or the ability to determine the WAAS performance during the reporting period. These events include GPS or WAAS anomalies, relevant receiver malfunctions, and receiver maintenance conducted. Detailed analyses of particular events are documented in the Discrepancy Reports (DR). The DRs are posted on the website http://www.nstb.tc.faa.gov under 'WAAS Technical Reports' and can also be accessed via hyperlink from Table 1-5 below. Please note "TOW" is the time of GPS week, which is the cumulative number of seconds since 00:00:00 Sunday (GMT without leap seconds).

Table 1-6 lists events related to WAAS upgrades that happened this quarter. Table 1-7 lists events related to GUS switchovers. A GUS switchover is the transition from one uplink site to the other uplink site for a GEO.

Table 1-5 Events

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
10/2/2013	10/2/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Significant geomagnetic activity, Kp-6, caused disturbances to the ionosphere which resulted in increased GIVE values which impacted LPV and LPV-200 service availability in Alaska and western Canada. See plot(s): LPV_10/2/2013 LPV200_10/2/2013
10/8/2013	10/9/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Significant geomagnetic activity, Kp-5, caused disturbances to the ionosphere which resulted in increased GIVE values which impacted LPV and LPV-200 service availability in Alaska and western Canada. The event straddled the day rollover. It started with minor LPV-200 impact to northern Canada on 8 Oct and peaked with significant LPV and LPV-200 service degradations in Alaska and western Canada on 9 Oct. See plot(s): LPV200_10/8/2013 LPV_10/9/2013

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				LPV200_10/9/2013
10/9/2013	10/9/2013	Washington DC (ZDC1), Washington DC (ZDC2), Washington DC (ZDC3)	Local	Brief, localized RFI caused the WAAS receivers at ZDC (Leesburg VA) to partially lose tracking of some GPS satellites. This resulted in a short LPV-200 outage to be declared in the observed availability performance for ZDC in this report.
10/9/2013	10/9/2013	GEO133, Santa Paula (SZP)	None	Nine missing WAAS user messages from the AMR GEO, PRN-133, over the time of week interval seconds 303959 to 303992. Problem was caused by tracking (pointing) problems with the Santa Paula uplink dish. The dish lost tracking because the frequency of the tracking beacon on the satellite was changed by the satellite provider, INMARSAT, without coordination with the uplink site. Two GUS manual switchovers were performed during the event.
10/11/2013	10/11/2013	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Canada	Simultaneous communication data outages on both network rings to the Iqaluit Canada reference station (YFB) resulted in the loss of services from that station. This caused LPV and LPV-200 service outages to northern Canada. See plot(s): LPV_10/11/2013 LPV200_10/11/2013
10/11/2013	10/11/2013	Washington DC (ZDC1), Washington DC (ZDC2), Washington DC (ZDC3)	Local	Brief, localized RFI caused the WAAS receivers at ZDC (Leesburg VA) to lose tracking of most GPS satellites. This resulted in a short LPV and LPV-200 outage to be declared in the observed availability performance for ZDC in this report.
10/13/2013	10/13/2013	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Canada	A RFI event resulted in the loss of services from the Iqaluit Canada reference station (YFB). This resulted in GIVE values being set to either 45 meters or "Not Monitored" for multiple Iono Grid Points (IGPs) in the northern Canada region resulting in degradation to the LPV and LPV-200 service availability in northern Canada (mostly LPV-200). See plot(s): LPV_10/13/2013 LPV200_10/13/2013
10/14/2013	10/15/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity, Kp-4, caused disturbances to the ionosphere which resulted in increased GIVE values which impacted: LPV service availability in Alaska and western Canada on 10/14/13, LPV-200 service availability in Alaska, Canada, and north central CONUS on 10/14/13, and LPV-200 service availability in Canada. See plot(s): LPV_10/14/2013 LPV200_10/14/2013 LPV_10/15/2013 LPV200_10/15/2013
10/17/2013	10/17/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Slight geomagnetic activity, Kp-3, caused disturbances to the ionosphere which resulted in increased GIVE values which caused minor degradation to LPV-200 service availability in northern Canada. See plot(s): LPV200_10/17/2013

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
10/20/2013	10/20/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Elevated solar wind activity caused disturbances to the ionosphere which resulted in increased GIVE values which caused minor degradation to LPV-200 service availability in northern Canada. See plot(s): LPV200_10/20/2013
10/22/2013	10/22/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Elevated solar wind activity caused disturbances to the ionosphere which resulted in increased GIVE values which caused minor degradation to LPV and LPV-200 service availability along the northern edge of Canada. See plot(s): LPV200_10/22/2013
10/26/2013	10/26/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Elevated solar wind activity caused disturbances to the ionosphere which resulted in increased GIVE values which caused minor degradation to LPV-200 service availability in north central Canada. See plot(s): LPV200_10/26/2013
10/27/2013	10/27/2013	GEO135,Littleton (APA)	LPV_Alaska, LPV200_Alaska, LPV200_Canada, RNP3_Alaska, RNP1_Alaska	A failure at the Littleton CO uplink for the CRW GEO, PRN-135, caused a switchover to the Napa CA uplink. This resulted in a brief (16 second) service outage to the area of north western Alaska where there is only single GEO coverage provided by CRW (GPS time of week 73837-73853). The increased UDREs for the CRW ranging signal during the carrier smoothing settling period and some minor elevations in GIVE values for northern IGPs also resulted in a minor degradation to the LPV-200 service availability along the northern edge of Canada. See plot(s): LPV_10/27/2013 LPV200_10/27/2013 RNP1_10/27/2013 RNP3_10/27/2013
10/29/2013	10/29/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity, Kp-3, caused disturbances to the ionosphere which resulted in increased GIVE values which caused degraded LPV and LPV-200 service availability in northern Canada. Planned maintenance on PRN-26 also contributed to the degradation in the LPV-200 service availability in northern Canada. See plot(s): LPV_10/29/2013 LPV200_10/29/2013
10/29/2013	10/29/2013	PRN26	LPV200_Canada	Planned maintenance on PRN-26, NANU 2013060, caused the temporary loss of service from that satellite which contributed to the degradation in LPV-200 service availability in northern Canada on 10/29/13. See plot(s): LPV200_10/29/2013
10/30/2013	10/30/2013	PRN4	LPV200_CONUS	Carrier phase glitch on PRN-4 resulted in the re-initialization of the carrier smoothing algorithms in WAAS; this resulted in a brief elevation in the UDRE values for PRN-4. This event contributed to the degradation to LPV-200 service availability in CONUS on 10/30/13. Elevated GIVE values from geomagnetic activity disturbing the ionosphere also contributed to the degradation.

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				See plot(s): LPV200_10/30/2013
10/30/2013	10/31/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity, Kp-3, caused disturbances to the ionosphere which resulted in increased GIVE values which impacted: LPV and LPV-200 service availability in northern Alaska and northern Canada on 10/30/13 and 10/31/13, LPV-200 service availability California, New Mexico, and Nevada on 10/30/13, and LPV-200 service availability in California and western Nevada on 10/31/13. Carrier phase glitch on PRN-4 on 10/30/13, unplanned maintenance on PRN-2 on 10/31/13, and DNU ranging on CRW GEO, PRN-135 also contributed to the service degradations. See plot(s): LPV_10/30/2013 LPV200_10/30/2013 LPV_10/31/2013 LPV200_10/31/2013
10/31/2013	10/31/2013	PRN135	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	CRW GEO, PRN-135, UDRE set to "Do Not Use" due to a trip of the Code Carrier Coherence monitor (only applies to ranging quality, data link of corrections not impacted) for approximately 4 hours (time of GPS week, seconds 375017 to 389012). Loss of GEO ranging services contributed to the service degradations seen on 10/31/13. See plot(s): LPV_10/31/2013 LPV200_10/31/2013
10/31/2013	11/4/2013	PRN2	LPV_Canada, LPV200_All	Unplanned maintenance on PRN-2, NANU 2013062, resulted in the loss of services of PRN-2 on 11/3/13 and 11/4/13. This contributed to the LPV-200 service availability degradation seen for CONUS, Alaska, and Canada on 11/3/13 and 11/4/13, and the LPV service availability in Canada on 11/3/13 and 11/4/13. The signal quality of PRN-2 began having intermittent problems starting on 10/31/13. Those problems included periods of: degraded C/No, increased carrier phase noise, and correlation peak deformation. The periods of correlation peak deformation caused elevated SQM metrics in the WAAS SQM monitor, but did not reach the point where the monitor needed to trip. See DR 118 PRN2 Anomaly. See plot(s): LPV_11/4/2013 LPV200_11/4/2013
11/1/2013	11/1/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Elevated solar wind activity caused disturbances to the ionosphere which resulted in increased GIVE values which caused minor degradation to LPV-200 service availability in north central Canada. See plot(s): LPV200_11/1/2013
11/1/2013	11/1/2013	GEO133	None	Navigation message with bad CRC on CRW GEO, PRN-133 for GPS time of week, second 494837.
11/4/2013	11/4/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada, LPV200_Mexico	Elevated solar wind activity caused disturbances to the ionosphere which resulted in increased GIVE values which caused degradation to LPV-200 service availability in Canada and Mexico. PRN-2 maintenance also contributed to the service degradation.

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				See plot(s): LPV200_11/4/2013
11/6/2013	11/6/2013	GEO133	None	Navigation message with bad CRC on CRW GEO, PRN-133, for GPS time of week, second 319368. Problem caused by a frequency reference glitch in the Santa Paula CA uplink (most likely either the frequency reference or the phase noise enhancer).
11/8/2013	11/8/2013	PRN21	LPV200_Canada	Carrier phase glitch on PRN-21 resulted in the re-initialization of the carrier smoothing algorithms in WAAS; this resulted in a brief elevation in the UDRE values for PRN-21. This event caused brief degradation to LPV-200 service availability in Canada. See plot(s): LPV200_11/8/2013
11/9/2013	11/11/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp-4 on 11/9/13, Kp-3 on 11/10/13, and Kp-4 on 11/11/13) caused disturbances to the ionosphere which resulted in increased GIVE values which impacted: LPV service availability in Canada on 11/10/13 and LPV-200 service availability in Alaska and Canada on 11/9/13 through 11/11/13. 11/10/13 was the worse of the 3 days. See plot(s): LPV200_11/9/2013 LPV_11/10/2013 LPV200_11/10/2013 LPV200_11/11/2013
11/13/2013	11/14/2013	GEO135, NAPA (APC)	LPV200_Alaska, LPV200_Canada	Manually directed switchover of the uplink for the CRW GEO, PRN-135, from the Napa CA uplink to the Littleton CO uplink caused a brief outage of service in the north western area of Alaska that only has single GEO coverage provided by CRW. GPS time of week seconds 288426 to 288431. The switchover also caused re-initialization of the carrier smoothing algorithms in WAAS for the CRW ranging signal which caused elevated UDREs for the CRW ranging signal. Those elevated UDREs contributed to degradation in the LPV-200 service availability in northern Alaska and northern Canada on 11/13/13 and 11/4/13. See plot(s): LPV200_11/13/2013 LPV200_11/14/2013
11/15/2013	11/16/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp-4 on 11/15/13 and Kp-3 on 11/16/13) caused disturbances to the ionosphere which resulted in increased GIVE values which impacted: LPV and LPV-200 service availability in Alaska and Canada on 11/15/13 and 11/16/13. See plot(s): LPV_11/15/2013 LPV200_11/15/2013 LPV_11/16/2013 LPV200_11/16/2013
11/19/2013	11/19/2013	PRN29	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Planned maintenance on PRN-29, NANU 2013066, resulted in the temporary loss of service from that satellite which impacted LPV and LPV-200 service availabilities in Alaska and Canada. See plot(s): LPV_11/19/2013 LPV200_11/19/2013
11/19/2013	11/19/2013	GEO135,Littleton (APA)	LPV200_CONUS, LPV200_Alaska, RNP3_All,	Brief outage of the CRW GEO, PRN-135, caused by an automatic switchover from the Littleton CO uplink to the Napa CA uplink, GPS time of week

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
			RNP1_All	seconds 175303 to175315. This caused a 12 second loss of service to the areas of north western Alaska where there is only single GEO coverage provided by CRW. Service impact from this event is not discernable on the plots because the planned maintenance on PRN-29 had a greater service impact. See plot(s): LPV200_11/19/2013 RNP1_11/19/2013 RNP3_11/19/2013
11/20/2013	11/20/2013	Washington DC (ZDC1), Washington DC (ZDC2), Washington DC (ZDC3)	Local	Brief, localized RFI caused the WAAS receivers at ZDC (Leesburg VA) to lose tracking of some GPS satellites. This resulted in a short LPV-200 outage to be declared in the observed availability performance for ZDC in this report.
11/25/2013	11/26/2013	PRN1	LPV200_CONUS	Planned maintenance on PRN-1, NANU 2013070, resulted in the temporary loss of service from that satellite which had a minor impact to LPV-200 service in the southern tip of Florida. Some of the WAAS receivers did not re-acquire PRN-1 until its second pass after the NANU. See DR 116 Fewer Reference Stations Than Expected Tracked PRN 1 Following Satellite Maintenance. See plot(s): LPV200_11/26/2013
12/1/2013	12/1/2013	PRN21	LPV200_CONUS, LPV200_Mexico	Carrier phase glitch on PRN-21 resulted in the re-initialization of the carrier smoothing algorithms in WAAS; this resulted in a brief elevation in the UDRE values for PRN-4. This event contributed to the minor degradation to LPV-200 service availability in southwest CONUS and Mexico. See plot(s): LPV200_12/1/2013
12/2/2013	12/2/2013	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Canada	Data communication outage to the Iqaluit Canada reference station (YFB) simultaneously on both networks resulted in the loss of service from that reference station. This caused LPV and LPV-200 service availability to be degraded in northern Canada. Problem was caused by a power failure and problems starting the engine/generator. See plot(s): LPV_12/2/2013 LPV200_12/2/2013
12/4/2013	2/3/2014	PRN1	CONUS	Starting on 12/4/13 through 2/3/14 (NANU 2014009), PRN-1 exhibited numerous carrier phase jerk anomalies of varying severity. Some events caused the carrier smoothing algorithm to reinitialize, others caused some or all of the WAAS receivers to loss lock and then reacquire PRN-1, which also reinitializes the carrier smoothing algorithm. The anomalies caused WAAS to alarm PRN-1 to the "not monitored" condition 15 to 25 times a day. The problem was resolved by maintenance being performed on the satellite. Some of the events caused minor LPV-200 outages to southern Florida. See DR 117 Excessive Not Monitored Alarms on PRN 1

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				SVN 63.
12/5/2013	12/5/2013	PRN25	LPV200_Canada	Planned maintenance on PRN-25, NANU 2013075, resulted in the temporary loss of service from that satellite which had an impact to LPV-200 service availability in eastern and northern Canada. See plot(s): LPV200_12/5/2013
12/8/2013	12/8/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Strong geomagnetic activity, Kp-6, caused disturbances to the ionosphere which resulted in increased GIVE values which impacted LPV and LPV-200 service availability in Canada. Alaska service availability was not impacted but the Fairbanks reference station observed a local LPV-200 outage of 41 seconds because those receivers lost track of some GPS satellites, causing the calculated VPL to go from 21 meters to 37 meters, most likely due to scintillation. See plot(s): LPV_12/8/2013 LPV200_12/8/2013
12/14/2013	12/14/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity, Kp-4, caused disturbances to the ionosphere which resulted in increased GIVE values which impacted LPV service availability in Canada and LPV-20 service availability in Alaska and Canada. See plot(s): LPV_12/14/2013 LPV200_12/14/2013
12/15/2013	12/15/2013	Barrow (BRW1), Barrow (BRW2), Barrow (BRW3)	LPV_Alaska, LPV200_Alaska	A 14 second communication outage to the Barrow AK reference station caused the temporary loss of the services of that reference station which caused the GIVE for three IGP's to be set to 45 meters. This caused a brief loss of the LPV and LPV-200 services in northern Alaska. See plot(s): LPV_12/15/2013 LPV200_12/15/2013
12/17/2013	12/17/2013	Goose Bay (YYR1), Goose Bay (YYR2), Goose Bay (YYR3)	LPV_Canada, LPV200_Canada	A communication outage to the Goose Bay Canada reference station (YYR) caused the temporary loss of the services of that reference station which caused degradation to the LPV and LPV-200 service availability in north eastern Canada. See plot(s): LPV_12/17/2013 LPV200_12/17/2013
12/17/2013	12/17/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV), PRN1, PRN8, PRN9, PRN17, PRN20, PRN28, PRN133, PRN135, PRN138	None	WAAS simultaneously bumped the UDREs on multiple PRNs by small amounts. Service availability was not impacted. The cause was isolated to a thread switch from the MMD-A to MMD-C (Merida Mexico) where the clock bias estimate for MMD-C was wrong. It is believed a frequency reference problem on MMD-A caused the switch and the corruption of the relative bias estimate for MMD-C. That frequency reference later experienced a failure and was replaced.
12/18/2013	12/18/2013	PRN4	LPV200_Canada	Carrier phase glitch on PRN-4 resulted in the re-initialization of the carrier smoothing algorithms in WAAS; this resulted in a brief elevation in the UDRE values for PRN-4. This event contributed to the minor degradation to LPV-200 service availability in Canada.

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				See plot(s): LPV200_12/18/2013
12/19/2013	12/19/2013	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Elevated solar wind activity caused disturbances to the ionosphere which resulted in increased GIVE values which caused degradation to LPV and LPV-200 service availabilities in Canada. See plot(s): LPV_12/19/2013 LPV200_12/19/2013
12/20/2013	12/20/2013	Goose Bay (YYR1), Goose Bay (YYR2), Goose Bay (YYR3)	LPV200_Canada	Communications outages simultaneously on both networks to the Goose Bay Canada reference station (YYR) resulted in the temporary loss of the services of that reference station. This caused a minor degradation to the LPV-200 service availability in northern Canada. See plot(s): LPV200_12/20/2013
12/22/2013	12/22/2013	PRN4	LPV200_CONUS	Carrier phase glitch on PRN-4 resulted in the re-initialization of the carrier smoothing algorithms in WAAS; this resulted in a brief elevation in the UDRE values for PRN-4. This event caused a minor degradation to the LPV-200 service availability in California (note - not all the California unavailability is from this event, some is a daily event). See plot(s): LPV200_12/22/2013
12/23/2013	12/23/2013	Washington D.C. (CnV), PRN138	LPV_Canada, LPV200_Canada	The ranging signal for the CRE GEO, PRN-138, was alarmed to "Do Not Use" from GPS time of week second 167128 to172219. The alarm was caused by the Code Carrier Coherence (CCC) monitor tripping. The cause of the incoherence was heavy snowfall at the Brewster WA uplink. This event caused minor degradation to the LPV and LPV-200 service availabilities in Canada. See plot(s): LPV_12/23/2013 LPV200_12/23/2013
12/26/2013	12/26/2013	Boston (ZBW1), Boston (ZBW2), Boston (ZBW3)	Local	Brief, localized RFI caused the WAAS receivers at ZBW (Nashua, NH) to lose tracking of most GPS satellites. This resulted in a short LPV and LPV-200 outage to be declared in the observed availability performance for ZBW in this report.

Table 1-6 WAAS Upgrades

Start Date	Emd Date	Location	Event Desription
11/20/2013	11/21/2013	Chicago (ZAU1), Chicago (ZAU2), Chicago (ZAU3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
11/21/2013	11/22/2013	Seattle (ZSE1), Seattle (ZSE2), Seattle (ZSE3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/02/2013	12/02/2013	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	Data communication outage to the Iqaluit Canada reference station (YFB) simultaneously on both networks resulted in the loss of service from that reference station. This caused LPV

			and LPV-200 service availability to be degraded in northern Canada. Problem was caused by a power failure and problems starting the engine/generator. See plot(s): LPV_12/2/2013 LPV200_12/2/2013
12/03/2013	12/06/2013	Honolulu (HNL1), Honolulu (HNL2), Honolulu (HNL3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/04/2013	12/05/2013	Miami (ZMA1), Miami (ZMA2), Miami (ZMA3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/04/2013	12/06/2013	Cold Bay (CDB1), Cold Bay (CDB2), Cold Bay (CDB3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/05/2013	12/05/2013	Gander (YQX1), Gander (YQX2), Gander (YQX3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/05/2013	12/06/2013	Kansas City (ZKC1), Kansas City (ZKC2), Kansas City (ZKC3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/09/2013	12/10/2013	Kotzebue (OTZ2), Kotzebue (OTZ3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/10/2013	12/11/2013	Boston (ZBW1), Boston (ZBW2), Boston (ZBW3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/10/2013	12/10/2013	Fairbanks (FAI2), Fairbanks (FAI3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/11/2013	12/13/2013	San Jose Del Cabo (MSD1), San Jose Del Cabo (MSD2), San Jose Del Cabo (MSD3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/12/2013	12/14/2013	Merida (MMD1), Merida (MMD2), Merida (MMD3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/13/2013	12/13/2013	New York (ZNY3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/16/2013	12/17/2013	Fairbanks (FAI1)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/16/2013	12/17/2013	Kotzebue (OTZ1)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/16/2013	12/16/2013	New York (ZNY1), New York (ZNY2)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
12/17/2013	12/18/2013	Jacksonville (ZJX1), Jacksonville (ZJX2), Jacksonville (ZJX3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
10/7/2013	10/7/2013	Manual	GEO133, Paumalu (HDH)	None	GEO 133, manual switchover from Paumalu to Santa Paula. TOW 111632-111637.
10/9/2013	10/9/2013	Manual	GEO133, Santa Paula (SZP) Paumalu (HDH)	None	Nine missing WAAS user messages from the AMR GEO, PRN-133, over the time of week interval seconds 303959 to 303992. Problem was caused by tracking (pointing) problems with the Santa Paula uplink dish. The dish lost tracking because the frequency of the tracking beacon on the satellite was changed by the satellite provider, INMARSAT, without coordination with the uplink site. Two GUS manual switchovers were performed during the event. GEO 133, manual switchover from Santa Paula to Paumalu. TOW 303992-304012. GEO 133, manual switchover from Paumalu to Santa Paula. TOW 322146-322151.
10/27/2013	10/27/2013	Faulted	GEO135, Littleton (APA)	LPV_Alaska, LPV200_Alaska, LPV200_Canada, RNP3_Alaska, RNP1_Alaska	A failure at the Littleton CO uplink for the CRW GEO, PRN-135, caused a switchover to the Napa CA uplink. This resulted in a brief (16 second) service outage to the area of north western Alaska where there is only single GEO coverage provided by CRW (GPS time of week 73837-73853). The increased UDREs for the CRW ranging signal during the carrier smoothing settling period and some minor elevations in GIVE values for northern IGPs also resulted in a minor degradation to the LPV-200 service availability along the northern edge of Canada. See plot(s): LPV_10/27/2013 LPV200_10/27/2013 RNP1_10/27/2013 RNP3_10/27/2013
11/8/2013	11/8/2013	Manual	GEO138, Woodbine (QWE)	None	GEO 138, manual switchover from Woodbine to Brewster-B. TOW 449766-449773.
11/13/2013	11/14/2013	Manual	GEO135, NAPA (APC)	LPV200_Alaska, LPV200_Canada	Manually directed switchover of the uplink for the CRW GEO, PRN-135, from the Napa CA uplink to the Littleton CO uplink caused a brief outage of service in the north western area of Alaska that only has single GEO coverage provided by CRW. GPS time of week seconds 288426 to 288431. The

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
					switchover also caused re-initialization of the carrier smoothing algorithms in WAAS for the CRW ranging signal which caused elevated UDREs for the CRW ranging signal. Those elevated UDREs contributed to degradation in the LPV-200 service availability in northern Alaska and northern Canada on 11/13/13 and 11/4/13. See plot(s): LPV200_11/13/2013 LPV200_11/14/2013
11/19/2013	11/19/2013	Faulted	GEO135, Littleton (APA)	LPV200_CONUS, LPV200_Alaska, RNP3_All, RNP1_All	Brief outage of the CRW GEO, PRN-135, caused by an automatic switchover from the Littleton CO uplink to the Napa CA uplink, GPS time of week seconds 175303 to175315. This caused a 12 second loss of service to the areas of north western Alaska where there is only single GEO coverage provided by CRW. Service impact from this event is not discernable on the plots because the planned maintenance on PRN-29 had a greater service impact. See plot(s): LPV200_11/19/2013 RNP1_11/19/2013 RNP3_11/19/2013

1.2 Report Overview

Section 2 documents the LPV and NPA performance observed for the indicated receiver locations (see Tables 1-2 and 1-3). The 95% accuracy index and the maximum inaccuracy for the reporting period are tabulated. The daily 95% accuracy index is plotted for each receiver. Histograms of the vertical and horizontal error distribution using the data from all the evaluated receivers are provided..

Section 3 summarizes the WAAS instantaneous availability performance, at each receiver, for three operational service levels during the reporting period. Daily availability is also plotted for each receiver evaluated. The number of outages and outage rate for each site is reported.

Section 4 provides geographic plots of the availability of the WAAS services rolled up for the quarter. Plots of the percent of the CONUS and Alaska service areas covered by various levels of service availability are provided.

Section 5 summarizes the number of HMI events detected during the reporting period and presents a safety margin index for each receiver. The safety margin index reflects the amount of over bounding of position error by WAAS protection levels. This section also includes update rates of WAAS messages transmitted from CRE, CRW, and AMR.

Section 6 provides the UDRE and GIVE bounding percentage and the 95% index of the range and ionospheric accuracy for each satellite tracked by the WAAS receiver at 12 locations.

Section 7 provides the GEO ranging performance for CRE and CRW.

Section 8 provides WAAS LPV availability and outages at selected airports.

Section 9 provides the assessment of WAAS CNMP bounding for the 114 WAAS receivers.

Section 10 provides the surveyed positions of all WREs and the difference between the WRE survey positions in the current operational software and the survey positions in this report.

Section 11 provides the daily and quarterly average of SQM PRN type biases and PRN biases.

Section 12 compares GPS broadcast orbits to IGS precise orbits and URA bounding analysis.

2.0 WAAS POSITION ACCURACY

Navigation error data, collected from WAAS and NSTB reference stations, was processed to determine position accuracy at each location. This was accomplished by utilizing the GPS/WAAS position solution tool to compute a RTCA DO-229D weighted least squares user navigation solution, and WAAS horizontal and vertical protection levels (HPL & VPL), once every second. The user position calculated for each receiver was compared to the surveyed position of the antenna to assess position error associated with the WAAS SIS over time. The position errors were analyzed and statistics were generated for the operational service levels shown in Table 1-1.

Table 2-1 shows PA horizontal and vertical position accuracy maintained for 95% of the time at LP, LPV and LNAV/VNAV operational service levels for the quarter. The table also includes 95% SPS accuracy for certain locations. Figures 2-1 to 2-6 show the daily horizontal and vertical 95% accuracy for LPV operational service level for the period. Note that WAAS accuracy statistics presented are compiled only when all WAAS corrections (fast, long term, and ionospheric) for at least 4 satellites are available. This is referred to as PA navigation mode. The percentage of time that PA navigation mode was supported by WAAS at each receiver is also shown in Table 2-1. A user is considered to be in NPA navigation mode if only WAAS fast and long term corrections are available to a user (i.e. no ionospheric corrections). Table 2-2 shows NPA horizontal position accuracy for 95% and 99.999% of the time. This table also shows the maximum NPA horizontal position error for the quarter. Figures 2-7 to 2-8 show the daily horizontal 95% accuracy for NPA.

Table 2-3 shows the maximum LPV error statistics. The column marked ‘Horizontal Error’ shows the maximum position errors while the calculated HPL meets the LPV service level defined in Table 1-1. The column marked ‘Vertical Error’ shows the maximum position errors while the calculated VPL meets the LPV service level. The columns marked ‘Horizontal Error/HPL’ and ‘Vertical Error/VPL’ show the ratio of position error to protection level at the time the maximum error occurred. The columns marked ‘Horizontal Maximum Ratio’ and ‘Vertical Maximum Ratio’ show the maximum position error to protection level ratio for the quarter.

During this reporting period, the maximum 95% CONUS horizontal and vertical LPV errors are 1.381 meters and 1.627 meters at Atlantic City and Houston, respectively. The minimum 95% CONUS horizontal and vertical LPV errors are 0.582 meters and 0.888 meters at Los Angeles and Salt Lake City, respectively. The maximum 95% and 99.999% NPA horizontal errors are 6.555 meters and 14.302, both at Honolulu. The minimum 95% and 99.999% horizontal errors are 1.324 meters and 2.746 meters at Oakland and Los Angeles, respectively.

The increases in 95% position errors on 10/9/2013, 10/30/2013, 10/31/2013, 11/09/2013, and 11/16/2013 in Figures 2.1 to 2.6 are due to geomagnetic activity. The increases in 95% position errors on 10/31/2013 in Figures 2.1 to 2.6 are also partly due to a CCC Monitor Trip on PRN135 which raised the GIVEs to Do Not Use for approximately 4 hours. The increases in 95% NPA position errors on 10/9/2013, 10/14/2013, 10/30/2013, 10/31/2013, and 12/25/2013 in Figure 2.7-2.8 are due to geomagnetic activity.

Figures 2-9 to 2-12 show the distributions of the vertical and horizontal errors at all 38 WAAS receiver locations combined in triangle charts and 2-D histogram plots for the quarter. The triangle charts in Figures 2-9 and 2-10 show the distributions of vertical position errors (VPE) versus vertical protection levels (VPL) and horizontal position errors (HPE) versus horizontal protection levels (HPL). The horizontal axis is the position error and the vertical axis is the WAAS protection levels. Lower protection levels equate to better availability. The diagonal line shows the point where error equals protection level. Above and to the left of the diagonal line in the chart, errors are

bounded (WAAS is providing integrity in the position domain); below and to the right, errors are not bounded (HMI could be present). The 2-D histogram plots in Figures 2-11 to 2-12 show the distributions of vertical and horizontal position errors and normalized position errors. The blue trace shows the distributions of the actual vertical and horizontal errors. The horizontal axis is the position errors and the vertical axis is the total count of data samples (log scale) in each 0.1-meter bin. The magenta trace show the distributions of the actual vertical and horizontal errors normalized by one-sigma value of the protection level; vertical - (VPL/5.33) and horizontal - (HPL/6.0). The horizontal axis is the standard units and vertical axis is the observed distribution of normalized errors data samples in each 0.1-sigma bin. Narrowness of the normalized error distributions shows very good observed safety performance.

Table 2-1 PA 95% Horizontal and Vertical Accuracy

Location	Horizontal (HAL=40m) (Meters)	Horizontal (HAL=556m) (Meters)	Vertical (VAL=50m) (Meters)	Percentage in PA mode (%)	SPS Accuracy	
					95% Horizontal (Meters)	95% Vertical (Meters)
Arcata	1.133	1.133	1.283	100	*	*
Atlantic City-a	1.381	1.381	1.536	100	*	*
Grand Forks	1.233	1.233	1.524	100	*	*
Oklahoma City	0.962	0.962	1.444	100	*	*
Albuquerque	0.704	0.704	1.009	100	2.059	7.149
Anchorage	0.652	0.652	1.275	100	*	*
Atlanta	0.767	0.767	1.259	100	2.355	7.381
Barrow	0.754	0.759	1.739	99.99981	*	*
Bethel	0.641	0.641	0.945	100	2.102	9.077
Billings	0.809	0.809	1.046	100	2.242	6.519
Boston	0.864	0.864	1.129	100	2.599	6.226
Chicago	1.001	1.001	1.060	100	*	*
Cleveland	0.787	0.787	1.065	100	2.478	6.488
Cold Bay	0.676	0.676	1.091	100	*	*
Dallas	0.772	0.772	1.407	100	*	*
Denver	0.631	0.631	0.889	100	*	*
Fairbanks	0.666	0.667	1.338	100	2.242	8.512
Gander	0.880	0.880	1.219	100	*	*
Goose Bay	0.903	0.903	1.191	100	*	*
Houston	0.998	0.998	1.627	100	2.230	7.636
Iqaluit	1.341	1.365	1.990	100	*	*
Jacksonville	0.879	0.879	1.486	100	*	*
Juneau	0.781	0.781	1.149	100	*	*
Kansas City	0.757	0.757	0.999	100	2.249	6.771
Kotzebue	0.690	0.692	1.212	99.99982	2.269	8.800
Los Angeles	0.582	0.582	1.104	100	2.089	8.142
Memphis	0.777	0.777	1.192	100	*	*
Merida	0.843	0.843	1.624	100	*	*
Mexico City	0.945	0.945	2.022	100	*	*
Miami	1.039	1.039	1.599	100	2.512	7.302
Minneapolis	0.775	0.775	0.921	100	2.281	6.296
New York	0.970	0.970	1.082	100	*	*
Oakland	0.659	0.659	1.230	100	2.066	8.297
Puerto Vallarta	0.986	0.986	1.438	100	*	*
Salt Lake City	0.692	0.692	0.888	100	2.135	7.044
San Jose Del Cabo	0.923	0.923	1.700	100	*	*
Seattle	0.840	0.840	0.936	100	2.152	7.484
Washington DC	0.911	0.911	1.249	100	2.573	6.809
Winnipeg	0.849	0.849	1.133	100	*	*

* = SPS Data not processed.

Table 2-2 NPA 95% and 99.999% Horizontal Accuracy

Location	95% Horizontal (meters)	99.999% Horizontal (meters)	Percentage in NPA mode (%)	Maximum Horizontal Error
Albuquerque	1.615	3.224	100	3.460
Anchorage	2.068	5.810	100	7.161
Atlanta	1.594	4.558	100	4.686
Barrow	2.380	5.182	100	5.402
Bethel	1.854	4.848	100	5.122
Billings	1.651	3.533	100	3.778
Boston	1.884	3.879	100	4.119
Cleveland	1.583	2.975	100	3.137
Cold Bay	1.527	4.866	100	5.074
Fairbanks	2.155	5.186	100	5.350
Gander	1.856	4.371	100	4.510
Honolulu	6.555	14.302	100	14.546
Houston	1.798	3.487	100	3.785
Iqaluit	3.186	6.828	100	6.979
Juneau	1.936	4.147	100	4.260
Kansas City	1.510	3.808	100	3.923
Kotzebue	2.030	5.231	100	5.395
Los Angeles	1.470	2.746	100	2.960
Merida	2.076	5.979	100	6.559
Miami	1.761	3.776	100	3.870
Minneapolis	1.654	3.279	100	3.466
Oakland	1.324	2.751	100	3.058
Salt Lake City	1.446	3.237	100	3.458
San Jose Del Cabo	2.085	8.284	100	8.536
San Juan	3.617	14.251	100	14.657
Seattle	1.669	3.876	100	4.104
Tapachula	3.522	12.912	100	13.198
Washington DC	1.835	3.385	100	3.500

Table 2-3 Maximum LPV Error Statistics

Location	Horizontal Error (m)	Horizontal Error/HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/VPL	Vertical Maximum Ratio
Arcata	2.947	0.205	0.206	4.960	0.128	0.166
Atlantic City	2.801	0.274	0.288	4.366	0.201	0.205
Grand Forks	2.770	0.149	0.234	4.540	0.132	0.207
Oklahoma City	2.514	0.291	0.292	4.634	0.199	0.239
Albuquerque	1.729	0.131	0.161	3.480	0.186	0.186
Anchorage	1.968	0.150	0.154	3.942	0.099	0.186
Atlanta	2.038	0.187	0.199	2.800	0.170	0.175
Barrow	2.646	0.124	0.152	6.397	0.203	0.210
Bethel	2.008	0.107	0.141	3.086	0.105	0.156
Billings	2.162	0.229	0.229	3.472	0.135	0.188
Boston	1.826	0.123	0.157	4.439	0.209	0.211
Chicago	1.916	0.207	0.207	2.916	0.147	0.187
Cleveland	1.740	0.182	0.182	3.409	0.138	0.206
Cold Bay	3.043	0.123	0.123	3.679	0.120	0.120
Dallas	1.837	0.195	0.195	3.263	0.148	0.246
Denver	2.050	0.155	0.208	5.639	0.236	0.237
Fairbanks	3.691	0.321	0.321	6.282	0.132	0.231
Gander	3.596	0.154	0.154	4.168	0.093	0.147
Goose Bay	4.596	0.162	0.168	5.318	0.117	0.163
Houston	1.908	0.172	0.205	3.384	0.238	0.238
Iqaluit	4.494	0.120	0.160	6.652	0.136	0.192
Jacksonville	1.861	0.197	0.197	3.133	0.173	0.185
Juneau	2.501	0.150	0.174	4.048	0.130	0.180
Kansas City	1.846	0.191	0.191	3.392	0.126	0.171
Kotzebue	2.779	0.146	0.168	5.311	0.167	0.167
Los Angeles	1.563	0.129	0.129	2.938	0.137	0.150
Memphis	1.908	0.187	0.190	4.264	0.137	0.222
Merida	1.836	0.114	0.176	3.727	0.152	0.170
Mexico City	2.675	0.183	0.185	3.886	0.105	0.178
Miami	1.943	0.135	0.170	3.839	0.125	0.177
Minneapolis	1.809	0.173	0.186	4.286	0.187	0.211
New York	2.056	0.166	0.187	3.175	0.154	0.174
Oakland	1.917	0.158	0.163	3.001	0.077	0.167
Puerto Vallarta	3.120	0.189	0.193	3.602	0.091	0.131
Salt Lake City	2.197	0.169	0.177	2.985	0.162	0.166
San Jose Del Cabo	2.535	0.149	0.171	3.895	0.097	0.181
Seattle	2.560	0.208	0.212	3.179	0.124	0.167
Washington DC	1.688	0.181	0.181	2.964	0.148	0.178
Winnipeg	3.339	0.196	0.217	5.697	0.139	0.201

Figure 2-1 LPV 95% Horizontal Accuracy

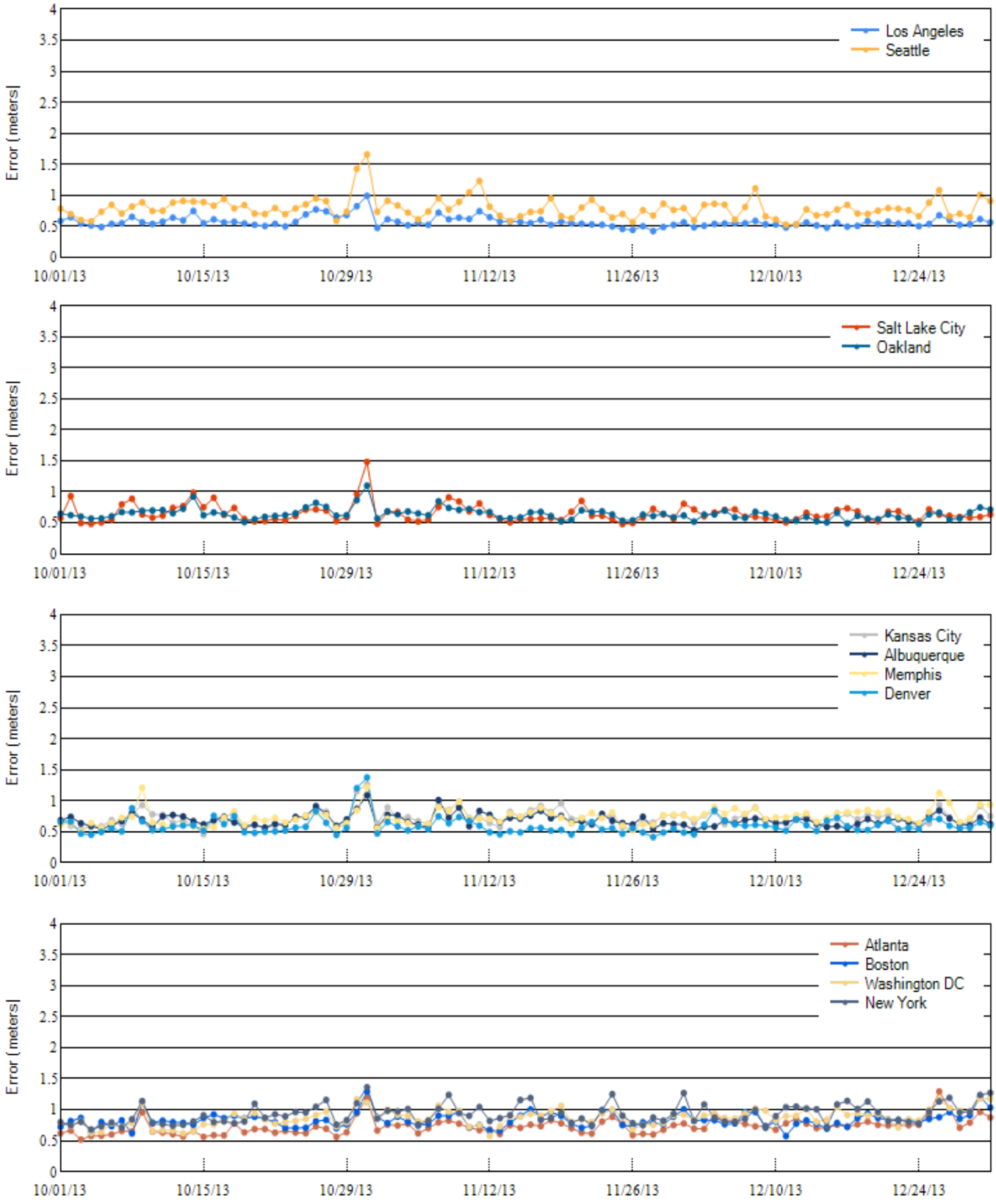


Figure 2-2 LPV 95% Horizontal Accuracy

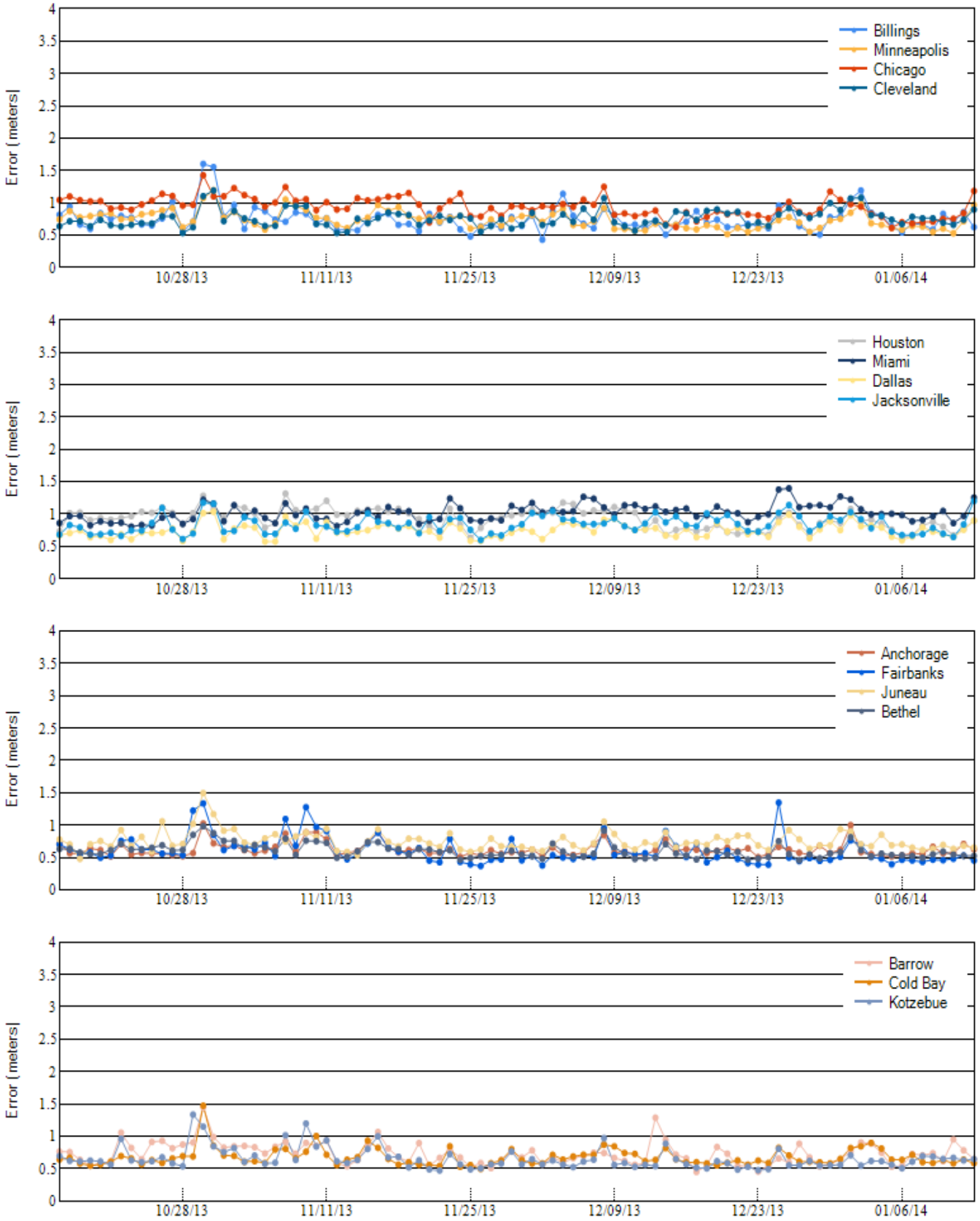


Figure 2-3 LPV 95% Horizontal Accuracy

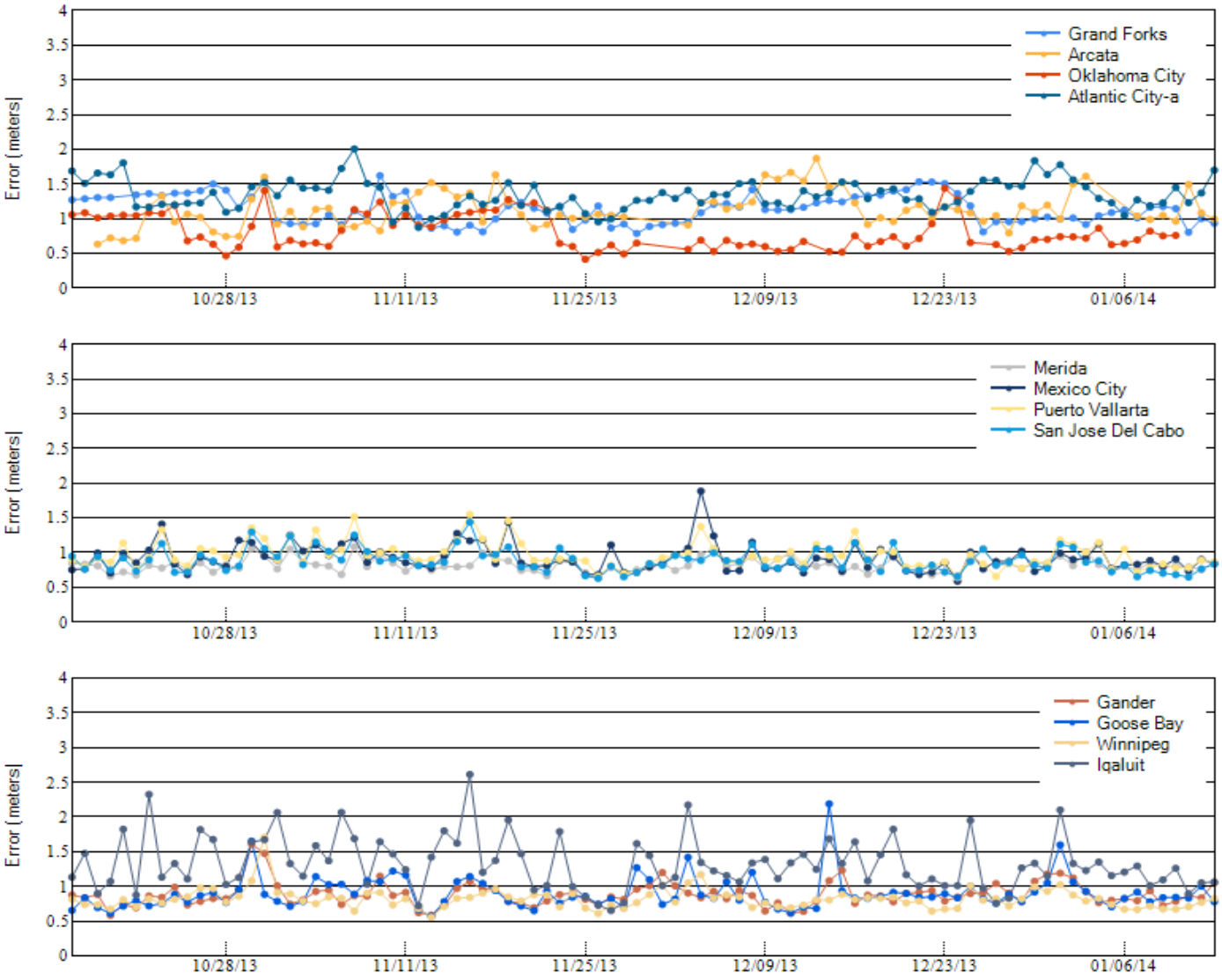


Figure 2-4 LPV 95% Vertical Accuracy

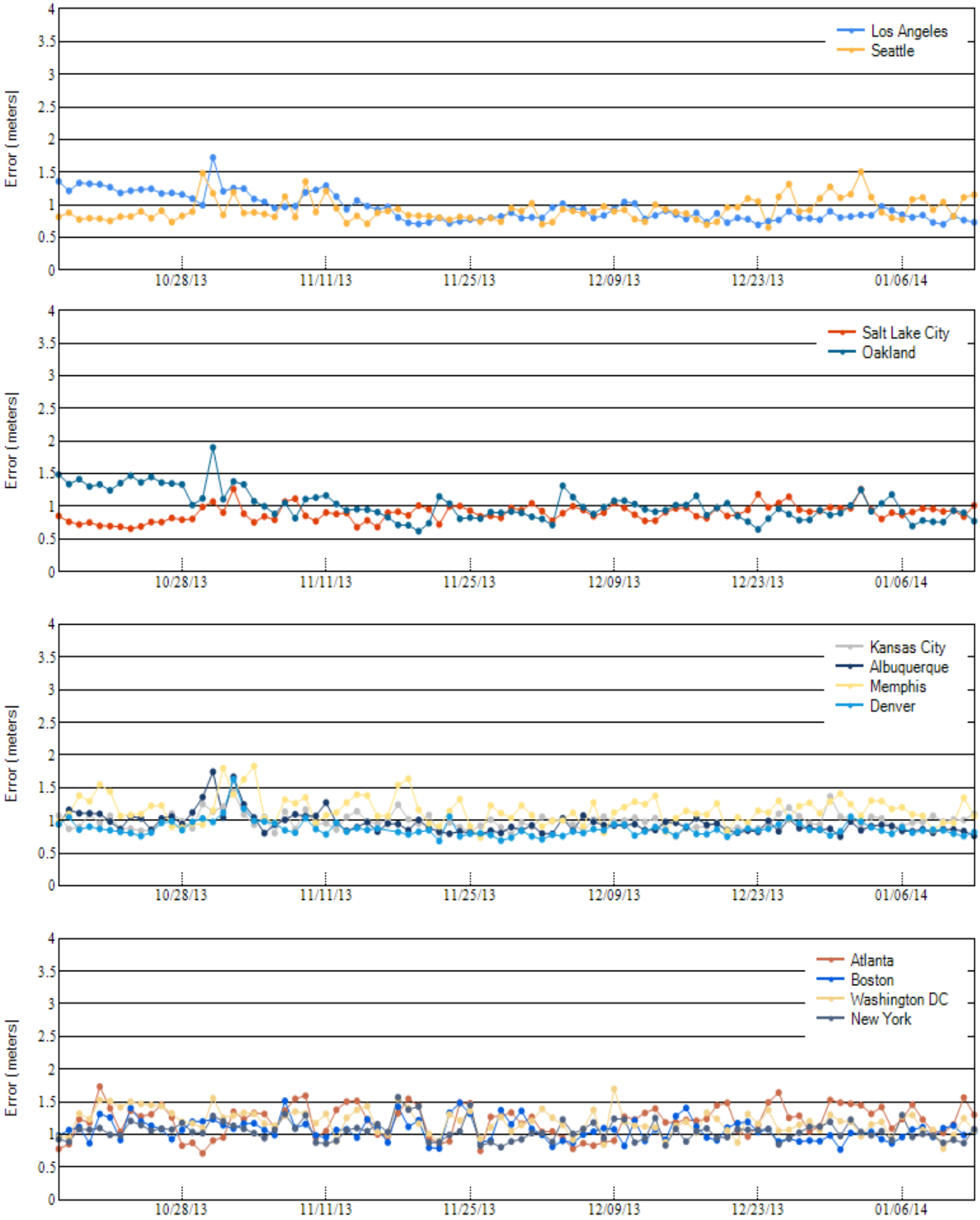


Figure 2-5 LPV 95% Vertical Accuracy

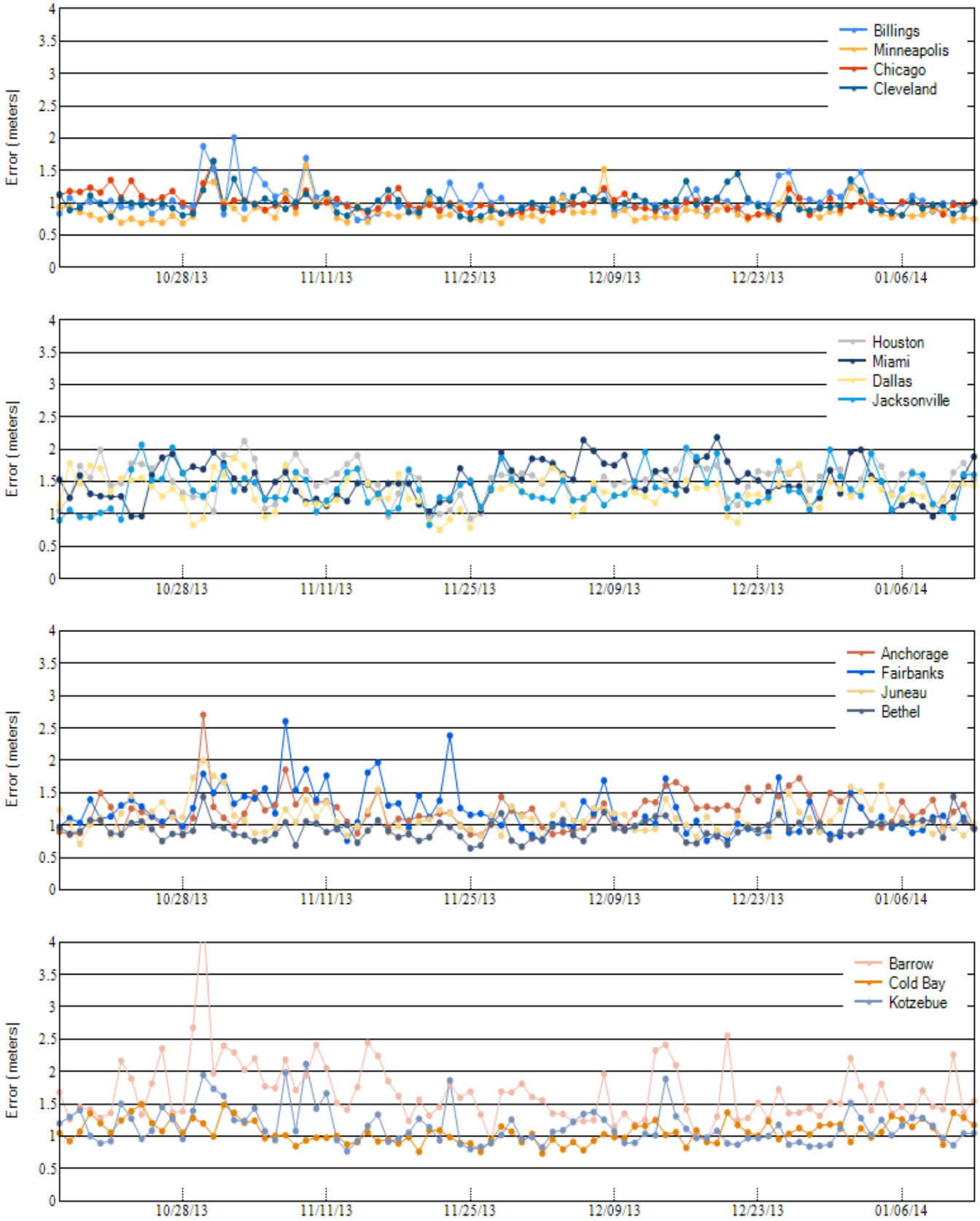


Figure 2-6 LPV 95% Vertical Accuracy

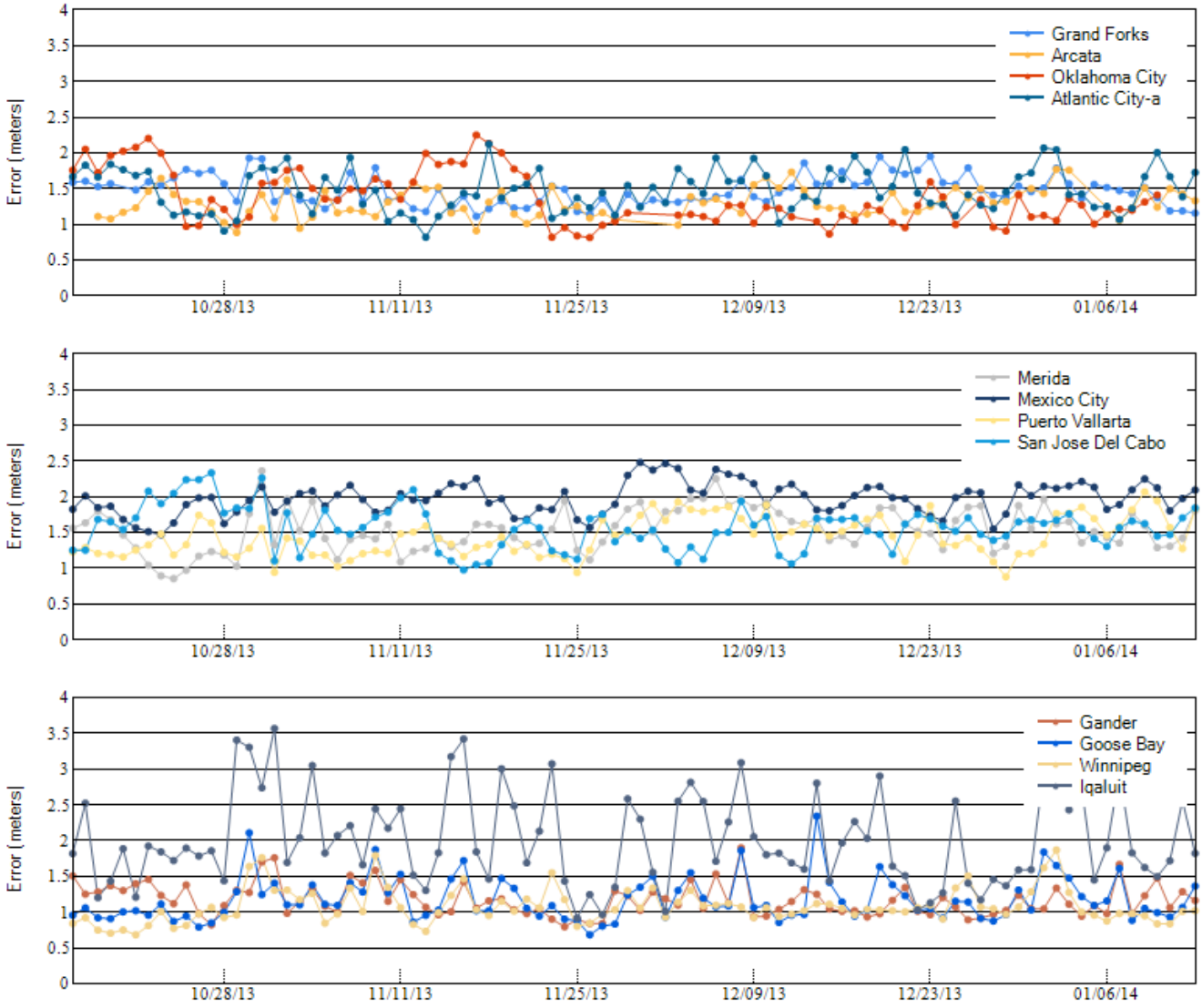


Figure 2-7 NPA 95% Horizontal Accuracy

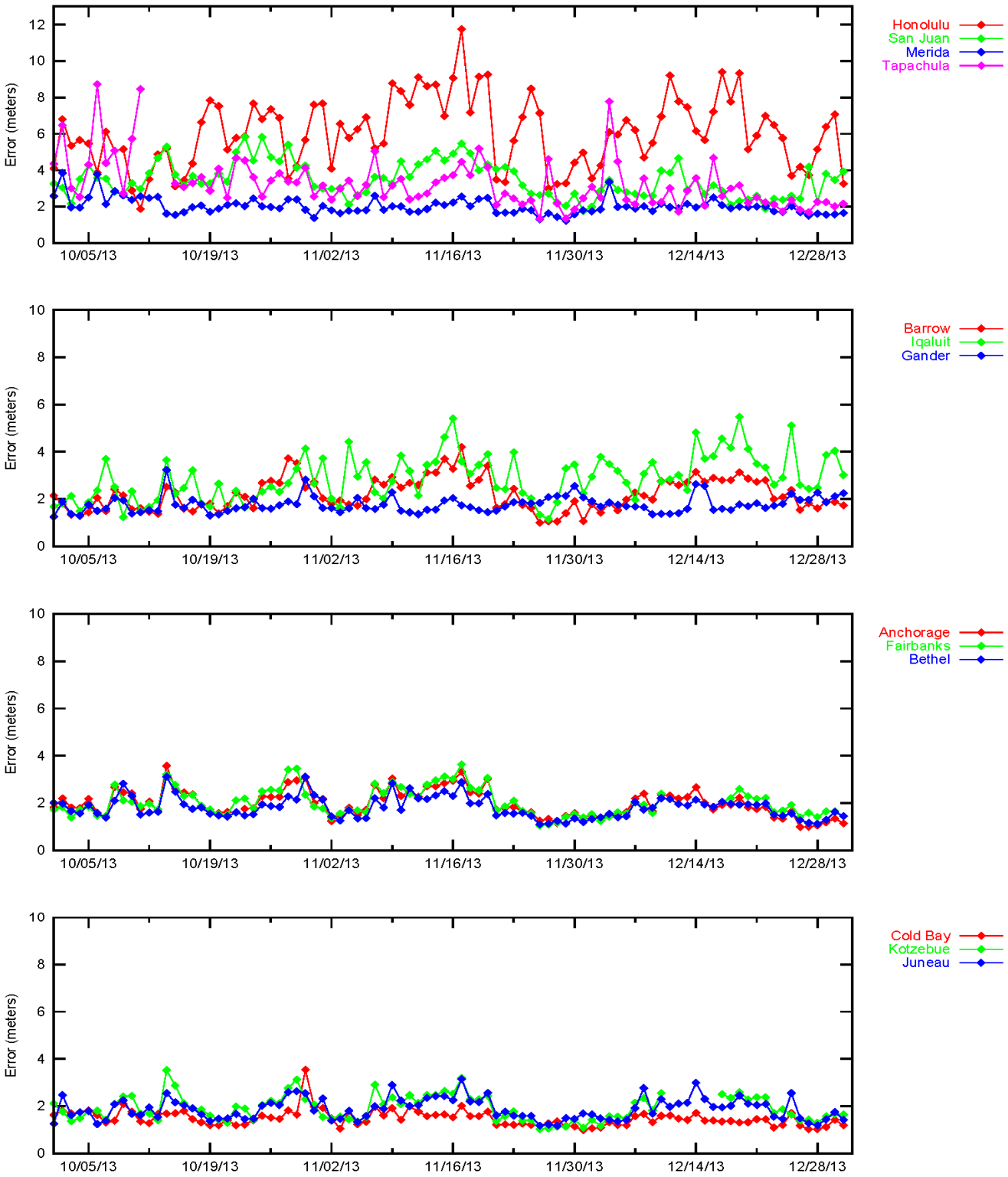


Figure 2-8 NPA 95% Horizontal Accuracy

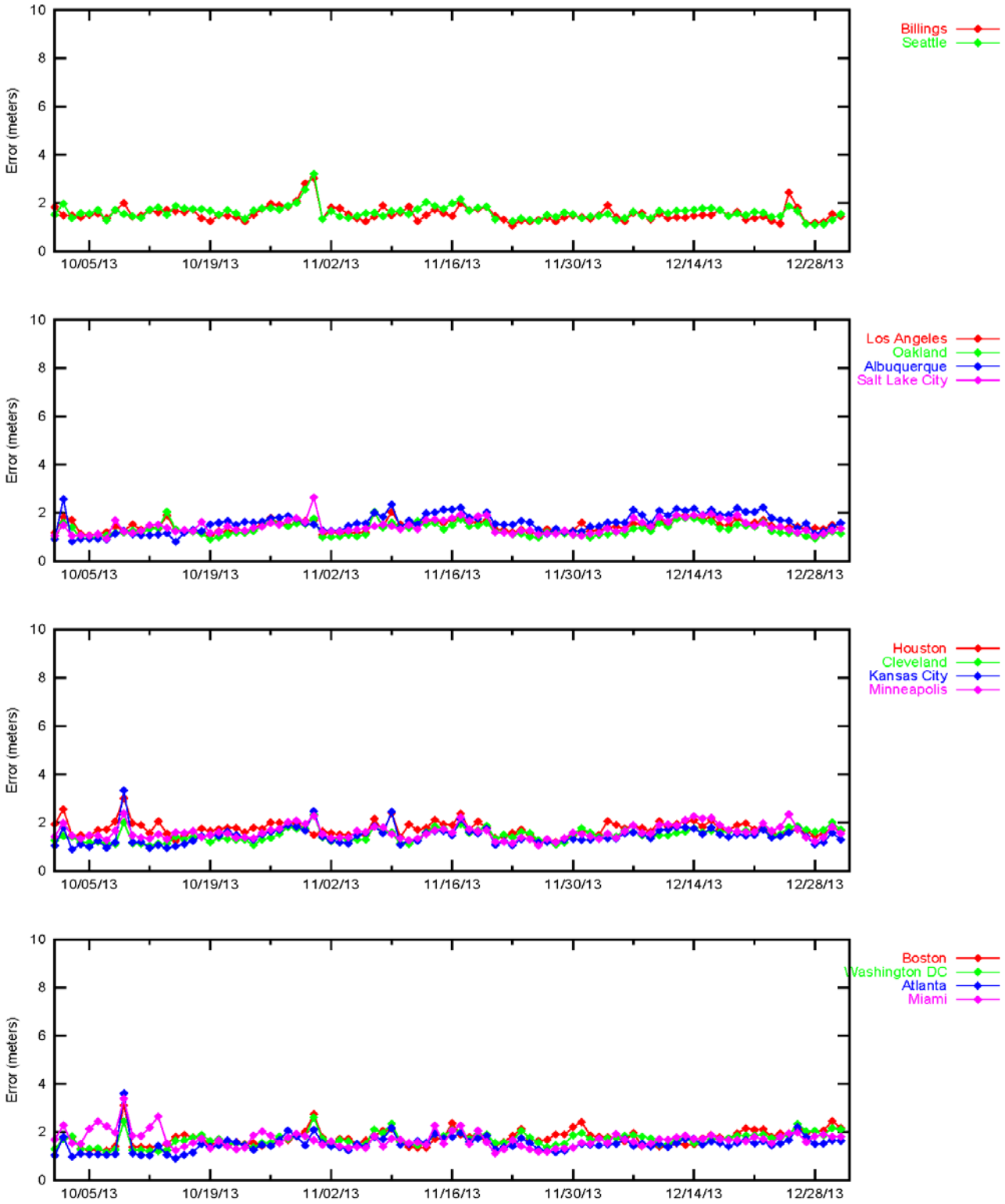


Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

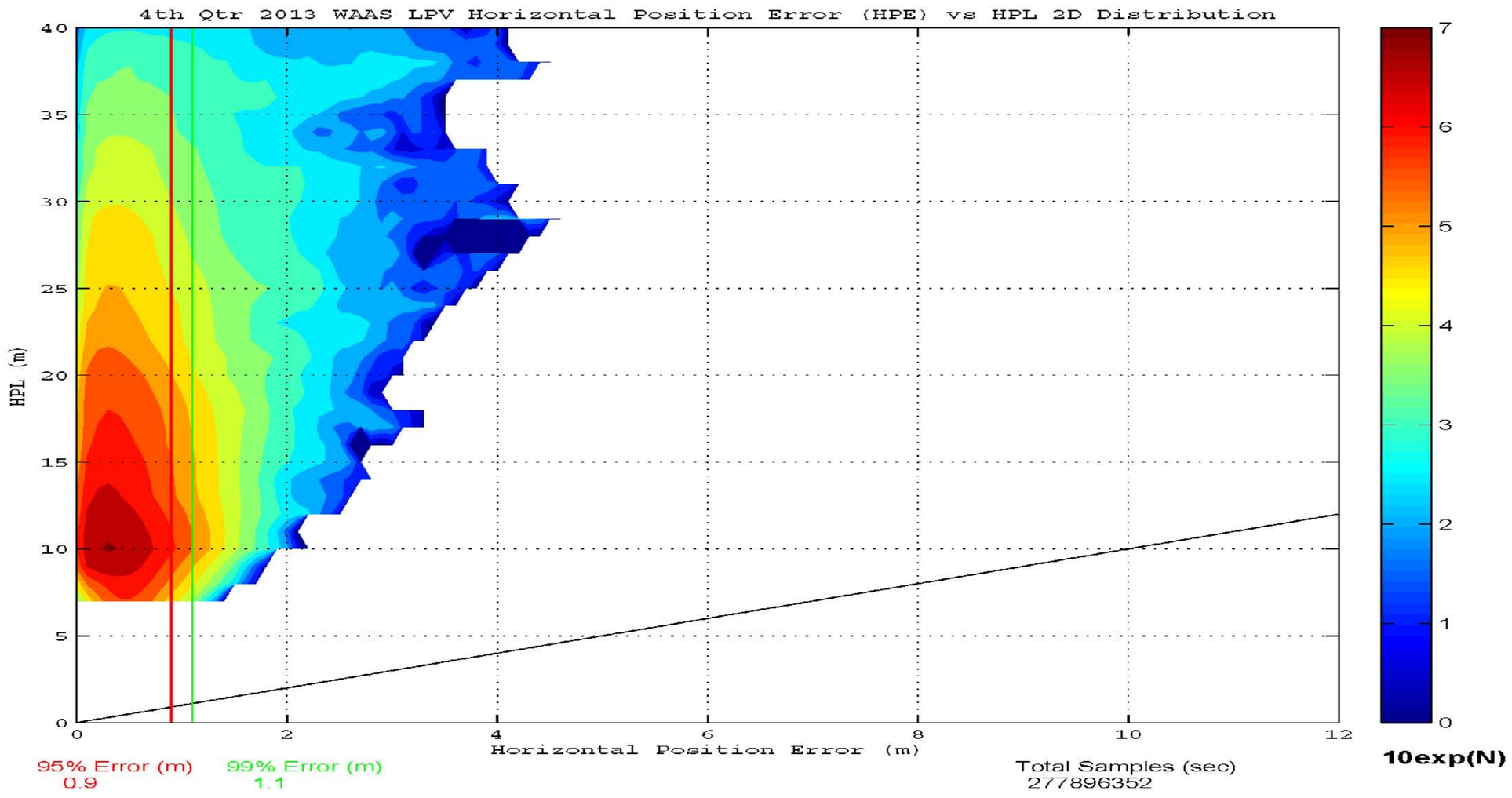


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

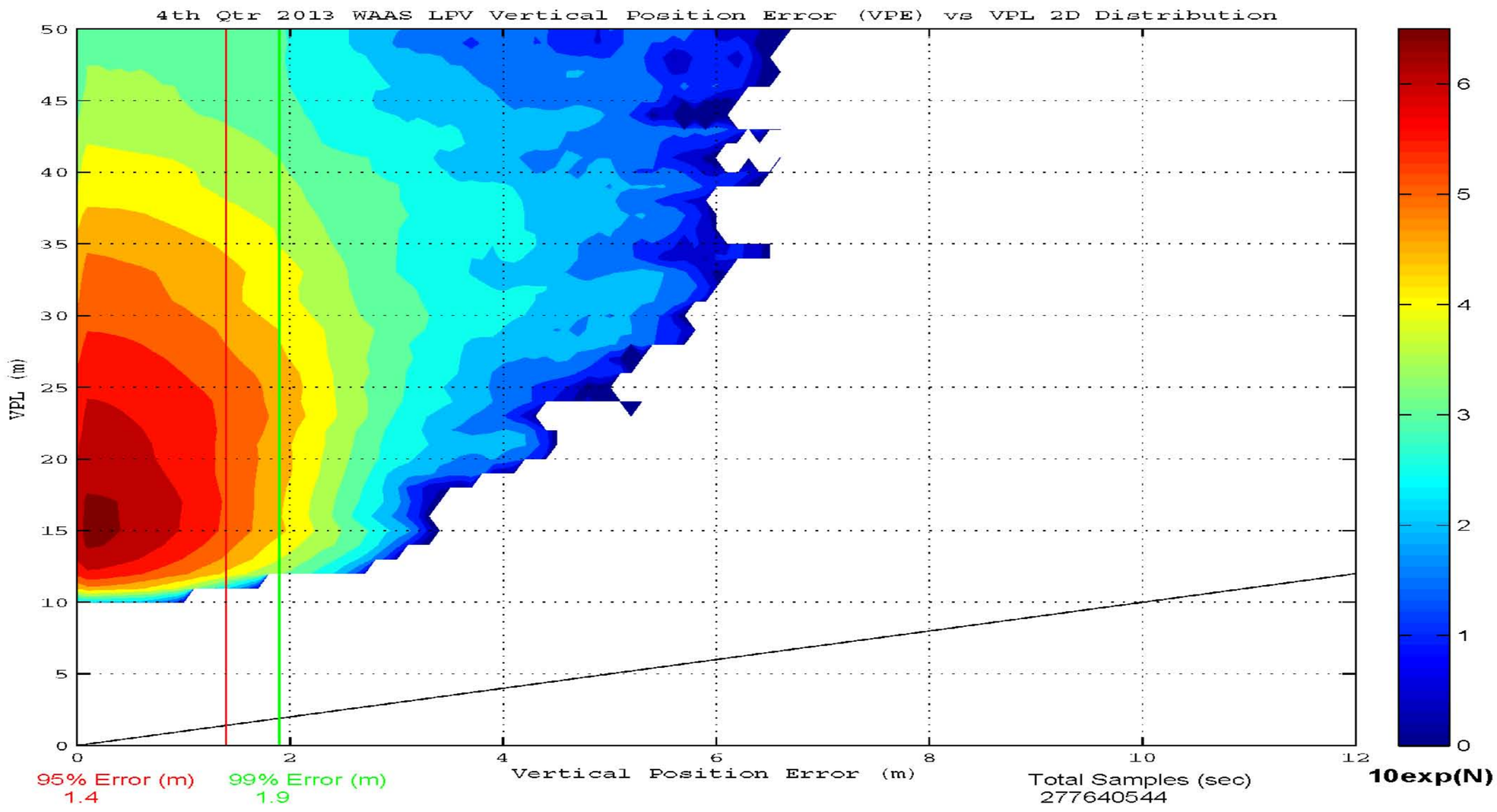


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

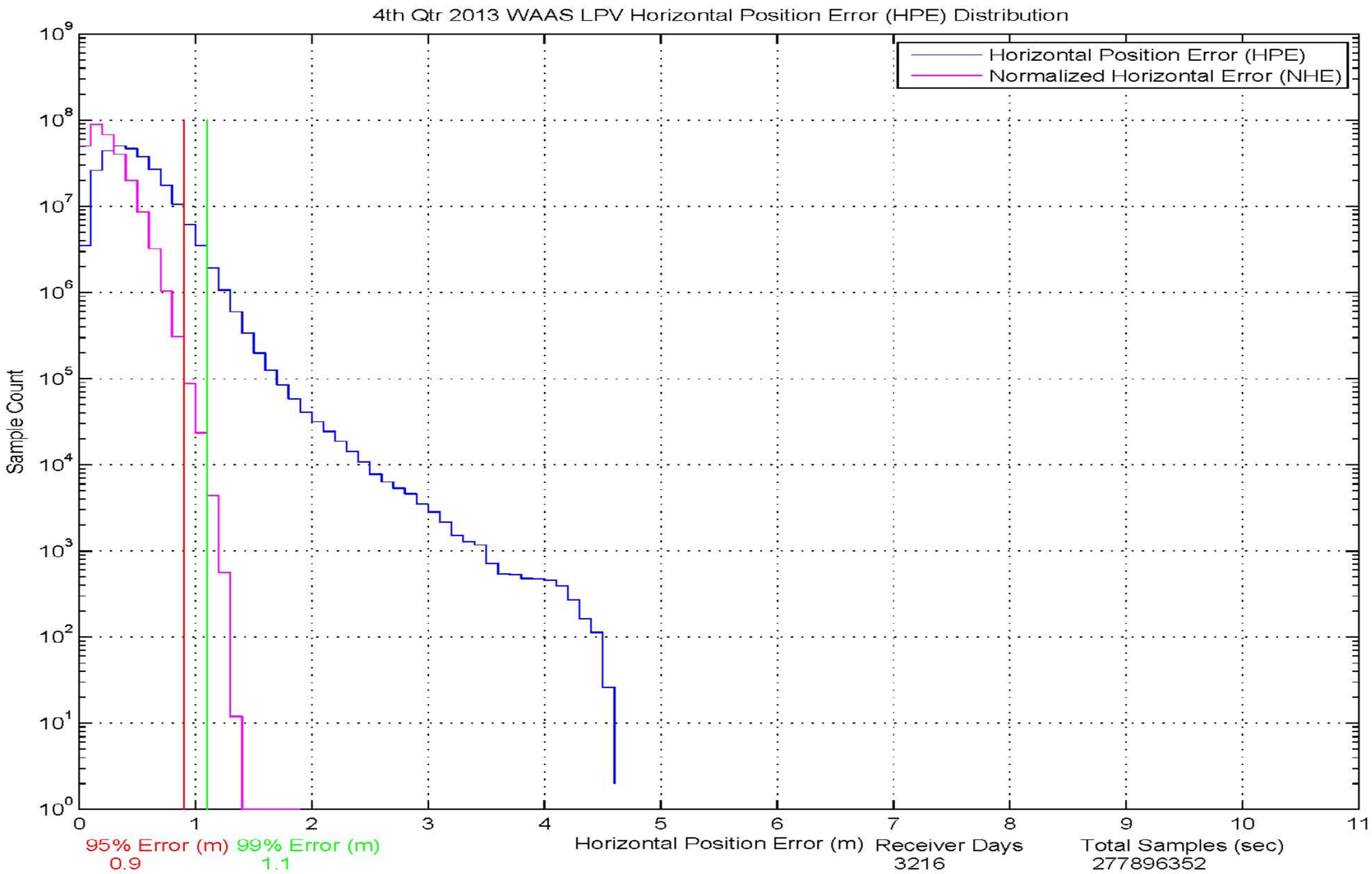
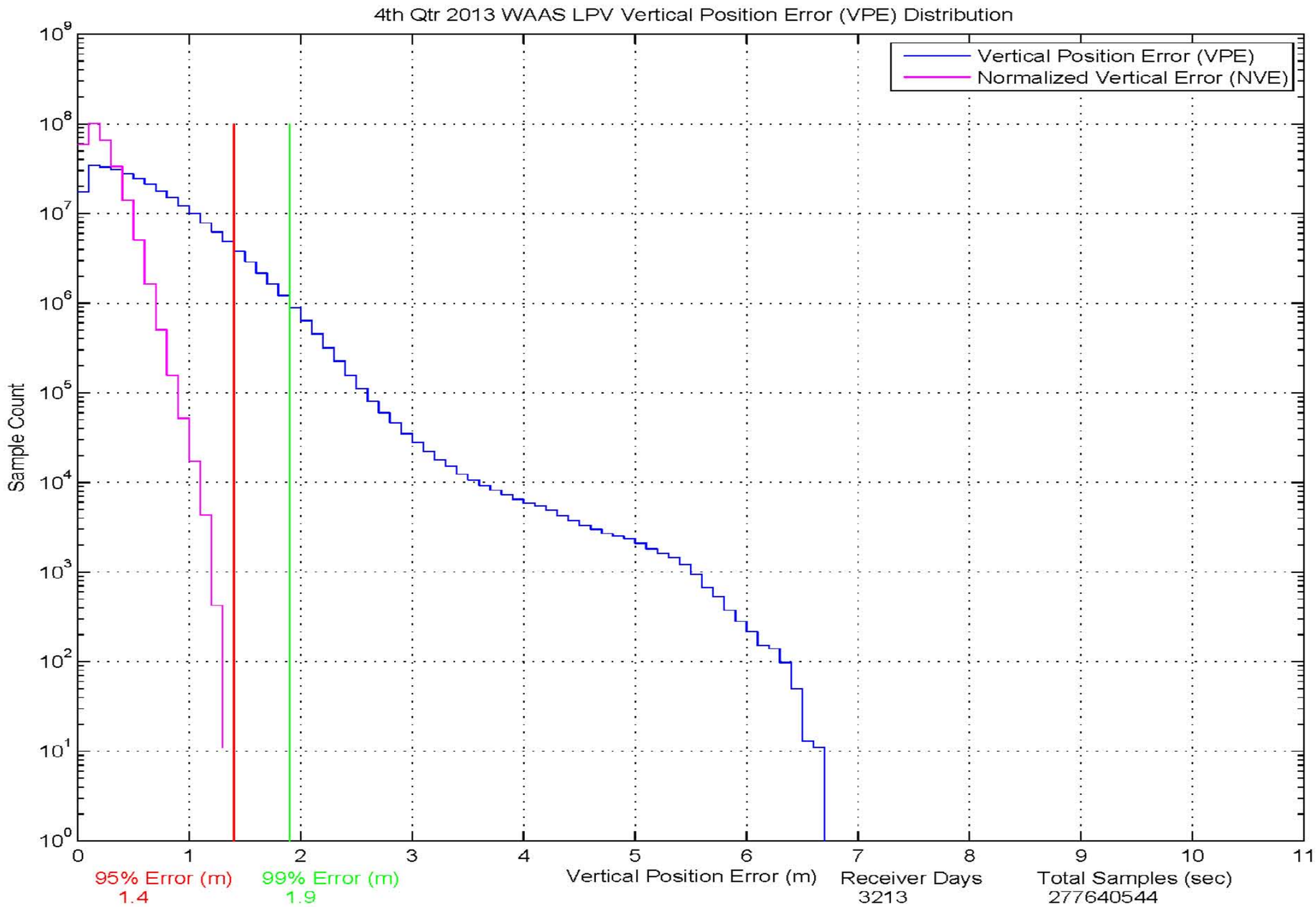


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



3.0 AVAILABILITY

The WAAS availability evaluation documents the percentage of time that the WAAS provided service for the operational service levels defined in Table 1-1. RTCA DO-229D Vertical and Horizontal Protection Levels were computed for each receiver being evaluated. Table 3-1 shows the protection levels that were maintained for 99% of the time for each receiver location for the quarter. The table also included the percentage in PA mode as described in section 2.0.

For this reporting period, the maximum 99% CONUS HPL and VPL are 17.739 meters at Miami and 34.311 meters, at Arcata, respectively. The minimum 99% CONUS HPL and VPL are 11.314 meters and 19.413 meters, both at Memphis. The maximum 99% Alaska HPL and VPL are 29.399 meters and 37.542 meters, both at Cold Bay. The minimum 99% Alaska HPL and VPL are 14.198 meters at Fairbanks and 23.969 meters at Juneau, respectively.

Availability of LP, LPV and LPV 200 service are evaluated by monitoring the WAAS protection levels at receiver locations throughout the test period. If both the vertical and horizontal protection levels are not greater than their respective alert limits (VAL and HAL) then the service is available. If either of the protection levels exceeds the required alert limit then the operational service at that location is considered unavailable and an outage in service is recorded with its duration. The operational service is not considered available again until the protection levels are both within the alert limits for at least 15 minutes. Although this will reduce operational service availability minimally, it substantially reduces the number of service outages and prevents excessive switching in and out of service availability. The percent of time that LP, LPV, and LPV 200 service is available using the fifteen-minute window criteria is presented in Table 3-2. The LP, LPV, and LPV 200 service outages and associated outage rate for the reporting period is presented in Table 3-4. The outage rate is the percent of approaches that theoretically would be interrupted by a loss of operational service once the approach had started. Figures 3-1 to 3-6 show the daily availability of LPV and LPV 200 service levels. Figures 3-7 to 3-12 show the daily interruptions of LPV and LPV 200 service levels for the evaluation period.

Availability of NPA service is evaluated by monitoring the WAAS horizontal protection level at receiver locations throughout the test period. If the horizontal protection level is not greater than the horizontal alert limit (HAL = 556m) then the service is available. If the horizontal protection level exceeds the required alert level or if WAAS navigation message is not received then the NPA service at that location is considered unavailable and an outage in service is recorded with its duration. The NPA service is not considered available again until the horizontal protection level is within the alert limit for at least 15 minutes. The percent of time that NPA service is available using the fifteen-minute window criteria is presented in Table 3-3. The NPA service outages and associated outage rate for this period is presented in Table 3-5. The outage rate is the percent of NPA approaches that theoretically would be interrupted by a loss of operational service once the approach had started.

Low PA and NPA availability for this reporting period are due to GPS satellite outages, carrier phase anomalies, GUS switchovers, geomagnetic activity, and elevated GIVE and UDRE values. Please refer to Table 1-5 for all the events that affected availability.

Manual GUS switchover on CRW GEO (PRN-135) on October 27 and November 13 elevated UDRE values and slightly reduced availability in Alaska and Canada. Manual GUS switchover on CRW GEO (PRN-135) on November 19 elevated UDRE values and slightly reduced availability in CONUS, Alaska and Canada.

A brief carrier phase anomaly on PRN-4 on October 30 and December 22 caused WAAS to issue a SV alert setting on PRN-4 to “Not Monitored”, resulting in a minor reduction in LPV-200 CONUS availability. A brief carrier phase anomaly on PRN-21 on November 8 and on PRN-4 on December 18 caused WAAS to issue a SV alert setting on PRN-21 and PRN-4 respectively to “Not Monitored”, resulting in a slight reduction in LPV-200 Canada availability. A brief carrier phase anomaly on PRN-138 on December 23 caused WAAS to issue a SV alert setting on PRN-138 to “Not Monitored”, resulting in a minor reduction in Canada availability.

Beginning on December 4, numerous SV alerts on PRN-1 caused slightly reduced availability in CONUS. The alerts occurred on multiple days and continued beyond the span of time covered in this report; see DR 117 Excessive Not Monitored Alarms on PRN 1 SVN 63.

Planned maintenance on PRN-26 on October 26 caused availability reduction in Canada. Planned maintenance on PRN-2 on November 3 –5 affected CONUS, Alaska and Canada availability; see DR 118 PRN2 Anomaly. Planned maintenance on PRN-29 on November 19 resulted in a minor reduction in CONUS, Alaska and Canada availability. Planned maintenance on PRN-1 on November 25 – 26 affected CONUS availability; see DR 116 Fewer Reference Stations Than Expected Tracked PRN 1 Following Satellite Maintenance. Planned maintenance on PRN-25 on December 5 caused availability drop in Canada.

Geomagnetic activity on October 2, October 8 -9, October 14-15, October 30 -31, November 9-11, November 15-16, and December 14 elevated GIVE values and affected availability in Alaska and Canada. Geomagnetic activity on October 14 and October 30-31 elevated GIVE values and caused slight degradation in availability CONUS and Alaska. Geomagnetic activity on October 17, October 20, October 29, November 4, December 8, and December 19 elevated GIVE values and caused availability drop in Canada.

Communication outages at Iqaluit on October 11 and December 2 increased GIVE values and caused availability reduction in Canada. Communication outages at Barrow on December 15 increased GIVE values and affected availability in Alaska. Communication outages at Goose Bay on December 17 and December 20 increased GIVE values and caused availability drop in Canada.

Radio frequency interference (RFI) caused localized loss of LPV/LPV200 availability at Washington, DC on October 9, October 11, November 20, and at Boston on December 26, but had no effect on WAAS service. Radio frequency interference (RFI) at Iqaluit on October 13 caused IGPs in Northern Canada to be set to “Not Monitored”, resulting in a loss of availability in Canada.

Table 3-1 99% Protection Level

Location	99% HPL (meters)	99% VPL (meters)	Percentage in PA mode
Arcata	16.601	34.311	100
Atlantic City	14.295	21.771	100
Grand Forks	16.664	26.514	100
Oklahoma City	11.904	22.657	100
Albuquerque	12.206	25.673	100
Anchorage	14.836	23.875	100
Atlanta	12.206	19.764	100
Barrow	19.314	37.156	99.999810
Bethel	19.004	29.746	100
Billings	14.951	22.553	100
Boston	15.772	22.066	100
Chicago	11.729	20.587	100
Cleveland	13.880	23.263	100
Cold Bay	29.399	37.542	100
Dallas	12.640	22.622	100
Denver	12.765	23.004	100
Fairbanks	14.198	24.569	100
Gander	28.545	40.249	100
Goose Bay	23.886	30.677	100
Houston	11.551	22.687	100
Iqaluit	37.359	49.808	100
Jacksonville	13.760	21.059	100
Juneau	15.156	23.969	100
Kansas City	11.501	19.645	100
Kotzebue	17.427	32.801	99.999820
Los Angeles	15.079	27.630	100
Memphis	11.314	19.413	100
Merida	19.099	32.566	100
Mexico City	30.033	41.301	100
Miami	17.739	25.813	100
Minneapolis	12.802	21.798	100
New York	14.947	22.097	100
Oakland	17.177	32.995	100
Puerto Vallarta	35.129	59.400	100
Salt Lake City	14.016	21.005	100
San Jose Del Cabo	29.504	44.983	100
Seattle	14.890	26.996	100
Washington DC	13.243	21.316	100
Winnipeg	16.719	25.467	100

Table 3-2 Quarterly Availability Statistics

Location	LP WAAS With 15 minute window	LPV WAAS *With 15 minute window*	LPV 200 WAAS *With 15 minute window*
Arcata	1	0.999998	0.986625
Atlantic City	1	1	1
Grand Forks	1	1	0.999788
Oklahoma City	1	1	1
Albuquerque	1	1	1
Anchorage	0.999930	0.999819	0.999165
Atlanta	1	1	1
Barrow	0.998042	0.997634	0.979797
Bethel	1	0.999951	0.999036
Billings	1	1	1
Boston	1	1	0.999992
Chicago	1	1	1
Cleveland	1	1	1
Cold Bay	0.999952	0.999836	0.943856
Dallas	1	1	1
Denver	1	1	1
Fairbanks	0.999311	0.999225	0.998368
Gander	0.999924	0.999504	0.910710
Goose Bay	0.999783	0.999746	0.996848
Houston	1	1	1
Iqaluit	0.991603	0.985199	0.890832
Jacksonville	1	1	1
Juneau	0.999574	0.999229	0.998736
Kansas City	1	1	1
Kotzebue	0.998943	0.998647	0.995031
Los Angeles	1	1	0.999940
Memphis	1	1	1
Merida	1	0.996458	0.994701
Mexico City	0.999743	0.999703	0.933140
Miami	1	1	0.999535
Minneapolis	1	1	1
New York	1	1	1
Oakland	1	1	0.989395
Puerto Vallarta	0.998857	0.977014	0.909856
Salt Lake City	1	1	1
San Jose Del Cabo	0.999661	0.993286	0.941702
Seattle	1	1	1
Washington DC	1	0.999992	0.999973
Winnipeg	1	1	0.999808

Table 3-3 NPA Availability

Location	NPA Availability (Excluding RAIM/FDE)
Albuquerque	1
Anchorage	1
Atlanta	1
Barrow	0.999999
Bethel	1
Billings	1
Boston	1
Cleveland	1
Cold Bay	1
Fairbanks	1
Gander	1
Honolulu	1
Houston	1
Iqaluit	1
Juneau	1
Kansas City	1
Kotzebue	0.999999
Los Angeles	1
Merida	1
Miami	1
Minneapolis	1
Oakland	1
Salt Lake City	1
San Jose Del Cabo	1
San Juan	1
Seattle	1
Tapachula	1
Washington DC	1

Table 3-4 LPV and LPV 200 Outage Rate (Per 150 sec approach)

Location	LP Outages	LP Outage Rates	LPV Outages	LPV Outage Rates	LPV 200 Outages	LPV 200 Outage Rates
Arcata	0	0	1	0.000022	103	0.002308
Atlantic City	0	0	0	0	0	0
Grand Forks	0	0	0	0	2	0.000038
Oklahoma City	0	0	0	0	0	0
Albuquerque	0	0	0	0	0	0
Anchorage	2	0.000038	2	0.000038	4	0.000076
Atlanta	0	0	0	0	0	0
Barrow	8	0.000151	9	0.000170	232	0.004469
Bethel	0	0	1	0.000019	5	0.000094
Billings	0	0	0	0	0	0
Boston	1	0.000019	1	0.000019	1	0.000019
Chicago	0	0	0	0	0	0
Cleveland	0	0	0	0	0	0
Cold Bay	2	0.000038	3	0.000057	434	0.008685
Dallas	0	0	0	0	0	0
Denver	0	0	0	0	0	0
Fairbanks	2	0.000038	4	0.000076	7	0.000132
Gander	2	0.000038	7	0.000132	519	0.010761
Goose Bay	1	0.000019	2	0.000038	22	0.000417
Houston	0	0	0	0	0	0
Iqaluit	35	0.000667	85	0.001631	774	0.016429
Jacksonville	0	0	0	0	0	0
Juneau	1	0.000019	2	0.000038	5	0.000095
Kansas City	0	0	0	0	0	0
Kotzebue	4	0.000076	5	0.000095	41	0.000779
Los Angeles	0	0	0	0	2	0.000038
Memphis	0	0	0	0	0	0
Merida	0	0	76	0.001441	99	0.001881
Mexico City	9	0.000170	18	0.000340	580	0.011740
Miami	0	0	0	0	11	0.000208
Minneapolis	0	0	0	0	0	0
New York	0	0	0	0	0	0
Oakland	0	0	0	0	101	0.001927
Puerto Vallarta	12	0.000227	159	0.003078	489	0.010164
Salt Lake City	0	0	0	0	0	0
San Jose Del Cabo	4	0.000076	117	0.002223	474	0.009500
Seattle	0	0	0	0	0	0
Washington DC	0	0	1	0.000019	3	0.000057
Winnipeg	0	0	0	0	1	0.000019

Table 3-5 NPA Outage Rates (Excluding FD/FDE)

Location	NPA Outages	NPA Outage Rate
Albuquerque	0	0
Anchorage	0	0
Atlanta	0	0
Barrow	1	0.000019
Bethel	0	0
Billings	0	0
Boston	0	0
Cleveland	0	0
Cold Bay	0	0
Fairbanks	0	0
Gander	0	0
Honolulu	0	0
Houston	0	0
Iqaluit	0	0
Juneau	0	0
Kansas City	0	0
Kotzebue	1	0.00002
Los Angeles	0	0
Merida	0	0
Miami	0	0
Minneapolis	0	0
Oakland	0	0
Salt Lake City	0	0
San Jose Del Cabo	0	0
San Juan	0	0
Seattle	0	0
Tapachula	0	0
Washington DC	0	0

Figure 3-1 LPV Instantaneous Availability

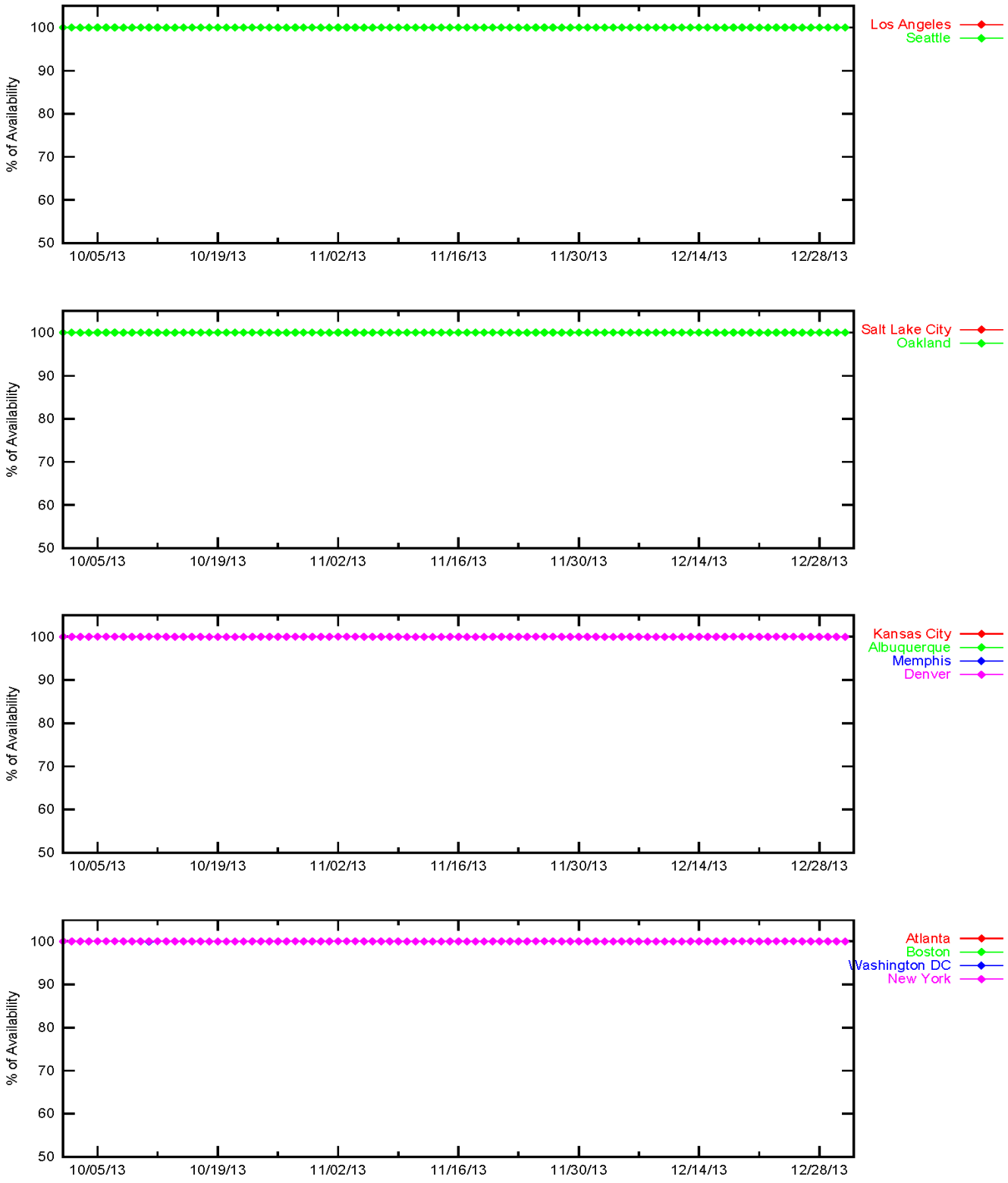


Figure 3-2 LPV Instantaneous Availability

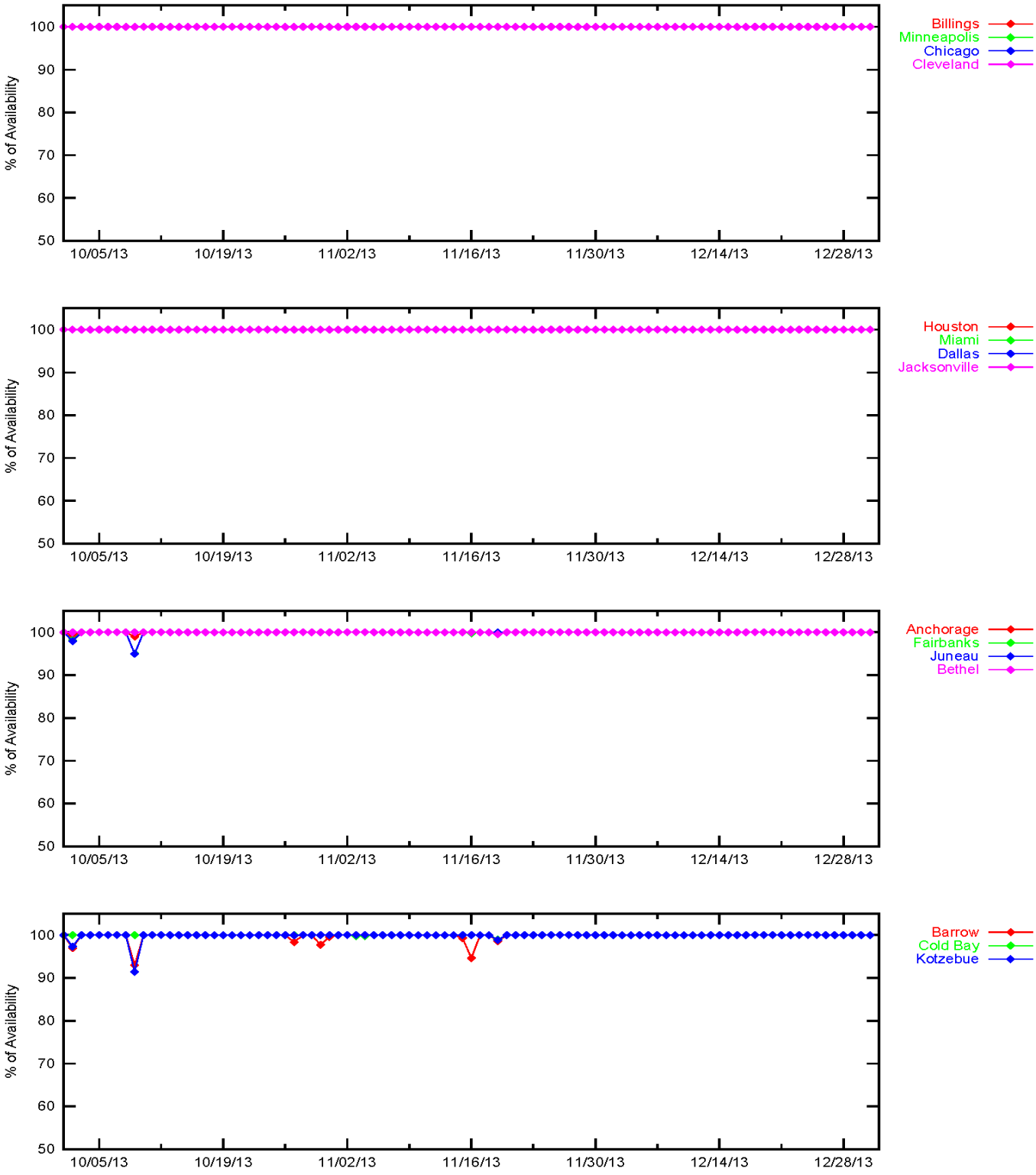


Figure 3-3 LPV Instantaneous Availability

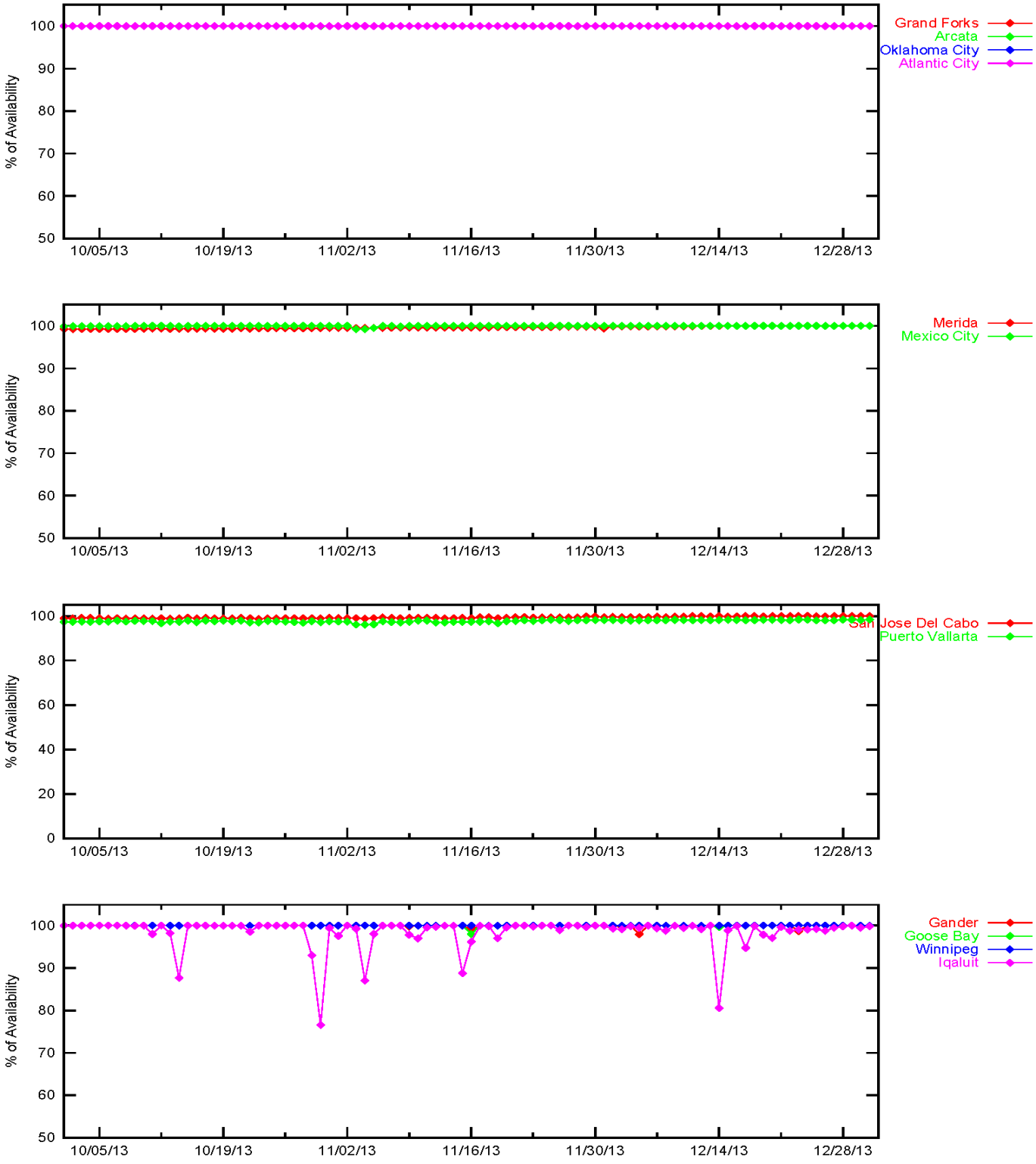


Figure 3-4 LPV 200 Instantaneous Availability

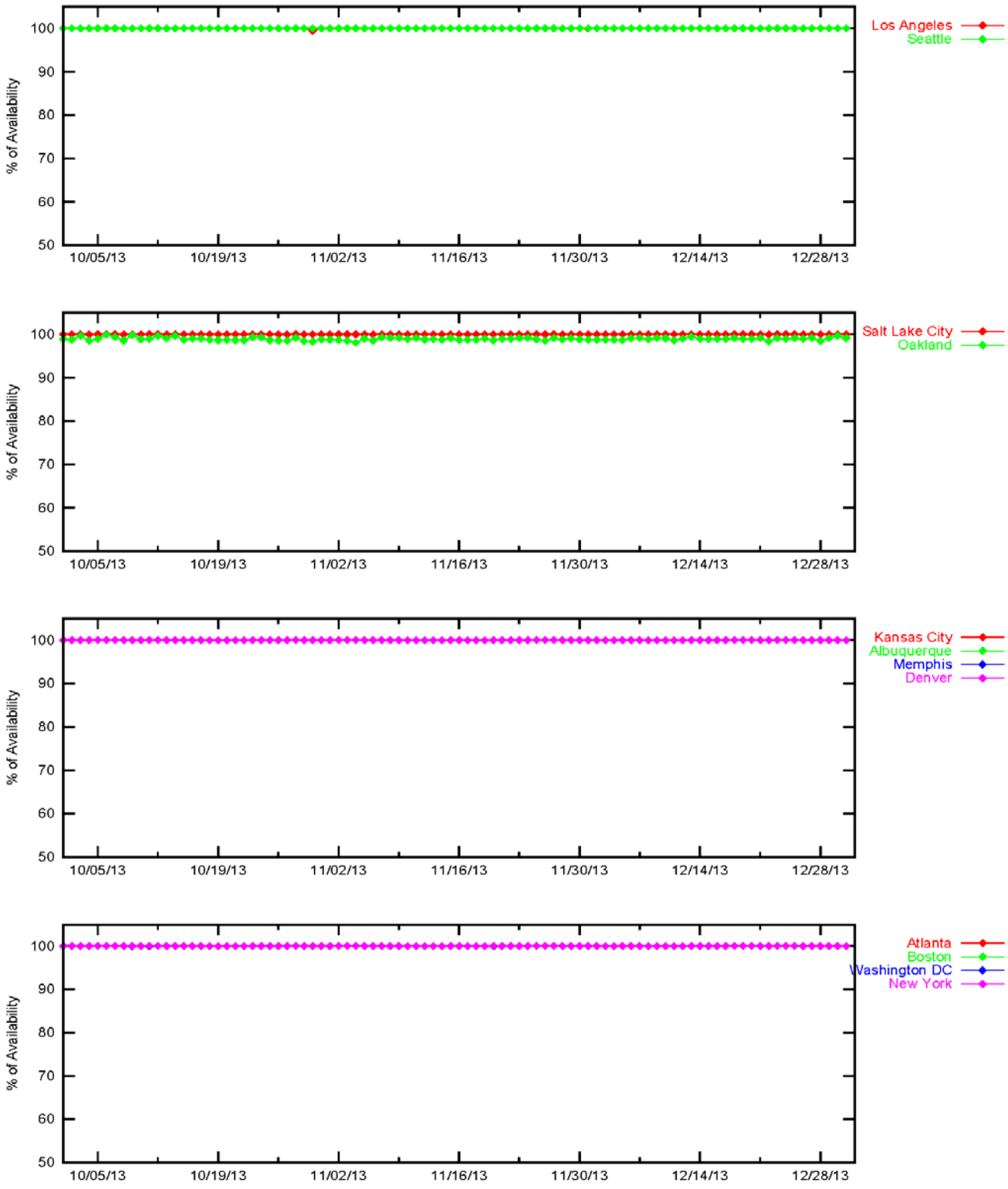


Figure 3-5 LPV 200 Instantaneous Availability

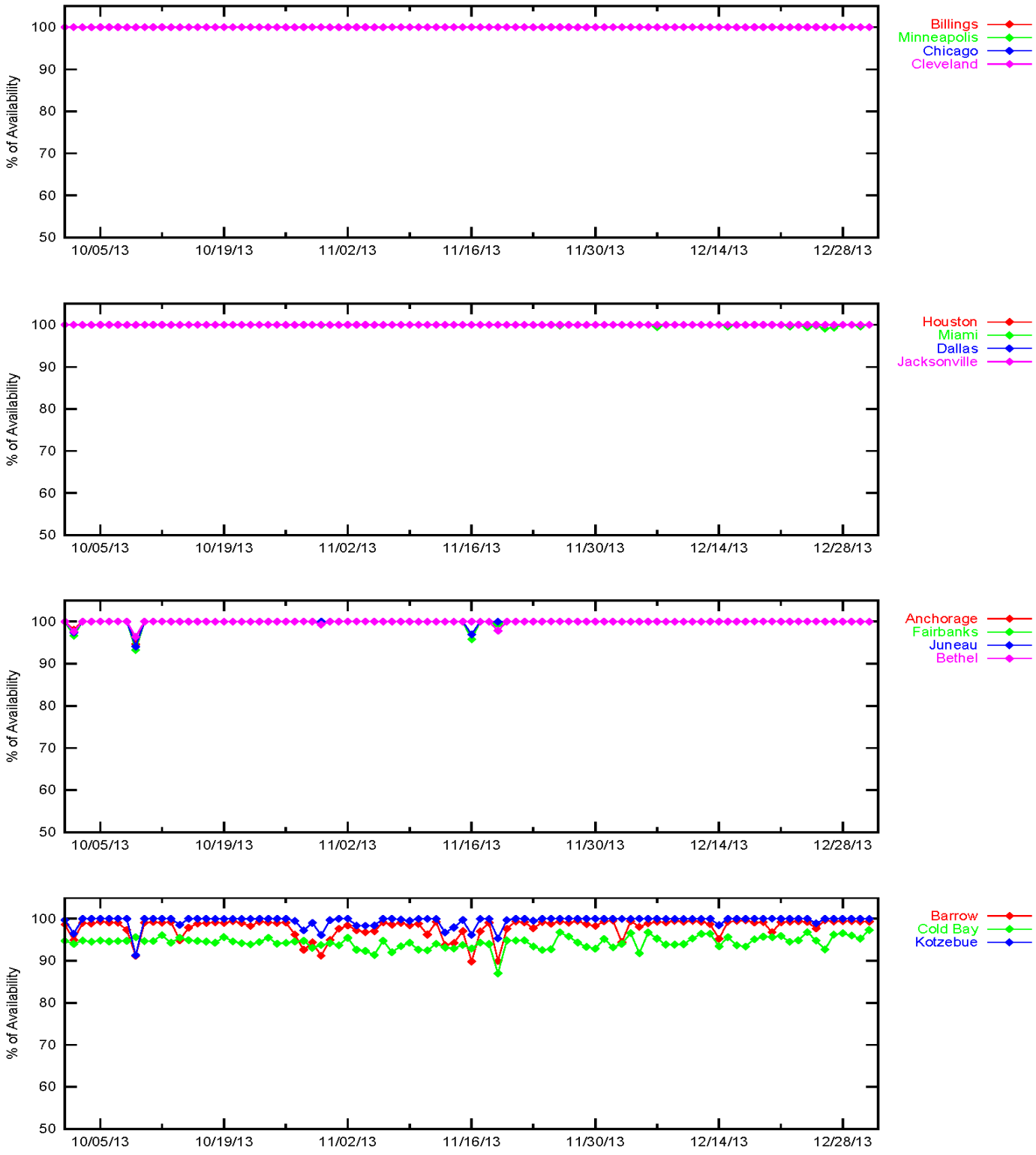


Figure 3-6 LPV 200 Instantaneous Availability

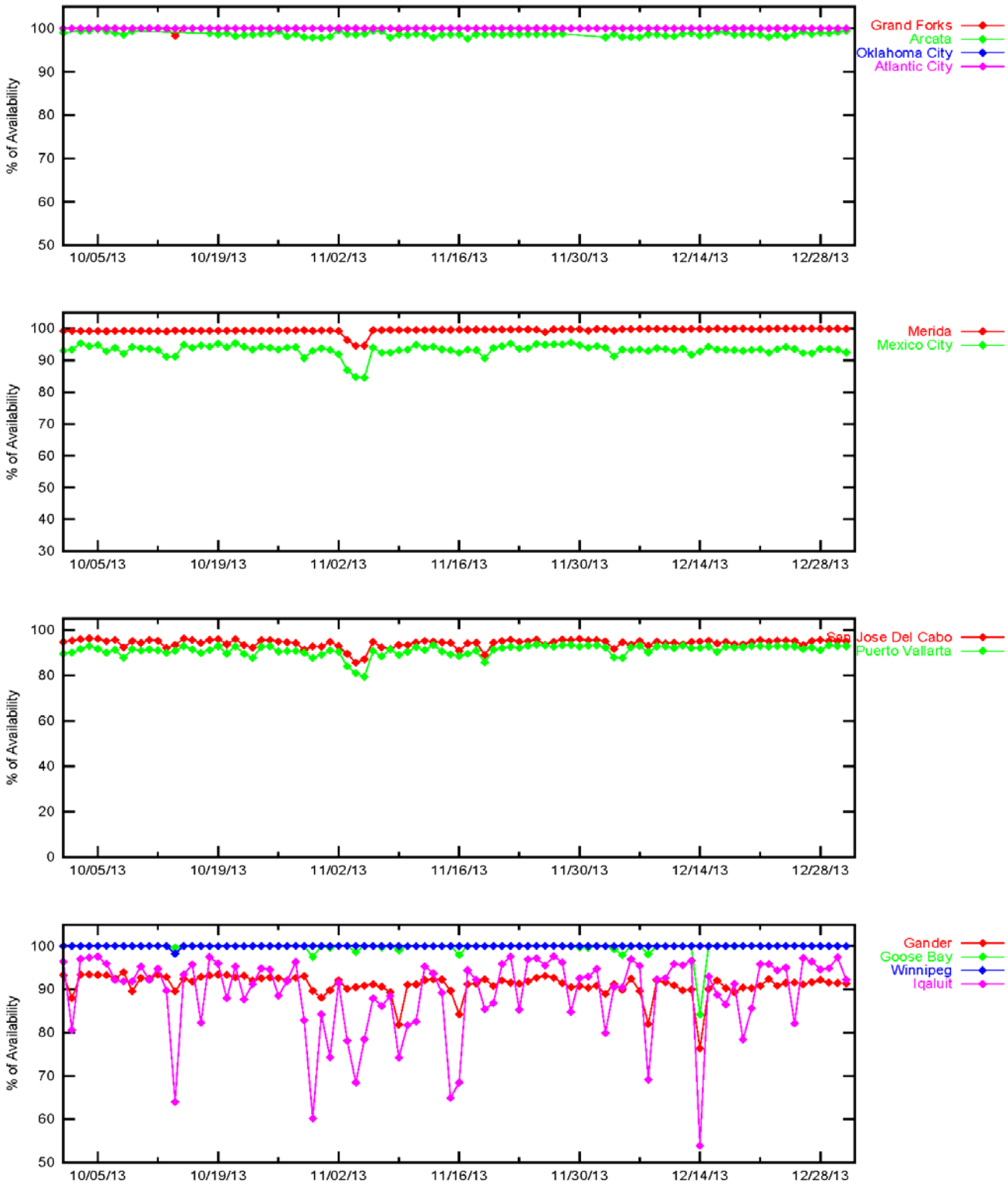


Figure 3-7 LPV Outages

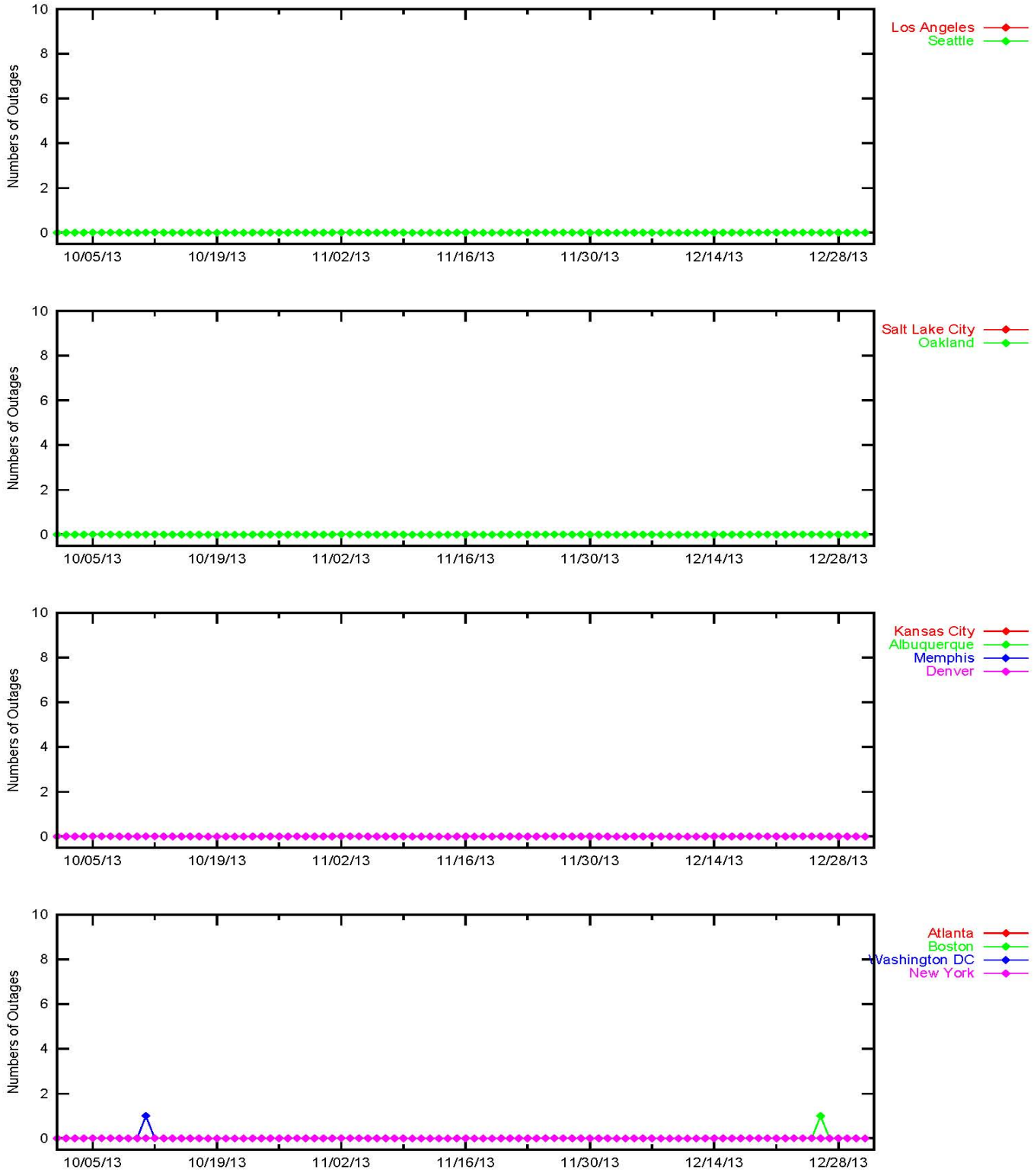


Figure 3-8 LPV Outages

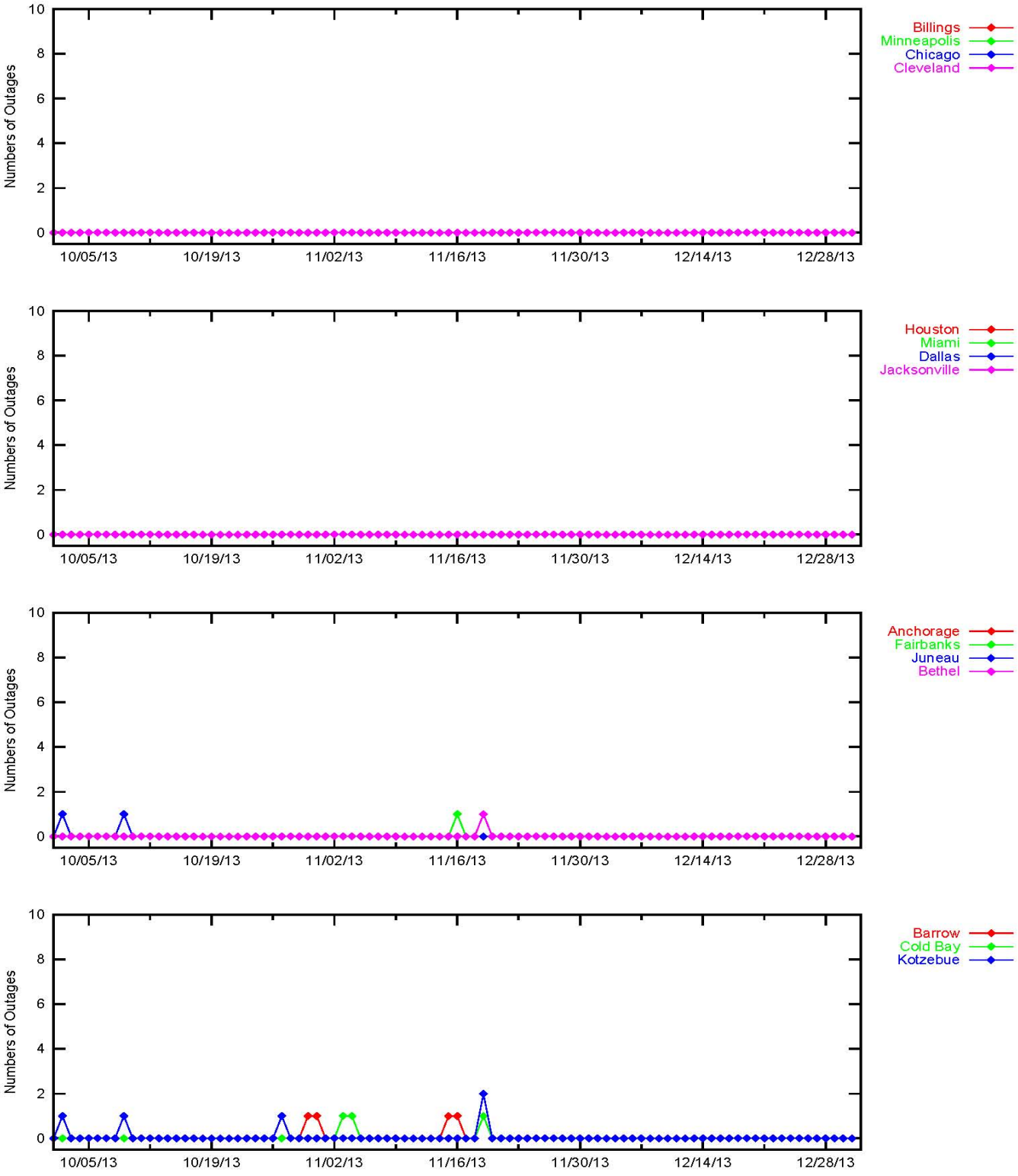


Figure 3-9 LPV Outages

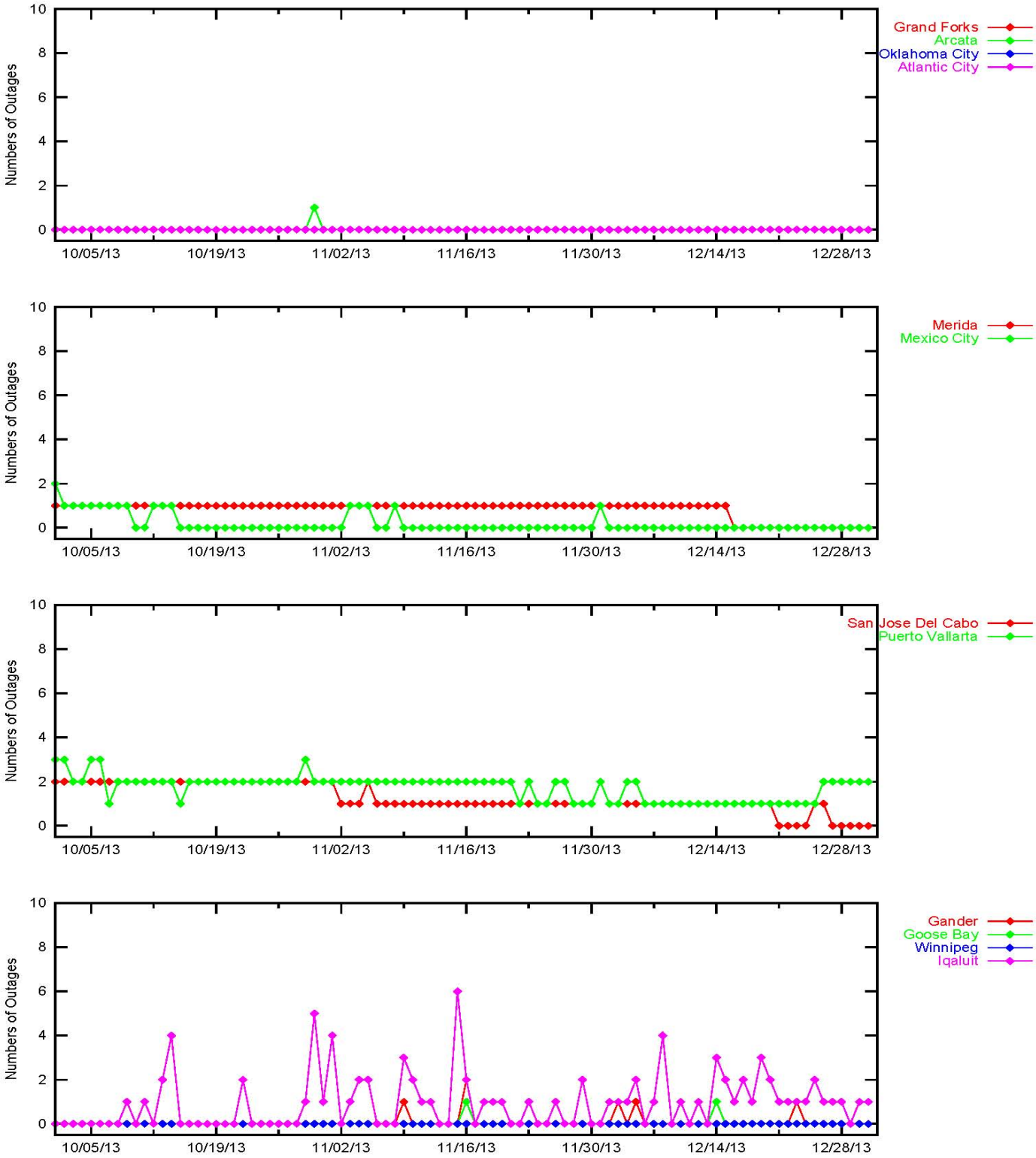


Figure 3-10 LPV 200 Outages

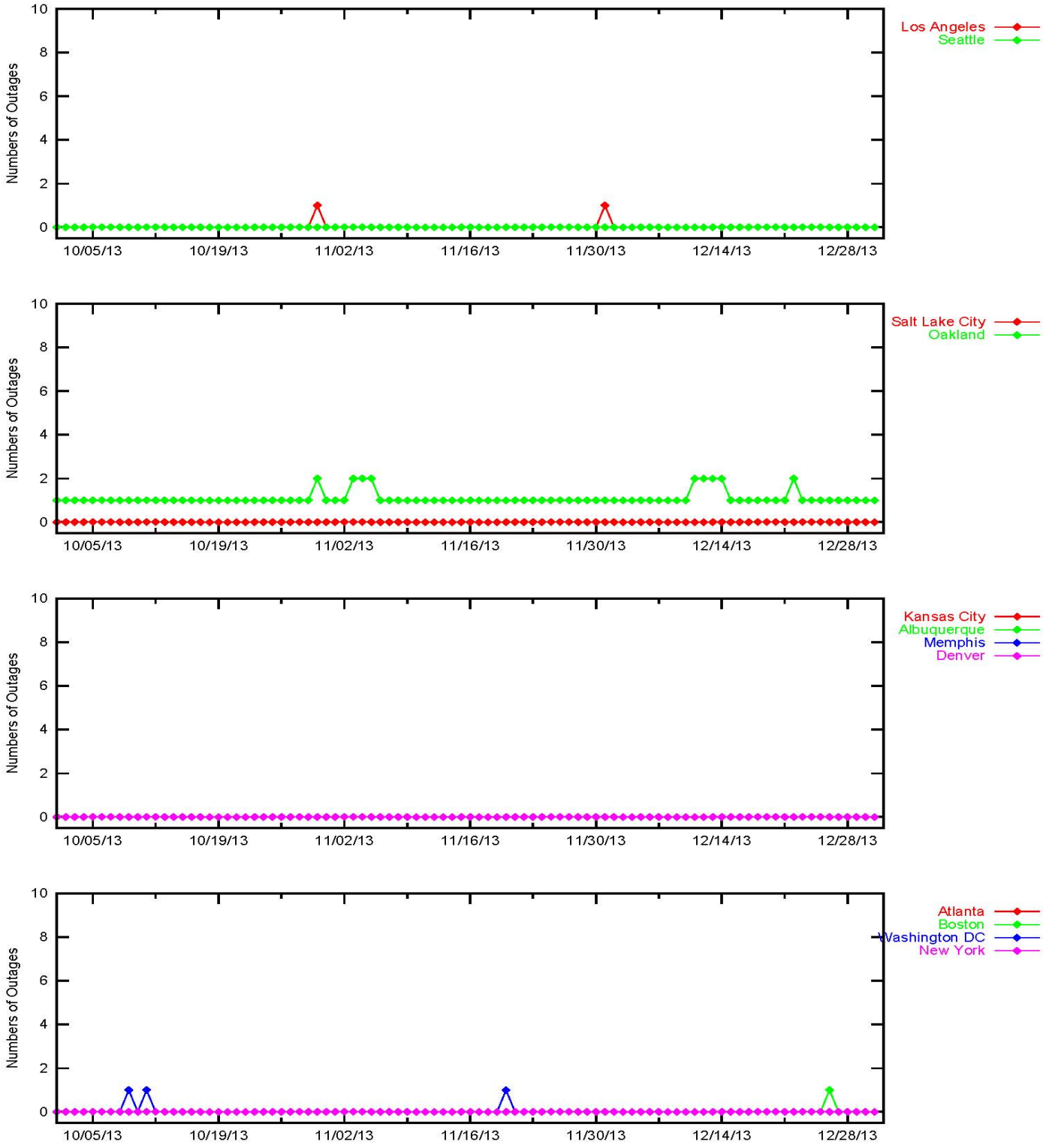


Figure 3-11 LPV 200 Outages

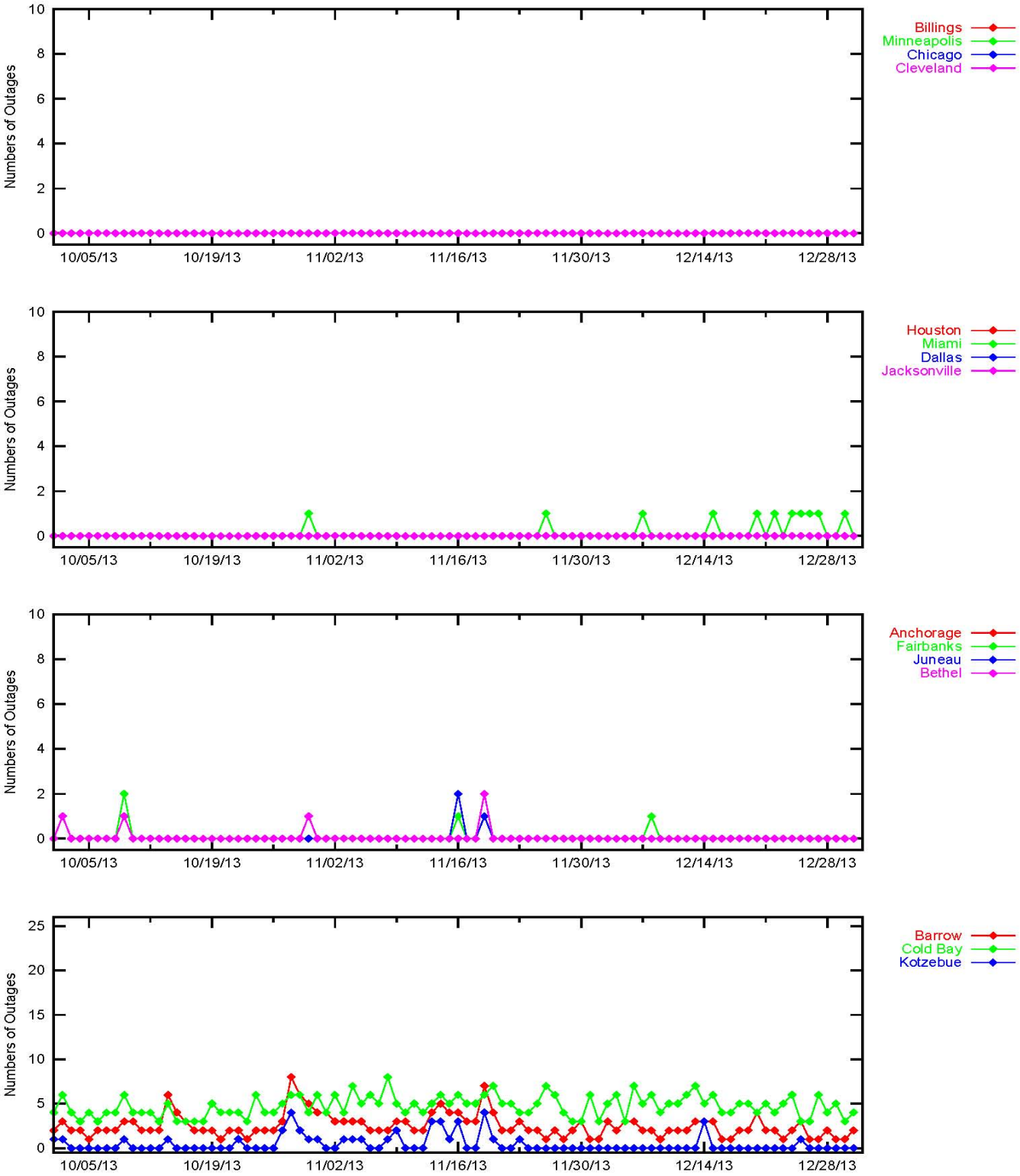
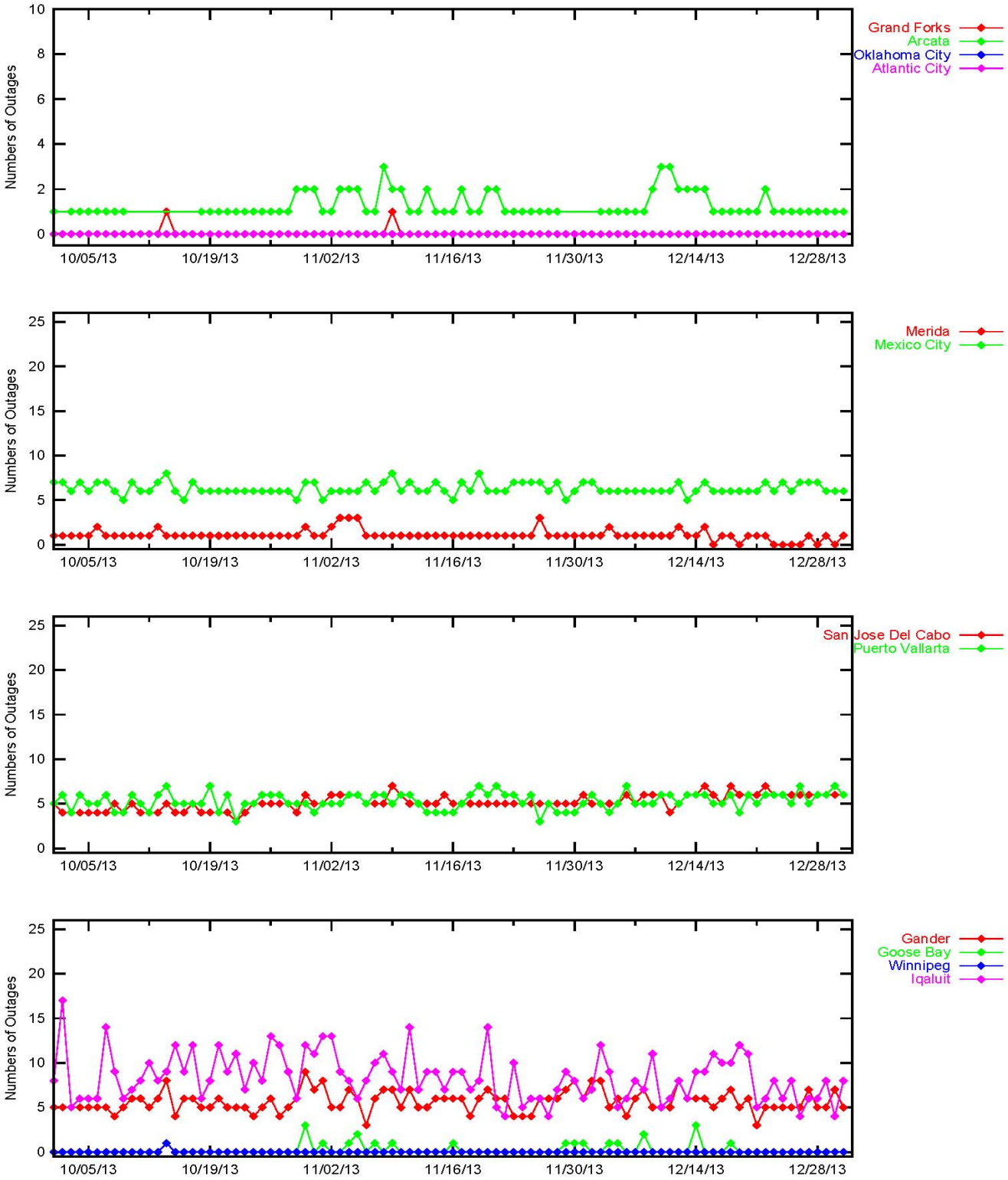


Figure 3-12 LPV 200 Outages



4.0 COVERAGE

The WAAS coverage area evaluation estimates the percent of service volume where WAAS provided service for the operational service levels defined in Table 1-1. The WAAS message and the GPS/GEO satellite status are used to determine WAAS availability across North America. For PA coverage, protection levels were calculated at 30-sec intervals at one degree spacing over the PA service volume, while NPA coverage were calculated at 30-sec intervals at five degree spacing over the NPA service volume.

Daily analysis for PA was conducted for LP, LPV and LPV 200 service levels. The coverage plots provide 100, 99.9, 99, 98 and 95% availability contours. Figure 4-1 shows the rollup LP North America coverage. Figure 4-2 shows the rollup LPV North America coverage. Figure 4-3 shows the rollup LPV 200 North America coverage. Figure 4-6 shows the daily LPV and LPV 200 CONUS coverage, and Figure 4-7 shows the daily LPV Alaska coverage at 99% availability and ionosphere Kp index values for this quarter. Figure 4-8 shows the daily LPV and LPV 200 Canada coverage at 99% availability and ionosphere Kp index values for this quarter. Please see Appendix B for coverage plots of 98% LP and LPV availability contour, and 99% LPV 200 availability contour. Kp quantifies the disturbance in the earth's magnetic field and is an indicator of solar storms causing geomagnetic disturbances that can cause the ionosphere to become unpredictable. WAAS increases GIVE values making PA service unavailable when WAAS detects that the ionosphere is disturbed.

Daily analysis for NPA was conducted for RNP 0.1 and RNP 0.3 service levels based on a 100% availability requirement. RNP 0.1 service is asserted to be available when HPL is less than 185 meters and RNP 0.3 service is asserted to be available when HPL is less than 556 meters. The NPA coverage plots provide 100, 99.9 and 99% availability contours. Figure 4-4 shows the rollup RNP 0.1 coverage and Figure 4-5 shows the rollup RNP 0.3 coverage for the quarter. Figure 4-9 shows the daily RNP coverage at 100% availability and ionosphere Kp index values for this quarter.

The coverage decreases for this quarter are mostly due to GUS switchovers, satellite outages, carrier phase anomalies, geomagnetic activity, and elevated UDRE and GIVE values. Please refer to Table 1-5 for all the events that affected coverage.

Manual GUS switchover on CRW GEO (PRN-135) on October 27 and November 13 elevated UDRE values and slightly reduced coverage in Alaska and Canada. Manual GUS switchover on CRW GEO (PRN-135) on November 19 elevated UDRE values and slightly reduced coverage in CONUS, Alaska and Canada. RNP 0.1 and RNP 0.3 coverage were slightly affected on October 27 and November 19.

A brief carrier phase anomaly on PRN-4 on October 30 and December 22 caused WAAS to issue a SV alert setting on PRN-4 to “Not Monitored”, resulting in a minor reduction in LPV-200 CONUS coverage. A brief carrier phase anomaly on PRN-21 on November 8 and on PRN-4 on December 18 caused WAAS to issue a SV alert setting on PRN-21 and PRN-4 respectively to “Not Monitored”, resulting in a slight reduction in LPV-200 Canada coverage. A brief carrier phase anomaly on PRN-138 December 23 caused WAAS to issue a SV alert setting on PRN-138 to “Not Monitored”, resulting in a minor reduction in Canada coverage.

Beginning on December 4, numerous SV alerts on PRN-1 caused slightly reduced coverage in CONUS. The alerts occurred on multiple days and continued beyond the span of time covered in this report; see DR 117 Excessive Not Monitored Alarms on PRN 1 SVN 63.

Planned maintenance on PRN-26 on October 26 caused coverage reduction in Canada. Planned maintenance on PRN-2 on November 3 – 5 affected CONUS, Alaska and Canada coverage; see DR 118 PRN2 Anomaly. Planned maintenance on PRN-29 on November 19 resulted in a minor reduction in CONUS, Alaska and Canada coverage. Planned maintenance on PRN-1 on November 25 – 26 affected CONUS coverage; see DR 116 Fewer Reference Stations Than Expected Tracked PRN 1 Following Satellite Maintenance. Planned maintenance on PRN-25 on December 5 caused coverage drop in Canada.

Geomagnetic activity on October 2, October 8 -9, October 14-15, October 30 -31, November 9-11, November 15-16, and December 14 elevated GIVE values and affected coverage in Alaska and Canada. Geomagnetic activity on October 14 and October 30-31 elevated GIVE values and caused slight degradation in coverage CONUS and

Alaska. Geomagnetic activity on October 17, October 20, October 29, November 4, December 8, and December 19 elevated GIVE values and caused coverage drop in Canada.

Communication outages at Iqaluit on October 11 and December 2 increased GIVE values and caused coverage reduction in Canada. Communication outages at Barrow on December 15 increased GIVE values and affected coverage in Alaska. Communication outages at Goose Bay on December 17 and December 20 increased GIVE values and caused coverage drop in Canada.

Radio frequency interference (RFI) caused localized loss of LPV/LPV200 coverage at Washington, DC on October 9, October 11, November 20, and at Boston on December 26, but had no effect on WAAS service. Radio frequency interference (RFI) at Iqaluit on October 13 caused IGPs in Northern Canada to be set to "Not Monitored", resulting in a loss of coverage in Canada.

Figure 4-1 LP North America Coverage for the Quarter

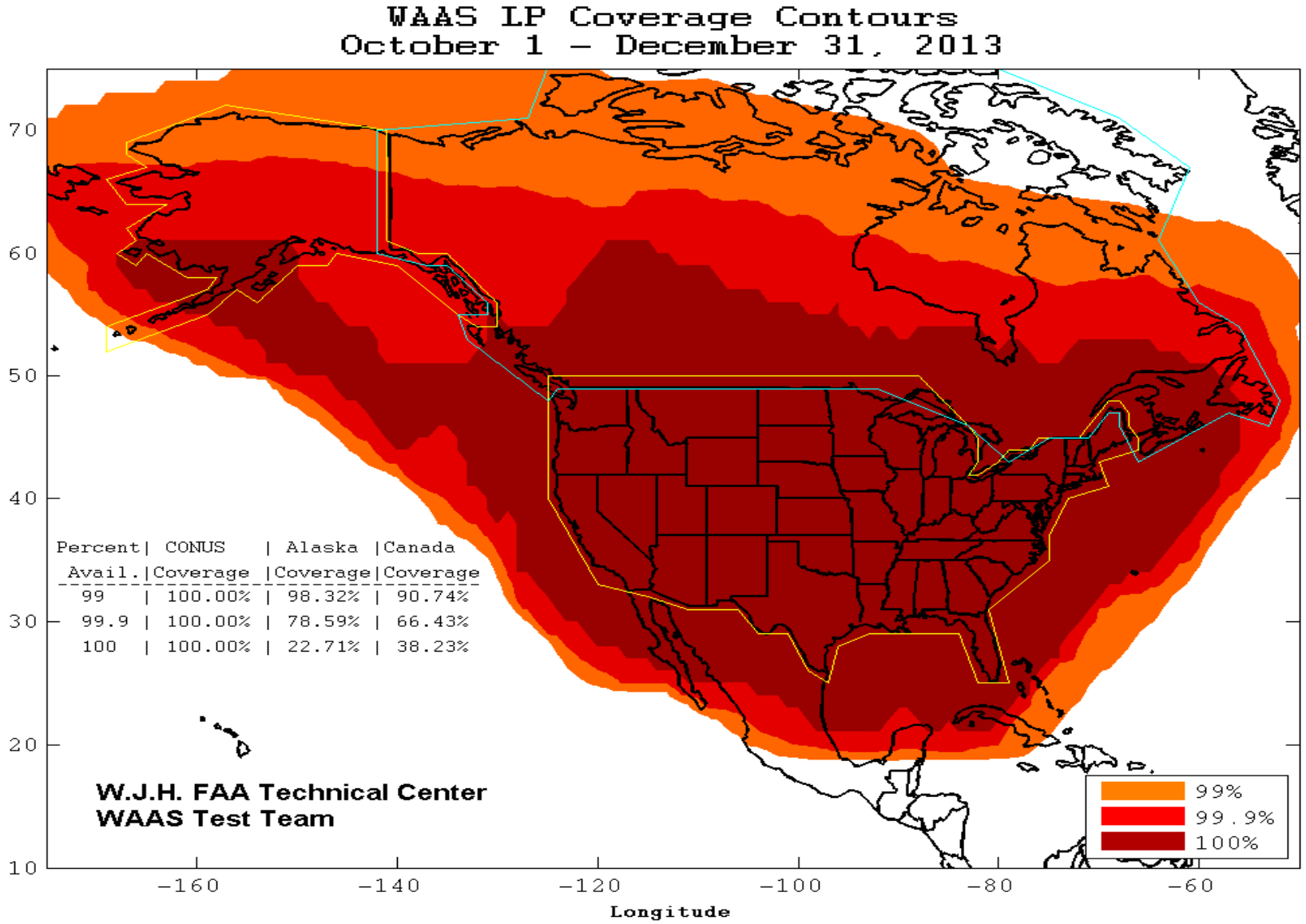


Figure 4-2 LPV North America Coverage for the Quarter

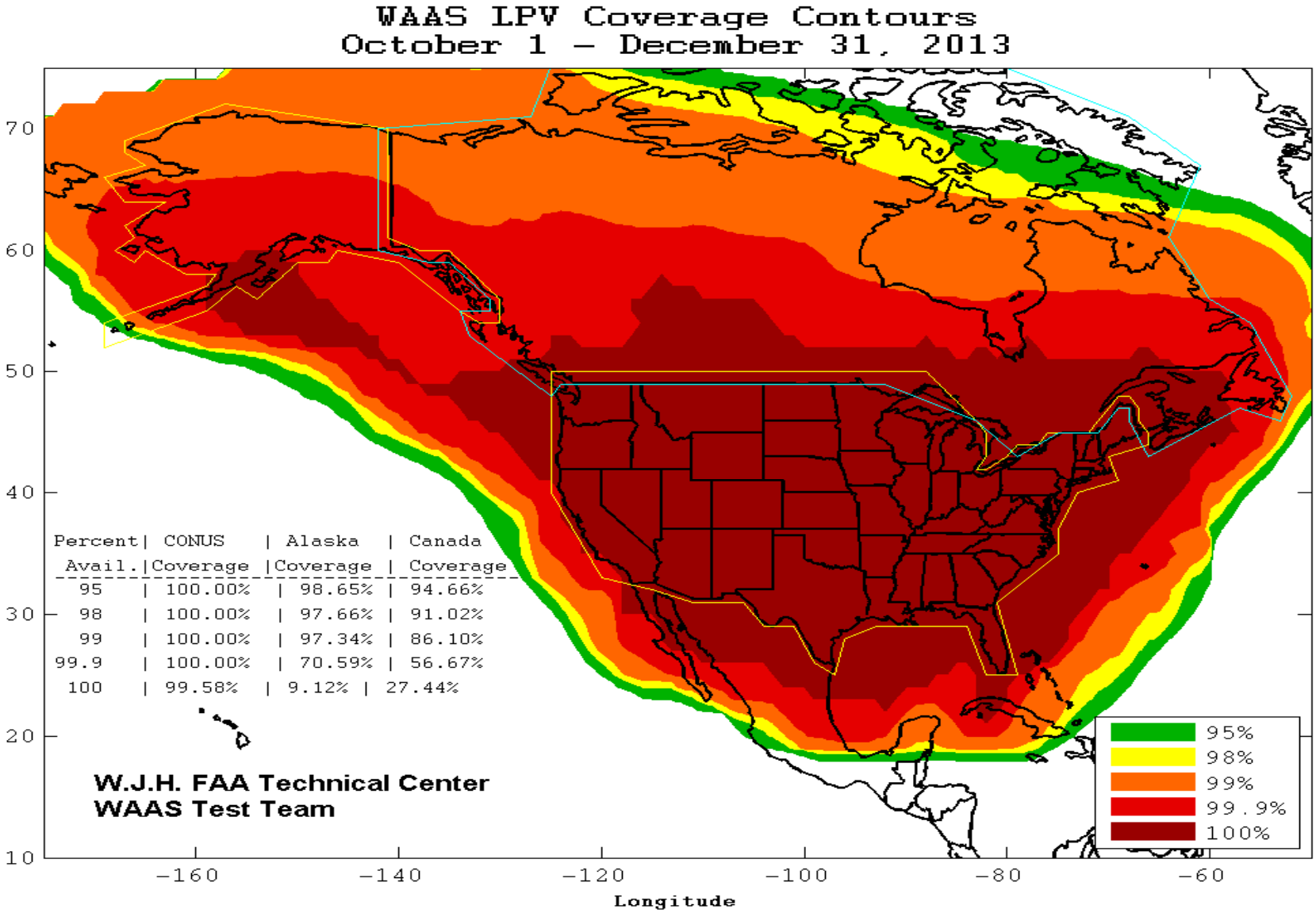


Figure 4-3 LPV 200 North America Coverage for the Quarter

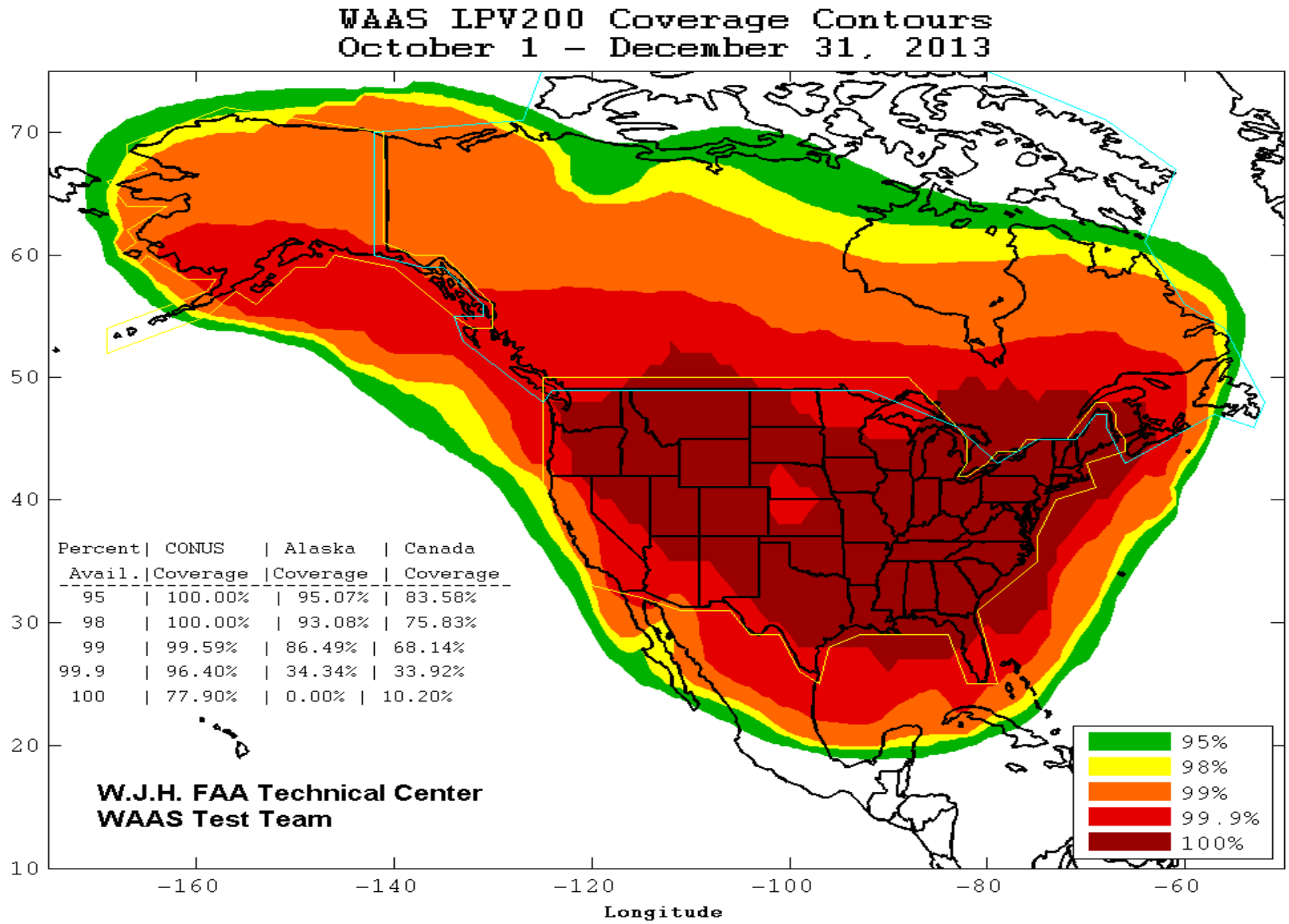


Figure 4-4 RNP 0.1 Coverage for the Quarter

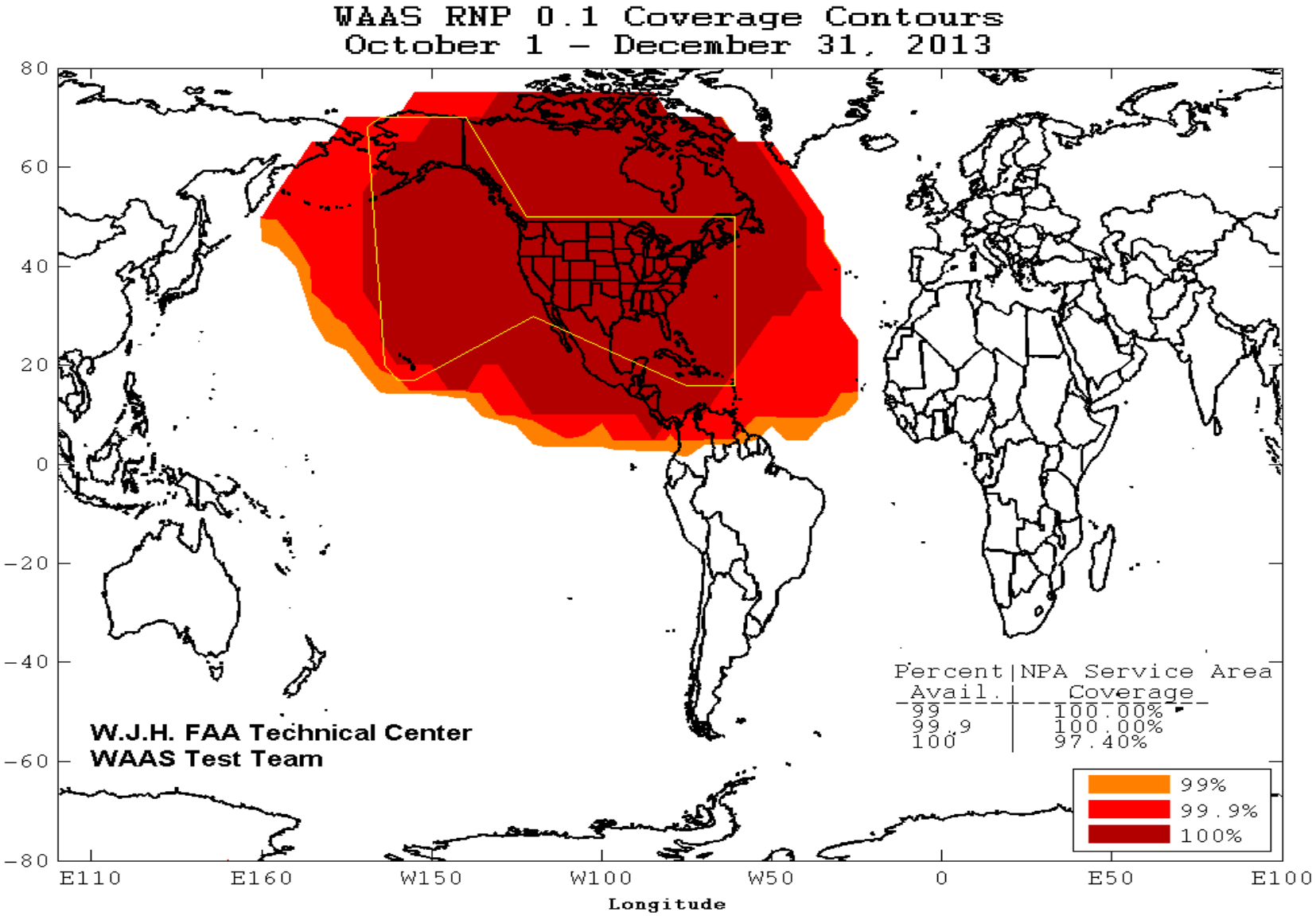


Figure 4-5 RNP 0.3 Coverage for the Quarter

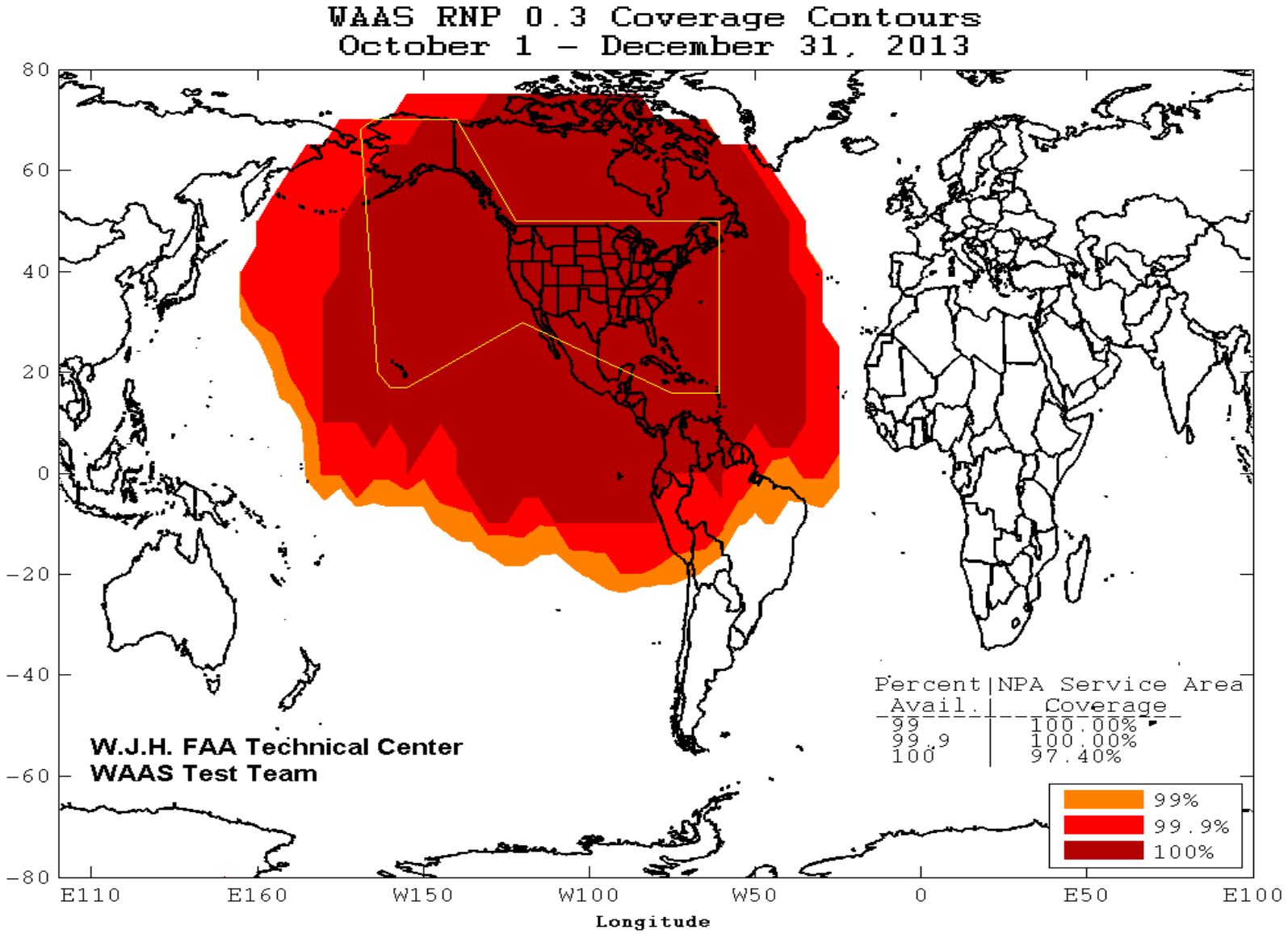


Figure 4-6 Daily LPV and LPV 200 CONUS Coverage

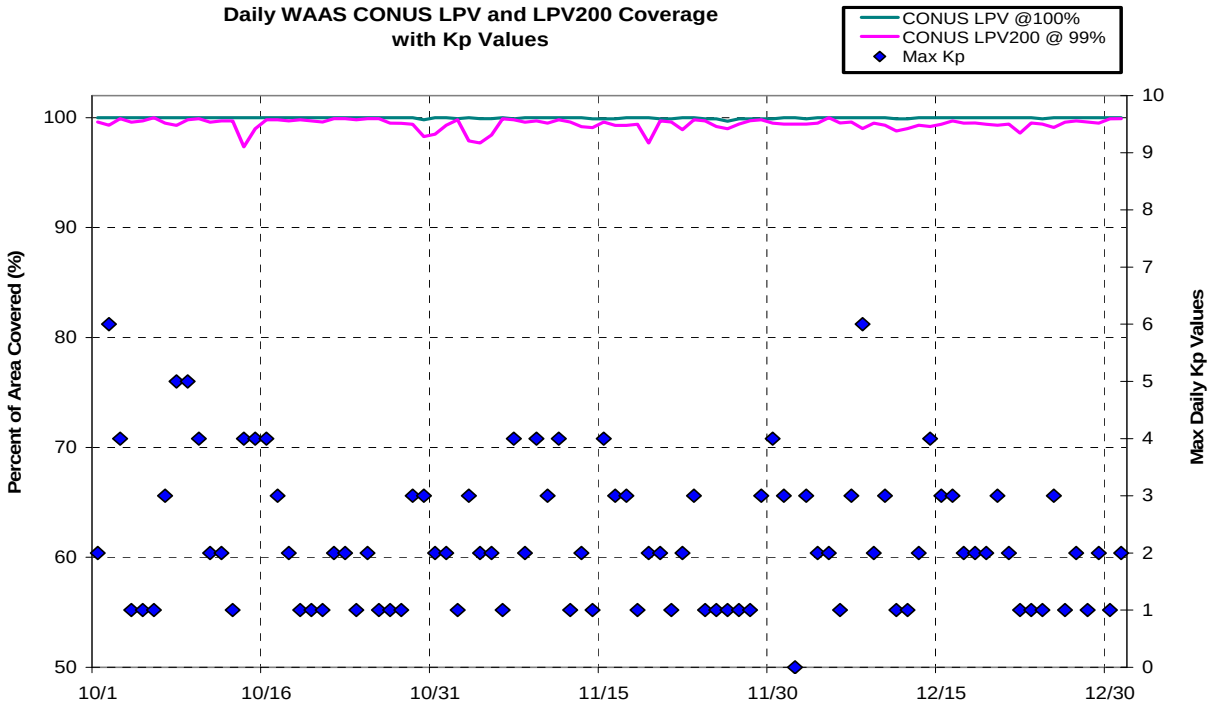


Figure 4-7 Daily LPV and LPV 200 Alaska Coverage

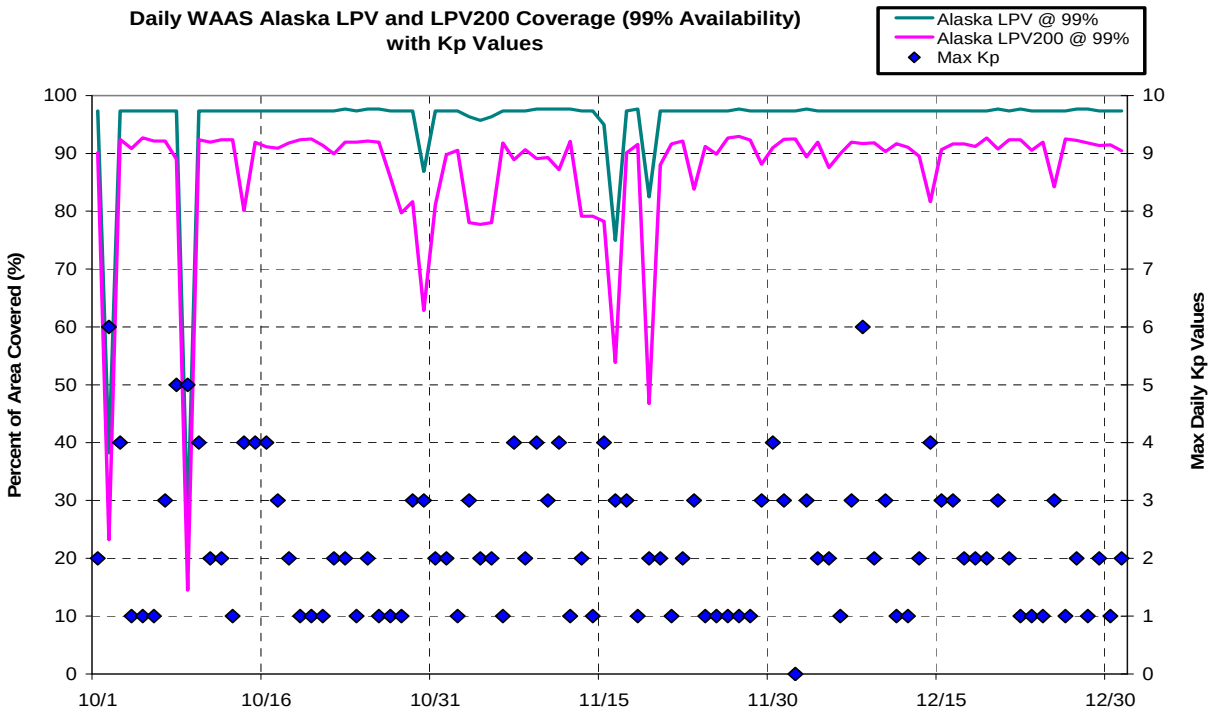


Figure 4-8 Daily LPV and LPV 200 Canada Coverage

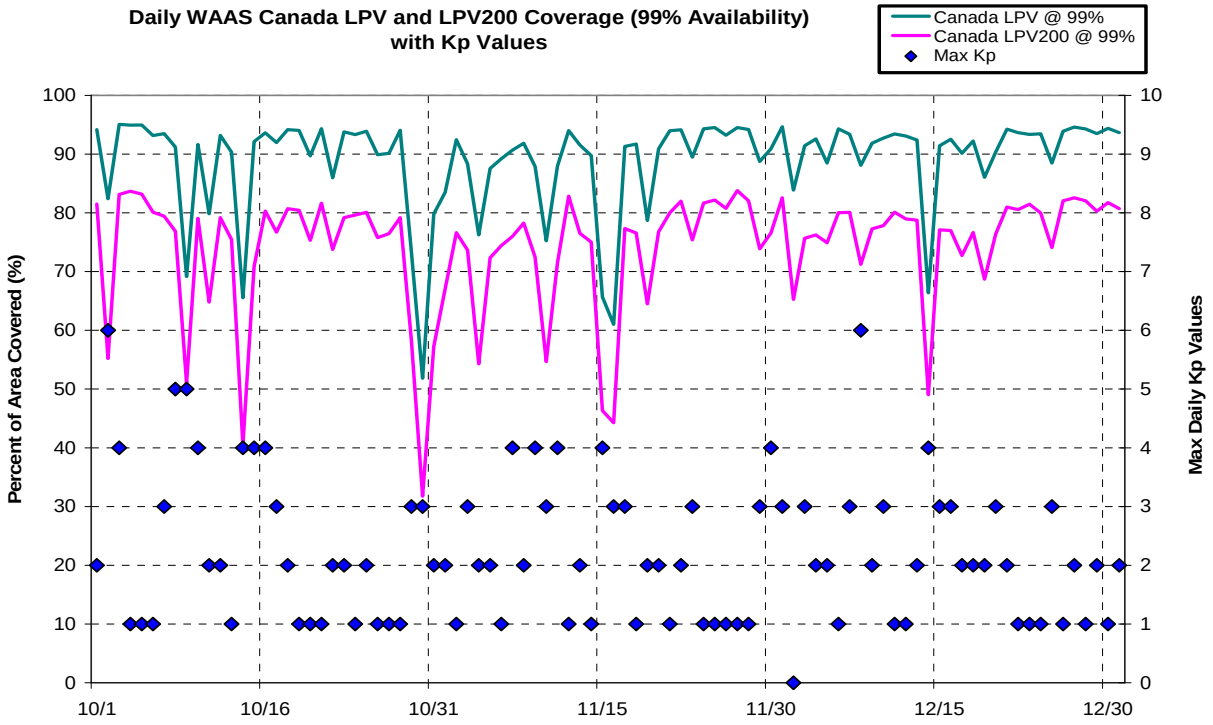
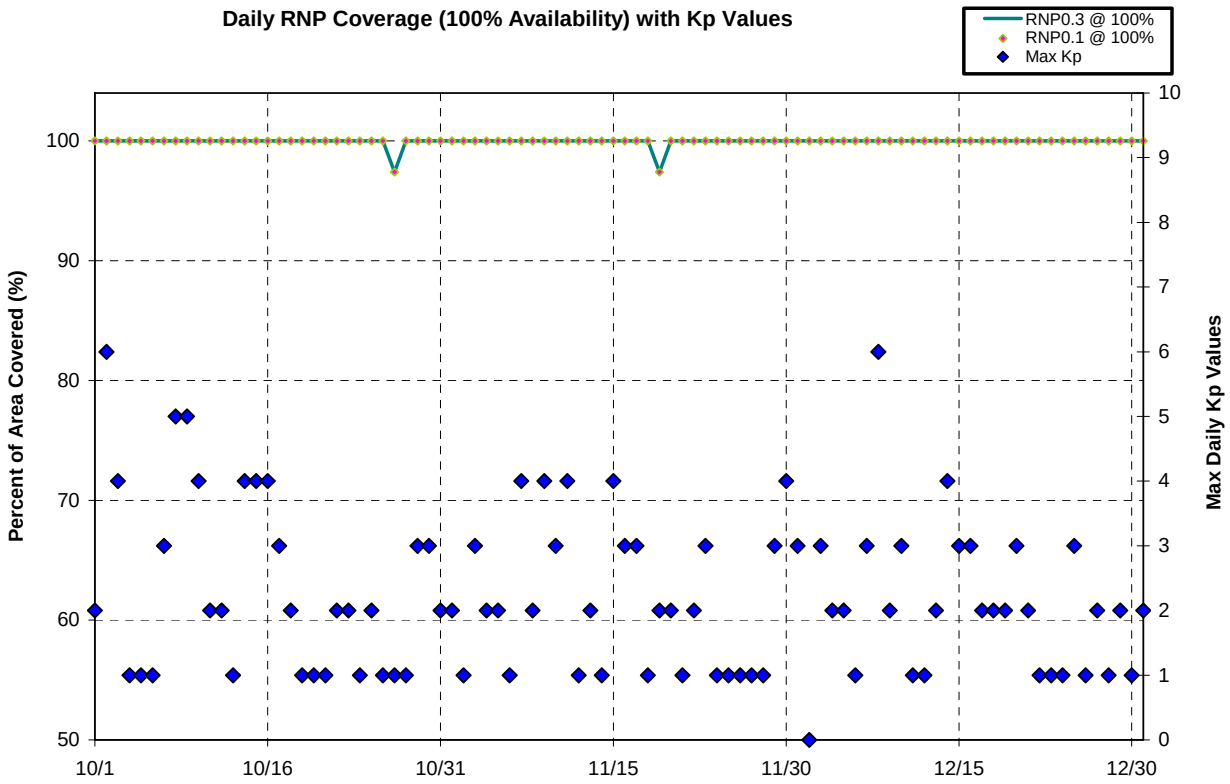


Figure 4-9 Daily RNP Coverage



5.0 INTEGRITY

5.1 HMI Analysis

Analysis of integrity includes the identification and evaluation of HMI (hazardously misleading information), as well as the generation of a safety index to illustrate the margin of safety that WAAS protection levels are providing. The safety index is a metric that shows how well the protection levels are bounding the maximum observed error when LPV service is available. The process for determining this index involves dividing the protection limit observed by the maximum observed error. An observed safety index of greater than one indicates safe bounding of the greatest observed error, less than one indicates that the maximum error was not bounded, and a result equal to one means that the error was equal to the protection level. An HMI occurs if the position error exceeds the protection level in the vertical or horizontal dimensions at any time and 6.2 seconds or more passes before this event is corrected by WAAS.

Table 5-1 lists the safety index and the number of HMI events. For this evaluation period, the lowest safety margin index is 3.12 at Fairbanks. There was no HMI event. Since WAAS was made available to the public in August 2000 there has not been an HMI event. WAAS was commissioned by the FAA for safety of life services in July 2003.

Table 5-1 Safety Margin Index and HMI Statistics

Location	Safety Index		
	Horizontal	Vertical	Number of HMIs
Arcata	4.87	7.81	0
Atlantic City	3.65	4.98	0
Grand Forks	6.70	7.56	0
Oklahoma City	3.44	5.03	0
Albuquerque	7.64	5.39	0
Anchorage	6.65	10.09	0
Atlanta	5.35	5.89	0
Barrow	8.09	4.93	0
Bethel	9.31	9.55	0
Billings	4.37	7.43	0
Boston	8.12	4.80	0
Chicago	4.83	6.79	0
Cleveland	5.51	7.26	0
Cold Bay	8.13	8.32	0
Dallas	5.12	6.75	0
Denver	6.46	4.23	0
Fairbanks	3.12	7.60	0
Gander	6.49	10.78	0
Goose Bay	6.17	8.51	0
Houston	5.82	4.21	0
Iqaluit	8.33	7.38	0
Jacksonville	5.07	5.79	0
Juneau	6.67	7.67	0
Kansas City	5.24	7.91	0
Kotzebue	6.83	6.00	0
Los Angeles	7.76	7.32	0
Memphis	5.36	7.31	0
Merida	8.76	6.56	0
Mexico City	5.46	9.49	0
Miami	7.43	8.01	0
Minneapolis	5.77	5.34	0
New York	6.01	6.49	0
Oakland	6.32	12.97	0
Puerto Vallarta	5.28	11.02	0
Salt Lake City	5.91	6.18	0
San Jose Del Cabo	6.72	10.32	0
Seattle	4.82	8.10	0
Washington DC	6.42	6.75	0
Winnipeg	5.10	7.19	0

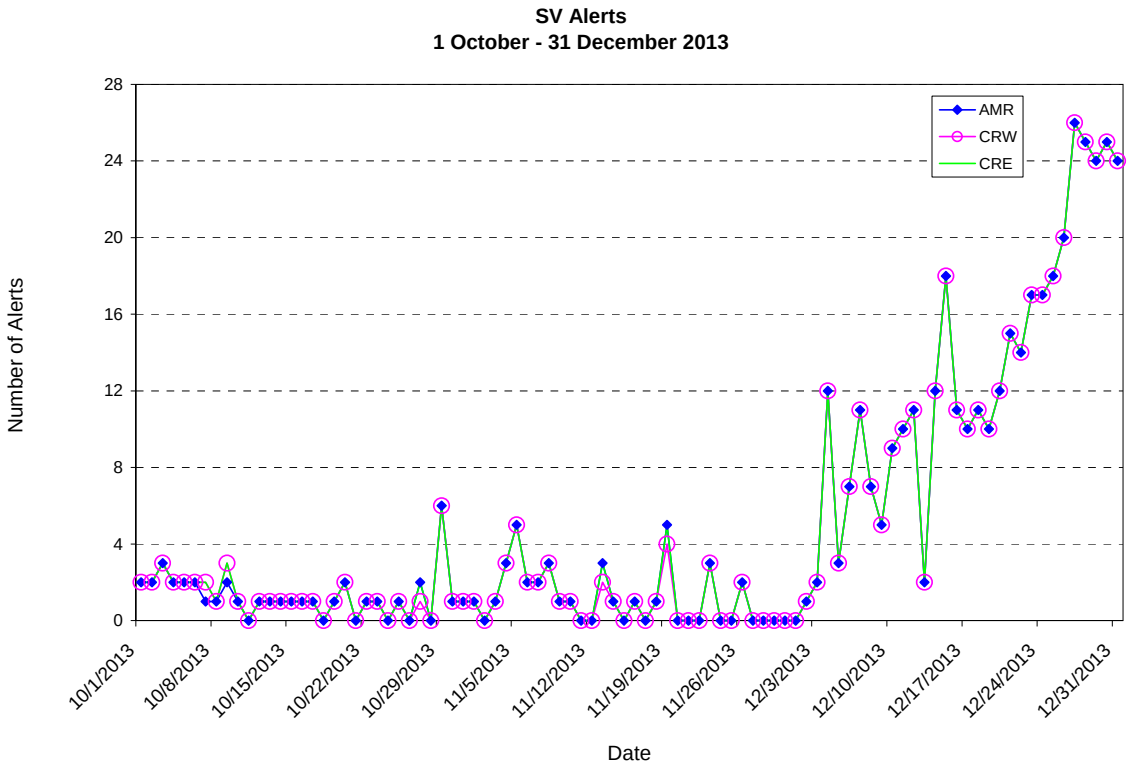
5.2 Broadcast Alerts

The WAAS transmits alert messages to protect the users if the active WAAS corrections are no longer bound by the UDREs. Alerts increase the User Differential Range Error (UDRE) for one or more PRNs, which can reduce the weighting of the satellite in the navigation solution, or completely exclude the satellite from the navigation solution. An increase in UDRE's after an alert effectively increases the user protection levels (HPL and VPL), which affects the availability. Additionally, if an alert message sequence lasts for more than 12 seconds, WAAS fast corrections can time out, causing a loss of continuity. Table 5-2 shows the total number of alerts and the average number of alerts per day. Figure 5-1 shows the number of SV alerts that occurred daily during the reporting period. Often the number of alerts on one GEO is the same as the number of alerts on the other GEO. Therefore, lines tend to overlap in most points on this plot.

Table 5-2 WAAS SV Alert

	Number of Alerts			Average Alerts Per Day		
Message Type	**AMR**	**CRW**	**CRE**	**AMR**	**CRW**	**CRE**
2	361	361	361	3.9239	3.9239	3.9239
3	22	22	22	0.2391	0.2391	0.2391
4	81	80	83	0.8804	0.8696	0.9022
5	0	0	0	0.0000	0.0000	0.0000
6	0	0	0	0.0000	0.0000	0.0000
24	0	0	0	0.0000	0.0000	0.0000
26	0	0	0	0.0000	0.0000	0.0000
Total Alerts	464	463	466	5.0435	5.0326	5.0652
Days in Service	92	92	92			

Figure 5-1 SV Daily Alert Trend



5.3 Availability of WAAS Messages (CRE, CRW, and AMR)

For an accurate and current user position to be calculated, the content of the WAAS message must be broadcast and received within precise time specifications. This aspect of the WAAS is critical to maintaining continuity requirements. Each message type in the WAAS SIS has a specific timeout interval and an expected worst case broadcast interval. Table 5-3 lists the maximum intervals at which each message must broadcast to meet system requirements.

GUS switchovers or broadcast WAAS alerts can interrupt the normal broadcast message stream. If these events occur at a time when the maximum interval of a specific message is approaching, that message may be delayed, resulting in its late transmittal.

Late messages statistics reported during the quarter were mainly caused by GEO SIS outages, GUS switchovers and SV alerts except message type 7 and 10. Occasionally, message type 7 and 10 were late and they were not caused by GEO SIS outages, GUS switchovers or SV alerts. The lateness of type 7 and type 10 messages has little or no impact on user performance and safety.

Tables 5-4 to 5-8 show fast correction, long correction, ephemeris covariance, ionosphere correction, and ionospheric mask message rates statistics broadcasted on AMR GEO. Table 5-9 to 5-13 show message rates statistics broadcasted on CRW GEO. Table 5-14 to 5-18 show message rates statistics on CRE GEO.

Table 5-3 Update Rates for WAAS Messages

Data	**Associated Message Types**	**Maximum Update Interval** (seconds)	**En Route, Terminal, NPA Timeout** (seconds)	**Precision Approach Timeout** (seconds)
WAAS in Test Mode	0	6	N/A	N/A
PRN Mask	1	60	None	None
UDREI	2-6, 24	6	18	12
Fast Corrections	2-5, 24	See Table A-8 in RTCA DO-229C	See Table A-8 in RTCA DO-229C	See Table A-8 in RTCA DO-229C
Long Term Corrections	24, 25	120	360	240
GEO Nav. Data	9	120	360	240
Fast Correction Degradation	7	120	360	240
Weighting Factors	8	120	240	240
Degradation Parameters	10	120	360	240
Ionospheric Grid Mask	18	300	None	None
Ionospheric Corrections	26	300	600	600
UTC Timing Data	12	300	None	None
Almanac Data	17	300	None	None

Table 5-4 WAAS Fast Correction and Degradation Message Rates – AMR

Message Type	On Time	Late	Max Late Length (seconds)
1	109294	4	126
2	1325728	55	13
3	1324378	304	22
4	1324608	272	12
7	100919	24	136
9	93108	0	0
10	101073	35	143
17	31753	2	306

Table 5-5 WAAS Long Correction Message Rates (Type 24 and 25) - AMR

SV	On Time	Late	Max Late Length (seconds)
1	47883	0	0
2	46075	0	0
3	48586	0	0
4	47452	0	0
5	48025	0	0
6	50022	0	0
7	47301	0	0
8	47623	0	0
9	46794	0	0
10	48757	0	0
11	49919	0	0
12	47749	0	0
13	47062	0	0
14	47398	0	0
15	47453	0	0
16	48221	0	0
17	47159	0	0
18	47058	0	0
19	49078	0	0
20	49047	0	0
21	47665	0	0
22	46542	0	0
23	47359	0	0
24	49396	0	0
25	49090	0	0
26	48296	0	0
27	49468	0	0
28	47057	0	0
29	47356	0	0
31	48244	0	0
32	47481	0	0

Table 5-6 WAAS Ephemeris Covariance Message Rates (Type 28) – AMR

SV	On Time	Late	Max Late Length (seconds)
1	39371	0	0
2	37850	0	0
3	39850	0	0
4	38952	1	209
5	39418	0	0
6	41094	1	208
7	38813	0	0
8	39117	0	0
9	38402	0	0
10	40031	3	209
11	41015	0	0
12	39237	0	0
13	38696	0	0
14	38902	0	0
15	38915	1	209
16	39602	0	0
17	38692	1	209
18	38607	0	0
19	40238	0	0
20	40267	0	0
21	39153	0	0
22	38219	0	0
23	38893	0	0
24	40578	1	203
25	40260	0	0
26	39650	0	0
27	40736	0	0
28	38649	0	0
29	38922	0	0
31	39575	0	0
32	38999	0	0
133	76290	0	0
135	76218	0	0
138	76296	0	0

Table 5-7 WAAS Ionospheric Correction Message Rates (Type 26) – AMR

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27527	13	307
0	1	27529	18	306
0	2	27536	19	307
1	0	27543	16	306
1	1	27531	20	306
1	2	27535	16	307
1	3	27546	10	311
1	4	27531	17	309
2	0	27532	12	306
2	1	27527	13	309
2	2	27559	13	306
2	3	27537	18	308
2	4	27538	17	310
3	0	27529	18	308
3	1	27544	11	307
3	2	27526	16	306
9	0	27535	16	306
9	1	27527	20	306
9	2	27537	14	307
9	3	27535	16	306
9	4	27530	13	307
9	5	27548	11	306
9	6	27535	20	307

Table 5-8 WAAS Ionospheric Mask Message Rates (Type 18) – AMR

Band	On Time	Late	Max Late Length (seconds)
0	36240	0	0
1	36252	1	472
2	36281	0	0
3	36245	0	0
9	36271	1	414

Table 5-9 WAAS Fast Correction and Degradation Message Rates – CRW

Message Type	On Time	Late	Max Late Length (seconds)
1	109228	6	131
2	1325724	56	19
3	1324376	305	19
4	1324599	274	18
7	100989	30	137
9	93108	0	0
10	100947	39	137
17	31763	3	306

Table 5-10 WAAS Long Correction Message Rates (Type 24 and 25) - CRW

SV	On Time	Late	Max Late Length (seconds)
1	47878	0	0
2	46080	0	0
3	48579	0	0
4	47449	1	149
5	48026	1	149
6	50021	0	0
7	47302	0	0
8	47609	0	0
9	46787	0	0
10	48756	0	0
11	49919	0	0
12	47746	0	0
13	47068	0	0
14	47404	0	0
15	47450	1	159
16	48219	0	0
17	47154	1	170
18	47019	0	0
19	49071	0	0
20	49041	0	0
21	47675	0	0
22	46532	0	0
23	47353	0	0
24	49393	0	0
25	49088	0	0
26	48288	0	0
27	49456	1	166
28	47074	0	0
29	47349	0	0
31	48239	0	0
32	47500	1	170

Table 5-11 WAAS Ephemeris Covariance Message Rates (Type 28) – CRW

SV	On Time	Late	Max Late Length (seconds)
1	39351	0	0
2	37851	0	0
3	39861	0	0
4	38961	0	0
5	39418	0	0
6	41108	0	0
7	38800	0	0
8	39120	0	0
9	38393	0	0
10	40042	0	0
11	41027	0	0
12	39228	0	0
13	38708	0	0
14	38923	0	0
15	38908	0	0
16	39596	0	0
17	38700	0	0
18	38607	1	209
19	40225	0	0
20	40278	0	0
21	39157	0	0
22	38215	1	211
23	38889	0	0
24	40590	1	211
25	40257	0	0
26	39656	0	0
27	40698	0	0
28	38658	0	0
29	38917	1	209
31	39602	0	0
32	38959	0	0
133	76273	0	0
135	76150	0	0
138	76364	0	0

Table 5-12 WAAS Ionospheric Correction Message Rates (Type 26) – CRW

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27530	19	311
0	1	27548	12	310
0	2	27544	12	306
1	0	27544	7	306
1	1	27528	12	306
1	2	27538	13	306
1	3	27552	15	306
1	4	27528	15	306
2	0	27534	21	307
2	1	27516	19	306
2	2	27552	11	311
2	3	27536	16	308
2	4	27540	4	306
3	0	27544	8	306
3	1	27542	14	306
3	2	27533	14	308
9	0	27540	11	307
9	1	27540	14	583
9	2	27535	17	306
9	3	27551	9	306
9	4	27530	10	306
9	5	27533	19	307
9	6	27534	18	306

Table 5-13 WAAS Ionospheric Mask Message Rates (Type 18) - CRW

Band	On Time	Late	Max Late Length (seconds)
0	36226	0	0
1	36223	0	0
2	36215	0	0
3	36213	0	0
9	36240	1	366

Table 5-14 WAAS Fast Correction and Degradation Message Rates – CRE

Message Type	On Time	Late	Max Late Length (seconds)
1	108841	3	127
2	1325729	56	12
3	1324383	304	15
4	1324612	272	12
7	100659	34	139
9	93110	0	0
10	100630	26	132
17	31763	0	0

Table 5-15 WAAS Long Correction Message Rates (Type 24 and 25) – CRE

SV	On Time	Late	Max Late Length (seconds)
1	47878	0	0
2	46077	0	0
3	48587	0	0
4	47453	1	151
5	48030	0	0
6	50024	0	0
7	47307	0	0
8	47621	0	0
9	46793	0	0
10	48755	0	0
11	49914	0	0
12	47754	0	0
13	47061	0	0
14	47408	0	0
15	47441	0	0
16	48228	0	0
17	47156	0	0
18	47046	0	0
19	49056	0	0
20	49049	0	0
21	47670	0	0
22	46547	0	0
23	47355	0	0
24	49398	0	0
25	49082	0	0
26	48306	0	0
27	49467	0	0
28	47073	0	0
29	47353	0	0
31	48255	0	0
32	47499	0	0

Table 5-16 WAAS Ephemeris Covariance Message Rates (Type 28) – CRE

SV	On Time	Late	Max Late Length (seconds)
1	39339	1	210
2	37864	0	0
3	39864	0	0
4	38963	0	0
5	39419	0	0
6	41103	0	0
7	38825	0	0
8	39129	0	0
9	38410	0	0
10	40051	0	0
11	41022	0	0
12	39215	0	0
13	38702	0	0
14	38925	0	0
15	38911	0	0
16	39599	0	0
17	38705	0	0
18	38595	0	0
19	40244	0	0
20	40268	0	0
21	39163	0	0
22	38216	0	0
23	38893	0	0
24	40608	0	0
25	40264	0	0
26	39658	0	0
27	40718	1	160
28	38664	0	0
29	38924	0	0
31	39568	1	210
32	38973	0	0
133	76277	0	0
135	76206	0	0
138	76313	0	0

Table 5-17 WAAS Ionospheric Correction Message Rates (Type 26) – CRE

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27564	21	311
0	1	27529	16	306
0	2	27524	13	307
1	0	27531	22	307
1	1	27550	15	307
1	2	27528	13	307
1	3	27536	17	306
1	4	27528	20	584
2	0	27537	16	307
2	1	27537	17	307
2	2	27538	20	306
2	3	27540	14	306
2	4	27534	12	306
3	0	27548	13	309
3	1	27534	23	307
3	2	27537	23	306
9	0	27547	13	307
9	1	27525	19	312
9	2	27524	13	312
9	3	27535	14	307
9	4	27538	15	307
9	5	27538	15	307
9	6	27534	15	307

Table 5-18 WAAS Ionospheric Mask Message Rates (Type 18) – CRE

Band	On Time	Late	Max Late Length (seconds)
0	36243	0	0
1	36224	0	0
2	36202	0	0
3	36205	0	0
9	36253	0	0

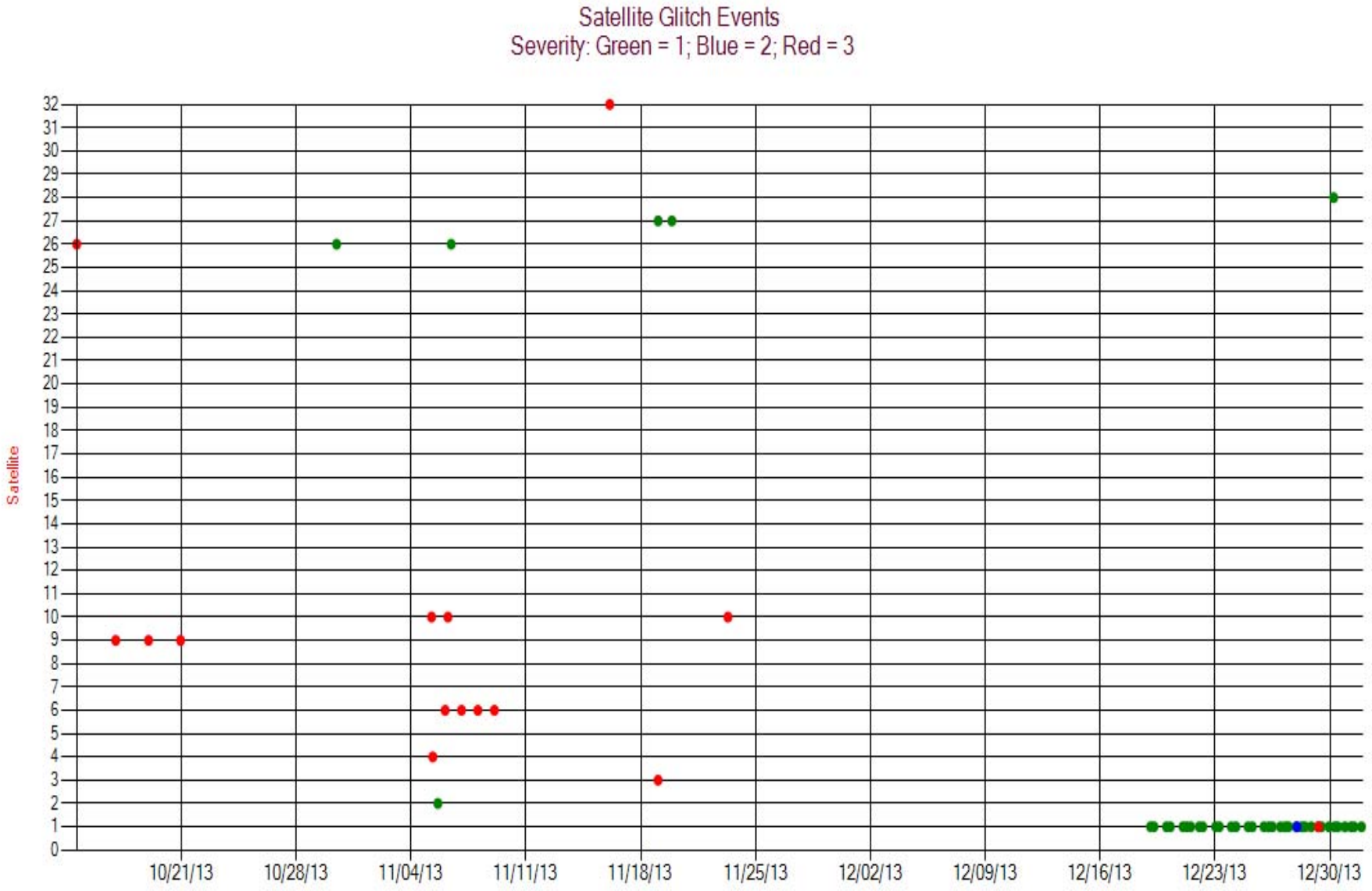
5.4 Satellite Glitches

The GPS satellites occasionally have periods of signal carrier stability 'glitches' of varying magnitude. These are short degradations in the signal that in severe cases cause WAAS to lose track or cycle slip for some or all of the WAAS receivers. The more severe glitches will cause the WAAS reported UDRE spike to 'Not Monitor' and result in an alert.

Figure 5-2 shows the satellite glitches visible to WAAS for the quarter. Glitches are categorized into three severity levels. Severity one glitches cause a significant number of the receivers to simultaneously have bad subframe parity, but not all receivers. Severity two glitches cause all of the receivers to report bad subframe parity data and some receivers to also have cycle slips and or lose tracking of L2 and or L1. Severity three glitches cause all of the receivers to lose track of both L1 and L2 data. Note, the tool that performs this Satellite Glitch Analysis reports times when more than 14 GPS satellites are in view for some of the WAAS reference stations. The NovAtel WAAS G2 receiver is only capable of tracking 14 GPS satellites at a given time. GPS users may also experience this condition.

Please note the data gap for this reporting period; from 11/25/13 to 12/19/13, the workstation running the Satellite Glitch tool went down, thus no outputs were available for those days. Numerous glitches were observed on PRN-1 beginning 12/4/13; see DR 117 Excessive Not Monitored Alarms on PRN 1 SVN 63.

Figure 5-2 SV Glitch Trend



6.0 SV RANGE ACCURACY

Range accuracy evaluation computes the probability that the WAAS User Differential Range Error (UDRE) and Grid Ionospheric Vertical Error (GIVE) statistically bound 99.9% of the range residuals for each satellite tracked by the receiver. A UDRE is broadcast by the WAAS for each satellite that is monitored by the system and the 99.9% bound (3.29 sigma) of the residual error on a pseudorange after application of fast and long-term corrections is checked. The pseudorange residual error is determined by taking the difference between the raw pseudorange and a calculated reference range. The reference range is equal to the true range between the corrected satellite position and surveyed user antenna plus all corrections (WAAS Fast Clock, WAAS Long-Term Clock, WAAS Ionospheric delay, Tropospheric delay, Receiver Clock Bias, and Multipath). Since the true ionospheric delay and multipath error are not precisely known, the estimated variance in these error sources are added to the UDRE before the comparing it to the residual error.

GPS satellite range residual errors were calculated for twelve WAAS receivers during the quarter. Table 6-1 and 6-2 show the range error 95% index and 99.9% (3.29 sigma) bounding statistics for each SV at the selected locations. Figures 6-1 to 6-2 show the range error for each SV as measured by the WAAS receivers at the Washington DC reference station.

A GIVE is broadcast by the WAAS for each IGP that is monitored by the system and the 99.9% (3.29 sigma) bound of the ionospheric error is checked. The WAAS broadcasts the ionospheric model using IGP's at predefined geographic locations. Each IGP contains the vertical ionospheric delay and the error in that delay in the form of the GIVE. The ionospheric error is determined by taking the difference between the WAAS vertical ionospheric delay interpolated from the IGP's and GPS dual frequency measurement at that GPS satellite.

GPS satellite ionospheric errors were calculated for twelve WAAS receivers during the quarter. Table 6-3 and 6-4 show the ionospheric error 95% index and 99.9% (3.29 sigma) bounding statistics for each SV at the selected locations. Figures 6-3 to 6-4 show the ionospheric error for each SV as measured by the WAAS receiver at the Washington DC reference station.

For this reporting period, most satellites range errors were bounded 99.9% of the time by UDRE. The unbounded range errors on PRN-1 were due to numerous alerts on PRN-1 starting on Dec. 4, 2013; see DR 117 Excessive Not Monitored Alarms on PRN 1 SVN 63. The unbounded range errors on PRN-2 were due to signal anomaly; see DR 118 PRN2 Anomaly. The unbounded range errors on PRN-19, PRN-23, PRN-25, and PRN-27 were due to geomagnetic activity. All other unbounded errors were due to noise and multipath.

Table 6-1 Range Error 95% index and 3.29 Sigma Bounding

Site →	Billings		Albuquerque		Boston		Washington DC		Houston		Kansas City	
SV ↓	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)
1	2.404	99.9999	2.777	100	2.667	100	2.340	100	2.235	100	2.087	100
2	1.797	100	2.131	100	2.750	100	2.814	99.9906	3.227	99.8078	2.523	100
3	1.625	100	1.269	100	1.401	100	1.045	100	1.093	100	1.119	100
4	1.850	100	1.480	100	1.558	100	1.204	100	1.456	100	2.492	100
5	2.102	100	1.723	100	1.459	100	1.088	100	1.127	100	1.615	100
6	1.602	100	1.427	100	1.248	100	0.991	100	0.979	100	1.145	100
7	1.335	100	1.012	100	1.323	100	1.089	100	1.211	100	0.930	100
8	0.948	100	0.746	100	1.005	100	1.013	100	1.412	100	1.243	100
9	1.926	100	1.148	100	1.206	100	1.764	100	1.101	100	1.568	100
10	1.012	100	0.911	100	1.134	100	1.356	100	2.271	100	1.221	100
11	1.160	100	0.990	100	0.957	100	1.347	100	2.251	100	1.056	100
12	1.357	100	1.113	100	1.707	100	1.128	100	1.278	100	0.973	100
13	1.526	100	1.538	100	1.107	100	1.194	100	1.868	100	1.040	100
14	1.548	100	0.853	100	1.027	100	1.635	100	1.747	100	1.777	100
15	1.541	100	1.561	100	1.103	100	0.862	100	1.140	100	1.320	100
16	1.103	100	1.382	100	1.378	100	1.352	100	2.035	100	1.708	100
17	2.746	100	1.255	100	1.595	100	0.866	100	1.394	100	1.218	100
18	1.198	100	1.292	100	1.636	100	1.875	100	2.046	100	1.461	100
19	2.405	100	2.054	100	2.838	100	2.820	100	3.451	99.9966	2.383	100
20	1.032	100	1.420	100	1.471	100	1.524	100	2.225	100	1.742	100
21	1.352	100	1.273	100	1.625	100	2.164	100	1.902	100	1.738	100
22	1.886	100	2.253	100	2.723	100	2.979	100	3.003	100	2.280	100
23	1.407	100	1.960	100	2.374	100	1.980	100	3.246	99.9786	2.023	100
24	3.011	99.9996	2.914	99.9186	2.850	100	2.847	100	3.162	100	2.797	100
25	2.765	99.9999	3.424	100	1.960	100	2.016	100	3.097	100	2.548	100
26	1.602	100	1.443	100	1.300	100	1.208	100	1.579	100	1.423	100
27	2.348	100	1.960	100	2.168	100	1.921	100	1.733	100	1.982	100
28	1.744	100	0.873	100	1.335	100	1.334	100	1.898	100	1.261	100
29	1.642	100	1.525	100	1.085	100	1.418	100	1.018	100	1.709	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	1.390	100	1.010	100	0.825	100	0.958	100	1.202	100	1.244	100
32	1.339	100	0.908	100	1.320	100	0.972	100	2.124	100	1.146	100
135	2.163	100	2.058	100	2.777	100	2.162	100	2.615	100	1.438	100
138	1.324	100	1.386	100	1.598	100	1.768	100	1.503	100	1.644	100

Table 6-2 Range Error 95% index and 3.29 Sigma Bounding

Site →	Los Angeles		Salt Lake City		Miami		Minneapolis		Atlanta		Juneau	
SV ↓	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)
1	2.161	100	2.628	99.9998	2.096	100	2.711	100	2.130	100	2.514	100
2	2.048	100	2.085	100	2.800	100	2.159	100	2.708	99.9937	1.886	100
3	2.015	100	1.410	100	0.864	100	1.278	100	0.829	100	1.702	100
4	1.505	100	1.596	100	1.837	100	1.383	100	1.250	100	1.738	100
5	1.645	100	1.731	100	0.918	100	2.094	100	1.027	100	1.925	100
6	1.125	100	1.691	100	0.863	100	1.137	100	0.957	100	1.617	100
7	1.299	100	1.320	100	1.971	100	1.350	100	0.795	100	1.813	100
8	1.016	100	1.017	100	0.792	100	1.556	100	1.049	100	1.525	100
9	1.494	100	1.869	100	1.369	100	1.113	100	0.996	100	1.889	100
10	0.931	100	0.972	100	1.106	100	0.873	100	1.347	100	1.026	100
11	1.050	100	1.012	100	2.825	100	1.122	100	1.377	100	0.909	100
12	0.908	100	1.278	100	1.244	100	1.520	100	1.092	100	1.199	100
13	1.008	100	2.378	100	1.024	100	1.271	100	1.072	100	1.446	100
14	0.960	100	0.946	100	1.724	100	0.947	100	1.603	100	0.895	100
15	1.620	100	1.743	100	1.051	100	1.946	100	0.779	100	1.896	100
16	1.648	100	1.164	100	1.604	100	1.361	100	1.742	100	0.926	100
17	0.963	100	1.528	100	1.236	100	0.993	100	0.906	100	1.389	100
18	1.271	100	1.280	100	1.499	100	1.319	100	2.028	100	1.046	100
19	2.352	100	2.367	100	2.797	100	2.020	100	3.069	100	1.815	100
20	1.395	100	1.116	100	1.441	100	1.296	100	1.740	100	1.066	100
21	1.325	100	1.048	100	2.416	100	1.179	100	1.892	100	0.964	100
22	2.308	100	2.115	100	2.909	99.9072	2.307	100	3.093	99.9913	2.101	100
23	2.069	100	1.574	100	2.013	100	1.328	100	2.491	100	1.364	100
24	2.841	99.8915	3.922	99.3484	2.353	100	2.552	100	2.327	100	3.317	100
25	2.324	100	2.169	100	1.962	100	2.179	100	1.524	100	2.534	100
26	1.443	100	1.644	100	0.979	100	1.327	100	0.997	100	1.634	100
27	2.572	100	2.161	100	1.806	100	2.425	99.9876	1.785	100	2.545	100
28	0.961	100	0.898	100	2.368	100	0.929	100	1.390	100	0.970	100
29	1.153	100	2.643	100	1.243	100	1.793	100	1.037	100	1.793	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	1.170	100	1.046	100	2.621	100	0.920	100	1.297	100	1.111	100
32	0.962	100	1.269	100	1.091	100	0.976	100	1.322	100	1.184	100
135	1.719	100	1.666	100	1.728	100	2.201	100	2.356	100	1.582	100
138	2.205	100	1.832	100	2.294	100	2.428	100	1.310	100	1.703	100

Table 6-3 Ionospheric Error 95% index and 3.29 Sigma Bounding

Site →	Billings		Albuquerque		Boston		Washington DC		Houston		Kansas City	
SV ↓	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)
1	1.520	100	1.697	100	1.740	100	1.468	100	1.471	100	1.372	100
2	1.459	100	1.519	100	1.880	100	1.874	100	2.117	100	1.851	100
3	0.672	100	0.749	100	0.748	100	0.611	100	0.611	100	0.705	100
4	1.113	100	1.165	100	1.178	100	0.993	100	1.286	100	1.741	100
5	1.220	100	1.194	100	1.111	100	0.531	100	1.092	100	1.076	100
6	0.708	100	0.656	100	0.675	100	0.508	100	0.620	100	0.551	100
7	0.815	100	0.782	100	0.842	100	0.685	100	0.729	100	0.842	100
8	0.394	100	0.523	100	0.623	100	0.503	100	0.475	100	0.685	100
9	0.835	100	0.811	100	0.708	100	0.776	100	0.558	100	0.835	100
10	0.373	100	0.403	100	0.457	100	0.532	100	1.052	100	0.506	100
11	0.570	100	0.483	100	0.416	100	0.487	100	1.046	100	0.397	100
12	0.472	100	0.599	100	0.813	100	0.357	100	0.630	100	0.446	100
13	0.853	100	0.904	100	0.749	100	0.630	100	0.922	100	0.622	100
14	0.907	100	0.403	100	0.550	100	0.563	100	0.712	100	0.887	100
15	0.891	100	1.017	100	0.763	100	0.730	100	0.940	100	0.825	100
16	0.685	100	0.615	100	0.650	100	0.660	100	0.890	100	0.679	100
17	1.872	100	0.997	100	1.206	100	0.521	100	0.710	100	0.708	100
18	0.803	100	0.655	100	0.834	100	0.859	100	1.034	100	0.713	100
19	1.505	100	1.396	100	1.550	100	1.650	100	2.431	100	1.624	100
20	0.720	100	0.649	100	0.708	100	0.683	100	1.010	100	0.736	100
21	0.960	100	0.816	100	1.016	100	1.148	100	1.153	100	0.942	100
22	1.568	100	1.517	100	1.782	100	1.811	100	1.937	100	1.572	100
23	1.265	100	1.270	100	1.624	100	1.468	100	2.102	100	1.399	100
24	1.910	100	1.973	100	1.903	100	1.776	100	1.884	100	1.699	100
25	1.424	100	1.854	100	1.271	100	1.245	100	1.456	100	1.397	100
26	0.867	100	0.893	100	0.747	100	0.624	100	0.895	100	0.808	100
27	1.301	100	1.340	100	1.320	100	1.165	100	1.293	100	1.237	100
28	1.251	100	0.458	100	0.732	100	0.615	100	0.751	100	0.646	100
29	0.767	100	0.970	100	0.647	100	0.644	100	0.659	100	0.884	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	0.721	100	0.641	100	0.509	100	0.333	100	0.844	100	0.957	100
32	0.645	100	0.613	100	0.505	100	0.446	100	0.841	100	0.526	100

Table 6-4 Ionospheric Error 95% index and 3.29 Sigma Bounding

Site →	Los Angeles		Salt Lake City		Miami		Minneapolis		Atlanta		Juneau	
SV ↓	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)
1	1.449	100	1.670	100	1.506	100	1.660	100	1.352	100	1.638	100
2	1.449	100	1.574	100	1.869	100	1.533	100	1.886	100	1.381	100
3	0.814	100	0.724	100	0.607	100	0.679	100	0.448	100	0.743	100
4	1.005	100	1.045	100	1.162	100	1.039	100	0.608	100	1.034	100
5	0.936	100	1.023	100	0.947	100	0.988	100	0.637	100	1.226	100
6	0.539	100	0.762	100	0.514	100	0.494	100	0.372	100	0.695	100
7	0.940	100	0.736	100	1.099	100	0.732	100	0.567	100	0.908	100
8	0.575	100	0.544	100	0.683	100	0.801	100	0.537	100	0.839	100
9	0.851	100	0.890	100	0.843	100	0.760	100	0.499	100	0.967	100
10	0.350	100	0.484	100	0.529	100	0.378	100	0.724	100	0.429	100
11	0.421	100	0.369	100	1.123	100	0.475	100	0.834	100	0.422	100
12	0.575	100	0.570	100	0.590	100	0.675	100	0.571	100	0.580	100
13	0.668	100	0.997	100	0.768	100	0.822	100	0.567	100	0.803	100
14	0.490	100	0.442	100	0.759	100	0.466	100	0.681	100	0.450	100
15	0.991	100	0.927	100	0.770	100	1.081	100	0.584	100	1.221	100
16	0.630	100	0.640	100	0.654	100	0.660	100	0.931	100	0.591	100
17	0.638	100	0.978	100	0.835	100	0.623	100	0.423	100	0.879	100
18	0.618	100	0.728	100	0.731	100	0.712	100	1.247	100	0.680	100
19	1.301	100	1.473	100	1.486	100	1.451	100	1.955	100	1.333	100
20	0.357	100	0.545	100	0.874	100	0.752	100	0.935	100	0.508	100
21	0.651	100	0.597	100	1.465	100	0.753	100	1.126	100	0.660	100
22	1.519	100	1.616	100	2.013	100	1.770	100	2.206	100	1.487	100
23	1.199	100	1.244	100	1.657	100	1.082	100	1.723	100	1.129	100
24	1.964	100	2.291	100	1.857	100	1.788	100	1.649	100	2.157	100
25	1.507	100	1.385	100	1.461	100	1.372	100	0.943	100	1.577	100
26	0.851	100	0.828	100	0.731	100	0.747	100	0.549	100	1.080	100
27	1.413	100	1.282	100	1.259	100	1.493	100	1.134	100	1.424	100
28	0.381	100	0.524	100	1.274	100	0.494	100	0.927	100	0.551	100
29	0.706	100	1.360	100	0.769	100	0.853	100	0.461	100	1.024	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	0.752	100	0.663	100	0.981	100	0.527	100	0.505	100	0.531	100
32	0.504	100	0.629	100	0.634	100	0.459	100	0.677	100	0.621	100

Figure 6-1 95% Range Error (PRN 1 – PRN 16) – Washington DC

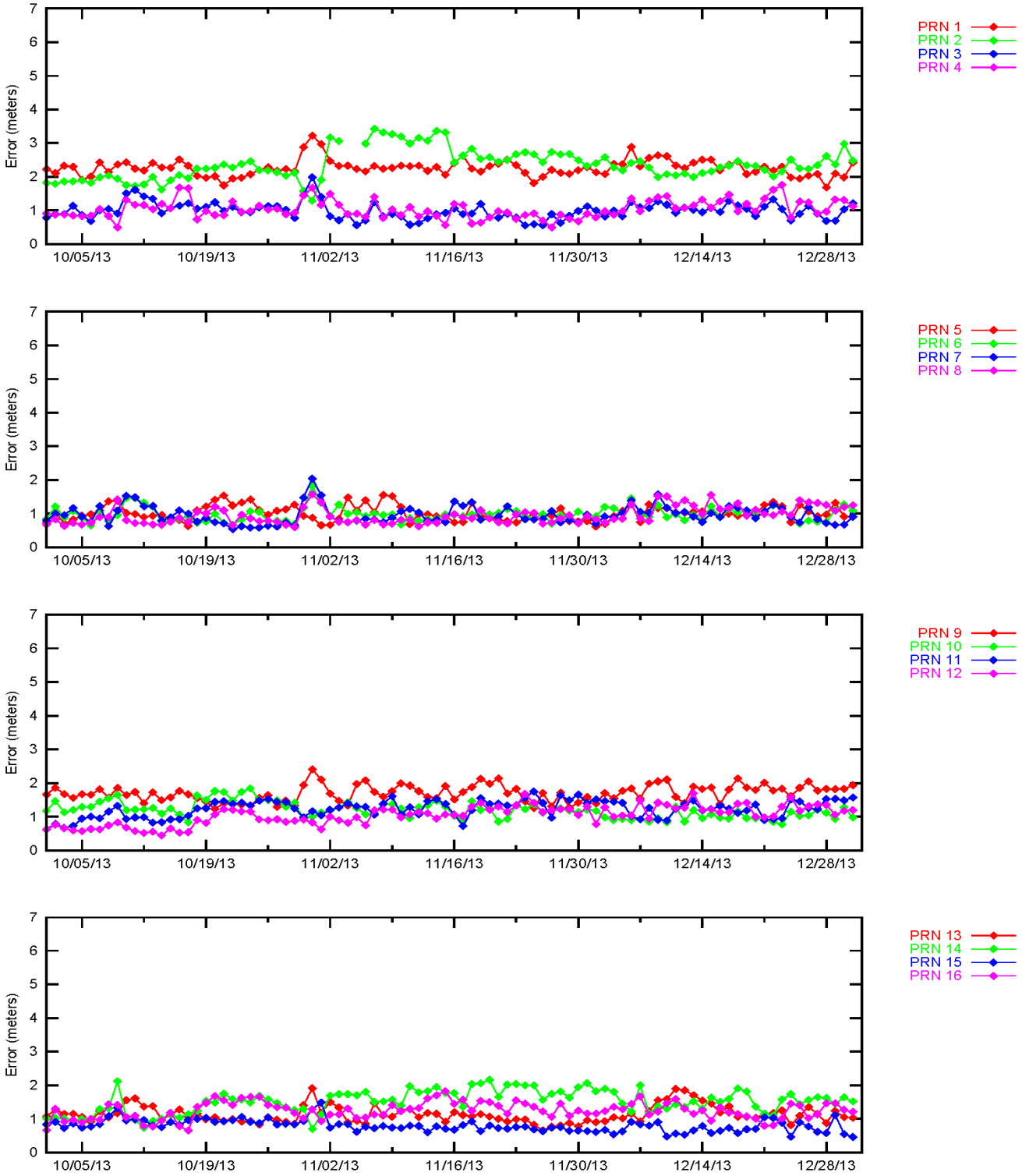


Figure 6-2 95% Range Error (PRN 17 – PRN 32) – Washington DC

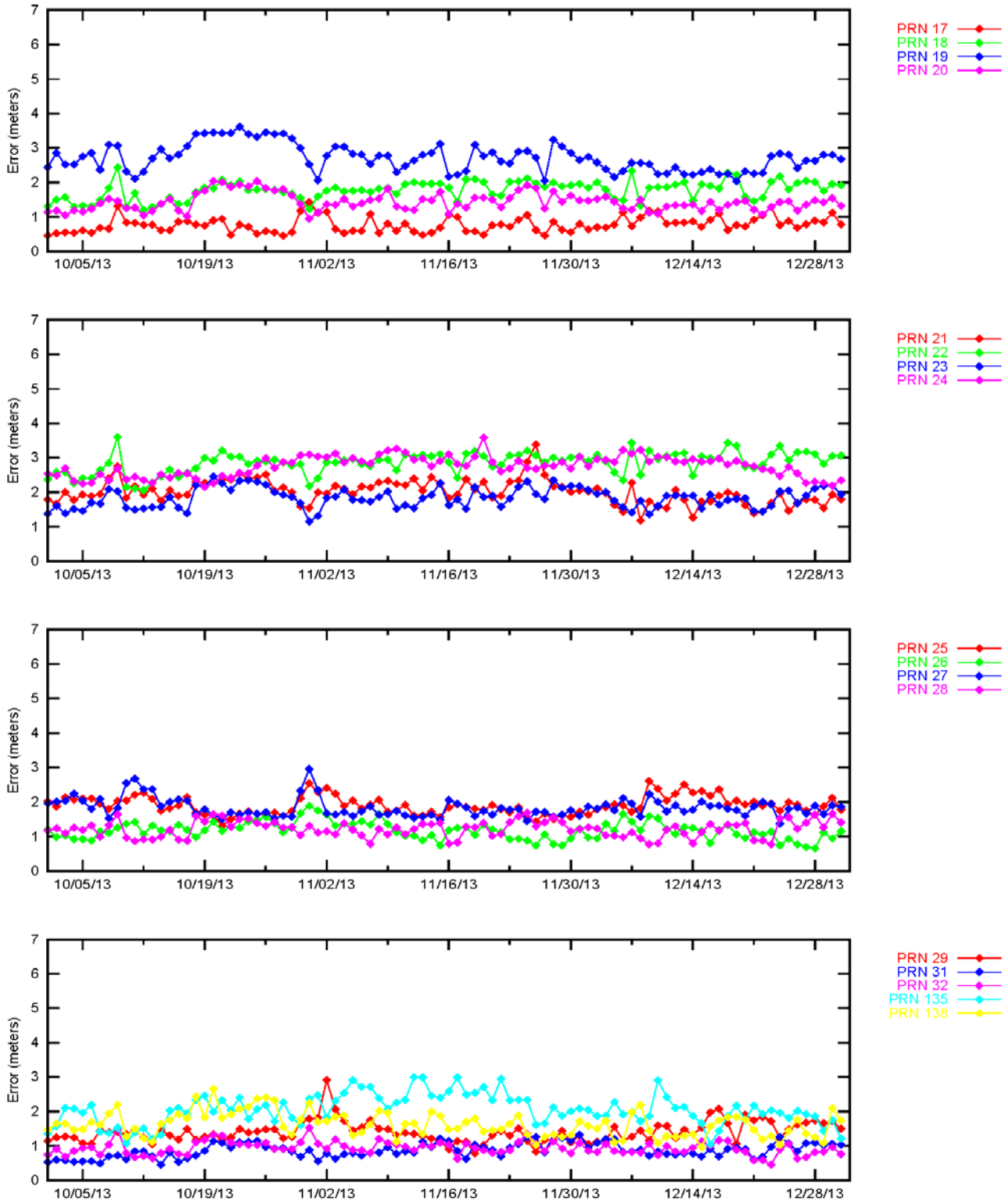


Figure 6-3 95% Ionospheric Error (PRN 1 – PRN 16) – Washington DC

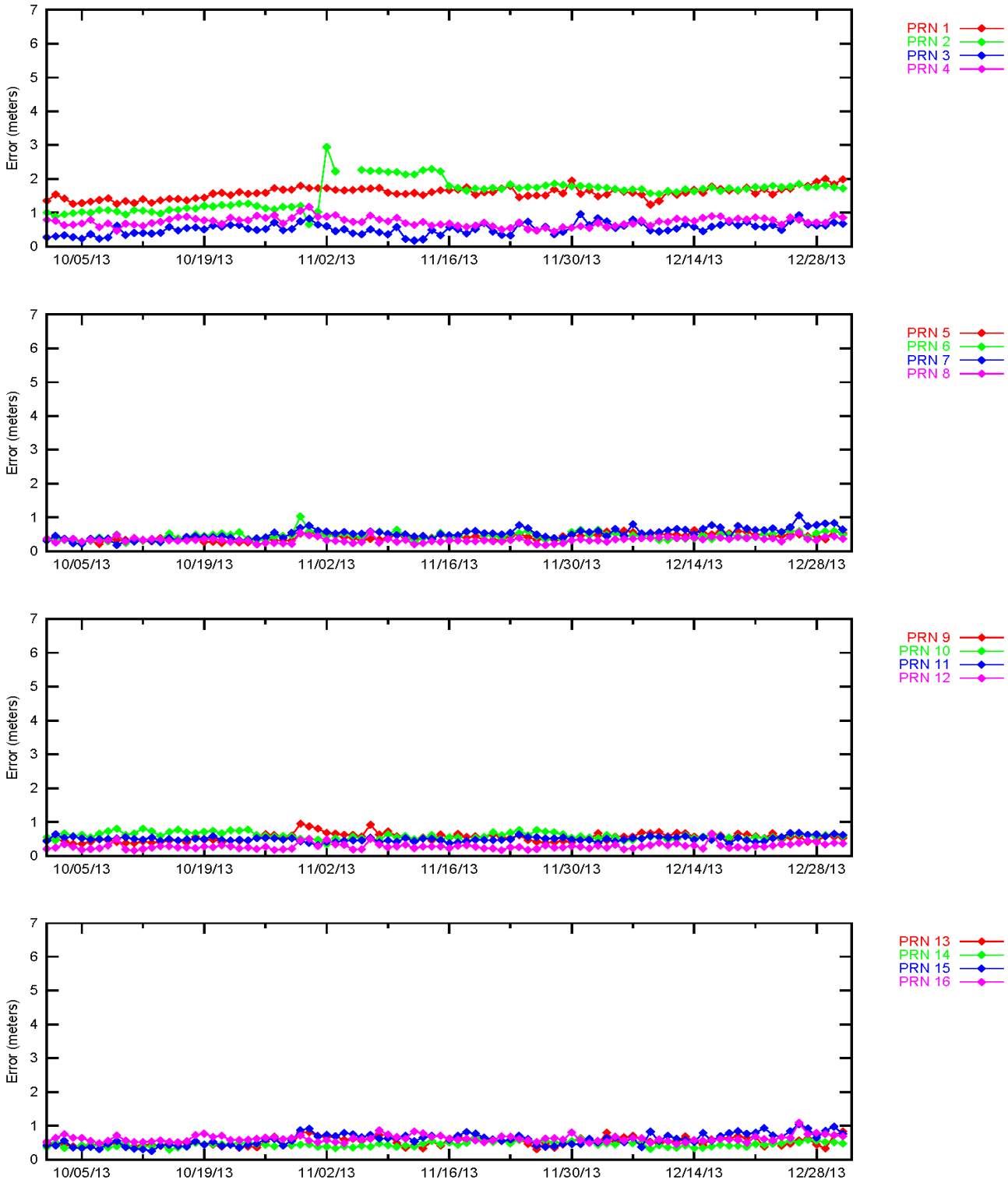
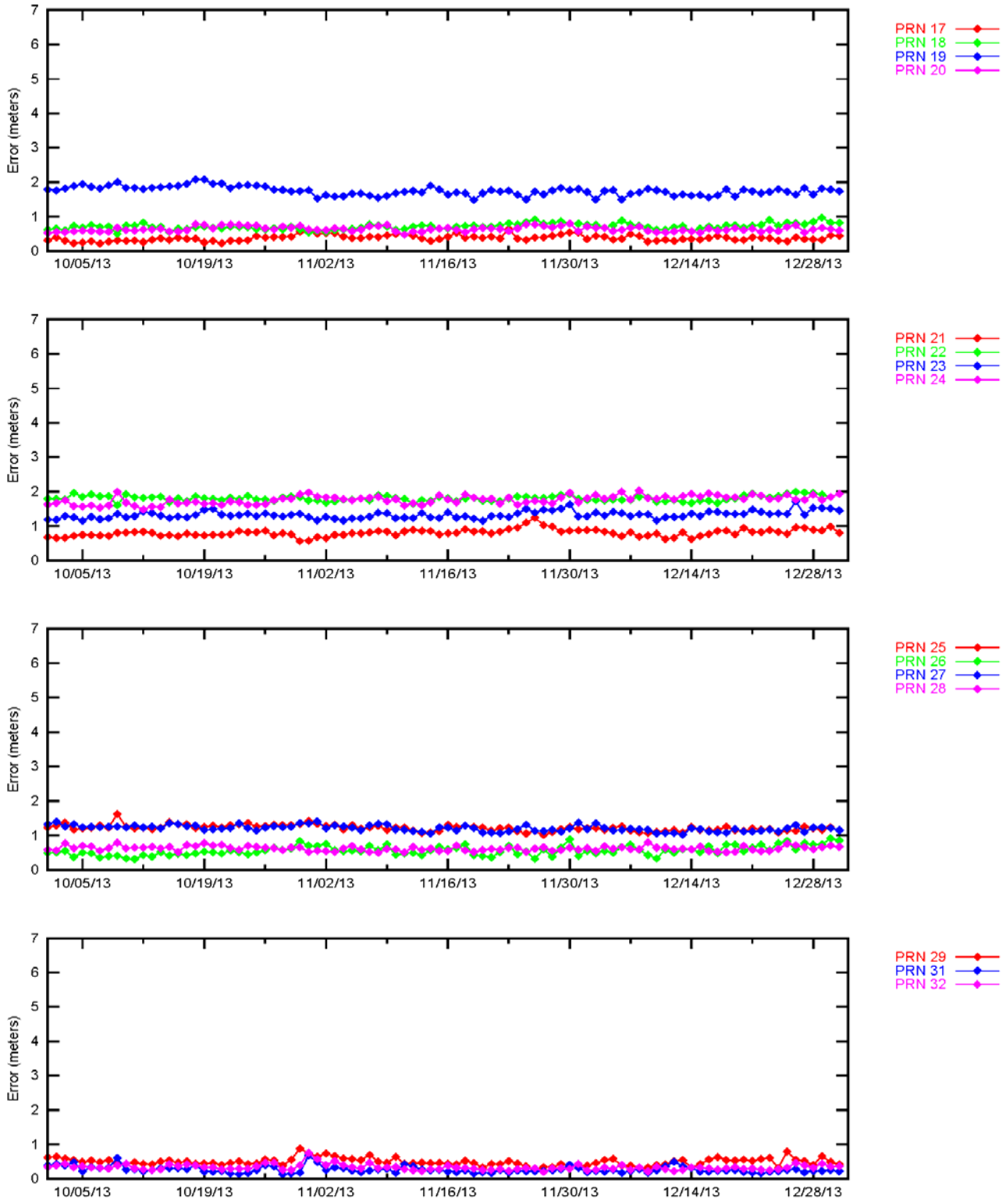


Figure 6-4 95% Ionospheric Error (PRN 17 - PRN 32) – Washington DC



7.0 GEO RANGING PERFORMANCE

The WAAS GEO navigation messages provide corrections and UDRE values for each satellite. The GEO ranging availability from each GEO navigation message source was evaluated separately to determine the quality of service provided.

Table 7-1 shows the GEO-Ranging performance. Figure 7-1 shows the trend of CRW GEO PA Ranging Availability. Figure 7-2 shows the trend of CRE GEO PA Ranging Availability. Figure 7-3 shows the trend of AMR GEO NPA Ranging Availability.

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
AMR 133	CRW	98.94	0.70	0.16	0.18
AMR 133	CRE	99.64	0.20	0.06	0.09
AMR 133	AMR	0.00	99.82	0.16	0.00
CRW 135	CRW	98.94	0.70	0.16	0.18
CRW 135	CRE	99.63	0.20	0.06	0.09
CRW 135	AMR	0.00	99.82	0.16	0.00
CRE 138	CRW	98.94	0.70	0.16	0.18
CRE 138	CRE	99.64	0.20	0.06	0.09
CRE 138	AMR	0.00	99.82	0.16	0.00

Figure 7-1 Daily PA CRW GEO Ranging Availability Trend

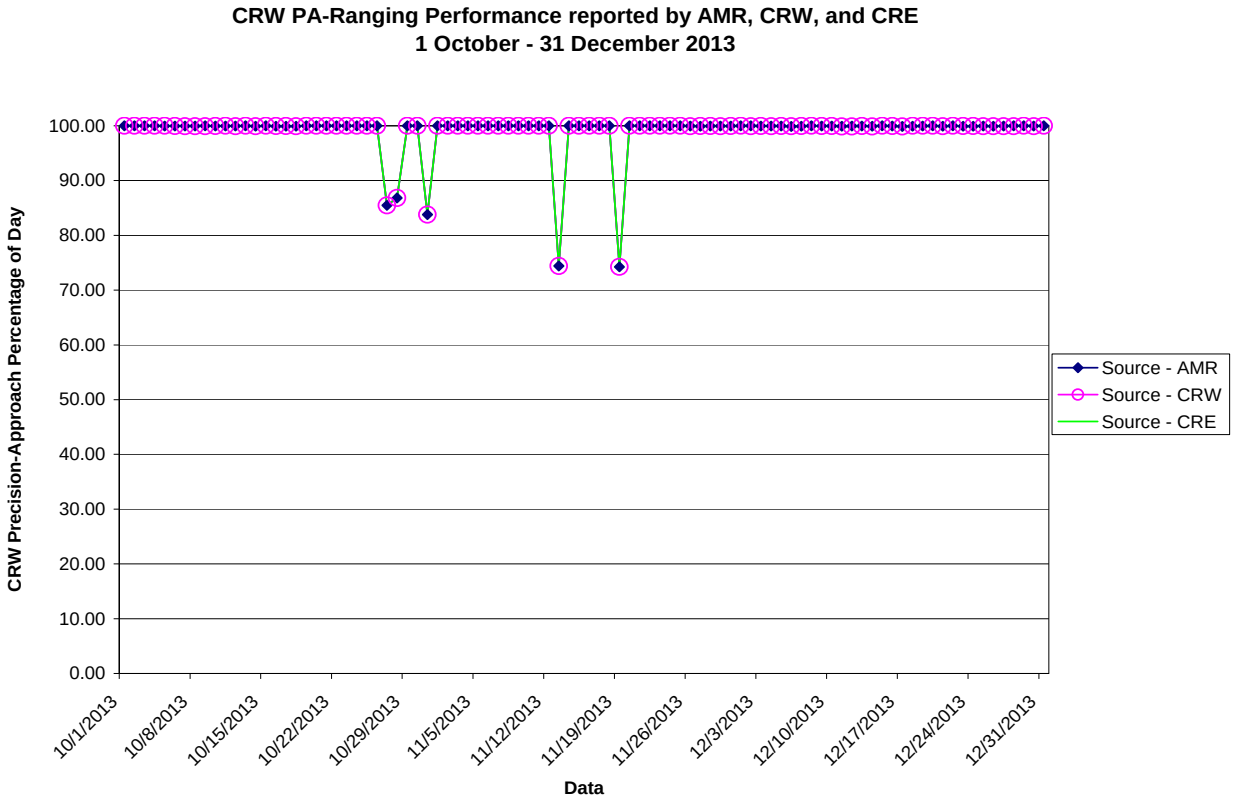


Figure 7-2 Daily PA CRE GEO Ranging Availability Trend

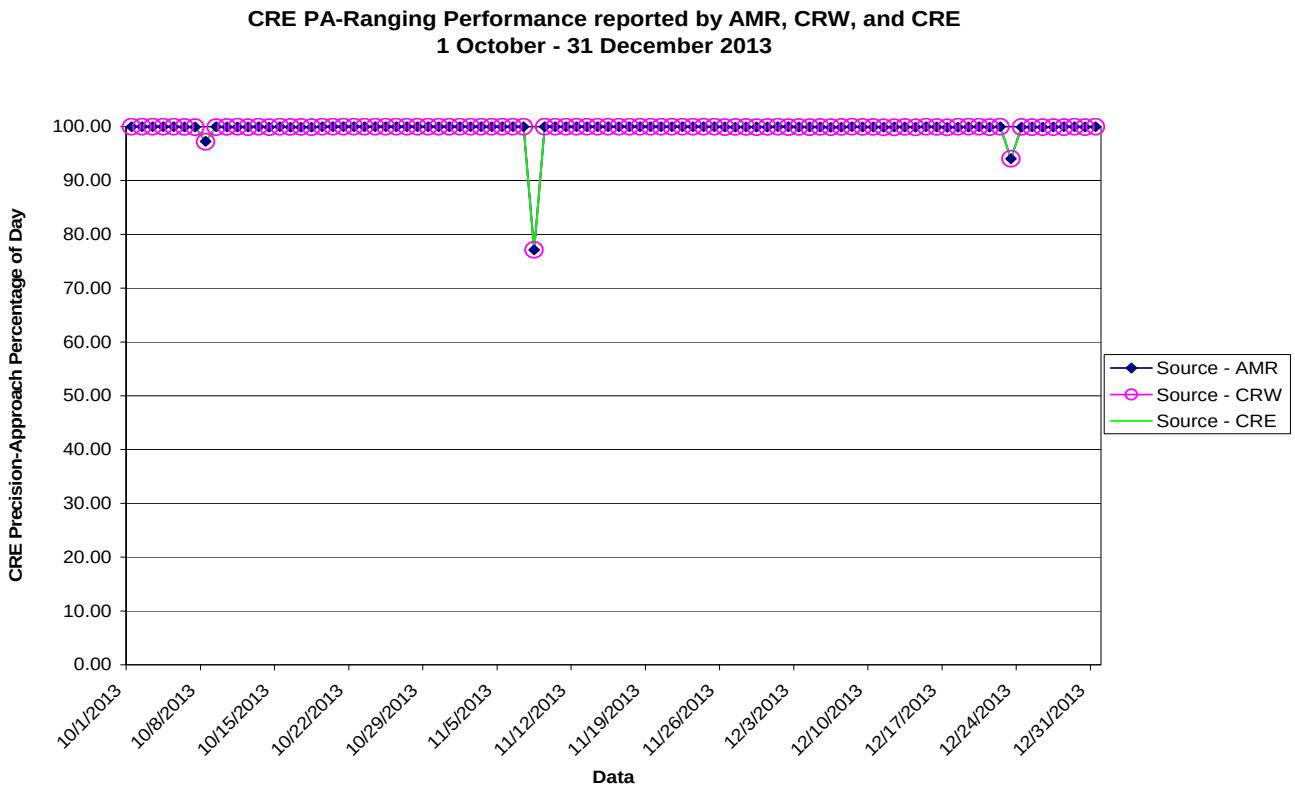
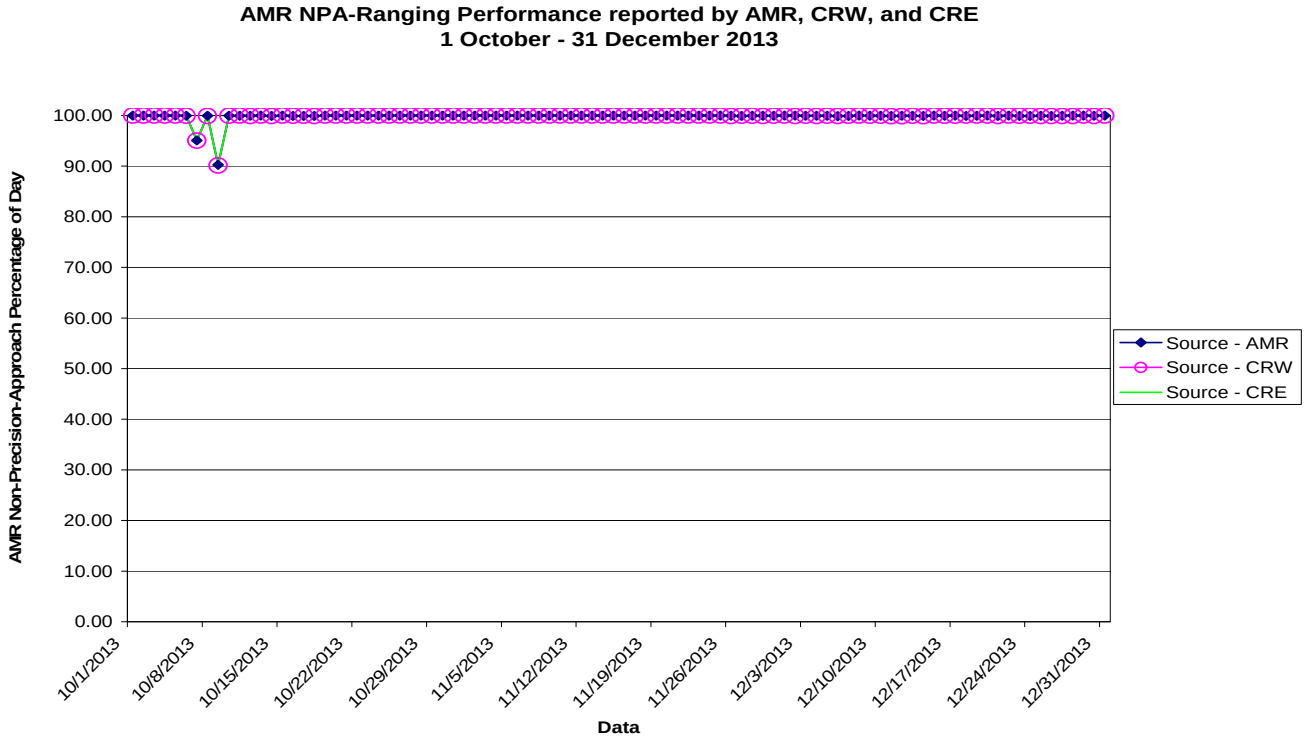


Figure 7-3 Daily NPA AMR GEO Ranging Availability Trend



8.0 WAAS AIRPORT AVAILABILITY

The WAAS airport availability evaluation determines the number and length LPV service outages at selected airports from the transmitted WAAS navigation message. The navigation messages transmitted from all GEO satellites are processed simultaneously, and WAAS protection levels (VPL and HPL) are computed at each airport once every 30 second in accordance with the RTCA DO-229D. Once the protection levels have been produced at each airport an LPV service evaluation is conducted to identify outages in service (i.e. when protection levels exceed alert limits). WAAS LPV service is available for a user when the vertical protection level (VPL) is less than or equal to vertical alert limit (VAL) of 50 meters and the horizontal protection level (HPL) is less than or equal to horizontal alert limit (HAL) of 40 meters. If both conditions are met at a specified airport location then WAAS LPV service is available at that airport. If either one of the conditions are not met at a specified airport location then WAAS LPV service at that airport is unavailable and an outage in LPV service is recorded with its duration. When the LPV service becomes unavailable it is not considered available again until protection levels are below or equal to alert limits for at least 15 minutes. Although this will reduce LPV service availability minimally, it substantially reduces the number of service outages and prevents excessive switching in and out of service availability. Similar service analysis is completed for LP and LPV 200 services in accordance with HAL and VAL shown in Table 1-1. The number of WAAS LPV service outages and the availability at selected airports in the US and Canada for this evaluation period of WAAS operation is presented in Table 8-1. Figures 8-1 to 8-6 provide the graphical representation of the LP, LPV and LPV 200 availability and outage counts at all airports, including many that do not have published approaches. These results are depicted geographically on an interactive web page at http://www.nstb.tc.faa.gov/AirportOutages/ .

The interactive web page can be accessed by entering the web address into an Internet browser and selecting the current quarter from the drop-down menu on the upper left corner and clicking “Submit Request”. The WAAS LPV airport layer will appear providing color coded availability results as shown in Figures 8-1 to 8-2. Rolling over any airport with the cursor displays the LPV availability and number of LPV outages for the reporting period. The “WAAS Layer” menu in the upper right of the display allows the user to select WAAS LP or LPV 200 availability and the number of outage results as shown in Figures 8-3 to 8-6. The user can review WAAS availability performance for US airports with GPS RNAV instrument approach procedures by selecting “Show all Airports”, or limit airports displayed to those with approved LPV approaches as provided in Table 8-1.

Table 8-1 WAAS LP, LPV, and LPV200 Outages and Availability

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CAL4	FORT MACKAY / ALBIAN AERODROME	AB	LPV	0	1	0	1	7	0.99897
CEV3	VEGREVILLE	AB	LPV	0	1	0	1	2	0.99997
CYEG	EDMONTON / JOSEPHBURG	AB	LPV	0	1	0	1	2	0.999951
CYXD	EDMONTON CITY CTR	AB	LPV	0	1	0	1	2	0.999958
2C7	SHAKTOOLIK	AK	LPV	2	0.999328	3	0.999049	5	0.998641
6A8	ALLAKAKET	AK	LP	3	0.999185	4	0.998758	5	0.9982
7KA	TATITLEK	AK	LP	2	0.999672	2	0.999468	2	0.999162
9A3	CHUATHBALUK	AK	LPV	2	0.99954	3	0.999528	4	0.999072
AKN	KING SALMON	AK	LPV	0	1	0	1	2	0.999845
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	2	0.999966	2	0.999872	4	0.999253
AQH	QUINHAGAK	AK	LPV	0	1	1	0.999955	4	0.999528
AQT	NUIQSUT	AK	LPV	4	0.998415	5	0.997917	19	0.996649
BET	BETHEL	AK	LPV200	0	1	1	0.999955	8	0.999136
BRW	WILEY POST-WILL ROGERS MEMORIAL	AK	LPV	8	0.998022	9	0.997626	217	0.982058
CDB	COLD BAY	AK	LPV200	2	0.999977	3	0.999864	420	0.94515
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	2	0.999649	1	0.99934	2	0.999223

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CLP	CLARKS POINT	AK	LPV	0	1	1	0.999996	3	0.999789
CXF	COLDFOOT	AK	LP	3	0.999083	5	0.998641	6	0.997932
D76	ROBERT CURTIS MEMORIAL	AK	LPV	4	0.998977	5	0.998687	28	0.996173
DLG	DILLINGHAM	AK	LPV	0	1	1	0.999996	3	0.999826
ELI	ELIM	AK	LPV	2	0.999306	3	0.999038	5	0.99857
ENA	KENAI MUNICIPAL	AK	LPV200	0	1	1	0.999966	3	0.999555
ENM	EMMONAK	AK	LPV	2	0.999317	3	0.999181	5	0.998566
FAI	FAIRBANKS INTL	AK	LPV200	2	0.999324	4	0.999238	4	0.998377
GAL	EDWARD G. PITKA	AK	LPV	3	0.999487	4	0.999317	5	0.998524
GKN	GULKANA	AK	LPV	2	0.999415	2	0.999385	4	0.998992
HLA	HUSLIA	AK	LPV	3	0.999189	3	0.998894	5	0.998245
HOM	HOMER	AK	LPV	0	1	0	1	3	0.999758
HPB	HOOPER BAY	AK	LP	2	0.999619	4	0.999453	52	0.997018
ILI	ILIAMNA	AK	LPV	0	1	0	1	2	0.999925
KAL	KALTAG	AK	LPV	2	0.999351	3	0.999068	5	0.998755
KSM	ST MARY'S	AK	LPV200	2	0.99954	4	0.999366	6	0.998709
KTN	KETCHIKAN INTL	AK	LPV	0	1	1	0.999604	2	0.999275
KWT	KWETHLUK	AK	LPV	0	1	1	0.999985	6	0.999192
KYU	KOYUKUK	AK	LPV	3	0.999498	4	0.999196	5	0.998494
MCG	MCGRATH	AK	LP	2	0.999574	4	0.999498	4	0.998679
MDM	MARSHALL DON HUNTER SR	AK	LP	2	0.99954	4	0.999381	4	0.998939
MDO	MIDDLETON ISLAND	AK	LP	1	0.999747	1	0.999321	1	0.999283
OOK	TOKSOOK BAY	AK	LP	0	1	1	0.999932	17	0.998037
ORT	NORTHWAY	AK	LP	2	0.999358	3	0.999336	3	0.998426
OTZ	RALPH WIEN MEMORIAL	AK	LPV200	4	0.998951	5	0.998645	34	0.995411
PAQ	PALMER MUNICIPAL	AK	LP	3	0.999751	3	0.999619	4	0.999185
RBY	RUBY	AK	LPV	3	0.999358	4	0.999094	5	0.998536
SCC	DEADHORSE	AK	LPV	5	0.998358	5	0.997981	21	0.996452
SCM	SCAMMON BAY	AK	LP	2	0.999441	3	0.999219	24	0.998226
SHG	SHUNGNAK	AK	LP	2	0.999068	4	0.998792	5	0.998022
SHX	SHAGELUK	AK	LPV	2	0.999551	4	0.99943	4	0.998905
SMK	ST MICHAEL	AK	LPV	2	0.999324	3	0.999192	5	0.998724
UNK	UNALAKLEET	AK	LP	2	0.999343	3	0.999056	5	0.998732
WLK	SELAWIK	AK	LPV	2	0.999068	3	0.998758	5	0.998041
WNA	NAPAKIAK	AK	LPV	0	1	1	0.999955	9	0.999317
YAK	YAKUTAT	AK	LPV200	1	0.99957	1	0.999407	4	0.999173
06A	MOTON FIELD MUNICIPAL	AL	LPV	0	1	0	1	0	1
0J6	HEADLAND MUNICIPAL	AL	LPV	0	1	0	1	0	1
0R1	ATMORE MUNICIPAL	AL	LP	0	1	0	1	0	1
12J	BREWTON MUNICIPAL	AL	LPV	0	1	0	1	0	1
1M4	POSEY FIELD	AL	LPV	0	1	0	1	0	1
1R8	BAY MINETTE MUNICIPAL	AL	LPV	0	1	0	1	0	1
2R5	ST ELMO	AL	LPV	0	1	0	1	0	1
3A1	FOLSOM FIELD	AL	LPV	0	1	0	1	0	1
3M8	NORTH PICKENS	AL	LP	0	1	0	1	0	1
4A9	ISBELL FIELD	AL	LPV	0	1	0	1	0	1
5R4	FOLEY MUNICIPAL	AL	LPV	0	1	0	1	0	1
79J	SOUTH ALABAMA RGNL AT BILL BENTON FIELD	AL	LPV	0	1	0	1	0	1
8A0	ALBERTVILLE MUNICIPAL T. J. BRUMLIK FIELD	AL	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
9A4	LAWRENCE COUNTY	AL	LPV200	0	1	0	1	0	1
ANB	ANNISTON METROPOLITAN	AL	LPV	0	1	0	1	0	1
ASN	TALLADEGA MUNICIPAL	AL	LPV200	0	1	0	1	0	1
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	0	1	0	1	0	1
BFM	MOBILE DOWNTOWN	AL	LPV200	0	1	0	1	0	1
BHM	BIRMINGHAM INTL	AL	LPV200	0	1	0	1	0	1
CQF	H L SONNY CALLAHAN	AL	LPV200	0	1	0	1	0	1
DCU	PRYOR FIELD RGNL	AL	LPV200	0	1	0	1	0	1
DHN	DOTHAN RGNL	AL	LPV200	0	1	0	1	0	1
EDN	ENTERPRISE MUNICIPAL	AL	LPV	0	1	0	1	0	1
EET	SHELBY COUNTY	AL	LPV	0	1	0	1	0	1
EKY	BESSEMER	AL	LPV	0	1	0	1	0	1
EUF	WEEDON FIELD	AL	LPV	0	1	0	1	0	1
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	0	1	0	1	0	1
HAB	MARION COUNTY RANKIN FITE	AL	LPV	0	1	0	1	0	1
HSV	HUNTSVILLE INTL CARL T JONES FIELD	AL	LPV200	0	1	0	1	0	1
JFX	WALKER COUNTY BEVILL FIELD	AL	LPV	0	1	0	1	0	1
JKA	JACK EDWARDS	AL	LPV200	0	1	0	1	0	1
M95	RICHARD ARTHUR FIELD	AL	LPV	0	1	0	1	0	1
MDQ	MADISON COUNTY EXECUTIVE TOM SHARP JR FIELD	AL	LPV	0	1	0	1	0	1
MGM	MONTGOMERY RGNL (DANNELLY FIELD)	AL	LPV200	0	1	0	1	0	1
MOB	MOBILE RGNL	AL	LPV200	0	1	0	1	0	1
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	0	1	0	1	0	1
PLR	ST CLAIR COUNTY	AL	LPV	0	1	0	1	0	1
PYP	CENTRE-PIEDMONT CHEROKEE COUNTY RGNL	AL	LPV	0	1	0	1	0	1
SCD	MERKEL FIELD SYLACAUGA MUNICIPAL	AL	LPV	0	1	0	1	0	1
SEM	CRAIG FIELD	AL	LPV	0	1	0	1	0	1
TCL	TUSCALOOSA RGNL	AL	LPV	0	1	0	1	0	1
TOI	TROY MUNICIPAL	AL	LPV	0	1	0	1	0	1
4M3	CARLISLE MUNICIPAL	AR	LPV	0	1	0	1	0	1
7M1	MC GEHEE MUNICIPAL	AR	LP	0	1	0	1	0	1
ARG	WALNUT RIDGE RGNL	AR	LPV200	0	1	0	1	0	1
ASG	SPRINGDALE MUNICIPAL	AR	LPV	0	1	0	1	0	1
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV200	0	1	0	1	0	1
BPK	OZARK RGNL	AR	LPV	0	1	0	1	0	1
BVX	BATESVILLE RGNL	AR	LPV	0	1	0	1	0	1
BYH	ARKANSAS INTERNATIONAL	AR	LPV200	0	1	0	1	0	1
CDH	HARRELL FIELD	AR	LPV	0	1	0	1	0	1
ELD	SOUTH ARKANSAS RGNL AT GOODWIN FIELD	AR	LPV	0	1	0	1	0	1
FSM	FORT SMITH RGNL	AR	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
FYV	DRAKE FIELD	AR	LPV	0	1	0	1	0	1
HRO	BOONE COUNTY	AR	LPV	0	1	0	1	0	1
JBR	JONESBORO MUNICIPAL	AR	LPV	0	1	0	1	0	1
LIT	ADAMS FIELD	AR	LPV200	0	1	0	1	0	1
M19	NEWPORT MUNICIPAL	AR	LPV	0	1	0	1	0	1
M77	HOWARD COUNTY	AR	LP	0	1	0	1	0	1
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	0	1	0	1	0	1
PBF	GRIDER FIELD	AR	LPV	0	1	0	1	0	1
ROG	ROGERS MUNICIPAL CARTER FIELD	AR	LPV	0	1	0	1	0	1
RUE	RUSSELLVILLE RGNL	AR	LPV	0	1	0	1	0	1
SGT	STUTTGART MUNICIPAL	AR	LPV	0	1	0	1	0	1
SLG	SMITH FIELD	AR	LPV	0	1	0	1	0	1
SRC	SEARCY MUNICIPAL	AR	LPV	0	1	0	1	0	1
SUZ	SALINE COUNTY RGNL	AR	LPV	0	1	0	1	0	1
TXK	TEXARKANA RGNL WEBB FIELD	AR	LPV	0	1	0	1	0	1
VBT	BENTONVILLE MUNICIPAL LOUISE M THADEN FIELD	AR	LPV	0	1	0	1	0	1
XNA	NORTHWEST ARKANSAS RGNL	AR	LPV200	0	1	0	1	0	1
AVQ	MARANA RGNL	AZ	LP	0	1	0	1	33	0.998826
D68	SPRINGERVILLE MUNICIPAL	AZ	LP	0	1	0	1	3	0.999875
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	1	0	1	4	0.999921
FFZ	FALCON FLD	AZ	LP	0	1	0	1	4	0.999815
FHU	SIERRA VISTA MUNICIPAL LIBBY AAF	AZ	LPV200	0	1	0	1	48	0.998698
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	1	0	1	0	1
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	1	0	1	5	0.999917
HII	LAKE HAVASU CITY	AZ	LPV	0	1	0	1	1	0.999989
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	1	0	1	1	0.999989
IGM	KINGMAN	AZ	LPV	0	1	0	1	1	0.999989
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	1	0	1	4	0.999747
P33	COCHISE COUNTY	AZ	LPV	0	1	0	1	7	0.999094
PGA	PAGE MUNICIPAL	AZ	LPV	0	1	0	1	0	1
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	1	0	1	5	0.999853
PRC	ERNEST A. LOVE FIELD	AZ	LPV	0	1	0	1	1	0.999989
RQE	WINDOW ROCK	AZ	LP	0	1	0	1	0	1
SAD	SAFFORD RGNL	AZ	LPV	0	1	0	1	5	0.999626
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LP	0	1	0	1	3	0.999951
SOW	SHOW LOW RGNL	AZ	LPV	0	1	0	1	3	0.9998
TUS	TUCSON INTL	AZ	LPV	0	1	0	1	42	0.998747
CYBL	CAMPBELL RIVER	BC	LPV	0	1	0	1	1	0.999906
CYCD	NANAIMO	BC	LPV	0	1	0	1	1	0.999992
CYVR	VANCOUVER INTL	BC	LPV	0	1	0	1	1	0.999989
CYXS	PRINCE GEORGE	BC	LPV	0	1	1	0.999996	3	0.999698
CYYJ	VICTORIA INTL	BC	LPV	0	1	0	1	0	1
CZBB	VANCOUVER BOUNDARY BAY	BC	LPV	0	1	0	1	1	0.999992

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
AAT	ALTURAS MUNICIPAL	CA	LPV	0	1	0	1	0	1
ACV	ARCATA	CA	LPV200	0	1	0	1	110	0.989006
APC	NAPA COUNTY	CA	LPV	0	1	0	1	98	0.990349
APV	APPLE VALLEY	CA	LPV	0	1	0	1	2	0.999943
AUN	AUBURN MUNICIPAL	CA	LPV	0	1	0	1	85	0.997007
BFL	MEADOWS FIELD	CA	LPV200	0	1	0	1	75	0.999234
BLH	BLYTHE	CA	LP	0	1	0	1	1	0.999989
C83	BYRON	CA	LPV	0	1	0	1	96	0.992357
CCR	BUCHANAN FIELD	CA	LPV	0	1	0	1	98	0.990659
CEC	JACK MC NAMARA FIELD	CA	LPV200	0	1	0	1	95	0.994316
CIC	CHICO MUNICIPAL	CA	LPV	0	1	0	1	94	0.997256
CMA	CAMARILLO	CA	LPV	0	1	0	1	94	0.998483
CNO	CHINO	CA	LPV	0	1	0	1	2	0.999943
CRQ	MC CLELLAN-PALOMAR	CA	LPV200	0	1	0	1	2	0.999943
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	1	0	1	98	0.991093
DAG	BARSTOW-DAGGETT	CA	LPV	0	1	0	1	1	0.999947
DWA	YOLO COUNTY DAVIS/WOODLAND/WINTERS	CA	LPV	0	1	0	1	97	0.993422
FAT	FRESNO YOSEMITE INTL	CA	LPV	0	1	0	1	75	0.998396
HAF	HALF MOON BAY	CA	LPV	0	1	0	1	102	0.986938
HHR	HAWTHORNE JACK NORTHROP FIELD	CA	LPV	0	1	0	1	2	0.999943
HWD	HAYWARD EXECUTIVE	CA	LPV	0	1	0	1	99	0.989376
LAX	LOS ANGELES INTL	CA	LPV	0	1	0	1	2	0.999943
LGB	LONG BEACH DAUGHERTY FIELD	CA	LPV	0	1	0	1	2	0.999943
LHM	LINCOLN RGNL KARL HARDER FIELD	CA	LPV200	0	1	0	1	89	0.995988
LLR	LITTLE RIVER	CA	LP	0	1	0	1	99	0.987391
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	1	0	1	94	0.99389
LVK	LIVERMORE MUNICIPAL	CA	LPV	0	1	0	1	98	0.991172
MAE	MADERA MUNICIPAL	CA	LPV	0	1	0	1	80	0.997139
MCE	MERCED RGNL MACREADY FIELD	CA	LPV	0	1	0	1	90	0.995758
MER	CASTLE	CA	LPV200	0	1	0	1	91	0.99589
MHR	SACRAMENTO MATHER	CA	LPV200	0	1	0	1	91	0.995528
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	1	0	1	76	0.999
MOD	MODESTO CITY-CO HARRY SHAM FIELD	CA	LPV	0	1	0	1	93	0.99469
MRY	MONTEREY PENINSULA	CA	LPV	0	1	0	1	101	0.988976
MYF	MONTGOMERY FIELD	CA	LPV200	0	1	0	1	2	0.999943
MYV	YUBA COUNTY	CA	LPV200	0	1	0	1	92	0.995739
O02	NERVINO	CA	LPV	0	1	0	1	38	0.999547
O27	OAKDALE	CA	LPV	0	1	0	1	90	0.995897
O69	PETALUMA MUNICIPAL	CA	LPV	0	1	0	1	99	0.988821
O88	RIO VISTA MUNICIPAL	CA	LP	0	1	0	1	97	0.993407
OAK	METROPOLITAN OAKLAND INTL	CA	LPV	0	1	0	1	99	0.9891
ONT	ONTARIO INTL	CA	LPV	0	1	0	1	2	0.999943
OVE	OROVILLE MUNICIPAL	CA	LPV	0	1	0	1	91	0.997169
OXR	OXNARD	CA	LPV	0	1	0	1	94	0.997886

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
PMD	PALMDALE USAF PLANT 42	CA	LPV200	0	1	0	1	2	0.999943
POC	BRACKETT FIELD	CA	LPV	0	1	0	1	2	0.999943
PRB	PASO ROBLES MUNICIPAL	CA	LPV200	0	1	0	1	97	0.993388
PVF	PLACERVILLE	CA	LPV	0	1	0	1	80	0.997747
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	1	0	1	2	0.999943
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	1	0	1	93	0.996649
RDD	REDDING MUNICIPAL	CA	LPV	0	1	0	1	92	0.996947
RHV	REID HILLVIEW OF SANTA CLARA	CA	LPV	0	1	0	1	98	0.990085
SAC	SACRAMENTO EXECUTIVE	CA	LPV200	0	1	0	1	94	0.994773
SAN	SAN DIEGO INTL	CA	LP	0	1	0	1	3	0.999936
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	1	1	0.999996	95	0.99512
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	0	1	0	1	99	0.992203
SCK	STOCKTON METROPOLITAN	CA	LPV	0	1	0	1	93	0.994226
SEE	GILLESPIE FIELD	CA	LP	0	1	0	1	2	0.999943
SFO	SAN FRANCISCO INTL	CA	LPV	0	1	0	1	99	0.98816
SJC	NORMAN Y. MINETA SAN JOSE INTL	CA	LPV	0	1	0	1	99	0.989885
SMF	SACRAMENTO INTL	CA	LPV200	0	1	0	1	96	0.994833
SMX	SANTA MARIA PUBLIC CAPT G ALLAN HANCOCK FIELD	CA	LPV200	0	1	1	0.999996	105	0.992391
SNA	JOHN WAYNE ORANGE COUNTY	CA	LPV	0	1	0	1	2	0.999943
SNS	SALINAS MUNICIPAL	CA	LPV200	0	1	0	1	97	0.990138
STS	CHARLES M. SCHULZ SONOMA COUNTY	CA	LPV	0	1	0	1	98	0.989134
TCY	TRACY MUNICIPAL	CA	LPV	0	1	0	1	96	0.992569
TOA	ZAMPERINI FIELD	CA	LPV200	0	1	0	1	2	0.999943
VCB	NUT TREE	CA	LPV	0	1	0	1	97	0.992712
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	1	0	1	2	0.999943
VIS	VISALIA MUNICIPAL	CA	LPV200	0	1	0	1	69	0.998845
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	1	0	1	2	0.999943
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	1	0	1	97	0.994456
ALS	SAN LUIS VALLEY RGNL BERGMAN FIELD	CO	LPV200	0	1	0	1	0	1
APA	CENTENNIAL	CO	LPV200	0	1	0	1	0	1
BJC	ROCKY MOUNTAIN METROPOLITAN	CO	LPV200	0	1	0	1	0	1
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	1	0	1	0	1
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	0	1	0	1	0	1
DEN	DENVER INTL	CO	LPV200	0	1	0	1	0	1
DRO	DURANGO LA PLATA COUNTY	CO	LPV200	0	1	0	1	0	1
FMM	FORT MORGAN MUNICIPAL	CO	LP	0	1	0	1	0	1
FNL	FORT COLLINS LOVELAND MUNICIPAL	CO	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
FTG	FRONT RANGE	CO	LPV200	0	1	0	1	0	1
GJT	GRAND JUNCTION RGNL	CO	LPV200	0	1	0	1	0	1
GXY	GREELEY-WELD COUNTY	CO	LPV	0	1	0	1	0	1
HDN	YAMPA VALLEY	CO	LPV	0	1	0	1	0	1
ITR	KIT CARSON COUNTY	CO	LPV	0	1	0	1	0	1
LAA	LAMAR MUNICIPAL	CO	LPV	0	1	0	1	0	1
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	1	0	1	0	1
MTJ	MONTROSE RGNL	CO	LPV	0	1	0	1	0	1
PUB	PUEBLO MEMORIAL	CO	LPV200	0	1	0	1	0	1
RIL	GARFIELD COUNTY RGNL	CO	LPV	0	1	0	1	0	1
STK	STERLING MUNICIPAL	CO	LPV	0	1	0	1	0	1
TEX	TELLURIDE RGNL	CO	LP	0	1	0	1	0	1
BDL	BRADLEY INTL	CT	LPV200	0	1	0	1	0	1
GON	GROTON-NEW LONDON	CT	LPV	0	1	0	1	0	1
HVN	TWEED-NEW HAVEN	CT	LPV	0	1	0	1	0	1
IJD	WINDHAM	CT	LP	0	1	0	1	0	1
OXC	WATERBURY-OXFORD	CT	LPV	0	1	0	1	0	1
DCA	RONALD REAGAN WASHINGTON NATL	DC	LPV	0	1	0	1	0	1
HEF	MANASSAS RGNL HARRY P. DAVIS FIELD	DC	LPV	0	1	0	1	0	1
IAD	WASHINGTON DULLES INTL	DC	LPV200	0	1	0	1	0	1
33N	DELAWARE AIRPARK	DE	LP	0	1	0	1	0	1
EVY	SUMMIT	DE	LPV	0	1	0	1	0	1
GED	SUSSEX COUNTY	DE	LPV	0	1	0	1	0	1
ILG	NEW CASTLE	DE	LPV	0	1	0	1	0	1
1J0	TRI-COUNTY	FL	LP	0	1	0	1	0	1
28J	PALATKA MUNICIPAL ARPT	FL	LPV	0	1	0	1	0	1
40J	PERRY-FOLEY	FL	LPV	0	1	0	1	0	1
54J	DEFUNIAK SPRINGS	FL	LP	0	1	0	1	0	1
AAF	APALACHICOLA MUNICIPAL	FL	LPV	0	1	0	1	0	1
APF	NAPLES MUNICIPAL	FL	LPV	0	1	0	1	5	0.999902
AVO	AVON PARK EXECUTIVE	FL	LPV	0	1	0	1	3	0.999962
BCT	BOCA RATON	FL	LPV	0	1	0	1	9	0.999698
BKV	HERNANDO COUNTY	FL	LPV	0	1	0	1	0	1
BOW	BARTOW MUNICIPAL	FL	LPV	0	1	0	1	0	1
CEW	BOB SIKES	FL	LPV	0	1	0	1	0	1
CHN	WAUCHULA MUNICIPAL	FL	LP	0	1	0	1	0	1
COI	MERRITT ISLAND	FL	LPV	0	1	0	1	3	0.999962
CRG	CRAIG MUNICIPAL	FL	LPV200	0	1	0	1	0	1
CTY	CROSS CITY	FL	LPV	0	1	0	1	0	1
DAB	DAYTONA BEACH INTL	FL	LPV200	0	1	0	1	0	1
DED	DELAND MUNICIPAL SIDNEY H TAYLOR FIELD	FL	LPV	0	1	0	1	0	1
DTS	DESTIN FORT WALTON BEACH	FL	LP	0	1	0	1	0	1
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	1	0	1	0	1
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	1	0	1	0	1
EYW	KEY WEST INTL	FL	LPV	0	1	0	1	7	0.999747

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
F45	NORTH PALM BEACH COUNTY GENERAL AVIATION	FL	LPV	0	1	0	1	9	0.999736
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	1	0	1	0	1
FLL	FORT LAUDERDALE HOLLYWOOD INTL	FL	LPV	0	1	0	1	11	0.99963
FMY	PAGE FIELD	FL	LPV	0	1	0	1	4	0.999962
FPR	ST LUCIE COUNTY INTL	FL	LPV	0	1	0	1	7	0.999875
FXE	FT LAUDERDALE EXECUTIVE	FL	LPV200	0	1	0	1	10	0.999649
GIF	WINTER HAVEN'S GILBERT	FL	LPV	0	1	0	1	1	0.999996
GNV	GAINESVILLE RGNL	FL	LPV	0	1	0	1	0	1
HEG	HERLONG RECREATIONAL	FL	LP	0	1	0	1	0	1
IMM	IMMOKALEE RGNL	FL	LPV	0	1	0	1	4	0.999932
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	1	0	1	2	0.999981
JAX	JACKSONVILLE INTL	FL	LPV200	0	1	0	1	0	1
LAL	LAKELAND LINDER RGNL	FL	LPV200	0	1	0	1	0	1
LCQ	LAKE CITY MUNICIPAL	FL	LPV	0	1	0	1	0	1
LEE	LEESBURG INTL	FL	LPV	0	1	0	1	0	1
MCO	ORLANDO INTL	FL	LPV200	0	1	0	1	2	0.999962
MIA	MIAMI INTL	FL	LPV	0	1	0	1	11	0.999604
MKY	MARCO ISLAND	FL	LPV	0	1	0	1	6	0.999875
MLB	MELBOURNE INTL	FL	LPV200	0	1	0	1	4	0.999928
MTH	THE FLORIDA KEYS MARATHON	FL	LPV	0	1	0	1	14	0.999373
OBE	OKEECHOBEE COUNTY	FL	LPV	0	1	0	1	8	0.999834
OCF	OCALA INTL JIM TAYLOR FIELD	FL	LPV200	0	1	0	1	0	1
OPF	OPA LOCKA EXECUTIVE	FL	LPV200	0	1	0	1	11	0.999615
ORL	EXECUTIVE	FL	LPV200	0	1	0	1	2	0.999992
PBI	PALM BEACH INTL	FL	LPV200	0	1	0	1	9	0.999721
PCM	PLANT CITY MUNICIPAL	FL	LPV	0	1	0	1	0	1
PGD	PUNTA GORDA	FL	LPV200	0	1	0	1	2	0.999992
PHK	PALM BEACH COUNTY GLADES	FL	LPV	0	1	0	1	9	0.99974
PIE	ST PETERSBURG-CLEARWATER INTL	FL	LPV200	0	1	0	1	0	1
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	1	0	1	10	0.999657
PNS	PENSACOLA RGNL	FL	LPV200	0	1	0	1	0	1
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	1	0	1	5	0.999974
SEF	SEBRING RGNL	FL	LPV	0	1	0	1	3	0.999951
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	1	0	1	0	1
SGJ	ST AUGUSTINE	FL	LPV	0	1	0	1	0	1
SRQ	SARASOTA BRADENTON INTL	FL	LPV200	0	1	0	1	1	0.999996
SUA	WITHAM FIELD	FL	LPV	0	1	0	1	8	0.999815
TIX	SPACE COAST RGNL	FL	LPV200	0	1	0	1	3	0.999977
TLH	TALLAHASSEE RGNL	FL	LPV200	0	1	0	1	0	1
TMB	KENDALL TAMIAMI EXECUTIVE	FL	LPV200	0	1	0	1	11	0.999524

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
TPA	TAMPA INTL	FL	LPV200	0	1	0	1	0	1
TPF	PETER O KNIGHT	FL	LP	0	1	0	1	0	1
VDF	TAMPA EXECUTIVE	FL	LPV	0	1	0	1	0	1
VNC	VENICE MUNICIPAL	FL	LP	0	1	0	1	2	0.999977
VQQ	CECIL FIELD	FL	LPV	0	1	0	1	0	1
VRB	VERO BEACH MUNICIPAL	FL	LPV200	0	1	0	1	6	0.999913
X07	LAKE WALES MUNICIPAL	FL	LP	0	1	0	1	3	0.999974
X14	LA BELLE MUNICIPAL	FL	LPV	0	1	0	1	4	0.999955
X26	SEBASTIAN MUNICIPAL	FL	LP	0	1	0	1	4	0.999925
X35	MARION CO & PARK OF COMMERCE	FL	LP	0	1	0	1	0	1
X51	HOMESTEAD GENERAL AVIATION	FL	LPV	0	1	0	1	11	0.999566
XFL	FLAGLER COUNTY	FL	LPV	0	1	0	1	0	1
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	1	0	1	0	1
09J	JEKYLL ISLAND	GA	LPV200	0	1	0	1	0	1
15J	COOK COUNTY	GA	LPV	0	1	0	1	0	1
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	1	0	1	0	1
18A	FRANKLIN COUNTY	GA	LPV	0	1	0	1	0	1
19A	JACKSON COUNTY	GA	LPV	0	1	0	1	0	1
2J5	MILLEN	GA	LPV	0	1	0	1	0	1
3J7	GREENE COUNTY RGNL	GA	LPV	0	1	0	1	0	1
48A	COCHRAN	GA	LPV	0	1	0	1	0	1
4A4	POLK COUNTY AIRPORT CORNELIUS MOORE FIELD	GA	LPV	0	1	0	1	0	1
4J1	BRANTLEY COUNTY	GA	LPV	0	1	0	1	0	1
4J6	ST MARYS	GA	LPV	0	1	0	1	0	1
52A	MADISON MUNICIPAL	GA	LP	0	1	0	1	0	1
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	0	1	0	1	0	1
70J	CAIRO-GRADY COUNTY	GA	LPV	0	1	0	1	0	1
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	0	1	0	1	0	1
ACJ	JIMMY CARTER RGNL	GA	LPV	0	1	0	1	0	1
AGS	AUGUSTA RGNL AT BUSH FIELD	GA	LPV200	0	1	0	1	0	1
AHN	ATHENS/BEN EPPS	GA	LPV	0	1	0	1	0	1
AJR	HABERSHAM COUNTY	GA	LPV	0	1	0	1	0	1
ATL	HARTSFIELD - JACKSON ATLANTA INTL	GA	LPV200	0	1	0	1	0	1
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	1	0	1	0	1
BGE	DECATUR COUNTY INDUSTRIAL AIR PARK	GA	LPV200	0	1	0	1	0	1
BHC	BAXLEY MUNICIPAL	GA	LPV	0	1	0	1	0	1
BIJ	EARLY COUNTY	GA	LPV	0	1	0	1	0	1
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	1	0	1	0	1
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	1	0	1	0	1
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	1	0	1	0	1
CNI	CHEROKEE COUNTY	GA	LPV	0	1	0	1	0	1
CSG	COLUMBUS METROPOLITAN	GA	LPV	0	1	0	1	0	1
CTJ	WEST GEORGIA RGNL O V GRAY FIELD	GA	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CVC	COVINGTON MUNICIPAL	GA	LPV	0	1	0	1	0	1
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	1	0	1	0	1
D73	MONROE-WALTON COUNTY	GA	LP	0	1	0	1	0	1
DNN	DALTON MUNICIPAL	GA	LPV	0	1	0	1	0	1
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	1	0	1	0	1
EZM	HEART OF GEORGIA RGNL	GA	LPV	0	1	0	1	0	1
FFC	ATLANTA RGNL FALCON FIELD	GA	LPV200	0	1	0	1	0	1
FTY	FULTON COUNTY AIRPORT-BROWN FIELD	GA	LPV	0	1	0	1	0	1
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	1	0	1	0	1
GVL	LEE GILMER MEMORIAL	GA	LPV	0	1	0	1	0	1
HOE	HOMERVILLE	GA	LPV	0	1	0	1	0	1
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	1	0	1	0	1
IIY	WASHINGTON WILKES COUNTY	GA	LPV	0	1	0	1	0	1
JES	JESUP-WAYNE COUNTY	GA	LPV	0	1	0	1	0	1
JYL	PLANTATION ARPK	GA	LPV	0	1	0	1	0	1
JZP	PICKENS COUNTY	GA	LPV	0	1	0	1	0	1
LGC	LAGRANGE-CALLAWAY	GA	LPV200	0	1	0	1	0	1
LZU	GWINNETT COUNTY BRISCOE FIELD	GA	LPV200	0	1	0	1	0	1
MAC	MACON DOWNTOWN	GA	LP	0	1	0	1	0	1
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	0	1	0	1	0	1
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	1	0	1	0	1
MLJ	BALDWIN COUNTY	GA	LPV	0	1	0	1	0	1
MQW	TELFAIR-WHEELER	GA	LPV	0	1	0	1	0	1
OKZ	KAOLIN FIELD	GA	LPV	0	1	0	1	0	1
OPN	THOMASTON UPSON COUNTY	GA	LPV200	0	1	0	1	0	1
PIM	HARRIS COUNTY	GA	LPV	0	1	0	1	0	1
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	1	0	1	0	1
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	1	0	1	0	1
RMG	RICHARD B RUSSELL	GA	LPV	0	1	0	1	0	1
RVJ	SWINTON SMITH FLD AT REIDSVILLE MUNICIPAL	GA	LP	0	1	0	1	0	1
RYY	COBB COUNTY MC COLLUM FIELD	GA	LPV200	0	1	0	1	0	1
SAV	SAVANNAH HILTON HEAD INTL	GA	LPV200	0	1	0	1	0	1
SBO	EAST GEORGIA REGIONAL	GA	LPV	0	1	0	1	0	1
TBR	STATESBORO BULLOCH COUNTY	GA	LPV	0	1	0	1	0	1
TMA	HENRY TIFTON MYERS	GA	LPV	0	1	0	1	0	1
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	0	1	0	1	0	1
TVI	THOMASVILLE RGNL	GA	LPV	0	1	0	1	0	1
VDI	VIDALIA RGNL	GA	LPV	0	1	0	1	0	1
VLD	VALDOSTA RGNL	GA	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
VPC	CARTERSVILLE	GA	LPV	0	1	0	1	0	1
WDR	WINDER-BARROW	GA	LPV	0	1	0	1	0	1
AIO	ATLANTIC MUNICIPAL	IA	LPV	0	1	0	1	0	1
ALO	WATERLOO RGNL	IA	LPV	0	1	0	1	0	1
AMW	AMES MUNICIPAL	IA	LPV	0	1	0	1	0	1
AWG	WASHINGTON MUNICIPAL	IA	LPV200	0	1	0	1	0	1
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	0	1	0	1	0	1
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	0	1	0	1	0	1
CID	THE EASTERN IOWA	IA	LPV200	0	1	0	1	0	1
CIN	ARTHUR N NEU	IA	LPV	0	1	0	1	0	1
CKP	CHEROKEE COUNTY RGNL	IA	LPV	0	1	0	1	0	1
CSQ	CRESTON MUNICIPAL	IA	LPV	0	1	0	1	0	1
CWI	CLINTON MUNICIPAL	IA	LPV200	0	1	0	1	0	1
DBQ	DUBUQUE RGNL	IA	LPV200	0	1	0	1	0	1
DEH	DECORAH MUNICIPAL	IA	LPV	0	1	0	1	0	1
DNS	DENISON MUNICIPAL	IA	LPV	0	1	0	1	0	1
DSM	DES MOINES INTL	IA	LPV	0	1	0	1	0	1
DVN	DAVENPORT MUNICIPAL	IA	LPV200	0	1	0	1	0	1
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	0	1	0	1	0	1
EFW	JEFFERSON MUNICIPAL	IA	LPV	0	1	0	1	0	1
EOK	KEOKUK MUNICIPAL	IA	LPV	0	1	0	1	0	1
EST	ESTHERVILLE MUNICIPAL	IA	LPV	0	1	0	1	0	1
FFL	FAIRFIELD MUNICIPAL	IA	LPV	0	1	0	1	0	1
FOD	FORT DODGE RGNL	IA	LPV200	0	1	0	1	0	1
FXY	FOREST CITY MUNICIPAL	IA	LPV	0	1	0	1	0	1
GGI	GRINNELL RGNL	IA	LPV	0	1	0	1	0	1
I75	OSCEOLA MUNICIPAL	IA	LPV	0	1	0	1	0	1
ICL	SCHENCK FIELD	IA	LPV	0	1	0	1	0	1
IIB	INDEPENDENCE MUNICIPAL	IA	LP	0	1	0	1	0	1
IKV	ANKENY RGNL	IA	LPV	0	1	0	1	0	1
IOW	IOWA CITY MUNICIPAL	IA	LPV	0	1	0	1	0	1
LRJ	LE MARS MUNICIPAL	IA	LPV	0	1	0	1	0	1
MCW	MASON CITY MUNICIPAL	IA	LPV200	0	1	0	1	0	1
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	0	1	0	1	0	1
MUT	MUSCATINE MUNICIPAL	IA	LPV	0	1	0	1	0	1
MXO	MONTICELLO RGNL	IA	LP	0	1	0	1	0	1
OOA	OSKALOOSA MUNICIPAL	IA	LPV	0	1	0	1	0	1
OTM	OTTUMWA RGNL	IA	LPV	0	1	0	1	0	1
OXV	KNOXVILLE MUNICIPAL	IA	LPV	0	1	0	1	0	1
PEA	PELLA MUNICIPAL	IA	LPV	0	1	0	1	0	1
POH	POCAHONTAS MUNICIPAL	IA	LPV	0	1	0	1	0	1
PRO	PERRY MUNICIPAL	IA	LPV200	0	1	0	1	0	1
RDK	RED OAK MUNICIPAL	IA	LPV	0	1	0	1	0	1
SDA	SHENANDOAH MUNICIPAL	IA	LPV	0	1	0	1	0	1
SHL	SHELDON MUNICIPAL	IA	LPV	0	1	0	1	0	1
SKI	SAC CITY MUNICIPAL	IA	LPV	0	1	0	1	0	1
SLB	STORM LAKE MUNICIPAL	IA	LPV	0	1	0	1	0	1
SPW	SPENCER MUNICIPAL	IA	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
SUX	SIOUX GATEWAY COL BUD DAY FIELD	IA	LPV200	0	1	0	1	0	1
TNU	NEWTON MUNICIPAL	IA	LPV	0	1	0	1	0	1
TVK	CENTERVILLE MUNICIPAL	IA	LPV	0	1	0	1	0	1
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	0	1	0	1	0	1
VTI	VINTON VETERANS MEMORIAL ARPK	IA	LPV	0	1	0	1	0	1
BOI	BOISE AIR TERMINAL GOWEN FIELD	ID	LPV	0	1	0	1	0	1
COE	PAPPY BOYINGTON FIELD	ID	LPV200	0	1	0	1	0	1
DIJ	DRIGGS-REED MEMORIAL	ID	LP	0	1	0	1	0	1
EUL	CALDWELL INDUSTRIAL	ID	LPV	0	1	0	1	0	1
GNG	GOODING MUNICIPAL	ID	LPV	0	1	0	1	0	1
IDA	IDAHO FALLS RGNL	ID	LPV200	0	1	0	1	0	1
JER	JEROME COUNTY	ID	LPV	0	1	0	1	0	1
LWS	LEWISTON NEZ PERCE COUNTY	ID	LPV200	0	1	0	1	0	1
MAN	NAMPA MUNICIPAL	ID	LPV	0	1	0	1	0	1
MYL	MC CALL MUNICIPAL	ID	LPV	0	1	0	1	0	1
PIH	POCATELLO RGNL	ID	LPV200	0	1	0	1	0	1
TWF	JOSLIN FIELD MAGIC VALLEY RGNL	ID	LPV200	0	1	0	1	0	1
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	0	1	0	1	0	1
3LF	LITCHFIELD MUNICIPAL	IL	LPV	0	1	0	1	0	1
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	0	1	0	1	0	1
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	0	1	0	1	0	1
ALN	ST LOUIS RGNL	IL	LPV200	0	1	0	1	0	1
ARR	AURORA MUNICIPAL	IL	LPV200	0	1	0	1	0	1
BLV	SCOTT AFB/MIDAMERICA	IL	LPV200	0	1	0	1	0	1
BMI	CENTRAL IL REGL ARPT AT BLOOMINGTON-NORMAL	IL	LPV	0	1	0	1	0	1
C15	PEKIN MUNICIPAL	IL	LPV	0	1	0	1	0	1
C73	DIXON MUNICIPAL CHARLES R. WALGREEN FLD	IL	LPV	0	1	0	1	0	1
CMI	UNIVERSITY OF ILLINOIS WILLARD	IL	LPV200	0	1	0	1	0	1
CPS	ST LOUIS DOWNTOWN	IL	LPV200	0	1	0	1	0	1
CUL	CARMI MUNICIPAL	IL	LP	0	1	0	1	0	1
DEC	DECATUR	IL	LPV200	0	1	0	1	0	1
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	0	1	0	1	0	1
DNV	VERMILION COUNTY	IL	LPV	0	1	0	1	0	1
DPA	DUPAGE	IL	LPV200	0	1	0	1	0	1
ENL	CENTRALIA MUNICIPAL	IL	LPV	0	1	0	1	0	1
FEP	ALBERTUS	IL	LPV	0	1	0	1	0	1
FOA	FLORA MUNICIPAL	IL	LPV	0	1	0	1	0	1
GBG	GALESBURG MUNICIPAL	IL	LPV200	0	1	0	1	0	1
HSB	HARRISBURG-RALEIGH	IL	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
I63	MOUNT STERLING MUNICIPAL	IL	LPV	0	1	0	1	0	1
IGQ	LANSING MUNICIPAL	IL	LPV	0	1	0	1	0	1
IKK	GREATER KANKAKEE	IL	LPV	0	1	0	1	0	1
LOT	LEWIS UNIVERSITY	IL	LPV200	0	1	0	1	0	1
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	0	1	0	1	0	1
MDW	CHICAGO MIDWAY INTL	IL	LPV	0	1	0	1	0	1
MLI	QUAD CITY INTL	IL	LPV200	0	1	0	1	0	1
MTO	COLES COUNTY MEMORIAL	IL	LPV	0	1	0	1	0	1
MVN	MOUNT VERNON	IL	LPV	0	1	0	1	0	1
MWA	WILLIAMSON COUNTY RGNL	IL	LPV200	0	1	0	1	0	1
ORD	CHICAGO-O'HARE INTL	IL	LPV200	0	1	0	1	0	1
PIA	GREATER PEORIA RGNL	IL	LPV	0	1	0	1	0	1
PNT	PONTIAC MUNICIPAL	IL	LPV	0	1	0	1	0	1
PWK	CHICAGO EXECUTIVE	IL	LPV	0	1	0	1	0	1
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	0	1	0	1	0	1
RPJ	ROCHELLE MUNICIPAL KORITZ FIELD	IL	LPV200	0	1	0	1	0	1
RSV	ROBINSON MUNICIPAL	IL	LPV	0	1	0	1	0	1
SAR	SPARTA COMMUNITY HUNTER FIELD	IL	LPV	0	1	0	1	0	1
SFY	TRI-TOWNSHIP	IL	LP	0	1	0	1	0	1
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	0	1	0	1	0	1
SQI	WHITESIDE COUNTY JOS J BITTORF FIELD	IL	LPV	0	1	0	1	0	1
UGN	WAUKEGAN RGNL	IL	LPV	0	1	0	1	0	1
UIN	QUINCY RGNL BALDWIN FIELD	IL	LPV200	0	1	0	1	0	1
4I7	PUTNAM COUNTY	IN	LPV	0	1	0	1	0	1
AID	ANDERSON MUNICIPAL DARLINGTON FIELD	IN	LPV	0	1	0	1	0	1
ASW	WARSAW MUNICIPAL	IN	LPV	0	1	0	1	0	1
BAK	COLUMBUS MUNICIPAL	IN	LPV	0	1	0	1	0	1
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	0	1	0	1	0	1
BMG	MONROE COUNTY	IN	LPV200	0	1	0	1	0	1
CEV	METTEL FIELD	IN	LPV	0	1	0	1	0	1
EKM	ELKHART MUNICIPAL	IN	LPV	0	1	0	1	0	1
EVV	EVANSVILLE RGNL	IN	LPV200	0	1	0	1	0	1
EYE	EAGLE CREEK AIRPARK	IN	LPV	0	1	0	1	0	1
FRH	FRENCH LICK MUNICIPAL	IN	LPV	0	1	0	1	0	1
FWA	FORT WAYNE INTL	IN	LPV200	0	1	0	1	0	1
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	0	1	0	1	0	1
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	0	1	0	1	0	1
GSH	GOSHEN MUNICIPAL	IN	LPV	0	1	0	1	0	1
GWB	DE KALB COUNTY	IN	LPV	0	1	0	1	0	1
GYY	GARY CHICAGO INTL	IN	LPV200	0	1	0	1	0	1
HFY	GREENWOOD MUNICIPAL	IN	LPV	0	1	0	1	0	1
HNB	HUNTINGBURG	IN	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
HUF	TERRE HAUTE INTL HULMAN FIELD	IN	LPV200	0	1	0	1	0	1
I22	RANDOLPH COUNTY	IN	LPV	0	1	0	1	0	1
IMS	MADISON MUNICIPAL	IN	LPV	0	1	0	1	0	1
IND	INDIANAPOLIS INTL	IN	LPV	0	1	0	1	0	1
JVY	CLARK RGNL	IN	LPV200	0	1	0	1	0	1
LAF	PURDUE UNIVERSITY	IN	LPV	0	1	0	1	0	1
MCX	WHITE COUNTY	IN	LP	0	1	0	1	0	1
MIE	DELAWARE COUNTY JOHNSON FIELD	IN	LPV	0	1	0	1	0	1
MQJ	MOUNT COMFORT	IN	LPV	0	1	0	1	0	1
MZZ	MARION MUNICIPAL	IN	LPV	0	1	0	1	0	1
OKK	KOKOMO MUNICIPAL	IN	LPV200	0	1	0	1	0	1
OVO	NORTH VERNON	IN	LPV	0	1	0	1	0	1
OXI	STARKE COUNTY	IN	LPV	0	1	0	1	0	1
PLD	PORTLAND MUNICIPAL	IN	LPV	0	1	0	1	0	1
RCR	FULTON COUNTY	IN	LPV	0	1	0	1	0	1
RID	RICHMOND MUNICIPAL	IN	LPV200	0	1	0	1	0	1
RZL	JASPER COUNTY	IN	LPV	0	1	0	1	0	1
SBN	SOUTH BEND RGNL	IN	LPV	0	1	0	1	0	1
SER	FREEMAN MUNICIPAL	IN	LPV	0	1	0	1	0	1
SMD	SMITH FIELD	IN	LPV	0	1	0	1	0	1
TEL	PERRY COUNTY MUNICIPAL	IN	LP	0	1	0	1	0	1
TYQ	INDIANAPOLIS EXECUTIVE	IN	LPV	0	1	0	1	0	1
VPZ	PORTER COUNTY MUNICIPAL	IN	LPV	0	1	0	1	0	1
3AU	AUGUSTA MUNICIPAL	KS	LP	0	1	0	1	0	1
3K3	SYRACUSE HAMILTON COUNTY MUNICIPAL	KS	LPV	0	1	0	1	1	0.999996
AAO	COLONEL JAMES JABARA	KS	LPV	0	1	0	1	0	1
ADT	ATWOOD RAWLINS COUNTY CITY-COUNTY	KS	LPV	0	1	0	1	1	0.99997
ANY	ANTHONY MUNICIPAL	KS	LP	0	1	0	1	0	1
CBK	SHALZ FIELD	KS	LPV	0	1	0	1	1	0.999977
CNK	BLOSSER MUNICIPAL	KS	LP	0	1	0	1	1	0.999996
DDC	DODGE CITY RGNL	KS	LPV	0	1	0	1	0	1
EGT	WELLINGTON MUNICIPAL	KS	LPV	0	1	0	1	0	1
EHA	ELKHART-MORTON COUNTY	KS	LPV	0	1	0	1	0	1
EMP	EMPORIA MUNICIPAL	KS	LPV	0	1	0	1	0	1
EWK	NEWTON-CITY-COUNTY	KS	LPV	0	1	0	1	0	1
FOE	FORBES FIELD	KS	LPV	0	1	0	1	0	1
FSK	FORT SCOTT MUNICIPAL	KS	LPV	0	1	0	1	0	1
GBD	GREAT BEND MUNICIPAL	KS	LPV200	0	1	0	1	1	0.999996
GCK	GARDEN CITY RGNL	KS	LPV	0	1	0	1	1	0.999996
GLD	RENNER FIELD GOODLAND MUNICIPAL	KS	LPV200	0	1	0	1	1	0.999996
HQG	HUGOTON MUNICIPAL	KS	LPV	0	1	0	1	0	1
HUT	HUTCHINSON MUNICIPAL	KS	LPV	0	1	0	1	0	1
HYS	HAYS RGNL	KS	LPV200	0	1	0	1	1	0.999989

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
ICT	WICHITA MID-CONTINENT	KS	LPV200	0	1	0	1	0	1
IDP	INDEPENDENCE MUNICIPAL	KS	LPV	0	1	0	1	0	1
IXD	NEW CENTURY AIRCENTER	KS	LPV	0	1	0	1	0	1
K88	ALLEN COUNTY	KS	LPV	0	1	0	1	0	1
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV	0	1	0	1	0	1
LQR	LARNED PAWNEE CO	KS	LPV	0	1	0	1	1	0.999996
LWC	LAWRENCE MUNICIPAL	KS	LPV200	0	1	0	1	0	1
MHK	MANHATTAN RGNL	KS	LPV200	0	1	0	1	0	1
MPR	MCPHERSON	KS	LPV	0	1	0	1	0	1
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	0	1	0	1	0	1
NRN	NORTON MUNICIPAL	KS	LPV	0	1	0	1	2	0.999962
OEL	OAKLEY MUNICIPAL	KS	LPV	0	1	0	1	1	0.999985
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	0	1	0	1	0	1
OWI	OTTAWA MUNICIPAL	KS	LP	0	1	0	1	0	1
PPF	TRI-CITY	KS	LPV	0	1	0	1	0	1
PTS	ATKINSON MUNICIPAL	KS	LPV	0	1	0	1	0	1
PTT	PRATT INDUSTRIAL	KS	LPV	0	1	0	1	0	1
RPB	BELLEVILLE MUNICIPAL	KS	LPV	0	1	0	1	0	1
RSL	RUSSELL MUNICIPAL	KS	LPV	0	1	0	1	1	0.999985
SLN	SALINA MUNICIPAL	KS	LPV	0	1	0	1	0	1
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV200	0	1	0	1	0	1
TQK	SCOTT CITY MUNICIPAL	KS	LPV	0	1	0	1	1	0.999992
UKL	COFFEY COUNTY	KS	LPV	0	1	0	1	0	1
ULS	ULYSSES	KS	LPV	0	1	0	1	0	1
27K	GEORGETOWN SCOTT CO MARSHALL FIELD	KY	LPV200	0	1	0	1	0	1
2I0	MADISONVILLE MUNICIPAL	KY	LPV	0	1	0	1	0	1
6I2	LEBANON-SPRINGFIELD	KY	LP	0	1	0	1	0	1
7K4	OHIO COUNTY	KY	LPV	0	1	0	1	0	1
AAS	TAYLOR COUNTY	KY	LP	0	1	0	1	0	1
BRY	SAMUELS FIELD	KY	LPV	0	1	0	1	0	1
BWG	BOWLING GREEN WARREN CTY RGNL	KY	LPV	0	1	0	1	0	1
BYL	WILLIAMSBURG WHITLEY COUNTY	KY	LPV	0	1	0	1	0	1
CEY	KYLE-OAKLEY FIELD	KY	LPV	0	1	0	1	0	1
CPF	WENDELL H FORD	KY	LPV200	0	1	0	1	0	1
CVG	CINCINNATI NORTHERN KENTUCKY INTL	KY	LPV200	0	1	0	1	0	1
DVK	STUART POWELL FIELD	KY	LPV	0	1	0	1	0	1
DWU	ASHLAND RGNL	KY	LP	0	1	0	1	0	1
EHR	HENDERSON CITY-COUNTY	KY	LPV	0	1	0	1	0	1
EKX	ADDINGTON FIELD	KY	LPV	0	1	0	1	0	1
FGX	FLEMING-MASON	KY	LPV	0	1	0	1	0	1
GLW	GLASGOW MUNICIPAL	KY	LPV	0	1	0	1	0	1
HVC	HOPKINSVILLE CHRISTIAN COUNTY	KY	LPV	0	1	0	1	0	1
I39	MADISON	KY	LPV200	0	1	0	1	0	1
K22	BIG SANDY RGNL	KY	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
KY8	HANCOCK CO RON LEWIS FIELD	KY	LPV	0	1	0	1	0	1
LEX	BLUE GRASS	KY	LPV	0	1	0	1	0	1
LOU	BOWMAN FIELD	KY	LPV	0	1	0	1	0	1
LOZ	LONDON-CORBIN ARPT MAGEE FIELD	KY	LPV	0	1	0	1	0	1
M21	MUHLENBERG COUNTY	KY	LP	0	1	0	1	0	1
M97	MOREHEAD-ROWAN COUNTY CLYDE A THOMAS RGNL	KY	LPV	0	1	0	1	0	1
OWB	OWENSBORO DAVIESS COUNTY	KY	LPV200	0	1	0	1	0	1
PAH	BARKLEY RGNL	KY	LPV	0	1	0	1	0	1
SDF	LOUISVILLE INTL STANDIFORD FIELD	KY	LPV200	0	1	0	1	0	1
SME	LAKE CUMBERLAND RGNL	KY	LPV	0	1	0	1	0	1
TWT	STURGIS MUNICIPAL	KY	LPV	0	1	0	1	0	1
TZV	TOMPKINSVILLE MONROE COUNTY	KY	LPV	0	1	0	1	0	1
1L0	ST JOHN THE BAPTIST PARISH	LA	LPV	0	1	0	1	0	1
3R4	HART	LA	LPV	0	1	0	1	0	1
ACP	ALLEN PARISH	LA	LPV	0	1	0	1	0	1
AEX	ALEXANDRIA INTL	LA	LPV200	0	1	0	1	0	1
ARA	ACADIANA RGNL	LA	LPV	0	1	0	1	0	1
BQP	MOREHOUSE MEMORIAL	LA	LPV	0	1	0	1	0	1
BTR	BATON ROUGE METRO	LA	LPV200	0	1	0	1	0	1
BXA	GEORGE R CARR MEMORIAL AIR FIELD	LA	LPV	0	1	0	1	0	1
CWF	CHENNAULT INTL	LA	LPV200	0	1	0	1	0	1
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	1	0	1	0	1
ESF	ESLER RGNL	LA	LPV200	0	1	0	1	0	1
F88	JONESBORO	LA	LP	0	1	0	1	0	1
GAO	SOUTH LAFOURCHE LEONARD MILLER JR	LA	LPV	0	1	0	1	0	1
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	1	0	1	0	1
HUM	HOUMA-TERREBONNE	LA	LPV200	0	1	0	1	0	1
HZR	FALSE RIVER RGNL	LA	LPV	0	1	0	1	0	1
IER	NATCHITOCHES RGNL	LA	LPV	0	1	0	1	0	1
IYA	ABBEVILLE CHRIS CRUSTA MEML	LA	LPV	0	1	0	1	0	1
L38	LOUISIANA RGNL	LA	LPV	0	1	0	1	0	1
L39	LEESVILLE	LA	LPV	0	1	0	1	0	1
LCH	LAKE CHARLES RGNL	LA	LPV200	0	1	0	1	0	1
LFT	LAFAYETTE RGNL	LA	LPV	0	1	0	1	0	1
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	0	1	0	1	0	1
MLU	MONROE RGNL	LA	LPV200	0	1	0	1	0	1
MSY	LOUIS ARMSTRONG NEW ORLEANS INTL	LA	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
NEW	LAKEFRONT	LA	LPV	0	1	0	1	0	1
OPL	ST LANDRY PARISH AHART FIELD	LA	LPV	0	1	0	1	0	1
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	0	1	0	1	0	1
RSN	RUSTON RGNL AIRPORT	LA	LPV	0	1	0	1	0	1
SHV	SHREVEPORT RGNL	LA	LPV200	0	1	0	1	0	1
SPH	SPRINGHILL	LA	LPV	0	1	0	1	0	1
TVR	VICKSBURG TALLULAH RGNL	LA	LPV	0	1	0	1	0	1
UXL	SOUTHLAND FIELD	LA	LPV	0	1	0	1	0	1
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	0	1	0	1	0	1
ACK	NANTUCKET MEMORIAL	MA	LPV200	0	1	0	1	0	1
BAF	BARNES MUNICIPAL	MA	LPV	0	1	0	1	0	1
BED	LAURENCE G HANSCOM FLD	MA	LPV200	0	1	0	1	0	1
BOS	GEN EDWARD LAWRENCE LOGAN INTL	MA	LPV200	0	1	0	1	0	1
BVY	BEVERLY MUNICIPAL	MA	LPV	0	1	0	1	0	1
EWB	NEW BEDFORD RGNL	MA	LP	0	1	0	1	0	1
GBR	WALTER J KOLADZA	MA	LP	0	1	0	1	0	1
HYA	BARNSTABLE MUNICIPAL BOARDMAN/POLANDO FIELD	MA	LPV200	0	1	0	1	0	1
LWM	LAWRENCE MUNICIPAL	MA	LPV200	0	1	0	1	0	1
MVY	MARTHAS VINEYARD	MA	LPV200	0	1	0	1	0	1
ORE	ORANGE MUNICIPAL	MA	LPV	0	1	0	1	0	1
ORH	WORCESTER RGNL	MA	LPV200	0	1	0	1	0	1
OWD	NORWOOD MEMORIAL	MA	LPV	0	1	0	1	0	1
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	0	1	0	1	0	1
2G4	GARRETT COUNTY	MD	LPV	0	1	0	1	0	1
2W6	ST. MARY'S COUNTY RGNL	MD	LPV	0	1	0	1	0	1
BWI	BALTIMORE WASHINGTON INTL THURGOOD MARSHALL	MD	LPV200	0	1	0	1	0	1
CBE	GREATER CUMBERLAND RGNL	MD	LP	0	1	0	1	0	1
DMW	CARROLL COUNTY REGNL JACK B POAGE FIELD	MD	LPV200	0	1	0	1	0	1
ESN	EASTON/NEWNAM FIELD	MD	LPV	0	1	0	1	0	1
FDK	FREDERICK MUNICIPAL	MD	LPV	0	1	0	1	0	1
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	0	1	0	1	0	1
HGR	HAGERSTOWN RGNL RICHARD A HENSON FIELD	MD	LPV200	0	1	0	1	0	1
MTN	MARTIN STATE	MD	LPV	0	1	0	1	0	1
OXB	OCEAN CITY MUNICIPAL	MD	LPV	0	1	0	1	0	1
SBY	SALISBURY OCEAN CITY WICOMICO RGNL	MD	LPV200	0	1	0	1	0	1
1B0	DEXTER RGNL	ME	LP	0	1	0	1	0	1
81B	OXFORD COUNTY RGNL	ME	LP	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
AUG	AUGUSTA STATE	ME	LPV200	0	1	0	1	0	1
BGR	BANGOR INTL	ME	LPV	0	1	0	1	0	1
BHB	HANCOCK COUNTY BAR HARBOR	ME	LPV200	0	1	0	1	0	1
BXM	BRUNSWICK EXECUTIVE	ME	LPV	0	1	0	1	0	1
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV	0	1	0	1	0	1
HUL	HOULTON INTL	ME	LP	0	1	0	1	0	1
LEW	AUBURN LEWISTON MUNICIPAL	ME	LPV200	0	1	0	1	0	1
MLT	MILLINOCKET MUNICIPAL	ME	LPV	0	1	0	1	0	1
PQI	NORTHERN MAINE RGNL ARPT AT PRESQUE IS	ME	LPV200	0	1	0	1	0	1
PWM	PORTLAND INTL JETPORT	ME	LPV200	0	1	0	1	0	1
RKD	KNOX COUNTY RGNL	ME	LPV	0	1	0	1	0	1
SFM	SANFORD RGNL	ME	LPV200	0	1	0	1	0	1
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	0	1	0	1	0	1
77G	MARLETTE	MI	LPV	0	1	0	1	0	1
9D9	HASTINGS	MI	LP	0	1	0	1	0	1
ACB	ANTRIM COUNTY	MI	LPV	0	1	0	1	0	1
ADG	LENAWEE COUNTY	MI	LPV	0	1	0	1	0	1
AMN	GRATIOT COMMUNITY	MI	LPV	0	1	0	1	0	1
ANJ	SAULT STE MARIE MUNICIPAL SANDERSON FIELD	MI	LPV	0	1	0	1	0	1
APN	ALPENA COUNTY RGNL	MI	LPV	0	1	0	1	0	1
ARB	ANN ARBOR MUNICIPAL	MI	LPV	0	1	0	1	0	1
AZO	KALAMAZOO BATTLE CREEK INTL	MI	LPV	0	1	0	1	0	1
BAX	HURON COUNTY MEMORIAL	MI	LPV	0	1	0	1	0	1
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	0	1	0	1	0	1
BIV	TULIP CITY	MI	LPV	0	1	0	1	0	1
BTL	W K KELLOGG	MI	LPV200	0	1	0	1	0	1
CAD	WEXFORD COUNTY	MI	LPV200	0	1	0	1	0	1
CIU	CHIPPEWA COUNTY INTL	MI	LPV	0	1	0	1	0	1
CMX	HOUGHTON COUNTY MEMORIAL	MI	LPV	0	1	0	1	1	0.999966
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	0	1	0	1	0	1
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	0	1	0	1	0	1
DTW	DETROIT METROPOLITAN WAYNE COUNTY	MI	LPV200	0	1	0	1	0	1
ERY	LUCE COUNTY	MI	LPV	0	1	0	1	0	1
ESC	DELTA COUNTY	MI	LPV200	0	1	0	1	0	1
FFX	FREMONT MUNICIPAL	MI	LPV	0	1	0	1	0	1
FNT	BISHOP INTL	MI	LPV200	0	1	0	1	0	1
GDW	GLADWIN ZETTEL MEMORIAL	MI	LP	0	1	0	1	0	1
GLR	GAYLORD RGNL	MI	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
GRR	GERALD R. FORD INTL	MI	LPV200	0	1	0	1	0	1
HYX	SAGINAW COUNTY H.W. BROWNE	MI	LPV	0	1	0	1	0	1
IKW	JACK BARSTOW	MI	LPV	0	1	0	1	0	1
IMT	FORD	MI	LPV	0	1	0	1	0	1
IRS	KIRSCH MUNICIPAL	MI	LPV	0	1	0	1	0	1
ISQ	SCHOOLCRAFT COUNTY	MI	LP	0	1	0	1	0	1
IWD	GOGEBIC-IRON COUNTY	MI	LPV200	0	1	0	1	1	0.999966
JXN	JACKSON COUNTY REYNOLDS FIELD	MI	LPV200	0	1	0	1	0	1
LAN	CAPITAL REGION INTL	MI	LPV200	0	1	0	1	0	1
LDM	MASON COUNTY	MI	LPV	0	1	0	1	0	1
LWA	SOUTH HAVEN AREA RGNL	MI	LP	0	1	0	1	0	1
MBS	MBS INTL	MI	LPV200	0	1	0	1	0	1
MCD	MACKINAC ISLAND	MI	LPV	0	1	0	1	0	1
MKG	MUSKEGON COUNTY	MI	LPV200	0	1	0	1	0	1
MNM	MENOMINEE MARINETTE TWIN COUNTY	MI	LPV200	0	1	0	1	0	1
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	0	1	0	1	0	1
N98	BOYNE CITY MUNICIPAL	MI	LP	0	1	0	1	0	1
OEB	BRANCH COUNTY MEMORIAL	MI	LPV	0	1	0	1	0	1
OSC	OSCODA-WURTSMITH	MI	LPV200	0	1	0	1	0	1
OZW	LIVINGSTON COUNTY SPENCER J. HARDY	MI	LPV200	0	1	0	1	0	1
PHN	SAINT CLAIR COUNTY INTL	MI	LPV200	0	1	0	1	0	1
PLN	PELLSTON RGNL AIRPORT OF EMMET COUNTY	MI	LPV200	0	1	0	1	0	1
PTK	OAKLAND COUNTY INTL	MI	LPV200	0	1	0	1	0	1
RNP	OWOSSO COMMUNITY	MI	LPV	0	1	0	1	0	1
SAW	SAWYER INTL	MI	LPV200	0	1	0	1	1	0.999996
SLH	CHEBOYGAN COUNTY	MI	LPV	0	1	0	1	0	1
TTF	CUSTER	MI	LPV	0	1	0	1	0	1
TVC	CHERRY CAPITAL	MI	LPV	0	1	0	1	0	1
YIP	WILLOW RUN	MI	LPV	0	1	0	1	0	1
AEL	ALBERT LEA MUNICIPAL	MN	LPV	0	1	0	1	0	1
ANE	ANOKA COUNTY BLAINE ARPT (JANES FIELD)	MN	LPV	0	1	0	1	0	1
AUM	AUSTIN MUNICIPAL	MN	LPV200	0	1	0	1	0	1
AXN	CHANDLER FIELD	MN	LPV	0	1	0	1	0	1
BBB	BENSON MUNICIPAL	MN	LPV	0	1	0	1	0	1
BDE	BAUDETTE INTL	MN	LPV	0	1	0	1	1	0.999849
BDH	WILLMAR MUNICIPAL JOHN L RICE FIELD	MN	LPV	0	1	0	1	0	1
BJI	BEMIDJI RGNL	MN	LPV200	0	1	0	1	1	0.999902
BRD	BRAINERD LAKES RGNL	MN	LPV200	0	1	0	1	1	0.999992
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	0	1	0	1	0	1
CKC	GRAND MARAIS COOK COUNTY	MN	LPV	0	1	0	1	1	0.999917

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CKN	CROOKSTON MUNICIPAL KIRKWOOD FIELD	MN	LPV	0	1	0	1	1	0.999947
CNB	MYERS FIELD	MN	LPV	0	1	0	1	0	1
COQ	CLOQUET CARLTON COUNTY	MN	LPV	0	1	0	1	1	0.999932
CQM	COOK MUNICIPAL	MN	LP	0	1	0	1	1	0.999898
D39	SAUK CENTRE MUNICIPAL	MN	LP	0	1	0	1	0	1
DLH	DULUTH INTL	MN	LPV200	0	1	0	1	1	0.999936
DTL	DETROIT LAKES WETHING FIELD	MN	LPV	0	1	0	1	1	0.999996
DXX	LAC QUI PARLE COUNTY	MN	LPV200	0	1	0	1	0	1
ELO	ELY MUNICIPAL	MN	LPV200	0	1	0	1	1	0.999906
ETH	WHEATON MUNICIPAL	MN	LP	0	1	0	1	0	1
FCM	FLYING CLOUD	MN	LPV200	0	1	0	1	0	1
FFM	FERGUS FALLS MUNICIPAL EINAR MICKELSON FLD	MN	LPV200	0	1	0	1	0	1
FKA	FILLMORE COUNTY	MN	LPV	0	1	0	1	0	1
FOZ	BIGFORK MUNICIPAL	MN	LP	0	1	0	1	1	0.999894
FRM	FAIRMONT MUNICIPAL	MN	LPV	0	1	0	1	0	1
FSE	FOSSTON MUNICIPAL	MN	LP	0	1	0	1	1	0.999909
GPZ	GRAND RAPIDS/ITASCA CO-GORDON NEWSTROM	MN	LPV	0	1	0	1	1	0.999913
HCD	HUTCHINSON MUNICIPAL BUTLER FIELD	MN	LPV	0	1	0	1	0	1
HIB	RANGE RGNL	MN	LPV200	0	1	0	1	1	0.999921
INL	FALLS INTL	MN	LPV	0	1	0	1	1	0.999868
JKJ	MOORHEAD MUNICIPAL	MN	LPV	0	1	0	1	1	0.999996
LJF	LITCHFIELD MUNICIPAL	MN	LPV	0	1	0	1	0	1
LVN	AIRLAKE	MN	LPV200	0	1	0	1	0	1
LXL	LITTLE FALLS/MORRISON CO-LINDBERGH FLD	MN	LPV	0	1	0	1	0	1
LYV	QUENTIN AANENSON FIELD	MN	LPV200	0	1	0	1	0	1
MGG	MAPLE LAKE MUNICIPAL	MN	LP	0	1	0	1	0	1
MKT	MANKATO RGNL	MN	LPV200	0	1	0	1	0	1
MML	SOUTHWEST MINNESOTA RGNL MARSHALL/RYAN FIELD	MN	LPV200	0	1	0	1	0	1
MSP	MINNEAPOLIS ST PAUL INTL WOLD-CHAMBERLAIN	MN	LPV200	0	1	0	1	0	1
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	0	1	0	1	1	0.999996
ONA	WINONA MUNICIPAL MAX CONRAD FIELD	MN	LPV	0	1	0	1	0	1
ORB	ORR RGNL	MN	LP	0	1	0	1	1	0.999891
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	0	1	0	1	0	1
OWA	OWATONNA DEGNER RNGL	MN	LPV200	0	1	0	1	0	1
PKD	PARK RAPIDS MUNICIPAL KONSHOK FIELD	MN	LPV200	0	1	0	1	1	0.99997
RGK	RED WING RGNL	MN	LPV200	0	1	0	1	0	1
ROS	RUSH CITY RGNL	MN	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
ROX	ROSEAU MUNICIPAL RUDY BILLBERG FIELD	MN	LPV	0	1	0	1	1	0.999834
RRT	WARROAD INTL MEMORIAL	MN	LPV	0	1	0	1	1	0.999838
RST	ROCHESTER INTL	MN	LPV200	0	1	0	1	0	1
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	0	1	0	1	0	1
SAZ	STAPLES MUNICIPAL	MN	LPV	0	1	0	1	0	1
STC	ST CLOUD RGNL	MN	LPV200	0	1	0	1	0	1
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	0	1	0	1	0	1
TVF	THIEF RIVER FALLS	MN	LPV	0	1	0	1	1	0.999872
TWM	RICHARD B HELGESON	MN	LPV	0	1	0	1	1	0.99994
VVV	ORTONVILLE MUNICIPAL MARTINSON FIELD	MN	LP	0	1	0	1	0	1
1H0	CREVE COEUR	MO	LPV	0	1	0	1	0	1
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	0	1	0	1	0	1
6M6	LEWIS COUNTY RGNL	MO	LPV	0	1	0	1	0	1
8WC	WASHINGTON COUNTY AIRPORT	MO	LPV	0	1	0	1	0	1
AIZ	LEE C FINE MEMORIAL	MO	LPV	0	1	0	1	0	1
BBG	BRANSON	MO	LPV200	0	1	0	1	0	1
BUM	BUTLER MEMORIAL	MO	LPV	0	1	0	1	0	1
CGI	CAPE GIRARDEAU RGNL	MO	LPV	0	1	0	1	0	1
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	0	1	0	1	0	1
COU	COLUMBIA RGNL	MO	LPV	0	1	0	1	0	1
DMO	SEDALIA MEMORIAL	MO	LPV	0	1	0	1	0	1
DXE	DEXTER MUNICIPAL	MO	LPV	0	1	0	1	0	1
EIW	COUNTY MEMORIAL	MO	LPV	0	1	0	1	0	1
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	1	0	1	0	1
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	0	1	0	1	0	1
EZZ	CAMERON MEMORIAL	MO	LPV	0	1	0	1	0	1
FAM	FARMINGTON RGNL	MO	LPV	0	1	0	1	0	1
FTT	ELTON HENSLEY MEMORIAL	MO	LPV	0	1	0	1	0	1
FWB	BRANSON WEST MUNICIPAL EMERSON FIELD	MO	LPV200	0	1	0	1	0	1
FYG	WASHINGTON RGNL	MO	LPV	0	1	0	1	0	1
GPH	MIDWEST NATIONAL AIR CENTER	MO	LPV	0	1	0	1	0	1
H21	CAMDENTON MEMORIAL	MO	LPV	0	1	0	1	0	1
H79	ELDON MODEL AIRPARK	MO	LP	0	1	0	1	0	1
HAE	HANNIBAL RGNL	MO	LPV	0	1	0	1	0	1
HFJ	MONETT MUNICIPAL	MO	LPV	0	1	0	1	0	1
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	0	1	0	1	0	1
IRK	KIRKSVILLE RGNL	MO	LPV200	0	1	0	1	0	1
JEF	JEFFERSON CITY MEMORIAL	MO	LPV	0	1	0	1	0	1
JLN	JOPLIN RGNL	MO	LPV	0	1	0	1	0	1
K02	PERRYVILLE MUNICIPAL	MO	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
K57	GOULD PETERSON MUNICIPAL	MO	LPV	0	1	0	1	0	1
LRY	LAWRENCE SMITH MEMORIAL	MO	LPV	0	1	0	1	0	1
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	0	1	0	1	0	1
M05	CARUTHERSVILLE MEM	MO	LPV	0	1	0	1	0	1
M17	BOLIVAR MUNICIPAL	MO	LPV	0	1	0	1	0	1
M48	HOUSTON MEMORIAL	MO	LPV	0	1	0	1	0	1
MAW	MALDEN MUNICIPAL	MO	LPV	0	1	0	1	0	1
MBY	OMAR N BRADLEY	MO	LPV	0	1	0	1	0	1
MCI	KANSAS CITY INTL	MO	LPV	0	1	0	1	0	1
MHL	MARSHALL MEML MUNICIPAL	MO	LPV	0	1	0	1	0	1
MKC	CHARLES B. WHEELER DOWNTOWN	MO	LPV200	0	1	0	1	0	1
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	0	1	0	1	0	1
MYJ	MEXICO MEMORIAL	MO	LPV	0	1	0	1	0	1
NVD	NEVADA MUNICIPAL	MO	LPV200	0	1	0	1	0	1
PLK	M. GRAHAM CLARK DOWNTOWN	MO	LPV200	0	1	0	1	0	1
POF	POPLAR BLUFF MUNICIPAL	MO	LPV	0	1	0	1	0	1
RCM	SKYHAVEN	MO	LPV	0	1	0	1	0	1
SGF	SPRINGFIELD BRANSON NATIONAL	MO	LPV	0	1	0	1	0	1
SIK	SIKESTON MEML MUNICIPAL	MO	LPV	0	1	0	1	0	1
STJ	ROSECRANS MEMORIAL	MO	LPV200	0	1	0	1	0	1
STL	LAMBERT-ST LOUIS INTL	MO	LPV200	0	1	0	1	0	1
SUS	SPIRIT OF ST LOUIS	MO	LPV200	0	1	0	1	0	1
TBN	WAYNESVILLE ST ROBERT RGNL FORNEY AAF	MO	LPV	0	1	0	1	0	1
TRX	TRENTON MUNICIPAL	MO	LPV	0	1	0	1	0	1
UBX	CUBA MUNICIPAL	MO	LPV	0	1	0	1	0	1
UNO	WEST PLAINS MUNICIPAL	MO	LPV	0	1	0	1	0	1
UUV	SULLIVAN RGNL	MO	LPV	0	1	0	1	0	1
VER	JESSE VIERTEL MEMORIAL	MO	LPV	0	1	0	1	0	1
VIH	ROLLA NATIONAL	MO	LPV200	0	1	0	1	0	1
87I	YAZOO COUNTY	MS	LPV	0	1	0	1	0	1
CKM	FLETCHER FIELD	MS	LPV	0	1	0	1	0	1
CRX	ROSCOE TURNER	MS	LPV200	0	1	0	1	0	1
GLH	MID DELTA RGNL	MS	LPV200	0	1	0	1	0	1
GNF	GRENADA MUNICIPAL	MS	LPV	0	1	0	1	0	1
GPT	GULFPORT-BILOXI INTL	MS	LPV200	0	1	0	1	0	1
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	0	1	0	1	0	1
GWO	GREENWOOD-LEFLORE	MS	LPV	0	1	0	1	0	1
HBG	HATTIESBURG BOBBY L. CHAIN MUNICIPAL	MS	LPV200	0	1	0	1	0	1
HEZ	HARDY-ANDERS FIELD NATCHEZ-ADAMS COUNTY	MS	LPV	0	1	0	1	0	1
HKS	HAWKINS FIELD	MS	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
HSA	STENNIS INTL	MS	LPV200	0	1	0	1	0	1
IDL	INDIANOLA MUNICIPAL	MS	LPV	0	1	0	1	0	1
JAN	JACKSON-EVERS INTL	MS	LPV200	0	1	0	1	0	1
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	1	0	1	0	1
LUL	HESLER-NOBLE FIELD	MS	LPV	0	1	0	1	0	1
M40	MONROE COUNTY	MS	LPV	0	1	0	1	0	1
M43	PRENTISS JEFFERSON DAVIS COUNTY	MS	LPV	0	1	0	1	0	1
MCB	MC COMB PIKE COUNTY JOHN E LEWIS FIELD	MS	LPV	0	1	0	1	0	1
MEI	KEY FIELD	MS	LPV200	0	1	0	1	0	1
MJD	PICAYUNE MUNICIPAL	MS	LPV	0	1	0	1	0	1
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	1	0	1	0	1
OLV	OLIVE BRANCH	MS	LPV	0	1	0	1	0	1
PIB	HATTIESBURG-LAUREL RGNL	MS	LPV200	0	1	0	1	0	1
PQL	TRENT LOTT INTL	MS	LPV200	0	1	0	1	0	1
RNV	CLEVELAND MUNICIPAL	MS	LPV	0	1	0	1	0	1
STF	GEORGE M BRYAN	MS	LPV200	0	1	0	1	0	1
TUP	TUPELO RGNL	MS	LPV200	0	1	0	1	0	1
UOX	UNIVERSITY-OXFORD	MS	LPV	0	1	0	1	0	1
UTA	TUNICA MUNICIPAL	MS	LPV200	0	1	0	1	0	1
1S3	TILLITT FIELD	MT	LPV	0	1	0	1	0	1
4U6	CIRCLE TOWN COUNTY	MT	LPV	0	1	0	1	0	1
6S8	LAUREL MUNICIPAL	MT	LPV	0	1	0	1	0	1
7S0	RONAN	MT	LPV	0	1	0	1	0	1
BIL	BILLINGS LOGAN INTL	MT	LPV200	0	1	0	1	0	1
BTM	BERT MOONEY	MT	LPV	0	1	0	1	0	1
BZN	GALLATIN FIELD	MT	LPV	0	1	0	1	0	1
GDV	DAWSON COMMUNITY	MT	LPV	0	1	0	1	0	1
GGW	WOKAL FIELD GLASGOW INTL	MT	LPV200	0	1	0	1	0	1
GPI	GLACIER PARK INTL	MT	LPV	0	1	0	1	0	1
GTF	GREAT FALLS INTL	MT	LPV200	0	1	0	1	0	1
HLN	HELENA RGNL	MT	LPV	0	1	0	1	0	1
HVR	HAVRE CITY-COUNTY	MT	LPV	0	1	0	1	0	1
LVM	MISSION FIELD	MT	LP	0	1	0	1	0	1
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	0	1	0	1	0	1
M75	MALTA	MT	LP	0	1	0	1	0	1
MLS	FRANK WILEY FIELD	MT	LPV	0	1	0	1	0	1
MSO	MISSOULA INTERNATIONAL	MT	LPV	0	1	0	1	0	1
OLF	L M CLAYTON	MT	LPV200	0	1	0	1	0	1
PWD	SHER-WOOD	MT	LPV200	0	1	0	1	0	1
RPX	ROUNDUP	MT	LPV	0	1	0	1	0	1
SBX	SHELBY	MT	LP	0	1	0	1	0	1
SDY	SIDNEY RICHLAND MUNICIPAL	MT	LPV	0	1	0	1	0	1
WYS	YELLOWSTONE	MT	LPV200	0	1	0	1	0	1
CYCL	CHARLO	NB	LPV	0	1	0	1	0	1
CYQM	MONCTON INTL	NB	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
AFP	ANSON COUNTY JEFF CLOUD FIELD	NC	LPV	0	1	0	1	0	1
AKH	GASTONIA MUNICIPAL	NC	LPV	0	1	0	1	0	1
AVL	ASHEVILLE RGNL	NC	LPV	0	1	0	1	0	1
BUY	BURLINGTON ALAMANCE RGNL	NC	LPV200	0	1	0	1	0	1
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	0	1	0	1	0	1
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	0	1	0	1	0	1
DPL	DUPLIN COUNTY	NC	LPV200	0	1	0	1	0	1
ECG	ELIZABETH CITY CG AIR STATION RGNL	NC	LPV	0	1	0	1	0	1
EDE	NORTHEASTERN RGNL	NC	LPV200	0	1	0	1	0	1
EHO	SHELBY CLEVELAND COUNTY RGNL	NC	LPV	0	1	0	1	0	1
EQY	MONROE RGNL	NC	LPV	0	1	0	1	0	1
EWN	COASTAL CAROLINA RGNL	NC	LPV	0	1	0	1	0	1
EXX	DAVIDSON COUNTY	NC	LPV	0	1	0	1	0	1
EYF	CURTIS L BROWN JR FIELD	NC	LPV200	0	1	0	1	0	1
FAY	FAYETTEVILLE RGNL GRANNIS FIELD	NC	LPV200	0	1	0	1	0	1
FQD	RUTHERFORD CO MARCHMAN FIELD	NC	LPV	0	1	0	1	0	1
GSO	PIEDMONT TRIAD INTL	NC	LPV200	0	1	0	1	0	1
GWW	WAYNE EXECUTIVE JETPORT	NC	LPV200	0	1	0	1	0	1
HKY	HICKORY RGNL	NC	LPV200	0	1	0	1	0	1
HNZ	HENDERSON-OXFORD	NC	LPV	0	1	0	1	0	1
HRJ	HARNETT COUNTY	NC	LPV	0	1	0	1	0	1
ILM	WILMINGTON INTL	NC	LPV200	0	1	0	1	0	1
INT	SMITH REYNOLDS	NC	LPV200	0	1	0	1	0	1
IPJ	LINCOLNTON LINCOLN COUNTY RGNL	NC	LPV	0	1	0	1	0	1
ISO	KINSTON REGL JETPORT AT STALLINGS FIELD	NC	LPV	0	1	0	1	0	1
IXA	HALIFAX NORTHAMPTON RGNL	NC	LPV200	0	1	0	1	0	1
JNX	JOHNSTON COUNTY	NC	LPV200	0	1	0	1	0	1
JQF	CONCORD RGNL	NC	LPV	0	1	0	1	0	1
LBT	LUMBERTON MUNICIPAL	NC	LPV	0	1	0	1	0	1
LHZ	TRIANGLE NORTH EXECUTIVE	NC	LPV200	0	1	0	1	0	1
MEB	LAURINBURG-MAXTON	NC	LPV200	0	1	0	1	0	1
MQI	DARE COUNTY RGNL	NC	LPV	0	1	0	1	0	1
MRH	MICHAEL J. SMITH FIELD	NC	LPV	0	1	0	1	0	1
MRN	FOOTHILLS RGNL	NC	LPV200	0	1	0	1	0	1
MWK	MOUNT AIRY SURRY COUNTY	NC	LPV	0	1	0	1	0	1
OAJ	ALBERT J ELLIS	NC	LPV200	0	1	0	1	0	1
OCW	WARREN FIELD	NC	LPV	0	1	0	1	0	1
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	1	0	1	0	1
PGV	PITT-GREENVILLE	NC	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
PMZ	PLYMOUTH MUNICIPAL	NC	LP	0	1	0	1	0	1
RCZ	RICHMOND COUNTY	NC	LPV	0	1	0	1	0	1
RDU	RALEIGH-DURHAM INTL	NC	LPV200	0	1	0	1	0	1
RUQ	ROWAN COUNTY	NC	LPV200	0	1	0	1	0	1
RWI	ROCKY MOUNT WILSON RGNL	NC	LPV	0	1	0	1	0	1
SOP	MOORE COUNTY	NC	LPV	0	1	0	1	0	1
SUT	CAPE FEAR RGNL JETPORT HOWIE FRANKLIN FLD	NC	LPV	0	1	0	1	0	1
SVH	STATESVILLE RGNL	NC	LPV	0	1	0	1	0	1
TDF	PERSON COUNTY	NC	LPV200	0	1	0	1	0	1
TTA	RALEIGH EXEC AT SANFORD LEE COUNTY	NC	LPV200	0	1	0	1	0	1
VUJ	STANLY COUNTY	NC	LPV200	0	1	0	1	0	1
2C8	CAVALIER MUNICIPAL	ND	LPV	0	1	0	1	1	0.999857
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	0	1	0	1	1	0.999981
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	0	1	0	1	0	1
BIS	BISMARCK MUNICIPAL	ND	LPV200	0	1	0	1	0	1
BWP	HARRY STERN	ND	LPV	0	1	0	1	0	1
D09	BOTTINEAU MUNICIPAL	ND	LPV	0	1	0	1	0	1
D55	ROBERTSON FIELD	ND	LPV	0	1	0	1	1	0.999887
D60	TIOGA MUNICIPAL	ND	LPV	0	1	0	1	0	1
DIK	DICKINSON THEODORE ROOSEVELT RGNL	ND	LPV200	0	1	0	1	0	1
DVL	DEVILS LAKE RGNL	ND	LPV	0	1	0	1	1	0.999989
FAR	HECTOR INTL	ND	LPV200	0	1	0	1	1	0.999989
GAF	HUTSON FIELD	ND	LPV	0	1	0	1	1	0.999864
GFK	GRAND FORKS INTL	ND	LPV	0	1	0	1	1	0.999974
GWR	GWINNER ROGER MELROE FIELD	ND	LPV200	0	1	0	1	0	1
HZE	MERCER COUNTY RGNL	ND	LPV	0	1	0	1	0	1
ISN	SLOULIN FLD INTL	ND	LPV200	0	1	0	1	0	1
JMS	JAMESTOWN RGNL	ND	LPV200	0	1	0	1	0	1
MOT	MINOT INTL	ND	LPV	0	1	0	1	0	1
RUG	RUGBY MUNICIPAL	ND	LP	0	1	0	1	0	1
S25	WATFORD CITY MUNICIPAL	ND	LPV	0	1	0	1	0	1
07K	CENTRAL CITY MUNICIPAL LARRY REINEKE FIELD	NE	LPV	0	1	0	1	0	1
0B4	HARTINGTON MUNICIPAL	NE	LPV	0	1	0	1	0	1
0C4	PENDER MUNICIPAL	NE	LPV	0	1	0	1	0	1
0V3	PIONEER VILLAGE FIELD	NE	LPV	0	1	0	1	1	0.999962
12K	SUPERIOR MUNICIPAL	NE	LPV	0	1	0	1	1	0.999974
4V9	ANTELOPE COUNTY	NE	LPV	0	1	0	1	0	1
6K3	CREIGHTON MUNICIPAL	NE	LPV	0	1	0	1	0	1
7V7	RED CLOUD MUNICIPAL	NE	LPV	0	1	0	1	1	0.999962
8V2	STUART ATKINSON MUNICIPAL	NE	LPV	0	1	0	1	0	1
93Y	DAVID CITY MUNICIPAL	NE	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
9V5	MODISETT	NE	LPV	0	1	0	1	0	1
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	0	1	0	1	0	1
AHQ	WAHOO MUNICIPAL	NE	LPV	0	1	0	1	0	1
AIA	ALLIANCE MUNICIPAL	NE	LPV200	0	1	0	1	0	1
ANW	AINSWORTH MUNICIPAL	NE	LPV200	0	1	0	1	0	1
AUH	AURORA MUNICIPAL AL POTTER FIELD	NE	LPV	0	1	0	1	0	1
BBW	BROKEN BOW MUNICIPAL	NE	LPV	0	1	0	1	0	1
BFF	WESTERN NEB. RGNL WILLIAM B. HEILIG FIELD	NE	LPV	0	1	0	1	0	1
BIE	BEATRICE MUNICIPAL	NE	LPV200	0	1	0	1	0	1
BVN	ALBION MUNICIPAL	NE	LPV	0	1	0	1	0	1
CDR	CHADRON MUNICIPAL	NE	LPV200	0	1	0	1	0	1
CEK	CRETE MUNICIPAL	NE	LPV	0	1	0	1	0	1
CZD	COZAD MUNICIPAL	NE	LPV	0	1	0	1	2	0.99994
EAR	KEARNEY RGNL	NE	LPV200	0	1	0	1	1	0.999955
FBY	FAIRBURY MUNICIPAL	NE	LPV	0	1	0	1	0	1
FET	FREMONT MUNICIPAL	NE	LPV	0	1	0	1	0	1
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	0	1	0	1	0	1
FNB	BRENNER FIELD	NE	LPV	0	1	0	1	0	1
GGF	GRANT MUNICIPAL	NE	LPV	0	1	0	1	0	1
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	0	1	0	1	0	1
GRN	GORDON MUNICIPAL	NE	LPV	0	1	0	1	0	1
HDE	BREWSTER FIELD	NE	LPV	0	1	0	1	3	0.999947
HSI	HASTINGS MUNICIPAL	NE	LPV	0	1	0	1	0	1
IBM	KIMBALL MUNICIPAL ROBERT E ARRAJ FIELD	NE	LPV	0	1	0	1	0	1
IML	IMPERIAL MUNICIPAL	NE	LPV	0	1	0	1	0	1
JYR	YORK MUNICIPAL	NE	LPV	0	1	0	1	0	1
LBF	NORTH PLATTE RGNL AIRPORT LEE BIRD FIELD	NE	LPV	0	1	0	1	2	0.999962
LCG	WAYNE MUNICIPAL	NE	LPV	0	1	0	1	0	1
LNK	LINCOLN	NE	LPV	0	1	0	1	0	1
LXN	JIM KELLY FIELD	NE	LPV	0	1	0	1	3	0.999947
MCK	MCCOOK RGNL	NE	LPV	0	1	0	1	2	0.999962
MLE	MILLARD	NE	LPV	0	1	0	1	0	1
ODX	EVELYN SHARP FIELD	NE	LPV	0	1	0	1	0	1
OFK	KARL STEFAN MEMORIAL	NE	LPV	0	1	0	1	0	1
OGA	SEARLE FIELD	NE	LPV	0	1	0	1	0	1
OKS	GARDEN COUNTY	NE	LPV	0	1	0	1	0	1
OLU	COLUMBUS MUNICIPAL	NE	LPV	0	1	0	1	0	1
OMA	EPPLEY AIRFIELD	NE	LPV	0	1	0	1	0	1
ONL	THE O'NEILL MUNICIPAL JOHN L BAKER FIELD	NE	LPV	0	1	0	1	0	1
PMV	PLATTSMOUTH MUNICIPAL	NE	LPV	0	1	0	1	0	1
RBE	ROCK COUNTY	NE	LPV	0	1	0	1	0	1
SNY	SIDNEY MUNICIPAL LLOYD W. CARR FIELD	NE	LPV	0	1	0	1	0	1
SWT	SEWARD MUNICIPAL	NE	LPV	0	1	0	1	0	1
TIF	THOMAS COUNTY	NE	LPV	0	1	0	1	0	1
VTN	MILLER FIELD	NE	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
ASH	BOIRE FLD	NH	LPV	0	1	0	1	0	1
CNH	CLAREMONT MUNICIPAL	NH	LP	0	1	0	1	0	1
CON	CONCORD MUNICIPAL	NH	LPV	0	1	0	1	0	1
DAW	SKYHAVEN	NH	LPV	0	1	0	1	0	1
EEN	DILLANT-HOPKINS	NH	LPV	0	1	0	1	0	1
HIE	MOUNT WASHINGTON RGNL	NH	LPV	0	1	0	1	0	1
LCI	LACONIA MUNICIPAL	NH	LPV	0	1	0	1	0	1
LEB	LEBANON MUNICIPAL	NH	LPV	0	1	0	1	0	1
MHT	MANCHESTER	NH	LPV200	0	1	0	1	0	1
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	0	1	0	1	0	1
39N	PRINCETON	NJ	LPV	0	1	0	1	0	1
47N	CENTRAL JERSEY RGNL	NJ	LP	0	1	0	1	0	1
4N1	GREENWOOD LAKE	NJ	LP	0	1	0	1	0	1
ACY	ATLANTIC CITY INTL	NJ	LPV200	0	1	0	1	0	1
CDW	ESSEX COUNTY	NJ	LPV	0	1	0	1	0	1
EWR	NEWARK LIBERTY INTL	NJ	LPV	0	1	0	1	0	1
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	0	1	0	1	0	1
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	0	1	0	1	0	1
N14	FLYING W	NJ	LPV	0	1	0	1	0	1
N40	SKY MANOR	NJ	LP	0	1	0	1	0	1
TEB	TETERBORO	NJ	LPV	0	1	0	1	0	1
TTN	TRENTON MERCER	NJ	LPV200	0	1	0	1	0	1
VAY	SOUTH JERSEY RGNL	NJ	LP	0	1	0	1	0	1
WWD	CAPE MAY COUNTY	NJ	LPV	0	1	0	1	0	1
CYDF	DEER LAKE	NL	LPV	0	1	0	1	109	0.992429
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV	0	1	0	1	0	1
CNM	CAVERN CITY AIR TRML	NM	LP	0	1	0	1	0	1
CVN	CLOVIS MUNICIPAL	NM	LPV	0	1	0	1	0	1
DMN	DEMING MUNICIPAL	NM	LPV	0	1	0	1	4	0.999751
FMN	FOUR CORNERS RGNL	NM	LPV200	0	1	0	1	0	1
HOB	LEA COUNTY RGNL	NM	LPV200	0	1	0	1	0	1
LAM	LOS ALAMOS	NM	LP	0	1	0	1	0	1
ONM	SOCORRO MUNICIPAL	NM	LP	0	1	0	1	0	1
ROW	ROSWELL INTL AIR CENTER	NM	LPV	0	1	0	1	0	1
SRR	SIERRA BLANCA RGNL	NM	LPV200	0	1	0	1	0	1
SVC	GRANT COUNTY	NM	LPV	0	1	0	1	4	0.99974
CYHZ	HALIFAX / STANFIELD INTL	NS	LPV	0	1	0	1	0	1
CYEV	INUVIK	NT	LPV	4	0.998471	5	0.99806	24	0.995358
ELY	ELY ARPT-YELLAND FLD	NV	LPV	0	1	0	1	0	1
LAS	MC CARRAN INTL	NV	LPV	0	1	0	1	1	0.999989
RNO	RENO/TAHOE INTL	NV	LPV	0	1	0	1	18	0.999868
RTS	RENO/STEAD	NV	LPV	0	1	0	1	17	0.999872
TPH	TONOPAH	NV	LP	0	1	0	1	1	0.999985
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	1	0	1	0	1
06N	RANDALL	NY	LP	0	1	0	1	0	1
1B1	COLUMBIA COUNTY	NY	LPV	0	1	0	1	0	1
44N	SKY ACRES	NY	LPV	0	1	0	1	0	1
4B6	TICONDEROGA MUNICIPAL	NY	LPV	0	1	0	1	0	1
5B2	SARATOGA COUNTY	NY	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
5G0	LE ROY	NY	LP	0	1	0	1	0	1
7G0	LEDGEDALE AIRPARK	NY	LPV	0	1	0	1	0	1
9G0	BUFFALO AIRFIELD	NY	LP	0	1	0	1	0	1
ALB	ALBANY INTL	NY	LPV200	0	1	0	1	0	1
ART	WATERTOWN INTL	NY	LPV200	0	1	0	1	0	1
BGM	GREATER BINGHAMTON EDWIN A LINK FIELD	NY	LPV200	0	1	0	1	0	1
BUF	BUFFALO NIAGARA INTL	NY	LPV200	0	1	0	1	0	1
D38	CANANDAIGUA	NY	LP	0	1	0	1	0	1
ELM	ELMIRA/CORNING RGNL	NY	LPV200	0	1	0	1	0	1
ELZ	WELLSVILLE MUNICIPAL	NY	LPV	0	1	0	1	0	1
FOK	FRANCIS S. GABRESKI	NY	LPV200	0	1	0	1	0	1
FRG	REPUBLIC	NY	LPV200	0	1	0	1	0	1
FZY	OSWEGO COUNTY	NY	LPV	0	1	0	1	0	1
GFL	FLOYD BENNETT MEMORIAL	NY	LPV	0	1	0	1	0	1
GVQ	BATAVIA	NY	LPV200	0	1	0	1	0	1
HPN	WESTCHESTER COUNTY	NY	LPV	0	1	0	1	0	1
HTF	HORNELL MUNICIPAL	NY	LPV	0	1	0	1	0	1
HTO	EAST HAMPTON	NY	LPV	0	1	0	1	0	1
HWV	BROOKHAVEN	NY	LPV	0	1	0	1	0	1
IAG	NIAGARA FALLS INTL	NY	LPV	0	1	0	1	0	1
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	0	1	0	1	0	1
ITH	ITHACA TOMPKINS RGNL	NY	LPV	0	1	0	1	0	1
JFK	JOHN F KENNEDY INTL	NY	LPV	0	1	0	1	0	1
JHW	CHAUTAUQUA COUNTY JAMESTOWN	NY	LPV200	0	1	0	1	0	1
K09	PISECO	NY	LP	0	1	0	1	0	1
LGA	LA GUARDIA	NY	LPV200	0	1	0	1	0	1
MAL	MALONE-DUFORT	NY	LPV	0	1	0	1	0	1
MGJ	ORANGE COUNTY	NY	LPV	0	1	0	1	0	1
MSS	MASSENA INTL RICHARDS FIELD	NY	LPV	0	1	0	1	0	1
MSV	SULLIVAN COUNTY INTL	NY	LPV	0	1	0	1	0	1
N66	ONEONTA MUNICIPAL	NY	LPV	0	1	0	1	0	1
NY0	FULTON COUNTY	NY	LPV	0	1	0	1	0	1
OGS	OGDENSBURG INTL	NY	LPV	0	1	0	1	0	1
OLE	CATTARAUGUS COUNTY OLEAN	NY	LPV	0	1	0	1	0	1
PBG	PLATTSBURGH INTL	NY	LPV	0	1	0	1	0	1
PEO	PENN YAN	NY	LPV	0	1	0	1	0	1
POU	DUTCHESS COUNTY	NY	LPV	0	1	0	1	0	1
RME	GRIFFISS INTL	NY	LPV200	0	1	0	1	0	1
ROC	GREATER ROCHESTER INTL	NY	LPV200	0	1	0	1	0	1
SCH	SCHENECTADY COUNTY	NY	LPV200	0	1	0	1	0	1
SDC	WILLIAMSON-SODUS	NY	LPV	0	1	0	1	0	1
SLK	ADIRONDACK RGNL	NY	LPV200	0	1	0	1	0	1
SWF	STEWART INTL	NY	LPV200	0	1	0	1	0	1
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	0	1	0	1	0	1
VGC	HAMILTON MUNICIPAL	NY	LPV	0	1	0	1	0	1
0G6	WILLIAMS COUNTY	OH	LPV	0	1	0	1	0	1
16G	SENECA COUNTY	OH	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
1G0	WOOD COUNTY	OH	LPV	0	1	0	1	0	1
1G3	KENT STATE UNIV	OH	LPV	0	1	0	1	0	1
4I3	KNOX COUNTY	OH	LPV200	0	1	0	1	0	1
6G5	BARNESVILLE-BRADFIELD	OH	LP	0	1	0	1	0	1
AOH	LIMA ALLEN COUNTY	OH	LPV200	0	1	0	1	0	1
AXV	NEIL ARMSTRONG	OH	LPV	0	1	0	1	0	1
BJJ	WAYNE COUNTY	OH	LPV	0	1	0	1	0	1
BKL	BROOKHAVEN	OH	LPV	0	1	0	1	0	1
CAK	AKRON-CANTON RGNL	OH	LPV200	0	1	0	1	0	1
CGF	CUYAHOGA COUNTY	OH	LPV	0	1	0	1	0	1
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	1	0	1	0	1
CMH	PORT COLUMBUS INTL	OH	LPV200	0	1	0	1	0	1
CQA	LAKEFIELD	OH	LPV	0	1	0	1	0	1
CXY	CAPITAL CITY	OH	LPV	0	1	0	1	0	1
DAY	JAMES M COX DAYTON INTL	OH	LPV200	0	1	0	1	0	1
DLZ	DELAWARE MUNICIPAL	OH	LPV	0	1	0	1	0	1
EDJ	BELLEFONTAINE RGNL	OH	LPV	0	1	0	1	0	1
FDY	FINDLAY	OH	LPV	0	1	0	1	0	1
FZI	FOSTORIA METROPOLITAN	OH	LPV	0	1	0	1	0	1
GQQ	GALION MUNICIPAL	OH	LP	0	1	0	1	0	1
HAO	BUTLER CO RGNL	OH	LPV	0	1	0	1	0	1
HZY	ASHTABULA COUNTY	OH	LPV	0	1	0	1	0	1
I19	GREENE COUNTY LEWIS A JACKSON RGNL	OH	LPV	0	1	0	1	0	1
I66	CLINTON FIELD	OH	LPV	0	1	0	1	0	1
I68	LEBANON-WARREN COUNTY	OH	LPV	0	1	0	1	0	1
I69	CLERMONT COUNTY	OH	LP	0	1	0	1	0	1
I74	GRIMES FIELD	OH	LPV	0	1	0	1	0	1
ILN	AIRBORNE AIRPARK	OH	LPV200	0	1	0	1	0	1
LCK	RICKENBACKER INTL	OH	LPV200	0	1	0	1	0	1
LHQ	FAIRFIELD COUNTY	OH	LPV200	0	1	0	1	0	1
LNN	WILLOUGHBY	OH	LPV	0	1	0	1	0	1
LPR	LORAIN COUNTY RGNL	OH	LPV200	0	1	0	1	0	1
LUK	CINCINNATI MUNICIPAL LUNKEN FIELD	OH	LPV	0	1	0	1	0	1
MFD	MANSFIELD LAHM RGNL	OH	LPV200	0	1	0	1	0	1
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	0	1	0	1	0	1
MNN	MARION MUNICIPAL	OH	LPV	0	1	0	1	0	1
MRT	UNION COUNTY	OH	LP	0	1	0	1	0	1
MWO	MIDDLETOWN REGIONAL HOOK FIELD	OH	LPV	0	1	0	1	0	1
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	1	0	1	0	1
OWX	PUTNAM COUNTY	OH	LPV	0	1	0	1	0	1
OXD	MIAMI UNIVERSITY	OH	LPV	0	1	0	1	0	1
PCW	CARL R KELLER FIELD	OH	LPV	0	1	0	1	0	1
PHD	HARRY CLEVER FIELD	OH	LP	0	1	0	1	0	1
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	0	1	0	1	0	1
RZT	ROSS COUNTY	OH	LPV	0	1	0	1	0	1
S24	SANDUSKY COUNTY RGNL	OH	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
SGH	SPRINGFIELD BECKLEY MUNICIPAL	OH	LPV200	0	1	0	1	0	1
TDZ	TOLEDO EXECUTIVE	OH	LP	0	1	0	1	0	1
TOL	TOLEDO EXPRESS	OH	LPV200	0	1	0	1	0	1
TSO	CARROLL COUNTY-TOLSON	OH	LP	0	1	0	1	0	1
TZR	BOLTON FIELD	OH	LPV200	0	1	0	1	0	1
UNI	OHIO UNIVERSITY SNYDER FIELD	OH	LPV200	0	1	0	1	0	1
USE	FULTON COUNTY	OH	LPV	0	1	0	1	0	1
UYF	MADISON COUNTY	OH	LPV	0	1	0	1	0	1
YNG	YOUNGSTOWN WARREN RGNL	OH	LPV	0	1	0	1	0	1
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	0	1	0	1	0	1
80F	ANTLERS MUNICIPAL	OK	LPV	0	1	0	1	0	1
ADH	ADA MUNICIPAL	OK	LPV	0	1	0	1	0	1
ADM	ARDMORE MUNICIPAL	OK	LPV200	0	1	0	1	0	1
AXS	ALTUS QUARTZ MOUNTAIN RGNL	OK	LPV	0	1	0	1	0	1
BKN	BLACKWELL TONKAWA MUNICIPAL	OK	LPV	0	1	0	1	0	1
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	0	1	0	1	0	1
CHK	CHICKASHA MUNICIPAL	OK	LPV200	0	1	0	1	0	1
CLK	CLINTON RGNL	OK	LPV200	0	1	0	1	0	1
CSM	CLINTON-SHERMAN	OK	LPV200	0	1	0	1	0	1
DUA	EAKER FIELD	OK	LPV	0	1	0	1	0	1
DUC	HALLIBURTON FIELD	OK	LPV	0	1	0	1	0	1
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	1	0	1	0	1
F22	PERRY MUNICIPAL	OK	LPV	0	1	0	1	0	1
FDR	FREDERICK RGNL	OK	LPV200	0	1	0	1	0	1
GCM	CLAREMORE RGNL	OK	LPV	0	1	0	1	0	1
GMJ	GROVE MUNICIPAL	OK	LPV	0	1	0	1	0	1
GOK	GUTHRIE-EDMOND RGNL	OK	LPV	0	1	0	1	0	1
GUY	GUYMON MUNICIPAL	OK	LPV	0	1	0	1	0	1
GZL	STIGLER RGNL	OK	LPV	0	1	0	1	0	1
HBR	HOBART MUNICIPAL	OK	LPV	0	1	0	1	0	1
HSD	SUNDANCE AIRPARK	OK	LPV	0	1	0	1	0	1
MKO	DAVIS FIELD	OK	LPV	0	1	0	1	0	1
MLC	MC ALESTER RGNL	OK	LPV	0	1	0	1	0	1
OKC	WILL ROGERS WORLD	OK	LPV200	0	1	0	1	0	1
OKM	OKMULGEE RGNL	OK	LPV	0	1	0	1	0	1
OUN	UNIVERSITY OF OKLAHOMA WESTHEIMER	OK	LPV200	0	1	0	1	0	1
OWP	WILLIAM R. POGUE MUNICIPAL	OK	LPV	0	1	0	1	0	1
PNC	PONCA CITY RGNL	OK	LPV	0	1	0	1	0	1
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	0	1	0	1	0	1
PWA	WILEY POST	OK	LPV200	0	1	0	1	0	1
RCE	CLARENCE E. PAGE MUNICIPAL	OK	LPV	0	1	0	1	0	1
RVS	RICHARD LLOYD JONES JR	OK	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
SNL	SHAWNEE RGNL	OK	LPV200	0	1	0	1	0	1
SWO	STILLWATER RGNL	OK	LPV	0	1	0	1	0	1
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	0	1	0	1	0	1
TUL	TULSA INTL	OK	LPV200	0	1	0	1	0	1
WDG	ENID WOODRING RGNL	OK	LPV200	0	1	0	1	0	1
WWR	WEST WOODWARD	OK	LPV	0	1	0	1	0	1
CNS7	KINCARDINE	ON	LPV	0	1	0	1	0	1
CYHD	DRYDEN REGIONAL	ON	LPV	0	1	0	1	3	0.999743
CYKF	KITCHENER / WATERLOO	ON	LPV	0	1	0	1	0	1
CYOW	OTTAWA MACDONALD CARTIER INTL	ON	LPV	0	1	0	1	0	1
CYQT	THUNDER BAY	ON	LPV	0	1	0	1	2	0.999917
CYTS	TIMMINS / VICTOR M POWER	ON	LPV	0	1	0	1	0	1
CYXL	SIOUX LOOKOUT	ON	LPV	0	1	0	1	3	0.999698
AST	ASTORIA RGNL	OR	LPV	0	1	0	1	5	0.999958
BDN	BEND MUNICIPAL	OR	LPV	0	1	0	1	0	1
CVO	CORVALLIS MUNICIPAL	OR	LPV200	0	1	0	1	4	0.99997
EUG	MAHLON SWEET FIELD	OR	LPV200	0	1	0	1	4	0.999977
GCD	GRANT CO RGNL OGILVIE FIELD	OR	LPV	0	1	0	1	0	1
HIO	PORTLAND-HILLSBORO	OR	LPV200	0	1	0	1	0	1
LGD	LA GRANDE/UNION COUNTY	OR	LPV	0	1	0	1	0	1
LMT	KLAMATH FALLS	OR	LPV	0	1	0	1	0	1
MMV	MCMINNVILLE MUNICIPAL	OR	LPV	0	1	0	1	1	0.999996
ONO	ONTARIO MUNICIPAL	OR	LPV	0	1	0	1	0	1
PDT	EASTERN OREGON RGNL AT PENDLETON	OR	LPV200	0	1	0	1	0	1
PDX	PORTLAND INTL	OR	LPV200	0	1	0	1	0	1
RDM	ROBERTS FIELD	OR	LPV200	0	1	0	1	0	1
S33	MADRAS MUNICIPAL	OR	LPV	0	1	0	1	0	1
SLE	MCNARY FLD	OR	LPV200	0	1	0	1	0	1
SPB	SCAPPOOSE INDUSTRIAL AIRPARK	OR	LPV	0	1	0	1	0	1
UAO	AURORA STATE	OR	LPV	0	1	0	1	0	1
22N	JAKE ARNER MEMORIAL	PA	LP	0	1	0	1	0	1
2G9	SOMERSET COUNTY	PA	LPV	0	1	0	1	0	1
8G2	CORRY-LAWRENCE	PA	LPV	0	1	0	1	0	1
8N8	DANVILLE	PA	LP	0	1	0	1	0	1
9D4	DECK	PA	LPV	0	1	0	1	0	1
ABE	LEHIGH VALLEY INTL	PA	LPV	0	1	0	1	0	1
AFJ	WASHINGTON COUNTY	PA	LPV200	0	1	0	1	0	1
AGC	ALLEGHENY COUNTY	PA	LPV200	0	1	0	1	0	1
AOO	ALTOONA-BLAIR COUNTY	PA	LPV	0	1	0	1	0	1
AVP	WILKES-BARRE SCRANTON INTL	PA	LPV	0	1	0	1	0	1
AXQ	CLARION COUNTY	PA	LPV	0	1	0	1	0	1
BFD	BRADFORD RGNL	PA	LPV200	0	1	0	1	0	1
BTP	BUTLER COUNTY K W SCHOLTER FLD	PA	LPV	0	1	0	1	0	1
BVI	BEAVER FALLS MUNICIPAL	PA	LPV	0	1	0	1	0	1
DUJ	DUBOIS RGNL	PA	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
ERI	ERIE INTL/TOM RIDGE FIELD	PA	LPV	0	1	0	1	0	1
FIG	CLEARFIELD-LAWRENCE	PA	LPV	0	1	0	1	0	1
FKL	VENANGO RGNL	PA	LPV	0	1	0	1	0	1
FWQ	ROSTRAVER	PA	LPV	0	1	0	1	0	1
GKJ	PORT MEADVILLE	PA	LP	0	1	0	1	0	1
HMZ	BEDFORD COUNTY	PA	LPV	0	1	0	1	0	1
HZL	HAZLETON MUNICIPAL	PA	LPV	0	1	0	1	0	1
IPT	WILLIAMSPORT RGNL	PA	LPV	0	1	0	1	0	1
JST	JOHN MURTHA JOHNSTOWN CAMBRIA COUNTY	PA	LPV200	0	1	0	1	0	1
LBE	ARNOLD PALMER RGNL	PA	LPV	0	1	0	1	0	1
LNS	LANCASTER	PA	LPV	0	1	0	1	0	1
LOM	WINGS FIELD	PA	LPV	0	1	0	1	0	1
MDT	HARRISBURG INTL	PA	LPV	0	1	0	1	0	1
MPO	POCONO MOUNTAINS MUNICIPAL	PA	LPV	0	1	0	1	0	1
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	0	1	0	1	0	1
N38	WELLSBORO JOHNSTON	PA	LP	0	1	0	1	0	1
N79	NORTHUMBERLAND COUNTY	PA	LPV	0	1	0	1	0	1
OYM	ST MARYS MUNICIPAL	PA	LPV	0	1	0	1	0	1
PHL	PHILADELPHIA INTL	PA	LPV	0	1	0	1	0	1
PIT	PITTSBURGH INTL	PA	LPV200	0	1	0	1	0	1
PNE	NORTHEAST PHILADELPHIA	PA	LPV	0	1	0	1	0	1
PSB	MID STATE	PA	LPV	0	1	0	1	0	1
RDG	READING RGNL CARL A SPAATZ FLD	PA	LPV	0	1	0	1	0	1
RVL	MIFFLIN COUNTY	PA	LPV	0	1	0	1	0	1
THV	YORK	PA	LP	0	1	0	1	0	1
UCP	NEW CASTLE MUNICIPAL	PA	LPV	0	1	0	1	0	1
UKT	QUAKERTOWN	PA	LP	0	1	0	1	0	1
UNV	UNIVERSITY PARK	PA	LPV200	0	1	0	1	0	1
VVS	JOSEPH A. HARDY CONNELLSVILLE	PA	LPV200	0	1	0	1	0	1
WAY	GREENE COUNTY	PA	LPV	0	1	0	1	0	1
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	0	1	0	1	0	1
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	0	1	0	1	0	1
ZER	SCHUYLKILL COUNTY JOE ZERBEY	PA	LPV200	0	1	0	1	0	1
CPN8	OPINACA	QC	LPV	1	0.999996	2	0.999951	5	0.999321
CSR3	VICTORIAVILLE	QC	LPV	0	1	0	1	0	1
CTP9	KATTINIQ / DONALDSON	QC	LPV	13	0.996792	19	0.996192	120	0.980786
CYEY	AMOS	QC	LPV	0	1	0	1	0	1
CYHU	MONTREAL / STHUBERT	QC	LPV	0	1	0	1	0	1
CYIF	STAUGUSTIN	QC	LPV	1	0.999981	1	0.999868	57	0.996452
CYMX	MONTREAL (MIRABEL INTL)	QC	LPV	0	1	0	1	0	1
CYQB	QUEBEC / JEAN LESAGE INTL	QC	LPV	0	1	0	1	0	1
CYRI	RIVIEREDULOUP	QC	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CYRQ	TROISRIVIERES	QC	LPV	0	1	0	1	0	1
CYVB	BONAVENTURE	QC	LPV	0	1	0	1	0	1
CYVP	KUUJJUAQ	QC	LPV	4	0.998958	6	0.99823	50	0.992093
CYYY	MONTJOLI	QC	LPV	0	1	0	1	0	1
BID	BLOCK ISLAND STATE	RI	LPV	0	1	0	1	0	1
OQU	QUONSET STATE	RI	LPV	0	1	0	1	0	1
PVD	THEODORE FRANCIS GREEN STATE	RI	LPV200	0	1	0	1	0	1
6J0	LEXINGTON COUNTY AT PELION	SC	LPV	0	1	0	1	0	1
AIK	AIKEN MUNICIPAL	SC	LPV200	0	1	0	1	0	1
AND	ANDERSON RGNL	SC	LPV200	0	1	0	1	0	1
ARW	BEAUFORT COUNTY	SC	LPV200	0	1	0	1	0	1
BBP	MARLBORO COUNTY JETPOR H E AVENT FIELD	SC	LPV	0	1	0	1	0	1
BNL	BARNWELL RGNL	SC	LPV	0	1	0	1	0	1
CAE	COLUMBIA METROPOLITAN	SC	LPV200	0	1	0	1	0	1
CDN	WOODWARD FIELD	SC	LPV	0	1	0	1	0	1
CEU	OCONEE COUNTY RGNL	SC	LPV200	0	1	0	1	0	1
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	1	0	1	0	1
CRE	GRAND STRAND	SC	LPV200	0	1	0	1	0	1
DCM	CHESTER CATAWBA RGNL	SC	LPV	0	1	0	1	0	1
DYB	SUMMERVILLE	SC	LPV200	0	1	0	1	0	1
FDW	FAIRFIELD COUNTY	SC	LPV	0	1	0	1	0	1
FLO	FLORENCE RGNL	SC	LPV	0	1	0	1	0	1
GGE	GEORGETOWN COUNTY	SC	LPV200	0	1	0	1	0	1
GMU	GREENVILLE DOWNTOWN	SC	LPV200	0	1	0	1	0	1
GSP	GREENVILLE SPARTANBURG INTL ROGER MILLIKEN	SC	LPV200	0	1	0	1	0	1
GYH	DONALDSON CENTER	SC	LPV	0	1	0	1	0	1
HYW	CONWAY-HORRY COUNTY	SC	LPV	0	1	0	1	0	1
JZI	CHARLESTON EXECUTIVE	SC	LPV200	0	1	0	1	0	1
LKR	LANCASTER COUNTY MC WHIRTER FIELD	SC	LPV200	0	1	0	1	0	1
LQK	PICKENS COUNTY	SC	LPV	0	1	0	1	0	1
LRO	MT PLEASANT RGNL FAISON FIELD	SC	LPV	0	1	0	1	0	1
MKS	BERKELEY COUNTY	SC	LPV	0	1	0	1	0	1
MYR	MYRTLE BEACH INTL	SC	LPV200	0	1	0	1	0	1
OGB	ORANGEBURG MUNICIPAL	SC	LPV200	0	1	0	1	0	1
RBW	LOWCOUNTRY RGNL	SC	LPV200	0	1	0	1	0	1
SMS	SUMTER	SC	LPV200	0	1	0	1	0	1
SPA	SPARTANBURG DOWNTOWN MEMORIAL	SC	LPV200	0	1	0	1	0	1
UDG	DARLINGTON COUNTY JETPORT	SC	LPV	0	1	0	1	0	1
UZA	ROCK HILL YORK CO BRYANT FIELD	SC	LPV200	0	1	0	1	0	1
0D8	GETTYSBURG MUNICIPAL	SD	LPV200	0	1	0	1	0	1
49B	STURGIS MUNICIPAL	SD	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
9D1	GREGORY MUNICIPAL FLYNN FIELD	SD	LPV	0	1	0	1	0	1
ABR	ABERDEEN RGNL	SD	LPV200	0	1	0	1	0	1
ATY	WATERTOWN RGNL	SD	LPV200	0	1	0	1	0	1
BKX	BROOKINGS RGNL	SD	LPV	0	1	0	1	0	1
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	0	1	0	1	0	1
FSD	JOE FOSS FIELD	SD	LPV200	0	1	0	1	0	1
HON	HURON RGNL	SD	LPV200	0	1	0	1	0	1
HSR	HOT SPRINGS MUNICIPAL	SD	LP	0	1	0	1	0	1
ICR	WINNER RGNL	SD	LPV	0	1	0	1	0	1
MBG	MOBRIDGE MUNICIPAL	SD	LPV	0	1	0	1	0	1
MDS	MADISON MUNICIPAL	SD	LPV	0	1	0	1	0	1
MHE	MITCHELL MUNICIPAL	SD	LPV	0	1	0	1	0	1
MKA	MILLER MUNICIPAL	SD	LPV200	0	1	0	1	0	1
PIR	PIERRE RGNL	SD	LPV	0	1	0	1	0	1
RAP	RAPID CITY RGNL	SD	LPV200	0	1	0	1	0	1
SPF	BLACK HILLS CLYDE ICE FIELD	SD	LPV	0	1	0	1	0	1
VMR	HAROLD DAVIDSON FIELD	SD	LPV	0	1	0	1	0	1
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	0	1	0	1	0	1
CKQ8	MCARTHUR RIVER	SK	LPV	1	0.999951	3	0.999777	15	0.997452
CYKJ	KEY LAKE	SK	LPV	0	1	1	0.99994	14	0.998343
0A3	SMITHVILLE MUNICIPAL	TN	LP	0	1	0	1	0	1
0M3	JOHN A BAKER	TN	LP	0	1	0	1	0	1
0M4	BENTON COUNTY	TN	LPV	0	1	0	1	0	1
0M5	HUMPHREYS COUNTY	TN	LP	0	1	0	1	0	1
1A3	MARTIN CAMPBELL FIELD	TN	LP	0	1	0	1	0	1
1M5	PORTLAND MUNICIPAL	TN	LPV	0	1	0	1	0	1
2A0	MARK ANTON	TN	LPV	0	1	0	1	0	1
2M8	CHARLES W. BAKER	TN	LPV	0	1	0	1	0	1
3M7	LAFAYETTE MUNICIPAL	TN	LPV	0	1	0	1	0	1
BGF	WINCHESTER MUNICIPAL	TN	LPV	0	1	0	1	0	1
BNA	NASHVILLE INTL	TN	LPV200	0	1	0	1	0	1
CHA	LOVELL FIELD	TN	LPV200	0	1	0	1	0	1
CKV	OUTLAW FIELD	TN	LPV	0	1	0	1	0	1
CSV	CROSSVILLE MEMORIAL WHITSON FIELD	TN	LPV200	0	1	0	1	0	1
DKX	KNOXVILLE DOWNTOWN ISLAND	TN	LPV	0	1	0	1	0	1
DYR	DYERSBURG RGNL	TN	LPV	0	1	0	1	0	1
FYE	FAYETTE CO	TN	LPV	0	1	0	1	0	1
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	0	1	0	1	0	1
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	0	1	0	1	0	1
GZS	ABERNATHY FIELD	TN	LPV	0	1	0	1	0	1
HZD	CARROLL COUNTY	TN	LPV	0	1	0	1	0	1
JWN	JOHN C. TUNE	TN	LPV	0	1	0	1	0	1
LUG	ELLINGTON	TN	LPV	0	1	0	1	0	1
M01	GENERAL DEWITT SPAIN	TN	LPV	0	1	0	1	0	1
M33	SUMNER COUNTY RGNL	TN	LP	0	1	0	1	0	1
M54	LEBANON MUNICIPAL	TN	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	0	1	0	1	0	1
MBT	MURFREESBORO MUNICIPAL	TN	LPV	0	1	0	1	0	1
MEM	MEMPHIS INTL	TN	LPV200	0	1	0	1	0	1
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	0	1	0	1	0	1
MMI	MCMINN COUNTY	TN	LPV	0	1	0	1	0	1
MOR	MOORE-MURRELL	TN	LPV	0	1	0	1	0	1
MQY	SMYRNA	TN	LPV	0	1	0	1	0	1
MRC	MAURY COUNTY	TN	LPV	0	1	0	1	0	1
NQA	MILLINGTON RGNL JETPORT	TN	LPV	0	1	0	1	0	1
PHT	HENRY COUNTY	TN	LPV200	0	1	0	1	0	1
PVE	BEECH RIVER RGNL	TN	LPV	0	1	0	1	0	1
RKW	ROCKWOOD MUNICIPAL	TN	LPV	0	1	0	1	0	1
SNH	SAVANNAH HARDIN COUNTY	TN	LPV	0	1	0	1	0	1
SRB	UPPER CUMBERLAND RGNL	TN	LPV200	0	1	0	1	0	1
SYI	BOMAR FIELD SHELBYVILLE MUNICIPAL	TN	LPV	0	1	0	1	0	1
SZY	ROBERT SIBLEY	TN	LPV	0	1	0	1	0	1
THA	TULLAHOMA RGNL WM NORTHERN FLD	TN	LPV	0	1	0	1	0	1
TRI	TRI-CITIES RGNL TN/VA	TN	LPV200	0	1	0	1	0	1
TYS	MCGHEE-TYSON	TN	LPV	0	1	0	1	0	1
UCY	EVERETT-STEWART RGNL	TN	LPV200	0	1	0	1	0	1
11R	BRENHAM MUNICIPAL	TX	LPV	0	1	0	1	0	1
2F5	LAMESA MUNICIPAL	TX	LP	0	1	0	1	0	1
2R9	KARNES COUNTY	TX	LP	0	1	0	1	0	1
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	0	1	0	1	0	1
45R	HAWTHORNE FIELD	TX	LP	0	1	0	1	0	1
50R	LOCKHART MUNICIPAL	TX	LPV	0	1	0	1	0	1
5C1	BOERNE STAGE FIELD	TX	LP	0	1	0	1	0	1
5T9	MAVERICK COUNTY MEMORIAL INTL	TX	LPV	0	1	0	1	1	0.999996
6R3	CLEVELAND MUNICIPAL	TX	LPV	0	1	0	1	0	1
77F	WINTERS MUNICIPAL	TX	LP	0	1	0	1	0	1
8F3	CROSBYTON MUNICIPAL	TX	LP	0	1	0	1	0	1
ABI	ABILENE RGNL	TX	LPV200	0	1	0	1	0	1
ACT	WACO RGNL	TX	LPV200	0	1	0	1	0	1
ADS	ADDISON	TX	LPV	0	1	0	1	0	1
AFW	FORT WORTH ALLIANCE	TX	LPV200	0	1	0	1	0	1
ALI	ALICE INTERNATIONAL	TX	LPV	0	1	0	1	0	1
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	1	0	1	0	1
ARM	WHARTON RGNL	TX	LPV	0	1	0	1	0	1
ASL	HARRISON COUNTY	TX	LPV	0	1	0	1	0	1
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	1	0	1	0	1
AXH	HOUSTON-SOUTHWEST	TX	LPV	0	1	0	1	0	1
BAZ	NEW BRAUNFELS MUNICIPAL	TX	LPV	0	1	0	1	0	1
BBD	CURTIS FIELD	TX	LPV	0	1	0	1	0	1
BKD	STEPHENS COUNTY	TX	LP	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BPG	BIG SPRING MC MAHON WRINKLE	TX	LPV	0	1	0	1	0	1
BPT	SOUTHEAST TEXAS RGNL	TX	LPV200	0	1	0	1	0	1
BRO	BROWNSVILLE SOUTH PADRE ISLAND INTL	TX	LP	0	1	0	1	1	0.999996
BWD	BROWNWOOD RGNL	TX	LPV	0	1	0	1	0	1
BYY	BAY CITY MUNICIPAL	TX	LPV	0	1	0	1	0	1
CFD	COULTER FIELD	TX	LPV	0	1	0	1	0	1
CLL	EASTERWOOD FIELD	TX	LPV200	0	1	0	1	0	1
CNW	TSTC WACO	TX	LPV200	0	1	0	1	0	1
COM	COLEMAN MUNICIPAL	TX	LPV	0	1	0	1	0	1
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	1	0	1	0	1
CXO	LONE STAR EXECUTIVE	TX	LPV200	0	1	0	1	0	1
DAL	DALLAS LOVE FIELD	TX	LPV200	0	1	0	1	0	1
DFW	DALLAS-FT WORTH INTL	TX	LPV200	0	1	0	1	0	1
DKR	HOUSTON COUNTY	TX	LP	0	1	0	1	0	1
DRT	DEL RIO INTL	TX	LPV	0	1	0	1	0	1
DTO	DENTON MUNICIPAL	TX	LPV	0	1	0	1	0	1
DUX	MOORE COUNTY	TX	LPV200	0	1	0	1	0	1
DWH	DAVID WAYNE HOOKS MEMORIAL	TX	LPV	0	1	0	1	0	1
E01	ROY HURD MEMORIAL	TX	LP	0	1	0	1	0	1
E11	ANDREWS COUNTY	TX	LPV	0	1	0	1	0	1
E19	GRUVER MUNICIPAL	TX	LP	0	1	0	1	0	1
E30	BRUCE FIELD	TX	LPV	0	1	0	1	0	1
E38	ALPINE-CASPARIS MUNICIPAL	TX	LP	0	1	0	1	3	0.999977
EBG	EDINBURG INTL	TX	LPV	0	1	0	1	1	0.999996
EDC	AUSTIN EXECUTIVE	TX	LPV200	0	1	0	1	0	1
EFD	ELLINGTON FIELD	TX	LPV200	0	1	0	1	0	1
ELA	EAGLE LAKE	TX	LP	0	1	0	1	0	1
ELP	EL PASO INTL	TX	LP	0	1	0	1	4	0.999894
ERV	KERRVILLE MUNICIPAL LOUIS SCHREINER FLD	TX	LPV	0	1	0	1	0	1
ETN	EASTLAND MUNICIPAL	TX	LP	0	1	0	1	0	1
F00	JONES FIELD	TX	LPV	0	1	0	1	0	1
F05	WILBARGER COUNTY	TX	LPV	0	1	0	1	0	1
FST	FT. STOCKTON PECOS COUNTY	TX	LPV	0	1	0	1	0	1
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	0	1	0	1	0	1
FWS	FORT WORTH SPINKS	TX	LPV200	0	1	0	1	0	1
GDJ	GRANBURY RGNL	TX	LPV	0	1	0	1	0	1
GGG	EAST TEXAS RGNL	TX	LPV	0	1	0	1	0	1
GKY	ARLINGTON MUNICIPAL	TX	LPV200	0	1	0	1	0	1
GLE	GAINESVILLE MUNICIPAL	TX	LPV	0	1	0	1	0	1
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	0	1	0	1	0	1
GNC	GAINES COUNTY	TX	LPV	0	1	0	1	0	1
GRK	ROBERT GRAY AAF	TX	LPV200	0	1	0	1	0	1
GVT	MAJORS	TX	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
GYI	NORTH TEXAS RGNL PERRIN FIELD	TX	LPV200	0	1	0	1	0	1
HBV	JIM HOGG COUNTY	TX	LPV	0	1	0	1	1	0.999996
HDO	HONDO MUNICIPAL	TX	LPV	0	1	0	1	0	1
HOU	WILLIAM P HOBBY	TX	LPV200	0	1	0	1	0	1
HQZ	MESQUITE METRO	TX	LPV	0	1	0	1	0	1
HRL	VALLEY INTL	TX	LPV200	0	1	0	1	1	0.999996
HRX	HEREFORD MUNICIPAL	TX	LPV200	0	1	0	1	0	1
IAH	GEORGE BUSH INTERCONTINENTAL HOUSTON	TX	LPV200	0	1	0	1	0	1
IKG	KLEBERG COUNTY	TX	LPV	0	1	0	1	0	1
INJ	HILLSBORO MUNICIPAL	TX	LPV	0	1	0	1	0	1
IWS	WEST HOUSTON	TX	LP	0	1	0	1	0	1
JAS	JASPER COUNTY-BELL FIELD	TX	LPV	0	1	0	1	0	1
JSO	CHEROKEE COUNTY	TX	LPV200	0	1	0	1	0	1
JWY	MID-WAY RGNL	TX	LPV200	0	1	0	1	0	1
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	1	0	1	0	1
LBX	BRAZORIA COUNTY	TX	LPV	0	1	0	1	0	1
LFK	ANGELINA COUNTY	TX	LPV	0	1	0	1	0	1
LHB	HEARNE MUNICIPAL	TX	LPV200	0	1	0	1	0	1
LLN	LEVELLAND MUNICIPAL	TX	LPV	0	1	0	1	0	1
LNC	LANCASTER	TX	LPV200	0	1	0	1	0	1
LRD	LAREDO INTL	TX	LPV200	0	1	0	1	4	0.999966
LUD	DECATUR MUNICIPAL	TX	LPV	0	1	0	1	0	1
LVJ	PEARLAND RGNL	TX	LPV	0	1	0	1	0	1
LXY	MEXIA-LIMESTONE CO	TX	LP	0	1	0	1	0	1
MAF	MIDLAND INTL	TX	LPV200	0	1	0	1	0	1
MDD	MIDLAND AIRPARK	TX	LPV	0	1	0	1	0	1
MFE	MC ALLEN MILLER INTL	TX	LPV	0	1	0	1	1	0.999996
MNZ	HAMILTON MUNICIPAL	TX	LPV	0	1	0	1	0	1
OCH	A L MANGHAM JR RGNL	TX	LPV200	0	1	0	1	0	1
ODO	ODESSA-SCHLEMEYER FIELD	TX	LPV200	0	1	0	1	0	1
ONY	OLNEY MUNICIPAL	TX	LPV	0	1	0	1	0	1
ORG	ORANGE COUNTY	TX	LPV	0	1	0	1	0	1
PEQ	PECOS MUNICIPAL	TX	LPV200	0	1	0	1	0	1
PIL	PORT ISABEL CAMERON COUNTY	TX	LPV	0	1	0	1	1	0.999996
PPA	PERRY LEFORS FIELD	TX	LPV	0	1	0	1	0	1
PRX	COX FIELD	TX	LPV	0	1	0	1	0	1
PSX	PALACIOS MUNICIPAL	TX	LPV	0	1	0	1	0	1
PVW	HALE COUNTY	TX	LPV	0	1	0	1	0	1
RAS	MUSTANG BEACH	TX	LPV	0	1	0	1	0	1
RBD	DALLAS EXECUTIVE	TX	LPV	0	1	0	1	0	1
RBO	NUECES COUNTY	TX	LP	0	1	0	1	0	1
RKP	ARANSAS COUNTY	TX	LPV	0	1	0	1	0	1
RYW	LAGO VISTA TX RUSTY ALLEN	TX	LP	0	1	0	1	0	1
SAT	SAN ANTONIO INTL	TX	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
SGR	SUGAR LAND RGNL	TX	LPV200	0	1	0	1	0	1
SJT	SAN ANGELO RGNL MATHIS FIELD	TX	LPV	0	1	0	1	0	1
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV200	0	1	0	1	0	1
SNK	WINSTON FIELD	TX	LPV200	0	1	0	1	0	1
SWW	AVENGER FIELD	TX	LPV	0	1	0	1	0	1
T41	LA PORTE MUNICIPAL	TX	LPV	0	1	0	1	0	1
T59	WHEELER MUNICIPAL	TX	LP	0	1	0	1	0	1
T78	LIBERTY MUNICIPAL	TX	LP	0	1	0	1	0	1
T82	GILLESPIE COUNTY	TX	LPV	0	1	0	1	0	1
TFP	T P MC CAMPBELL	TX	LPV	0	1	0	1	0	1
TKI	COLLIN COUNTY RGNL AT MC KINNEY	TX	LPV200	0	1	0	1	0	1
TME	HOUSTON EXECUTIVE	TX	LPV	0	1	0	1	0	1
TPL	DRAUGHON-MILLER CENTRAL TEXAS RGNL	TX	LPV200	0	1	0	1	0	1
TRL	TERRELL MUNICIPAL	TX	LPV	0	1	0	1	0	1
TYR	TYLER POUNDS RGNL	TX	LPV200	0	1	0	1	0	1
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	0	1	0	1	0	1
VCT	VICTORIA RGNL	TX	LPV200	0	1	0	1	0	1
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	0	1	0	1	0	1
BCE	BRYCE CANYON	UT	LPV	0	1	0	1	0	1
BDG	BLANDING MUNICIPAL	UT	LPV	0	1	0	1	0	1
BMC	BRIGHAM CITY	UT	LP	0	1	0	1	0	1
DTA	DELTA MUNICIPAL	UT	LP	0	1	0	1	0	1
ENV	WENDOVER	UT	LPV	0	1	0	1	0	1
FOM	FILLMORE MUNICIPAL	UT	LPV	0	1	0	1	0	1
LGU	LOGAN-CACHE	UT	LPV	0	1	0	1	0	1
OGD	OGDEN-HINCKLEY	UT	LPV	0	1	0	1	0	1
PUC	CARBON COUNTY RGNL BUCK DAVIS FIELD	UT	LP	0	1	0	1	0	1
PVU	PROVO MUNICIPAL	UT	LPV200	0	1	0	1	0	1
SGU	ST GEORGE MUNICIPAL	UT	LPV	0	1	0	1	0	1
SLC	SALT LAKE CITY INTL	UT	LP	0	1	0	1	0	1
U14	NEPHI MUNICIPAL	UT	LPV	0	1	0	1	0	1
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	1	0	1	0	1
VEL	VERNAL	UT	LP	0	1	0	1	0	1
0VG	LEE COUNTY	VA	LPV	0	1	0	1	0	1
8W2	NEW MARKET	VA	LP	0	1	0	1	0	1
AVC	MECKLENBURG BRUNSWICK RGNL	VA	LPV	0	1	0	1	0	1
BCB	VIRGINIA TECH MONTGOMERY EXECUTIVE	VA	LPV	0	1	0	1	0	1
CHO	CHARLOTTESVILLE ALBEMARLE	VA	LPV	0	1	0	1	0	1
CJR	CULPEPER RGNL	VA	LPV	0	1	0	1	0	1
CPK	CHESAPEAKE RGNL	VA	LPV200	0	1	0	1	0	1
DAN	DANVILLE RGNL	VA	LPV200	0	1	0	1	0	1
EMV	EMPORIA GREENSVILLE RGNL	VA	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
FCI	CHESTERFIELD COUNTY	VA	LPV	0	1	0	1	0	1
FKN	FRANKLIN MUNICIPAL JOHN BEVERLY ROSE	VA	LPV	0	1	0	1	0	1
FVX	FARMVILLE RGNL	VA	LPV	0	1	0	1	0	1
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	0	1	0	1	0	1
HLX	TWIN COUNTY	VA	LPV	0	1	0	1	0	1
HSP	INGALLS FIELD	VA	LPV	0	1	0	1	0	1
HWY	WARRENTON-FAUQUIER	VA	LPV200	0	1	0	1	0	1
JFZ	TAZEWELL COUNTY	VA	LPV	0	1	0	1	0	1
JYO	LEESBURG EXECUTIVE	VA	LPV	0	1	0	1	0	1
LKU	LOUISA COUNTY FREEMAN FIELD	VA	LPV	0	1	0	1	0	1
LNP	LONESOME PINE	VA	LPV	0	1	0	1	0	1
LUA	LURAY CAVERNS	VA	LP	0	1	0	1	0	1
LYH	LYNCHBURG RGNL PRESTON GLENN FIELD	VA	LPV	0	1	0	1	0	1
MFV	ACCOMACK COUNTY	VA	LPV	0	1	0	1	0	1
MKJ	MOUNTAIN EMPIRE	VA	LPV	0	1	0	1	0	1
MTV	BLUE RIDGE	VA	LPV	0	1	0	1	0	1
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	0	1	0	1	0	1
OKV	WINCHESTER RGNL	VA	LPV200	0	1	0	1	0	1
ORF	NORFOLK INTL	VA	LPV200	0	1	0	1	0	1
PHF	NEWPORT NEWS WILLIAMSBURG INTL	VA	LPV200	0	1	0	1	0	1
PSK	NEW RIVER VALLEY	VA	LPV200	0	1	0	1	0	1
PTB	DINWIDDIE COUNTY	VA	LPV	0	1	0	1	0	1
RIC	RICHMOND INTL	VA	LPV200	0	1	0	1	0	1
RMN	STAFFORD RGNL	VA	LPV	0	1	0	1	0	1
ROA	ROANOKE RGNL WOODRUM FIELD	VA	LPV	0	1	0	1	0	1
SFQ	SUFFOLK EXECUTIVE	VA	LP	0	1	0	1	0	1
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	0	1	0	1	0	1
VJI	VIRGINIA HIGHLANDS	VA	LPV	0	1	0	1	0	1
W63	MARKS MUNICIPAL	VA	LP	0	1	0	1	0	1
W78	WILLIAM M TUCK	VA	LPV	0	1	0	1	0	1
XSA	TAPPAHANNOCK-ESSEX COUNTY	VA	LPV	0	1	0	1	0	1
BTV	BURLINGTON INTL	VT	LPV200	0	1	0	1	0	1
FSO	FRANKLIN COUNTY STATE	VT	LPV	0	1	0	1	0	1
MPV	EDWARD F KNAPP STATE	VT	LPV	0	1	0	1	0	1
RUT	RUTLAND SOUTHERN VERMONT RGNL	VT	LPV	0	1	0	1	0	1
ALW	WALLA WALLA RGNL	WA	LPV	0	1	0	1	0	1
AWO	ARLINGTON MUNICIPAL	WA	LPV200	0	1	0	1	0	1
BLI	BELLINGHAM INTL	WA	LPV200	0	1	0	1	1	0.999996
BVS	SKAGIT RGNL	WA	LPV	0	1	0	1	0	1
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	0	1	0	1	0	1
CLS	CHEHALIS-CENTRALIA	WA	LPV	0	1	0	1	0	1
DEW	DEER PARK	WA	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
EPH	EPHRATA MUNICIPAL	WA	LPV	0	1	0	1	0	1
FHR	FRIDAY HARBOR	WA	LPV	0	1	0	1	0	1
GEG	SPOKANE INTL	WA	LPV200	0	1	0	1	0	1
HQM	BOWERMAN	WA	LPV200	0	1	0	1	1	0.999996
MWH	GRANT CO INTL	WA	LPV200	0	1	0	1	0	1
OLM	OLYMPIA RGNL	WA	LPV	0	1	0	1	0	1
OTH	SOUTHWEST OREGON RGNL	WA	LPV	0	1	0	1	10	0.999849
PAE	SNOHOMISH COUNTY (PAINE FIELD)	WA	LPV200	0	1	0	1	0	1
PSC	TRI-CITIES	WA	LPV200	0	1	0	1	0	1
PWT	BREMERTON NATIONAL	WA	LPV	0	1	0	1	0	1
RLD	RICHLAND	WA	LPV	0	1	0	1	0	1
RNT	RENTON MUNICIPAL	WA	LPV	0	1	0	1	0	1
SEA	SEATTLE-TACOMA INTL	WA	LPV200	0	1	0	1	0	1
TDO	ED CARLSON MEMORIAL SOUTH LEWIS CO	WA	LPV	0	1	0	1	0	1
TIW	TACOMA NARROWS	WA	LPV	0	1	0	1	0	1
YKM	YAKIMA AIR TERMINAL MCALLISTER FIELD	WA	LPV200	0	1	0	1	0	1
57C	EAST TROY MUNICIPAL	WI	LPV	0	1	0	1	0	1
82C	MAUSTON NEW LISBON UNION	WI	LP	0	1	0	1	0	1
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	0	1	0	1	0	1
ARV	LAKELAND NOBLE F. LEE MEMORIAL FIELD	WI	LPV	0	1	0	1	1	0.999985
ASX	JOHN F. KENNEDY MEMORIAL	WI	LPV	0	1	0	1	1	0.999955
ATW	OUTAGAMIE COUNTY RGNL	WI	LPV200	0	1	0	1	0	1
AUW	WAUSAU DOWNTOWN	WI	LPV200	0	1	0	1	0	1
BCK	BLACK RIVER FALLS AREA	WI	LPV	0	1	0	1	0	1
C29	MIDDLETON MUNICIPAL MOREY FIELD	WI	LPV	0	1	0	1	0	1
C35	REEDSBURG MUNICIPAL	WI	LP	0	1	0	1	0	1
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	0	1	0	1	0	1
CMY	SPARTA/FORT MC COY	WI	LPV	0	1	0	1	0	1
CWA	CENTRAL WISCONSIN	WI	LPV200	0	1	0	1	0	1
DLL	BARABOO WISCONSIN DELLS	WI	LPV	0	1	0	1	0	1
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	0	1	0	1	0	1
EGV	EAGLE RIVER UNION	WI	LPV	0	1	0	1	1	0.999989
ENW	KENOSHA RGNL	WI	LPV200	0	1	0	1	0	1
ETB	WEST BEND MUNICIPAL	WI	LPV	0	1	0	1	0	1
EZS	SHAWANO MUNICIPAL	WI	LPV	0	1	0	1	0	1
FLD	FOND DU LAC COUNTY	WI	LPV	0	1	0	1	0	1
GRB	AUSTIN STRAUBEL INTL	WI	LPV200	0	1	0	1	0	1
HXF	HARTFORD MUNICIPAL	WI	LPV	0	1	0	1	0	1
HYR	SAWYER COUNTY	WI	LPV	0	1	0	1	1	0.999992
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	0	1	0	1	0	1
LNR	TRI-COUNTY RGNL	WI	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
LSE	LA CROSSE MUNICIPAL	WI	LPV	0	1	0	1	0	1
LUM	MENOMONIE MUNICIPAL SCORE FIELD	WI	LPV	0	1	0	1	0	1
MDZ	TAYLOR COUNTY	WI	LPV	0	1	0	1	0	1
MFI	MARSHFIELD MUNICIPAL	WI	LPV	0	1	0	1	0	1
MKE	GENERAL MITCHELL INTL	WI	LPV200	0	1	0	1	0	1
MRJ	IOWA COUNTY	WI	LPV200	0	1	0	1	0	1
MSN	DANE COUNTY RGNL TRUAX FIELD	WI	LPV200	0	1	0	1	0	1
MTW	MANITOWOC COUNTY	WI	LPV200	0	1	0	1	0	1
MWC	LAWRENCE J TIMMERMAN	WI	LPV	0	1	0	1	0	1
OCQ	J DOUGLAS BAKE MEML	WI	LP	0	1	0	1	0	1
OSH	WITTMAN RGNL	WI	LPV	0	1	0	1	0	1
OVS	BOSCOBEL	WI	LPV	0	1	0	1	0	1
PBH	PRICE COUNTY	WI	LPV	0	1	0	1	1	0.999985
PCZ	WAUPACA MUNICIPAL	WI	LPV	0	1	0	1	0	1
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	0	1	0	1	0	1
RAC	JOHN H. BATTEN	WI	LPV	0	1	0	1	0	1
RCX	RUSK COUNTY	WI	LPV	0	1	0	1	0	1
RHI	RHINELANDER ONEIDA COUNTY	WI	LPV200	0	1	0	1	0	1
RNH	NEW RICHMOND RGNL	WI	LPV	0	1	0	1	0	1
RPD	RICE LAKE RGNL CARL'S FIELD	WI	LPV	0	1	0	1	0	1
RRL	MERRILL MUNICIPAL	WI	LPV	0	1	0	1	0	1
SBM	SHEBOYGAN COUNTY MEMORIAL	WI	LPV200	0	1	0	1	0	1
STE	STEVENS POINT MUNICIPAL	WI	LPV200	0	1	0	1	0	1
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	0	1	0	1	0	1
SUW	RICHARD I BONG	WI	LP	0	1	0	1	1	0.999936
TKV	TOMAHAWK RGNL	WI	LP	0	1	0	1	0	1
UES	WAUKESHA COUNTY	WI	LPV200	0	1	0	1	0	1
UNU	DODGE COUNTY	WI	LPV	0	1	0	1	0	1
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	0	1	0	1	0	1
Y50	WAUTOMA MUNICIPAL	WI	LP	0	1	0	1	0	1
3I2	MASON COUNTY	WV	LPV	0	1	0	1	0	1
BKW	RALEIGH COUNTY MEMORIAL	WV	LPV200	0	1	0	1	0	1
BLF	MERCER COUNTY	WV	LPV	0	1	0	1	0	1
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV	0	1	0	1	0	1
CRW	YEAGER	WV	LPV200	0	1	0	1	0	1
HLG	WHEELING OHIO CO	WV	LPV200	0	1	0	1	0	1
HTS	TRI-STATE MILTON J. FERGUSON FIELD	WV	LPV200	0	1	0	1	0	1
I18	JACKSON COUNTY	WV	LPV200	0	1	0	1	0	1
LWB	GREENBRIER VALLEY	WV	LPV	0	1	0	1	0	1
MGW	MORGANTOWN MUNICIPAL WALTER L. BILL HART FIELD	WV	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
MRB	EASTERN WV RGNL SHEPHERD	WV	LPV	0	1	0	1	0	1
PKB	MID-OHIO VALLEY RGNL	WV	LPV	0	1	0	1	0	1
SXL	SUMMERSVILLE	WV	LP	0	1	0	1	0	1
USW	BOGGS FIELD	WV	LP	0	1	0	1	0	1
W22	UPSHUR COUNTY RGNL	WV	LPV	0	1	0	1	0	1
7V6	CAMP GUERNSEY	WY	LP	0	1	0	1	0	1
COD	YELLOWSTONE RGNL	WY	LPV	0	1	0	1	0	1
CPR	NATRONA COUNTY INTL	WY	LPV	0	1	0	1	0	1
CYS	CHEYENNE RGNL JERRY OLSON FIELD	WY	LPV	0	1	0	1	0	1
DGW	CONVERSE COUNTY	WY	LPV200	0	1	0	1	0	1
ECS	MONDELL FIELD	WY	LPV	0	1	0	1	0	1
EVW	EVANSTON UINTA COUNTY BURNS FIELD	WY	LPV	0	1	0	1	0	1
GCC	GILLETTE CAMPBELL COUNTY	WY	LPV	0	1	0	1	0	1
JAC	JACKSON HOLE	WY	LPV	0	1	0	1	0	1
LAR	LARAMIE RGNL	WY	LPV	0	1	0	1	0	1
PNA	RALPH WENZ FIELD	WY	LPV	0	1	0	1	0	1
RIW	RIVERTON RGNL	WY	LPV200	0	1	0	1	0	1
RKS	ROCK SPRINGS SWEETWATER COUNTY	WY	LPV200	0	1	0	1	0	1
RWL	RAWLINS MUNICIPAL HARVEY FIELD	WY	LPV	0	1	0	1	0	1
SAA	SHIVELY FIELD	WY	LPV	0	1	0	1	0	1
SHR	SHERIDAN COUNTY	WY	LPV	0	1	0	1	0	1
WRL	WORLAND MUNICIPAL	WY	LPV	0	1	0	1	0	1
CYQH	WATSON LAKE	YT	LPV	1	0.999664	2	0.999336	5	0.99809
CYXY	WHITEHORSE ERIK NIELSEN INTL	YT	LPV	1	0.999551	3	0.999223	3	0.998381

Figure 8-1 WAAS LP Availability at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

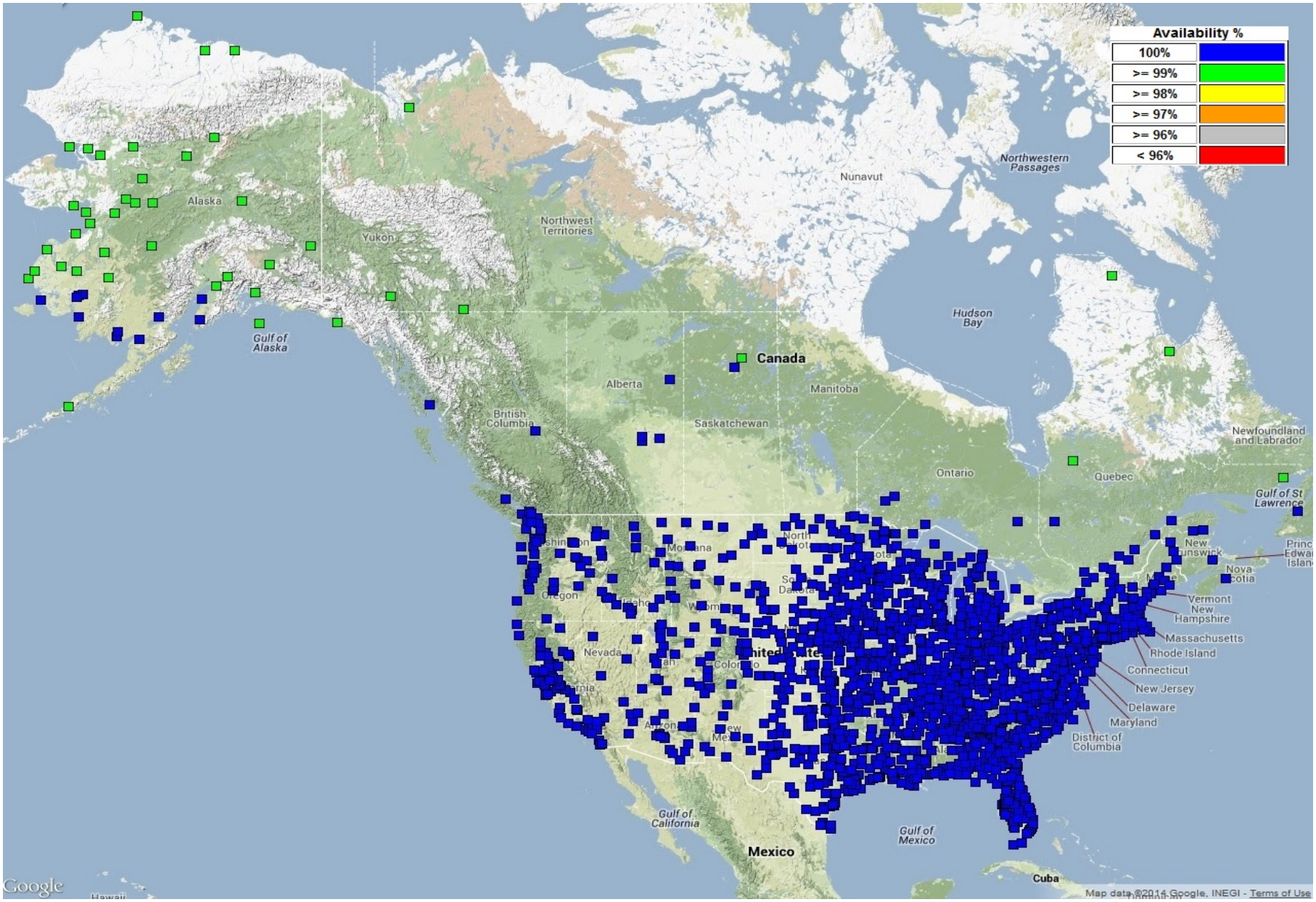


Figure 8-2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

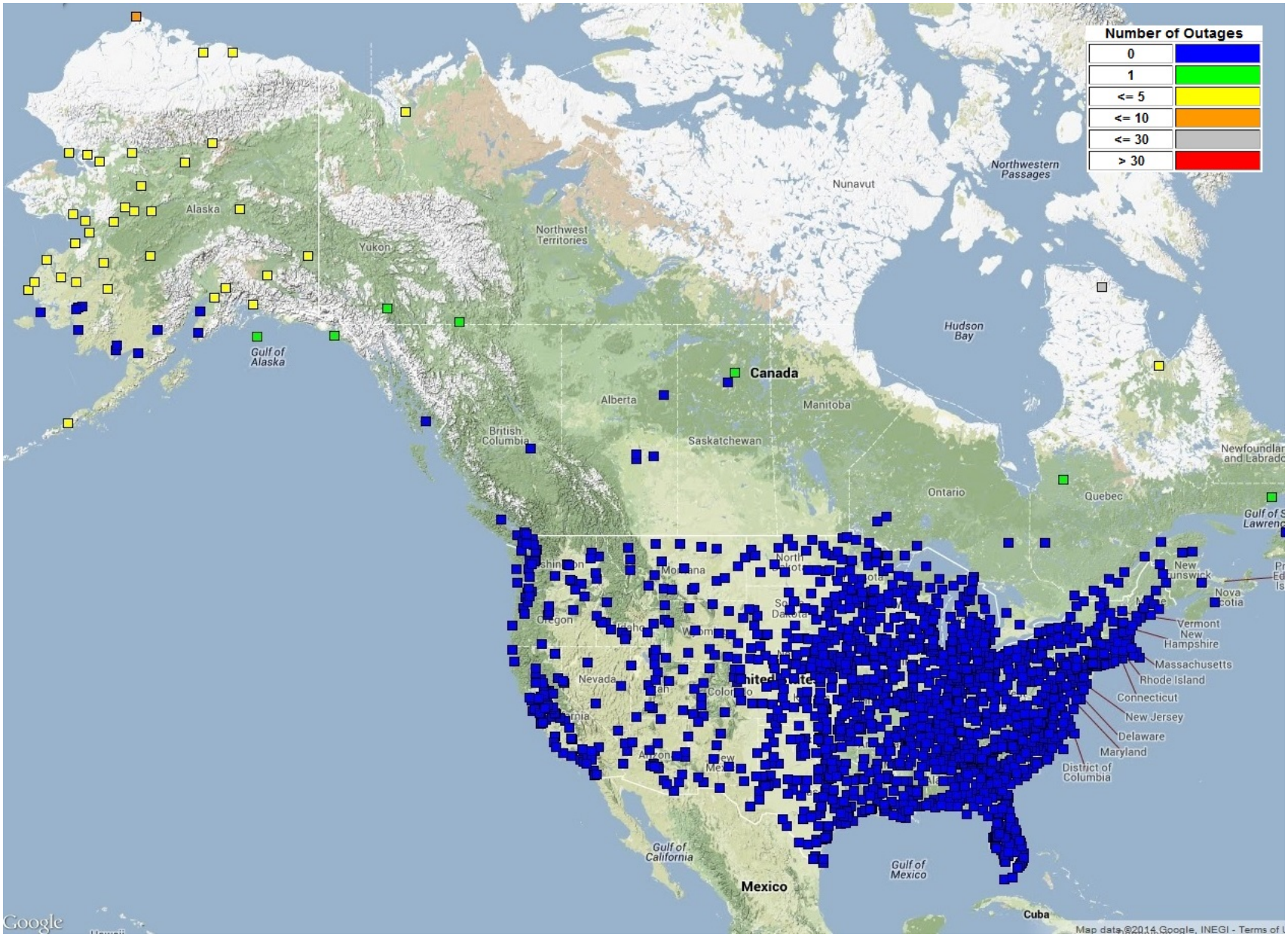


Figure 8-3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

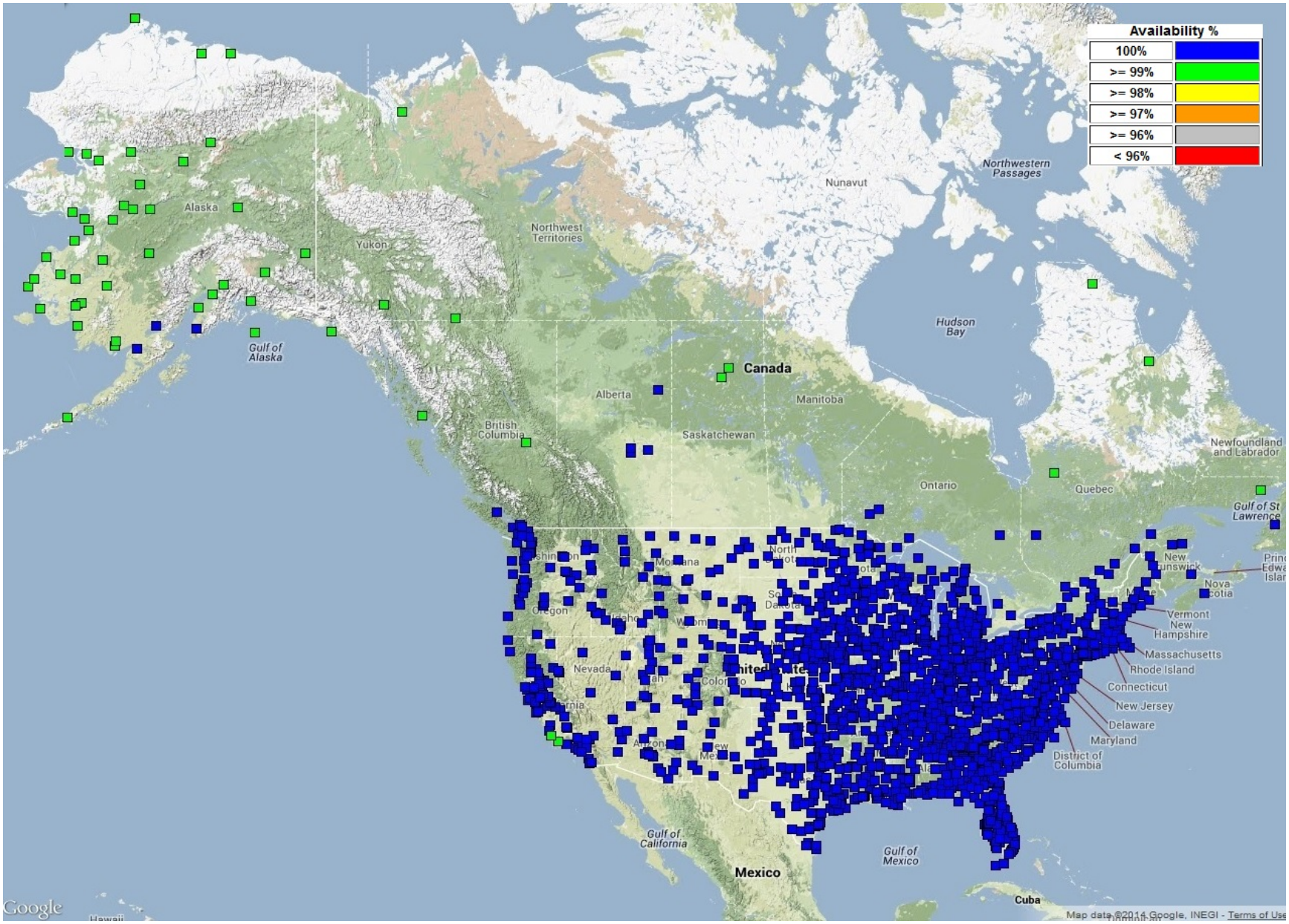


Figure 8-4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

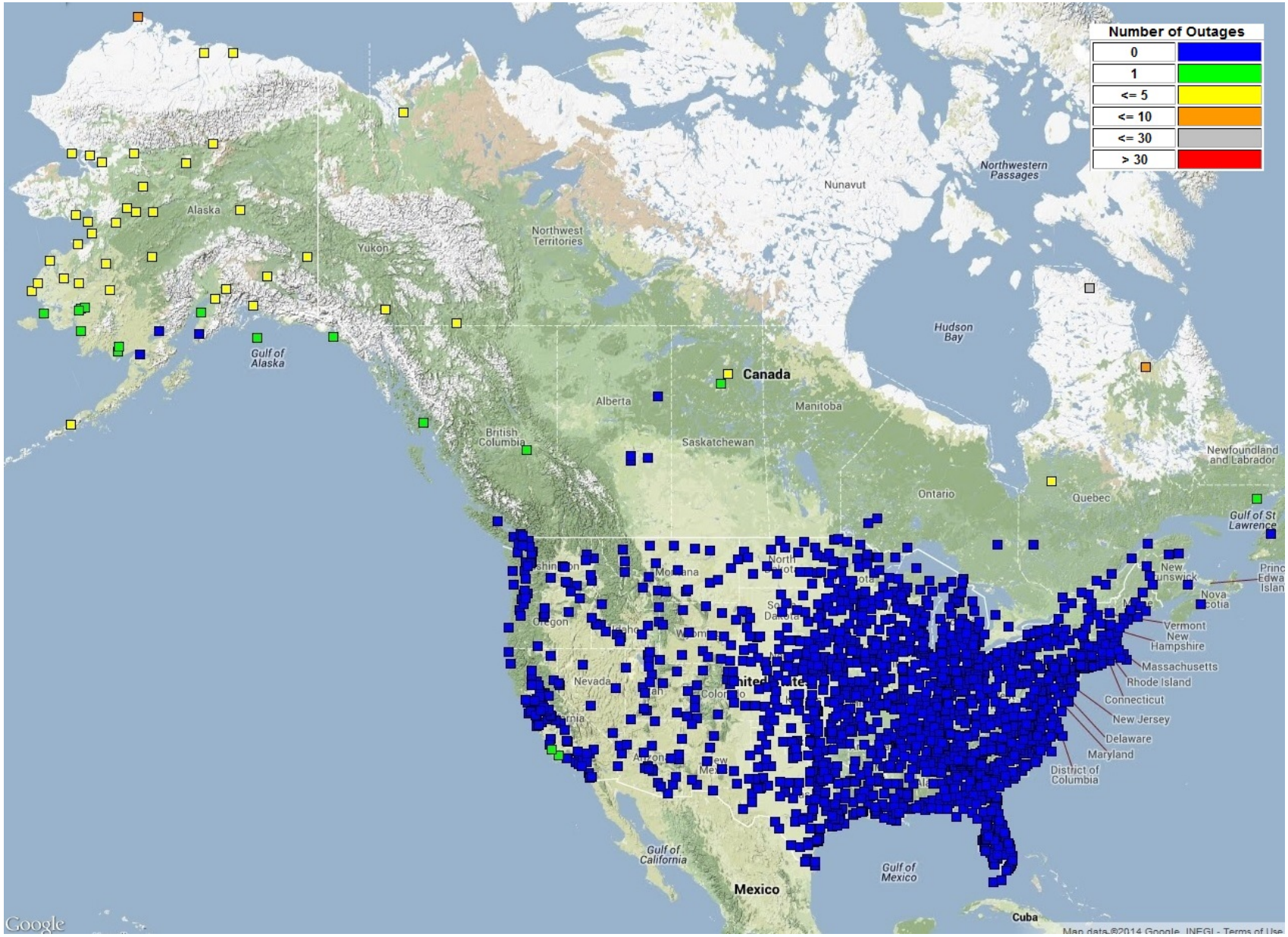


Figure 8-5 WAAS LPV 200 Availability at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

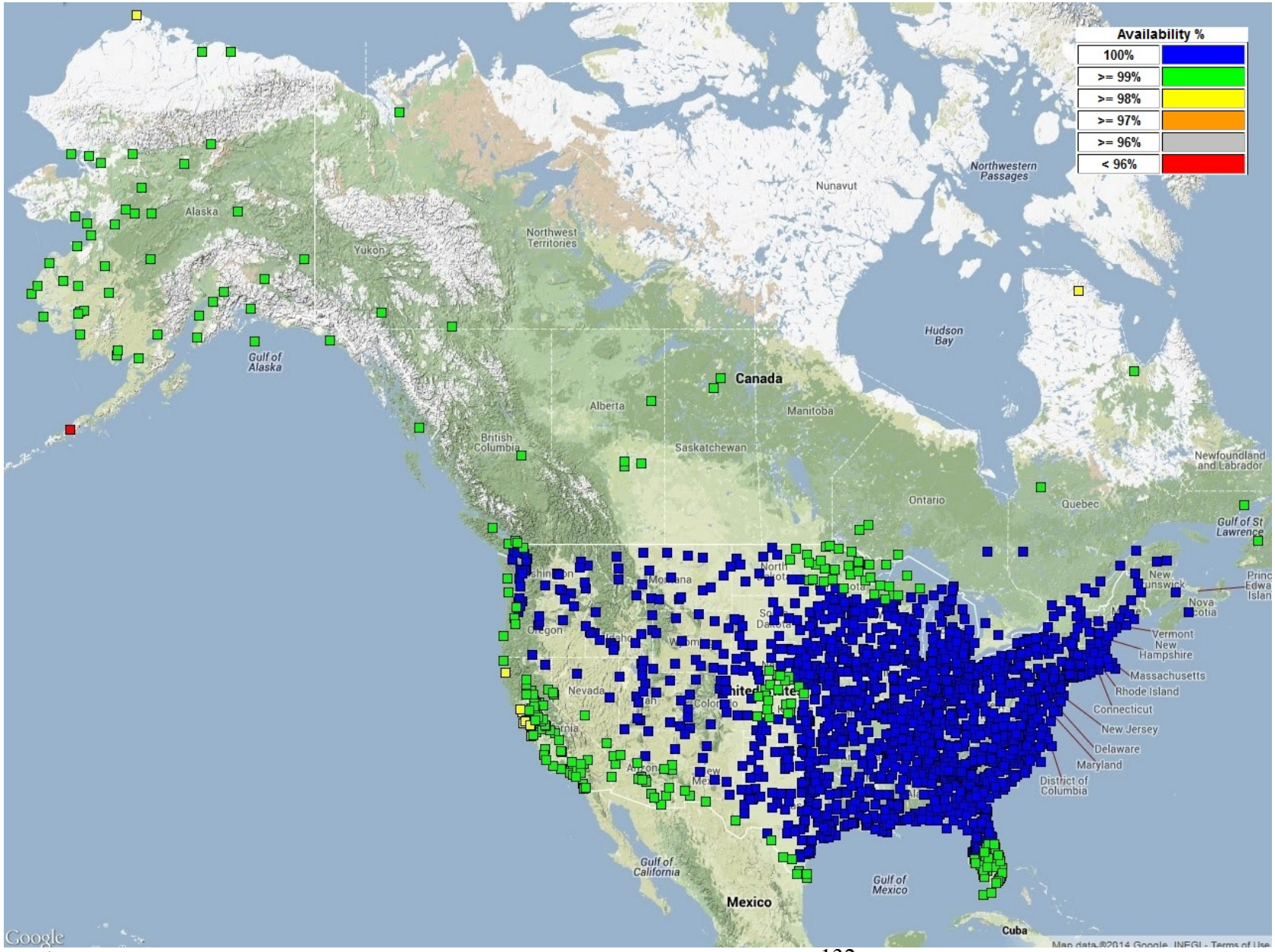
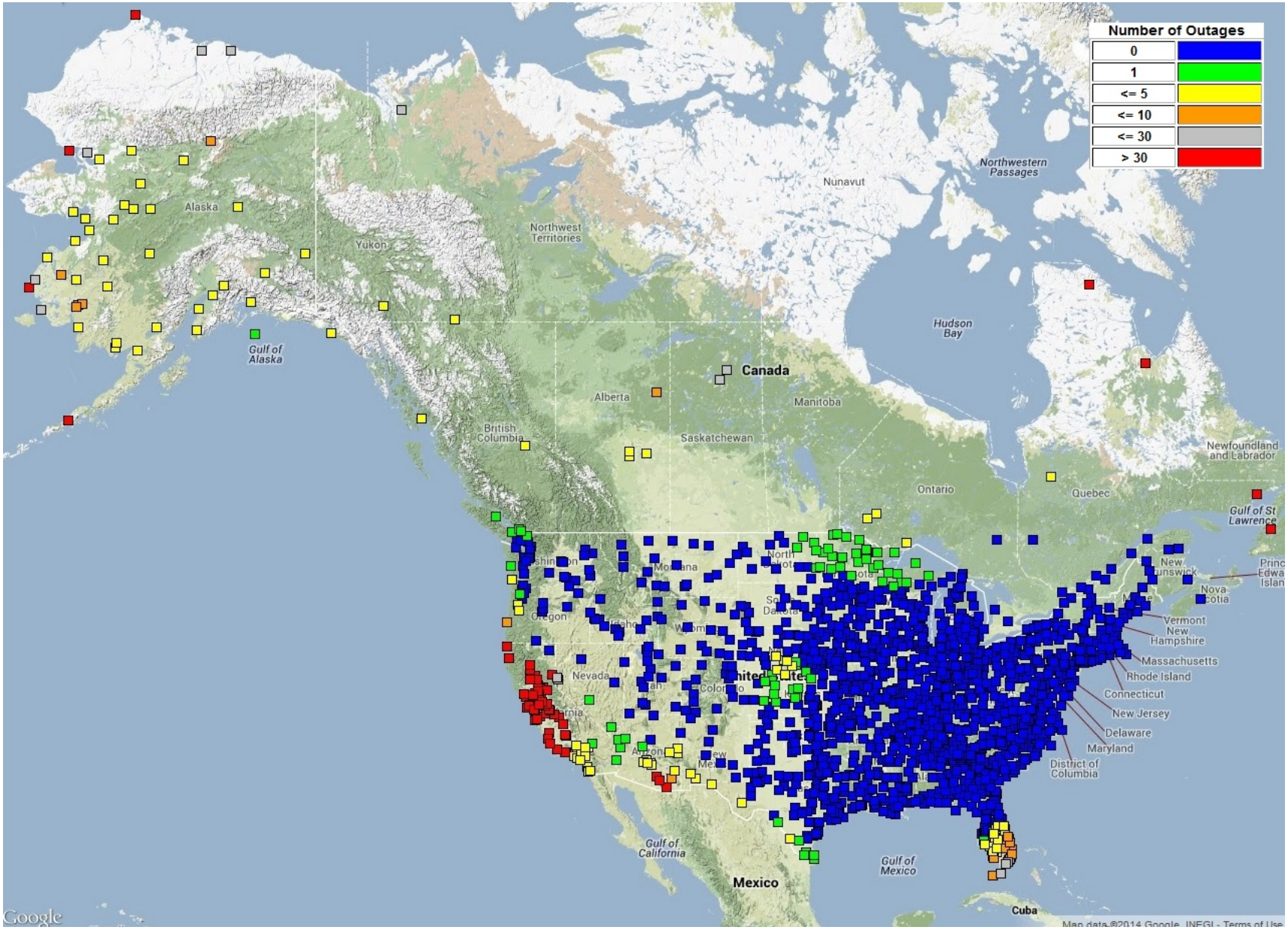


Figure 8-6 WAAS LPV 200 Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures



9.0 WAAS DETERMINISTIC CODE NOISE AND MULTIPATH (CNMP) BOUNDING ANALYSIS

WAAS utilizes a deterministic model to estimate the residual CNMP noise after the application of standard dual frequency carrier smoothing techniques to minimize the effects of multipath and code noise. This analysis performs an assessment of how well that deterministic model bounds the actual errors. This analysis is periodically performed as part of the WAAS Test Team's off-line monitoring to ensure that there are no drastic detrimental changes to the multipath environment at the WAAS Reference Stations (WRSs). This analysis also ensures that WAAS system is not indefinitely exposed to conspiring receiver failure symptoms that would invalidate the CNMP bounding estimate in a manner that would exceed the assumption that no more than one reference station is conspiring to deceive the WAAS monitors at any time by underestimating the residual measurement noise the safety monitors. Although some failures mechanisms that cause CNMP bounding issues are occasionally seen, no "conspiring" errors have ever been detected. That is, data has caused the safety monitors to trip unnecessarily versus missing a necessary trip.

The analysis post processes measurement data to estimate the pseudorange code to carrier ambiguity for each entire arc of measurements for each satellite pass. The ambiguity estimate is then used to level the carrier measurement. The leveled carrier is then used as a multipath free truth estimate. The WAAS real time deterministic CNMP smoothing algorithm is then applied to the original measurements. The difference between the smoothed measurements and the leveled truth measurements is compared to the deterministic noise estimates. Only arcs with continuous carrier phase greater in length than 7200 seconds are utilized for this analysis to minimize the impacts of non-zero mean multipath biasing the truth estimates. The WAAS dual frequency cycle slip detector algorithm is used to detect any discontinuities in the carrier phase.

Statistics are calculated on how well the 0.1 multiples of the deterministically estimated standard deviation bounds the difference between the leveled truth and the real time smoothed measurements. Those statistics are then compared to a theoretical Gaussian distribution and an extensive set of plots are generated and manually reviewed. Table 9-1 recaps the results of that manual analysis.

Table 9-1 CNMP Bounding Statistics

WAAS Site	WRE	Jan 13	Feb 13	Mar 13	Apr 13	May 13	Jun 13	Jul 13	Aug 13	Sep 13	Oct 13	Nov 13	Dec 13
Albuquerque	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Anchorage	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Atlanta	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Barrow	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Bethel	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Billings	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Boston	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Chicago	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Cleveland	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Cold Bay	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Dallas	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Denver	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Fairbanks	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Gander	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Goose Bay	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Honolulu	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Houston	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Iqaluit	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Jacksonville	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●

- ● **Excellent** - 3.29σ bounded 100%
- ● **Good** - 4σ bounded 100%
- ● **Fair** - 4σ bounded 100% with one worst satellite excluded (Requires manual review if symptoms repeat from month to month)
- ● **Poor** – Requires manual review
- – No data available

WAAS Site	WRE	Jan 13	Feb 13	Mar 13	Apr 13	May 13	Jun 13	Jul 13	Aug 13	Sep 13	Oct 13	Nov 13	Dec 13
Juneau	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Kansas City	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Kotzebue	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Los Angeles	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Memphis	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Merida	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Mexico City	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	–	–	–	–	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Miami	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Minneapolis	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
New York	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Oakland	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Puerto Vallarta	A	●	●	●	●	●	●	●	–	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Salt Lake City	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
San Jose Del Cabo	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
San Juan	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Seattle	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Tapachula	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Washington, DC	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Winnipeg	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●

- ● **Excellent** - 3.29σ bounded 100%
- ● **Good** - 4σ bounded 100%
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- ● **Poor** – Requires manual review
- – No data available

10.0 WAAS REFERENCE STATION SURVEY VALIDATION

Antenna L1 phase center position surveys were performed for all the WAAS Reference Station antennas using 25 hour sets of data from 23:00 on 1/3/14 to 23:59:30 on 1/4/14.

Duplicate surveys were performed using both the National Geodetic Survey (NGS) Online Positioning User Service (OPUS) and the Canadian Spatial Reference System (CSRS) Precise Point Positioning (PPP) service. The IGS08 reference frame is used for the OPUS solutions. The value of -0.4445 meters was used for the antenna reference point (ARP) to antenna phase center (APC) offset for the MicroPulse MPL-WAAS-2225W WAAS antennas in the processing.

The overall RMS quality metrics reported by OPUS were all <= 2.4 cm. The CSRS surveys' RSSs of the reported ECEF sigmas for the 1/4/14 data set were all <= 9 mm. The OPUS and CSRS surveys for the 1/4/14 data set agreed to an average of 1.4 cm., with a standard deviation of 5 mm. The maximum of difference was 3.4 cm. for Albuquerque thread A (ZAB-A).

The OPUS positions were compared to the positions in WAAS software Release 4.0 (Build W7.006) which is the current fielded version of the WAAS software. The OPUS surveys agree with the Release 4 positions to better or equal than 6.0 cm. for all sites except Mexico City (MMX) which were 10.9 cm, 11.1 cm and 11.3 cm respectively for MMX1, MMX2, and MMX3. The non-MMX maximum was at MTP1, Tapachula Mexico thread A.

The "take action" threshold established by the WAAS Integrity Performance Panel (WIPP) is 25 cm. for Mexico City and 10 cm. for the remaining sites. The large MMX allowance is required because of the rapid subsidence in Mexico City (approximately 28 to 30 cm / year).

Table 10-1 lists the WAAS antenna L1 phase center positions as of 1/4/14.

Figures 10-1 to 10-3 show the RSS of the ECEF differences between the 1/4/14 OPUS survey antenna phase center locations and the locations in the WAAS Releases 4 software. Each reference station has three independent strings of WAAS receiving equipment (WRE). A surveyed antenna phase center location is required for each WRE. All three strings of a reference station are shown in the three figures. For example, BET1 identifies the RSS of the ECEF deltas for the Bethel WRE string 1(A). The next two bars in the chart are Bethel string 2(B) and Bethel string 3(C). Figures 10-4 to 10-6 show the OPUS surveys overall RMS quality indications.

Figures 10-7 to 10-9 show the RSS of the ECEF difference between the positions obtained from OPUS and the positions obtained from CSRS. Note that that OPUS positions are in IGS08 and the CSRS positions are in ITRF-2008. Figures 10-10 to 10-12 show the RSS of the ECEF sigma's survey qualities reported by CSRS.

Figures 10-13 to 10-15 show the RSS of the ECEF difference between the positions obtained from OPUS and the positions in the Release W7.012C version of the WAAS operational software that will be fielded mid-year 2014. The Release W7.012C positions were obtained by decoding the binary site specific adaptation files to be used by the operational software. The local velocities have been used to interpolate the positions forward in time to maximize the duration of time before the next software update for antenna positions is required. The difference on 1/4/13 for Mexico City is 31 cm, which is above the 25 cm requirement for Mexico City. However, that value will have shrunk to 20 cm by June 2014. The next largest outliers (but still under the 10 cm requirement) are Hawaii, Oakland, and Los Angeles, which are the other quicker moving sites.

Table 10-1 WAAS Antenna Positions (OPUS IGS08) as of 1/4/14

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
BET1	-2965385.048	-972576.626	5543892.887	60.7879153972222	-161.8417249138890	52.175
BET2	-2965385.816	-972580.347	5543891.827	60.7878959527778	-161.8416643944440	52.172
BET3	-2965388.395	-972577.478	5543890.964	60.7878799833333	-161.8417292000000	52.178
BIL1	-1416445.887	-4223577.005	4550862.149	45.8037068861111	-108.5397232027780	1112.235
BIL2	-1416449.951	-4223574.869	4550862.867	45.8037161166667	-108.5397814944440	1112.239
BIL3	-1416441.585	-4223574.269	4550866.001	45.8037565944444	-108.5396819333330	1112.235
BRW1	-1886758.930	-809058.660	6018494.468	71.2827648555556	-156.7899249250000	15.565
BRW2	-1886756.343	-809055.921	6018495.653	71.2827976083333	-156.7899667277780	15.578
BRW3	-1886755.254	-809059.700	6018495.473	71.2827929444444	-156.7898578166670	15.565
CDB1	-3484099.057	-1084748.800	5213678.623	55.1923740388889	-162.7064044444440	49.697
CDB2	-3484105.694	-1084741.598	5213675.675	55.1923279750000	-162.7065433944440	49.672
CDB3	-3484111.973	-1084734.829	5213672.927	55.1922845111111	-162.7066741805560	49.689
FAI1	-2304741.812	-1448715.275	5748843.674	64.8096299777778	-147.8473409555560	149.925
FAI2	-2304741.340	-1448706.468	5748846.069	64.8096804027778	-147.8474926027780	149.927
FAI3	-2304732.812	-1448707.407	5748849.211	64.8097469416667	-147.8473803500000	149.910
HNL1	-5508637.114	-2234493.220	2303722.243	21.3129907666667	-157.9208283666670	24.668
HNL2	-5508656.274	-2234483.543	2303687.001	21.3126478972222	-157.9209842111110	25.011
HNL3	-5508647.693	-2234497.474	2303694.096	21.3127165083333	-157.9208287000000	25.060
JNU1	-2354254.898	-2388549.647	5407043.106	58.3625745611111	-134.5857071250000	16.094
JNU2	-2354252.814	-2388565.756	5407036.936	58.3624689916667	-134.5854885805560	16.092
JNU3	-2354239.598	-2388568.609	5407041.399	58.3625453916667	-134.5852935611110	16.091
MMD1	35070.413	-5959686.664	2264365.763	20.9319092416667	-89.6628407555556	29.115
MMD2	35065.492	-5959687.037	2264364.982	20.9319015416667	-89.6628880833333	29.157
MMD3	35065.156	-5959685.255	2264369.641	20.9319466027778	-89.6628912138889	29.156
MMX1	-948701.035	-5943935.180	2109212.577	19.4316537277778	-99.0683896888889	2235.146
MMX2	-948696.599	-5943935.005	2109214.997	19.4316769583333	-99.0683482555555	2235.129
MMX3	-948705.466	-5943935.366	2109210.150	19.4316304111111	-99.0684310611111	2235.171
MPR1	-1570142.227	-5759530.603	2238184.750	20.6790032722222	-105.2492032722220	10.976
MPR2	-1570139.402	-5759530.109	2238188.797	20.6790413611111	-105.2491783611110	11.265
MPR3	-1570143.509	-5759527.989	2238190.562	20.6790593555556	-105.2492217416670	10.985
MSD1	-1979519.797	-5523222.996	2493106.828	23.1604473111111	-109.7176489472220	104.274
MSD2	-1979521.357	-5523225.326	2493100.420	23.1603844555556	-109.7176556111110	104.254
MSD3	-1979525.810	-5523222.058	2493104.098	23.1604205805556	-109.7177073138890	104.254
MTP1	-254854.352	-6162909.168	1617805.067	14.7913660055556	-92.3679991694444	54.944
MTP2	-254850.740	-6162910.201	1617801.638	14.7913340027778	-92.3679652500000	54.922
MTP3	-254855.508	-6162910.308	1617800.108	14.7913199333333	-92.3680094611111	54.825
OTZ1	-2396056.027	-750356.164	5843502.510	66.8873320888889	-162.6113729000000	10.883
OTZ2	-2396052.858	-750354.334	5843504.032	66.8873668972222	-162.6113911388890	10.881
OTZ3	-2396052.839	-750358.273	5843503.543	66.8873556166667	-162.6113052305560	10.886
YFB1	1035381.423	-2634289.648	5696539.543	63.7314905500000	-68.5431839388889	10.029
YFB2	1035372.210	-2634296.042	5696538.174	63.7314643527778	-68.5434048555556	9.944
YFB3	1035366.150	-2634306.818	5696534.410	63.7313865638889	-68.5435988166667	10.026

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
YQX1	2430424.618	-3419640.389	4788223.823	48.9664900333333	-54.5976323138889	146.864
YQX2	2430432.576	-3419639.043	4788220.762	48.9664481361111	-54.5975330777778	146.861
YQX3	2430440.483	-3419637.684	4788217.768	48.9664069055556	-54.5974343055556	146.883
YWG1	-520164.383	-4083475.934	4855843.045	49.9005744055556	-97.2593977277778	222.101
YWG2	-520150.513	-4083468.877	4855850.439	49.9006774166667	-97.2592186361111	222.119
YWG3	-520152.388	-4083477.995	4855842.616	49.9005682861111	-97.2592284888889	222.114
YYR1	1885341.413	-3321428.365	5091171.669	53.3086471861111	-60.4194684805556	37.856
YYR2	1885344.362	-3321419.881	5091176.081	53.3087135444444	-60.4193671750000	37.856
YYR3	1885340.086	-3321413.073	5091182.082	53.3088036305556	-60.4193725444444	37.869
ZAB1	-1488636.847	-5003946.534	3654557.705	35.1735753916667	-106.5673498388890	1620.120
ZAB2	-1488631.511	-5003948.211	3654557.678	35.1735747472222	-106.5672884611110	1620.175
ZAB3	-1488632.287	-5003950.802	3654553.826	35.1735323333333	-106.5672885138890	1620.167
ZAN1	-2659536.656	-1549114.774	5567750.758	61.2292017194444	-149.7802509277780	80.700
ZAN2	-2659548.420	-1549110.821	5567746.280	61.2291180694444	-149.7804247388890	80.710
ZAN3	-2659541.369	-1549106.695	5567750.755	61.2292016583333	-149.7804250444440	80.701
ZAU1	138704.107	-4761244.137	4227763.927	41.7826580500000	-88.3313367944444	195.881
ZAU2	138704.368	-4761248.752	4227758.774	41.7825957388889	-88.3313352722222	195.893
ZAU3	138711.071	-4761248.488	4227758.846	41.7825966333333	-88.3312545861111	195.890
ZBW1	1490299.213	-4448983.170	4306010.498	42.7357205305556	-71.4804259416667	39.113
ZBW2	1490304.325	-4448981.160	4306010.844	42.7357245416667	-71.4803589527778	39.141
ZBW3	1490306.034	-4448984.784	4306006.536	42.7356717500000	-71.4803532194445	39.140
ZDC1	1069125.763	-4839598.996	4001126.516	39.1015959083333	-77.5427465527778	80.076
ZDC2	1069128.151	-4839603.613	4001120.299	39.1015239138889	-77.5427311111111	80.053
ZDC3	1069124.052	-4839602.708	4001122.497	39.1015493222222	-77.5427751222222	80.068
ZDV1	-1273628.610	-4711375.568	4094890.110	40.1873033027778	-105.1272243527780	1541.350
ZDV2	-1273622.915	-4711377.090	4094890.130	40.1873035388889	-105.1271551500000	1541.350
ZDV3	-1273624.924	-4711380.283	4094885.839	40.1872530694444	-105.1271681333330	1541.336
ZFW1	-659983.203	-5324060.786	3438276.475	32.8306497055556	-97.0664718222222	155.629
ZFW2	-659988.469	-5324063.326	3438271.471	32.8305963027778	-97.0665242972222	155.578
ZFW3	-659983.497	-5324063.849	3438271.679	32.8305983333333	-97.0664709138889	155.613
ZHU1	-513864.471	-5506451.710	3166720.471	29.9618963166667	-95.3314262638889	10.852
ZHU2	-513867.121	-5506455.113	3166714.315	29.9618318305556	-95.3314503250000	10.927
ZHU3	-513873.402	-5506457.758	3166708.718	29.9617735944444	-95.3315125694444	10.919
ZJX1	772646.443	-5434462.185	3237231.744	30.6988596833333	-81.9081851138889	2.133
ZJX2	772649.764	-5434463.735	3237228.341	30.6988240694444	-81.9081530694445	2.118
ZJX3	772645.704	-5434466.173	3237225.238	30.6987915194444	-81.9081986083333	2.117
ZKC1	-415247.521	-4954556.385	3982161.117	38.8801594388889	-94.7908338833333	305.896
ZKC2	-415231.129	-4954557.708	3982161.170	38.8801600944444	-94.7906443722222	305.890
ZKC3	-415237.246	-4954561.058	3982155.979	38.8801019333333	-94.7907113916667	305.628
ZLA1	-2474409.946	-4637294.623	3602183.534	34.6035183972222	-118.0838956055560	763.497
ZLA2	-2474404.664	-4637297.428	3602183.537	34.6035184805556	-118.0838304138890	763.489
ZLA3	-2474411.278	-4637297.117	3602179.565	34.6034744805556	-118.0838956166670	763.570
ZLC1	-1808273.223	-4486410.818	4145303.018	40.7860432888889	-111.9521776750000	1287.431
ZLC2	-1808274.614	-4486414.423	4145298.520	40.7859899055556	-111.9521769916670	1287.418

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
ZLC3	-1808270.406	-4486416.133	4145298.520	40.7859898305556	-111.9521231916670	1287.428
ZMA1	966042.298	-5662999.811	2761581.503	25.8246122750000	-80.3191897972222	-7.597
ZMA2	966029.324	-5662999.115	2761585.988	25.8246599916667	-80.3193161833333	-8.225
ZMA3	966037.402	-5662997.949	2761586.340	25.8246620305556	-80.3192348083333	-7.883
ZME1	4070.889	-5226189.292	3644028.432	35.0673942055556	-89.9553700222222	68.604
ZME2	4070.919	-5226186.741	3644032.541	35.0674377305556	-89.9553696722222	68.877
ZME3	4064.723	-5226186.620	3644032.693	35.0674395027778	-89.9554375972222	68.861
ZMP1	-249978.391	-4539297.504	4458955.058	44.6374632750000	-93.1520856000000	262.662
ZMP2	-249972.588	-4539297.845	4458955.058	44.6374631388889	-93.1520123388889	262.677
ZMP3	-249973.685	-4539302.123	4458950.584	44.6374071027778	-93.1520231805556	262.616
ZNY1	1406144.622	-4627343.982	4144322.055	40.7843286027778	-73.0971658277778	6.444
ZNY2	1406146.419	-4627347.013	4144317.275	40.7842758777778	-73.0971559000000	5.913
ZNY3	1406140.862	-4627348.672	4144317.314	40.7842763111111	-73.0972246027778	5.917
ZOA1	-2684436.873	-4293337.388	3865351.860	37.5430539333333	-122.0159479055560	-3.514
ZOA2	-2684433.864	-4293341.471	3865349.436	37.5430263666667	-122.0158945416670	-3.511
ZOA3	-2684438.247	-4293342.358	3865345.589	37.5429819972222	-122.0159312722220	-3.417
ZOB1	650770.176	-4754715.667	4187420.752	41.2971544972222	-82.2064448138889	223.678
ZOB2	650777.858	-4754714.844	4187422.769	41.2971667972222	-82.2063526138889	225.179
ZOB3	650776.189	-4754719.663	4187414.979	41.2970870750000	-82.2063801583333	223.455
ZSE1	-2308930.274	-3668169.678	4663526.480	47.2869932527778	-122.1883728555560	82.104
ZSE2	-2308934.662	-3668175.221	4663520.071	47.2869077000000	-122.1883829111110	82.162
ZSE3	-2308935.722	-3668179.495	4663516.126	47.2868559944444	-122.1883646722220	82.100
ZSU1	2462589.441	-5529372.128	2003724.477	18.4313357694444	-65.9934767722222	-28.090
ZSU2	2462587.511	-5529377.491	2003712.186	18.4312186694444	-65.9935141138889	-28.073
ZSU3	2462594.142	-5529375.235	2003710.107	18.4311990305556	-65.9934480888889	-28.126
ZTL1	529840.400	-5305248.808	3489342.850	33.3796886027778	-84.2967260416667	261.133
ZTL2	529846.772	-5305247.960	3489343.132	33.3796917722222	-84.2966569972222	261.112
ZTL3	529847.461	-5305251.400	3489337.903	33.3796350861111	-84.2966533055556	261.151

Figure 10-1 WAAS Release 4 Antenna Positions Deltas from 1/4/14 OPUS Survey

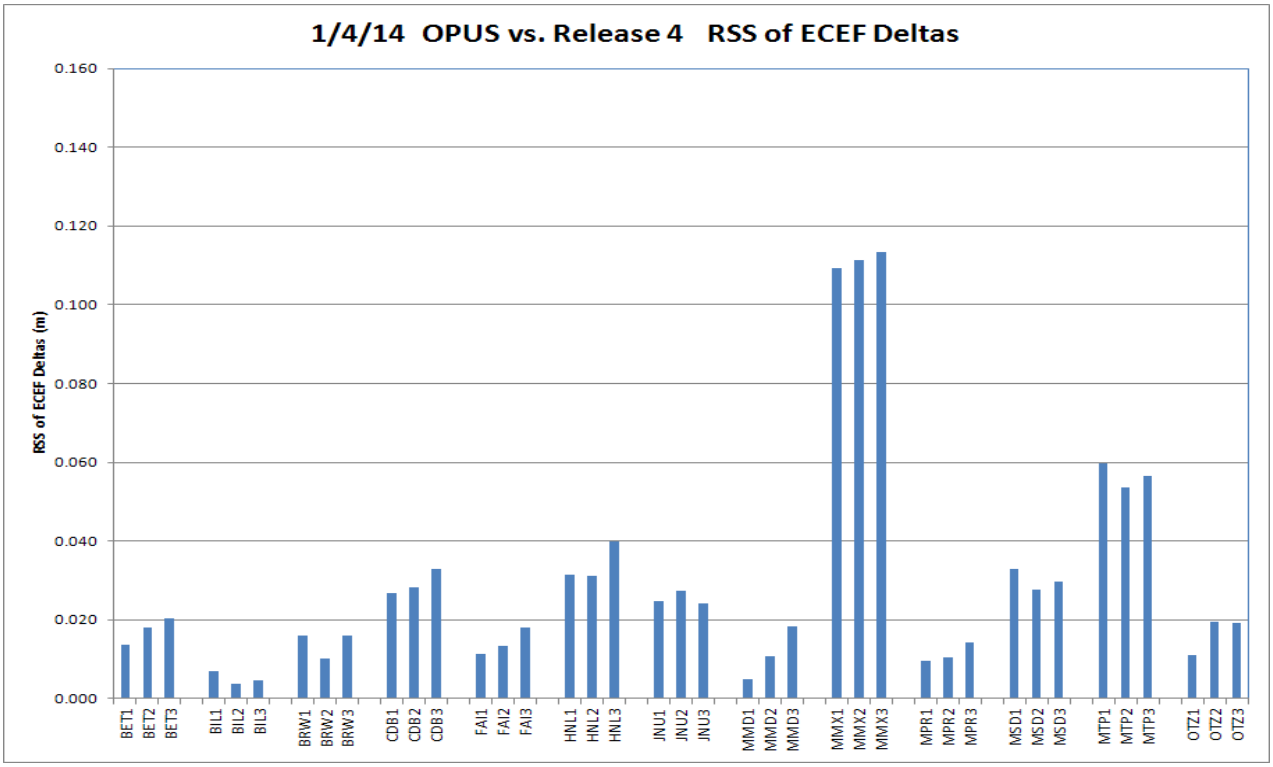


Figure 10-2 WAAS Release 4 Antenna Positions Deltas from 1/4/14 OPUS Survey

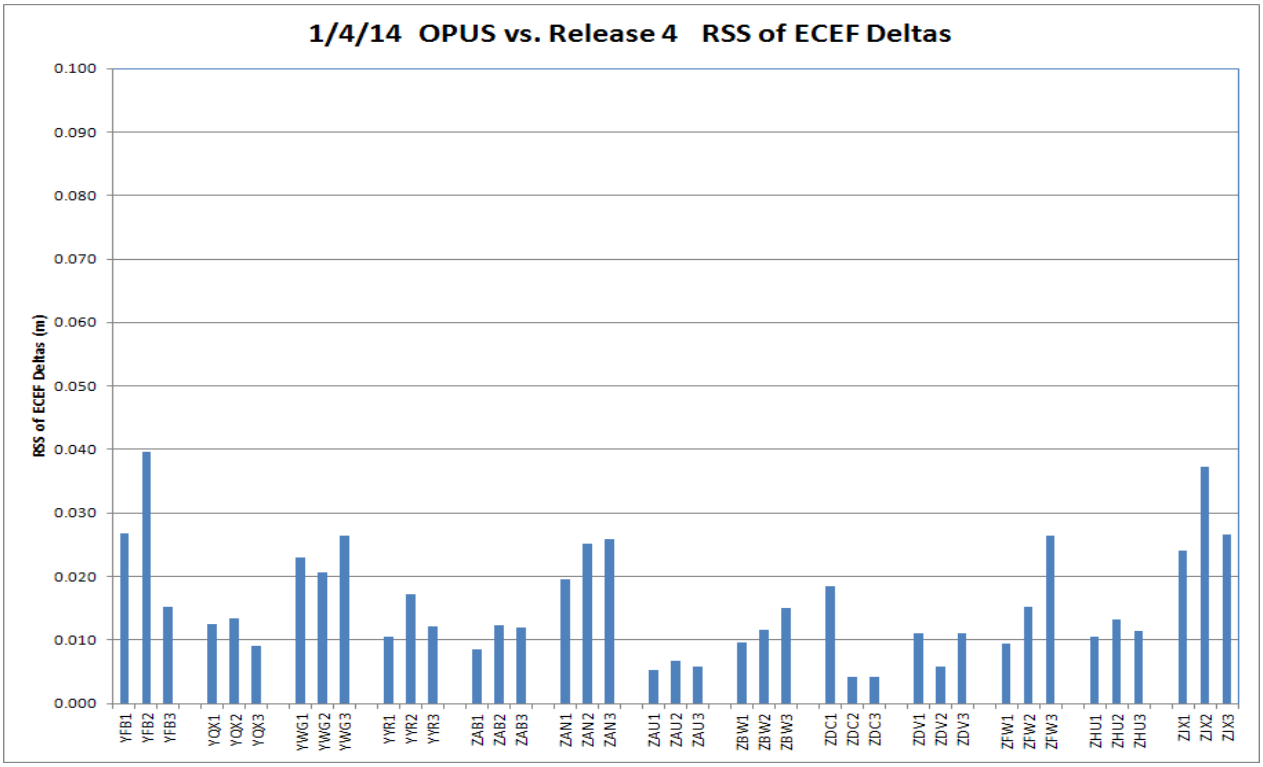


Figure 10-3 WAAS Release 4 Antenna Positions Deltas from 1/4/14 OPUS Survey

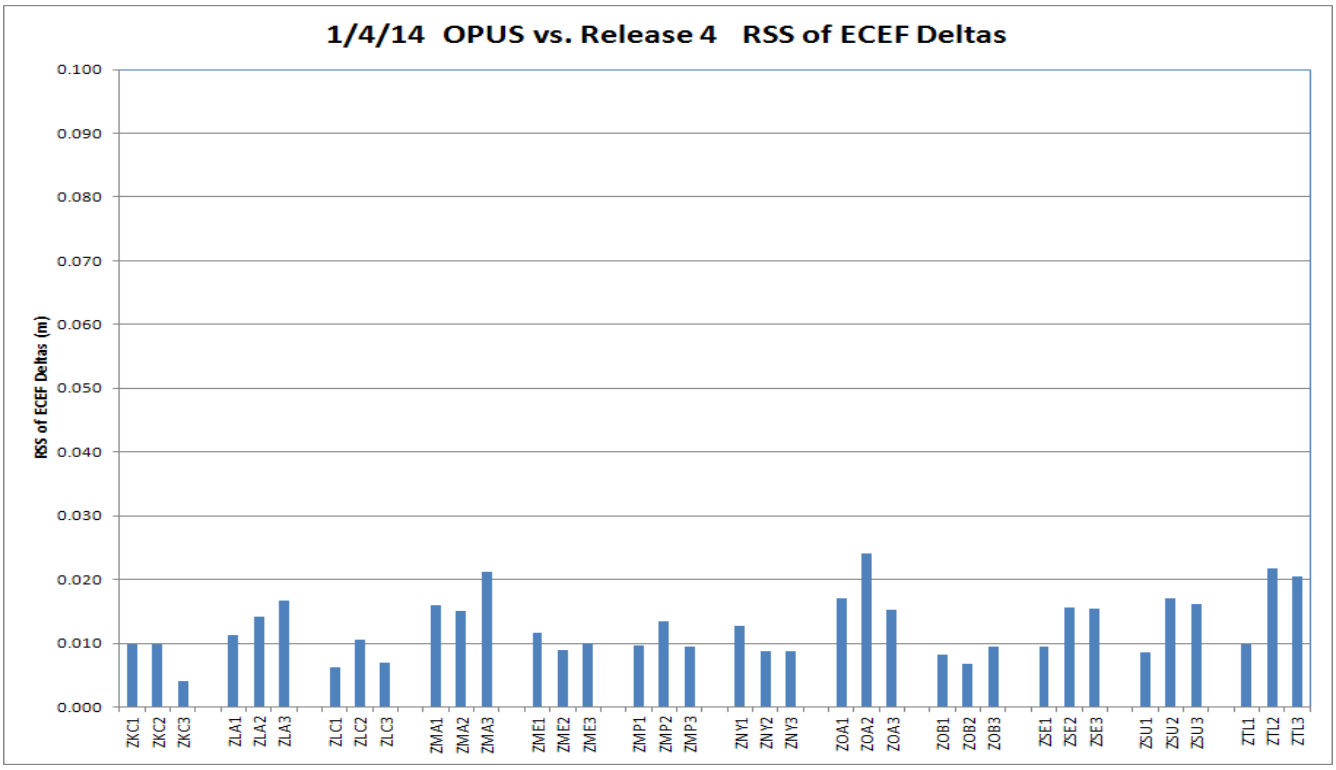


Figure 10-4 1/4/14 OPUS Survey Overall RMS Qualities

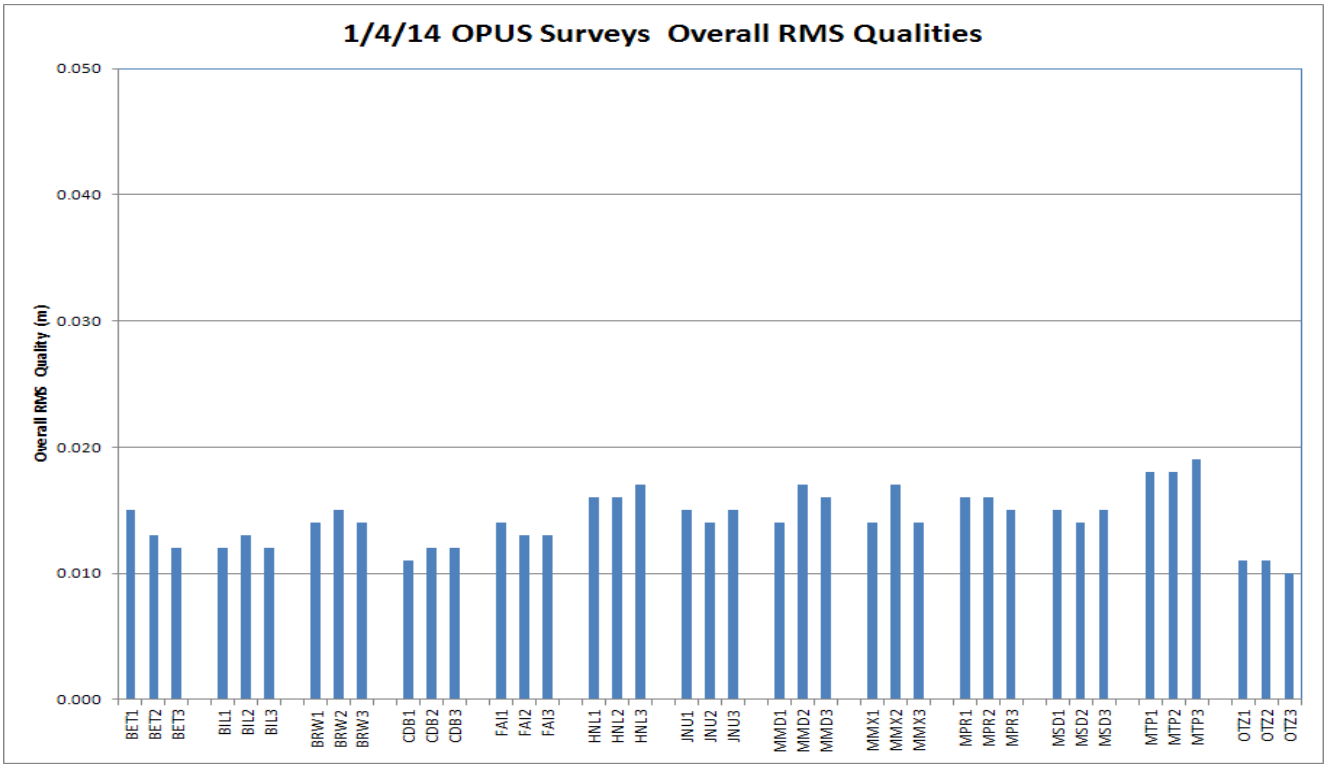


Figure 10-5 1/4/14 OPUS Survey Overall RMS Qualities

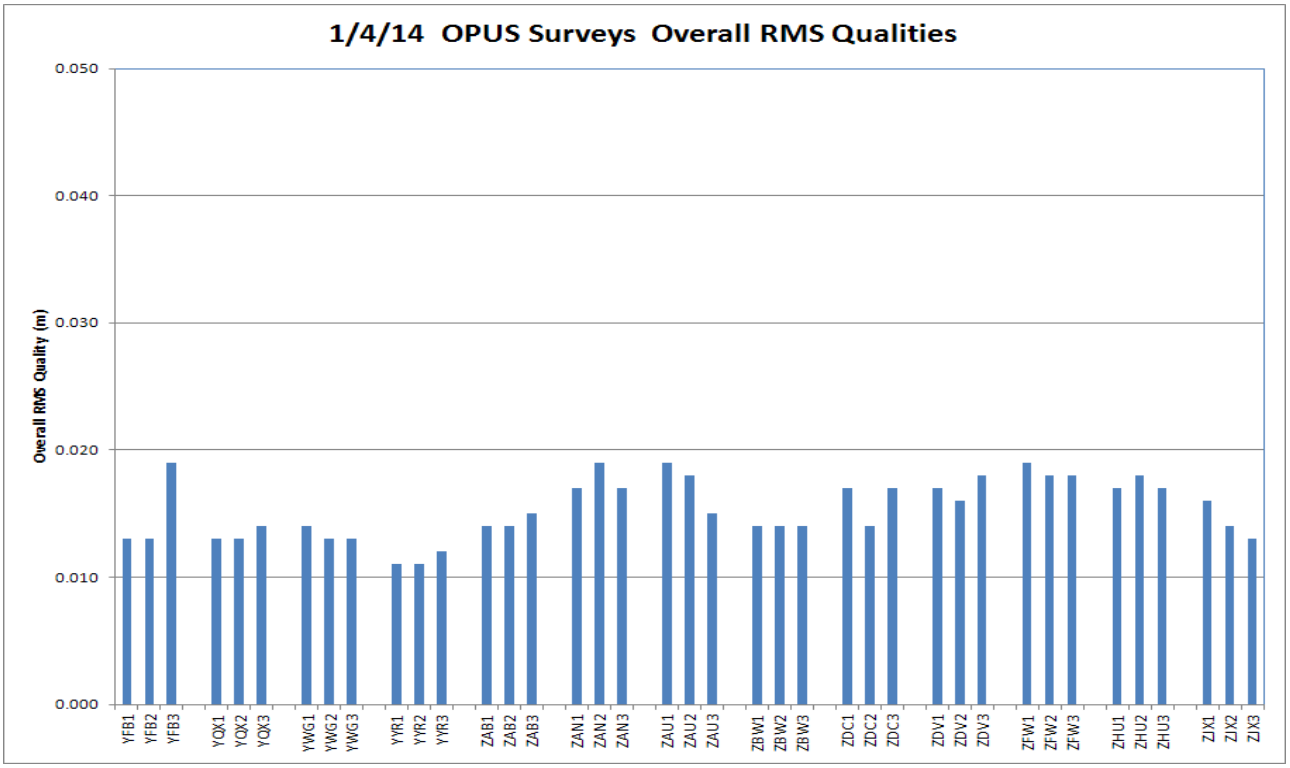


Figure 10-6 1/4/14 OPUS Survey Overall RMS Qualities

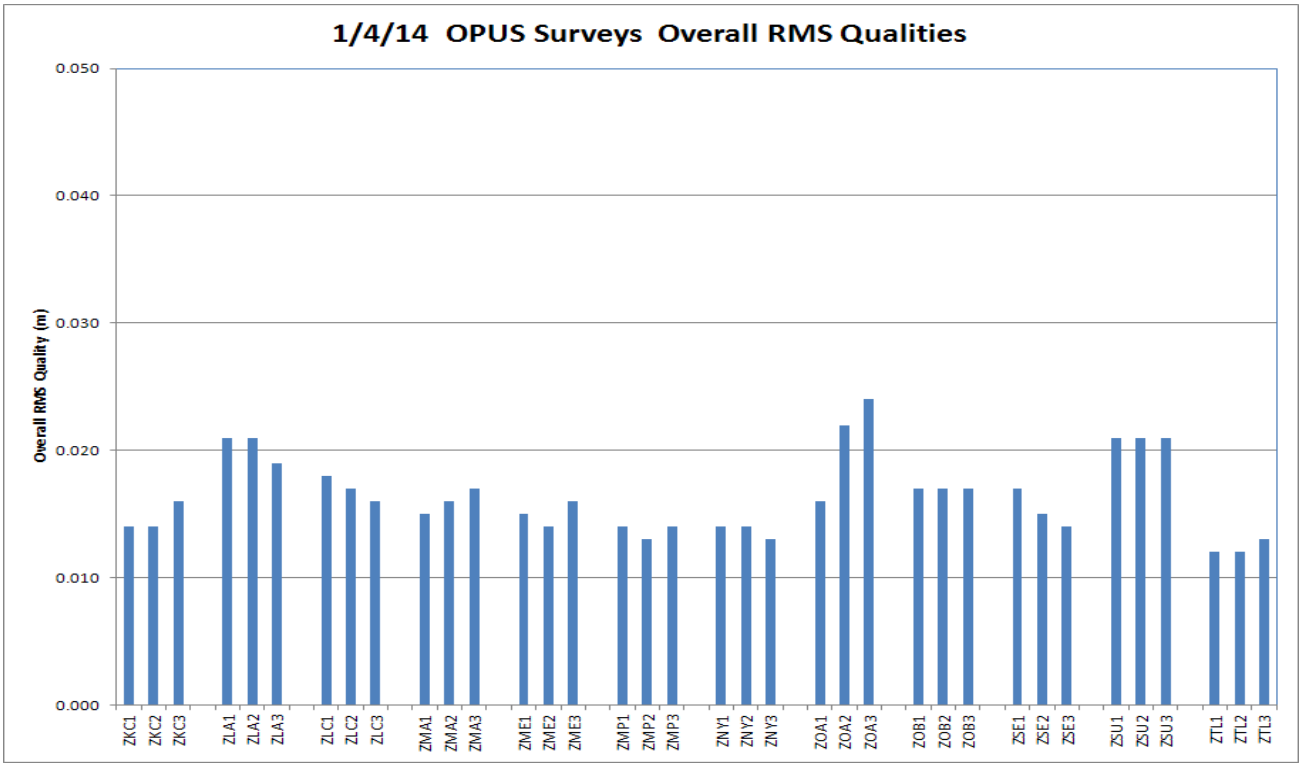


Figure 10-7 1/4/14 OPUS vs. CSRS RSS ECEF Deltas

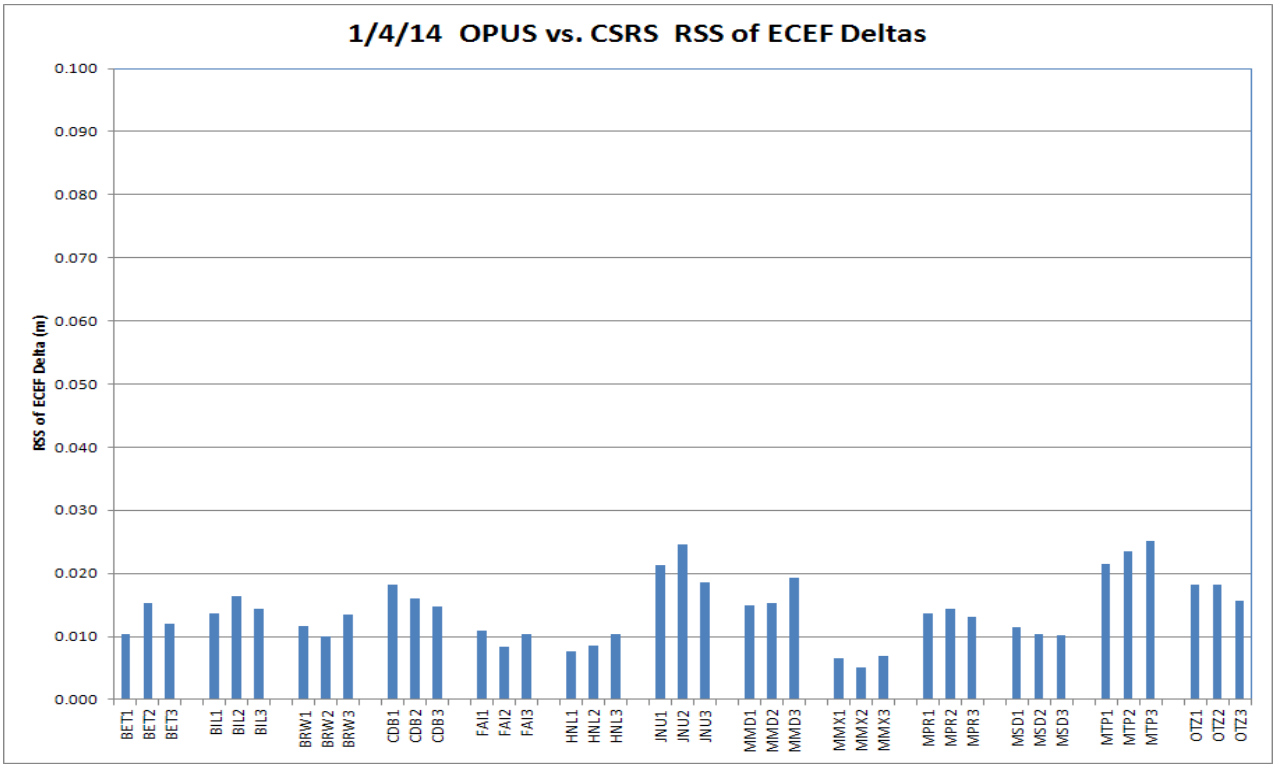


Figure 10-8 1/4/14 OPUS vs. CSRS RSS ECEF Deltas

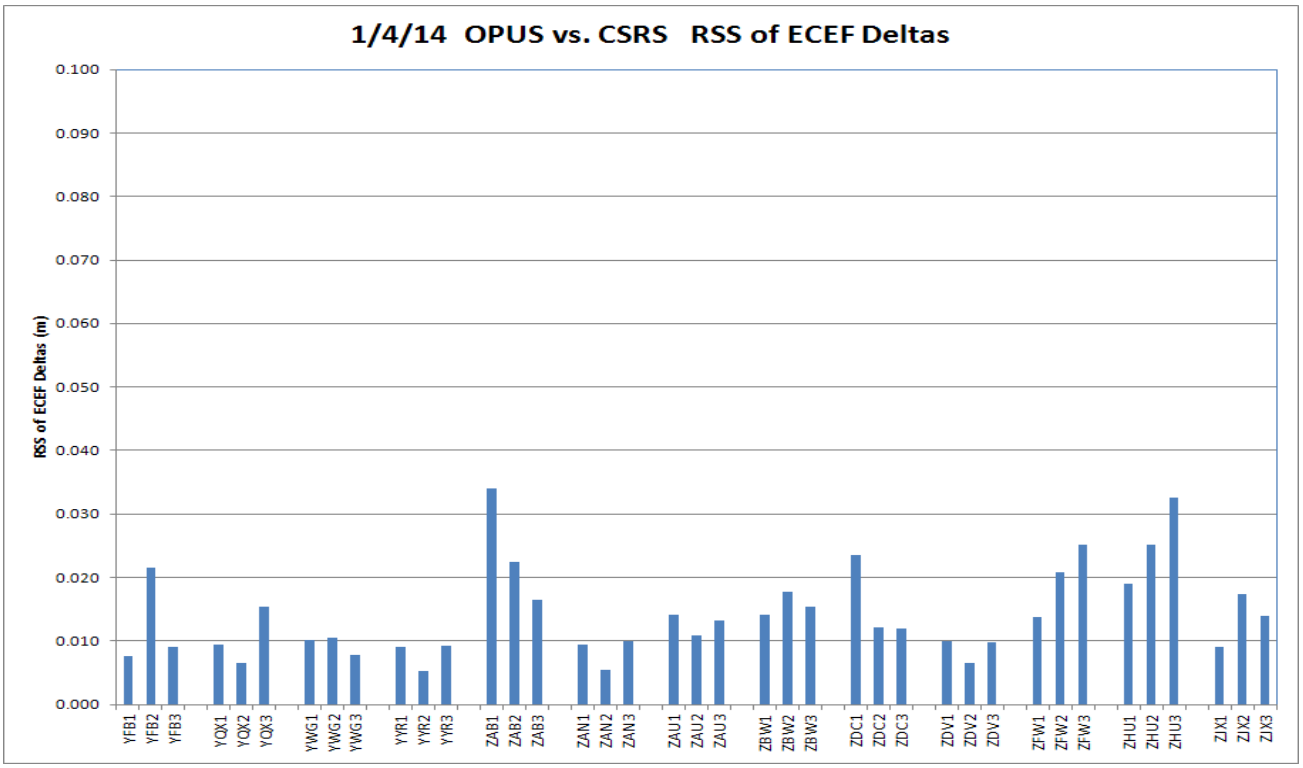


Figure 10-9 1/4/14 OPUS vs. CSRS RSS ECEF Deltas

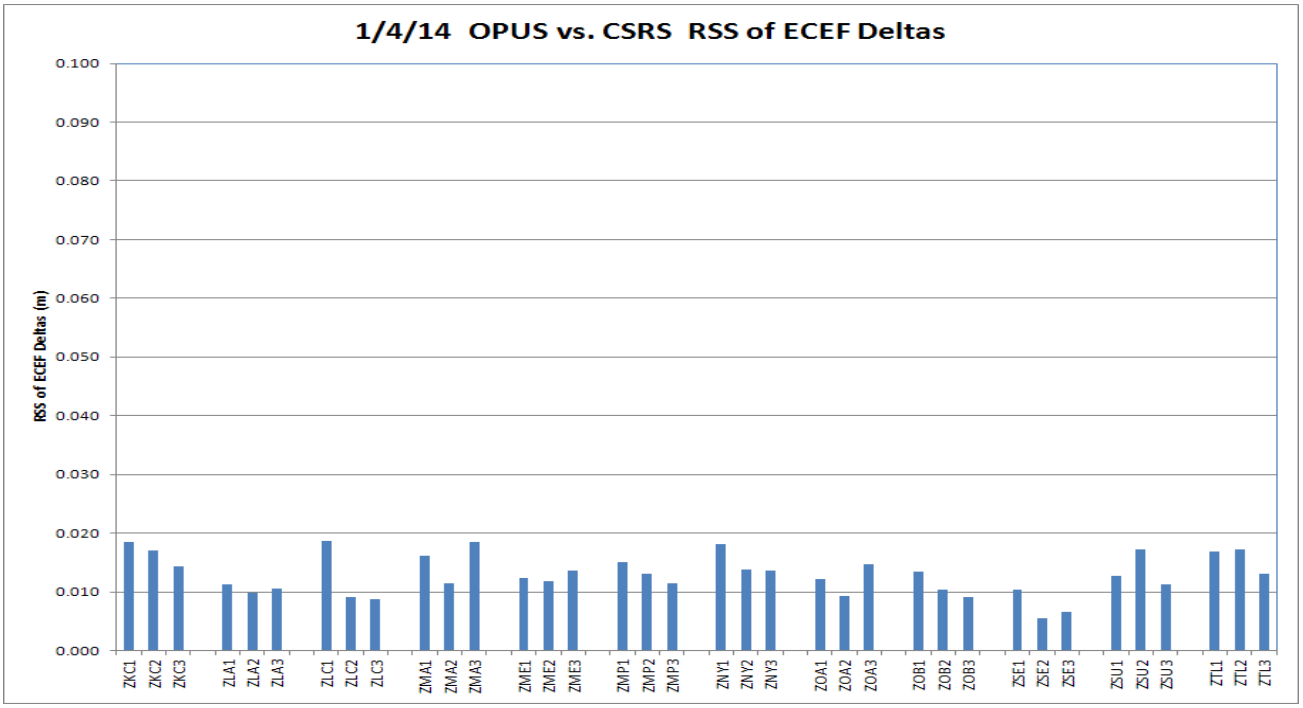


Figure 10-10 1/4/14 CSRS Survey Qualities

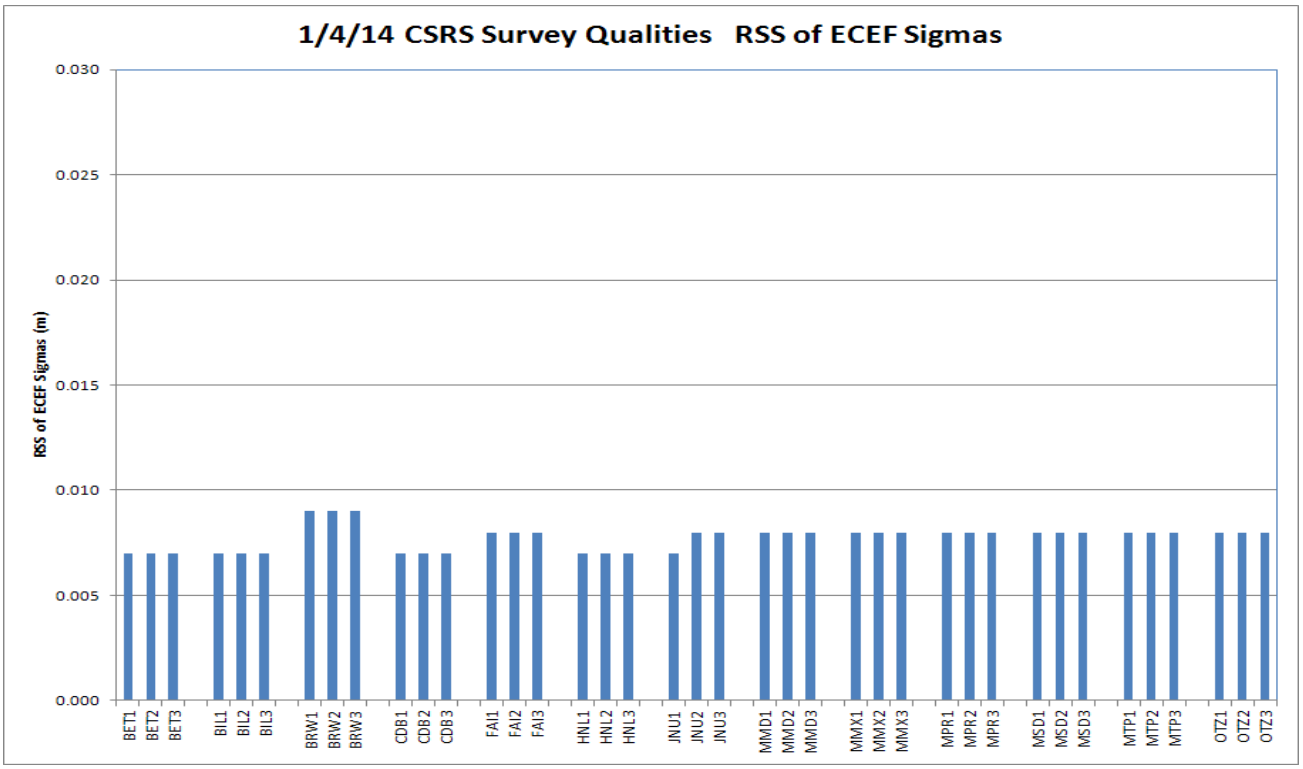


Figure 10-11 1/4/14 CSRS Survey Qualities

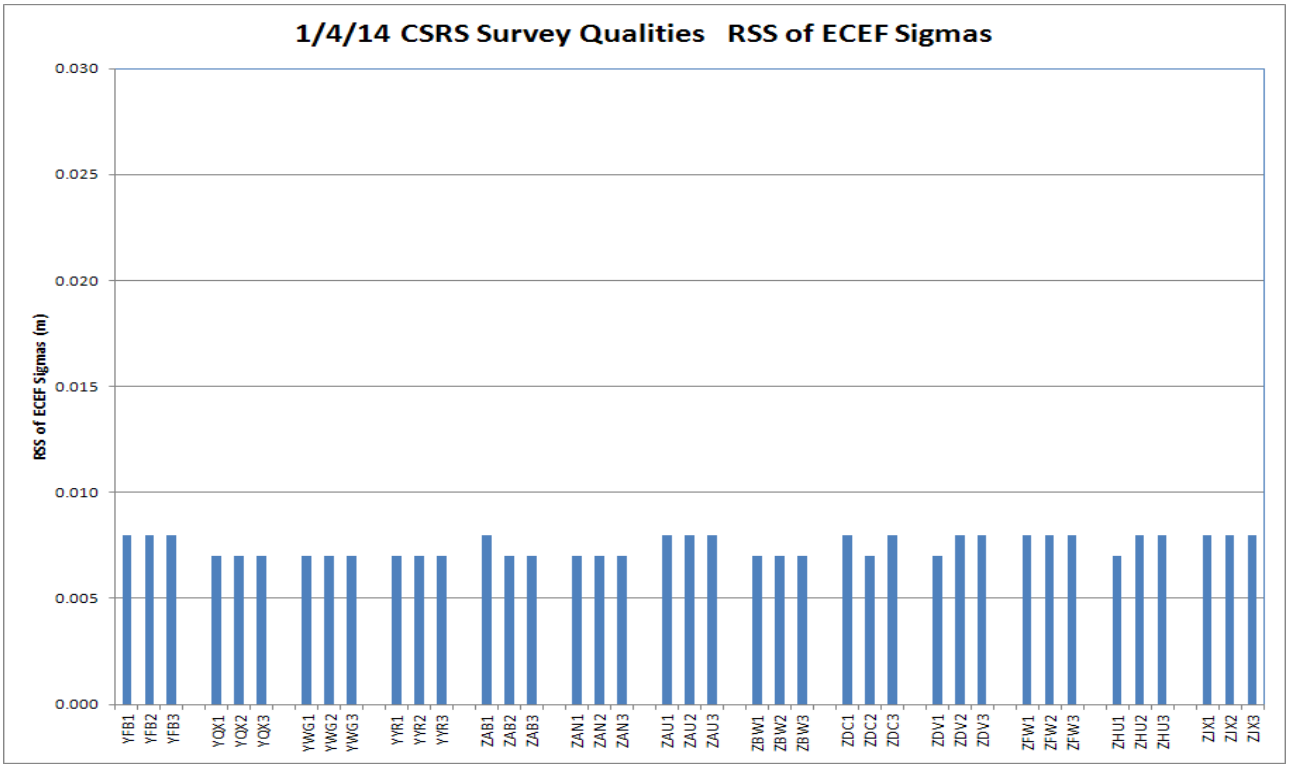


Figure 10-12 1/4/14 CSRS Survey Qualities

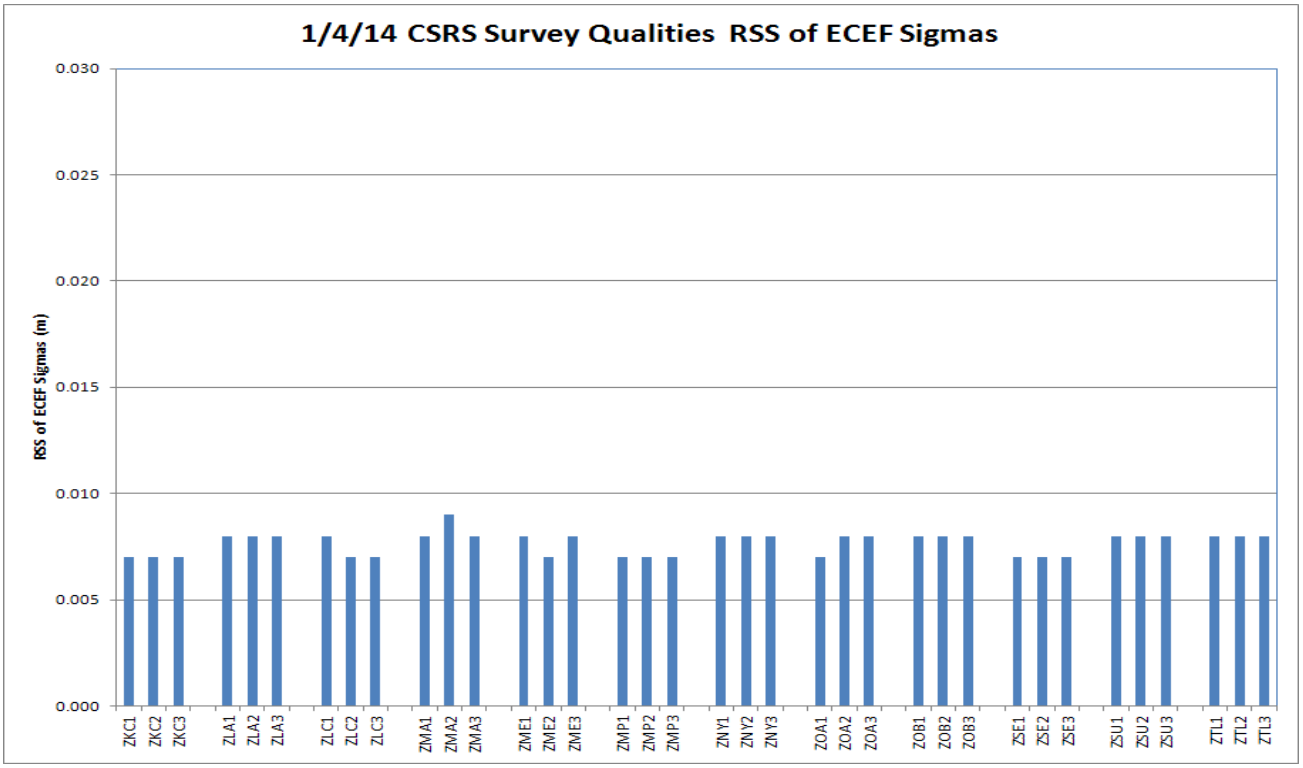


Figure 10-13 1/4/14 OPUS vs. RLS W7.012C

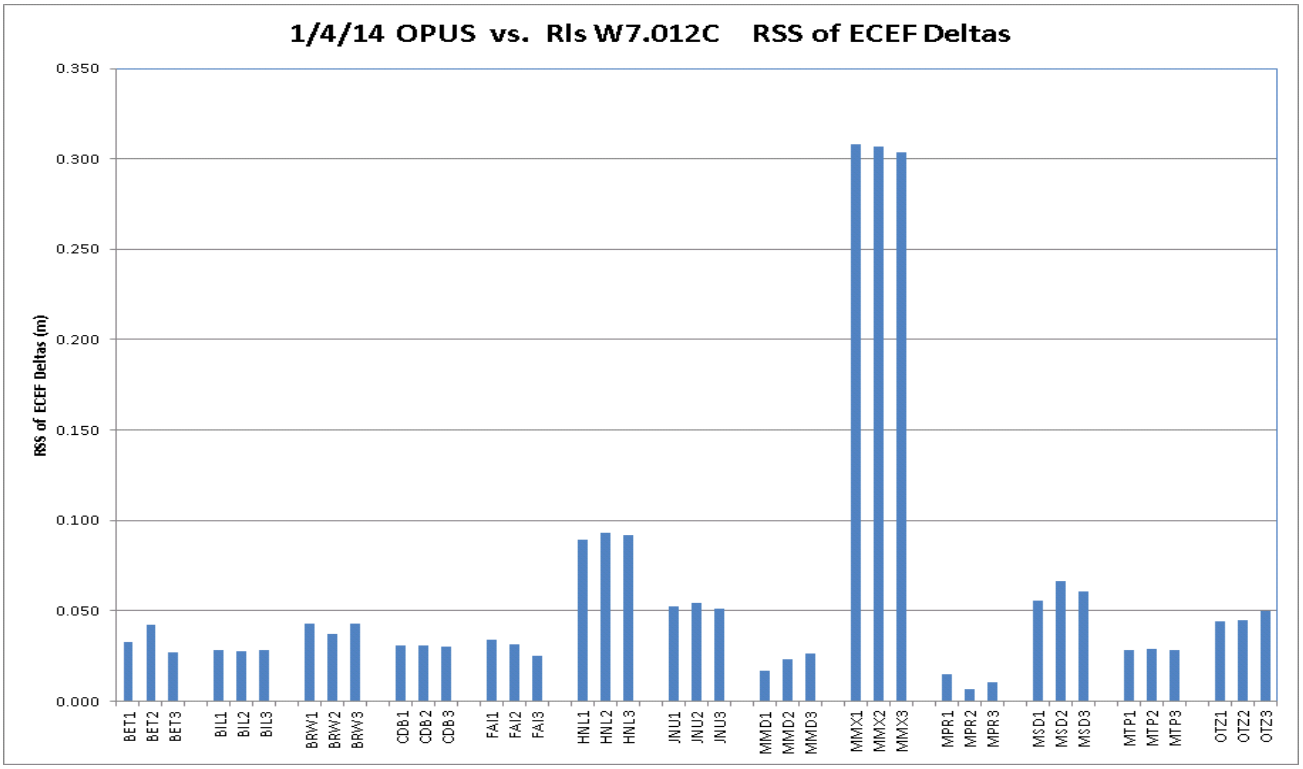


Figure 10-14 1/4/14 OPUS vs. RLS W7.012C

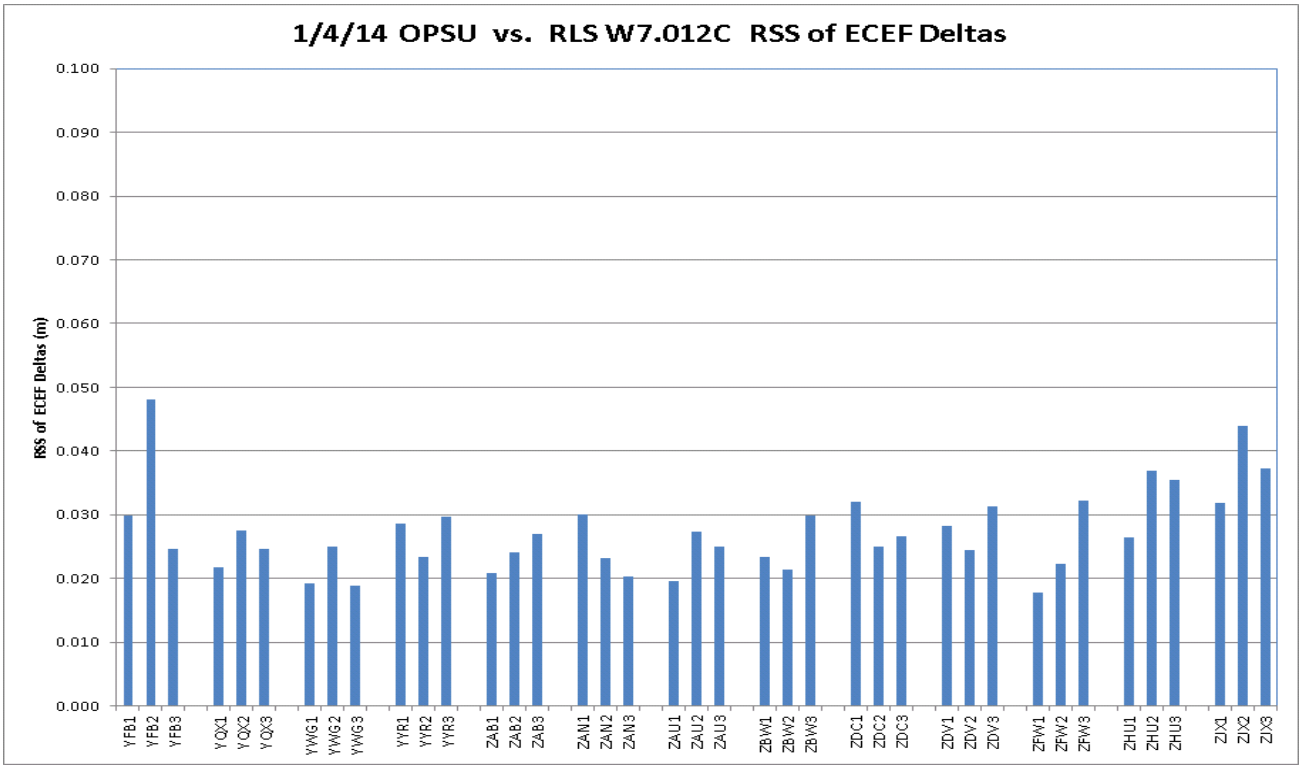
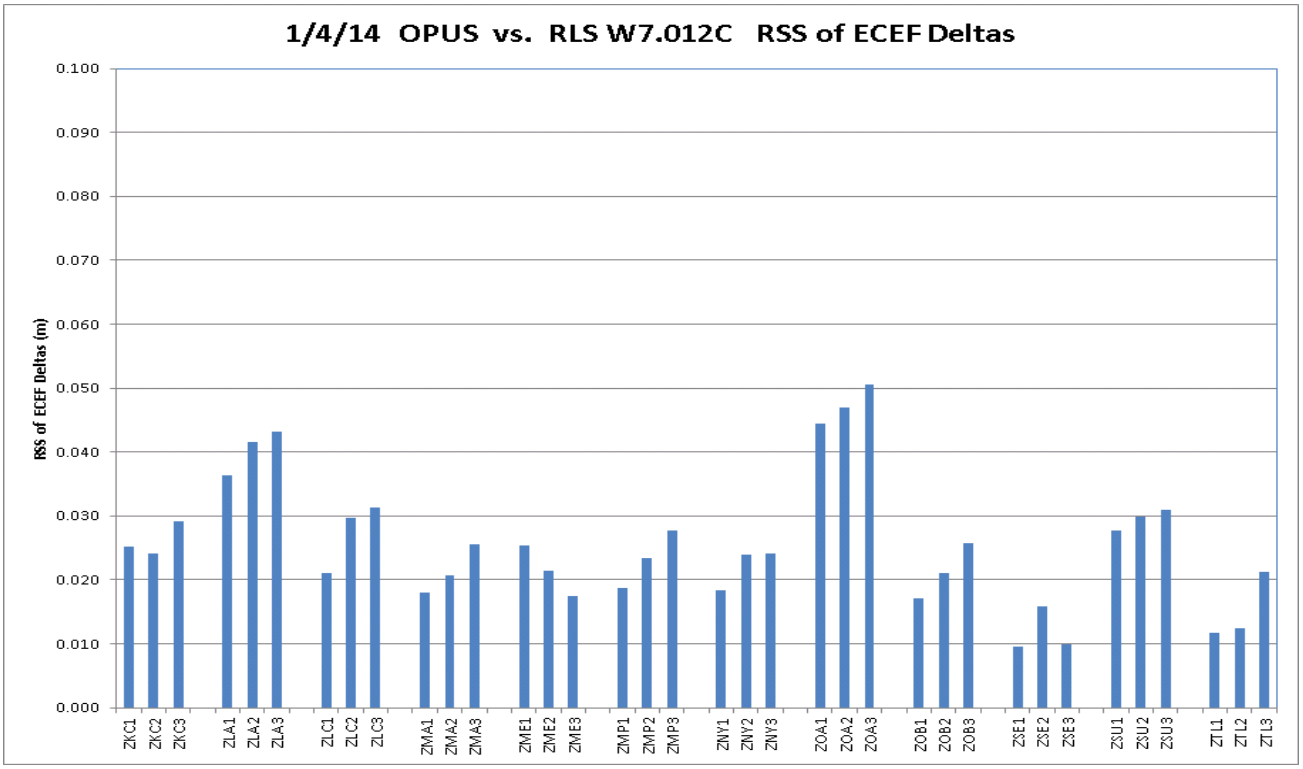


Figure 10-15 1/4/14 OPUS vs. RLS W7.012C



11.0 SIGNAL QUALITY MONITOR (SQM)

The Signal Quality Monitor (SQM) is designed to detect signal deformations that originate in the GPS or GEO satellites and ensures that the UDRE values are sufficiently inflated to protect given the monitor's current observations. SQM processes various correlator spacing measurements produced by the reference station receivers to form four detection metrics for each receiver and calculates statistics based on the observed performance against "ideal" signal correlation peaks. This results in an estimate of the overall deformation per satellite. The deformation level calculated is then compared against threshold values, which includes the acceptable error levels per UDRE value. If the estimated deformation exceeds threshold, the monitor trips for the given satellite and the UDRE value is set to 'Don't Use'. The monitor depends on the entire ground network in order to ensure that the satellite is the source of any problem detected rather than a localized affect. Currently all 114 receivers are being used in the SQM computations.

WAAS SQM offline monitoring effort includes the monitoring of the PRN type biases, trips, and the estimated deformation for each satellite that will be referred to as PRN bias in this report.

11.1 Alpha Metrics

The alpha metrics values are pre-determined by offline integrity analysis and are defined as constants in the SQM algorithm. These values remained unchanged for this reporting period and are listed in Table 11-1. Currently there are 4 sets of alpha metrics in the WAAS SQM algorithm that form four detection metrics for each receiver channel. For this report, the four detection metrics will be referred to as: DM1, DM2, DM3, and DM4.

Table 11-1 Alpha Metrics

Correlator Spacing	DM1	DM2	DM3	DM4
-0.1	0	0.43407318	0	-0.36110353
-0.075	0	0.48570652	-0.0058771682	-0.74860302
-0.05	-0.4071265	-0.69931105	-0.011382325	0.23726003
-0.025	1	-0.010099034	0.00037033029	-0.0076011735
0	0	0	0	0
0.025	-0.25	0.13317879	0.99991788	-0.062414070
0.05	1.008525	-0.22851782	0	0.25177272
0.075	0	0.10209042	0	0.42875623
0.1	0	0.078436452	0	0.41602138

11.2 Type Bias

PRN Type biases are evaluated as part of the WAAS SQM offline monitoring effort. Depending on the PRN number of any given satellite, it can be classified into three categories of correlation function shapes: skinny (Type 0), nominal (Type 1), and broad (Type 2). Wideband geostationary satellites are considered a different type (Type 3). PRN-type estimates are computed at each epoch and daily averages are computed for each type, for four detection metrics.

For this reporting period, geostationary satellites type biases are not evaluated. Table11-3 shows the rollup average for the quarter. Table 11-4 shows the rollup average since January 1, 2008. Figure 11-1 shows the daily average for the four detection metrics for the quarter.

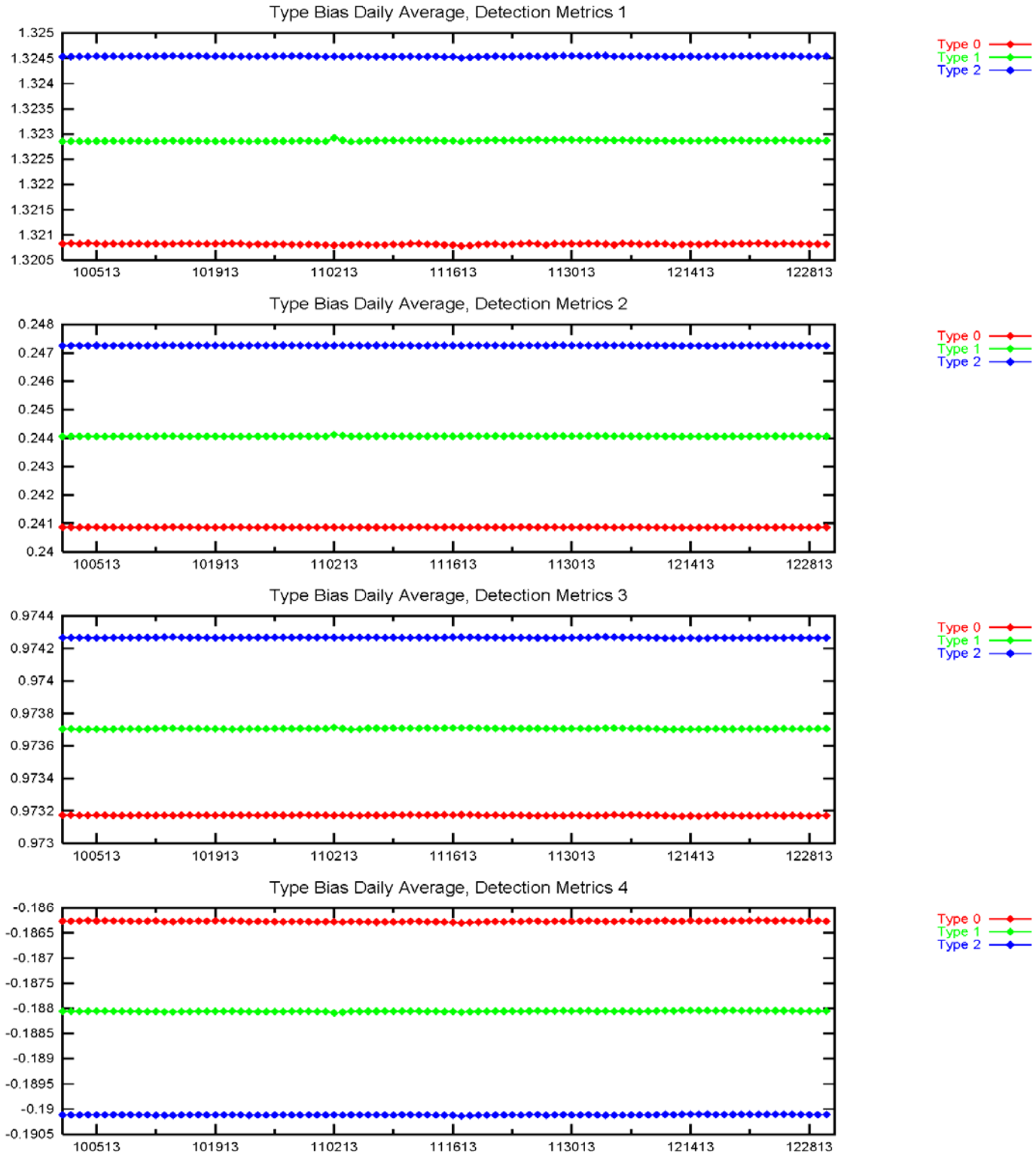
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3208200	1.3228700	1.3245400
DM 2	0.2408650	0.2440680	0.2472560
DM 3	0.9731720	0.9737060	0.9742670
DM 4	-0.1862730	-0.1880580	-0.1901140

Table 11-3 Type Bias Average Since January 1, 2008

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3209100	1.3228800	1.3245900
DM 2	0.2408480	0.2440920	0.2472740
DM 3	0.9731740	0.9737090	0.9742750
DM 4	-0.1862130	-0.1880650	-0.1901010

Figure 11-1 Type Bias Average Trend



11.3 PRN Bias

PRN biases are evaluated as part of the WAAS SQM offline monitoring effort. PRN bias is the overall estimated deformation per satellite across receivers. Detection metrics are adjusted for inter-receiver bias, corrected for PRN type bias, and combined across receivers for each satellite. Relying on the assertion that the majority of the SV signals are healthy and normal, detection metrics are normalized over all the satellites on orbit resulting in an overall PRN bias for each satellite. PRN biases are collected at each epoch and daily averages are computed for each satellite, for four detection metrics.

Table 11-4 and Figure 11-2 show the rollup PRN bias average for the quarter. Figures 11-3 to 11-10 show the PRN bias average trend for each SV. The maximum average for DM1 for this quarter is PRN 23 at 0.001001. The maximum average for DM2 is PRN 11 at 0.0002033. The maximum average for DM3 is PRN 10 at 0.0002646 and the maximum average for DM4 is PRN 23 at 0.0004332.

For this reporting period, geostationary satellite biases are not evaluated. Please refer to Table 1-5 for events that may have an impact on PRN bias statistics. The small spikes in PRN bias daily average are due to satellite outages. On the days of satellite maintenance, partial data resulted in a slightly varied PRN bias daily average compared to full day data average. The spikes on PRN-2 in Figure 11-3 were due to PRN-2 experienced intermittent problems starting on 10/31/13. Those problems included periods of degraded C/No, increased carrier phase noise, and correlation peak deformation. The periods of correlation peak deformation caused elevated SQM metrics; see DR 118 PRN2 Anomaly.

Table 11-4 PRN Bias Average for the Quarter

PRN	SVN	DM1	DM2	DM3	DM4
1	63	0.0002306	0.0001305	0.0000839	0.0000993
2	61	0.0004626	0.0001204	0.0000730	0.0001209
3	33	0.0001771	0.0000707	0.0001044	0.0003244
4	34	0.0001807	0.0000450	0.0000608	0.0001235
5	50	0.0001196	0.0001198	0.0000604	0.0001058
6	36	0.0002130	0.0000732	0.0000639	0.0001019
7	34	0.0001313	0.0000756	0.0000342	0.0001354
8	38	0.0001455	0.0001534	0.0000405	0.0001099
9	39	0.0001545	0.0000483	0.0000615	0.0000911
10	40	0.0006366	0.0000474	0.0002562	0.0000966
11	46	0.0009433	0.0002000	0.0000592	0.0002585
12	58	0.0001553	0.0000742	0.0000971	0.0000749
13	43	0.0005704	0.0000500	0.0000748	0.0001629
14	41	0.0006732	0.0001258	0.0001105	0.0001279
15	55	0.0001323	0.0000567	0.0000246	0.0001519
16	56	0.0001310	0.0000658	0.0001208	0.0003272
17	53	0.0001480	0.0000678	0.0000398	0.0001283
18	54	0.0006702	0.0001184	0.0000430	0.0002389
19	59	0.0004360	0.0001601	0.0000463	0.0000901
20	51	0.0001285	0.0000525	0.0000359	0.0001607
21	45	0.0003561	0.0001127	0.0001668	0.0001165
22	47	0.0003950	0.0000552	0.0000870	0.0003460
23	60	0.0010003	0.0001655	0.0000372	0.0004160
24	65	0.0002248	0.0000535	0.0000420	0.0001041
25	62	0.0003137	0.0001855	0.0000885	0.0001151
26	26	0.0002250	0.0000689	0.0001380	0.0000928
27	66	0.0006339	0.0001891	0.0000755	0.0002967
28	44	0.0002779	0.0000454	0.0000328	0.0000919
29	57	0.0002683	0.0000618	0.0000982	0.0003110
30	30				
31	52	0.0003919	0.0001469	0.0000377	0.0002380
32	23	0.0001935	0.0000595	0.0001023	0.0000918

Figure 11-2 PRN Bias Average for the Quarter

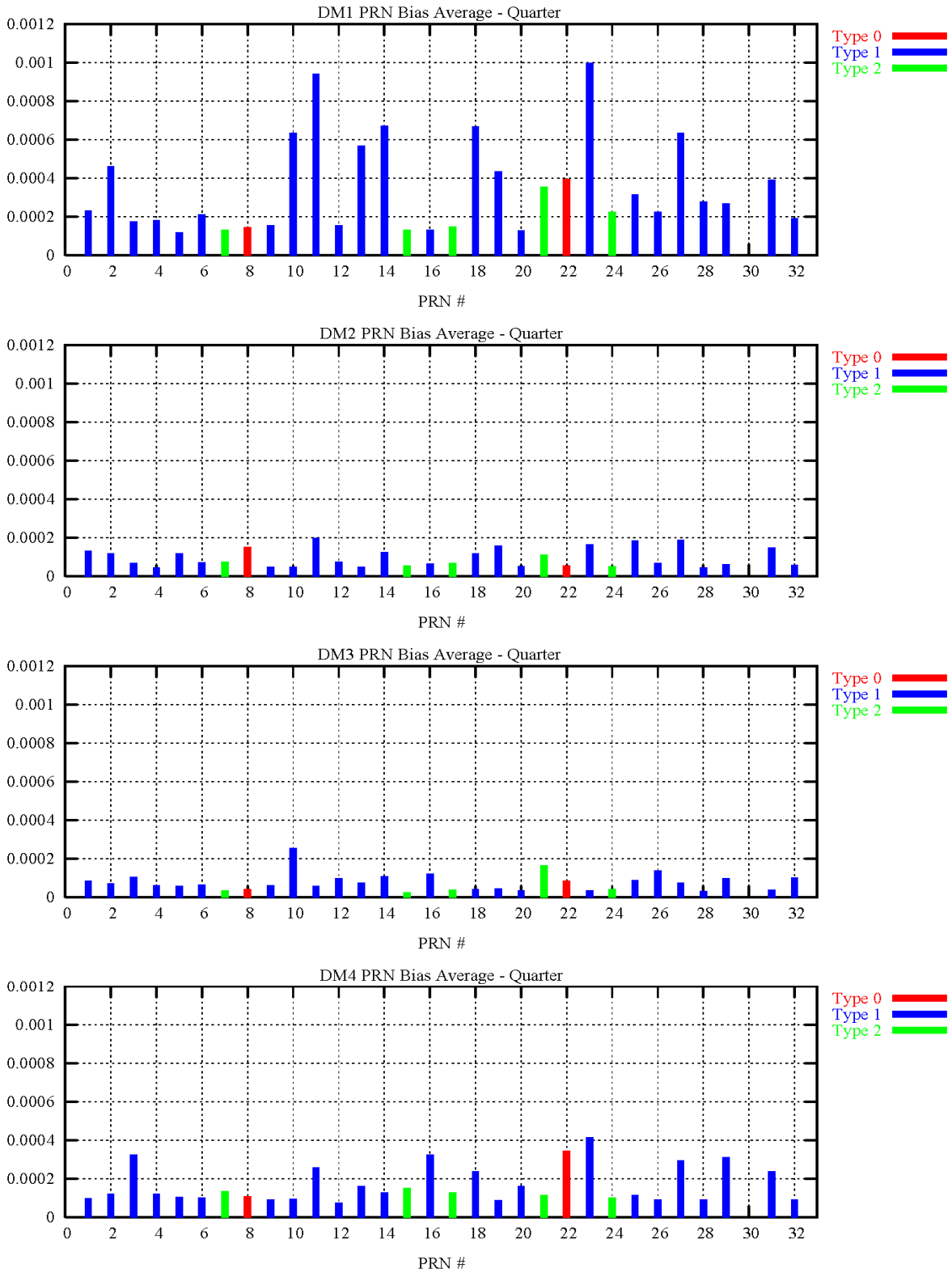


Figure 11-3 PRN Bias Average Trend (PRN 1 – PRN 4)

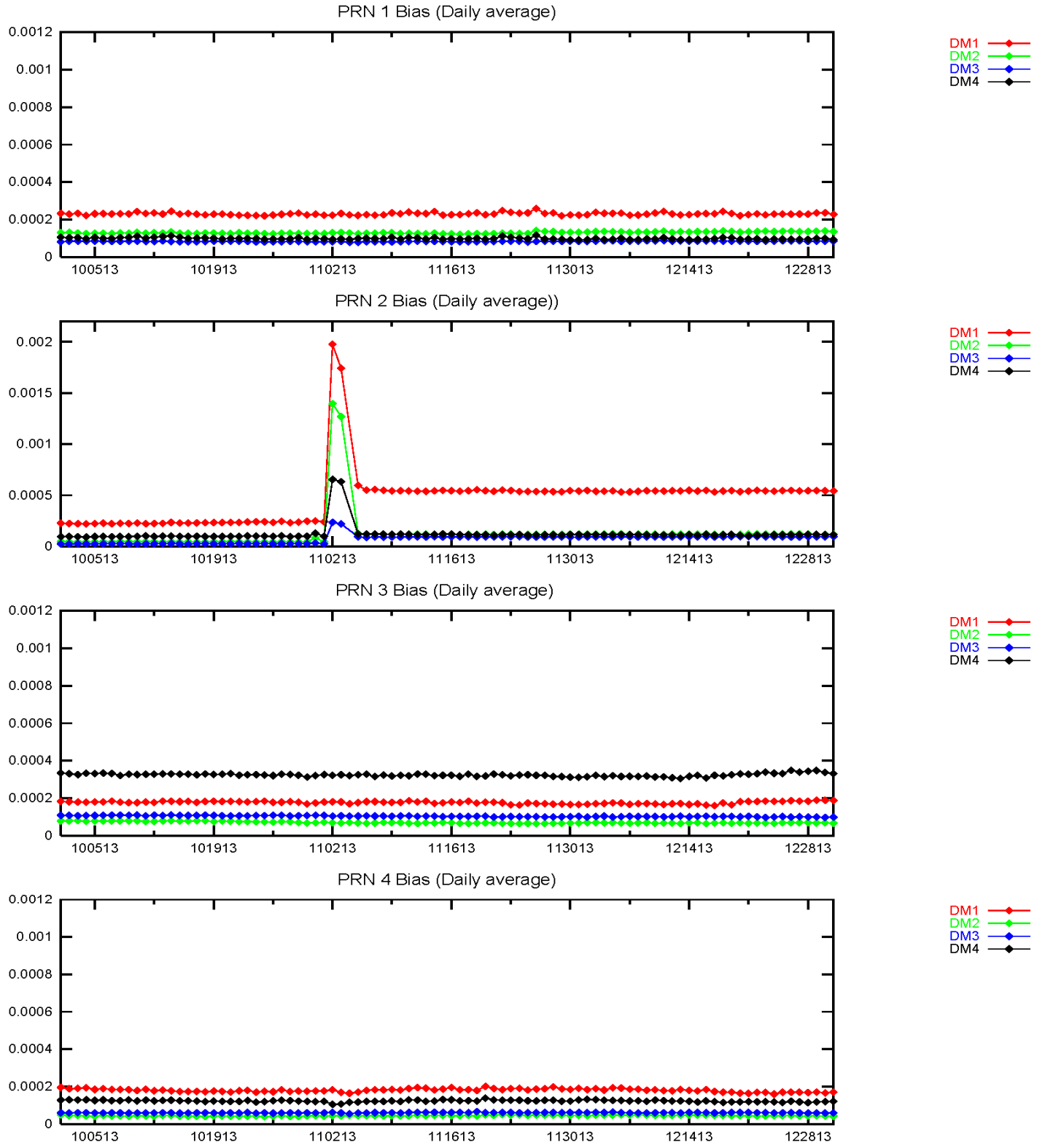


Figure 11-4 PRN Bias Average Trend (PRN 5 – PRN 8)

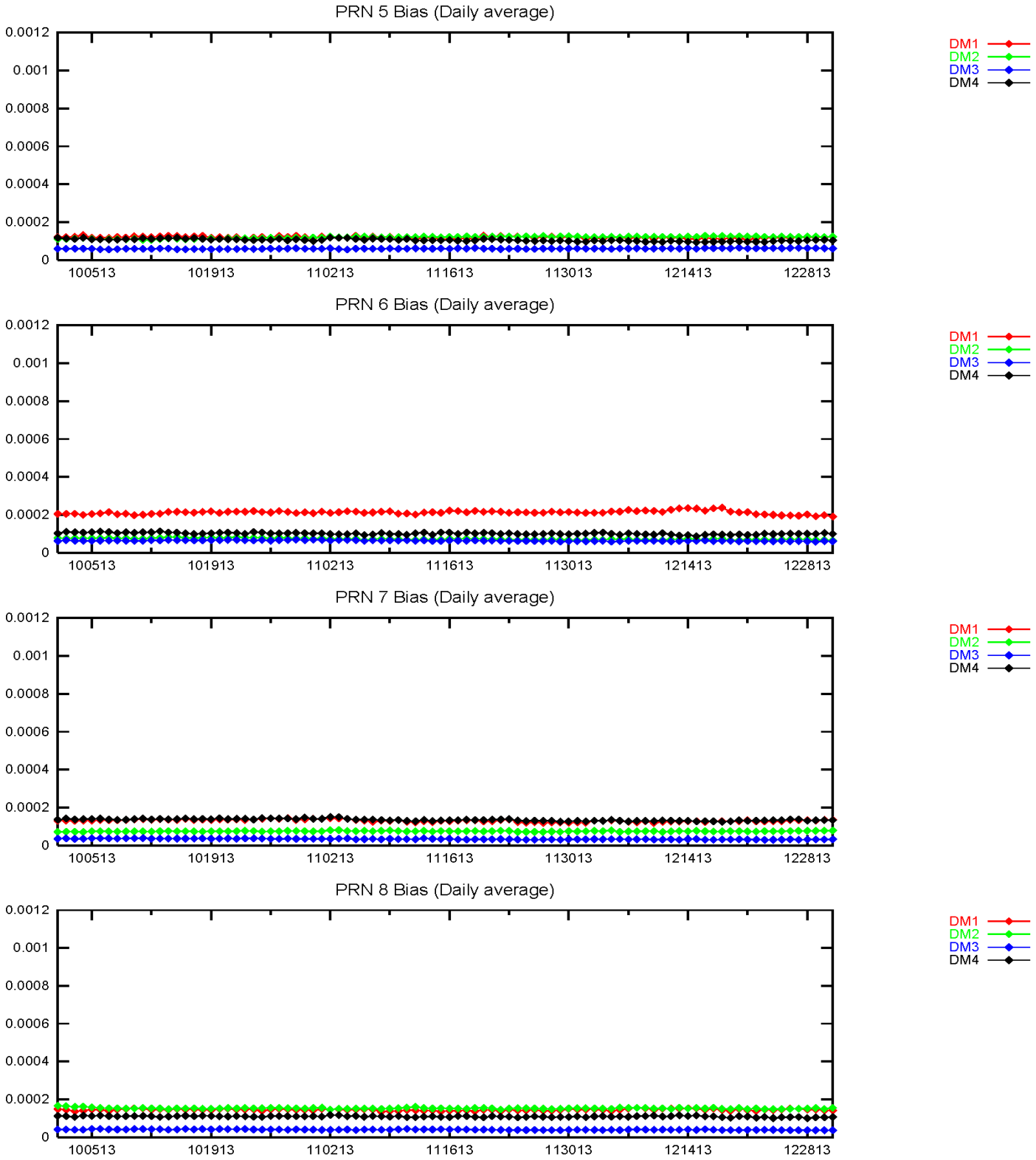


Figure 11-5 PRN Bias Average Trend (PRN 9 – PRN 12)

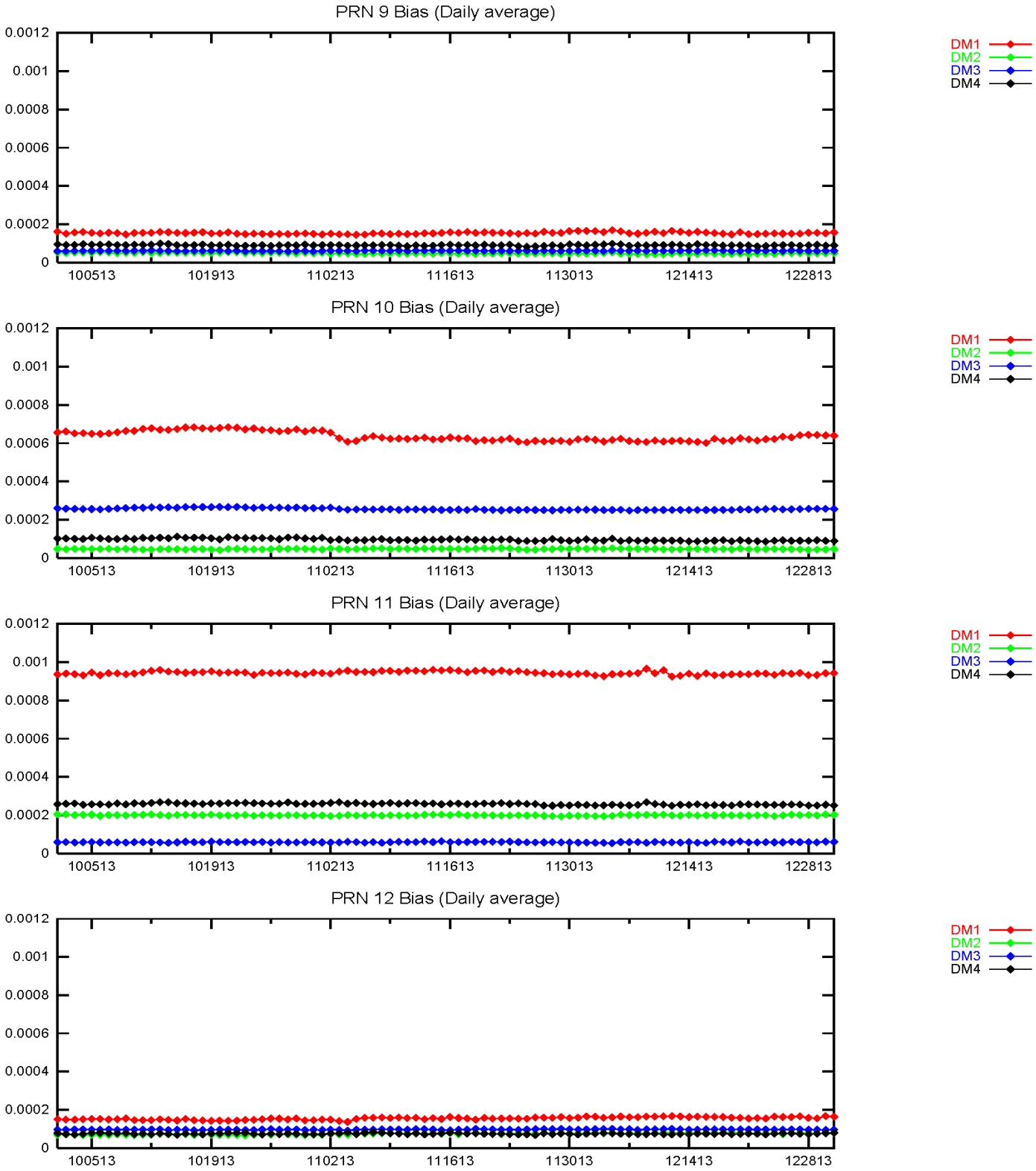


Figure 11-6 PRN Bias Average Trend (PRN 13 – PRN 16)

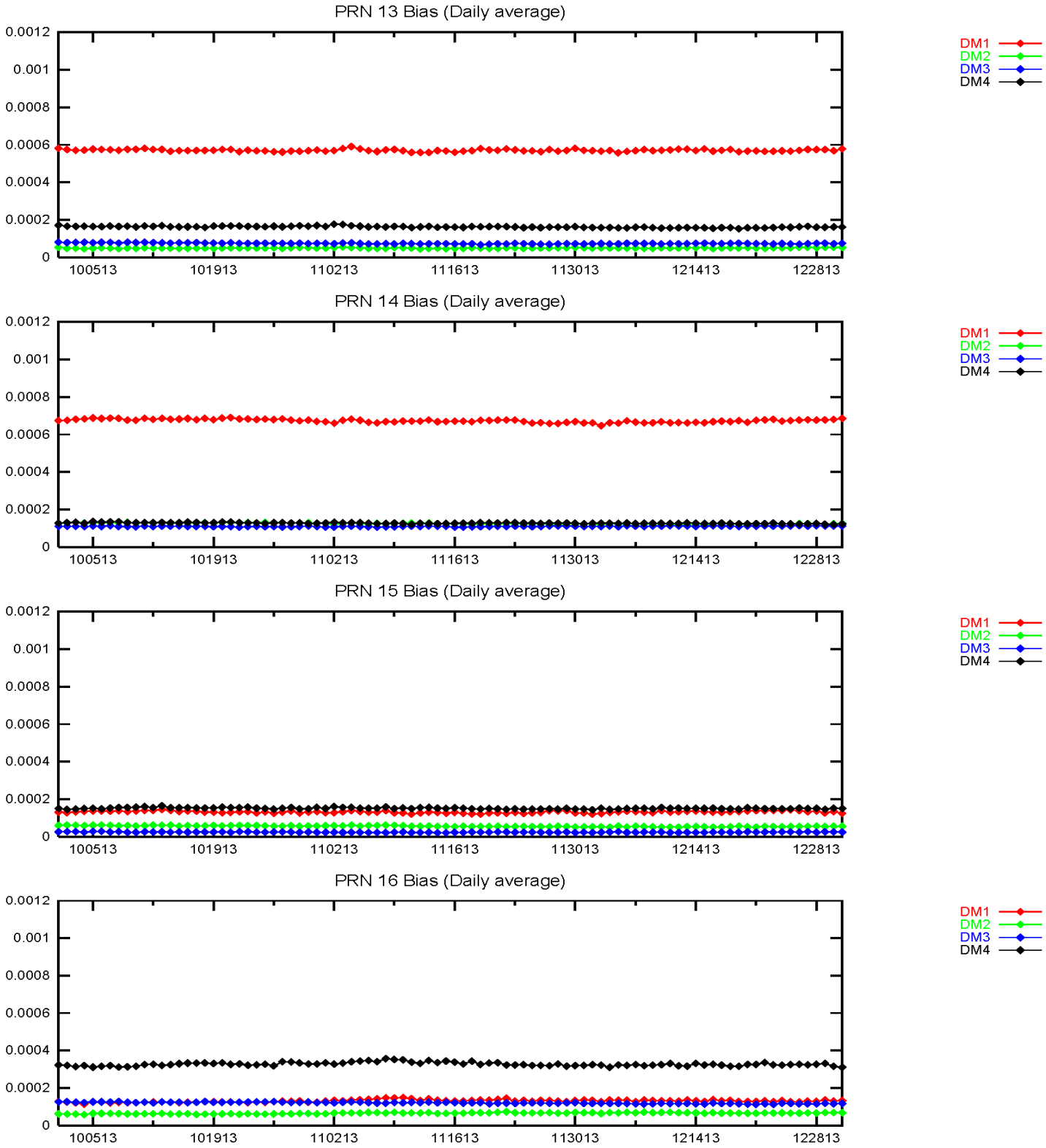


Figure 11-7 PRN Bias Average Trend (PRN 17 – PRN 20)

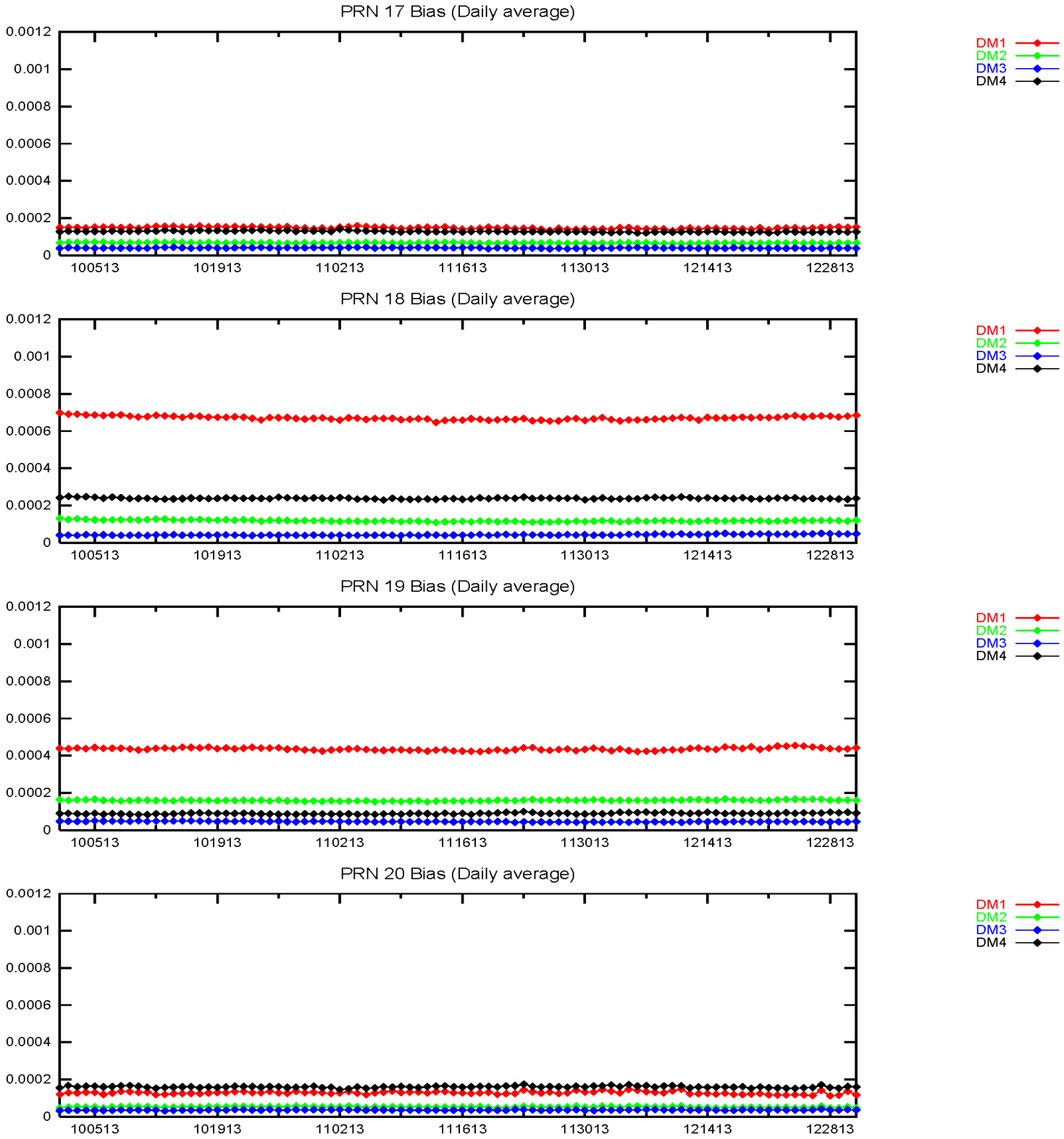


Figure 11-8 PRN Bias Average Trend (PRN 21 – PRN 24)

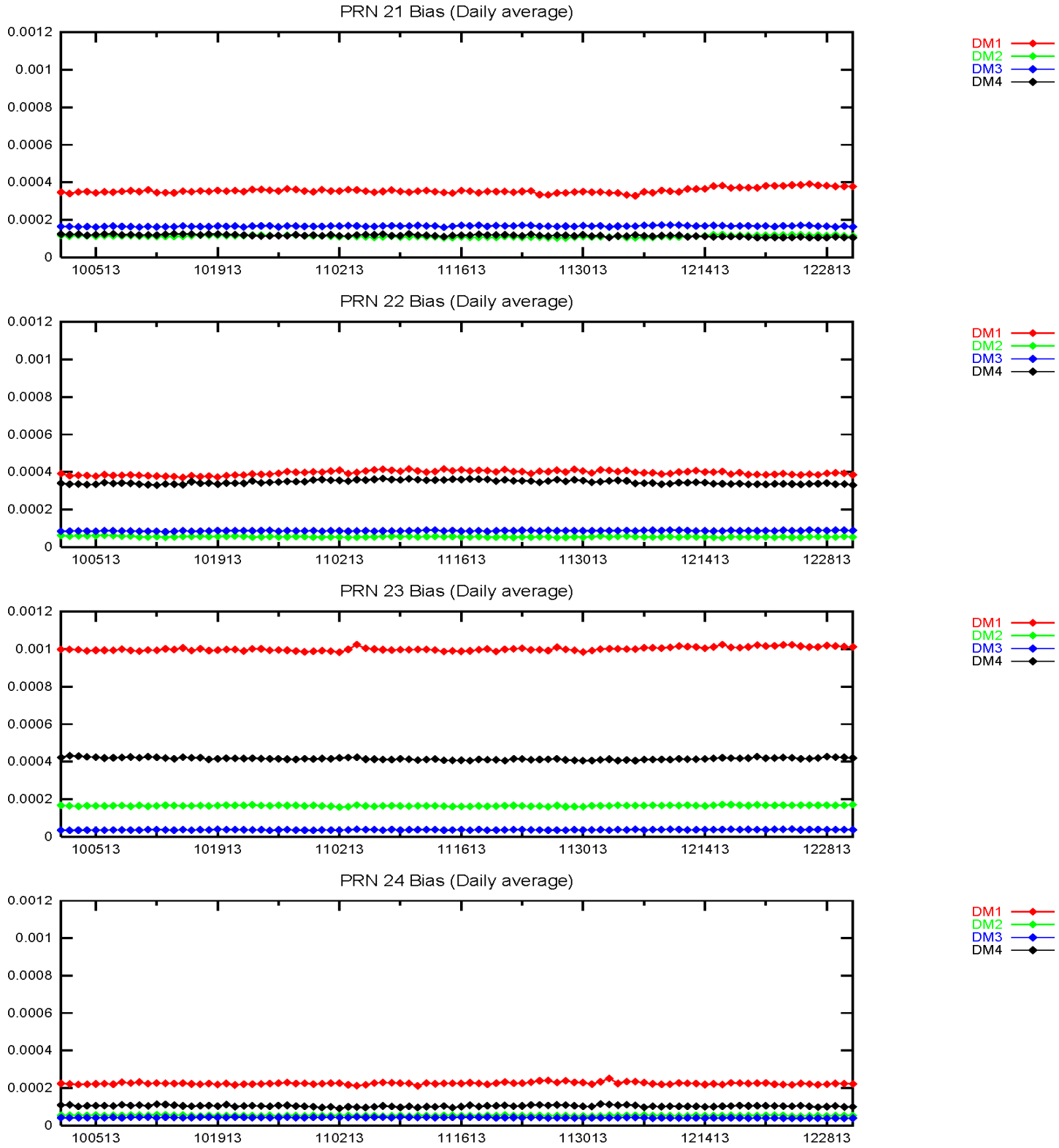


Figure 11-9 PRN Bias Average Trend (PRN 25 – PRN 28)

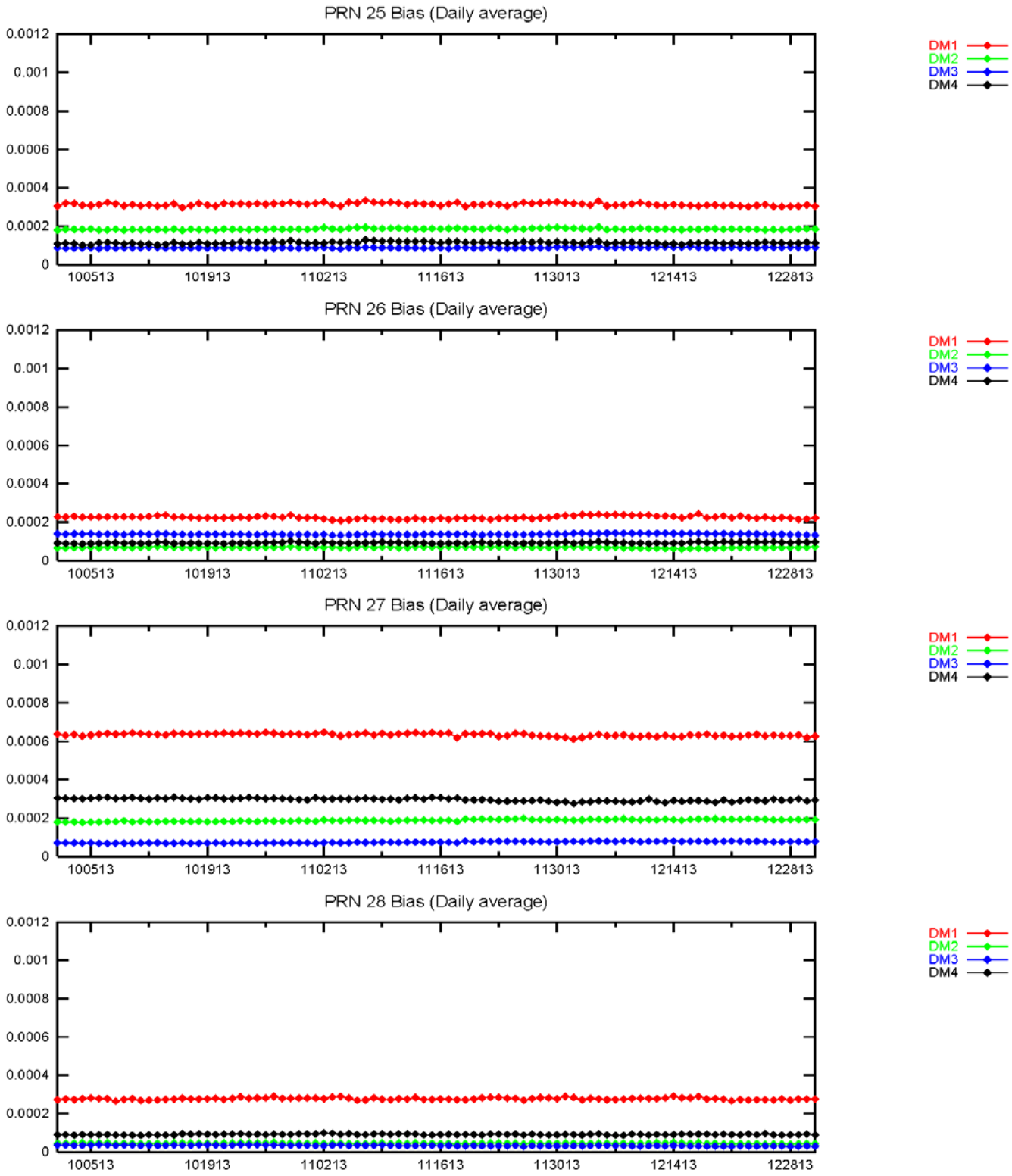
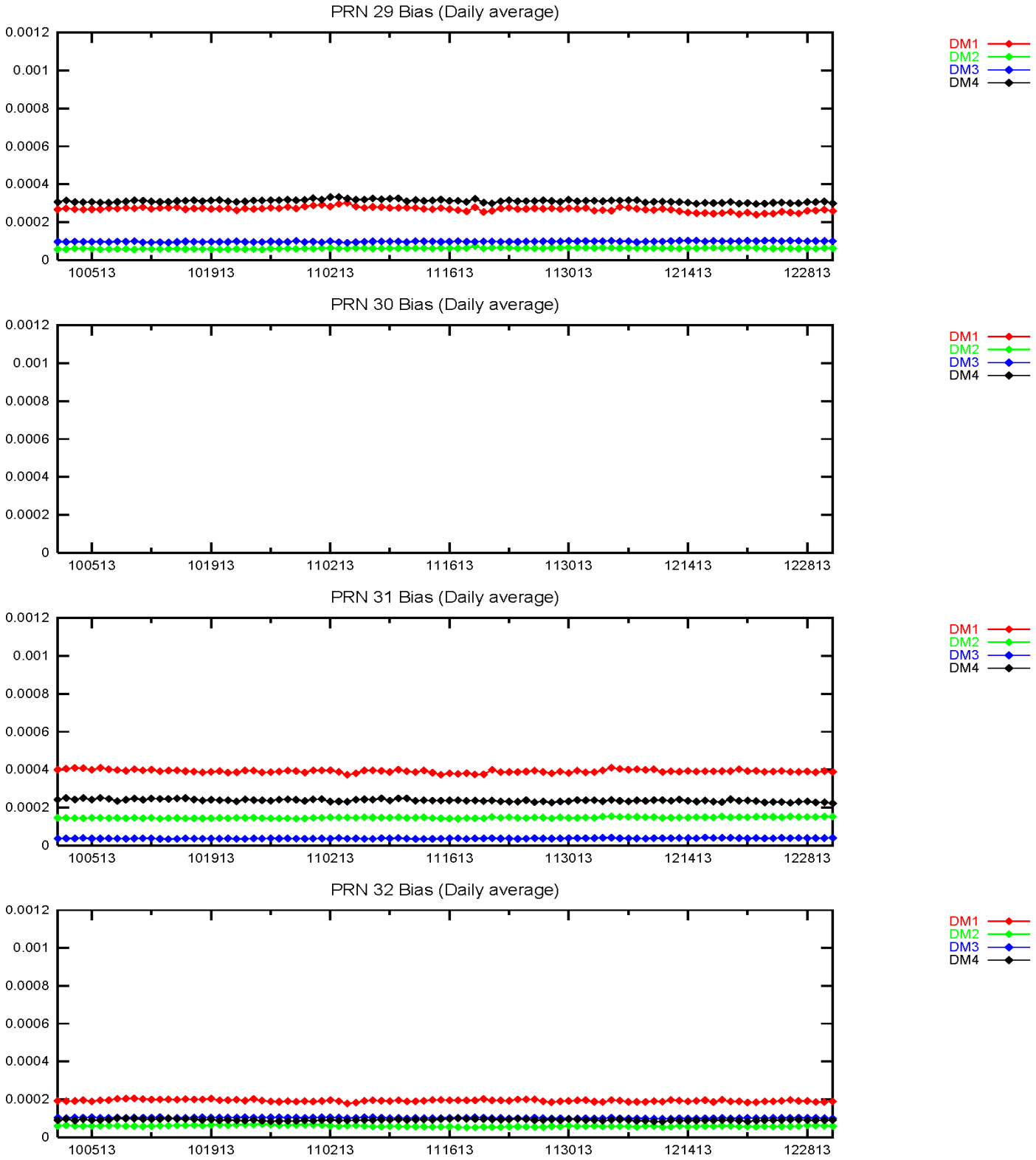


Figure 11-10 PRN Bias Average Trend (PRN 29 – PRN 32)



11.4 SQM Trips

SQM trip occurs when the estimated deformation exceeds threshold. There were no SQM trips for this quarter.

12.0 GPS BROADCAST ORBIT VS. NGA PRECISE ORBITS ANALYSIS AND URA BOUNDING ANALYSIS

As part of the WAAS off-line monitoring process, the accuracy of the GPS broadcast ephemeris is periodically compared to the NGA precise orbit information to monitor the validity of an a priori assumption concerning the accuracy of the GPS broadcast ephemeris information that is part of a brute force computer simulation analysis utilized as part of the safety proof of the WAAS MT-28 functionality. That brute force analysis searches a simulated error sphere around a GPS satellite for a worst-case projection of post correction ephemeris error to any user. A pessimistic extrapolation of historical data was used as an a priori to limit the radius of the searched sphere to a finite distance. This periodic off-line monitoring verifies that the original logic of the a priori assumption remains sound.

The assumption being validated is:
Height Error: +/- 15 meters (standard deviation < 2.8 m),
Along Track Error: +/- 65 meters (standard deviation < 12.2 m)
Cross Track Error: +/- 30 meters (standard deviation < 5.6 m)

All IGS high rate 15 minute broadcast navigation data RINEX format files are downloaded and merged into 24 hour broadcast navigation data files. A majority voting algorithm is used to screen the high rate navigation data after a LSB recovery algorithm is applied. NGA APC precise ephemeris referenced to the GPS satellite antenna phase center is downloaded from the NGA site. GPS satellite positions are computed every 15 minutes and differenced with the precise orbits. The resulting error information is then segregated into the Height, Along Track, and Cross Track (HAC) error data. The standard deviation of the error is then computed for each dimension for each satellite.

The assumption is valid if a 5.33 scaling of the standard deviation across all satellites is within the a priori. One year of data from 1/1/13 to 12/31/13 is presented. Only data points where GPS is healthy and valid precise data is available are considered. Figure 12-1 shows the broadcast orbit accuracy standard deviations. Figure 12-2 shows the broadcast orbit error means. Figure 12-3 shows the availability of data. There were no points where GPS was healthy and the NGA data was missing. There are no points where GPS navigation data is unavailable other than during NANUs.

The sign convention for this analysis is error = broadcast ECEF - precise ECEF. Along track is positive in the direction of the velocity vector. Cross track completes a right hand system with height and along track.

Figures 12-4 through 12-35 are plots of the height, along track, and cross track error relative to NGA precise orbits by PRN number. These plots do not include clock error.

Figures 12-36 through 12-43 are QQ plots of the URA normalized total range error (height, along track, cross track, and clock) projected onto the surface of the earth. +/- 13.8° from the boresight of the satellite is used to approximate the surface of the earth. The max URA of the broadcast URA index range is used. The range of the QQ plot axis's have been fixed at +/- 5. Annotations are provided for any instances beyond that range.

Errors larger than 3 times URA were investigated.

Figures 12-44 through 12-75 are histograms of the height error, along track error, cross track error, and URA normalized range error.

Figures 12-76 to 12-107 are the timelines of the URA normalized range error. Missing data points are in red and are labeled with the pertinent NANUs.

Figures 12-108 and 12-109 are URA bounding plots. Figure 108 uses the maximum URA value per the broadcast URA index per the index ranges in IS-GPS-800. Figure 109 uses the nominal URA value per the broadcast URA index and the formula in IS-GPS-800.

Figure 12-1 GPS Broadcast Orbit Accuracy Standard Deviations

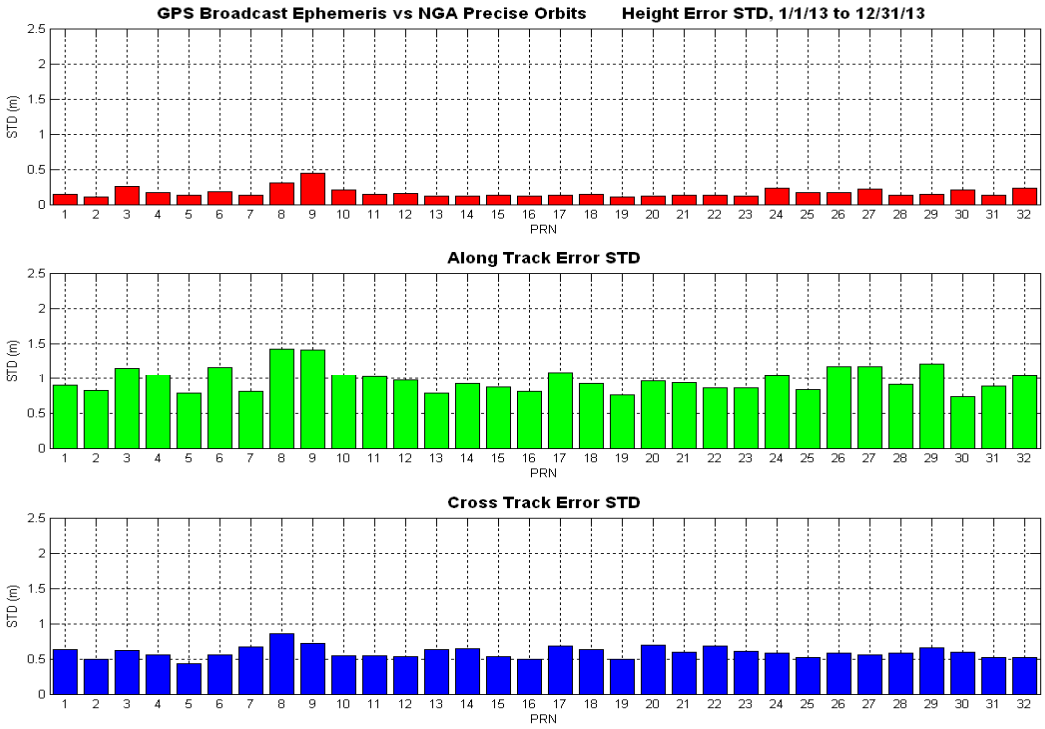


Figure 12-2 GPS Broadcast Orbit Accuracy Standard Deviations

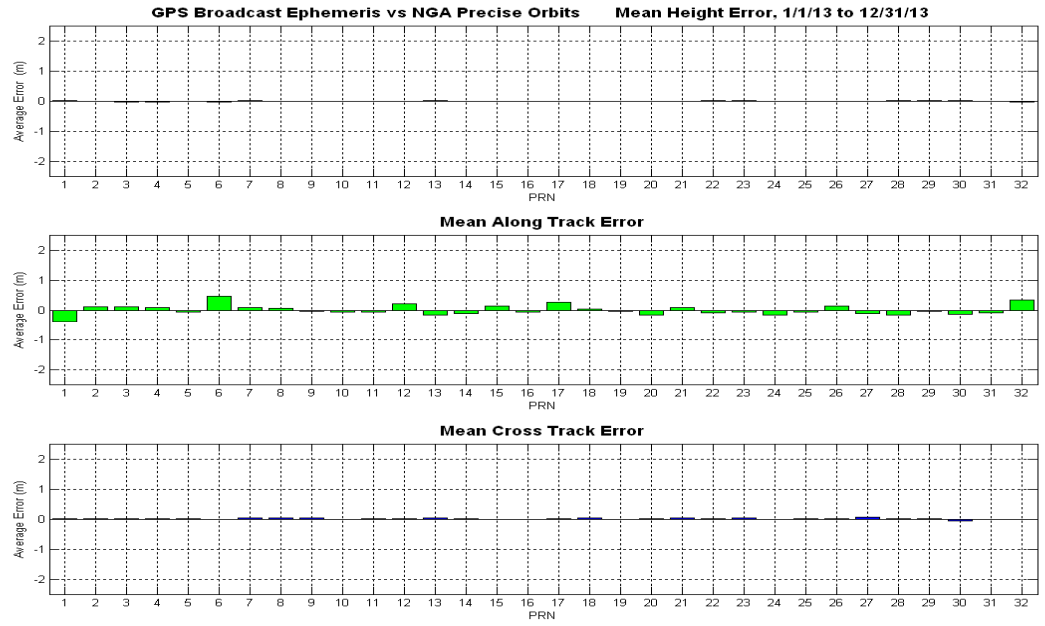


Figure 12-3 Broadcast Ephemeris vs. NGA Precise Data Availabiity

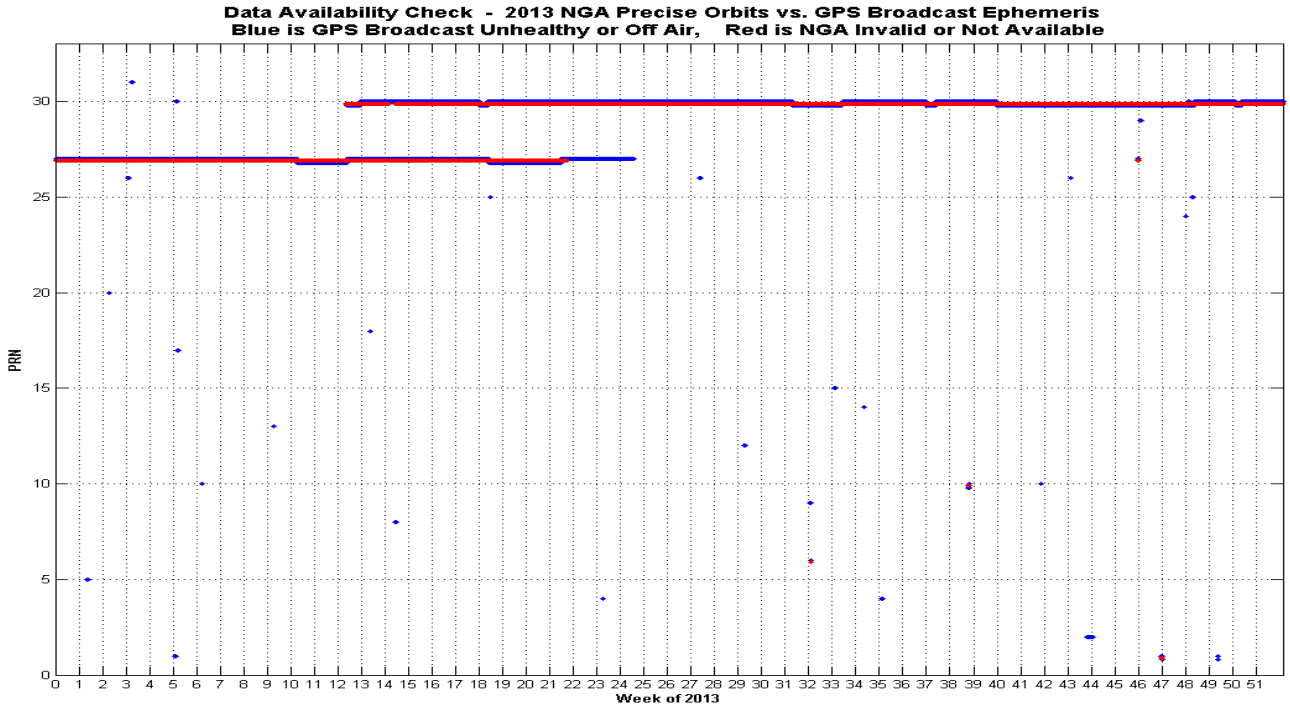


Figure 12-4 Orbit Error PRN-1 (SVN-63)

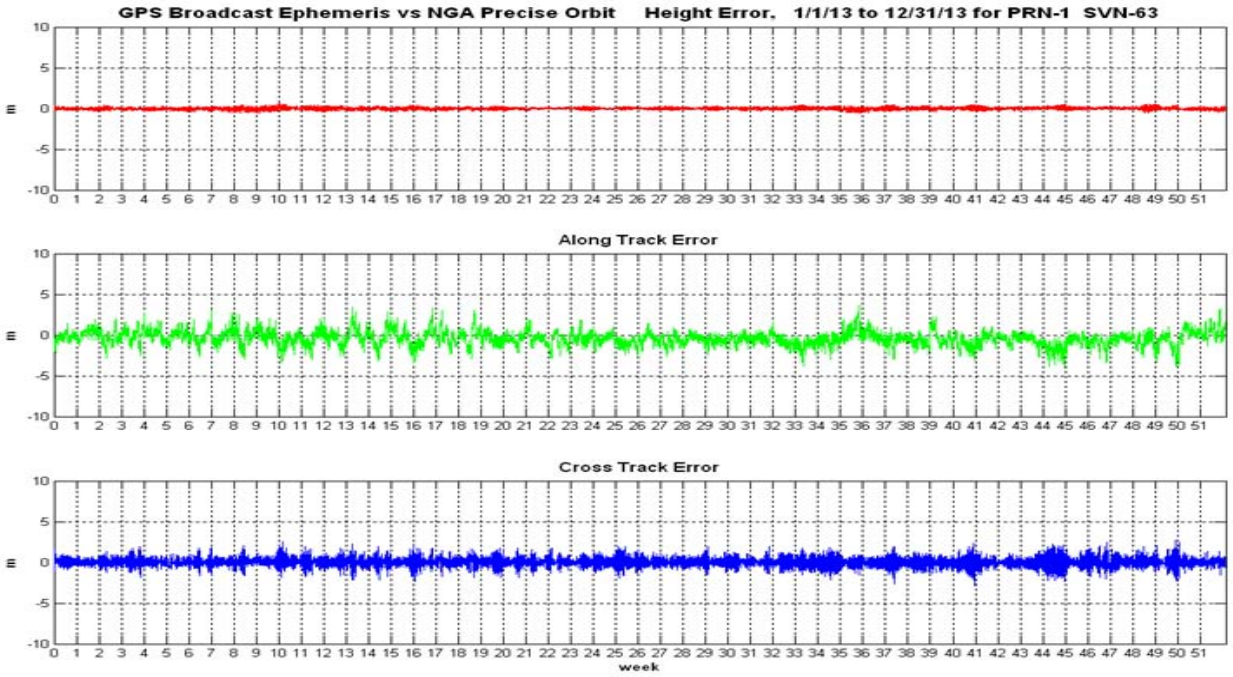


Figure 12-5 Orbit Error PRN-2 (SVN-61)

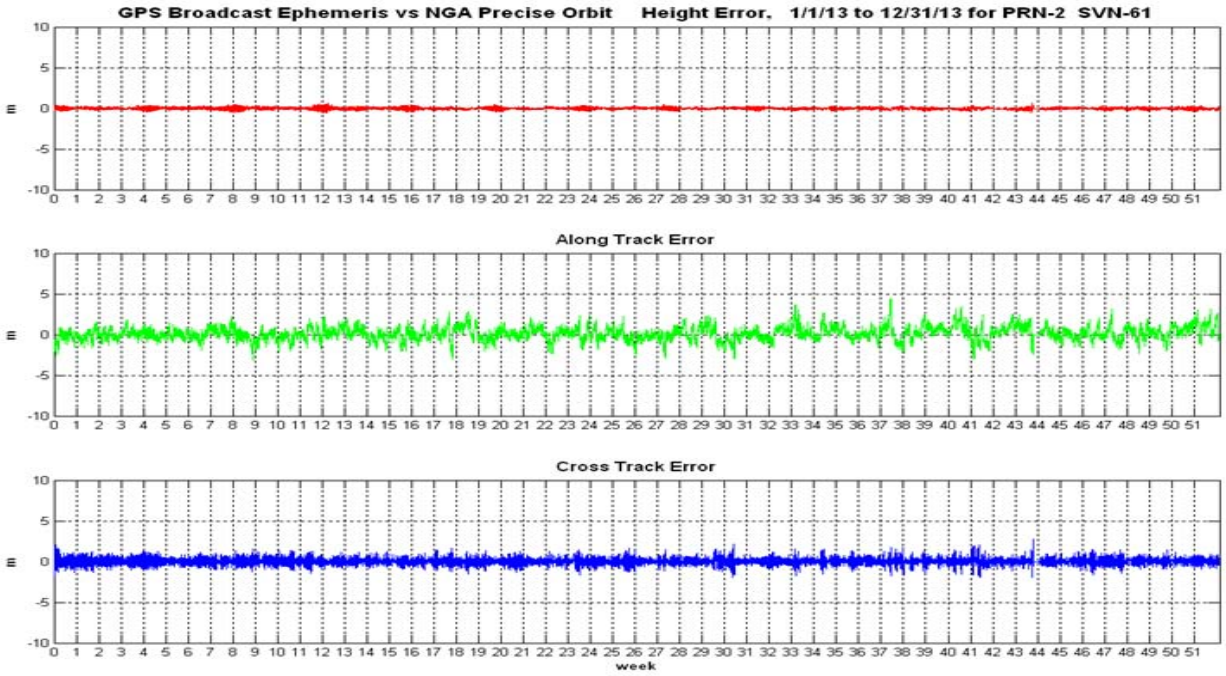


Figure 12-6 Orbit Error PRN-3 (SVN-33)

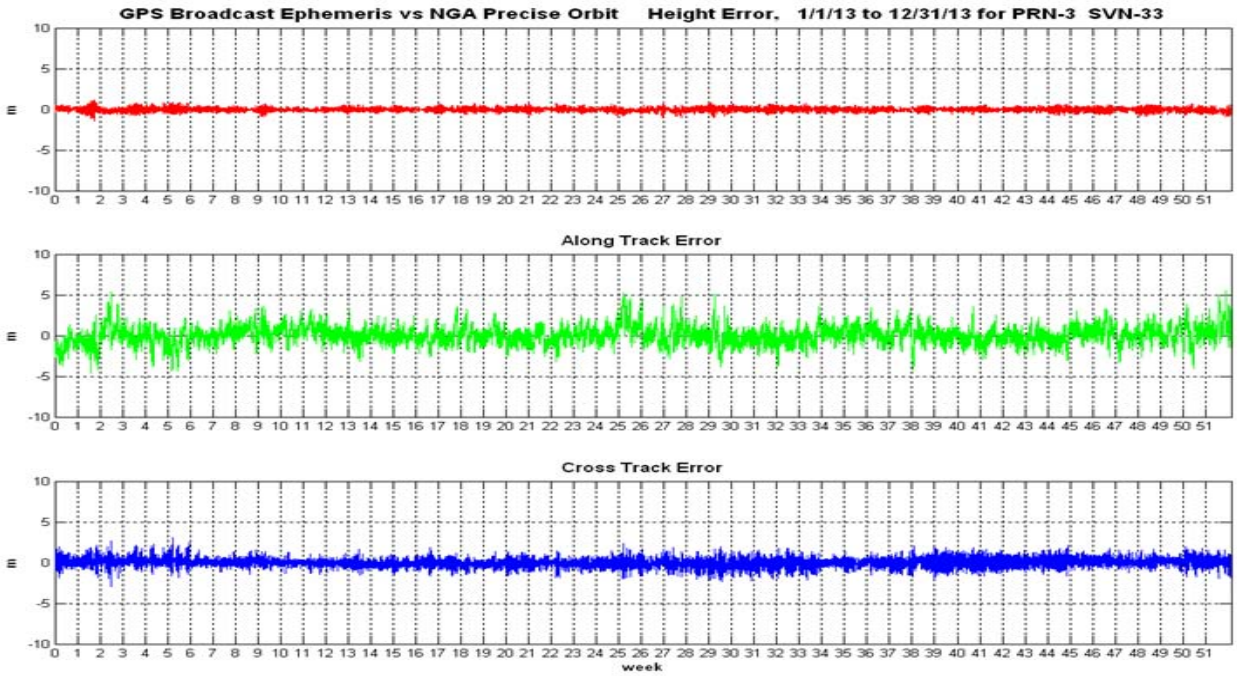


Figure 12-7 Orbit Error PRN-4 (SVN-34)

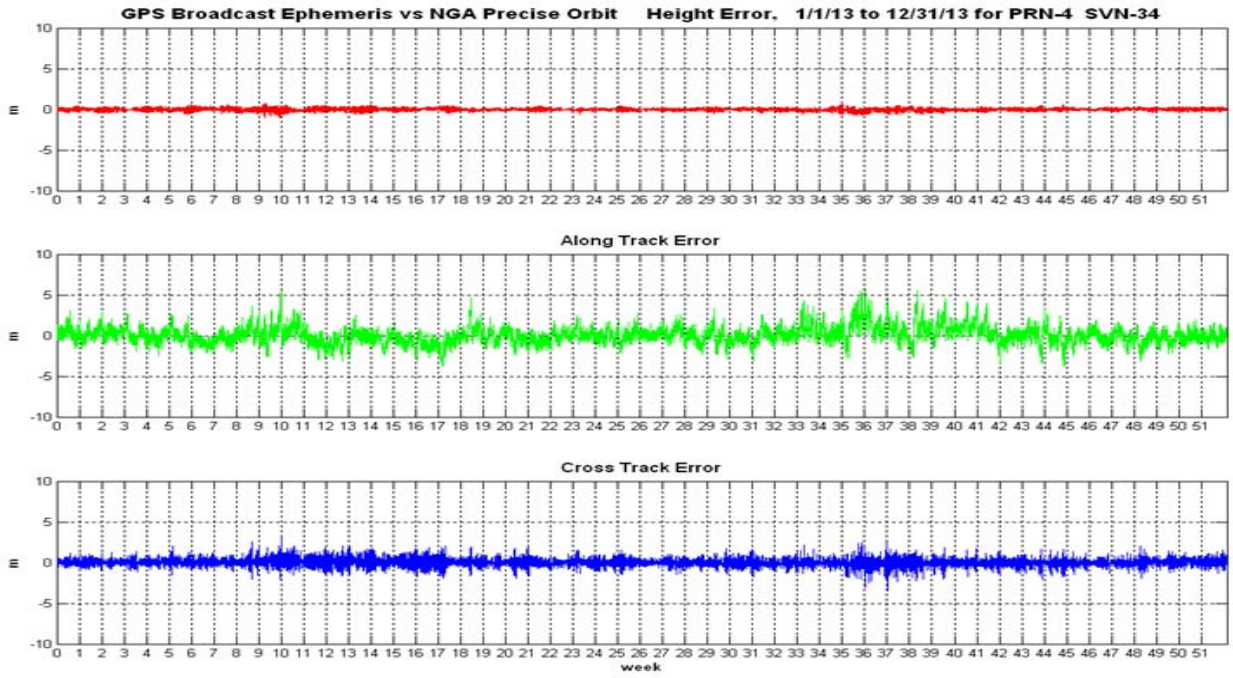


Figure 12-8 Orbit Error PRN-5 (SVN-50)

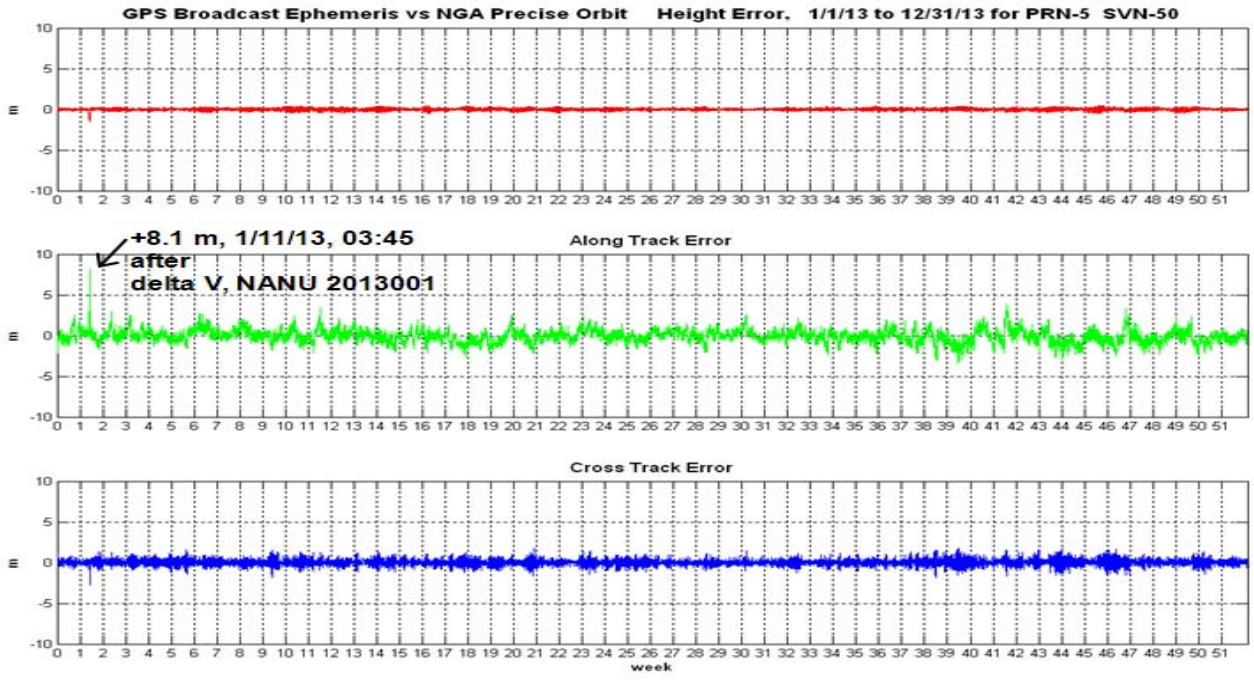


Figure 12-9 Orbit Error PRN-6 (SVN-36)

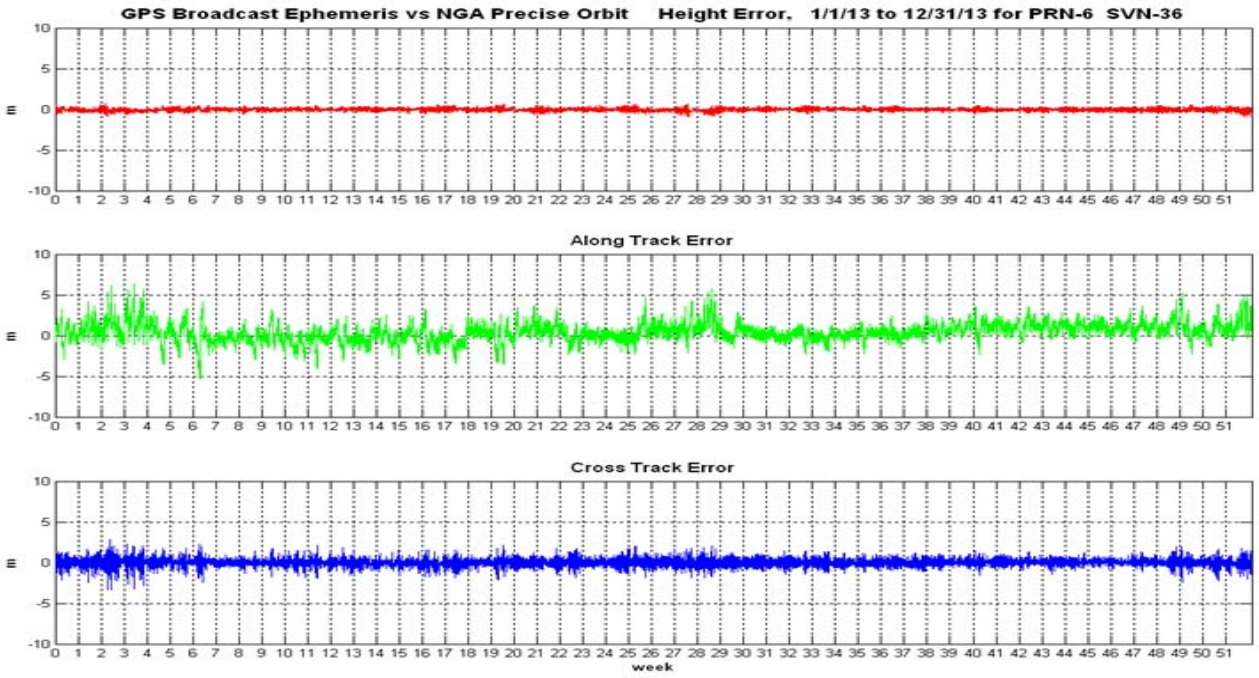


Figure 12-10 Orbit Error PRN-7 (SVN-48)

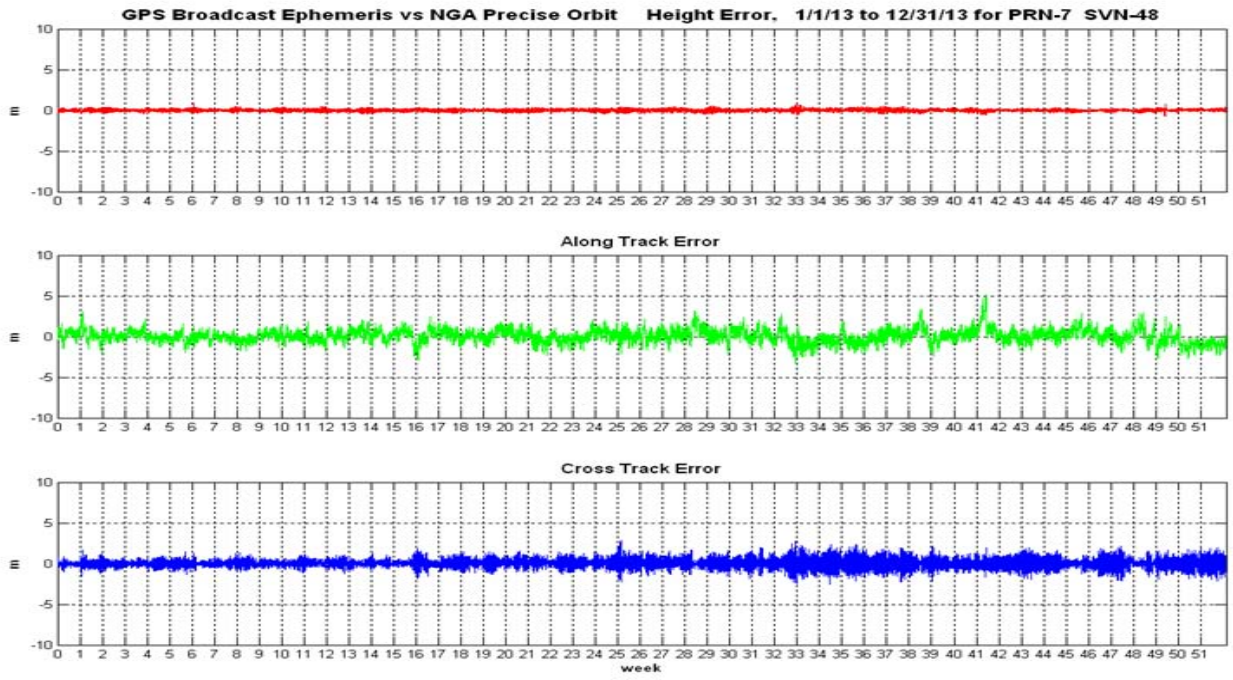


Figure 12-11 Orbit Error PRN-8 (SVN-38)

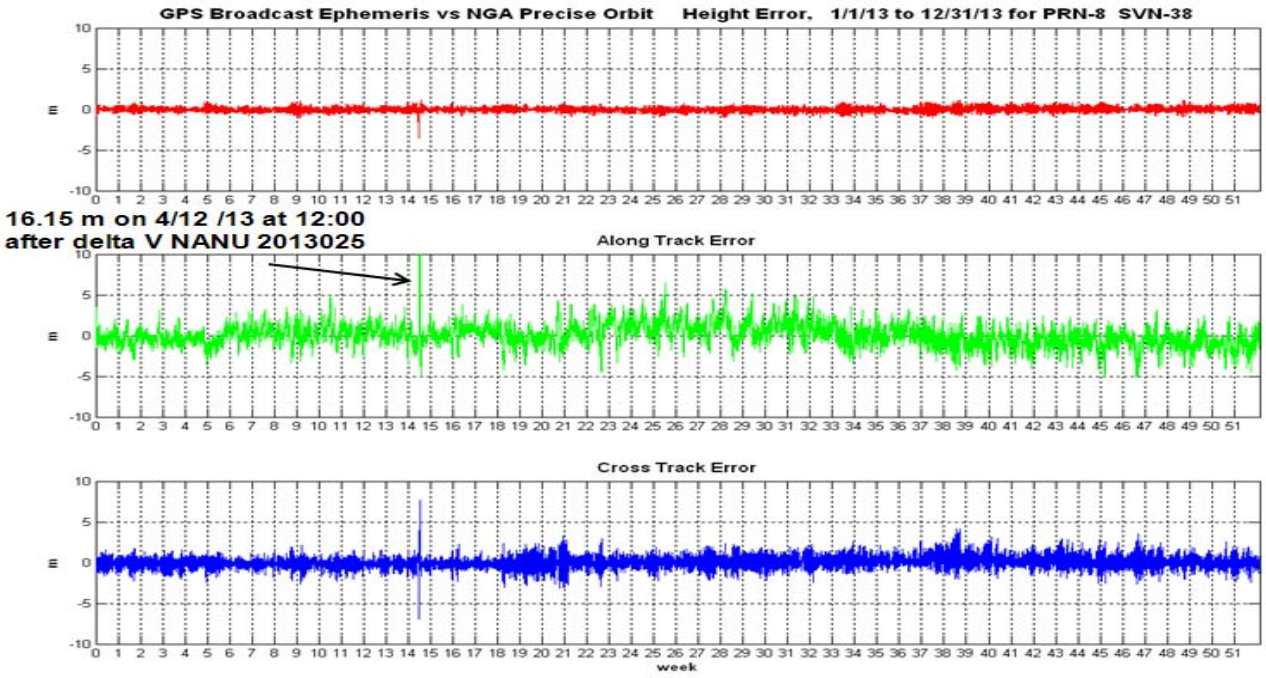


Figure 12-12 Orbit Error PRN-9 (SVN-39)

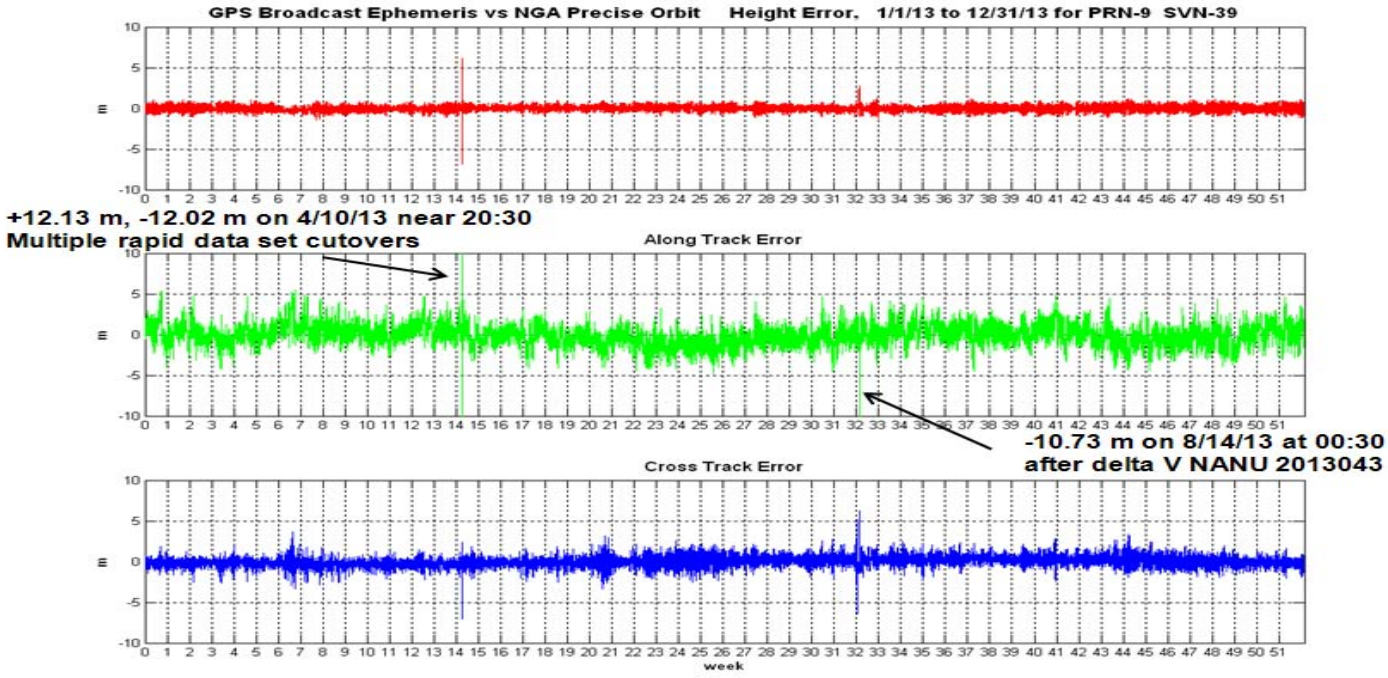


Figure 12-13 Orbit Error PRN-10 (SVN-40)

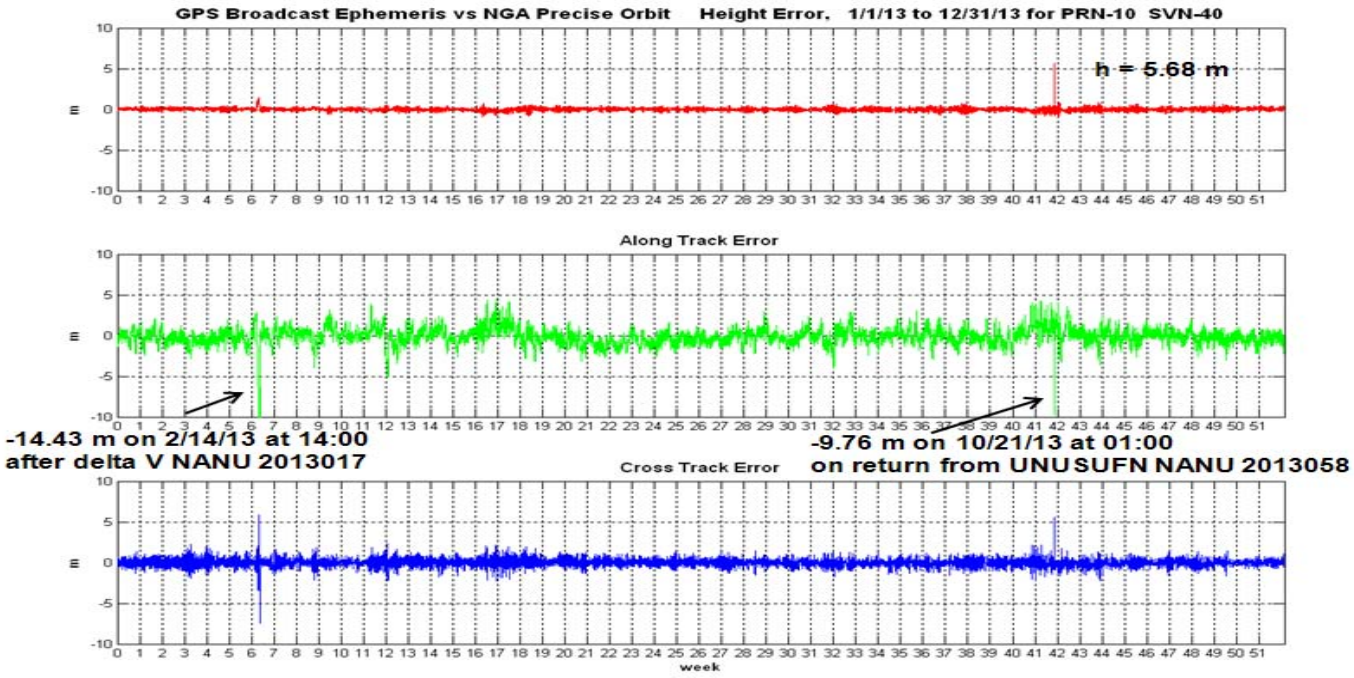


Figure 12-14 Orbit Error PRN-11 (SVN-46)

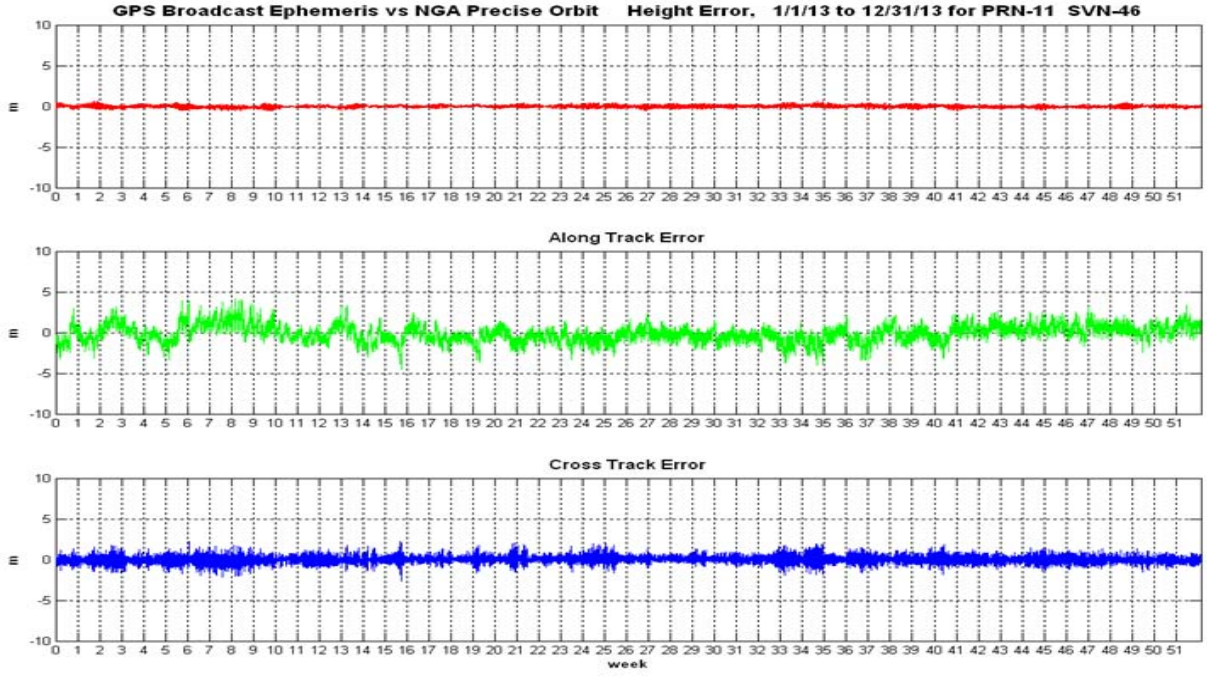


Figure 12-15 Orbit Error PRN-12 (SVN-58)

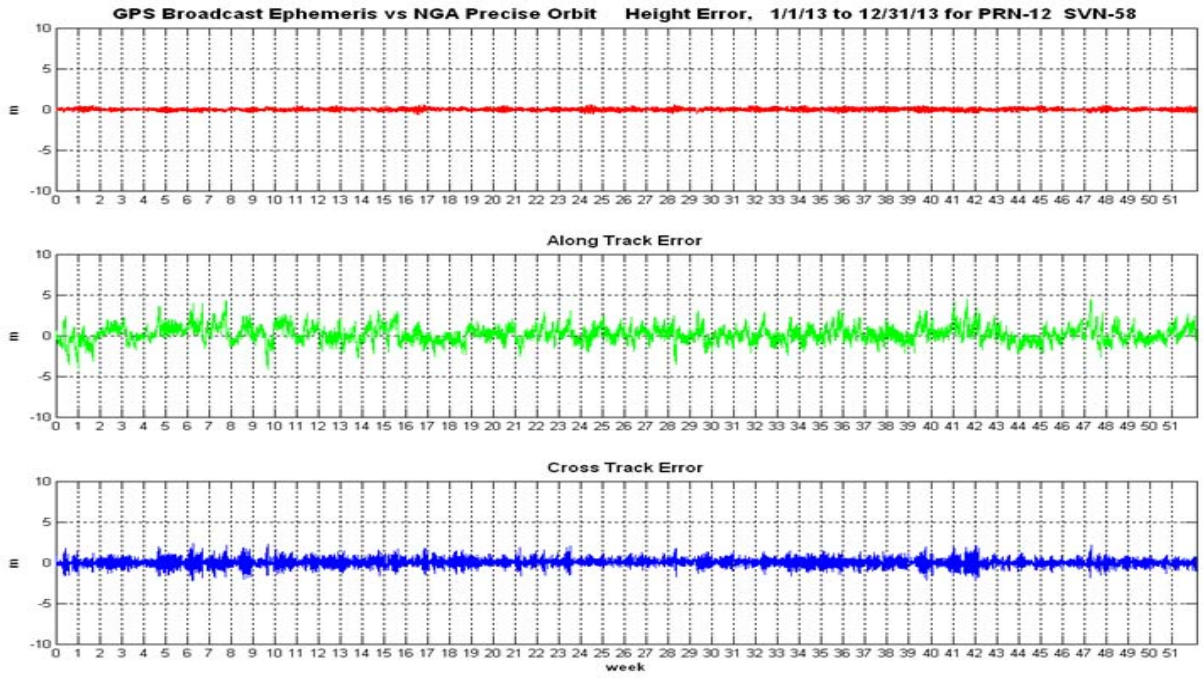


Figure 12-16 Orbit Error PRN-13 (SVN-43)

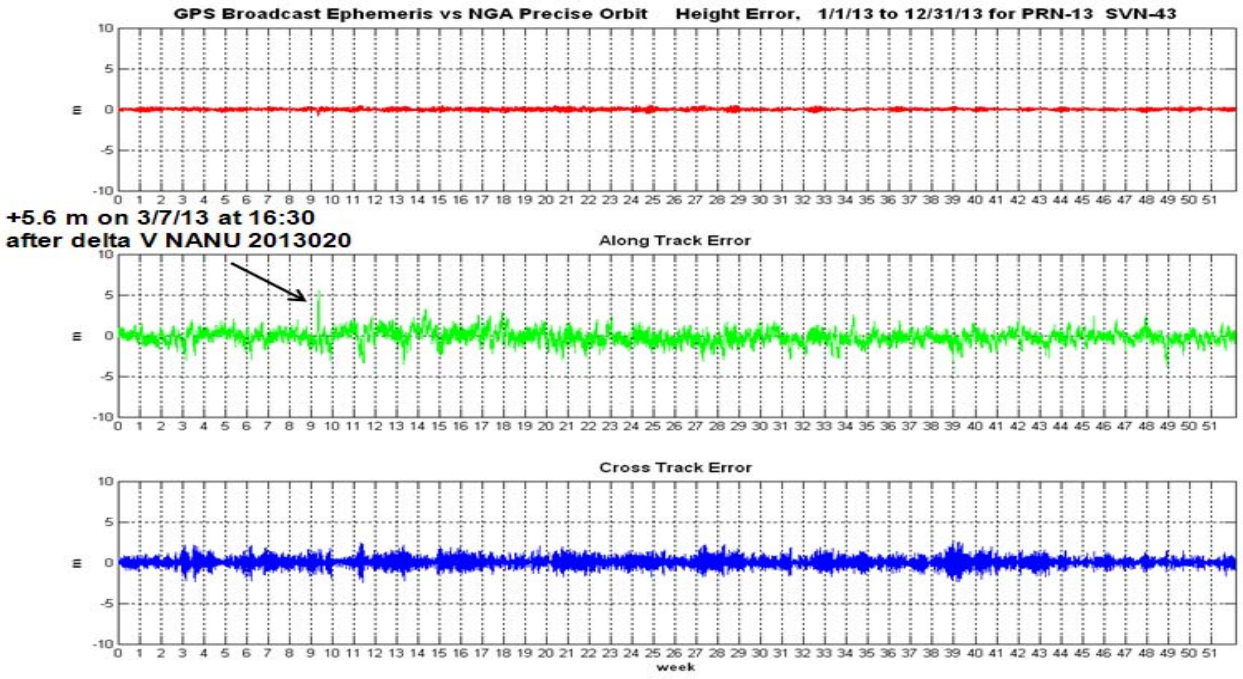


Figure 12-17 Orbit Error PRN-14 (SVN-41)

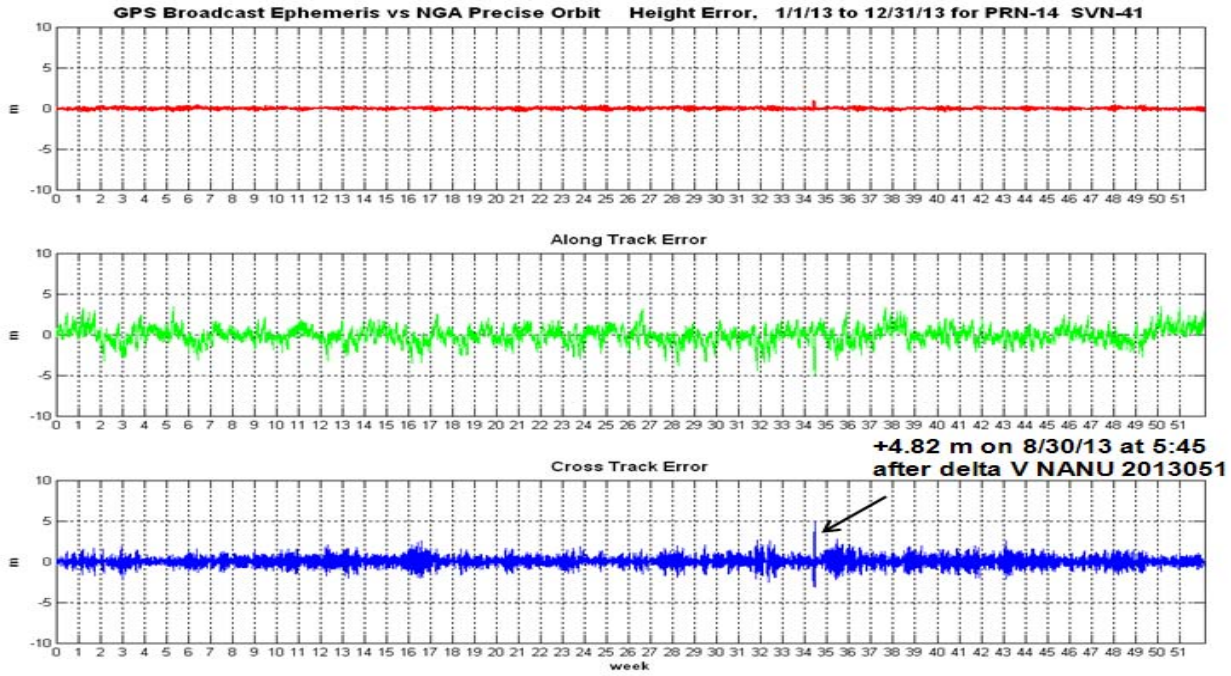


Figure 12-18 Orbit Error PRN-15 (SVN-55)

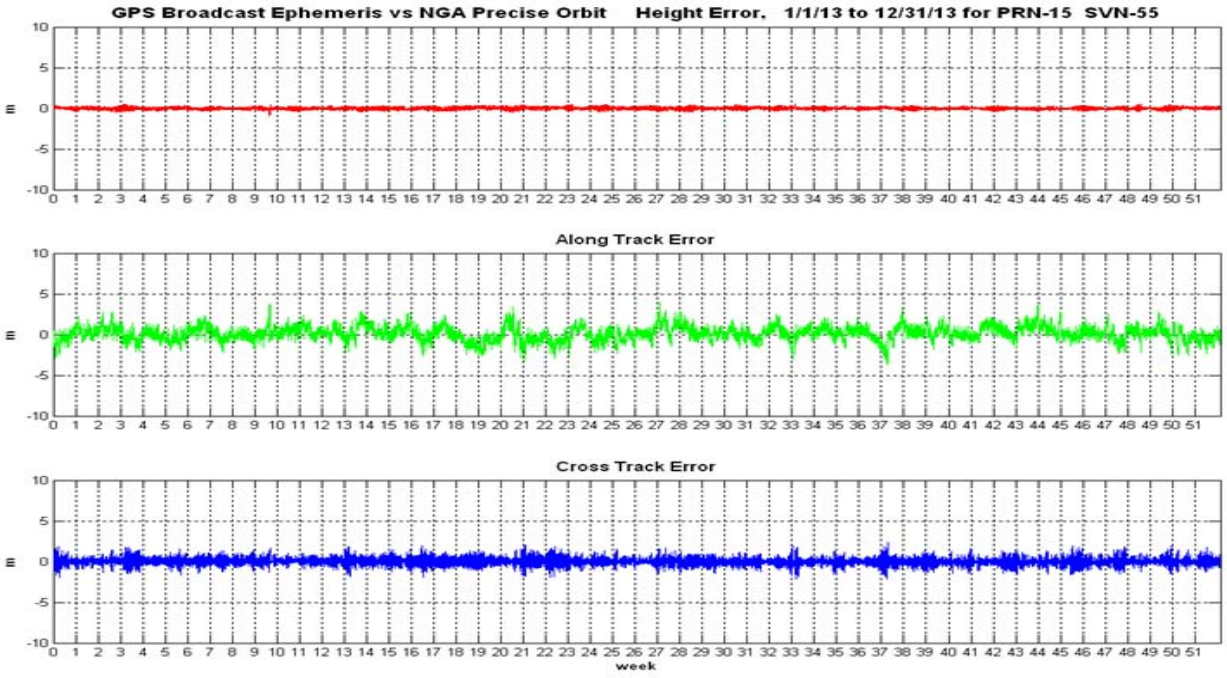


Figure 12-19 Orbit Error PRN-16 (SVN-56)

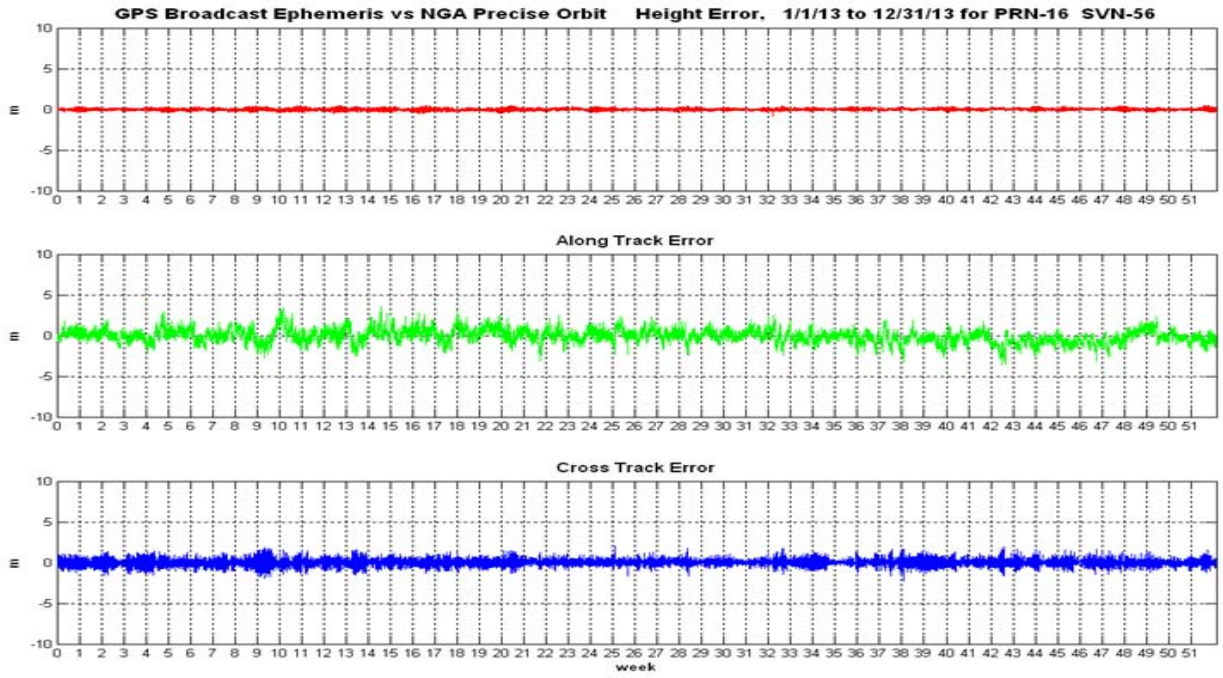


Figure 12-20 Orbit Error PRN-17 (SVN-53)

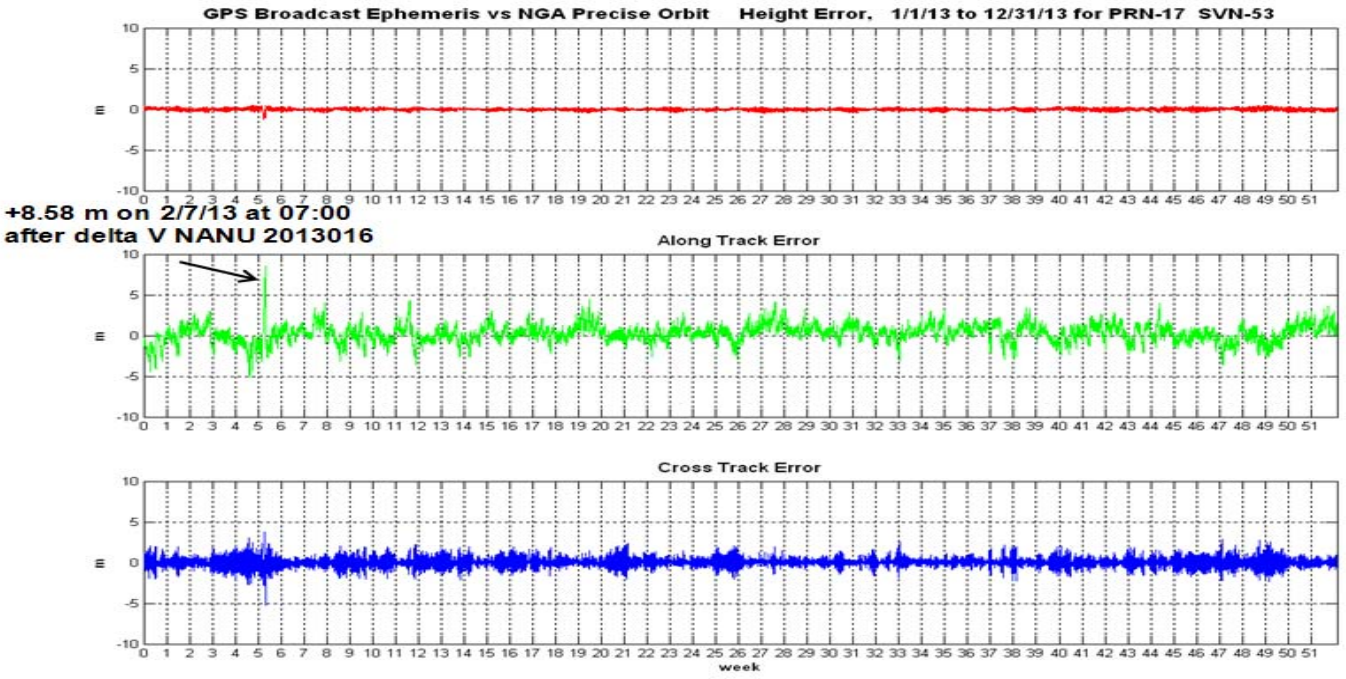


Figure 12-21 Orbit Error PRN-18 (SVN-54)

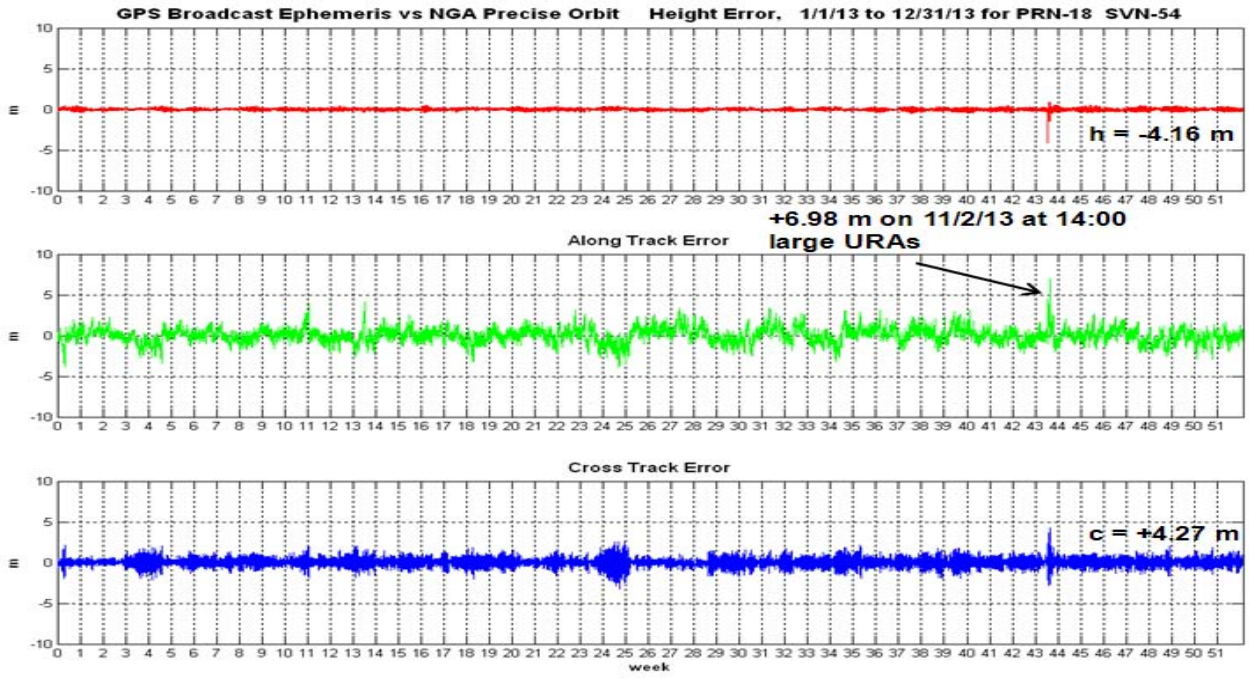


Figure 12-22 Orbit Error PRN-19 (SVN-59)

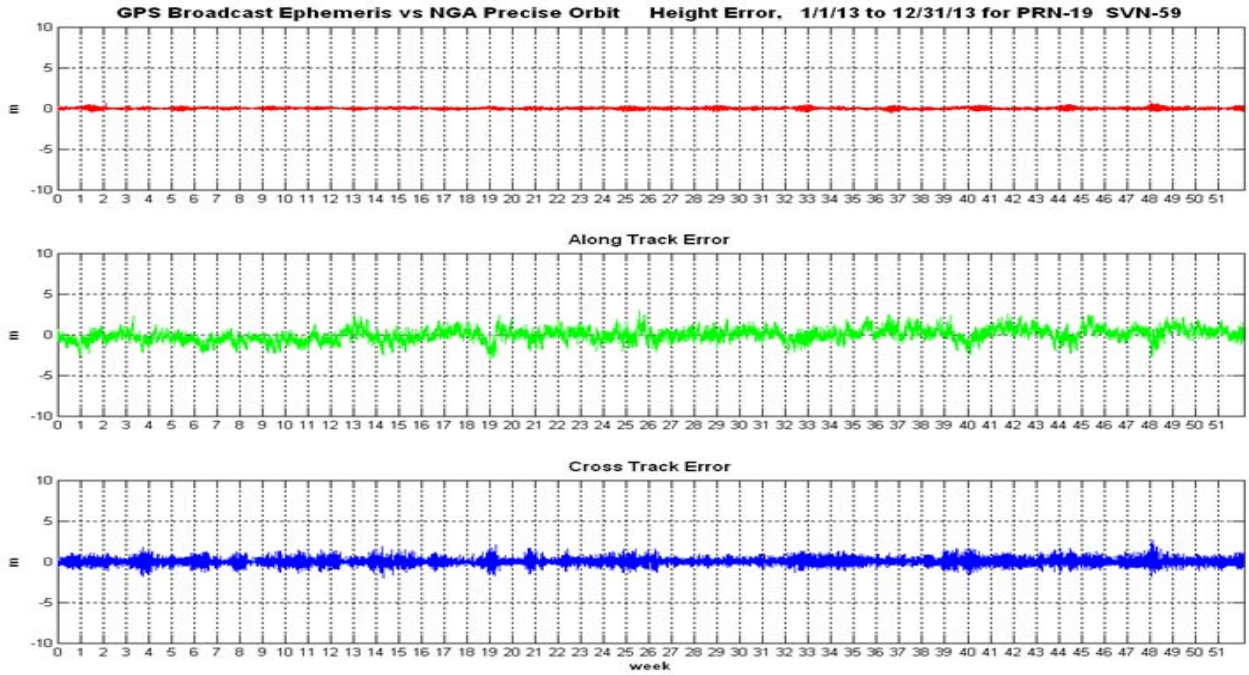


Figure 12-23 Orbit Error PRN-20 (SVN-51)

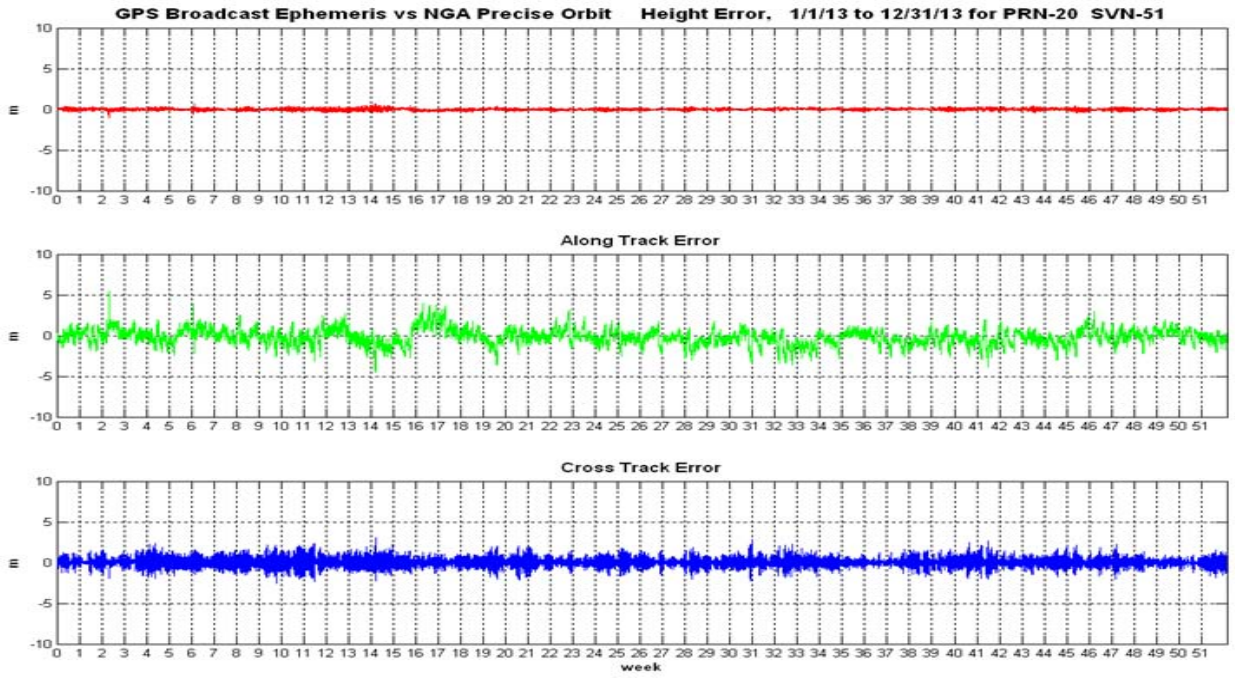


Figure 12-24 Orbit Error PRN-21 (SVN-45)

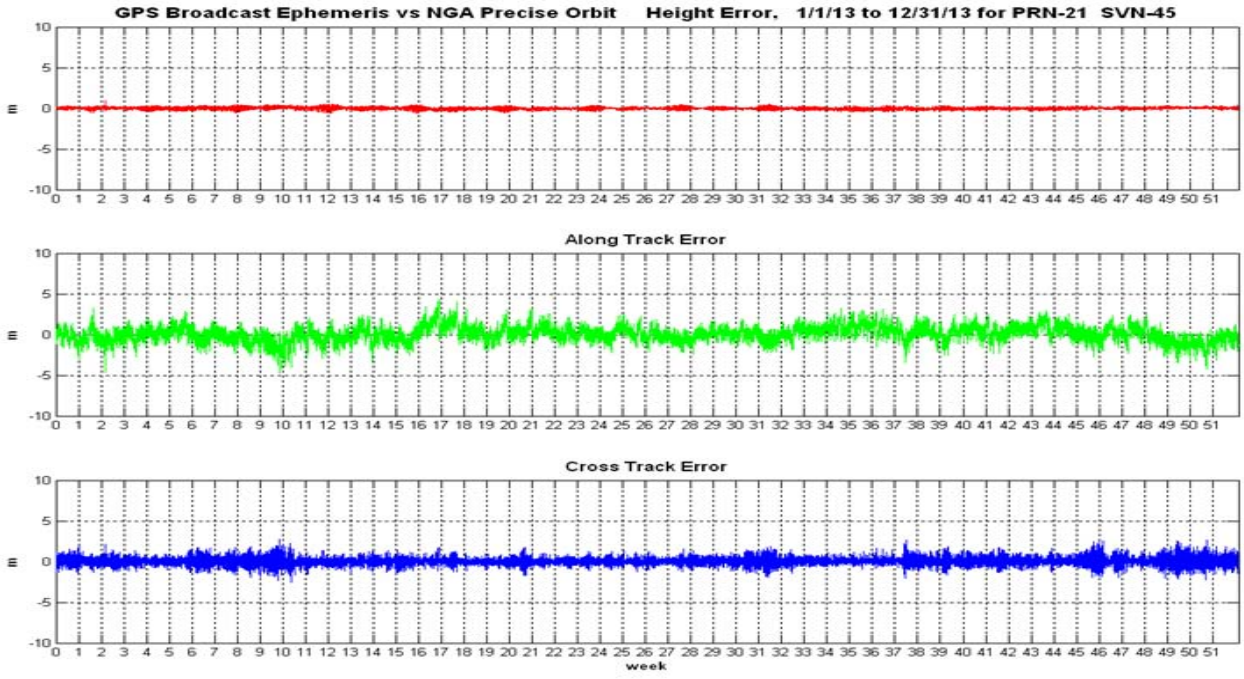


Figure 12-25 Orbit Error PRN-22 (SVN-47)

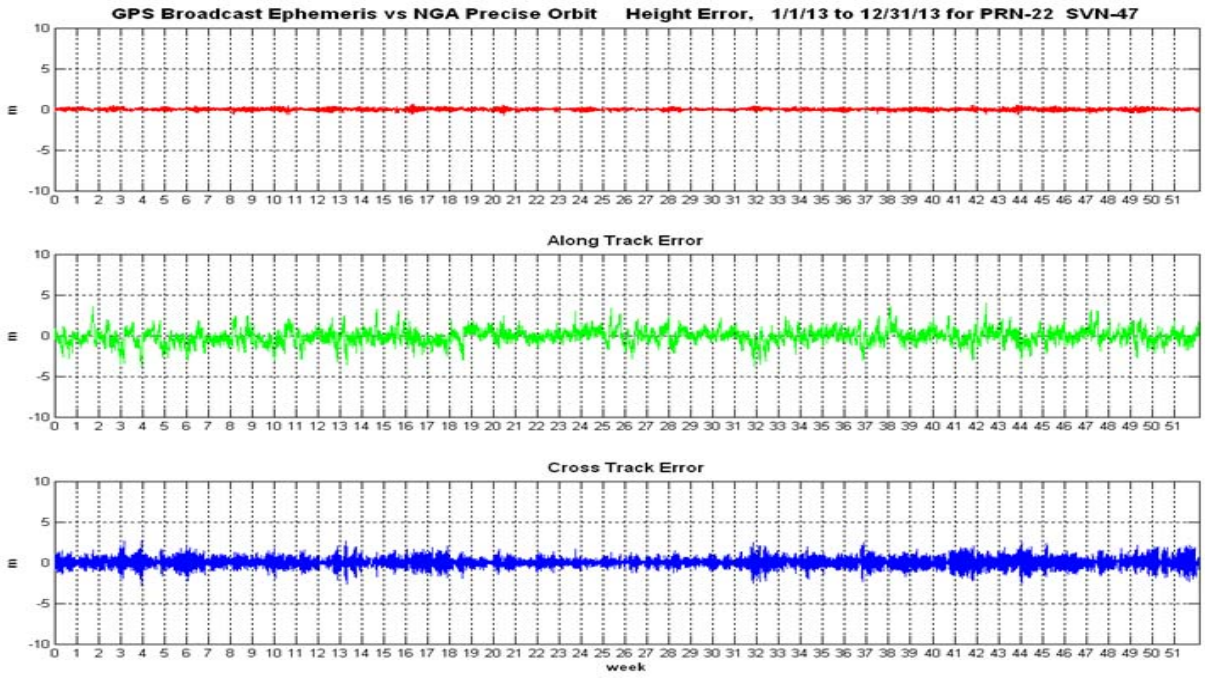


Figure 12-26 Orbit Error PRN-23 (SVN-60)

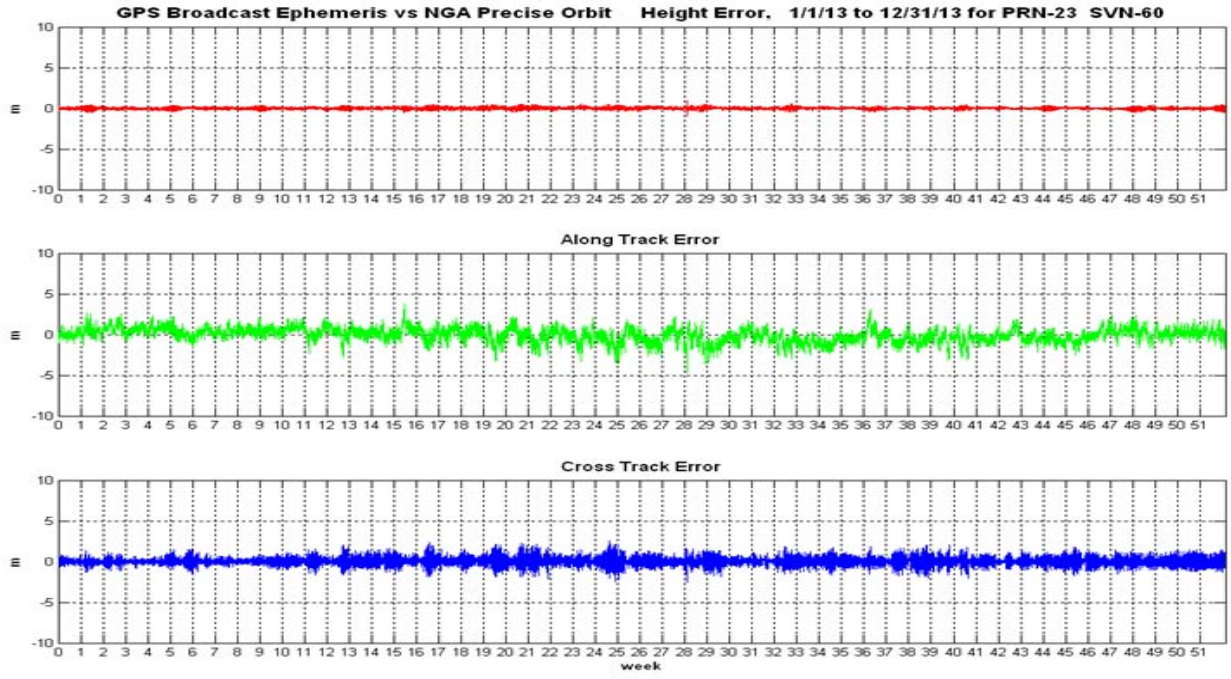


Figure 12-27 Orbit Error PRN-24 (SVN-65)

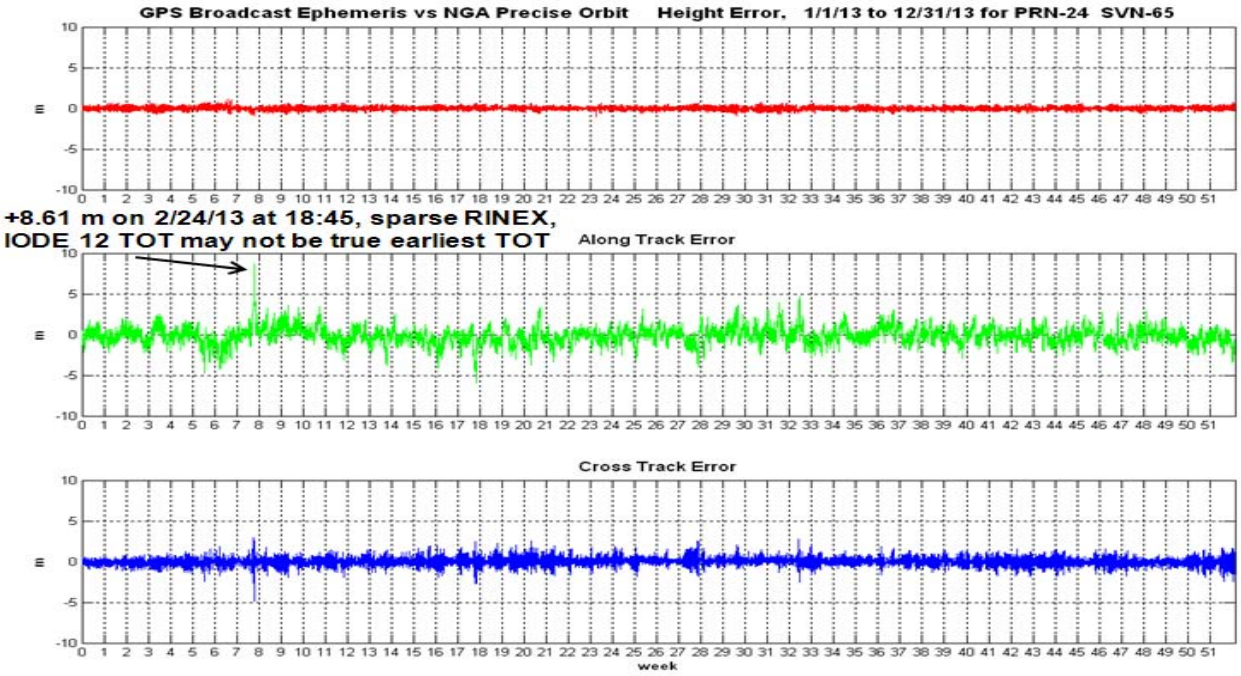


Figure 12-28 Orbit Error PRN-25 (SVN-62)

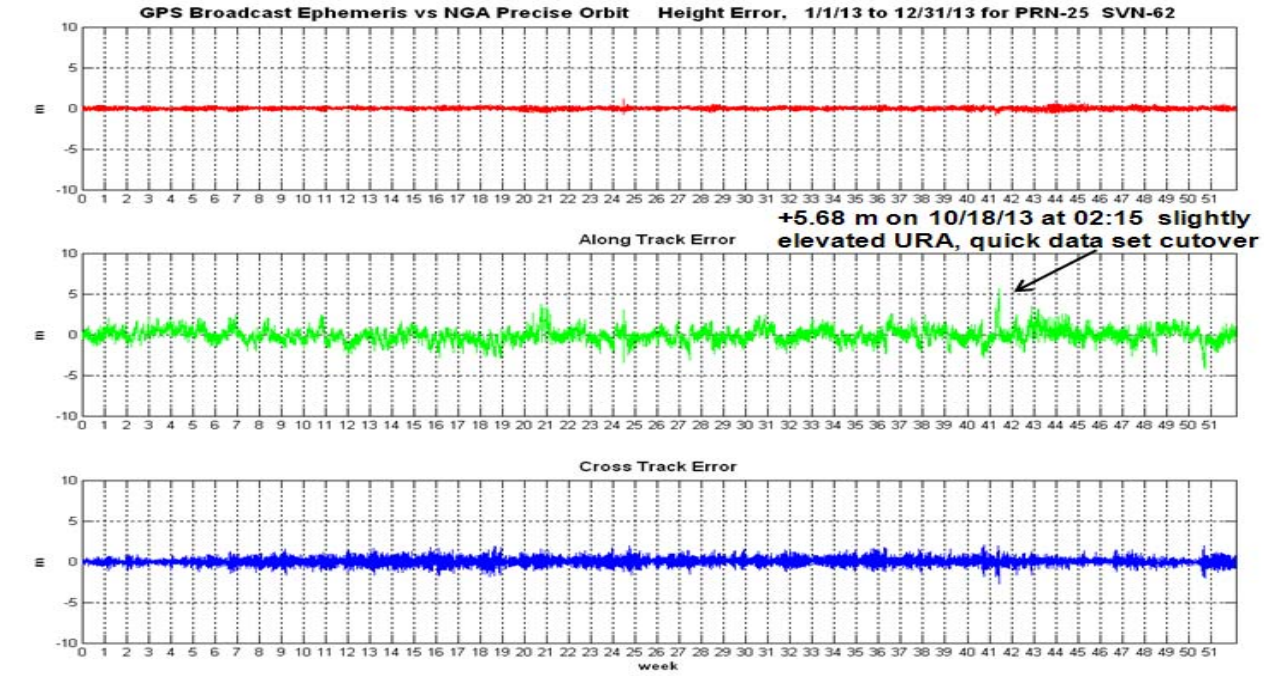


Figure 12-29 Orbit Error PRN-26 (SVN-26)

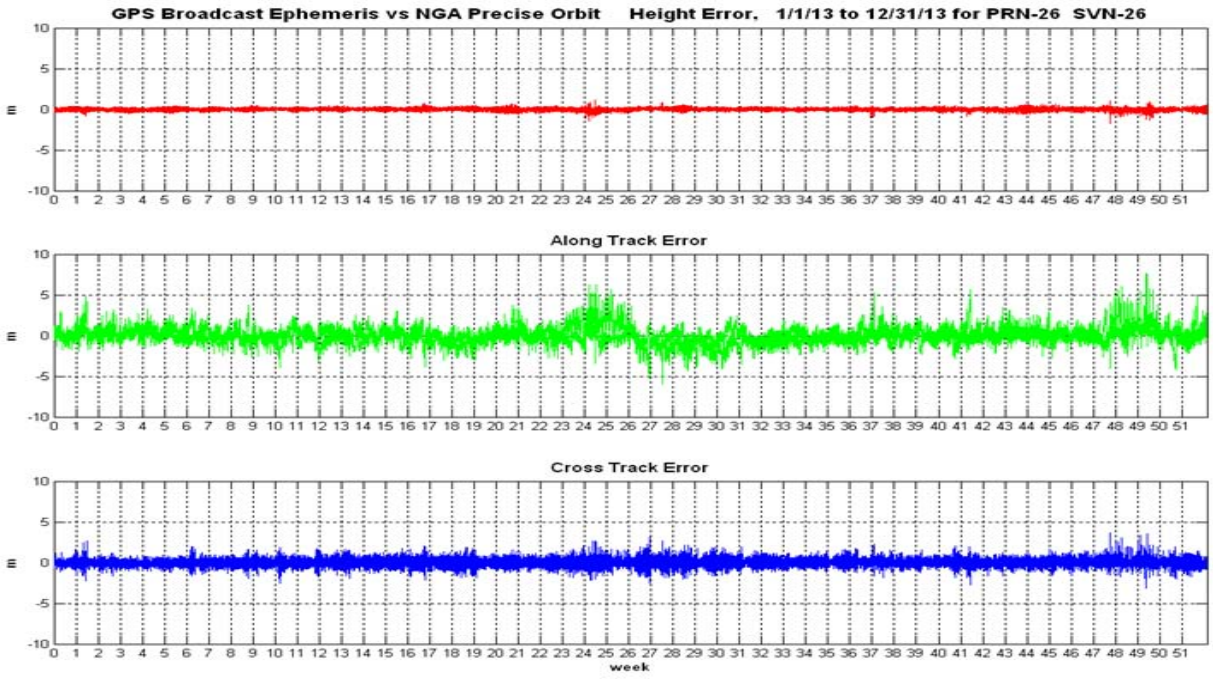


Figure 12-30 Orbit Error PRN-27 (SVN-27)

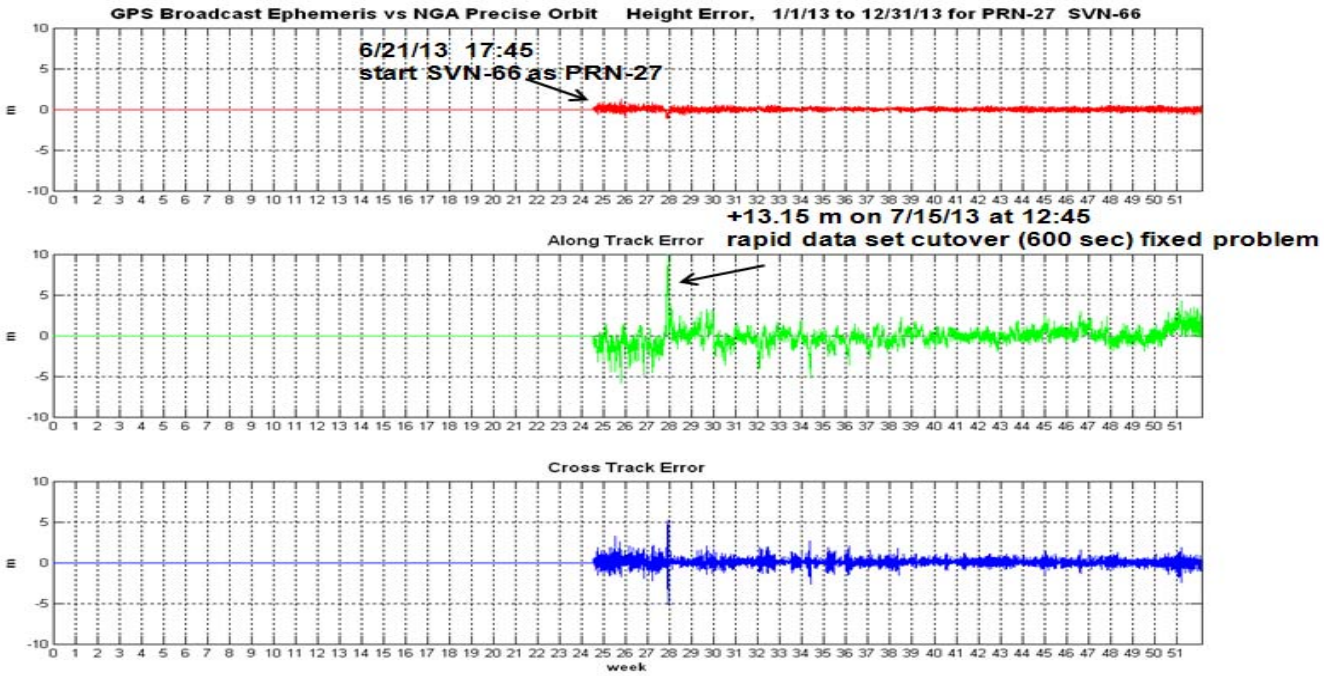


Figure 12-31 Orbit Error PRN-28 (SVN-44)

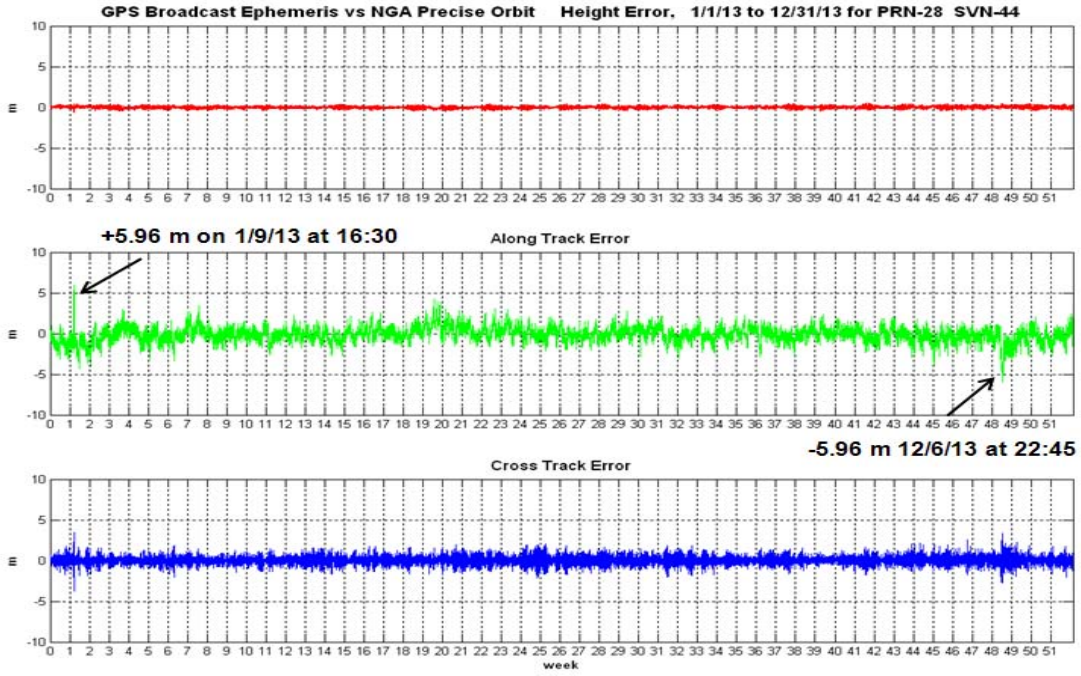


Figure 12-32 Orbit Error PRN-29 (SVN-57)

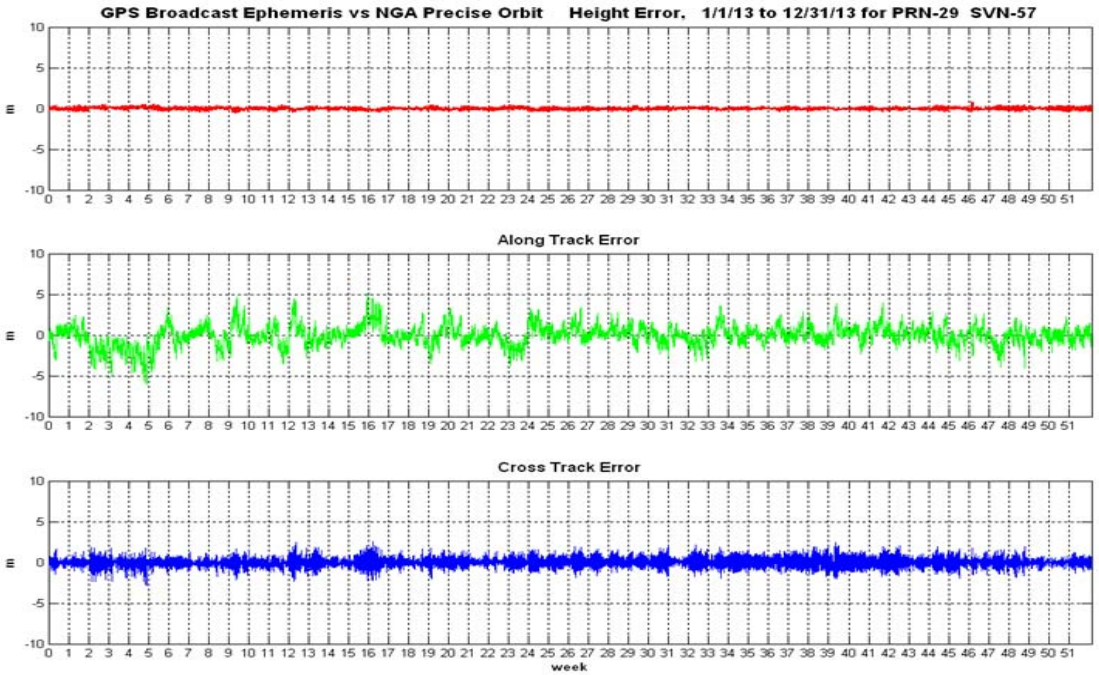


Figure 12-33 Orbit Error PRN-30 (SVN-35)

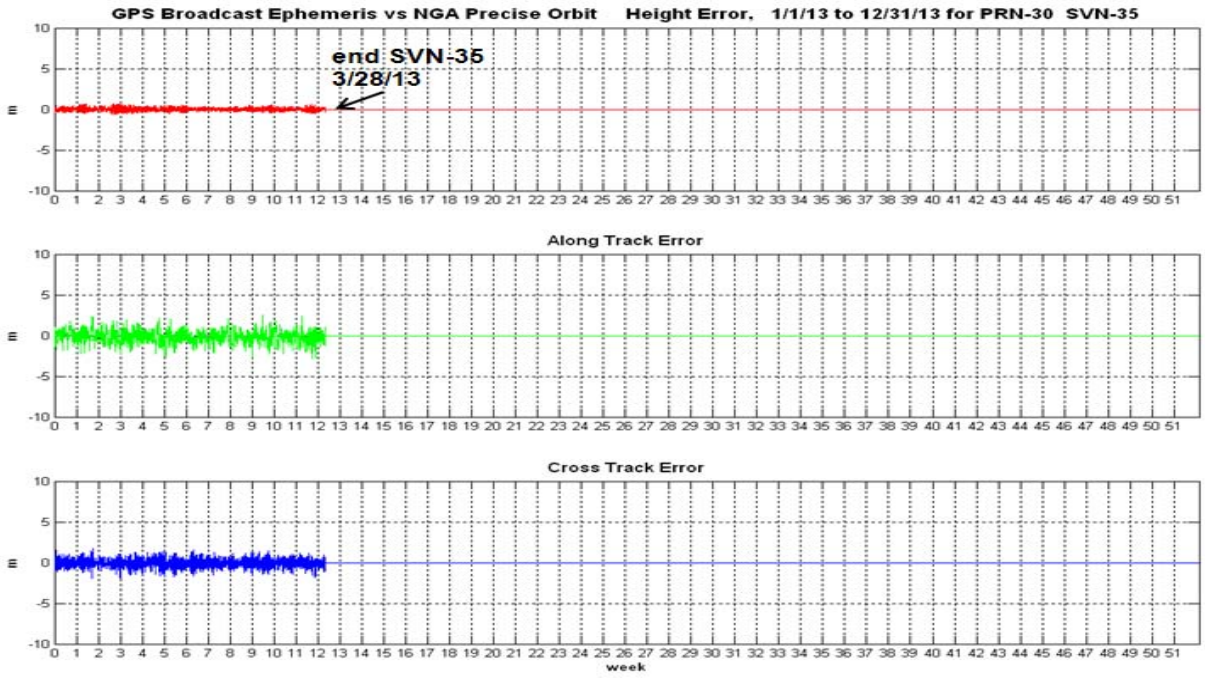


Figure 12-34 Orbit Error PRN-31 (SVN-52)

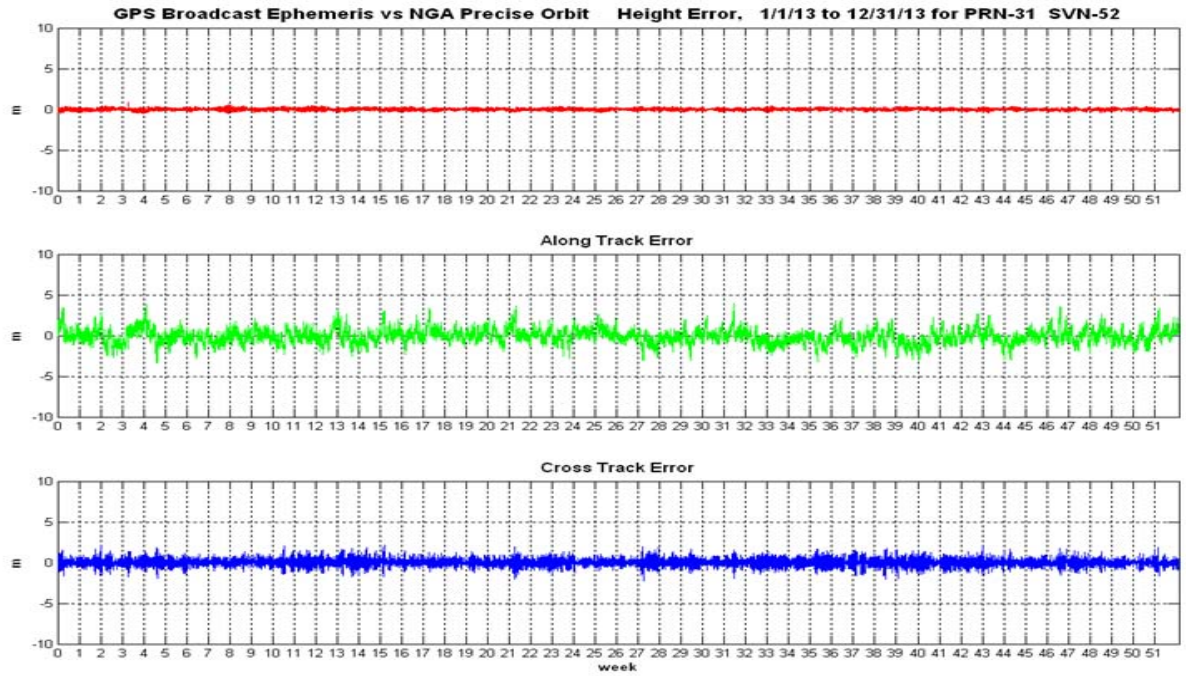


Figure 12-35 Orbit Error PRN-32 (SVN-23)

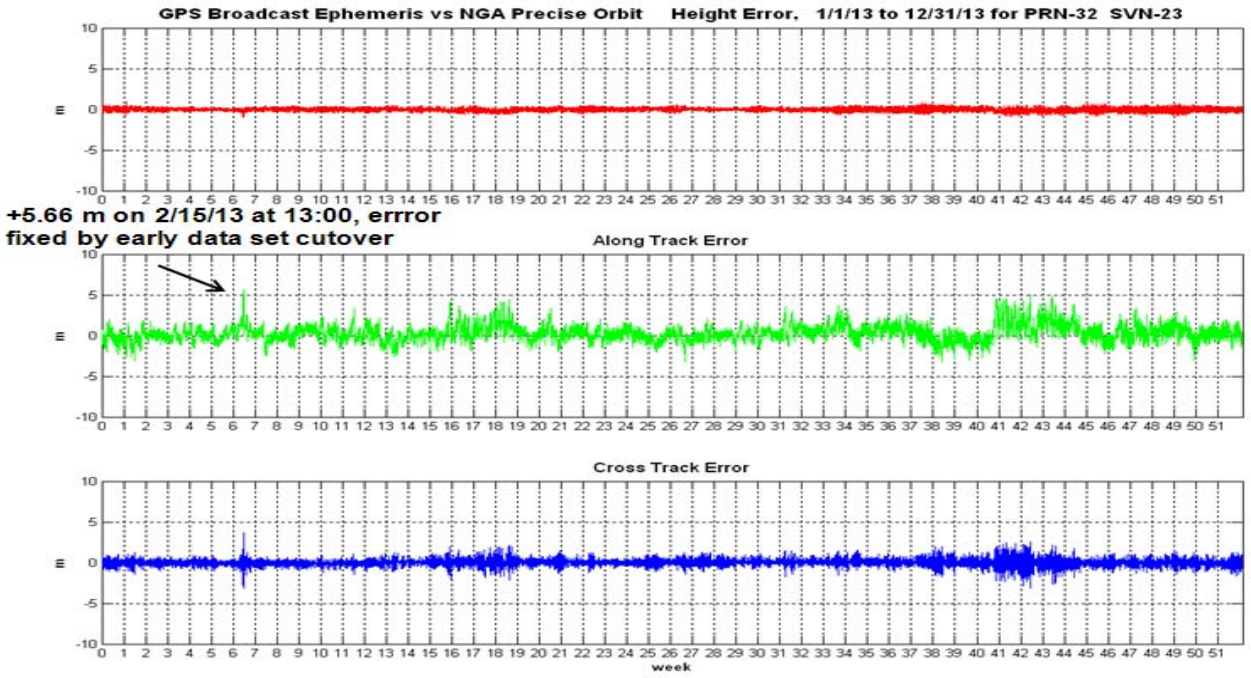


Figure 12-36 QQ Plots of Range Error PRNs 1 to 4

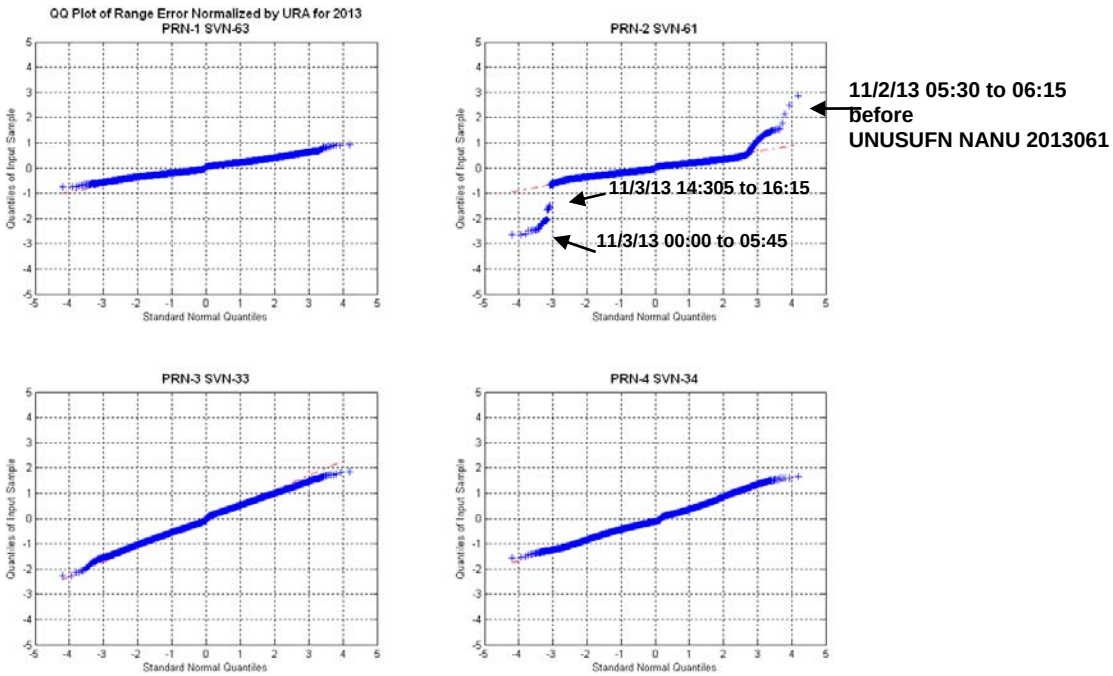


Figure 12-37 QQ Plots of Range Error PRNs 5 to 8

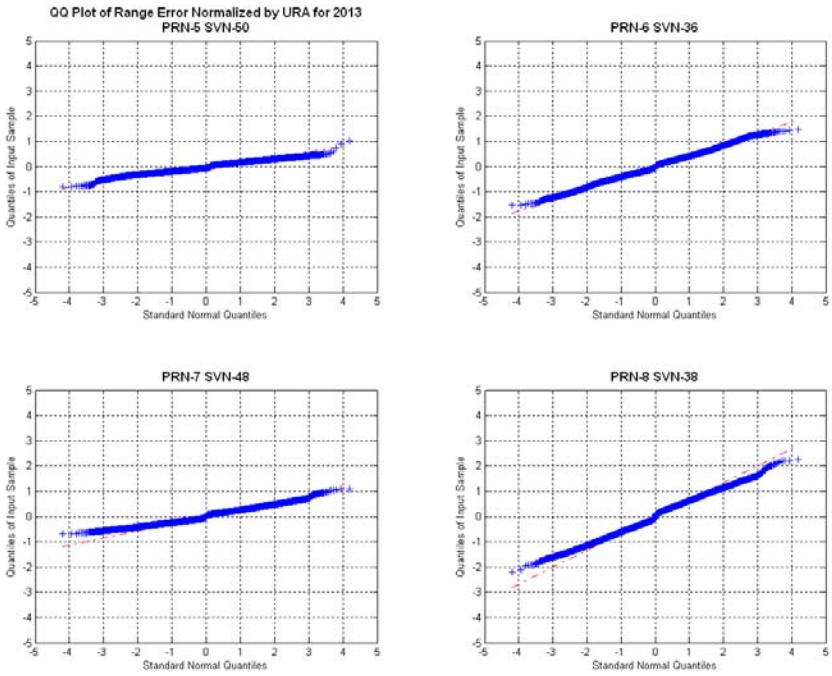


Figure 12-38 QQ Plots of Range Error PRNs 9 to 12

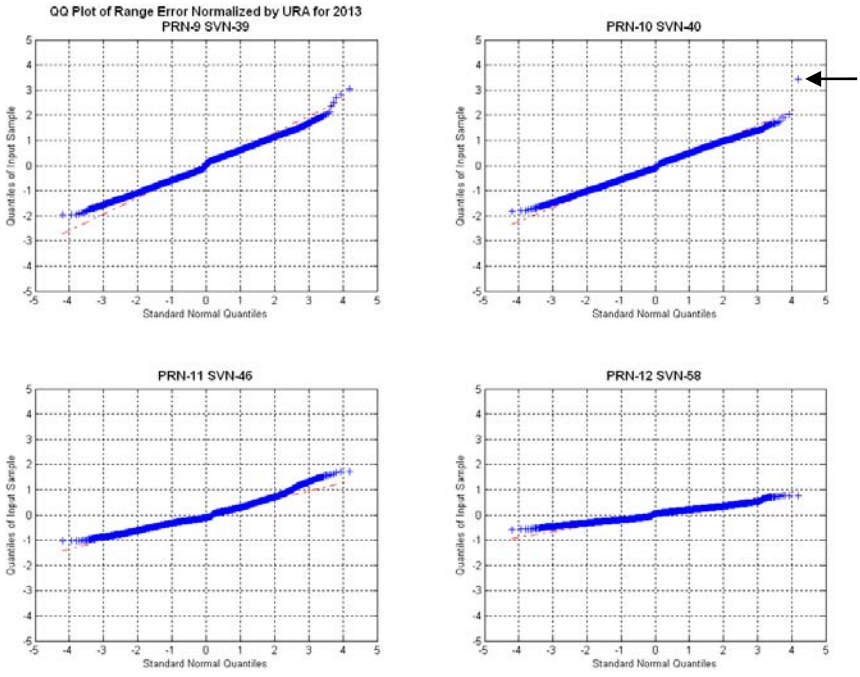


Figure 12-39 QQ Plots of Range Error PRNs 13 to 16

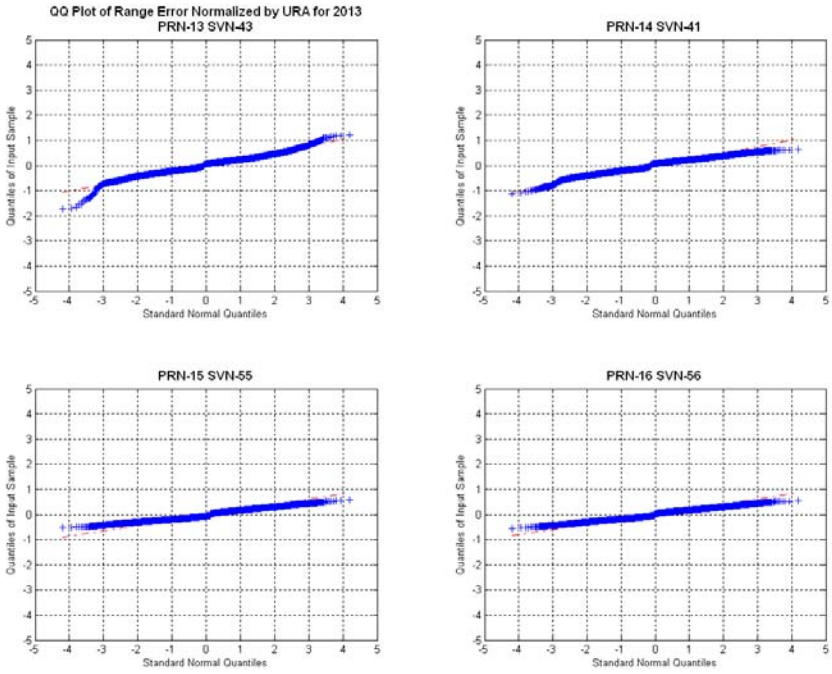


Figure 12-40 QQ Plots of Range Error PRNs 17 to 20

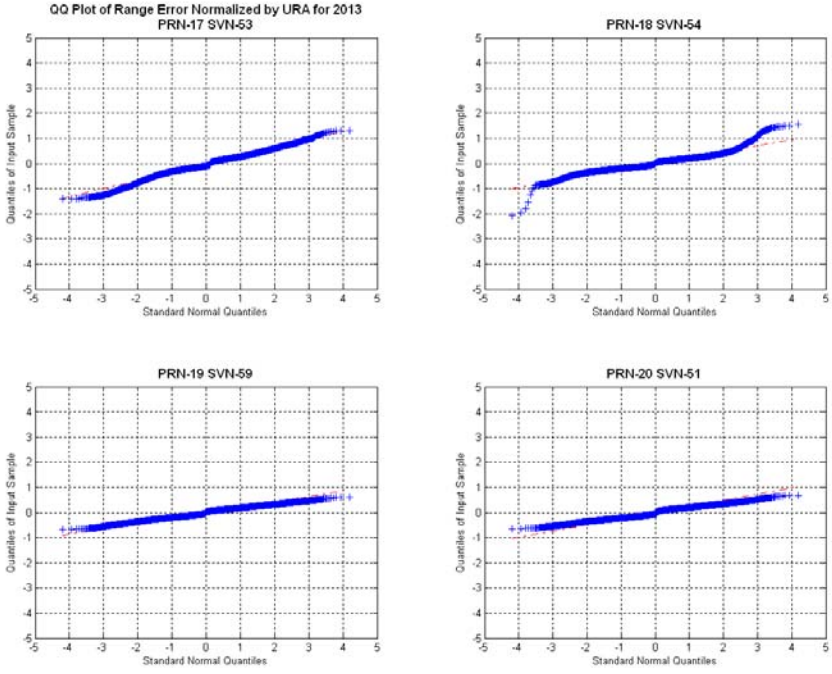


Figure 12-41 QQ Plots of Range Error PRNs 21 to 24

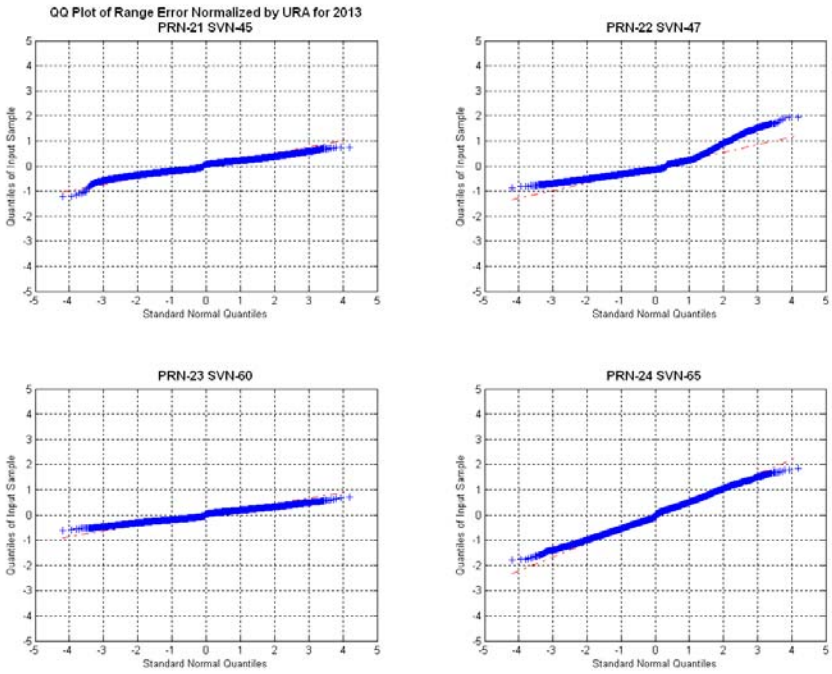


Figure 12-42 QQ Plots of Range Error PRNs 25 to 28

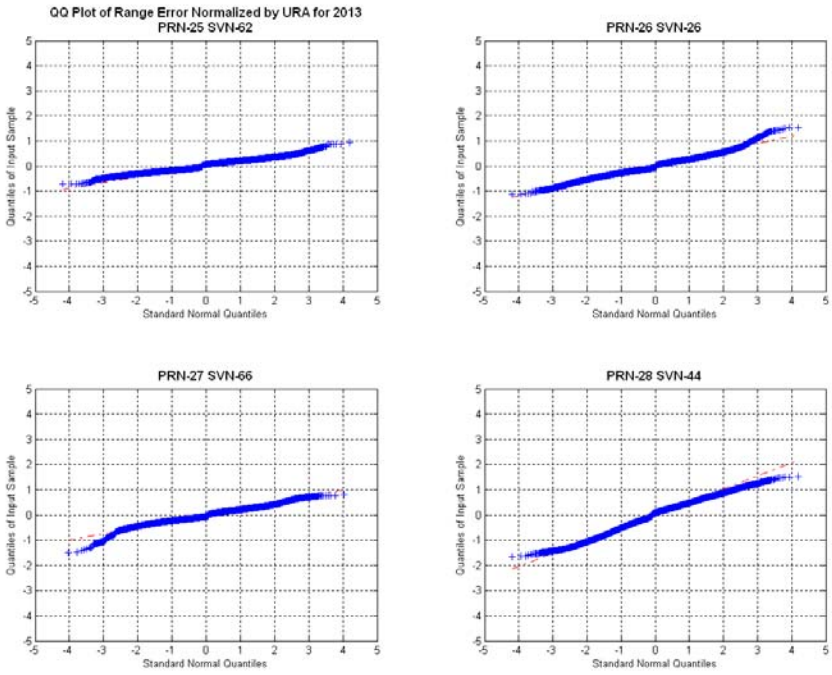


Figure 12-43 QQ Plots of Range Error PRNs 29 to 32

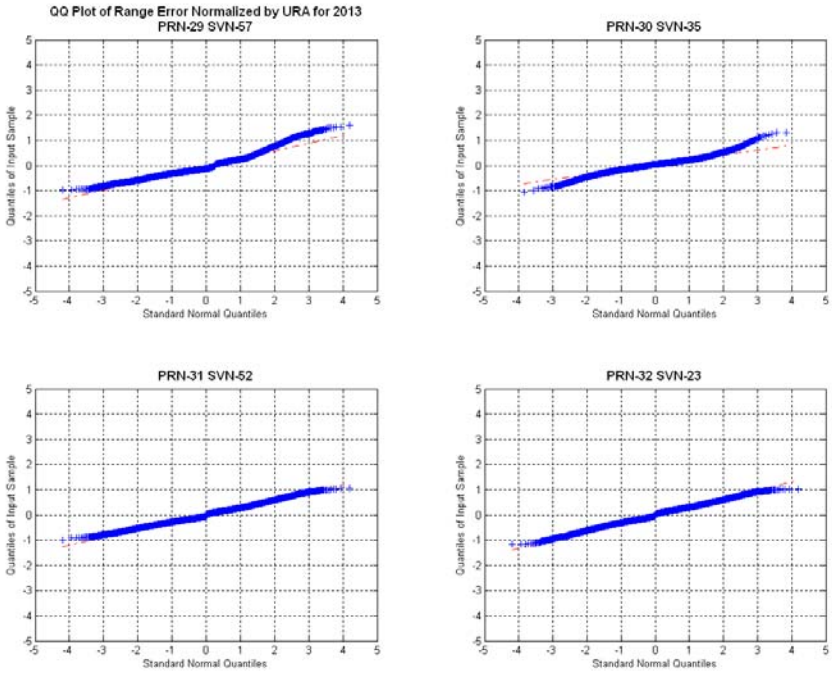


Figure 12-44 Histograms of H, A, C, and Range Error PRN-1

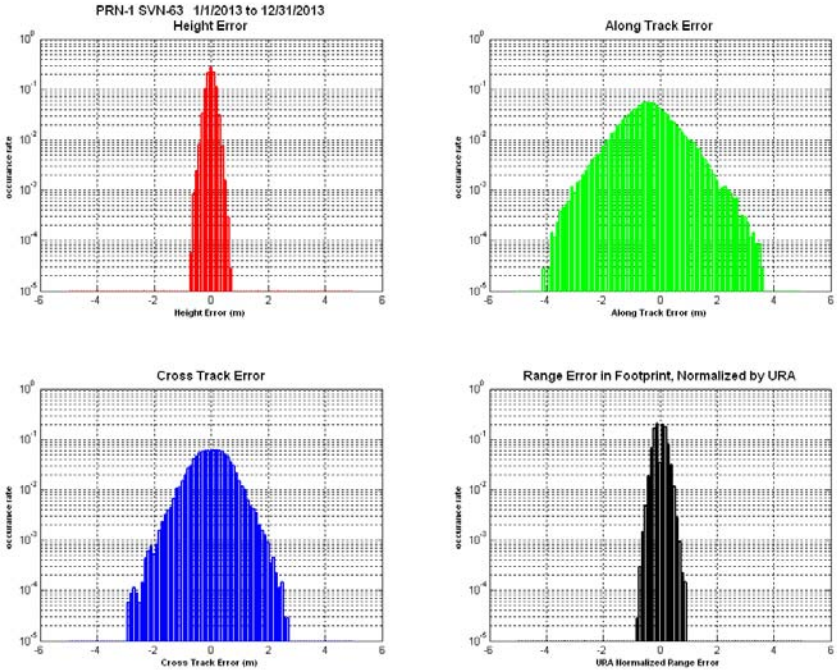


Figure 12-45 Histograms of H, A, C, and Range Error PRN-2

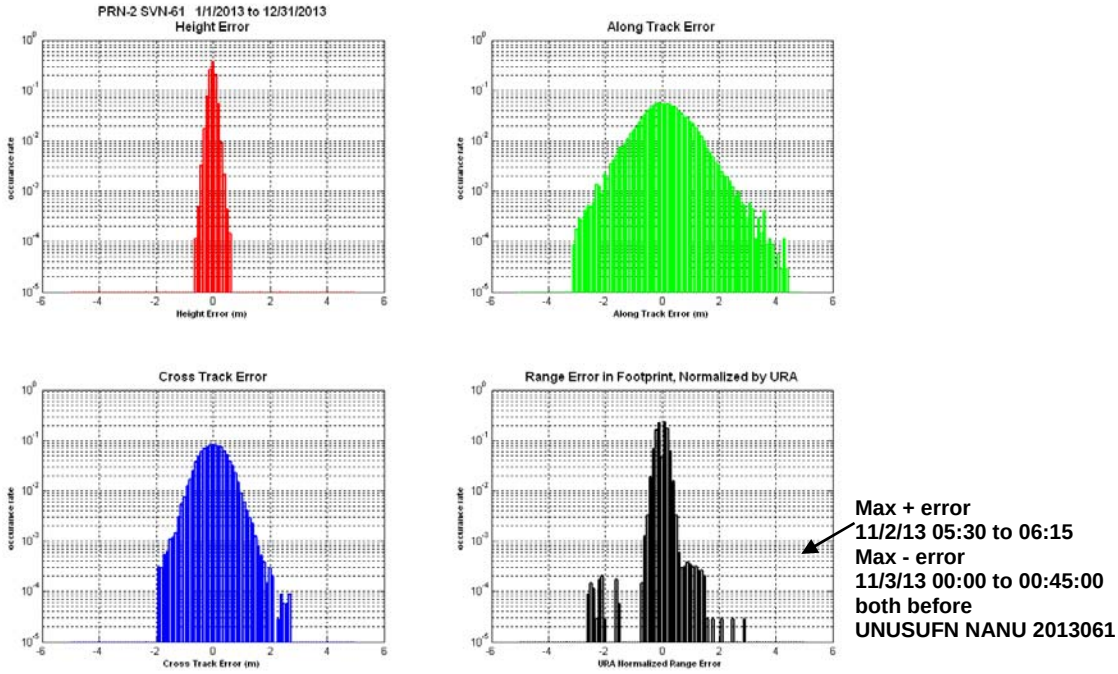


Figure 12-46 Histograms of H, A, C, and Range Error PRN-3

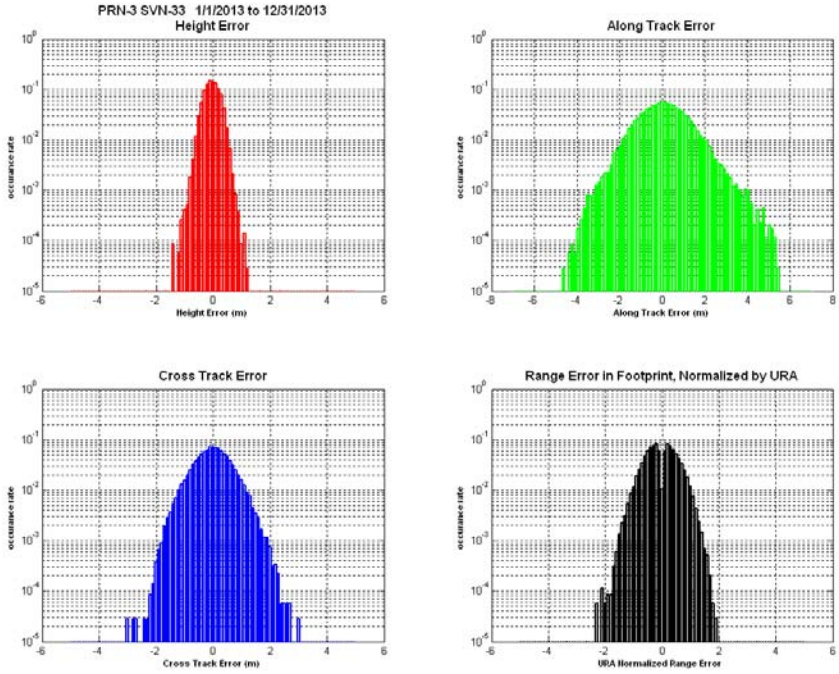


Figure 12-47 Histograms of H, A, C, and Range Error PRN-4

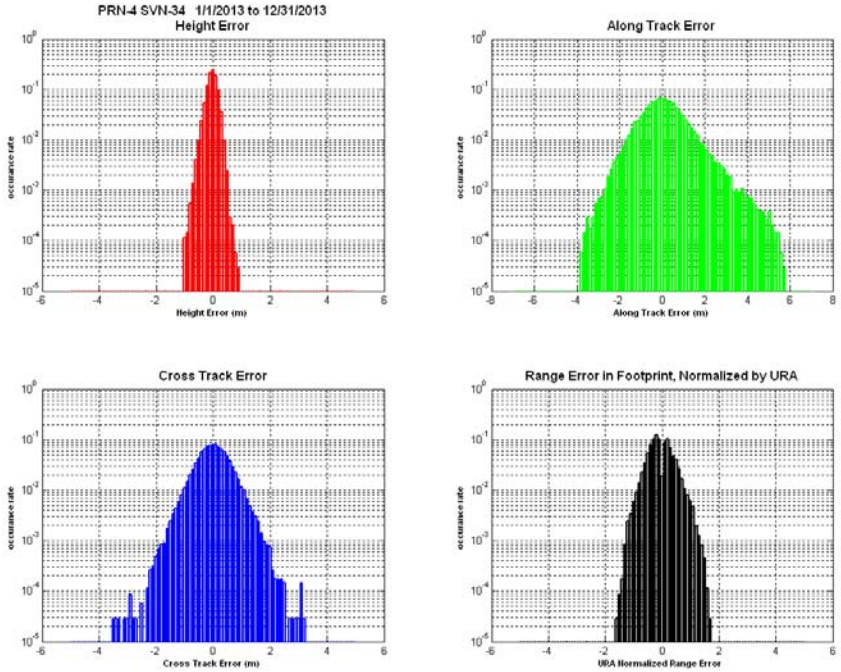


Figure 12-48 Histograms of H, A, C, and Range Error PRN-5

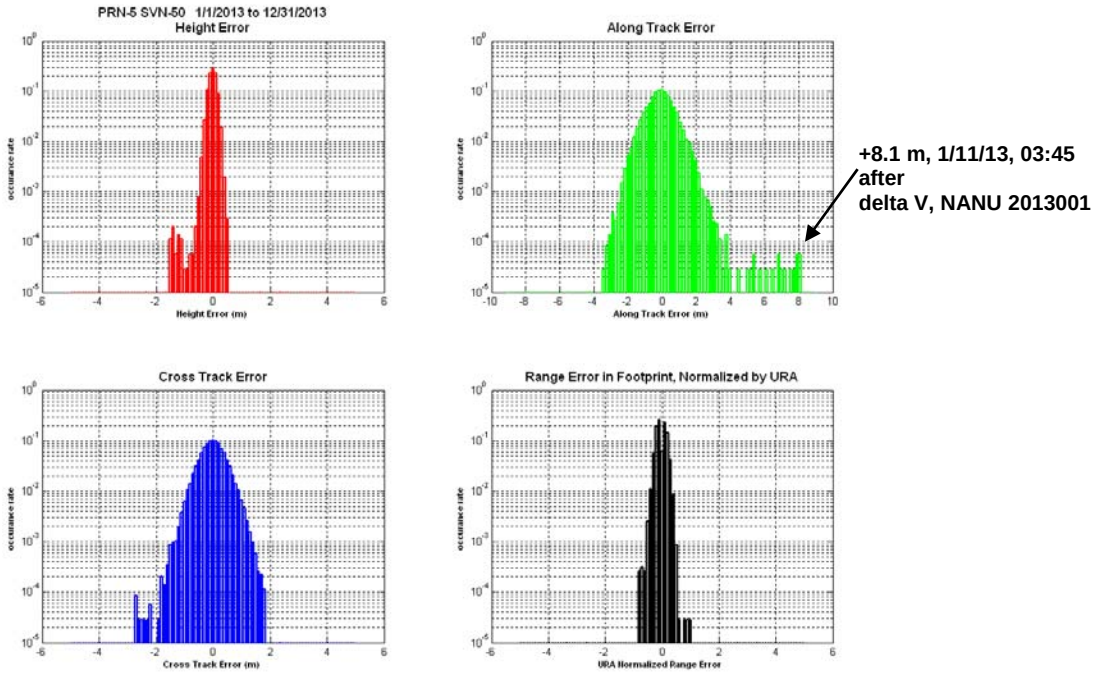


Figure 12-49 Histograms of H, A, C, and Range Error PRN-6

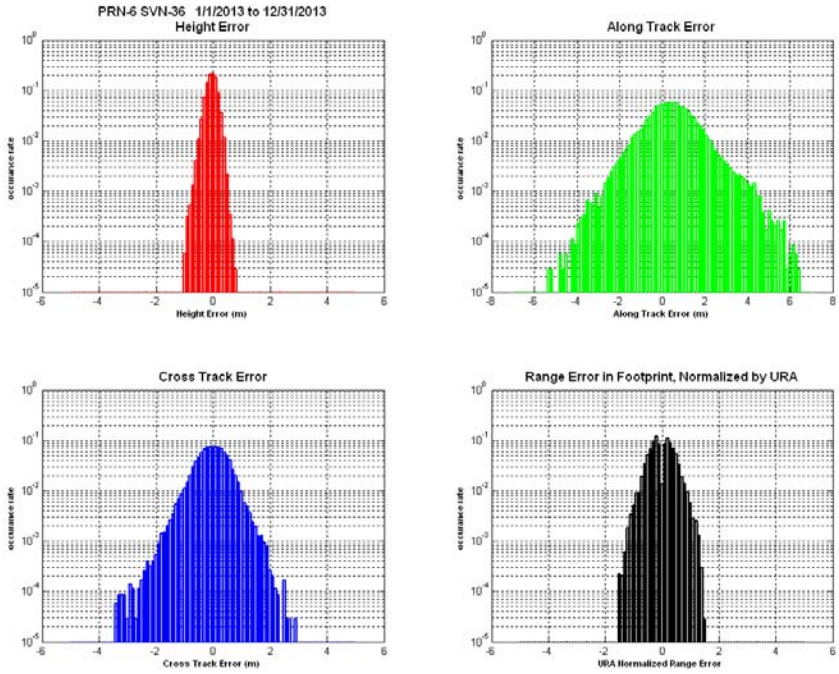


Figure 12-50 Histograms of H, A, C, and Range Error PRN-7

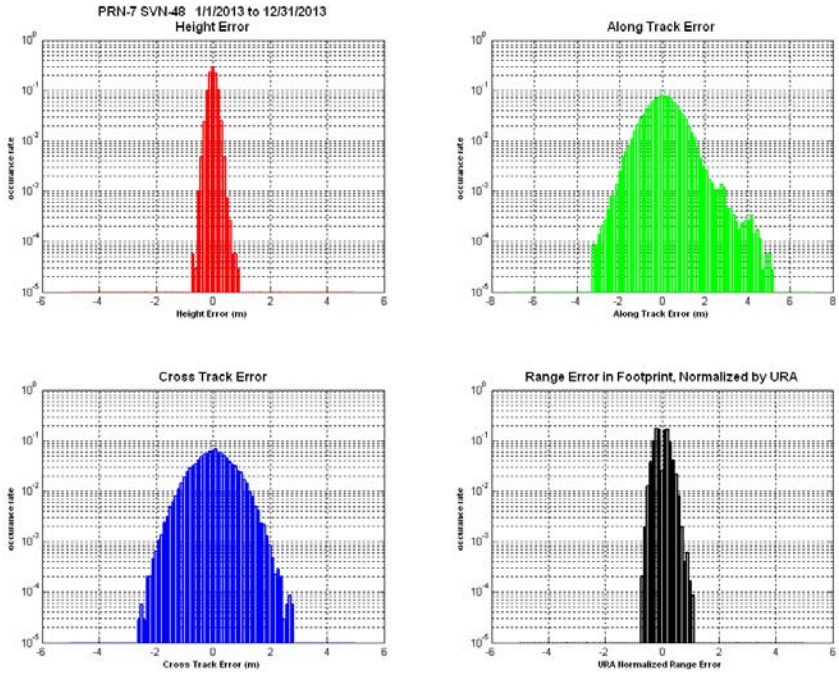


Figure 12-51 Histograms of H, A, C, and Range Error PRN-8

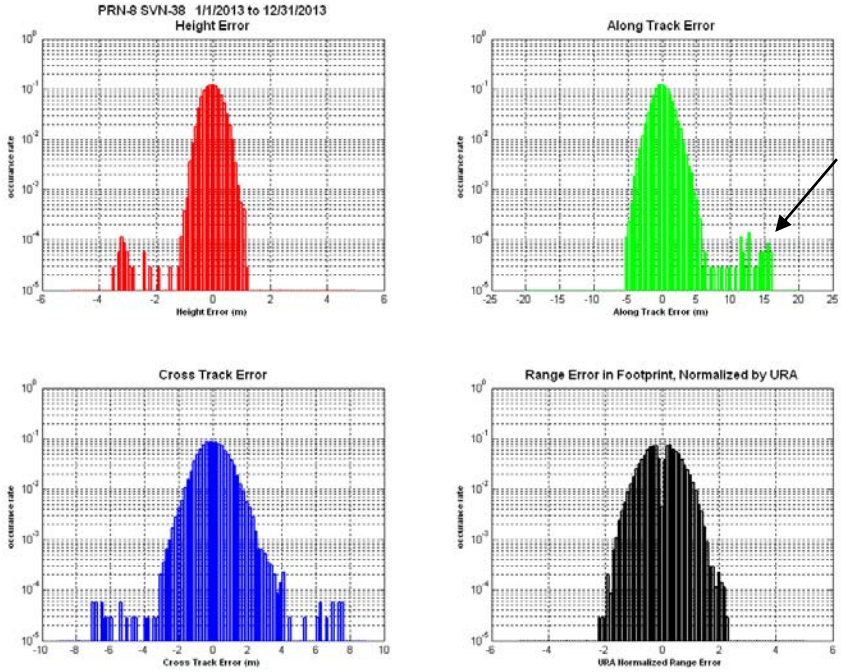


Figure 12-52 Histograms of H, A, C, and Range Error PRN-9

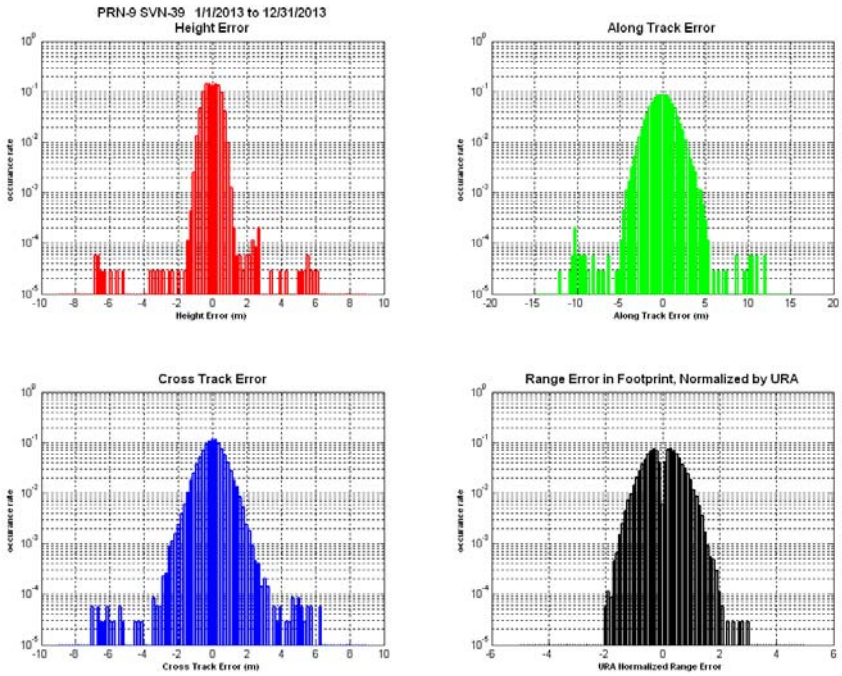
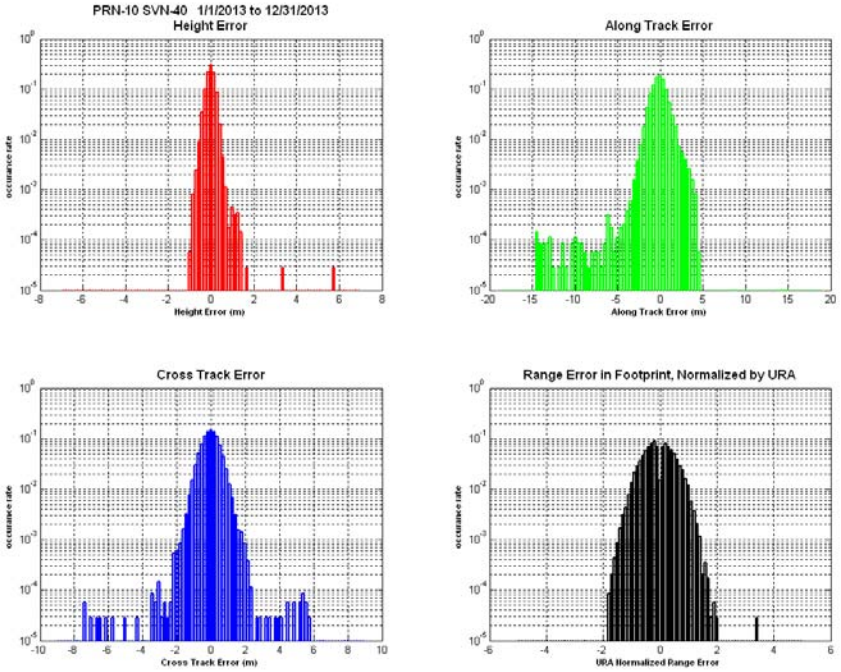


Figure 12-53 Histograms of H, A, C, and Range Error PRN-10



HAC histogram tails are the 2/14/13 and 10/21/13 events, see figure-13

Figure 12-54 Histograms of H, A, C, and Range Error PRN-11

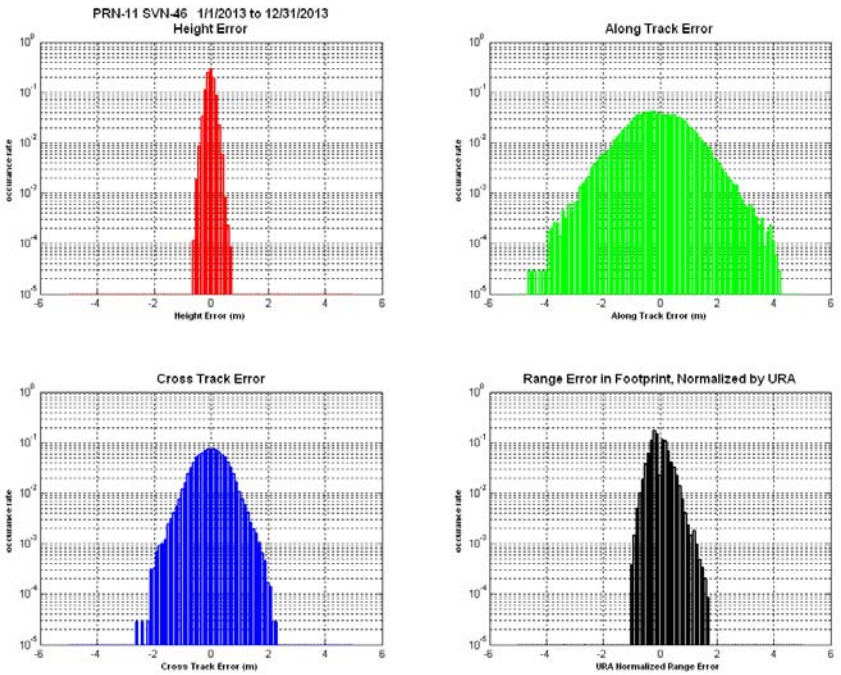


Figure 12-55 Histograms of H, A, C, and Range Error PRN-12

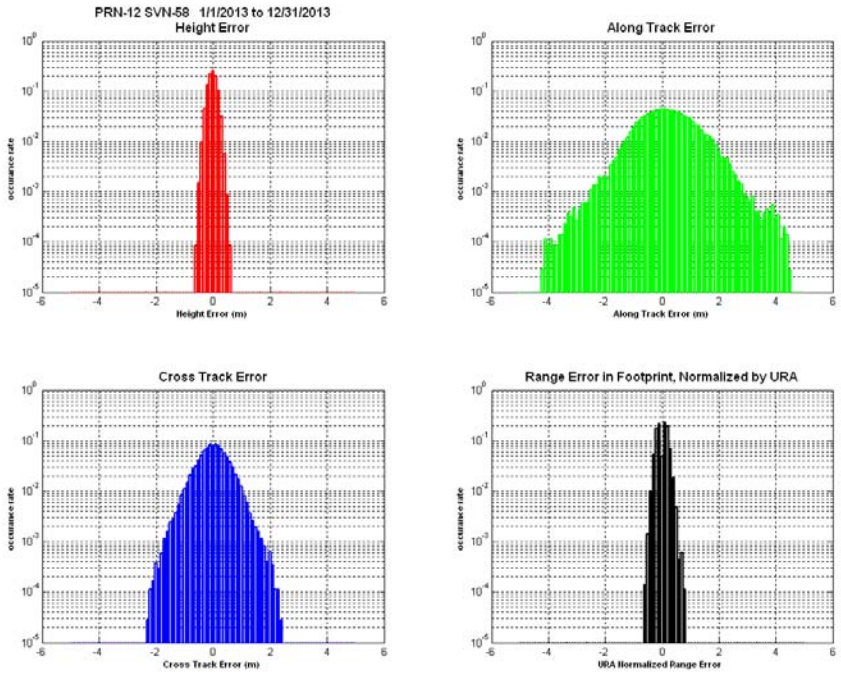


Figure 12-56 Histograms of H, A, C, and Range Error PRN-13

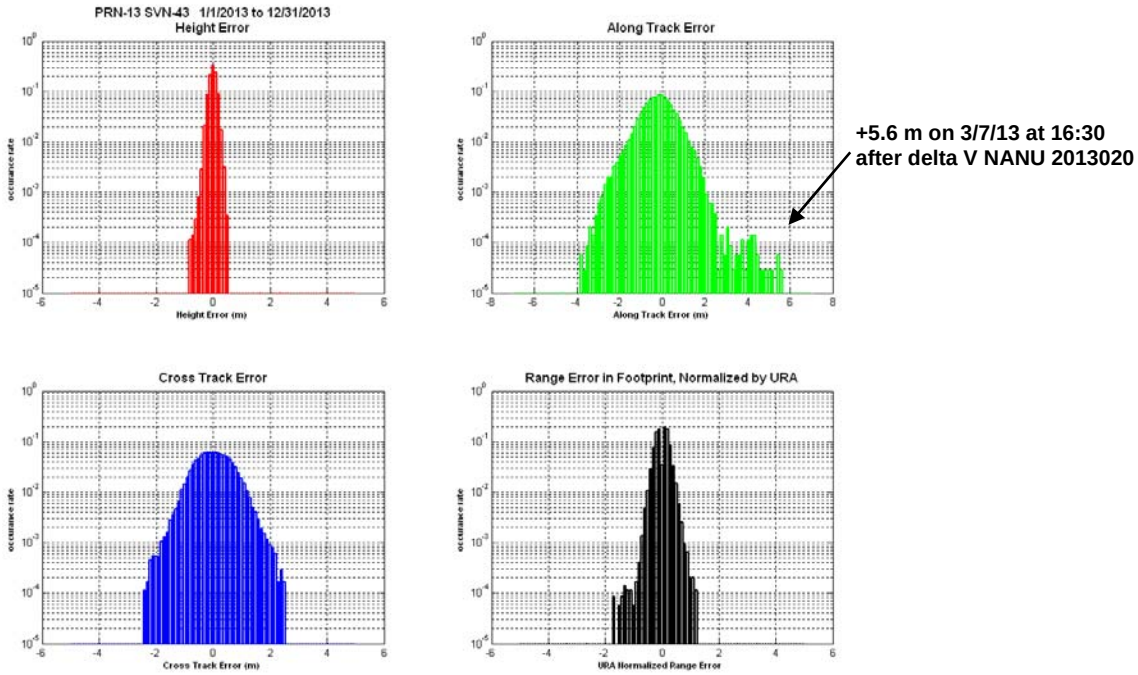


Figure 12-57 Histograms of H, A, C, and Range Error PRN-14

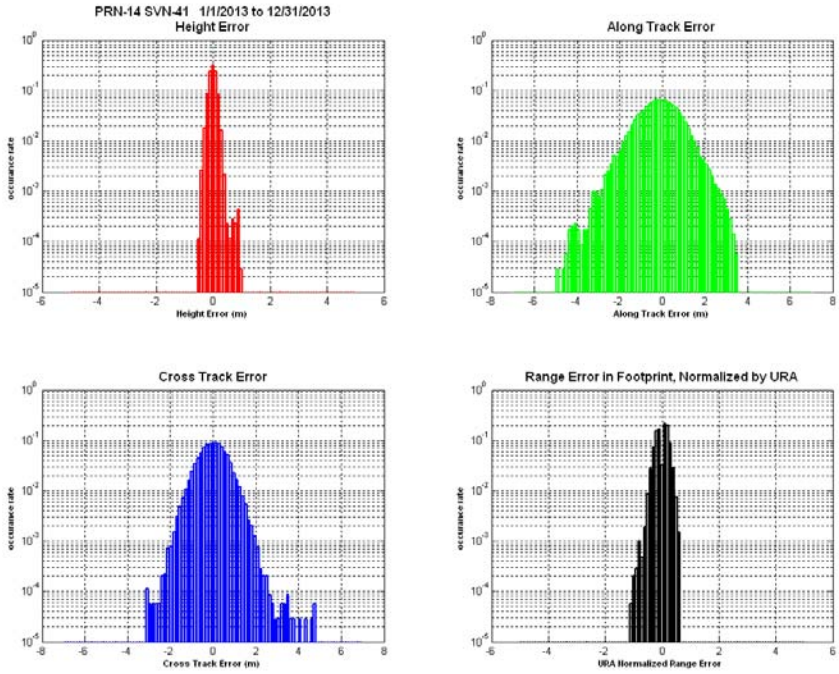


Figure 12-58 Histograms of H, A, C, and Range Error PRN-15

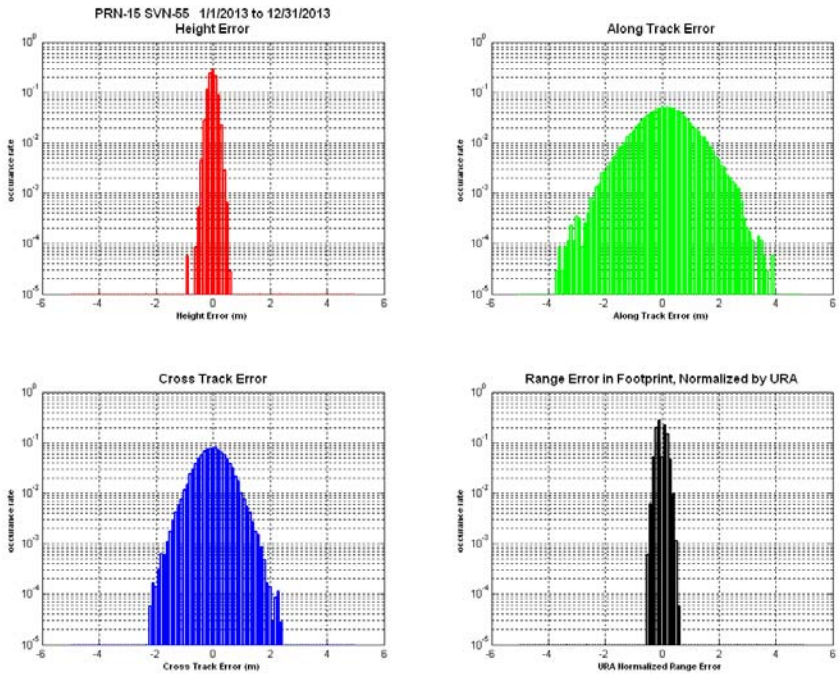


Figure 12-59 Histograms of H, A, C, and Range Error PRN-16

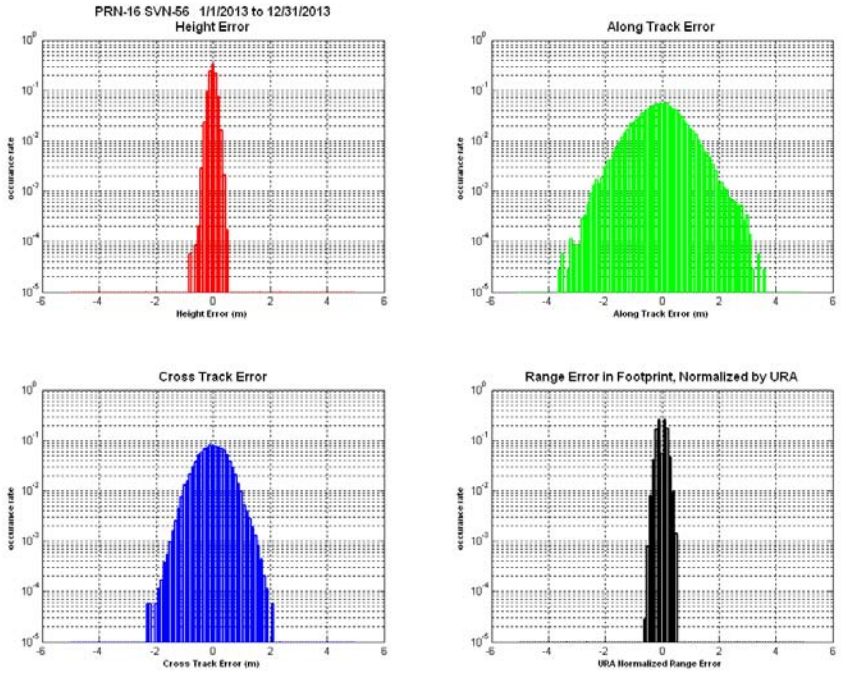


Figure 12-60 Histograms of H, A, C, and Range Error PRN-17

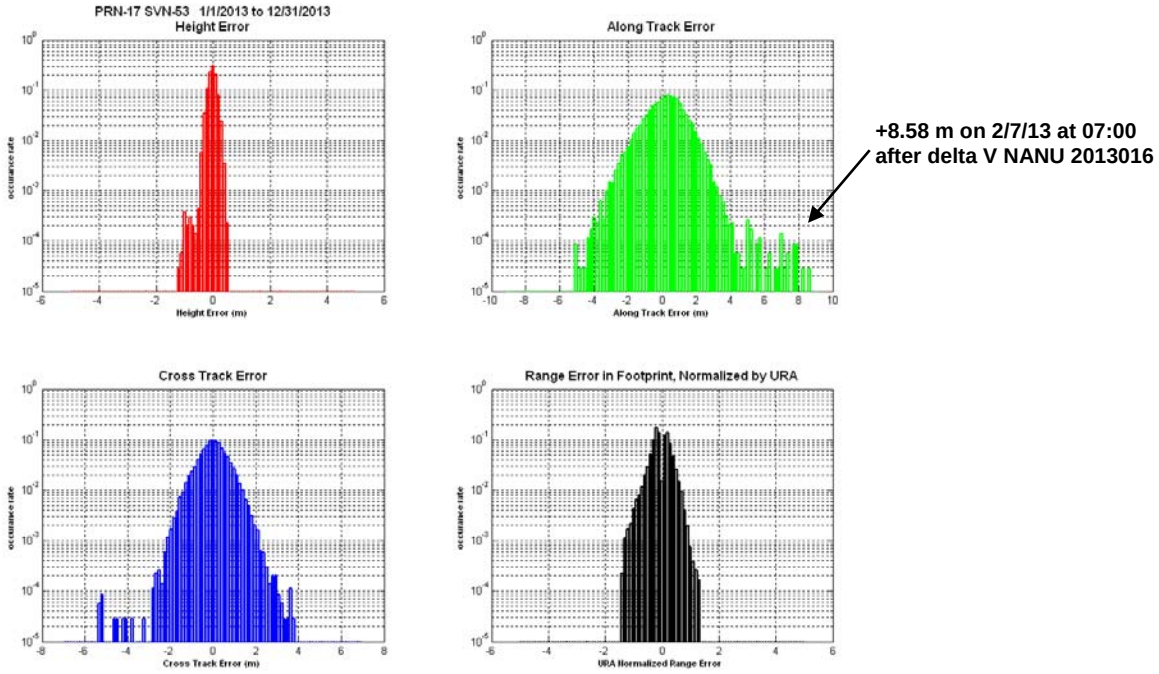
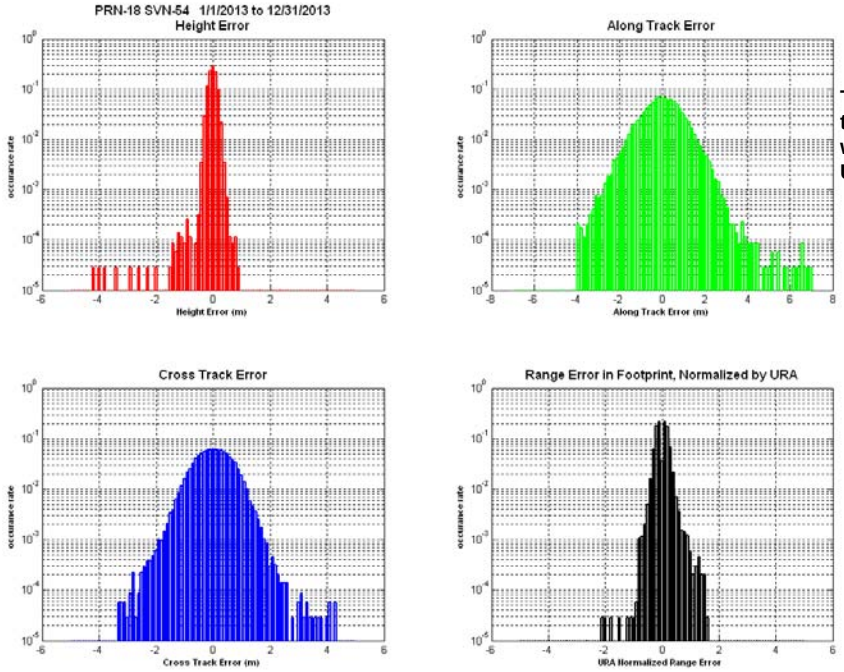


Figure 12-61 Histograms of H, A, C, and Range Error PRN-18



Tails on HAC histograms are the 11/23 event near 14:00 and were accompanied by large URAs

Figure 12-62 Histograms of H, A, C, and Range Error PRN-19

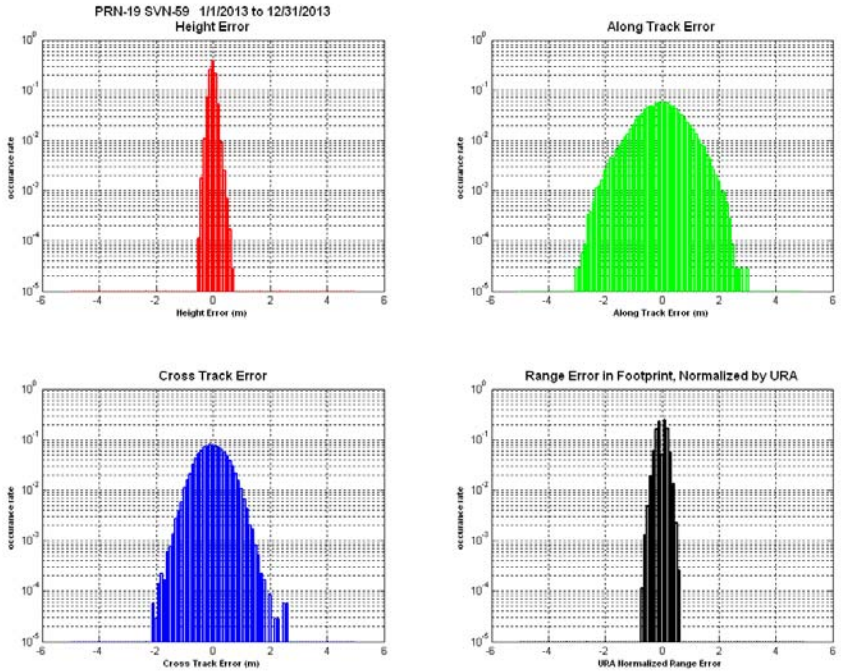


Figure 12-63 Histograms of H, A, C, and Range Error PRN-20

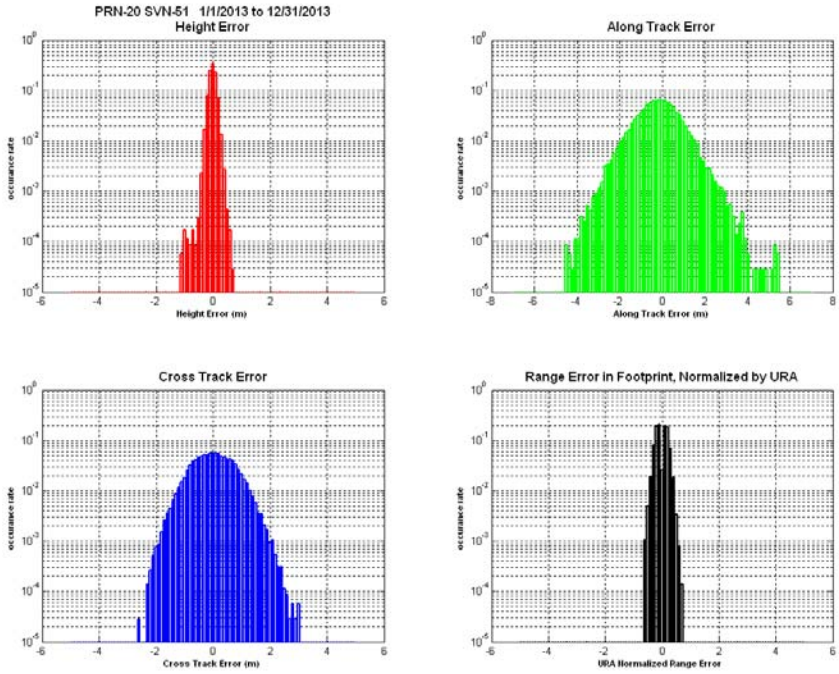


Figure 12-64 Histograms of H, A, C, and Range Error PRN-21

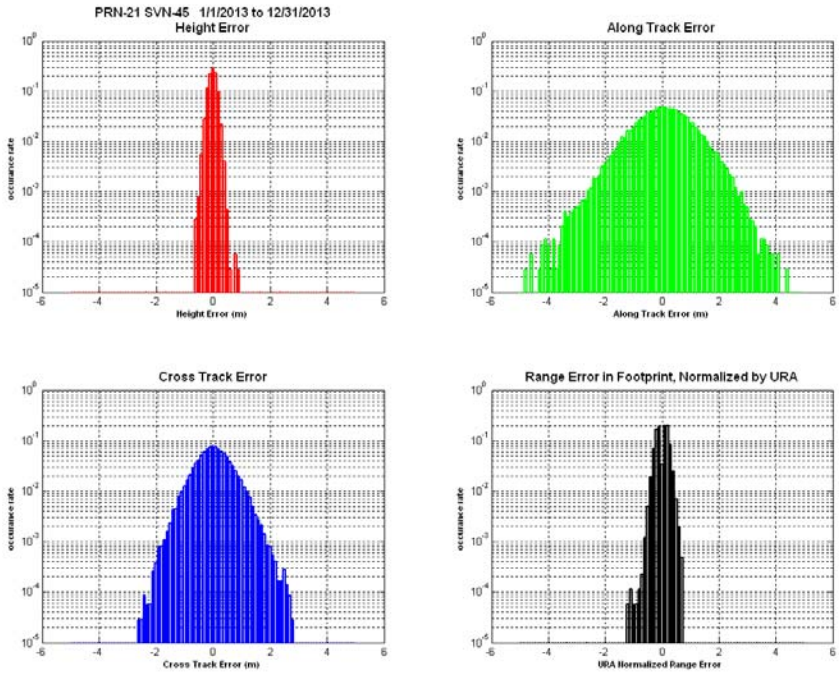


Figure 12-65 Histograms of H, A, C, and Range Error PRN-22

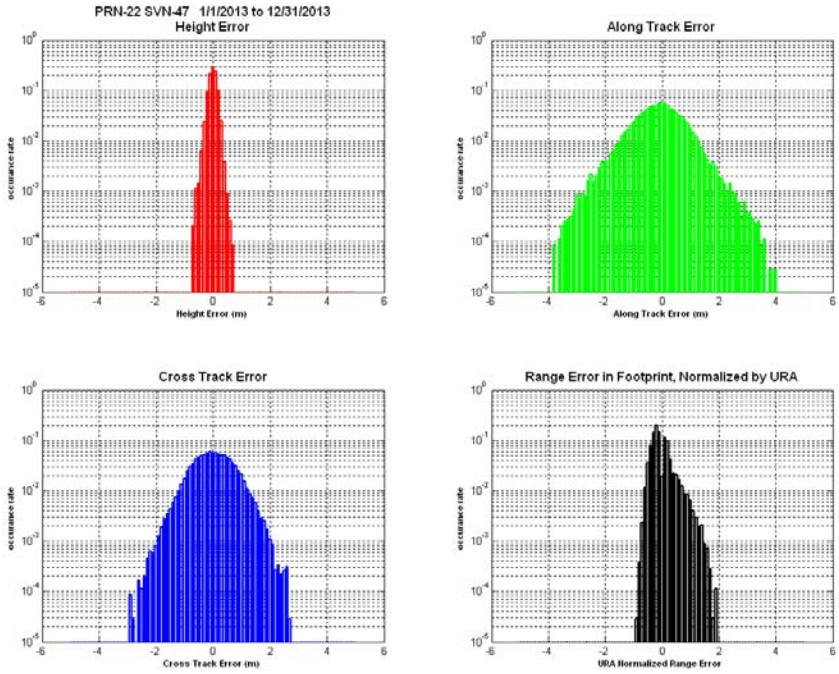


Figure 12-66 Histograms of H, A, C, and Range Error PRN-23

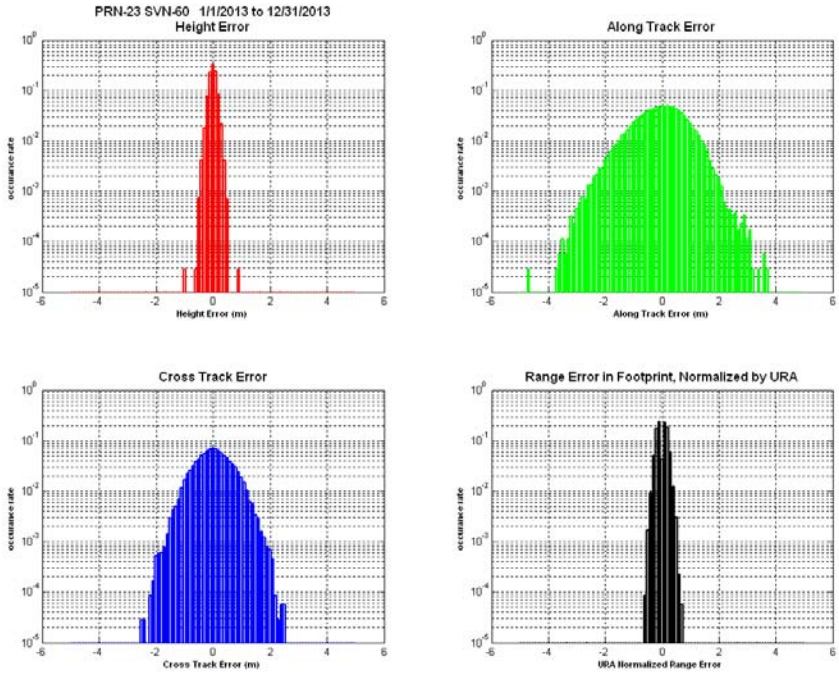


Figure 12-67 Histograms of H, A, C, and Range Error PRN-24

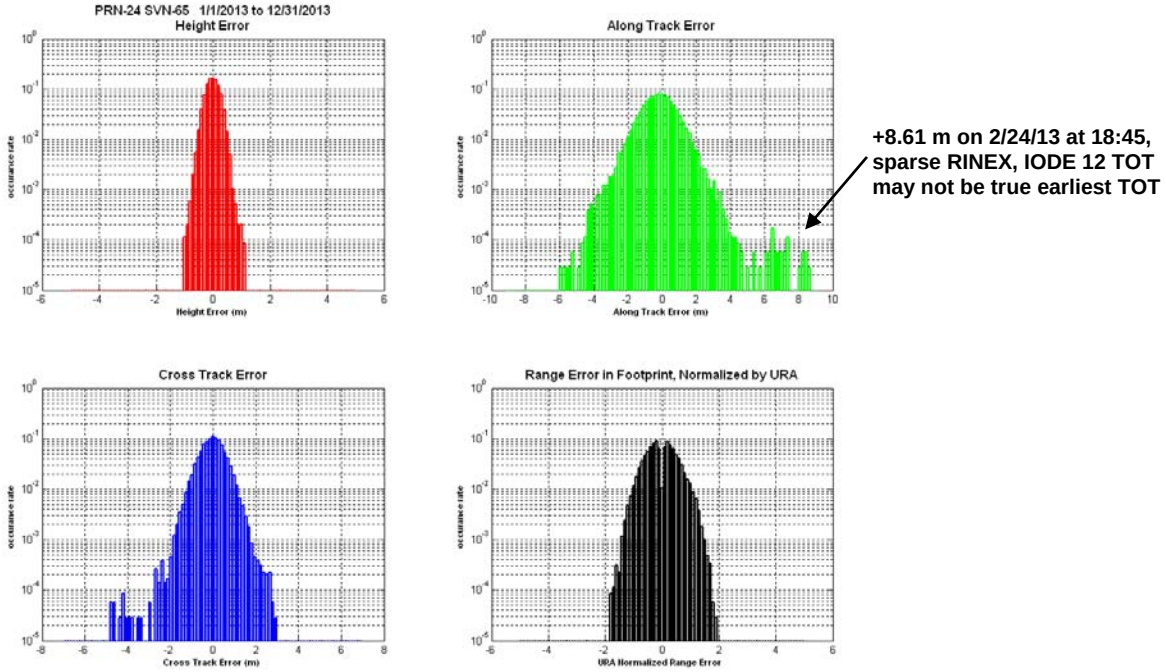


Figure 12-68 Histograms of H, A, C, and Range Error PRN-25

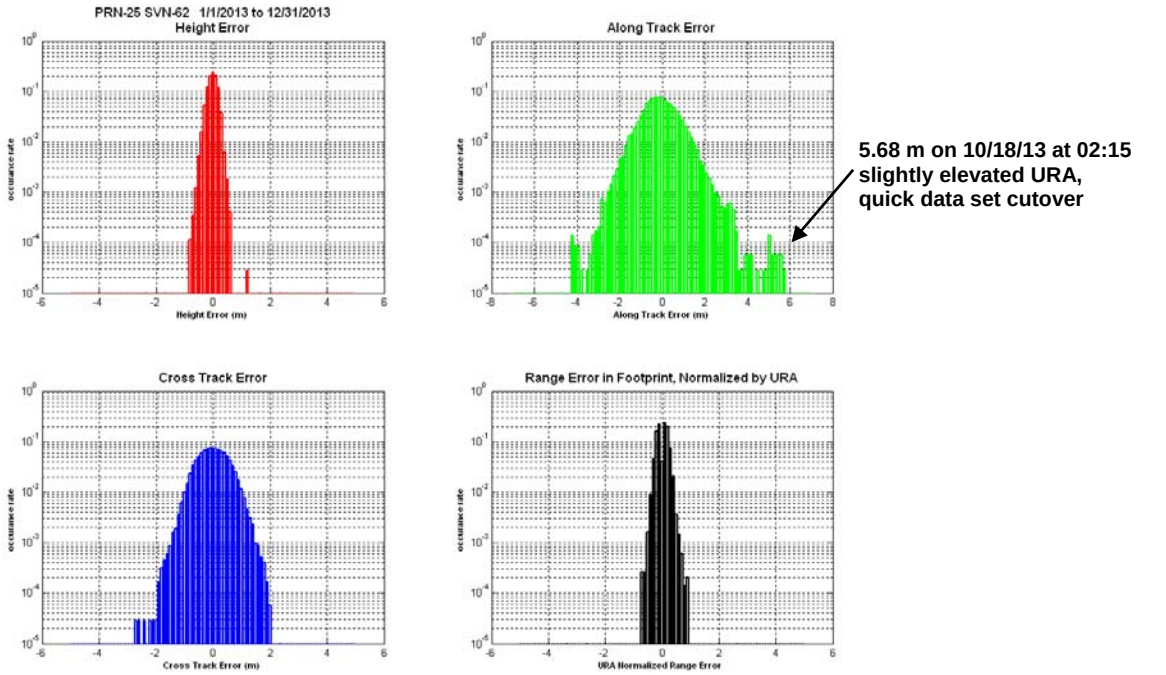


Figure 12-69 Histograms of H, A, C, and Range Error PRN-26

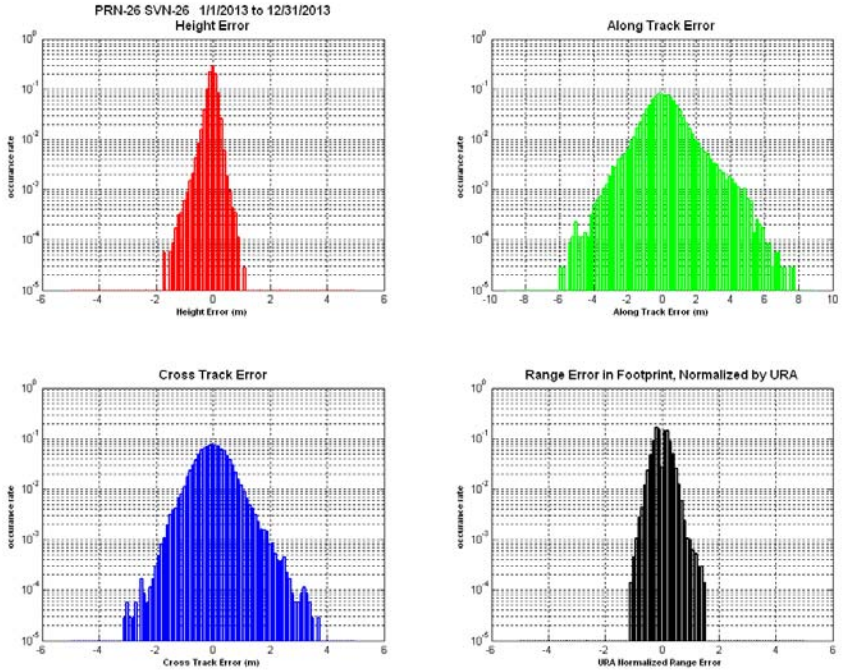


Figure 12-70 Histograms of H, A, C, and Range Error PRN-27

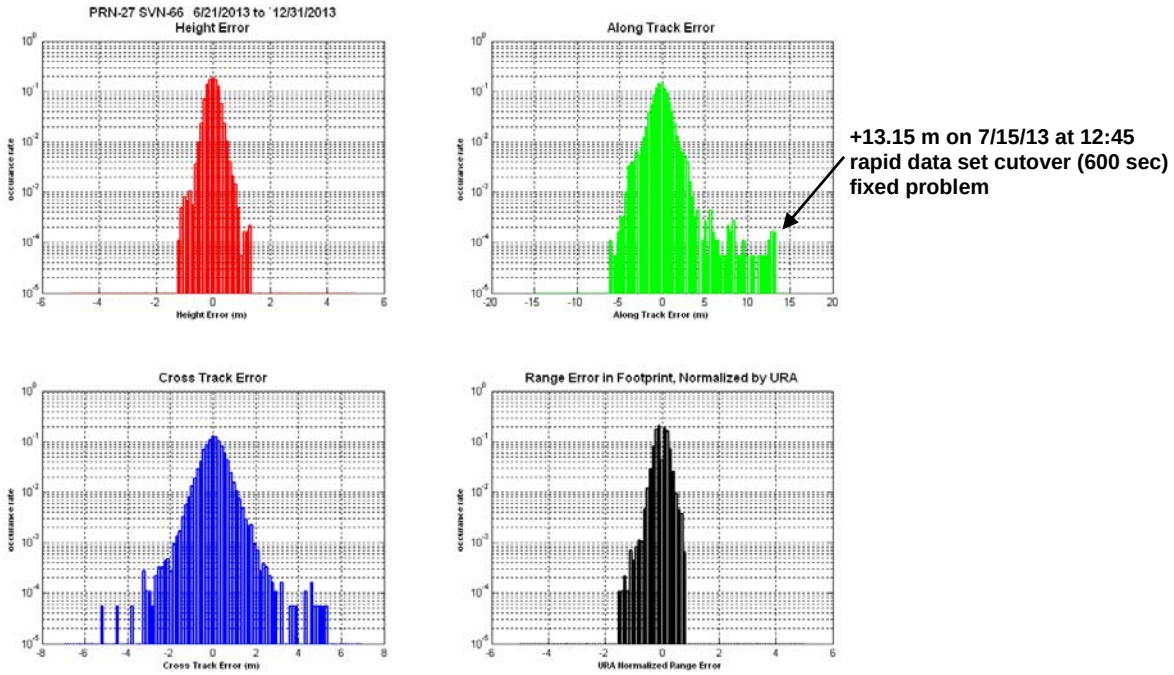


Figure 12-71 Histograms of H, A, C, and Range Error PRN-28

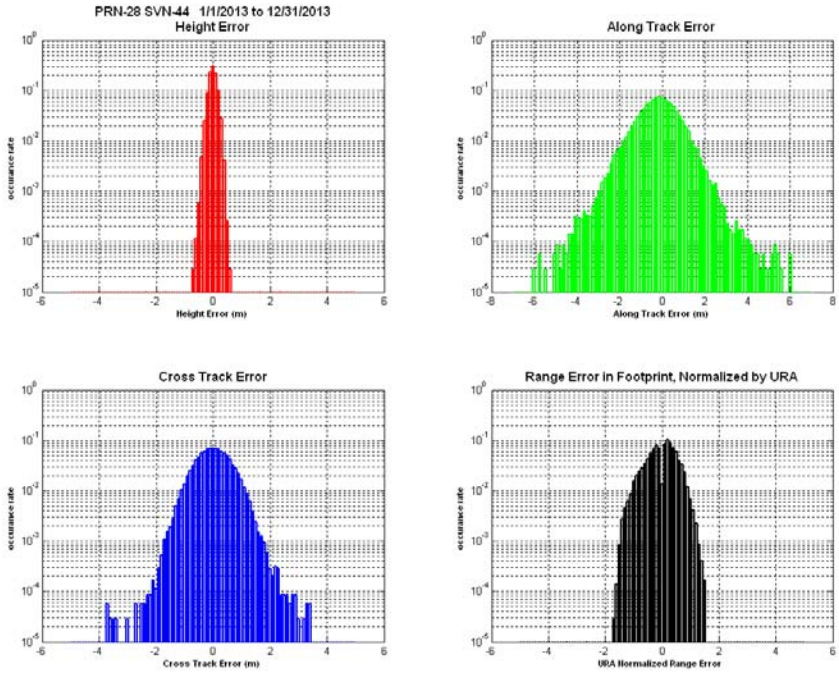


Figure 12-72 Histograms of H, A, C, and Range Error PRN-29

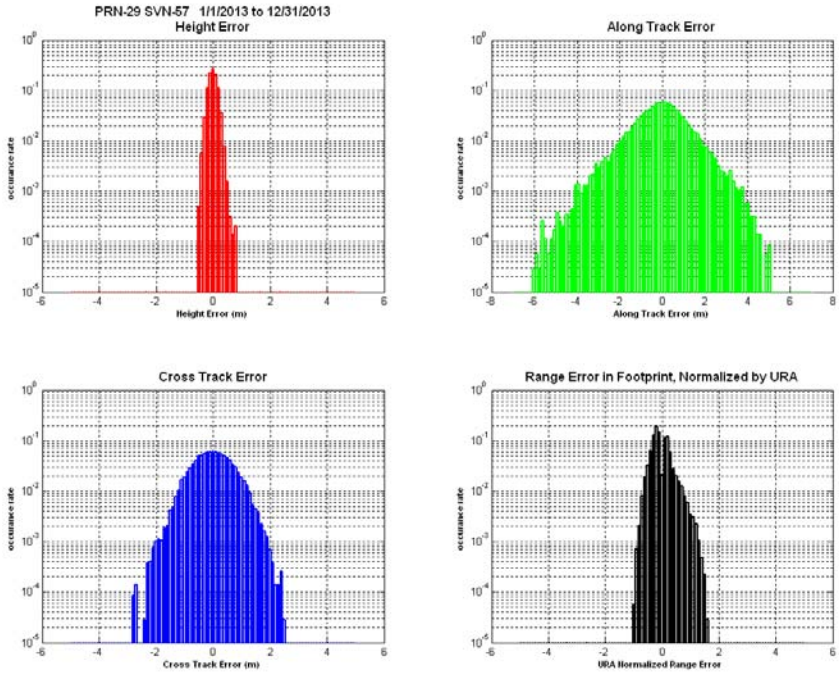


Figure 12-73 Histograms of H, A, C, and Range Error PRN-30

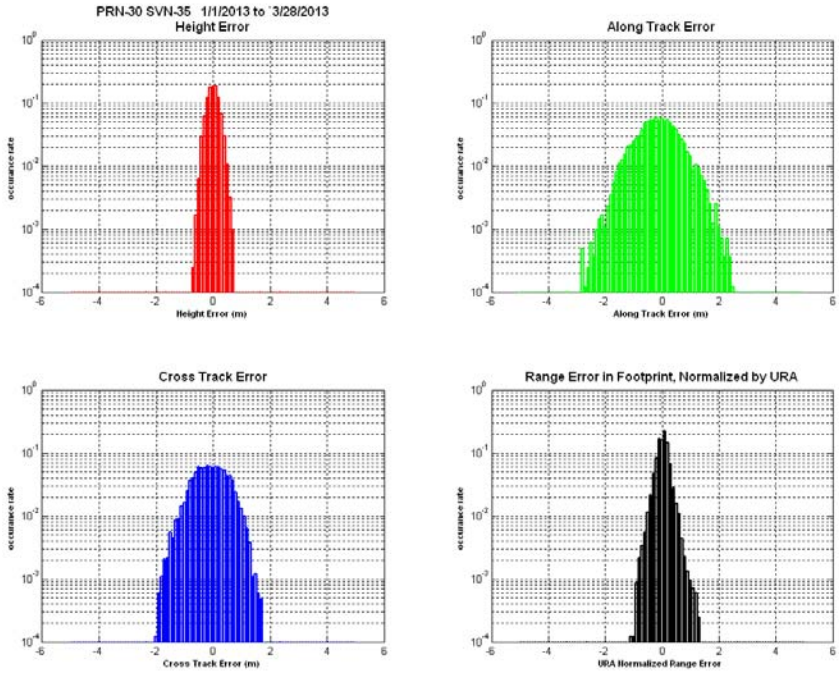


Figure 12-74 Histograms of H, A, C, and Range Error PRN-31

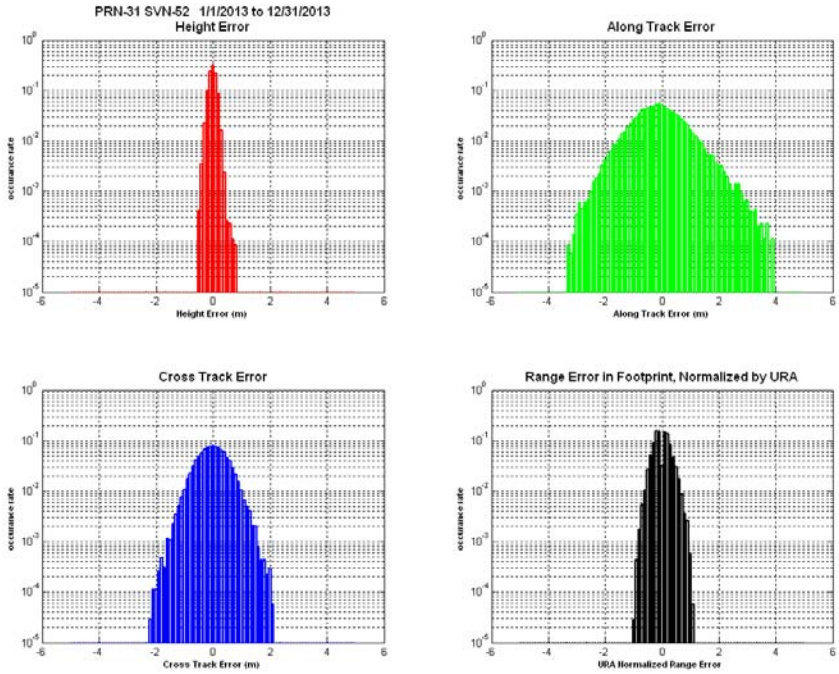


Figure 12-75 Histograms of H, A, C, and Range Error PRN-32

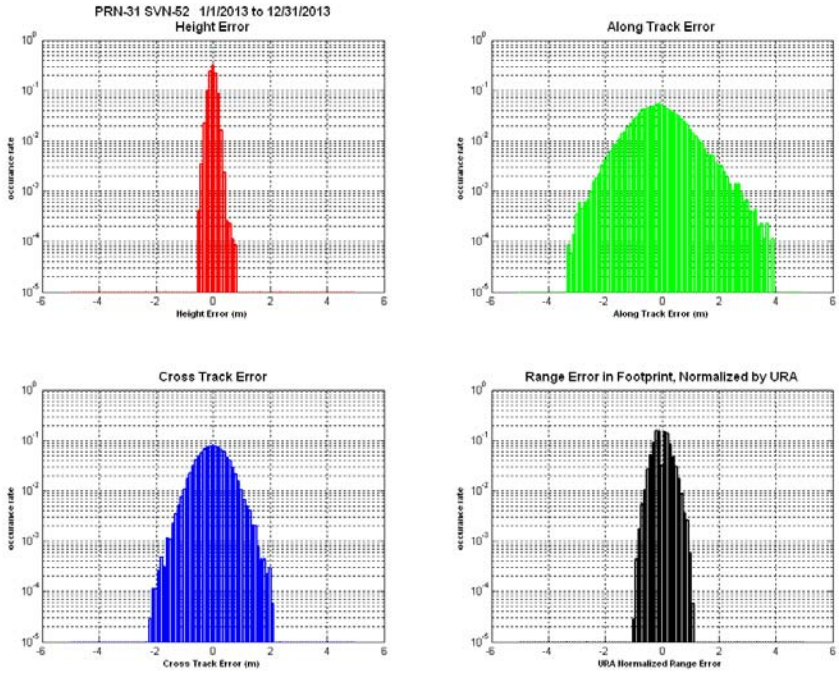


Figure 12-76 Timeline of URA Normalized Range Error PRN-1 SVN-63

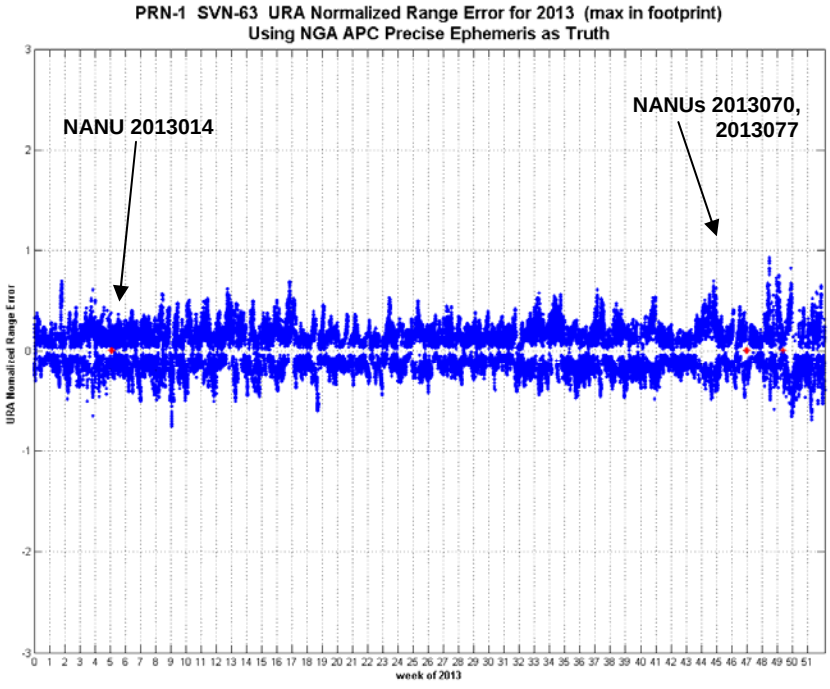


Figure 12-77 Timeline of URA Normalized Range Error PRN-2 SVN-61

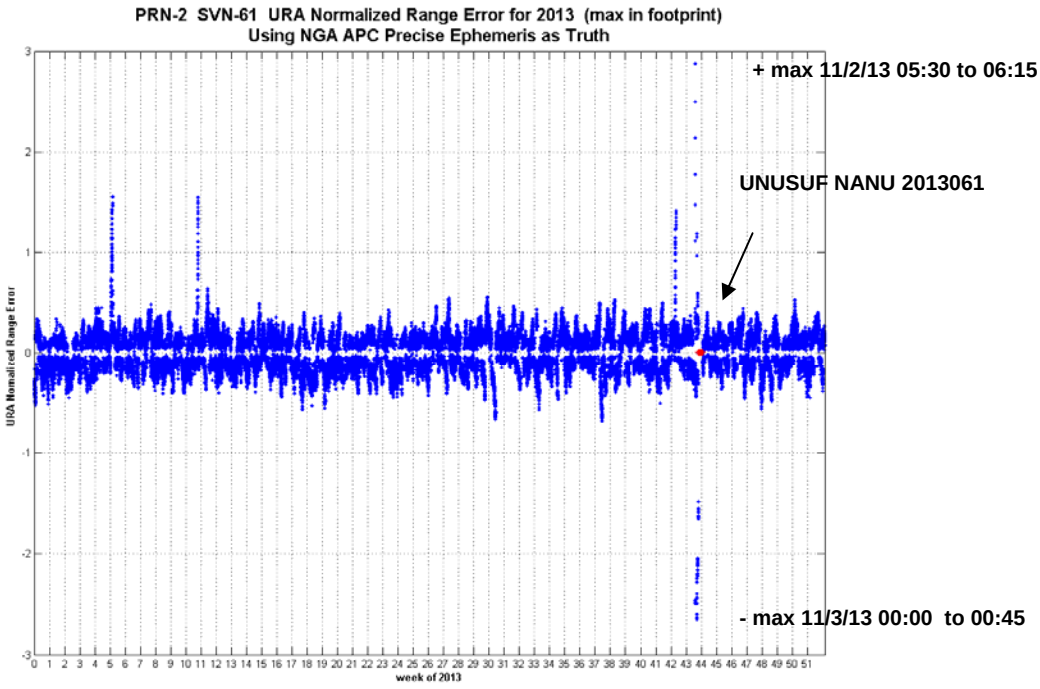


Figure 12-78 Timeline of URA Normalized Range Error PRN-3 SVN-33

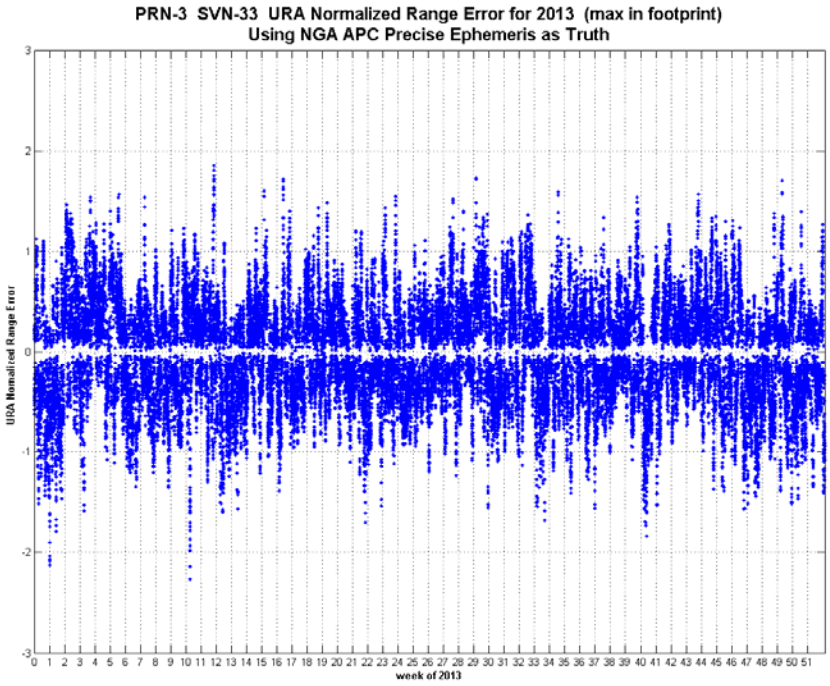


Figure 12-79 Timeline of URA Normalized Range Error PRN-4 SV-34

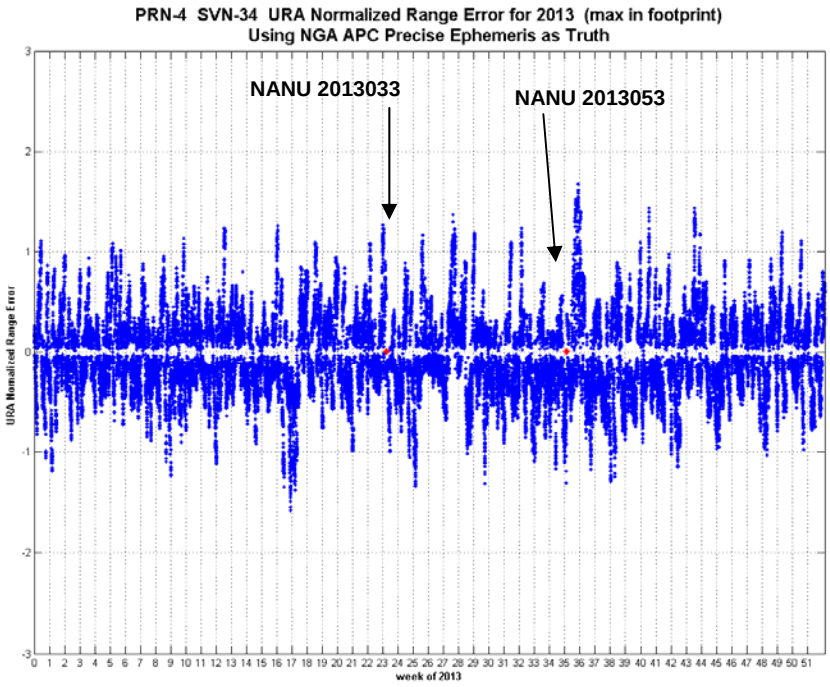


Figure 12-80 Timeline of URA Normalized Range Error PRN-5 SVN-50

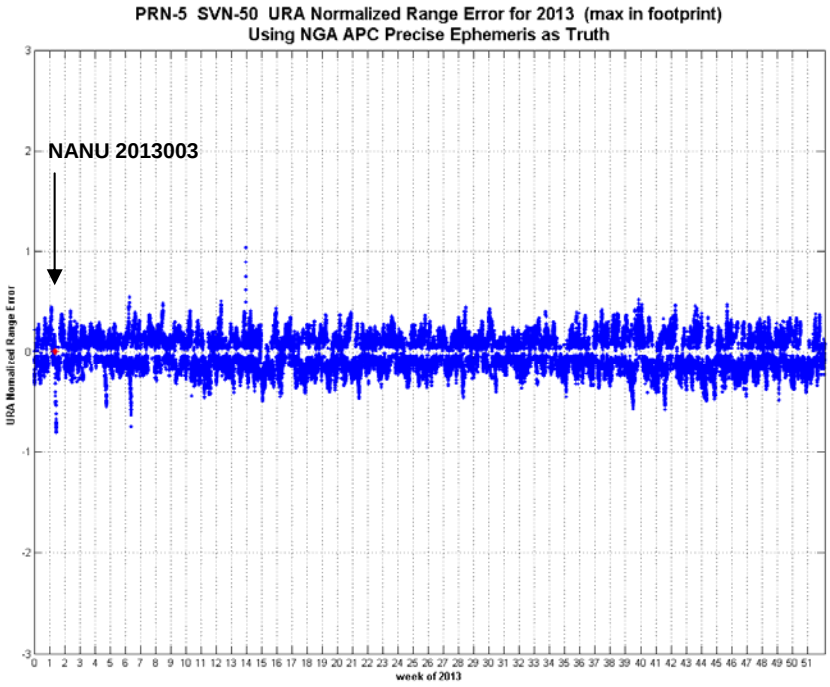


Figure 12-81 Timeline of URA Normalized Range Error PRN-6 SVN-36

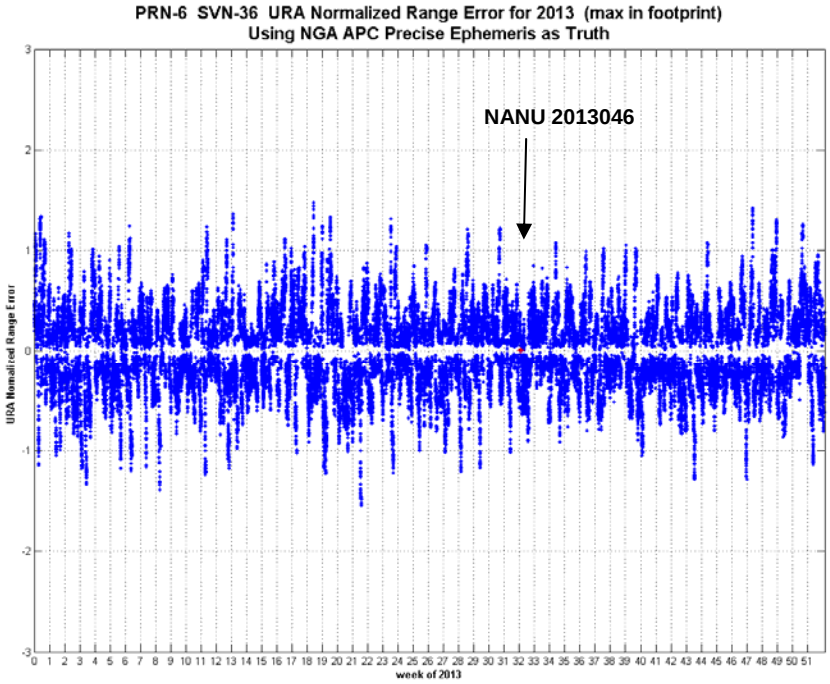


Figure 12-82 Timeline of URA Normalized Range Error PRN-7 SVN-48

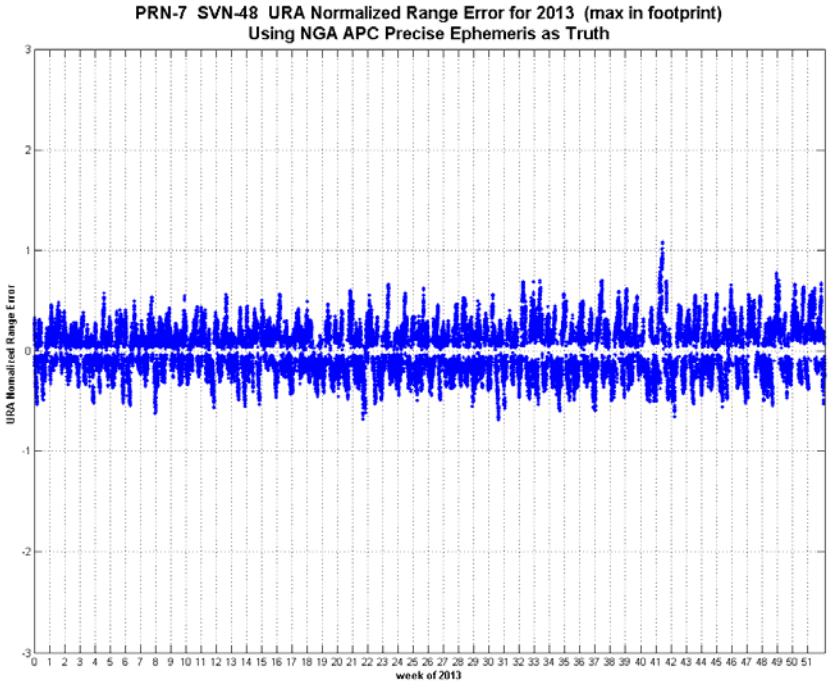


Figure 12-83 Timeline of URA Normalized Range Error PRN-8 SVN-38

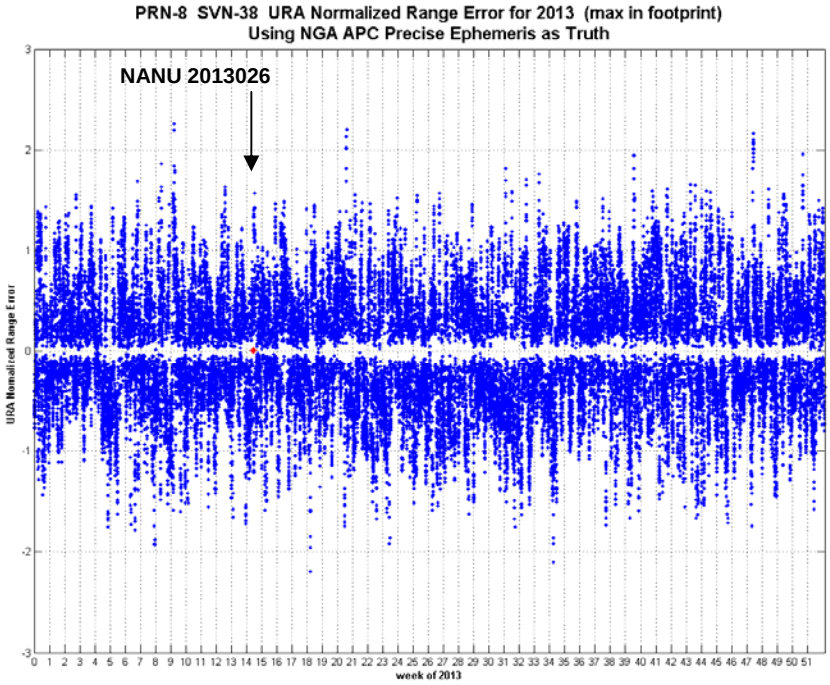


Figure 12-84 Timeline of URA Normalized Range Error PRN-9 SVN-39

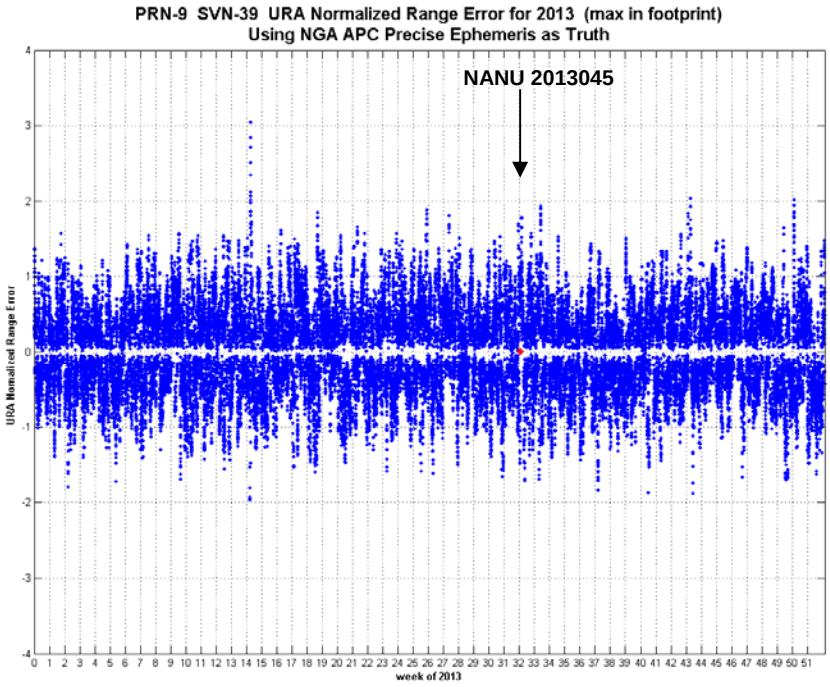


Figure 12-85 Timeline of URA Normalized Range Error PRN-10 SVN-40

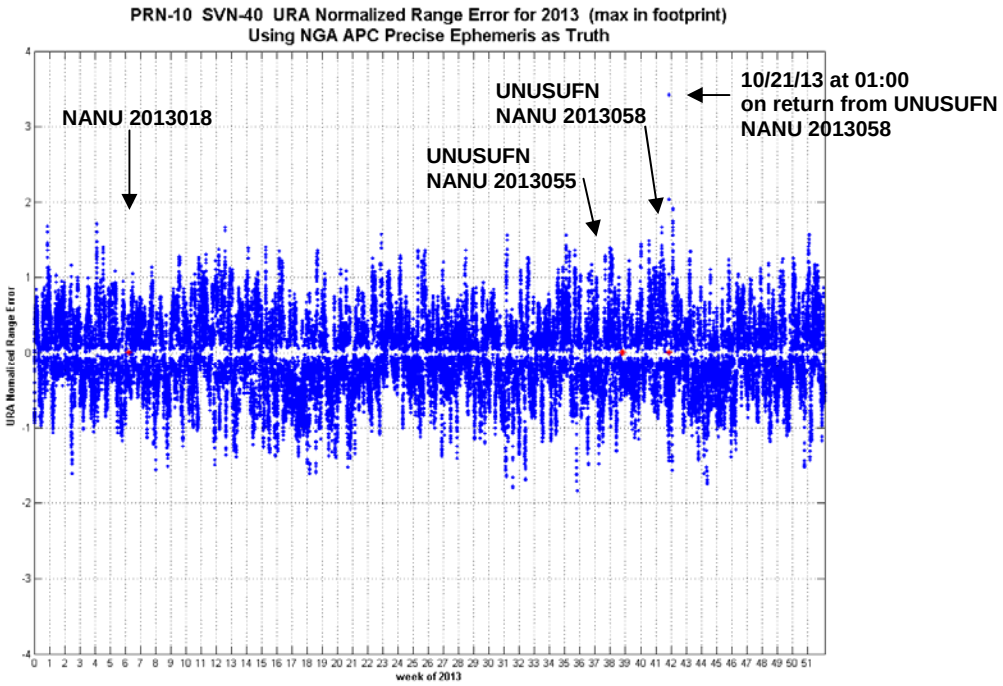


Figure 12-86 Timeline of URA Normalized Range Error PRN-11 SVN-46

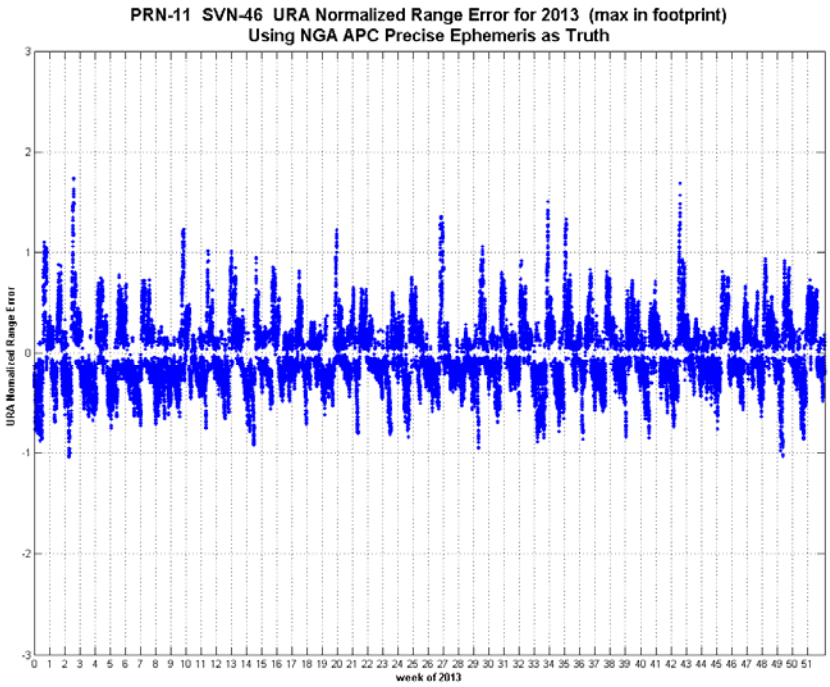


Figure 12-87 Timeline of URA Normalized Range Error PRN-12 SVN-58

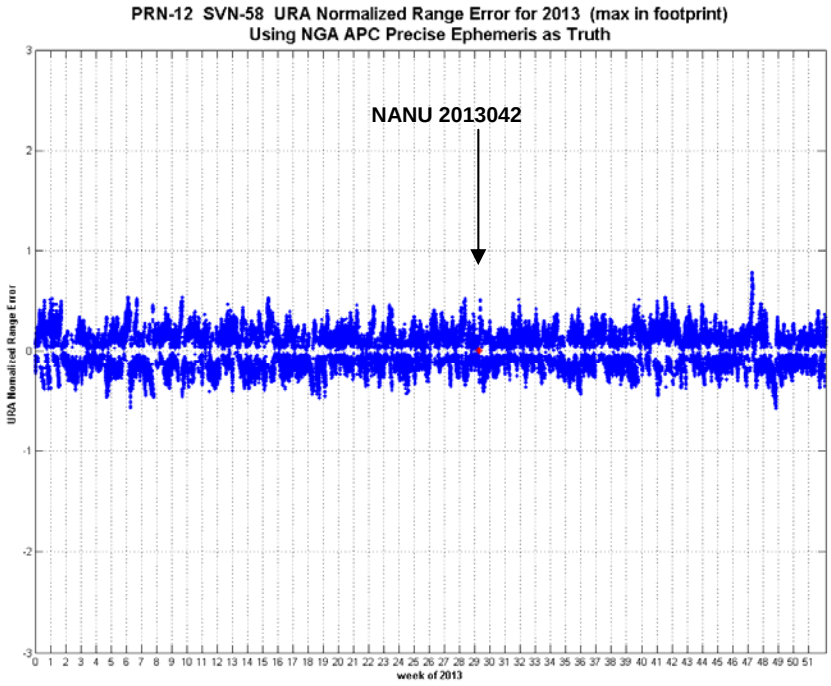


Figure 12-88 Timeline of URA Normalized Range Error PRN-13 SVN-43

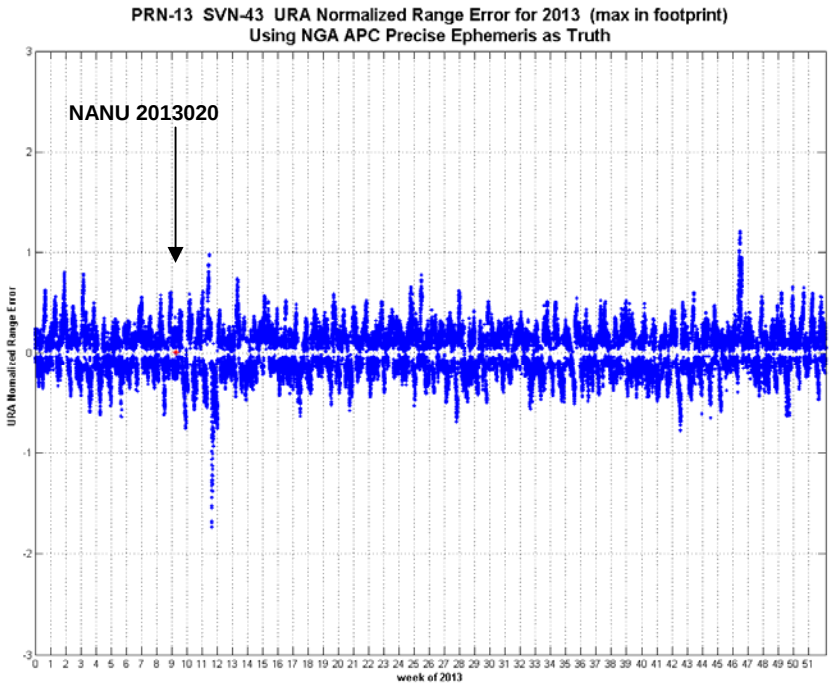


Figure 12-89 Timeline of URA Normalized Range Error PRN-14 SVN-41

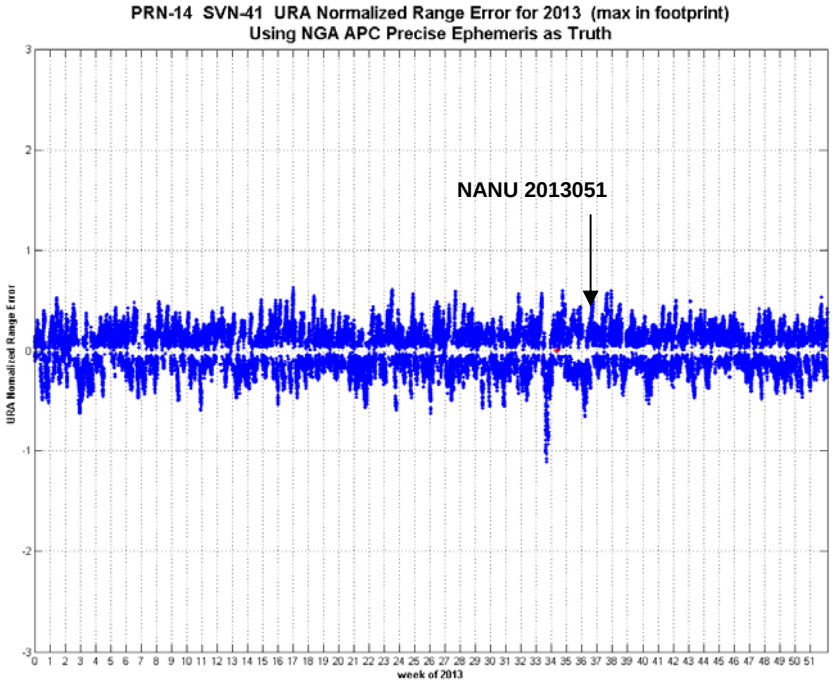


Figure 12-90 Timeline of URA Normalized Range Error PRN-15 SVN-55

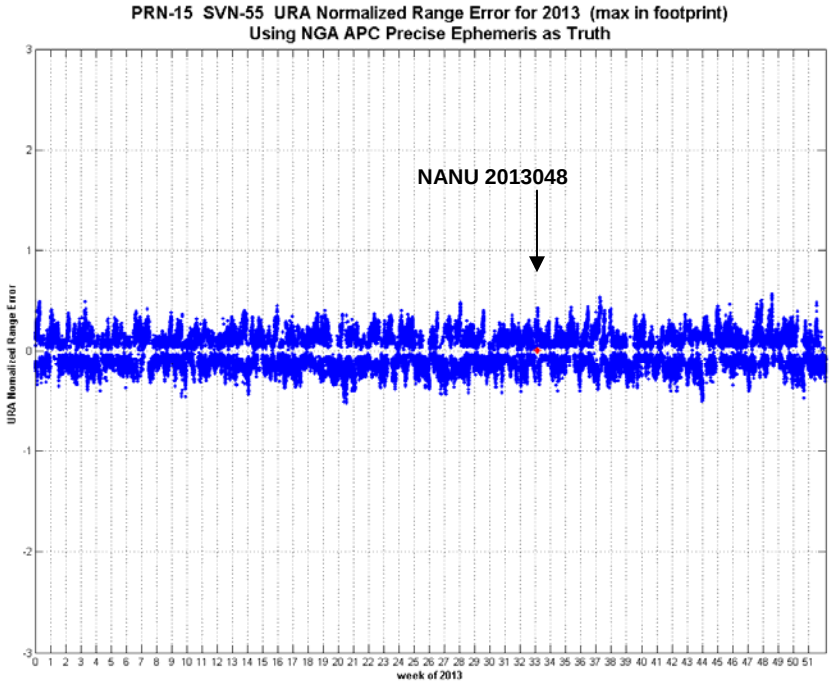


Figure 12-91 Timeline of URA Normalized Range Error PRN-16 SVN-56

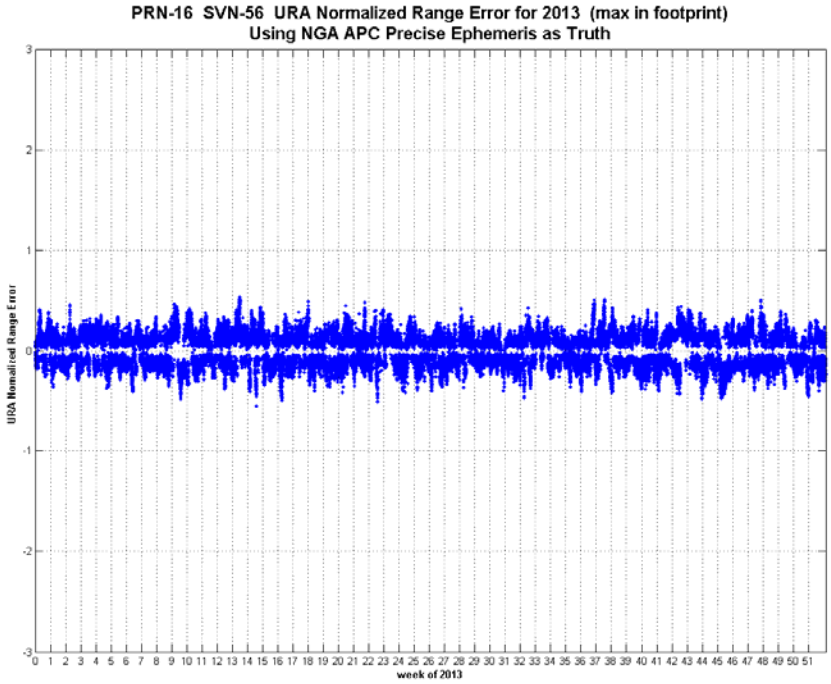


Figure 12-92 Timeline of URA Normalized Range Error PRN-17 SVN-53

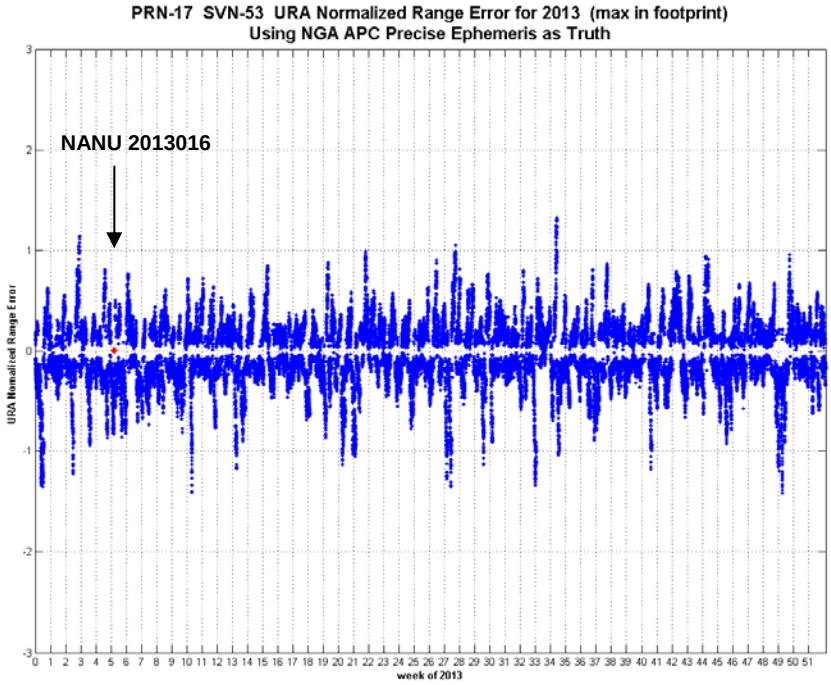


Figure 12-93 Timeline of URA Normalized Range Error PRN-18 SVN-54

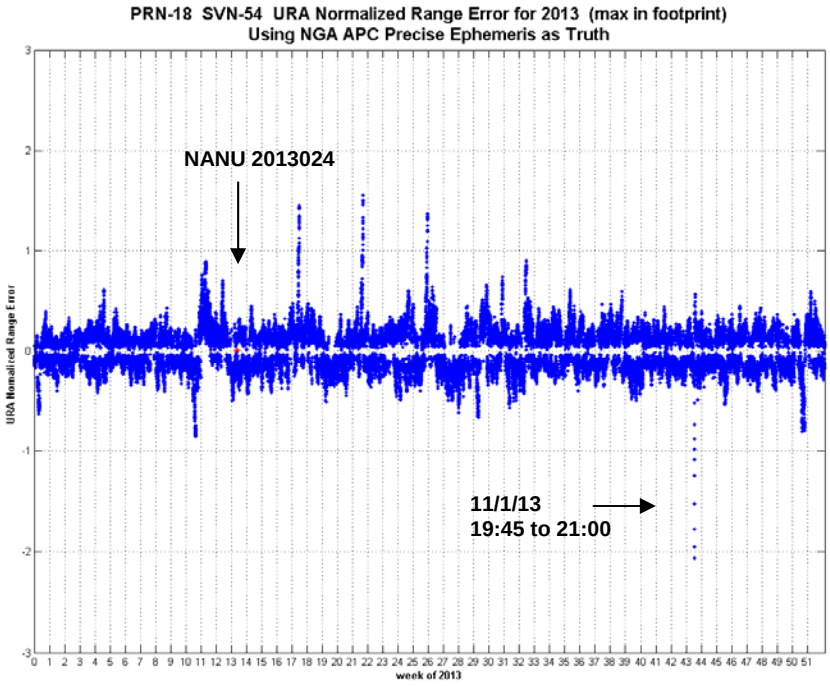


Figure 12-94 Timeline of URA Normalized Range Error PRN-19 SVN-59

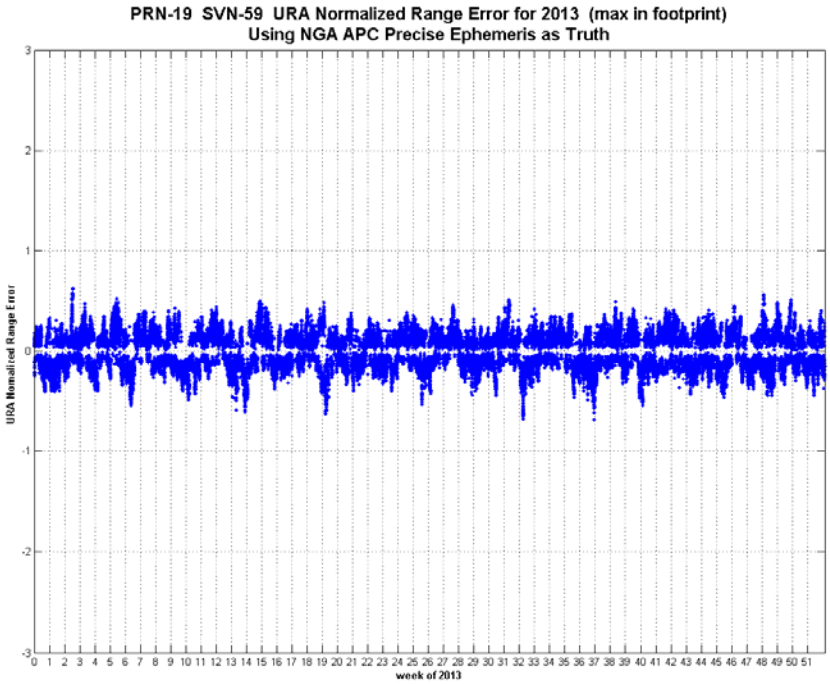


Figure 12-95 Timeline of URA Normalized Range Error PRN-20 SVN-51

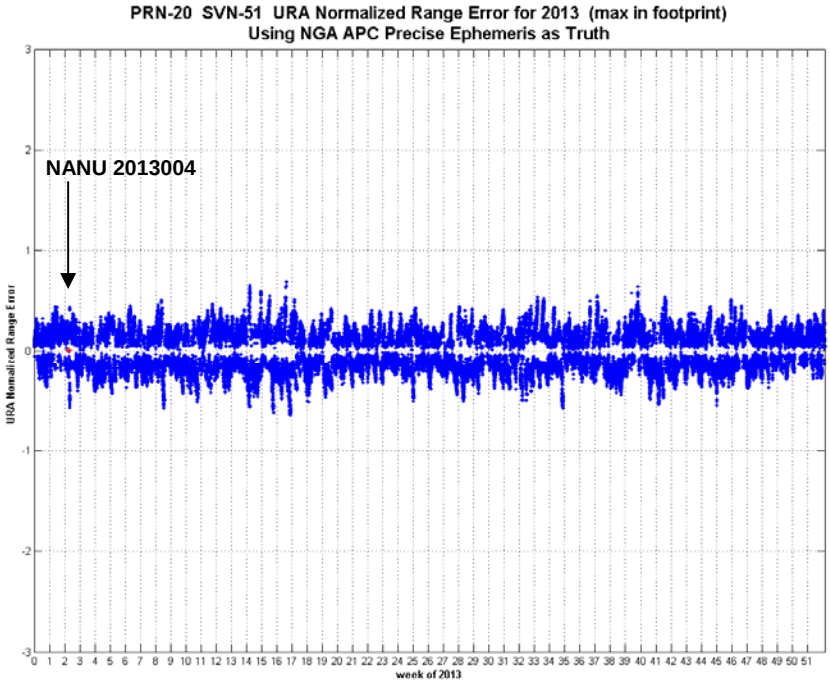


Figure 12-96 Timeline of URA Normalized Range Error PRN-21 SVN-45

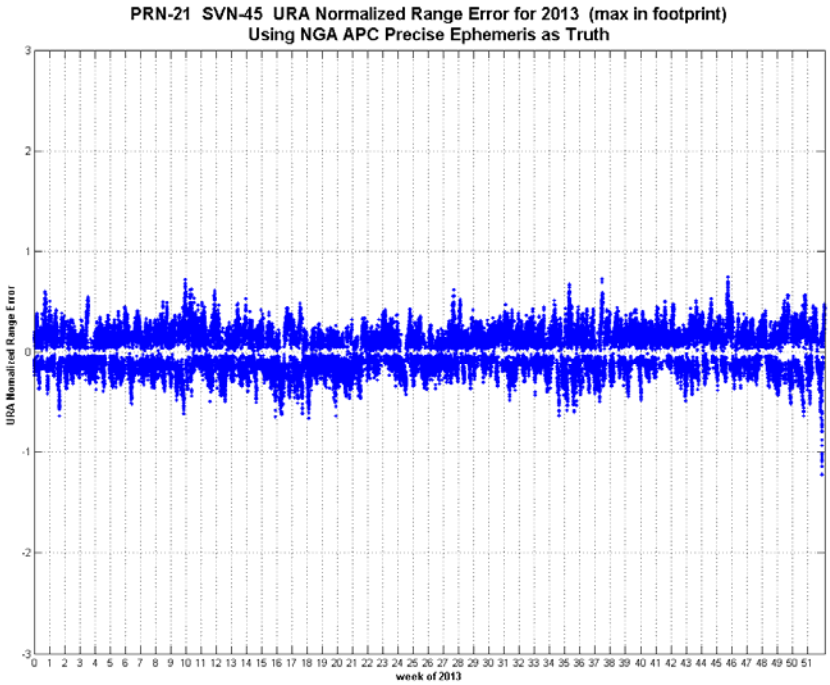


Figure 12-97 Timeline of URA Normalized Range Error PRN-22 SVN-47

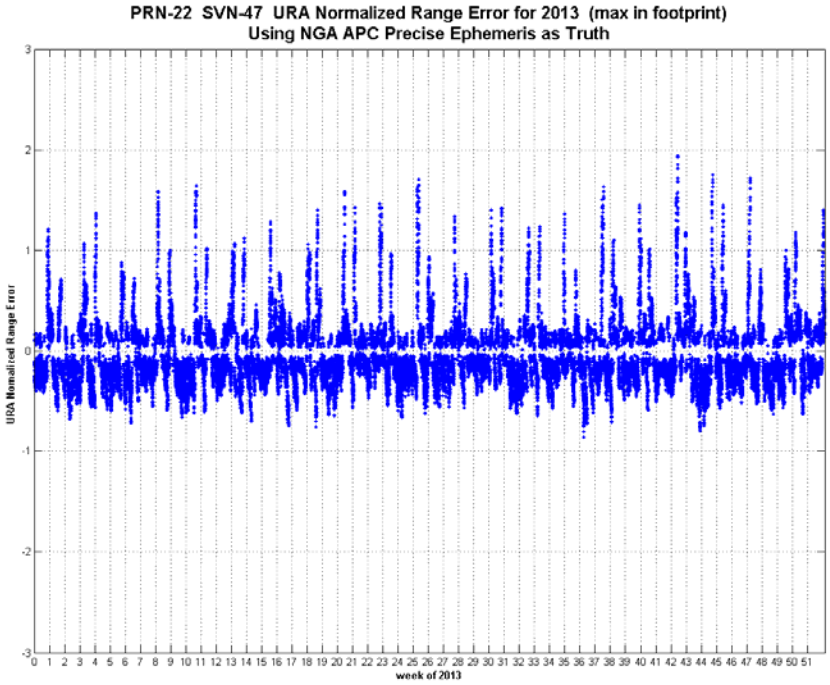


Figure 12-98 Timeline of URA Normalized Range Error PRN-23 SVN-60

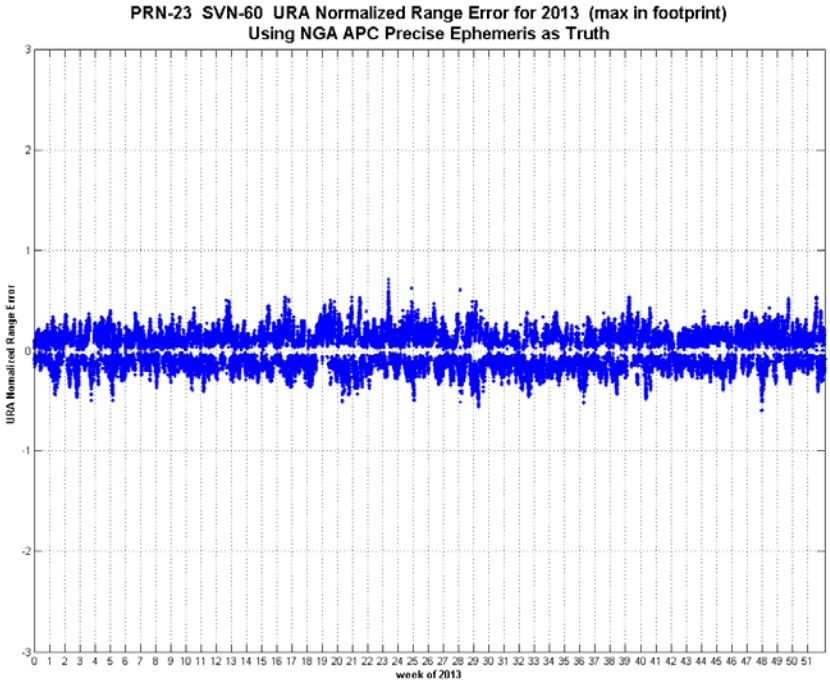


Figure 12-99 Timeline of URA Normalized Range Error PRN-24 SVN-24

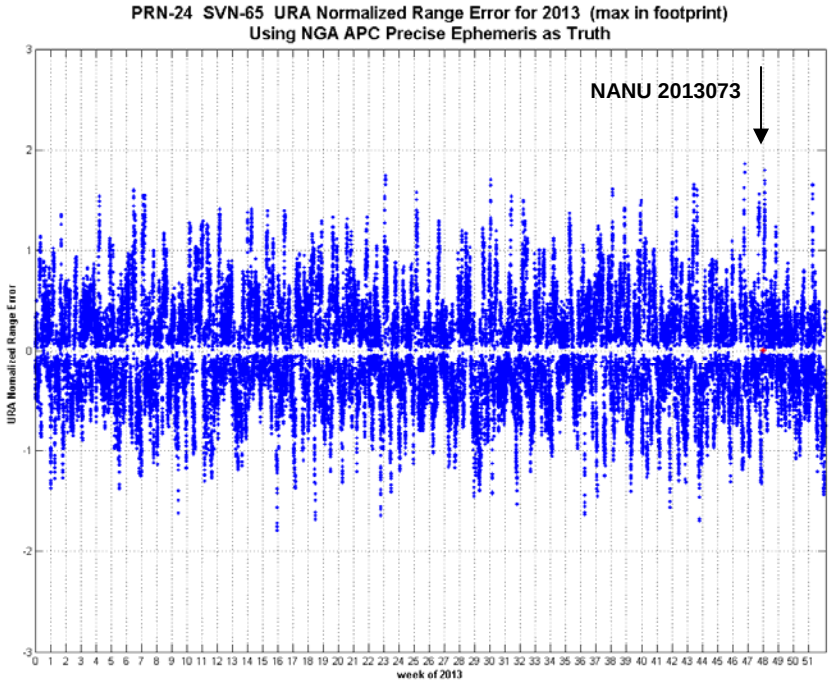


Figure 12-100 Timeline of URA Normalized Range Error PRN-25 SVN-62

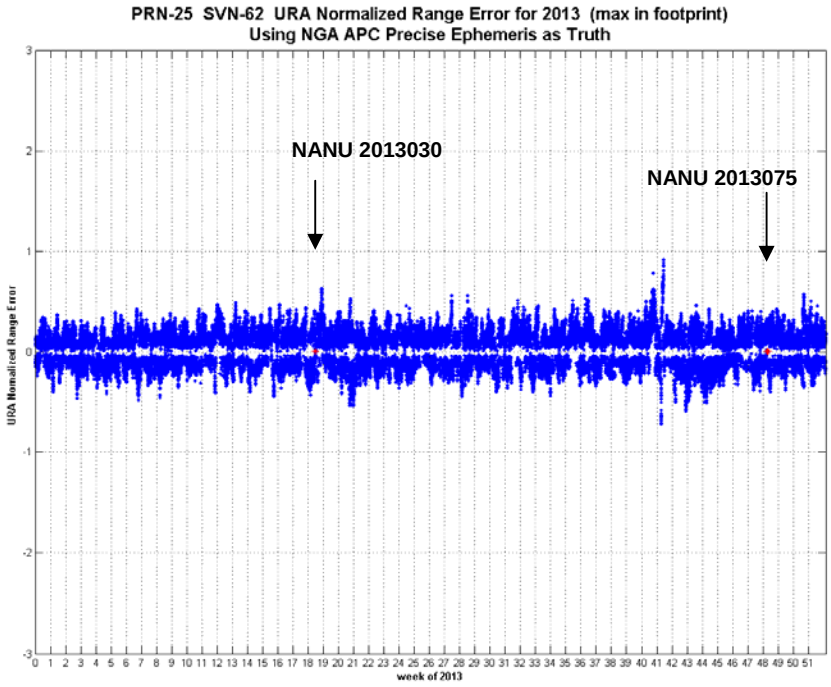


Figure 12-101 Timeline of URA Normalized Range Error PRN-26 SVN-26

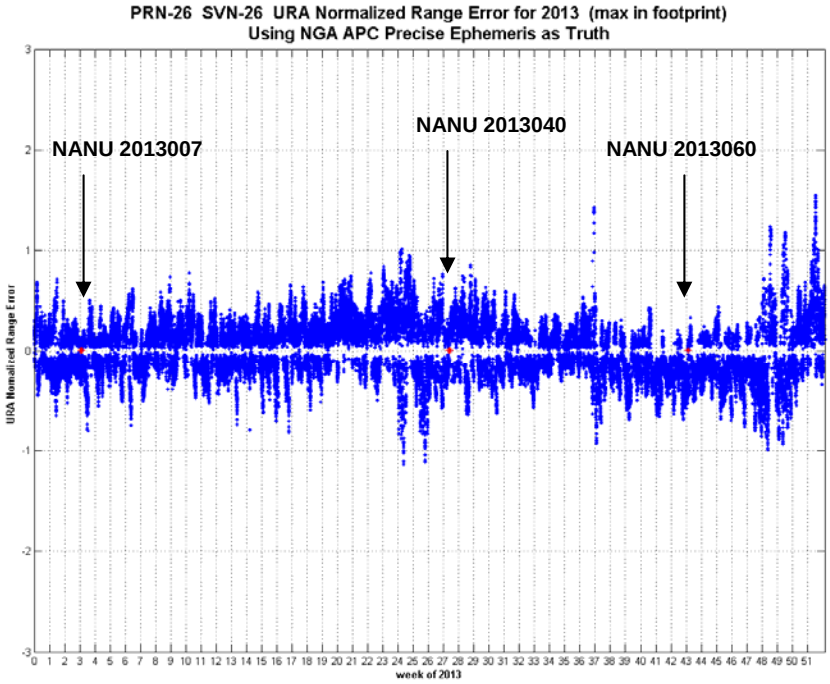


Figure 12-102 Timeline of URA Normalized Range Error PRN-27 SVN-27

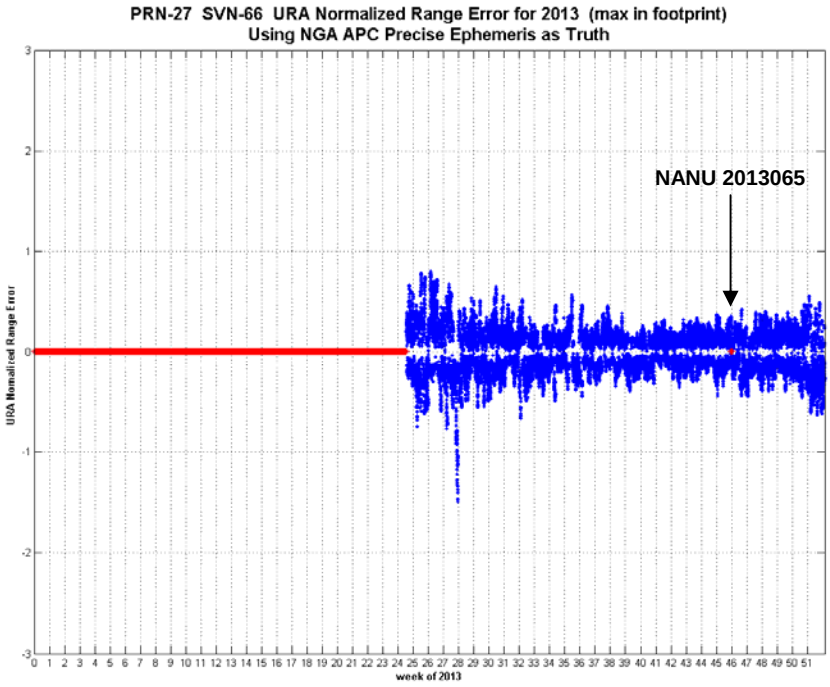


Figure 12-103 Timeline of URA Normalized Range Error PRN-28 SVN-44

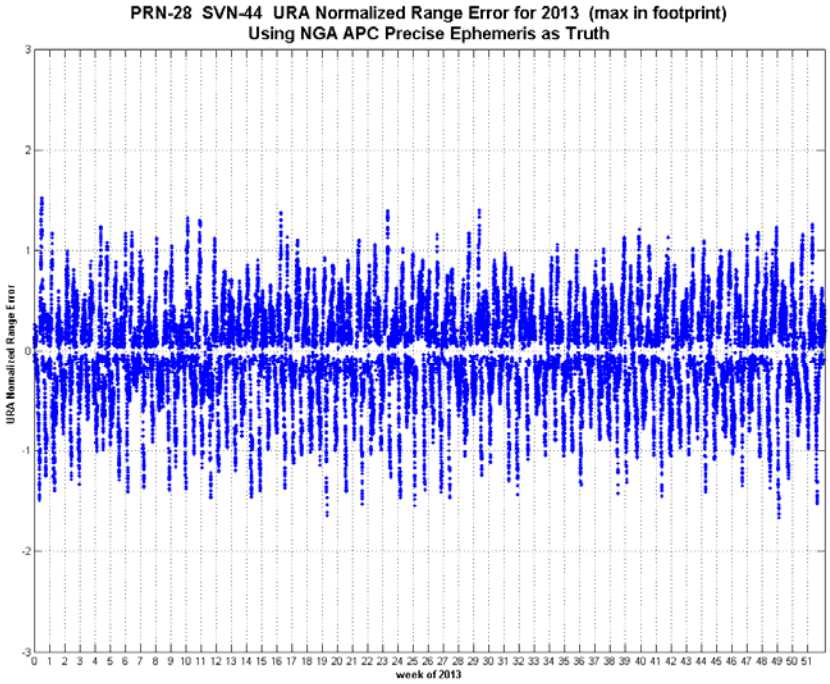


Figure 12-104 Timeline of URA Normalized Range Error PRN-29 SVN-57

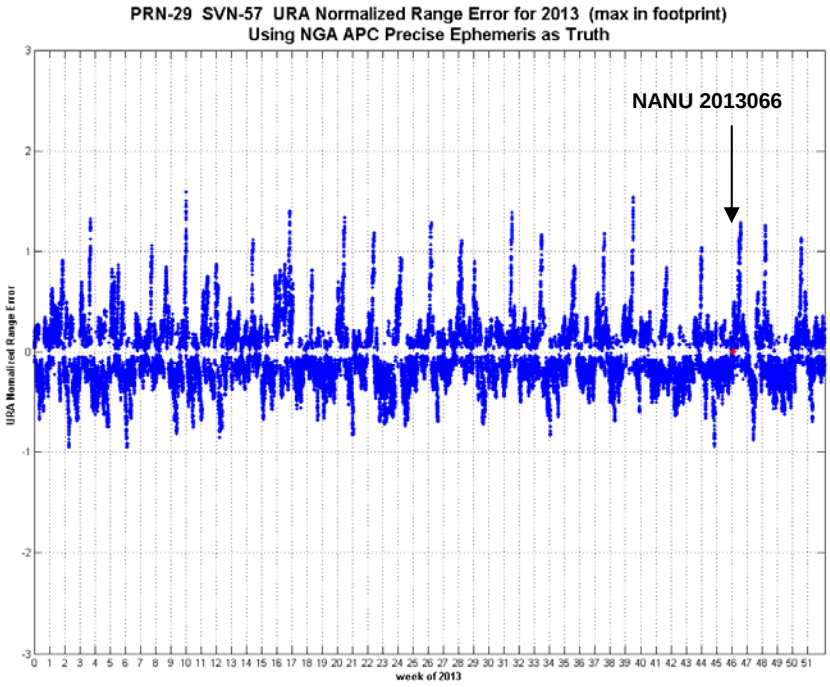


Figure 12-105 Timeline of URA Normalized Range Error PRN-30 SVN-35

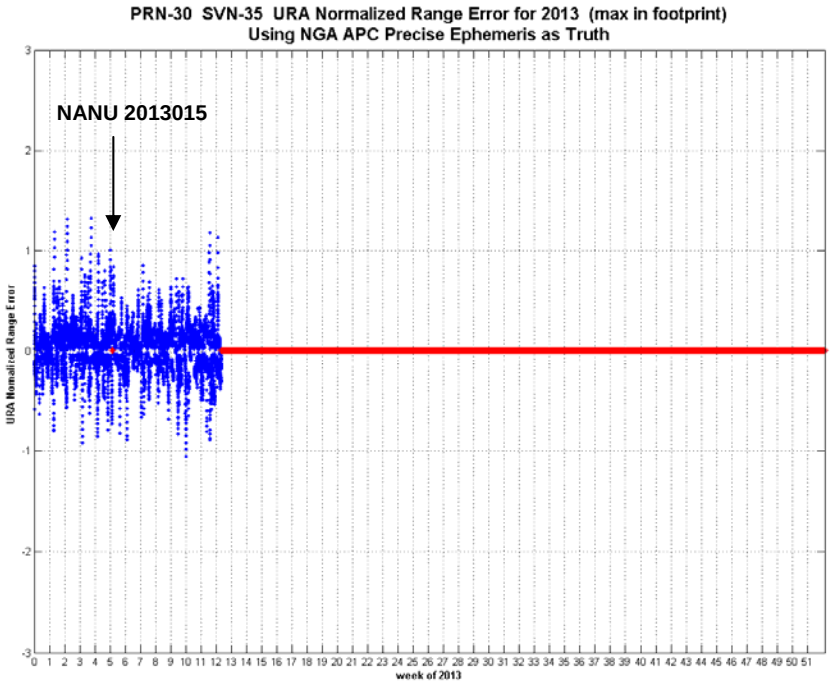


Figure 12-106 Timeline of URA Normalized Range Error PRN-31 SVN-52

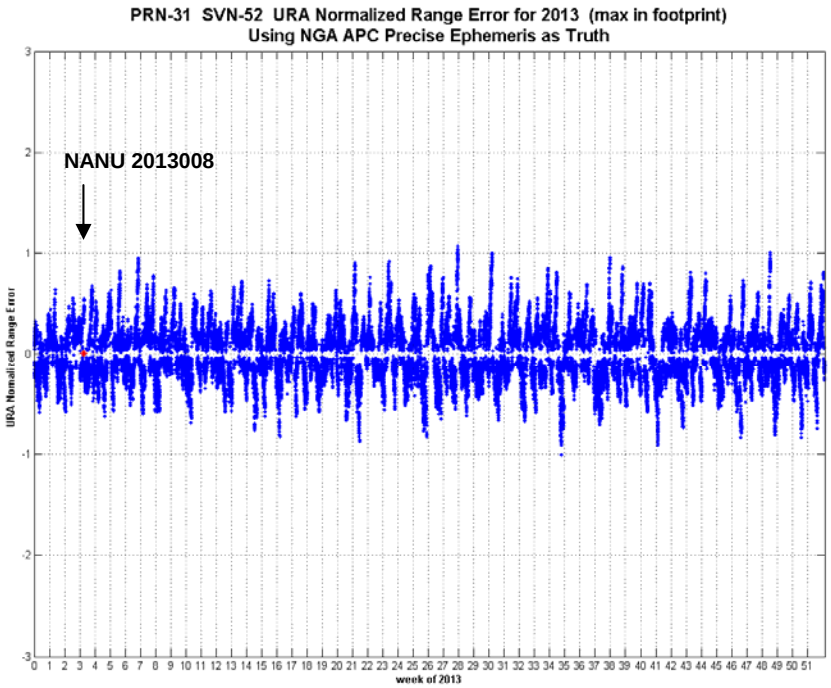


Figure 12-107 Timeline of URA Normalized Range Error PRN-32 SVN-23

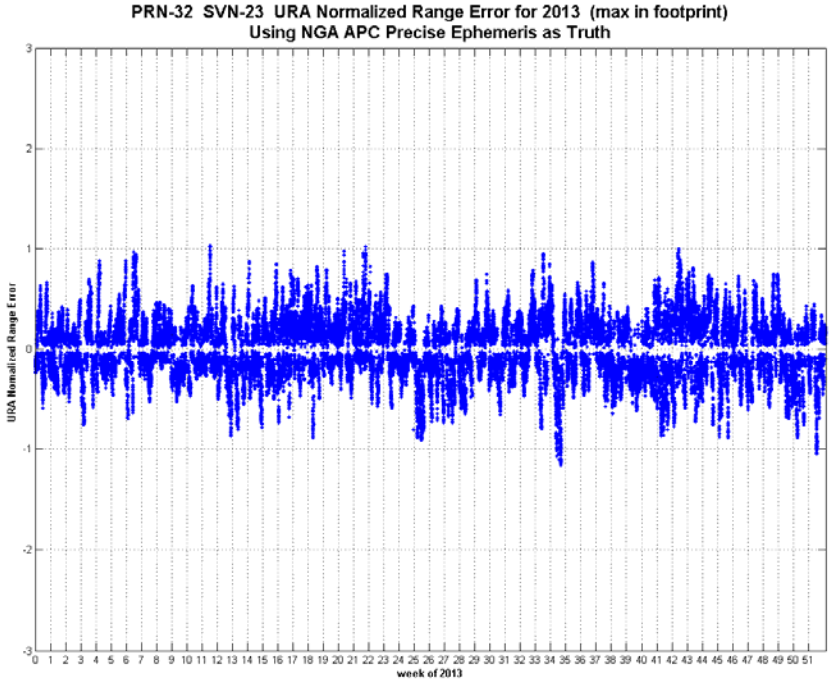


Figure 12-108 2013 URA Over-bounding, Max URA

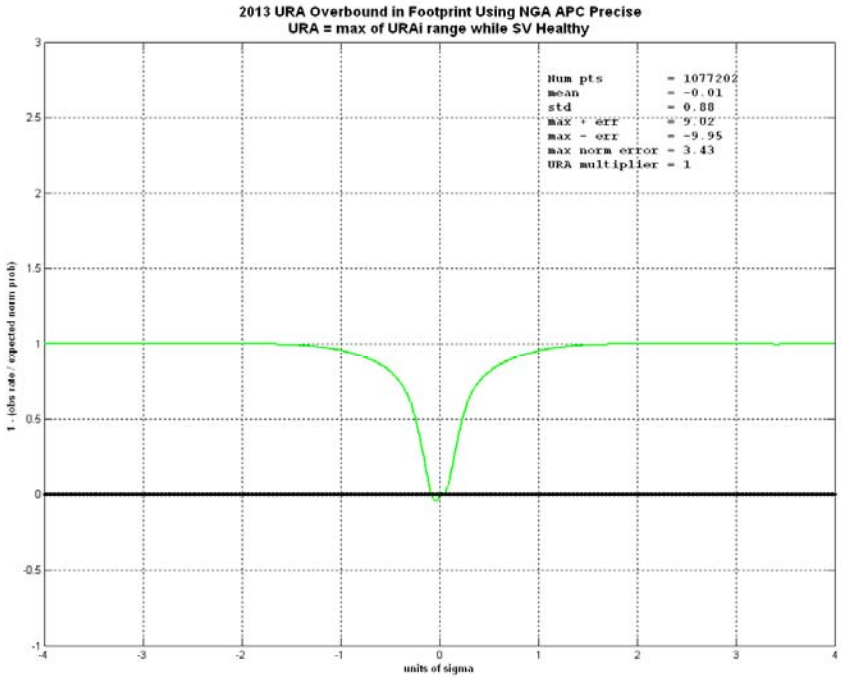
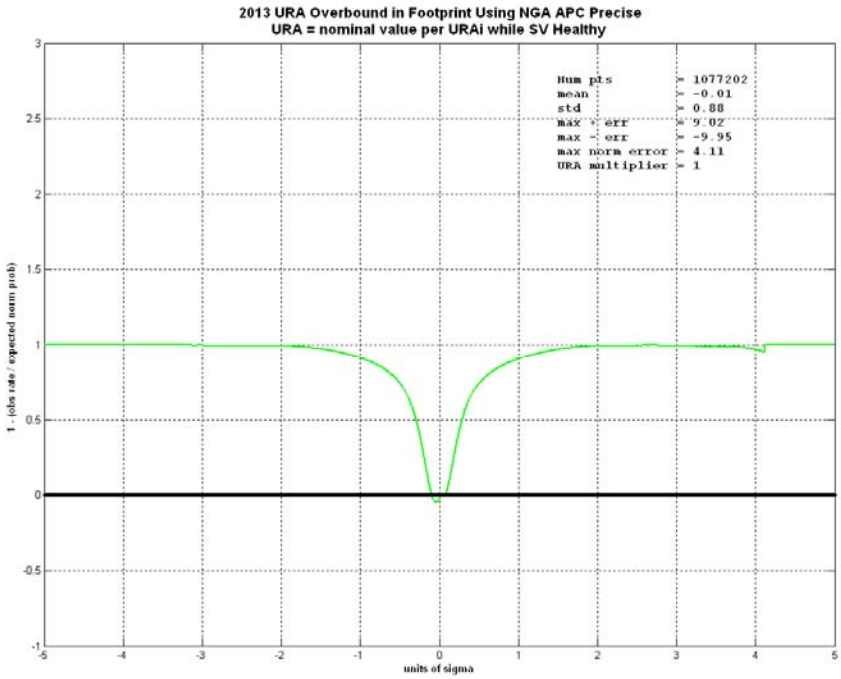


Figure 12-109 2013 URA Over-bounding, Nominal URA



Appendix A: Glossary

General Terms and Definitions

Alert. An alert is an indication provided by the GPS/WAAS equipment to inform the user when the positioning performance achieved by the equipment does not meet the integrity requirements.

Availability. The availability of a navigation system is the ability of the system to provide the required function and performance at the initiation of the intended operation. Availability is an indication of the ability of the system to provide usable service within the specified coverage area.

C&V. The Correction and Verification Subsystem.

CONUS. Continental United States.

Continuity. The continuity of a system is the ability of the total system (comprising all elements necessary to maintain aircraft position within the defined airspace) to perform its function without interruption during the intended operation. More specifically, continuity is the probability that the specified system performance will be maintained for the duration of a phase of operation, presuming that the system was available at the beginning of that phase of operation.

Coverage. The coverage provided by a radio navigation system is that surface area or space volume in which the signals are adequate to permit the user to determine position to a specified level of accuracy. Coverage is influenced by system geometry, signal power levels, receiver sensitivity, atmospheric noise conditions, and other factors that affect signal availability.

Dilution of Precision (DOP). The magnifying effect on GPS position error induced by mapping GPS ranging errors into position through the position solution. The DOP may be represented in any user local coordinate desired. Examples are HDOP for local horizontal, VDOP for local vertical, PDOP for all three coordinates, and TDOP for time.

DR. Discrepancy Report

Fault Detection and Exclusion (FDE). Fault detection and exclusion is a receiver processing scheme that autonomously provides integrity monitoring for the position solution, using redundant range measurements. The FDE consists of two distinct parts: fault detection and fault exclusion. The fault detection part detects the presence of an unacceptably large position error for a given mode of flight. Upon the detection, fault exclusion follows and excludes the source of the unacceptably large position error, thereby allowing navigation to return to normal performance without an interruption in service.

GEO. Geostationary Satellite.

Global Positioning System (GPS). A space-based positioning, velocity, and time system composed of space, control, and user segments. The space segment, when fully operational, will be composed of 24 satellites in six orbital planes. The control segment consists of five monitor stations, three ground antennas, and a master control station. The user segment consists of antennas and receiver-processors that provide positioning, velocity, and precise timing to the user.

Grid Ionospheric Vertical Error (GIVE). GIVEs indicate the accuracy of ionospheric vertical delay correction at a geographically defined ionospheric grid point (IGP). WAAS transmits one GIVE for each IGP in the mask.

Hazardous Misleading Information (HMI). Hazardous misleading information is any position data, that is output, that has an error larger than the current protection level (HPL/VPL), without any indication of the error (e.g., alert message sequence).

Horizontal Alert Limit (HAL). The Horizontal Alert Limit (HAL) is the radius of a circle in the horizontal plane (the local plane tangent to the WGS-84 ellipsoid), with its center being at the true position, which describes the region that is

required to contain the indicated horizontal position with a probability of $1\text{-}10^{-7}$ per flight hour, for a particular navigation mode, assuming the probability of a GPS satellite integrity failure being included in the position solution is less than or equal to 10^{-4} per hour.

Horizontal Protection Level (HPL). The Horizontal Protection Level is the radius of a circle in the horizontal plane (the plane tangent to the WGS-84 ellipsoid), with its center being at the true position, which describes the region that is assured to contain the indicated horizontal position. It is based upon the error estimates provided by WAAS.

IGS. International GPS Service.

Ionospheric Grid Point (IGP). IGP is a geographically defined point for which the WAAS provides the vertical ionospheric delay.

LNAV. Lateral Navigation.

LP. Localizer Performance. LP is a WAAS operational service level with a HAL equal to 40 meters.

LPV. Localizer Performance with Vertical Guidance. LPV is a WAAS operational service level with a HAL equal to 40 meters and a VAL equal to 50 meters.

LPV 200. Localizer Performance with Vertical Guidance to 200 ft decision height. LPV 200 is a WAAS operational service level with a HAL equal to 40 meters and a VAL equal to 35 meters.

MOPS. Minimum Operational Performance Standards.

NANU. Notice Advisory to Navstar Users. NANU is an advisory message to inform users of a change in the GPS constellation. These messages inform users in advance of planned maintenance and also notify users of unscheduled outages.

Navigation Message. Message structure designed to carry navigation data.

Non-Precision Approach (NPA) Navigation Mode. The Non-Precision Approach navigation mode refers to the navigation solution operating with a minimum of four satellites with fast and long term WAAS corrections (no WAAS ionospheric corrections) available.

Position Solution. The use of ranging signal measurements and navigation data from at least four satellites to solve for three position coordinates and a time offset.

Precision Approach (PA) Navigation Mode. The Precision Approach navigation mode refers to the navigation solution operating with a minimum of four satellites with all WAAS corrections (fast, long term, and ionospheric) available.

RFI. Radio Frequency Interference.

Selective Availability. Protection technique employed by the DOD to deny full system accuracy to unauthorized users.

Signal Quality Monitor (SQM). SQM monitors correlator measurements to detect signal deformations that originate in the GPS or GEO satellites and ensures that the UDREs are sufficiently inflated to protect given the monitor's current observations.

Standard Positioning Service (SPS). Three-dimensional position and time determination capability provided to a user equipped with a minimum capability GPS SPS receiver in accordance with GPS national policy and the performance specifications.

SV. Space Vehicle.

User Differential Range Error (UDRE). UDRE's indicate the accuracy of combined fast and slow error corrections. WAAS transmits one UDRE for each satellite in the mask.

Vertical Alert Limit (VAL). The Vertical Alert Limit is half the length of a segment on the vertical axis (perpendicular to the horizontal plane of WGS-84 ellipsoid), with its center being at the true position, which describes the region that is required to contain the indicated vertical position with a probability of $1\text{-}10^{-7}$ per flight hour, for a particular navigation mode, assuming the probability of a GPS satellite integrity failure being included in the position solution is less than or equal to 10^{-4} per hour.

Vertical Protection Level (VPL). The Vertical Protection Level is half the length of a segment on the vertical axis (perpendicular to the horizontal plane of WGS-84 ellipsoid), with its center being at the true position, which describes the region that is assured to contain the indicated vertical position. It is based upon the error estimates provided by WAAS.

VNAV. Vertical Navigation.

Wide Area Augmentation System (WAAS). The WAAS is made up of an integrity reference monitoring network, processing facilities, geostationary satellites, and control facilities. Wide area reference stations and integrity monitors are widely dispersed data collection sites that contain GPS/WAAS ranging receivers that monitor all signals from the GPS, as well as the WAAS geostationary satellites. The reference stations collect measurements from the GPS and WAAS satellites so that differential corrections, ionospheric delay information, GPS/WAAS accuracy, WAAS network time, GPS time, and UTC can be determined. The wide area reference station and integrity monitor data are forwarded to the central data processing sites. These sites process the data in order to determine differential corrections, ionospheric delay information, and GPS/WAAS accuracy, as well as verify residual error bounds for each monitored satellite. The central data processing sites also generate navigation messages for the geostationary satellites and WAAS messages. This information is modulated on the GPS-like signal and broadcast to the users from geostationary satellites.

Appendix B: Additional Coverage Plots

This section includes coverage plots with 99% LPV 200 availability contour, 98% LPV availability contours, and 98% LP availability contours for the quarter. Figure B.1 shows CONUS coverage with 98% LP availability contour. Figure B.2 shows Alaska coverage with 98% LP availability contour. .Figure B.3 shows CONUS coverage with 98% LPV availability contour. Figure B.4 shows Alaska coverage with 98% LPV availability contour. Figure B.5 shows CONUS coverage with 99% LPV 200 availability contour. Figure B.6 shows Alaska coverage with 99% LPV 200 availability contour.

Figure B-1 98% CONUS LP Availability Contour

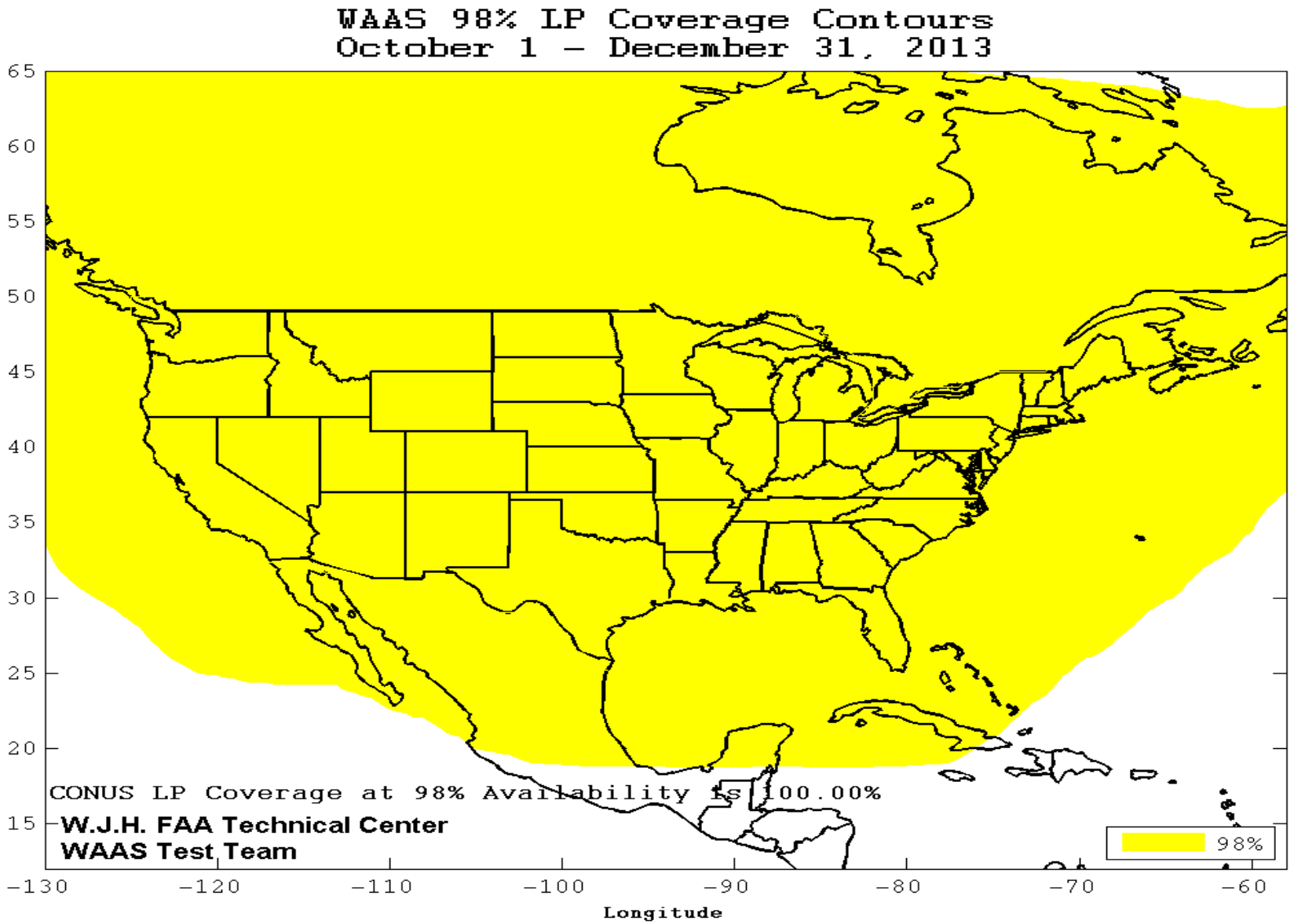


Figure B-2 98% Alaska LP Availability Contour

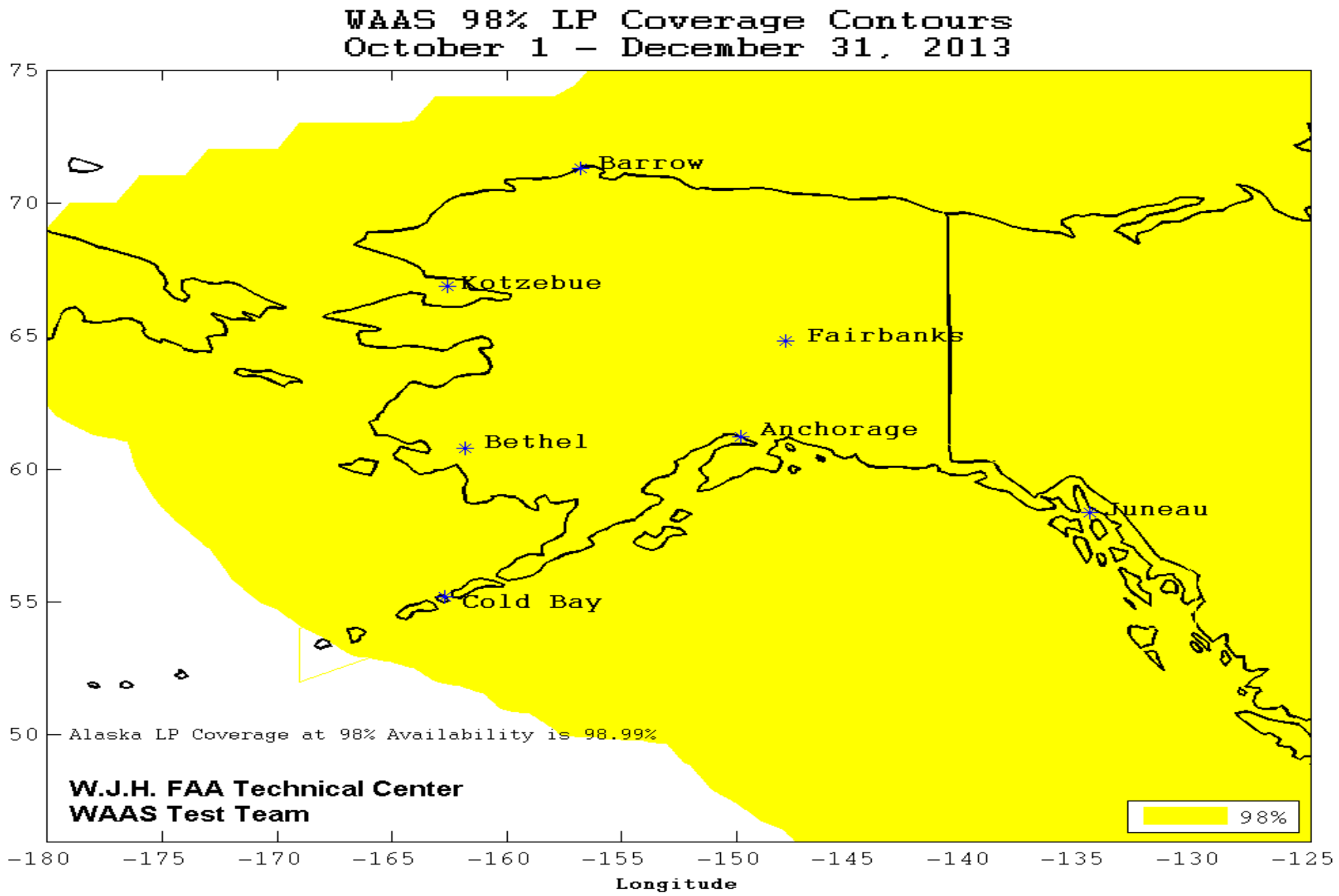


Figure B-3 98% CONUS LPV Availability Contour

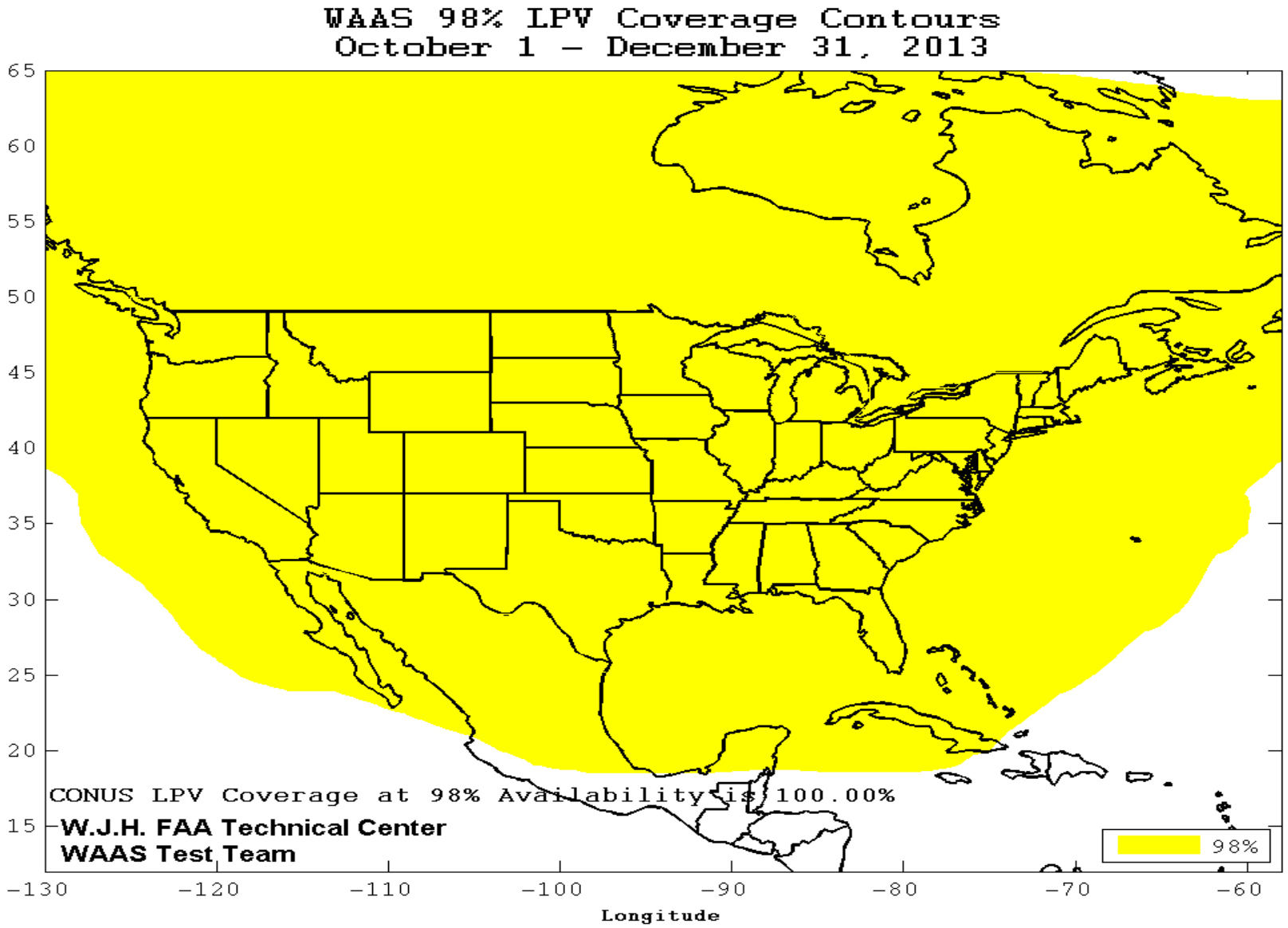


Figure B-4 98% Alaska LPV Availability Contour

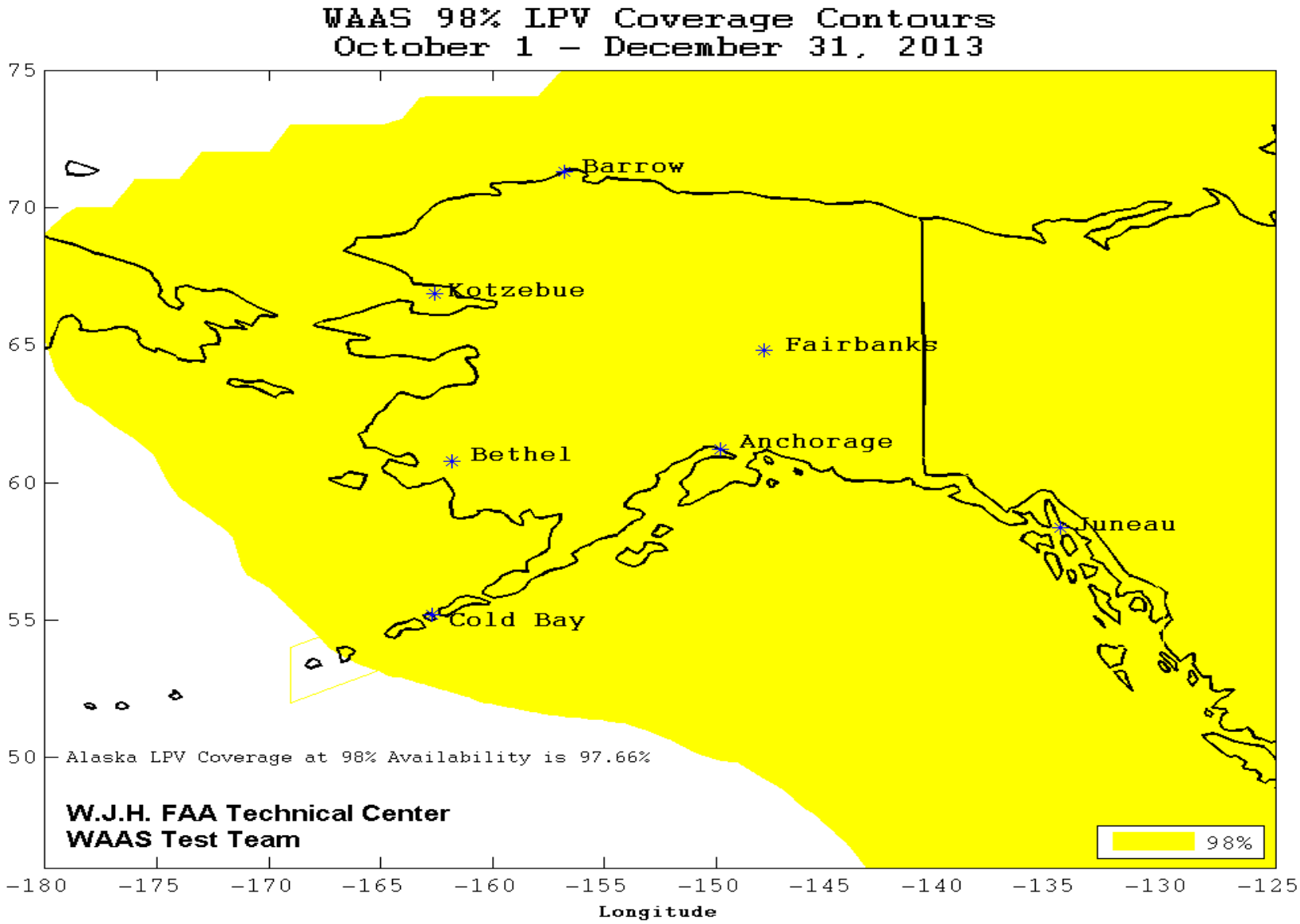


Figure B-5 99% CONUS LPV 200 Availability Contour

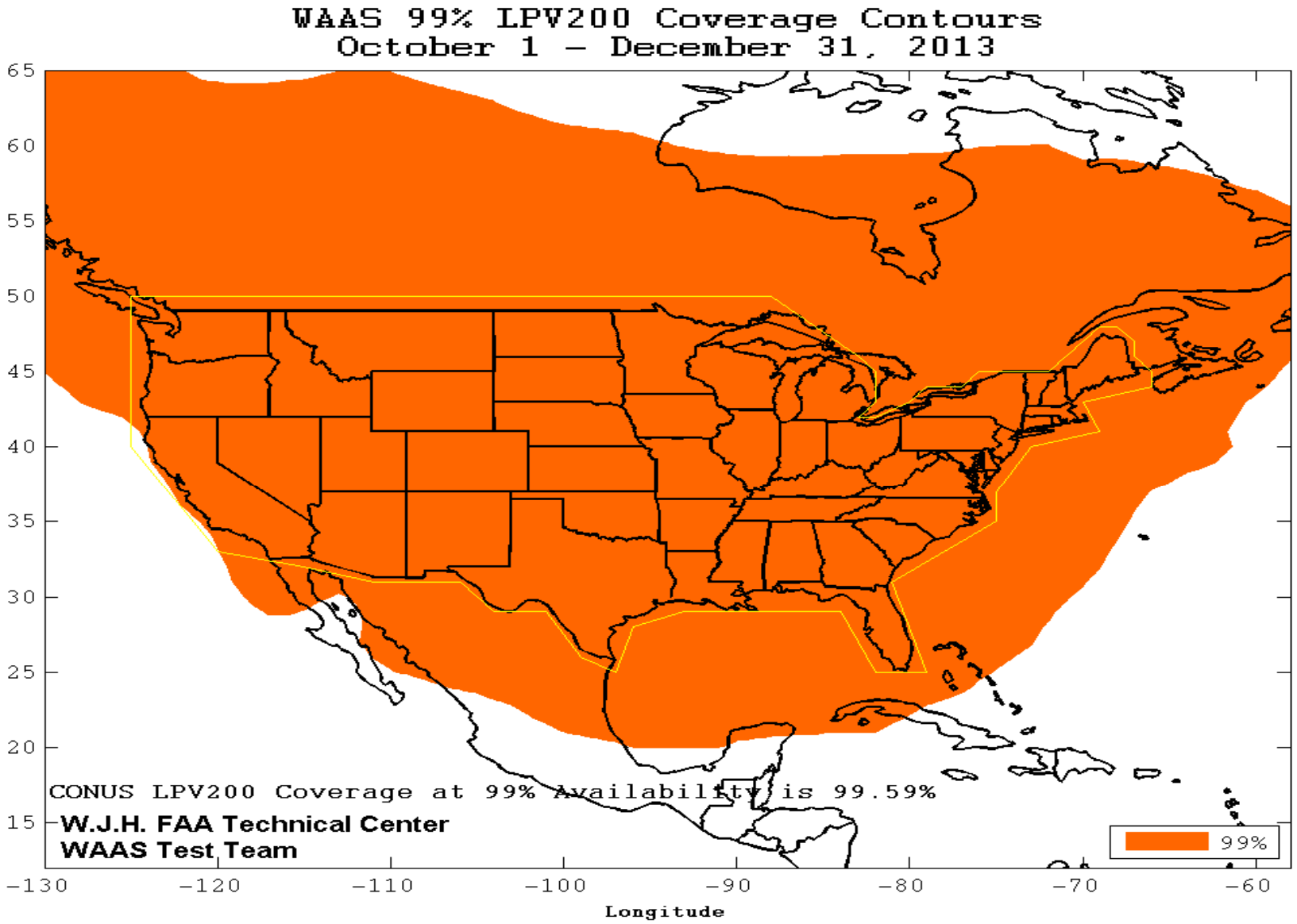


Figure B-6 99% Alaska LPV 200 Availability Contour